Dell EMC PowerEdge C4140

Installation and Service Manual

D≪LL Technologies

Notes, cautions, and warnings

(i) **NOTE:** A NOTE indicates important information that helps you make better use of your product.

△ **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

△ **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

Contents

About this document

This document provides an overview about the system, information about installing and replacing components, technical specifications, diagnostic tools, and guidelines to be followed while installing certain components.

Dell EMC PowerEdge C4140 system overview

The Dell EMC PowerEdge C4140 system is a 1U, dual socket rack system supports up to:

● Two Intel Xeon Scalable processors
● Twenty four DIMM slots
● Storage capacity of four Graphical Processing Units
● Two power supply units (PSUs)
● Optional two 2.5-inch cabled SATA SSDs installed only in PSU 2 bay

Table 1. C4140 system options

System Options	No of Proces sors	No of GPUs	GPU form Factor	Processor - GPU PCIe Link(s)	(*)Optional Add-In Cards
Configuration B	2	4 (x16 Slot)	PCIe	(1) x16 Link	(2) x16 AIC PCIe
Configuration C	2	4 (x16 Slot)	PCIe	(4) x16 Links	(2) x16 AIC PCIe
Configuration G	2	4 (x16 Slot)	PCIe	(2) x16 Links	(2) x16 AIC PCIe
Configuration K	2	4 (x16 Socket)	SXM2	(1) x16 Link	(2) x16 AIC PCIe
Configuration M	2	4 (x16 Socket)	SXM2	(4) x16 Links	(2) x16 AIC PCIe

ⓘ **NOTE:** (*) Slot #2 is reserved for BOSS card.

For more information, see the Dell EMC PowerEdge C4140 Technical Specifications on the product documentation page.

Topics:

Front view and panel of the system

Figure 1. Front view of the system

1. Control panel

For more information, see the Dell EMC PowerEdge C4140 Technical Specifications on the product documentation page.

Control panel

Figure 2. Control panel

1. Power-on indicator/power button

2. System-health indicator

3. System identification button

System diagnostics and indicator codes

Table 2. System diagnostics and indicator codes

Icon	Indicator, button, or connector	Description
⊶	Health indicator	Indicates the health of the system. ● If the system is powered on and in good health, the indicator lights solid blue. No corrective action is required. ● The indicator blinks amber if the system is on or in standby, and if any error exists (For example, a failed fan). See the System Event Log or system messages for the specific issue. For information about the event and error messages generated by the system firmware and agents that monitor system components, go to qrl.dell.com > **Look Up** > **Error Code**, type the error code, and then click **Look it up**.Invalid memory configurations can cause a blank screen or no video output. See the Getting help section.
⏻	Power-on indicator, power button	The power-on indicator lights when the system powered on. The power button controls the power supply output to the system. ⓘ **NOTE:** On ACPI-compliant operating systems, turning off the system using the power button causes the system to perform a graceful shutdown before power to the system is turned off.
ⓘ	System identification button	The identification button on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pressed, the corresponding system identification button on the back flashes until one of the buttons is pressed again. Press the system identification button to turn the system ID on or off. If the system stops responding during POST, press and hold the system ID button for more than five seconds to enter BIOS progress mode. To reset iDRAC (if not disabled in F2 iDRAC setup), press and hold the button for more than 15 seconds.
⊝	NMI button	Used to troubleshoot software and device driver errors when running certain operating systems. Use a paper clip to press this button. Use this button only if directed to do so by qualified support personnel or by the operating system documentation.

Rear view of the system
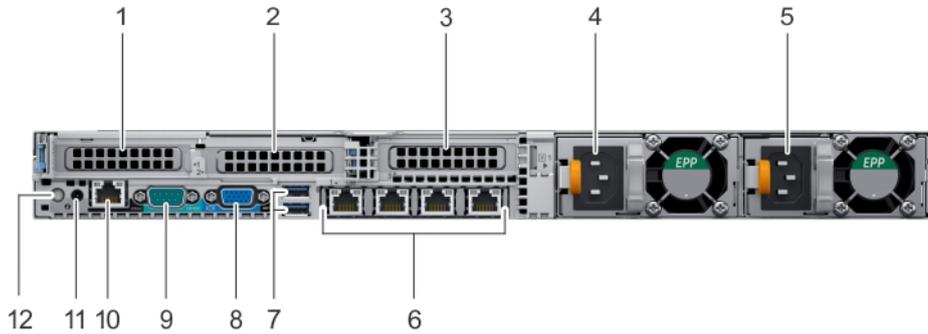
Figure 3. Rear view of the system

1. PCIe expansion card slot 1
2. PCIe expansion card slot 2
   ⓘ **NOTE:** This slot is dedicated for BOSS card.

3. PCIe expansion card slot 3
4. Power supply unit (PSU 1)
5. Power supply unit (PSU 2)
6. Ethernet connectors (4)
7. USB connectors (2)
8. Video connector
9. Serial connector
10. iDRAC Enterprise port
11. NMI button
12. System identification button

For more information, see the Dell EMC PowerEdge C4140 Technical Specifications on the product documentation page.

NIC indicator codes

Each NIC on the back of the system has indicators that provide information about the activity and link status. The activity LED indicator indicates if data is flowing through the NIC, and the link LED indicator indicates the speed of the connected network.
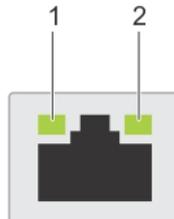
Figure 4. NIC indicator codes

1. Link LED indicator
2. Activity LED indicator

Table 3. NIC indicator codes

Status	Condition
Link and activity indicators are off.	The NIC is not connected to the network.
Link indicator is green, and activity indicator is blinking green.	The NIC is connected to a valid network at its maximum port speed, and data is being sent or received.
Link indicator is amber, and activity indicator is blinking green.	The NIC is connected to a valid network at less than its maximum port speed, and data is being sent or received.
Link indicator is green, and activity indicator is off.	The NIC is connected to a valid network at its maximum port speed, and data is not being sent or received.
Link indicator is amber, and activity indicator is off.	The NIC is connected to a valid network at less than its maximum port speed, and data is not being sent or received.

Table 3. NIC indicator codes (continued)

Status	Condition
Link indicator is blinking green, and activity is off.	NIC identify is enabled through the NIC configuration utility.

Power supply unit indicator codes

AC power supply units (PSUs) have an illuminated translucent handle that serves as an indicator. The indicator shows whether power is present or if a power fault has occurred.

(i) **NOTE:** The 2400 W and 2000 W PSUs use a C20 connector.
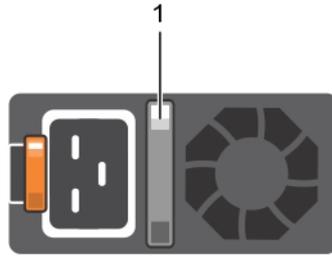
Figure 5. AC PSU status indicator

1. AC PSU status indicator/handle

Table 4. AC PSU status indicator codes

Power indicator codes	Condition
Green	A valid power source is connected to the PSU and the PSU is operational.
Blinking amber	Indicates a problem with the PSU.
Not illuminated	Power is not connected to the PSU.
Blinking green	When the firmware of the PSU is being updated, the PSU handle blinks green. ⚠ **CAUTION: Do not disconnect the power cord or unplug the PSU when updating firmware. If firmware update is interrupted, the PSUs do not function.**
Blinking green and turns off	When hot-plugging a PSU, the PSU handle blinks green five times at a rate of 4 Hz and turns off. This indicates a PSU mismatch with respect to efficiency, feature set, health status, or supported voltage. ⚠ **CAUTION: If two PSUs are installed, both the PSUs must have the same type of label; for example, Extended Power Performance (EPP) label. Mixing PSUs from previous generations of PowerEdge servers is not supported, even if the PSUs have the same power rating. This results in a PSU mismatch condition or failure to turn the system on.** ⚠ **CAUTION: When correcting a PSU mismatch, replace only the PSU with the blinking indicator. Swapping the PSU to make a matched pair can result in an error condition and unexpected system shutdown. To change from a high output configuration to a low output configuration or vice versa, you must turn off the system.** ⚠ **CAUTION: The 120 V AC PSU is not recommended for this system and using the same can cause system throttling.** ⚠ **CAUTION: If two PSUs are used, they must be of the same type, operate from the same line voltage, and have the same maximum output power.**

Locating Service Tag of your system

Your system is identified by a unique Express Service Code and Service Tag number. The Express Service Code is and Service Tag are found on the back of the system by pulling out the information tag. Alternatively, the information may be on a sticker on the chassis of the system. This information is used by Dell EMC to route support calls to the appropriate personnel.
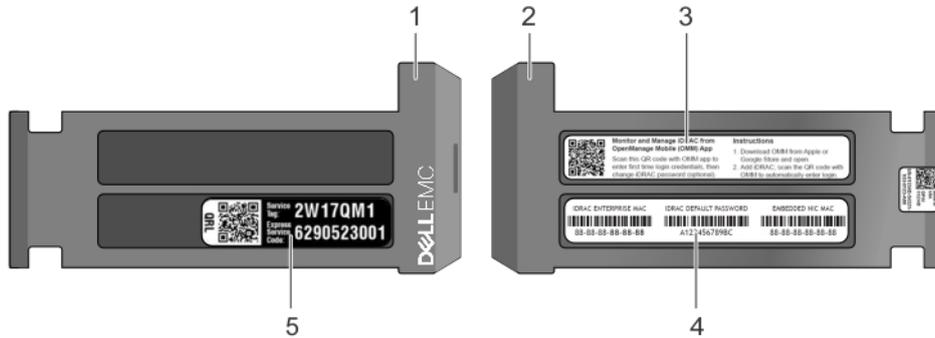
Figure 6. Locating Service Tag of your system

1. Information tag (top view)
2. Information tag (back view)
3. OpenManage Mobile (OMM) label
4. iDRAC MAC address and iDRAC secure password label
5. Service Tag

Inside the system

The 2.5-inch drive cage is completely independent of the GPU configuration of the system and is supported on the switchboard, NVLink, or cabled configuration (B, C, G, K, and M).

The optional two 2.5-inch cabled SATA SSDs is installed only in PSU 2 bay.
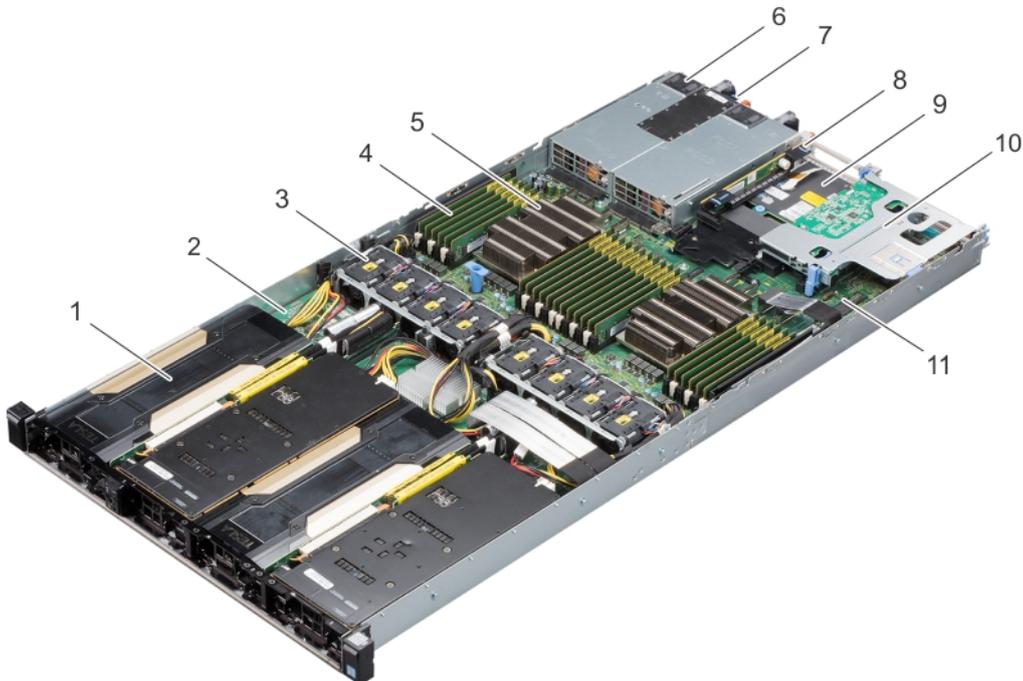
Figure 7. Configuration B

1. PCIe GPU (4)
2. PCIe switch board
3. Cooling fan (8)
4. DIMMs (24)
5. Processor and heat sink (2)
6. PSU (2)
7. Information tag
8. Riser 2A (Low-profile PCIe expansion card: Slot 3)

9. Network daughter card (NDC)   10. Riser 1A (Low-profile PCIe expansion cards: Slots 1 and 2)
11. System board
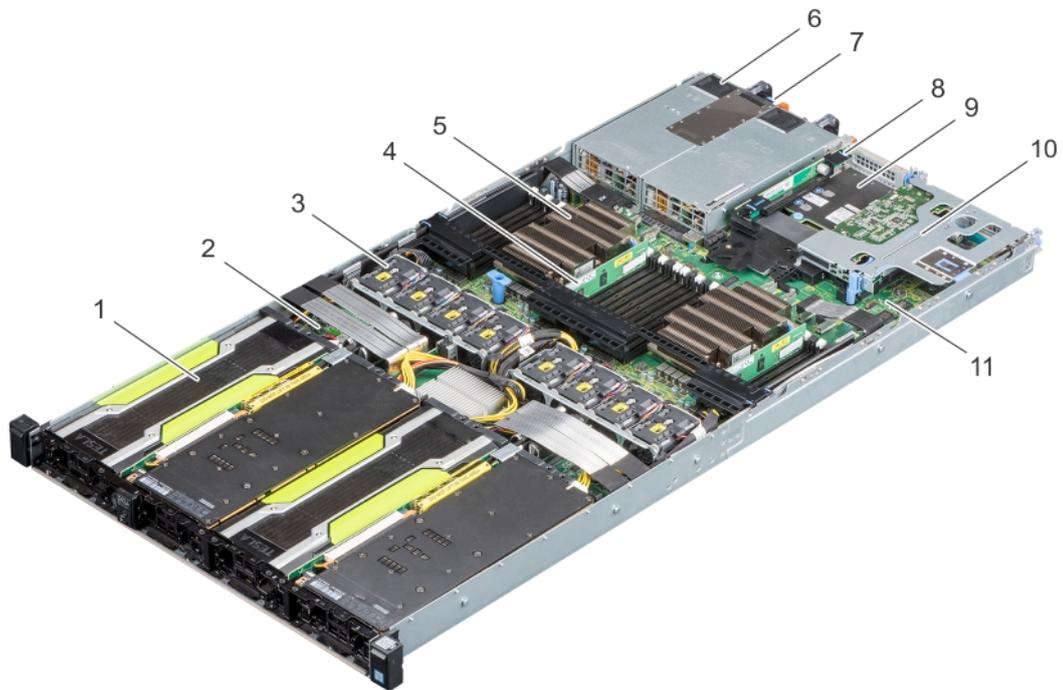
Figure 8. Configuration G

1. PCIe GPU (4)   2. PCIe switch board
3. Cooling fan (8)   4. DIMMs (24)
5. Processor and heat sink (2)   6. PSU (2)
7. Information tag   8. Riser 2A (Low-profile PCIe expansion card: Slot 3)
9. Network daughter card (NDC)   10. Riser 1A (Low-profile PCIe expansion cards: Slots 1 and 2)
11. System board
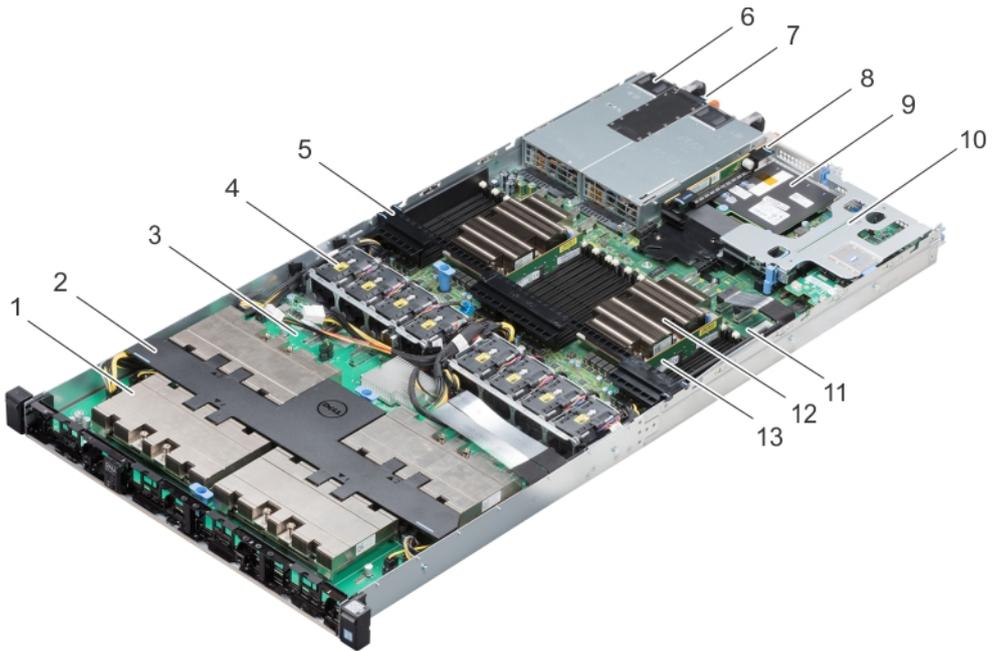
Figure 9. Configuration K

1. NVLink Heat sink and processor (4)
2. NVLink air shroud
3. NVLink board
4. Cooling fan (8)
5. Air shroud
6. PSU (2)
7. Information tag
8. Riser 2A (Low-profile PCIe expansion card: Slot 3)
9. Network daughter card (NDC)
10. Riser 1A (Low-profile PCIe expansion cards: Slots 1 and 2)
11. System board
12. Processor and heat sink (2)
13. DIMMs (24)
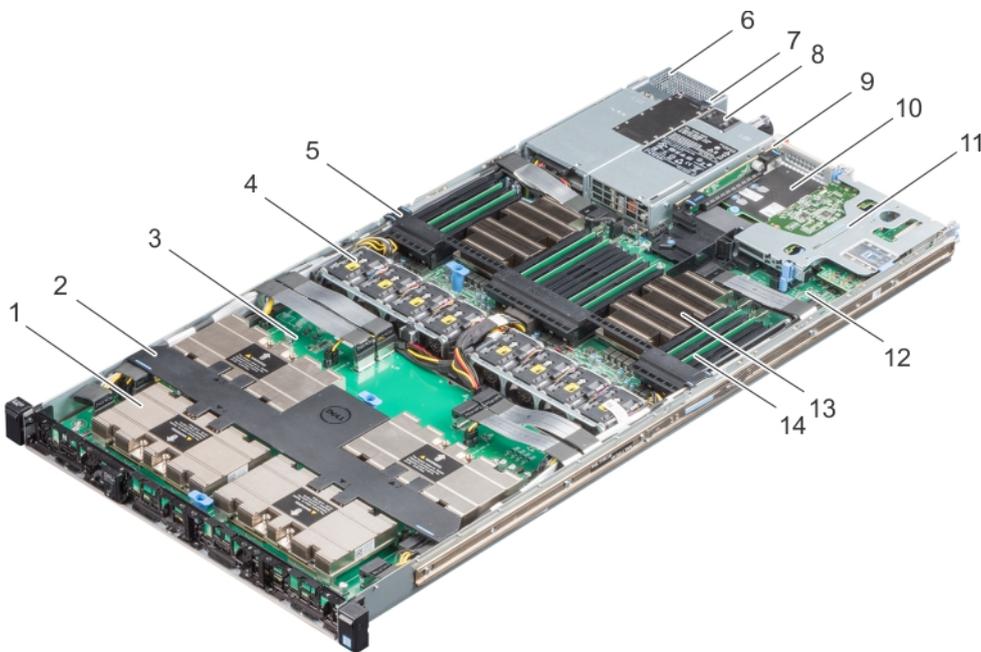
Figure 10. Configuration M

1. NVLink Heat sink and processor (4)
2. NVLink air shroud
3. NVLink board
4. Cooling fan (8)
5. Air shroud
6. Rear SATA SSD cage

7. Information tag
8. PSU
9. Riser 2A (Low-profile PCIe expansion card: Slot 3)
10. Network daughter card (NDC)
11. Riser 1A (Low-profile PCIe expansion cards: Slots 1 and 2)
12. System board
13. Processor and heat sink (2)
14. DIMMs (24)

System information label
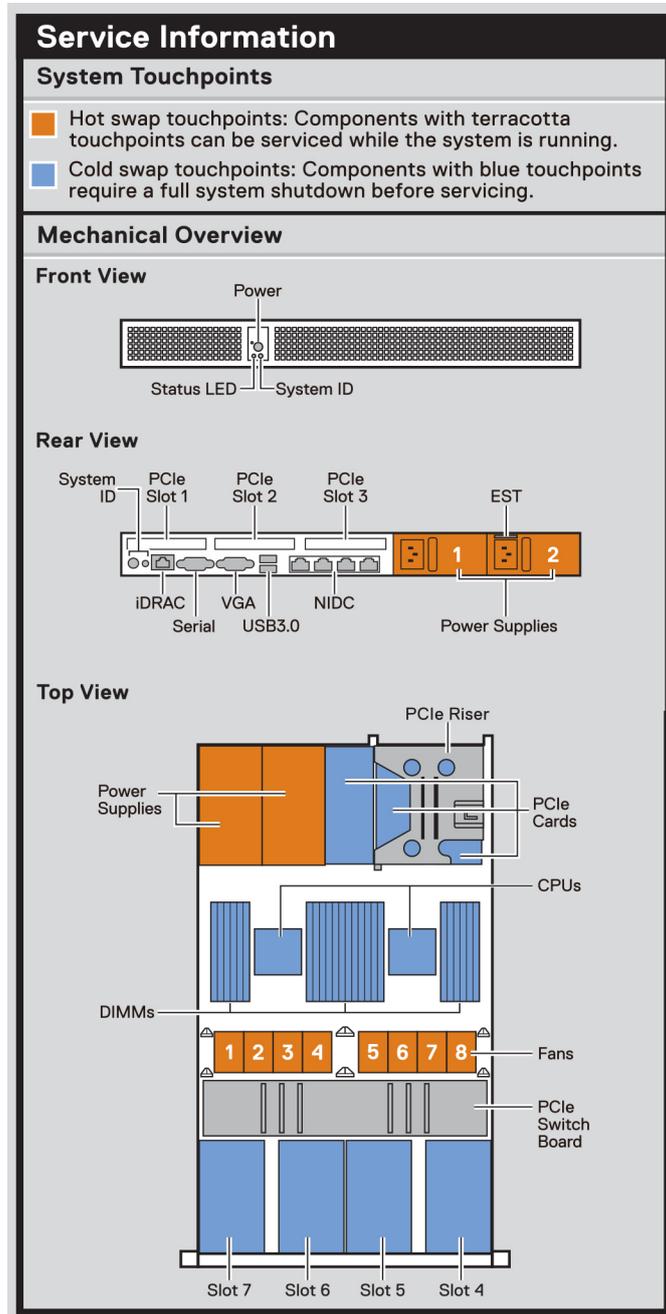
Figure 11. PowerEdge C4140 – Service information

Memory Information

⚠️ **Caution:** Memory (DIMMs) and CPUs may be hot during servicing.

B6 B5 B4   B1 B2 B3 A6 A5 A4   A1 A2 A3
B12 B11 B10   B7 B8 B9 A12 A11 A10   A7 A8 A9

◇ 2   ◇ 1
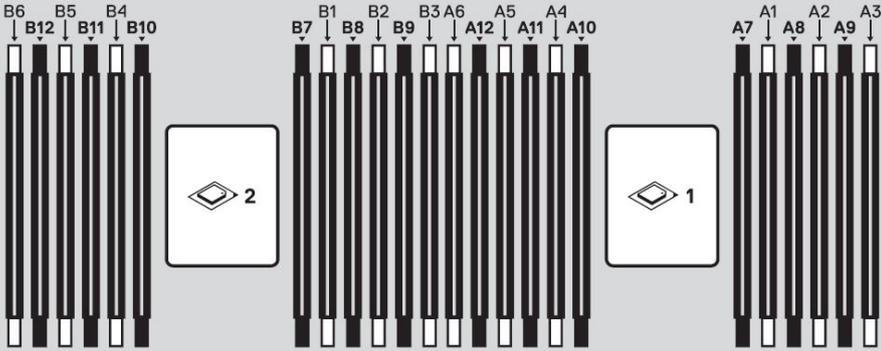
Memory Population

Configuration	Sequence
Memory-Optimized, exactly 4 or 8 DIMMs per socket	1, 2, 4, 5, 7, 8, 10, 11
Memory-Optimized, all other DIMM configs	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Mirroring	(1, 2, 3, 4, 5, 6) (7, 8, 9, 10, 11, 12)

Latest population rules and Memory Sparing details are documented in the *Installation and Service Manual*.

Icon Legend

|⟆| VGA Display	⊐	PCI
|⟊|⟊| Serial	⚡	Power Supply
◇	CPU	⊘	Reset (NMI)
EST	Express Service Tag	SS⟿	USB 3.0
✿	Fan	⎍⎄	Status
▨	Memory Bank	ⓘ	System ID

Figure 12. Memory information
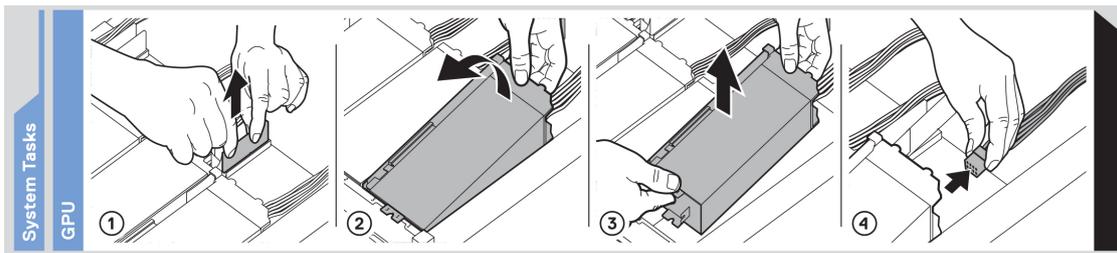
Figure 13. GPU installation
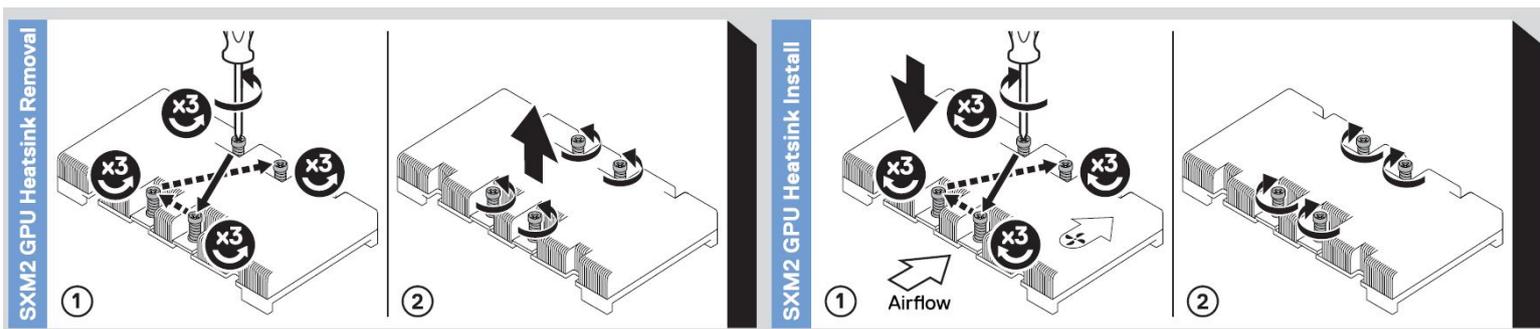
Figure 14. SXM2 GPU heat sink removal and installation
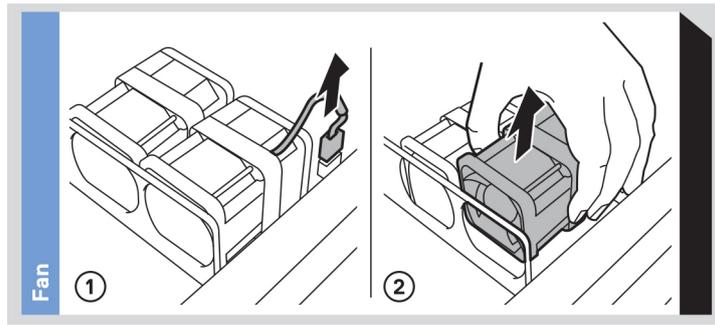
Figure 15. System fan removal
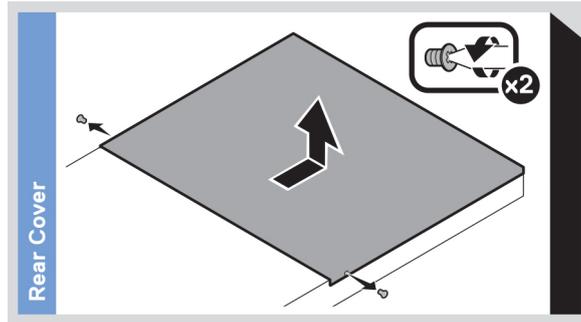
Figure 16. Rear cover removal

Figure 17. NVLink board

Electrical Overview

System Board Connections

#	Component	#	Component	#	Component
1	Riser 1	16	Slot 4 Power	31	CPU2 M3
2	TPM Module	17	Fan 7	32	CPU2 M2
3	Coin Cell Battery	18	Fan 6	33	PSU 1
4	CPU1 S1	19	Intrusion Cable	34	Internal USB 3.0
5	CPU1 S2	20	Fan 5	35	IDSDM+vFlash
6	CPU1 S4	21	Switch Board Power	36	Riser 2
7	CPU1 S3	22	Slot 6 Power	37	NDC
8	CPU2 DIMM Ch 3/4/5	23	Fan 4		
9	CPU2	24	Fan 3		
10	CPU2 DIMM Ch 0/1/2	25	Fan 2		
11	CPU1 DIMM Ch 3/4/5	26	Fan 1		
12	CPU1	27	Slot 7 Power		
13	CPU1 DIMM Ch 0/1/2	28	CPU2 M1		
14	Slot 5 Power	29	CPU2 M4		
15	Fan 8	30	PSU 2		

Jumper Settings

Jumper	Setting	Description
PWRD_EN	(default)	BIOS password is enabled.
		BIOS password is disabled. iDRAC local access unlocked at next AC power cycle. iDRAC password reset is enabled in F2 iDRAC settings menu.
NVRAM_CLR	(default)	BIOS configuration settings retained at system boot.
		BIOS configuration settings cleared at system boot.

