Hewlett Packard
Enterprise

HPE ProLiant DL110 Gen11 Server User Guide

Part Number: 30-B80B26F8-003
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Edition: 3

HPE ProLiant DL110 Gen11 Server User Guide

Abstract

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

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Notices

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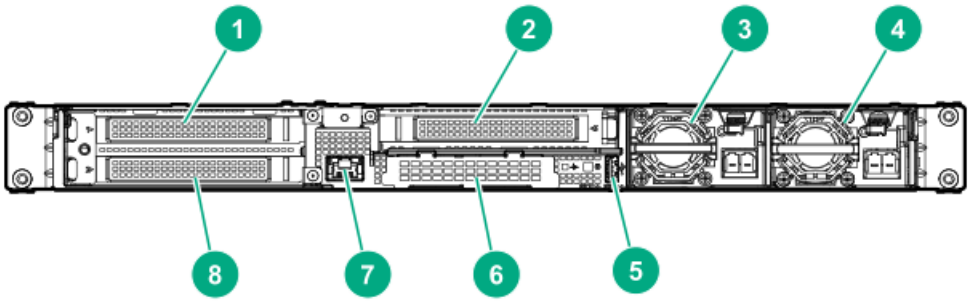
- Documentation feedback

Component identification

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

Subtopics

Front panel components



Item	Description
1	Slot 1 PCIe5 x16 (16, 8, 4)
2	Slot 3 PCIe5 x16 (16, 8, 4) [1]
3	Flexible Slot power supply 2 (optional)
4	Flexible Slot power supply 1
5	iLO service port
6	Slot 14 OCP PCIe5 x16 [2]
7	iLO dedicated network port
8	Slot 2 PCIe5 x16 (16, 8, 4)

1 Slot 3 is located on the secondary riser board option.
2 This slot supports an SFF OCP NIC 3.0 adapter option.

Subtopics

iLO Service Port

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

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

The Service Port is a USB port with the label **iLO** on the front of the server.

To find out if your server supports this feature, see the server specifications document at the following website: **https://www.hpe.com/info/quickspecs**.

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

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

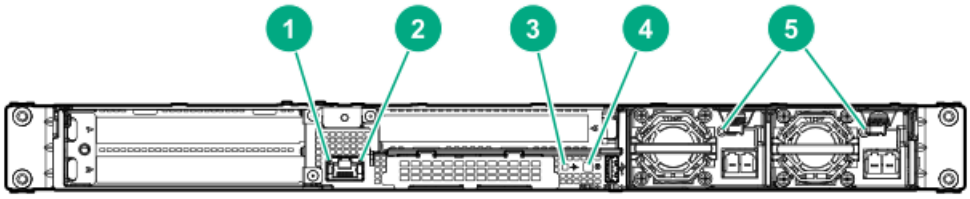
  When you use this feature, the connected USB flash drive is not accessible by the host operating system.
- Connect a client (such as a laptop) with a supported USB to Ethernet adapter to access the following:
  - iLO web interface
  - Remote console
  - iLO RESTful API
  - CLI

When you use the iLO Service Port:

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

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

Front panel LEDs and button



Item	Description	Status	Definition
1	iLO link LED	Solid green	Network link
		Off	No network link
2	iLO status LED	Solid green	Linked to network
		Flashing green	Network active
		Off	No network activity
3	Health LED [1]	Solid green	Normal
		Flashing amber	System degraded [2]
		Flashing red	System critical [1]
4	Power On/Standby button and system power LED [1]	Solid green	System on
		Flashing green	Performing power-on sequence
		Solid amber	System in standby
		Off	No power present [3]
5	Power supply LED	Solid green	The power supply is operating normally.
		Off	No power present [3]

1 When the health and power-on LEDs flash simultaneously, a power fault has occurred. For more information, see Front panel LED power fault codes.

2 If the health LED indicates a degraded or critical state, review the system Integrated Management Log (IML) or use HPE iLO to review the system health status.

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

Subtopics

Front panel LED power fault codes

Front panel LED power fault codes

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

Subsystem	LED behavior
System board	1 flash
Processor	2 flashes
Memory	3 flashes
Riser board PCIe slots	4 flashes
FlexibleLOM	5 flashes
Storage controller	6 flashes
System board PCIe slots	7 flashes
Power backplane	8 flashes
Storage backplane	9 flashes
Power supply	10 flashes
PCIe expansion cards installed in riser board	11 flashes
Chassis	12 flashes
GPU card	13 flashes

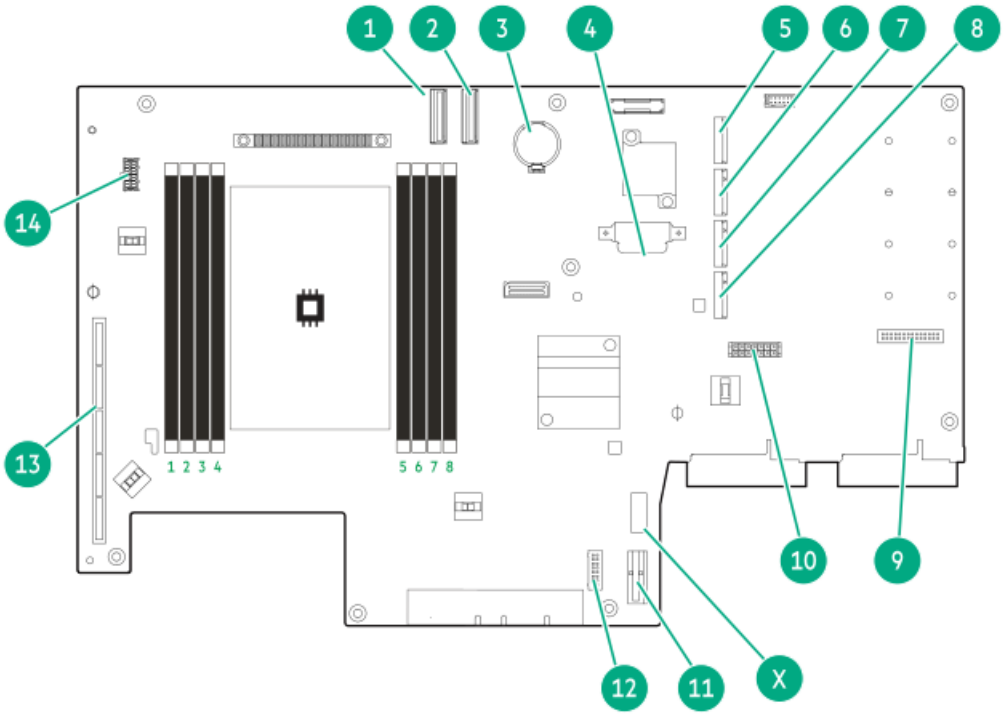
System board components

IMPORTANT:

If a processor with a thermal design power (TDP) value ≤ 165 W is installed, Hewlett Packard Enterprise recommends enabling a processor performance profile.

IMPORTANT:

The server does not support embedded networking. Instead, install a compatible PCIe or OCP networking adapter. For a list of supported adapters, see the product QuickSpecs on the Hewlett Packard Enterprise website (**https://www.hpe.com/info/quickspecs**).



Item	Description
1	MCIO port 1
2	MCIO port 2
3	System battery
4	iLO dedicated network module connector
5	M.2 slot 1 *
6	M.2 slot 2 *
7	M.2 slot 3 *
8	M.2 slot 4 *
9	Fan signal connector
10	Fan power connector
11	Secondary riser connector
12	iLO service port cable connector
13	Primary riser connector
14	Accelerator auxiliary power connector
X	System maintenance switch

* The onboard M.2 slots support SATA and NVMe SSDs in 2280 and 22110 form factors.

Subtopics

Enabling a processor performance profile

System maintenance switch descriptions

DIMM label identification

DIMM slot numbering

Heatsink and processor socket components

Enabling a processor performance profile

Procedure

1. From the boot screen, press F9 to enter UEFI System Utilities.
2. From the System Utilities screen, select System Configuration > BIOS/Platform Configuration (RBSU) > Power and Performance Options > Advanced Performance Tuning Options.
3. Enable the Enhanced Processor Performance option.

   Enabling this option adjusts the processor settings to a more aggressive setting that increases performance, but might result in higher power consumption.
4. Select a processor performance profile.
5. Save your setting.
6. Reboot the server.

System maintenance switch descriptions

Position	Default	Function
S1 [1]	Off	• Off—iLO 6 security is enabled. • On—iLO 6 security is disabled.
S2	Off	Reserved
S3	Off	Reserved
S4	Off	Reserved
S5 [1]	Off	• Off—Power-on password is enabled. • On—Power-on password is disabled.
S6 [1, 2, 3]	Off	• Off—No function • On—Restore default manufacturing settings
S7	Off	Reserved
S8	Off	Reserved
S9	Off	Reserved
S10	Off	Reserved
S11	Off	Reserved
S12	Off	Reserved

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

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

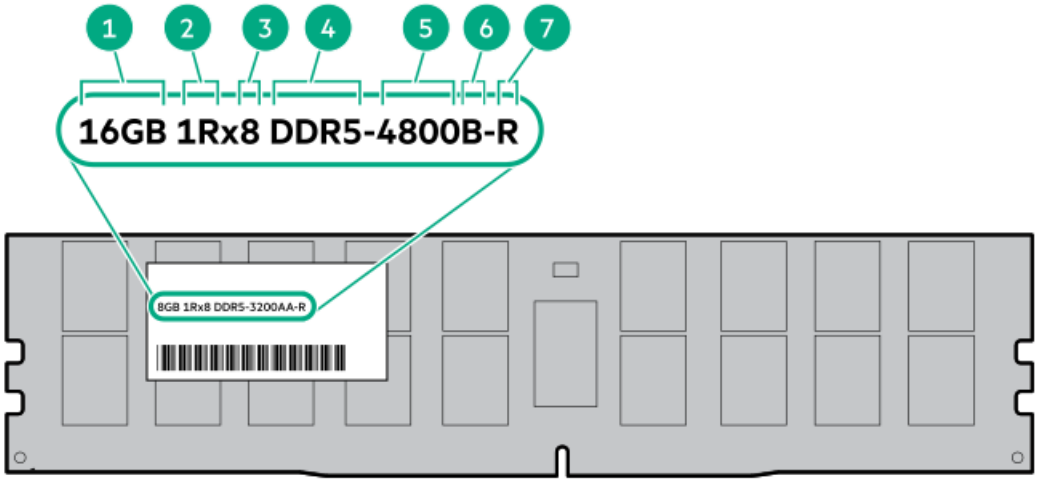
[3] When the system maintenance switch position 6 is set to the On position and Secure Boot is enabled, some configurations cannot be restored. For more information, see Configuring the server.

DIMM label identification

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

For more information about product features, specifications, options, configurations, and compatibility, see the HPE DDR5 SmartMemory QuickSpecs:

https://www.hpe.com/docs/server-memory

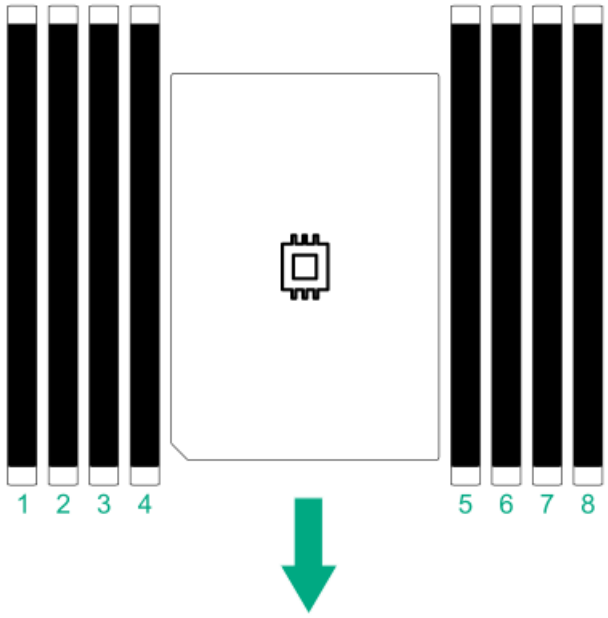


Item	Description	Example
1	Capacity [1]	16 GB 32 GB 64 GB 128 GB 256 GB
2	Rank	1R—Single rank 2R—Dual rank 4R—Quad rank 8R—Octal rank
3	Data width on DRAM	x4—4-bit x8—8-bit
4	Memory generation	PC5—DDR5
5	Maximum memory speed [1]	4800 MT/s
6	CAS latency	B—42-42-42 B—50-42-42 (for 128 GB and 256 GB capacities)
7	DIMM type	E—UDIMM (unbuffered with ECC) R—RDIMM (registered)

[1] The maximum memory speed and capacity is a function of the memory type, memory configuration, and processor model.

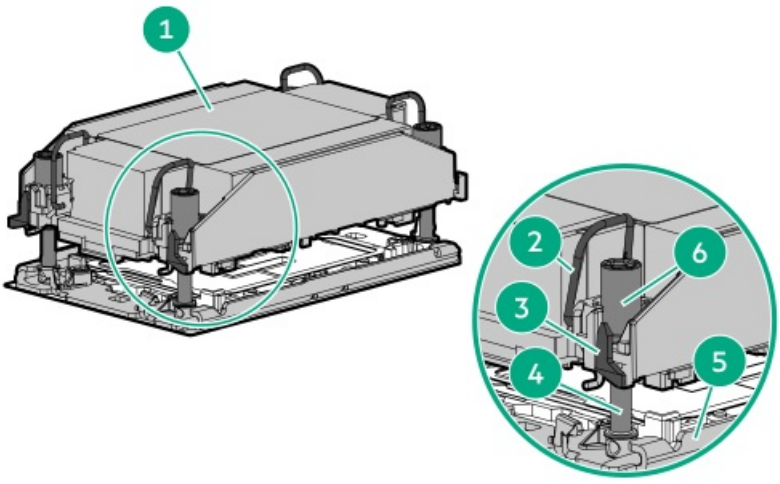
DIMM slot numbering

The arrow points to the front of the server.



Heatsink and processor socket components

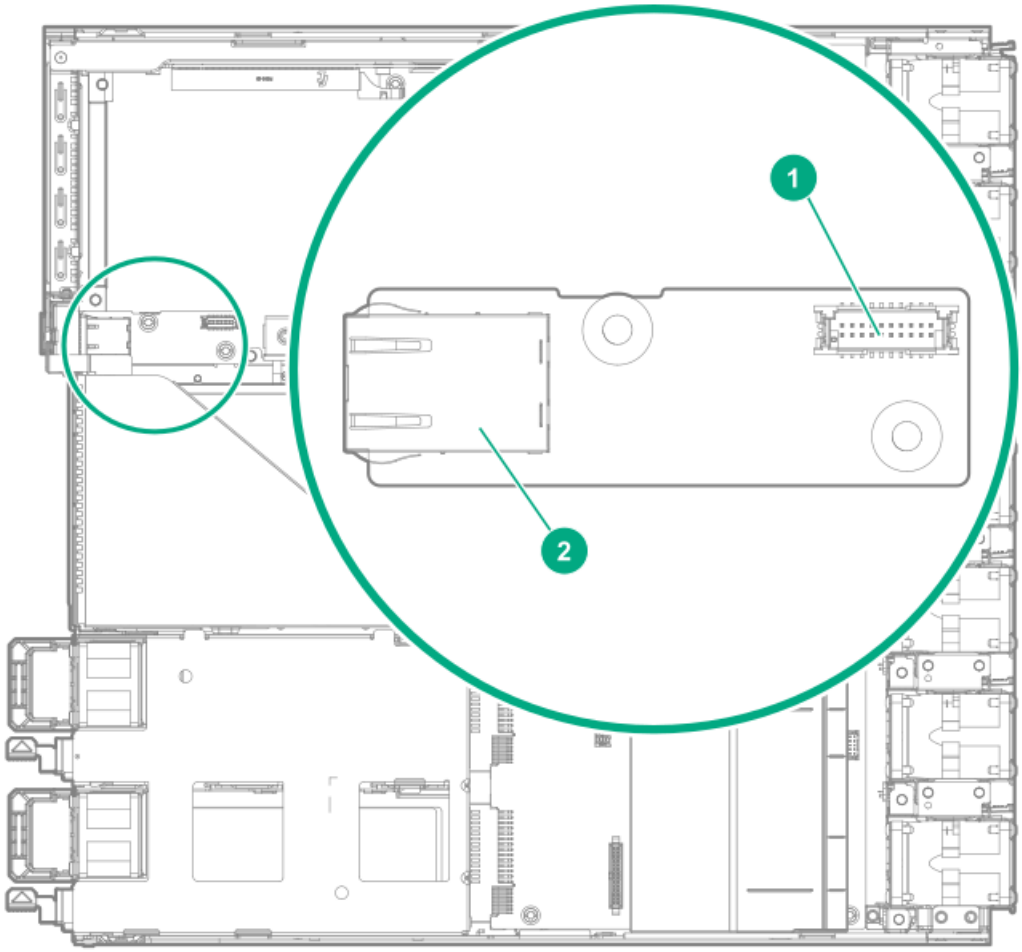
A standard heatsink is shown. Your heatsink might look different.



Item	Description
1	Processor-heatsink module*
2	Anti-tilt wires
3	Processor carrier release tabs
4	Bolster plate guide posts
5	Bolster plate
6	Heatsink screws

* This module consists of the heatsink attached to the processor that is already secured in its carrier.

iLO dedicated network module components

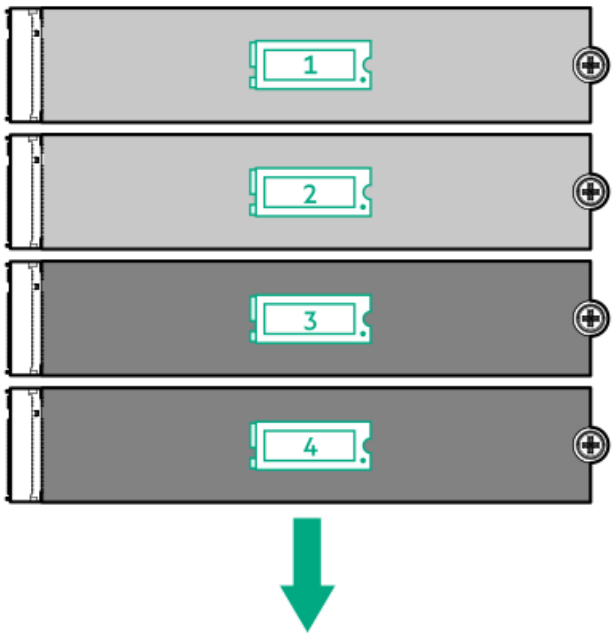


Item	Description
1	iLO dedicated network cable connector
2	iLO dedicated network port

M.2 SSD numbering

The server has four M.2 slots on the system board. These slots support SATA and NVMe SSDs in 2280 and 22110 form factors.

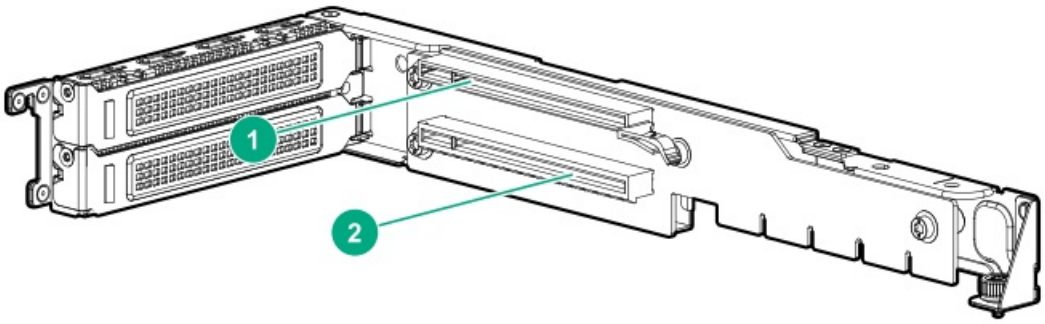
The SSDs installed in the M.2 slots 1 and 2 make up the first RAID pair. The SSDs for the second RAID pair are installed in the M.2 slots 3 and 4.



The arrow points to the front of the server.

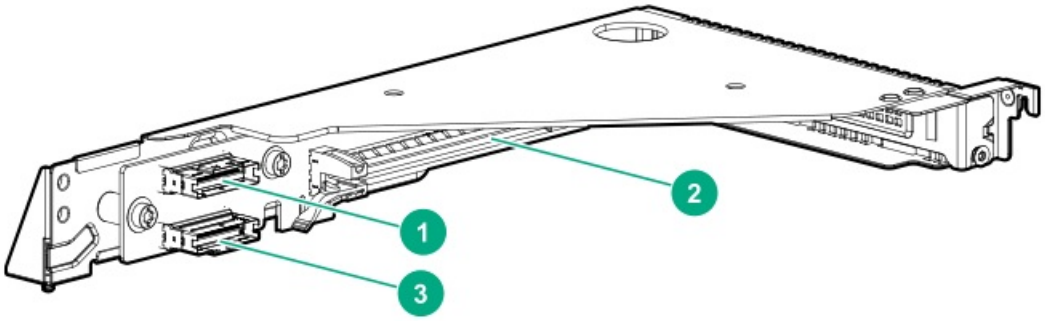
Riser board components

Primary riser board



Item	Description	Supported peripherals
1	Slot 1 PCIe5 x16 (16, 8, 4)	• Full-height, half-length expansion card • Half-height, half-length expansion card
2	Slot 2 PCIe5 x16 (16, 8, 4)	• Full-height, half-length expansion card • Half-height, half-length expansion card

Secondary riser board



Item	Description	Supported peripherals
1	MCIO port 1	MCIO cable*
2	Slot 3 PCIe5 x16 (16, 8, 4)	• Full-height, half-length expansion card • Half-height, half-length expansion card
3	MCIO port 2	MCIO cable*

* The MCIO cable is for routing the PCIe bus signal of the secondary riser.

Fan numbering

To provide sufficient airflow to the system, the server is by default populated by seven hot-plug fans. These fans are high-performance, dual-rotor fan modules.

Fan mode behavior

The seven fan setup provides redundant fan support. In redundant fan mode, if a fan rotor failure occurs:

- The system switches to nonredundant fan mode. The system continues to operate in this mode.
- The system Health LED flashes amber.

If a second fan rotor failure or a missing fan occurs, the operating system gracefully shuts down.

Trusted Platform Module 2.0

The Trusted Platform Module 2.0 (TPM) is a hardware-based system security feature that securely stores artifacts used to authenticate the platform. These artifacts can include passwords, certificates, and encryption keys.

The TPM 2.0 is embedded on the server system board.

The TPM 2.0 is supported with specific operating system support such as Microsoft Windows Server 2012 R2 and later. For more

information about operating system support, see the product QuickSpecs on the Hewlett Packard Enterprise website (https://www.hpe.com/info/quickspecs). For more information about Microsoft Windows BitLocker Drive Encryption feature, see the Microsoft website (https://www.microsoft.com).

Subtopics

Trusted Platform Module 2.0 guidelines

CAUTION:

- Always observe the TPM guidelines in this section. Failure to follow these guidelines can cause hardware damage or halt data access.
- If you do not follow procedures for modifying the server and suspending or disabling the TPM in the OS, an OS that is using TPM might lock all data access. This includes updating system or option firmware, replacing hardware such as the system board and drives, and modifying TPM OS settings.
- Changing the TPM mode after installing an OS might cause problems, including loss of data.

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

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

- When the embedded TPM is enabled, the Trusted Platform Module operates in TPM 2.0 mode.
- Use the UEFI System Utilities to configure the TPM. From the System Utilities screen, select System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Trusted Platform Module options. For more information, see the UEFI user guide:

  https://www.hpe.com/support/UEFIGen11-UG-en
- When using the Microsoft Windows BitLocker Drive Encryption feature, always retain the recovery key or password. The recovery key or password is required to enter Recovery Mode after BitLocker detects a possible compromise of system integrity.
- HPE is not liable for blocked data access caused by improper TPM use. For operating instructions, see the documentation for the encryption technology feature provided by the operating system.

BitLocker recovery key/password retention guidelines

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

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

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

Setup

This chapter describes general operational requirements and safety reminders, as well as the initial setup procedure for the server.

Subtopics

Initial system installation

Depending on your technical expertise and the complexity of the product, for the initial system installation, select one of the following options:

- Ordering the HPE Installation Service
- Setting up the server

Subtopics

HPE Installation Service

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

The HPE Installation Service provides the following benefits:

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

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

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

Intel VROC support

Intel Virtual RAID on CPU (Intel VROC) provides enterprise-level hybrid RAID support. Note the following information:

- Intel VROC provides RAID support for direct attached SATA and NVMe SSDs.
- The Intel VROC driver is required. For the OS-specific driver download, see the following page:

  https://support.hpe.com/hpesc/public/docDisplay?docId=sd00002239en_us&page=GUID-249FA246-0985-4598-8D7E-94069560F959.html
- Intel VROC requires the server boot mode to be set to UEFI Mode.
- Intel VROC RAID support is disabled by default. In the pre-OS environment, use UEFI System Utilities to enable Intel VROC and create a VROC RAID volume. These tasks are not supported in Intelligent Provisioning.
- The VROC RAID volume must use drives of the same interface and form factor.
- Intel VROC supports RAID management through the following tools:
  - Non-OS specific: UEFI System Utilities
  - Windows: Intel VROC GUI, Intel VROC CLI
  - Linux: `mdadm` CLI

For more information on Intel VROC features and configuration, see Configuring storage controllers.

Setting up the server

Prerequisites

Before setting up the server:

- As a best practice, Hewlett Packard Enterprise recommends installing the latest firmware, drivers, and system software before using the server for the first time. You have these options:
  - HPE GreenLake for Compute Ops Management is an advanced software-as-a-service platform that securely streamlines operations from edge-to-cloud and automates key life cycle tasks through a unified single browser-based interface. For more information on using HPE GreenLake for Compute Ops Management , see **https://www.hpe.com/info/com-docs**.
  - Use the Firmware Update option in Intelligent Provisioning—Intelligent Provisioning is a server deployment tool embedded in HPE ProLiant servers. To access Intelligent Provisioning, during the server boot process, press **F10**. For more information, see the Intelligent Provisioning user guide at **https://www.hpe.com/info/intelligentprovisioning/docs**.
  - Download the Service Pack for ProLiant (SPP)—SPP is a comprehensive system software and firmware update solution that is delivered as a single ISO image. This solution uses Smart Update Manager (SUM) as the deployment tool.
    - The preferred method for downloading an SPP is by creating an SPP custom download at **https://www.hpe.com/servers/spp/custom**.

      This option reduces the size of the SPP by excluding firmware and drivers for OS and server models that are not needed.
    - The SPP is also available for download from the SPP download page at **https://www.hpe.com/servers/spp/download**.
- Verify that your OS or virtualization software is supported:
  https://www.hpe.com/support/Servers-Certification-Matrices
- This server does not support PCIe or OCP type storage controllers. For storage configuration, use either SATA AHCI (default) or Intel Virtual RAID on CPU (Intel VROC). If you plan to use Intel VROC, review these important information before setting up the server .
- Read the Operational requirements for the server.

- Read the safety and compliance information:
  https://www.hpe.com/support/safety-compliance-enterpriseproducts

Procedure

1. Unbox the server and verify the contents:
   - Server
   - Power cord
   - Rack installation hardware
   - Documentation
2. (Optional) Install the hardware options.
3. Install the server into the rack:
   - Install the server into a two-post rack
   - Install the server into a four-post rack
4. Press the Power On/Standby button.
5. Decide how to manage the server:
   - Locally: Connect a supported USB Ethernet adapter to the iLO service port . Hewlett Packard Enterprise recommends the HPE USB to Ethernet Adapter (Q7Y55A).
   - Remotely: Connect to the iLO web interface and run a remote console:
     a. Verify the following:
        - iLO is licensed to use the remote console feature.
          If iLO is not licensed, visit the HPE website:

          https://www.hpe.com/info/ilo
        - The iLO management port is connected to a secure network.

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

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

        Note the following:
        - The iLO hostname is on the iLO information label on the access panel.
        - If a DHCP server assigns the IP address, the IP address appears on the boot screen.
        - If a static IP address is assigned, use that IP address.
        - The default login credentials are on the iLO information label on the access panel.

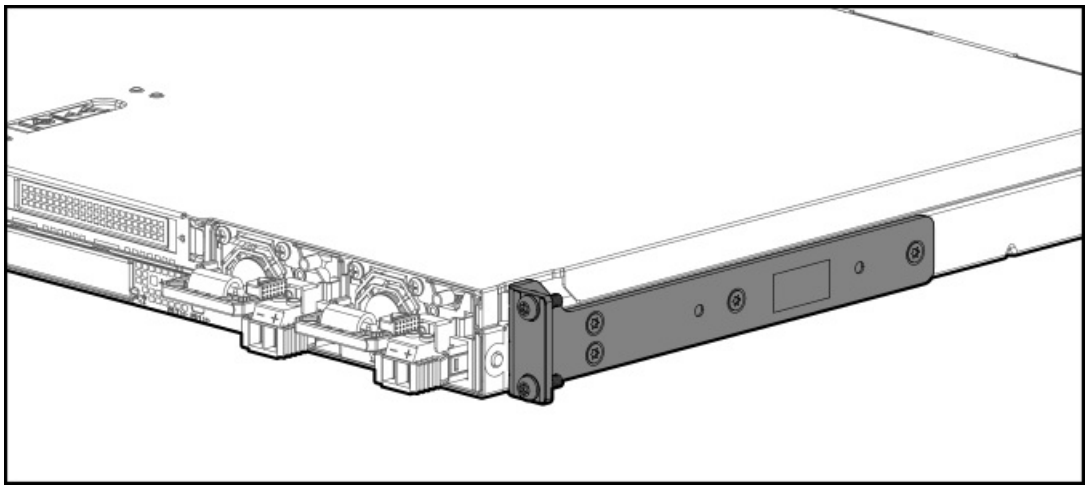
     c. Enter the iLO login name and password, and then click Log In.

     d. In the navigation tree, click the Remote Console & Media link, and then launch a remote console.
6. Configure the initial setup of the server.
7. Set up the storage .
8. Deploy an OS or virtualization software.
9. After the OS is installed, update the drivers.
10. Register the server.

