HPE ProLiant BL460c Gen10 Server Blade User Guide

Abstract

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

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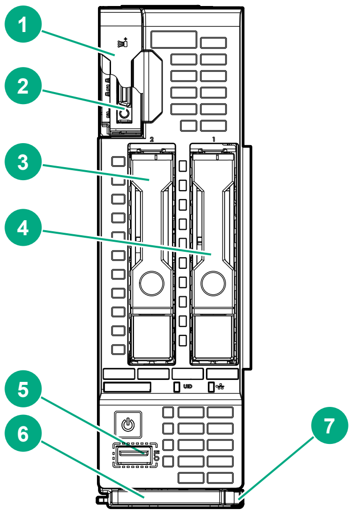
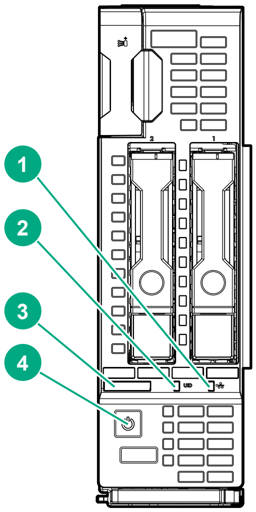
Front panel components



Item	Description
1	Serial label pull tab
2	HPE c-Class Blade SUV connector[1] (behind the serial label pull tab)
3	Drive bay 2
4	Drive bay 1
5	iLO Service port
6	Server blade release lever
7	Server blade release latch

[1] The SUV connector and the c-Class Blade SUV Cable are used for some server blade configuration and diagnostic procedures.

Front panel LEDs and buttons



Item	Description	Status
1	NIC status LED	Solid green = Link to network Flashing green (1 flash per second) = Network active Off = No network activity
2	UID LED	Solid blue = Activated Flashing blue: • 1 flash per second = Remote management or firmware upgrade in progress • 4 flashes per second = iLO manual reboot sequence initiated • 8 flashes per second = iLO manual reboot sequence in progress Off = Deactivated

Table Continued

Item	Description	Status
3	Health LED	Solid green = Normal Flashing green (1 flash per second) = iLO is rebooting Flashing amber = System degraded Flashing red (1 flash per second) = System critical If the health LED indicates a degraded or critical state, review the system IML or use iLO to review the system health status.
4	Power On/Standby button and system power LED	Solid green = System on Flashing green (1 flash per second) = Performing power on sequence Solid amber = System in standby Off = No power present Facility power is not present, power cord is not attached, no power supplies are installed, power supply failure has occurred, or the server blade is not plugged in.

Front panel LED power fault codes

The number of flashes in each sequence corresponds to the subsystem impacted by the power fault. The following table provides a list of power fault codes, and the subsystems that are affected. Not all power faults are used by all Server Blades.

Subsystem	Front panel LED behavior
System board	1 flash
Processor	2 flashes
Memory	3 flashes
Mezzanine slots	4 flashes
FlexibleLOM	5 flashes
Removable HPE Flexible Smart Array controller/ NVMe Pass-Through	6 flashes
Power backplane or storage backplane	8 flashes

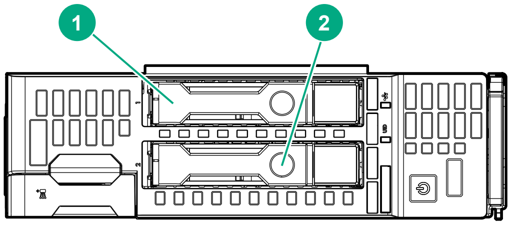
Serial label pull tab information

The serial label pull tab is on the front panel of the server blade. To locate the serial label pull tab, see **Front panel components** on page 6. The serial label pull tab provides the following information:

- Product serial number
- iLO information
- QR code that points to mobile-friendly documentation

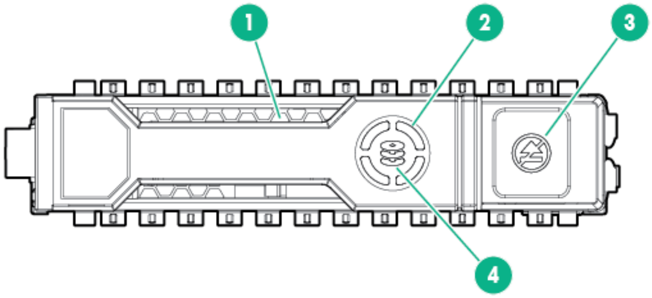
Drive numbering

Depending on the configuration, this server blade can support hard drives, SSDs, NVMe SSDs, and uFF drives (supported in a SFF Flash Adapter) in the drive bays. Depending on the device installed, the bay number might be different.



Item	Hard drive/SSD bay numbering	uFF drive bay numbering	NVMe drive bay numbering
1	1	1 and 101	1
2	2	2 and 102	2

Hot-plug drive LED definitions

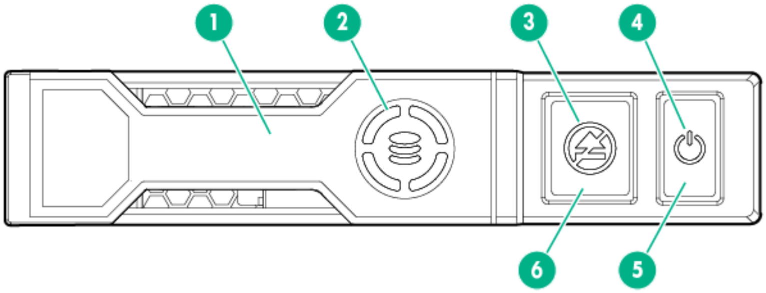


Item	LED	Status	Definition
1	Locate	Solid blue	The drive is being identified by a host application.
		Flashing blue	The drive carrier firmware is being updated or requires an update.
2	Activity ring	Rotating green	Drive activity
		Off	No drive activity
3	Do not remove	Solid white	Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.
		Off	Removing the drive does not cause a logical drive to fail.
4	Drive status	Solid green	The drive is a member of one or more logical drives.

Table Continued

Item	LED	Status	Definition
		Flashing green	The drive is doing one of the following: - Rebuilding - Performing a RAID migration - Performing a strip size migration - Performing a capacity expansion - Performing a logical drive extension - Erasing - Spare part activation
		Flashing amber/ green	The drive is a member of one or more logical drives and predicts the drive will fail.
		Flashing amber	The drive is not configured and predicts the drive will fail.
		Solid amber	The drive has failed.
		Off	The drive is not configured by a RAID controller or a spare drive.

NVMe SSD components



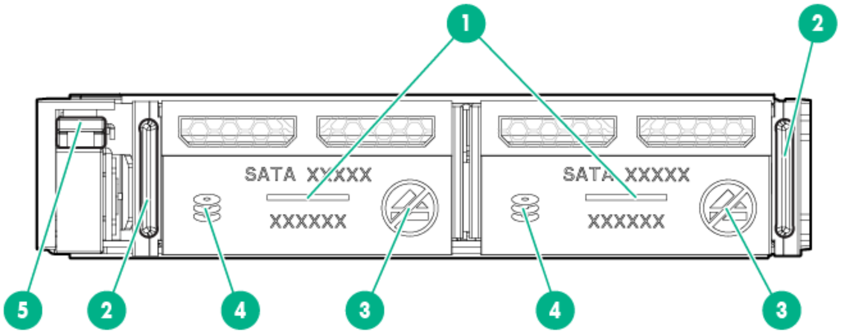
Item	Component	Status	Definition
1	Release lever	—	Ejects the NVMe drive carrier from the cage.
2	Activity ring LED	Rotating green	Drive activity
		Off	No drive activity
3	Do Not Remove LED	Solid white	Drive is powered on and configured in system. Do not remove the drive.
		Flashing white	Ejection request pending. Do not remove the drive.

Table Continued

Item	Component	Status	Definition
		Off	Drive removed from the PCIe bus and can be ejected.
4	Power LED	Solid green	Drive is powered on and configured in system. Do not remove the drive.
		Flashing green	Ejection request pending. Do not remove the drive.
		Off	Drive removed from the PCIe bus and can be ejected.
5	Power button	—	Momentary press to request drive removal from PCIe bus and ejection. Drive removal request can be denied by operating system.
6	Do Not Remove button	—	Releases the release lever for removal and insertion.

Upon NVMe SSD insertion, an LED initiation sequence will be visible - lighting each LED in the carrier in sequence from left to right. The sequence will cycle until the drive is recognized by the system. When the SSD is recognized by the system - the Do Not Remove LED will be solid white and the Power LED will be solid green.

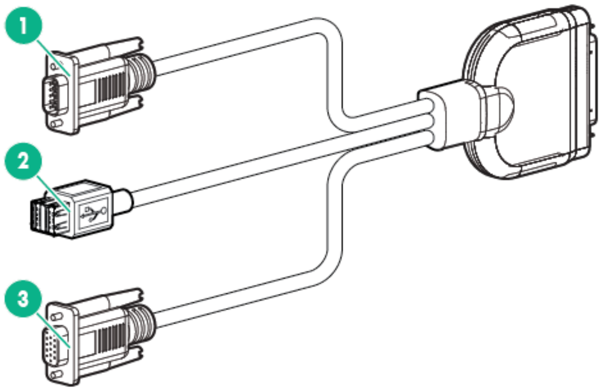
SFF flash adapter components and LED definitions



Item	Component	Description
1	Locate	• Off—Normal • Solid blue—The drive is being identified by a host application. • Flashing blue—The drive firmware is being updated or requires an update.
2	uFF drive ejection latch	Removes the uFF drive when released.
3	Do not remove LED	• Off—OK to remove the drive. Removing the drive does not cause a logical drive to fail. • Solid white—Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.
4	Drive status LED	• Off—The drive is not configured by a RAID controller or a spare drive. • Solid green—The drive is a member of one or more logical drives. • Flashing green (4 Hz)—The drive is operating normally and has activity. • Flashing green (1 Hz)—The drive is rebuilding, erasing, or performing a RAID migration, stripe size migration, capacity expansion, logical drive extension, or spare activation. • Flashing amber/green (1 Hz)—The drive is a member of one or more logical drives that predicts the drive will fail. • Solid amber—The drive has failed. • Flashing amber (1 Hz)—The drive is not configured and predicts the drive will fail.
5	Adapter ejection release latch and handle	Removes the SFF flash adapter when released.

SUV cable connectors

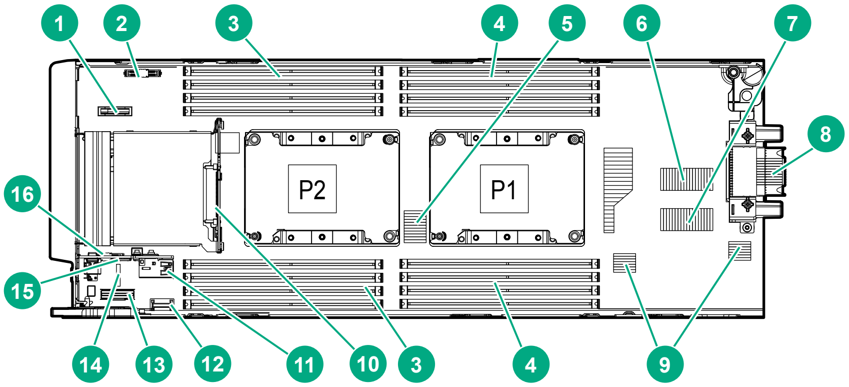
△ **CAUTION:** Before disconnecting the SUV cable from the connector, always squeeze the release buttons on the sides of the connector. Failure to do so can result in damage to the equipment.



Item	Connector	Description
1	Serial	For trained personnel to connect a null modem serial cable and perform advanced diagnostic procedures
2	USB[1]	For connecting up to two USB 2.0 devices
3	Video	For connecting a video monitor

[1] The USB connectors on the SUV cable do not support devices that require greater than a 500mA power source.

System board components



Item	Description
1	System battery
2	M.2 enablement option connector
3	Processor 2 DIMM slots (8)
4	Processor 1 DIMM slots (8)

Table Continued

Item	Description
5	Storage controller or NVMe pass-through board connector
6	Mezzanine connector 1 (Type A mezzanine only)
7	Mezzanine connector 2 (Type A or Type B mezzanine)
8	Enclosure connector
9	FlexibleLOM connectors (2)
10	SAS/SATA or NVMe backplane
11	Internal USB 3.0 connector
12	Energy pack connector
13	Direct-connect SATA connector
14	System maintenance switch
15	microSD card slot
16	TPM connector

System maintenance switch

Position	Default	Function

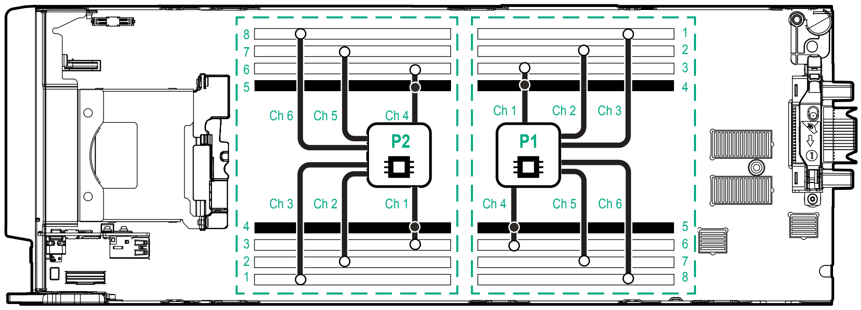
S1	Off	Off = iLO security is enabled.
		On = iLO security is disabled.

S2	Off	Off = System configuration can be changed. On = System configuration is locked.
S3	Off	Reserved
S4	Off	Reserved
S5	Off	Off = Power-on password is enabled. On = Power-on password is disabled.
S6	Off	Off = No function. On = ROM reads system configuration as invalid.
S7	Off	Reserved
S8	—	Reserved
S9	Off	Reserved
S10	—	Reserved
S11	—	Reserved
S12	—	Reserved

CAUTION: Clearing CMOS, NVRAM, or both deletes configuration information. Be sure to configure the server blade properly to prevent data loss.

DIMM slot locations

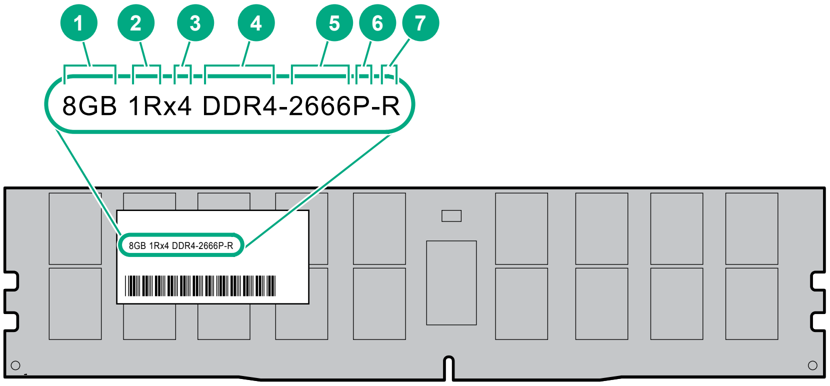
DIMM slots are numbered sequentially (1 through 8) for each processor and designate the DIMM slot ID for population rules and spare replacement.



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

DIMM label identification

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



Item	Description	Example
1	Capacity	8 GB 16 GB 32 GB 64 GB 128 GB
2	Rank	1R = Single rank 2R = Dual rank 4R = Quad rank 8R = Octal rank

3	Data width on DRAM	x4 = 4-bit
		x8 = 8-bit
		x16 = 16-bit

4	Memory generation	PC4 = DDR4
5	Maximum memory speed	2133 MT/s 2400 MT/s 2666 MT/s 2933 MT/s

6	CAS latency	P = CAS 15-15-15
		T = CAS 17-17-17
		U = CAS 20-18-18
		V = CAS 19-19-19 (for RDIMM, LRDIMM)
		V = CAS 22-19-19 (for 3DS TSV LRDIMM)
		Y = CAS 21-21-21 (for RDIMM, LRDIMM)
		Y = CAS 24-21-21 (for 3DS TSV LRDIMM)

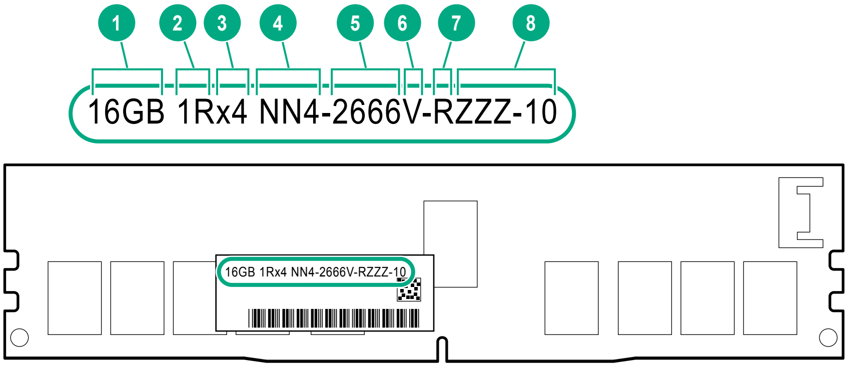
7	DIMM type	R = RDIMM (registered)
		L = LRDIMM (load reduced)
		E = Unbuffered ECC (UDIMM)

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

NVDIMM identification

NVDIMM boards are blue instead of green. This change to the color makes it easier to distinguish NVDIMMs from DIMMs.

To determine NVDIMM characteristics, see the full product description as shown in the following example:

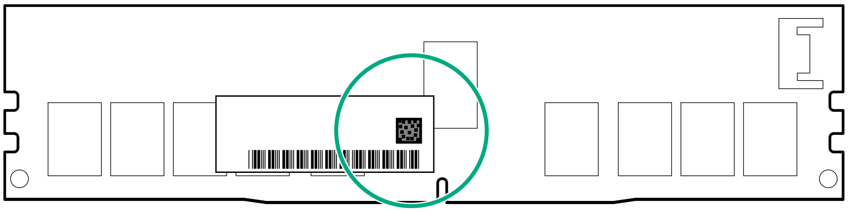


Item	Description	Definition
1	Capacity	16 GiB
2	Rank	1R (Single rank)
3	Data width per DRAM chip	x4 (4 bit)
4	Memory type	NN4=DDR4 NVDIMM-N
5	Maximum memory speed	2667 MT/s
6	Speed grade	V (latency 19-19-19)
7	DIMM type	RDIMM (registered)
8	Other	—

For more information about NVDIMMs, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).

NVDIMM 2D Data Matrix barcode

The 2D Data Matrix barcode is on the right side of the NVDIMM label and can be scanned by a cell phone or other device.

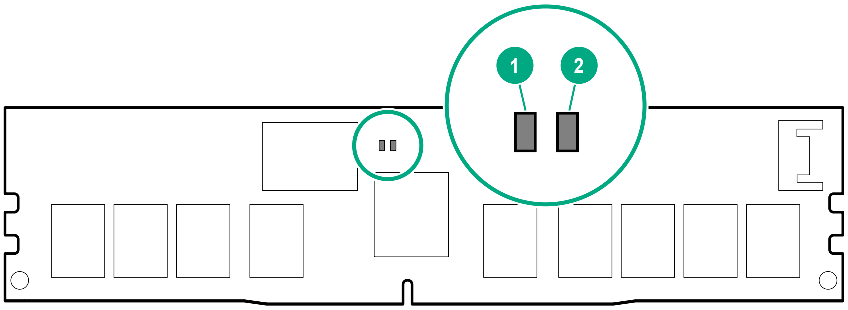


When scanned, the following information from the label can be copied to your cell phone or device:

- (P) is the module part number.
- (L) is the technical details shown on the label.
- (S) is the module serial number.