Figure 18. System board connections

Signal and Power Cable Routing

■ Signal cable   ■ Power cable

PCIe Switchboard Configuration B
CPU2   CPU1
PCIe Switch Board
Slot 7   Slot 6   Slot 5   Slot 4

PCIe Switchboard Configuration G
CPU2   CPU1
Slot 7   Slot 6   Slot 5   Slot 4

PCIe Direct Attach Configuration C
CPU2   CPU1
Slot 7   Slot 6   Slot 5   Slot 4
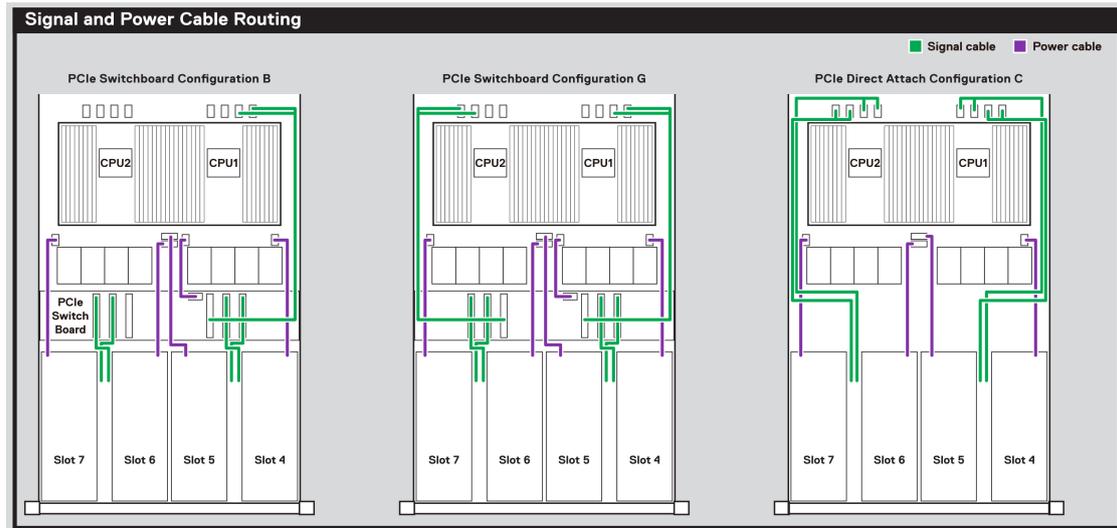
Figure 19. Signal and power cable routing for configurations B, C and G

Signal and Power Cable Routing

Signal cable Power cable

SXM2 Configuration K

SXM2 Configuration M
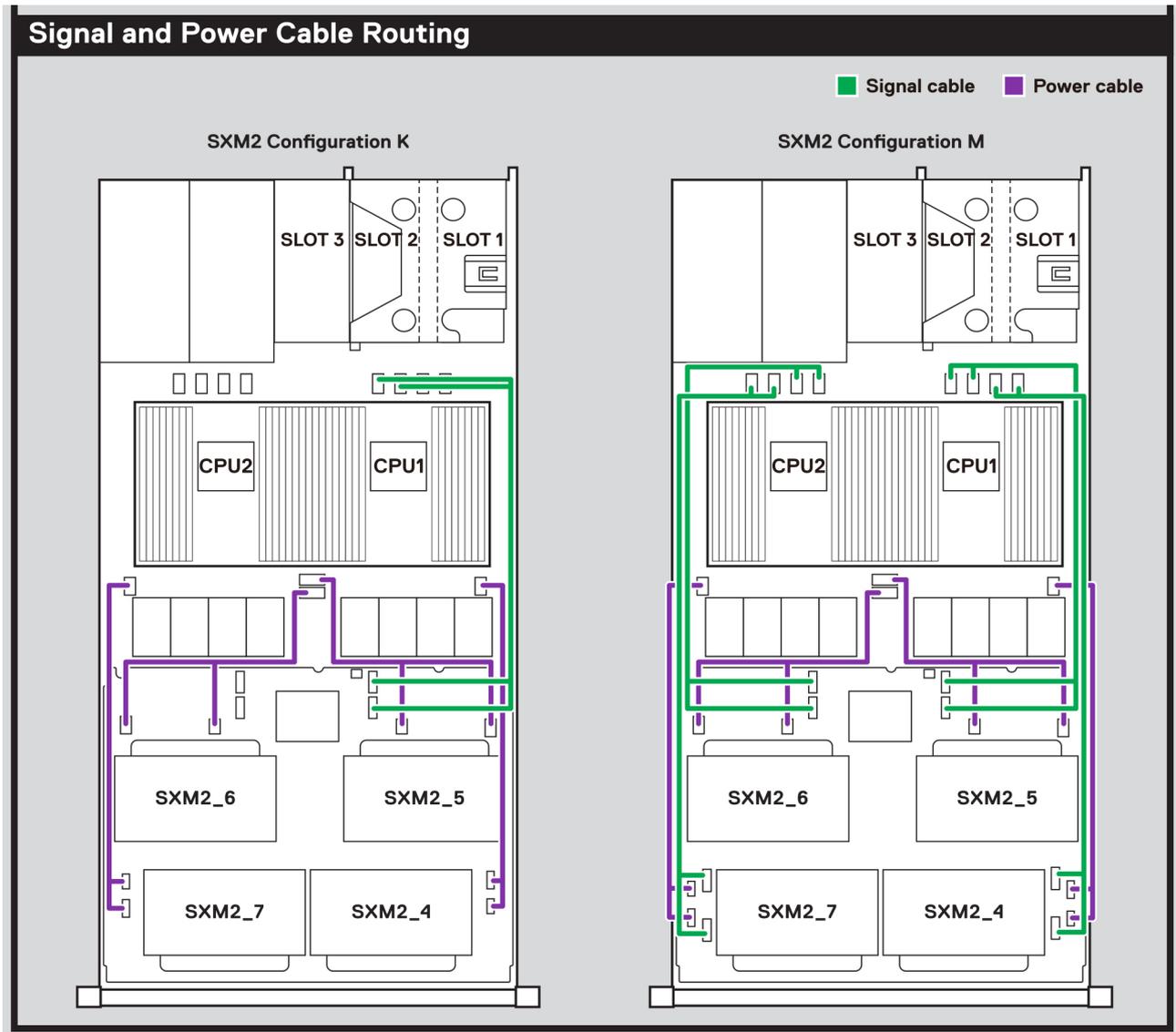
Figure 20. Signal and power cable routing for configurations K and M

Service Information

Remove these six parts before releasing the system board.

1 PCIE Guide
2 NDC Guide
3 PCH Shroud Base
4 Left Cable Guide
5 PCH Shroud
6 Right Cable Guide
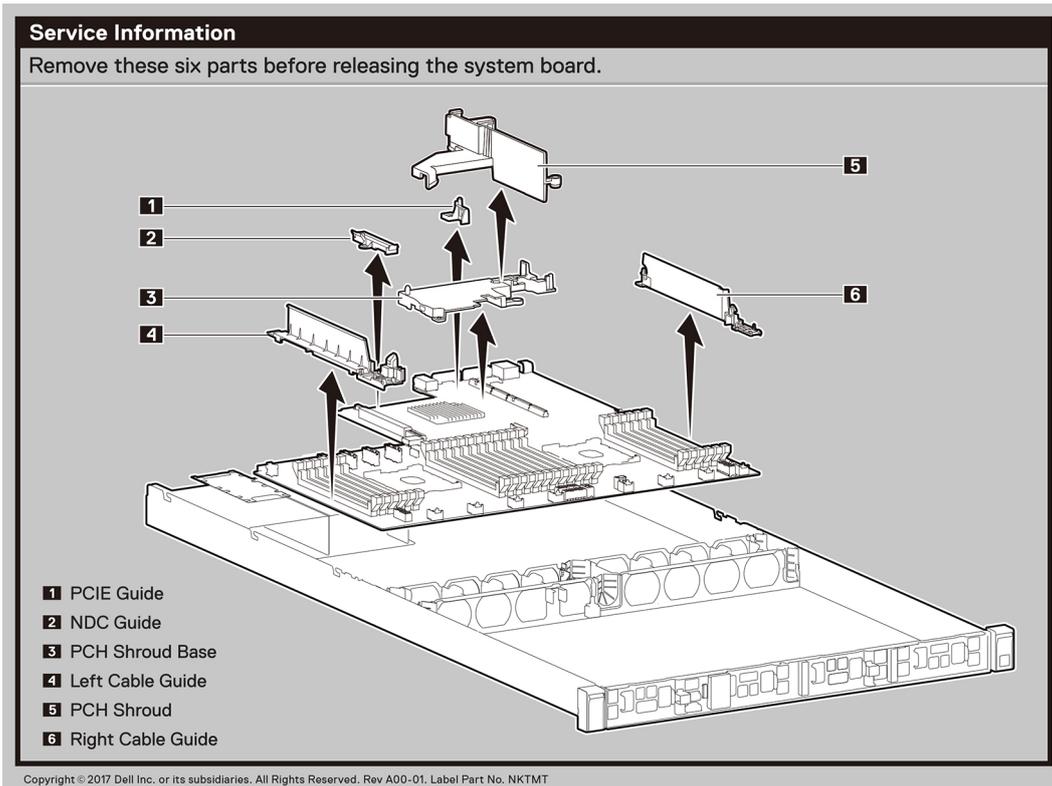
Figure 21. System board removal

3

Initial system setup and configuration

Topics:

- Setting up your system
- iDRAC configuration
- Options to install the operating system

Setting up your system

Perform the following steps to set up your system:

Steps

1. Unpack the system.
2. Install the system into the rack. For more information about installing the system into the rack, see the *Rail Installation Guide* at www.dell.com/poweredgemanuals.
3. Connect the peripherals to the system.
4. Connect the system to its electrical outlet.
5. Power on the system by pressing the power button or by using iDRAC.
6. Power on the attached peripherals.

   For more information about setting up your system, see the *Getting Started Guide* that shipped with your system.

   For information on how to manage basic settings and features of the system, see the Dell EMC PowerEdge C4140 BIOS and UEFI Reference Guide on the product documentation page.

iDRAC configuration

The Integrated Dell Remote Access Controller (iDRAC) is designed to make system administrators more productive and improve the overall availability of Dell systems. iDRAC alerts administrators about system issues and enables them to perform remote system management. This reduces the need for physical access to the system.

Options to set up iDRAC IP address

To enable communication between your system and iDRAC, you must first configure the network settings based on your network infrastructure.

(i) **NOTE:** For static IP configuration, you must request for it at the time of purchase.

This option is set to **DHCP** by Default. You can set up the IP address by using one of the following interfaces:

Interfaces	Document/Section
iDRAC Settings utility	*Dell Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals
Dell Deployment Toolkit	*Dell Deployment Toolkit User's Guide* at www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Dell Lifecycle Controller	*Dell Lifecycle Controller User's Guide* at www.dell.com/poweredgemanuals

Log in to iDRAC

You can log in to iDRAC as:
- iDRAC user
- Microsoft Active Directory user
- Lightweight Directory Access Protocol (LDAP) user

If you have opted for secure default access to iDRAC, you must use the iDRAC secure default password available on the system Information tag. If you have not opted for secure default access to iDRAC, then use the default user name and password —root and calvin. You can also log in by using your Single Sign-On or Smart Card.

(i) **NOTE:** You must have the iDRAC credentials to log in to iDRAC.

(i) **NOTE:** Ensure that you change the default username and password after setting up the iDRAC IP address.

For more information about logging in to the iDRAC and iDRAC licenses, see the latest *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals.

You can also access iDRAC by using RACADM. For more information, see the *RACADM Command Line Interface Reference Guide* at www.dell.com/poweredgemanuals.

Options to install the operating system

If the system is shipped without an operating system, install a supported operating system by using one of the following resources:

Table 5. Resources to install the operating system

Resources	Location
iDRAC	www.dell.com/idracmanuals
Lifecycle Controller	www.dell.com/idracmanuals > Lifecycle Controller
OpenManage Deployment Toolkit	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Dell certified VMware ESXi	www.dell.com/virtualizationsolutions
Installation and How-to videos for supported operating systems on PowerEdge systems	Supported Operating Systems for Dell EMC PowerEdge systems

Methods to download firmware and drivers

You can download the firmware and drivers by using any of the following methods:

Table 6. Firmware and drivers

Methods	Location
From the Dell EMC support site	www.dell.com/support/home
Using Dell Remote Access Controller Lifecycle Controller (iDRAC with LC)	www.dell.com/idracmanuals
Using Dell Repository Manager (DRM)	www.dell.com/openmanagemanuals > Repository Manager
Using Dell OpenManage Essentials	www.dell.com/openmanagemanuals > OpenManage Essentials
Using Dell OpenManage Enterprise	www.dell.com/openmanagemanuals > OpenManage Enterprise
Using Dell Server Update Utility (SUU)	www.dell.com/openmanagemanuals > Server Update Utility
Using Dell OpenManage Deployment Toolkit (DTK)	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit

Table 6. Firmware and drivers (continued)

Methods	Location
Using iDRAC virtual media	www.dell.com/idracmanuals

Downloading drivers and firmware

Dell EMC recommends that you download and install the latest BIOS, drivers, and systems management firmware on your system.

Prerequisites

Ensure that you clear the web browser cache before downloading the drivers and firmware.

Steps

1. Go to www.dell.com/support/home.
2. In the **Drivers & Downloads** section, type the Service Tag of your system in the **Enter a Service Tag or product ID** box, and then click **Submit**.

   ⓘ **NOTE:** If you do not have the Service Tag, select **Detect Product** to allow the system to automatically detect the Service Tag, or click **View products**, and navigate to your product.

3. Click **Drivers & Downloads**.
   The drivers that are applicable to your system are displayed.
4. Download the drivers to a USB drive, CD, or DVD.

4

PowerEdge C4140 installing and removing system components

Topics:

Safety instructions

ⓘ **NOTE:** Whenever you need to lift the system, get others to assist you. To avoid injury, do not attempt to lift the system by yourself.

⚠ **WARNING: Opening or removing the system cover while the system is powered on may expose you to a risk of electric shock.**

⚠ **CAUTION: Do not operate the system without the cover for a duration exceeding five minutes. Operating the system without the system cover can result in component damage.**

⚠ **CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.**

ⓘ **NOTE:** It is recommended that you always use an antistatic mat and antistatic strap while working on components inside the system.

⚠ **CAUTION: To ensure proper operation and cooling, all bays in the system and system fans must be always populated with a component or a blank.**

Before working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Power off the system and all attached peripherals.
2. Disconnect the system from the electrical outlet and disconnect the peripherals.
3. If applicable, remove the system from the rack.

   For more information, see the *Rack Installation Guide* at For additional information about environmental certifications, please refer to the Product Environmental Datasheet located with the Manuals & Documents on www.dell.com/poweredgemanuals.
4. Remove the front system cover.
5. Remove the rear system cover.

After working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Install the rear system cover.
2. Install the front system cover.
3. If applicable, install the system into the rack.

   For more information, see the *Rack Installation Guide* at For additional information about environmental certifications, please refer to the Product Environmental Datasheet located with the Manuals & Documents on www.dell.com/poweredgemanuals.
4. Reconnect the peripherals and connect the system to the electrical outlet.
5. Turn on the attached peripherals and then turn on the system.

Recommended tools

You need the following tools to perform the removal and installation procedures:
- Phillips #1 screwdriver
- Phillips #2 screwdriver
- Torx #T30 screwdriver
- Plastic scribe
- 1/4 inch flat blade screwdriver
- Wrist grounding strap connected to the ground
- ESD mat

System cover

Removing the front system cover

Prerequisites

⚠️ **CAUTION: Do not operate the system without the system cover. This can result in overheating and cause component damage.**

1. Follow the safety guidelines listed in the Safety instructions section.

2. Power off the system and all attached peripherals.
3. Disconnect the system from the electrical outlet and disconnect the peripherals.
4. If applicable, remove the system from the rack.

   (i) **NOTE:** For more information, see the *Rail Installation Guide* at www.dell.com/poweredgemanuals.

Steps

1. Using a 1/4 inch flat head or a Phillips #2 screwdriver, turn the lock on the release-latch counterclockwise to the unlock position.
2. Press the release tabs on the system cover, and slide the cover toward the front of the system.
3. Lift the cover away from the system.
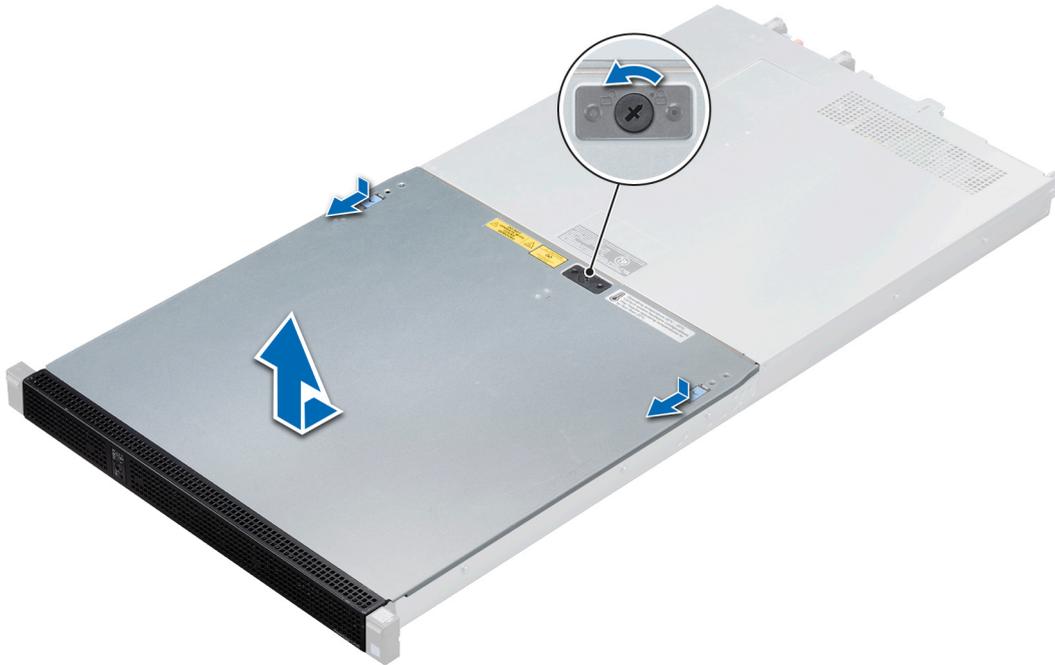
Figure 22. Removing the front system cover

Installing the front system cover

Prerequisites

⚠ **CAUTION: Do not operate the system without the system cover. This can result in overheating and cause component damage.**

1. Follow the safety guidelines listed in the Safety instructions section.
2. Power off the system and all attached peripherals.
3. Disconnect the system from the electrical outlet and disconnect the peripherals.
4. If applicable, remove the system from the rack.

   (i) **NOTE:** For more information, see the *Rail Installation Guide* at www.dell.com/poweredgemanuals.

5. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.

Steps

1. Align the slots of the system top cover with the tabs on the chassis.
2. Slide the cover toward the back of the chassis until release tabs click into place.
3. Using a 1/4 inch flat head or Phillips #2 screwdriver, turn the lock on the release-latch clockwise to the lock position.

Figure 23. Installing the front system cover

Next steps

Follow the procedure listed in the After working inside your system.

Removing the rear system cover

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Power off the system and all attached peripherals.
3. Disconnect the system from the electrical outlet and disconnect the peripherals.
4. If applicable, remove the system from the rack.

   (i) **NOTE:** For more information, see the *Rail Installation Guide* at www.dell.com/poweredgemanuals.

Steps

1. Using a Phillips #2 screwdriver, remove the screws that secure the rear system cover to the system.
2. Slide the cover towards the back of the system.
3. Lift the cover away from the system.
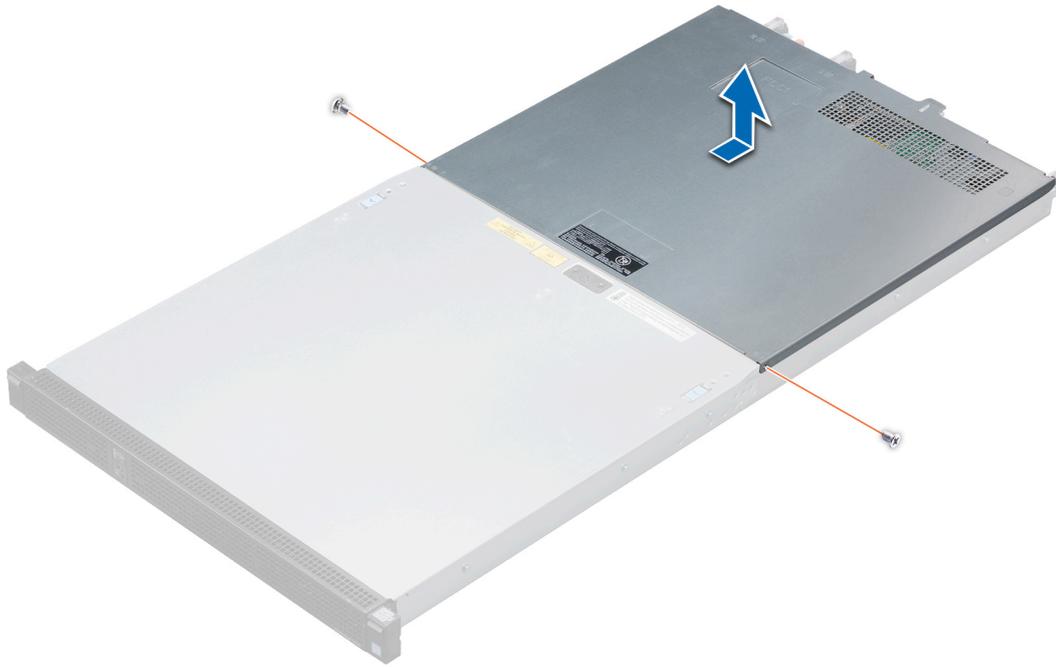
Figure 24. Removing the rear system cover

Installing the rear system cover

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Power off the system and all attached peripherals.
3. Disconnect the system from the electrical outlet and disconnect the peripherals.
4. If applicable, remove the system from the rack.

   (i) **NOTE:** For more information, see the *Rail Installation Guide* at www.dell.com/poweredgemanuals.
5. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.

   (i) **NOTE:** Route the cables properly when you replace them to prevent the cable from being pinched or crimped.

   ⚠ **CAUTION: While installing the rear cover, if there is any resistance do not apply force. Check the areas that are highlighted in the image and ensure that the cables are clear of the lid feature and chassis wall.**

Steps

1. Align the tabs on the system cover with the guide slots on the system and slide the cover towards the front of the system.

   The system cover slides forward, the tabs on the system cover engage with the guide slots on the system and the cover latch locks into place.

   ⚠ **CAUTION: Place the cables below the guide slots on the system and do not slide the rear cover forward if cables are getting pinched.**
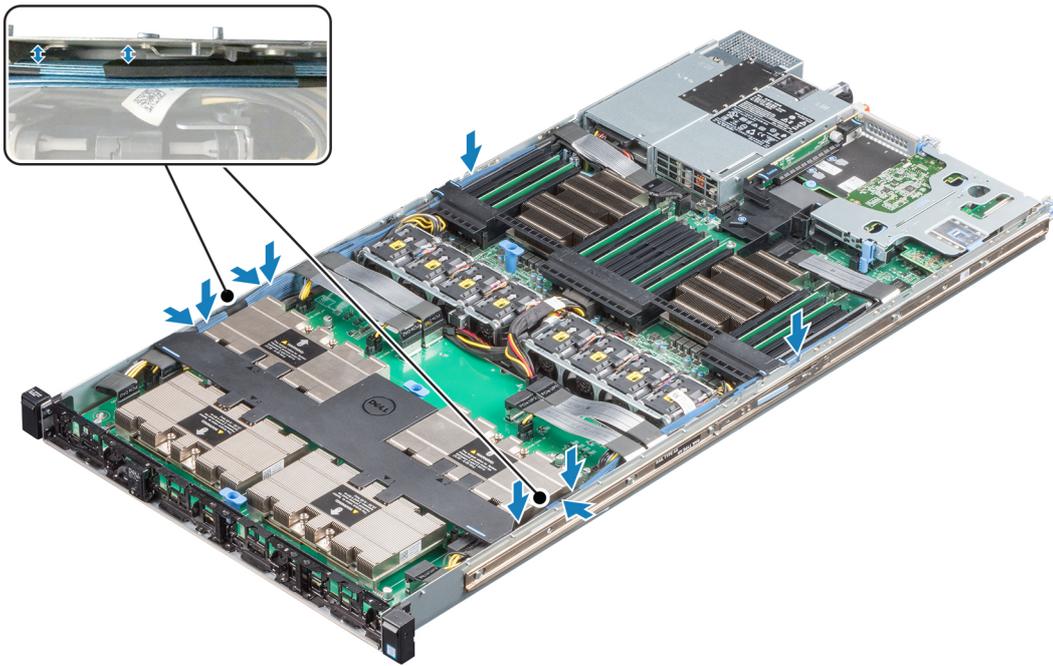
Figure 25. Cable placement along chassis wall

2. Using a Phillips #2 screwdriver, secure the cover in place with screws.

Figure 26. Installing the rear system cover

Next steps

Follow the procedure listed in the After working inside your system.

Air shroud

Removing the air shroud

Prerequisites

Never operate your system with the air shroud removed. The system may get overheated, resulting in shutdown of the system and loss of data.

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.

Steps

1. Holding the blue touch points, lift the air shroud out of the system.
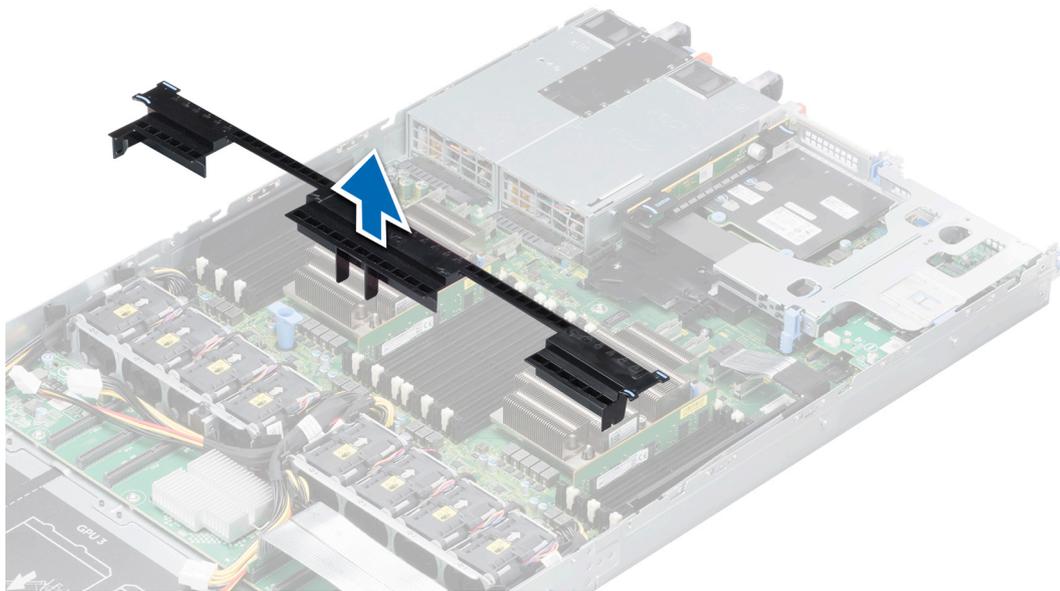
Figure 27. Removing the system air shroud for B, C, G, K and M configurations

2. Holding the blue touch points, lift the NVLink air shroud from the NVLink board.
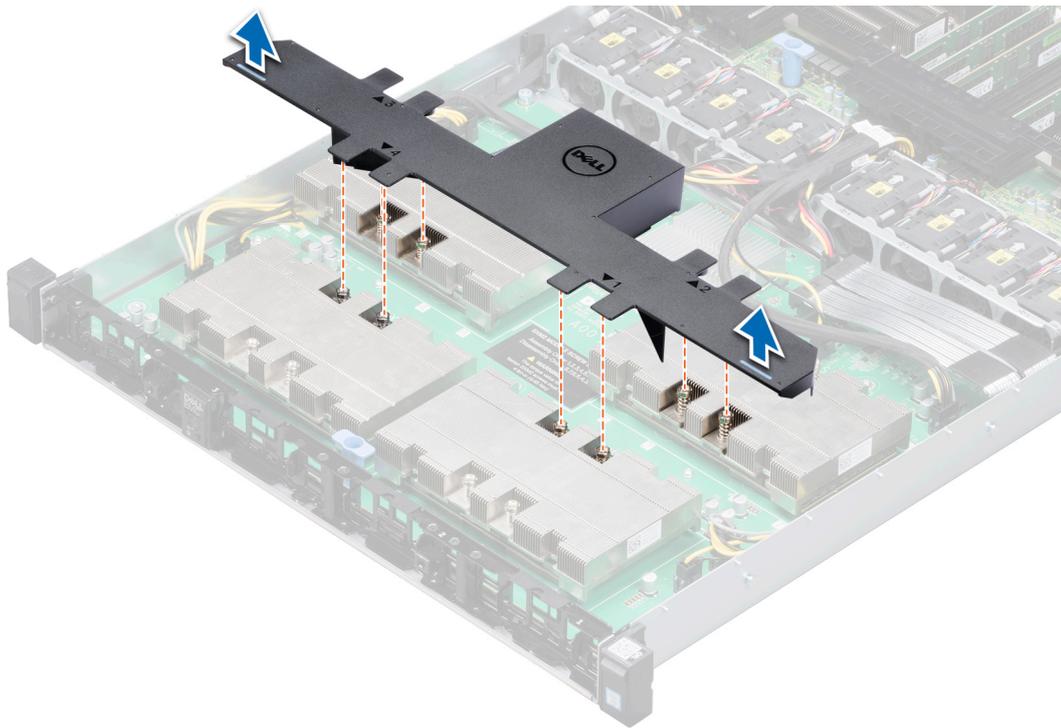
Figure 28. Removing the system air shroud for K and M configurations

Next steps

Replace the air shroud.

Installing the air shroud

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.

ⓘ **NOTE:** Route the cable properly to prevent the cable from being pinched or crimped.

Steps

1. Align the tabs on the air shroud with the slots on the system.
2. Lower the air shroud into the system until it is firmly seated.

   When firmly seated, the memory socket numbers marked on the air shroud align with the respective memory sockets.
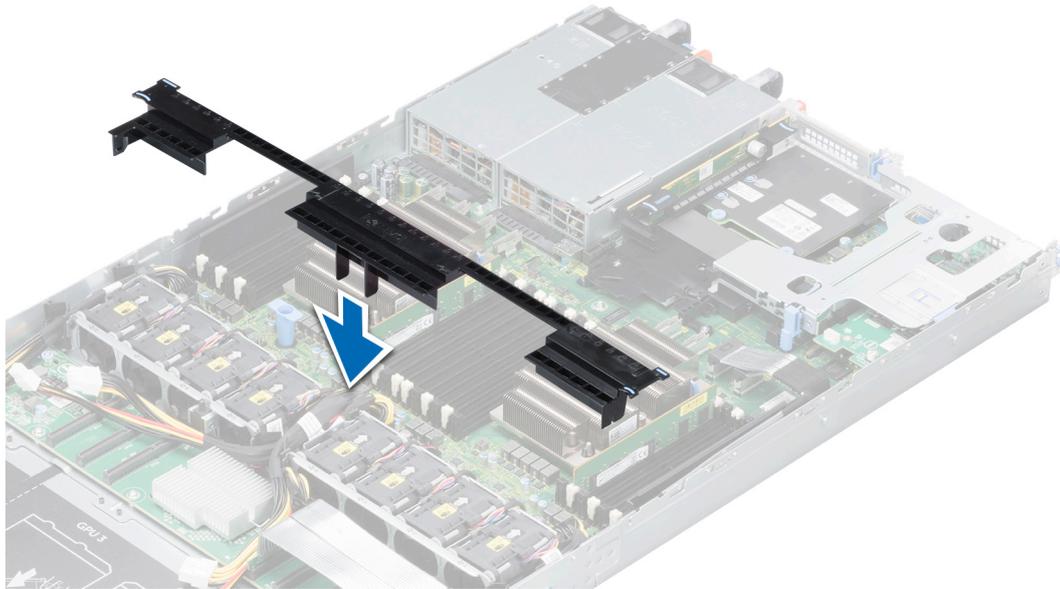
Figure 29. Installing the system air shroud or B, C, G, K and M Configurations

3. Align the guide slots on the NVLink air shroud with the screws on the graphics heat sink.
4. Lower the NVLink air shroud into the NVLink board until it is firmly seated.
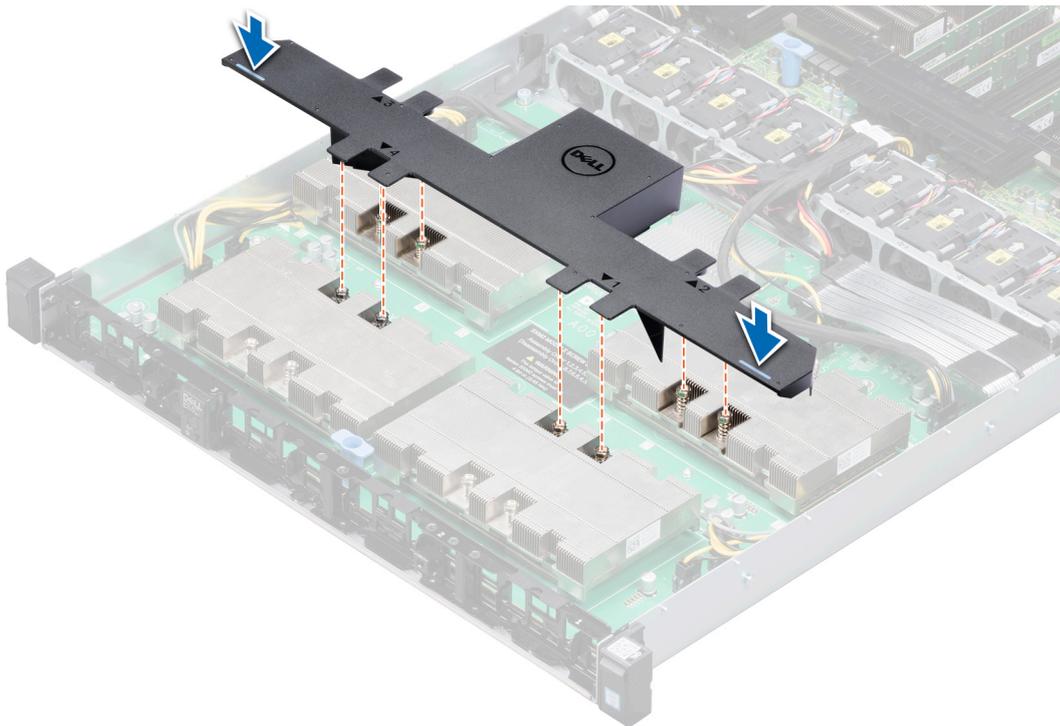
Figure 30. Installing the air shroud for K and M Configurations

Next steps

Follow the procedure listed in After working inside your system.

Cooling fans

Removing a cooling fan

Prerequisites

ⓘ **NOTE:** Opening or removing the system cover when the system is on may expose you to a risk of electric shock. Exercise utmost care while removing or installing fans.

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Removing the air shroud.

Steps

1. Press the release tabs on the fan cable connector and disconnect it from the connector on the system board.
2. Lift the fan out of the fan cage.
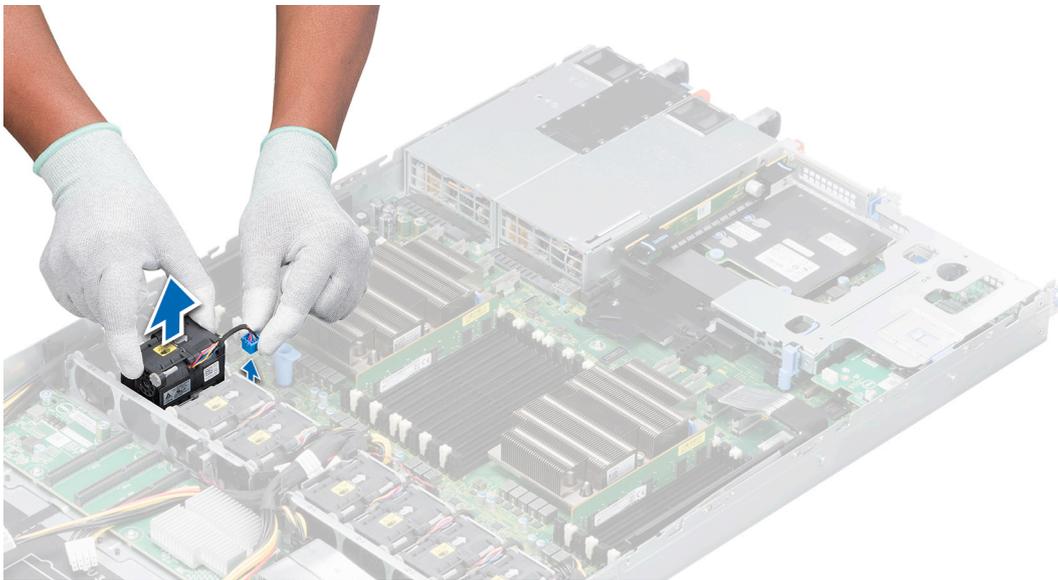
Figure 31. Removing a cooling fan

Next steps

Replace the cooling fan.

