HPE Synergy 480 Gen11 Compute Module User Guide

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HPE Synergy 480 Gen11 Compute Module User Guide

Abstract

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

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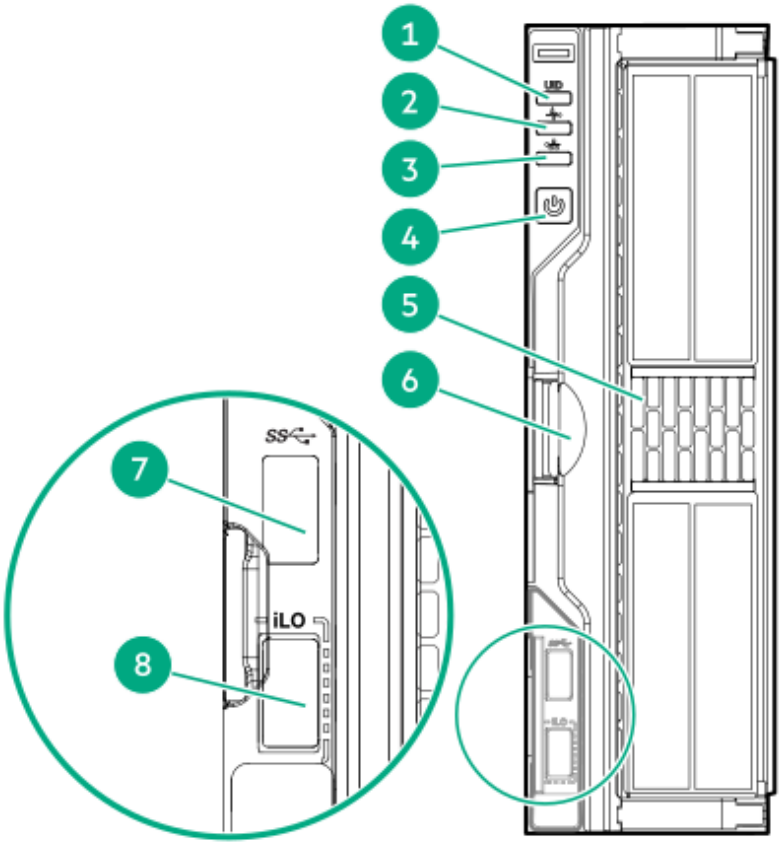
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Component identification

Subtopics

Front panel LEDs and buttons
Drive cage kit options
Drive numbering
HPE Basic drive LED definitions
EDSFF SSD LED definitions
Serial label pull tab information
System board components
Heatsink and processor socket components
Component and LED identification for HPE Synergy hardware

Front panel LEDs and buttons



The drive configuration will vary depending on the drive kit.

Item	Description	Status
1	UID LED	Solid blue = Activated Flashing blue (1 Hz/cycle per sec) = Remote management or firmware upgrade in progress Off = Deactivated
2	Health status LED	Solid green = Normal Flashing green (1 Hz/cycle per sec) = iLO is rebooting. Flashing amber = System degraded Flashing red (1 Hz/cycle per sec) = System critical
3	Mezzanine NIC status LED	Solid green= Link on any Mezzanine NIC Flashing green= Activity on any Mezzanine NIC Off = No link or activity on any Mezzanine NIC
4	Power On/Standby button and system power LED	Solid green = System on Flashing green (1 Hz/cycle per sec) = Performing power on sequence Solid amber = System in standby Off = No power present **NOTE** If all other LEDs are off, then no compute module power is present (facility power is not present, power cord is not attached, power supplies are not installed or a power supply failure has occurred). If the health LED is flashing green while the system power LED is off, then the **Power On/Standby** button service is initializing or an iLO reboot is in progress.
5	Drive cage assembly	Removable drive kit options for 2SFF, 4SFF, or 8 EDSFF drive bays.
6	Handle release latch	The handle release latch for the compute module.

Item	Description	Status
7	USB 3.0 connection	The external USB 3.0 connector located behind the serial pull tab.
8	iLO USB connection	The external USB iLO Service Port (169.254.1.2) located behind the serial label pull tab.

Drive cage kit options

The HPE Synergy 480 Gen11 Compute Module has the following drive cage kit options:

- HPE Synergy 480 Gen11 2SFF SAS/SATA/NVMe Premium Drive Cage kit (tri-mode)
- HPE Synergy 480 Gen11 4SFF SAS/SATA/NVMe Premium Drive Cage kit (tri-mode)
- HPE Synergy 480 Gen11 4SFF NVMe Direct Connect Drive Cage Kit
- HPE Synergy 480 Gen11 8EDSFF NVMe E3.S Direct Connect Drive Cage Kit
- HPE Synergy 480 Gen11 driveless front panel

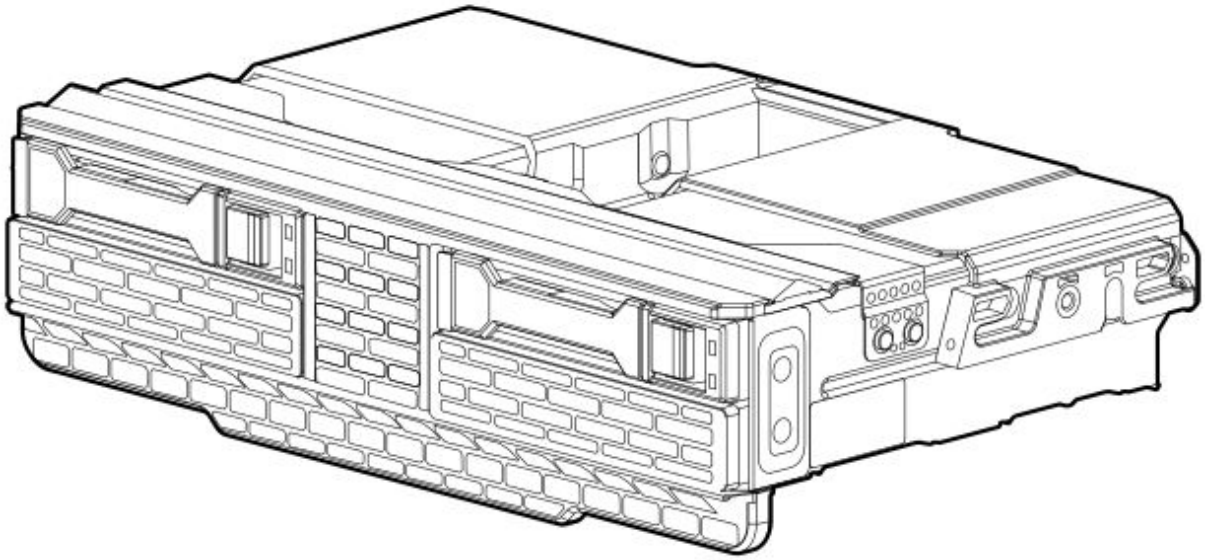
NOTE

Your front drive cage may look different from the front drive cages shown in this guide.

Subtopics

2SFF tri-mode premium drive cage kit
4SFF drive cage kits
8EDSFF direct connect drive cage kit
Driveless front panel

2SFF tri-mode premium drive cage kit



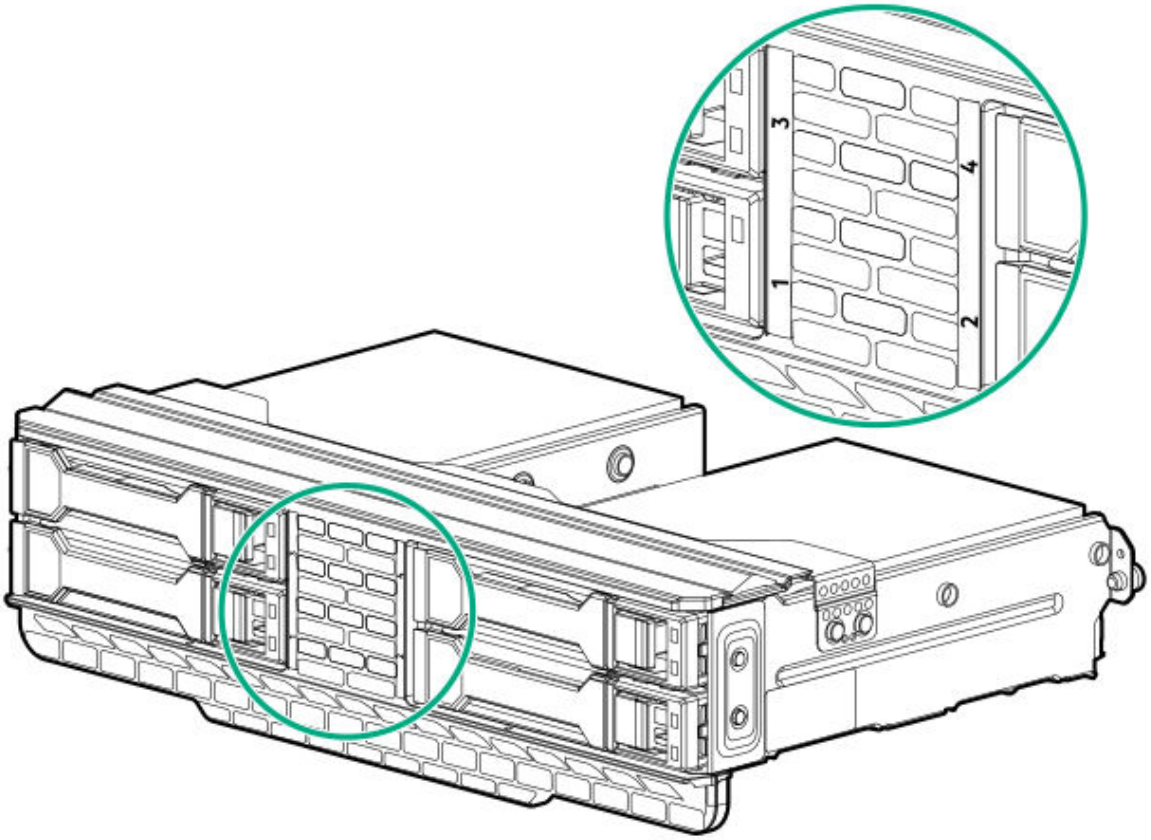
The 2SFF drive cage kit supports either SATA, SAS or NVMe drives through the HPE SR416ie-m Gen11 controller.

For bay drive numbering, see Drive numbering.

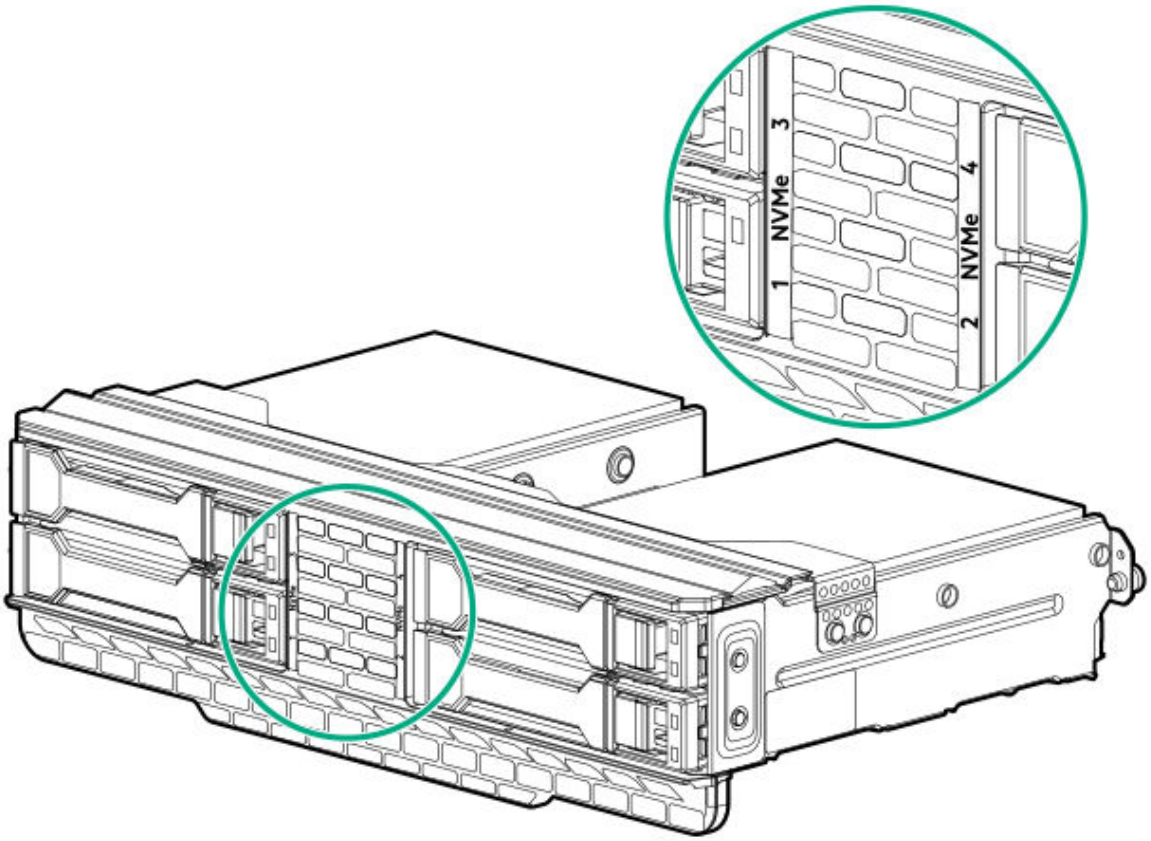
4SFF drive cage kits

The HPE Synergy 480 Gen11 Compute Module supports two types of 4SFF drive configurations:

- **4SFF tri-mode premium:** Supports four SFF SATA, SAS or NVMe drives through the HPE SR416ie-m Gen11 controller.

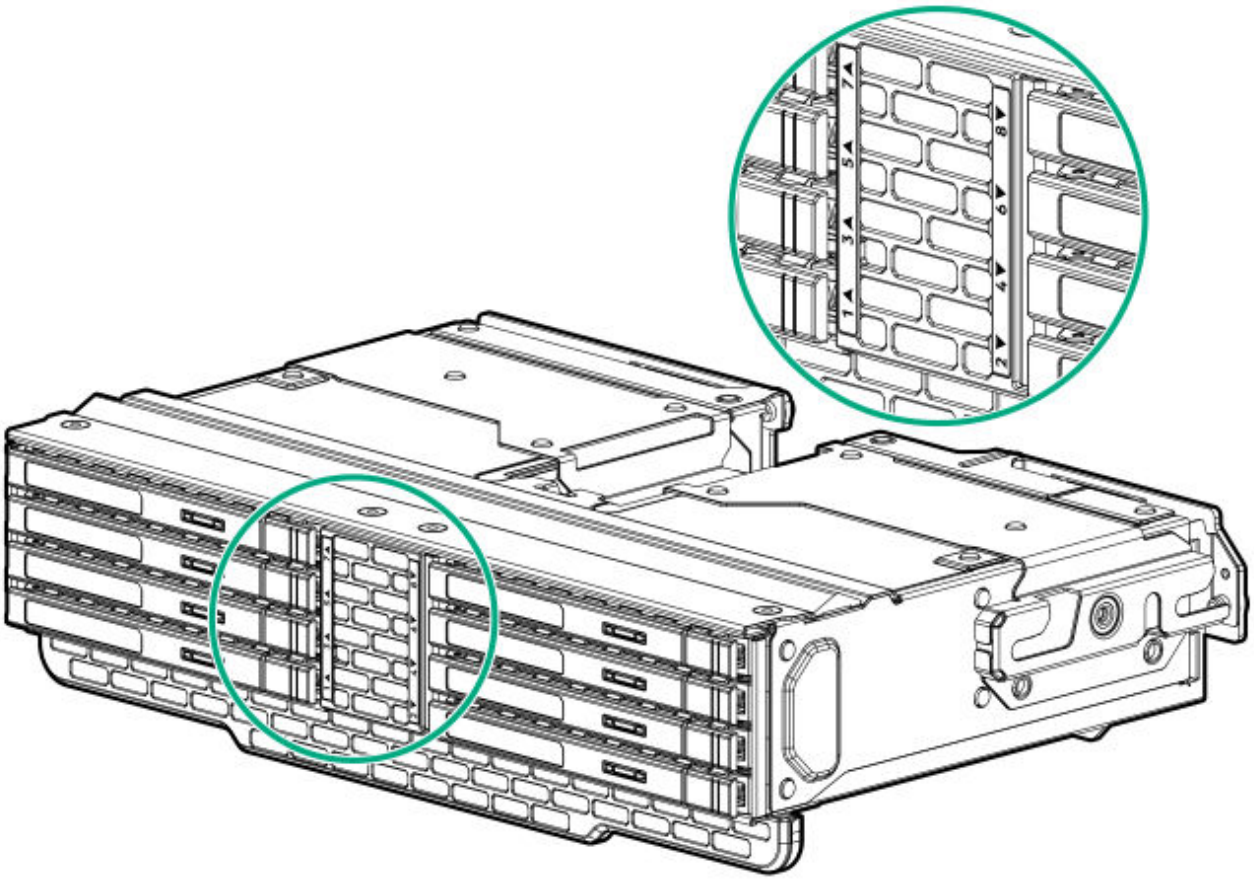


- **4SFF NVMe direct connect:** Supports four SFF NVMe drives through direct connect.



For bay drive numbering, see Drive numbering.

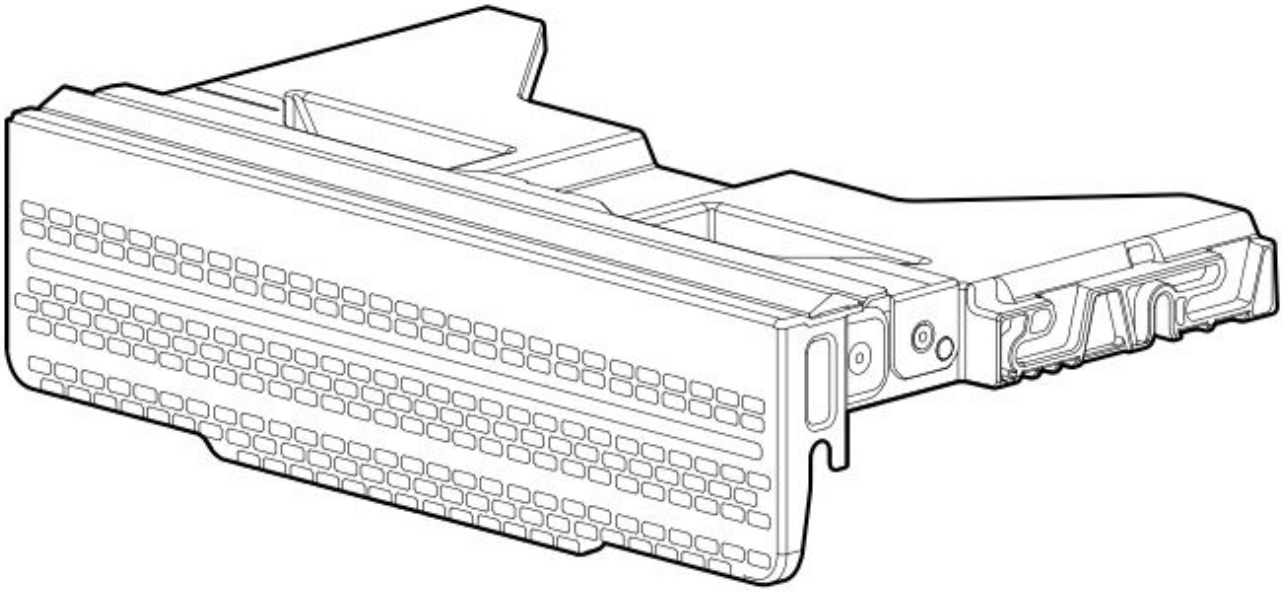
8EDSFF direct connect drive cage kit



This kit supports 8 EDSFF E3.S NVMe drives.

For bay drive numbering, see Drive numbering.

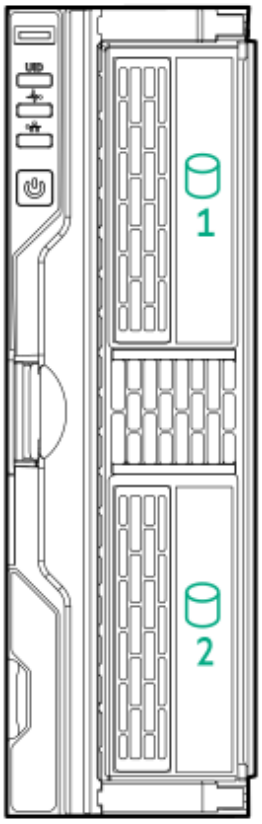
Driveless front panel



Drive numbering

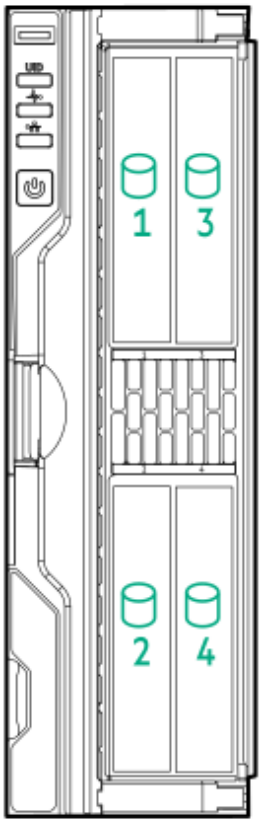
Drive cage kit bay numbering and supported drives vary dependent on the type of drive cage kit installed.

2SFF tri-mode premium drive cage kit



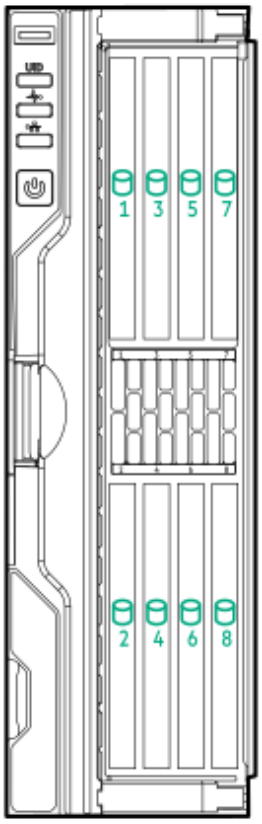
All drives are either SATA, SAS or NVMe.

4SFF tri-mode premium and direct connect NVMe drive cage kits



Hard drive/SSD bay numbering	Direct Connect	Tri-mode Premium
1	NVMe drive	SATA, SAS or NVMe drive
2	NVMe drive	SATA, SAS or NVMe drive
3	NVMe drive	SATA, SAS or NVMe drive
4	NVMe drive	SATA, SAS or NVMe drive

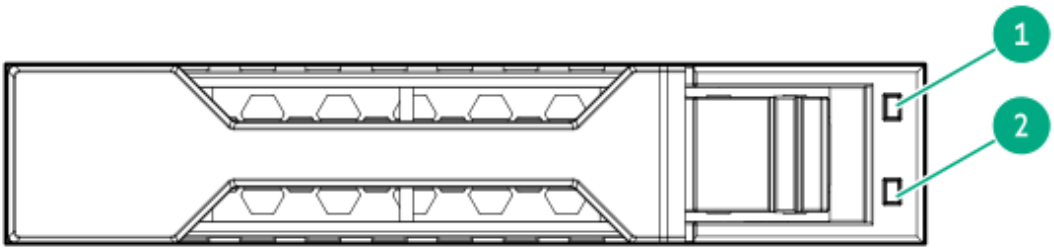
8EDSFF direct connect drive cage kit



All drives are E3.S NVMe drives.

HPE Basic drive LED definitions

SFF drive



Item	LED	State	Definition
1	Fault/Locate	Solid amber	This drive has failed, is unsupported, or is i nvalid.
		Solid blue	The drive is operating normally and being i dentified by a management application.
		Flashing amber /blue (1 flash p er second)	The drive has failed, or a predictive failure alert has been received for this drive. The drive has also been identified by a manage ment application.
		Flashing amber (1 flash per sec ond)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
		Off	The drive is operating normally and not bei ng identified by a management application .
2	Online/Activity	Solid green	The drive is online and has no activity.
		Flashing green (1 flash per sec ond)	The drive is doing one of the following: • Rebuilding or performing a RAID • Performing a stripe size migration • Performing a capacity expansion • Performing a logical drive extension • Erasing • Spare part activation
		Flashing green (4 flashes per s econd)	The drive is operating normally and has act ivity.
		Off	The drive is not configured by a RAID cont roller or is a spare drive.

EDSFF SSD LED definitions

This compute module supports hot-plug Enterprise and Data Center Standard Form Factor (EDSFF) drives. Specifically, E3.S form factor PCIe5 NVMe SSDs. The EDSFF drive carrier has two LEDs:

- Amber/blue LED—Managed by the drive backplane in conjunction with the storage controller and is used to indicate drive status.
- Green LED—Managed by the drive itself and indicates the drive activity.



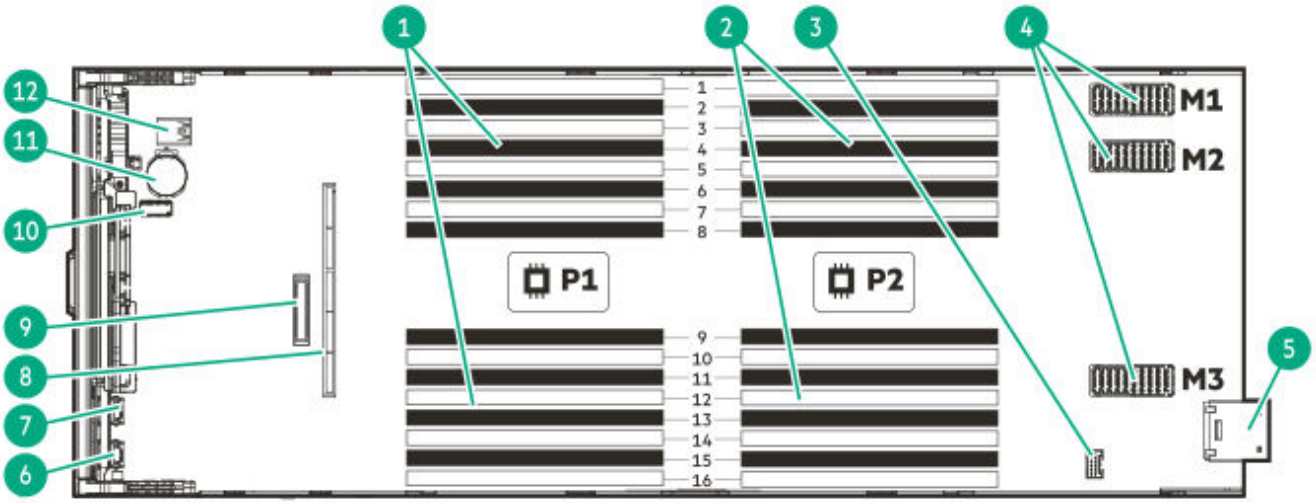
Item	LED	State	Definition
1	Fault/Locate	Solid amber	This drive has failed, is unsupported, or is invalid.
		Solid blue	The drive is operating normally and being identified by a management application.
		Flashing amber/blue (1 flash per second)	The drive has failed, or a predictive failure alert has been received for this drive. The drive has also been identified by a management application.
		Flashing amber (1 flash per second)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
		Off	The drive is operating normally and not being identified by a management application.
2	Online/Activity	Solid green	The drive is online and has no activity.
		Flashing green (4 flashes per second)	The drive is operating normally and has activity.
		Off	No power present

Serial label pull tab information

The serial label pull tab is on the front panel of the compute module. To locate the serial label pull tab, see Front panel LEDs and buttons. The serial label pull tab provides the following information:

- Product serial number
- HPE iLO information

System board components



Item	Description
1	Processor 1 DIMM slots (16)
2	Processor 2 DIMM slots (16)
3	HPE Smart Storage Hybrid Capacitor connector
4	Mezzanine connectors (M1, M2, and M3)
5	Management/power
6	External USB iLO Service Port (behind the pull tab)
7	External USB 3.0 connector located behind the pull tab
8	Drive backplane connector
9	M.2 adapter connector
10	System maintenance switch

Item	Description
11	System battery
12	Internal USB 3.0 connector

Subtopics

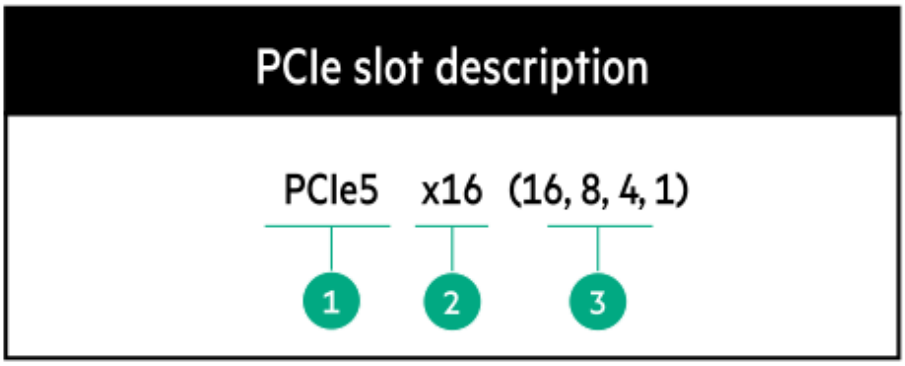
System maintenance switch
PCIe5 slot description
Mezzanine connector definitions
DIMM slot locations
DIMM label identification

System maintenance switch

Position	Default	Function
S1 [1]	Off	Off = HPE iLO password is enabled. On = HPE iLO password is disabled.
S2	Off	Reserved
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 = Reset configuration
S7	Off	Reserved
S8	Off	Reserved
S9	Off	Reserved
S10	Off	Reserved
S11	Off	Reserved
S12	Off	Reserved

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

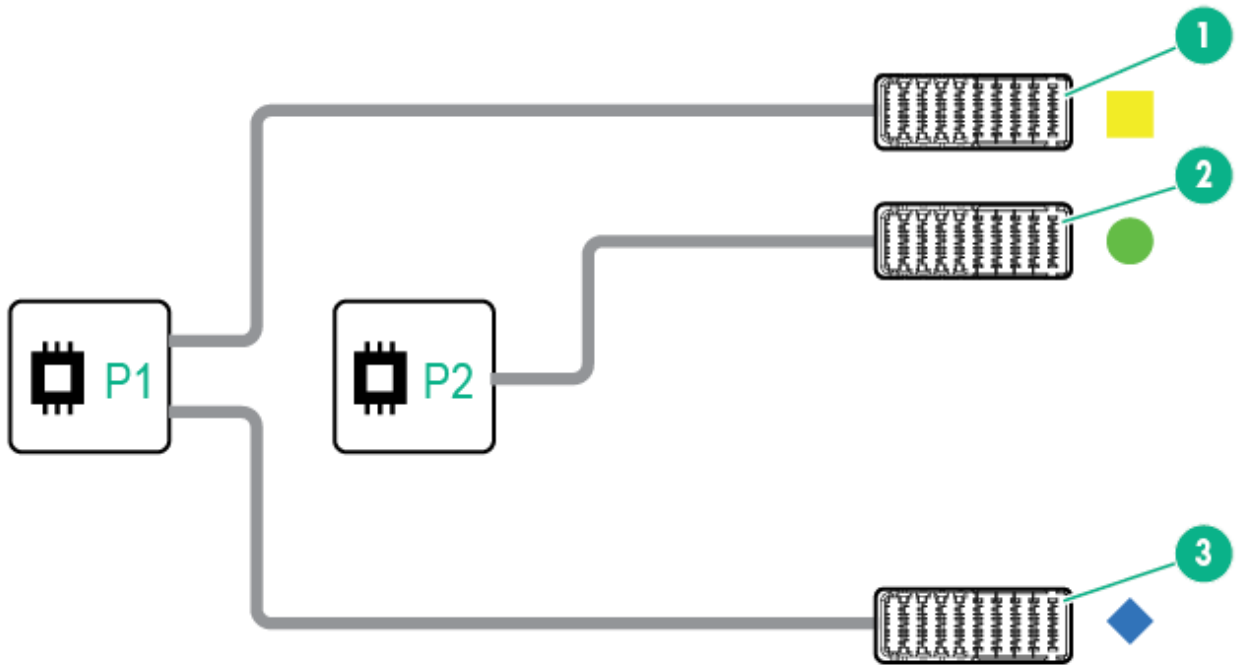
PCIe5 slot description



Item	Description	Definition
1	PCI Express version	Each PCIe version corresponds to a specific d ata transfer rate between the processor and p eripheral devices. Generally, a version update corresponds to an increase in transfer rate. • PCIe 1.x • PCIe 2.x • PCIe 3.x • PCIe 4.x • PCIe 5.x The PCIe technology is under constant develo pment. For the latest information, see the **PCI -SIG website**.
2	Physical connector link width	PCIe devices communicate through a logical connection called an interconnect or link. At t he physical level, a link is composed of one or more lanes. The number of lanes is written wit h an x prefix with x16 being the largest size in common use. • x1 • x2

Item	Description	Definition
		• x4 • x8 • x16
3	Negotiable link width	These numbers correspond to the maximum link bandwidth supported by the slot.