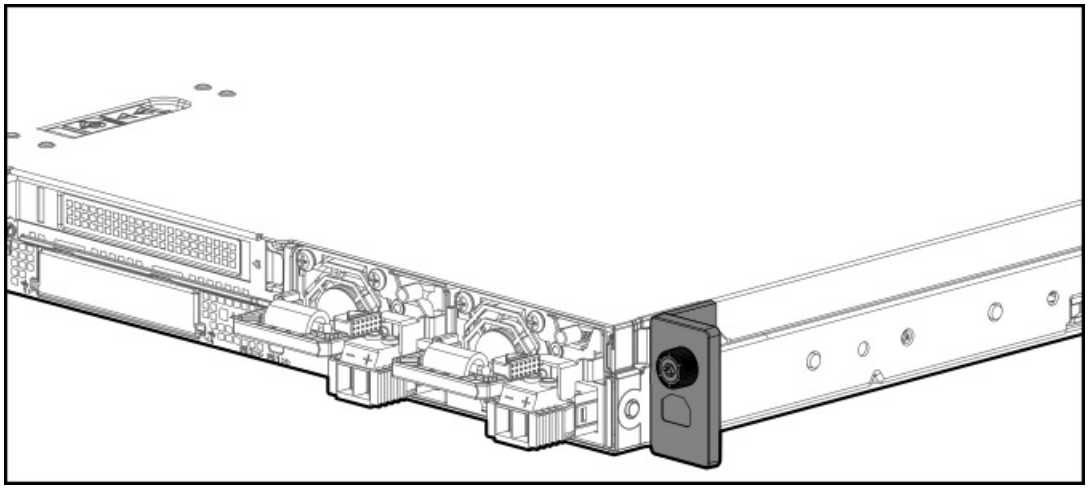
Rack installation support

The server occupies 1U space in a rack. The type of chassis ears installed determines whether the server can be installed in a two-post or a four-post rack.

- Long chassis ears for two-post or four-post rack installation.



- Short chassis ears for four-post rack installation.



Subtopics

Install the server into a two-post rack

Install the server into a four-post rack

Install the server into a two-post rack

Prerequisites

- The server is secured to the rack by four screws fastened to the front rack columns. There are no rack rails supporting this server. Get help to lift and stabilize the server during rack installation. **At least two people must install the server into the rack:** One person to support the server weight, and the other to install the screws.
- Before you perform this procedure, review the:
  - Space and airflow requirements
  - Rack warnings and cautions

- Server warnings and cautions

- A fully populated server is heavy. Hewlett Packard Enterprise recommends removing the external chassis components before installing the server into a rack.
- T-25 Torx #10 x 3-1/2 screws (included in the server box)
- For first-time installation in a square-hole rack, the following items are required:
  - Standard cage nuts (included in the server box)
  - Cage nut insertion tool
- Before you perform this procedure, make sure that you have a T-25 Torx screwdriver or a torque screwdriver with T-25 Torx bit available.

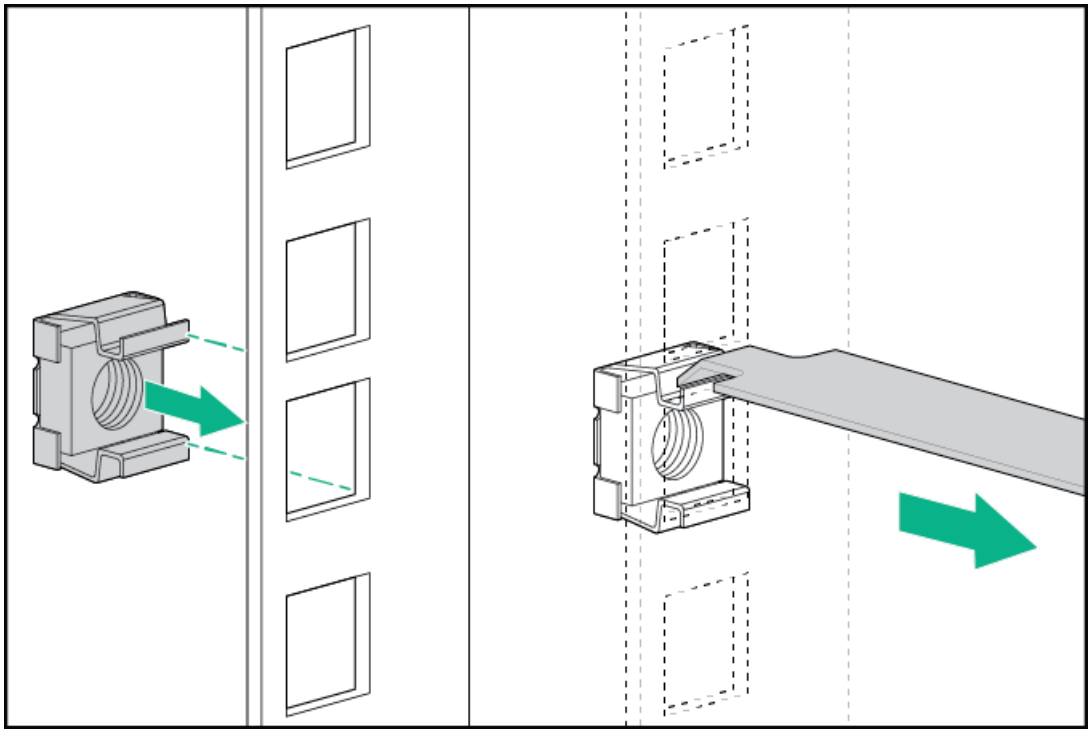
About this task

IMPORTANT:

To install the server in the rack, use the T-25 Torx #10 x 3-1/2 screws and cage nuts that shipped with the server. These screws are designed to support the weight of this server. To replace this hardware, use M6 mounting screws with matching standard cage nuts.

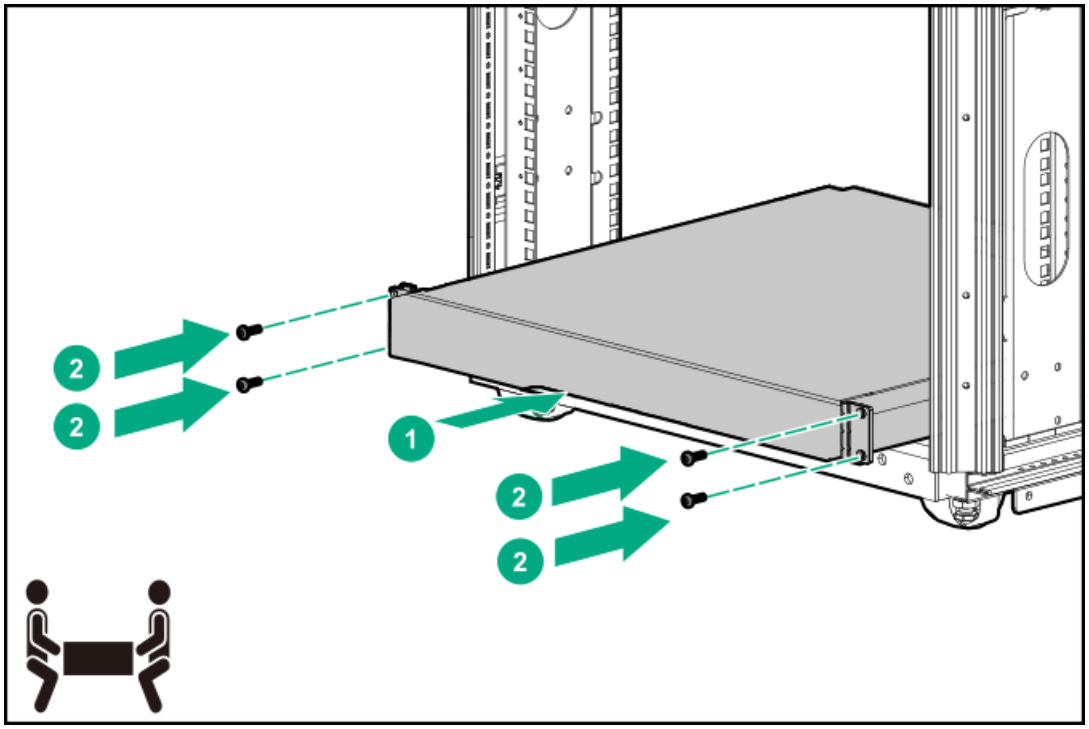
Procedure

1. For first-time installation in a square-hole rack, install the cage nuts on the front rack columns. When installed, the lips (flanges) on the cage nut must face the outside of the rack:
   a. Hook the bottom lip of the cage nut in the square perforation of the front rack column.
   b. Insert the tip of the insertion tool through the perforation and hook the top lip of the cage nut.
   c. Use the insertion tool to pull the cage nut through the hole until the top lip snaps into position.



2. **At least two people must install the server into the rack.**
   a. First person: While supporting the weight of the server, position the server inside the rack so that the chassis ears are flush against the rack columns.
   b. Second person: Fully tighten the rack screws until the chassis ears are completely flush against the rack columns.

HPE recommends applying 2.37 N·m (21 lbf-in) of torque to securely tighten the rack screws.



3. Inspect the server installation in the rack.
   - Make sure that the chassis ears are completely flush against the rack columns.
   - Make sure that there is no bending or tilting of the chassis ears.
4. Connect all peripheral cables to the server.
5. Connect each power cord to the server.
6. Connect each power cord to the power source.
7. Employ industry best practices in routing and managing the peripheral cables and power cords.
8. Power up the server.

Results

The installation is complete.

Install the server into a four-post rack

Prerequisites

- Get help to lift and stabilize the server during rack installation. **If the server is installed higher than chest level, an additional two people might be required to help install the server:** One person to support the server weight, and the other two to slide the server into the rack.
- Before you perform this procedure, review the:
  - Space and airflow requirements
  - Rack warnings and cautions
  - Server warnings and cautions
- A fully populated server is heavy. Hewlett Packard Enterprise recommends removing the external chassis components before installing the server into a rack.

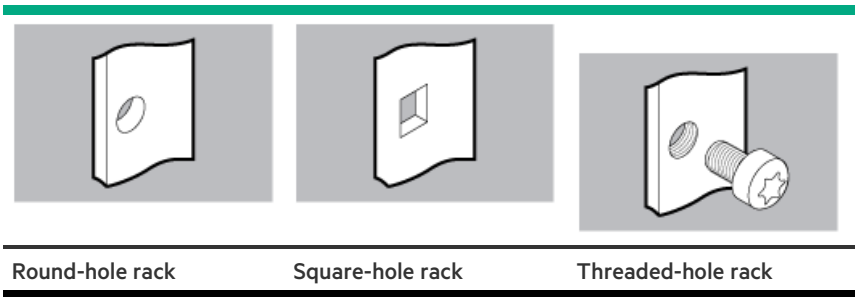
- Before you perform this procedure, make sure that you have the following items available:
  - T-25 Torx screwdriver or a bit driver with T-25 Torx bit
  - Small slotted screwdriver—This tool is required only if you plan to install the server in a threaded-hole rack.

About this task

This server supports the HPE 1U Quick Deploy Friction Rack Rail Kit (775612-B21) . This rail kit supports the following specifications:

- Type: Friction rack rail (stab-in)
- Minimum rail length: 609.60 mm (24.00 in)
- Rail adjustability range: 558.80 to 866.10 mm (22.00 to 34.10 in)

The rack rails can be installed in round-hole, square-hole, or threaded-hole racks. The illustrations used in this procedure show an icon in the upper right corner of the image. This icon indicates the rack type for which the action illustrated in the image is valid.

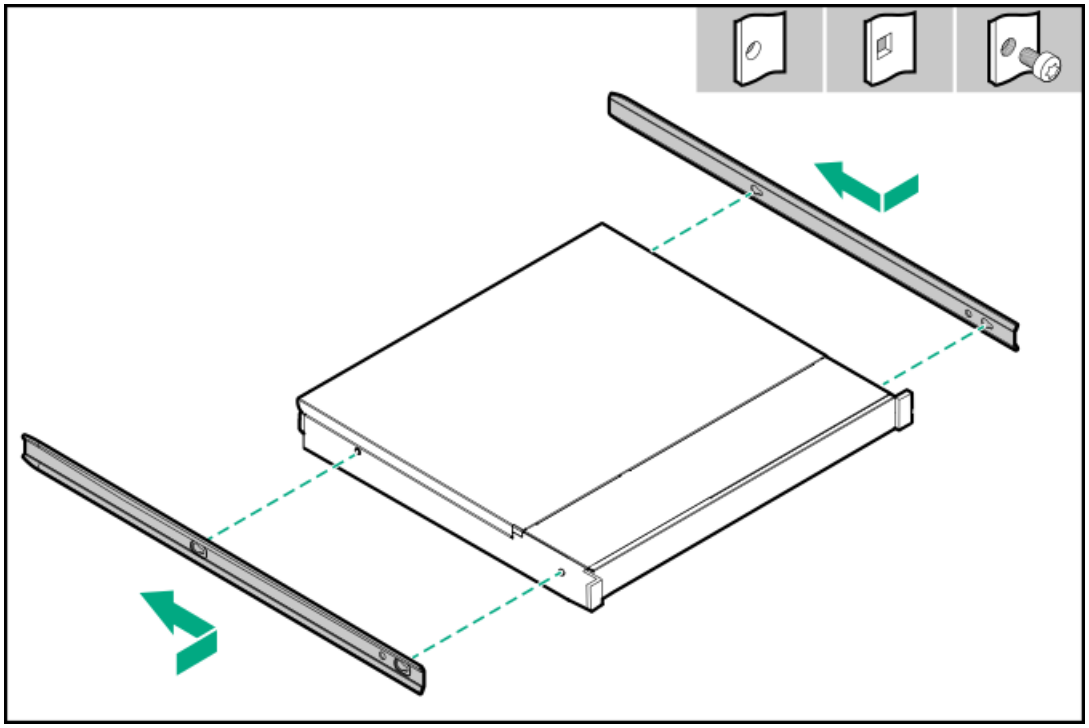


Round-hole rack	Square-hole rack	Threaded-hole rack

Procedure

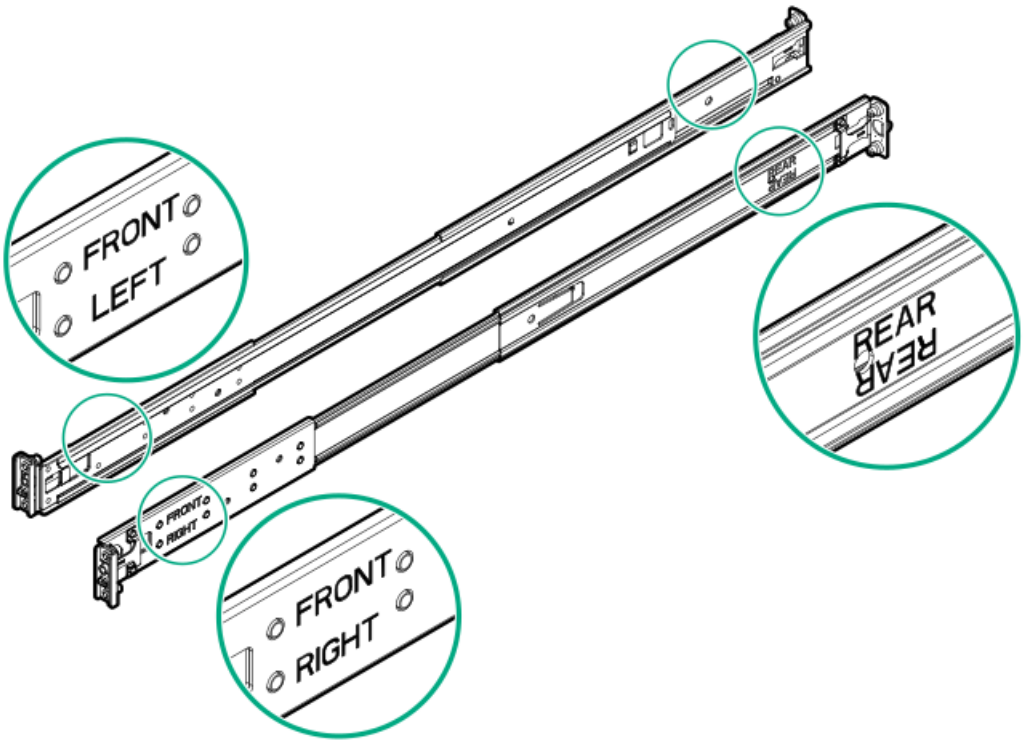
Installing the rack rails on the rack

1. Attach the sliding rails to the server:
   a. Insert the spools on the sides of the server through the notches on the rails.
   b. Slide the rail towards the rear panel to lock it into place.

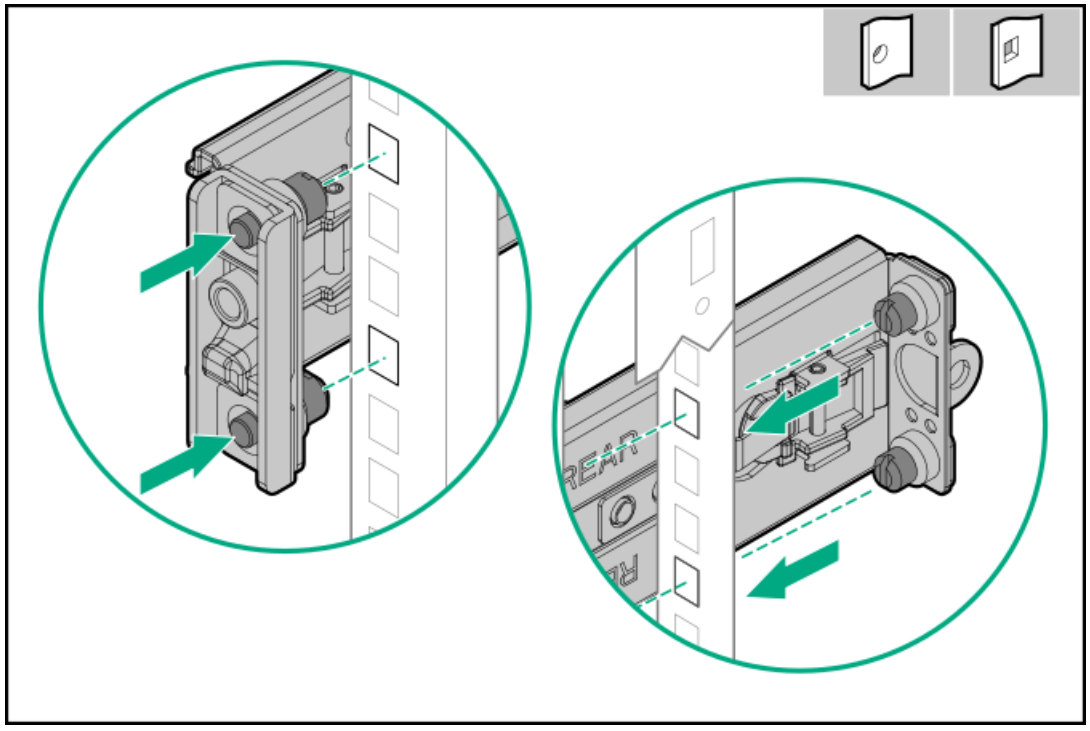


2. Locate the orientation markers on the mounting rails.
   - The front end of the rails is marked as **FRONT LEFT** or **FRONT RIGHT**.

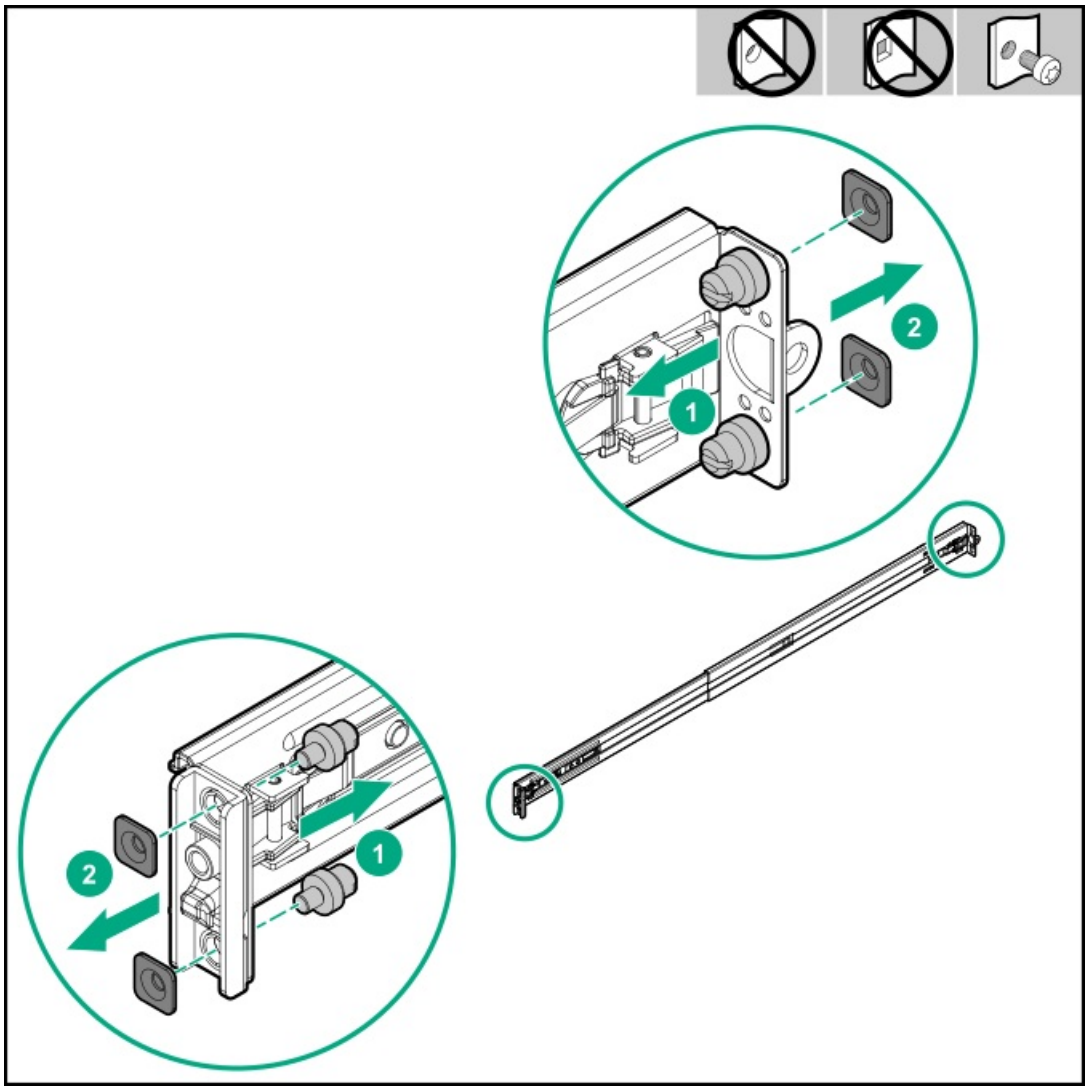
- The other end of the rails is marked as **REAR**.



3. Extend the inner rail of the mounting rails to align with the depth of the rack.
4. To install the mounting rails in a round-hole or square-hole rack, insert the pins on the mounting flanges into the rack column holes.

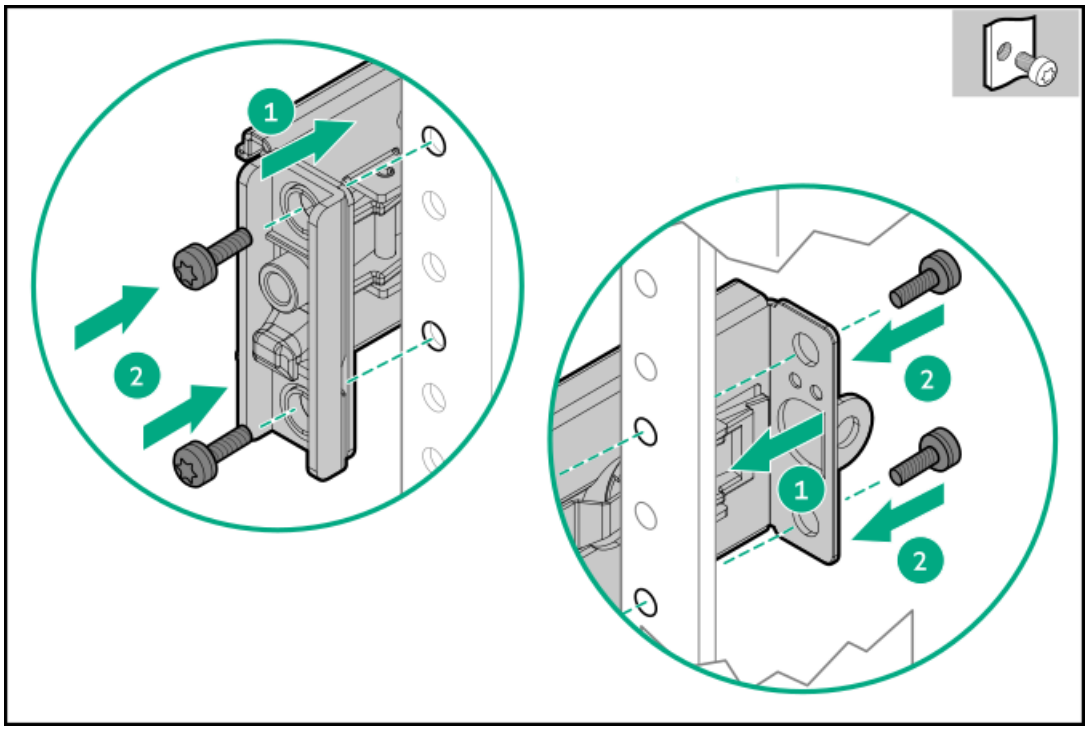


5. To install the mounting rails in a threaded-hole rack, do the following:
   a. Remove the pins and washers from the mounting rails.



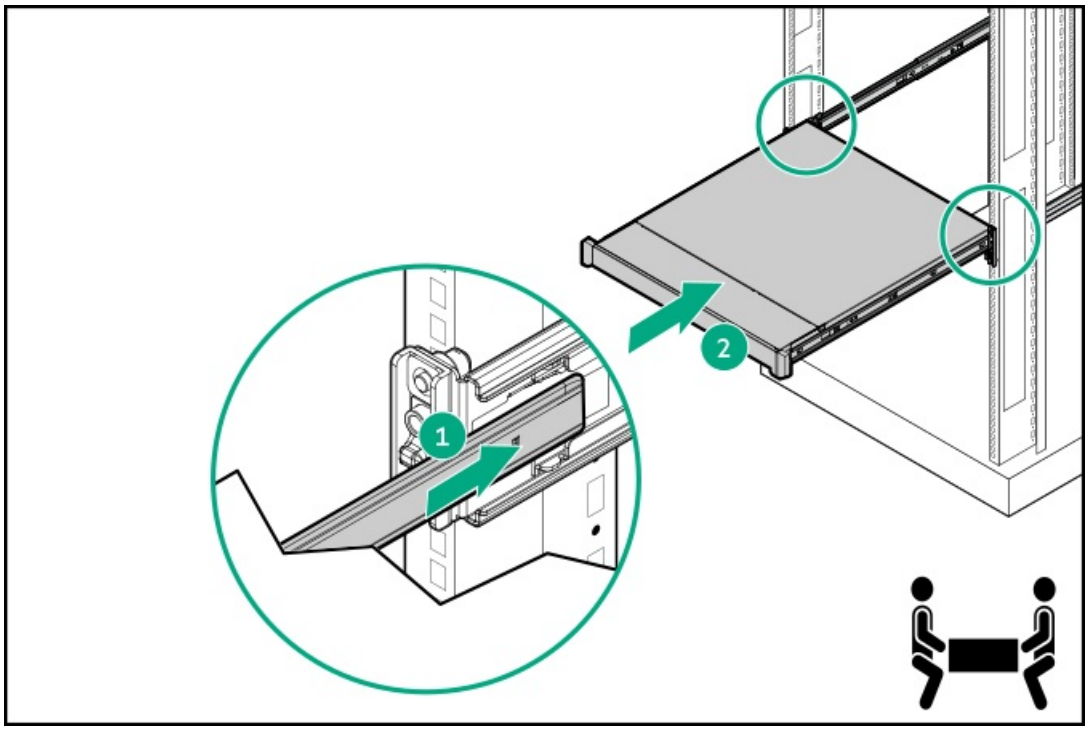
b. Position the holes on the mounting flanges against the threaded holes on the rack column.

c. Install the rack mounting screws.



Installing the server into the rack

6. Install the server into the rack:
   a. Insert the sliding rails into the rack mounting rails.
   b. Slide the server into the rack until the chassis ears are flush against the rack columns.

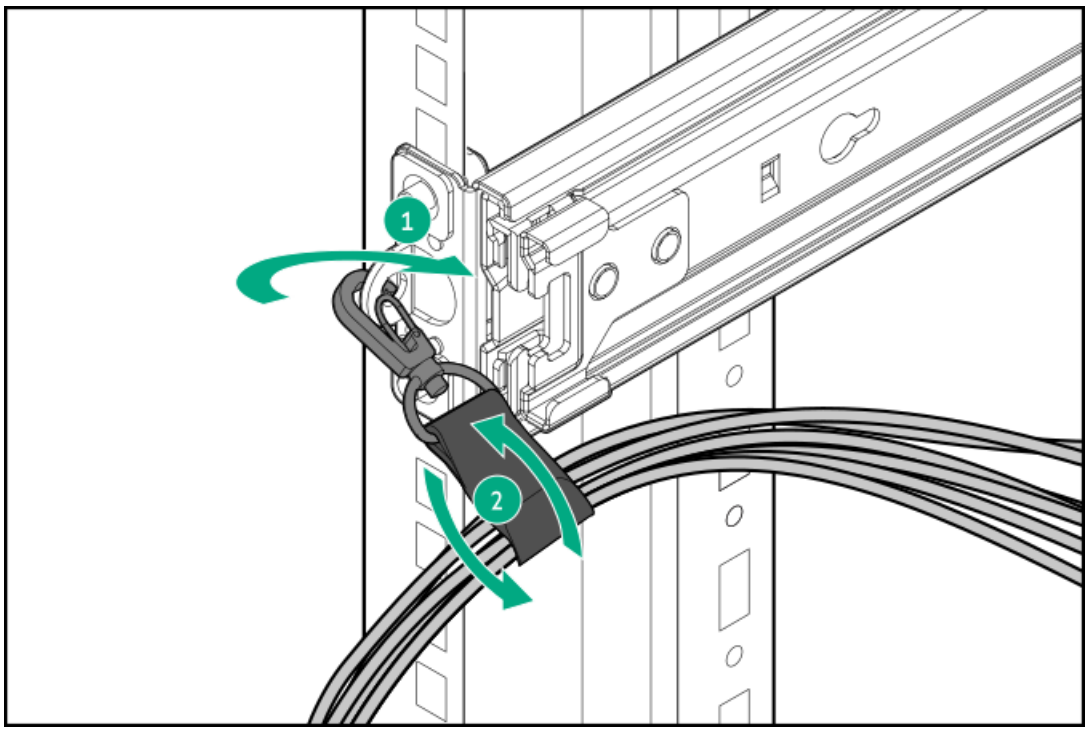


7. Connect all peripheral cables to the server.
8. Connect each power cord to the server.
9. Optional: Install the rack rail hook-and-loop strap.