Installing a cooling fan

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Removing the air shroud.

Steps

1. Lower the fan into the fan cage.
2. Press the release tabs on the fan cable connector and connect the cable connector to the connector on the system board.

   ⓘ **NOTE:** Route the cable properly when installing, to prevent the cable from being pinched or crimped.
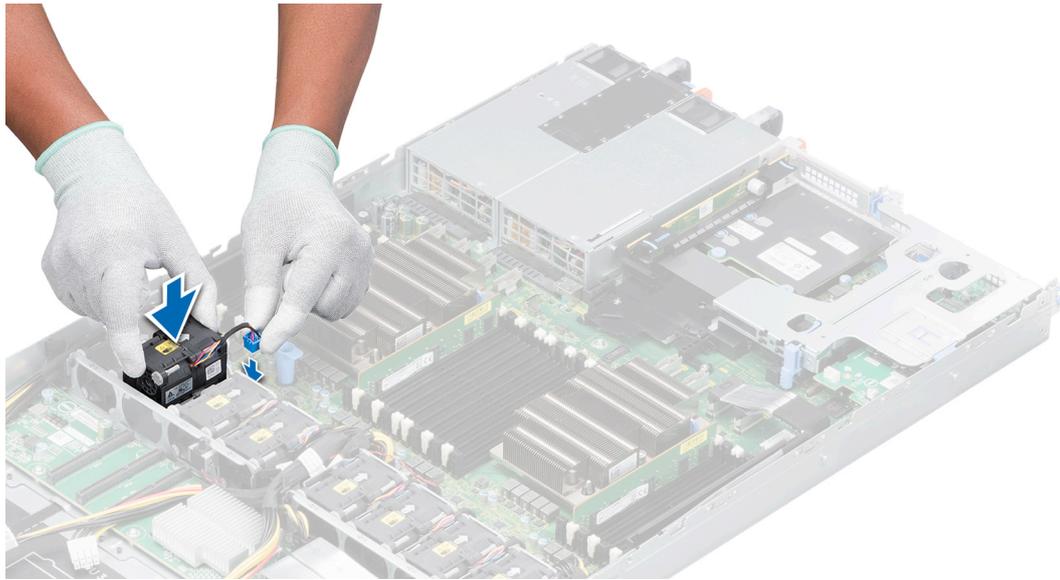
Figure 32. Installing a cooling fan

Next steps

1. Install the air shroud..
2. Follow the procedure listed in After working inside your system.

Hard drives

Removing the 2.5-inch drive cage

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.
3. Disconnect the power and signal cable from the system board.
4. Keep the Phillips #1 screwdriver ready.

Steps

1. Disconnect the cables from the system board.
2. Remove the screw securing the drive cage to the chassis.
3. Slide the drive cage out of the drive cage slot.
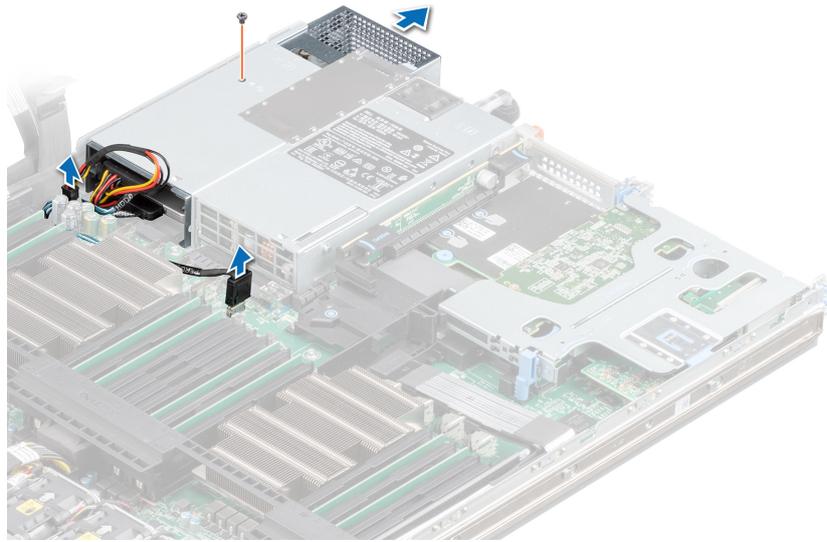
Figure 33. Removing the 2.5-inch drive cage

Next steps

If you are removing the drive cage permanently, install any one of the following:
- PSU blank
- PSU 2
- 2.5-inch drive cage

Installing the 2.5-inch drive cage

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.
3. Remove the PSU or PSU blank, if installed.
4. Install the 2.5-inch drives in drive cage.
5. Route the power and signal cables through the drive cage slot.
6. Keep the Phillips #1 screwdriver ready.

Steps

1. Slide the drive cage into the PSU 2 bay in the chassis.
2. Secure the drive cage to the drive cage slot by using the screws.
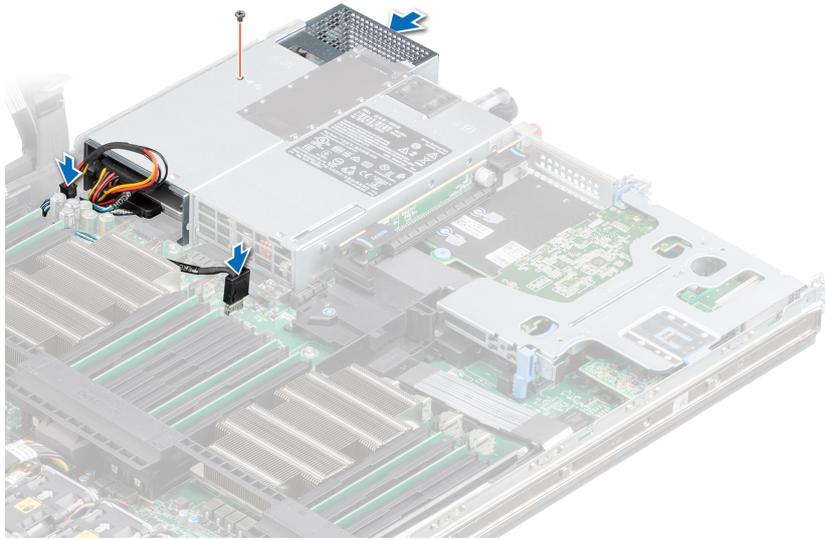
Figure 34. Installing the 2.5-inch drive cage

Next steps

1. Connect the power cable to the system board.
2. Connect the signal cables to the system board or expansion card.
3. Follow the procedure listed in After working inside your system.

Removing the 2.5-inch drive cage cover

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.
3. Remove the 2.5-inch drive cage.
4. Keep the Phillips #1 screwdriver ready.

Steps

1. Remove the screws securing the drive cage cover to the drive cage.
2. Slide the drive cage cover toward the front of the drive cage to disengage it from the slots on the drive cage.
3. Lift the drive cage cover away from the drive cage.
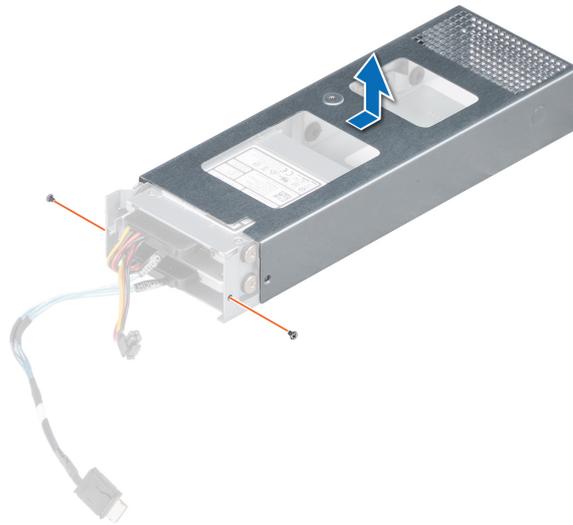
Figure 35. Removing the 2.5-inch drive cage cover

Next steps

Replace the 2.5-inch drives.

Installing the 2.5-inch drive cage cover

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.
3. Remove the drive cage.
4. If applicable, install the 2.5-inch drives into the drive cage.
5. Connect the power and signal cables to the drive in the drive cage.

   ⓘ **NOTE:** Ensure that the connector labeled HDD0 is plugged into upper drive before reinstalling bay.

Steps

1. Lower the drive cage cover onto the drive cage.
2. Slide the drive cage cover toward the back of the cage to engage it with the slots on the drive cage.
3. Use the screws to secure the drive cage cover to the drive cage.
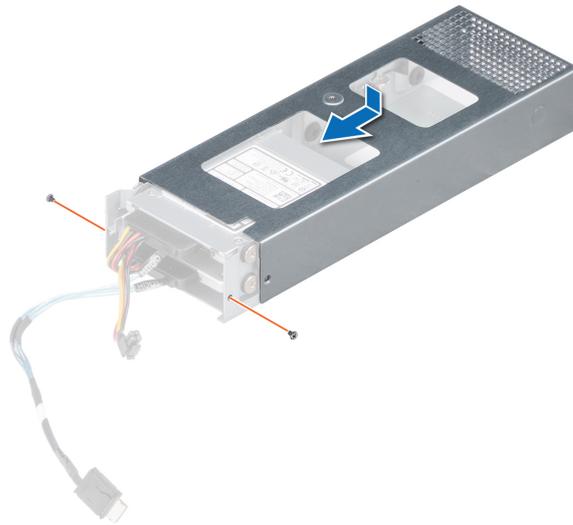
Figure 36. Installing the 2.5-inch drive cage cover

Next steps

1. Install the drive cage into the PSU 2 bay.
2. Follow the procedure listed in After working inside your system.

Removing 2.5-inch cabled drives from the drive cage

Prerequisites

(i) **NOTE:** To identify the drive, see the label on the drive cable. For more information, see Drive Specifications in the PowerEdge C4140 Technical Specs at .www.dell.com/poweredgemanuals.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.
3. Keep the Phillips #2 screwdriver ready.
4. Remove the 2.5-inch drive cage.
5. Remove the 2.5-inch drive cage cover.

Steps

1. Remove the screws securing the drive to the drive cage.

   (i) **NOTE:** If the 2.5-inch drive has Torx screw, use Torx 6 screwdriver to remove the screws securing the drive to the drive cage. ✪

2. Remove drives 0 and 1 by performing the following steps:
   a. Disconnect the signal and power cable from the drives.
   b. Lift drive 0 out of the drive cage.
   c. Slide drive 1 out of the drive cage.
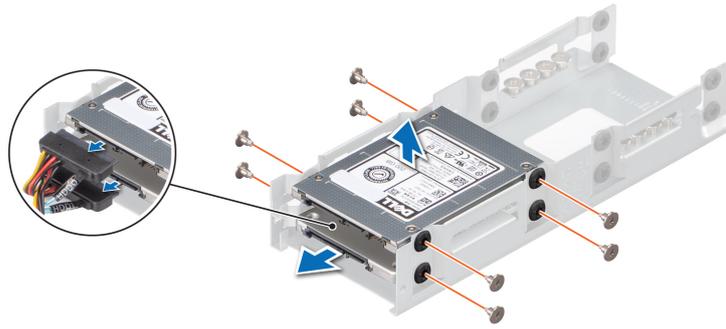
Figure 37. Removing a 2.5-inch cabled drive from the drive cage

Next steps

1. Install the drives.
2. Install the drive cage cover.
3. Install the drive cage into the drive cage slot in the chassis.

Installing a 2.5-inch cabled drive into the drive cage

Prerequisites

ⓘ **NOTE:** To identify the drive, see the label on the drive cable. For more information, see Drive Specifications in the PowerEdge C4140 Technical Specs at .www.dell.com/poweredgemanuals.

1. Follow the safety guidelines listed in the Safety instructions section.
2. Keep the Phillips #2 screwdriver ready.
3. Remove the 2.5-inch drive cage.
4. Remove the 2.5-inch drive cage cover.

Steps

To install drive 0 and drive 1, perform the following steps:

a. Slide drive 1 into the drive cage.
b. Lower drive 0 into the drive cage.
c. Secure the drives to the drive cage by using the screws.
d. ⓘ **NOTE:** If the 2.5-inch drive has Torx screw, use Torx 6 screwdriver to secure the drives to the drive cage. ✲

    Connect the power and signal cable to the drives.

ⓘ **NOTE:** Ensure that the connector labeled HDD0 is plugged into upper drive before reinstalling bay.
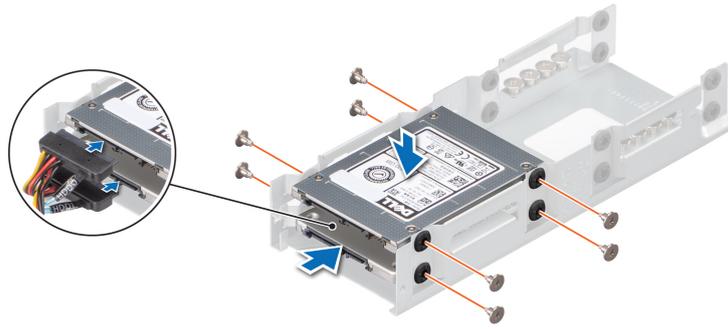
Figure 38. Installing a 2.5-inch cabled drive in the drive cage

Next steps

1. Install the 2.5-inch drive cage cover.
2. Install the drive cage into the drive cage slot.
3. Connect the power and signal cables to the system board.
4. Follow the procedure listed in After working inside your system.
5. Enter System Setup and ensure that the drive's controller is enabled.
6. Exit the System Setup program and reboot the system.
7. Install any software required for the drive operation as described in the documentation for the drive.

Intrusion switch

Removing the intrusion switch

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Ensure that the GPU power and signal cables do not interfere with the intrusion switch cable.
4. Keep the plastic scribe ready.

Steps

1. Disconnect and remove the intrusion switch cable connector from the connector on the system board.

   ⓘ **NOTE:** Observe the routing of the cable as you remove it from the system. Route the cable properly when you replace it to prevent the cable from being pinched or crimped.

2. Using a plastic scribe, slide the intrusion switch out of the intrusion switch slot.
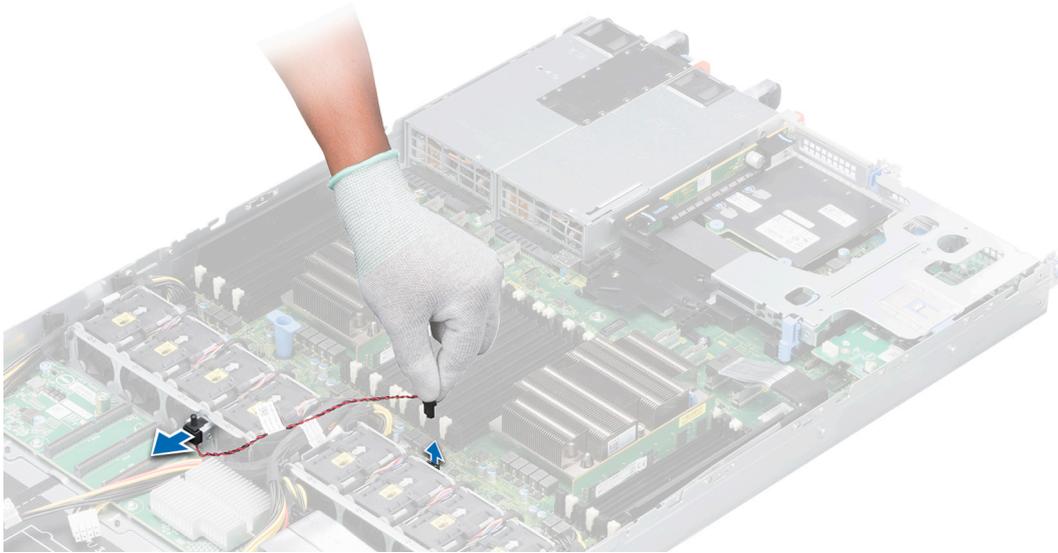
Figure 39. Removing the intrusion switch

Next steps

Replace the intrusion switch.

Installing the intrusion switch

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.

Steps

1. Align and slide the intrusion switch into the slot in the system.
2. Connect the intrusion switch cable connector to the connector on the system board.
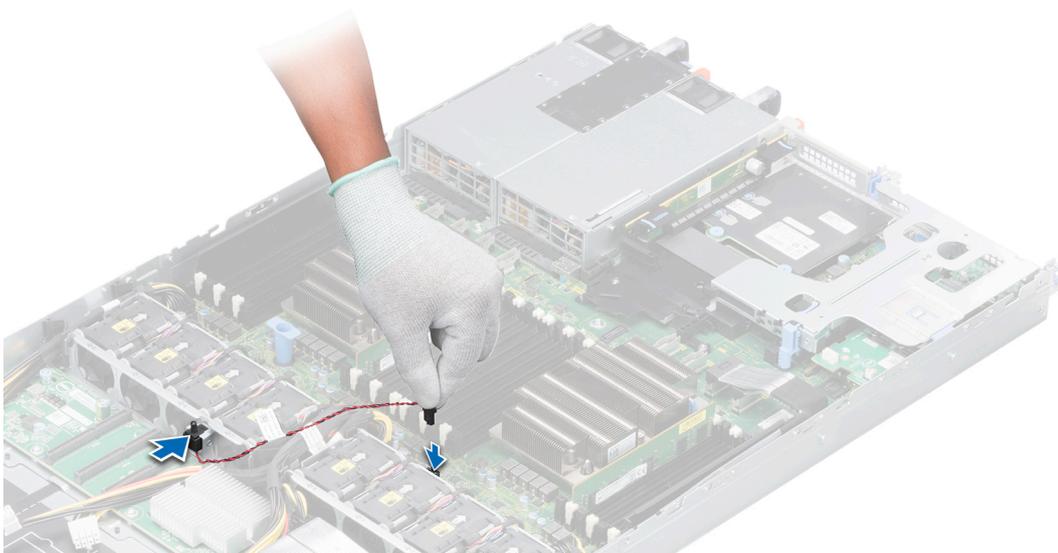
Figure 40. Installing the intrusion switch

Next steps

Follow the procedure listed in After working inside your system section.

System memory

System memory guidelines

The system supports DDR4 registered DIMM (RDIMMs) slots and load reduced DIMM (LRDIMMs) slots. System memory holds the instructions that are executed by the processor.

Your system contains 24 memory sockets split into two sets of 12 sockets, one set per processor. Each 12-socket set is organized into six channels. Six memory channels are allocated to each processor. In each channel, the release tabs of the first socket are marked white, and the second socket black.
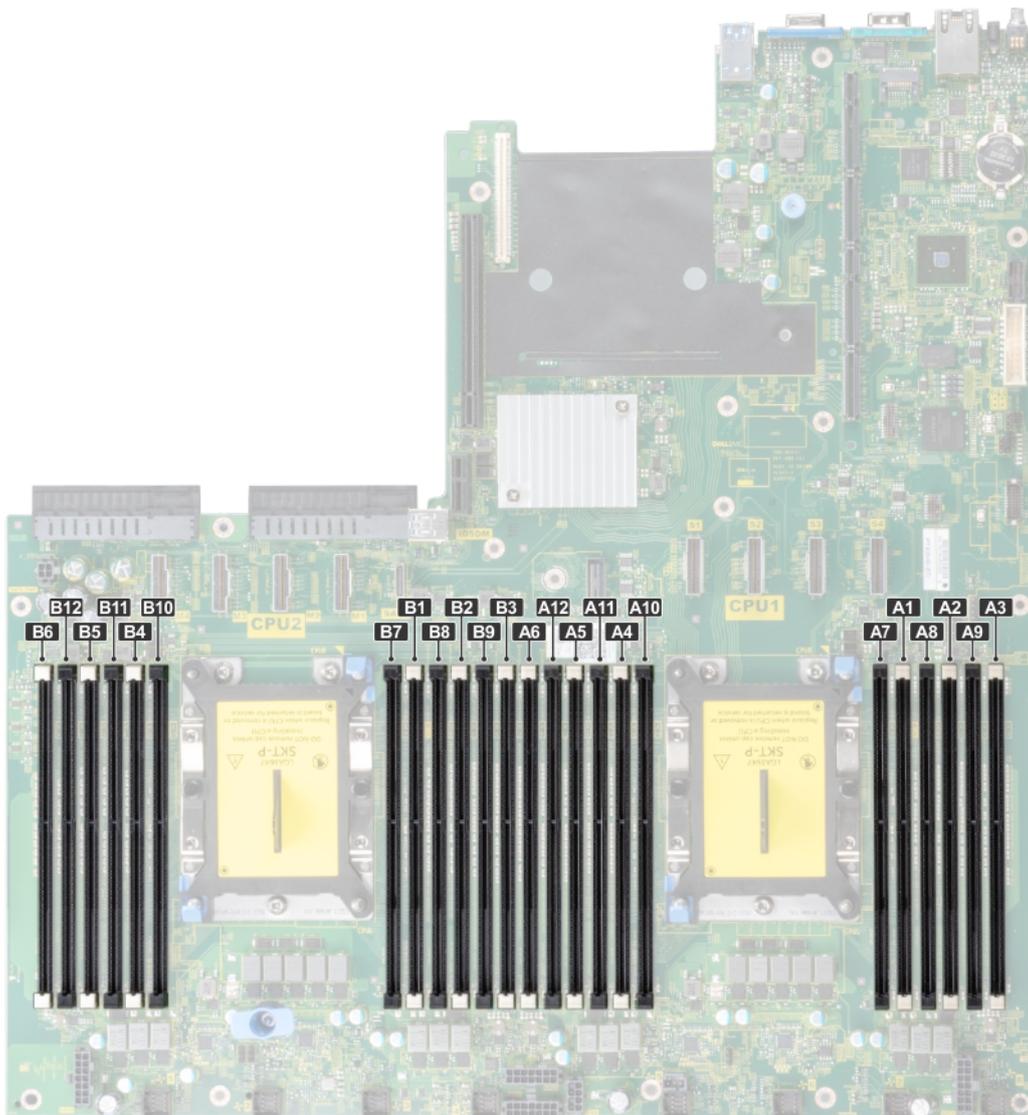
Figure 41. System memory location

Memory channels are organized as follows:

Table 7. Memory channels

Processor	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
Processor 1	Slots A1 and A7	Slots A2 and A8	Slots A3 and A9	Slots A4 and A10	Slots A5 and A11	Slots A6 and A12
Processor 2	Slots B1 and B7	Slots B2 and B8	Slots B3 and B9	Slots B4 and B10	Slots B5 and B11	Slots B6 and B12

Table 8. Memory population

Processor	DIMM type	DIMM Ranking	Capacity	Voltage	Maximum Speed (1 DIMM per channel)	Maximum Speed (2 DIMM per channel)
SkyLake	RDIMM	1R/2R	8 GB, 16 GB, 32 GB	1.2 V	2666	2666
	RDIMM	4R/8R	64 GB, 128 GB	1.2 V	2666	2666
CascadeLake	RDIMM	1R	8 GB	1.2 V	2666	2666
	RDIMM	2R	16 GB, 32 Gb, 64 GB	1.2 V	2933	2666
	LRDIMM	4R/8R	64 GB, 128 Gb	1.2 V	2666	2666

General memory module installation guidelines

To ensure optimal performance of your system, observe the following general guidelines when configuring your system memory. If your system's memory configurations fail to observe these guidelines, your system might not boot, stop responding during memory configuration, or operate with reduced memory.

The memory bus may operate at frequency can be 2933 MT/s, 2666 MT/s, 2400 MT/s, or 2133 MT/s depending on the following factors:

- System profile selected (for example, Performance Optimized, or Custom [can be run at high speed or lower])
- Maximum supported DIMM speed of the processors. For memory frequency of 2933 MT/s, one DIMM per channel is supported.
- Maximum supported DIMM speed of the processors.
- Maximum supported speed of the DIMMs

(i) **NOTE:** MT/s indicates DIMM speed in MegaTransfers per second.

The system supports Flexible Memory Configuration, enabling the system to be configured and run in any valid chipset architectural configuration. The following are the recommended guidelines for installing memory modules:

- All DIMMs must be DDR4.
- RDIMMs and LRDIMMs must not be mixed.
- x4 and x8 DRAM based memory modules can be mixed.
- Up to two RDIMMs can be populated per channel regardless of rank count.
- Up to two LRDIMMs can be populated per channel regardless of rank count.
- A maximum of two different ranked DIMMs can be populated in a channel regardless of rank count.
- If memory modules with different speeds are installed, they will operate at the speed of the slowest installed memory module(s).
- Populate memory module sockets only if a processor is installed.
  - For dual-processor systems, sockets A1 to A12 and sockets B1 to B12 are available.
- Populate all the sockets with white release tabs first, followed by the black release tabs.
- When mixing memory modules with different capacities, populate the sockets with memory modules with the highest capacity first.

  For example, if you want to mix 8 GB and 16 GB memory modules, populate 16 GB memory modules in the sockets with white release tabs and 8 GB memory modules in the sockets with black release tabs.

- Memory modules of different capacities can be mixed provided other memory population rules are followed.

For example, 8 GB and 16 GB memory modules can be mixed.

- In a dual-processor configuration, the memory configuration for each processor must be identical.

  For example, if you populate socket A1 for processor 1, then populate socket B1 for processor 2, and so on.

- Mixing of more than two memory module capacities in a system is not supported.
- Unbalanced memory configurations will result in a performance loss so always populate memory channels identically with identical DIMMs for best performance.
- Populate six identical memory modules per processor (one DIMM per channel) at a time to maximize performance.

DIMM population update for Performance Optimized mode with quantity of 4 and 8 DIMMs per processor.

- When the DIMM quantity is 4 per processor, the population is slot 1, 2, 4, 5.
- When the DIMM quantity is 8 per processor, the population is slot 1, 2, 4, 5, 7, 8, 10, 11 (2-2-2 platforms).

Mode-specific guidelines

The configurations allowed depend on the memory mode selected in the System BIOS.

Table 9. Memory operating modes

Memory Operating Mode	Description
Optimizer Mode	The **Optimizer Mode** if enabled, the DRAM controllers operate independently in the 64-bit mode and provide optimized memory performance.
Mirror Mode	The **Mirror Mode** if enabled, the system maintains two identical copies of data in memory, and the total available system memory is one half of the total installed physical memory. Half of the installed memory is used to mirror the active memory modules. This feature provides maximum reliability and enables the system to continue running even during a catastrophic memory failure by switching over to the mirrored copy. The installation guidelines to enable Mirror Mode require that the memory modules be identical in size, speed, and technology, and they must be populated in sets of 6 per processor.
Single Rank Spare Mode	**Single Rank Spare Mode** allocates one rank per channel as a spare. If excessive correctable errors occur in a rank or channel, while the operating system is running, they are moved to the spare area to prevent errors from causing an uncorrectable failure. Requires two or more ranks to be populated in each channel.
Multi Rank Spare Mode	**Multi Rank Spare Mode** allocates two ranks per channel as a spare. If excessive correctable errors occur in a rank or channel, while the operating system is running, they are moved to the spare area to prevent errors from causing an uncorrectable failure. Requires three or more ranks to be populated in each channel.
	With single rank memory sparing enabled, the system memory available to the operating system is reduced by one rank per channel.
	For example, in a dual-processor configuration with 24x 16 GB dual-rank memory modules, the available system memory is: 3/4 (ranks/channel) × 24 (memory modules) × 16 GB = 288 GB, and not 24 (memory modules) × 16 GB = 384 GB. For multi rank sparing, the multiplier changes to 1/2 (ranks/channel).
	(i) **NOTE:** To use memory sparing, this feature must be enabled in the BIOS menu of System Setup.

Table 9. Memory operating modes (continued)

Memory Operating Mode	Description
	(i) **NOTE:** Memory sparing does not offer protection against a multi-bit uncorrectable error.
Dell Fault Resilient Mode	The **Dell Fault Resilient Mode** if enabled, the BIOS creates an area of memory that is fault resilient. This mode can be used by an OS that supports the feature to load critical applications or enables the OS kernel to maximize system availability. (i) **NOTE:** This feature is only supported in Gold and Platinum Intel processors. (i) **NOTE:** Memory configuration has to be of same size DIMM, speed, and rank.

Optimizer Mode

This mode supports Single Device Data Correction (SDDC) only for memory modules that use x4 device width. It does not impose any specific slot population requirements.

- Dual processor: Populate the slots in round robin sequence starting with processor 1.

  (i) **NOTE:** Processor 1 and processor 2 population should match.

Table 10. Memory population rules

Processor	Configuration	Memory population	Memory population information

Dual processor (Start with processor1. processor1 and processor 2 population should match)	Optimized (Independent channel) population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}…	• Odd amount of DIMMs per processor allowed.
			• Optimizer population order is not traditional for 4 and 8 DIMM installations of single processor.
			  ○ For 4 DIMMs: A1, A2, A4, A5
			  ○ For 8 DIMMs: A1, A2, A4, A5, A7, A8, A10, A11

	Mirroring population order	A{1,2,3,4,5,6}, B{1,2,3,4,5,6}	Mirroring is supported with 6 DIMMs per processor.
	Single rank sparing population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}…	Populate in this order, odd amount per processor allowed. Requires two ranks or more per channel.
	Multi rank spare population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}…	Populate in this order, odd amount per processor allowed. Requires three ranks or more per channel.
	Fault resilient population order	A{1,2,3,4,5,6}, B{1,2,3,4,5,6}	Supported with 6 DIMMs per processor.

Removing a memory module

Prerequisites

⚠️ **WARNING: Allow the memory modules to cool after you power off the system.**

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.

3. Remove the air shroud.

Steps

1. Locate the appropriate memory module socket.

⚠ **CAUTION: Handle each memory module only by the card edges, ensuring not to touch the middle of the memory module or metallic contacts.**

2. Push the ejectors outward on both ends of the memory module socket to release the memory module from the socket.
3. Lift and remove the memory module from the system.

ⓘ **NOTE:** If you are removing the memory module permanently, install a memory module blank. The procedure to install a memory module blank is similar to that of the memory module.
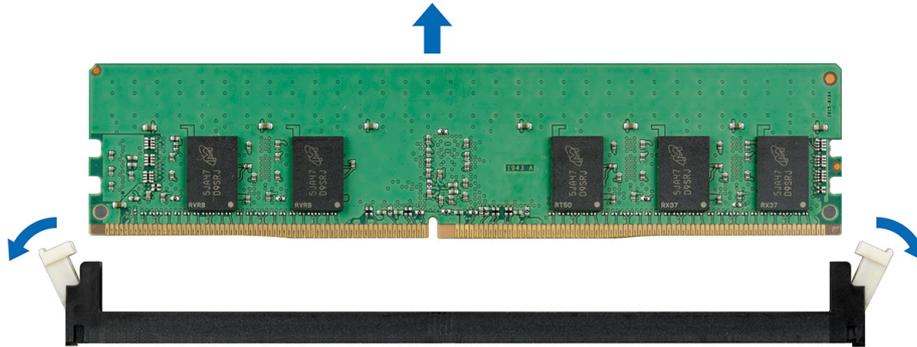
Figure 42. Removing a memory module

Next steps

Replace the memory module.

Installing a memory module

Prerequisites

Follow the safety guidelines listed in Safety instructions.

⚠ **CAUTION: To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. Remove memory module blanks only if you intend to install memory modules in those sockets.**

Steps

1. Locate the appropriate memory module socket.

⚠ **CAUTION: Handle each memory module only by the card edges, ensuring not to touch the middle of the memory module or metallic contacts.**

⚠ **CAUTION: To prevent damage to the memory module or the memory module socket during installation, do not bend or flex the memory module. You must insert both ends of the memory module simultaneously.**

2. Open the ejectors on the memory module socket outward to allow the memory module to be inserted into the socket.
3. Align the edge connector of the memory module with the alignment key of the memory module socket, and insert the memory module in the socket.

⚠ **CAUTION: Do not apply pressure at the center of the memory module; apply pressure at both ends of the memory module evenly.**

ⓘ **NOTE:** The memory module socket has an alignment key that enables you to install the memory module in the socket in only one orientation.

4. Press the memory module with your thumbs until the socket levers firmly click into place.

Figure 43. Installing a memory module

Next steps

1. Install the air shroud.
2. Follow the procedure listed in After working inside your system.
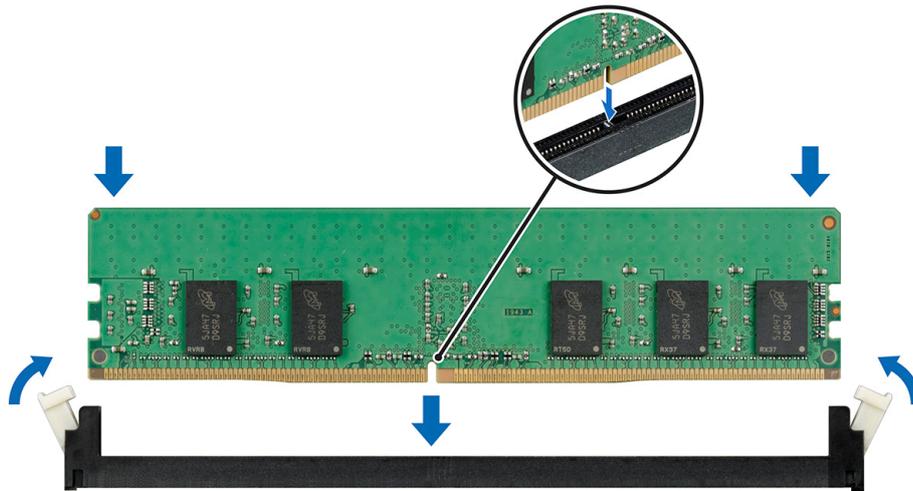3. To verify if the memory module has been installed properly, press F2 and navigate to **System Setup Main Menu > System BIOS > Memory Settings**. In the **Memory Settings** screen, the System Memory Size must reflect the updated capacity of the installed memory.
4. If the value is incorrect, one or more of the memory modules may not be installed properly. Ensure that the memory module is firmly seated in the memory module socket.
5. Run the system memory test in system diagnostics.