Example: (P)HMN82GR7AFR4N-VK (L)16GB 1Rx4 NN4-2666V-RZZZ-10(S)80AD-01-1742-11AED5C2

NVDIMM LED identification



Item	LED description	LED color
1	Power LED	Green
2	Function LED	Blue

NVDIMM-N LED combinations

State	Definition	NVDIMM-N Power LED (green)	NVDIMM-N Function LED (blue)
0	AC power is on (12V rail) but the NVM controller is not working or not ready.	On	Off
1	AC power is on (12V rail) and the NVM controller is ready.	On	On
2	AC power is off or the battery is off (12V rail off).	Off	Off
3	AC power is on (12V rail) or the battery is on (12V rail) and the NVDIMM-N is active (backup and restore).	On	Flashing

NVDIMM Function LED patterns

For the purpose of this table, the NVDIMM-N LED operates as follows:

- Solid indicates that the LED remains in the on state.
- Flashing indicates that the LED is on for 2 seconds and off for 1 second.
- Fast-flashing indicates that the LED is on for 300 ms and off for 300 ms.

State	Definition	NVDIMM-N Function LED
0	The restore operation is in progress.	Flashing
1	The restore operation is successful.	Solid or On
2	Erase is in progress.	Flashing
3	The erase operation is successful.	Solid or On
4	The NVDIMM-N is armed, and the NVDIMM-N is in normal operation.	Solid or On
5	The save operation is in progress.	Flashing
6	The NVDIMM-N finished saving and battery is still turned on (12 V still powered).	Solid or On
7	The NVDIMM-N has an internal error or a firmware update is in progress. For more information about an NVDIMM-N internal error, see the IML.	Fast-flashing

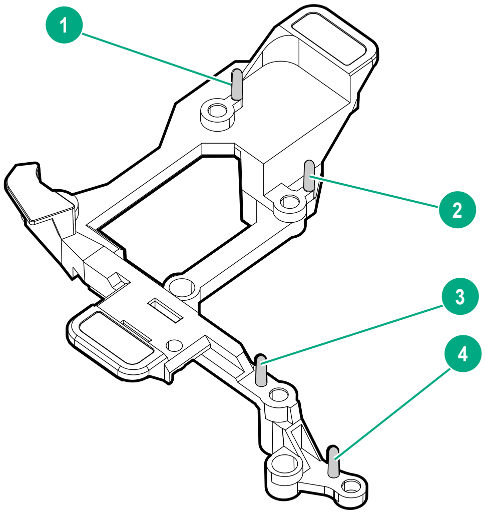
Mezzanine connector definitions

Item	PCIe
Mezzanine connector 1	x16, Type A mezzanine card only
Mezzanine connector 2	x16, Type A or B mezzanine card

NOTE: When installing a mezzanine card option on mezzanine connector 2, processor 2 must be installed.

Mezzanine connector guide pin locations

The mezzanine assembly supports two mezzanine cards in this server blade. When installing a mezzanine card into the assembly, be sure to use the guide pins associated with the mezzanine connector.



Item	Description
1 and 3	Mezzanine connector 2
2 and 4	Mezzanine connector 1

Operations

Power up the server blade

The OA initiates an automatic power-up sequence when the server blade is installed. If the default setting is changed, use one of the following methods to power up the server blade:

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

When the server blade goes from the standby mode to the full power mode, the system power LED changes from amber to solid green. The health LED flashes green when the Power On/Standby Button service is being initialized. For more information about the system power LED status, see **Front panel LEDs and buttons** on page 7.

For more information about the OA, see the OA setup and installation guide on the **Hewlett Packard Enterprise website**.

Power down the server blade

Procedure

- Press and release the Power On/Standby button.

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

- Press and hold the Power On/Standby button for more than 4 seconds to force the server blade to enter standby mode.

  This method forces the server blade 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.

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

- Use the OA CLI to execute one of the following commands:

  - `poweroff server [bay number]`

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

  - `poweroff server [bay number] force`

    This form of the command forces the server blade to enter standby mode without properly exiting applications and the OS. If an application stops responding, this method forces a shutdown.

- Use the OA GUI to initiate a shutdown:

  1. Select the **Enclosure Information** tab.
  2. In the Device Bays item, select the server.
  3. From the Virtual Power menu, initiate a shutdown of applications and the OS:

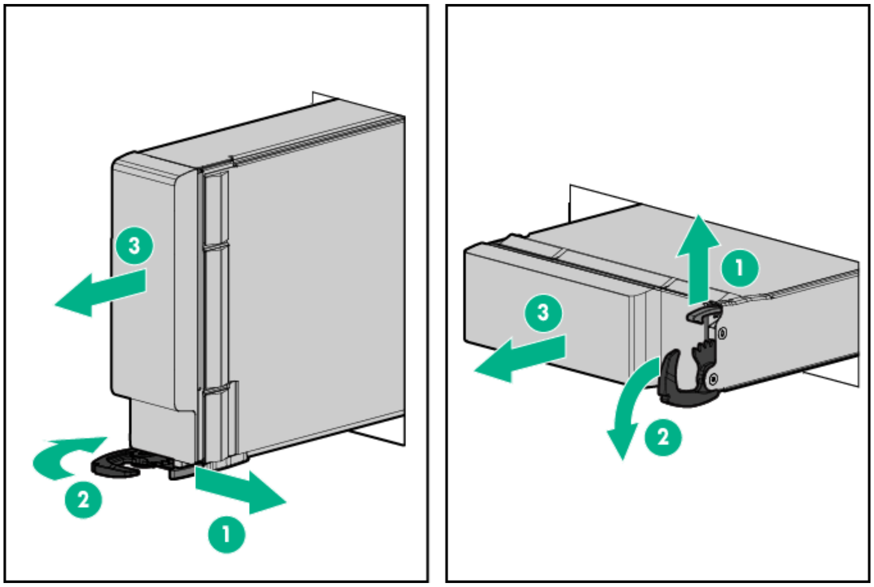
- For a controlled shutdown, select **Momentary Press**.
- For an emergency shutdown, select **Press and Hold**.

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

Remove the server blade

Procedure

1. Identify the proper server blade.
2. **Power down the server blade** on page 21.
3. Remove the server blade.



4. Place the server blade on a flat, level work surface.

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

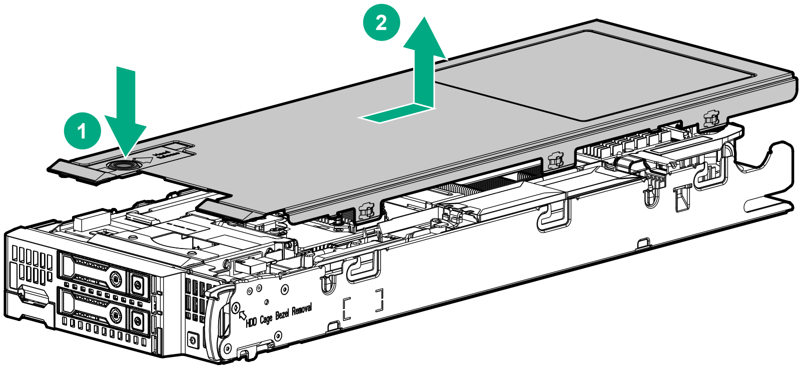
△ **CAUTION:** To prevent damage to electrical components, properly ground the server blade before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

Remove the access panel

Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.

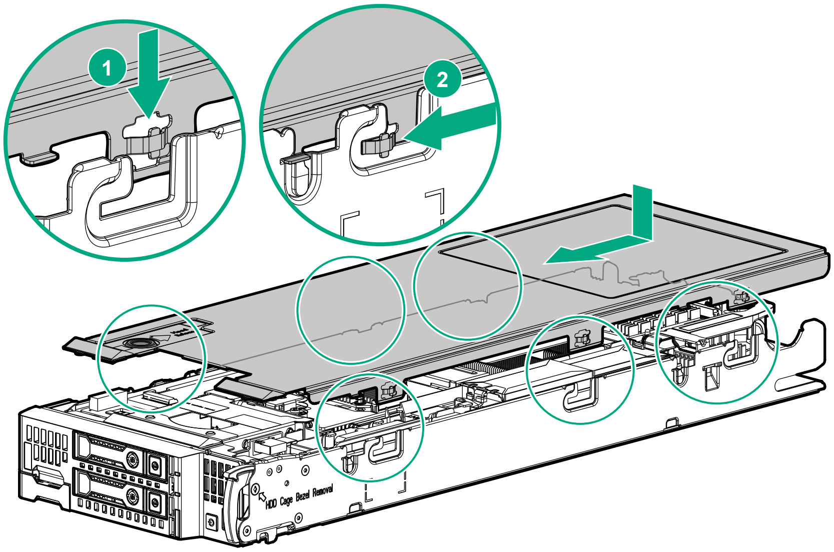
4. Press the access panel release button.
5. Slide the access panel towards the rear of the server blade, and then lift to remove the panel.



Install the access panel

Procedure

1. Align the access panel with the guides on the server blade in all six places and place the access panel on top of the server blade.
2. Slide the access panel forward until it clicks into place.



Remove the DIMM baffles

The server contains two DIMM baffles.

Procedure

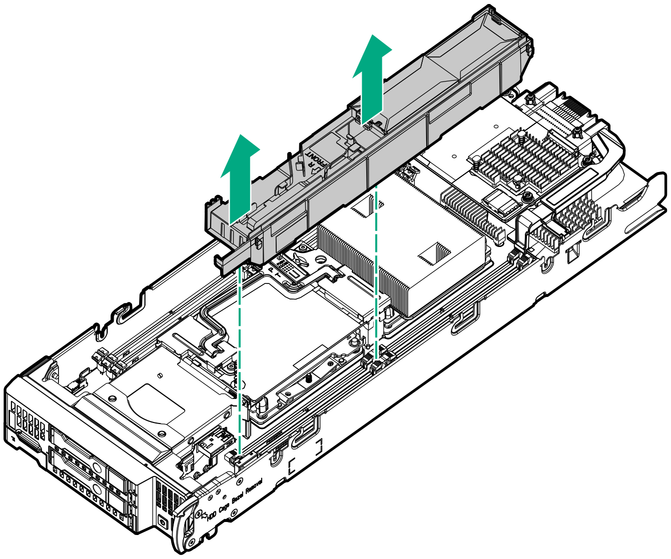
1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.

4. **Remove the access panel** on page 22.
5. If installed, remove the direct connect SATA cable (**Remove the direct connect SATA cable** on page 31).
6. If installed, remove the internal USB drive.

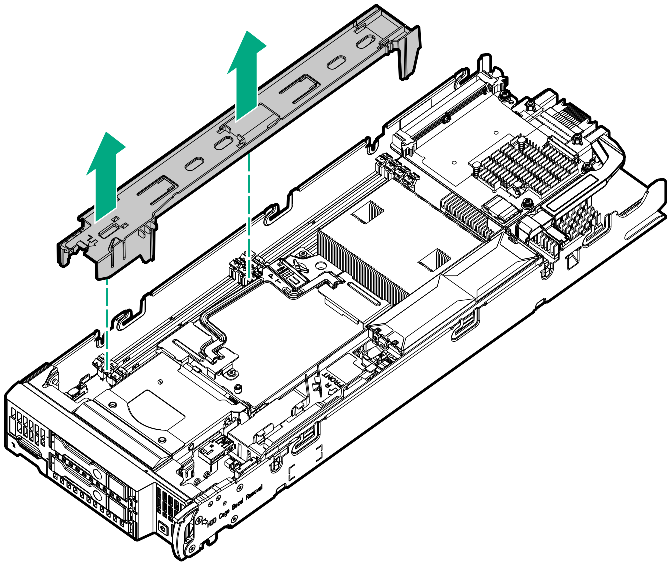
   To locate the internal USB connector, see **System board components** on page 13.
7. Remove one or more DIMM baffles:

   > **IMPORTANT:** When removing a DIMM baffle, do not remove the following options when installed on the DIMM baffle:
   >
   > - M.2 enablement option (left DIMM baffle)
   > - HPE Smart Storage Battery (right DIMM baffle)

   - DIMM baffle (right side)



   - DIMM baffle (left side)



Install the DIMM baffles

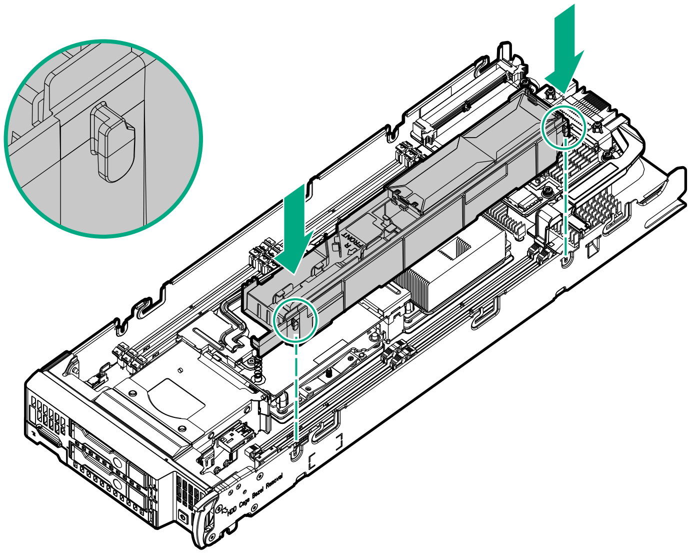
The server has two DIMM baffles.

Procedure

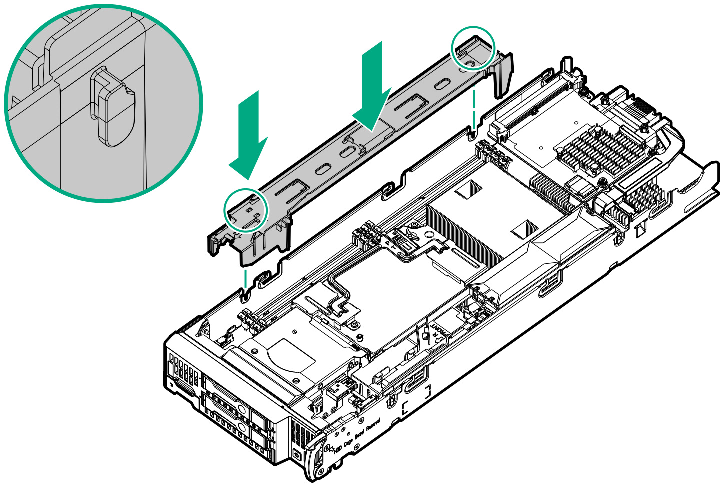
1. Align and install the DIMM baffle:

   IMPORTANT: When installing each DIMM baffle, be sure that the alignment tabs engage with the side of the server blade.

   - DIMM baffle (right side)



   - DIMM baffle (left side)



2. If removed, install the internal USB drive.

   To locate the internal USB connector, see **System board components** on page 13.

3. If removed, install the direct connect SATA cable (**Install the direct connect SATA cable** on page 31.

4. **Install the access panel** on page 23.

5. **Install the server blade** on page 42.

6. **Power up the server blade** on page 21.

Remove an M.2 SSD from the M.2 riser board

Prerequisites

To remove an M.2 SSD from the M.2 riser, you need a No. 1 Phillips screwdriver.

Procedure

1. **Power down the server blade** on page 21.

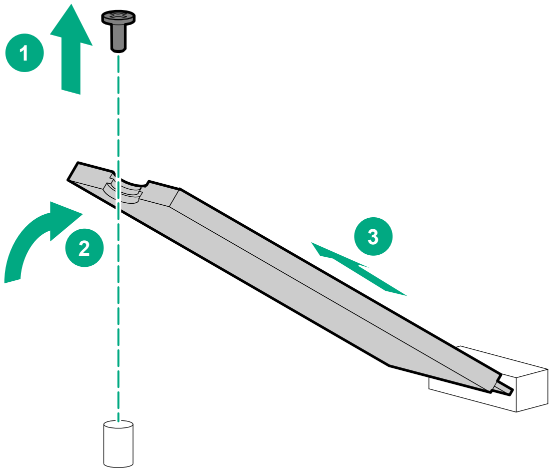
2. **Remove the server blade** on page 22.

3. Place the server blade on a flat, level work surface.

4. **Remove the access panel** on page 22.

5. Remove the left DIMM baffle from the server blade (**Remove the DIMM baffles** on page 23).

6. Remove the M.2 SSD from the M.2 riser board. Use a No. 1 Phillips screwdriver to disengage the screw.

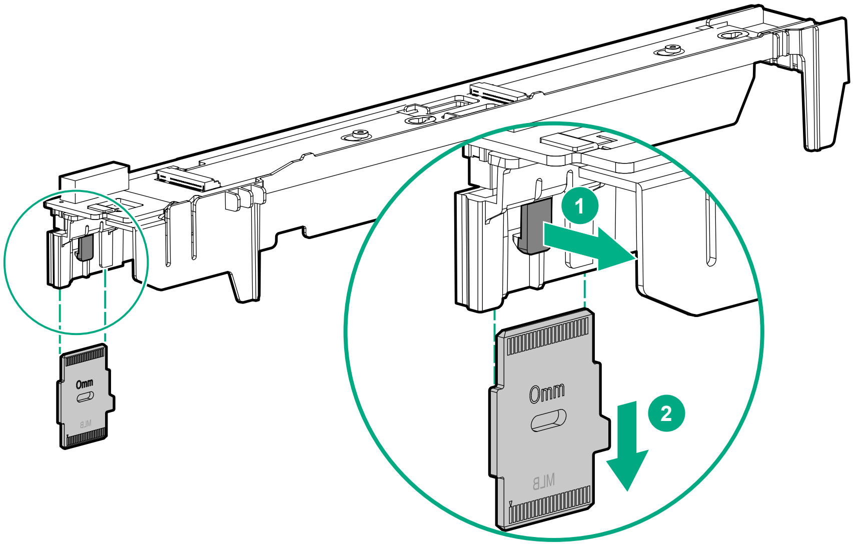


7. If necessary, repeat the M.2 SSD removal procedure for a second drive.

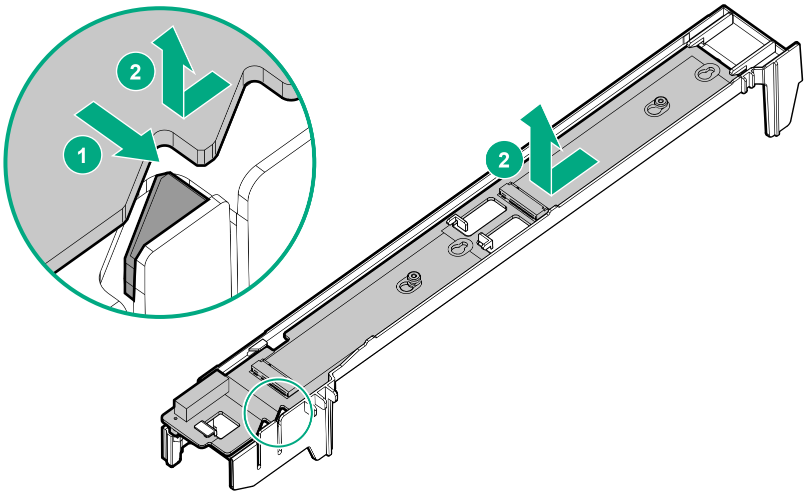
Remove the M.2 interposer board and the M.2 riser board

Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. Remove the left DIMM baffle from the server blade (**Remove the DIMM baffles** on page 23).
6. Remove the M.2 interposer board.



7. Remove the M.2 riser board from the left DIMM baffle.



Relocate the PEM nut and rubber stopper

This procedure is required if the PEM nut and rubber stoppers must be relocated to support the length of the M.2 SSDs being installed.