Mezzanine connector definitions



Item	Connector identification	Supported card types	Fabric	Supported ICM bays
1	Mezzanine connector 1 (M1)	Type C and Type D	1	ICM 1 and 4

Item	Connector identification	Supported card types	Fabric	Supported ICM bays
2	Mezzanine connector 2 (M2)*	Type C and Type D	2	ICM 2 and 5
3	Mezzanine connector 3 (M3)	Type C only	3	ICM 3 and 6

NOTE

The HPE SR416ie-m Gen11 controller can only be installed on mezzanine 1.

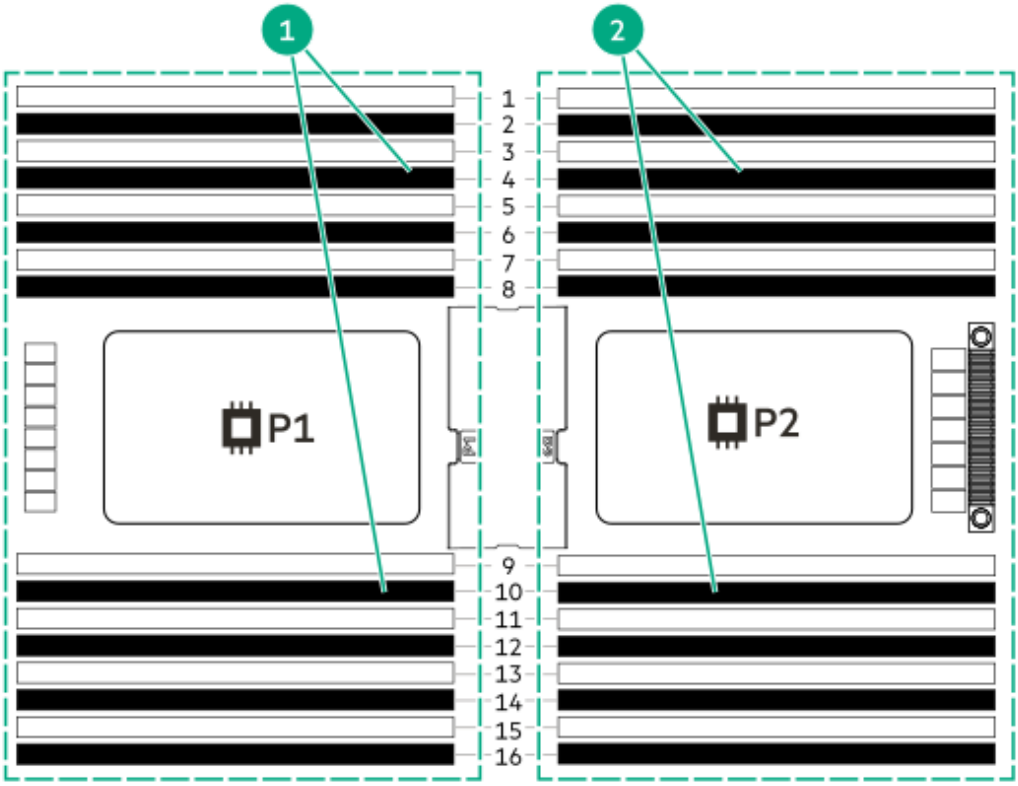
* When installing a mezzanine option on mezzanine connector 2, processor 2 must be installed.

DIMM slot locations

DIMM slots are numbered sequentially (1 through 16) for each processor. For more information on DIMM population rules, see **https://www.hpe.com/docs/intel-population-rules-Gen11**.

The slots indicate the slot order within each channel:

- White—First slot of a channel
- Black—Second slot of a channel



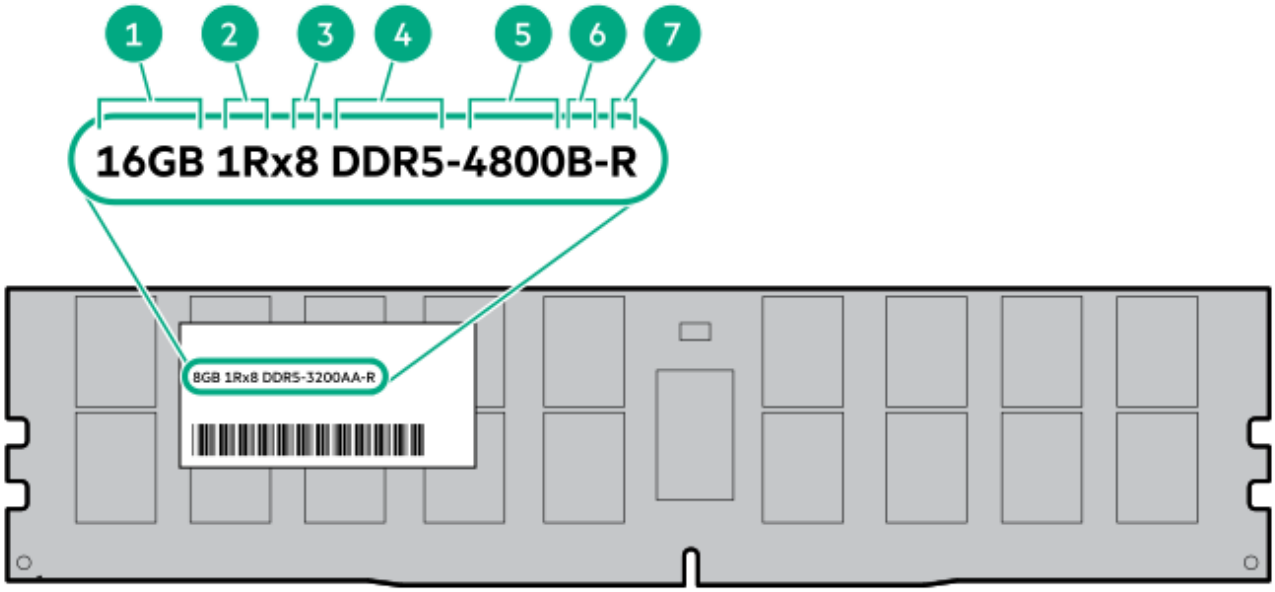
1	First socket channel
2	Second socket channel

DIMM label identification

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

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

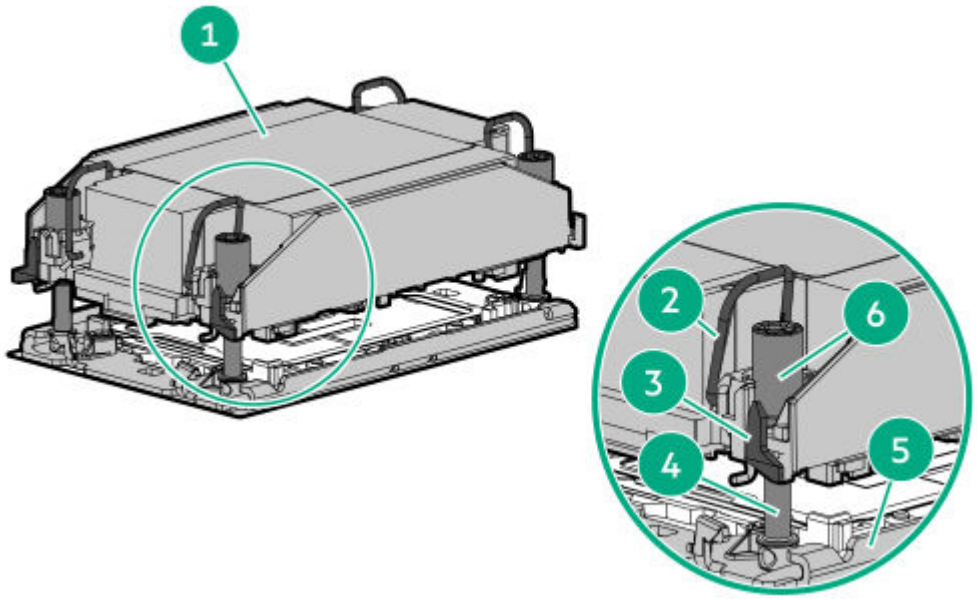
https://www.hpe.com/docs/server-memory



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

Heatsink and processor socket components

A standard heatsink is shown, your heatsink might look different.



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

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

Component and LED identification for HPE Synergy hardware

For more information about component and LED identification for HPE Synergy components, see the product-specific maintenance and service guide or the **HPE Synergy 12000 Frame Setup and Installation Guide** in the Hewlett Packard Enterprise Support Center.

Operations

Subtopics

Powering up the compute module
Powering down the compute module
Removing the compute module
Removing the compute module end cap
Removing the access panel
Removing the drive cage assembly
Turning the DIMM baffle
Removing the DIMM baffle
Installing the compute module end cap
Installing the access panel
Installing the DIMM baffle

Powering up the compute module

About this task

To power up the compute module, use one of the following methods:

- Press the Power On/Standby button after the power LED has turned amber.
- Use the virtual power button through HPE iLO.

Powering down the compute module

About this task

Before powering down the compute module for any upgrade or maintenance procedures, perform a backup of the system and all data. Then, shut down, as appropriate, applications and operating systems. A successful shutdown is indicated by the system power LED displaying amber.

> **IMPORTANT**
> Always attempt a controlled shutdown before forcing a shutdown. Application data can be lost when forcing a shutdown of applications and the OS.

Before proceeding, verify the following:

- The compute module is in standby mode by observing that the system power LED is amber.
- The UID LED is not flashing blue.

> **NOTE**
>
> - When the compute module is in standby mode, auxiliary power is still being provided to the system.
> - If the UID LED is flashing blue, a remote session, or a firmware update is in progress.

To power down the compute module, use one of the following methods:

- To perform a controlled shutdown of applications and the OS before the compute module enters standby mode, do one of the following:
  - Press and release the **Power On/Standby** button.
  - Select the **Momentary press** power off selection in HPE OneView.
  - Select the **Momentary press** virtual power button selection in HPE iLO.
- To force the compute module to enter standby mode, do one of the following:
  - Press and hold the **Power On/Standby** button for more than four seconds.
  - Select the **Press and hold** power off selection in HPE OneView.
  - Select the **Press and hold** virtual power button selection in HPE iLO.

These methods force the compute module to enter standby mode without properly exiting applications and the OS. If an application stops responding, use this method to force a shutdown.

Removing the compute module

Prerequisites

CAUTION

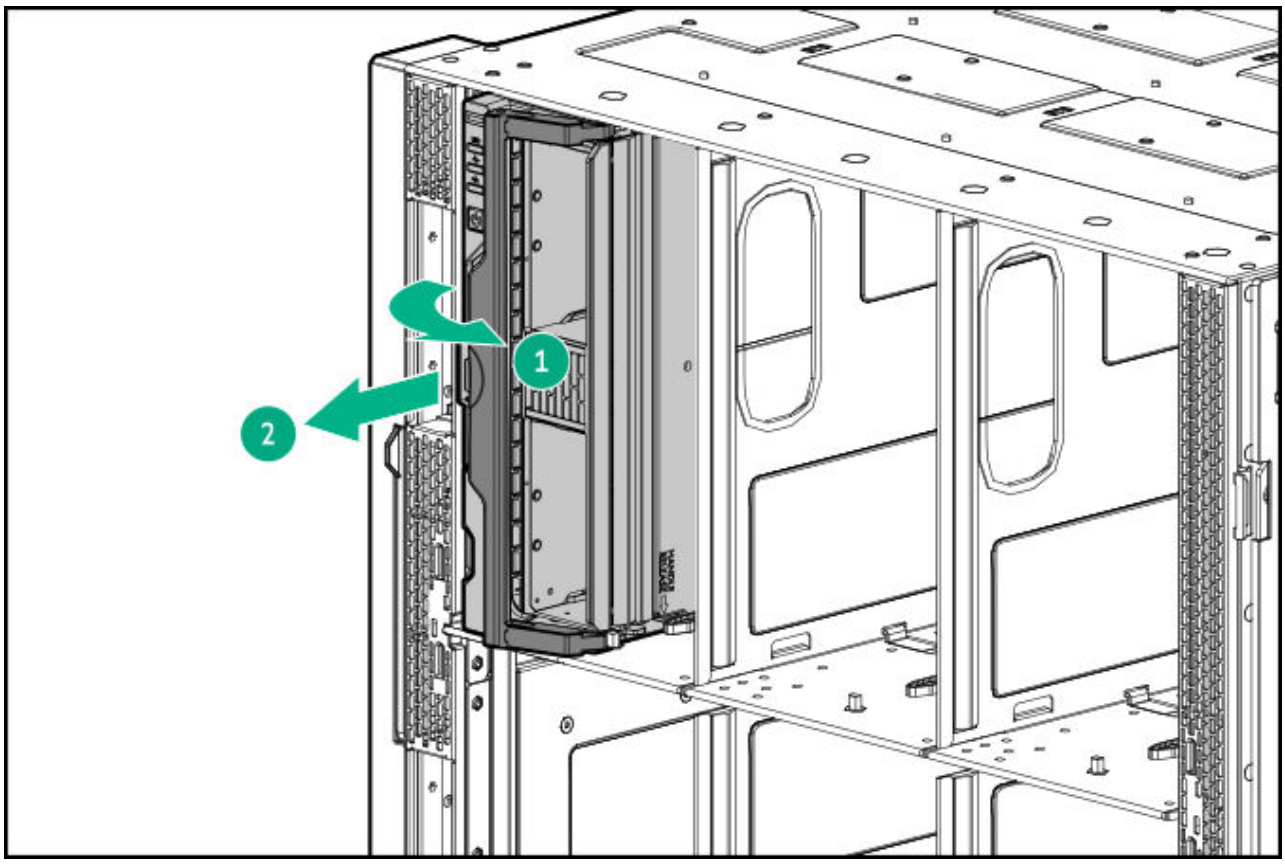
Before removing the compute module, verify that the compute module is in standby mode. In standby mode, the system power LED is off or solid amber. Also, verify that the UID LED is off or solid blue.

Procedure

1. Identify the proper compute module.
2. Power down the compute module.
3. Remove the compute module from the frame.

WARNING

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



4. Place the compute module on a flat, level work surface.

> **CAUTION**
>
> To prevent damage to electrical components, properly ground the compute module before beginning any installation procedure. Improper grounding can cause ESD.

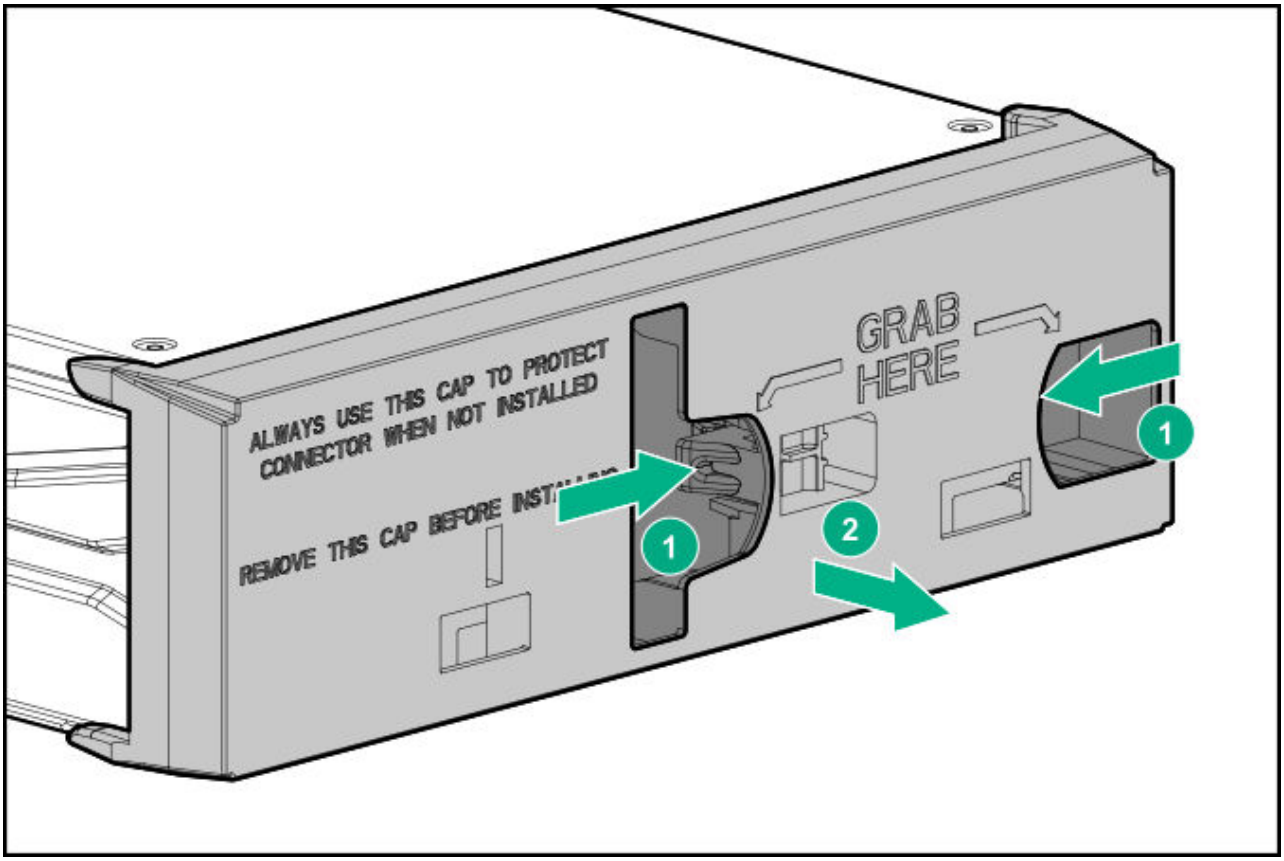
5. Install the compute module end cap.

Removing the compute module end cap

About this task

Procedure

1. Place the compute module on a flat, level work surface.
2. Remove the compute module end cap.

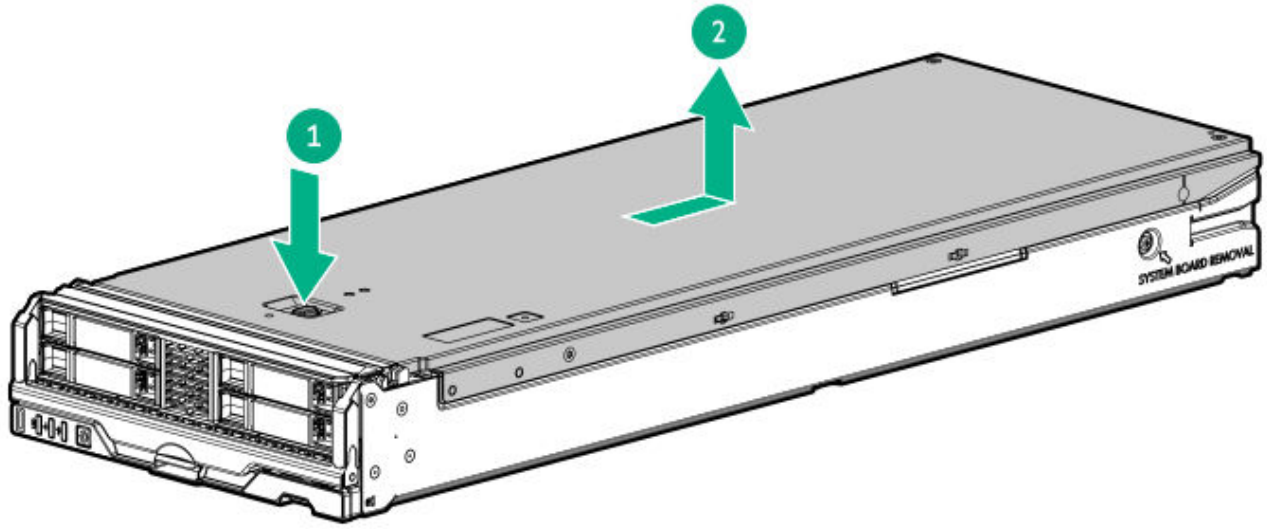


Removing the access panel

About this task

Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Press the access panel release button.



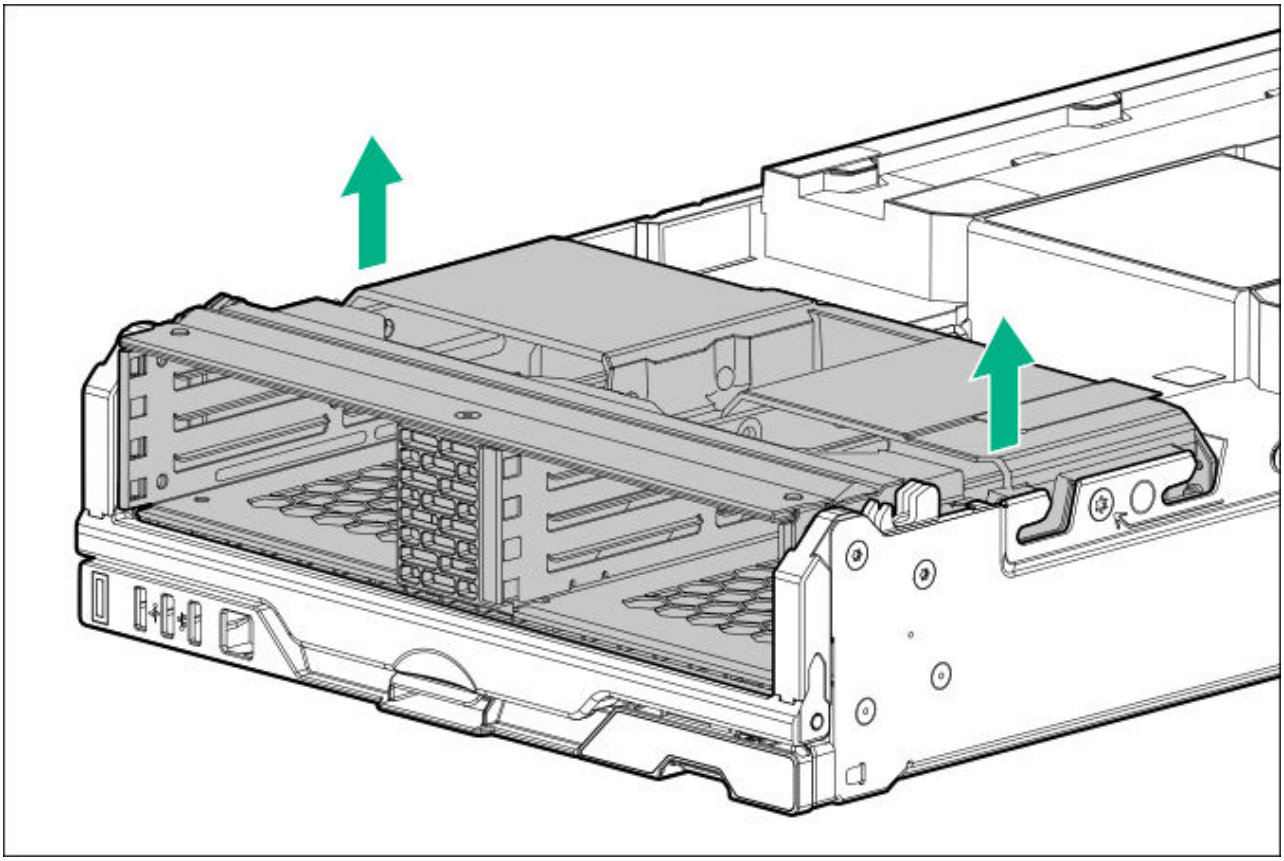
5. Slide the access panel towards the rear of the compute module, and then lift to remove the panel.

Removing the drive cage assembly

Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Remove the access panel.
5. If an MCIO cable is present, disconnect the MCIO cable from the drive cage assembly.
6. Grab the front and rear of the drive cage assembly.
7. Lift to remove the drive cage assembly.

> **NOTE**
>
> This compute module offers four options for drive cage assemblies. As such, your drive cage assembly may look different from the image below. However, the removal steps are the same.



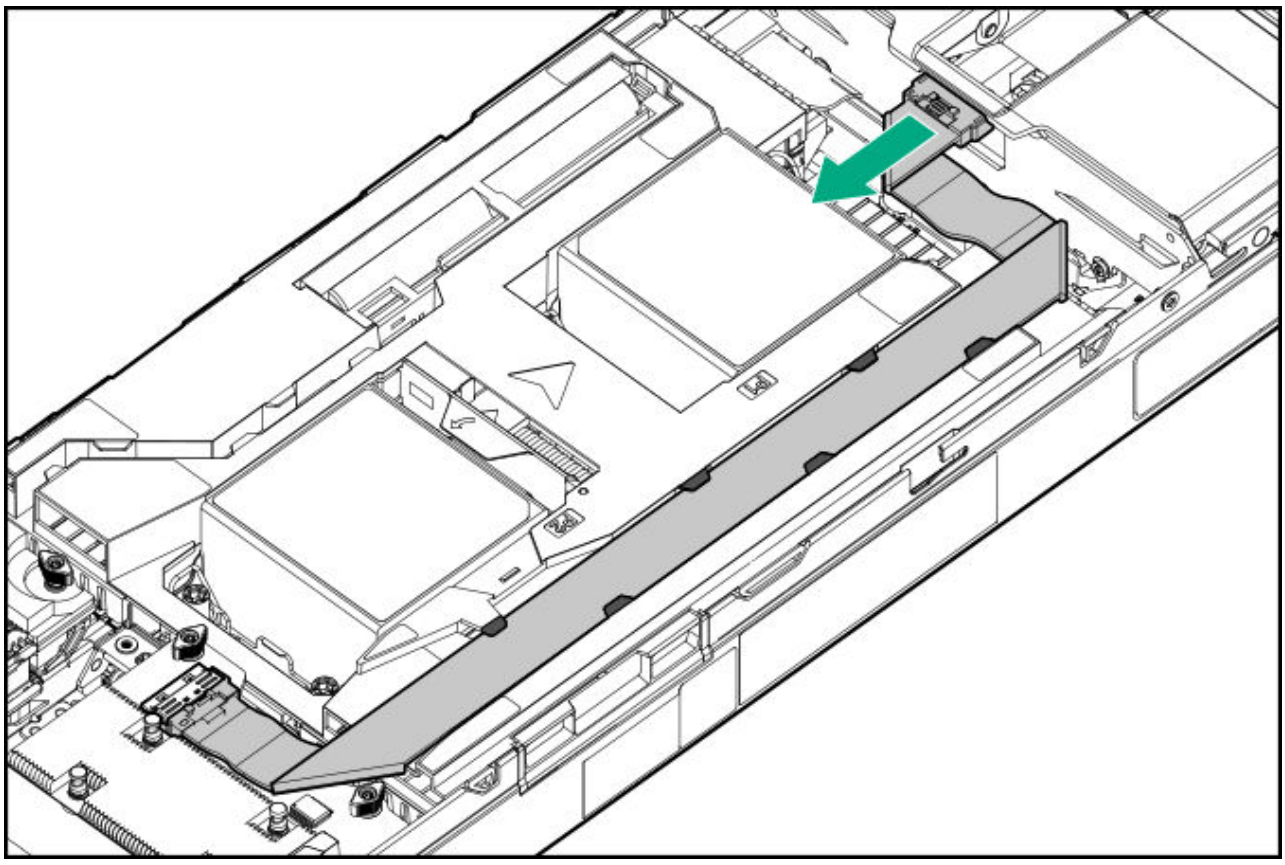
Turning the DIMM baffle

About this task

This procedure outlines moving the DIMM baffle to access components.

