

# Dell EMC PowerEdge C6420

## Installation and Service Manual

## Notes, cautions, and warnings

 **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.

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# Dell EMC PowerEdge C6420 overview

The PowerEdge C6420 sled supports up to two Intel Xeon Scalable processors with 28 cores per processor. The sled also supports dedicated mezzanine, PCIe and Open Compute Project (OCP) adapters for expansion and connectivity.

 **NOTE:** The Intel Xeon Scalable processor with fabric connector is also known as Native Omnipath.

## Topics:

- [Supported configurations](#)
- [Back view of the PowerEdge C6420 sled](#)
- [Network ports indicator codes](#)
- [Sled to hard drive mapping](#)
- [Expander zoning](#)
- [Locating the Service Tag of your system](#)
- [System information label](#)

## Supported configurations

The PowerEdge C6420 system supports the following configurations:

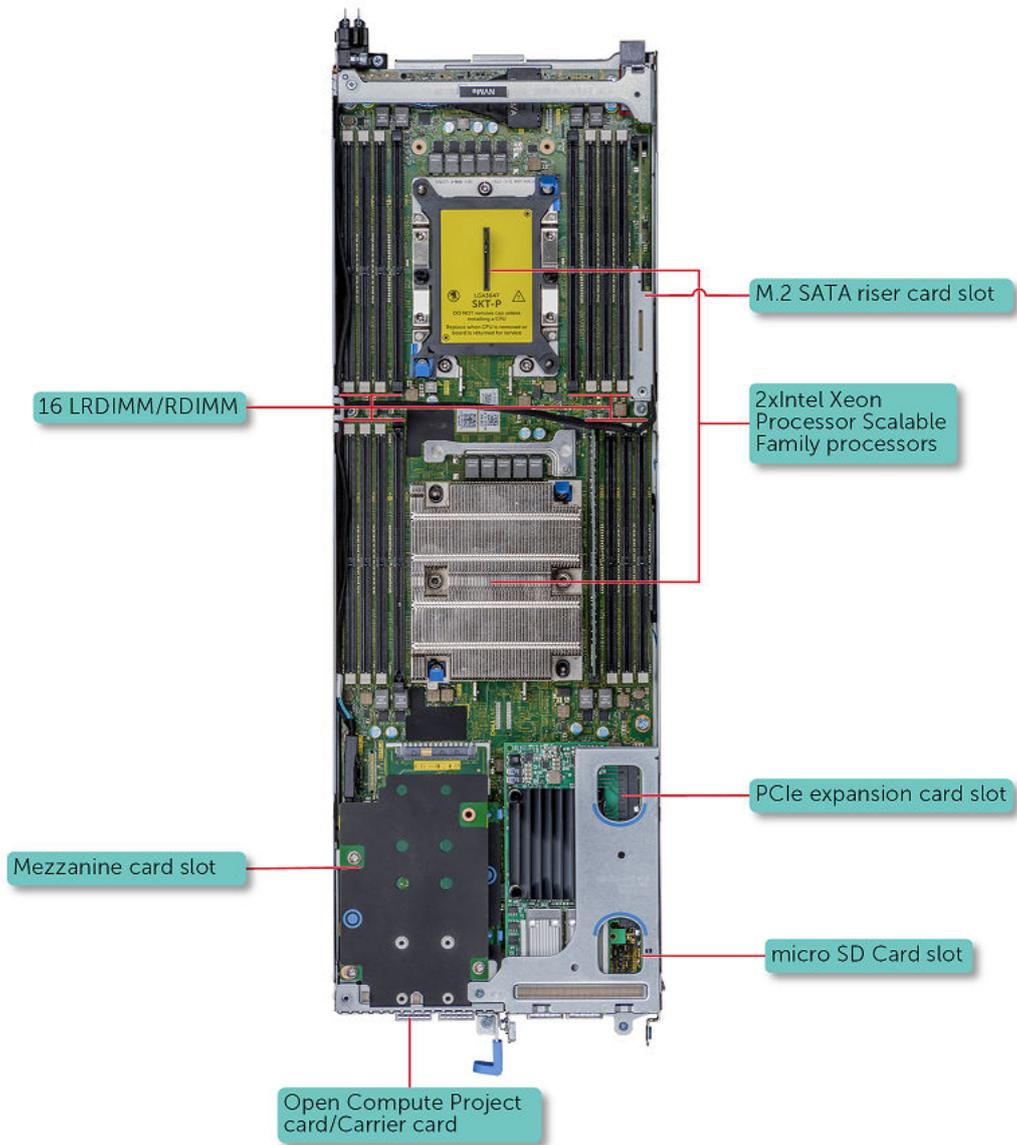


Figure 1. Supported configurations for PowerEdge C6420

## Chassis configuration summary table

Table 1. Chassis configuration summary table

PE C6400 Chassis Config.	PEC6420 support	PEC6520 support
24 x 2.5" SAS/SATA Backplane	Yes	Yes
8 x 2.5" NVME + 16 X 2.5" SAS/SATA backplane	Yes	Yes
12 x 3.5" SAS/SATA Backplane	Yes	Yes
Diskless No backplane	Yes	Yes
Expander Backplane	Yes	No
24 x 2.5" All/PURE NVME backplane	No	Yes