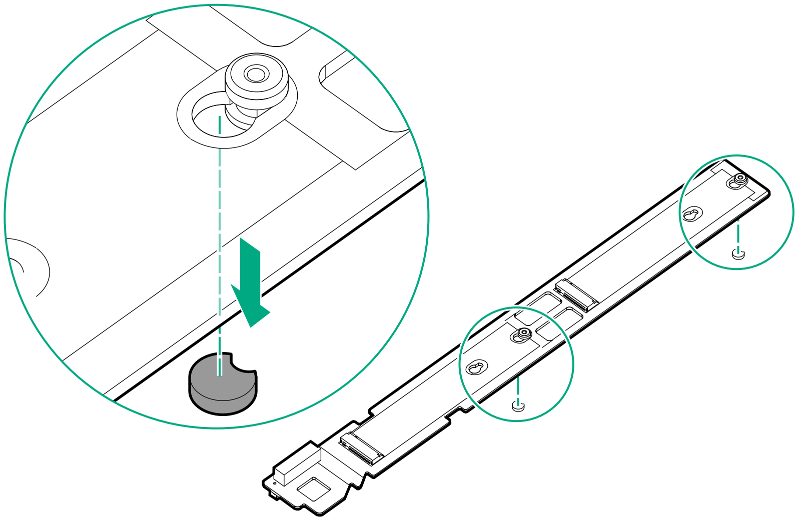
Prerequisites

To remove the M.2 SSDs from the M.2 riser, you need a No. 1 Phillips screwdriver.

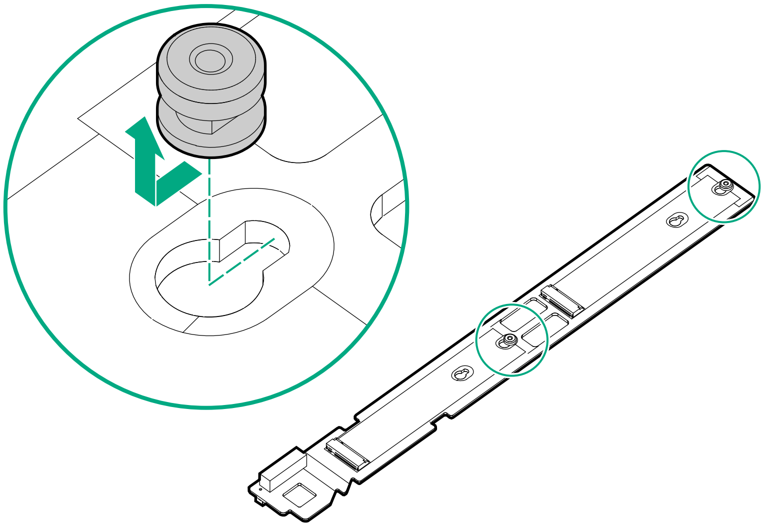
Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. Remove the left DIMM baffle.

   See **Remove the DIMM baffles** on page 23.
6. **Remove the M.2 interposer board and the M.2 riser board** on page 27.
7. If installed, **Remove an M.2 SSD from the M.2 riser board** on page 26.
8. Remove the rubber stoppers from the M.2 riser.

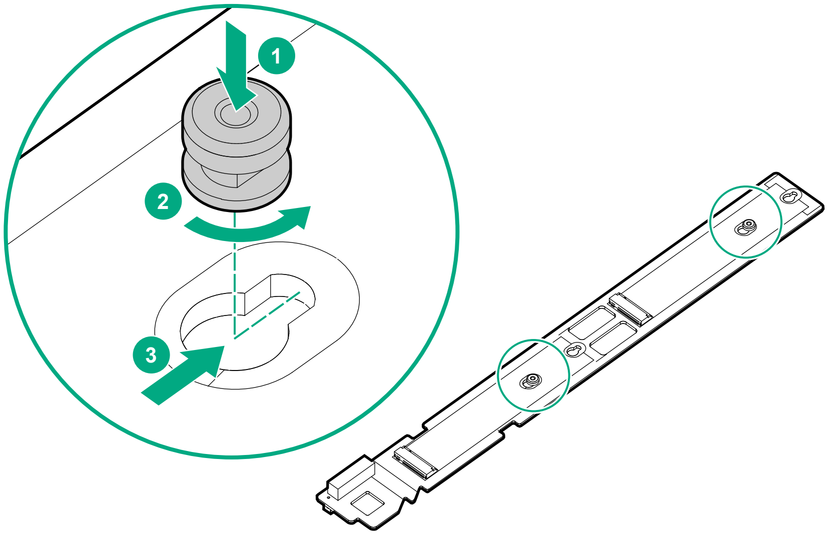


9. Remove the PEM nuts from the M.2 riser.

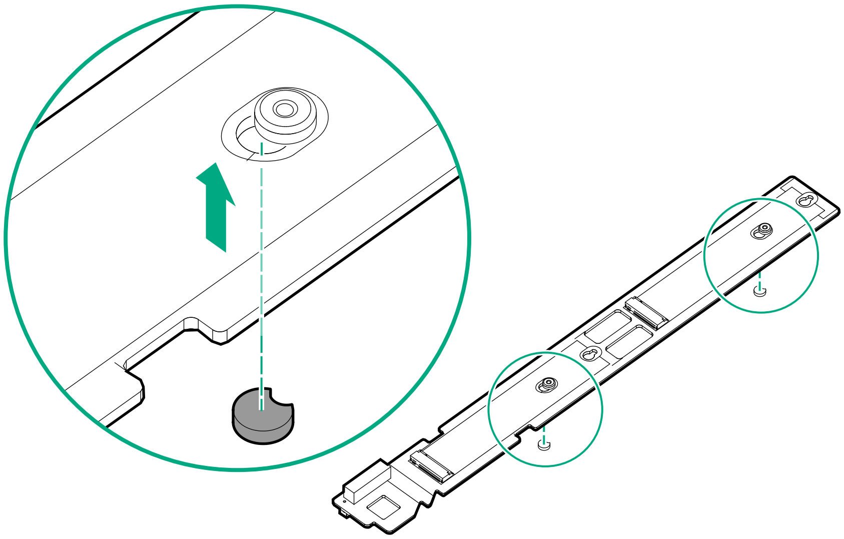


10. Install the PEM nuts in the new location on the M.2 riser.

> △ **CAUTION:** Always install the PEM nut with the thicker edge on top of the M.2 riser and the thinner edge on the bottom of the M.2 riser. Failure to install the PEM nut in the proper orientation can cause damage to the components.



11. Install the rubber stoppers in the new locations to secure the PEM nuts in the M.2 riser.



12. Install the M.2 SSDs on the M.2 riser board (**Installing the M.2 SSDs** on page 59).
13. Install the M.2 riser board and the M.2 interposer board on the left DIMM baffle (**Installing the M.2 riser board and M.2 interposer board** on page 57).
14. Install the left DIMM baffle.

    See **Install the DIMM baffles** on page 25.
15. **Install the access panel** on page 23.
16. **Install the server blade** on page 42.
17. **Power up the server blade** on page 21.

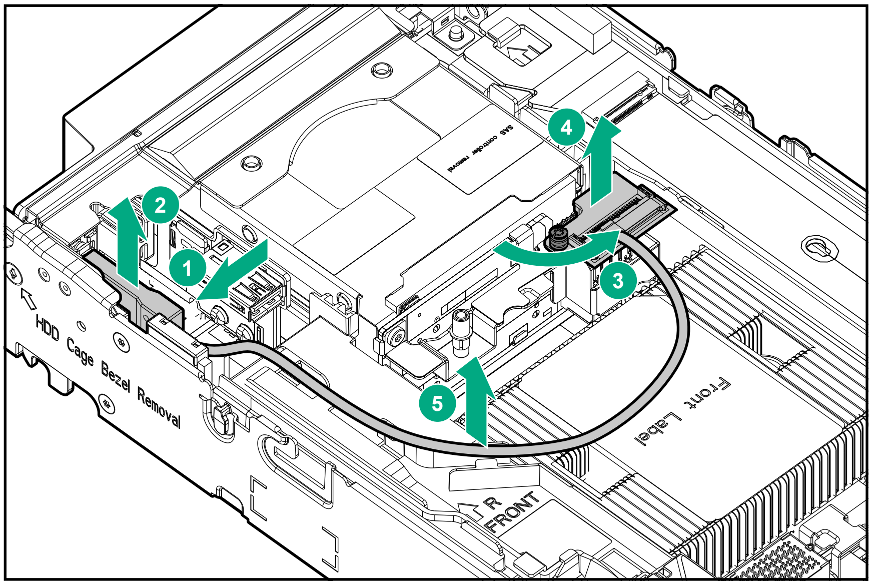
Remove the direct connect SATA cable

Prerequisites

To remove the direct connect SATA cable, you need a T-15 Torx screwdriver.

Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. Remove the direct connect SATA cable.



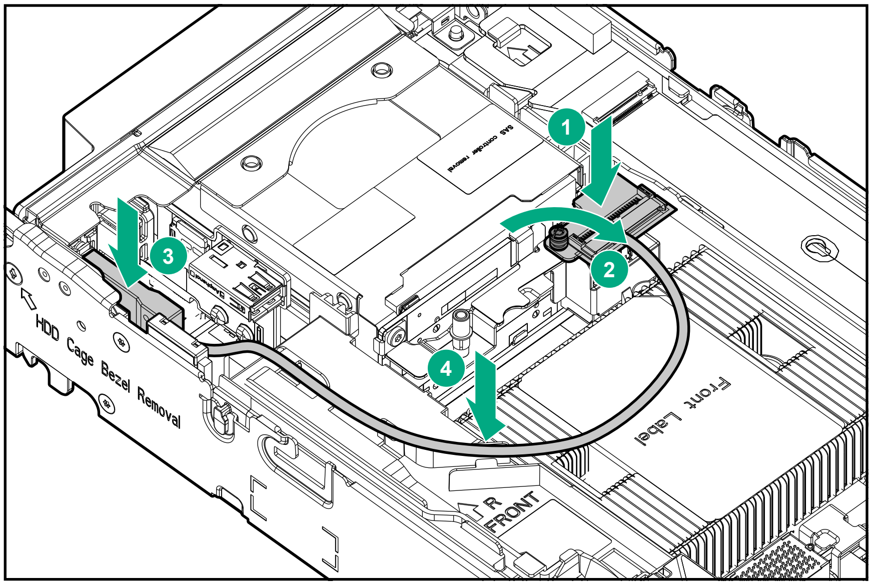
Install the direct connect SATA cable

Prerequisites

To install the direct connect SATA cable, you need a T-15 Torx screwdriver.

Procedure

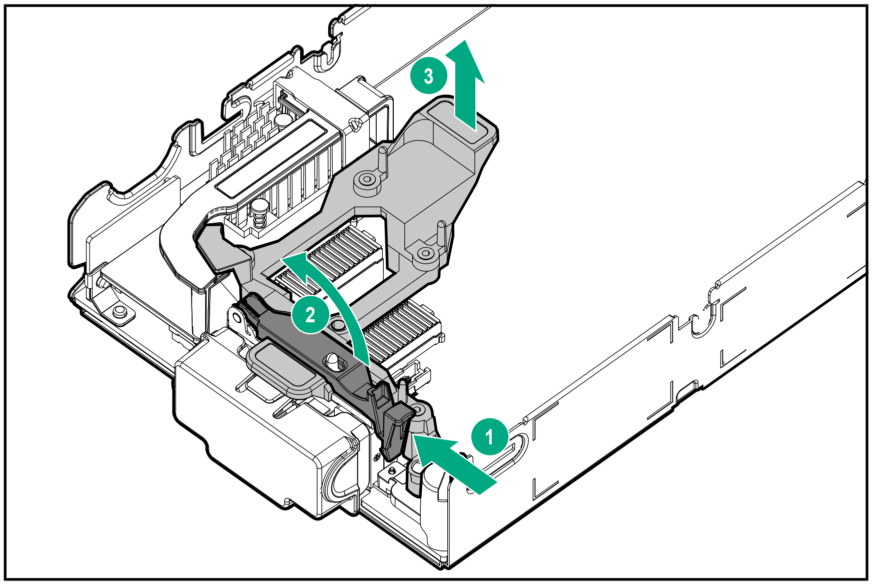
1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. Install the direct connect SATA cable.



Remove the mezzanine assembly

Procedure

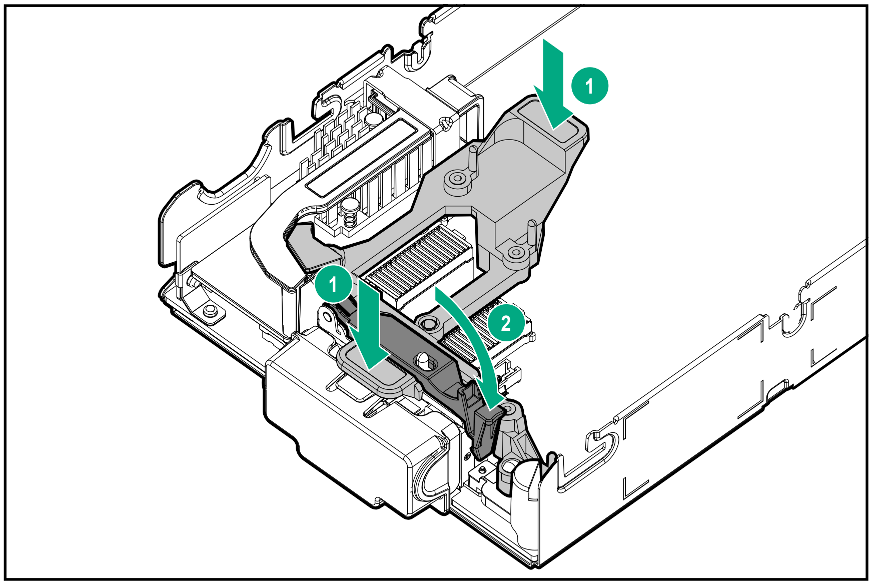
1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. Remove the mezzanine assembly.



Install the mezzanine assembly

Procedure

1. Install the mezzanine assembly

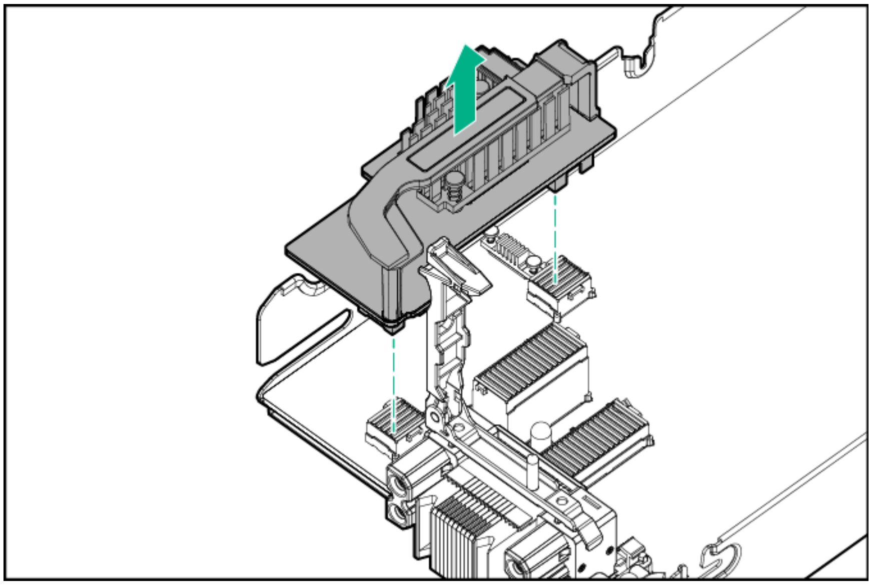


2. **Install the access panel** on page 23.
3. **Install the server blade** on page 42.
4. **Power up the server blade** on page 21.

Remove the FlexibleLOM

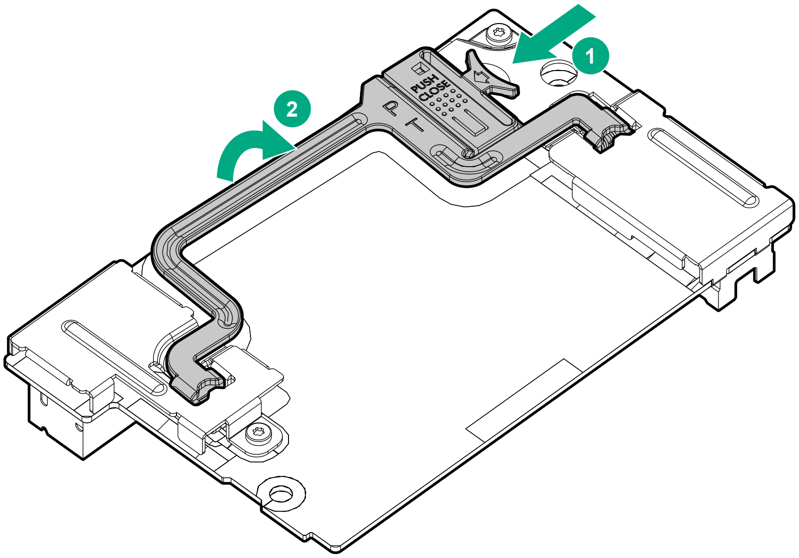
Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. **Remove the mezzanine assembly** on page 32.
6. Use the FlexibleLOM handle to remove the FlexibleLOM from the system board.

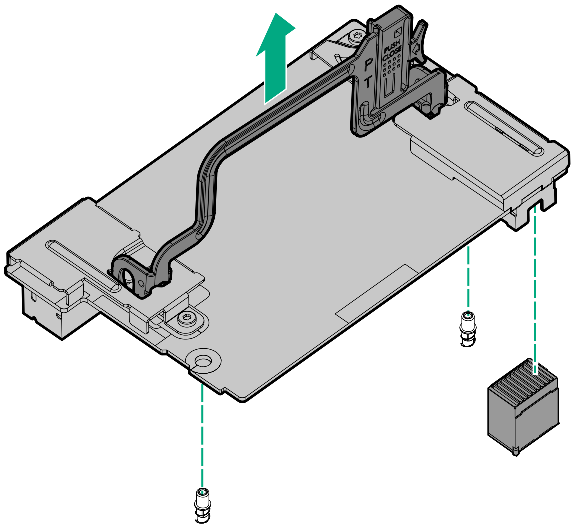


Remove the storage controller or NVMe pass-through board

1. Back up all server blade data.
2. **Power down the server blade** on page 21.
3. **Remove the server blade** on page 22.
4. Place the server blade on a flat, level work surface.
5. **Remove the access panel** on page 22.
6. Prepare the storage controller/NVMe pass-through board for removal.



7. Remove the storage controller/NVMe pass-through board.



Remove an NVMe SSD

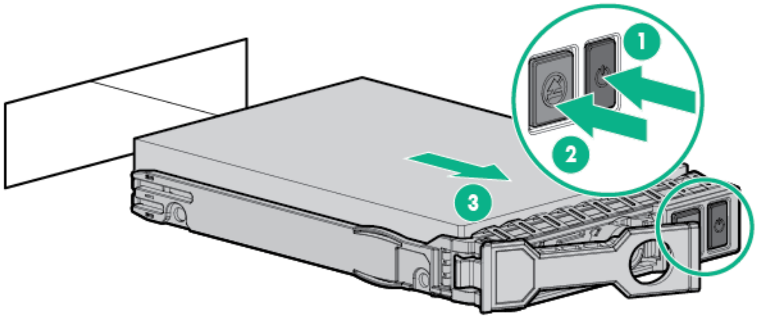
Procedure

1. Observe the LED status of the drive and determine if it can be removed.
2. Remove the drive:

   a. Press the power button.

      The Do Not Remove button illuminates and flashes. Wait until the flashing stops and the Do Not Remove button is no longer illuminated.