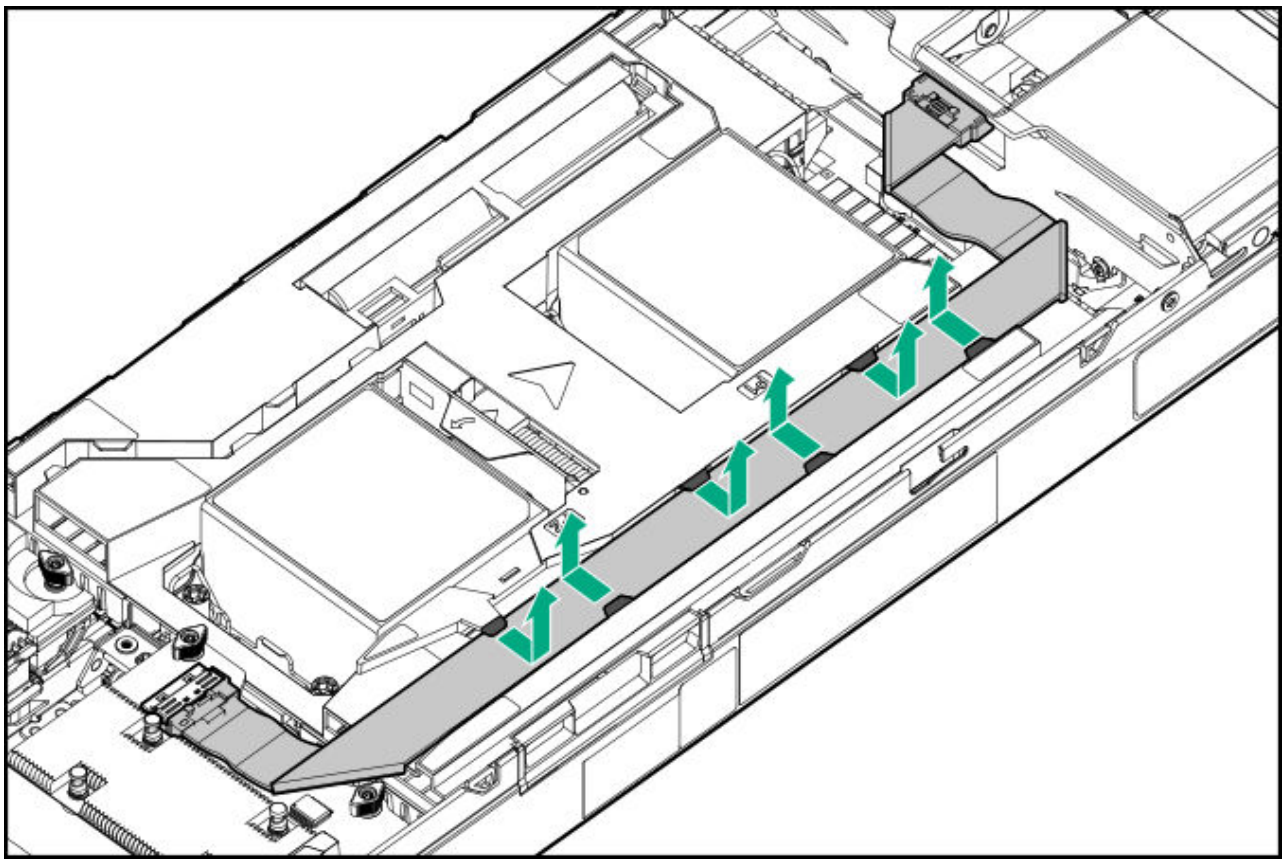
Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Remove the access panel.
5. If an MCIO cable is present, disconnect the MCIO cable connector from the drive assembly.

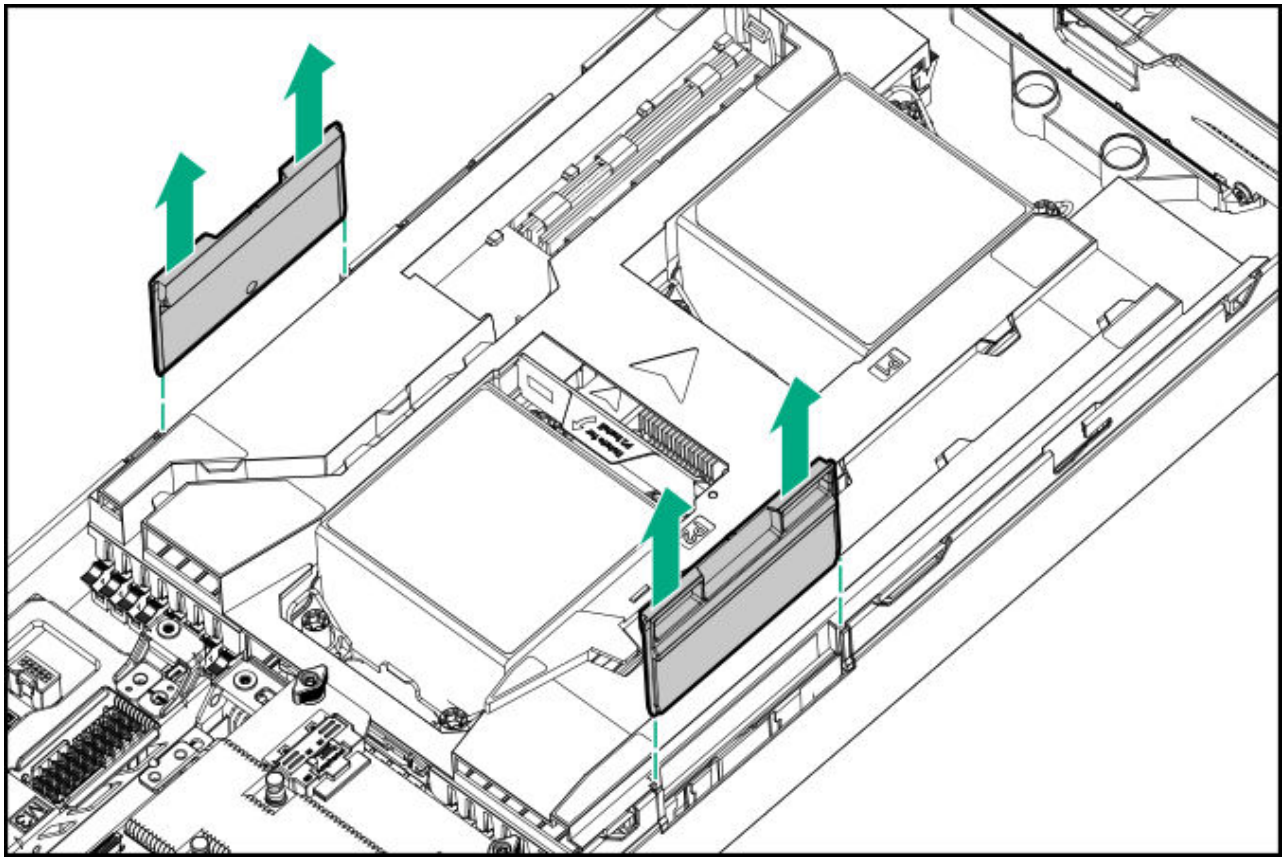


6. Remove the MCIO cable from the DIMM baffle.

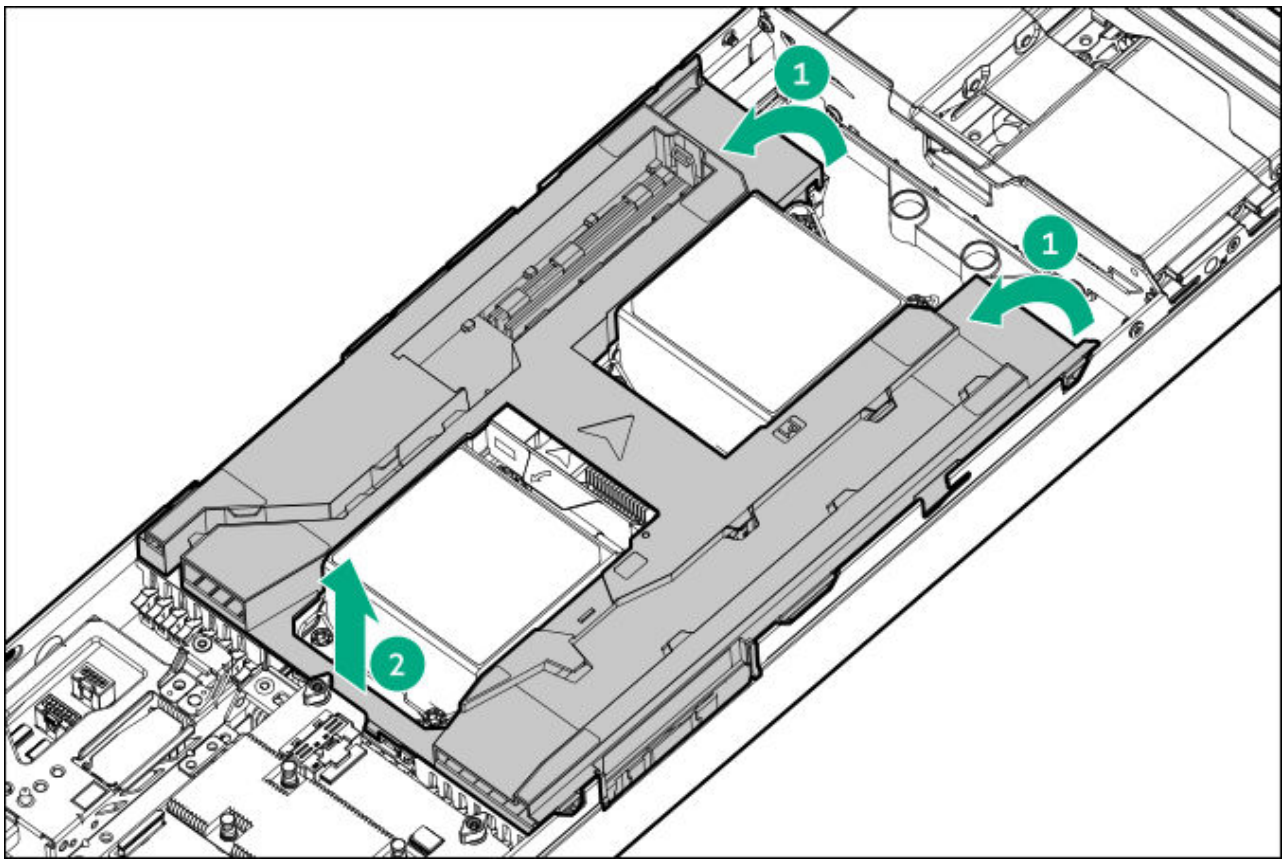
> **NOTE**
>
> Keep the MCIO cable attached to the HPE SR416ie-m controller connector and move the rest of the cable off to the side.



7. Remove the air blockers.



8. Turn the DIMM baffle over.



NOTE

Most procedures will require turning the DIMM baffle over, rather than removing the DIMM baffle.

Removing the DIMM baffle

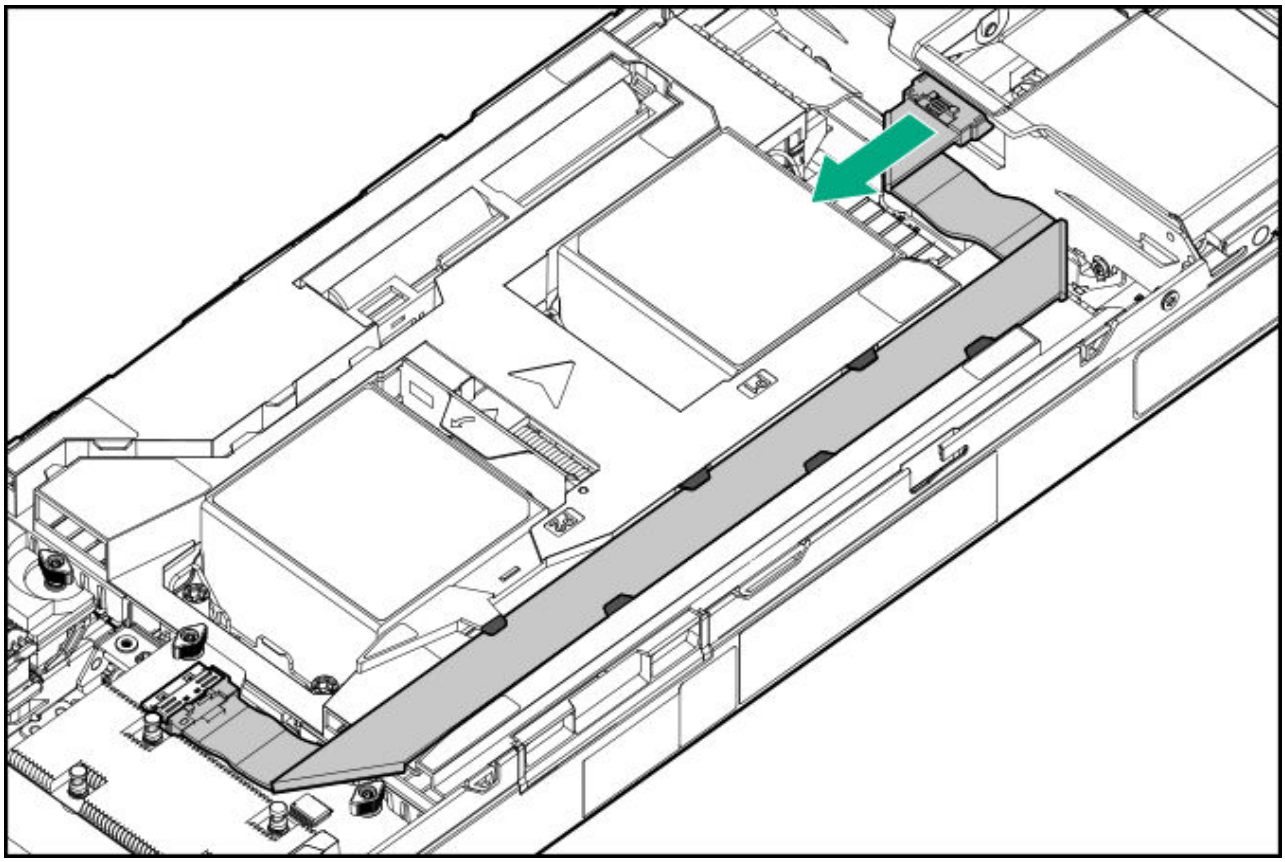
About this task

This procedure outlines removing the DIMM baffle.

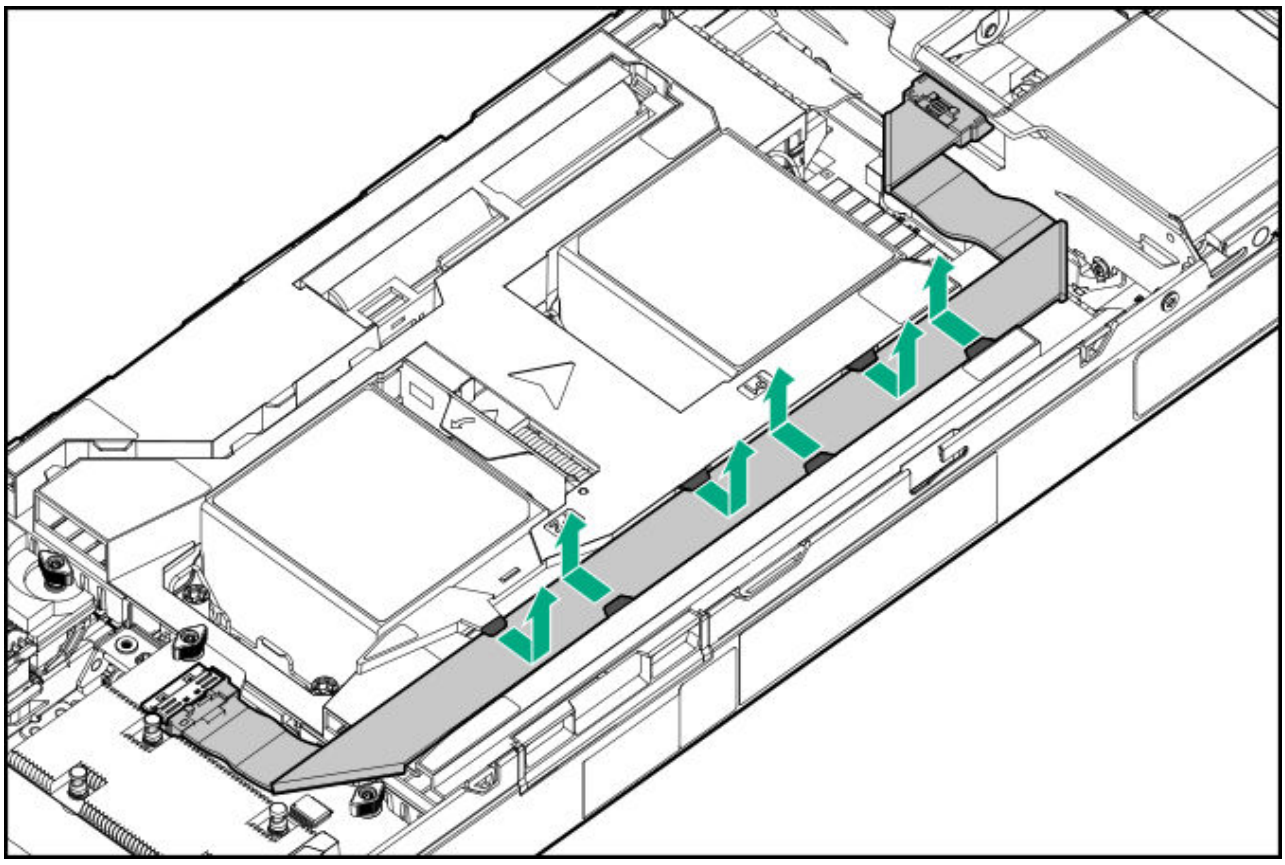
Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Remove the access panel.

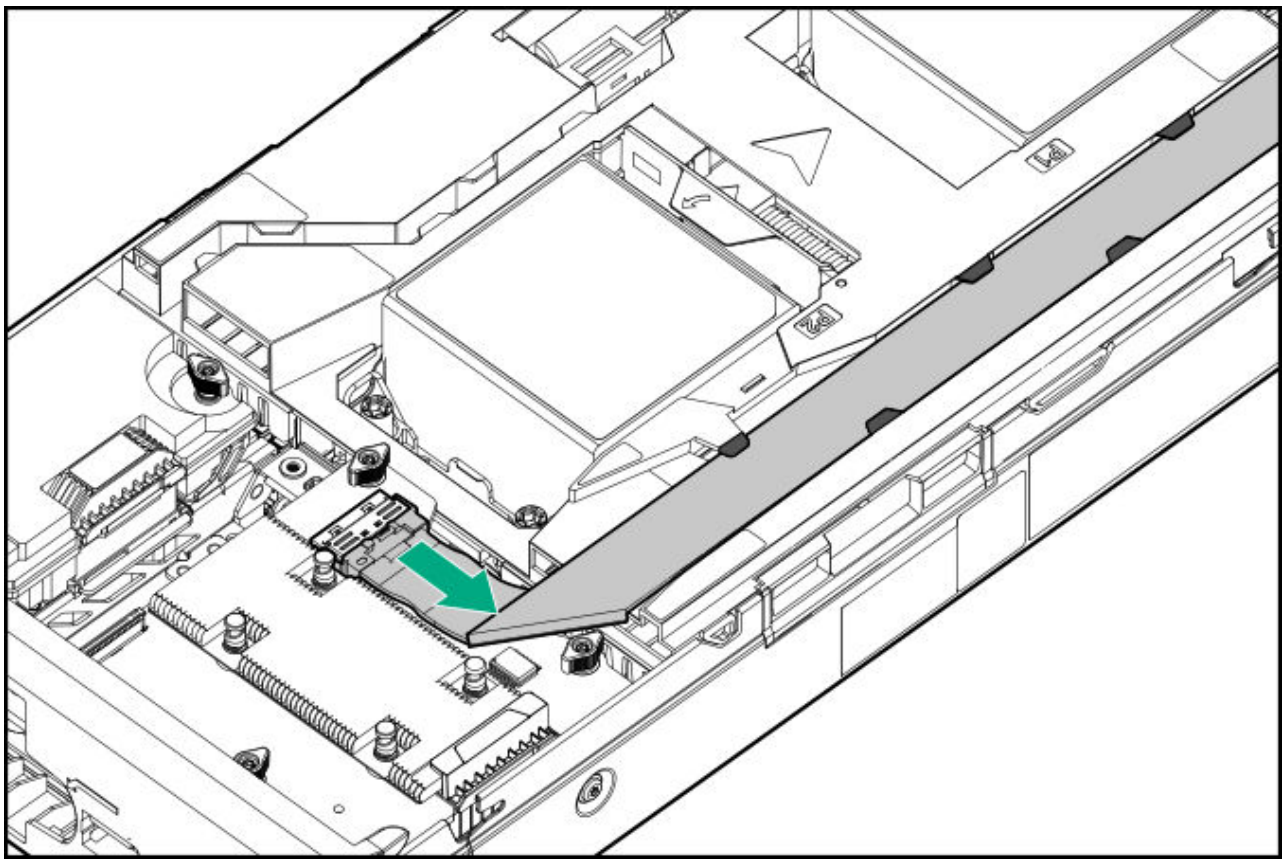
5. If an MCIO cable is present, disconnect the MCIO cable connector from the drive cage assembly.



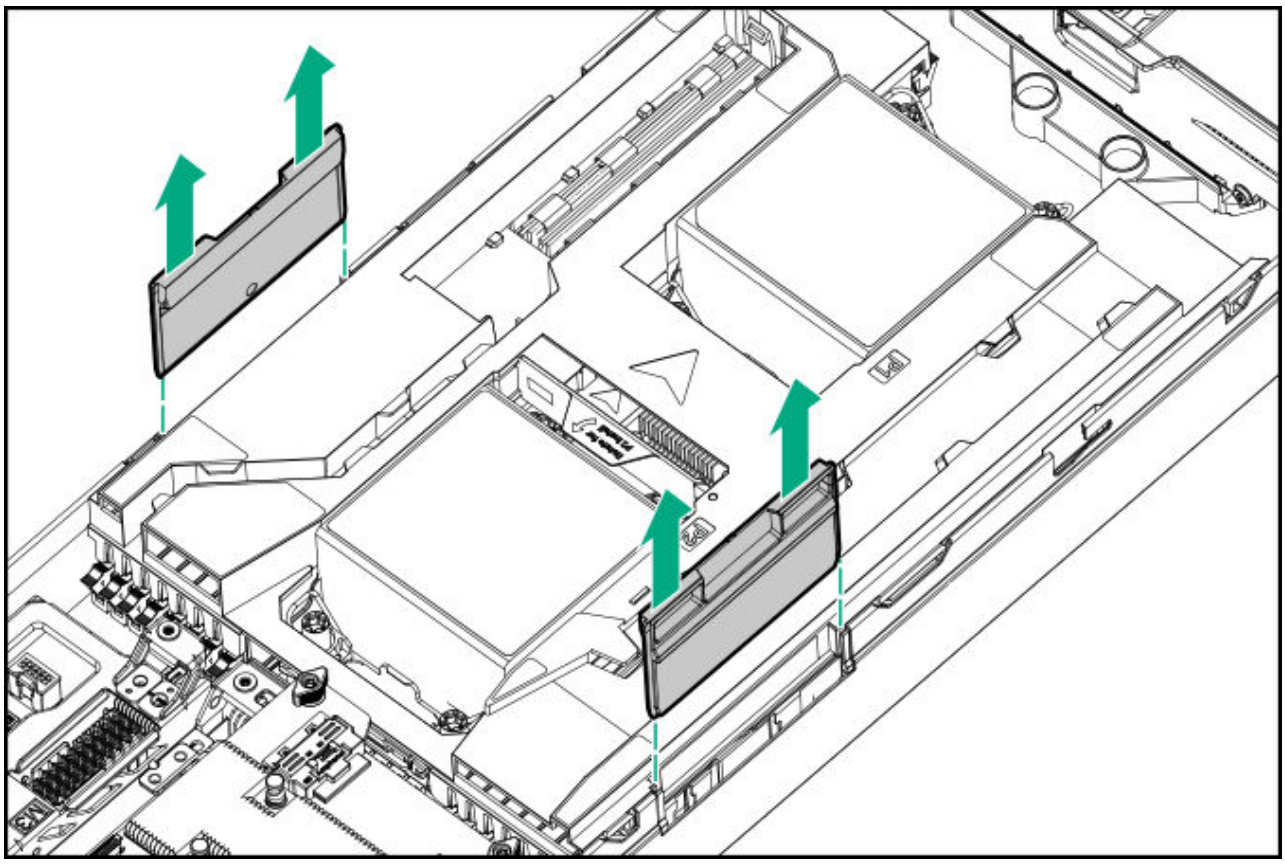
6. Remove the MCIO cable from the DIMM baffle.



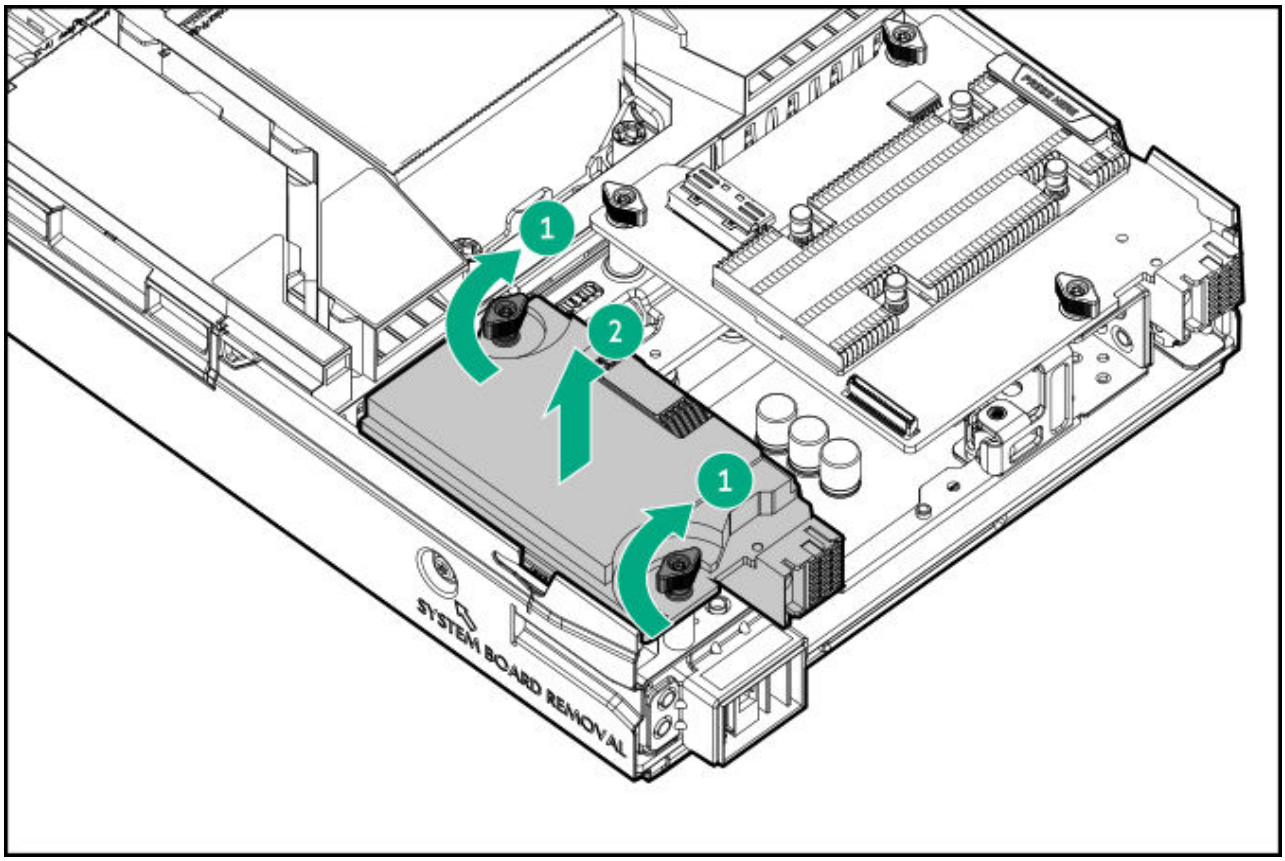
7. Remove the MCIO cable from the HPE SR416ie-m controller connector.



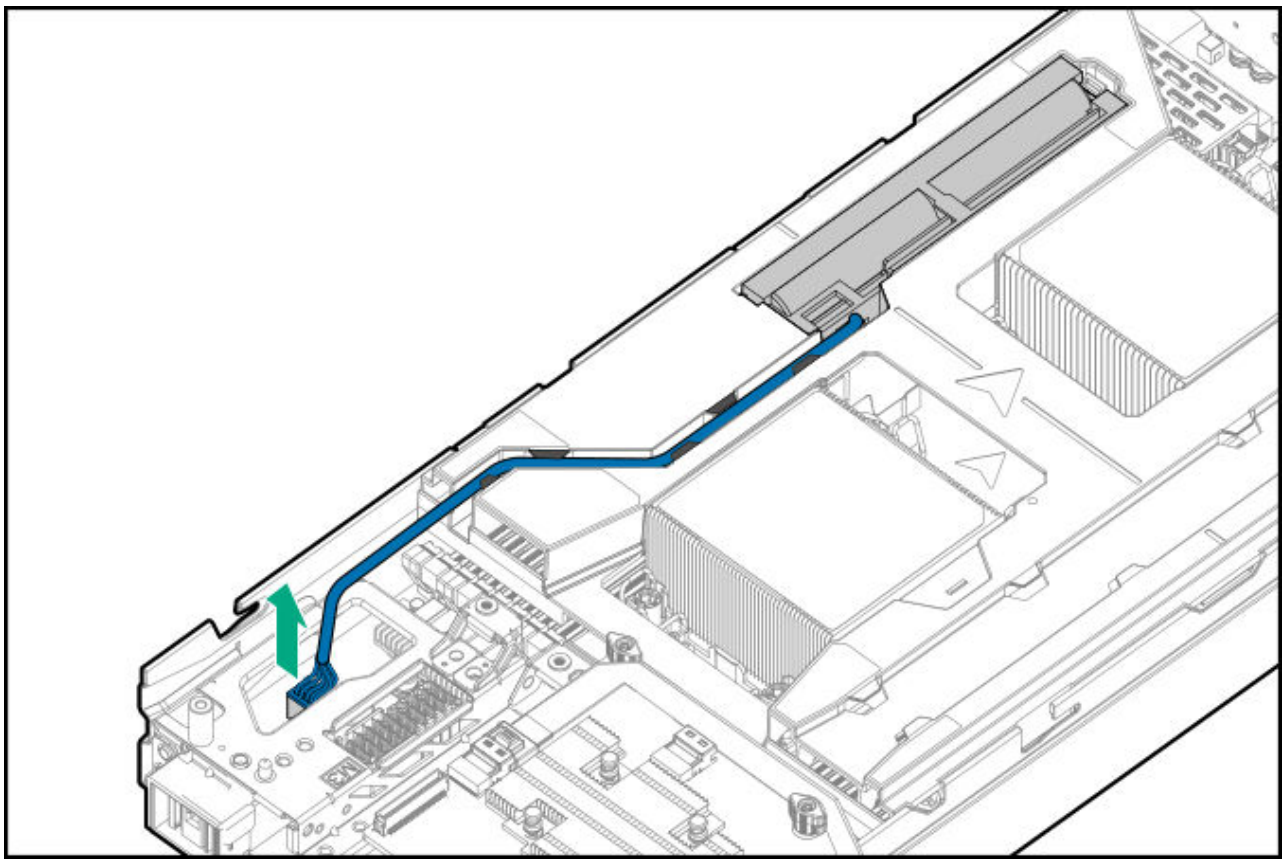
8. Remove the air blockers.