Expansion cards and expansion card risers

(i) **NOTE:** A System Event Log (SEL) event is logged if an expansion card riser is not supported or missing. It does not prevent your system from turning on. However, if a F1/F2 pause occurs with an error message, see *Troubleshooting expansion cards* section in the *Dell EMC PowerEdge Servers Troubleshooting Guide* at www.dell.com/poweredgemanuals.

Expansion card installation guidelines

Depending on your system configuration, the following PCI Express (PCIe) generation 3 expansion cards are supported:

Table 11. Expansion card riser configurations

Expansion card riser	PCIe slots on the riser	Processor connection	Height	Length	Slot width
Riser 1A	Slot 1	Processor 1	Low Profile	Half Length	x16
	Slot 2	Processor 1	Low Profile	Half Length	x4
Riser 2A	Slot 3	Processor 2	Low Profile	Half Length	x16

(i) **NOTE:** The expansion card slots are not hot-swappable.

The following table provides guidelines for installing expansion cards to ensure proper cooling and mechanical fit. The expansion cards with the highest priority should be installed first using the slot priority indicated. All the other expansion cards should be installed in the card priority and slot priority order.

Table 12. Riser configurations: 1A + 2A

Card type	Slot priority	Form factor	Maximum number of cards
BOSS (SATA) (Inventon)	2	Low Profile	1
NVMe PCIe SSD (Dell,Samsung, Intel, Mellanox, SolarFlare)	1, 3	Low Profile	2
NDC (Intel)	Integrated Slot	NONE	1
GPU (NVIDIA)	4, 5, 6, 7	NONE	4

Table 13. PCIe slots on the riser for Configurations B and K

Configurations: B and K	Slot width	Length	Height	Processor 1 (PCIe ports)	Processor 2 (PCIe ports)
Slot 1	Single width	Half Length	Low Profile	x16	-
Slot 2	Single width	Half Length	Low Profile	X4	-
Slot 3	Single width	Half Length	Low Profile	-	x16
Slot 4	Double width	Full Height	NA	x16	-
Slot 5	Double width	Full Height	NA	x16	-
Slot 6	Double width	Full Height	NA	x16	-
Slot 7	Double width	Full Height	NA	x16	-

Table 14. PCIe slots on the riser for Configurations C, G and M

Configurations: C, G and M	Slot width	PCIe slots on the riser	Height	Processor 1 (PCIe ports)	Processor 2 (PCIe ports)
Slot 1	Single width	Half Length	Low Profile	x16	-
Slot 2	Single width	Half Length	Low Profile	X4	-
Slot 3	Single width	Half Length	Low Profile	-	x16
Slot 4	Double width	Full Height	NA	x16	-
Slot 5	Double width	Full Height	NA	x16	-
Slot 6	Double width	Full Height	NA	-	x16
Slot 7	Double width	Full Height	NA	-	x16

Removing an expansion card riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. If applicable, disconnect any cables connected to the expansion card.

Steps

Hold the touch points, and lift the expansion card riser, from the riser connector, on the system board.

ⓘ **NOTE:**
- While removing riser 1, press the tabs and hold the touch point to lift the expansion card riser from the system board.
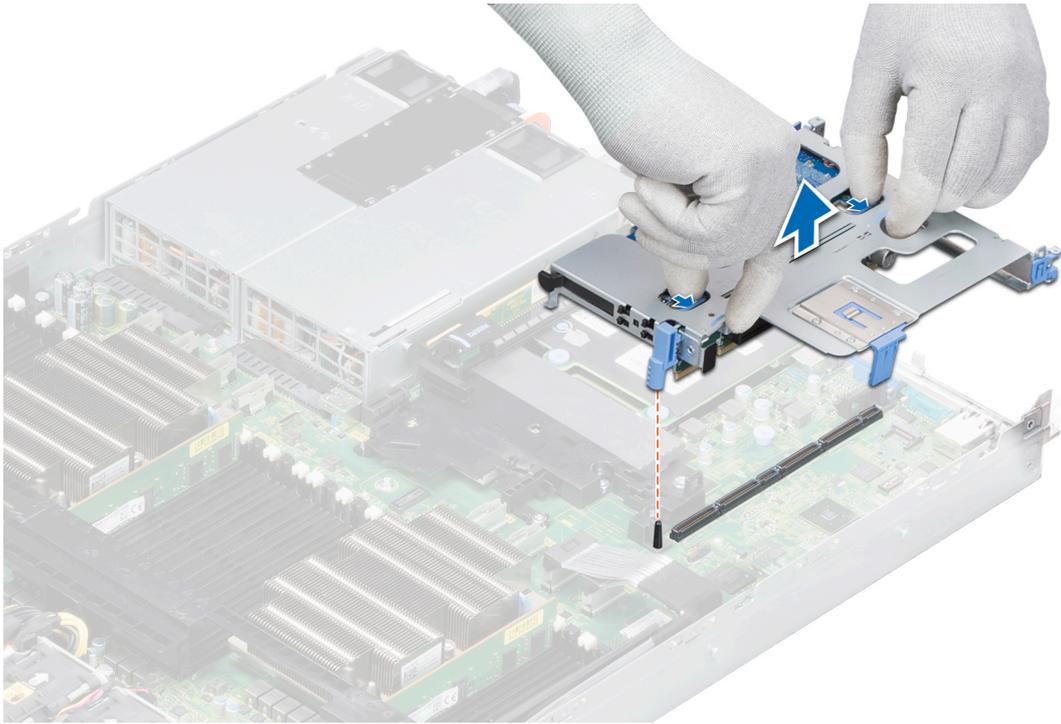- If installed remove the expansion card from the riser , before removing the expansion card riser 2.

Figure 44. Removing expansion card riser 1
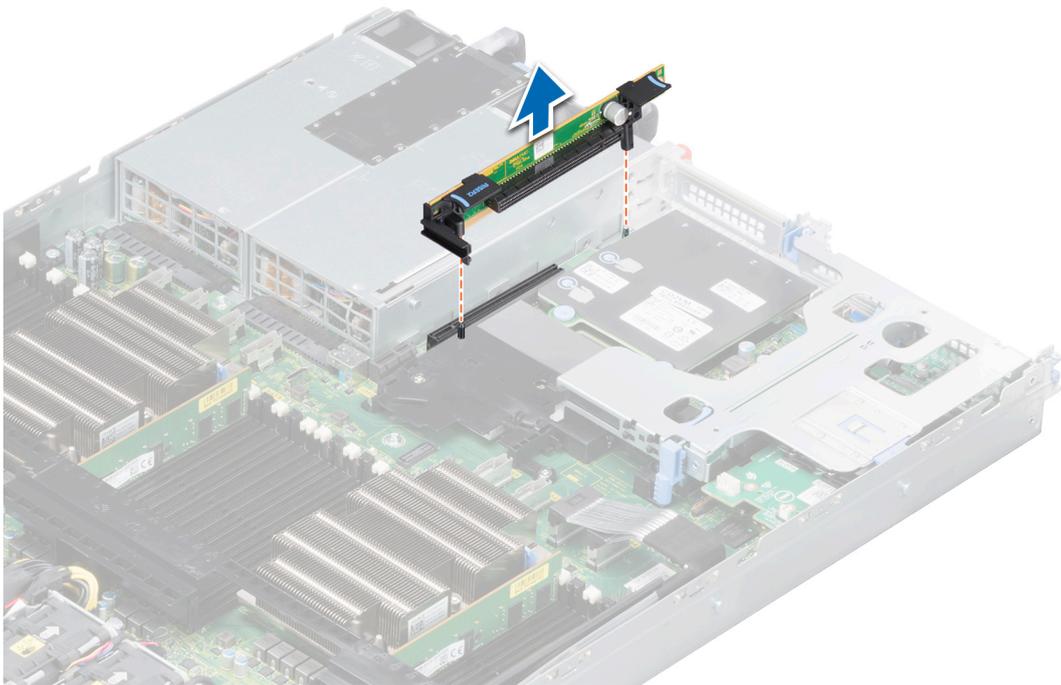
Figure 45. Removing expansion card riser 2

Next steps

Install the expansion card riser.

Installing an expansion card riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. if applicable, install an expansion card into the riser before installing the expansion card riser 2.

Steps

1. Holding the blue touch points on the expansion card riser, align the expansion card with the connector on the system board.

   ⓘ **NOTE:** While installing riser 1, press the tabs and hold the touch point to align the expansion card riser and the riser guide pin on the system board.

2. Lower the expansion card riser into place until the expansion card riser is fully seated with the connector on the system board.
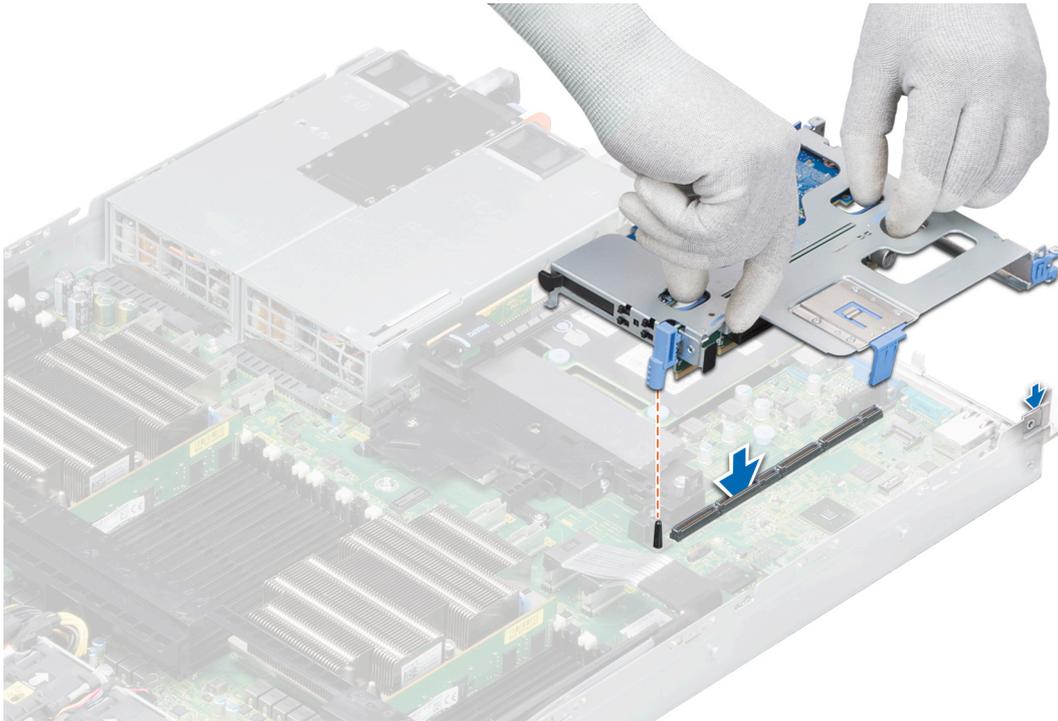
Figure 46. Installing expansion card riser 1
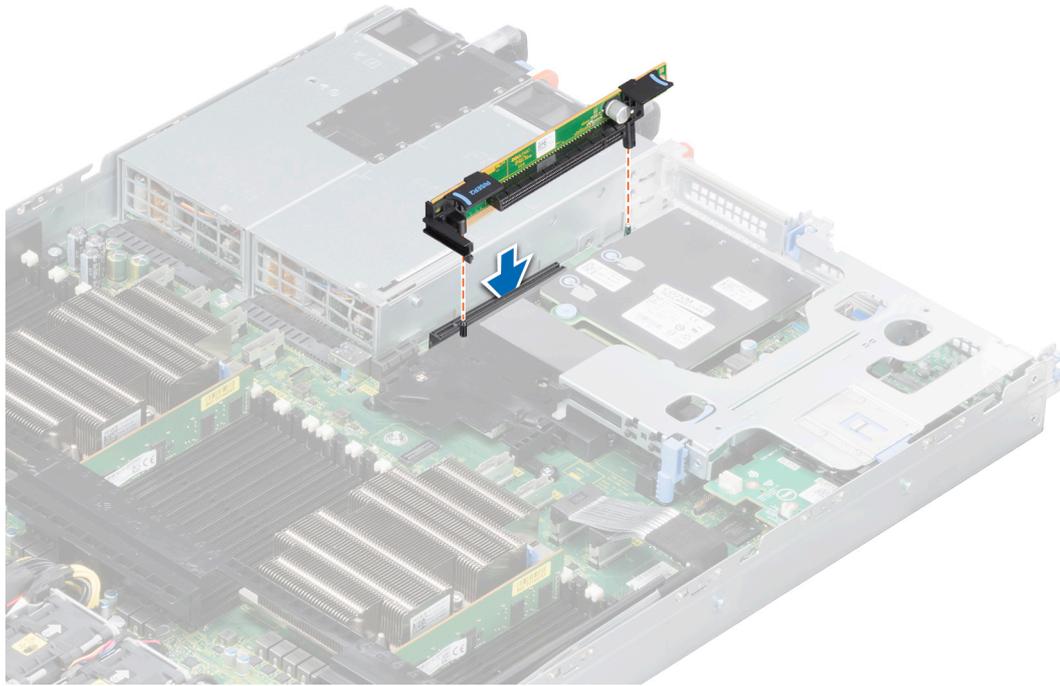
Figure 47. Installing expansion card riser 2

Next steps

1. Follow the procedure listed in After working inside your system.
2. Install any device drivers required for the card as described in the documentation for the card.

Removing an expansion card from the expansion card riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. If applicable, disconnect the cables from the expansion card.

ⓘ **NOTE:** When removing a card from the riser 1, open the PCIe card holder latch. If applicable, remove the PCIe guide and then remove the expansion card.

Steps

1. If applicable, lift the expansion card latches out of the slot.
2. Holding the expansion card by its edges, remove the card from the riser.
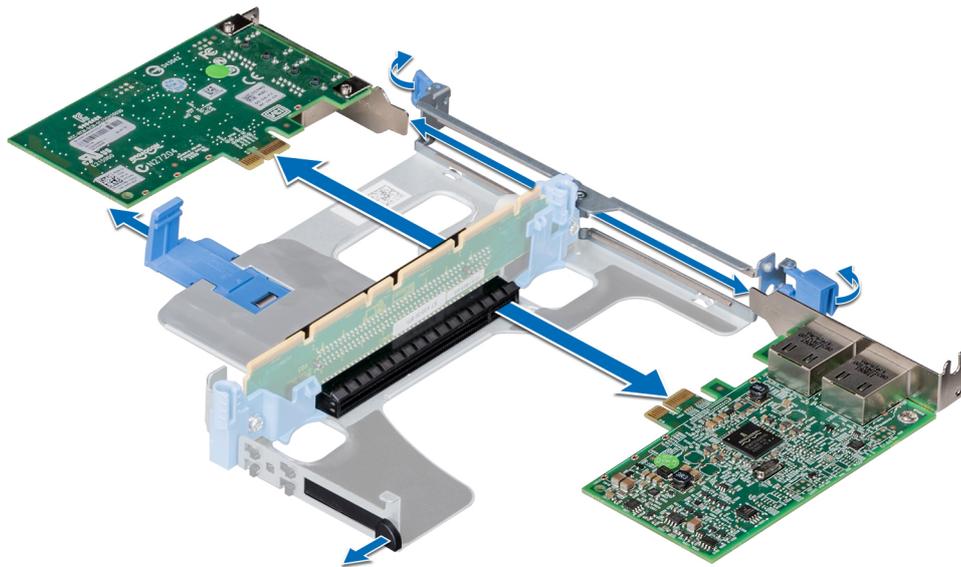
Figure 48. Removing expansion card from riser 1
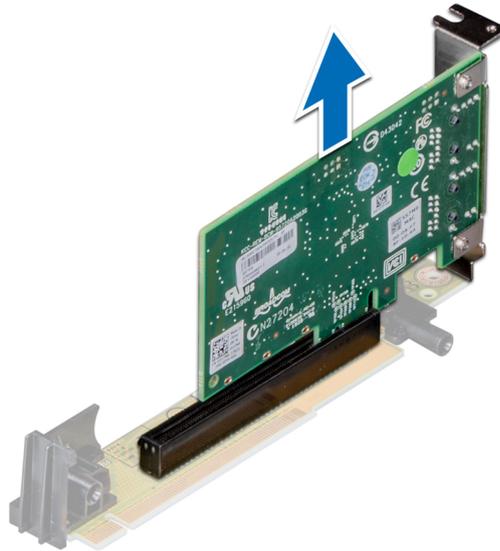
Figure 49. Removing expansion card from riser 2

3. Install a expansion card filler bracket if you are not going to replace the expansion card. .

   ⓘ **NOTE:** You must install a filler bracket over an empty expansion card slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system. .
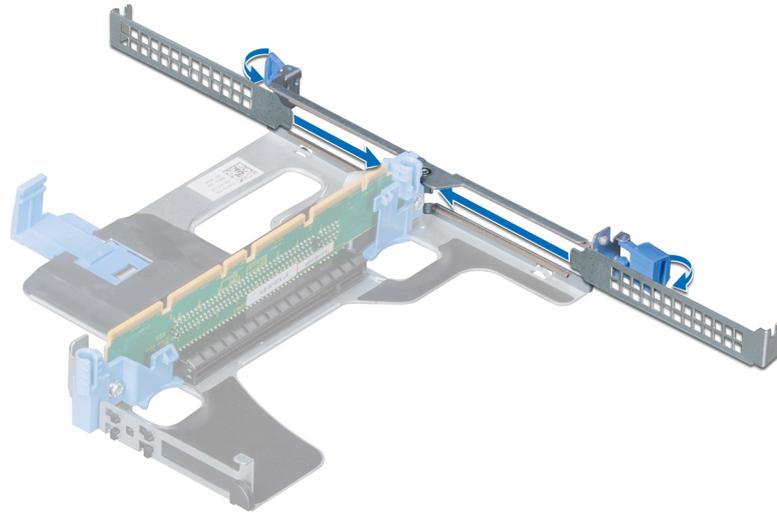
Figure 50. Installing a filler bracket into a riser

Next steps

Install expansion card into expansion card riser.

Installing an expansion card into expansion card riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. If installing a new expansion card, unpack it and prepare the card for installation.

   ⓘ **NOTE:** For instructions, see the documentation accompanying the card.

ⓘ **NOTE:** When installing a card into the riser 1, open the PCIe card holder latch. If applicable, open the PCIe guide and then install the expansion card.

Steps

1. If applicable, lift the expansion card latch and remove the filler bracket.

   ⓘ **NOTE:** Store the filler bracket for future use. Filler brackets must be installed in empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.
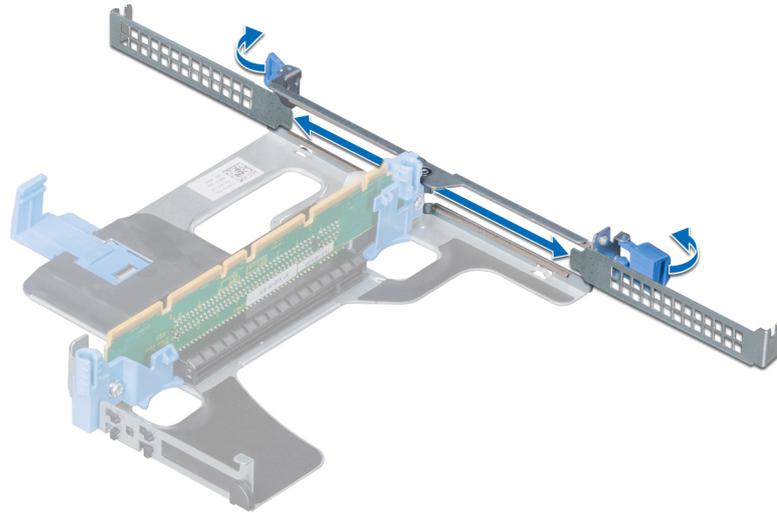
Figure 51. Removing the metal filler bracket from a riser

2. Holding the card by its edges, insert the expansion card to connect it to the connector on the riser.
3. Close the expansion card latch.
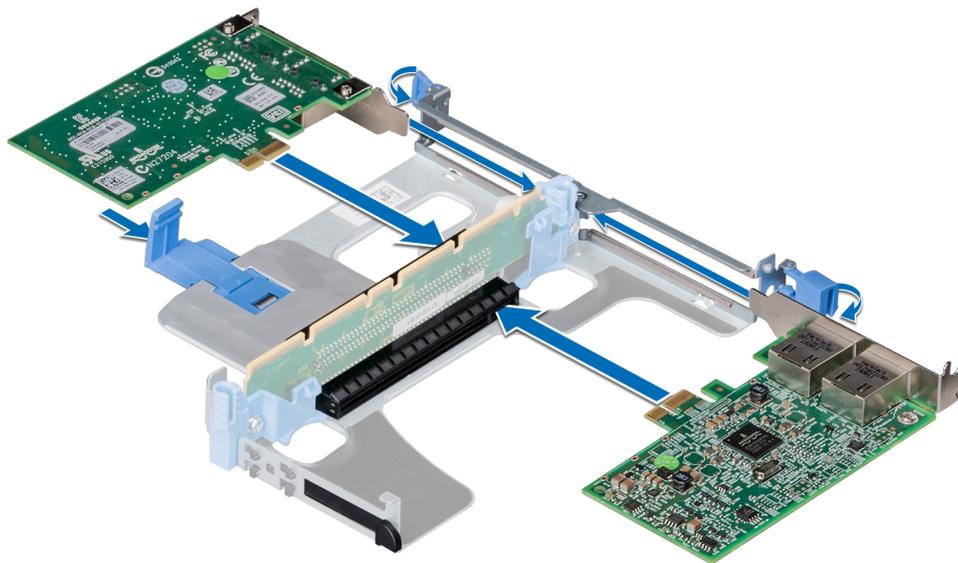
Figure 52. Installing expansion cards into the expansion riser 1
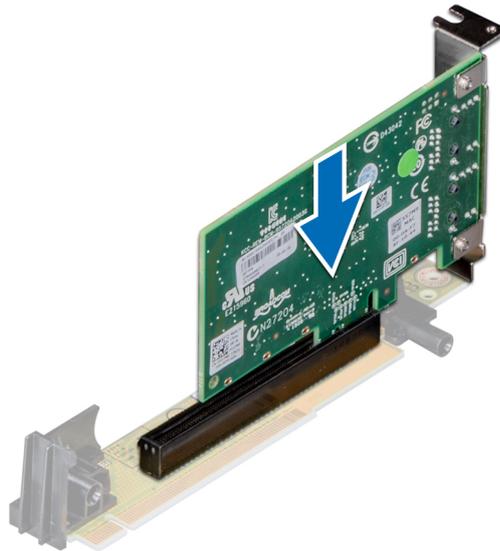
Figure 53. Installing an expansion card into the expansion riser 2

Next steps

1. After installing a card into the riser 1, close the PCIe card holder latch.
2. Follow the procedure listed in After working inside your system.
3. Install any device drivers required for the card as described in the documentation for the card.

Processor and heat sink

Removing a processor and heat sink module

Prerequisites

⚠️ **WARNING: The heat sink may be hot to touch for some time after the system has been powered down. Allow the heat sink to cool before removing it.**

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.

Steps

1. Using a Torx #T30 screwdriver, loosen the screws on the heat sink in the order below:
   a. Loosen the first screw three turns.
   b. Loosen the second screw completely.
   c. Return to the first screw and loosen it completely.

   ⓘ **NOTE:** It is normal for the heat sink to slip off the blue retention clips when the screws are partially loosened, continue to loosen the screw(s).

2. Pushing both blue retention clips simultaneously, lift the processor and heat sink module (PHM) out of the system.
3. Set the PHM aside with the processor side facing up.
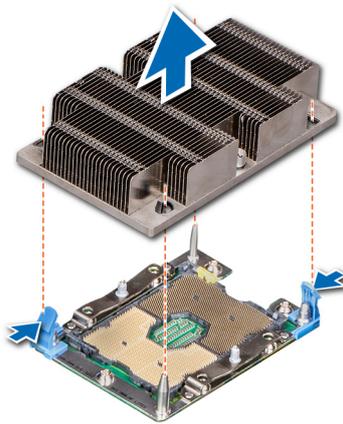
Figure 54. Removing a processor and heat sink module

Next steps

1. Install the processor.
2. Replace the processor and heat sink module.

Removing the processor

Prerequisites

(i) **NOTE:** Only remove the processor from the processor and heat sink module if you are replacing the processor or heat sink. This procedure is not required when replacing a system board.

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.
4. Remove the processor and heat sink module.

Steps

1. Place the heat sink with the processor side facing up.
2. Insert a flat blade screwdriver into the release slot marked with a yellow label. Twist (do not pry) the screwdriver to break the thermal paste seal.
3. Push the retaining clips on the processor bracket to unlock the bracket from the heat sink.
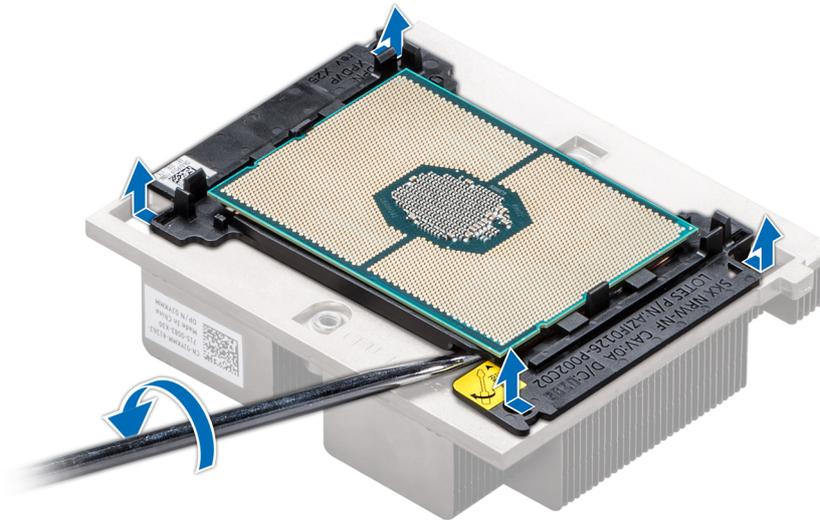
Figure 55. Loosening the processor bracket

4. Lift the bracket and the processor away from the heat sink, and place the processor connector side down on the processor tray.
5. Flex the outer edges of the bracket to release the bracket from the processor.

   (i) **NOTE:** Ensure that the processor and the bracket are placed in the tray after you remove the heat sink.

Figure 56. Removing the processor bracket

Next steps

Install the processor into the processor and heat sink module..

Installing the processor

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Place the processor in the processor tray.

   ⓘ **NOTE:** Ensure that the pin 1 indicator on the processor tray is aligned with the pin 1 indicator on the processor.

2. Flex the outer edges of the bracket around the processor ensuring that the processor is locked into the clips on the bracket.

   ⓘ **NOTE:** Ensure that the pin 1 indicator on the bracket is aligned with the pin 1 indicator on the processor before placing the bracket on the processor.

   ⓘ **NOTE:** Ensure that the processor and the bracket are placed in the tray before you install the heat sink.

Figure 57. Installing the processor bracket

3. If you are using an existing heat sink, remove the thermal grease from the heat sink by using a clean lint-free cloth.
4. Use the thermal grease syringe included with your processor kit to apply the grease in a quadrilateral design on the top of the processor.

   ⚠ **CAUTION: Applying too much thermal grease can result in excess grease coming in contact with and contaminating the processor socket.**

   ⓘ **NOTE:** The thermal grease syringe is intended for single use only. Dispose the syringe after you use it.
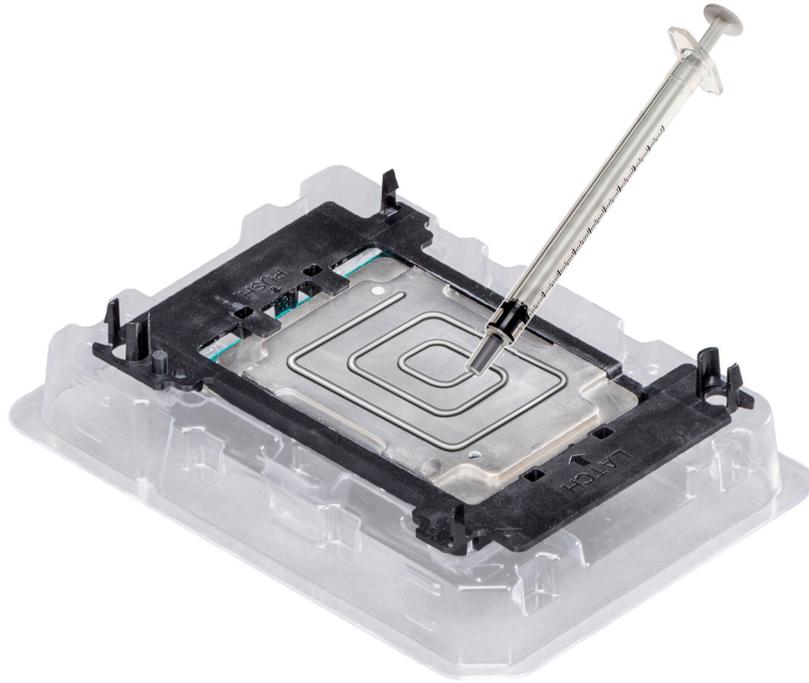
Figure 58. Applying thermal grease on top of the processor

5. Place the heat sink on the processor and push down on the base of the heat sink until the bracket locks onto the heat sink.

   (i) **NOTE:**
   - Ensure that the two guide pin holes on the bracket match the guide holes on the heat sink.
   - Do not press on the heat sink fins.
   - Ensure that the pin 1 indicator on the heat sink is aligned with the pin 1 indicator on the bracket before placing the heat sink onto the processor and bracket.
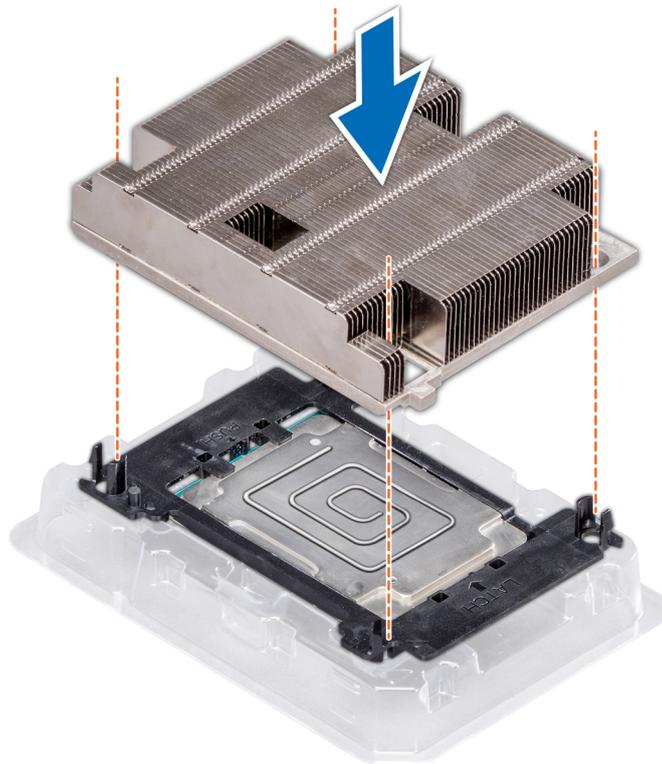
Figure 59. Installing the heat sink onto the processor

Next steps

1. Install the processor and heat sink module.
2. Install the air shroud.
3. Follow the procedure listed in After working inside your system.

Installing a processor and heat sink module

Prerequisites

⚠ **CAUTION: Never remove the heat sink from a processor unless you intend to replace the processor. The heat sink is necessary to maintain proper thermal conditions.**

⚠ **WARNING: The heat sink may be hot to touch for some time after the system has been powered down. Allow the heat sink to cool before removing it.**

1. Follow the safety guidelines listed in Safety instructions.
2. If installed, remove the processor/DIMM blank and CPU dust cover.

   The procedure to remove the processor/DIMM blank is similar to that of the memory module.

Steps

1. Align the pin 1 indicator of the heat sink to the system board and then place the processor and heat sink module (PHM) on the processor socket.

   ⚠ **CAUTION: To avoid damaging the fins on the heat sink, do not press down on the heat sink fins.**

   ⓘ **NOTE:** Ensure that the PHM is held parallel to the system board to prevent damaging the components.

2. Push the blue retention clips inward to allow the heat sink to drop into place.
3. Supporting the heat sink with one hand.

4. Using the Torx #T30 screwdriver, tighten the screws on the heat sink in the order below:
   a. Partially tighten the first screw (approximately 3 turns).
   b. Tighten the second screw completely.
   c. Return to the first screw and tighten it completely.

If the PHM slips off the blue retention clips when the screws are partially tightened, follow these steps to secure the PHM:
   a. Loosen both the heat sink screws completely.
   b. Lower the PHM on to the blue retention clips, follow the procedure described in step 2.
   c. Secure the PHM to the system board, follow the procedure described in step 4.