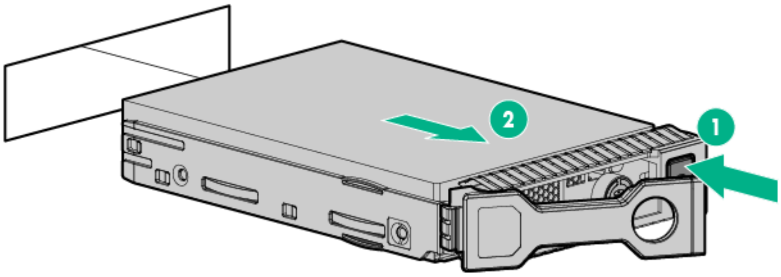
   b. When the Do Not Remove button is no longer illuminated, press the Do Not Remove button and then remove the drive.



Remove a SAS or SATA drive

1. Determine status of drives from LED Definitions.

   For more information, see **Hot-plug drive LED definitions** on page 9.
2. Back up all server blade data on the drive.
3. Remove the drive.



Remove the front panel/drive cage assembly

Prerequisites

To remove the front panel/drive cage assembly, you need a T-15 Torx screwdriver.

Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. Do one of the following:
   - Remove the storage controller or the NVMe passthrough board, if installed (**Remove the storage controller or NVMe pass-through board** on page 34).
   - **Remove the direct connect SATA cable** on page 31.
6. If installed, remove the internal USB drive. To locate the internal USB connector, see **System board components** on page 13.
7. **Remove the DIMM baffles** on page 23.

   IMPORTANT: When removing a DIMM baffle, do not remove the following options when installed on the DIMM baffle:

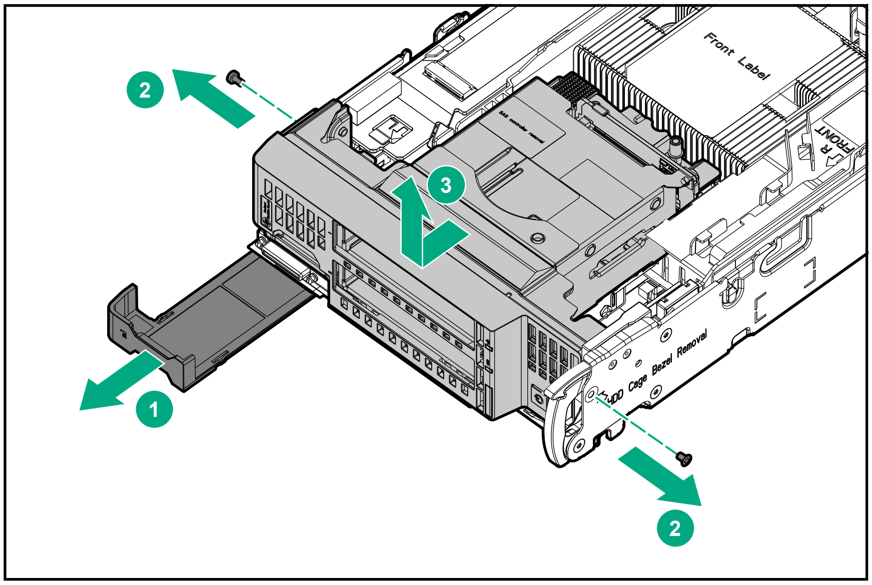
   - M.2 enablement option (left DIMM baffle)
   - HPE Smart Storage Battery (right DIMM baffle)

8. Remove the front panel/drive cage assembly:

   a. Extend the serial label pull tab from the front of the server blade.

   b. Remove the two T-15 screws from the front panel/drive cage assembly.

   c. Remove the component.



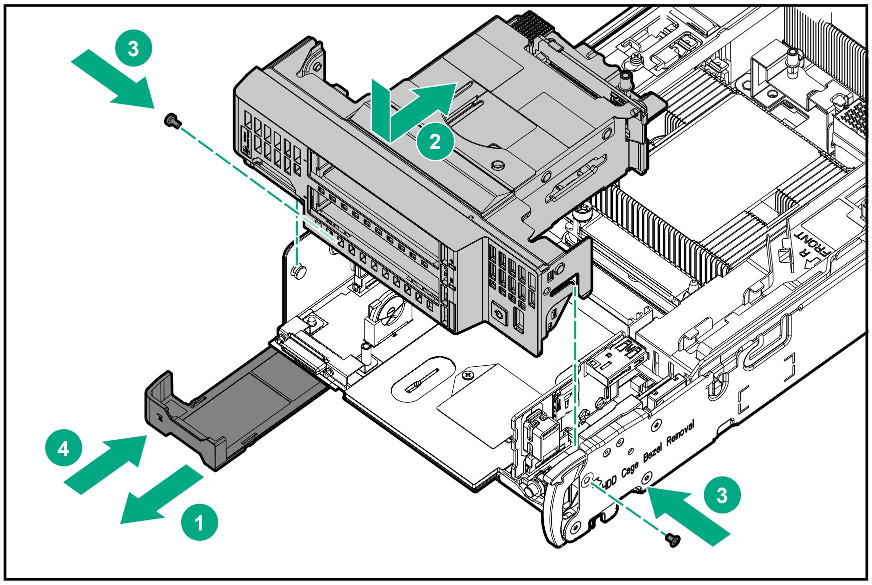
Install the front panel/drive cage assembly

Prerequisites

To install the front panel/drive cage assembly, you need a T-15 Torx screwdriver.

Procedure

1. Install the front panel/drive cage assembly:
   a. Extend the serial label pull tab from the front of the server blade.
   b. Align the pins on the chassis and slide the front panel/drive cage assembly into the server blade.
   c. Secure the assembly with two T-15 screws.
   d. Close the serial label pull tab.



2. **Install the DIMM baffles** on page 25.
3. Do one of the following:
   - Install the storage controller (**HPE Smart Array P204i SR Gen10 Controller option** on page 48) or the NVMe pass-through board.
   - **Install the direct connect SATA cable** on page 31.
4. **Install the access panel** on page 23.
5. **Install the server blade** on page 42.
6. **Power up the server blade** on page 21.

Setup

Overview

Installation of a server blade requires the following steps.

Procedure

1. Install and configure a BladeSystem c-Class enclosure.
2. Install any server blade options.
3. Install interconnect modules in the enclosure.
4. Connect the interconnect modules to the network.
5. Install a server blade.
6. Complete the server blade configuration.

Server blade warnings and cautions

⚠ **WARNING:** To reduce the risk of shock or injury from high-current electrical energy, do not remove the server blade access panel and then install the server blade into the enclosure.

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

△ **CAUTION:** Do not operate the server blade with the access panel removed. Operating the server blade in this manner results in improper airflow and improper cooling that can lead to thermal damage.

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

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

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

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

Installing an HPE BladeSystem c-Class enclosure

Before performing any server blade-specific procedures, install an HPE BladeSystem c-Class enclosure.

The most current documentation for the server blade and other BladeSystem components is available on the **Hewlett Packard Enterprise website**.

Preparing the enclosure

Each HPE BladeSystem enclosure ships with device bay dividers to support half-height devices. If the dividers have been removed, always reinstall the dividers before installing half-height devices and device bay blanks. For more information on installing the device bay dividers, see the enclosure setup and installation guide.

Prerequisites
Review the following alerts before installing the enclosure.

△ **CAUTION:** When installing half-height blades in a quadrant, always install a divider in that quadrant. Failure to install the divider can result in damage to the connectors on the server blades.

△ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server blade or the enclosure unless all recommended drive and device bays are populated with either a component or a blank.

ⓘ **IMPORTANT:** For optimal cooling and system performance, configure the HPE BladeSystem c7000 enclosure with 10 fans.

Installing server blade options

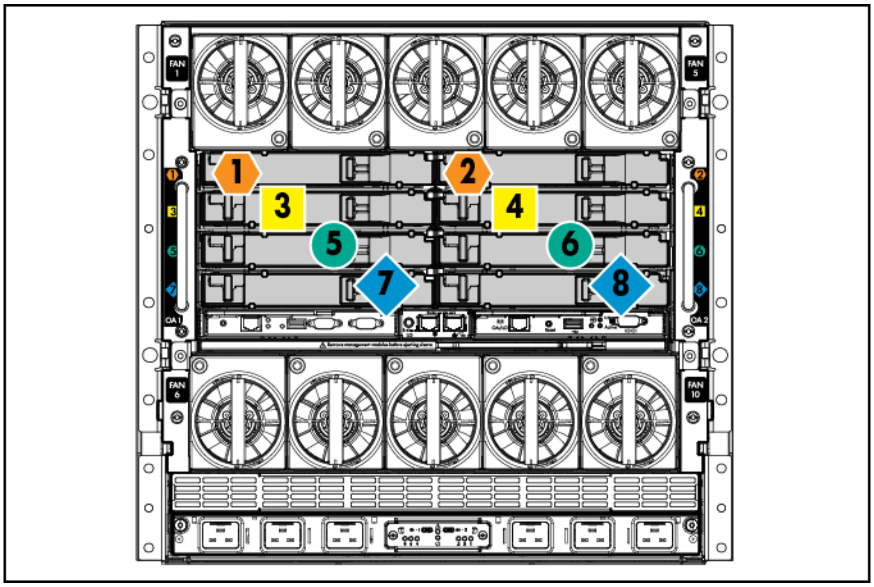
Before installing and initializing the server blade, install any server blade options, such as an additional processor, hard drive, or mezzanine card. For server blade options installation information, see "**Hardware options installation**."

Installing interconnect modules

For specific steps to install interconnect modules, see the documentation that ships with the interconnect module.

Interconnect bay numbering and device mapping

HPE BladeSystem c7000 Enclosure

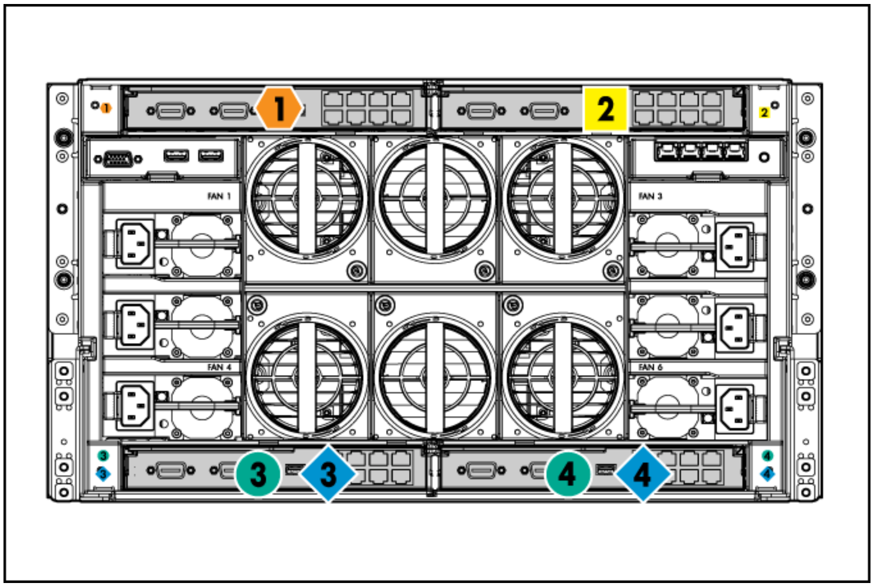


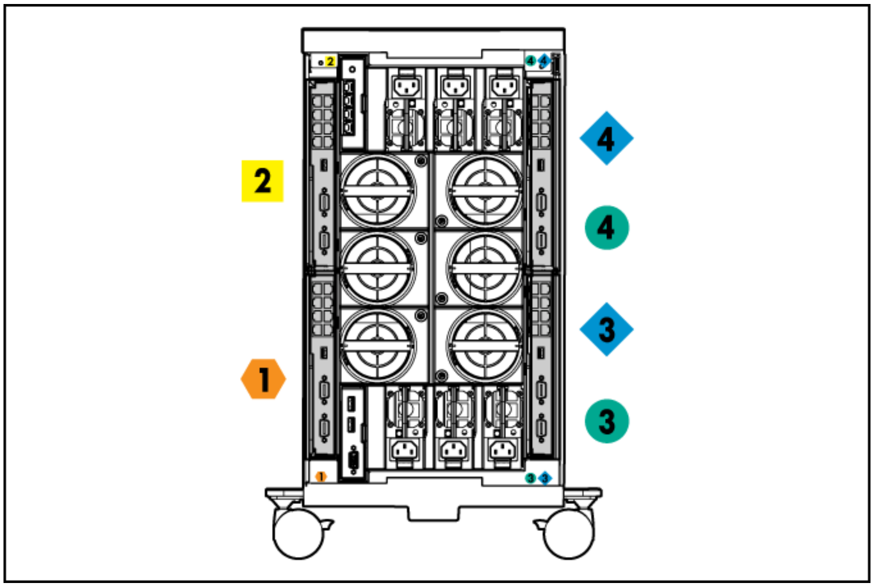
To support network connections for specific signals, install an interconnect module in the bay corresponding to the FlexibleLOM or mezzanine signals.

Server blade signal	Interconnect bay	Interconnect bay labels
FlexibleLOM	1 and 2	⬢
Mezzanine 1	3 and 4	🟨
Mezzanine 2	5 and 6	🟢
Mezzanine 2	7 and 8	🔷

For detailed port mapping information, see the BladeSystem enclosure installation poster or the BladeSystem enclosure setup and installation guide on the **Hewlett Packard Enterprise website**.

- HPE BladeSystem c3000 Enclosure





Server blade signal	Interconnect bay number	Interconnect bay label	Notes
FlexibleLOM	1	⬢	—
Mezzanine 1	2	🟨	Four-port cards connect to bay 2.
Mezzanine 2	3 and 4	🟢 🔷	◦ Four-port cards ◦ Ports 1 and 3 connect to bay 3. ◦ Ports 2 and 4 connect to bay 4.

Connecting to the network

To connect the BladeSystem to a network, each enclosure must be configured with network interconnect devices to manage signals between the server blades and the external network.

Two types of interconnect modules are available for BladeSystem c-Class enclosures:

- Pass-Thru modules
- Switch modules

For more information about interconnect module options, see the **Hewlett Packard Enterprise website**.

IMPORTANT: To connect to a network with a Pass-Thru module, always connect the Pass-Thru module to a network device that supports Gigabit or 10 Gb speed, depending on the corresponding Pass-Thru model.

Install the server blade

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

CAUTION: Failure to install the divider in a quadrant when installing half-height blades can result in damage to the connectors on the server blade.

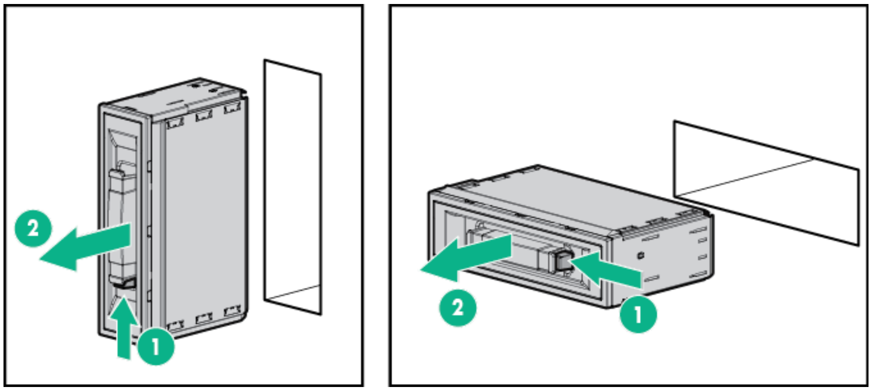
For the best possible BladeSystem and Virtual Connect experience, and to prevent a future reboot, Hewlett Packard Enterprise requires updating the Onboard Administrator and Virtual Connect to the correct version before installing an HPE ProLiant Gen10 server blade. The version information is on the tag on the front of the server blade.

For more information on this and other specific firmware and driver requirements, as well as the latest firmware and driver versions, download the latest SPP from the Hewlett Packard Enterprise website (**http://www.hpe.com/servers/spp/download**).

Procedure

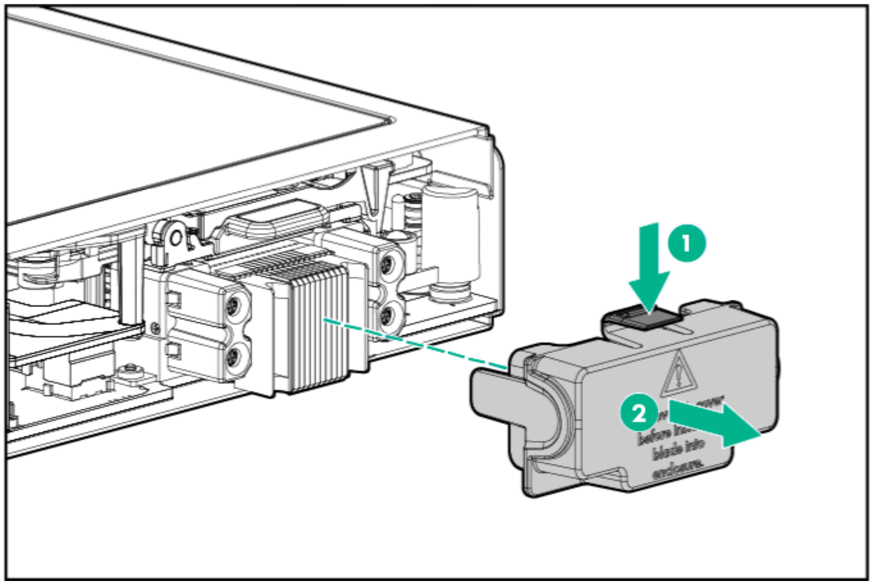
1. Remove the device bay blank.

   Retain the blank for future use.

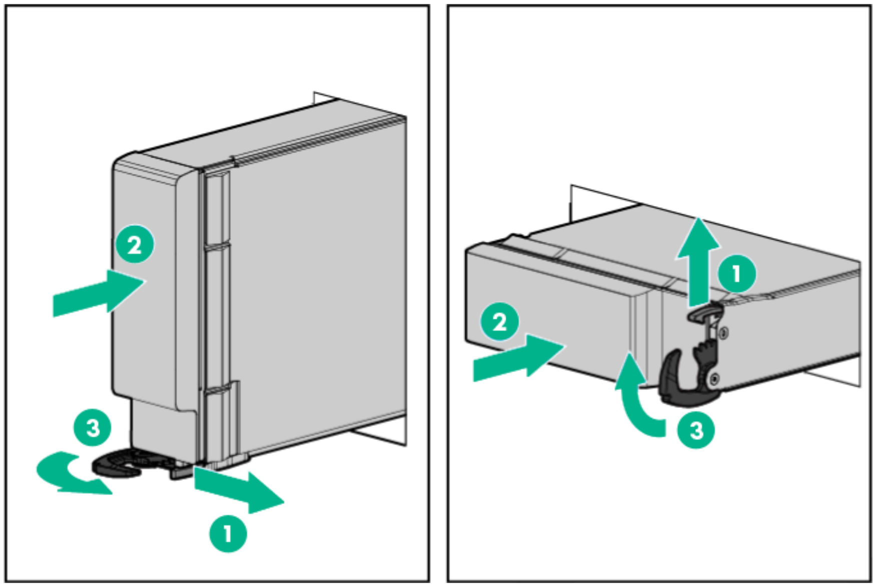


2. Remove the enclosure connector cover.

   Retain the cover for future use.



3. Install the server blade.



Completing the configuration

To complete the server blade and BladeSystem configuration, see the overview card that ships with the enclosure.

Hardware options installation

Introduction

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

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

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

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

Drive bay options

Two SFF drive bays are on the front panel of the server blade. The following options are supported in the drive bays:

- SFF SAS hard drives
- SFF SATA hard drives
- SFF SAS SSDs
- SFF SATA SSDs
- NVMs SSDs
- uFF SATA SSDs with the SFF Flash Adapter

Ensure that the server blade is configured properly when installing the drive options. For example, be sure that the drive option is configured with the proper backplane and other required components.

Installing the SAS and SATA drive options

The server blade supports hot plug SAS and SATA hard drives and hot plug SAS and SATA SSDs.