9. If present, remove the mezzanine 3 option card.



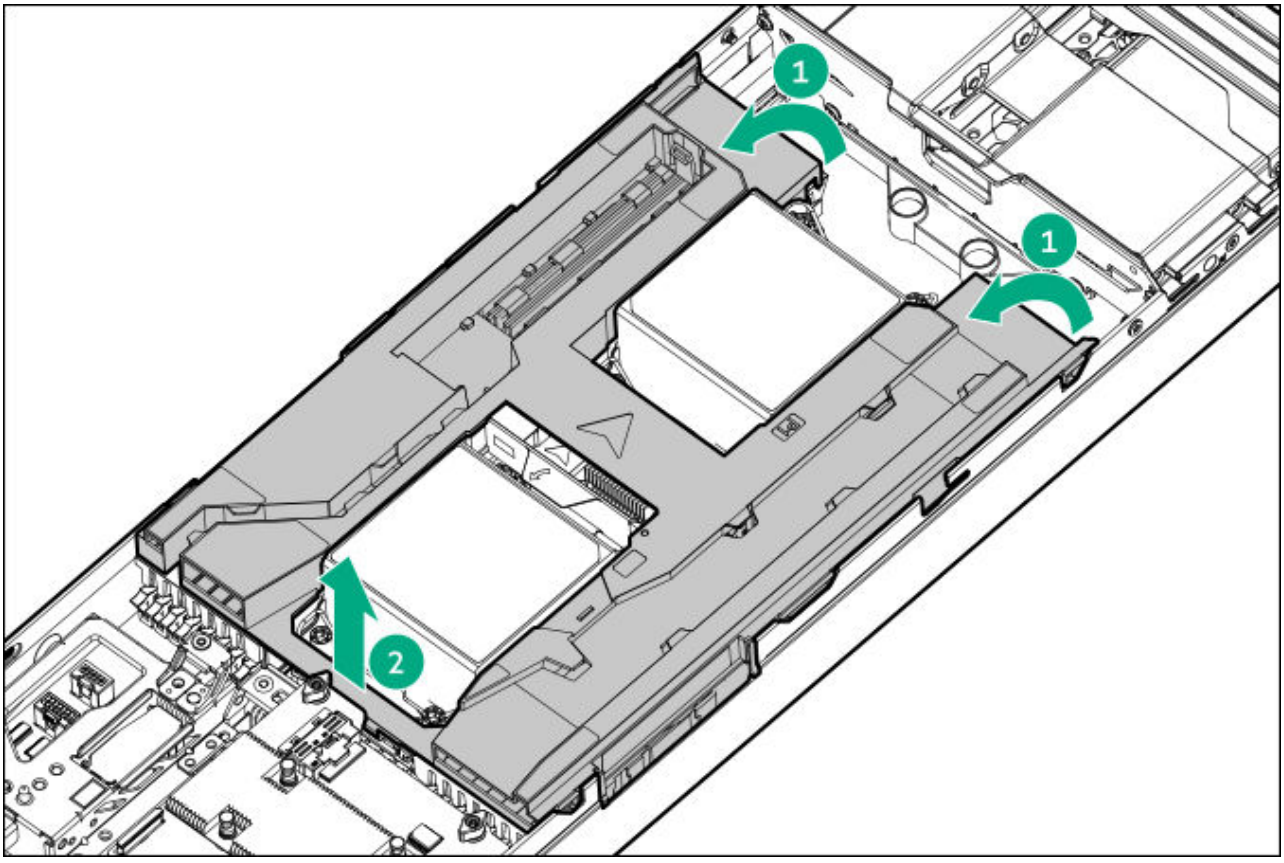
0. Disconnect the HPE Smart Storage Hybrid Capacitor cable.



NOTE

Disconnect the energy pack cable from the port located under the mezzanine 3 option card.

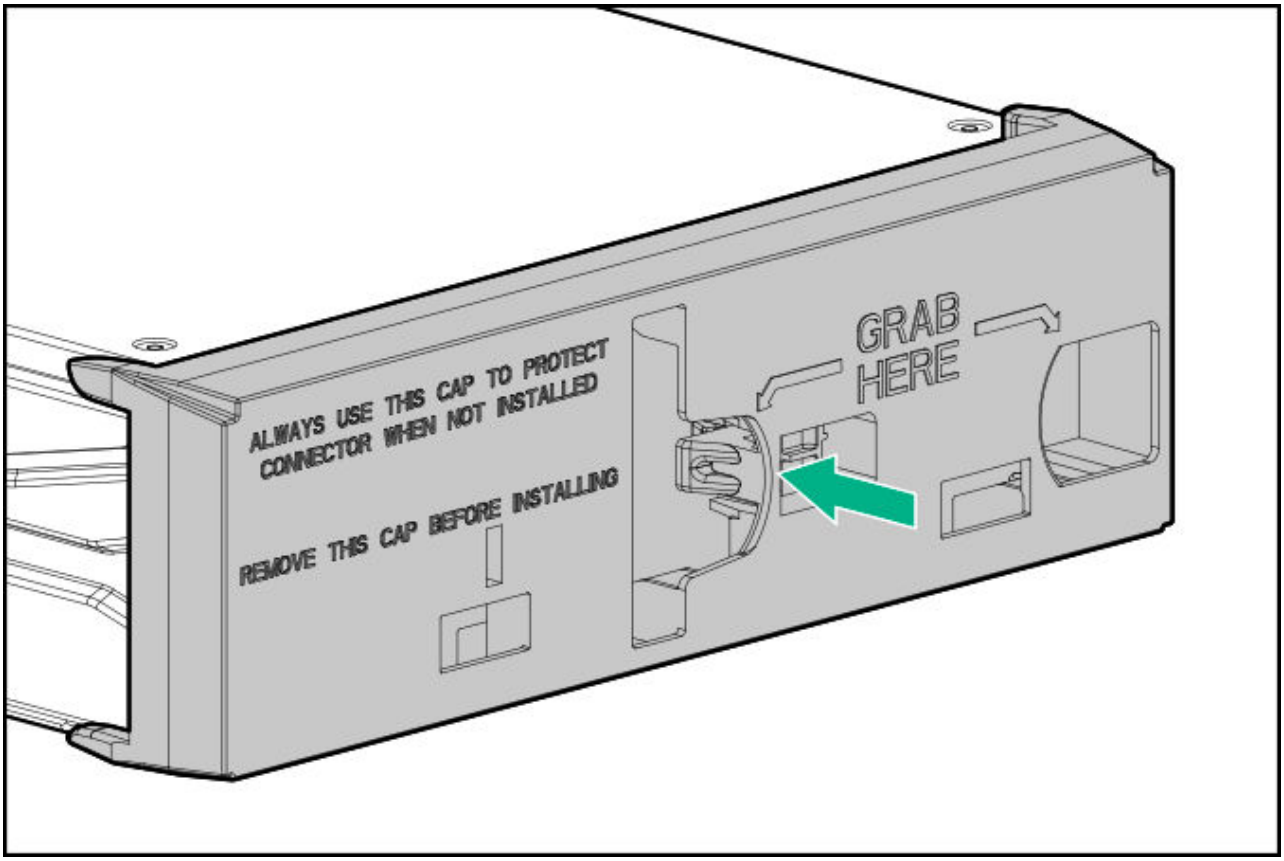
1. Lift the DIMM baffle from the system board.



Installing the compute module end cap

Procedure

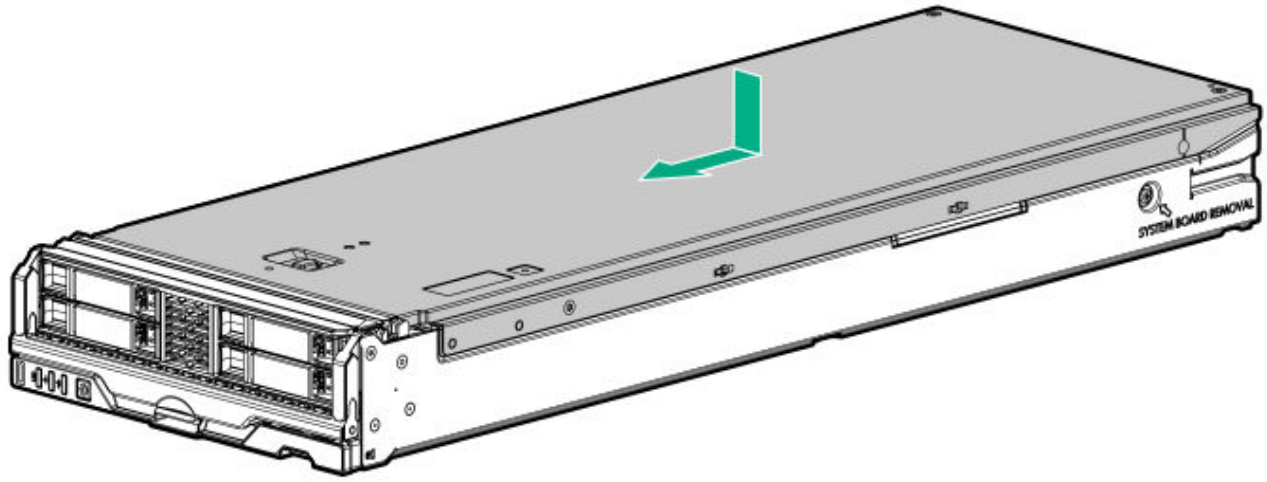
1. Place the compute module on a flat, level work surface.
2. Install the compute module end cap.



Installing the access panel

Procedure

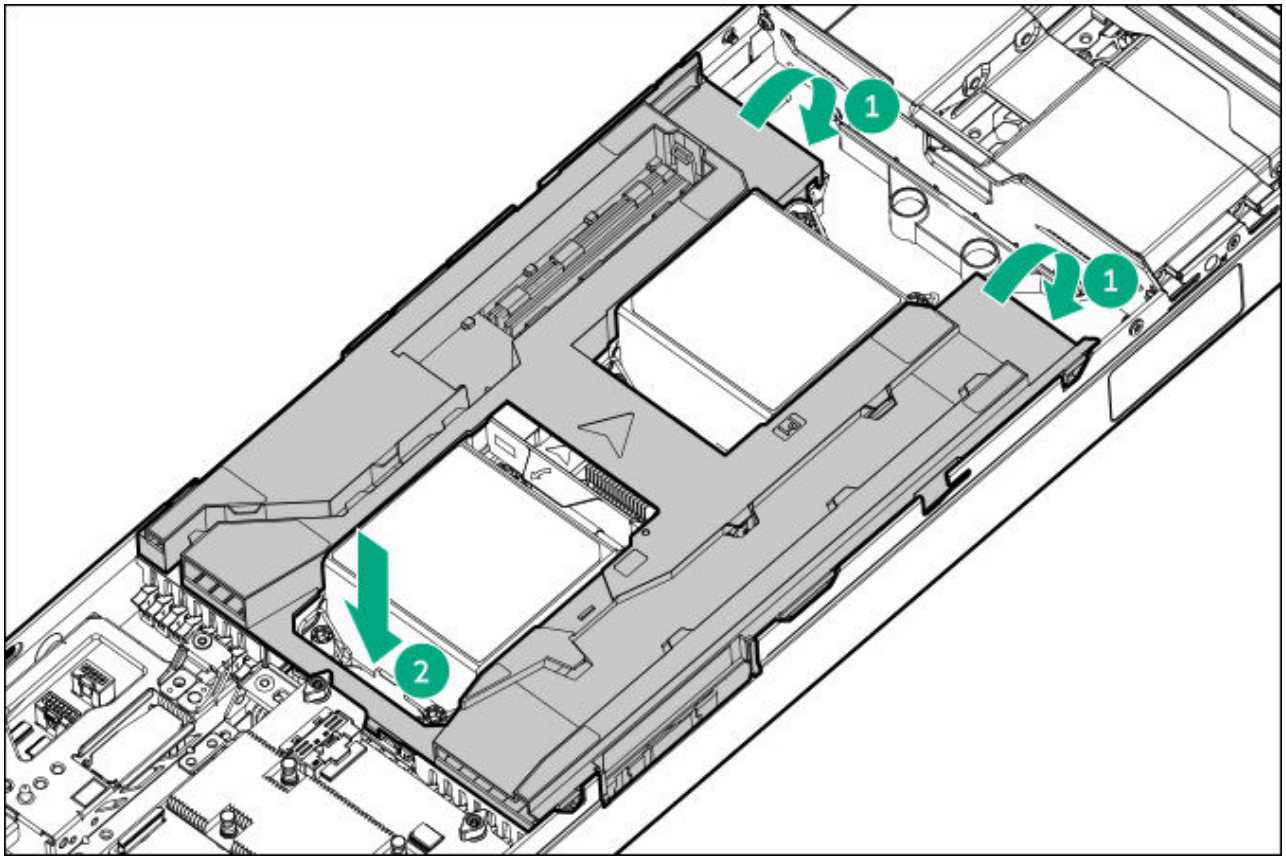
1. Place the access panel on top of the compute module.
2. Slide the access panel forward until it clicks into place.



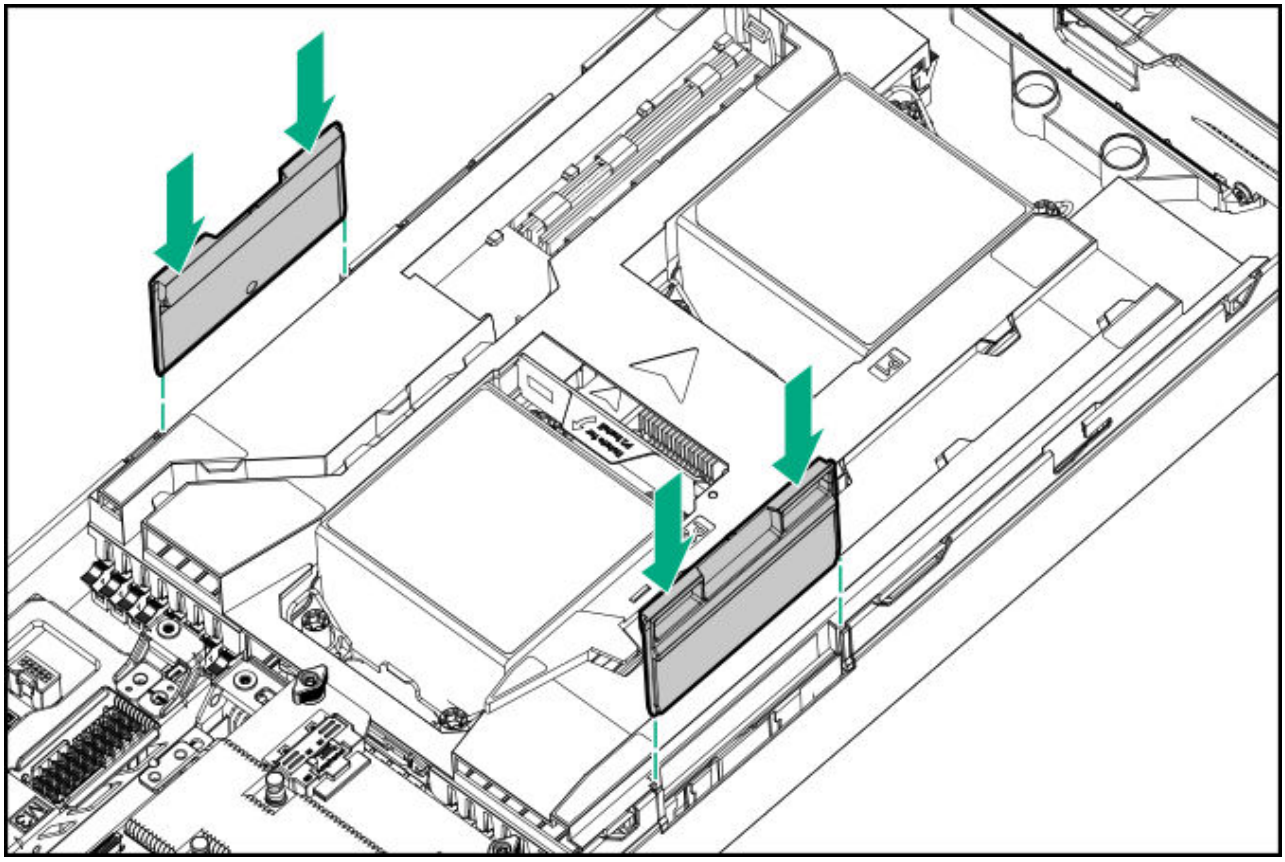
Installing the DIMM baffle

Procedure

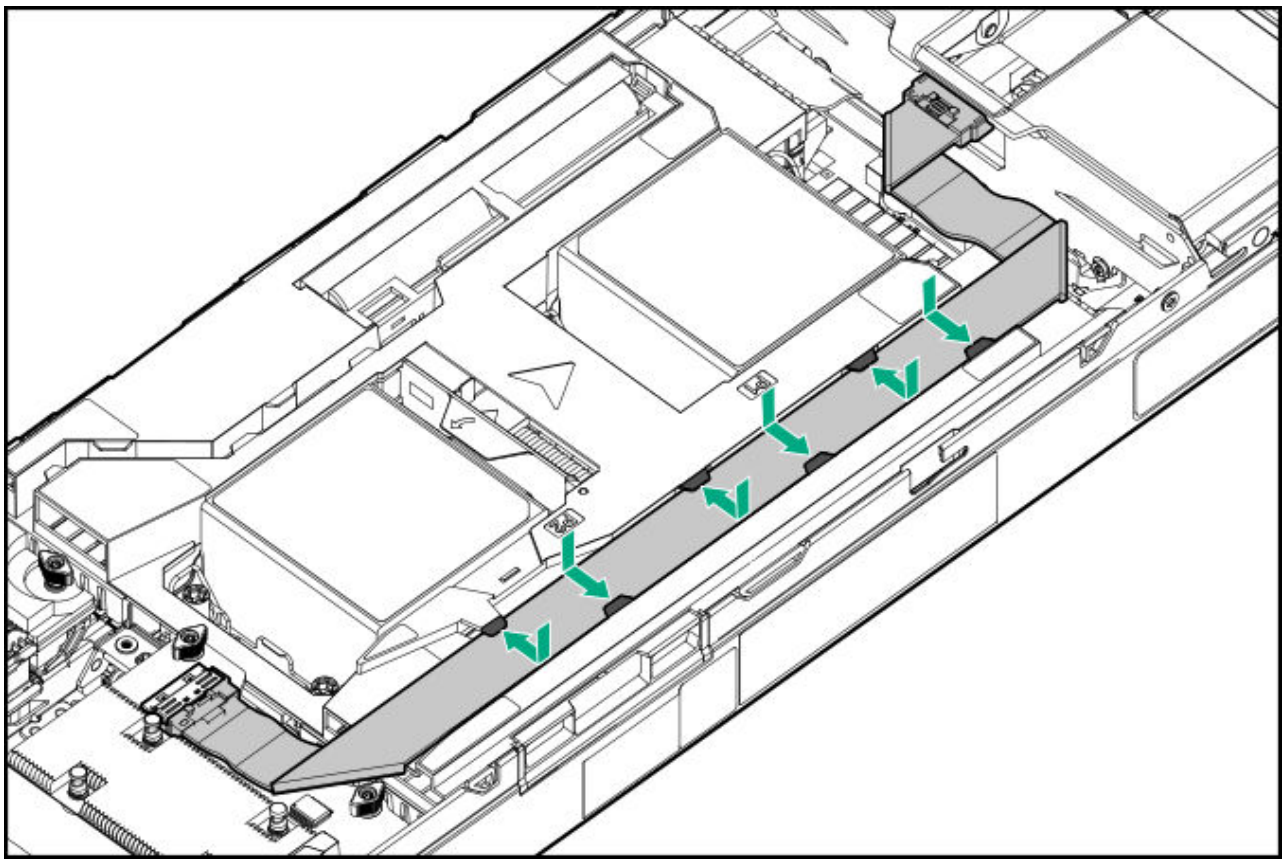
1. Insert the DIMM baffle into the compute module.



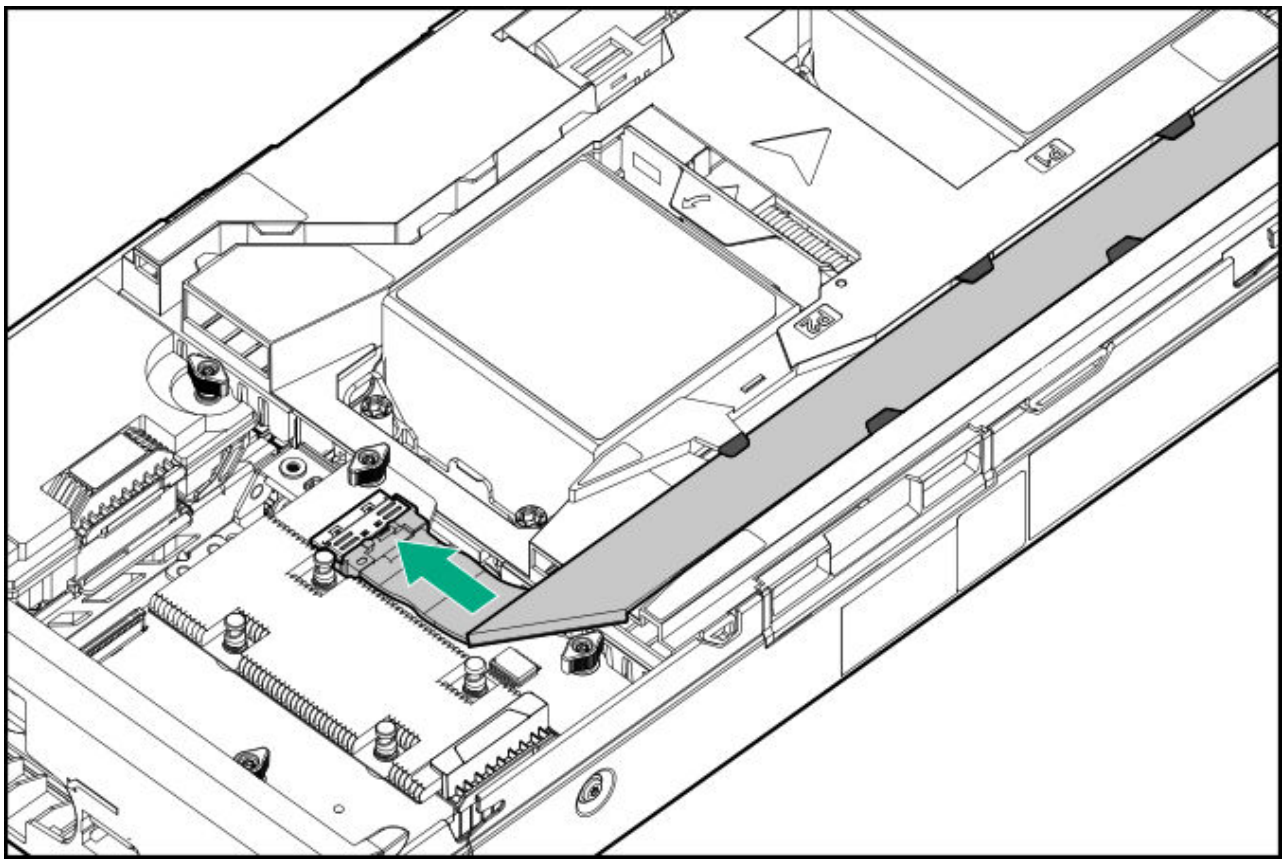
2. Install the air blockers.



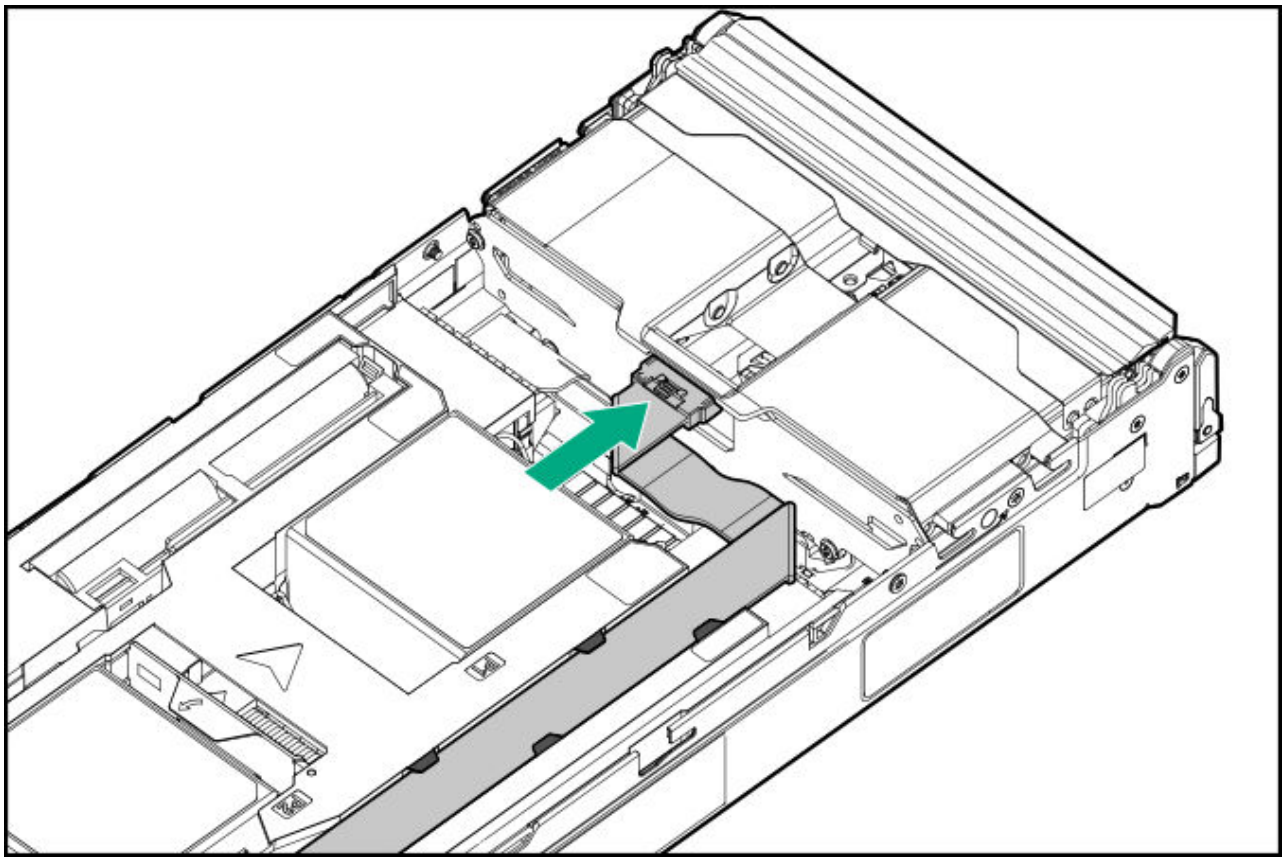
3. Attach the MCIO cable to the DIMM baffle.



4. Attach the MCIO cable to the HPE SR416ie-m Gen11 controller.



5. Attach the MCIO cable to the drive assembly.



6. Install the HPE Smart Storage Hybrid Capacitor.
7. Install the mezzanine option card.

Setup

Subtopics

Installation overview
Installing the compute module
Completing the configuration

Installation overview

About this task

Use this section and the following procedure to install the HPE Synergy 480 Gen11 Compute Module in a frame for the first time.

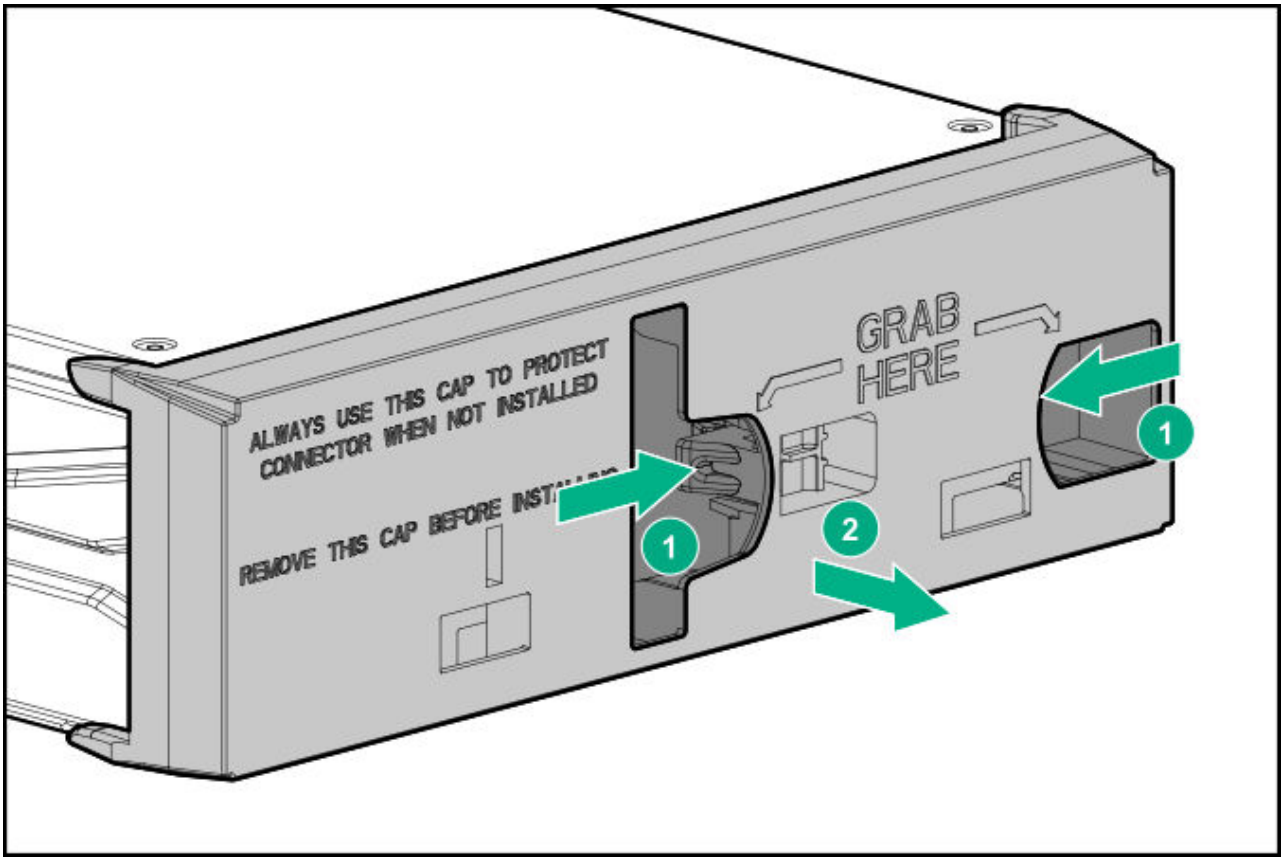
Procedure

1. Install supported options for the compute module.
2. Install the compute module.
3. Complete the compute module configuration.