   Use the rack rail hook-and-loop strap to manage the rear panel cables. The hook-and-loop strap can be installed on either the left or right rack mounting rail.

a. Attach the strap carabiner to the rack mounting rail.

b. Bundle the rear panel power cords and peripheral cables, and then wrap the strap around the cables.



10. Employ industry best practices in routing and managing the peripheral cables and power cords.
11. Verify that the peripheral cables and power cords are secured properly.

    Two people are needed for this procedure: one to slide the server in and out of the rack, and the other to observe the peripheral cables and power cords.

    a. Fully extend the server out of the rack.

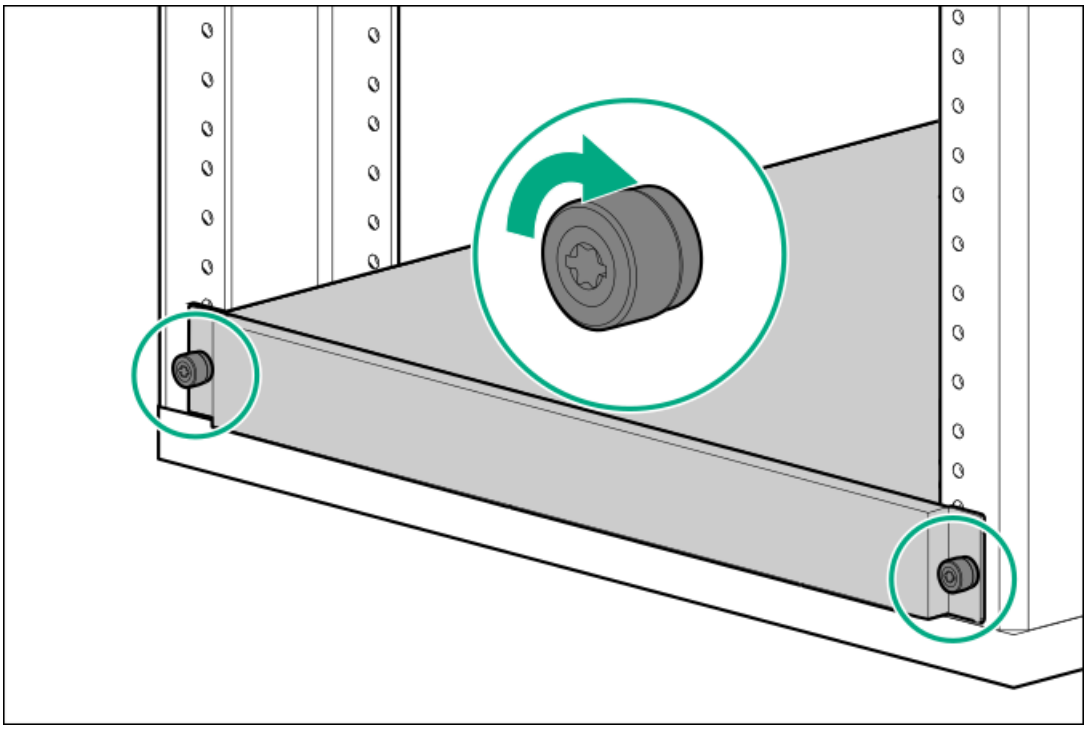
    b. Make sure that there is enough slack in the cables and cords secured in the hook-and-loop strap for a full extension of the rack rails.

       Make sure that there is no cable binding or crimping.

    c. Slide the server in and out of the rack to verify that there is no risk of accidental disconnection of the peripheral cables and power cords.

12. Fully tighten the chassis ear screws until the ears are completely flush against the rack columns.

    HPE recommends applying 2.37 N·m (21 lbf-in) of torque to securely tighten the screws.



13. Power up the server.

Results

The installation is complete.

Operational requirements

When preparing the site and planning the installation for the HPE ProLiant DL110 Gen11 Server, be sure to observe the following general operational requirements:

- Space and airflow requirements
- Temperature requirements
- Power requirements
- Electrical grounding requirements

For server-specific environmental requirements, see Environmental specifications.

Subtopics

Space and airflow requirements

Temperature requirements

Power requirements

Electrical grounding requirements

Space and airflow requirements

To allow for servicing and adequate airflow, observe the following space and airflow requirements when installing the server in an:

- Indoor commercial rack—Leave a minimum clearance of:
  - 63.00 cm (24.80 in) in front of the rack
  - 76.20 cm (30.00 in) behind the rack
  - 121.90 cm (47.99 in) from the back of the rack to the back of another rack or row of racks
- Outdoor Radio Access Network (RAN) cabinets and compact indoor racks in RAN sites—Leave a minimum clearance of:
  - 8.00 cm (3.15 in) in front of the rack
  - 20.00 cm (7.87 in) behind the rack

Observe the following additional airflow requirements:

- Servers draw in cool air through the front door and expel warm air through the rear door. Therefore, the front and rear rack doors must be adequately ventilated to allow ambient room air to enter the cabinet, and the rear door must be adequately ventilated to allow the warm air to escape from the cabinet.
- To prevent improper cooling and damage to the equipment, do not block the ventilation openings.
- When vertical space in the rack is not filled by a server or rack component, the gaps between the components cause changes in airflow through the rack and across the servers. Cover all gaps with blanking panels to maintain proper airflow. Using a rack without blanking panels results in improper cooling which can lead to thermal damage.
- If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and 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 7.00 cm (2.75 in).

Temperature requirements

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

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

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

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

Power requirements

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

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

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

Electrical grounding requirements

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

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

Rack warnings and cautions

WARNING:

When all components are removed, the server weighs 9.62 kg (21.21 lb). When all components are installed, the server can weigh up to 11.4 kg (25.13 lb).

Before configuring your rack solution, be sure to check the rack manufacturer weight limits and specifications. Failure to do so can result in physical injury or damage to the equipment and the facility.

WARNING:

The server is heavy. To reduce the risk of personal injury or damage to the equipment, do the following:

- Observe local occupational health and safety requirements and guidelines for manual material handling.
- Depending on the type of chassis ears installed, you can install the server into a two or four-post rack. Get help to lift and stabilize the server during installation and removal from the rack. **At least two people must install and remove the server from the rack.**
  - Two-post rack: The server is secured to the rack by four screws fastened to the front rack columns.
  - Four-post rack: The server is secured to the rack by two screws fastened to the front rack columns.
- The server weighs more than 9.62 kg (21.21 lb), so at least two people must lift the server into the rack together. Installing and aligning a server higher than chest level requires at least two people.
- Use caution when installing the server in or removing the server from the rack.
- Before extending a component outside the rack, stabilize the rack. Extend only one component at a time. If more than one component is extended, a rack may become unstable.
- Do not stack anything on top of rail-mounted component 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 has anti-tip measures in place. Such measures include floor-bolting, anti-tip feet, ballast, or a combination as specified by the rack manufacturer and applicable codes.
- The leveling jacks (feet) are extended to the floor.
- The full weight of the rack rests on the leveling jacks (feet).
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple rack installations.

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

- At least two people are needed to safely unload the rack from the pallet. An empty 42U rack can weigh as much as 115 kg (253 lb), can stand more than 2.1 m (7 ft) tall, and might become unstable when being moved on its casters.
- Never stand in front of the rack when it is rolling down the ramp from the pallet. Always handle the rack from both sides.

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:
Before installing the server in a 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 server.
- Be sure sufficient clearance exists for cabling, installation and removal of the server, and movement of the rack doors.

Server warnings and cautions

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

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

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

- Do not disassemble, crush, or puncture the energy pack.
- Do not short external contacts.
- Do not dispose of the energy pack in fire or water.
- Do not expose the energy pack to low air pressure as it might lead to explosion or leakage of flammable liquid or gas.
- Do not expose the energy pack to temperatures higher than 60°C (140°F).

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

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

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

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

CAUTION: 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.

Electrostatic discharge

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

To prevent electrostatic damage:

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

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

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

Operations

This chapter describes the hardware operations carried out prior to and after installing or removing a hardware component, or performing a server maintenance or troubleshooting procedure. Before performing these hardware operations, review the:

- Rack warnings and cautions
- Server warnings and cautions

Subtopics

Power up the server

Procedure

- Press the Power On/Standby button.
- Use the virtual power button through iLO 6.

Power down the server

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

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

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

- Press and release the Power On/Standby button.
  This method activates a controlled shutdown of applications and the OS before the server enters standby mode. It can also activate a shutdown behavior governed by an OS configuration or policy.
- Press and hold the Power On/Standby button for more than 4 seconds to force the server to enter standby mode.
  This method forces the server to enter standby mode without properly exiting applications and the OS. If an application stops responding, you can use this method to force a shutdown.
- Use a virtual power button selection through iLO 6.
  This method initiates a controlled remote shutdown of applications and the OS before the server enters standby mode.

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

Remove the server from a rack

The procedure for removing the server from a rack differs depending on the type of chassis ears installed .

Subtopics

Remove the server from a two-post rack

Remove the server from a four-post rack

Remove the server from a two-post rack

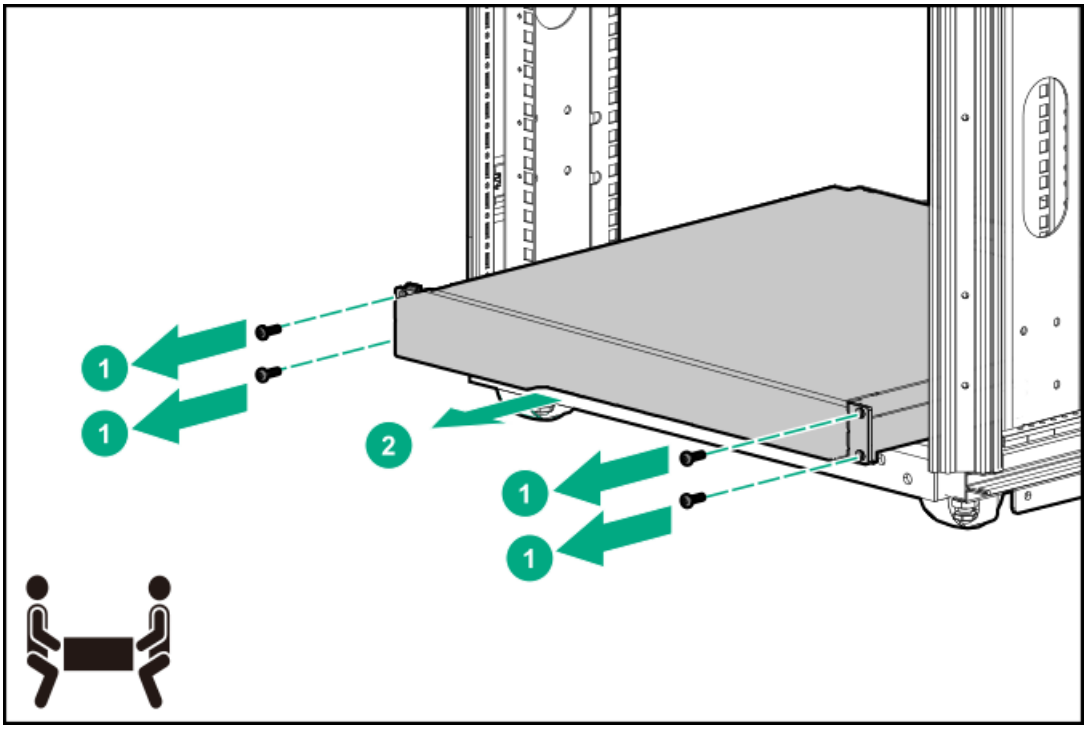
Prerequisites

- The server is secured to the rack by four screws fastened to the front rack columns. There are no rack rails supporting this server. Get help to lift and stabilize the server during removal from the rack. **At least two people must remove the server from the rack:** One person to support the server weight, and the other to remove the screws.
- Before you perform this procedure, review the:
  - Rack warnings and cautions
  - Server warnings and cautions
- A fully populated server is heavy. Hewlett Packard Enterprise recommends removing the external chassis components before removing the server from the rack.
- Before you perform this procedure, make sure that you have a T-25 Torx screwdriver or a torque screwdriver with T-25 Torx bit available.

Procedure

1. Power down the server.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. **At least two people must remove the server from the rack.**
   a. First person: Support the weight of the server.
   b. Second person: Remove the screws from the rack.

c. Remove the server from the rack.



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

Remove the server from a four-post rack

Prerequisites

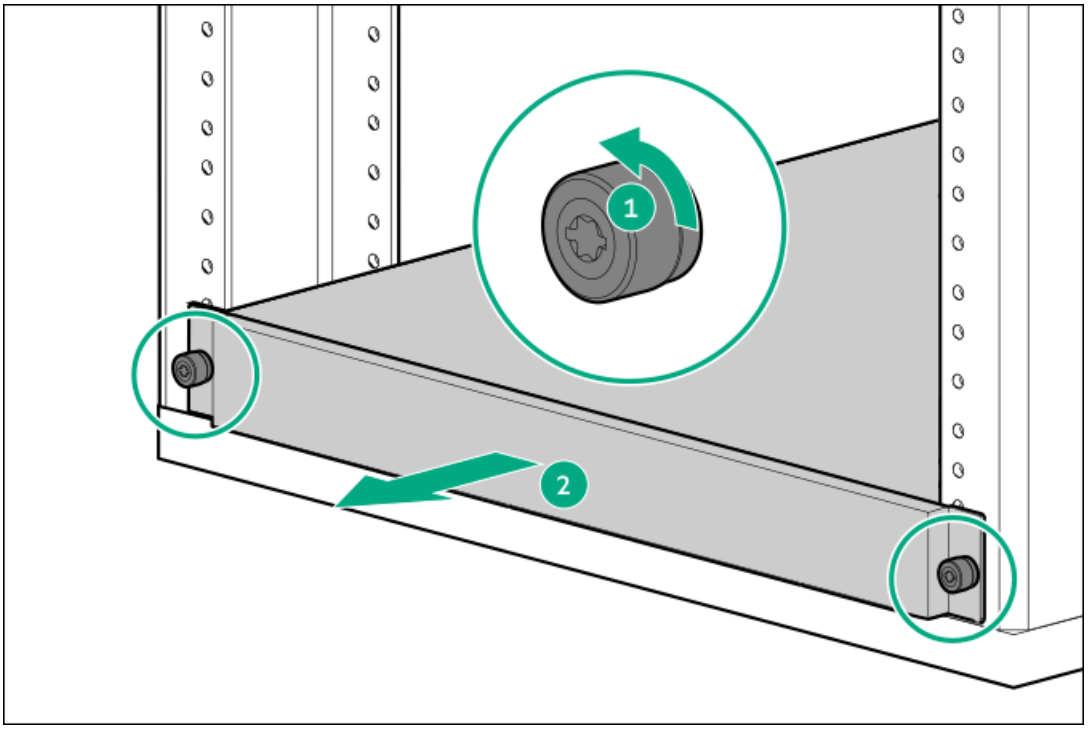
- Get help to lift and stabilize the server during removal from the rack. **If the server is installed higher than chest level, an additional two people might be required to help remove the server:** One person to support the server weight, and the other two to slide the server out of the rack.
- Before you perform this procedure, review the:
  - Rack warnings and cautions
  - Server warnings and cautions
- A fully populated server is heavy. Hewlett Packard Enterprise recommends removing the external chassis components before removing the server from the rack.
- Before you perform this procedure, make sure that you have a T-25 Torx screwdriver or a torque screwdriver with T-25 Torx bit available.

Procedure

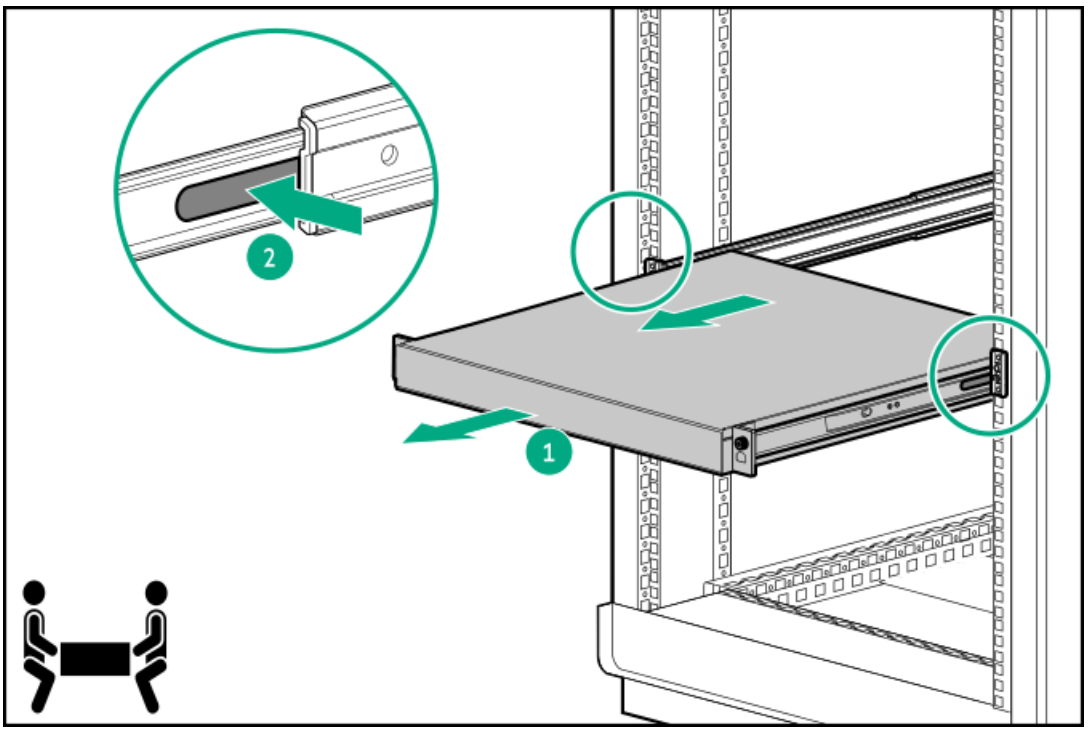
1. Power down the server.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.

WARNING: To reduce the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before extending a component from the rack.

4. Extend the server from the rack:
   a. Loosen the chassis ear screws.
   b. Slide the server out of the rack until the rail-release latches are engaged.



5. Remove the server from the rack:
   a. Press and hold the protruding surface of the sliding rails.
   b. Remove the server from the rack.



6. Place the server on a flat, level work surface.

Remove the access panel

Prerequisites

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

About this task

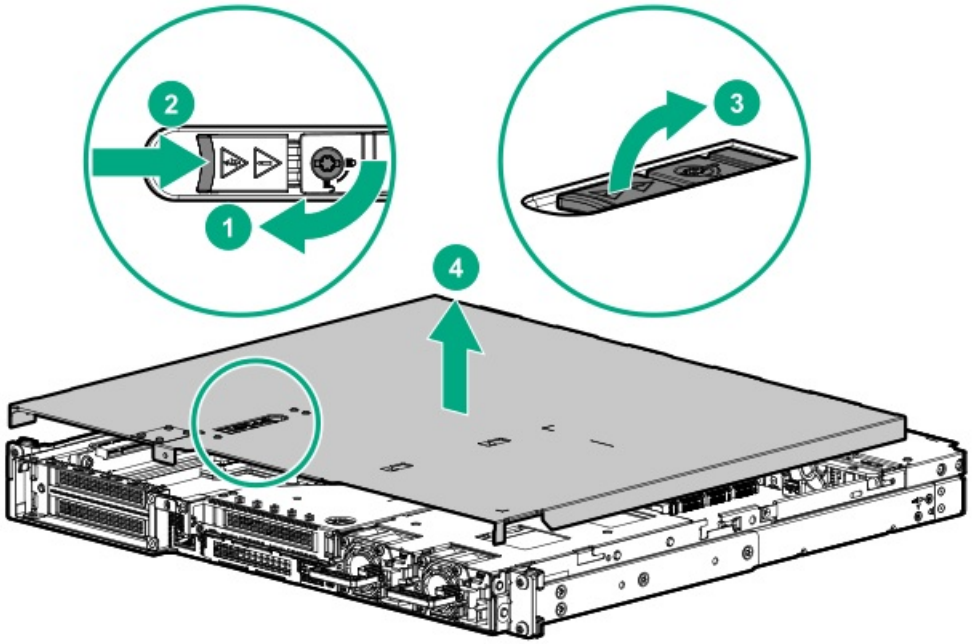
WARNING:
To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

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

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.

Procedure

1. Power down the server.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack:
   - Remove the server from a two-post rack.
   - Remove the server from a four-post rack.
5. Place the server on a flat, level work surface.
6. Remove the access panel:
   a. If necessary, unlock the access panel latch.
   b. To disengage the access panel from the chassis, press the release button and pull up the latch.
   c. Lift the access panel.



Remove the DIMM air baffle

Prerequisites

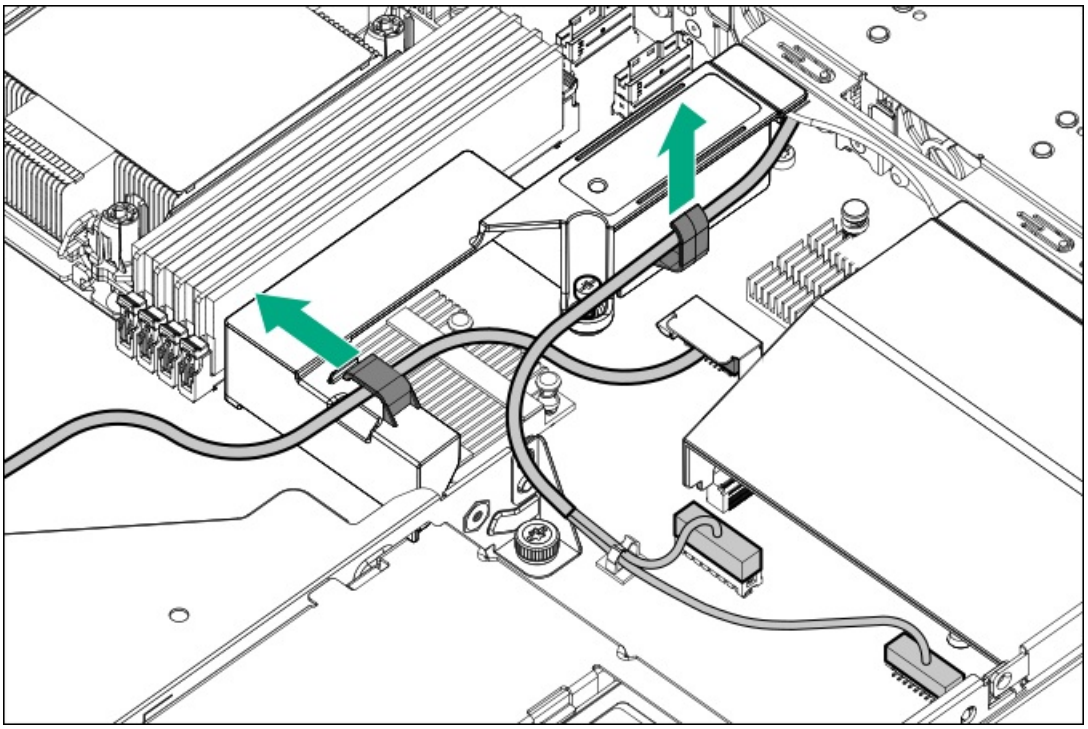
Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

About this task

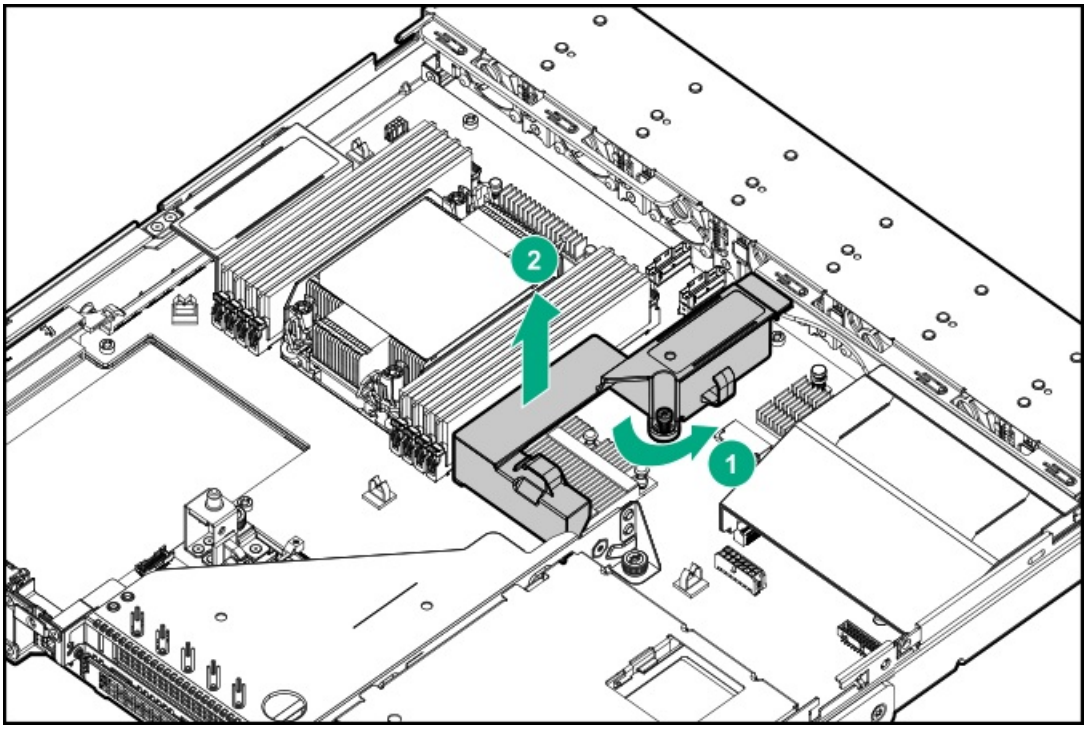
CAUTION: For proper cooling, do not operate the server without the access panel, baffles, or blanks installed.

Procedure

1. Power down the server.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack:
   - Remove the server from a two-post rack.
   - Remove the server from a four-post rack.
5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. If installed, use the pull tab on the MCIO cables to disconnect them from the riser board.
8. Release the following cables from the cable hooks on the DIMM air baffle:
   - iLO dedicated network cable
   - Fan power and signal cable bundle



9. Loosen the captive screw, and then remove the air baffle.



Remove the SSD air baffle

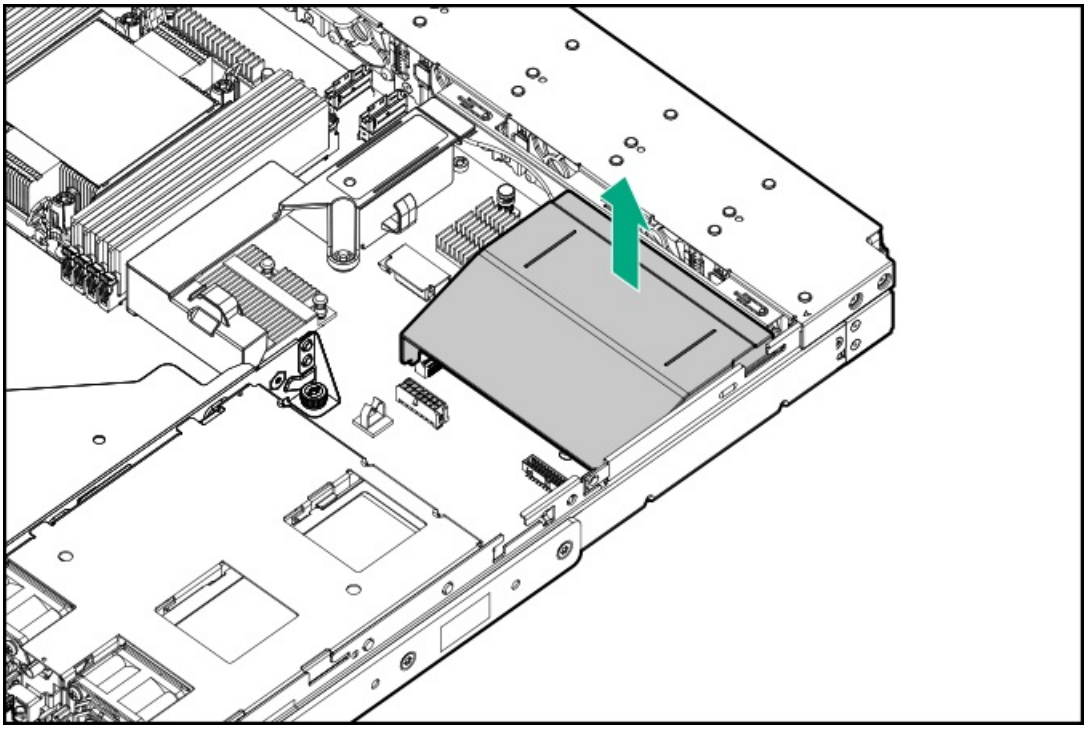
About this task

CAUTION: For proper cooling, do not operate the server without the access panel, baffles, or blanks installed.