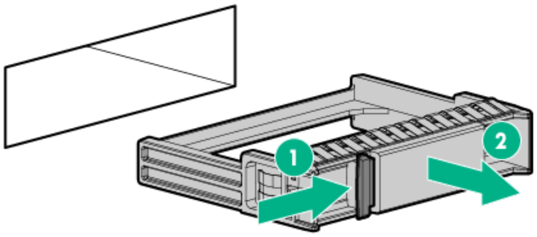
Prerequisites

To support SAS and SATA hard drives or SSDs, install the SAS/SATA HDD backplane with one of the following:

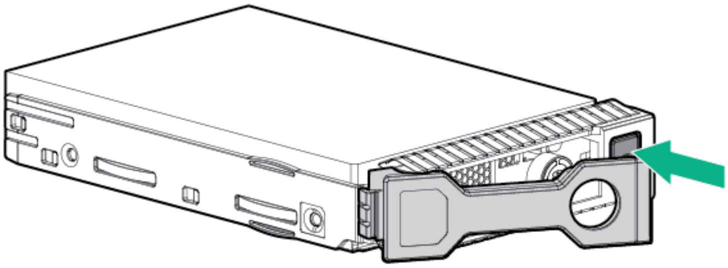
- Direct connect SATA cable (supports SATA drives only)
- HPE Smart Array P204i SR Gen10 Controller (supports both SAS and SATA drives)

Procedure

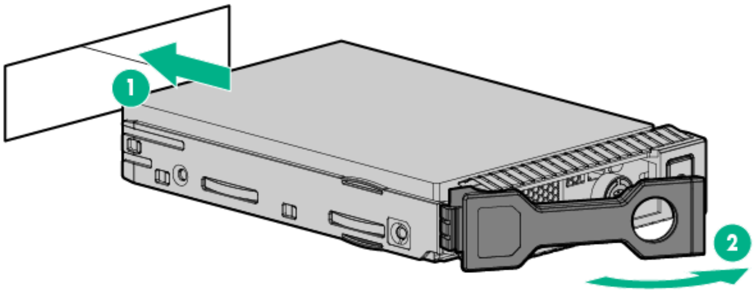
1. Remove the drive blank.



2. Prepare the drive.



3. Install the drive.



4. Determine the status of the drive from the drive LED definitions.

   For more information, see **Hot-plug drive LED definitions** on page 9.

Installing the NVMe SSD options

The server blade supports hot-plug NVMe SSDs when configured for NVMe drive support.

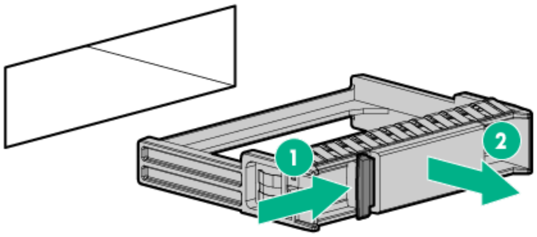
Prerequisites

Before installing an NVMe SSD into a server blade, the server blade must be configured with the following components:

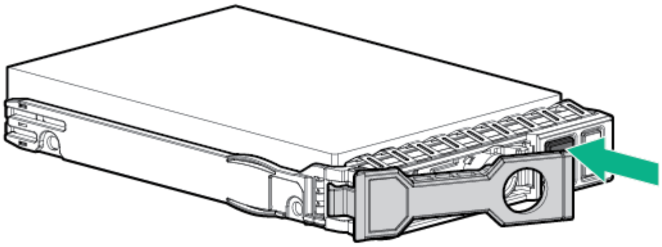
- NVMe pass-through board
- NVMe backplane

Procedure

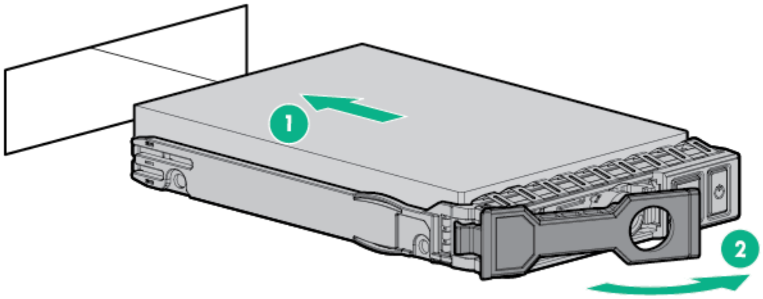
1. Remove the drive blank.



2. Press the Do Not Remove button to release the Release lever.



3. Install the drive.



4. Determine the status of the drive.

   For more information, see the **NVMe SSD components** on page 10.

Installing the SFF Flash Adapter option

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

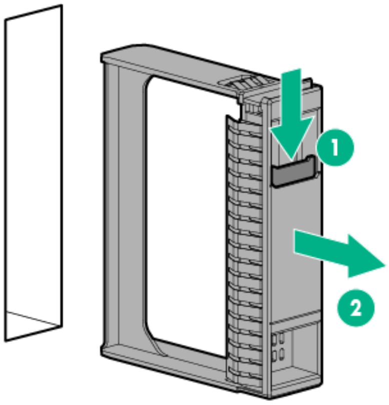
Prerequisites

To support uFF drives and the SFF Flash Adapter option, install the SAS/SATA HDD backplane with one of the following:

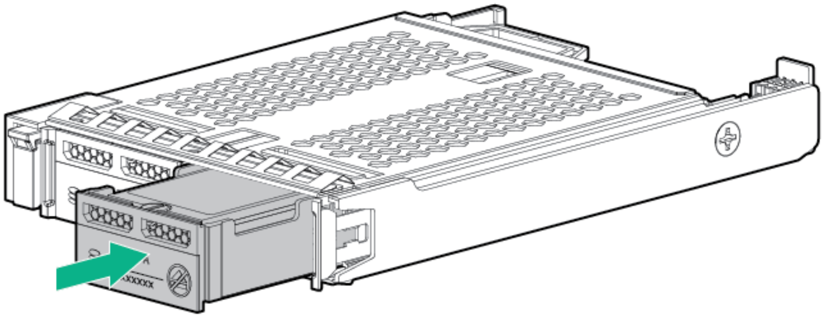
- Direct connect SATA cable
- HPE Smart Array P204i SR Gen10 Controller

Procedure

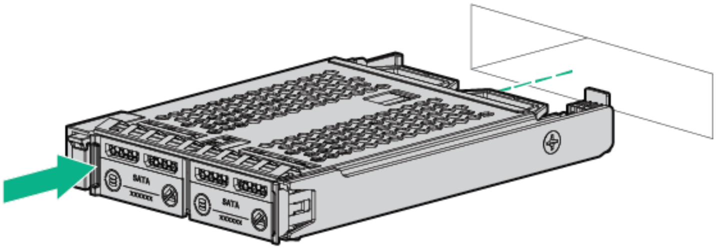
1. Remove the drive blank.



2. Install the uFF drives in the SFF Flash Adapter.



3. Install the SFF Flash Adapter by pushing firmly near the left-side adapter ejection handle until the latching spring engages in the drive bay.



HPE Smart Array P204i SR Gen10 Controller option

When the HPE Smart Array P204i SR Gen10 Controller is installed, this server blade supports the following options:

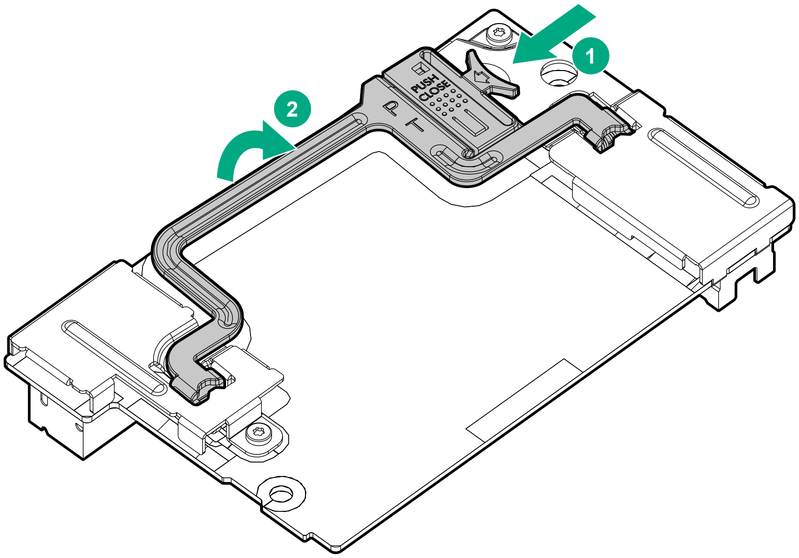
- Up to two SAS or SATA SSDs
- Up to two SAS or SATA hard drives
- Up to two SFF Flash Adapters (up to 4 uFF drives)

Prerequisites

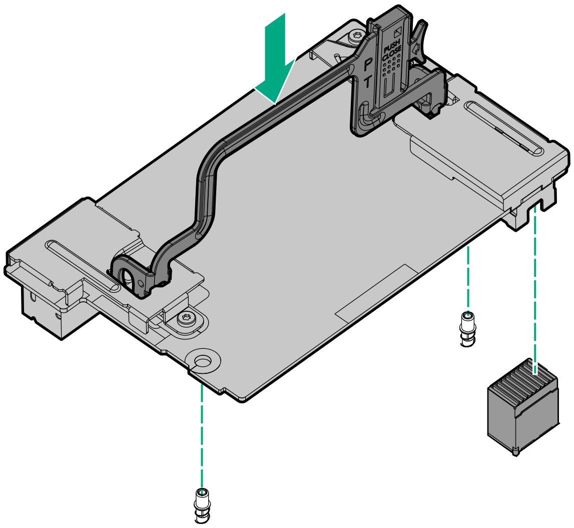
To support this storage controller, the SAS/SATA backplane is installed on the server blade. For server blades that support NVMe drives, an NVMe backplane is installed and an NVMe passthrough board will be installed in this location.

Procedure

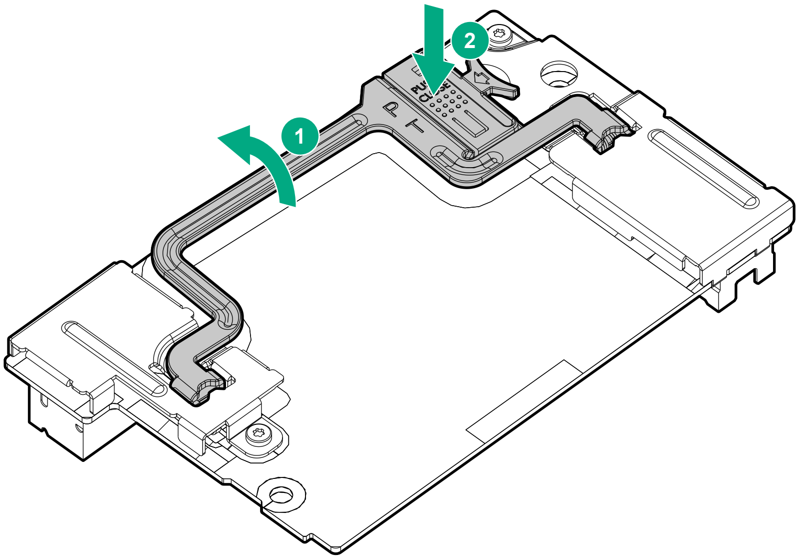
1. Back up all server blade data.
2. **Power down the server blade** on page 21.
3. **Remove the server blade** on page 22.
4. Place the server blade on a flat, level work surface.
5. **Remove the access panel** on page 22.
6. Remove the direct connect SATA cable, if installed (**Remove the direct connect SATA cable** on page 31).
7. Prepare the storage controller for installation.



8. Align the storage controller with the alignment pins and lower it onto the connector.



9. Close the storage controller handle to seat the storage controller on the connector.



10. **Install the access panel** on page 23.
11. **Install the server blade** on page 42.
12. **Power up the server blade** on page 21.

HPE Smart Storage Battery

The HPE Smart Storage Battery supports the following devices:

HPE Smart Array SR controllers

A single 96W battery can support up to 24 devices.

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

Installing the HPE Smart Storage Battery

⚠ **WARNING:** The server blade may contain internal replaceable battery cells or battery packs. A risk of fire, burns, or explosions exists if the battery pack is not properly handled. To reduce the risk of personal injury:

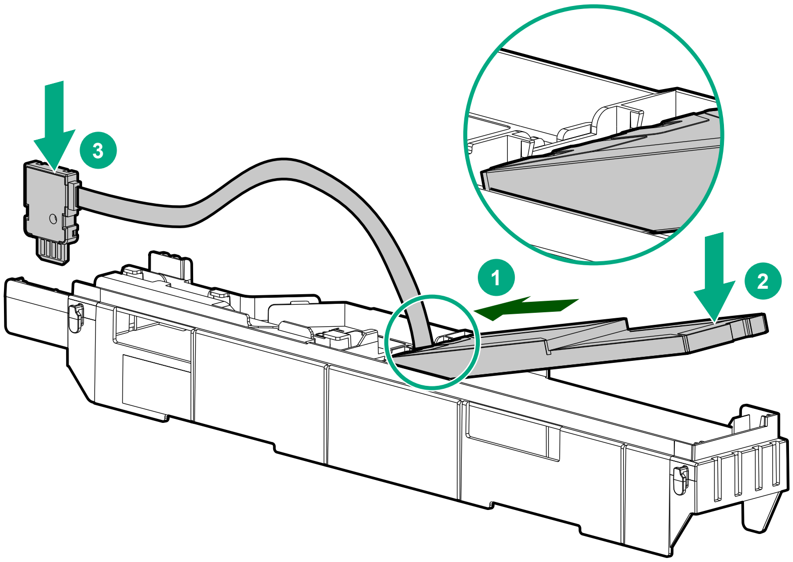
- Do not attempt to recharge the battery outside of the installed application.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose of the battery in fire or water.
- Replace only with the Hewlett Packard Enterprise spare battery designated for this product. Dispose of used batteries according to the manufacturer's instructions and local disposal requirements.
- For battery holders (for example, coin cells), observe the correct polarity when changing the battery/cell. A danger of explosion exists if the battery is installed incorrectly.

System ROM and firmware messages may display "energy pack" in place of "Smart Storage Battery." Energy pack refers to both HPE Smart Storage Batteries and HPE Smart Storage Hybrid Capacitors.

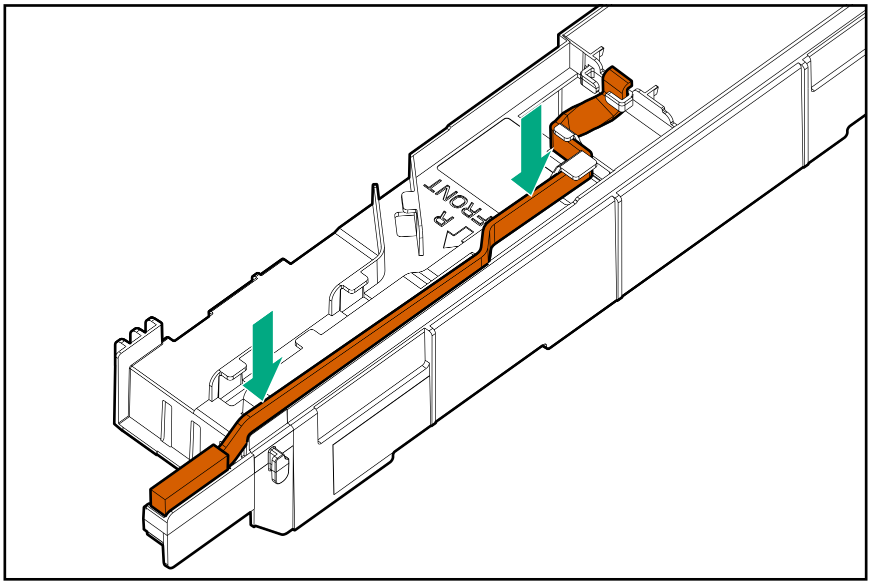
Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. If installed, remove the direct connect SATA cable (**Remove the direct connect SATA cable** on page 31).
6. If installed, remove the internal USB drive.

   To locate the internal USB connector, see **System board components** on page 13.
7. Remove the right DIMM baffle (**Remove the DIMM baffles** on page 23).
8. Install the HPE Smart Storage Battery on the right DIMM baffle.



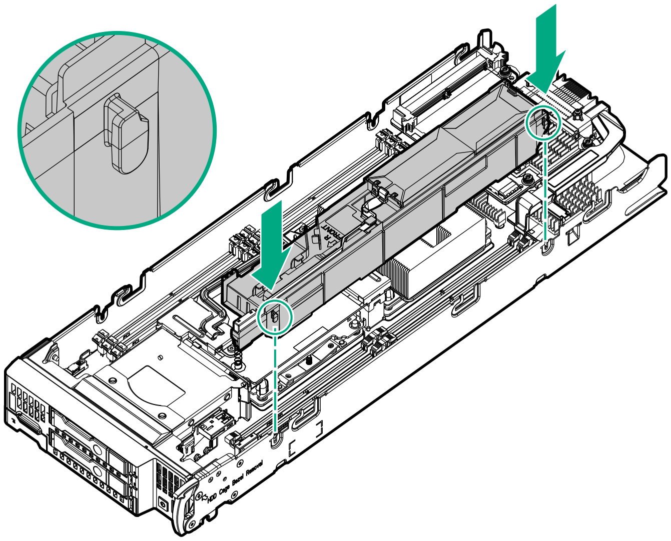
9. Route the cable on the right DIMM baffle.



IMPORTANT: When installing each DIMM baffle, be sure that the alignment tabs engage with the side of the server blade.

10. Align and install the DIMM baffle.

    Press down on the cable connector to fully seat the HPE Smart Storage Battery cable connector to the system board.



11. If removed, install the direct connect SATA cable (**Install the direct connect SATA cable** on page 31).
12. If removed, install the internal USB drive.

    To locate the internal USB connector, see **System board components** on page 13.
13. **Install the access panel** on page 23.
14. **Install the server blade** on page 42.
15. **Power up the server blade** on page 21.

Mezzanine card option

Optional mezzanine cards are classified as Type A mezzanine cards and Type B mezzanine cards. The type of the mezzanine card determines where it can be installed in the server blade.

- Install Type A mezzanine cards on Mezzanine 1 connector or Mezzanine 2 connector.
- Install Type B mezzanine cards on Mezzanine 2 connector.

Before installing the mezzanine card, be sure to review the following:

- **System board components** on page 13 for mezzanine connector location
- **Mezzanine connector definitions** on page 19
- **Mezzanine connector guide pin locations** on page 19
- **Interconnect bay numbering and device mapping** on page 40

When installing a mezzanine option on mezzanine connector 2, processor 2 must be installed.

Optional mezzanine cards enable external storage, network connectivity, or provide Fiber Channel support.

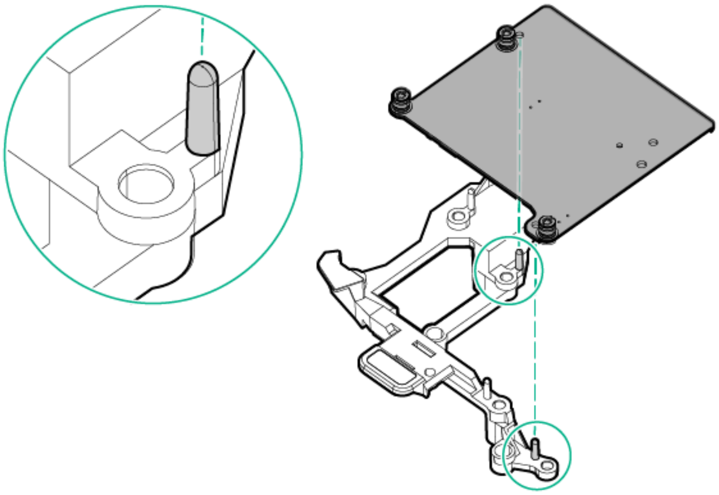
Installing the mezzanine card option

Prerequisites

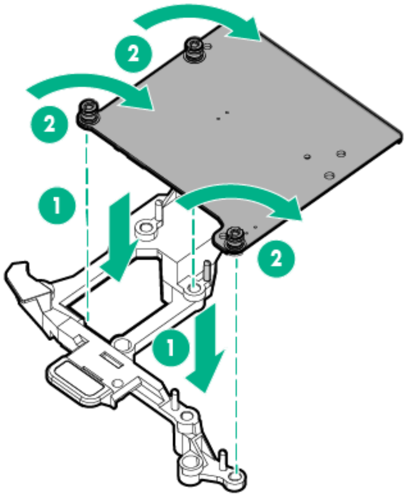
To install the mezzanine card option, you need a T-15 Torx screwdriver.

Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. **Remove the mezzanine assembly** on page 32.
6. Align the mezzanine card using the appropriate guide pins on the mezzanine assembly.

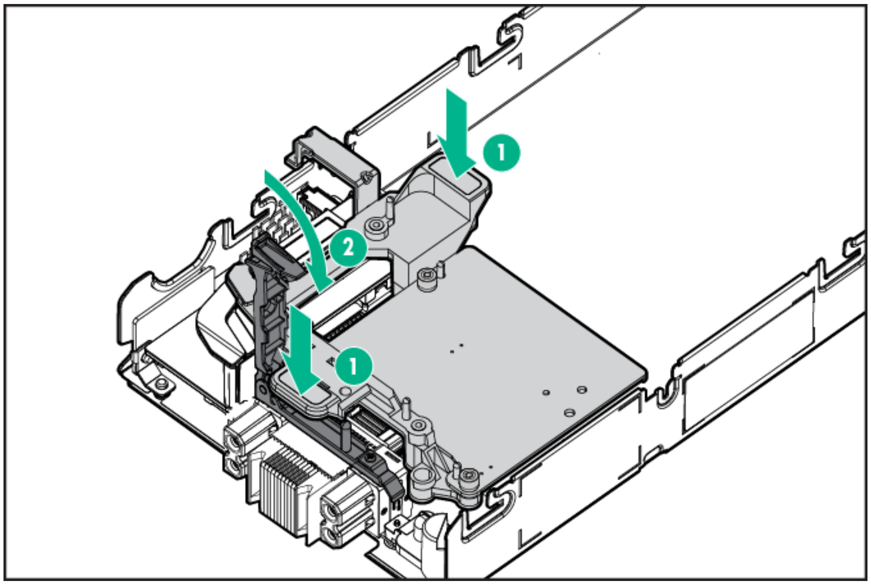


7. Install the mezzanine card in the mezzanine assembly.



8. Align the mezzanine assembly with the guide pins on the system board, and then install the mezzanine assembly on the system board.

   Press firmly on the mezzanine assembly handles, and then close the mezzanine assembly latch.



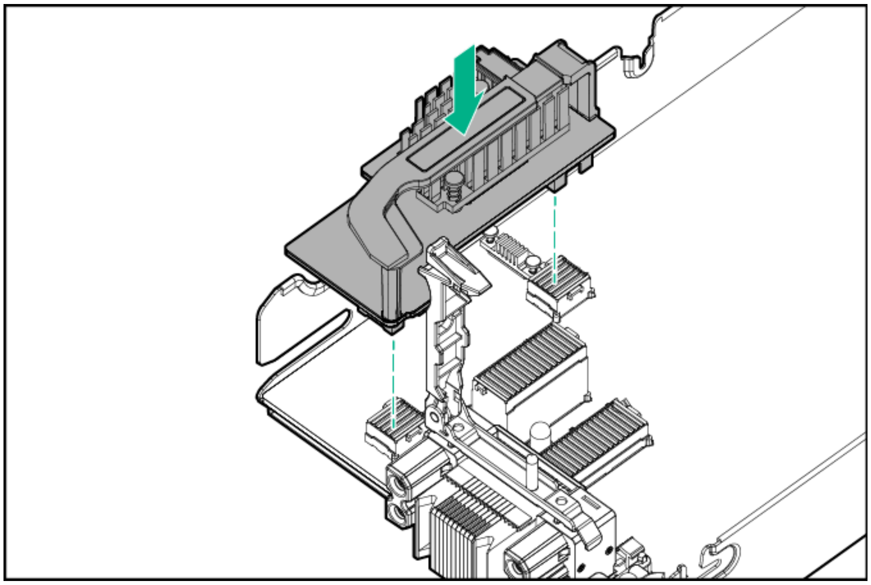
9. **Install the access panel** on page 23.
10. **Install the server blade** on page 42.
11. **Power up the server blade** on page 21.

FlexibleLOM option

Installing the FlexibleLOM

Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. **Remove the mezzanine assembly** on page 32.
6. Install the FlexibleLOM.



7. **Install the mezzanine assembly** on page 33.
8. **Install the access panel** on page 23.
9. **Install the server blade** on page 42.
10. **Power up the server blade** on page 21.

M.2 enablement option

The M.2 enablement option consists of an M.2 riser and an M.2 interposer board that installs on the left DIMM baffle. When the option is installed, the server blade supports up to two M.2 SSDs.

The M.2 riser board can support both 2280 and 22110 M.2 SSD options. If the M.2 riser is not configured for the correct length of the M.2 SSDs being installed, relocate the PEM nut and rubber stoppers to the location that support the drives being installed (**Relocate the PEM nut and rubber stopper** on page 28).

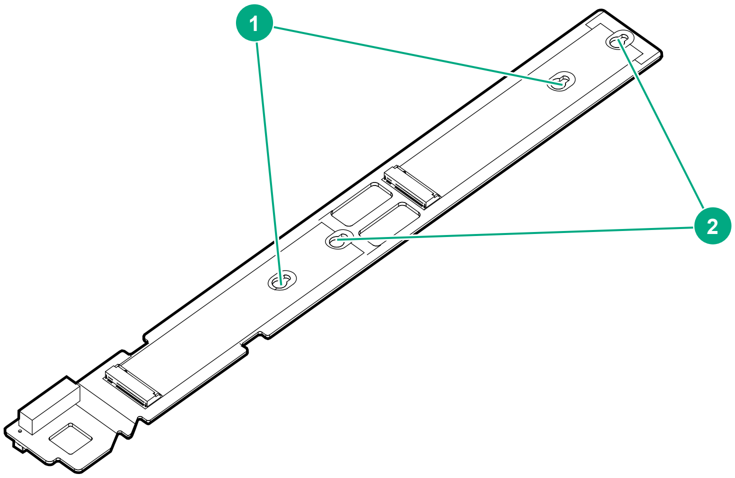


Figure 1: M.2 SSD PEM nut locations

1. Supports M.2 2280 SSD installation
2. Supports M.2 22110 SSD installation

Installing the M.2 riser board and M.2 interposer board

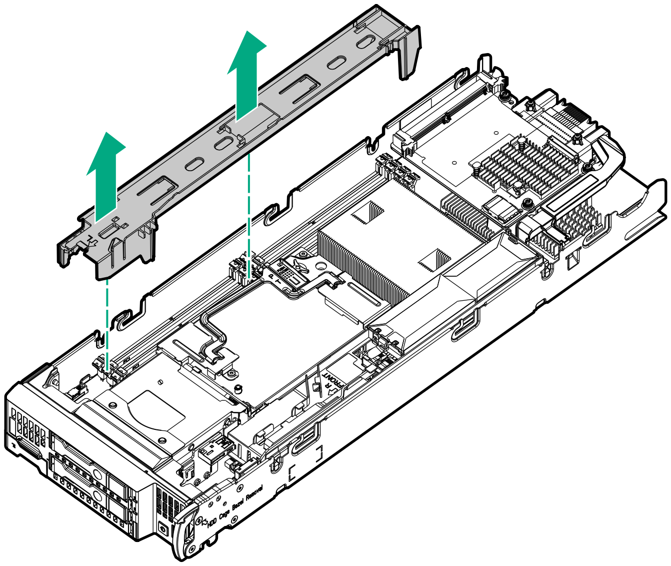
The M.2 riser board supports two M.2 SSDs. This server blade does not support mixing M.2 SSD sizes or bus protocols.

Prerequisites

To install the M.2 SSDs on the M.2 riser board, you need a No. 1 Phillips screwdriver.

Procedure

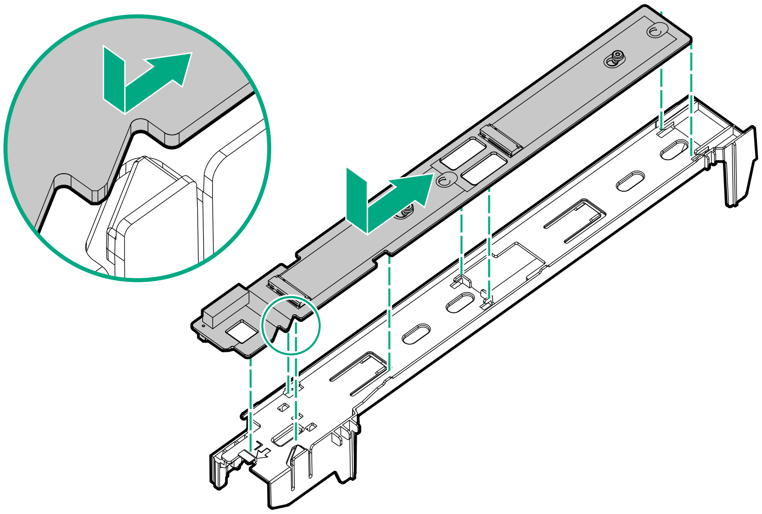
1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. Remove the left DIMM baffle.



6. Verify that the PEM nuts and rubber stoppers are in the correct location to support the length of the M.2 SSDs being installed. Relocate the PEM nuts and rubber stoppers, if necessary.

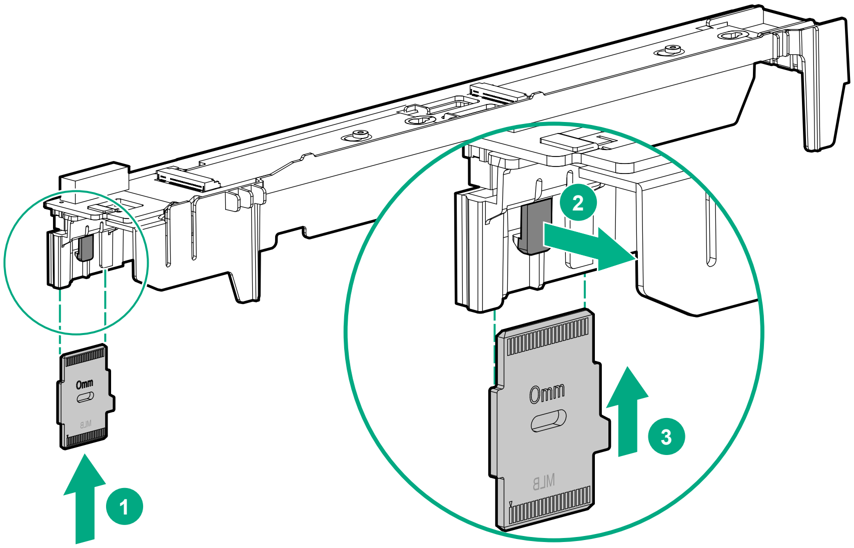
   See **Relocate the PEM nut and rubber stopper** on page 28.
7. Install the M.2 SSDs on the M.2 riser board.
   See **Installing the M.2 SSDs** on page 59.
8. Align and install the M.2 riser board on the left DIMM baffle.

   ⓘ **IMPORTANT:** Be sure that the M.2 riser board aligns with the 7 guides and the triangular notch on the left DIMM baffle.



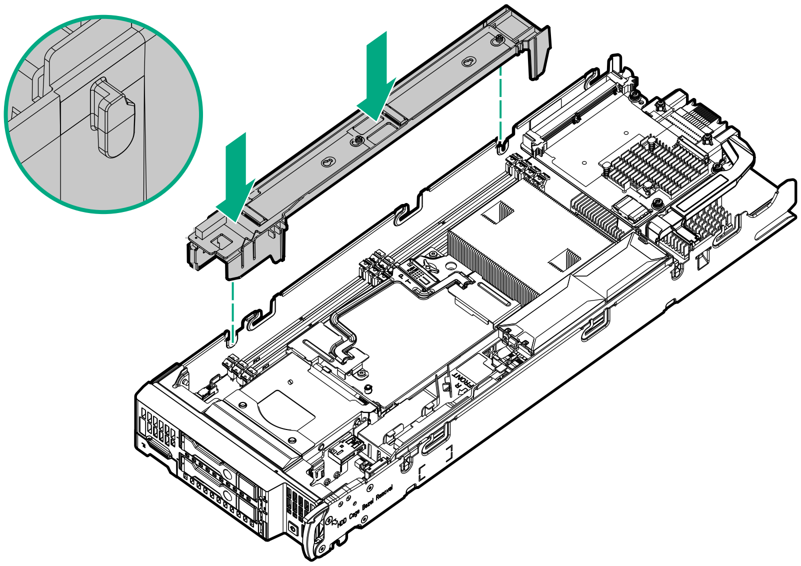
9. Install the M.2 interposer board on the left DIMM baffle.

   IMPORTANT: MLB is printed on the M.2 interposer board to indicate edge of the board that connects to the system board. When the M.2 interposer board is installed, MLB must face out towards the edge of the server blade.



10. Align and install the left DIMM baffle in the server blade.

    IMPORTANT: When installing each DIMM baffle, be sure that the alignment tabs engage with the side of the server blade.



11. **Install the access panel** on page 23.
12. **Install the server blade** on page 42.
13. **Power up the server blade** on page 21.

Installing the M.2 SSDs

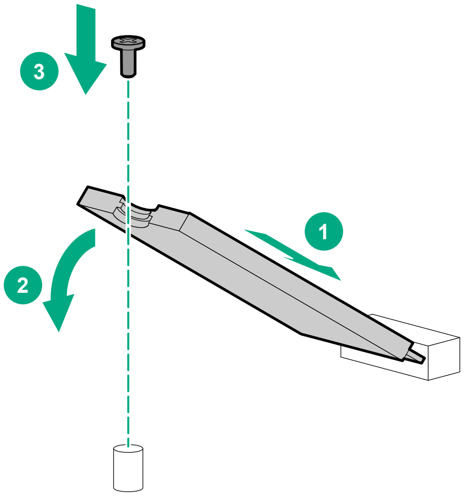
Prerequisites

A No. 1 Phillips screwdriver is required to perform this procedure.

Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. Remove the left DIMM baffle (**Remove the DIMM baffles** on page 23).
6. Verify that the PEM nuts and rubber stoppers are in the correct location to support the length of the M.2 SSDs being installed. Relocate the PEM nuts and rubber stoppers, if necessary.

   For more information, see **Relocate the PEM nut and rubber stopper** on page 28.
7. Remove the screw with a No. 1 Phillips screwdriver, and then install the M.2 SSD.



8. If necessary, repeat the M.2 SSD installation procedure for a second drive.
9. Install the left DIMM baffle (**Install the DIMM baffles** on page 25).
10. **Install the access panel** on page 23.
11. **Install the server blade** on page 42.
12. **Power up the server blade** on page 21.

Memory options

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

DIMM and NVDIMM population information

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

DIMM-processor compatibility

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

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

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

HPE SmartMemory speed information

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

Installing a DIMM

The server supports up to 16 DIMMs.

Prerequisites

Before installing this option, be sure that you have the following the components included with the hardware option kit.

For more information on specific options, see the server blade QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).

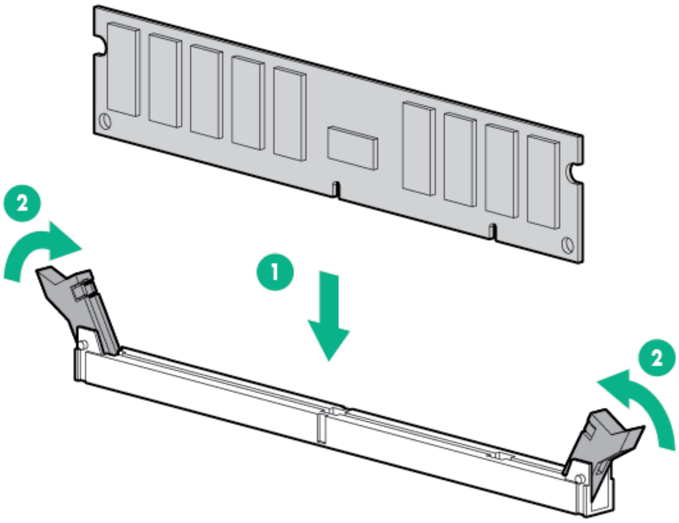
Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.

   IMPORTANT: When removing a DIMM baffle, do not remove the following options when installed on the DIMM baffle:

   - M.2 enablement option (left DIMM baffle)
   - HPE Smart Storage Battery (right DIMM baffle)

5. **Remove the DIMM baffles** on page 23.
6. Open the appropriate DIMM slot latches.
7. Install the DIMM.



8. **Install the DIMM baffles** on page 25.
9. **Install the access panel** on page 23.
10. **Install the server blade** on page 42.
11. **Power up the server blade** on page 21.

To configure the memory mode, use the BIOS/Platform Configuration (RBSU) in the UEFI System Utilities.

HPE 16GB NVDIMM option

HPE NVDIMMs are flash-backed NVDIMMs used as fast storage and are designed to eliminate smaller storage bottlenecks. The HPE 16GB NVDIMM for HPE ProLiant Gen10 servers is ideal for smaller database storage bottlenecks, write caching tiers, and any workload constrained by storage bottlenecks.

The HPE 16GB NVDIMM is supported on select HPE ProLiant Gen10 servers with first generation Intel Xeon Scalable processors. The server blade can support up to 12 NVDIMMs in 2 socket servers (up to 192GB) and up to 24 NVDIMMs in 4 socket servers (up to 384GB). The HPE Smart Storage Battery provides backup power to the memory slots allowing data to be moved from the DRAM portion of the NVDIMM to the Flash portion for persistence during a power down event.

For more information on HPE NVDIMMs, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/persistentmemory**).

NVDIMM-processor compatibility

HPE 16GB NVDIMMs are only supported in servers with first generation Intel Xeon Scalable processors installed.

Server requirements for NVDIMM support

Before installing an HPE 16GB NVDIMM in a server blade, make sure that the following components and software are available:

- A supported HPE server using Intel Xeon Scalable Processors: For more information, see the NVDIMM QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).
- An HPE Smart Storage Battery
- A minimum of one regular DIMM: The system cannot have only NVDIMM-Ns installed.
- A supported operating system with persistent memory/NVDIMM drivers. For the latest software information, see the Hewlett Packard Enterprise website (**http://persistentmemory.hpe.com**).
- For minimum firmware versions, see the HPE 16GB NVDIMM User Guide on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/nvdimm-docs**).

To determine NVDIMM support for your server blade, see the server blade QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).

Installing an NVDIMM

⚠ **CAUTION:** To avoid damage to the hard drives, memory, and other system components, the air baffle, drive blanks, and access panel must be installed when the server is powered up.

⚠ **CAUTION:** To avoid damage to the hard drives, memory, and other system components, be sure to install the correct DIMM baffles for your server model.

⚠ **CAUTION:** DIMMs are keyed for proper alignment. Align notches in the DIMM with the corresponding notches in the DIMM slot before inserting the DIMM. Do not force the DIMM into the slot. When installed properly, not all DIMMs will face in the same direction.

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

△ **CAUTION:** Failure to properly handle DIMMs can cause damage to DIMM components and the system board connector.