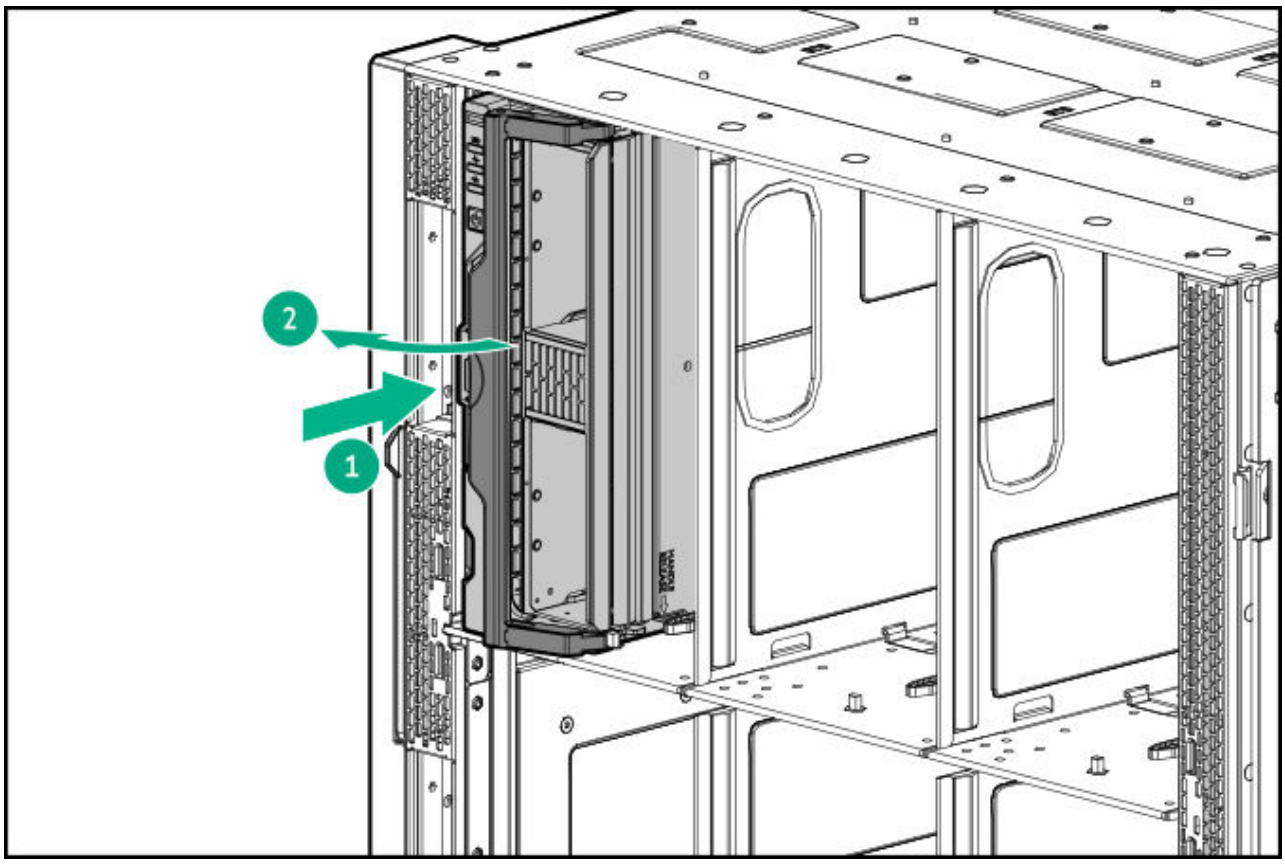
Installing the compute module

Procedure

1. Verify that the device bay is configured for a half-height compute module. For more information, see the setup and installation guide for the frame on the **Hewlett Packard Enterprise website**.
2. Remove the compute module end cap.



3. Open the compute module handle.
4. Slide the compute module into the enclosure slot until it is fully inserted. Rotate the handle until it latches.



5. Review the compute module front panel LEDs to determine the compute module status. For more information on the compute module LEDs, see "Component identification."

Results

To remove the component, reverse the installation procedure.

CAUTION

Before removing the compute module, be sure to verify that the compute module is in standby mode by observing that the system power LED is amber. Also, verify that the UID LED is not flashing blue.

Completing the configuration

About this task

When a compute module is added to an existing configuration, HPE OneView automatically detects the new hardware. HPE OneView is hosted on the HPE Synergy

Composer appliance installed in the HPE Synergy 12000 Frame. You can use HPE OneView to comprehensively manage an HPE Synergy system throughout the hardware life cycle.

To configure the compute module for the first time, log in to HPE OneView from the frame using your assigned user name and password. For more information, see the HPE Synergy 12000 Frame Setup and Installation Guide (**https://www.hpe.com/info/synergy-12000-frame-docs**). For more information about HPE OneView, see the HPE OneView User Guide for HPE Synergy (**https://www.hpe.com/info/synergy-docs**).

Hardware options installation

This chapter provides instructions for installing supported hardware options.

To ensure proper HPE Synergy 480 Gen11 Compute Module deployment and operation, Hewlett Packard Enterprise recommends installing only HPE-validated hardware options. To see the list of validated options for this HPE Synergy 480 Gen11 Compute Module, see the product QuickSpecs on the HPE Synergy 480 Gen11 Compute Module website:

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

To view the warranty for your HPE Synergy 480 Gen11 Compute Module and supported options, see Warranty information.

Subtopics

Introduction
Hard drives
Drive cage options
Controllers
Processor and heatsink options
HPE Smart Storage Hybrid Capacitor
Memory options
Trusted Platform Module
Retaining the BitLocker recovery key/password

Introduction

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

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.

Hard drives

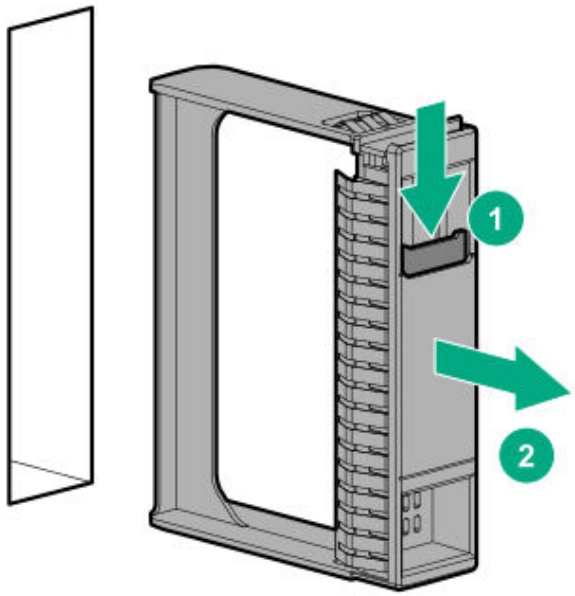
Subtopics

Installing SAS, SATA, or solid state drives
Installing E3.S drives

Installing SAS, SATA, or solid state drives

Procedure

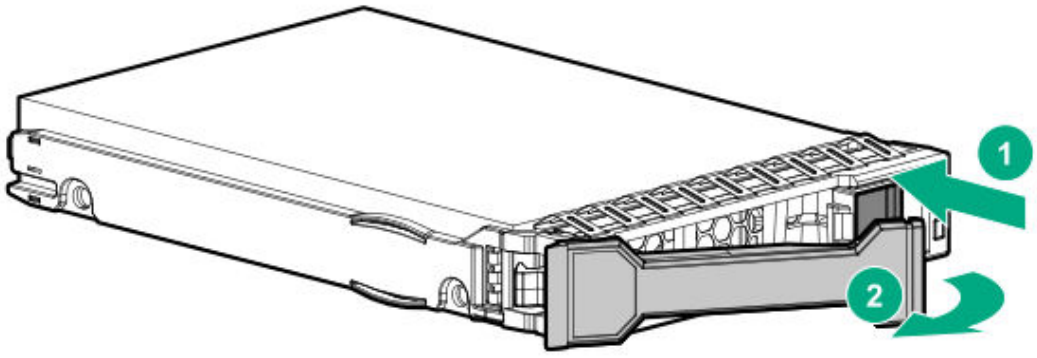
1. Remove the drive blank.



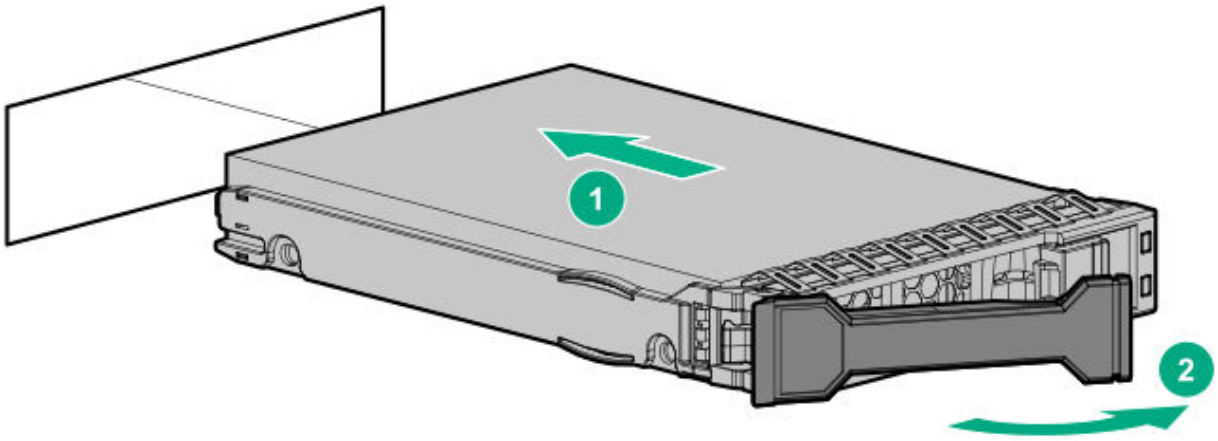
CAUTION

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

2. Prepare the drive.



3. Install the drive.

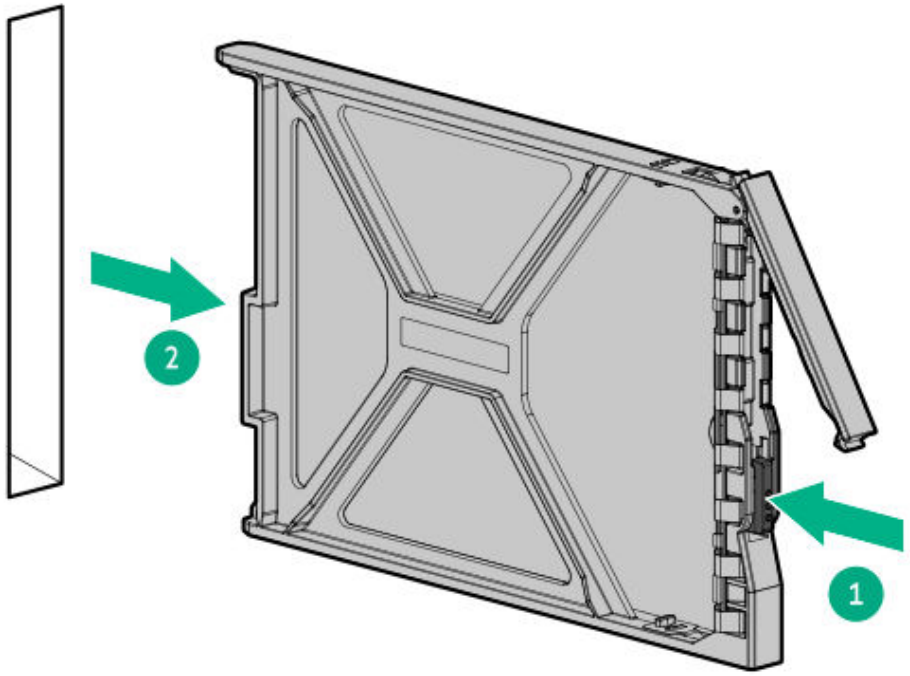


4. Determine the status of the drive from the drive LED definitions.

Installing E3.S drives

Procedure

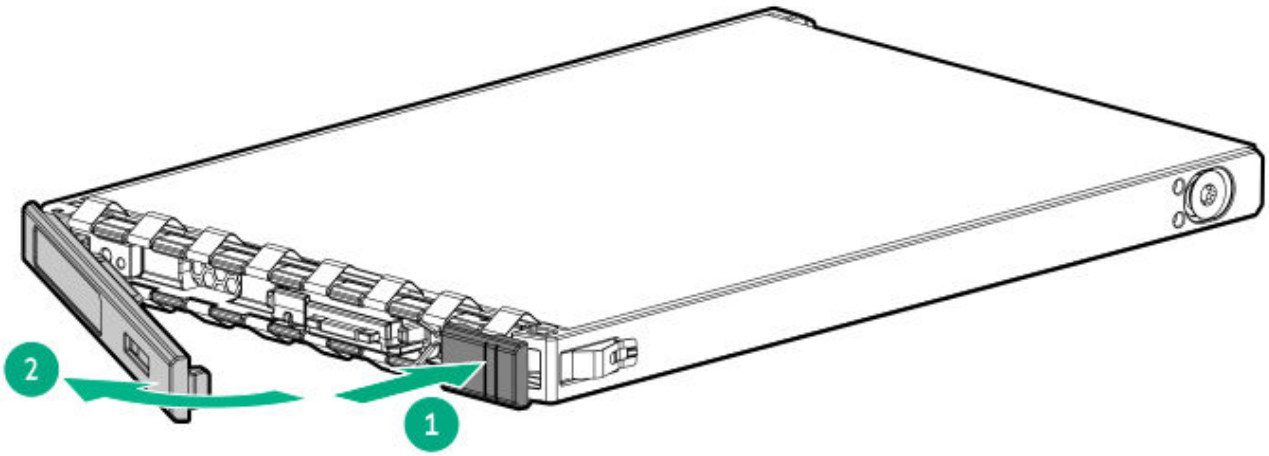
1. Remove the drive blank.



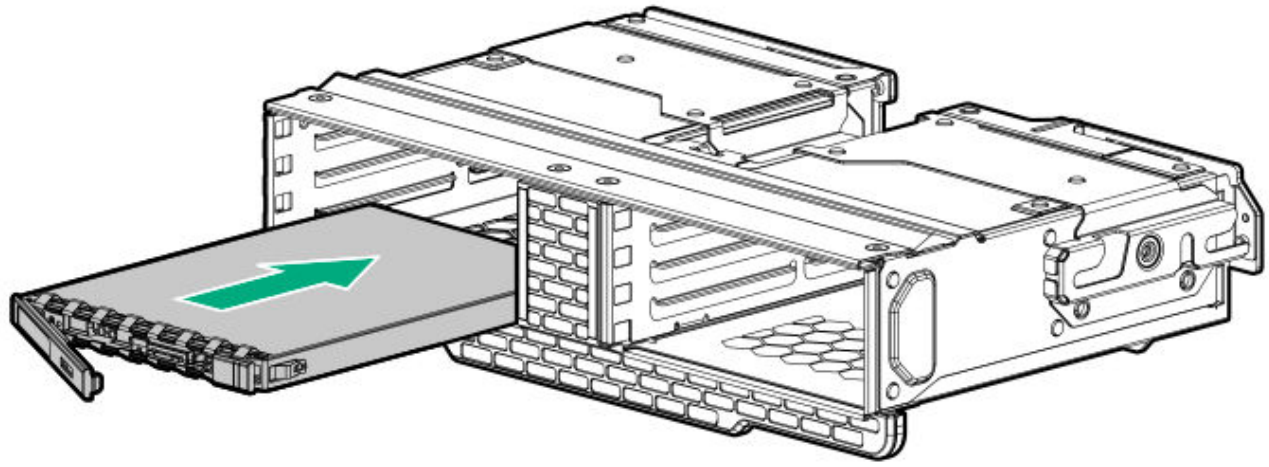
CAUTION

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

2. Prepare the drive.



3. Install the drive.



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

Drive cage options

Subtopics

Installing the driveless cage kit
Installing the 2SFF and 4SFF tri-mode premium drive cage kits
Installing the 4SFF and 8EDSFF direct connect NVMe drive cage kits

Installing the driveless cage kit

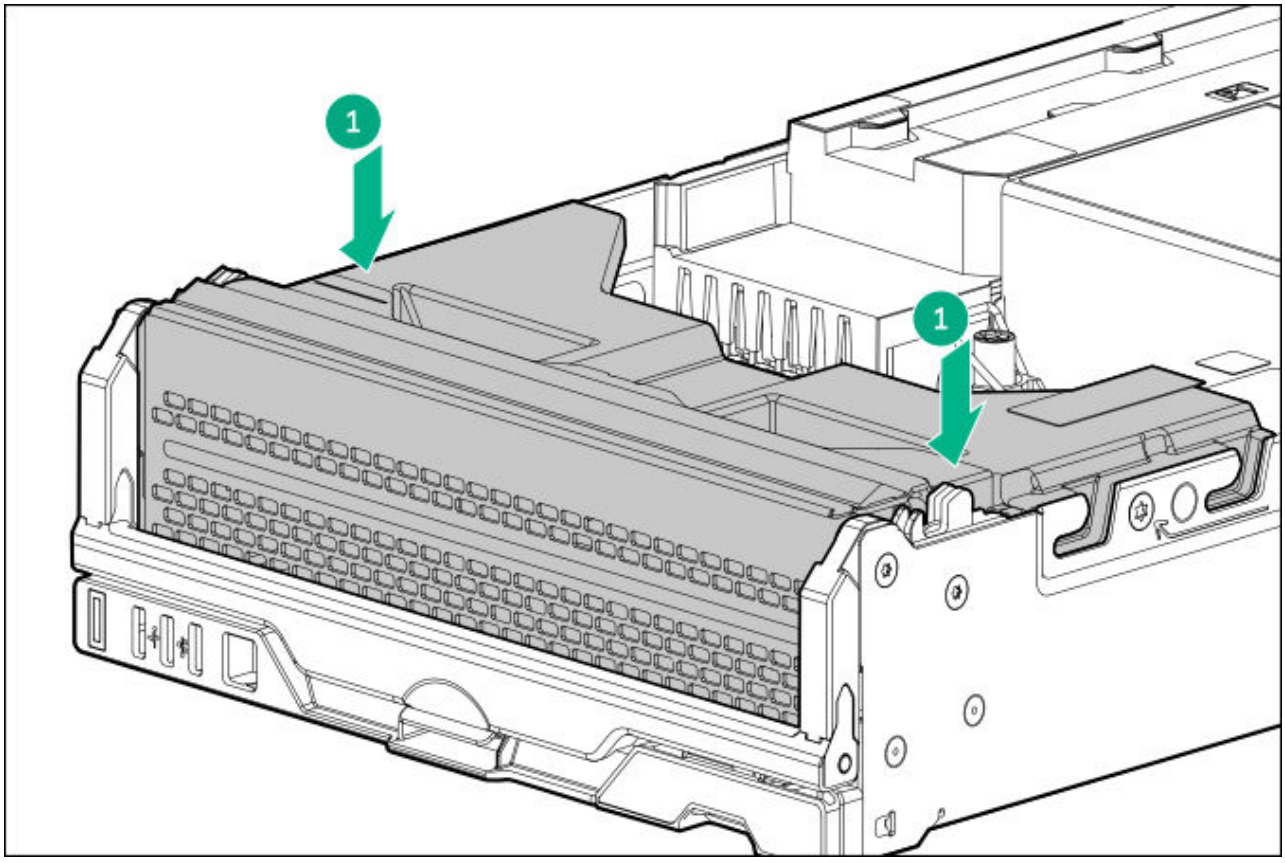
Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Remove the access panel.
5. If a drive cage is installed, disconnect the MCIO cable and remove the existing drive cage assembly.
6. Install the driveless cage.



NOTE

The driveless cage does not require cabling.

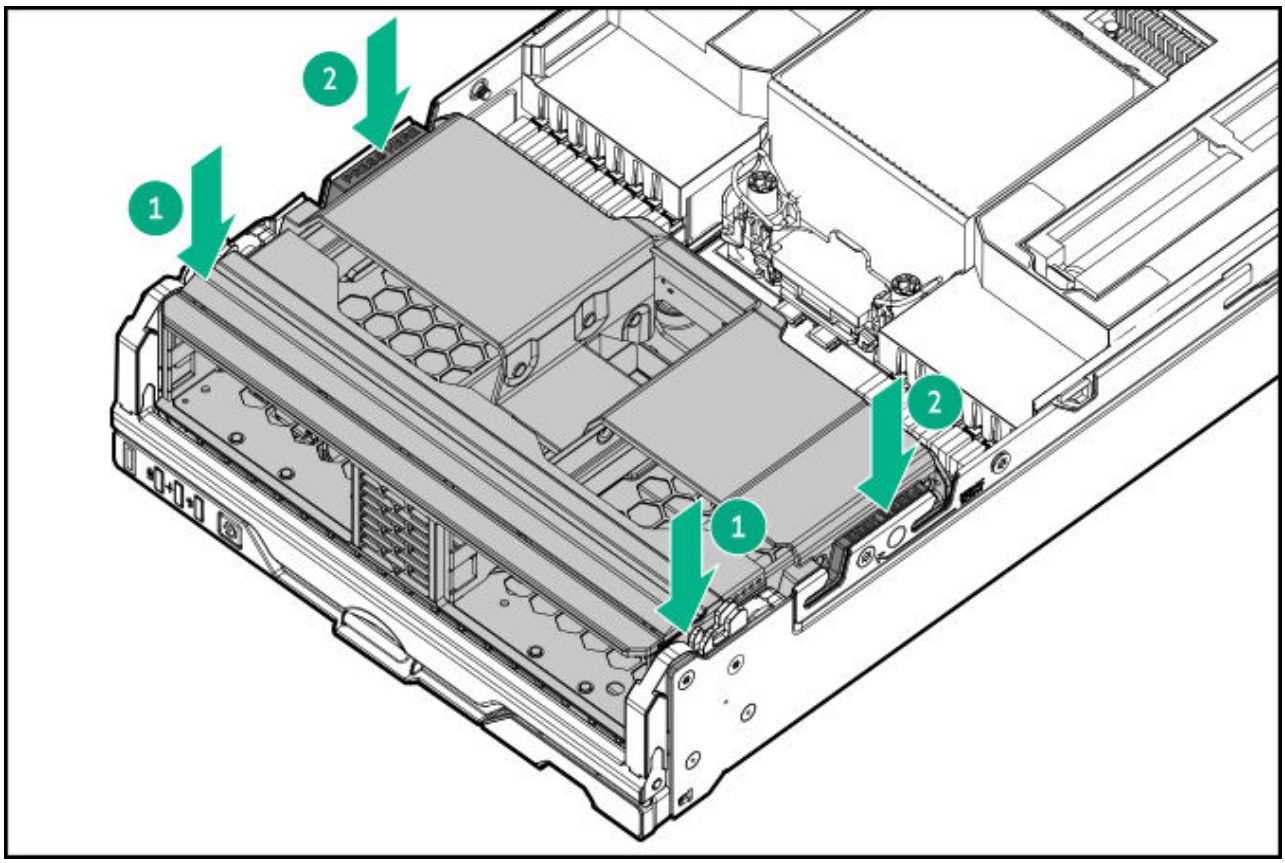


7. Install the access panel.

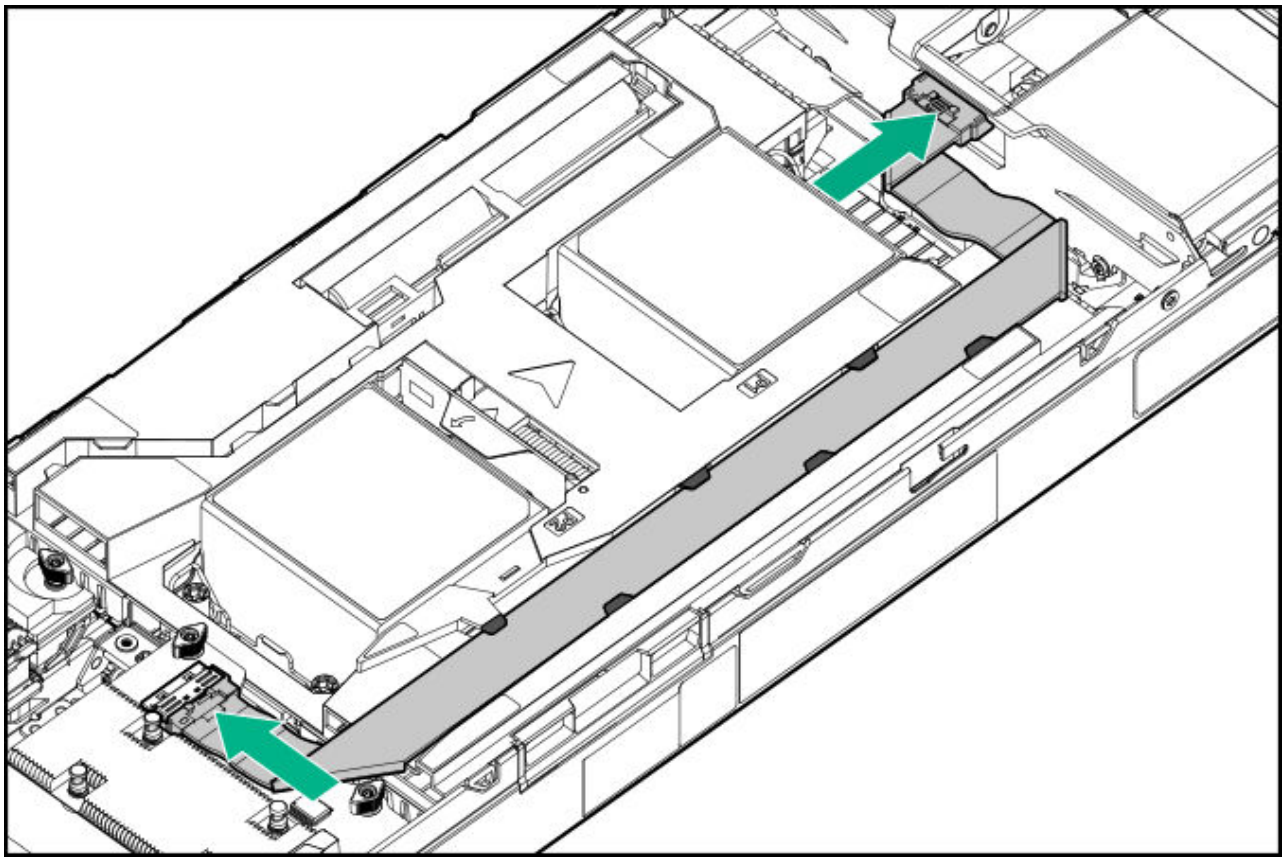
Installing the 2SFF and 4SFF tri-mode premium drive cage kits

Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Remove the access panel.
5. If a drive cage is installed, disconnect the MCIO cable and remove the existing drive cage assembly.
6. Install the front drive cage.



7. Connect the MCIO cable to the HPE SR416ie-m Gen11 controller and the drive cage assembly.



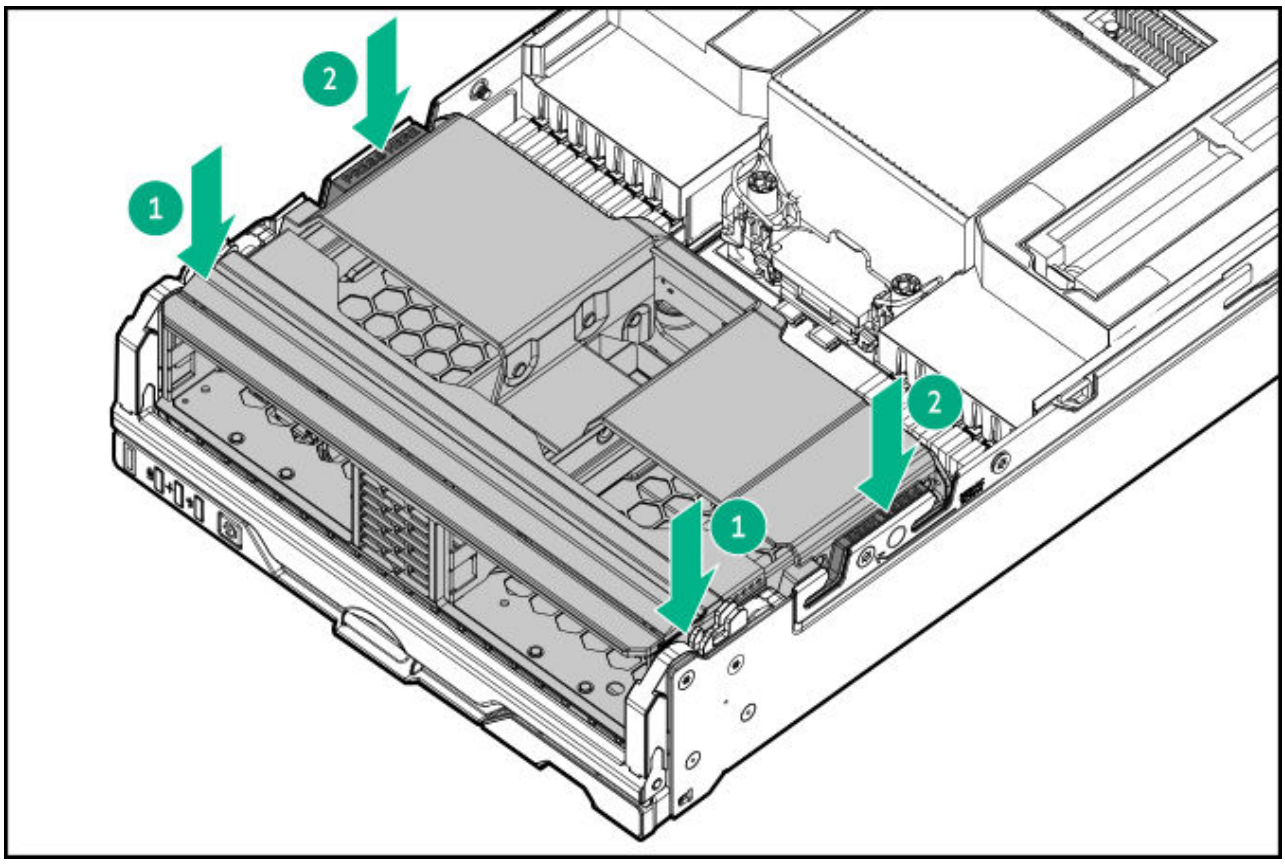
8. Install the access panel.
9. Install the drives.