ⓘ **NOTE:** The processor and heat sink module retention screws should not be tightened to more than 0.13 kgf-m (1.35 N.m or 12 in-lbf).
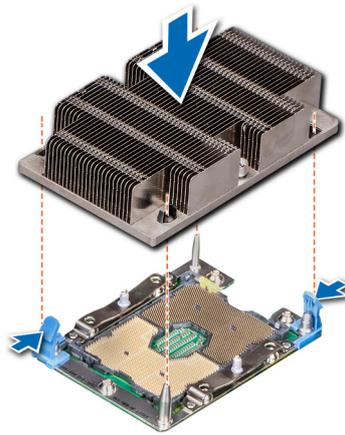
Figure 60. Installing a processor and heat sink module (1U)

Next steps

Follow the procedure listed in After working inside your system.

Network daughter card

Removing the network daughter card

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the expansion card riser.

Steps

1. Using a Phillips #2 screwdriver, loosen the captive screws that secure the network daughter card (NDC) to the system board.
2. Hold the NDC by the edges on either side of the touch points, and lift to remove it from the connector on the system board.
3. Slide the NDC towards the front of the system until the Ethernet connectors are clear of the slot in the back panel.
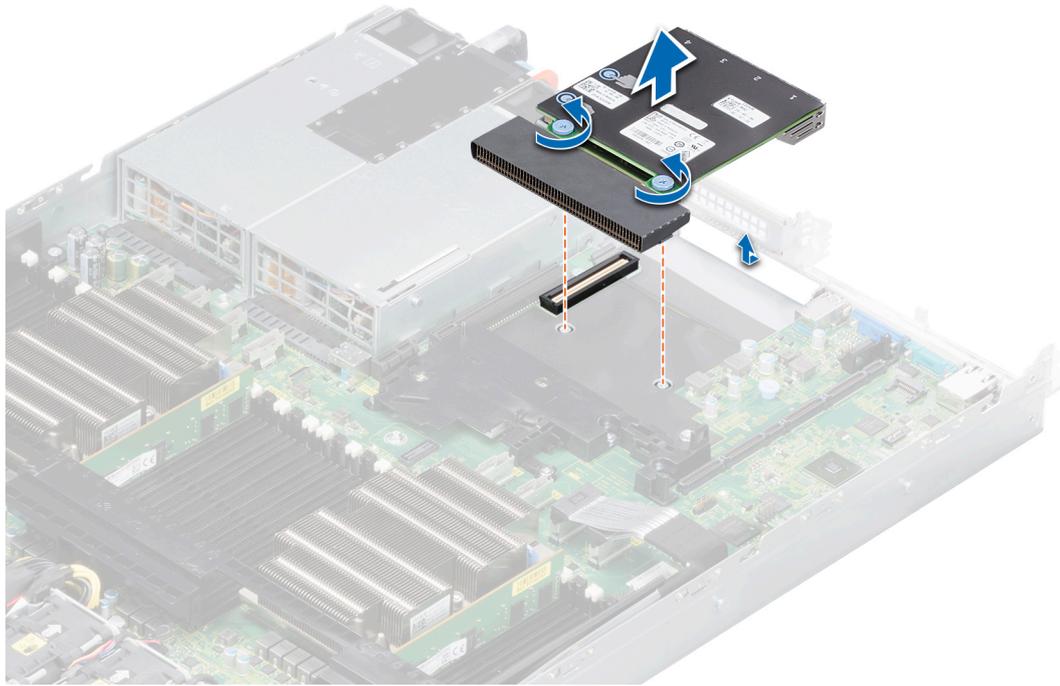
Figure 61. Removing the network daughter card

Next steps

Replace the network daughter card.

Installing the network daughter card

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Orient the NDC so that the Ethernet connectors fit through the slot in the chassis.
2. Align the captive screws at the back-end of the card with the screw holes on the system board.
3. Press the touch points on the card until the card connector is firmly seated on the system board connector.
4. Using a Phillips #2 screwdriver, tighten the captive screws to secure the NDC to the system board.
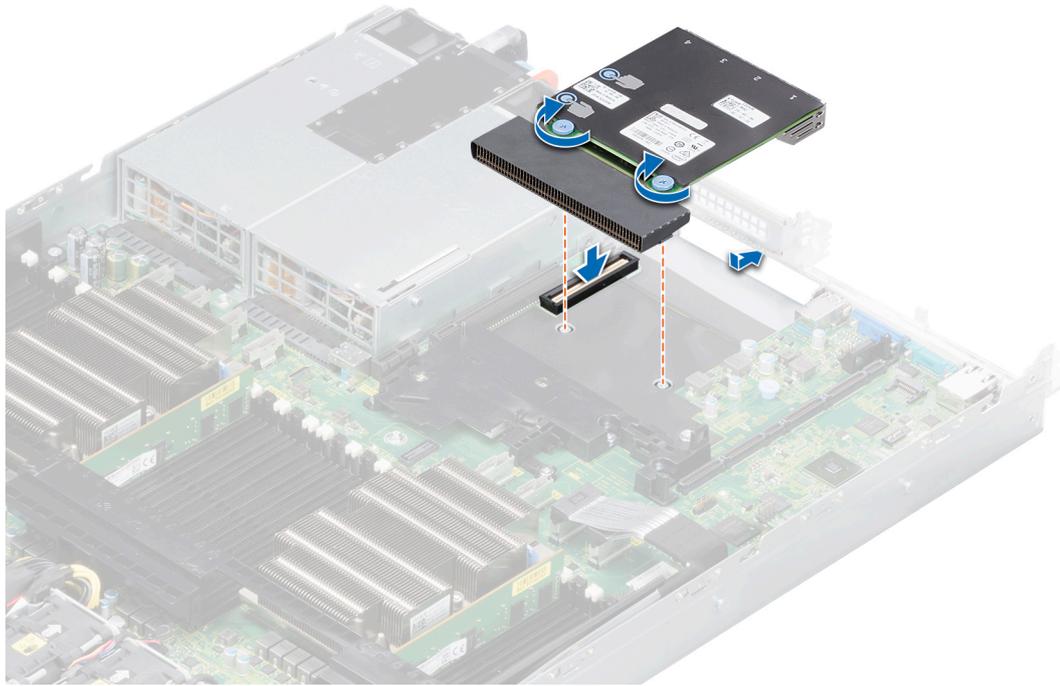
Figure 62. Installing the network daughter card

Next steps

Follow the procedure listed in After working inside your system.

System battery

Replacing the system battery

Prerequisites

⚠ **WARNING: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions. See the safety instructions that came with your system for more information.**

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the expansion card riser 1.

Steps

1. Locate the battery socket. For more information, see the System board jumpers and connectors section.

   ⚠ **CAUTION: To avoid damage to the battery connector, you must firmly support the connector while installing or removing a battery.**

2. Use a plastic scribe to pry out the system battery.

Figure 63. Removing the system battery

3. To install a new system battery, hold the battery with the positive side facing up and slide it under the securing tabs.
4. Press the battery into the connector until it snaps into place.

Figure 64. Installing the system battery

Next steps

1. Install the expansion card riser 1.
2. Follow the procedure listed in After working inside your system.
3. While booting, press F2 to enter the System Setup and ensure that the battery is operating properly.
4. Enter the correct time and date in the System Setup **Time** and **Date** fields.
5. Exit the System Setup.

Optional internal USB memory key

ⓘ **NOTE:** To locate the internal USB port on the system board, see the System board jumpers and connectors section.

Replacing the optional internal USB memory key

Prerequisites

⚠ **CAUTION: To avoid interference with other components in the server, the maximum permissible dimensions of the USB memory key are 15.9 mm wide x 57.15 mm long x 7.9 mm high.**

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.

Steps

1. Locate the USB port or USB memory key on the system board.
   To locate the USB port, see the Jumpers and connectors section.
2. If installed, remove the USB memory key from the USB port.
3. Insert the replacement USB memory key into the USB port.

Next steps

1. Follow the procedure listed in After working inside your system.
2. While booting, press F2 to enter **System Setup** and verify that the system detects the USB memory key.

Graphics processing unit

The Dell EMC PowerEdge C4140 supports two form factors of GPUs:
- Four PCIe GPUs supported with the GPU switch board or system board.
- Four SXM2 GPUs supported with the NVLink board.

PCIe Graphics processing unit

The following are the high-level steps that you must perform to replace the PCIe GPUs:

1. Remove the GPU blank.
2. Remove the GPU riser cable from the system board.
3. Remove the GPU.
4. Remove the GPU riser cable board.
5. Remove the GPU brackets from the GPU removed from your system.
6. Remove the custom GPU brackets from the replacement GPU.
7. Remove the optional GPU switch board.
8. Install the optional GPU switch board.
9. Install the custom GPU brackets on the GPU removed from your system.
10. Install the GPU brackets on the replacement GPU.
11. Install the GPU riser cable board.
12. Install the GPU blank.
13. Install the GPU.
14. Install the GPU riser cable on the system board.

GPU installation guidelines

- The processor must be of 150 W or less.
- Due to the high power consumption of GPUs, the ambient system inlet temperature is restricted to 25°C to ensure adequate system cooling when one or more GPU cards are installed.
  - (i) **NOTE:** Certain system configurations may require reduction in the maximum ambient system inlet temperature limit. The performance of the system may be impacted when operating above the maximum temperature limit or with a faulty fan.
- All GPUs must be of the same type and model.
- You can install up to four GPUs.
  - (i) **NOTE:** Incorrect removal and installation of the GPUs will cause operational issues to your system.

Removing a GPU riser cable from the GPU switch board

Prerequisites

⚠ **CAUTION: The GPU riser cables should be removed before removing the GPUs to prevent pin damage in the GPU connectors on the GPU switch board.**

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.

Steps

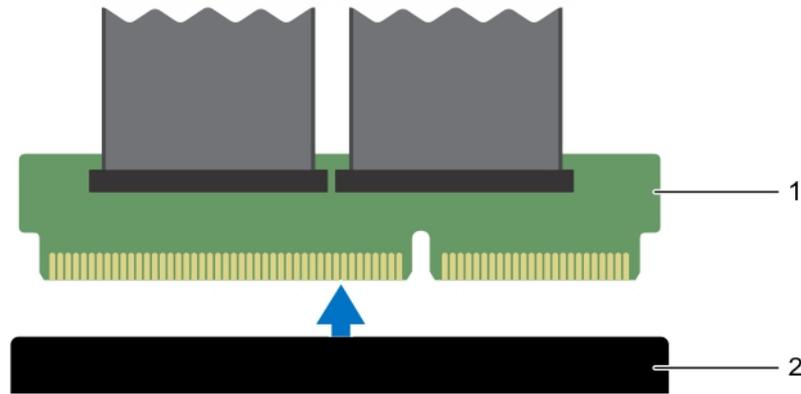Disconnect the GPU riser cable from the GPU riser cable connector on the GPU switch board.

Figure 65. Removing a GPU riser cable from the system board for configurations B and G

a. riser cable connector
b. riser cable connector slot on GPU switch board

Removing a GPU

Prerequisites

⚠ **CAUTION: You can remove GPU4 and GPU6 independently. However, prior to removing GPU5, ensure that you remove GPU4 and prior to removing GPU7, ensure that you remove GPU6.**

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the GPU riser cables connected to the switch board or system board.

   ⚠ **CAUTION: The GPU riser cables should be removed before removing the GPUs to prevent pin damage in the GPU connectors on the system board.**

4. Disconnect the power cables connected to the system board.

Steps

1. Hold the GPU by the support brackets, and lift the GPU at an angle to release it from the guide pins on the front inner wall of the chassis.

   ⓘ **NOTE:** Do not hold the GPU by the GPU riser cable board while removing the GPU.

2. Lift the GPU out of the chassis.

   ⚠ **CAUTION: While removing the GPU out of the chassis ensure that the guide pins on the chassis do not scrape the GPU.**

3. Disconnect the power cable connected to the GPU.
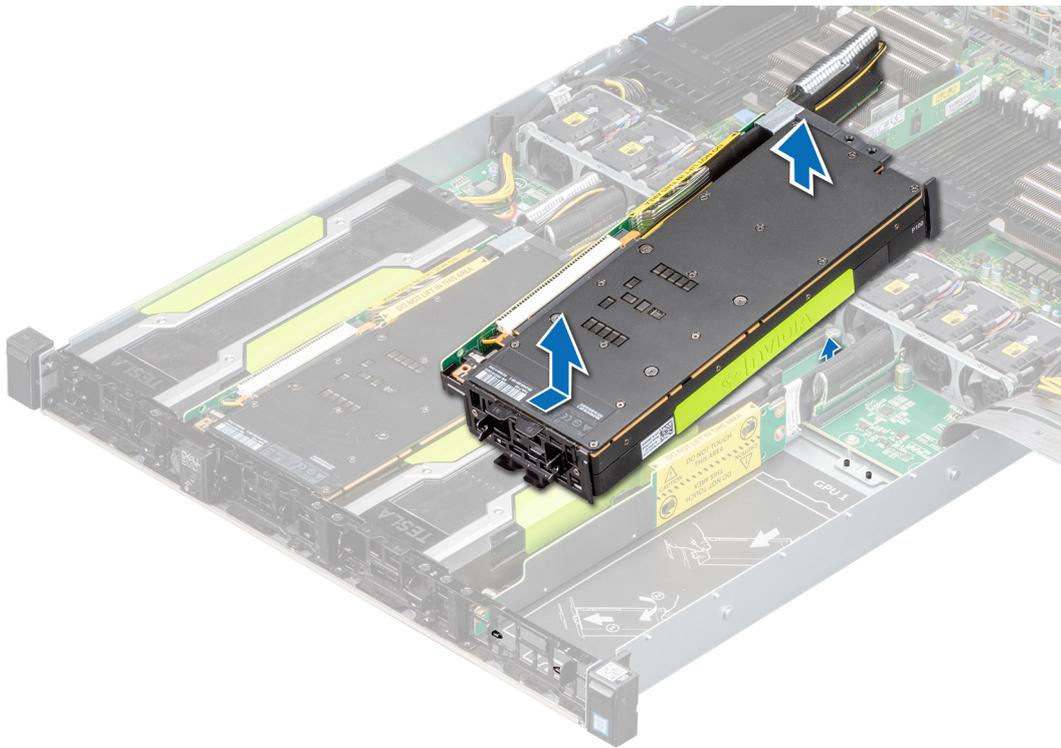
Figure 66. Removing a GPU4 for Configurations B and G

ⓘ **NOTE:** The procedure to remove GPU6 is identical to GPU4.
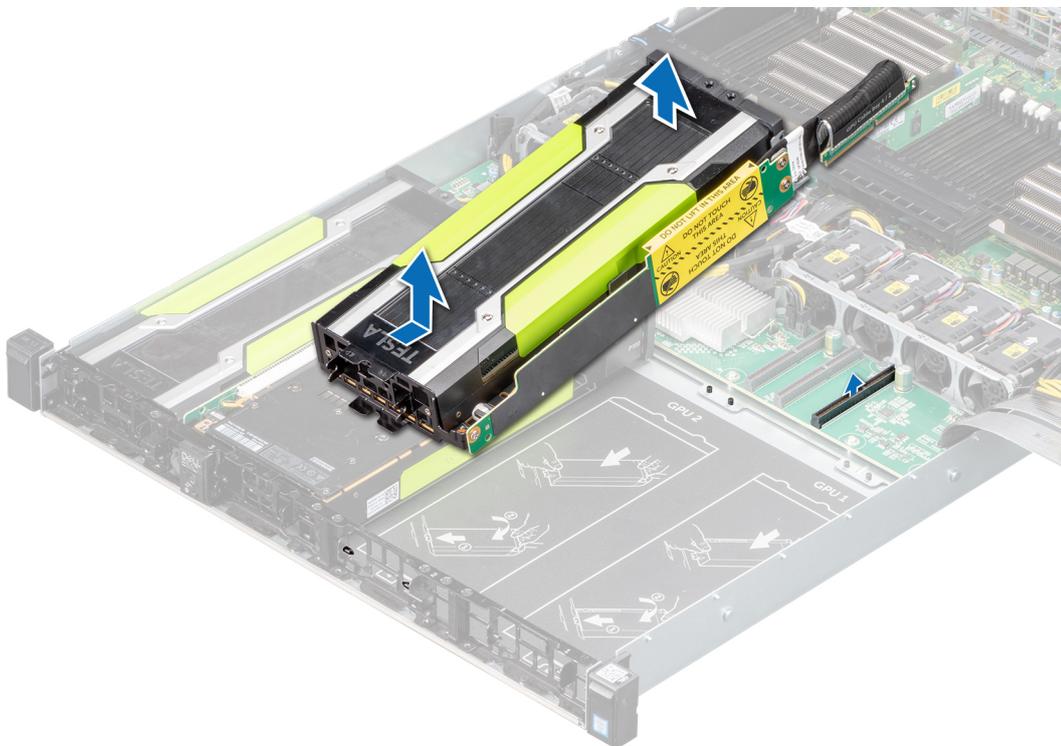
Figure 67. Removing a GPU5 for Configurations B and G

ⓘ **NOTE:** The procedure to remove GPU7 is identical to GPU5.

Next steps

Remove the GPU riser cable board.

Removing a GPU riser cable board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Keep the Philips #2 screwdriver ready.
4. Disconnect the power cables connected to the GPU.
5. Remove the GPU from the chassis.

Steps

1. Remove the screws securing the GPU riser cable board to the GPU.
2. Pull the GPU riser cable board to disengage the connector on the GPU riser cable board from the GPU.
3. Remove the GPU riser cable routed through the GPU riser cable clip.

Figure 68. Removing a GPU riser cable board

ⓘ **NOTE:** The procedure to remove the riser cable clip is same for configuration B, C and G.

Removing the GPU brackets from the GPUs removed from your system

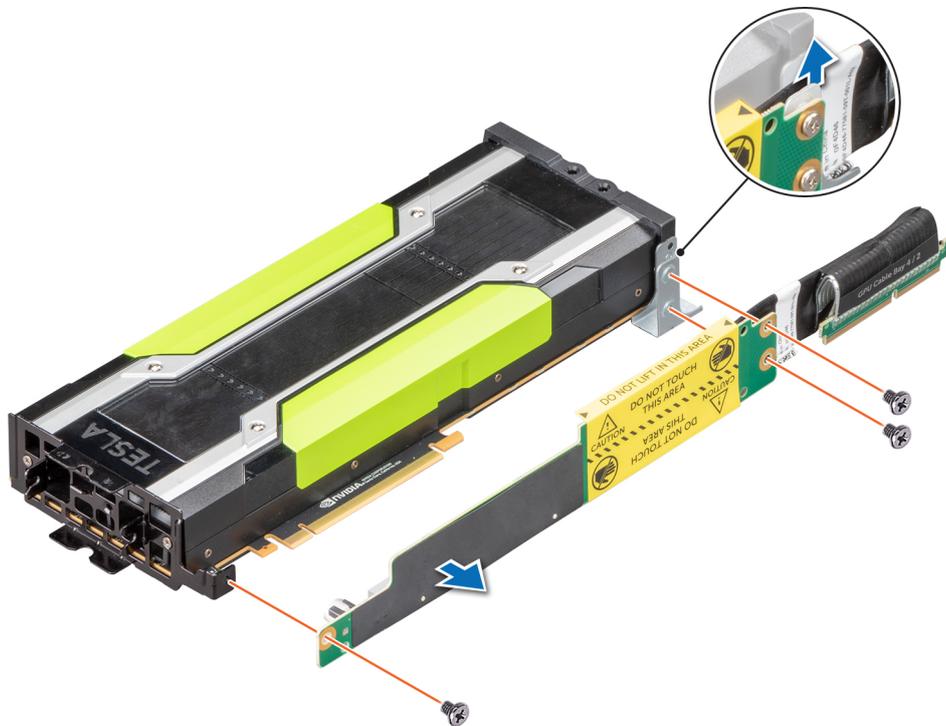The Nvidia brackets are installed on the GPUs shipped with your system. These brackets should be removed from the GPUs and install the DellEMC brackets.

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Keep the Philips #1 and #2 screwdrivers ready.
4. Remove the GPU riser cable board.

Steps

1. Remove the screws securing the front I/O bracket to the GPU, and remove the I/O bracket.
2. Remove the screws securing the support bracket to the GPU, and remove the support bracket.

Figure 69. Removing the GPU I/O brackets and the support brackets

1. Torx screw (2)
2. support bracket
3. GPU
4. I/O bracket
5. screw (5)

Removing the GPU brackets from the replacement GPUs

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Keep the Philips #1, #2, and the Torx T6 screwdrivers ready.
4. Remove the custom GPU brackets from the GPU removed from your system.

Steps

1. Remove the screws securing the front I/O bracket to the GPU, and remove the I/O bracket.
2. Remove the screws securing the support bracket to the GPU, and remove the support bracket.
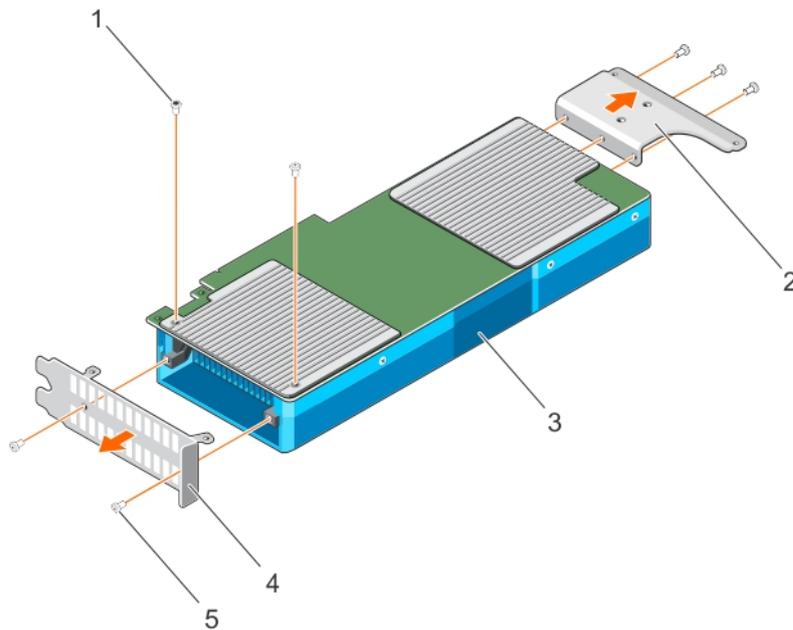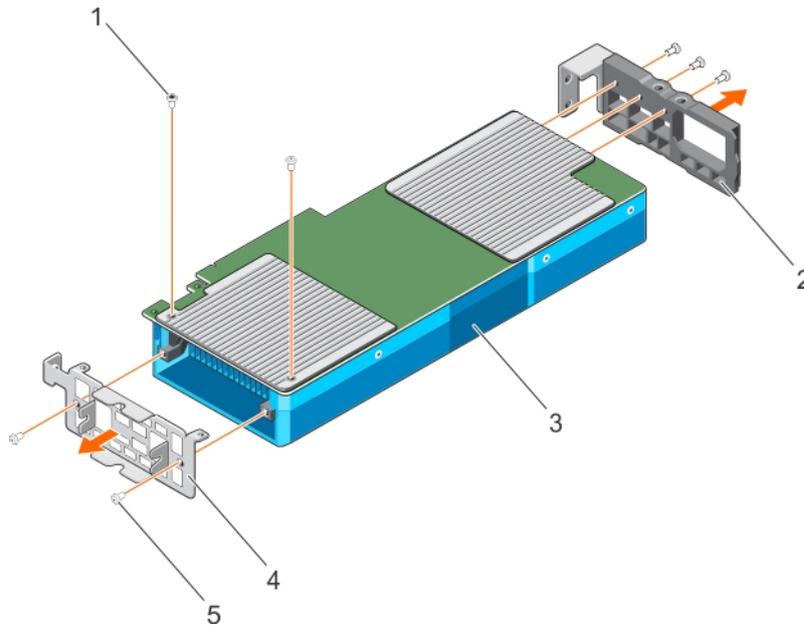
Figure 70. Removing the GPU I/O brackets and the support brackets

1. Torx screw (2)
2. support bracket
3. GPU
4. I/O bracket
5. screw (5)

Removing the GPU switch board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the system top cover (front and rear).
4. Disconnect the GPU signal cables from the system board and then from the switch board.

   ⓘ **NOTE:** The GPU riser signal cable should be removed from the switch board before removing the GPUs to prevent pin damage in the GPU connectors on the switch board.

5. Remove all GPUs from the chassis.
6. Disconnect the switch board power cable.
7. Keep the Philips #2 screwdriver ready.

Steps

1. Loosen the screws securing the GPU switch board to the chassis.
2. Slide the GPU switch board toward the front of the chassis to disengage the slots on the GPU switch board from the tabs on the chassis.
3. Lift the GPU switch board out of the chassis.
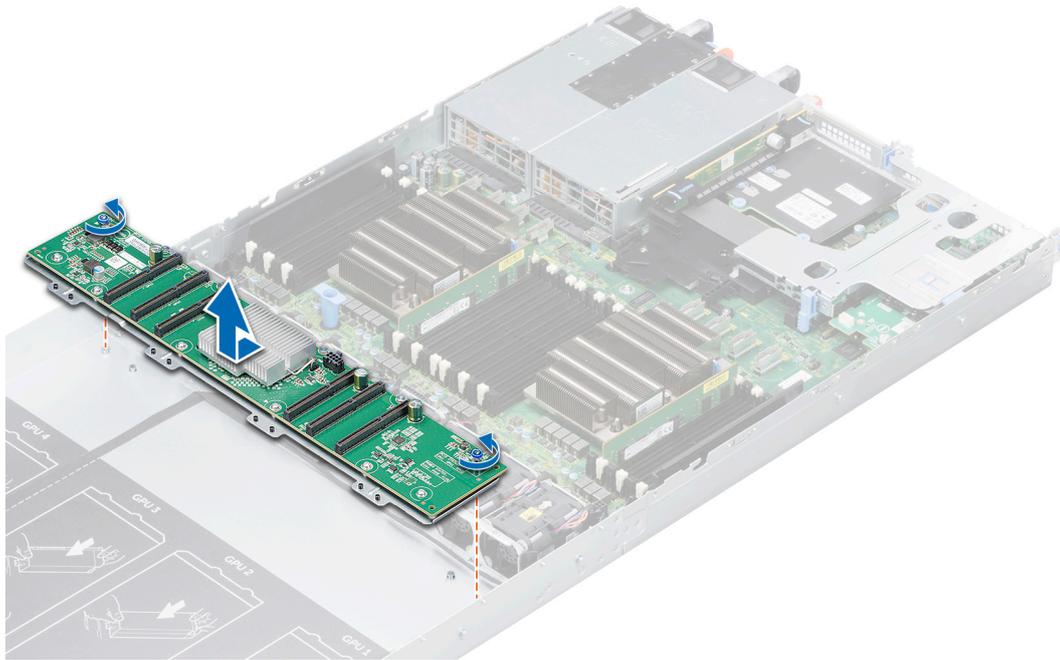
Figure 71. Removing the GPU switch board for configurations B and G

Installing the optional GPU switch board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Align the tabs on the chassis with the slots on the GPU switch board.
2. Slide the GPU switch board toward the back of the chassis to engage the slots on the GPU switch board with the tabs on the chassis.
3. Tighten the screws securing the switch board to the chassis.
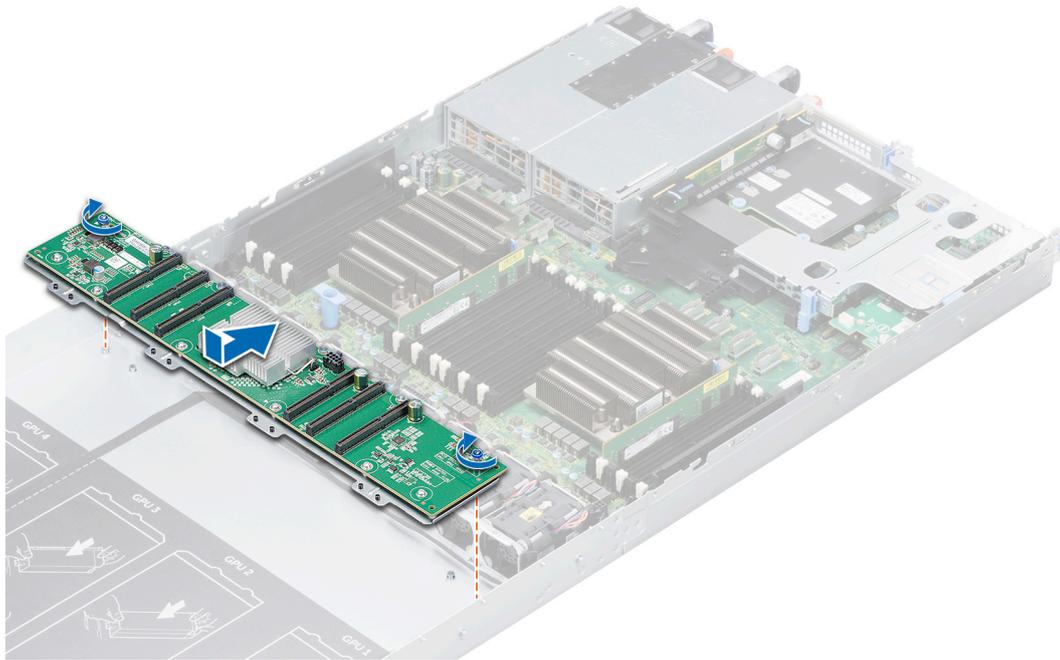
Figure 72. Installing the GPU switch board

Next steps

1. Connect the GPU switch board power cable.
2. Installing a GPU
3. Connect the GPU signal cables to the switch board and the system board.
4. Follow the procedure listed in After working inside your system.

Installing the custom GPU brackets on the replacement GPUs

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Keep the Phillips #1 and #2 screwdrivers ready.
3. Install the GPU brackets on the GPU removed from your system.

Steps

1. Align the screw holes on the front I/O bracket with the screw holes on the GPU.
2. Secure the I/O bracket to the GPU by using the screws.
3. Align the screw holes on the support bracket with the screw holes on the GPU.
4. Secure the support bracket to the GPU by using the screws.

Figure 73. Installing the custom GPU I/O brackets and the support brackets

1. Torx screw (2)
2. support bracket
3. GPU
4. I/O bracket
5. screw (5)

Next steps

Follow the procedure listed in After working inside your system.

Installing the GPU brackets on the GPUs removed from your system

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Keep the Phillips #1, #2, and the Torx T6 screwdrivers ready.
3. Remove the GPU brackets.

Steps

1. Align the screw holes on the front I/O bracket with the screw holes on the GPU.
2. Secure the I/O bracket to the GPU by using the screws.
3. Align the screw holes on the support bracket with the screw holes on the GPU.
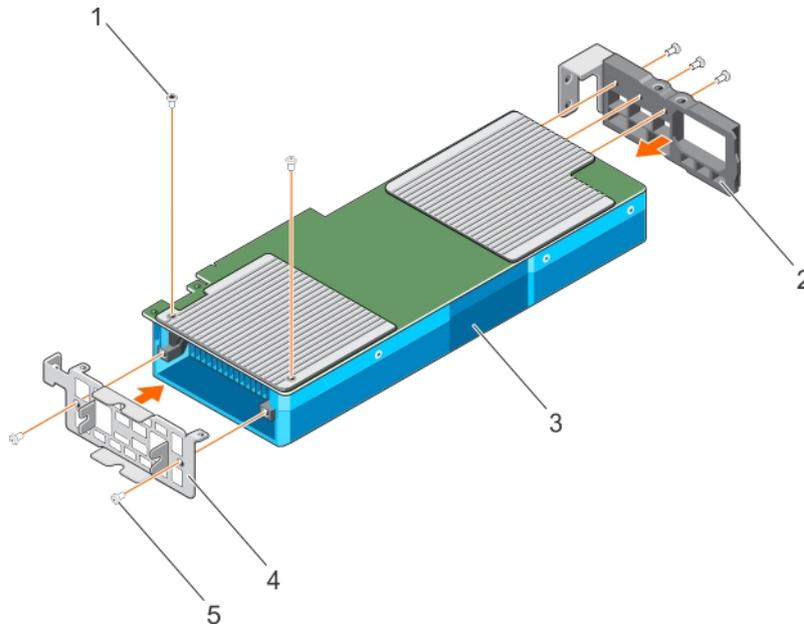4. Secure the support bracket to the GPU by using the screws.
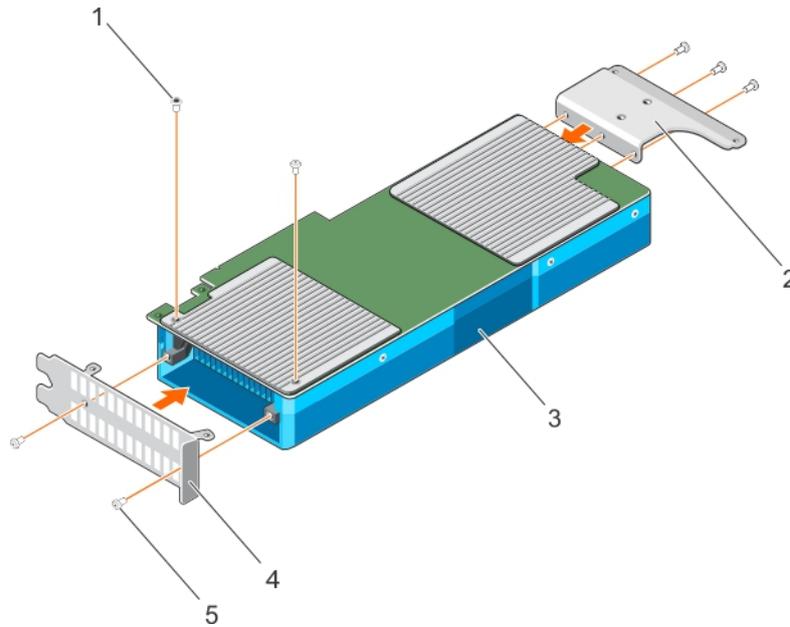
Figure 74. Installing the GPU I/O brackets and the support brackets

1. Torx screw (2)
2. support bracket
3. GPU
4. I/O bracket
5. screw (5)

Next steps

Follow the procedure listed in After working inside your system.