△ **CAUTION:** Unlike traditional storage devices, NVDIMMs are fully integrated in with the ProLiant server blade. Data loss can occur when system components, such as the processor or HPE Smart Storage Battery, fails. HPE Smart Storage battery is a critical component required to perform the backup functionality of NVDIMMs. It is important to act when HPE Smart Storage Battery related failures occur. Always follow best practices for ensuring data protection.

Prerequisites

Before installing an NVDIMM, be sure the server blade meets the **Server requirements for NVDIMM support** on page 62.

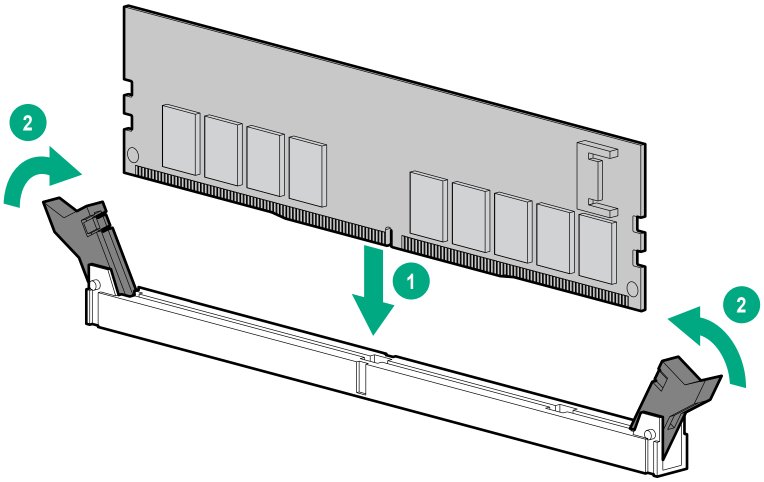
Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.

   ⓘ **IMPORTANT:** When removing a DIMM baffle, do not remove the following options when installed on the DIMM baffle:

   - M.2 enablement option (left DIMM baffle)
   - HPE Smart Storage Battery (right DIMM baffle)

5. **Remove the DIMM baffles** on page 23.
6. Locate any NVDIMMs already installed in the server blade.
7. Verify that all LEDs on any installed NVDIMMs are off.
8. Install the NVDIMM.



9. Install and connect the HPE Smart Storage Battery, if it is not already installed (**HPE Smart Storage Battery option**).

10. Install any components removed to access the DIMM slots and the HPE Smart Storage Battery.
11. **Install the access panel** on page 23.
12. **Install the server blade** on page 42.
13. **Power up the server blade** on page 21.
14. If required, sanitize the NVDIMM-Ns. For more information, see **NVDIMM sanitization** on page 64.

Configuring the server blade for NVDIMMs

After installing NVDIMMs, configure the server blade for NVDIMMs. For information on configuring settings for NVDIMMs, see the *HPE 16GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/nvdimm-docs**).

The server blade can be configured for NVDIMMs using either of the following:

- UEFI System Utilities—Use System Utilities through the Remote Console to configure the server blade for NVDIMM memory options by pressing the **F9** key during POST. For more information about UEFI System Utilities, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/uefi/docs**).
- iLO RESTful API for HPE iLO 5—For more information about configuring the system for NVDIMMs, see **https://hewlettpackard.github.io/ilo-rest-api-docs/ilo5/**.

Saving system default settings as user default settings

After configuring the NVDIMM settings for the server blade, Hewlett Packard Enterprise recommends saving the settings as the user default settings. To save the settings, do the following:

Procedure

1. From the System Utilities screen, select **System Configuration** —> **BIOS/Platform Configuration (RBSU)** —> **System Default Options** —> **User Default Options**, and press the **Enter** key.
2. Select **Save User Defaults**, and press the **Enter** key.
3. Select **Yes, Save** to save the current settings as the system default settings, and then press the **Enter** key.
4. Press the **F10** key to save the changes.

For more information about changing the settings, see the UEFI System Utilities User Guide for your server blade on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/UEFI/docs**).

NVDIMM sanitization

Media sanitization is defined by NIST SP800-88 Guidelines for Media Sanitization (Rev 1, Dec 2014) as "a general term referring to the actions taken to render data written on media unrecoverable by both ordinary and extraordinary means."

The specification defines the following levels:

- Clear: Overwrite user-addressable storage space using standard write commands; might not sanitize data in areas not currently user-addressable (such as bad blocks and overprovisioned areas)
- Purge: Overwrite or erase all storage space that might have been used to store data using dedicated device sanitize commands, such that data retrieval is "infeasible using state-of-the-art laboratory techniques"
- Destroy: Ensure that data retrieval is "infeasible using state-of-the-art laboratory techniques" and render the media unable to store data (such as disintegrate, pulverize, melt, incinerate, or shred)

The NVDIMM-N Sanitize options are intended to meet the Purge level.

For more information on sanitization for NVDIMMs, see the following sections in the *HPE 16GB NVDIMM User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/nvdimm-docs**):

- NVDIMM sanitization policies
- NVDIMM sanitization guidelines
- Setting the NVDIMM-N Sanitize/Erase on the Next Reboot Policy

NIST SP800-88 *Guidelines for Media Sanitization* (Rev 1, Dec 2014) is available for download from the NIST website (**http://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-88r1.pdf**).

NVDIMM relocation guidelines

Requirements for relocating NVDIMMs or a set of NVDIMMs when the data must be preserved

- The destination server blade hardware must match the original server blade hardware configuration.
- All System Utilities settings in the destination server blade must match the original System Utilities settings in the original server blade.
- If NVDIMM-Ns are used with NVDIMM Interleaving ON mode in the original server blade, do the following:
  - Install the NVDIMMs in the same DIMM slots in the destination server blade.
  - Install the entire NVDIMM set (all the NVDIMM-Ns on the processor) on the destination server blade.

  This guideline would apply when replacing a system board due to system failure.

  If any of the requirements cannot be met during NVDIMM relocation, do the following:

  - Manually back up the NVDIMM-N data before relocating NVDIMM-Ns to another server blade.
  - Relocate the NVDIMM-Ns to another server blade.
  - Sanitize all NVDIMM-Ns on the new server blade before using them.

Requirements for relocating NVDIMMs or a set of NVDIMMs when the data does not have to be preserved

If data on the NVDIMM-N or set of NVDIMM-Ns does not have to be preserved, then

- Move the NVDIMM-Ns to the new location and sanitize all NVDIMM-Ns after installing them to the new location. For more information, see **NVDIMM sanitization** on page 64.
- Observe all DIMM and NVDIMM population guidelines. For more information, see **DIMM and NVDIMM population information** on page 60.

- Observe the process for removing an NVDIMM.
- Observe the process for installing an NVDIMM.
- Review and configure the system settings for NVDIMMs. For more information, see **Configuring the server blade for NVDIMMs** on page 64.

Installing the processor-heatsink assembly

Intelligent System Tuning supports specific processors and configurations. For more information, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).

IMPORTANT: Existing HPE ProLiant and HPE Synergy Gen10 server products containing first-generation Intel Xeon Scalable processors may not be upgraded to second-generation Intel Xeon Scalable processors at this time. For more information, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).

Prerequisites

Before installing the processor-heatsink assembly, be sure to have the following:

- The processor-heatsink assembly kit contents
- T-30 Torx screwdriver

Procedure

1. Observe the following alerts:

   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: When handling the heatsink, always hold it along the top and bottom of the fins. Holding it from the sides can damage the fins.

   CAUTION: To avoid damage to the processor or system board, only authorized personnel should attempt to replace or install the processor in this server blade.

   CAUTION: To prevent possible server blade malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number.

   CAUTION: If installing a processor with a faster speed, update the system ROM before installing the processor.

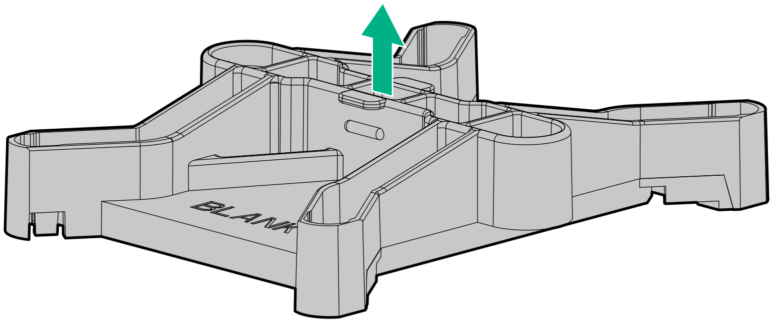
   To download firmware and view installation instructions, see the **Hewlett Packard Enterprise Support Center website**.

   CAUTION: THE CONTACTS ARE VERY FRAGILE AND EASILY DAMAGED. To avoid damage to the socket or processor, do not touch the contacts.

2. Update the system ROM.

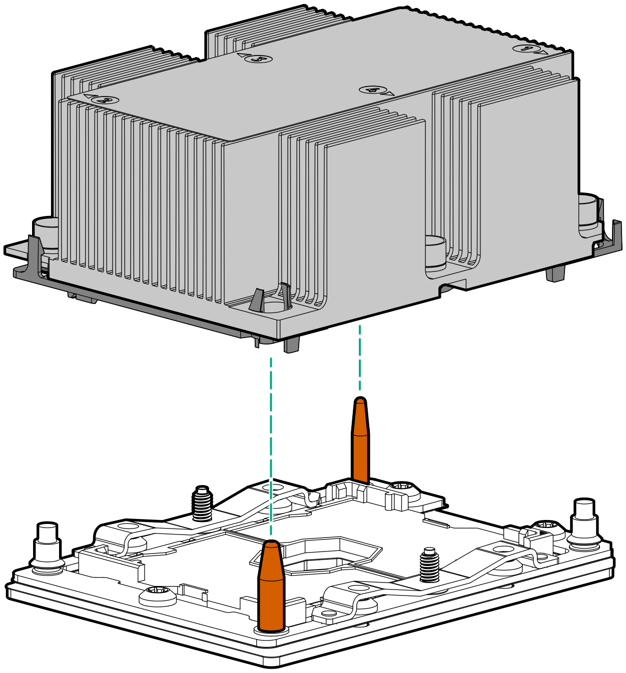
   Locate and download the latest ROM version from the Hewlett Packard Enterprise website at **http://www.hpe.com/support**. Follow the instructions on the website to update the system ROM.

3. **Power down the server blade** on page 21.
4. **Remove the server blade** on page 22.
5. **Remove the access panel** on page 22.
6. **Remove the DIMM baffles** on page 23.
7. Remove the heatsink blank. Retain the heatsink blank for future use.

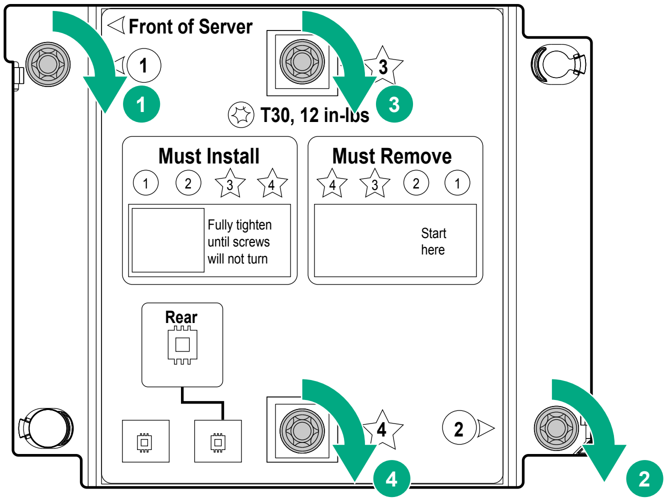


8. Install the processor-heatsink assembly:
   - **a.** Locate the Pin 1 indicator on the processor frame and the socket.
   - **b.** Align the processor heatsink assembly with the alignment pins and gently lower it down until it sits evenly on the socket. The heatsink alignment pins are keyed. The processor will only install one way.

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



9. Using a T-30 Torx screwdriver, fully tighten each heatsink nut in the order indicated on the heatsink label (1 > 2 > 3 > 4) until it no longer turns.



10. **Install the DIMM baffles** on page 25.

11. **Install the access panel** on page 23.

12. **Install the server blade** on page 42.

13. **Power up the server blade** on page 21

HPE Trusted Platform Module 2.0 Gen10 option

Overview

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

This procedure includes three sections:

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

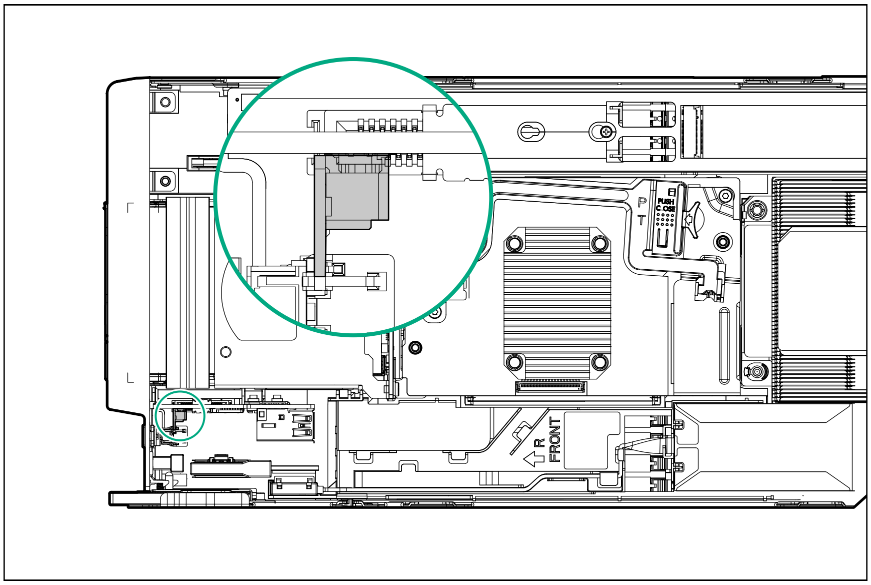
HPE TPM 2.0 installation is supported with specific operating system support such as Microsoft® Windows Server® 2012 R2 and later. For more information about operating system support, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**). For more information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

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

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

TPM 2.0 location

The TPM 2.0 is located on the system board near the front of the server blade.

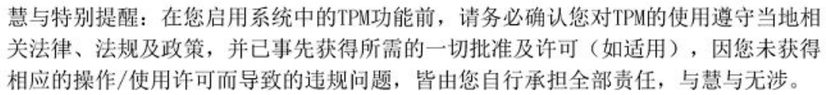


HPE Trusted Platform Module 2.0 Guidelines

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

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

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


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

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

- Do not remove an installed TPM. Once installed, the TPM becomes a permanent part of the system board.
- When installing or replacing hardware, Hewlett Packard Enterprise service providers cannot enable the TPM or the encryption technology. For security reasons, only the customer can enable these features.
- When returning a system board for service replacement, do not remove the TPM from the system board. When requested, Hewlett Packard Enterprise Service provides a TPM with the spare system board.

- Any attempt to remove the cover of an installed TPM from the system board can damage the TPM cover, the TPM, and the system board.
- If the TPM is removed from the original server and powered up on a different server, data stored in the TPM including keys will be erased.
- When using BitLocker, always retain the recovery key/password. The recovery key/password is required to complete Recovery Mode after BitLocker detects a possible compromise of system integrity.
- Hewlett Packard Enterprise is not liable for blocked data access caused by improper TPM use. For operating instructions, see the TPM documentation or the encryption technology feature documentation provided by the operating system.

Installing and enabling the HPE TPM 2.0 Gen10 Kit

Installing the Trusted Platform Module board

Preparing the server blade for installation

Procedure

1. Observe the following warnings:

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

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

   For rack and tower servers, remove the power cord.

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

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

2. Update the system ROM.

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

3. Power down the server blade (**Power down the server blade** on page 21).
4. **Remove the server blade** on page 22.
5. Place the server blade on a flat, level work surface.
6. **Remove the access panel** on page 22.
7. Remove any options or cables that may prevent access to the TPM connector.
8. Proceed to **Installing the TPM board and cover** on page 71.

Installing the TPM board and cover

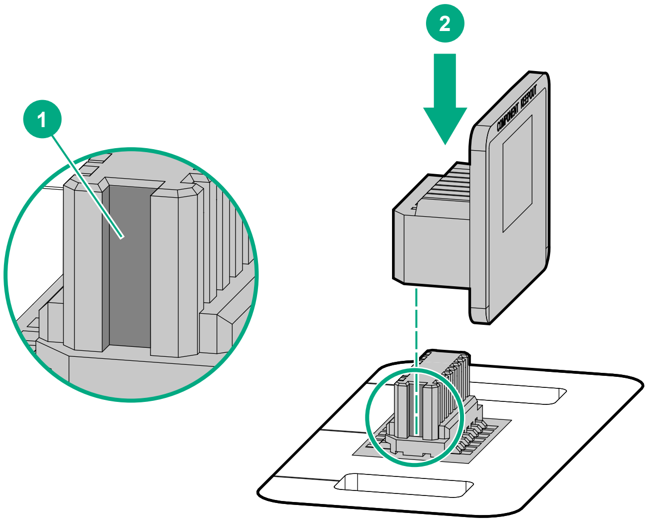
Procedure

1. Observe the following alerts:

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

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

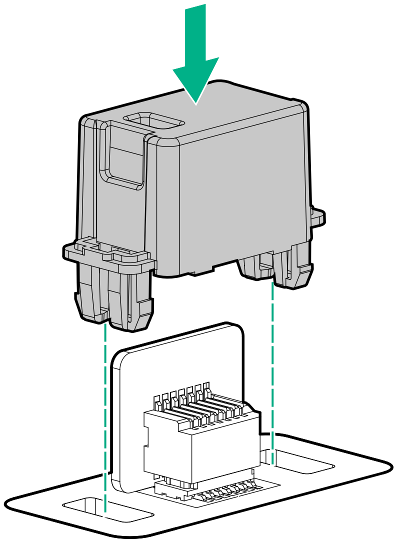
2. Align the TPM board with the key on the connector, and then install the TPM board. To seat the board, press the TPM board firmly into the connector. To locate the TPM connector on the system board, see the server blade label on the access panel.



3. Install the TPM cover:

   a. Line up the tabs on the cover with the openings on either side of the TPM connector.

   b. To snap the cover into place, firmly press straight down on the middle of the cover.



4. Proceed to **Preparing the server blade for operation** on page 72.

Preparing the server blade for operation

Procedure

1. Install any options or cables previously removed to access the TPM connector.
2. **Install the access panel** on page 23.
3. **Install the server blade** on page 42.
4. **Power up the server blade** on page 21.

Enabling the Trusted Platform Module

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

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

Enabling the Trusted Platform Module as TPM 2.0

Procedure

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

- "Current TPM Type" is set to **TPM 2.0**.
- "Current TPM State" is set to **Present and Enabled**.
- "TPM Visibility" is set to **Visible**.

4. If changes were made in the previous step, press the **F10** key to save your selection.
5. If F10 was pressed in the previous step, do one of the following:

   - If in graphical mode, click **Yes**.
   - If in text mode, press the **Y** key.

6. Press the **ESC** key to exit System Utilities.
7. If changes were made and saved, the server blade prompts for reboot request. Press the **Enter** key to confirm reboot.

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

   - Changing from TPM 1.2 and TPM 2.0
   - Changing TPM bus from FIFO to CRB
   - Enabling or disabling TPM
   - Clearing the TPM

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

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

Enabling the Trusted Platform Module as TPM 1.2

Procedure

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

   - If in graphical mode, click **Yes**.
   - If in text mode, press the **Y** key.

7. Press the **ESC** key to exit System Utilities.

   The server blade reboots a second time without user input. During this reboot, the TPM setting becomes effective.