Installing the 4SFF and 8EDSFF direct connect NVMe drive cage kits

Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Remove the access panel.
5. If a drive cage is installed, disconnect the MCIO cable and remove the existing drive cage assembly.
6. Install the front drive cage.

> **NOTE**
>
> - No cabling is required for this drive cage assembly.
> - The following image is the 8EDSFF drive cage, and it appear differently from your drive kit.



7. Install the access panel.
8. Install the appropriate drives.

> **NOTE**
>
> The 8EDSFF drive cage assembly supports only E3.S drives.

Controllers

Subtopics

Installing mezzanine card options
Installing the HPE SR416ie-m Gen11 controller
Installing the NS204i-d Gen11 controller

Installing mezzanine card options

About this task

Mezzanine options are classified as Type C and Type D mezzanine cards. The type of mezzanine card determines where the card can be installed in the compute module. Some mezzanine cards require an interconnect module to be installed in the associated ICM bay in the rear of the frame. The location of the mezzanine card determines the location of the interconnect modules.

Be sure to review the mezzanine card-mapping information in the **HPE Synergy Configuration and Compatibility Guide**.

For more information about the association between the mezzanine bay and the interconnect bays, see the HPE Synergy 12000 Frame Setup and Installation Guide on the **Hewlett Packard Enterprise website**.

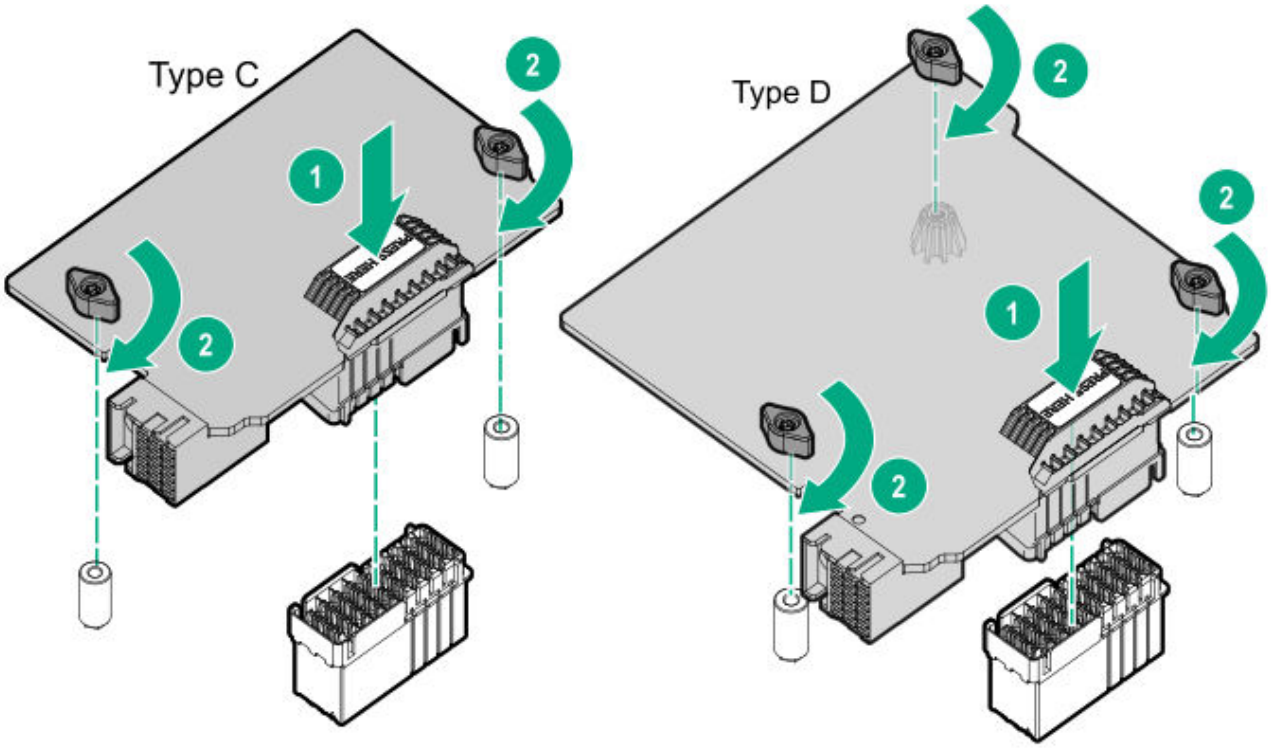
Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Remove the access panel.
5. Locate the appropriate mezzanine connector.

   To locate the connector, see the System board components.
6. If installed, remove the mezzanine connector cover.
7. Install the mezzanine card.

   Firmly press the **PRESS HERE** label above the mezzanine connector to seat the card.

   If a GPU mezzanine adapter is installed in the compute module, an additional mounting bracket is required.



Installing the HPE SR416ie-m Gen11 controller

About this task

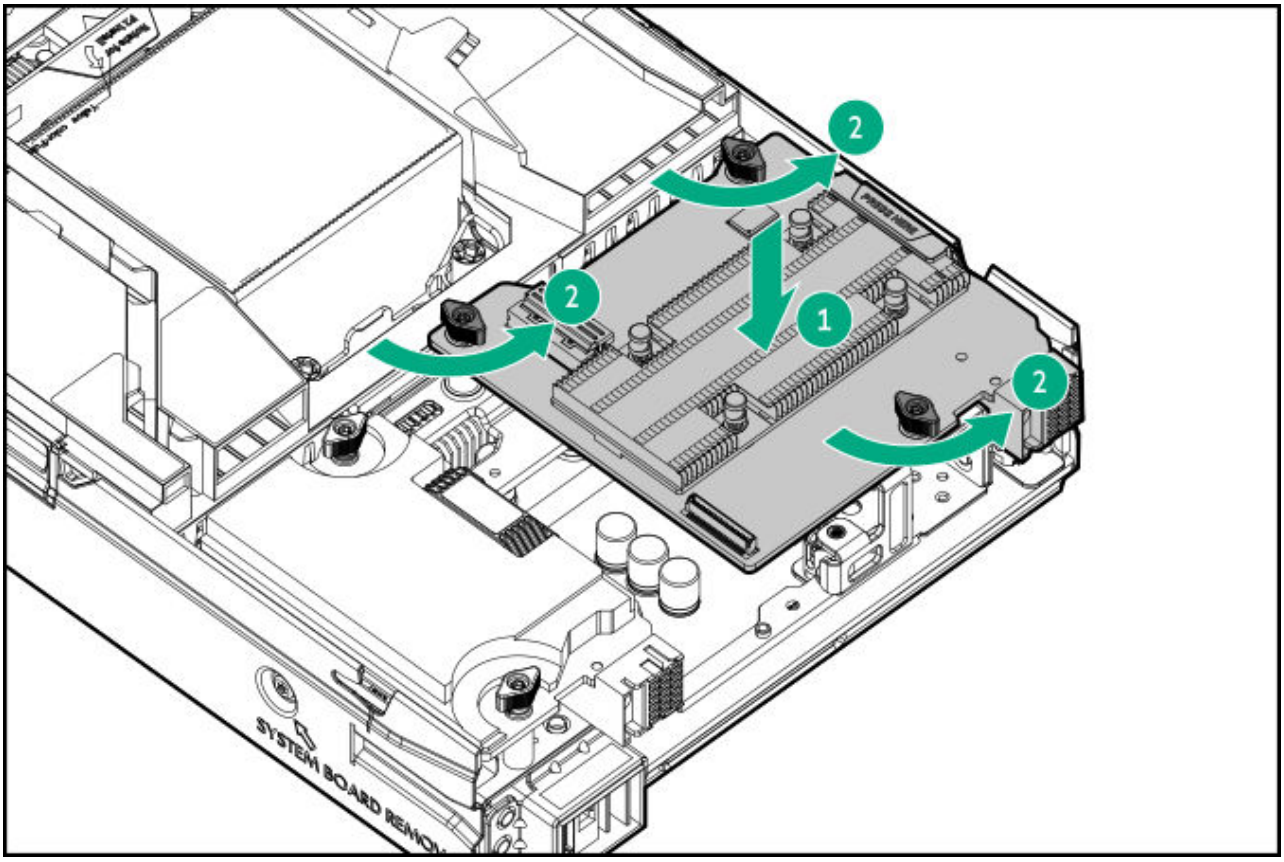
IMPORTANT

For more information about the association between the mezzanine bay and the interconnect bays, see the HPE Synergy 12000 Frame Setup and Installation Guide on the **HPE Support Center website**. Where you install the mezzanine card determines where you must install the interconnect modules.

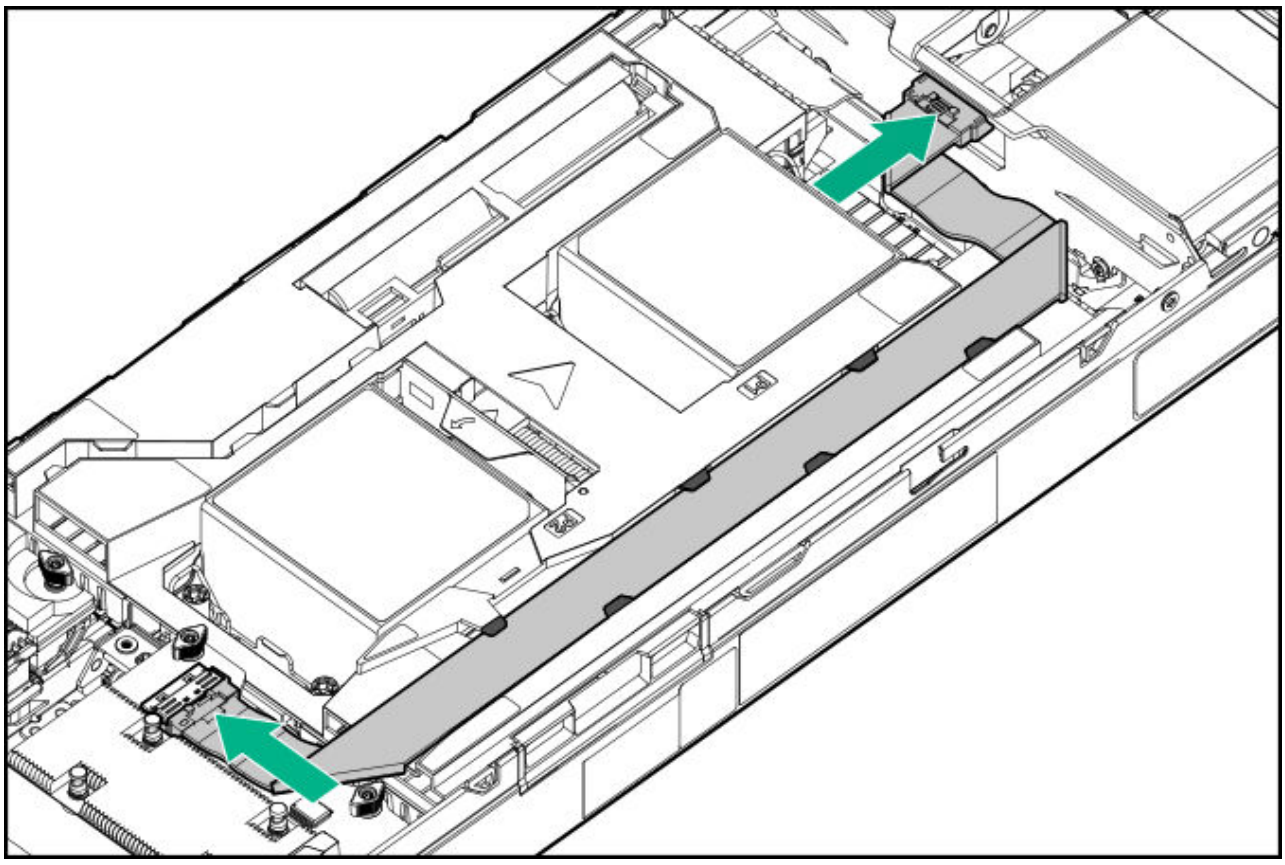
Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.

4. Remove the access panel.
5. Locate the appropriate mezzanine connector. To locate the connector, see the System board components.
6. Install the HPE SR416ie-m Gen11 controller into mezzanine slot 1.



7. Install and route the MCIO cable from the drive assembly to the controller port of the HPE SR416ie-m Gen11 controller in mezzanine 1.



8. Install the access panel.

Installing the NS204i-d Gen11 controller

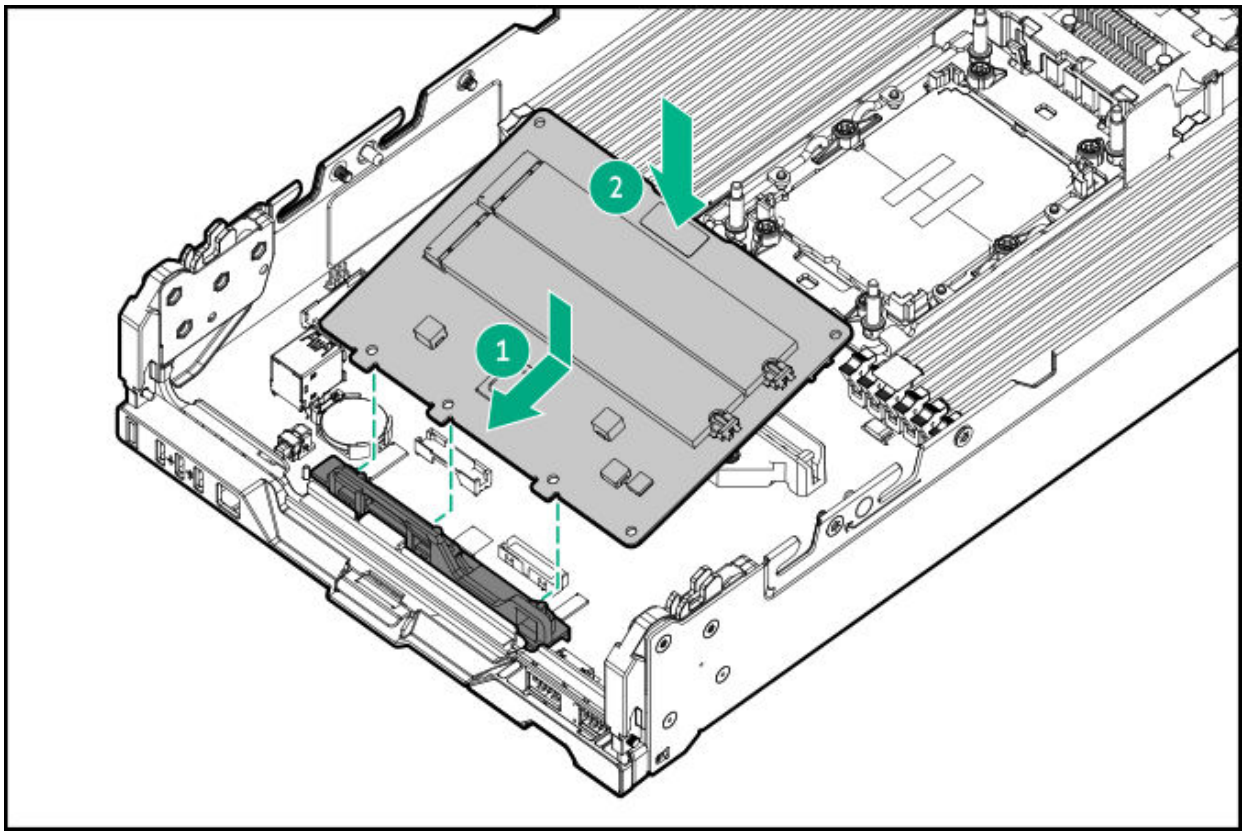
Prerequisites

Before completing this procedure, verify that the M.2 SSD flash drivers are installed onto the controller.

Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Remove the access panel.
5. Remove the drive cage assembly.
6. Angle and insert the NS204i-d controller into the system board.

a. Make sure to align the controller edges to the edge slots and the alignment pins near the front of the compute module.



b. Press where indicated on the NS204i-d controller to lower it onto the system board connector until it is fully engaged. The controller will click into place when fully engaged.

Subtopics

Installing the M.2 SSD flash drive in the NS204i-d Gen11 controller

Installing the M.2 SSD flash drive in the NS204i-d Gen11 controller

Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.

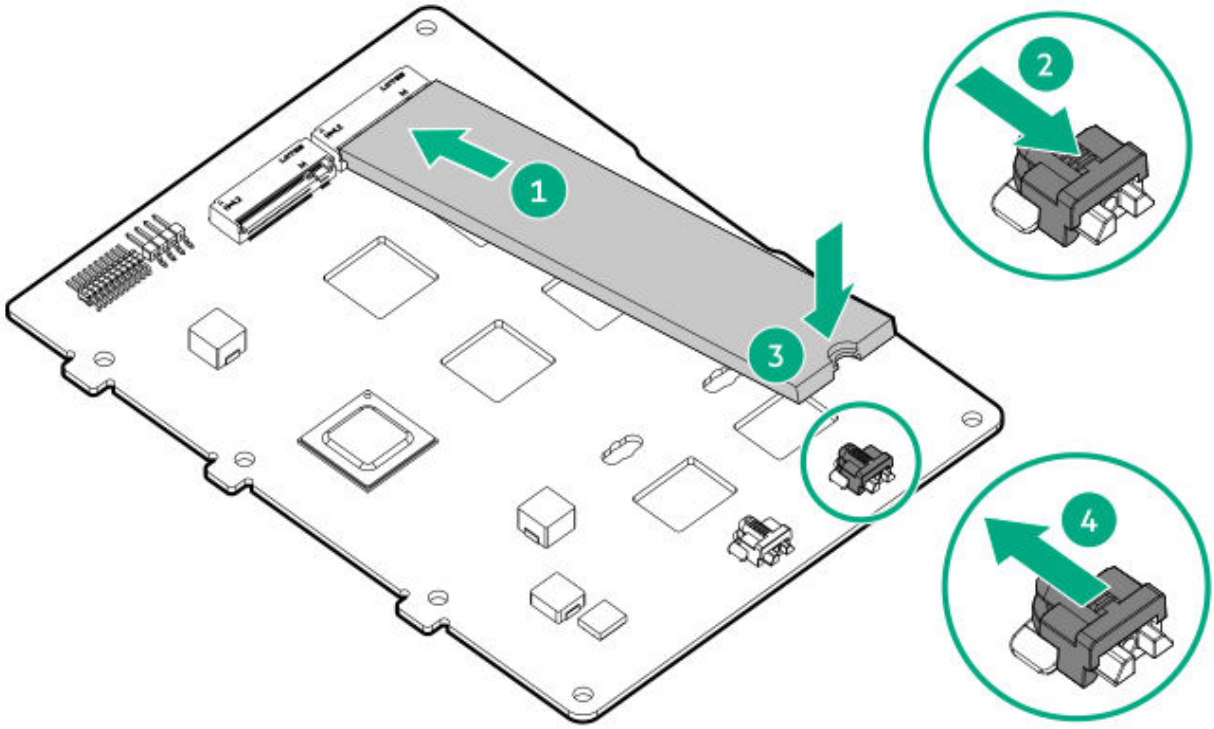
4. Remove the access panel.
5. Remove the drive cage assembly.
6. Locate the NS204i-d controller.
7. Install the SSD flash drive into the connector at an angle and lower it into the NS204i-d controller latches.

NOTE

Based on the type of M.2 SSD drives being installed, move the latches on the controller to the appropriate location on the NS204i-d controller. If installing 22x80 M.2 SSD drives, move the latches closer. If installing 22x110 M.2 SSD drives, move the latches further. To adjust the latch positions, rotate the latch 90 degrees and lift to release the latch from the controller.

NOTE

Mixing of the M.2 SSD drives is not supported.



8. Press the SSD flash drive where indicated. Close the latch to secure the drive to the NS204i-d controller.
9. Repeat the installation steps for the second SSD flash drive, as applicable.
0. Install the NS204i-d controller into the compute module.

Processor and heatsink options

Subtopics

Processor cautions
Installing the processor heatsink assembly
Installing the processor

Processor cautions

CAUTION

To avoid damage to the processor or system board, only authorized personnel should attempt to replace or install the processor in this compute module.

CAUTION

To prevent possible compute module malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number.

CAUTION

The pins on the processor socket and on the processor are very fragile and easily damaged. To avoid component damage, **do not touch these pins**. Any damage to them might require replacing the system board and/or processor.

IMPORTANT

Processor socket 1 must be populated at all times or the compute module does not function.

IMPORTANT

If installing a processor with a faster speed, update the system ROM before installing the processor. To download firmware, go to the Hewlett Packard Enterprise Support Center website (**https://www.hpe.com/support/hpesc**).

Installing the processor heatsink assembly

Prerequisites

To complete this procedure, you need a T-30 Torx screwdriver.

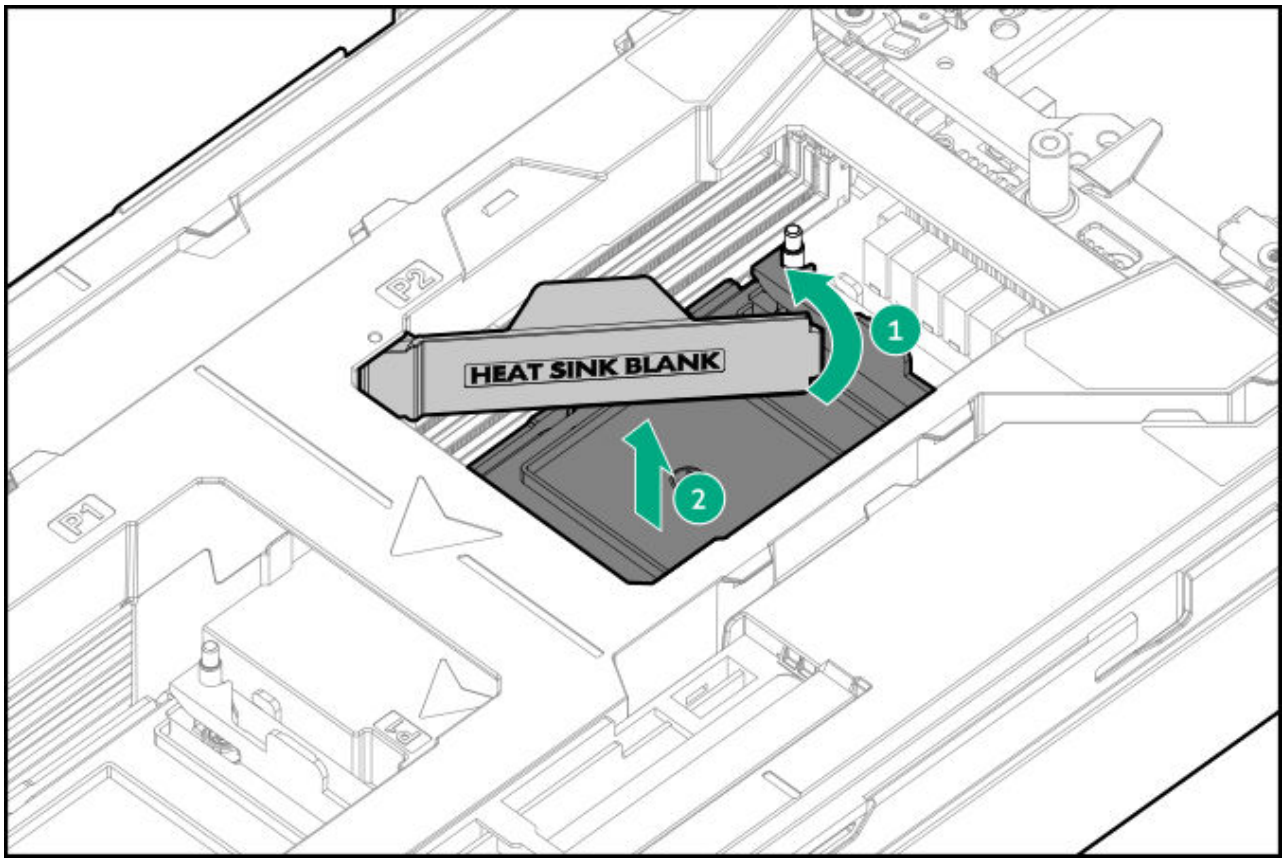
About this task

This compute module supports up to 2 processors.

Procedure

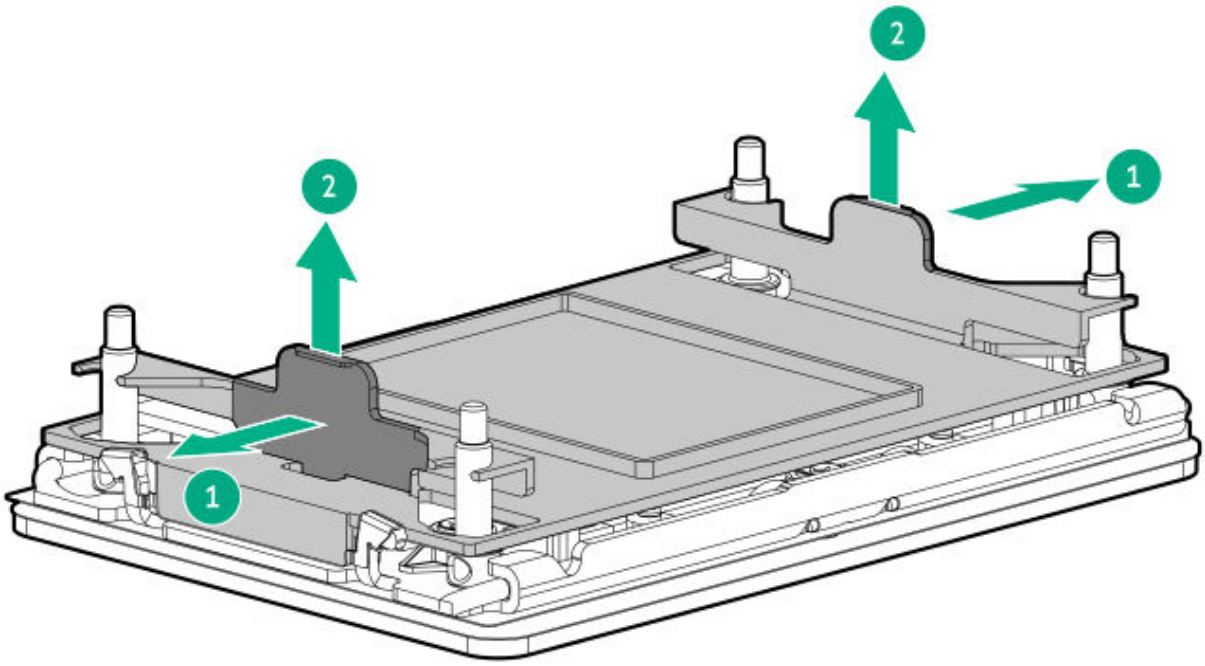
1. Observe the processor cautions and warnings.
2. Update the system ROM.

   Locate and download the latest ROM version from the **Hewlett Packard Enterprise website**. Follow the instructions on the website to update the system ROM.
3. Power down the compute module.
4. Remove the compute module.
5. Place the compute module on a flat, level work surface.
6. Remove the access panel.
7. Rotate and secure the heatsink blank into the closed position.