Installing a GPU riser cable board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Keep the Philips #2 screwdriver ready.
3. Install the custom GPU brackets on the replacement GPU.

Steps

1. Route the riser cable through the riser cable clip.
2. Align the connector on the riser cable board with the card edge connector on the GPU and press till it clicks into place.
3. Align the screw holes on the riser cable board with the screw holes on the GPU bracket.
4. Secure the riser cable board to the GPU by using the screws.
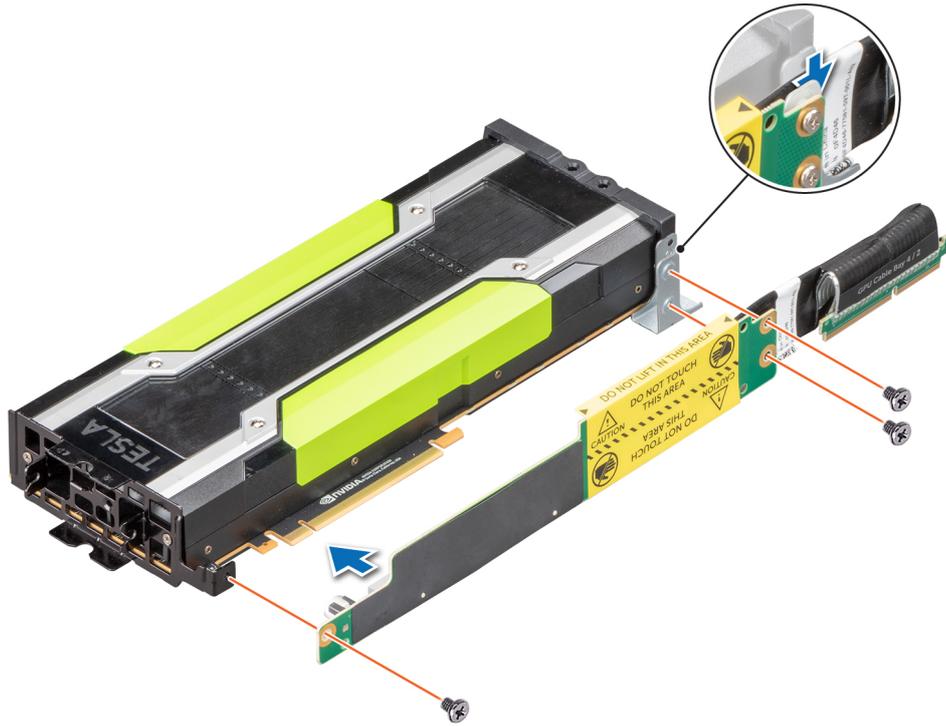
Figure 75. Installing a GPU riser cable from the system board

ⓘ **NOTE:** The procedure to install the riser cable clip is same for configuration B, C and G.

ⓘ **NOTE:** Do not hold the GPU by the GPU riser cable board.

Next steps

1. Connect the power cables to the GPU.

Installing a GPU

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the GPU installation guidelines listed in GPU installation guidelines.
3. Install the GPU brackets.
4. Install the GPU riser cable board.

Steps

1. Lower the front of the GPU at an angle and slide it to engage the slots on the GPU with the guide pins on the front inner wall of the chassis.

   ⓘ **NOTE:** Do not hold the GPU by the GPU riser cable board.

   ⚠ **CAUTION: While installing the GPU, ensure that the guide pins on the chassis do not scrape the GPU.**

2. Lower the back of the GPU to engage the guide holes on the GPU with the guide pins on the chassis.
3. Connect the GPU power cables to the GPU and the system board or the switch board.
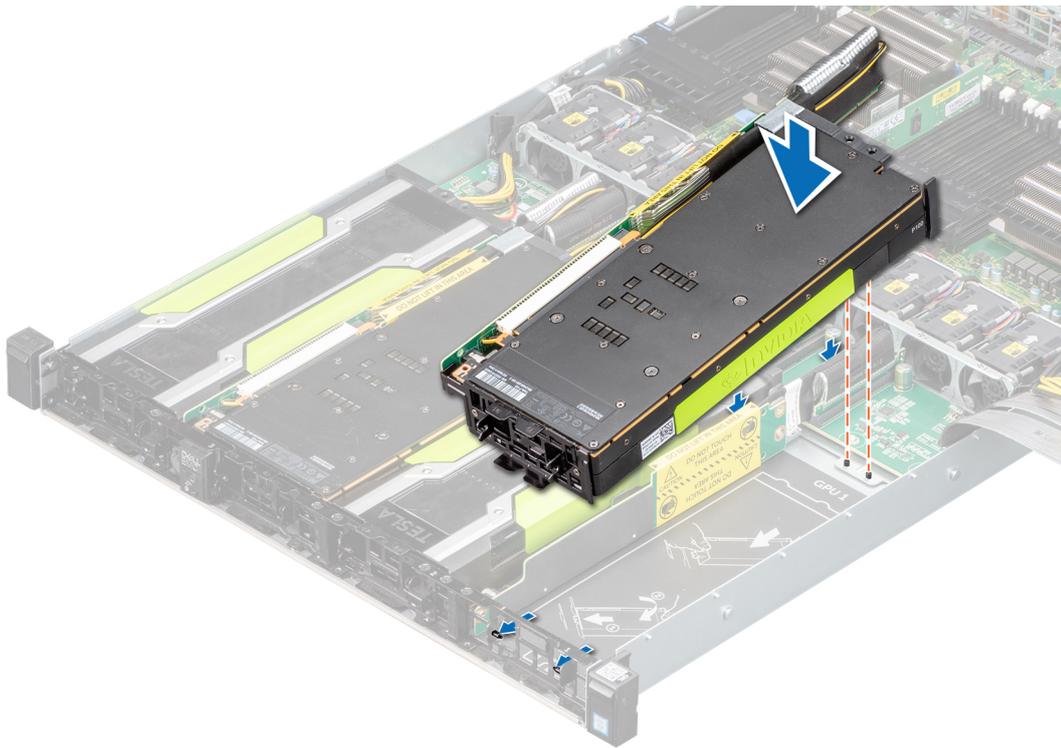
Figure 76. Installing the GPU4 for Configurations B and G

(i) **NOTE:** The procedure to install GPU6 is identical to GPU4.
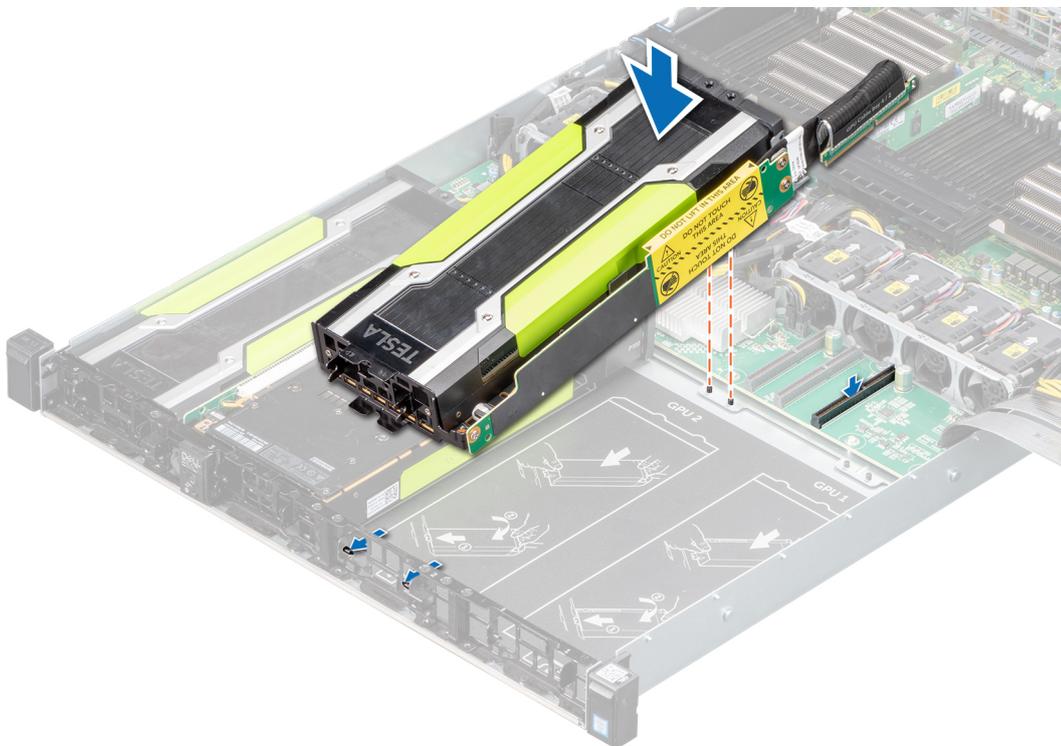
Figure 77. Installing the GPU5 for Configurations B and G

(i) **NOTE:** The procedure to install GPU7 is identical to GPU5.

Next steps

⚠ **CAUTION: The GPU should be installed in the system before installing the GPU riser cables to prevent pin damage in the PCIe connectors on the system board or switch board.**

1. Install the GPU riser cable to the system board.

Installing a GPU riser cable on the GPU switch board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Install the GPU.

   ⚠ **CAUTION: The GPU should be installed in the system before installing the GPU riser cables to prevent pin damage in the PCIe connectors on the GPU switch board.**

Steps

Insert the card edge connector firmly into the GPU riser card connector until the card is fully seated.
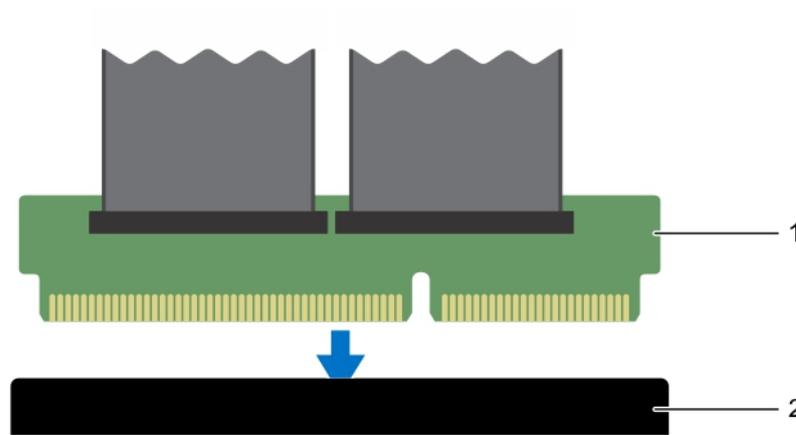
Figure 78. Installing a GPU riser cable board for configurations B and G

a. riser cable connector
b. riser cable connector slot on the GPU switch board

Next steps

Follow the procedure listed in After working inside your system.

GPU cabling diagrams
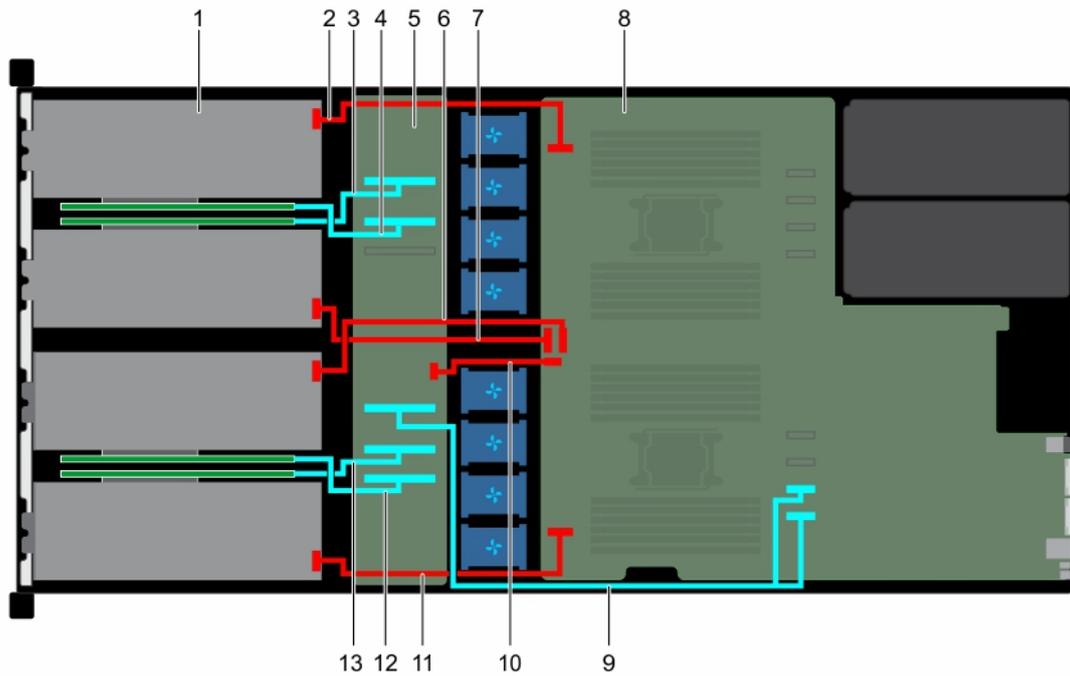
Figure 79. Configuration B: Cabling dual processor systems with PCIe GPUs and GPU switch board

1. GPU 7
2. GPU 7 power cable
3. GPU 6 cable on the GPU switch board
4. GPU 7 cable on the GPU switch board
5. GPU switch board
6. GPU 6 power cable
7. GPU 5 power cable
8. system board
9. GPU switch board to system board CPU1 cable
10. GPU switch board to system board cable
11. GPU 4 power
12. GPU 5 cable on the GPU switch board
13. GPU 4 cable on the GPU switch board
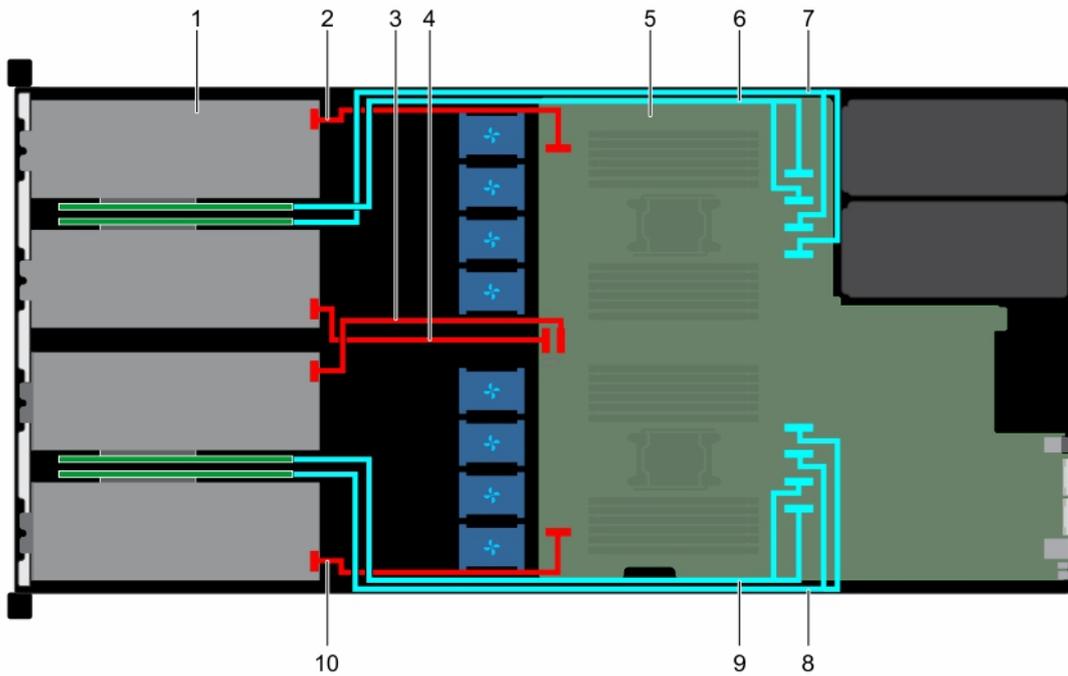
Figure 80. Configuration C: Cabling dual processor systems with PCIe GPUs and no GPU switch board

1. GPU 7
2. GPU 7 power cable
3. GPU 6 power cable
4. GPU 5 power cable
5. system board
6. GPU 7 cable on the system board
7. GPU 6 cable on the system board
8. GPU 4 cable on the system board
9. GPU 5 cable on the system board
10. GPU 4 power cable
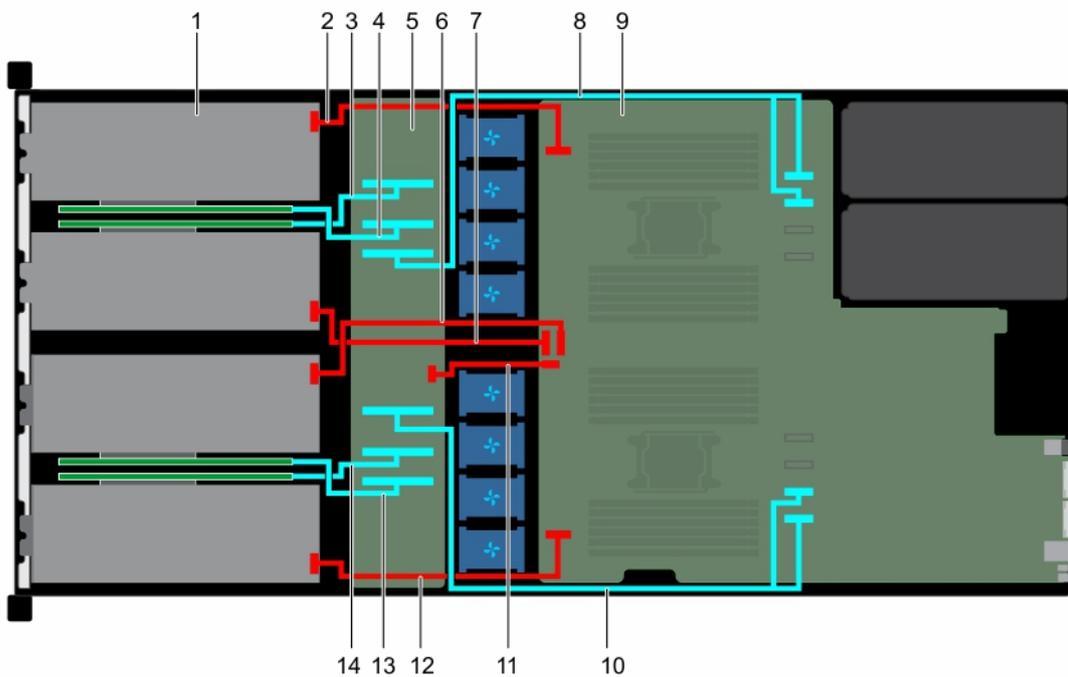
Figure 81. Configuration G: Cabling dual processor systems with PCIe GPUs and a GPU switch board

1. GPU 7
2. GPU 7 power cable
3. GPU 6 cable on the GPU switch board
4. GPU 7 cable on the GPU switch board
5. GPU switch board
6. GPU 6 power cable
7. GPU 5 power cable
8. GPU switch board to system board CPU2 cable

9. system board
10. GPU switch board to system board CPU1 cable
11. GPU switch board to system board cable
12. GPU 4 power
13. GPU 5 cable on the GPU switch board
14. GPU 4 cable on the GPU switch board
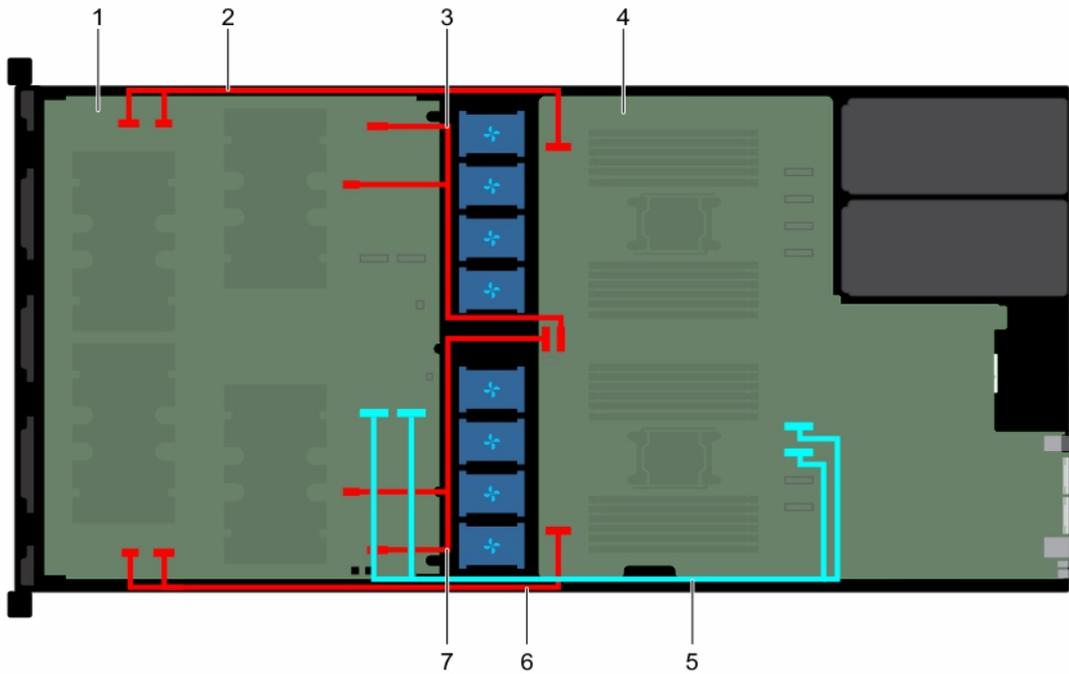
Figure 82. Configuration K: Cabling dual processor systems with SXM2 GPUs

1. NVLink board
2. GPU 7 power cable
3. GPU 6 power cable
4. system board
5. GPU 4 and 5 cables on the system board
6. GPU 4 power cable
7. GPU 5 power cable
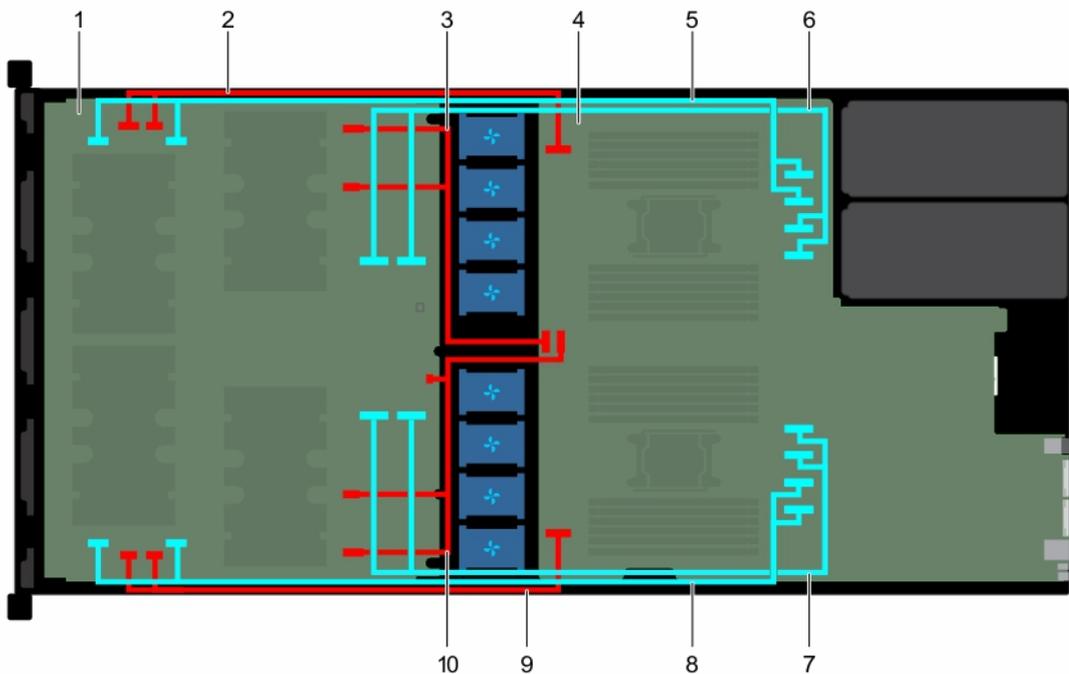
Figure 83. Configuration M: Cabling dual processor systems with SXM2 GPUs- direct connect

1. NVLink board
2. GPU 7 power cable

3. GPU 6 power cable
5. GPU 7signal cable
7. GPU 4 and 5 cables on the system board
9. GPU 4 power cable

4. system board
6. GPU 6 and 7 cables on the system board
8. GPU 4 signal cable
10. GPU 5 power cable

SXM2 Graphics processing unit

The following are the high-level steps that you must perform to replace the SXM2 GPUs:

1. Remove the NVLink air shroud.
2. Remove the SXM2 heat sink.
3. Remove the SXM2 GPU.
4. Remove the NVLink Board.
5. Install the NVLink Board.
6. Install the SXM2 GPU.
7. Install the SXM2 heat sink.
8. Install the NVLink air shroud.

Removing the NVLink Air Shroud

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.

Steps

Lift and remove the NVLink air shroud from the NVLink board.
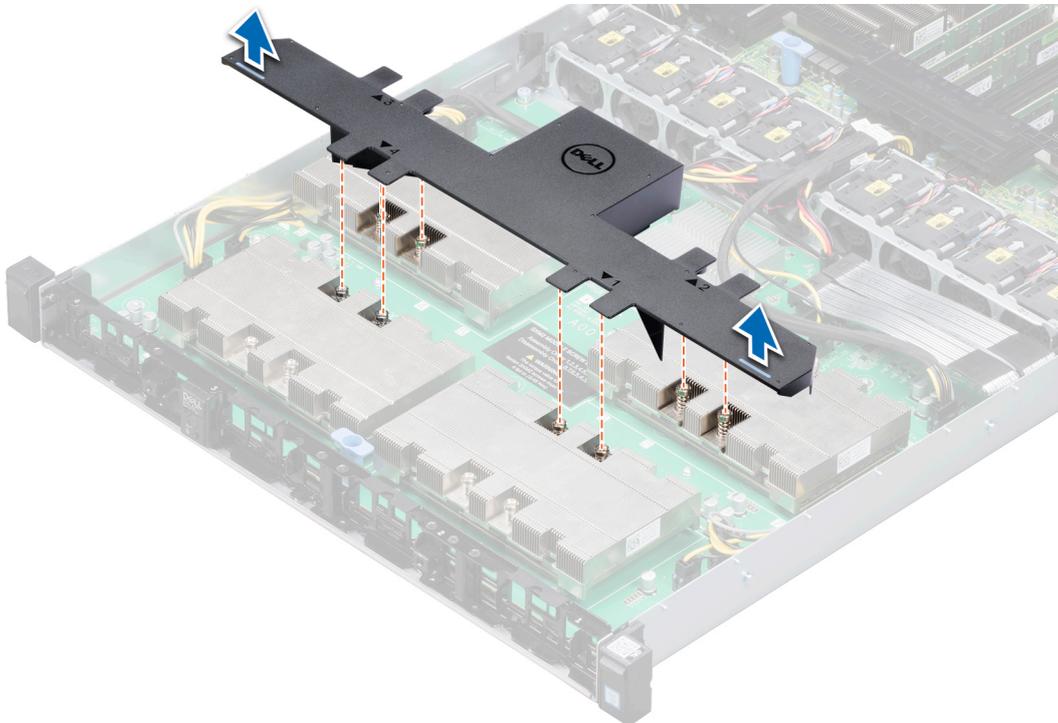
Figure 84. Removing NVLink air shroud

Removing the SXM2-GPU Heat Sink

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.
3. Remove the NVLink air shroud.

Steps

1. Using a Phillips #1 screwdriver, loosen the screws on the heat sink in the order that is mentioned below:
   a. Loosen the first screw three turns.
   b. Loosen the screw diagonally opposite to the screw you loosened.
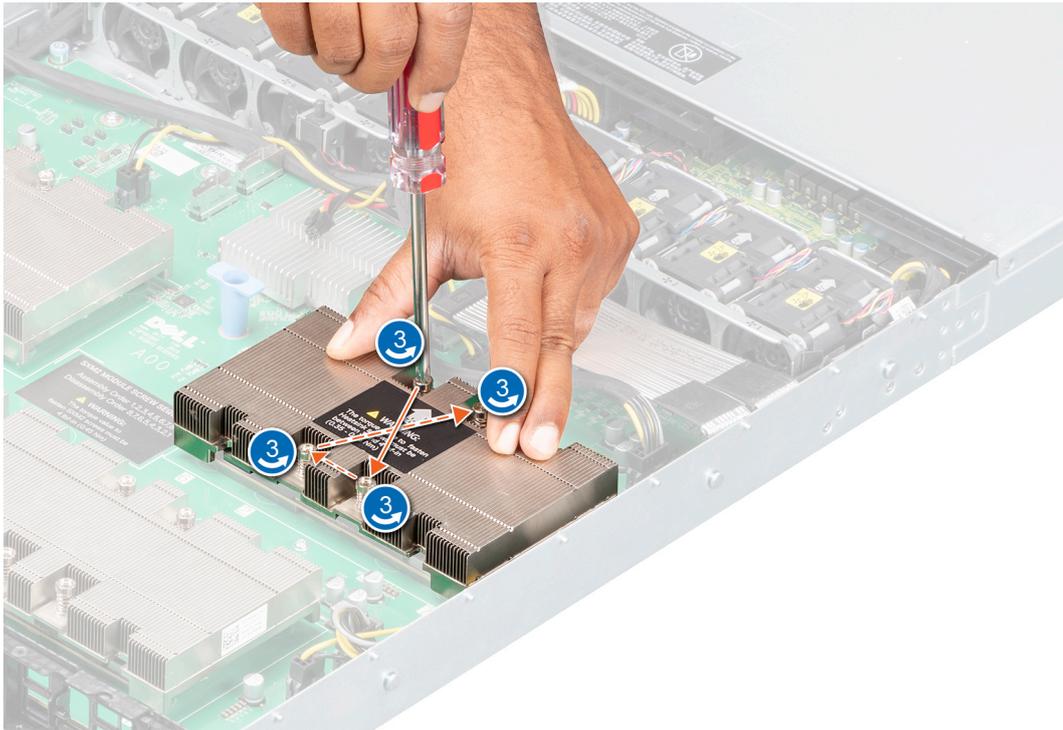
Figure 85. Removing the SXM2-GPU heat sink screws

2. Repeat the procedure for the remaining two screws.
3. Return to the first screw to loosen it completely.
4. Following the same diagonal pattern, loosen the remaining screws completely.
5. Lift the heat sink from the NVLink board.
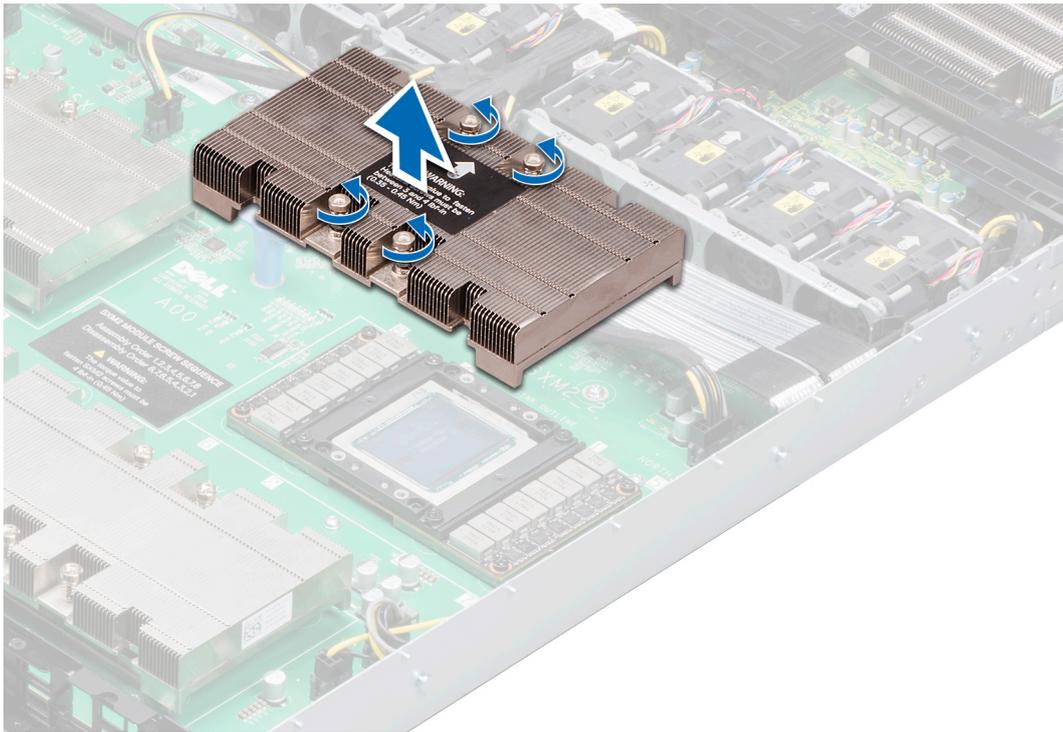
Figure 86. Removing the SXM2-GPU heat sink

Next steps

Remove a SXM2 GPU

Removing the SXM2 GPU

Prerequisites

⚠️ **CAUTION: To avoid any damage to the SXM2 GPU, ensure that you loosen the screws in a descending order starting from the screw numbered 8, on the NVLink board.**

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.
3. Remove the NVLink air shroud.
4. Remove the SXM2-GPU heat sink.