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

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

Retaining the recovery key/password

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

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

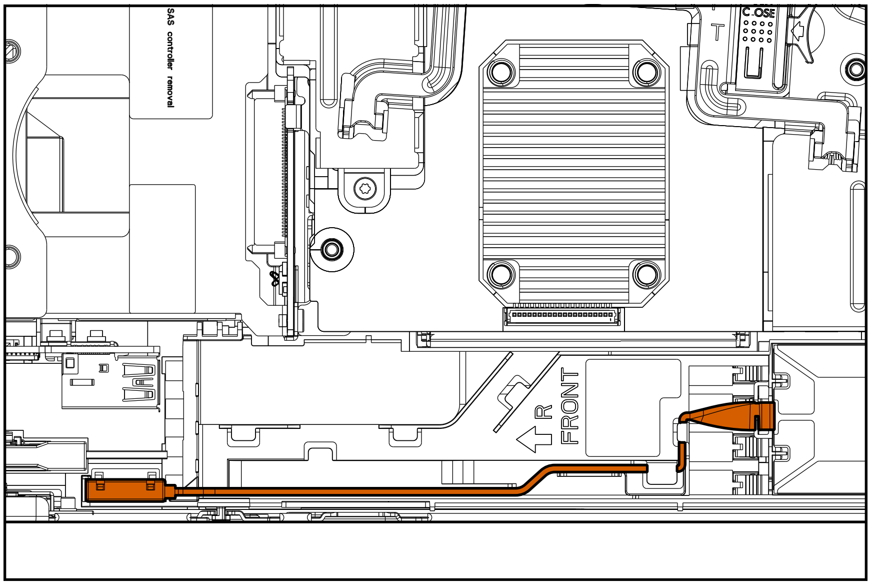
- Always store the recovery key/password in multiple locations.
- Always store copies of the recovery key/password away from the server blade.
- Do not save the recovery key/password on the encrypted hard drive.

Cabling

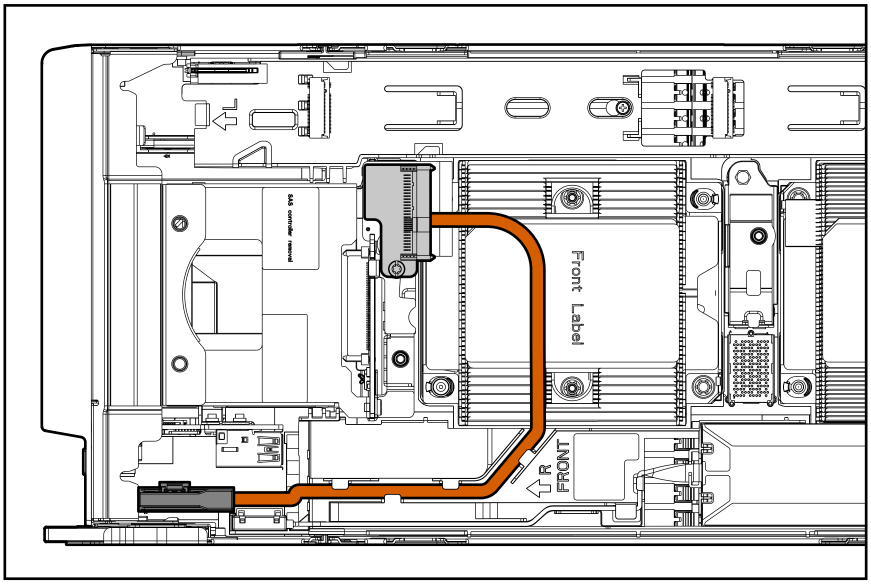
Cabling resources

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

HPE Smart Storage Battery cabling



Direct connect SATA cabling



Using the HPE c-Class Blade SUV Cable

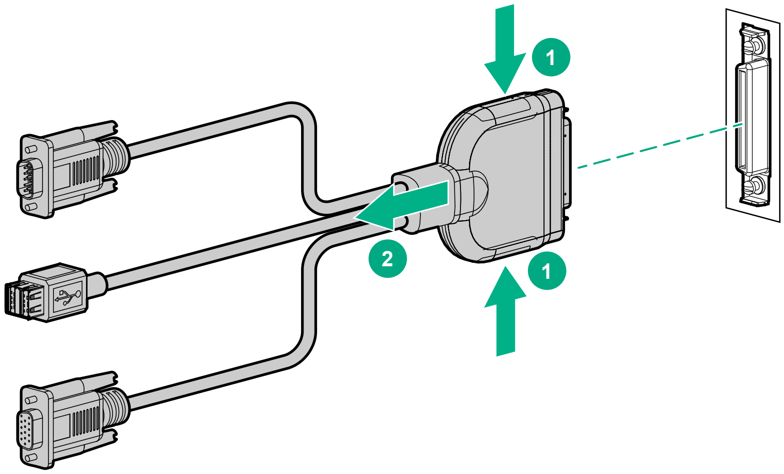
The c-Class Blade SUV Cable enables the user to perform server blade administration, configuration, and diagnostic procedures by connecting video and USB devices directly to the server blade. For SUV cable connectors, see "**SUV cable connectors**."

Disconnecting and replacing the SUV cable

△ **CAUTION:** Before disconnecting the SUV cable from the connector, always squeeze the release buttons on the sides of the connector. Failure to do so can result in damage to the equipment.

Procedure

1. Disconnect the SUV cable from the server blade.
    a. Press and hold both sides of the connector.
    b. Disconnect the cable from the server blade.



To replace the component, reverse the removal procedure.

Connecting locally to a server blade with video and USB devices

Use the SUV cable to connect a monitor and any of the following USB devices:

- USB hub
- USB keyboard
- USB mouse
- USB CD/DVD-ROM drive

The USB connectors on the SUV cable do not support devices that require greater than a 500mA power source.

Numerous configurations are possible. This section offers two possible configurations. For more information, see **USB support** on page 89.

Accessing a server blade with local KVM

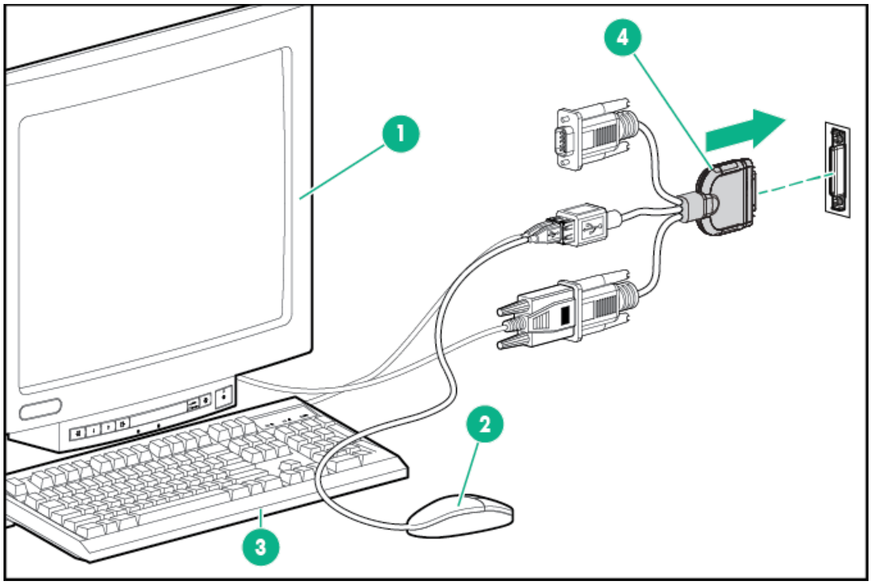
Prerequisites

For this configuration, a USB hub is not necessary. To connect additional devices, use a USB hub.

△ **CAUTION:** Before disconnecting the SUV cable from the connector, always squeeze the release buttons on the sides of the connector. Failure to do so can result in damage to the equipment.

Procedure

1. Open the serial label pull tab and connect the c-Class Blade SUV Cable to the server blade.
2. Connect the video connector to a monitor.
3. Connect a USB mouse to one USB connector.
4. Connect a USB keyboard to the second USB connector.



Item	Description
1	Monitor
2	USB mouse
3	USB keyboard
4	c-Class Blade SUV Cable

Accessing local media devices

Prerequisites

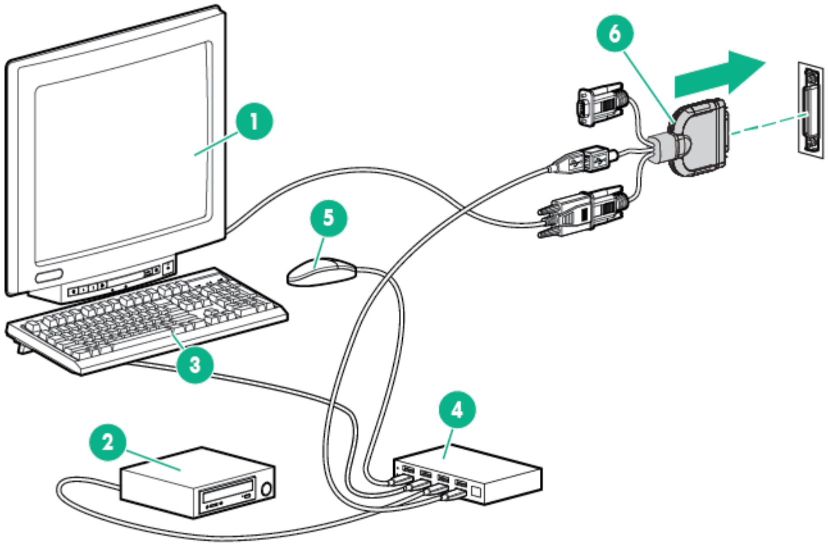
Use the following configuration when configuring a server blade or loading software updates and patches from a USB CD/DVD-ROM.

Use a USB hub when connecting a USB CD-ROM drive to the server blade. The USB connectors on the SUV cable do not support devices that require a power source greater than 500mA. The USB hub provides additional connections and the power required to support USB keys or external drives that require more than 500mA at 5V.

Procedure

1. Open the serial label pull tab and connect the c-Class Blade SUV cable to the server blade.
2. Connect the video connector to a monitor.
3. Connect a USB hub to one USB connector.
4. Connect the following to the USB hub:

    - USB CD/DVD-ROM drive
    - USB keyboard
    - USB mouse



Item	Description
1	Monitor
2	USB CD/DVD-ROM drive
3	USB keyboard
4	USB hub
5	USB mouse
6	c-Class Blade SUV Cable

Troubleshooting

Troubleshooting resources

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

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

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

Software and configuration utilities

Server mode

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

Software or configuration utility	Server mode
Active Health System on page 81	Online and Offline
HPE iLO 5 on page 81	Online and Offline
HPE Smart Storage Administrator on page 88	Online and Offline
iLO RESTful API on page 83	Online and Offline
Intelligent Provisioning on page 84	Online and Offline
Scripting Toolkit for Windows and Linux on page 85	Online
Service Pack for ProLiant on page 90	Online and Offline
Smart Update Manager on page 90	Online and Offline
UEFI System Utilities on page 86	Offline

Product QuickSpecs

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

Active Health System Viewer

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

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

Active Health System

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

The Active Health System provides:

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

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

Active Health System data collection

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

Examples of information that is collected:

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

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

Active Health System Log

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

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

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

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

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

HPE iLO 5

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

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

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

iLO Federation

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

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

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

iLO supports the following features:

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

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

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

iLO Service Port

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

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

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

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

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

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

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

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

When you use the iLO Service Port:

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

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

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

iLO RESTful API

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

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

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

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

RESTful Interface Tool

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

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

iLO Amplifier Pack

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

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

Integrated Management Log

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

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

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

Intelligent Provisioning

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

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

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

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

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

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

To access Intelligent Provisioning:

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

Intelligent Provisioning operation

Intelligent Provisioning includes the following components:

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

IMPORTANT:

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

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

Intelligent Provisioning provides installation help for the following operating systems:

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

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

Management Security

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

For information about the iLO Advanced Premium Security Edition license, see **http://www.hpe.com/servers/ilopremium**.

Scripting Toolkit for Windows and Linux

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

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

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

UEFI System Utilities

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

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

HPE servers with UEFI can provide:

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

Selecting the boot mode

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

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

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

Prerequisite

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

Procedure

1. From the **System Utilities** screen, select **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Boot Options** > **Boot Mode**.
2. Select a setting.

  - **UEFI Mode** (default)—Configures the system to boot to a UEFI compatible operating system.
  - **Legacy BIOS Mode**—Configures the system to boot to a traditional operating system in Legacy BIOS compatibility mode.

3. Save your setting.
4. Reboot the server.

Secure Boot

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

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

When Secure Boot is enabled:

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

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

You can configure Secure Boot:

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

Launching the Embedded UEFI Shell

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

Prerequisites

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

Procedure

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

   The **Embedded UEFI Shell** screen appears.
2. Press any key to acknowledge that you are physically present.

   This step ensures that certain features, such as disabling **Secure Boot** or managing the **Secure Boot** certificates using third-party UEFI tools, are not restricted.
3. If an administrator password is set, enter it at the prompt and press **Enter**.

   The `Shell>` prompt appears.
4. Enter the commands required to complete your task.
5. Enter the `exit` command to exit the Shell.

HPE Smart Storage Administrator

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

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

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

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

- Accessing HPE SSA in the offline environment

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

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

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

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

HPE InfoSight for servers

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

HPE InfoSight for servers:

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

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

USB support

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

External USB functionality

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

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

Redundant ROM support

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

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

Safety and security benefits

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

Keeping the system current

Updating firmware or system ROM

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

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

More information

Updating firmware from the System Utilities on page 91

Service Pack for ProLiant

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

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

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

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

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

Smart Update Manager

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

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

Key features of SUM include:

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

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

Smart Update Tools

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

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

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

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

Updating firmware from the System Utilities

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

Procedure

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

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

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

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

Updating the firmware from the UEFI Embedded Shell

Procedure

1. Access the System ROM Flash Binary component for your server from the Hewlett Packard Enterprise Support Center (**http://www.hpe.com/support/hpesc**).
2. Copy the binary file to a USB media or iLO virtual media.
3. Attach the media to the server.

4. Boot to the UEFI Embedded Shell.
5. To obtain the assigned file system volume for the USB key, enter `map -r`.
6. Change to the file system that contains the System ROM Flash Binary component for your server. Enter one of the `fsx` file systems available, such as `fs0:` or `fs1:`, and press **Enter**.
7. Use the `cd` command to change from the current directory to the directory that contains the binary file.
8. Flash the system ROM by entering `fwupdate -d BIOS -f` *`filename`*.
9. Reboot the server. A reboot is required after the firmware update in order for the updates to take effect and for hardware stability to be maintained.

Online Flash components

This component provides updated system firmware that can be installed directly on supported operating systems. Additionally, when used in conjunction with SUM, this Smart Component allows the user to update firmware on remote servers from a central location. This remote deployment capability eliminates the need for the user to be physically present at the server to perform a firmware update.

Drivers

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

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

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

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

Software and firmware

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

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

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

Operating system version support

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

HPE Pointnext Portfolio

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

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

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

Utilize the Advisory and Transformation Services in the following areas:

- Private or hybrid cloud computing
- Big data and mobility requirements
- Improving data center infrastructure
- Better use of server, storage, and networking technology

For more information, see the Hewlett Packard Enterprise website:

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

Proactive notifications

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

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

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

Removing and replacing the system battery

If the server blade no longer automatically displays the correct date and time, then replace the battery that provides power to the real-time clock. Under normal use, battery life is 5 to 10 years.

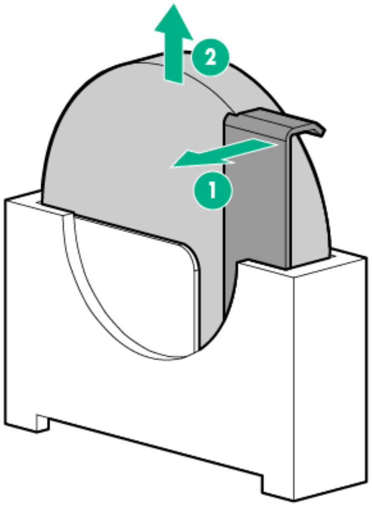
⚠ **WARNING:** The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace only with the spare designated for this product.

Procedure

1. **Power down the server blade** on page 21.
2. **Remove the server blade** on page 22.
3. Place the server blade on a flat, level work surface.
4. **Remove the access panel** on page 22.
5. Identify the battery location.

   For more information on battery location, see **System board components** on page 13.
6. Remove the left DIMM baffle (**DIMM baffle (left side)**).
7. Remove the battery.



IMPORTANT: Replacing the system board battery resets the system ROM to its default configuration. After replacing the battery, reconfigure the system through UEFI System Utilities.

To replace the component, reverse the removal procedure.

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

Electrostatic discharge

Preventing electrostatic discharge

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

Procedure

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

Grounding methods to prevent electrostatic discharge

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

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

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

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

Specifications

Environmental specifications

Specification	Value
Temperature range[1]	**—**
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)[2]	**—**
Operating	10% to 90% @ 28°C (82.4°F)
Nonoperating	5% to 95% @ 38.7°C (101.7°F)
Altitude[3]	—
Operating	3,050 m (10,000 ft)
Nonoperating	9,144 m (30,000 ft)

[1] The following temperature conditions and limitations apply:

- All temperature ratings shown are for sea level.
- An altitude derating of 1°C per 304.8 m (1.8°F per 1,000 ft) up to 3,048 m (10,000 ft) applies.
- No direct sunlight is allowed.
- The maximum permissible rate of change is 10°C/hr (18°F/hr).
- The type and number of options installed might reduce the upper temperature and humidity limits.
- Operating with a fan fault or above 30°C (86°F) might reduce system performance.

[2] Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F).

[3] Maximum storage altitude corresponds to a minimum pressure of 70 kPa (10.1 psia).

Server blade specifications

Specification	Value
Height	180.70 mm (7.11 in)
Depth	517.51mm (20.37 in)
Width	55.37 mm (2.18 in)
Weight (maximum)	6.33 kg (13.96 lb)
Weight (minimum)	4.50 kg (9.90 lb)

Websites

General websites

Hewlett Packard Enterprise Information Library

www.hpe.com/info/EIL

Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix

www.hpe.com/storage/spock

Storage white papers and analyst reports

www.hpe.com/storage/whitepapers

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

Support and other resources

Accessing Hewlett Packard Enterprise Support

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

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

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

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

Information to collect

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

Accessing updates

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

  Hewlett Packard Enterprise Support Center
  www.hpe.com/support/hpesc
  Hewlett Packard Enterprise Support Center: Software downloads
  www.hpe.com/support/downloads
  Software Depot
  www.hpe.com/support/softwaredepot

- To subscribe to eNewsletters and alerts:

  www.hpe.com/support/e-updates

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

  www.hpe.com/support/AccessToSupportMaterials

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

Customer self repair

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

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

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

Remote support

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

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

Remote support and Proactive Care information

HPE Get Connected

www.hpe.com/services/getconnected

HPE Proactive Care services

www.hpe.com/services/proactivecare

HPE Proactive Care service: Supported products list

www.hpe.com/services/proactivecaresupportedproducts

HPE Proactive Care advanced service: Supported products list

www.hpe.com/services/proactivecareadvancedsupportedproducts

Proactive Care customer information

Proactive Care central

www.hpe.com/services/proactivecarecentral

Proactive Care service activation

www.hpe.com/services/proactivecarecentralgetstarted

Warranty information

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

HPE ProLiant and IA-32 Servers and Options

www.hpe.com/support/ProLiantServers-Warranties

HPE Enterprise and Cloudline Servers

www.hpe.com/support/EnterpriseServers-Warranties

HPE Storage Products

www.hpe.com/support/Storage-Warranties

HPE Networking Products

www.hpe.com/support/Networking-Warranties

Regulatory information

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

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

Additional regulatory information

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

www.hpe.com/info/reach

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

www.hpe.com/info/ecodata

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

www.hpe.com/info/environment

Documentation feedback

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