Procedure

1. Power down the server.

2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack:
   - Remove the server from a two-post rack.
   - Remove the server from a four-post rack.
5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. Remove the SSD air baffle.



Remove the primary riser air baffle

About this task

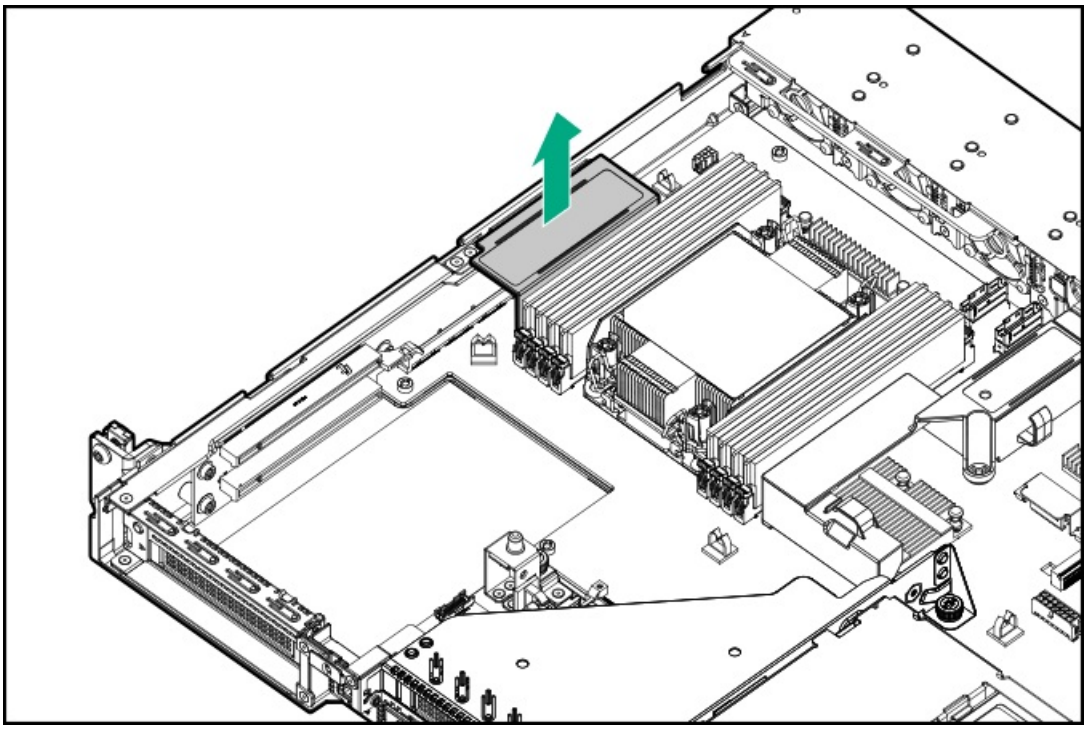
CAUTION: For proper cooling, do not operate the server without the access panel, baffles, or blanks installed.

Procedure

1. Power down the server.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack:

- Remove the server from a two-post rack.
- Remove the server from a four-post rack.

5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. Remove the primary riser air baffle.



Remove the riser cage

Prerequisites

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

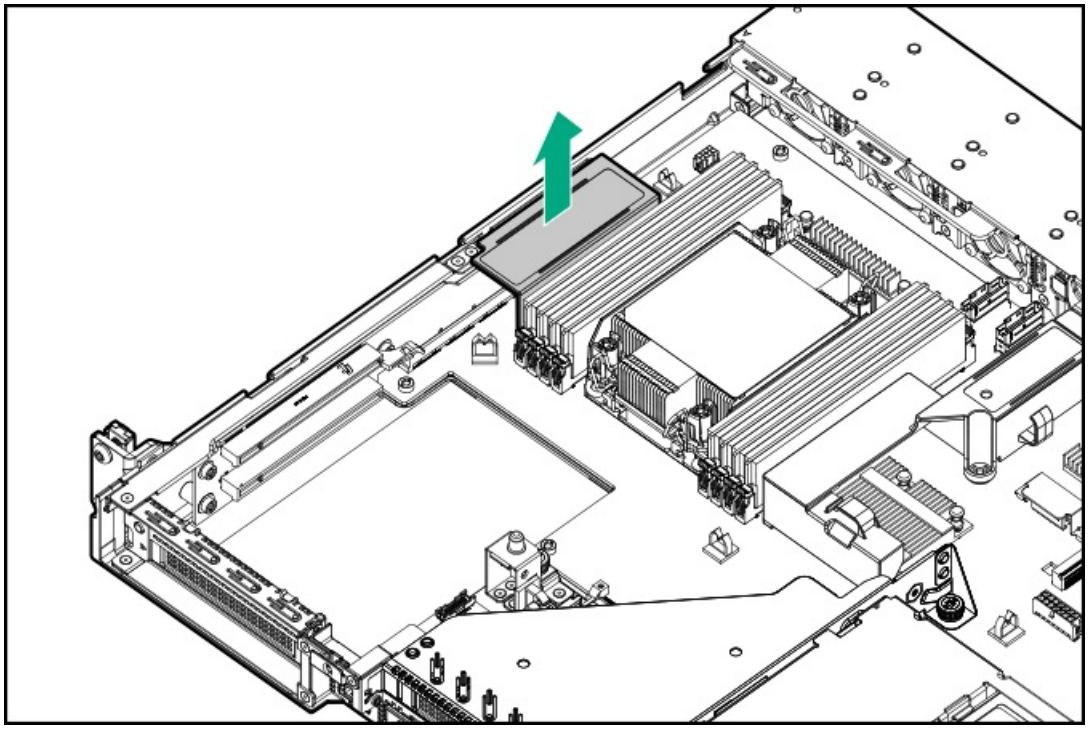
About this task

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

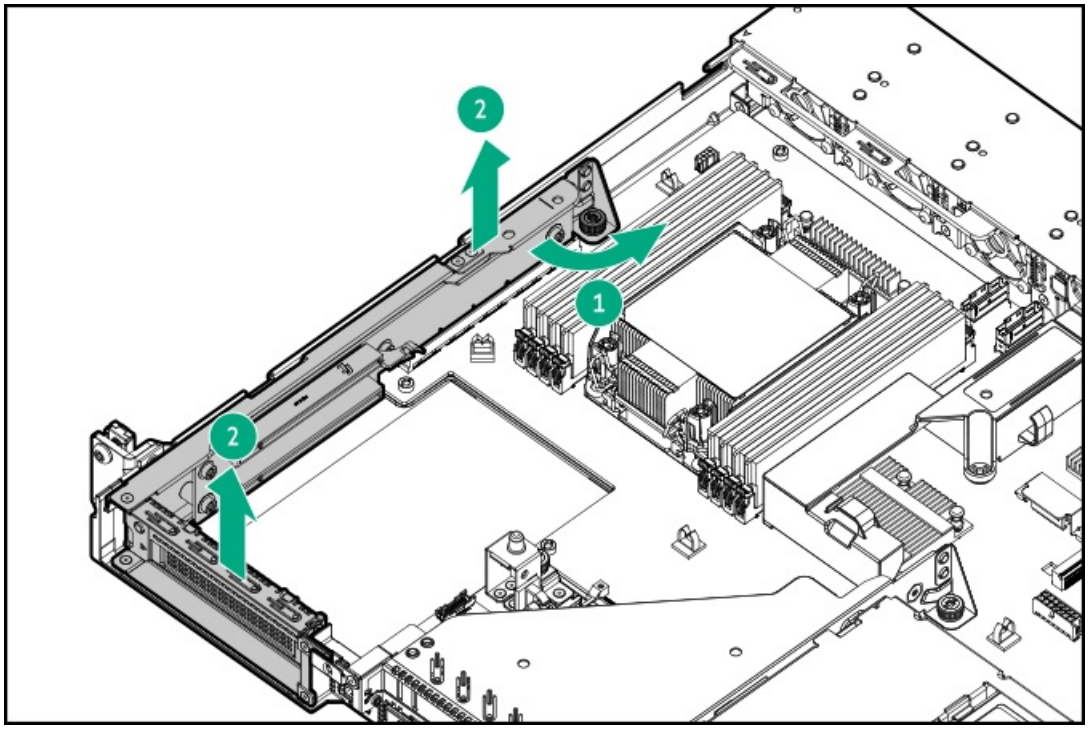
Procedure

1. Power down the server.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack:
   - Remove the server from a two-post rack.
   - Remove the server from a four-post rack.

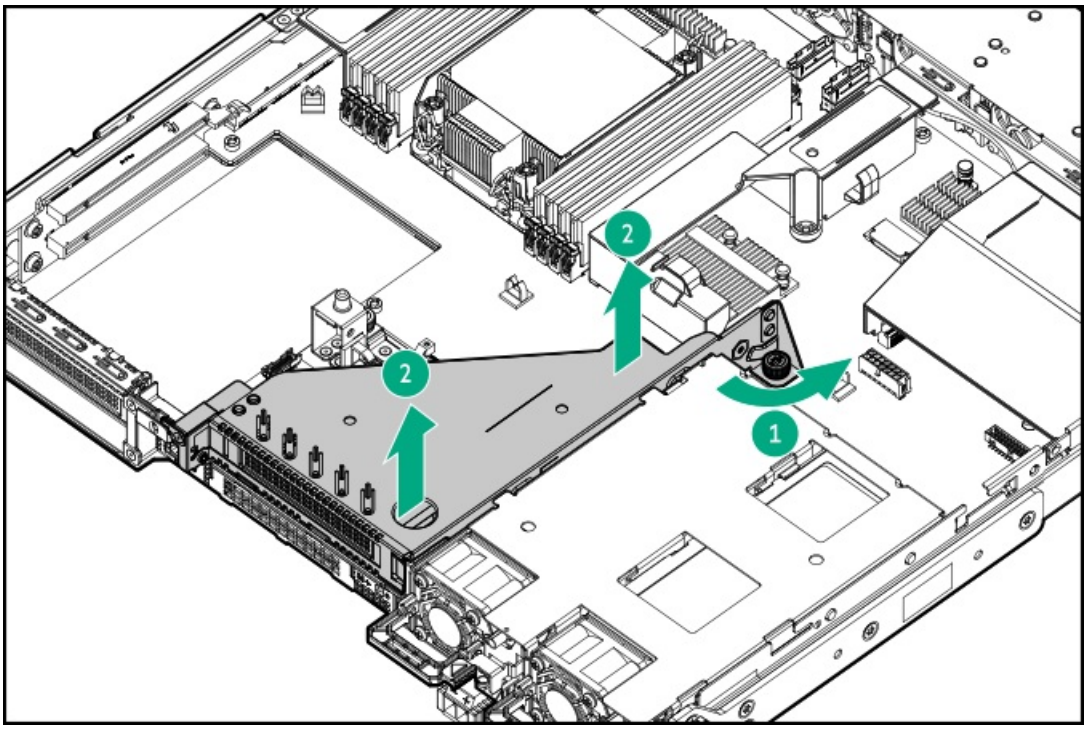
5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. To remove the primary riser cage, do the following:
   a. Remove the primary riser air baffle.



   b. Loosen the captive screw, and then lift the riser cage from the system board.



8. Before removing the secondary riser cage, use the pull tab on the MCIO cables to disconnect them from the riser board .
9. To remove the secondary riser cage, loosen the captive screw, and then lift the riser cage from the system board.



Install the riser cage

Prerequisites

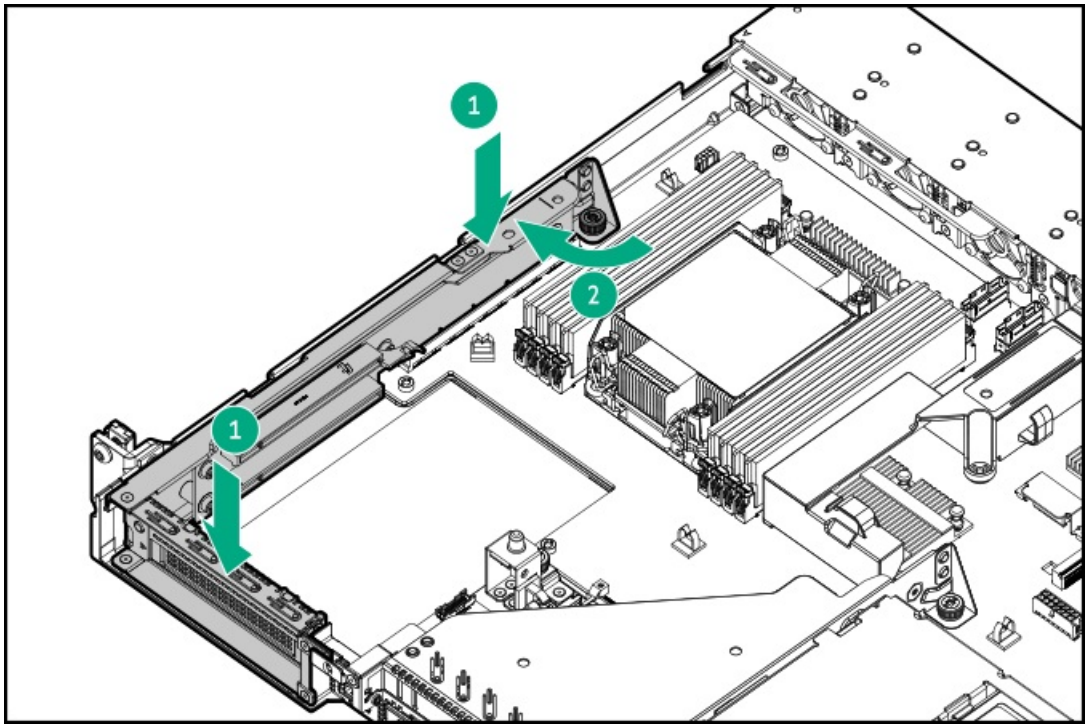
Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

Procedure

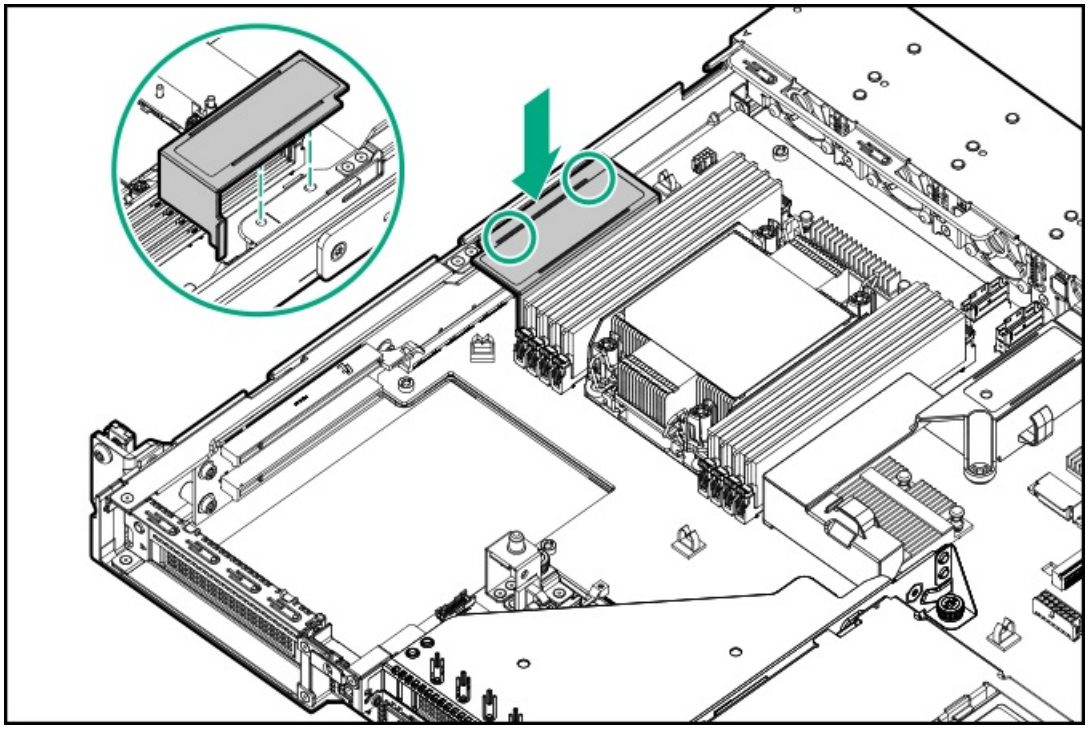
1. To install the primary riser cage, do the following:
   a. Carefully press the riser down on its system board connector.

      Make sure that the riser board is firmly seated.

   b. Tighten the captive screw.



c. Install the primary riser air baffle.

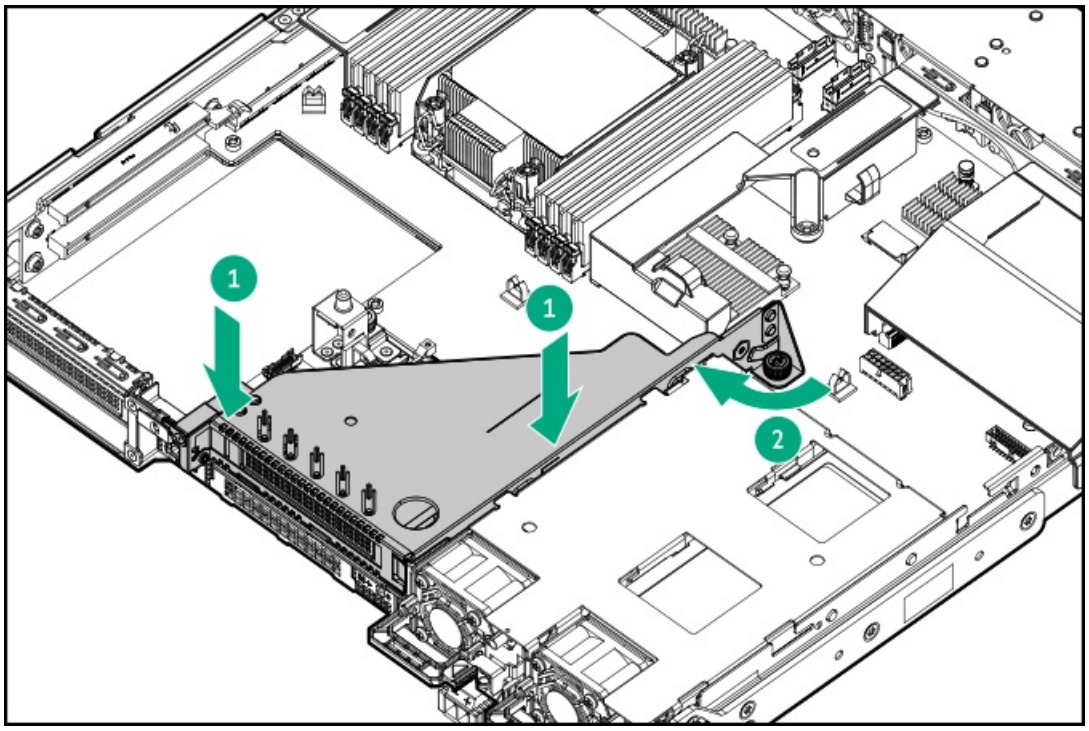


2. To install the secondary riser cage, do the following:

   a. Carefully press the riser down on its system board connector.

      Make sure that the riser board is firmly seated.

   b. Tighten the captive screw.



3. Connect the MCIO cables to the riser board .

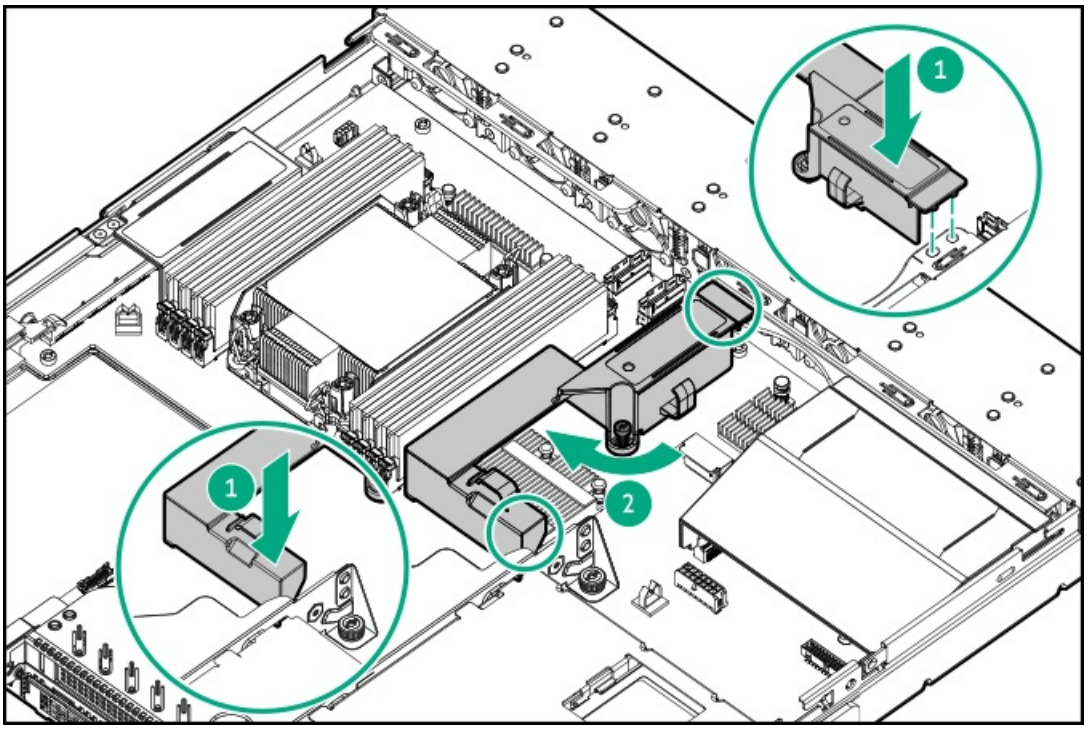
Install the DIMM air baffle

Prerequisites

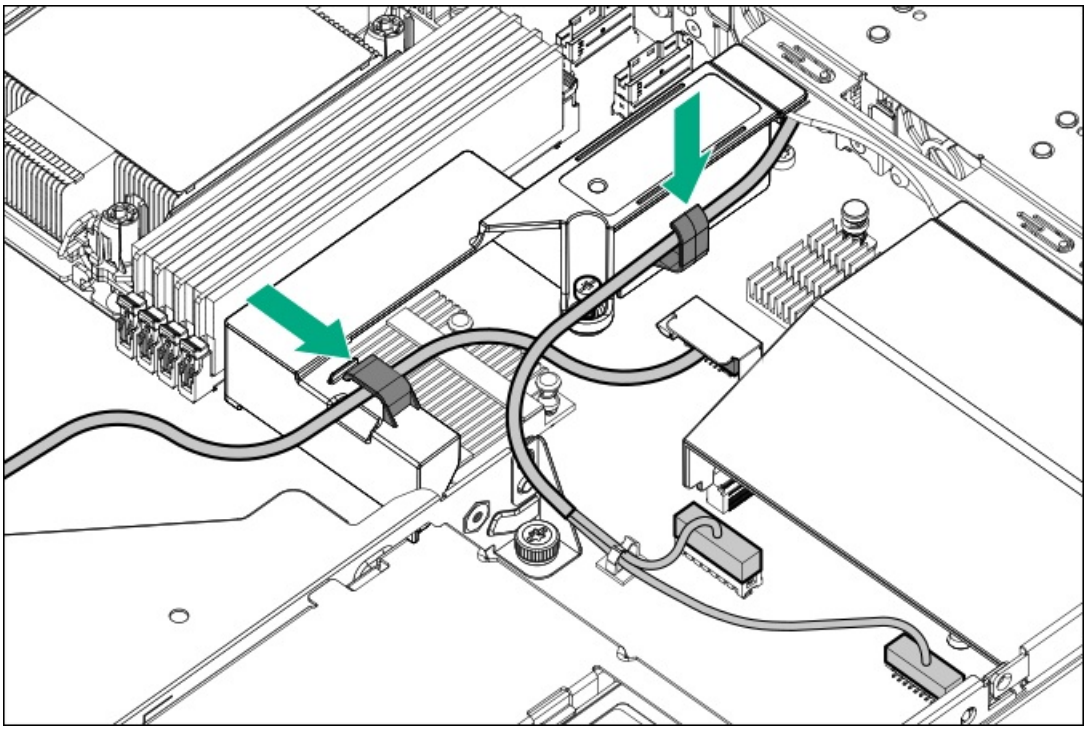
Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

Procedure

1. Insert the alignment pins on the air baffle into the corresponding holes on the chassis.
2. Tighten the captive screw.



3. Secure the following cables in the cable hooks on the DIMM air baffle:
   - iLO dedicated network cable
   - Fan power and signal cable bundle



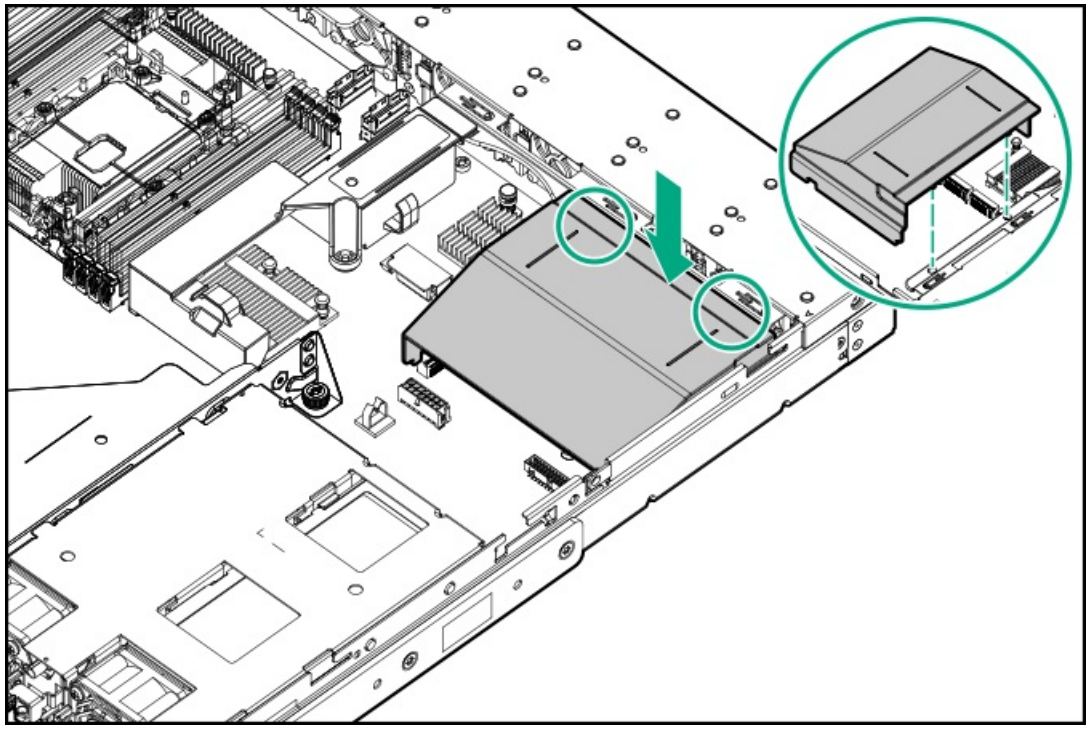
4. If removed, connect the MCIO cables to the riser board .

Install the SSD air baffle

Procedure

Install the SSD air baffle.

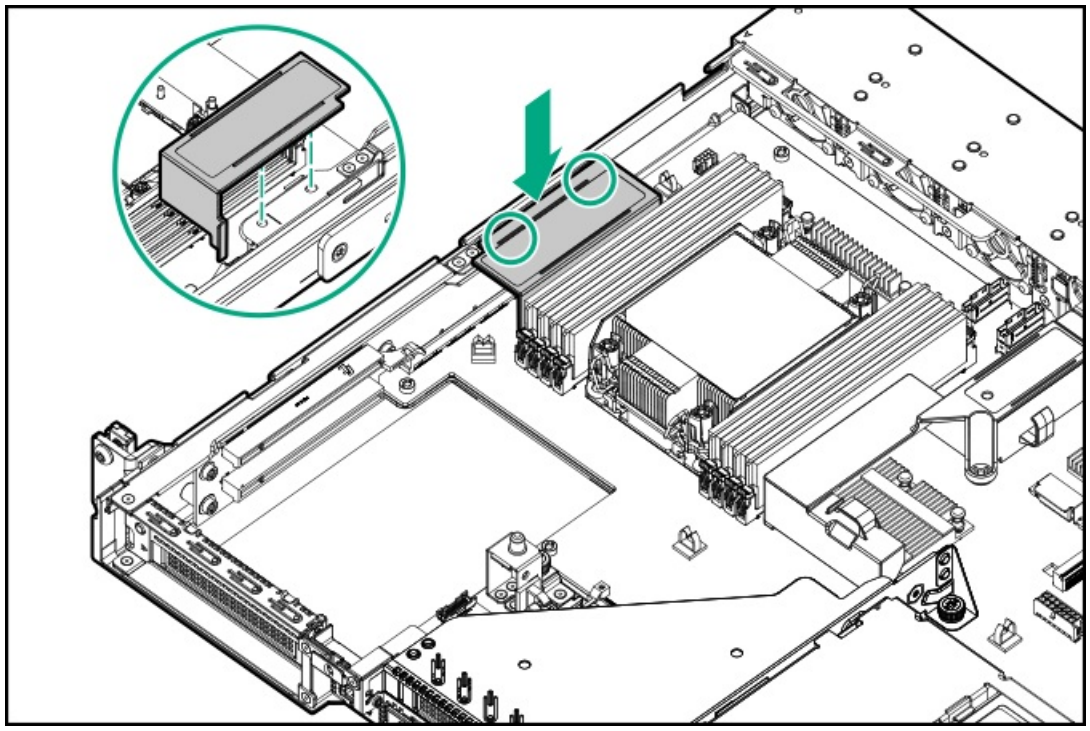
1. Insert the alignment pins on the air baffle into the corresponding holes on the chassis.