Steps

1. Loosen the captive screws that secure the SXM2 GPU to the NVLink board in a descending order, as labeled on the NVLink board.
2. Lift and remove the SXM2 GPU out of its socket on the NVLink board.
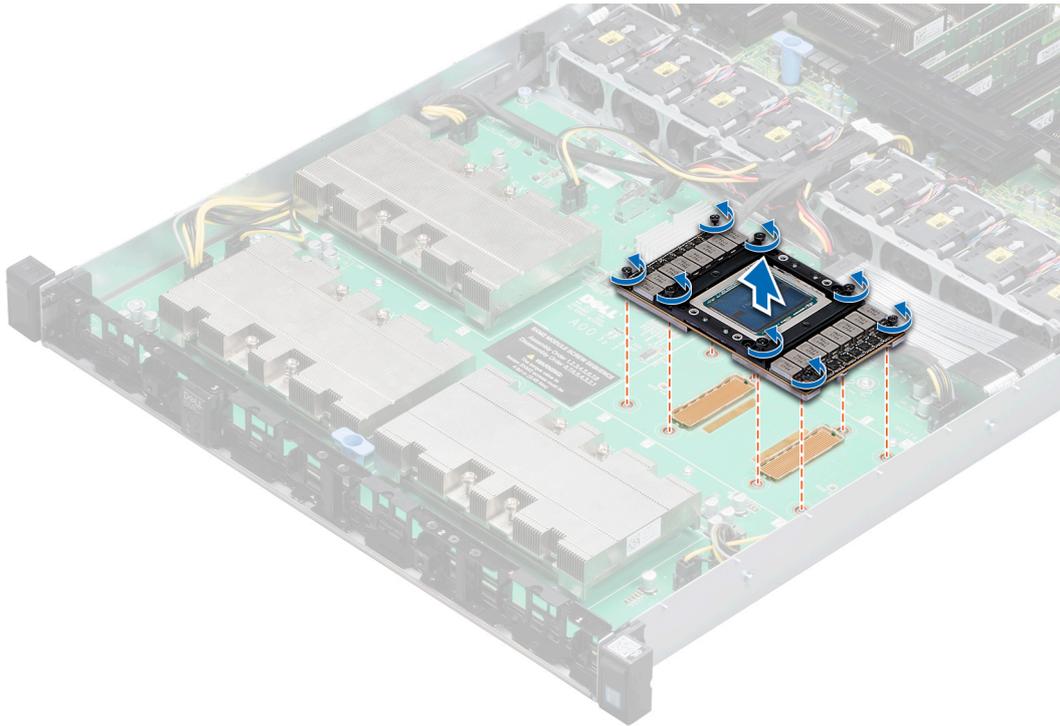
Figure 87. Removing the SXM2 GPU

3. If required, install the socket protective caps on the NVLink board.
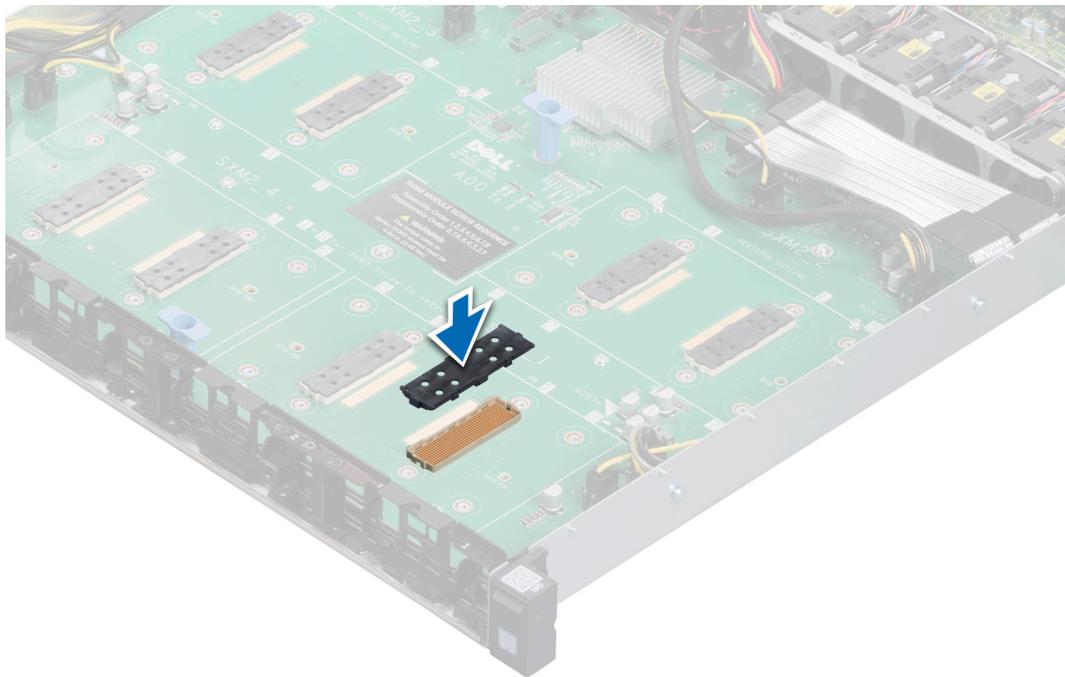
Figure 88. Installing the socket protective caps

Next steps

1. Remove the NVLink board.
2. Install a SXM2 GPU.

Removing the NVLink Board

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.
3. Remove the following components:
   a. NVLink air shroud
   b. SXM2-GPU Heat Sink
   c. SXM2 GPU(s)

   ⚠ **CAUTION: Disconnect the data cable from the system board and then remove the NVLink board to prevent pin damage in the PCIe connectors.**

4. Disconnect and remove the data and power cables from the NVLink board and the system board.

   ⚠ **CAUTION: The expansion card riser cables must be disconnected from the NVLink board before removing the NVLink board, to prevent pin damage in the PCIe connectors.**

5. Disconnect the expansion card riser cable from the NVLink board.

Steps

1. Loosen the thumbscrews that secure the NVLink board to the chassis.
2. Hold the NVLink board by the board holder, and slide the NVLink board towards the system fan to release it from the chassis.
3. Lift and remove the NVLink board out of the chassis.
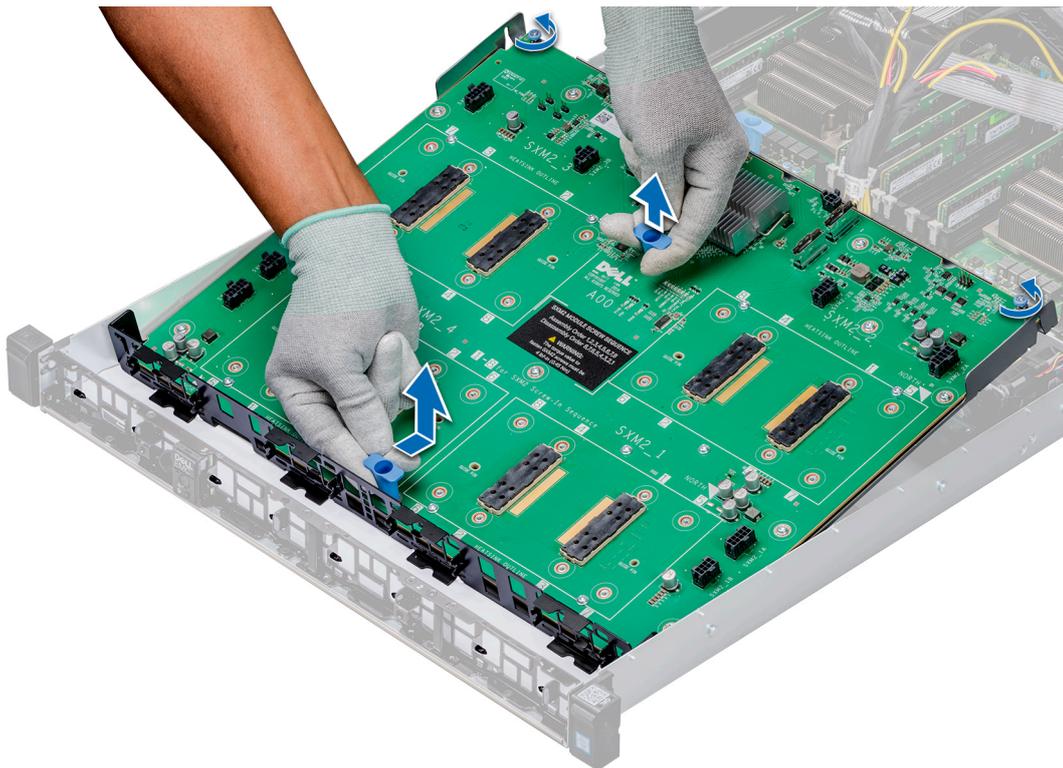
Figure 89. Removing the NVLink board

Next steps

1. Install the NVLink board.

Installing the NVLink Board

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Hold the board holders and lower the NVLink board into the chassis at an angle. Slide it to engage the slots on the NVLink board tray with the guide pins on the front inner wall of the chassis.
2. Tighten the thumbscrews to secure the NVLink board to the chassis.
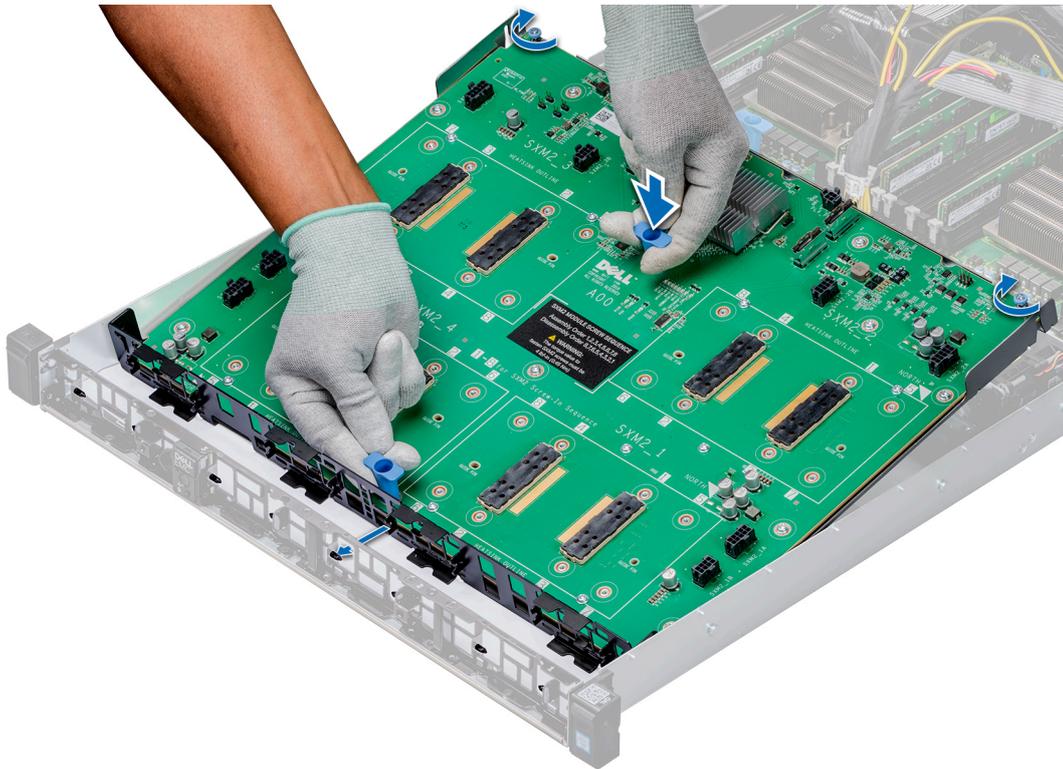
Figure 90. Installing the NVLink board

> ⚠ **CAUTION: Connect the data cable to the NVLink board and then to the system board to prevent pin damage in the PCIe connectors.**

3. Connect the data and power cables to the NVLink board and then to the system board.

Next steps

1. Install the SXM2 GPUs.
2. Install SXM2 heat sink.
3. Install air shroud.
4. Install system covers.

Installing an SXM2 GPU

Prerequisites

> ⚠ **CAUTION: To avoid any damage to the SXM2 GPU, ensure that you tighten the screws in ascending order starting from the screw numbered 1, on the NVLink board.**

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.

Steps

1. Unpack the new SXM2 GPU.
2. Locate the socket on the NVLink board.
3. If installed, remove the socket protective caps from the SXM2 GPU sockets on the NVLink board.
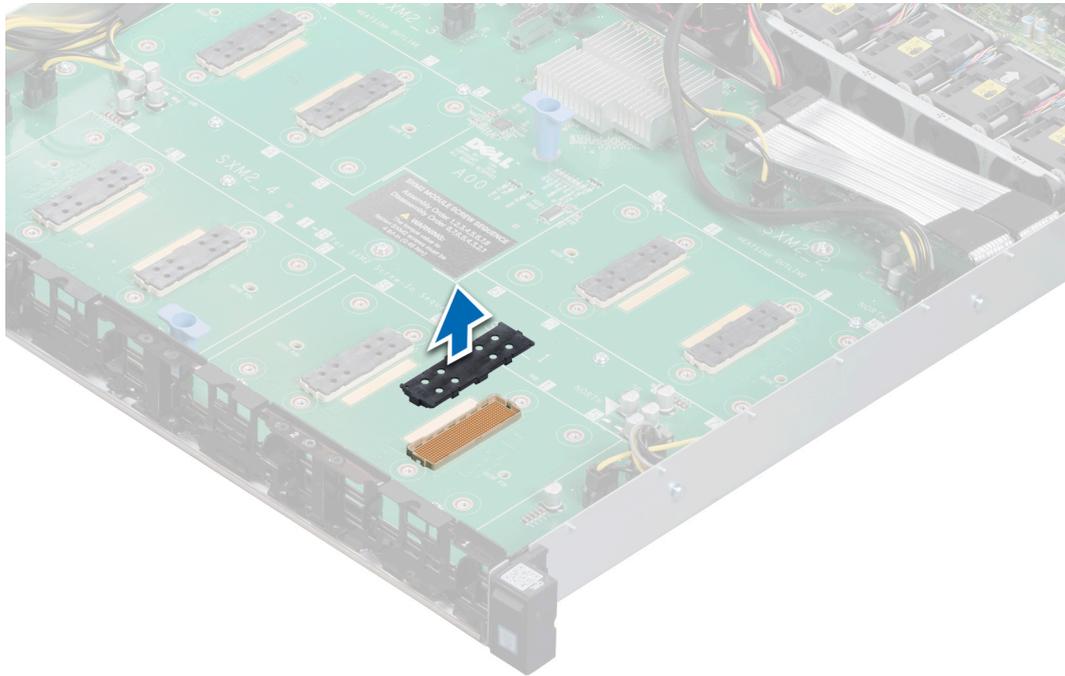
Figure 91. Removing the socket protective caps

4. If installed, remove the socket protective caps from the SXM2 GPU.
5. Align the guide pin on the SXM2 GPU card with the pin-1 on the NVLink board along with the guide pins, then place the SXM2 GPU socket.
6. Tighten the captive screws in ascending order as labeled on the NVlink board.
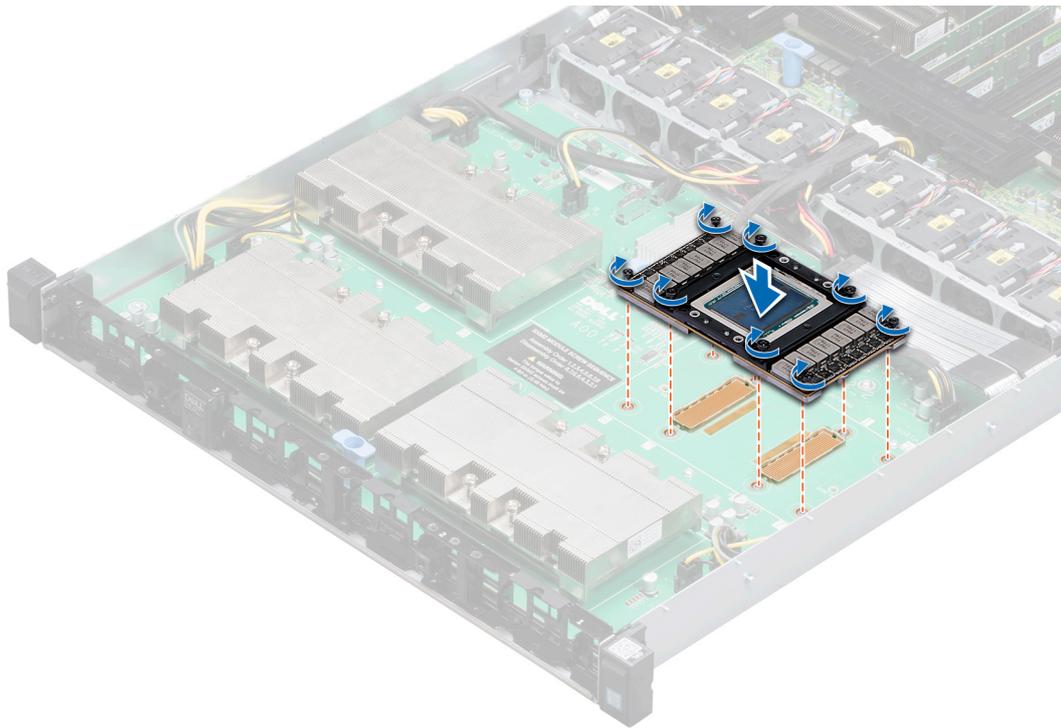
Figure 92. Installing SXM2 GPU

Next steps

1. Install the SXM2-GPU heat sink.
2. Install the NVLink air shroud.

Installing the SXM2-GPU Heat Sink

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.

Steps

1. If you are using an existing SXM2-GPU heat sink, remove the thermal grease from the heat sink by using a clean lint-free cloth.
2. Using the thermal grease syringe included with your processor kit apply the grease in a thin spiral on the top of the processor.

   ⚠️ **CAUTION: Applying too much thermal grease can result in excess grease coming in contact with and contaminating the processor socket.**

   ⓘ **NOTE:** The thermal grease syringe is intended for one-time use only. Dispose the syringe after you use it.

3. Align the screws on the heat sink with the standoffs on the system board.
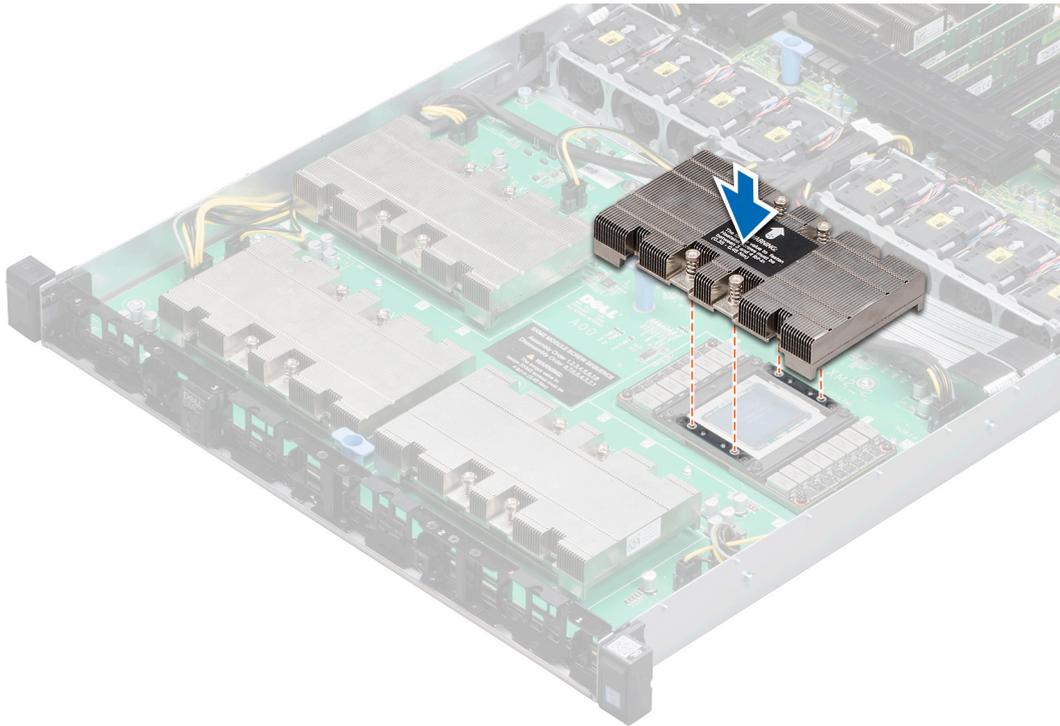
Figure 93. Installing the SXM2-GPU heat sink

4. Using a Philips #2 screwdriver tighten the screws in the following order to secure the heat sink to the system board:
   a. Tighten the first screw three turns.
   b. Tighten the screw diagonally opposite to the screw you tightened.
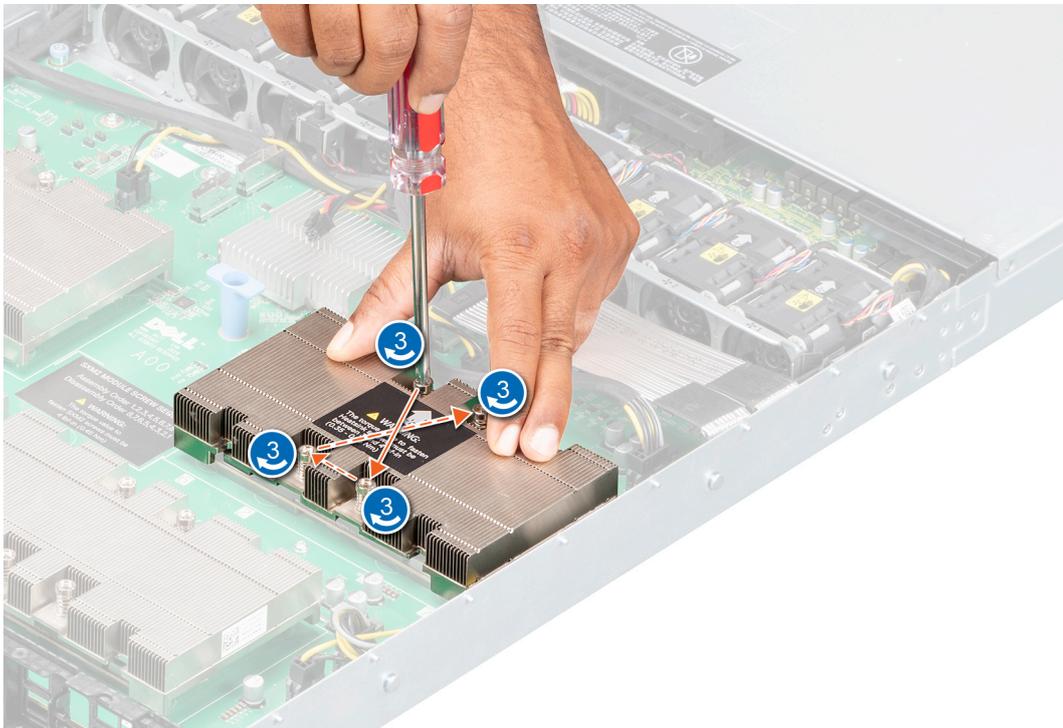
Figure 94. Installing the SXM2-GPU heat sink screws

5. Repeat the procedure for the remaining two screws.
6. Return to the first screw and tighten it.

7. Following the same diagonal pattern, tighten the remaining screws.

Next steps

1. Install the NVLink air shroud.

Installing the NVLink Air Shroud

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.

Steps

1. Align the guide slots on the NVLink air shroud with the screws on the graphics heat sink.
2. Lower the NVLink air shroud into the NVLink board until it is firmly seated.
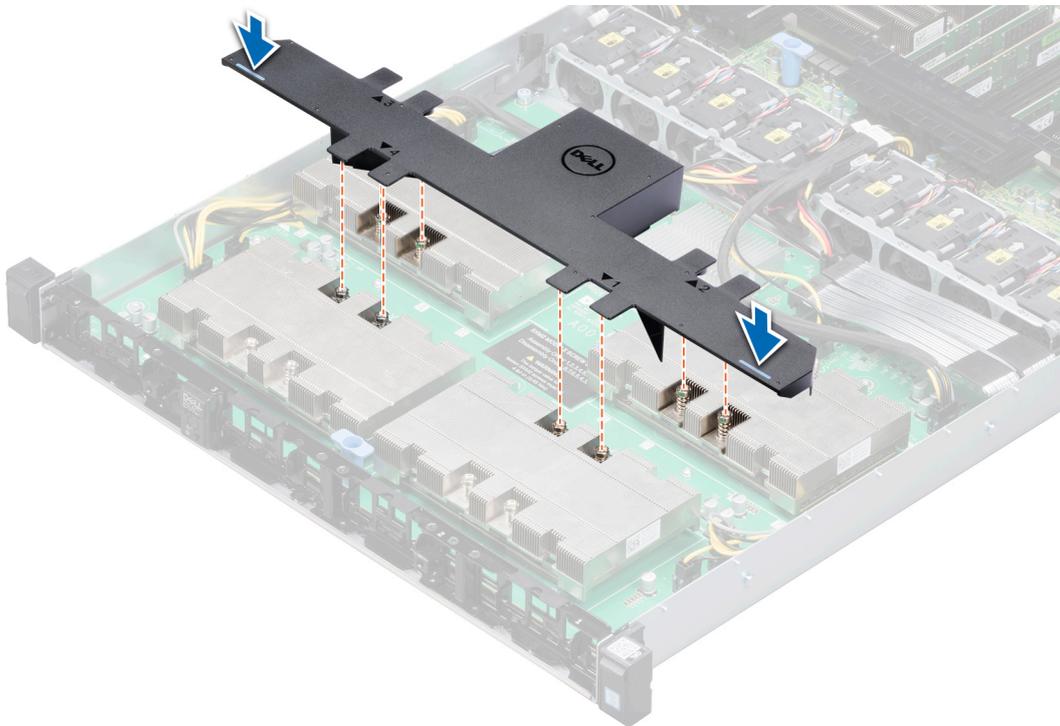
Figure 95. Installing a NVLink air shroud

Power supply units

Your system supports two 2400 W or 2000 W AC PSUs or two PSUs (one is supported if the optional SATA drive cage is installed)

(i) **NOTE:** For more information, see the PowerEdge C4140 Technical Specs at .www.dell.com/poweredgemanuals.

⚠ **CAUTION: If two PSUs are installed, both the PSUs must have the same type of label. For example, Extended Power Performance (EPP) label. Mixing PSUs from previous generations of PowerEdge servers is not supported, even if the PSUs have the same power rating. Mixing PSUs will result in mismatch condition or failure to turn the system on.**

NOTE: When two identical PSUs are installed, power supply redundancy (1+1 – with redundancy) is configured in system BIOS. In redundant mode, power is supplied to the system equally from both PSUs when Hot Spare is disabled. When Hot Spare is enabled, one of the PSUs is put into the sleep mode when system utilization is low in order to maximize efficiency.

CAUTION: If two PSUs are used, they must be of the same type, and have the same maximum output power.

CAUTION: If two PSUs are used, they must operate from the same AC linelevel or the system may report a PSU mismatch.

Removing a power supply unit blank

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

If you are installing a second power supply unit, remove the power supply unit blank in the bay by pulling the blank outward.

CAUTION: To ensure proper system cooling, the power supply unit blank must be installed in the second power supply unit bay in a non-redundant configuration. Remove the power supply unit blank only if you are installing a second power supply unit.
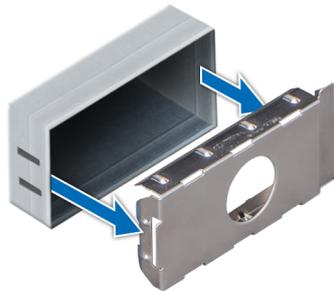
Figure 96. Removing a power supply unit blank

Next steps

Replace a power supply unit blank.

Installing a power supply unit blank

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

   NOTE: If the system is using only one PSU, the PSU must be installed in PSU bay 1 and the PSU blank must be installed in PSU bay 2.

Steps

Align the PSU blank with the PSU bay and push it into the PSU bay until it clicks into place.
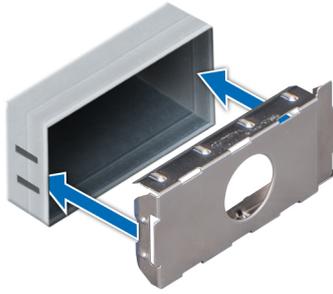
Figure 97. Installing a power supply unit blank

Next steps

Follow the procedure listed in After working inside your system.

Removing a power supply unit

Prerequisites

⚠️ **CAUTION: The system needs one power supply unit (PSU) for normal operation. On power-redundant systems, remove and replace only one PSU at a time in a system that is powered on.**

1. Follow the safety guidelines listed in Safety instructions.
2. Disconnect the power cable from the power source and from the PSU you intend to remove, and then remove the cable from the strap on the PSU handle.

Steps

Press the orange release latch and slide the PSU out of the system by using the PSU handle.
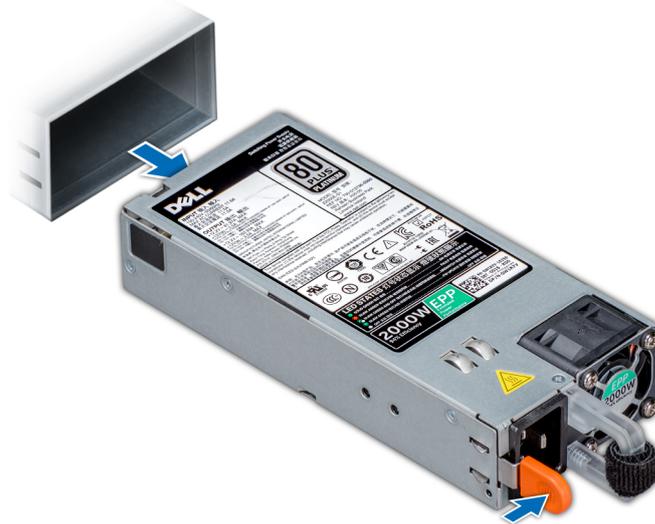
Figure 98. Removing a power supply unit

Next steps

Install the PSU.

Installing a power supply unit

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. For systems that support redundant PSU, ensure that both the PSUs are of the same type and have the same maximum output power.

   (i) **NOTE:** The maximum output power (shown in watts) is listed on the PSU label.

Steps

Slide the PSU into the system until the PSU is fully seated and the release latch snaps into place.

Figure 99. Installing a power supply unit

Next steps

1. Connect the power cable to the PSU, and plug the cable into a power outlet.

   ⚠ **CAUTION: When connecting the power cable to the PSU, secure the cable to the PSU with the strap.**

   (i) **NOTE:** When installing, hot swapping, or hot adding a new PSU, wait for 15 seconds for the system to recognize the PSU and determine its status. The PSU redundancy may not occur until discovery is complete. Wait until the new PSU is discovered and enabled before you remove the other PSU. The PSU status indicator turns green to signify that the PSU is functioning properly.

System board

Removing the system board

Prerequisites

⚠ **CAUTION: If you are using the Trusted Platform Module (TPM) with an encryption key, you may be prompted to create a recovery key during program or System Setup. Be sure to create and safely store this recovery key. If you replace this system board, you must supply the recovery key when you restart your system or program before you can access the encrypted data on your drives.**

⚠ **CAUTION: Do not attempt to remove the TPM plug-in module from the system board. Once the TPM plug-in module is installed, it is cryptographically bound to that specific system board. Any attempt to remove an installed TPM plug-in module breaks the cryptographic binding, and it cannot be re-installed or installed on another system board.**

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the following:
   a. Removing the air shroud
   b. Removing an expansion card riser
   c. Removing the power supply unit
   d. Replacing the optional internal USB memory key
   e. Removing PCH air shroud.
   f. Removing a processor and heat sink module
   g. Processors blanks (if applicable)

      ⚠ **CAUTION: To prevent damage to the processor socket when replacing a faulty system board, ensure that you cover the processor socket with the processor dust cover.**

   h. Removing a memory module
   i. Removing the network daughter card

Steps

1. Disconnect all cables from the system board.

   ⚠ **CAUTION: Take care not to damage the system identification button while removing the system board from the chassis.**

   ⚠ **CAUTION: Do not lift the system board by holding a memory module, processor, or other components.**

2. Using a Phillips #2 screwdriver, remove the ten screws securing the cable guides, PCIe guide, NDC guide, and PCH shroud base.
3. Remove both the cable guides, NDC guide, PCIe guide, and PCH shroud base.
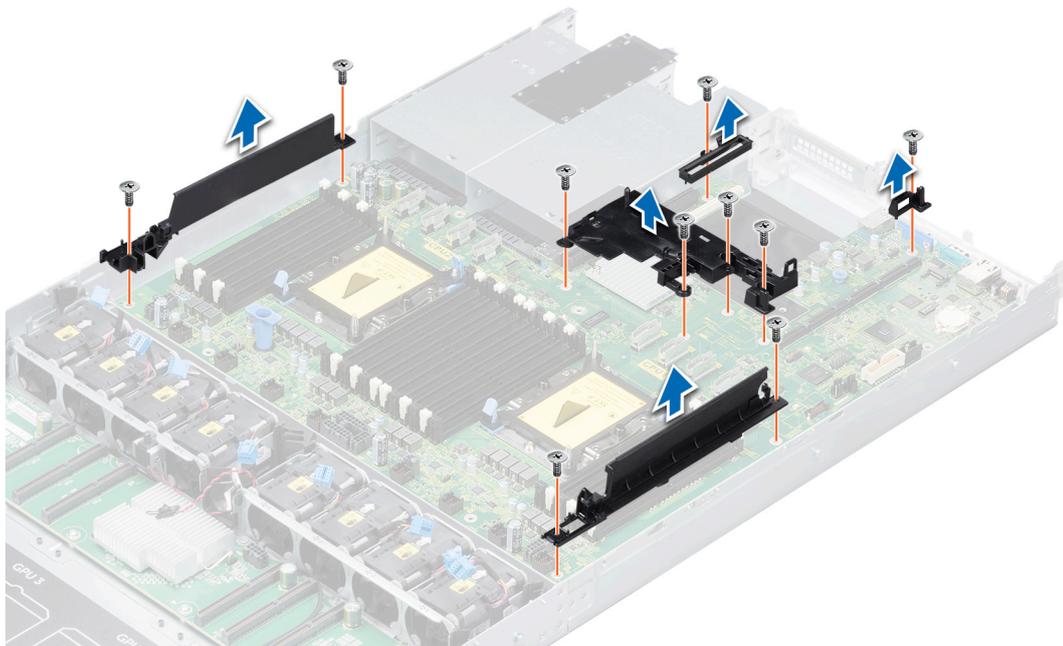
Figure 100. Remove the cable guides, NDC guide, PCIe guide, and PCH shroud base

4. Using Phillips #2 screwdriver, remove the seven screws securing the system board to the chassis.

5. Holding the system board holder, slide the system board toward the front of the chassis.
   Sliding the system board toward the front of the chassis disengages the connectors on the system board from the connector slots on the back of the chassis.
6. Lift the system board out of the chassis.
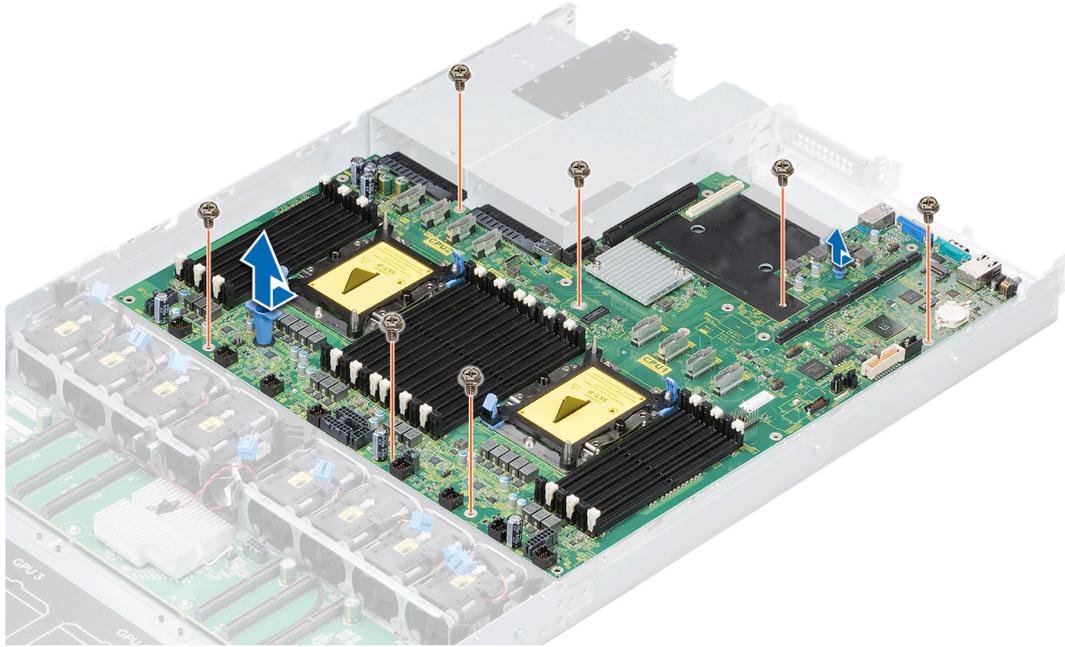
Figure 101. Removing the system board

Next steps

Install the system board.