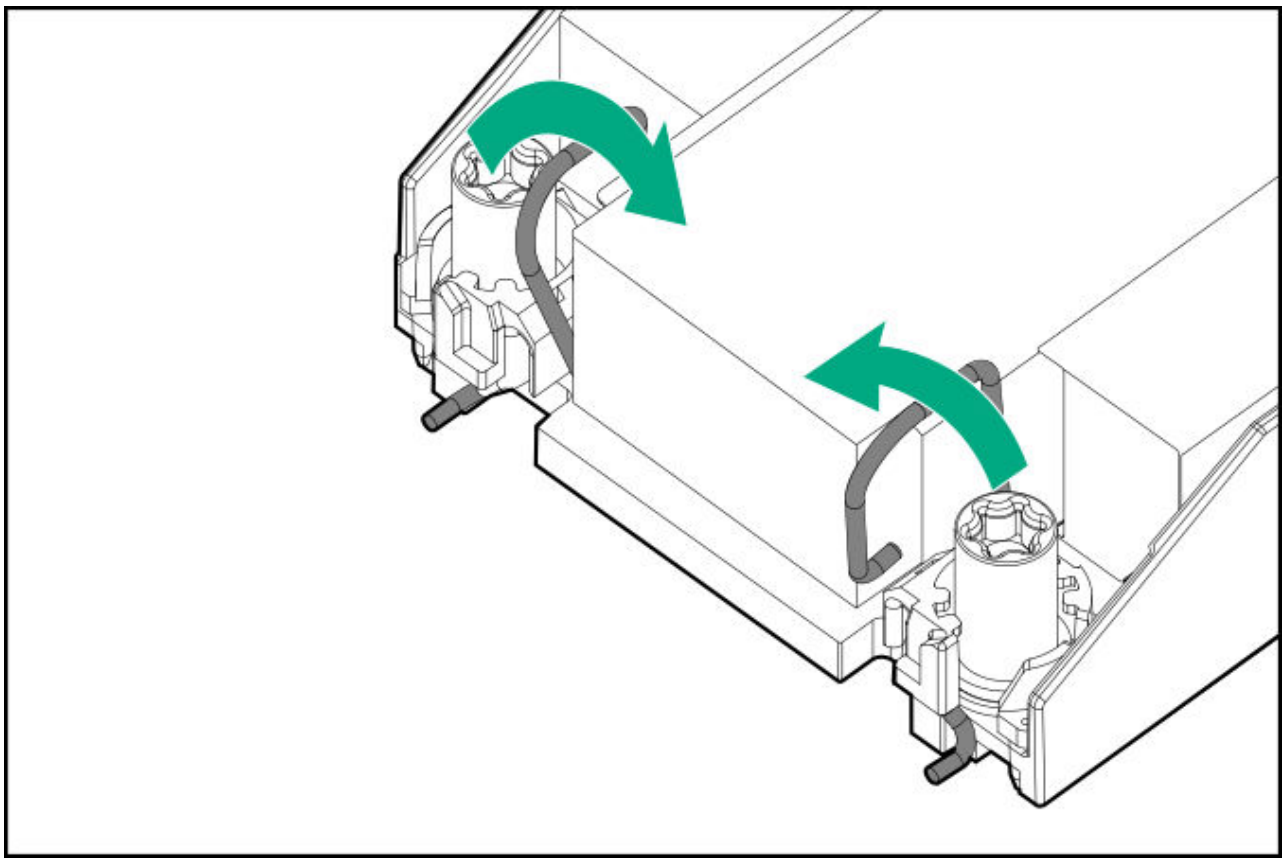


8. Turn the DIMM baffle over.
9. Remove the dust cover.

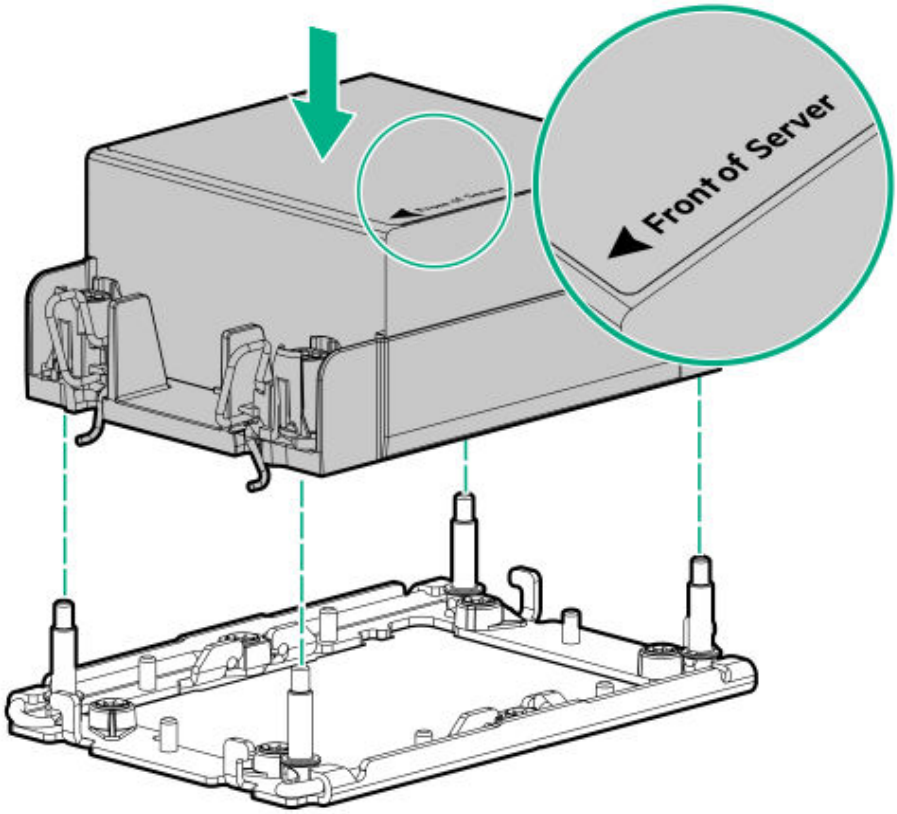
> **NOTE**
>
> Store the dust cover for possible future use.



0. Set the anti-tilt wires to the unlocked position.



1. Align the processor heatsink assembly with the alignment pins, and gently lower the processor heatsink onto the bolster plate guide posts.

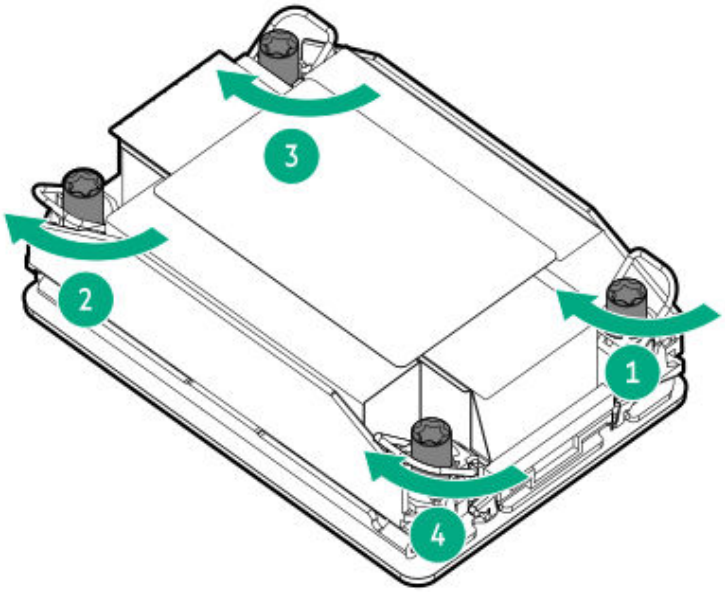


NOTE

The posts are keyed so that the module can only be installed one way. Note the **Front of server** text on the heatsink label to correctly orient the processor-heatsink module over the bolster plate.

2. Use a T-30 Torx screwdriver to tighten one pair of diagonally opposite heatsink screws (callouts 1 to 2), and then tighten the other pair of heatsink screws (callouts 3 to 4).

   When using a torque wrench to tighten the heatsink screws, set it to 0.9 N-m (8 in-lb) of torque.



3. Install the DIMM baffle.

Installing the processor

Prerequisites

- T-30 Torx screwdriver
- Thermal grease

About this task

CAUTION

To prevent possible compute module overheating, always populate each processor socket with a processor socket cover and a processor blank, or a processor and a heatsink.

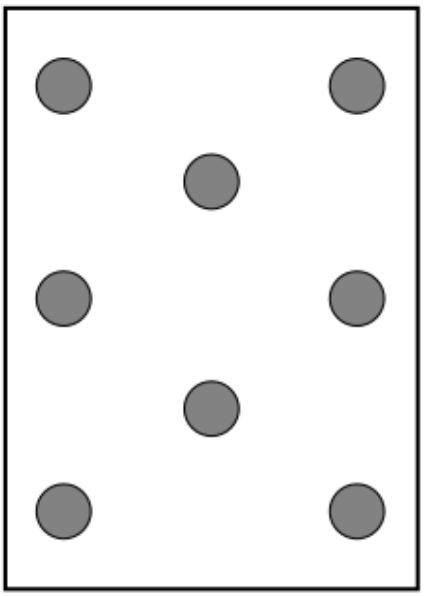
NOTE

There are two processor heatsinks for slots 1 and 2. Be sure that the appropriate processor heatsink is installed into the correct slot.

Procedure

1. Prepare the heatsink.

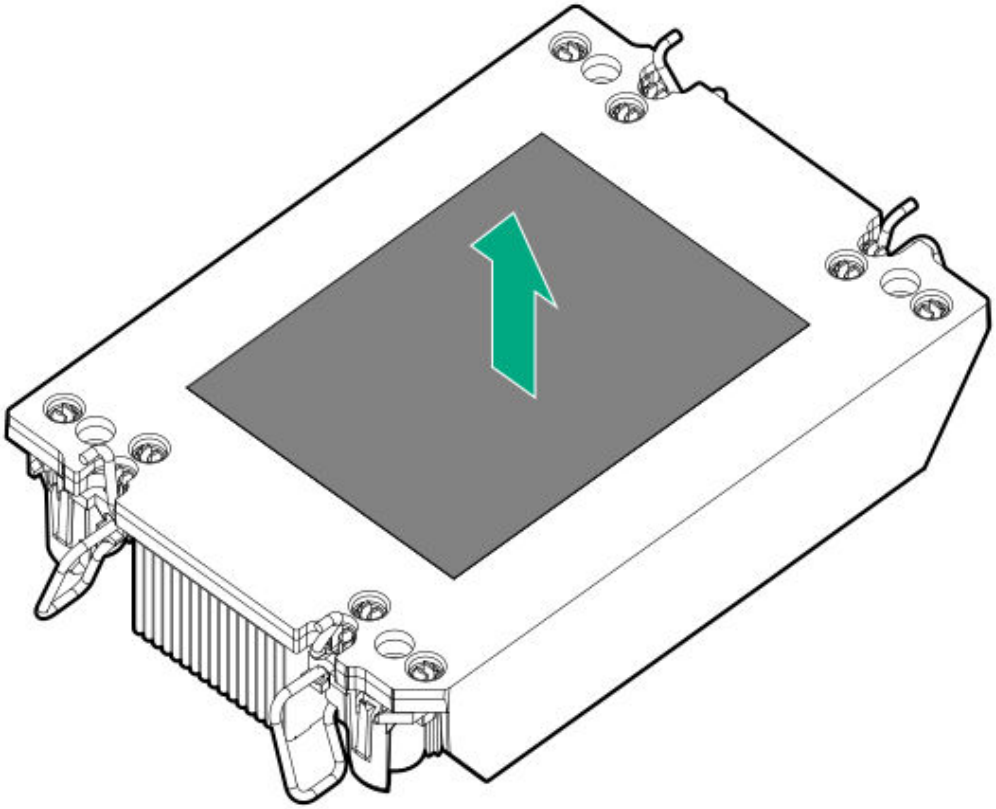
   If you are using the same heatsink, apply the full content of the thermal grease syringes on top of the processor. Follow the pattern shown in the following image.



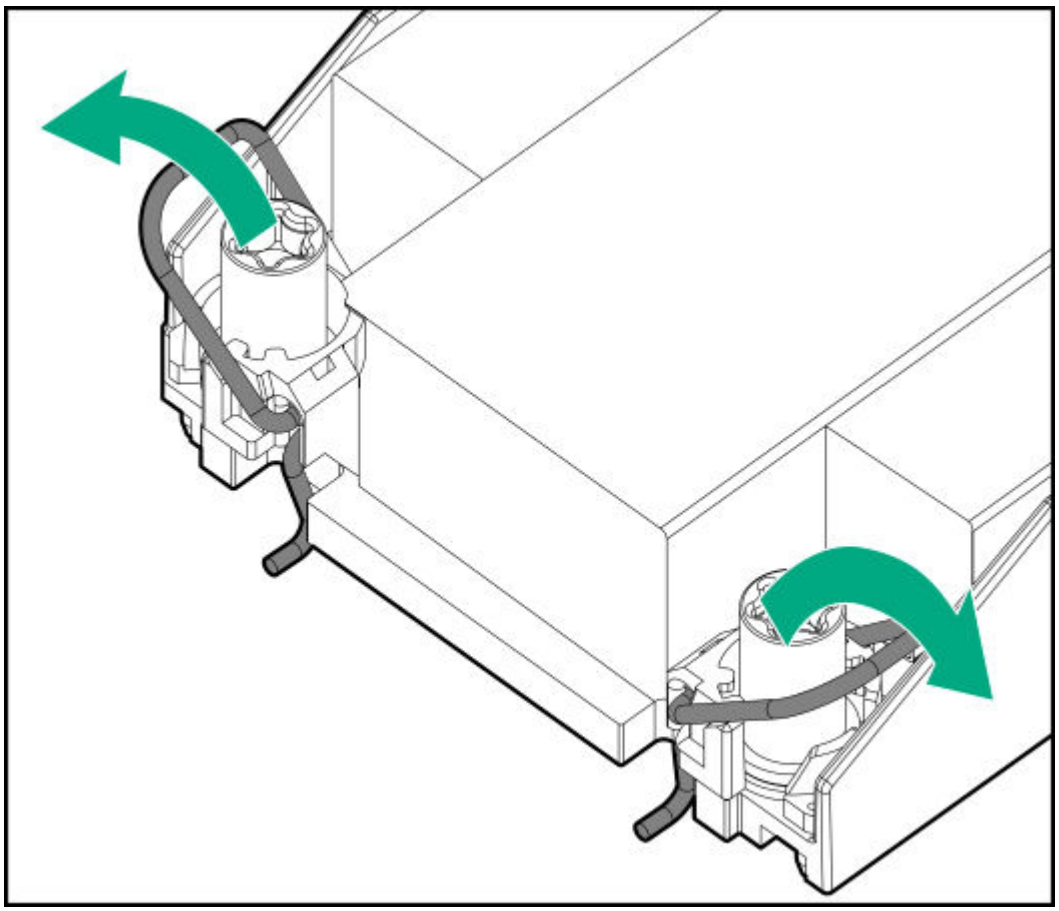
NOTE

Be sure that the previously used thermal grease on the heatsink is fully removed with the alcohol wipes included in the processor kit. This prepares the surface of the heatsink to be attached to the new processor.

If you are using a new heatsink, remove the protective film from the thermal interface material. No thermal grease needs to be applied.

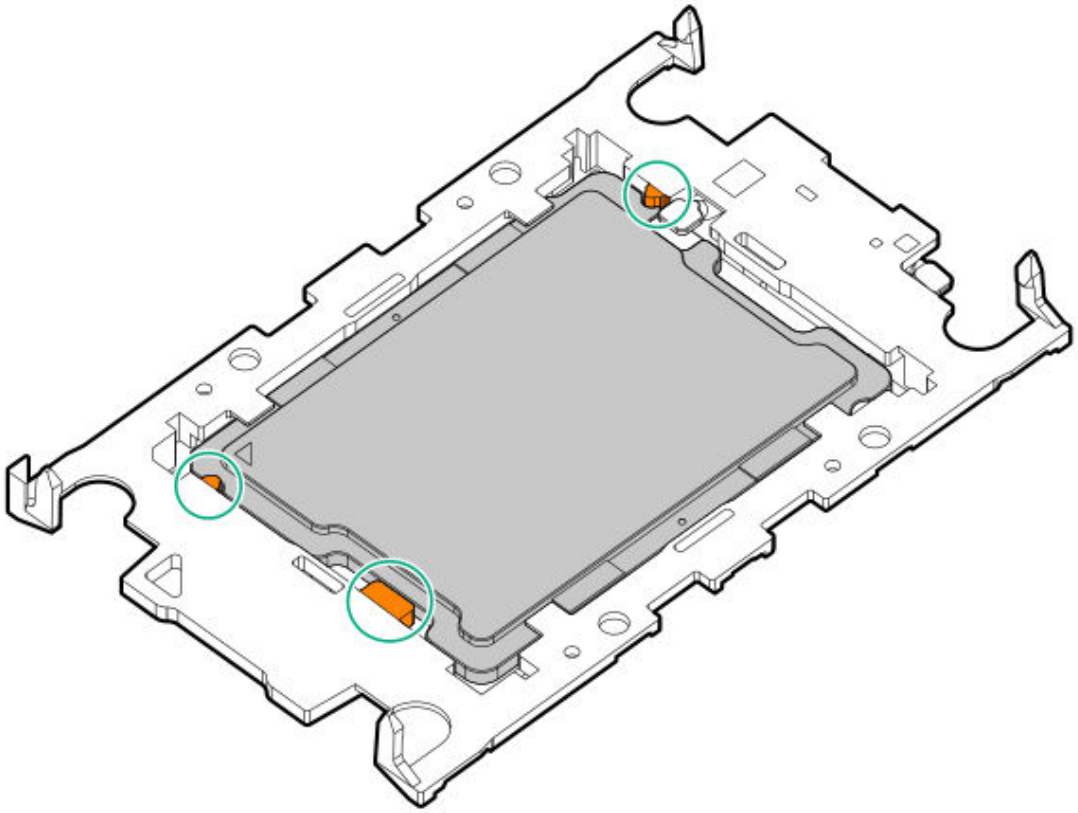


2. Set the anti-tilt wires to the locked position.

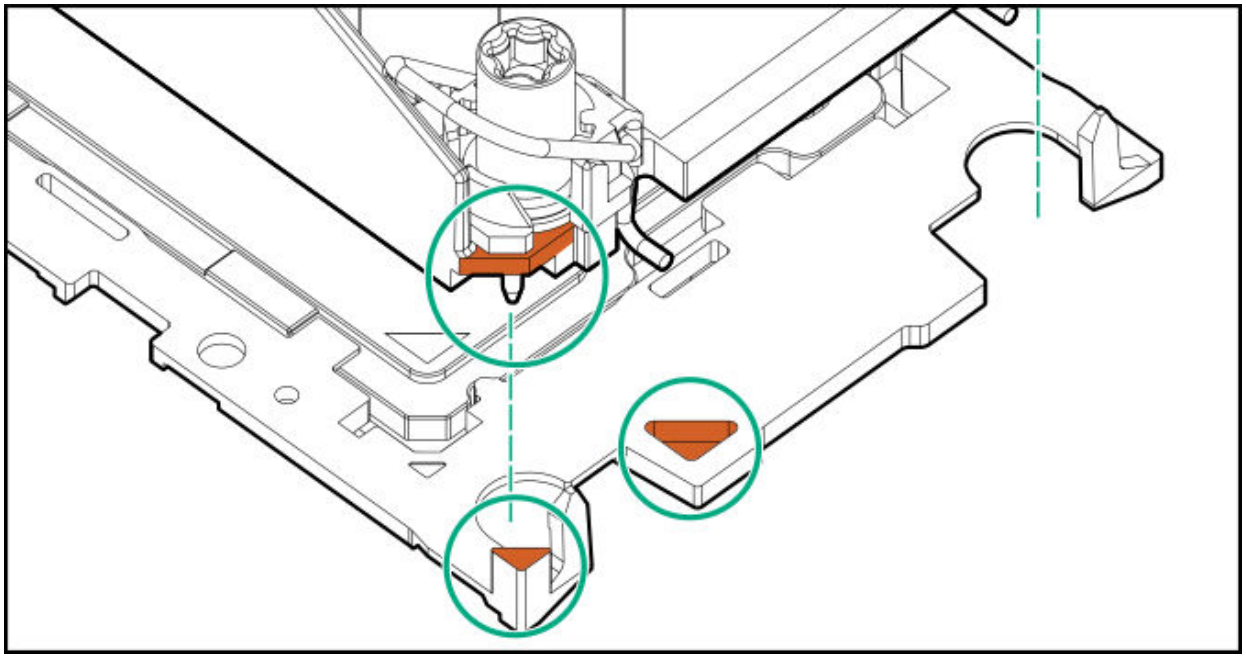


3. Verify that the processor is securely latched to the processor carrier.

   The following illustration calls out the keying feature tabs that secure the processor. Different processor carriers will have these tabs in different locations.



4. Attach the heatsink to the processor carrier:
   a. Align the pin 1 indicator on the processor carrier with that on the heatsink.

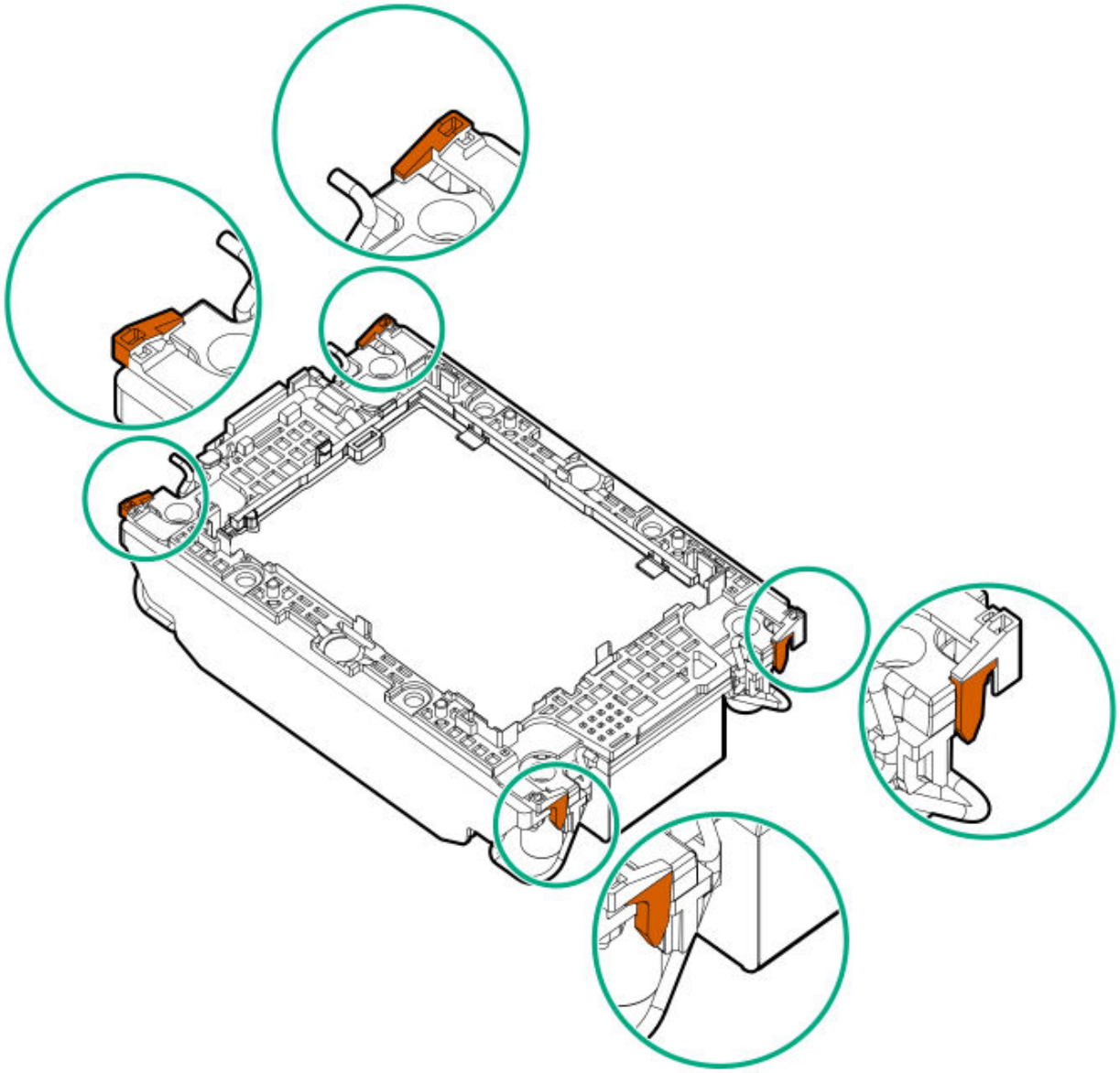


   b. Lower the heatsink on the processor carrier until the carrier tabs snap into place.

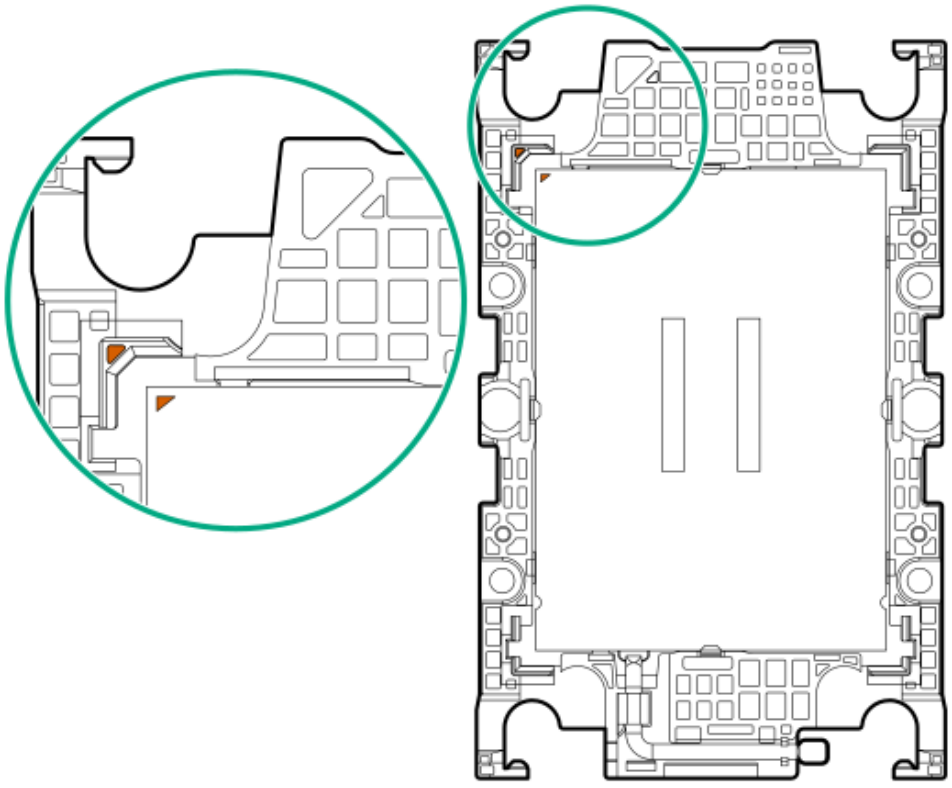
There will be an audible click to indicate that the heatsink is properly latched on the processor carrier.

5. Perform the following verification steps:

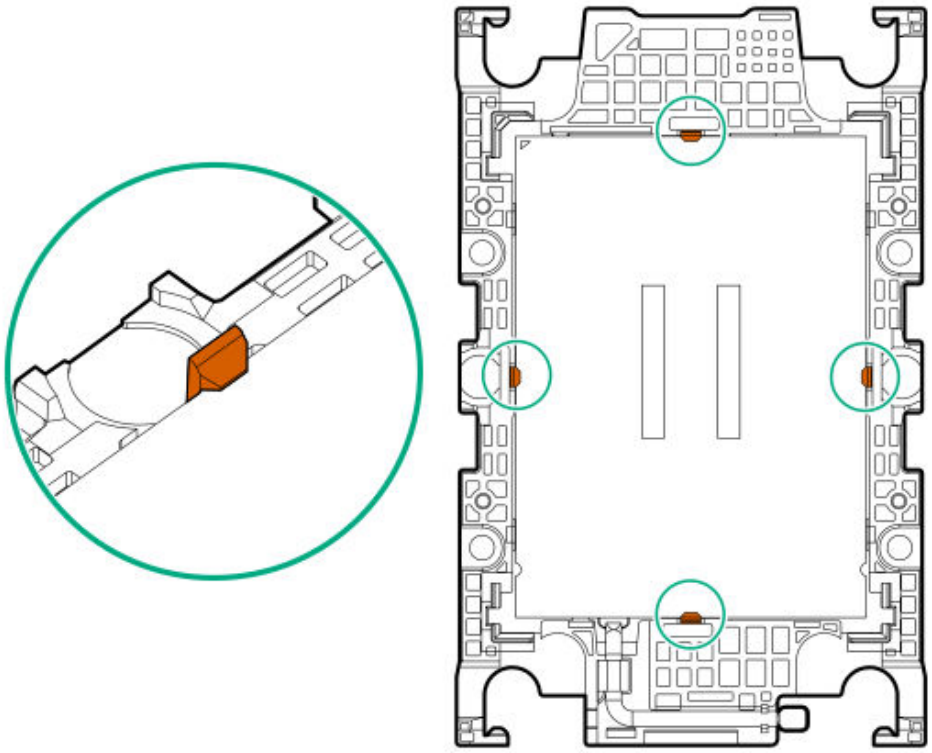
   a. Verify that the tabs on the processor carrier are securely latched on the heatsink.



   b. Verify that the pin 1 indicators on the processor and processor carrier are aligned.



c. Verity that the processor is properly secured by the carrier snaps.



6. Install the processor heatsink into the compute module.
7. Install the access panel

HPE Smart Storage Hybrid Capacitor

The HPE Smart Storage Hybrid Capacitor supports the following devices:

- HPE SR controllers

The capacitor pack can support up to two devices.

Before installing the HPE Smart Storage Hybrid Capacitor, verify that the system BIOS meets the minimum firmware requirements to support the capacitor pack.

> **IMPORTANT**
> If the system BIOS or controller firmware is older than the minimum recommended firmware versions, the capacitor pack will only support one device.

The capacitor pack is fully charged after the system boots.