Install the primary riser air baffle

Procedure

1. If removed, install the primary riser cage.
2. Insert the alignment pins on the air baffle into the corresponding holes on the riser cage.



Install the access panel

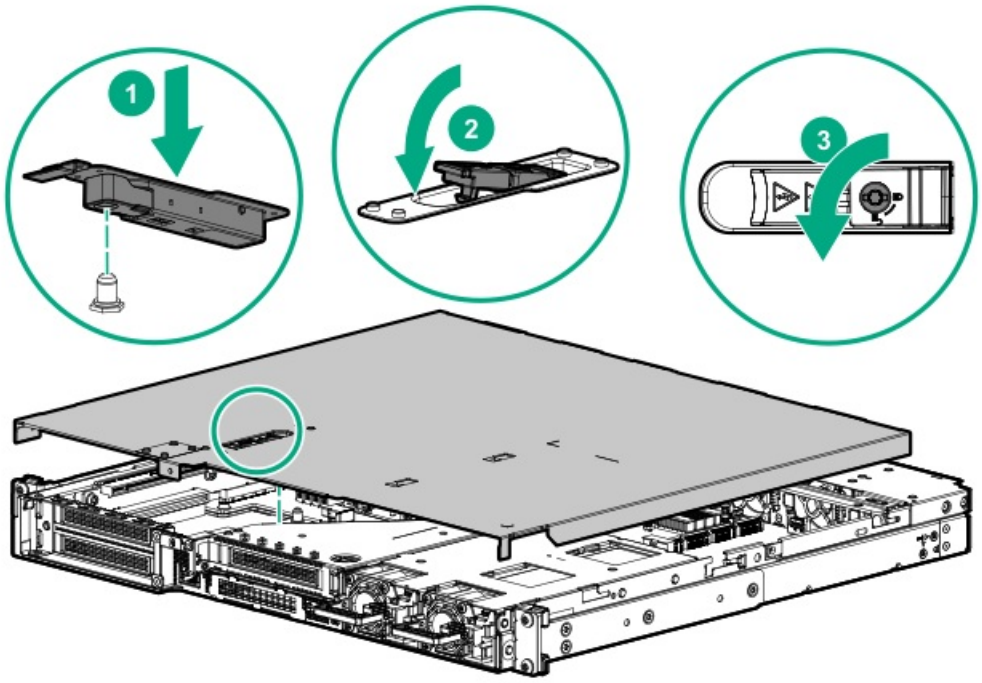
Prerequisites

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

Procedure

1. With the access panel latch open, insert the guide pin on the chassis through the hole on the bottom side of the latch.
2. Close the access panel latch.

   The access panel slides to the closed position.
3. Lock the access panel latch.



4. Perform the post-installation or maintenance steps required by the procedure that required the removal of the access panel.

Hardware options installation

To view the warranty for your server and supported options, see Warranty information.

Subtopics

Server data backup

Hardware option installation guidelines

Hewlett Packard Enterprise product QuickSpecs

Power supply options

Transceiver option

M.2 SSD options

Server data backup

To avoid data loss, make sure to back up all server data before installing or removing a hardware option, performing a server maintenance, or a troubleshooting procedure.

Server data in this context refers to information that may be required to return the system to a normal operating environment after completing a hardware maintenance or troubleshooting procedure. This information may include:

- User data files
- User account names and passwords
- Application settings and passwords
- Component drivers and firmware
- TPM recovery key/password
- BIOS configuration settings—Use the backup and restore function in UEFI System Utilities. For more information, see the UEFI user guide (**https://www.hpe.com/info/UEFI-manuals**).
  - Custom default system settings
  - Security passwords including those required for power-on and BIOS admin access, persistent memory, and Server Configuration Lock (for HPE Trusted Supply Chain servers)
  - Server serial number and the product ID
- iLO-related data—Use the iLO backup and restore function. For more information, see the iLO user guide (**https://www.hpe.com/support/ilo6**).
  - iLO license
  - Customer iLO user name, password, and DNS name
  - iLO configuration settings
- For servers managed by HPE GreenLake for Compute Ops Management , make sure that you have your HPE GreenLake account ID. For more information, see **HPE GreenLake for Compute Ops Management Getting Started Guide** .

Hardware option installation guidelines

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

CAUTION:

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

CAUTION:

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

- Install any hardware options before initializing the server.
- If multiple options are being installed, read the installation instructions for all the hardware options to identify similar steps and streamline the installation process.
- If the hardware option installation involves internal cabling, review the Cabling guidelines.

Hewlett Packard Enterprise product QuickSpecs

To learn more about your product, search the Hewlett Packard Enterprise website (**https://www.hpe.com/info/quickspecs**) for the product QuickSpecs:

- Supported options
- Supported configurations
- Component compatibility
- New features
- Specifications
- Part numbers

Power supply options

Depending on the installed options and the regional location where the server was purchased, the server can be configured with one of the supported power supplies.

Subtopics

Hot-plug power supply calculations

Power supply warnings and cautions

DC power supply warnings and cautions

Installing an AC power supply

Installing a DC power supply

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 (**https://www.hpe.com/info/poweradvisor/online**).

Power supply warnings and cautions

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

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

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

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

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

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

DC power supply warnings and cautions

WARNING: To reduce the risk of electric shock, be sure that the cable grounding kit is properly installed and connected to a suitable protective earth terminal before connecting the power source to the rack.

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 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.

Installing an AC power supply

Prerequisites

Before installing a power supply option, review the Power supply warnings and cautions.

About this task

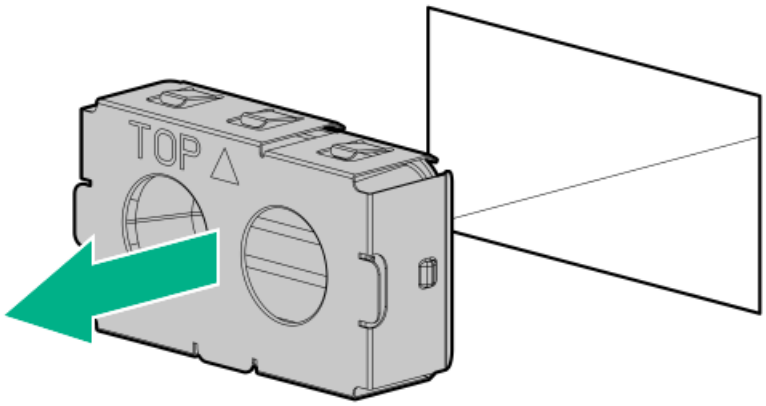
WARNING: To reduce the risk of personal injury from hot surfaces, allow the power supply, power supply blank, or dual slot power supply adapter to cool before touching it.

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.

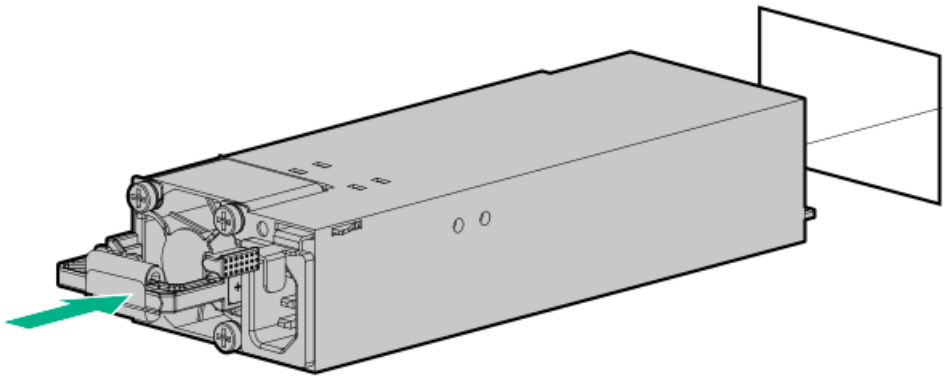
Procedure

1. If you are installing a power supply in the power supply bay 2, remove the power supply blank.

   Retain the blank for future use.



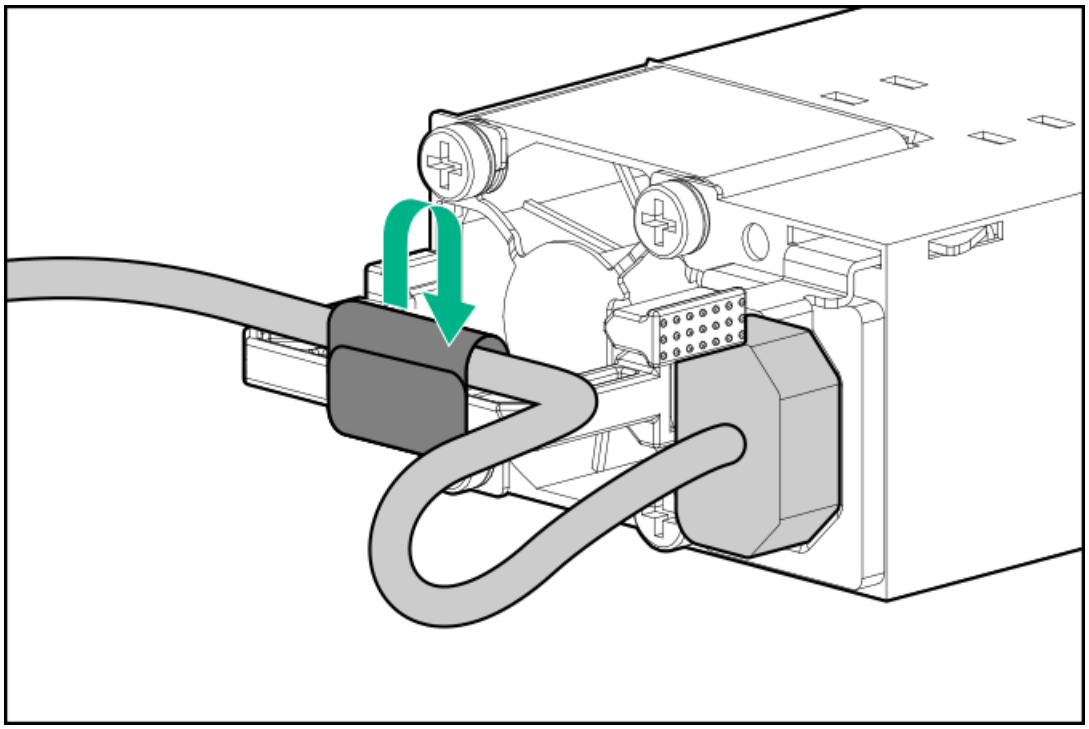
2. Immediately slide the power supply into the bay until it clicks into place.



3. Connect the power cord to the power supply.
4. 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.



5. Connect each power cord to the power source.
6. Make sure that the power supply LED is green.

Results

The installation is complete.

Installing a DC power supply

Prerequisites

- Power cable requirement: The HPE 2.85 m, 48 VDC Power Cable Kit (Q0H80A) can be purchased from an authorized Hewlett Packard Enterprise reseller. If HPE power cable option is not utilized, appropriate cabling must be implemented to ensure product reliability. Suitable options include either solid conductors or stranded conductors that have ferrules installed on the ends. The power cord connection must be made in consultation with a licensed electrician and be compliant with local code.
- Before installing a power supply option, review the following:
  - Power supply warnings and cautions
  - DC power supply warnings and cautions
- Before you perform this procedure, make sure that you have the following items available:
  - Phillips No. 1 screwdriver
  - Crimping tool

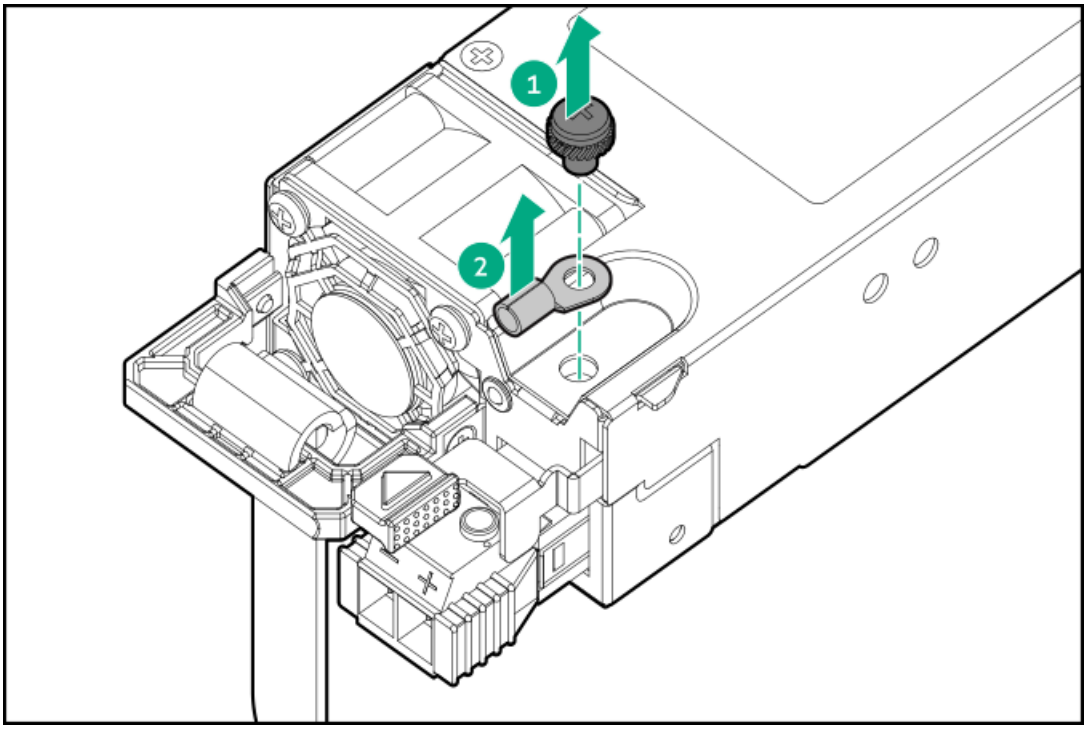
About this task

WARNING: To reduce the risk of personal injury from hot surfaces, allow the power supply, power supply blank, or dual slot power supply adapter to cool before touching it.

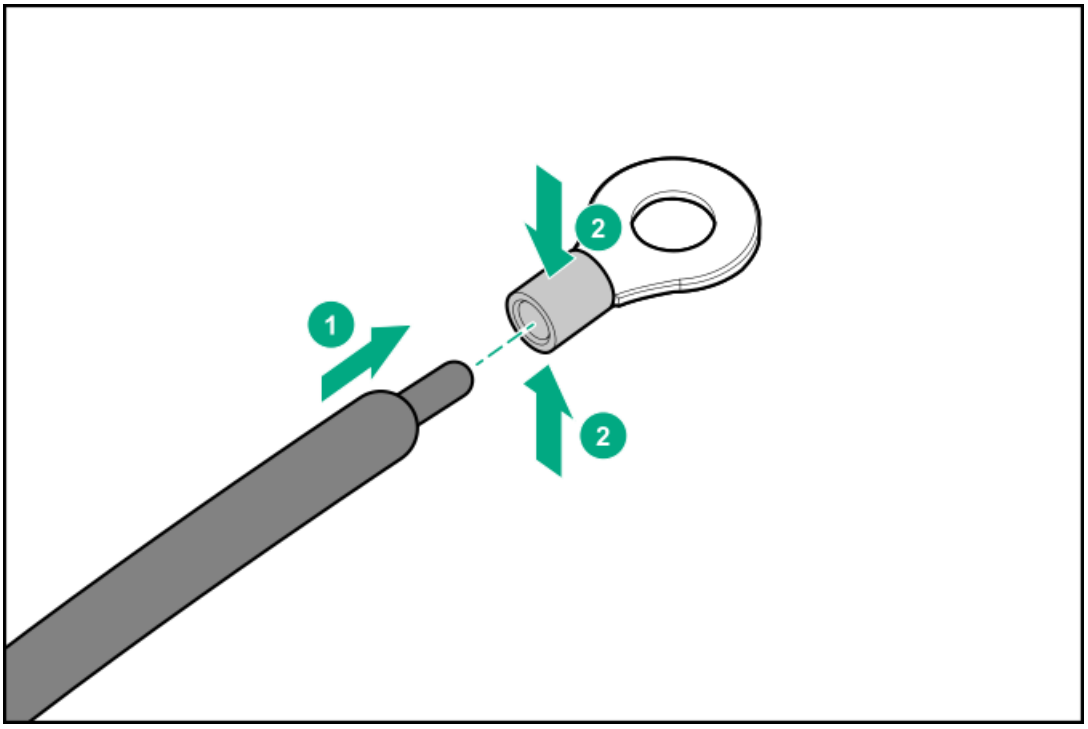
CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Procedure

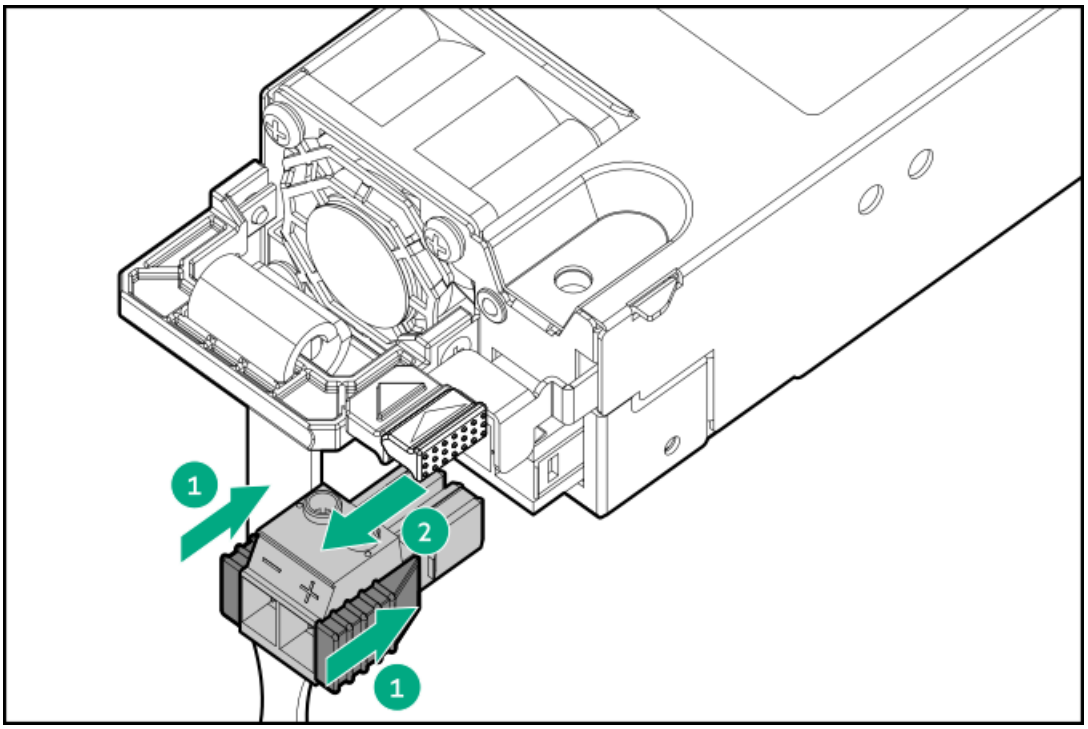
1. Remove the ring tongue.



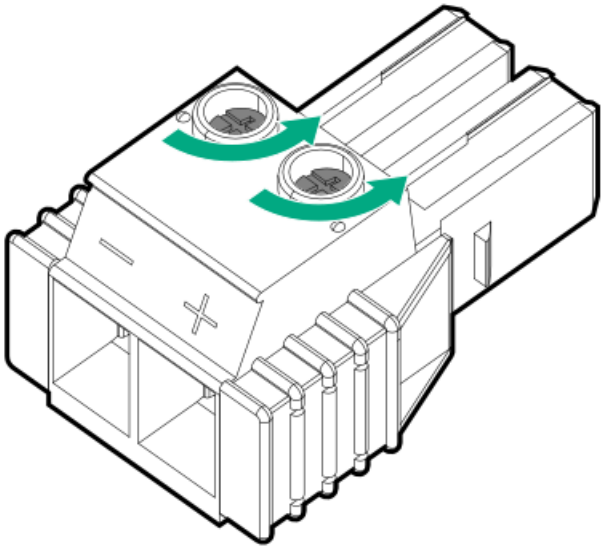
2. Crimp the ring tongue to the ground cable from the -48 V DC power source.



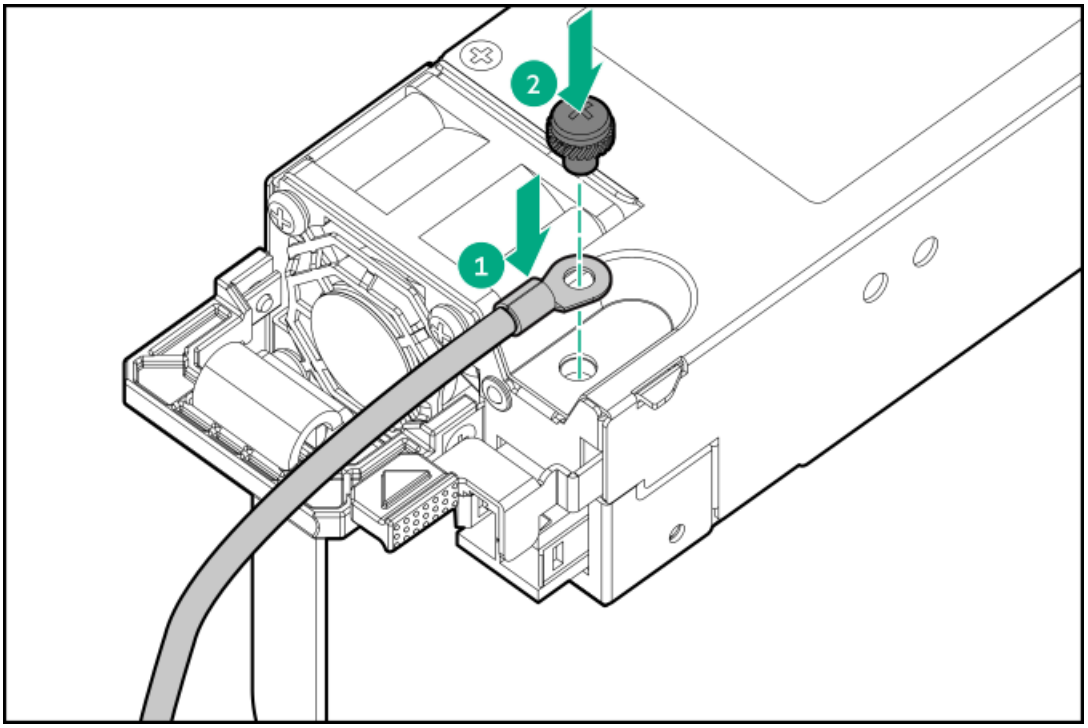
3. Remove the terminal block connector.



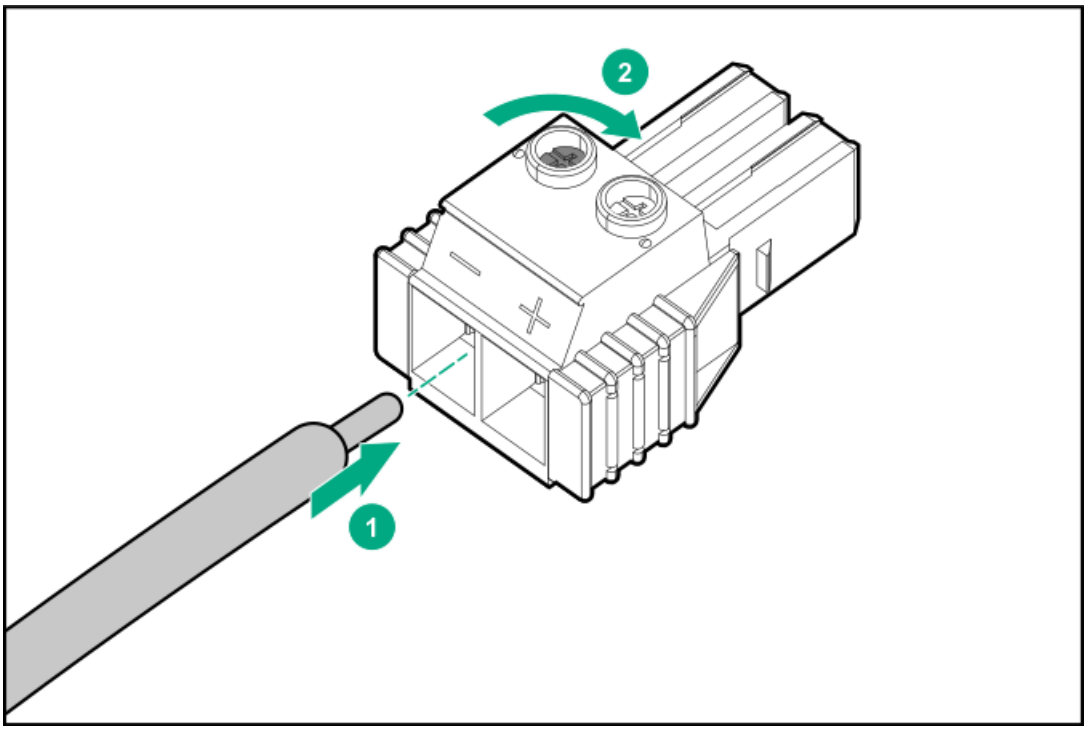
4. Loosen the screws on the terminal block connector.



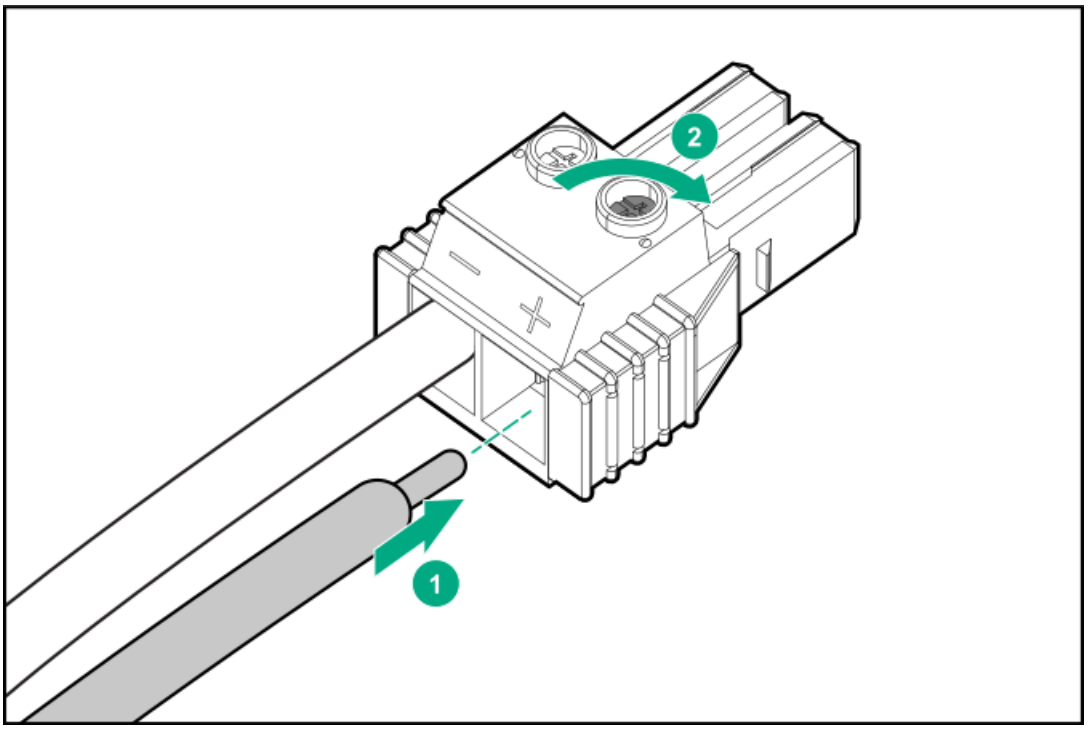
5. Attach the ground (earthed) wire or the green and yellow wire (6 mm² = 10 AWG) to the ground screw and washer and tighten to 1.47 N m (13.00 lb-in) of torque. The ground wire must be connected before the -48 V wire and the return wire.



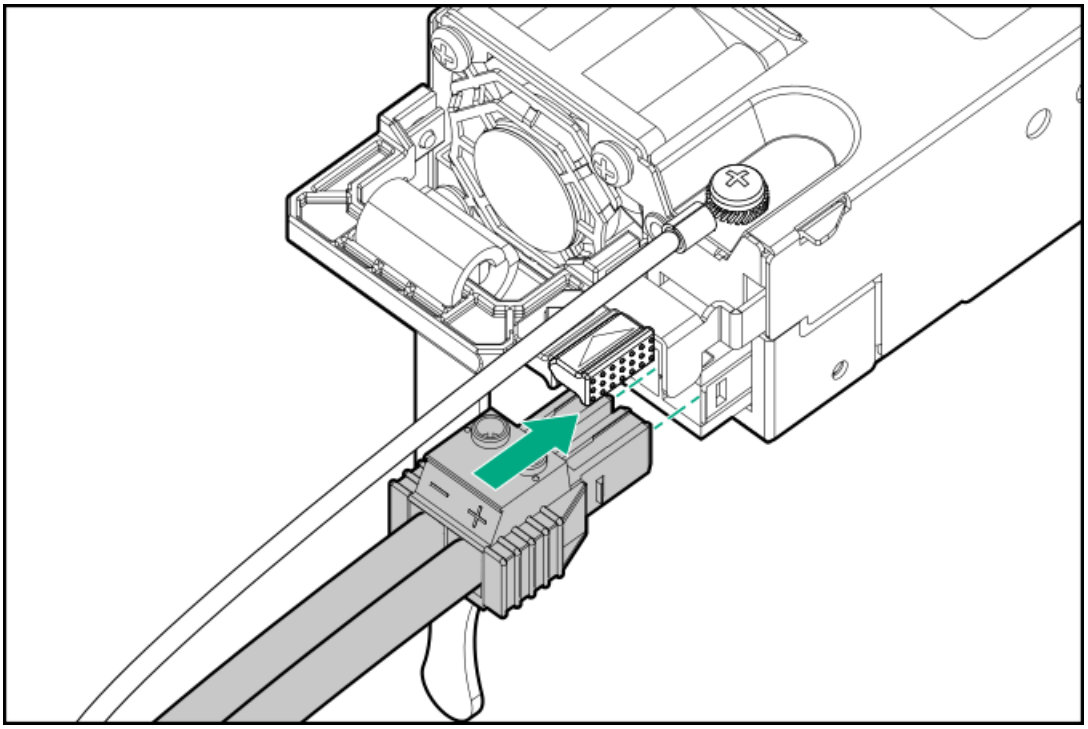
6. Insert the -48 V copper wire (6 mm² = 10 AWG) into the left side of the terminal block connector. Use a torque screwdriver to tighten the screw, and set a torque between 0.5 N m (4.43 lb-in) and 0.8 N m (7.08 lb-in).