Installing the system board

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Unpack the new system board assembly.

   ⚠ **CAUTION: Do not lift the system board by holding a memory module, processor, or other components.**

   ⚠ **CAUTION: Take care not to damage the system identification button while placing the system board into the chassis.**

2. Holding the system board holder, align the connectors on the system board with the slots on the chassis, and slide the system board towards the back of the system.
3. Using Phillips #2 screwdriver, tighten the screws to secure the system board to the chassis.
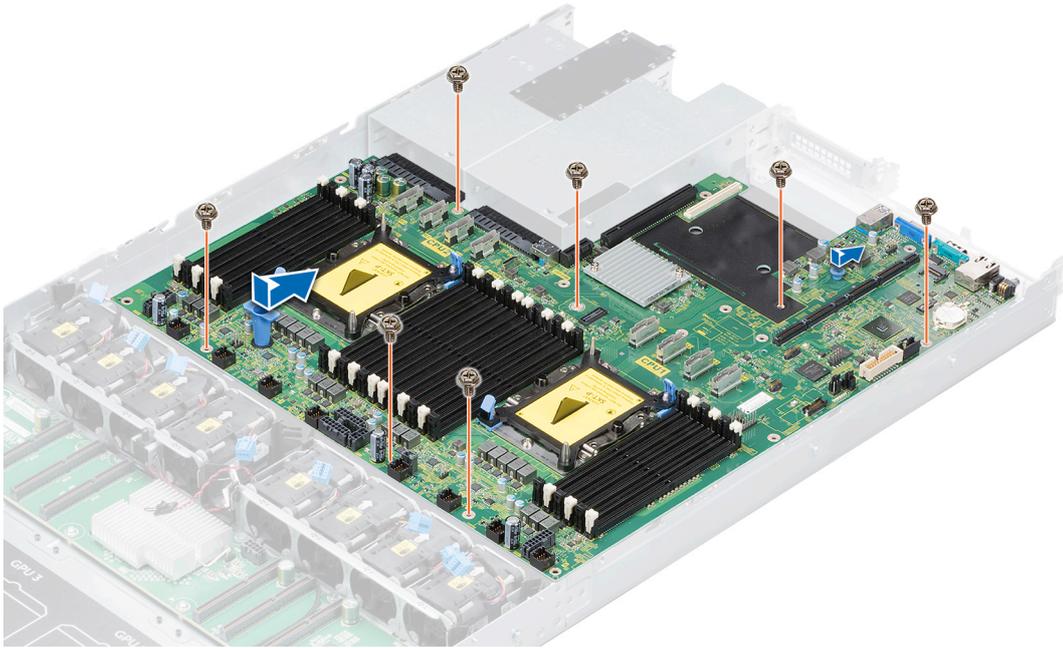
Figure 102. Installing the system board

4. Install both the cable guides, NDC guide, PCIe guide, and PCH shroud base.
5. Using Phillips #2 screwdriver, tighten the screws to secure both cable guides, NDC guide, PCIe guide, and PCH shroud base to the system board.
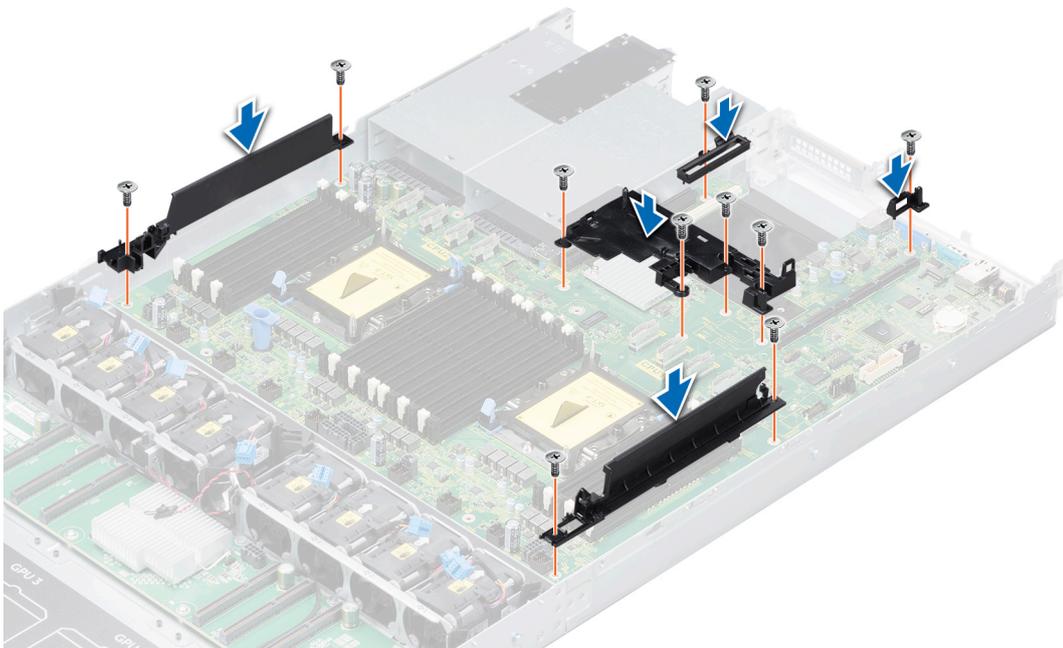
Figure 103. Installing the cable guides, NDC guide, PCIe guide, and PCH shroud base

Next steps

1. Upgrading the Trusted Platform Module

> (i) **NOTE:** The TPM plug-in module is attached to the system board and cannot be removed. A replacement TPM plug-in module is provided for all system board replacements, where a TPM plug-in module was installed.

2. Replace the following:
   a. Replacing the optional internal USB memory key
   b. Installing a processor and heat sink module
   c. Processors blanks (if applicable)
   d. Installing a memory module
   e. Installing the expansion card risers
   f. Installing PCH air shroud.
   g. Installing the air shroud

3. Reconnect all cables to the system board.

   > (i) **NOTE:** Ensure that the cables inside the system are routed along the chassis wall and secured using the cable securing bracket.

4. Follow the procedure listed in After working inside your system.

5. Ensure that you:
   a. Use the Easy Restore feature to restore the Service Tag. For more information, see the Restoring the system using Easy Restore section.
   b. If the Service Tag is not backed up in the backup flash device, enter the Service Tag manually. For more information, see the Manually update the Service Tag section.
   c. Update the BIOS and iDRAC versions.
   d. Re-enable the Trusted Platform Module (TPM). For more information, see the Upgrading the Trusted Platform Module section.

6. Import your new or existing iDRAC Enterprise license.

   For more information, see *iDRAC User's Guide*, at www.dell.com/poweredgemanuals.

Restoring the system using Easy Restore

The easy restore feature enables you to restore your service tag, license, UEFI configuration, and the system configuration data after replacing the system board. All data is backed up in a backup flash device automatically. If BIOS detects a new system board, and the service tag in the backup flash device, BIOS prompts the user to restore the backup information.

About this task

Below is a list of options available:

- Restore the service tag, license, and diagnostics information, press **Y**
- Navigate to the Lifecycle Controller based restore options, press **N.**
- Restore data from a previously created **Hardware Server Profile**, press **F10**

  > (i) **NOTE:** When the restore process is complete, BIOS prompts to restore the system configuration data.

- To restore the system configuration data, press **Y**
- To use the default configuration settings, press **N**

  > (i) **NOTE:** After the restore process is complete, system reboots.

Manually update the Service Tag

After replacing a system board, if Easy Restore fails, follow this process to manually enter the Service Tag, using **System Setup**.

About this task

If you know the system service tag, use the **System Setup** menu to enter the service tag.

Steps

1. Power on the system.
2. To enter the **System Setup**, press **F2**.
3. Click **Service Tag Settings**.

4. Enter the service tag.

  ⓘ **NOTE:** You can enter the service tag only when the **Service Tag** field is empty. Ensure that you enter the correct service tag. Once the service tag is entered, it cannot be updated or changed.

5. Click **OK**.

Trusted Platform Module

Upgrading the Trusted Platform Module

Prerequisites

ⓘ **NOTE:**
- Ensure that your operating system supports the version of the TPM module being installed.
- Ensure that you download and install the latest BIOS firmware on your system.
- Ensure that the BIOS is configured to enable UEFI boot mode.

About this task

⚠ **CAUTION: Once the TPM plug-in module is installed, it is cryptographically bound to that specific system board. Any attempt to remove an installed TPM plug-in module breaks the cryptographic binding, the removed TPM cannot be reinstalled or installed on another system board.**

Removing the TPM

Steps

1. Locate the TPM connector on the system board.
2. Press to hold the module down and remove the screw using the security Torx 8-bit shipped with the TPM module.
3. Slide the TPM module out from its connector.
4. Push the plastic rivet away from the TPM connector and rotate it 90° counterclockwise to release it from the system board.
5. Pull the plastic rivet out of its slot on the system board.

Installing the TPM

Steps

1. To install the TPM, align the edge connectors on the TPM with the slot on the TPM connector.
2. Insert the TPM into the TPM connector such that the plastic rivet aligns with the slot on the system board.
3. Press the plastic rivet until the rivet snaps into place.
4. Replace the screw that secures the TPM to the system board.
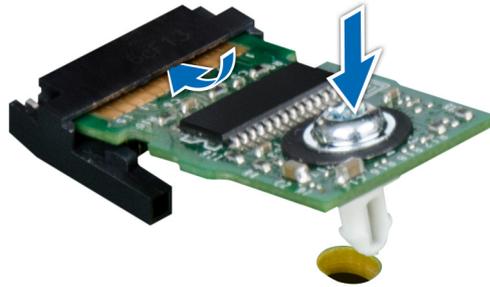
Figure 104. Installing the TPM

Next steps

1. Replace the system board.
2. Follow the procedure listed in Safety instructions.
3. To verify if the memory module has been installed properly, press F2 and navigate to **System Setup Main Menu > System BIOS > Memory Settings**. In the **Memory Settings** screen, the System Memory Size must reflect the updated capacity of the installed memory.
4. If the value is incorrect, one or more of the memory modules may not be installed properly. Ensure that the memory module is firmly seated in the memory module socket.
5. Run the system memory test in system diagnostics.

Initializing TPM for BitLocker users

Steps

1. Initialize the TPM.

   For more information, see initializing the TPM for Intel TXT users.
2. The **TPM Status** changes to **Enabled, Activated**.

Initializing the TPM 1.2 for TXT users

Steps

1. While booting your system, press F2 to enter System Setup.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
3. From the **TPM Security** option, select **On with Preboot Measurements**.
4. From the **TPM Command** option, select **Activate**.
5. Save the settings.
6. Restart your system.
7. Enter **System Setup** again.
8. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
9. From the **Intel TXT** option, select **On**.

Initializing the TPM 2.0 for TXT users

Steps

1. While booting your system, press F2 to enter System Setup.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.

3. From the **TPM Security** option, select **On**.
4. Save the settings.
5. Restart your system.
6. Enter **System Setup** again.
7. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
8. Select the **TPM Advanced Settings** option.
9. From the **TPM2 Algorithm Selection** option, select **SHA256**, then go back to **System Security Settings** screen.
10. On the **System Security Settings** screen, from the **Intel TXT** option, select **On**.
11. Save the settings.
12. Restart your system.

Control panel

Removing the control panel module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.
3. Remove the system top cover (front).

Steps

1. Hold and pull the plastic pull tab to disconnect the control panel cable from the control panel module.
2. Using a Phillips #1 screwdriver, remove the screws securing the control panel module to the chassis.
3. Lift the control panel module away from the chassis.
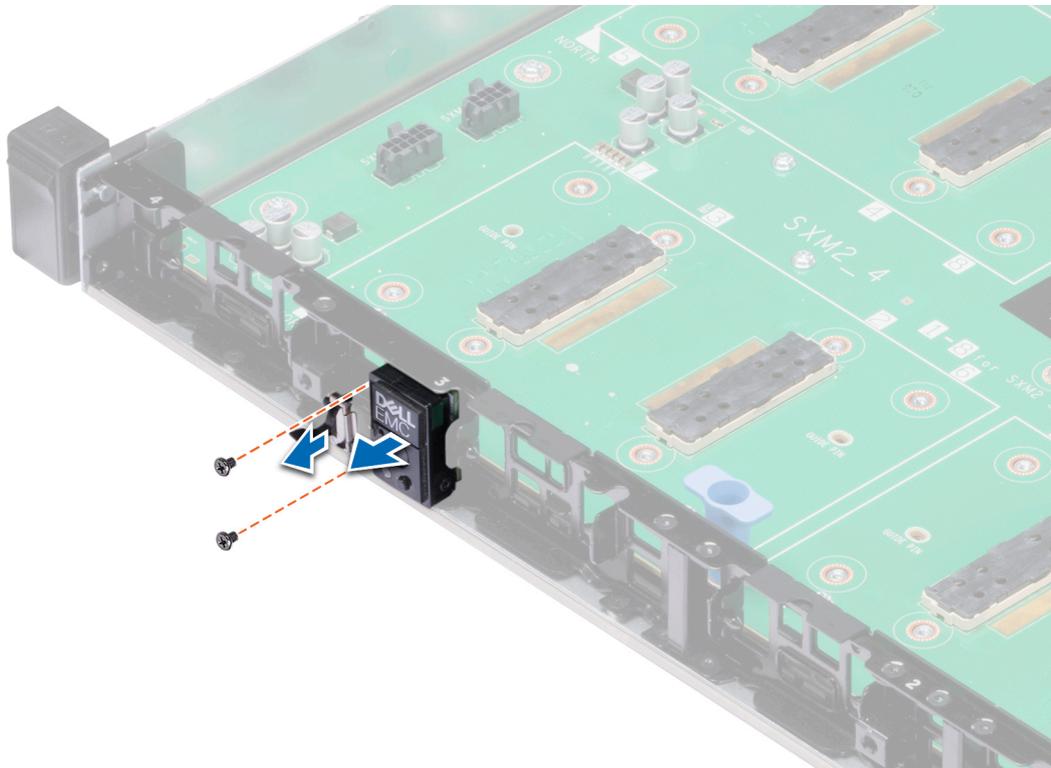
Figure 105. Removing the control panel module

Next steps

Replace the control panel module.

Installing the control panel module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in Before working inside your system.

Steps

1. Insert the control panel module behind the notch on the chassis.
2. Align the screw holes on the control panel module with the screw holes on the chassis.
3. Using the Phillips #1 screwdriver secure the panel to the to the chassis with the screws.
4. Connect the control panel cable to the control panel connector.
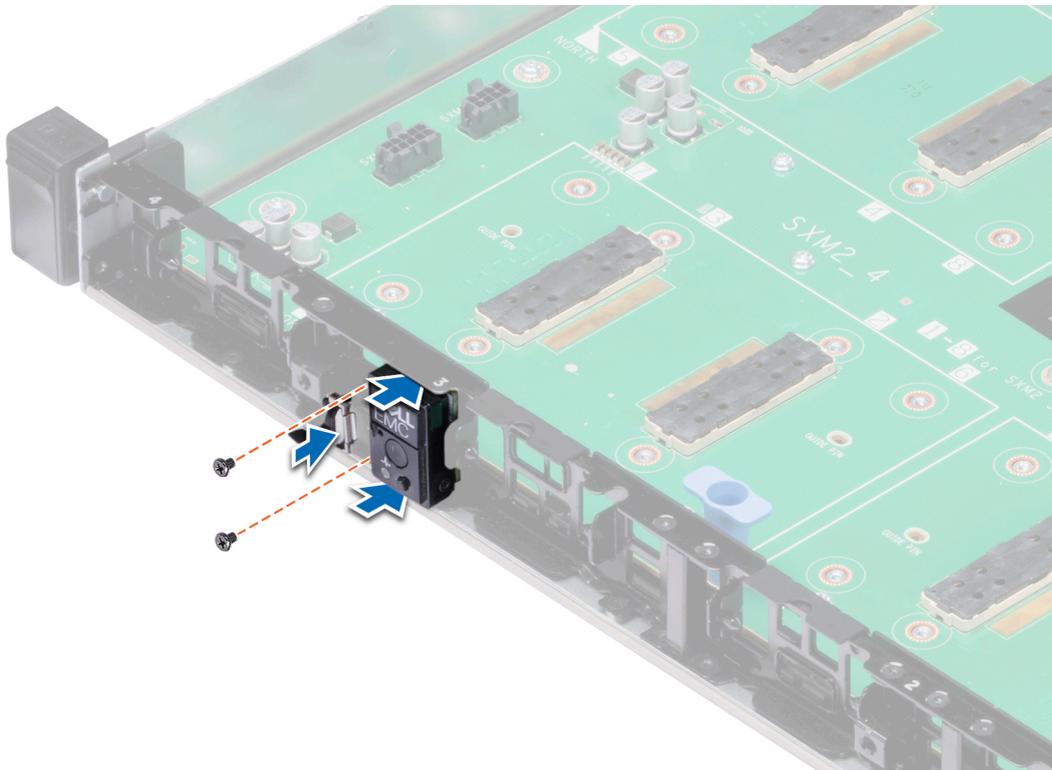
Figure 106. Installing the control panel module

Next steps

1. Install the system top cover (front).
2. Follow the procedure listed in After working inside your system.

Jumpers and connectors

This topic provides specific information about the jumpers. It also provides some basic information about jumpers and switches and describes the connectors on the various boards in the system. Jumpers on the system board help to disable the system and setup passwords. You must know the connectors on the system board to install components and cables correctly.

Topics:

- System board jumpers and connectors
- System board jumper settings
- Disabling forgotten password

System board jumpers and connectors
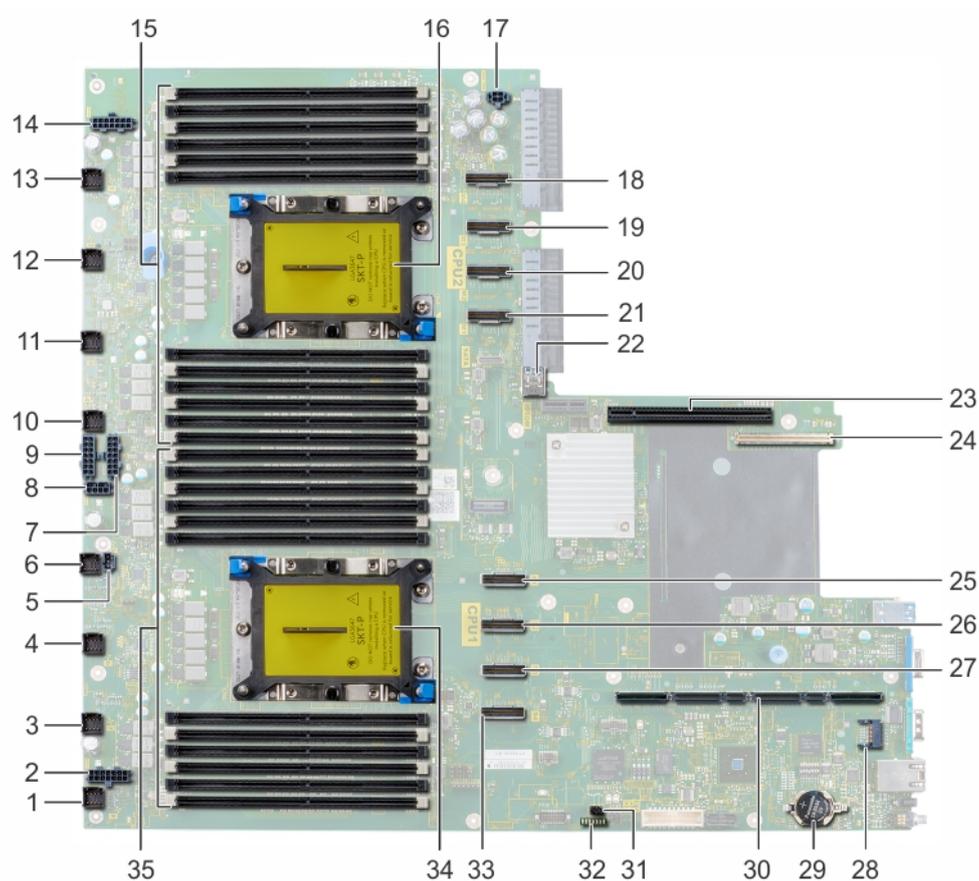
Figure 107. System board jumpers and connectors

Table 15. System board jumpers and connectors

Item	Connector	Description
1	J_FAN1U_8	Cooling fan connector 1
2	GPU_4_PWR	GPU 4 power connector
3	J_FAN1U_7	Cooling fan connector 2

Table 15. System board jumpers and connectors (continued)

Item	Connector	Description
4	J_FAN1U_6	Cooling fan connector 3
5	J_INTRUSION_DET1	Intrusion switch connector
6	J_FAN1U_5	Cooling fan connector 4
7	GPU_5_PWR	GPU 5 power connector
8	PLX_PWR (PCIe_Switch_board)	Switch board power connector
9	GPU_6_PWR	GPU 6 power connector
10	J_FAN1U_4	Cooling fan connector 5
11	J_FAN1U_3	Cooling fan connector 6
12	J_FAN1U_2	Cooling fan connector 7
13	J_FAN1U_1	Cooling fan connector 8
14	GPU_7_PWR	GPU 7 power connector
15	B6, B12, B5, B11, B4, B10, B7, B1, B8, B2, B9, B3	Memory module sockets
16	CPU2	Processor socket 2
17	SATA PWR	SATA power connector
18	M4	Data connector 4
19	M3	Data connector 3
20	M2	Data connector 2
21	M1	Data connector 1
22	J_USB_INT	Internal USB port
23	J_RISER2	Riser 2 connector
24	J_NDC	Network Daughter Card connector
25	S1	SAS connector 1
26	S2	SAS connector 2
27	S3	SAS connector 3
28	J_TPM_MODULE1	TPM module connector
29	BATTERY	Battery connector
30	J_R1_SS82_2	Riser 1 connector
31	CMOS_CLR	CMOS clear/NVRAM clear jumpers
32	OMNIVU_LED1	System board diagnostic LED indicators (7)
33	S4	SAS connector 4
34	CPU1	Processor socket 1
35	A6, A12, A5, A11, A4, A10, A7, A1, A8, A2, A9, A3	Memory module sockets

System board jumper settings

For information on resetting the password jumper to disable a password, see the Disabling a forgotten password section.

Disabling forgotten password

The software security features of the system include a system password and a setup password. The password jumper enables or disables password features and clears any password(s) currently in use.

Prerequisites

⚠ **CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.**

Steps

1. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover.
3. Move the jumper on the system board jumper from pins 2 and 4 to pins 4 and 6.
4. Install the system cover.

   The existing passwords are not disabled (erased) until the system boots with the jumper on pins 4 and 6. However, before you assign a new system and/or setup password, you must move the jumper back to pins 2 and 4.

   ⓘ **NOTE:** If you assign a new system and/or setup password with the jumper on pins 4 and 6, the system disables the new password(s) the next time it boots.

5. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
6. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
7. Remove the system cover.
8. Move the jumper on the system board jumper from pins 4 and 6 to pins 2 and 4.
9. Install the system cover.
10. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
11. Assign a new system and/or setup password.

System diagnostics

If you experience a problem with your system, run the system diagnostics before contacting Dell for technical assistance. The purpose of running system diagnostics is to test your system hardware without using additional equipment or risking data loss. If you are unable to fix the problem yourself, service and support personnel can use the diagnostics results to help you solve the problem.

Topics:

•   Dell Embedded System Diagnostics

Dell Embedded System Diagnostics

ⓘ **NOTE:** The Dell Embedded System Diagnostics is also known as Enhanced Pre-boot System Assessment (ePSA) diagnostics.

The Embedded System Diagnostics provides a set of options for particular device groups or devices allowing you to:

● Run tests automatically or in an interactive mode
● Repeat tests
● Display or save test results
● Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
● View status messages that inform you if tests are completed successfully
● View error messages that inform you of problems encountered during testing

Running the Embedded System Diagnostics from Boot Manager

Run the Embedded System Diagnostics (ePSA) if your system does not boot.

Steps

1. When the system is booting, press F11.
2. Use the up arrow and down arrow keys to select **System Utilities** > **Launch Diagnostics**.
3. Alternatively, when the system is booting, press F10, select **Hardware Diagnostics** > **Run Hardware Diagnostics**.
   The **ePSA Pre-boot System Assessment** window is displayed, listing all devices detected in the system. The diagnostics starts executing the tests on all the detected devices.

Results

Running the Embedded System Diagnostics from the Dell Lifecycle Controller

Steps

1. As the system boots, press F10.
2. Select **Hardware Diagnostics** → **Run Hardware Diagnostics**.
   The **ePSA Pre-boot System Assessment** window is displayed, listing all devices detected in the system. The diagnostics starts executing the tests on all the detected devices.

System diagnostic controls

Menu	Description
Configuration	Displays the configuration and status information of all detected devices.
Results	Displays the results of all tests that are run.
System health	Provides the current overview of the system performance.
Event log	Displays a time-stamped log of the results of all tests run on the system. This is displayed if at least one event description is recorded.

Getting help

Topics:

- Contacting Dell EMC
- Documentation feedback
- Accessing system information by using QRL
- Receiving automated support with SupportAssist
- Recycling or End-of-Life service information

Contacting Dell EMC

Dell EMC provides several online and telephone based support and service options. If you do not have an active internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell EMC product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell EMC for sales, technical assistance, or customer service issues:

Steps

1. Go to www.dell.com/support/home.
2. Select your country from the drop-down menu on the lower right corner of the page.
3. For customized support:
   a. Enter your system Service Tag in the **Enter your Service Tag** field.
   b. Click **Submit**.
      The support page that lists the various support categories is displayed.
4. For general support:
   a. Select your product category.
   b. Select your product segment.
   c. Select your product.
      The support page that lists the various support categories is displayed.
5. For contact details of Dell EMC Global Technical Support:
   a. Click Global Technical Support.
   b. The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell EMC Global Technical Support team.

Documentation feedback

You can rate the documentation or write your feedback on any of our Dell EMC documentation pages and click **Send Feedback** to send your feedback.

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) located on the information tag in the front of the system, to access the information about the PowerEdge system.

Prerequisites

Ensure that your smartphone or tablet has the QR code scanner installed.

The QRL includes the following information about your system:

- How-to videos
- Reference materials, including the Installtion and Service Manual, and mechanical overview
- Your system service tag to quickly access your specific hardware configuration and warranty information
- A direct link to Dell to contact technical assistance and sales teams

Steps

1. Go to www.dell.com/qrl and navigate to your specific product or
2. Use your smartphone or tablet to scan the model-specific Quick Resource (QR) code on your system or in the Quick Resource Locator section.

Quick Resource Locator for C4140

Figure 108. Quick Resource Locator for PowerEdge C4140

Receiving automated support with SupportAssist

Dell EMC SupportAssist is an optional Dell EMC Services offering that automates technical support for your Dell EMC server, storage, and networking devices. By installing and setting up a SupportAssist application in your IT environment, you can receive the following benefits:

- **Automated issue detection** — SupportAssist monitors your Dell EMC devices and automatically detects hardware issues, both proactively and predictively.
- **Automated case creation** — When an issue is detected, SupportAssist automatically opens a support case with Dell EMC Technical Support.
- **Automated diagnostic collection** — SupportAssist automatically collects system state information from your devices and uploads it securely to Dell EMC. This information is used by Dell EMC Technical Support to troubleshoot the issue.
- **Proactive contact** — A Dell EMC Technical Support agent contacts you about the support case and helps you resolve the issue.

The available benefits vary depending on the Dell EMC Service entitlement purchased for your device. For more information about SupportAssist, go to www.dell.com/supportassist.

Recycling or End-of-Life service information

Take back and recycling services are offered for this product in certain countries. If you want to dispose of system components, visit www.dell.com/recyclingworldwide and select the relevant country.

Documentation resources

This section provides information about the documentation resources for your system.

To view the document that is listed in the documentation resources table:

- From the Dell EMC support site:
  1. Click the documentation link that is provided in the Location column in the table.
  2. Click the required product or product version.
     - ⓘ **NOTE:** To locate the product name and model, see the front of your system.
  3. On the Product Support page, click **Manuals & documents**.
- Using search engines:
  - Type the name and version of the document in the search box.

Table 16. Additional documentation resources for your system

Task	Document	Location
Setting up your system	For more information about installing and securing the system into a rack, see the Rail Installation Guide included with your rack solution. For information about setting up your system, see the *Getting Started Guide* document that is shipped with your system.	www.dell.com/poweredgemanuals
Configuring your system	For information about the iDRAC features, configuring and logging in to iDRAC, and managing your system remotely, see the Integrated Dell Remote Access Controller User's Guide. For information about understanding Remote Access Controller Admin (RACADM) subcommands and supported RACADM interfaces, see the RACADM CLI Guide for iDRAC. For information about Redfish and its protocol, supported schema, and Redfish Eventing are implemented in iDRAC, see the Redfish API Guide. For information about iDRAC property database group and object descriptions, see the Attribute Registry Guide.	www.dell.com/poweredgemanuals
	For information about earlier versions of the iDRAC documents, see the iDRAC documentation. To identify the version of iDRAC available on your system, on the	www.dell.com/idracmanuals

Table 16. Additional documentation resources for your system (continued)

Task	Document	Location	
	iDRAC web interface, click **?** > **About**.		
	For information about installing the operating system, see the operating system documentation.	www.dell.com/ operatingsystemmanuals	
	For information about updating drivers and firmware, see the Methods to download firmware and drivers section in this document.	www.dell.com/support/drivers	
Managing your system	For information about systems management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	www.dell.com/poweredgemanuals	
	For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	www.dell.com/ openmanagemanuals > OpenManage Server Administrator	
	For information about installing, using, and troubleshooting Dell OpenManage Essentials, see the Dell OpenManage Essentials User's Guide.	www.dell.com/ openmanagemanuals > OpenManage Essentials	
	For information about installing, using, and troubleshooting Dell OpenManage Enterprise, see the Dell OpenManage Enterprise User's Guide.	www.dell.com/ openmanagemanuals > OpenManage Enterprise	
	For information about installing and using Dell SupportAssist, see the Dell EMC SupportAssist Enterprise User's Guide.	https://www.dell.com/ serviceabilitytools	
	For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.	www.dell.com/ openmanagemanuals	
	Working with the Dell PowerEdge RAID controllers	For information about understanding the features of the Dell PowerEdge RAID controllers (PERC), Software RAID controllers, or BOSS card and deploying the cards, see the Storage controller documentation.	www.dell.com/ storagecontrollermanuals
Understanding event and error messages	For information about the event and error messages that are generated by the system firmware and agents that monitor system components, see the Error Code Lookup.	www.dell.com/qrl	

Table 16. Additional documentation resources for your system (continued)

Task	Document	Location
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide.	www.dell.com/poweredgemanuals