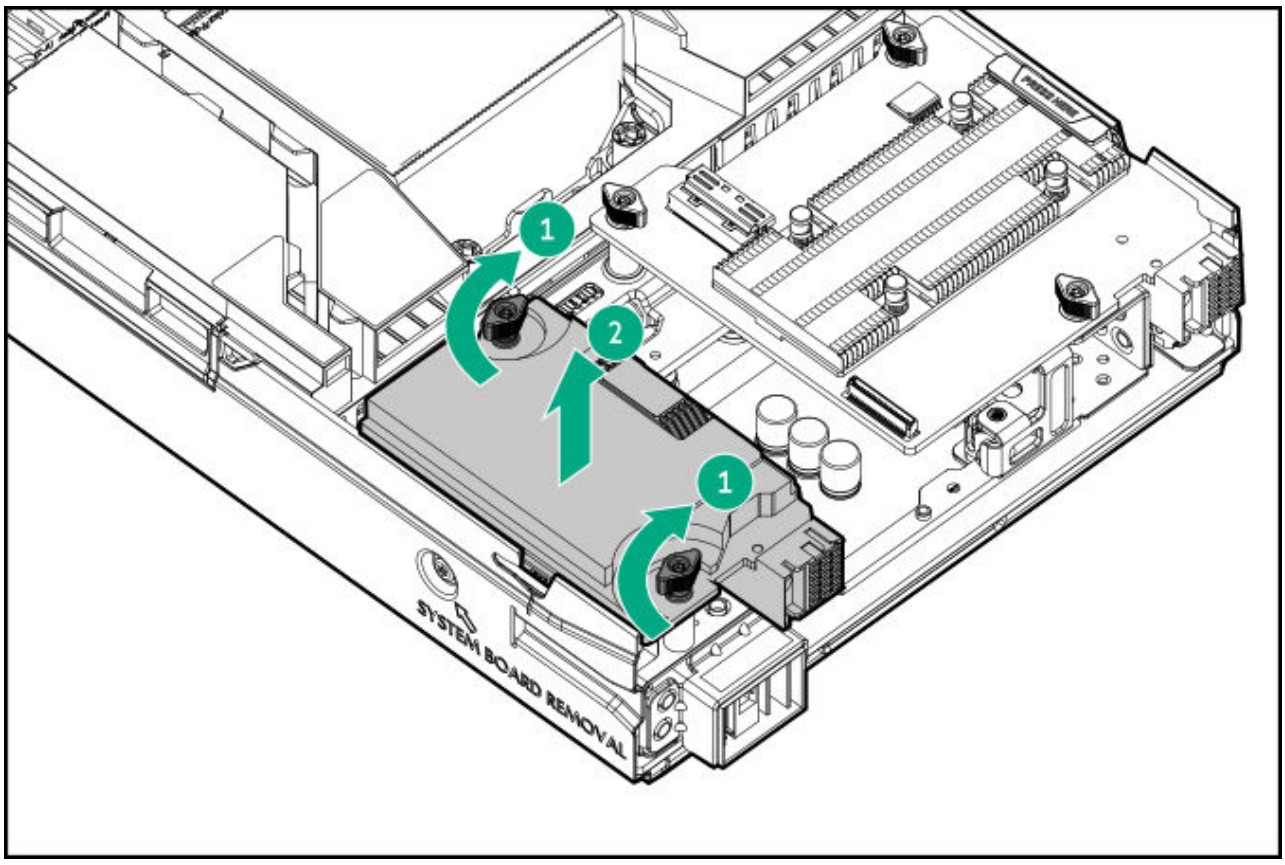
Subtopics

Installing the HPE Smart Storage Hybrid Capacitor

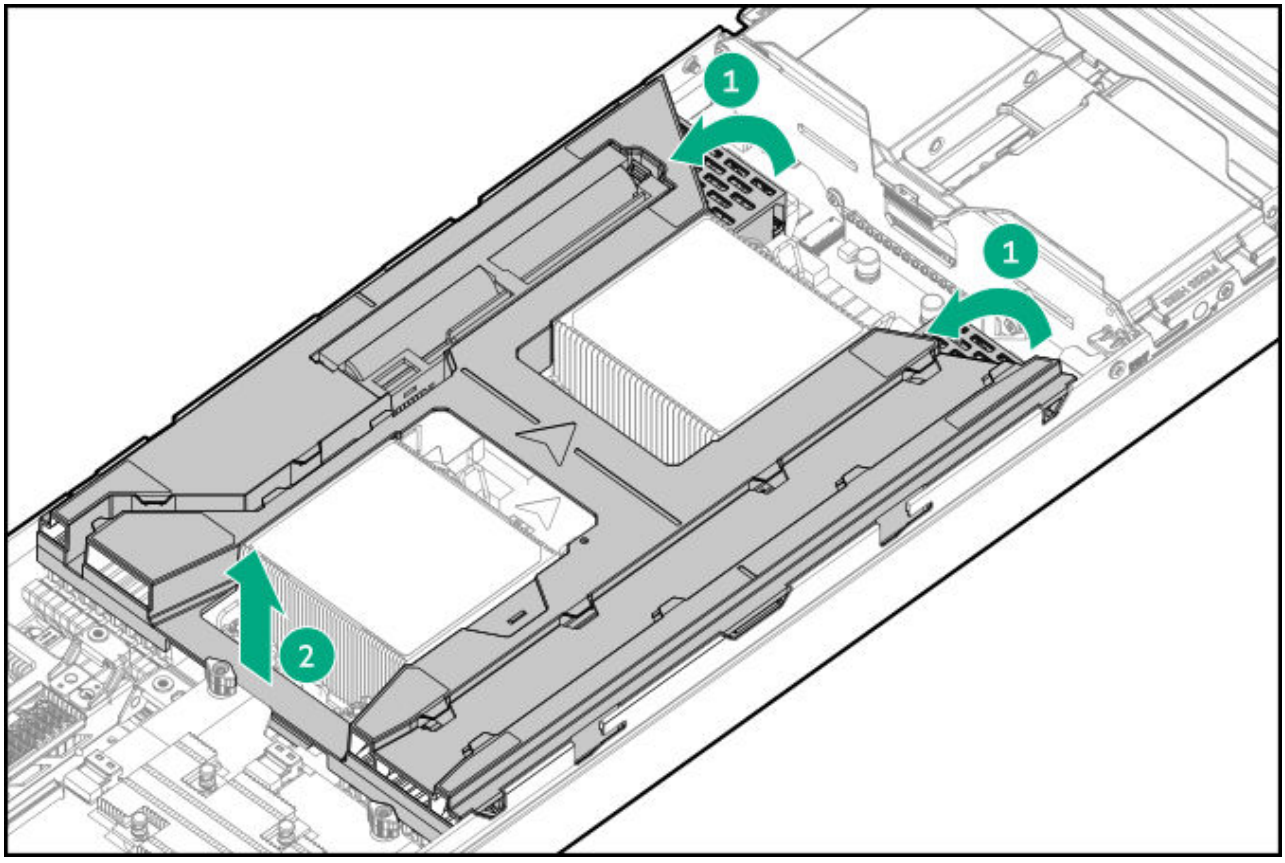
Installing the HPE Smart Storage Hybrid Capacitor

Procedure

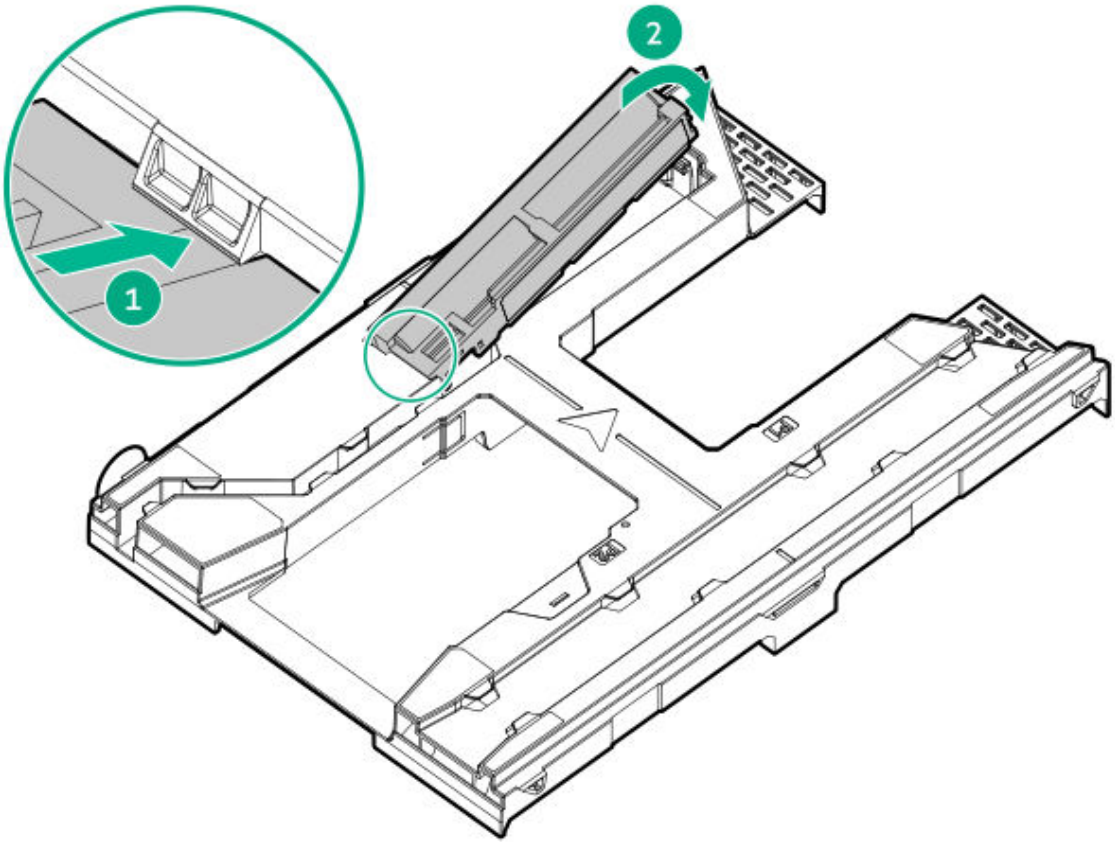
1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Remove the access panel.
5. If present, remove the mezzanine 3 option card.



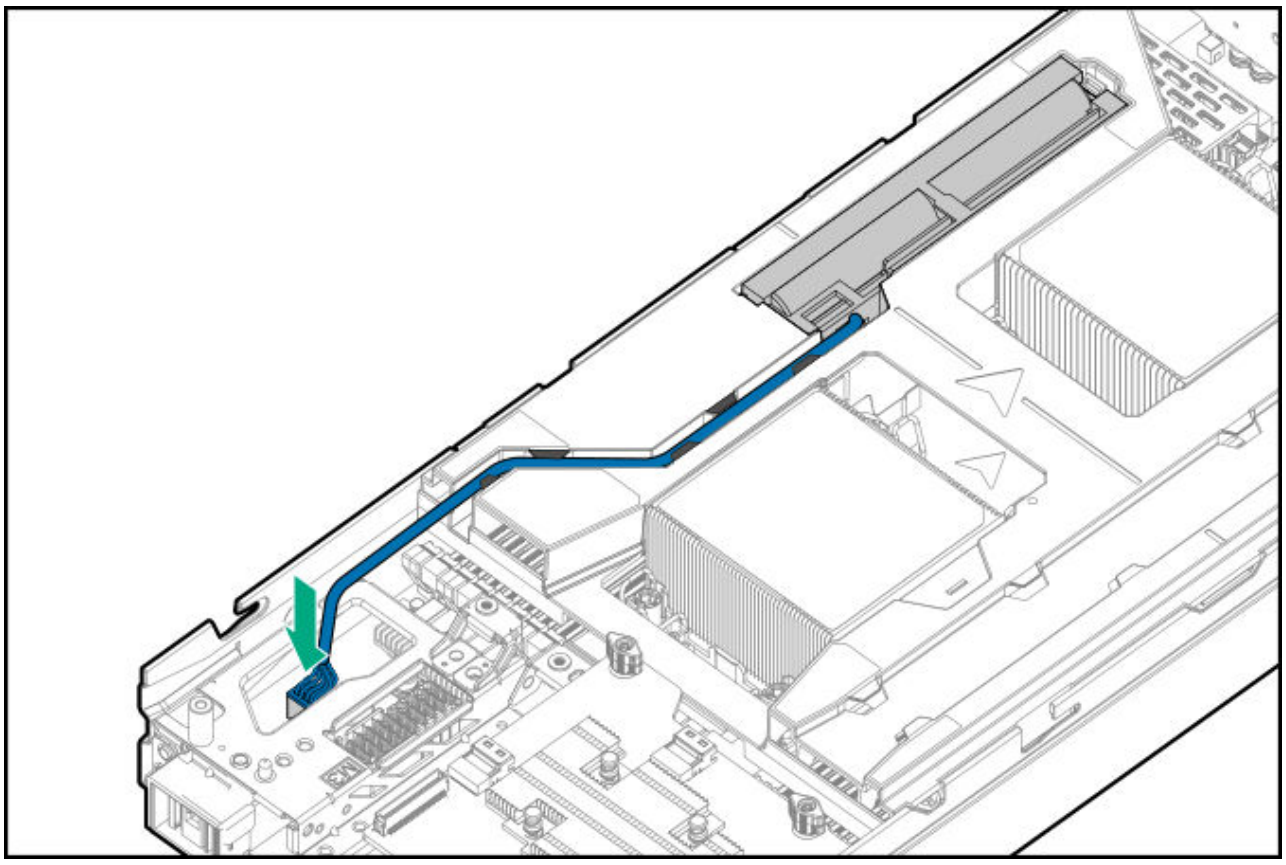
6. Remove the DIMM baffle from the system board.



7. Install the HPE Smart Storage Hybrid Capacitor.



8. Install the DIMM baffle.
9. Connect the HPE Smart Storage Hybrid Capacitor to the system board. To locate the HPE Smart Storage Hybrid Capacitor connector, see System board components.



0. Install the mezzanine option card.

Memory options

> **IMPORTANT**
> This compute module 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 compute module must be of the same type.

Subtopics

Memory population information

DIMM-processor compatibility
HPE SmartMemory speed information
Installing a DIMM

Memory population information

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

DIMM-processor compatibility

Fourth-generation Intel Xeon Scalable processors support DDR5-4800 DIMMs.

Do not mix DIMMs. Install only the supported DDR5-4800 DIMMs in the compute module.

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

Prerequisites

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

The components included with the hardware option kit.

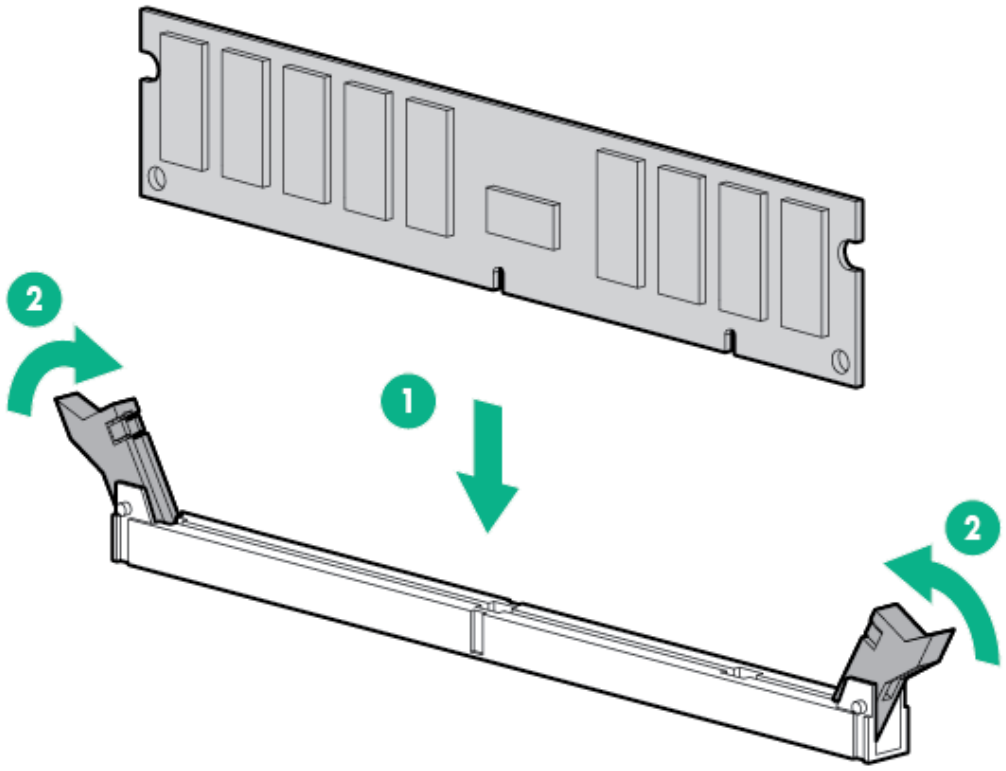
For more information on specific options, see the compute module QuickSpecs on the **Hewlett Packard Enterprise website**.

About this task

The server supports up to 32 DIMMs.

Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Remove the access panel.
5. Turn the DIMM baffle over.
6. Open the DIMM slot latches.
7. Install the DIMM.



8. Install the DIMM baffle.

Results

Use the BIOS/Platform Configuration (RBSU) in the UEFI System Utilities to configure the memory mode.

Trusted Platform Module

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

The TPM is embedded on the server system board.

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

Retaining the BitLocker 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 compute module.
- Do not save the recovery key/password on the encrypted hard drive.

Cabling

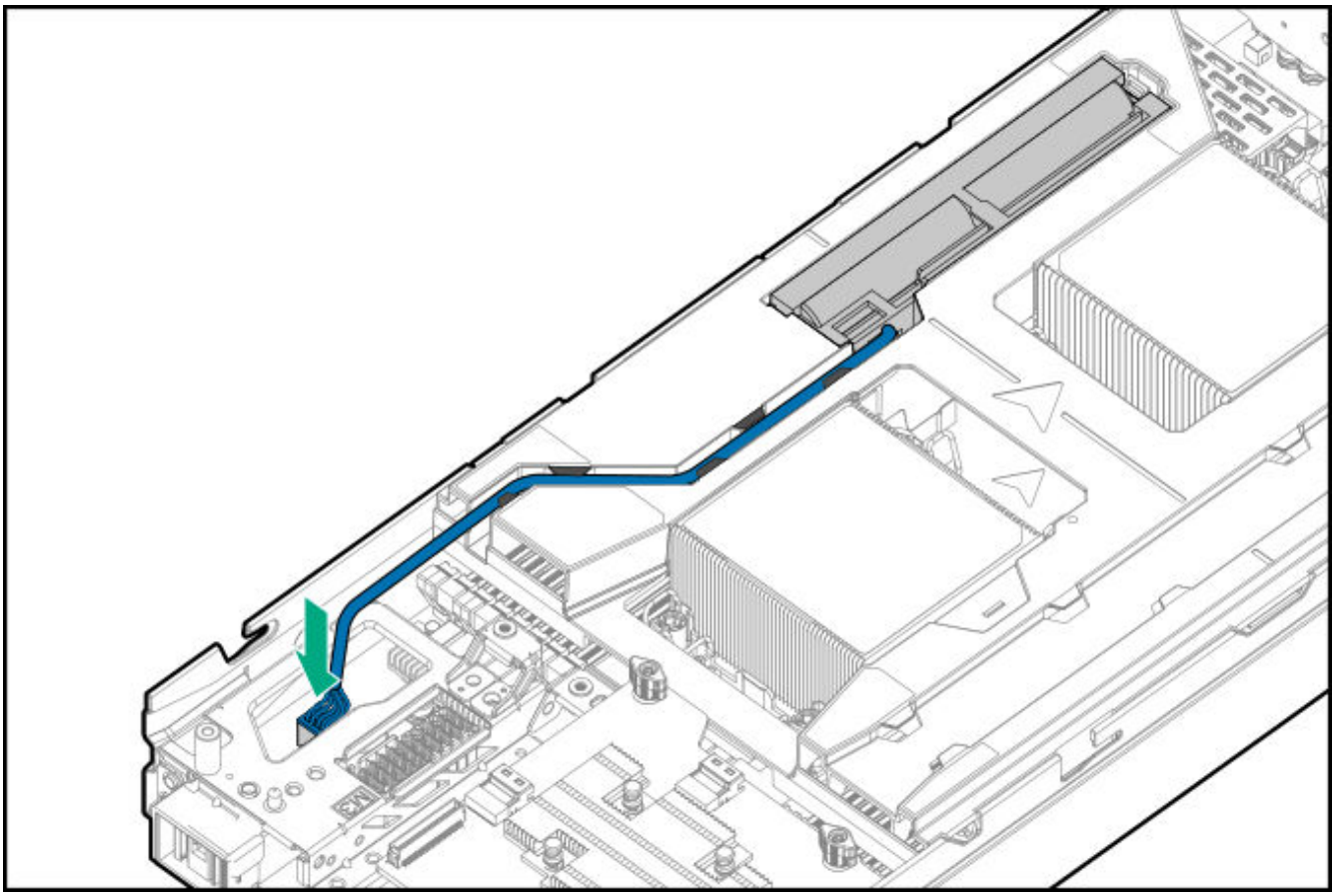
Subtopics

Cabling resources
HPE Smart Storage Hybrid Capacitor cabling
Cabling for the drive kits

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 (**https://www.hpe.com/info/qs**).

HPE Smart Storage Hybrid Capacitor cabling



Plug the HPE Smart Storage Hybrid Capacitor into the port located under the mezzanine option card.

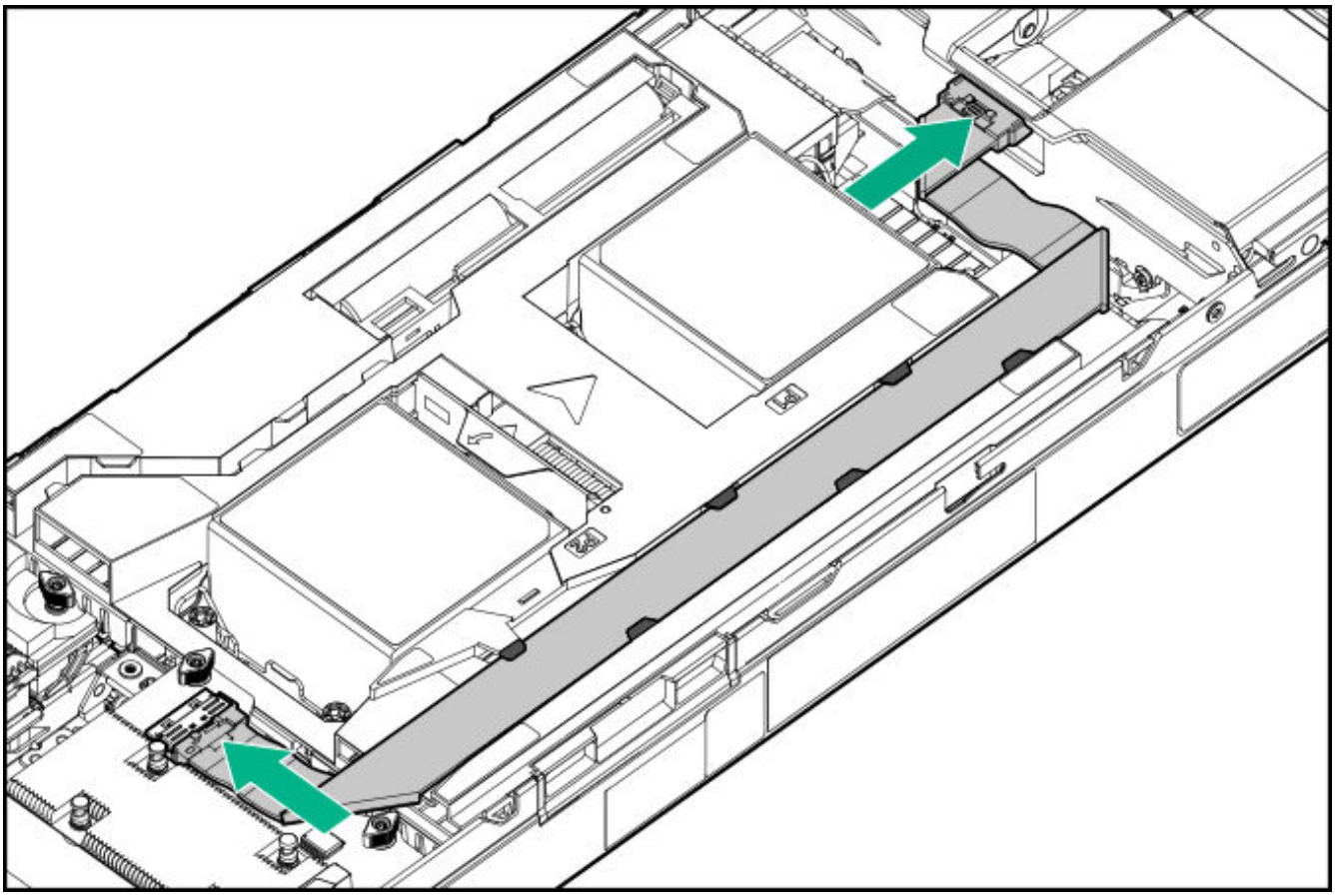
Cabling for the drive kits

Subtopics

Cabling for the 2SFF and 4SFF tri-mode premium drive cage kits

Cabling for the 2SFF and 4SFF tri-mode premium drive cage kits

Connect the 2SFF and 4SFF tri-mode premium drive kits with an MCIO cable to the drive assembly and the HPE SR416ie-m Gen11 controller.



Removing and replacing the system battery

Prerequisites

About this task

If the compute module no longer automatically displays the correct date and time, replace the system battery. The system battery provides power to the real-time clock. Under normal use, battery life is 5–10 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:

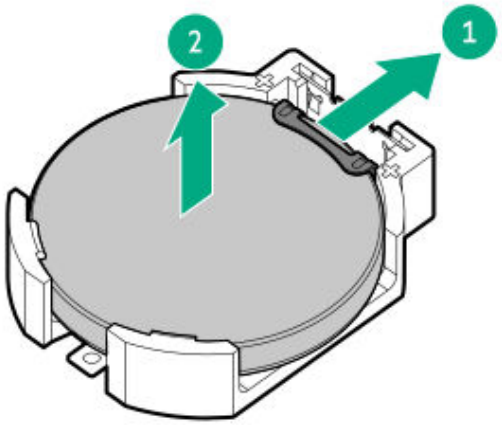
- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace only with the spare designated for this product.

IMPORTANT

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

Procedure

1. Power down the compute module.
2. Remove the compute module.
3. Place the compute module on a flat, level work surface.
4. Remove the access panel.
5. Remove all drives.
6. Remove the drive cage assembly.
7. Locate the battery. See the system board components.
8. Remove the battery.



IMPORTANT

Replacing the system board battery resets the system ROM to its default configuration. After replacing the battery, use HPE OneView or BIOS/Platform Configuration (RBSU) in the UEFI System Utilities to reconfigure the system.

Results

To replace the component, reverse the removal procedure.

Electrostatic discharge

Subtopics

Preventing electrostatic discharge
Grounding methods to prevent electrostatic discharge

Preventing electrostatic discharge

About this task

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

Procedure

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

Grounding methods to prevent electrostatic discharge

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

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ±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 Support Center**.

Specifications

For more information:

- **Extended ambient temperature guidelines: Extended Ambient Temperature Guidelines for Gen10 Plus HPE ProLiant and HPE Apollo servers and HPE Synergy**

- **Cable specifications: HPE Compute Transceiver and Cable Hardware Matrix**

Subtopics

Compute module environmental specifications
Compute module physical specifications

Compute module environmental specifications

Specification	Value
Temperature range*	—
Operating	10°C to 35°C (50°F to 95°F)
Non-operating	-30°C to 60°C (-22°F to 140°F)
Relative humidity (noncondensing)**	—
Operating	8% to 90% @ -12°C - 24°C (10.4°F - 75.2°F)
Non-operating	5% to 95% relative humidity (Rh) @ 38.7°C (101.7°F), maximum wet bulb temperature, n on-condensing
Altitude†	—
Operating	3050 m (10,000 ft)
Non-operating	9144 m (30,000 ft)

* The following temperature conditions and limitations apply:

- All temperature ratings shown are for sea level.
- An altitude derating of 1°C per 305m (1.8°F per 1,000.7 ft) above sea level
- 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.

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

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

Compute module physical specifications

The following details physical specifications for the HPE Synergy 480 Gen11 Compute Module.

Specification	Value
Height	63.60 mm (2.50 in)
Depth	606.50 mm (23.88 in)
Width	214.00 mm (8.43 in)
Weight (maximum)	9.01 kg (19.86 lb)
Weight (minimum)	6.57 kg (14.50 lb)

HPE Synergy documentation resources

The Hewlett Packard Enterprise Support Center provides a comprehensive, one stop location for all HPE Synergy documentation, including installation instructions, maintenance and service guides, best practices, and links to additional resources. It supports filtering to improve findability.

Subtopics

HPE Synergy firmware update resources

HPE Synergy firmware update resources

Several resources are available to assist you with updating firmware for the HPE Synergy solution. The HPE Synergy Software Release Information **site** provides interactive tools for firmware update information. In addition, you can use the HPE Synergy Software Releases - Overview page, available on the site, to access downloads for HPE Synergy software. Additional resources are also available within HPE OneView.

HPE Synergy documentation map

The Hewlett Packard Enterprise Support Center provides access to the HPE Synergy documentation. For quick links to different HPE Synergy document types, see **HPE Synergy Documentation Quick Links**.

In addition, the **HPE Synergy Software Release Information** site provides an interactive resource for software release information.

You can access drivers, manuals, and parts at **Hewlett Packard Enterprise Support Center**.

Software Release Information

HPE Synergy Software Release Information site, which include release information, such as:

- What's new with HPE Synergy releases
- Management combinations
- HPE Synergy Service Packs (SSPs)
- Operating systems
- Comparison tools
- Useful links

Managing

- **HPE OneView User Guide for HPE Synergy**
- **HPE OneView Best Practices Guide for Deployment and Management**
- **HPE Synergy Frame Link Module User Guide**

Planning

- **HPE Synergy Migration Guide**
- **HPE Synergy 12000 Frame Site Planning Guide**
- **HPE Synergy Configuration and Compatibility Guide**
- **HPE OneView Support Matrix for HPE Synergy**
- **HPE Synergy Power Management Overview**

Monitoring

- **HPE OneView User Guide for HPE Synergy**
- **HPE OneView Global Dashboard User Guide**

Installing hardware

- HPE Synergy Start Here Poster (included with frame)
- Rack Rails Installation Instructions for the HPE Synergy 12000 Frame (included with frame)

Maintaining

- Product maintenance and service guides
- **HPE OneView User Guide for HPE Synergy**

- HPE Synergy 12000 Frame Rack Template (included with frame)
- Hood labels
- **HPE Synergy Cabling Guide**
- **HPE OneView User Guide for HPE Synergy**—Quick Start: Initial hardware setup

- **HPE Synergy Appliances Maintenance and Service Guide**
- **HPE Synergy Appliances Maintenance and Service Guide for HPE Synergy Composer2**

Configuring for managing and monitoring

- **HPE OneView User Guide for HPE Synergy**
- **HPE OneView API Reference Quick Links**
- **HPE Synergy Software Release Information** site, which includes release information, such as:
  - What's new with HPE Synergy releases
  - Management combinations
  - HPE Synergy Service Packs (SSPs)
  - Operating systems
  - Comparison tools
  - Useful links

Troubleshooting

- HPE Synergy Troubleshooting Guide for Gen11
- HPE Synergy Troubleshooting Guide for Gen9, Gen10, and Gen10 Plus
- **Integrated Management Log Messages and Troubleshooting Guide for HPE ProLiant Gen11 servers and HPE Synergy**
- **HPE OneView Alerts User Guide for HPE Synergy**

Websites

HPE Synergy 480 Gen11 Compute Module Documentation

https://www.hpe.com/info/synergy480gen11-docs

HPE Synergy Documentation Quick Links

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

HPE Synergy Software Release Information

https://www.hpe.com/info/synergy-sw-release-information

For additional websites, see Support and other resources.

Support and other resources

Subtopics

Accessing Hewlett Packard Enterprise Support
HPE product registration
Accessing updates
Remote support
Warranty information
Regulatory information
Documentation feedback

Accessing Hewlett Packard Enterprise Support

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

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

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

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

Information to collect

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

HPE product registration

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

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

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

Accessing updates

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

  Hewlett Packard Enterprise Support Center

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

  Hewlett Packard Enterprise Support Center: Software downloads

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

  My HPE Software Center

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

- To subscribe to eNewsletters and alerts:

  https://www.hpe.com/support/e-updates

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

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

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

Remote support

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

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

HPE Get Connected

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

HPE Tech Care Service

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

HPE Complete Care

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

Warranty information

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

Regulatory information

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

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

Additional regulatory information

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

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

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

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

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

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

Documentation feedback

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