7. Insert the copper return wire (6 mm² = 10 AWG) into the right side of the terminal block connector. Use a torque screwdriver to tighten the screw, and set a torque between 0.5 N m (4.43 lb-in) and 0.8 N m (7.08 lb-in).



8. Install the terminal block connector into the power supply.

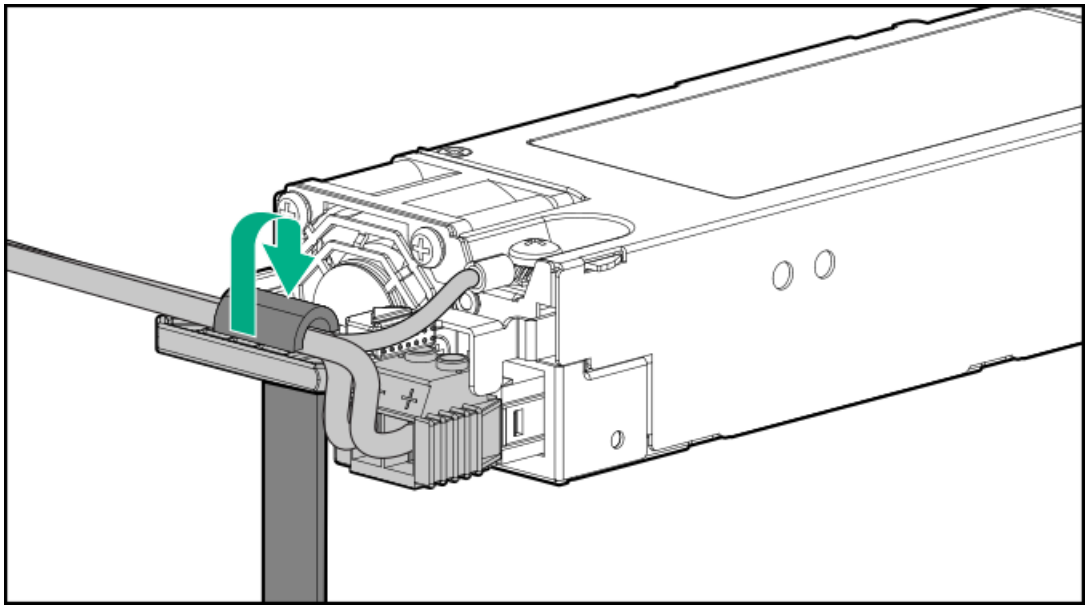


9. Secure the power cord, wires, and cables in the strain relief strap attached to the power supply handle:

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

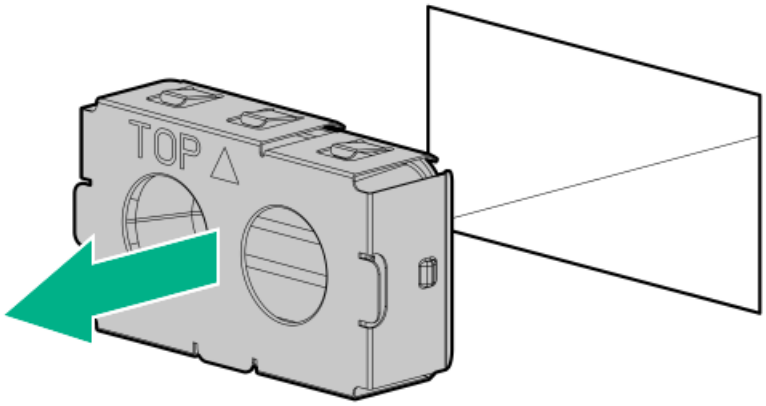
   > **CAUTION:** Avoid tight bend radii to prevent damaging the internal wires of a power cord or a server cable. Never bend power cords and server cables tight enough to cause a crease in the sheathing.

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

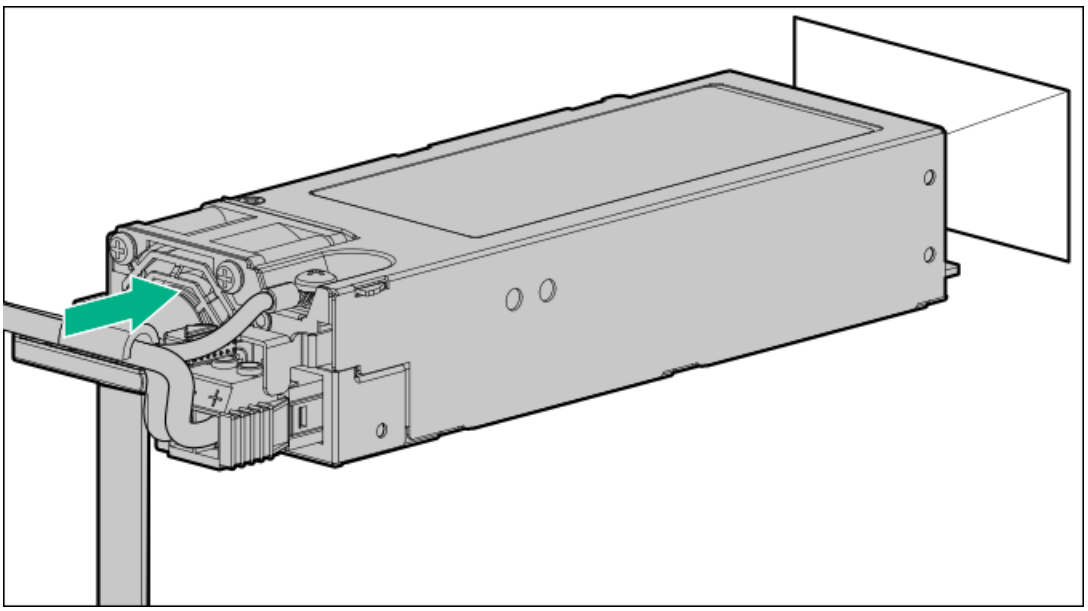


10. If you are installing a power supply in the power supply bay 2, remove the power supply blank.

    Retain the blank for future use.



11. Immediately slide the power supply into the bay until it clicks into place.



12. Make sure the -48 V DC power source is off or the PDU breaker is in the off position, and then connect the power cord to the -48 V DC

power source or PDU.

13. Turn on the -48 V power source or switch the PDU breaker to the on position.
14. Make sure that the power supply LED is green.

Results

The installation is complete.

Transceiver option

Transceivers serve as the connection between the adapter and the network cable for maintaining high-speed performance.

Subtopics

Transceiver warnings and cautions

Installing a transceiver

Transceiver warnings and cautions

WARNING:

Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes. To avoid eye injuries, avoid direct eye exposure to the beam from the fiber-optic transceiver or into the ends of fiber-optic cables when they are powered-up.

CAUTION:

The presence of dust in transceiver ports can cause poor cable connectivity. To prevent dust from entering, install a dust plug in an unused transceiver port.

CAUTION:

Supported transceivers can be hot-swapped—removed and installed while the server is powered-on. However, to prevent potential damage to the transceiver or the fiber-optic cable, disconnect the cable from the transceiver before hot-swapping it.

CAUTION:

Do not remove and install transceivers more often than is necessary. Doing so can shorten the useful life of the transceiver.

IMPORTANT:

When you replace a transceiver with another of a different type, the server might retain selected port-specific configuration settings that were configured for the replaced transceiver. Be sure to validate or reconfigure port settings as required.

Installing a transceiver

Prerequisites

Before installing a transceiver option, review the following:

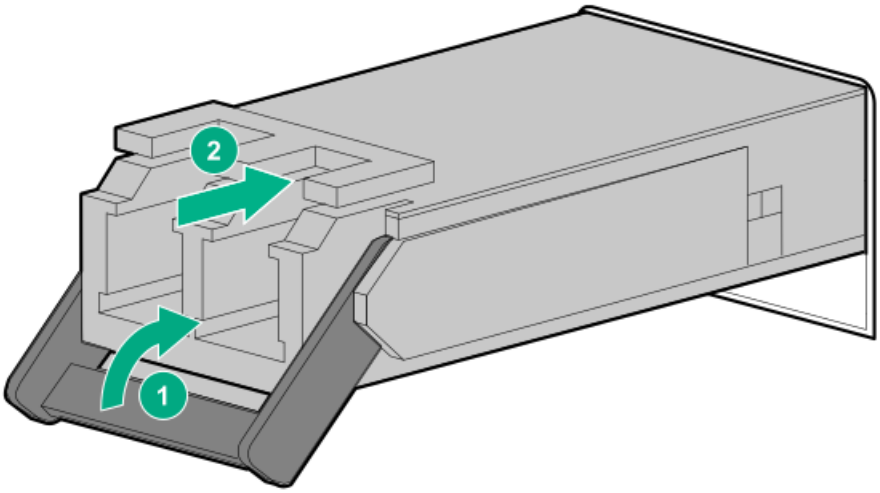
- Transceiver warnings and cautions

- Transceiver documentation for specific operational and cabling requirements

Procedure

1. Hold the transceiver by its sides and gently insert it into the network adapter port until it clicks into place.

   Transceivers are keyed so that they can only be inserted in the correct orientation. If the transceiver does not fit easily into the port, you might have positioned it incorrectly. Reverse the orientation of the transceiver and insert it again.



2. Remove the dust plug or protective cover from the transceiver.
3. Connect a compatible LAN segment cable to the transceiver.
4. Make sure that the NIC link LED on the port is solid green.

   For more information on the port LED behavior, see the documentation that ships with the transceiver.
5. If needed, see the transceiver documentation for the model-specific fastening mechanism applicable to the transceiver.

Results

The installation is complete.

M.2 SSD options

The server has four M.2 slots on the system board . These slots support SATA and NVMe SSDs in 2280 and 22110 form factors . Install an M.2 SSD option for:

- Booting up from flash solution
- Data backup/redundancy

Subtopics

Installing an M.2 SSD

Installing an M.2 SSD

Prerequisites

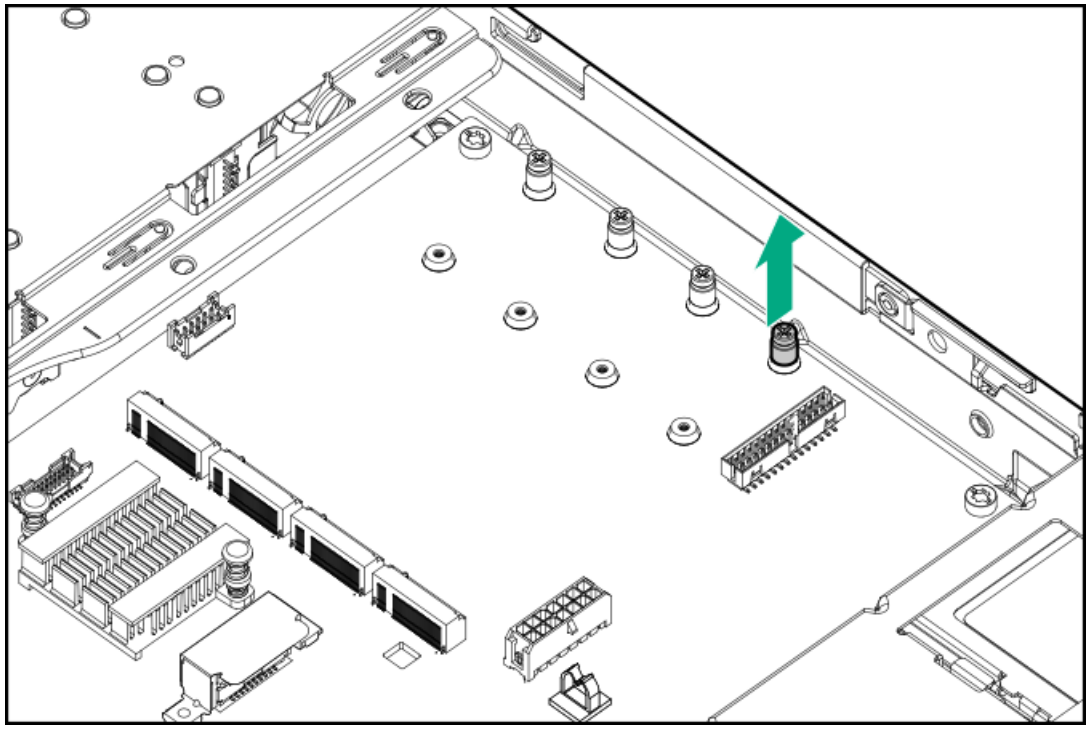
- If you plan to use Intel VROC to manage the M.2 SSDs, review the important Intel VROC support information.
- Before beginning installation, make sure that the server is updated with the latest operating system firmware and drivers.
- Before you perform this procedure, make sure that you have a Phillips No. 1 screwdriver available.

About this task

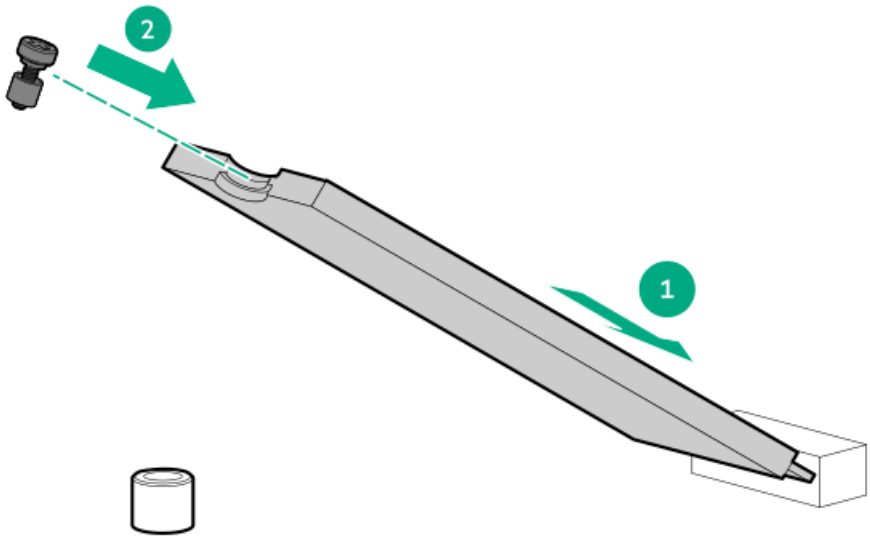
CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

Procedure

1. Power down the server.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack:
   - Remove the server from a two-post rack.
   - Remove the server from a four-post rack.
5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. Remove the SSD air baffle.
8. Remove the SSD jack screw from the M.2 location where you intend to install the new SSD.

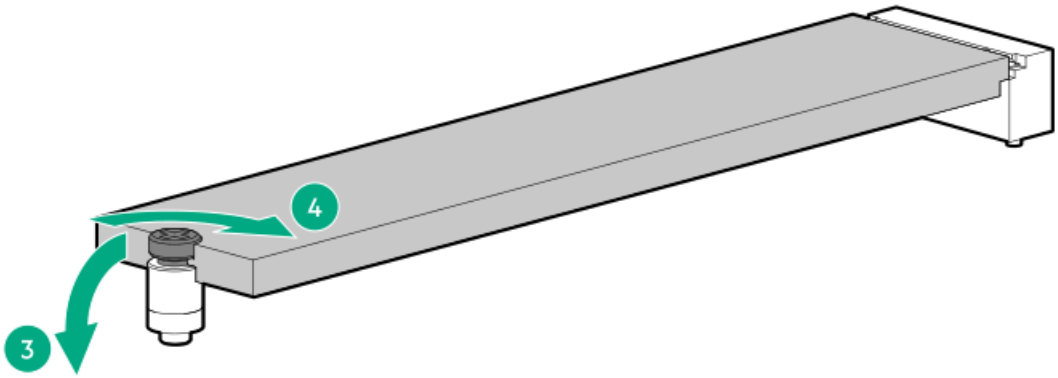


9. Install the M.2 SSD:
   a. Insert the SSD into the M.2 slot.
   b. Position the jack screw on the SSD notch.



c. Carefully press the SSD down to the horizontal position.

d. Tighten the SSD jack screw.



10. Install the SSD air baffle.
11. Install the access panel.
12. Install the server into the rack:
    - Install the server into a two-post rack.
    - Install the server into a four-post rack.
13. Connect all peripheral cables to the server.
14. Connect each power cord to the server.
15. Connect each power cord to the power source.
16. Power up the server.
17. Use Intel VROC to configure the SSDs.

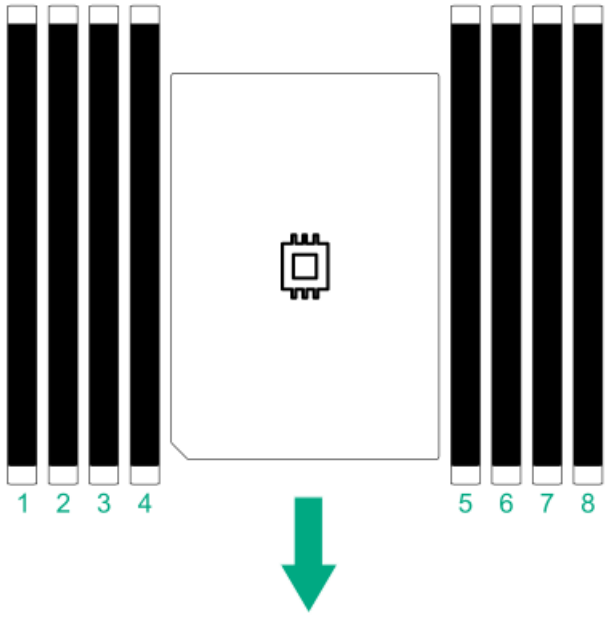
Results

The installation is complete.

Memory option

The server has eight DIMM slots supporting HPE DDR5 SmartMemory (RDIMM).

The arrow points to the front of the server.



Subtopics

HPE SmartMemory speed and population information

DIMM installation guidelines

Installing a DIMM

HPE SmartMemory speed and population information

For information about memory speed and server-specific DIMM population rules for HPE servers using 4th Generation Intel Xeon Scalable Processors, see the relevant memory technical paper in:

https://www.hpe.com/docs/server-memory

DIMM installation guidelines

When handling a DIMM, observe the following:

- Observe antistatic precautions.
- Handle the DIMM only along the edges.
- Do not touch the components on the sides of the DIMM.
- Do not touch the connectors on the bottom of the DIMM.
- Never wrap your fingers around a DIMM.
- Never bend or flex the DIMM.

When installing a DIMM, observe the following:

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

For more information, see the Hewlett Packard Enterprise website (**https://www.hpe.com/support/DIMM-20070214-CN**).

Installing a DIMM

Prerequisites

- Before installing a DIMM option, review the following:
  - DIMM population information
  - DIMM installation guidelines
- If not all DIMM slots are populated and a processor with a thermal design power (TDP) value ≥ 185 W is installed, install the DIMM blank kit (P43725-B21).

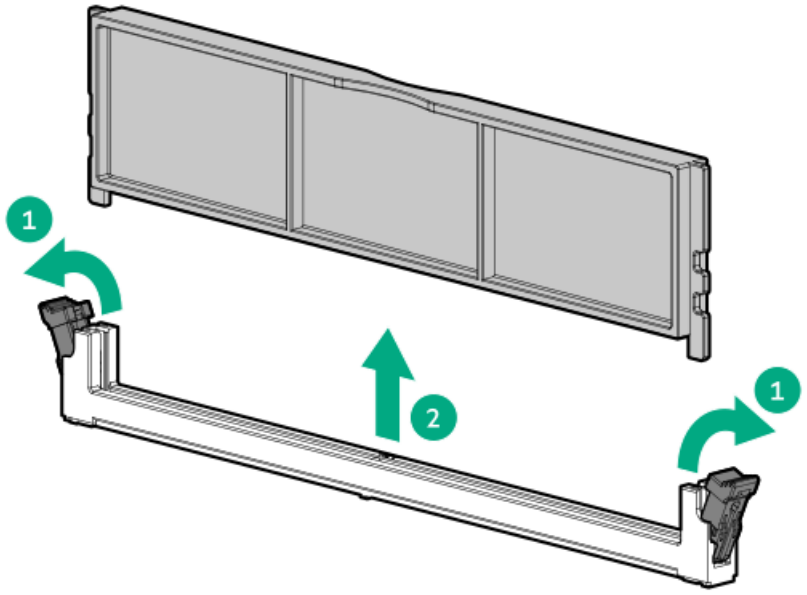
About this task

> **CAUTION:**
> Do not install ×4 and ×8 DRAM widths in the same server. All memory installed in the server must be of the same type. Installing different DIMM types can cause the server to halt during BIOS initialization.

> **CAUTION:** A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

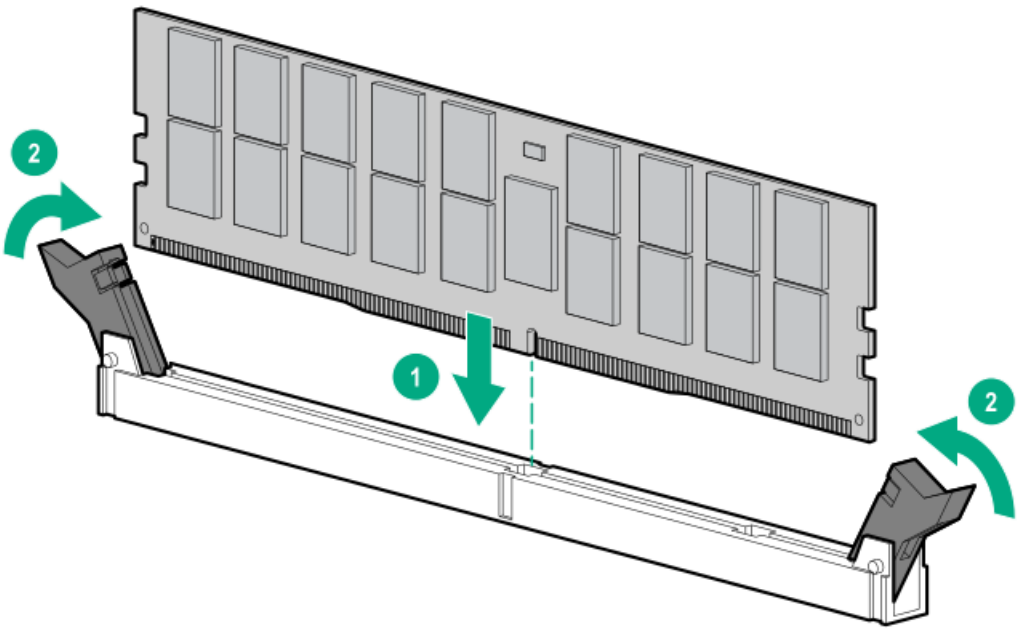
Procedure

1. Power down the server.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack:
   - Remove the server from a two-post rack.
   - Remove the server from a four-post rack.
5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. Remove the DIMM blank.



8. Install the DIMM:
   a. Open the DIMM slot latches.
   b. Align the notch on the bottom edge of the DIMM with the keyed surface of the DIMM slot, and then fully press the DIMM into the slot until the latches snap back into place.

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



9. Install the access panel.
10. Install the server into the rack:
    - Install the server into a two-post rack.
    - Install the server into a four-post rack.
11. Connect all peripheral cables to the server.
12. Connect each power cord to the server.

13. Connect each power cord to the power source.
14. Power up the server.
15. To configure the memory settings:
    a. From the boot screen, press **F9** to access UEFI System Utilities.
    b. From the System Utilities screen, select System Utilities > System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options.

Results

The installation is complete.

Secondary riser board option

IMPORTANT:
The secondary riser option is not supported when the server has a power-optimized 4th Gen Intel Xeon Scalable processor with Intel vRAN Boost (up to 20 cores).

The primary riser is default in the server. The server supports a secondary riser option for additional expansion capabilities. Both riser boards support the installation of full-height, half-length and half-height, half-length (low-profile) expansion cards.

Subtopics

Installing the secondary riser board

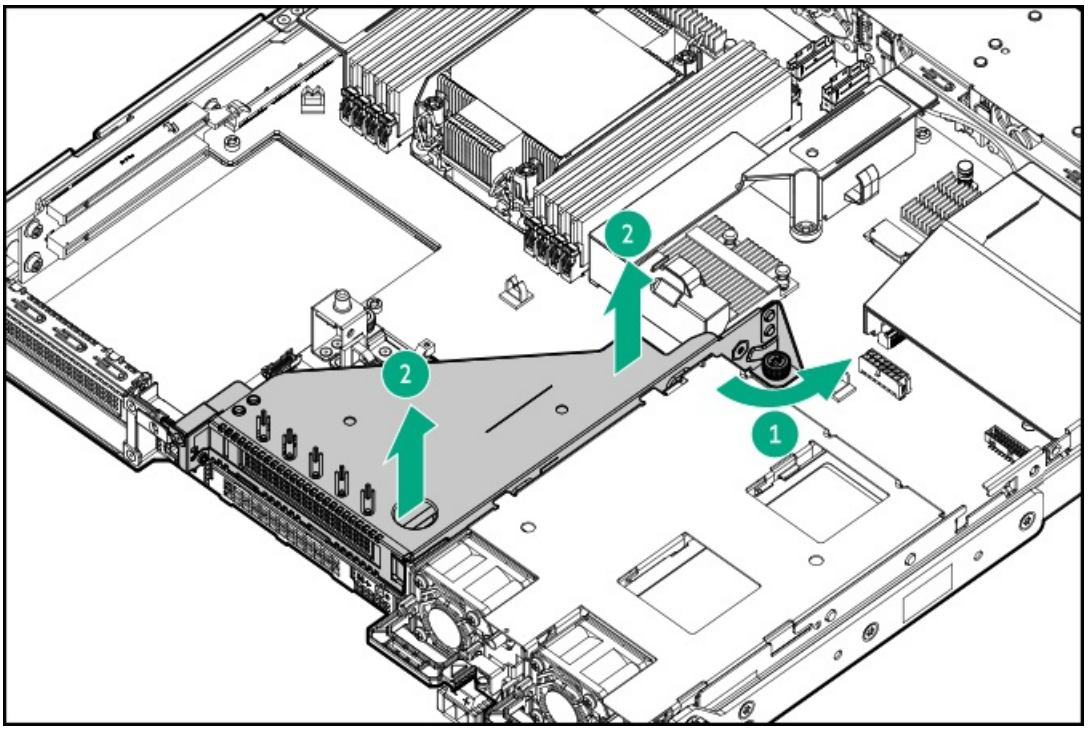
Installing the secondary riser board

Prerequisites

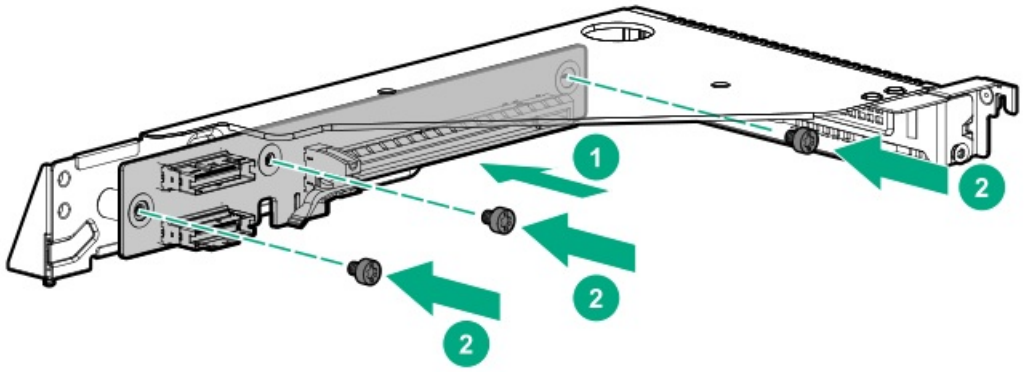
Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

Procedure

1. Power down the server.
2. Remove all power:
    a. Disconnect each power cord from the power source.
    b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack:
    - Remove the server from a two-post rack.
    - Remove the server from a four-post rack.
5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. To remove the secondary riser cage, loosen the captive screw, and then lift the riser cage from the system board.



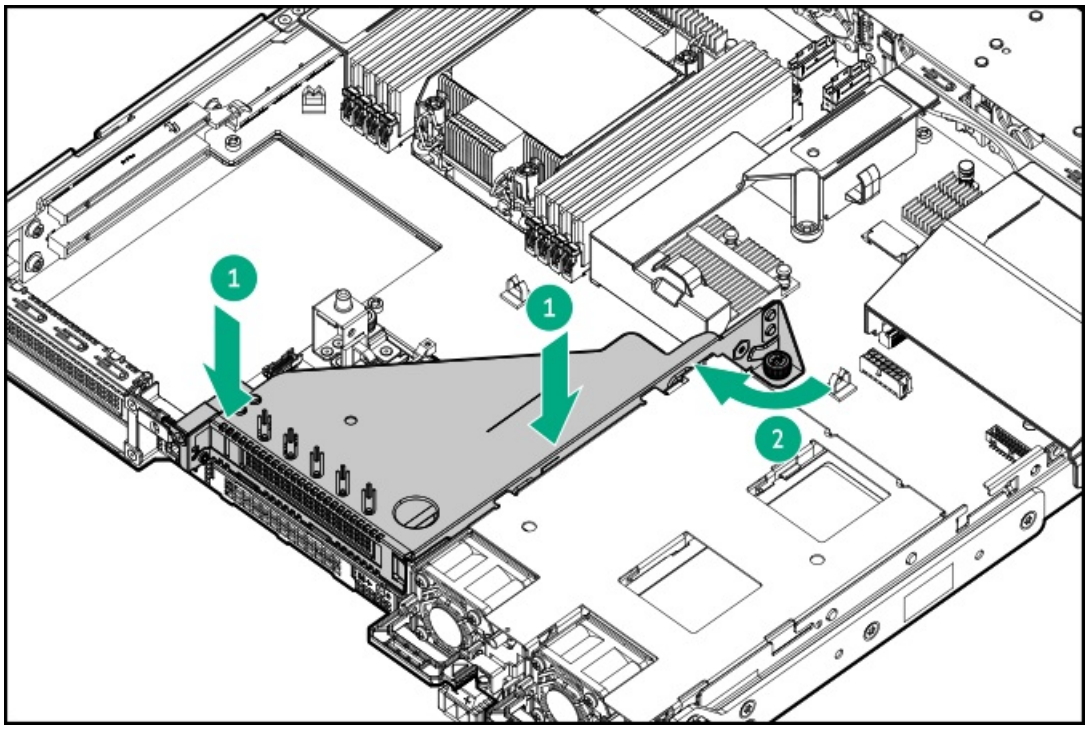
8. Attach the riser board to the cage, and then install the riser board screws.



9. To install the secondary riser cage, do the following:
   a. Carefully press the riser down on its system board connector.

      Make sure that the riser board is firmly seated.

   b. Tighten the captive screw.



10. Connect the MCIO cables to the secondary riser board and the system board .
11. Install the access panel.
12. Install the server into the rack:
    - Install the server into a two-post rack .
    - Install the server into a four-post rack .
13. Connect all peripheral cables to the server.
14. Connect each power cord to the server.
15. Connect each power cord to the power source.
16. Power up the server.

Results

The installation is complete.

Expansion card options

The server supports the installation of full-height, half-length and half-height, half-length (low-profile) PCIe expansion / add-in (AIC) cards such as:

- Ethernet adapter
- Accelerator (workload, computational, or graphics accelerator)

For more information on the expansion options validated for this server, see the server QuickSpecs on the Hewlett Packard Enterprise website:

https://www.hpe.com/info/quickspecs

Subtopics

Expansion option population guidelines

Expansion option population guidelines

To comply with the server mechanical and thermal requirements, see the following slot population information when installing PCIe and OCP expansion options:

Slot 1	Slot 2	Slot 3	Slot 14
Accelerator	NIC adapter *	NIC adapter	NIC adapter
Accelerator	Accelerator	NIC adapter	NIC adapter
Accelerator	Accelerator	Accelerator	NIC adapter
Options other than a NIC adapter	NIC adapter	Accelerator	NIC adapter *

* If an installed accelerator makes it hard to disconnect a network cable, use a plastic spudger to press the cable release tab.

Installing an expansion card

Prerequisites

- Check the electrical compatibility of the expansion option with the riser slot .
- Before you perform this procedure, make sure that you have the following items available:
  - T-10 Torx screwdriver
  - T-15 Torx screwdriver

About this task

CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all PCIe slots have either a riser slot blank or an expansion card installed.

CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

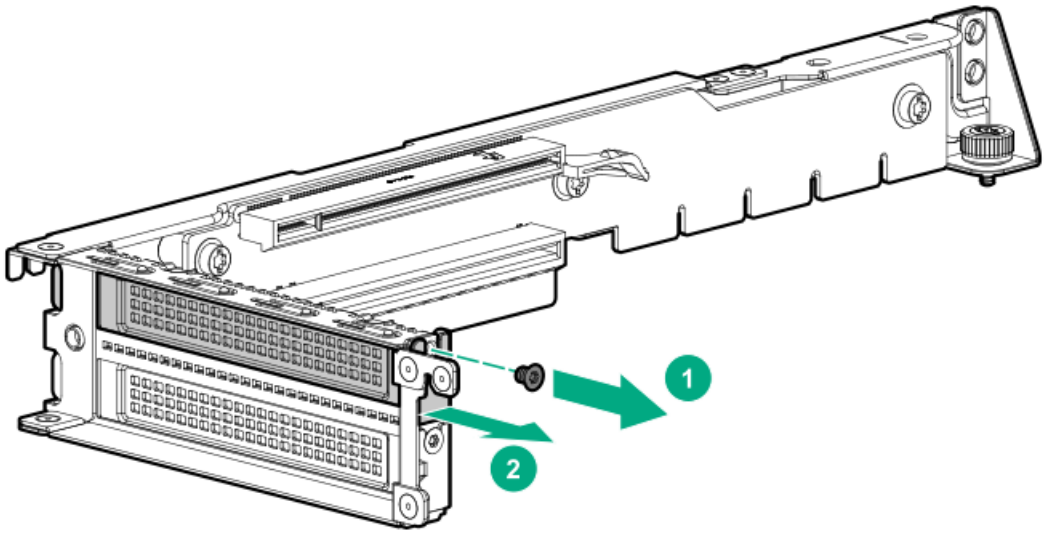
Procedure

1. Power down the server.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack:

- Remove the server from a two-post rack.
- Remove the server from a four-post rack.

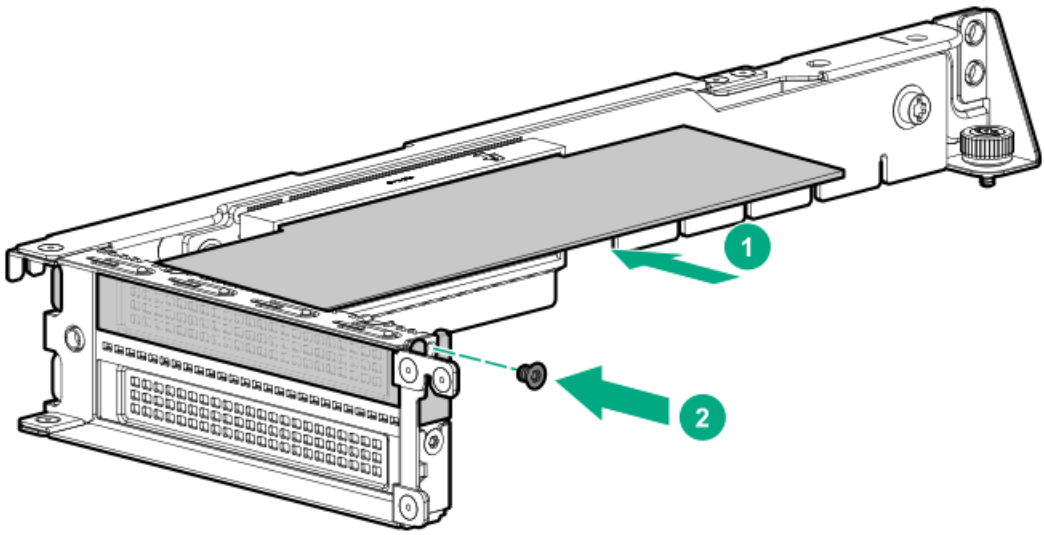
5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. To install an expansion card in the primary riser, do the following:
   a. Remove the primary riser cage.
   b. Remove the riser slot blank.

      Retain the blank for future use.



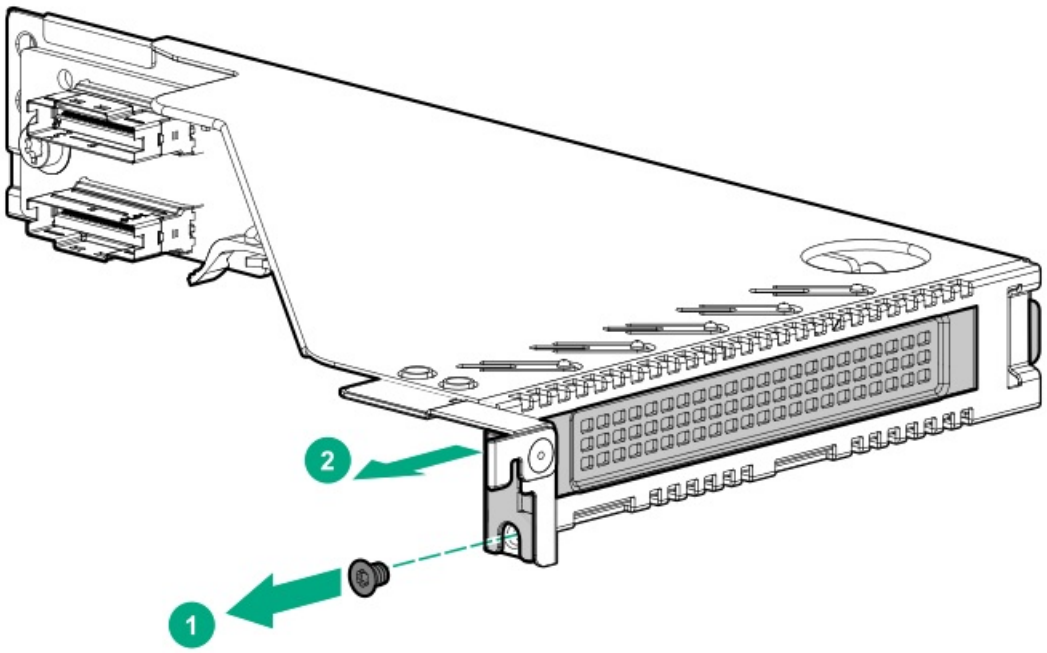
   c. Install the expansion card.

      Make sure that the card is seated firmly in the slot.



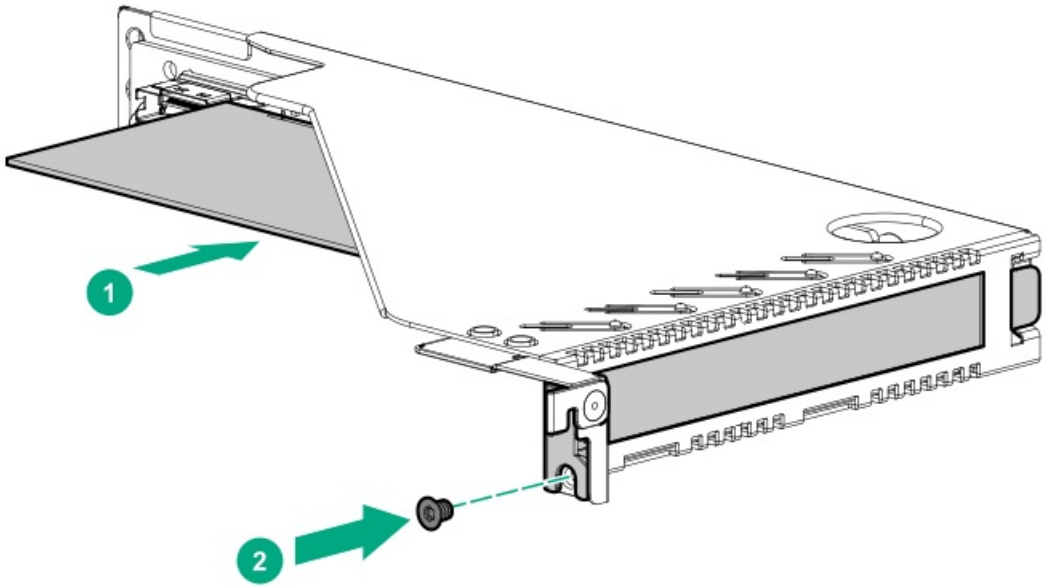
8. To install an expansion card in the secondary riser, do the following:
   a. Remove the secondary riser cage.
   b. Remove the riser slot blank.

Retain the blank for future use.



c. Install the expansion card.

Make sure that the card is seated firmly in the slot.



9. If installing accelerators, connect the accelerator auxiliary power cable.
10. Install the riser cage.
11. Install the access panel.
12. Install the server into the rack:
    - Install the server into a two-post rack.
    - Install the server into a four-post rack.
13. Connect all peripheral cables to the server.

14. Connect each power cord to the server.
15. Connect each power cord to the power source.
16. Power up the server.

Results

The installation is complete.

OCP NIC 3.0 adapter option

The server supports SFF dual-port and quad-port OCP NIC 3.0 adapter options with various interfaces and advanced interconnect features for high-bandwidth applications.

Subtopics

Installing an OCP NIC 3.0 adapter

Installing an OCP NIC 3.0 adapter

Prerequisites

- Review the Expansion option population guidelines.
- Before you perform this procedure, make sure that you have the following items available:
  - T-10 Torx screwdriver
  - Spudger or any small prying tool

About this task

> **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all PCIe slots have either a riser slot blank or an expansion card installed.

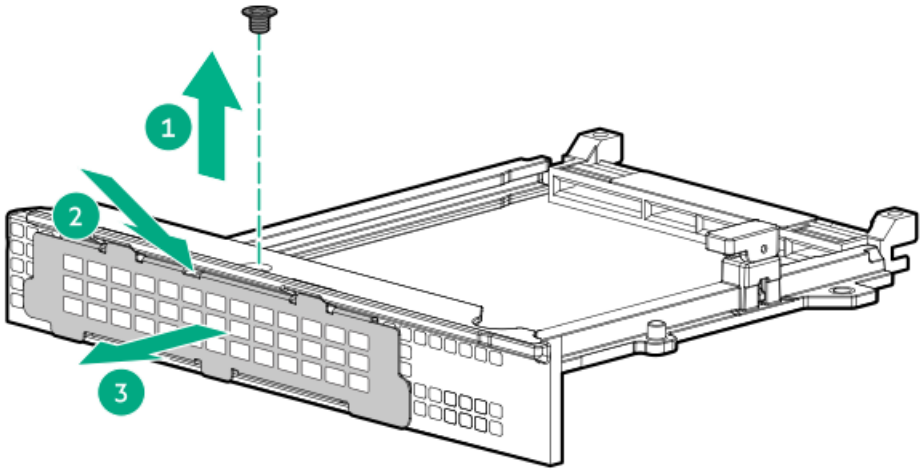
> **CAUTION:** A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

Procedure

1. Power down the server.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack:
   - Remove the server from a two-post rack.
   - Remove the server from a four-post rack.
5. Place the server on a flat, level work surface.
6. Remove the access panel.

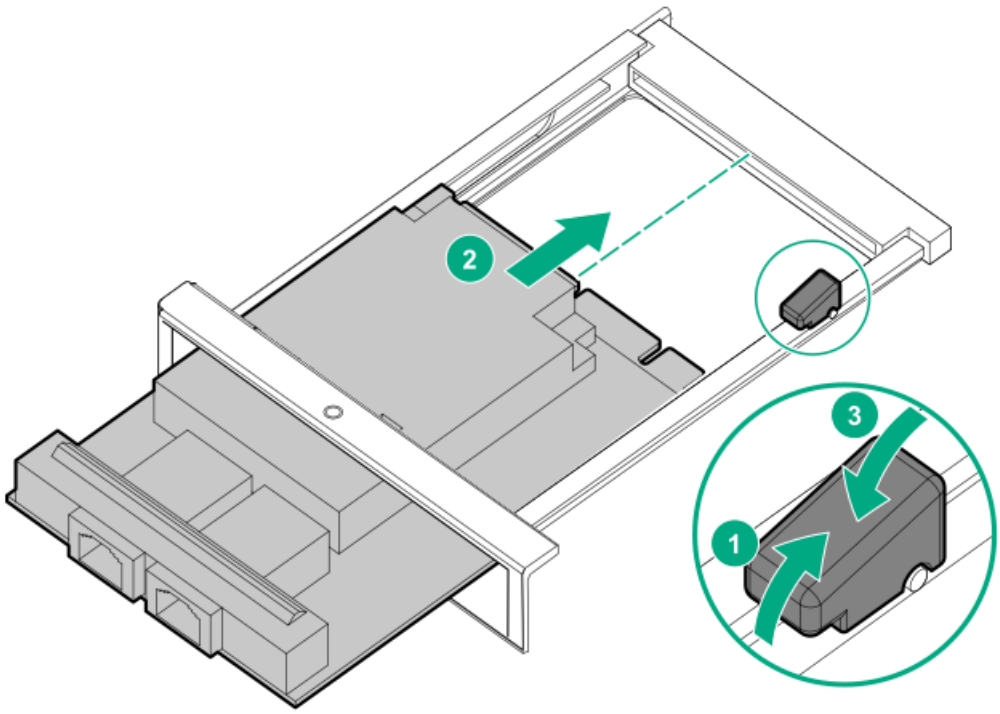
7. Remove the secondary riser cage.
8. Remove the OCP 3.0 NIC adapter blank:
   a. Remove the blank screw.
   b. Use a plastic spudger to pry the top side of the blank from the chassis.
   c. Remove the blank.

      Retain the blank for future use.



9. Install the OCP NIC 3.0 adapter:
   a. Rotate the locking pin to the open (vertical) position.
   b. Slide the adapter into the bay until it clicks into place.

      Make sure that the card is seated firmly in the slot.
   c. Rotate the locking pin to the close (horizontal) position.



10. Install the secondary riser cage.
11. Install the access panel.

12. Install the server into the rack:
    - Install the server into a two-post rack .
    - Install the server into a four-post rack .
13. Connect all peripheral cables to the server.
14. Connect each power cord to the server.
15. Connect each power cord to the power source.
16. Power up the server.

Results

The installation is complete.

Cabling

This chapter includes cabling guidelines and diagrams for internal component cabling.

Subtopics

Cabling guidelines

Observe the following:

- Some diagrams show alphabetical callouts A, B, C, etc. These callouts correspond to labels near the connectors on the cable.
- The cable colors in the cabling diagrams used in this chapter are for illustration purposes only.
- Observe all guidelines when working with server cables.

Before connecting cables

- Note the port labels on the PCA components. Not all 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.

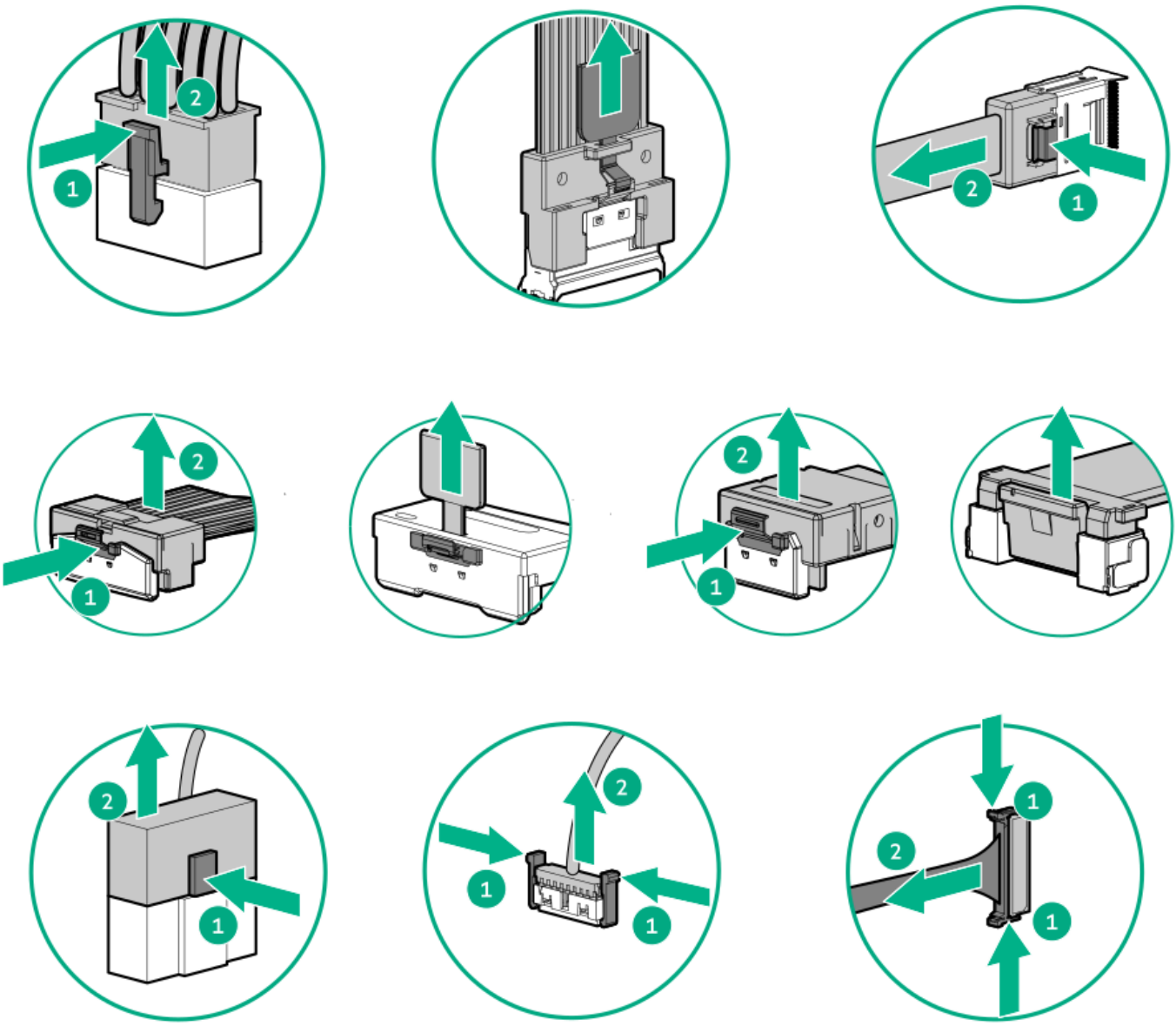
- Some data cables are prebent. Do not unbend or manipulate the cables.
- To prevent mechanical damage or depositing oil that is present on your hands, and other contamination, do not touch the ends of the connectors.

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 is 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.

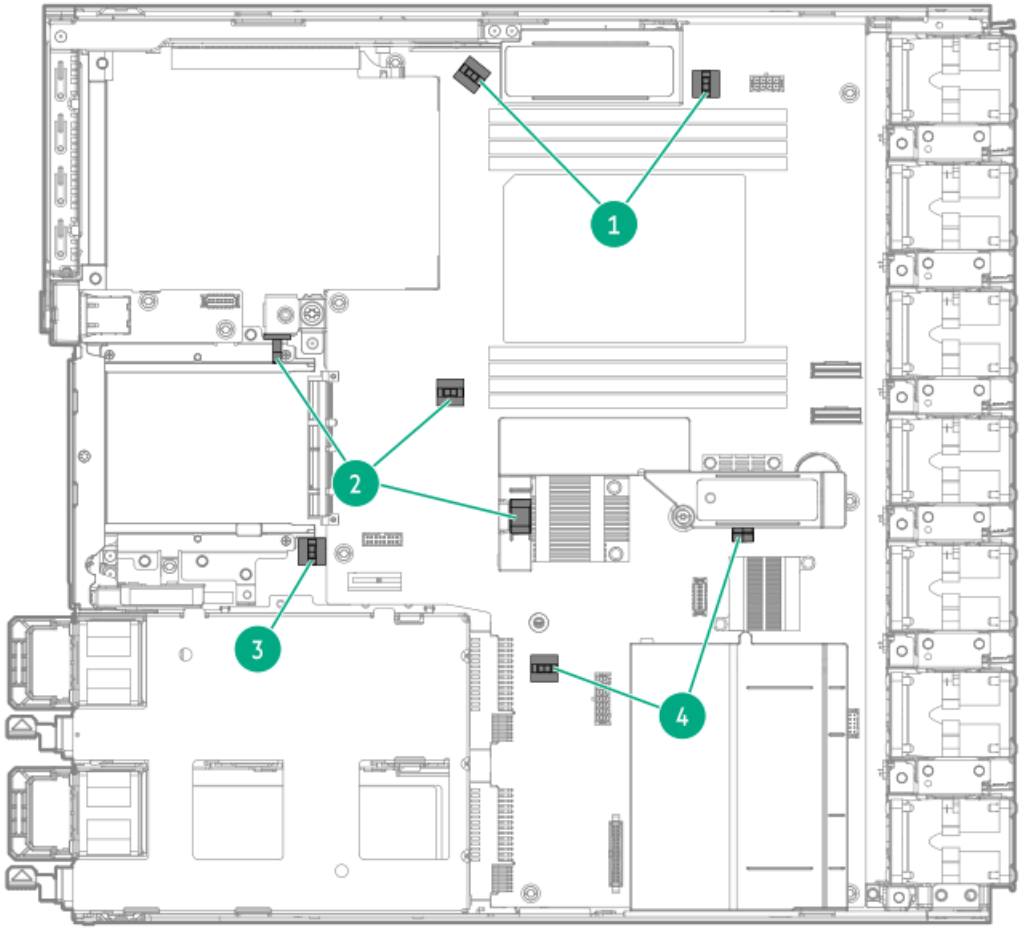
When disconnecting cables

- 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.

Internal cabling management



Item	Description
1	Secure the GPU auxiliary power cable in these clips.
2	Secure the iLO dedicated network cable in these clips.
3	Secure the front I/O cable in this clip.
4	Secure the fan power and signal cables in these clips.

Cabling diagrams

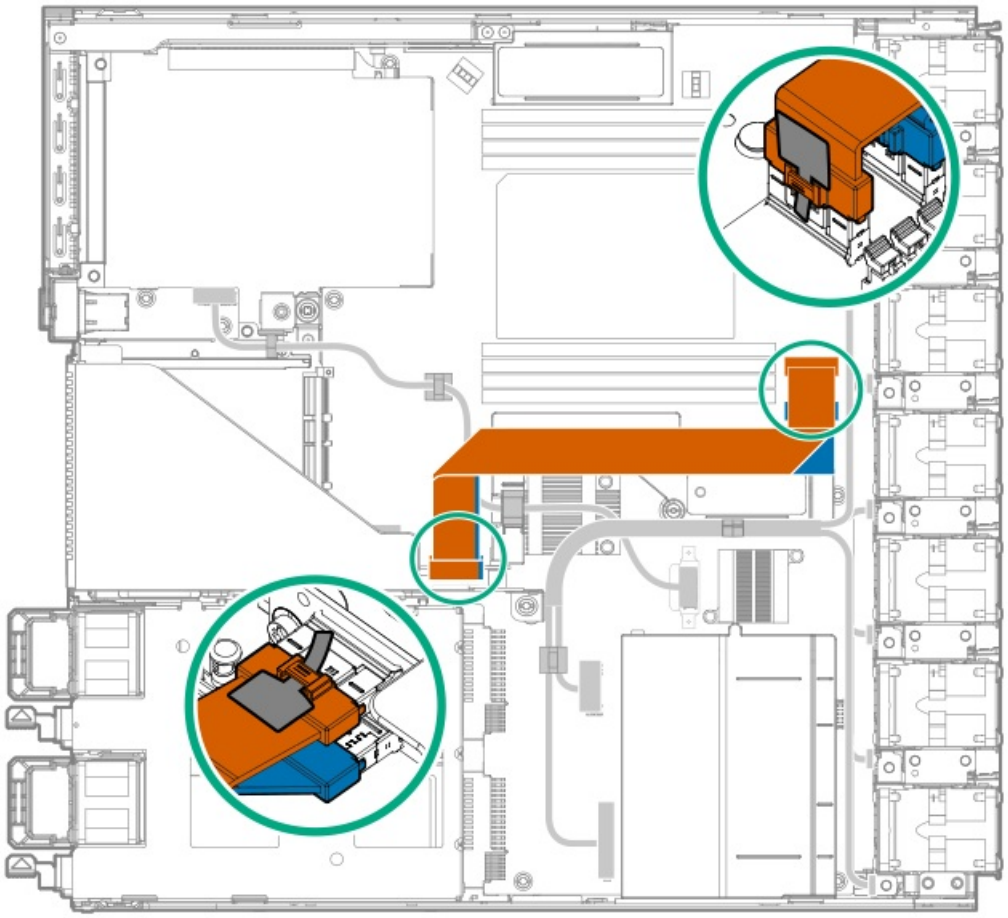
Observe the following:

- Before cabling components, see the cabling guidelines.
- Use the cable part number or search feature to find your diagram.

Component cabling	Cable part number
MCIO cabling for the secondary riser	P52313-001
iLO dedicated network module cabling	P41869-001
Fan power and signal cabling	P46294-001
Accelerator auxiliary power cabling	P63703-001
Front I/O cabling	P41870-001

MCIO cabling for the secondary riser

Make sure to route the MCIO cables on top of the iLO dedicated network cable.



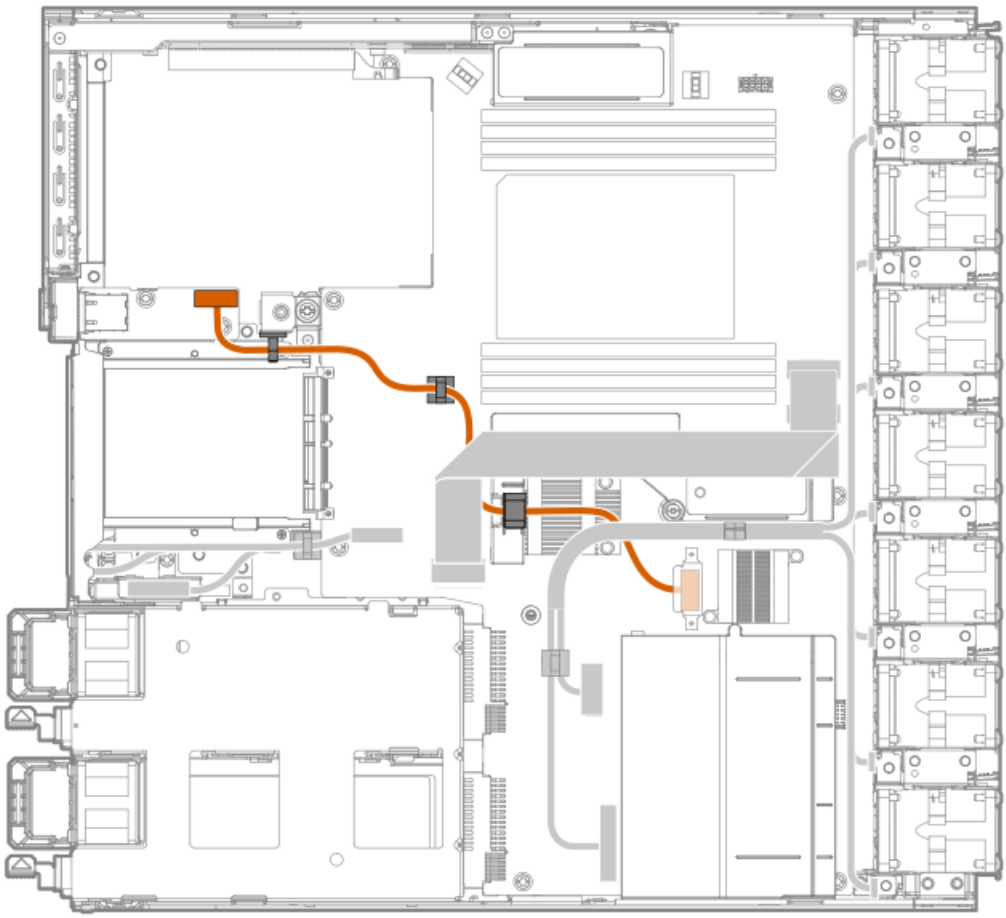
Cable part number	Color	From	To
P52313-001*	Orange	MCIO port 1 (system board)	MCIO port 1 (secondary riser)
	Blue	MCIO port 2 (system board)	MCIO port 2 (secondary riser)

* Option kit: P54288-B21

iLO dedicated network module cabling

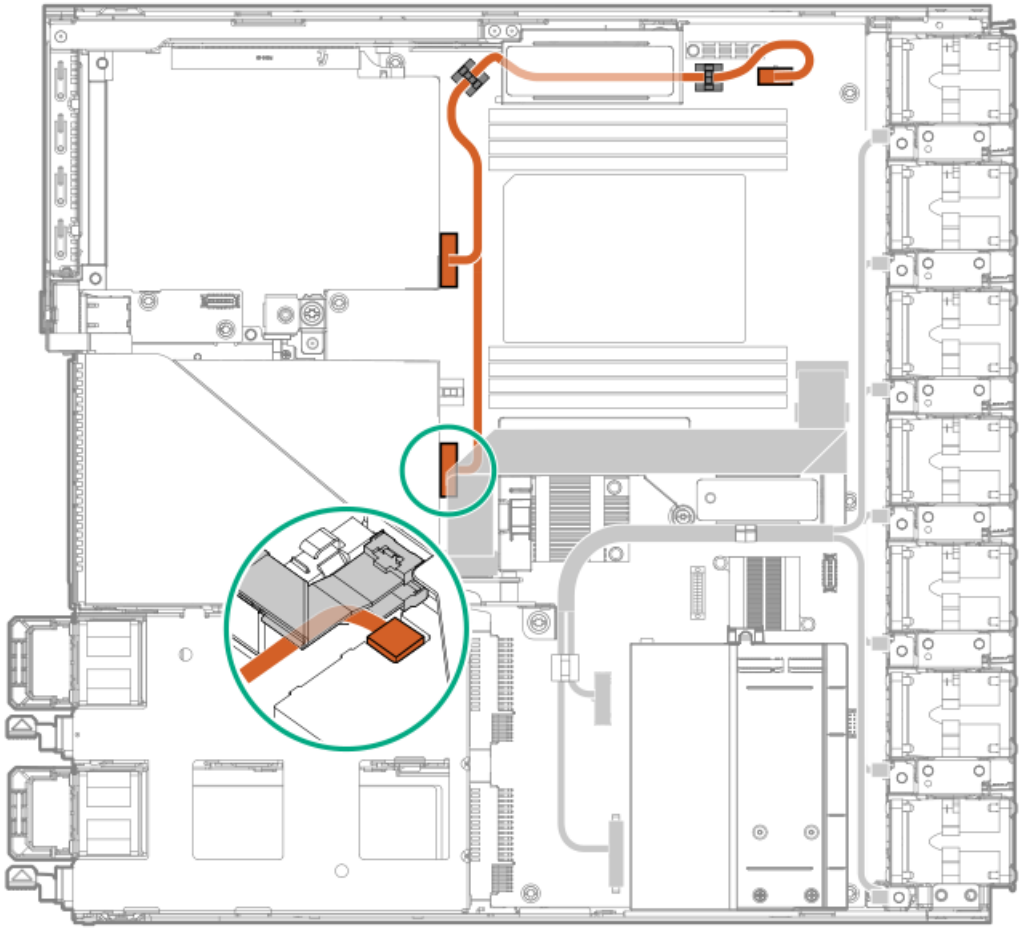
Observe the following iLO dedicated network module cabling guidelines:

- Route the iLO cable underneath the MCIO cables and the fan power and signal cables.
- Make sure that the iLO cable does not touch the fan power and signal cables. Secure the iLO cable in the highlighted cable clips on the DIMM air baffle and system board.



Cable part number	Color	From	To
P41869-001	Orange	iLO dedicated network module connector	iLO dedicated network module

Accelerator auxiliary power cabling



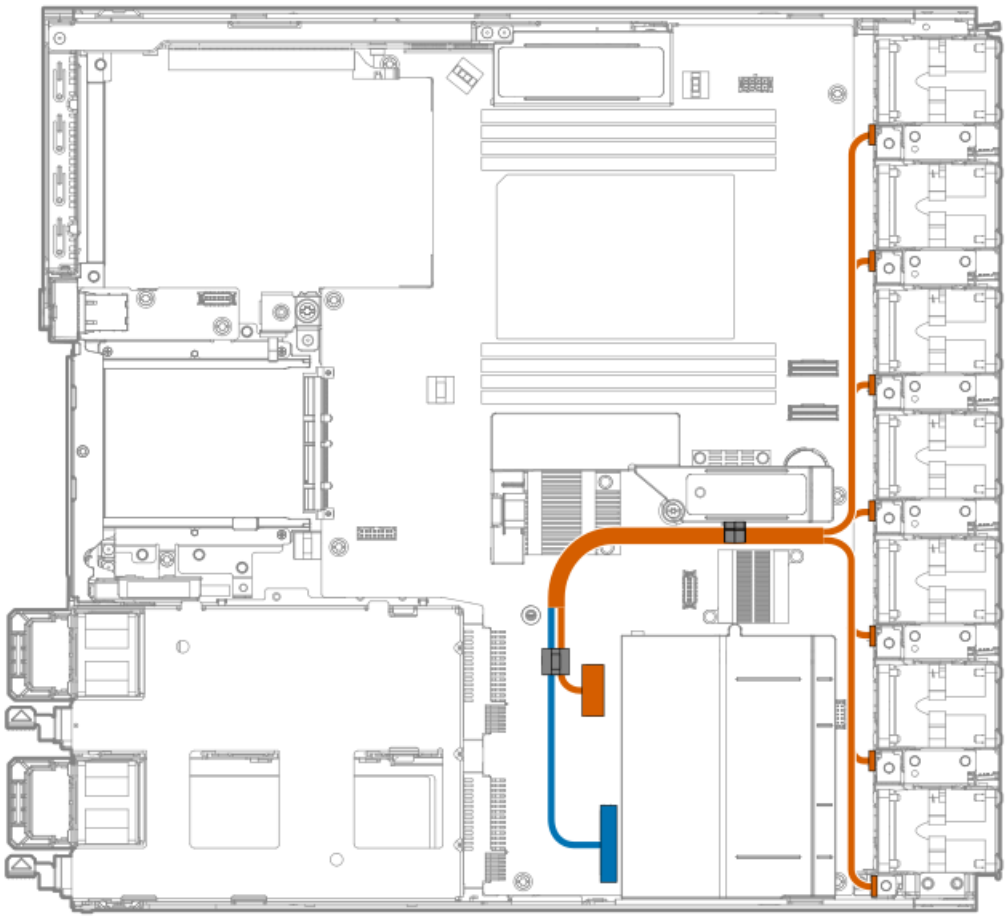
Cable part number	Color	From	To
P63703-001*	Orange	Accelerator auxiliary power connector	High-power accelerators in the primary and secondary risers

* Option kit: P64070-B21

Fan power and signal cabling

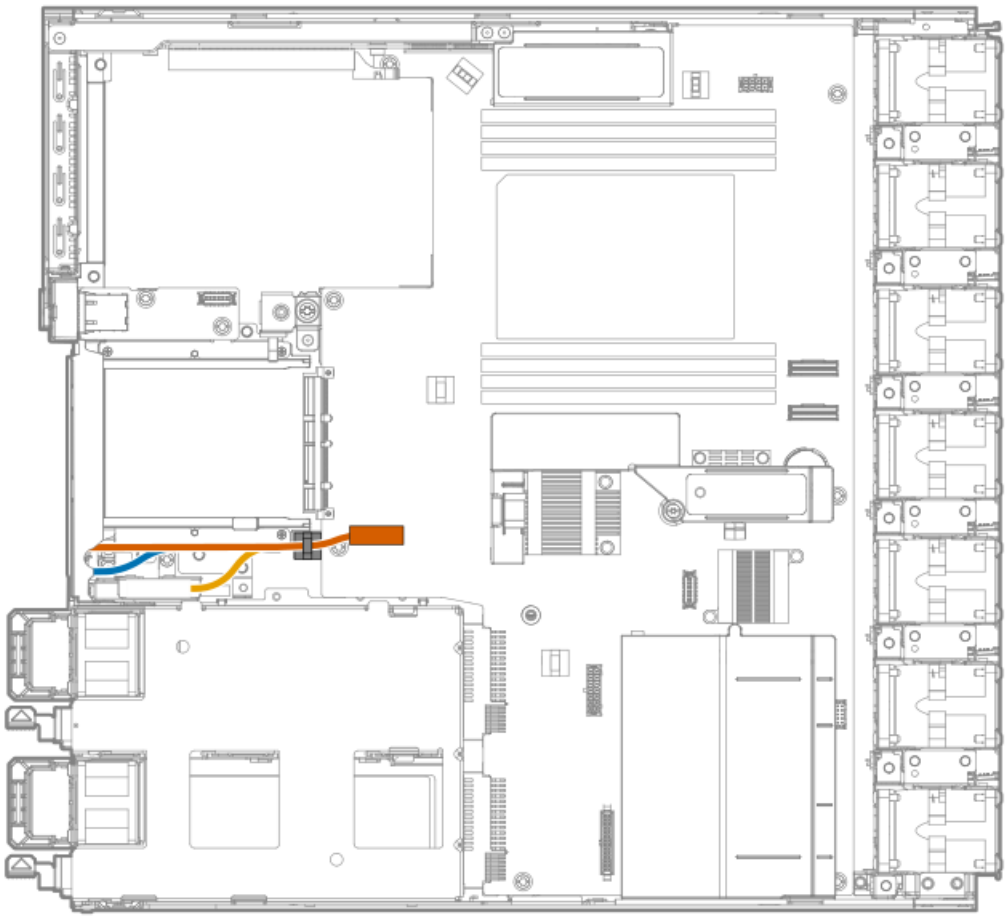
Observe the following fan cabling guidelines:

- Route the fan power and signal cables underneath the MCIO cables and above the iLO dedicated network cable.
- Make sure that the iLO cable does not touch the fan power and signal cables. Secure the fan power and signal cable bundle in the highlighted cable clips on the DIMM air baffle and system board.



Cable part number	Color	From	To
P46294-001	Orange	Fan power connector	Fan cage connectors
	Blue	Fan signal connector	

Front I/O cabling



Cable part number	Color	From	To
P41870-001	Orange	iLO service port cable connector	Health LED
	Gold		iLO service port
	Blue		Power On/Standby button

Configuration resources

Use the following resources to find documentation for configuring and managing your server.

- Some utilities might not apply to your server. For information about server compatibility with the products listed in this chapter, see the product QuickSpecs (**https://www.hpe.com/info/quickspecs**).
- Products ordered from HPE Factory Express might have already been configured with some or all the configurations in this chapter. To determine if any additional setup is required, see your HPE Factory Express order.
- For the most recent changes, feature enhancements, and bug fixes, see the latest product release notes.

Subtopics

Updating firmware or system ROM

Configuring the server

Configuring storage controllers

Deploying an OS

Configuring security

Optimizing the server

Server management

Managing Linux-based high performance compute clusters

Updating firmware or system ROM

To	Use
Download service packs	Service Pack for ProLiant (SPP) https://www.hpe.com/servers/spp/download
Deploy service packs to a single server	Smart Update Manager (SUM) https://www.hpe.com/info/sum-docs
Deploy service packs to multiple servers	HPE OneView https://www.hpe.com/support/oneview-docs
• Enable policy-based management of server or server group firmware for distributed server infrastructure • Monitor server compliance with a configured firmware baseline • Receive automatic iLO firmware updates • Receive baseline update alerts	HPE GreenLake for Compute Ops Management https://www.hpe.com/info/com-docs

Configuring the server

To configure	Use
Single server (GUI)	• Intelligent Provisioning https://www.hpe.com/info/intelligentprovisioning/docs • iLO remote console or web interface https://www.hpe.com/support/ilo6 • UEFI System Utilities https://www.hpe.com/info/UEFI-manuals • HPE GreenLake for Compute Ops Management https://www.hpe.com/info/com-docs
Single server (scripting)	• RESTful Interface Tool https://www.hpe.com/support/restfulinterface/docs • Python iLO Redfish Library (python-ilorest-library) https://github.com/HewlettPackard/python-ilorest-library • Scripting Tools for Windows Powershell https://www.hpe.com/info/powershell/docs • iLO RESTful API https://servermanagementportal.ext.hpe.com/docs/redfishservices/ilos/ilo6/ • HPE GreenLake for Compute Ops Management API https://developer.greenlake.hpe.com/
Multiple servers (either UI or scripting)	• HPE OneView [1] https://www.hpe.com/support/oneview-docs • HPE GreenLake for Compute Ops Management https://www.hpe.com/info/com-docs ○ **Server settings:** Define server-specific parameters such as firmware baselines, and then apply them to server groups. ○ **Server groups:** Organize servers into custom-defined sets with associated server settings, and then apply group-specific policies to create a consistent configuration across the servers in the group.

[1] For servers running HPE OneView, do not use another tool, such as iLO, to delete or change certain settings. For more information about using HPE OneView and iLO to manage the same server, see the iLO user guide at **https://www.hpe.com/support/ilo6**.

Configuring storage controllers

Controller type	Documentation
Intel VROC for HPE Gen11	Intel Virtual RAID on CPU for HPE Gen11 User Guide https://hpe.com/support/VROC-Gen11-UG OS-specific configuration guides: • Intel Virtual RAID on CPU (Intel VROC) for Windows User Guide https://www.intel.com/content/dam/support/us/en/documents/memory-and-storage/338065_Intel_VROC_UserGuide_Windows.pdf • Intel Virtual RAID on CPU (Intel VROC) for Linux User Guide https://www.intel.com/content/dam/support/us/en/documents/memory-and-storage/linux-intel-vroc-userguide-333915.pdf • Intel Volume Management Device Driver for VMware ESXi User Guide https://www.intel.com/content/dam/support/us/en/documents/memory-and-storage/ESXi-Intel-VROC-UserGuide.pdf

Deploying an OS

For a list of supported operating systems, see the HPE Servers Support & Certification Matrices:

https://www.hpe.com/support/Servers-Certification-Matrices

To	See
Configure the server to boot from a SAN	HPE Boot from SAN Configuration Guide https://www.hpe.com/info/boot-from-san-config-guide
Configure the server to boot from a PXE server	UEFI System Utilities User Guide for HPE ProLiant Gen11 Servers and HPE Synergy https://www.hpe.com/support/UEFIGen11-UG-en
Deploy an OS using iLO virtual media	iLO user guide https://www.hpe.com/support/ilo6
Deploy an OS using Intelligent Provisioning	Intelligent Provisioning user guide https://www.hpe.com/info/intelligentprovisioning/docs

Configuring security

To	See
Implement server security best practices.	• HPE Compute Security Reference Guide https://www.hpe.com/info/server-security-reference-en • HPE iLO 6 Security Technology Brief https://www.hpe.com/support/ilo6-security-en
Configure and use the Server Configuration Lock feature on HPE Trusted Supply Chain servers and other servers that have the Server Configuration Lock feature enabled.	Server Configuration Lock User Guide for HPE ProLiant servers and HPE Synergy https://www.hpe.com/info/server-config-lock-UG-en

Optimizing the server

To	See
Optimize server performance through management and tuning features.	HPE Server Performance Management and Tuning Guide https://www.hpe.com/info/server-performance-management-tuning-en
Obtain recommendations for resolving incorrect settings.	HPE InfoSight for Servers User Guide https://www.hpe.com/support/InfoSight-for-Servers-UG-en

Server management

To monitor	See
Single server	HPE iLO https://www.hpe.com/support/ilo6
Multiple servers	HPE OneView https://www.hpe.com/support/oneview-docs
Single or multiple servers	HPE GreenLake for Compute Ops Management https://www.hpe.com/info/com-docs

Managing Linux-based high performance compute clusters

To	Use
Provision, manage, and monitor clusters.	HPE Performance Cluster Manager https://www.hpe.com/support/hpcm_manuals
Optimize your applications.	HPE Performance Analysis Tools https://www.hpe.com/info/perftools
Optimize software library for low latency and high bandwidth, both on-node and off-node, for point-to-point and collective communications.	HPE Cray Programming Environment User Guide https://www.hpe.com/info/cray-pe-user-guides

Troubleshooting

Subtopics

NMI functionality

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

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

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

Troubleshooting resources

Troubleshooting resources are available for HPE Gen11 server products in the following documents:

- Troubleshooting Guide for HPE ProLiant Gen11 servers provides procedures for resolving common problems and comprehensive courses of action for fault isolation and identification, issue resolution, and software maintenance.

  https://www.hpe.com/info/gen11-troubleshooting

- Integrated Management Log Messages for HPE ProLiant Gen10, Gen10 Plus, and Gen11 servers and HPE Synergy provides IML messages and associated troubleshooting information to resolve critical and cautionary IML events.

  https://www.hpe.com/info/Troubleshooting-IML-en

System battery replacement

If the server no longer automatically displays the correct date and time, then replace the battery that provides power to the real-time clock.

Under normal use, battery life is 5–10 years.

Subtopics

System battery information

The server contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery that provides power to the real-time clock.

WARNING: If this battery is not properly handled, a risk of fire or burning exists. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not expose the battery to low air pressure as it might lead to explosion or leakage of flammable liquid or gas.
- Do not disassemble, crush, puncture, short external contacts, or dispose of the battery in fire or water.

Removing and replacing the system battery

Prerequisites

Before you perform this procedure, make sure that you have a small flat-bladed, nonconductive tool available.

About this task

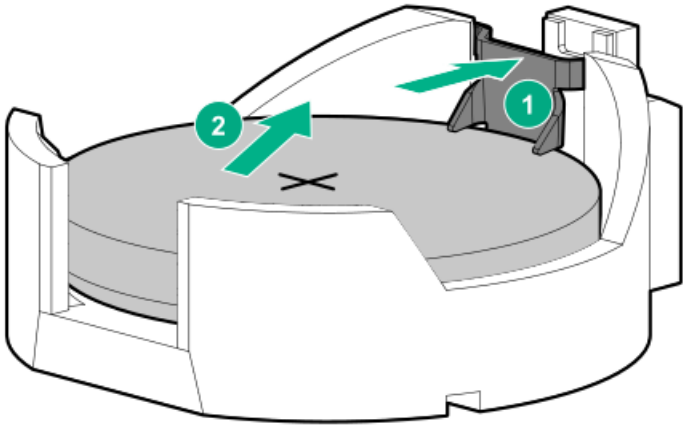
IMPORTANT: After replacing the system battery and applying power, wait for 10 minutes before powering on the server. This lead time is required for the server to reset and reinitialize the iLO configuration settings stored in SRAM.

Procedure

1. Power down the server.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack:
   - Remove the server from a two-post rack.
   - Remove the server from a four-post rack.
5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. Remove the DIMM air baffle.
8. Locate the battery on the system board.
9. Remove the system battery:

a. Use a small flat-bladed, nonconductive tool to press the battery latch.

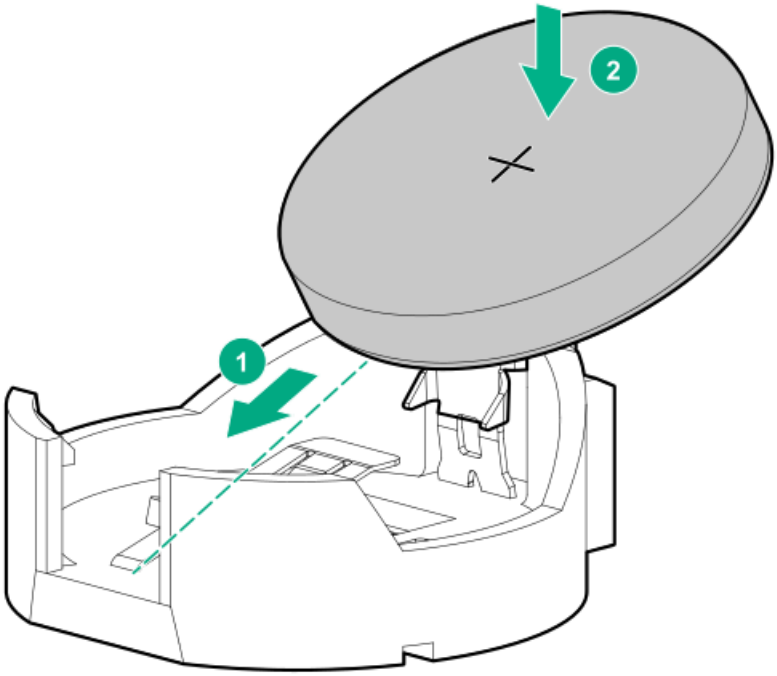
b. Remove the system battery from the socket.



10. Install the system battery:

    a. With the side of the battery showing the "+" sign facing up, insert the battery into the socket.

    b. Press the system battery down until it clicks into place.



11. Install the DIMM air baffle.
12. Install the access panel.
13. Install the server into the rack:
    - Install the server into a two-post rack.
    - Install the server into a four-post rack.
14. Connect all peripheral cables to the server.
15. Connect each power cord to the server.

16. Connect each power cord to the power source.
17. Wait for 10 minutes for the server to reset and reinitialize the iLO configuration settings stored in SRAM.

> **IMPORTANT:** If iLO security is disabled, the configuration will not be restored. To restore the configuration manually, see **https://www.hpe.com/support/ilo6**.

18. Power up the server.
19. Properly dispose of the old battery.

    For more information about battery replacement or proper disposal, contact an authorized reseller or support specialist.

Safety, warranty, and regulatory information

Subtopics

Regulatory information

Warranty information

Regulatory information

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

https://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:

https://www.hpe.com/info/reach

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

https://www.hpe.com/info/ecodata

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

https://www.hpe.com/info/environment

Subtopics

Notices for Eurasian Economic Union

Turkey RoHS material content declaration

Ukraine RoHS material content declaration

Notices for Eurasian Economic Union

EAC

Manufacturer and Local Representative Information

Manufacturer information:

Hewlett Packard Enterprise Company, 1701 E Mossy Oaks Road, Spring, TX 77389 U.S.

Local representative information Russian:

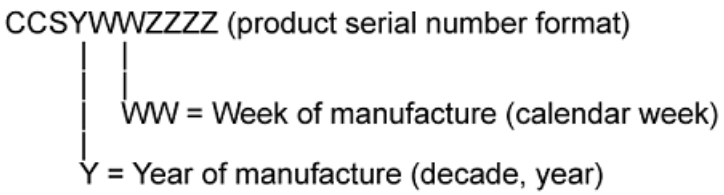
- **Russia**
  ООО "Хьюлетт Паккард Энтерпрайз", Российская Федерация, 125171, г. Москва, Ленинградское шоссе, 16А, стр.3, Телефон: +7 499 403 4248 Факс: +7 499 403 4677
- **Kazakhstan**
  ТОО «Хьюлетт-Паккард (К)», Республика Казахстан, 050040, г. Алматы, Бостандыкский район, проспект Аль-Фараби, 77/7, Телефон/факс: + 7 727 355 35 50

Local representative information Kazakh:

- **Russia**
  ЖШС "Хьюлетт Паккард Энтерпрайз", Ресей Федерациясы, 125171, Мәскеу, Ленинград тас жолы, 16А блок 3, Телефон: +7 499 403 4248 Факс: +7 499 403 4677
- **Kazakhstan**
  ЖШС «Хьюлетт-Паккард (К)», Қазақстан Республикасы, 050040, Алматы к., Бостандык ауданы, Әл-Фараби даңғ ылы, 77/7, Телефон/факс: +7 727 355 35 50

Manufacturing date:

The manufacturing date is defined by the serial number.



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

Turkey RoHS material content declaration

Türkiye Cumhuriyeti: AEEE Yönetmeliğine Uygundur

Ukraine RoHS material content declaration

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

Warranty information

To view the warranty information for your product, see the **warranty check tool**.

Specifications

Subtopics

Environmental specifications

Specifications	Value
Temperature range*	—
Operating	10°C to 35°C (50°F to 95°F)
Nonoperating	-30°C to 60°C (-22°F to 140°F)
Relative humidity (noncondensing)	—
Operating	8% to 90% 28°C (82.4°F) maximum wet bulb temperature, noncondensing
Nonoperating	5% to 95% 38.7°C (101.7°F) maximum wet bulb temperature, noncondensing
Altitude	—
Operating	3050 m (10,000 ft) This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1,500 ft/min).
Nonoperating	9144 m (30,000 ft) Maximum allowable altitude change rate is 457 m/min (1,500 ft/min).

Standard operating support

10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1,000 ft) above sea level to a maximum of 3,050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 20°C/hr (36°F/hr). The upper limit and rate of change may be limited by the type and number of options installed.

System performance during standard operating support might be reduced if operating above 30°C (86°F).

Extended ambient operating support

For approved hardware configurations, the supported system inlet range is extended to be:

- 5° to 10°C (41° to 50°F) and 35° to 40°C (95° 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 (2,953 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 3,050 m (10,000 ft).

The approved hardware configurations for this system are listed in the Extended Ambient Temperature Guidelines for Gen11 HPE ProLiant servers:
https://www.hpe.com/support/ASHRAEGen11

Mechanical specifications

Specification	Value
Dimensions	—
Height	4.29 cm (1.69 in)
Depth	43.18 cm (17.00 in)
Width	44.16 cm (17.39 in)
Weight, approximate values	—
Minimum	9.62 kg (21.21 lb)
Maximum	11.4 kg (25.13 lb)

Power supply specifications

Depending on the installed options and the regional location where the server was purchased, the server can be configured with one of the following power supplies. For detailed power supply specifications, see the QuickSpecs on the **Hewlett Packard Enterprise website**.

Subtopics

HPE 700 W Flex Slot Platinum Hot-plug Power Supply

HPE 700 W Flex Slot -48 VDC Hot-plug Low Halogen Power Supply

HPE 900 W–1000 W Flex Slot Titanium Hot-plug Power Supply

HPE 700 W Flex Slot Platinum Hot-plug Power Supply

Specification	Value		
Rated input voltage	100 VAC to 240 VAC 4.1 A to 8.3 A at 50 Hz to 60 Hz		
Input voltage range (V_{RMS})	100 VAC to 240 VAC		
Nominal frequency range	50 Hz to 60 Hz		
Nominal input voltage	100 V_{RMS}	200 V_{RMS}	240 V_{RMS}
Maximum rated output	700 W	700 W	700 W
Maximum rated input	780 W	753 W	753 W
Maximum rated volt-ampere	780 VA	753 VA	761 VA

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

- This equipment must be installed by trained service personnel.
- 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.

HPE 700 W Flex Slot -48 VDC 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	20 A maximum at -40 VDC
Rated input power	760 W at -40 VDC input 754 W at -48 VDC input, nominal input 744 W at -72 VDC input
Rated input power (BTUs per hour)	2593 at -40 VDC input 2572 at -48 VDC input, nominal input 2537 at -72 VDC input
Power supply output	—
Rated steady-state power	700 W at -40 VDC to -72 VDC
Maximum peak power	700 W at -40 VDC to -72 VDC

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

- This equipment must be installed by trained service personnel.
- 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.

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 900 W–1000 W Flex Slot Titanium Hot-plug 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
Rated input current	10.2 A at 100 VAC 6.1 A at 200 VAC
Maximum rated input power	1010 W at 100 VAC 1090 W at 200 VAC
BTUs per hour	3446 at 100 VAC 3719 at 200 VAC
Power supply output	—
Rated steady-state power	900 W at 100 VAC to 127 VAC 1000 W at 200 VAC to 240 VAC input
Maximum peak power	900 W at 100 VAC to 127 VAC 1000 W at 200 VAC to 240 VAC

Websites

General websites

Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix

https://www.hpe.com/storage/spock

Product white papers and analyst reports

https://www.hpe.com/us/en/resource-library

For additional websites, see Support and other resources.

Product websites

HPE ProLiant DL110 Gen11 Server user documents

https://www.hpe.com/info/dl110gen11-docs

Support and other resources

Subtopics

Accessing Hewlett Packard Enterprise Support

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

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

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

  https://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

HPE product registration

To gain the full benefits of the Hewlett Packard Enterprise Support Center and your purchased support services, add your contracts and products to your account on the HPESC.

- When you add your contracts and products, you receive enhanced personalization, workspace alerts, insights through the dashboards, and easier management of your environment.
- You will also receive recommendations and tailored product knowledge to self-solve any issues, as well as streamlined case creation for faster time to resolution when you must create a case.

To learn how to add your contracts and products, see https://www.hpe.com/info/add-products-contracts.

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

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

  My HPE Software Center

  https://www.hpe.com/software/hpesoftwarecenter

- To subscribe to eNewsletters and alerts:

  https://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:

  https://www.hpe.com/support/AccessToSupportMaterials

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

Customer self repair

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

For more information about CSR, contact your local service provider.

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 initiates a fast and accurate resolution based on the service level of your product. 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.

HPE Get Connected

https://www.hpe.com/services/getconnected

HPE Tech Care Service

https://www.hpe.com/services/techcare

HPE Complete Care Service

https://www.hpe.com/services/completecare

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, use the Feedback button and icons (at the bottom of an opened document) on the Hewlett Packard Enterprise Support Center portal (**https://www.hpe.com/support/hpesc**) to send any errors, suggestions, or comments. This process captures all document information.