## Back view of the PowerEdge C6420 sled

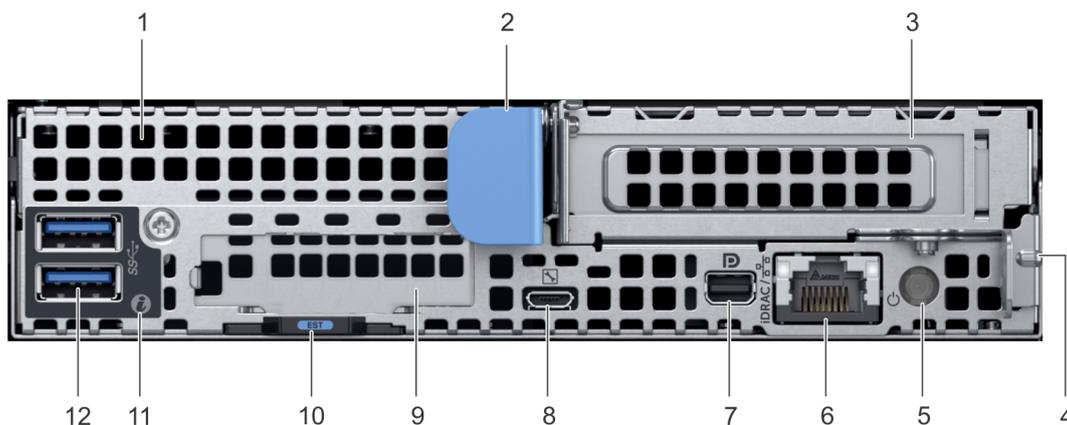


Figure 2. Back view of the PowerEdge C6420 sled

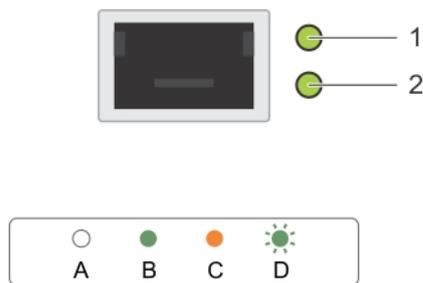
Table 2. Back panel features

Item	Indicator, button, or connector	Icon	Description
1	Mezzanine card slot	N/A	Enables you to connect mezzanine expansion cards. For more information, see the <i>Dell EMC PowerEdge C6420 Technical Specifications</i> on the product documentation page.
2	Sled release handle	N/A	Enables you to remove the sled from the enclosure.
3	Low Profile PCIe card slot	N/A	Enables you to connect PCI Express expansion cards. For more information, see the <i>Dell EMC PowerEdge C6420 Technical Specifications</i> on the product documentation page.
4	Sled release lock	N/A	Enables you to remove the sled from the enclosure.
5	Rear power button	N/A	Enables you to power on the sled while accessing it from the rear.
6	iDRAC or NIC port		Enables you to remotely access iDRAC. For more information, see the <i>Integrated Dell Remote Access Controller User's Guide</i> at <a href="http://www.dell.com/idracmanuals">www.dell.com/idracmanuals</a>
7	Mini display port		Enables you to connect a display device to the system. For more information, see the <i>Dell EMC PowerEdge C6420</i>

**Table 2. Back panel features (continued)**

Item	Indicator, button, or connector	Icon	Description
			<i>Technical Specifications</i> on the product documentation page.
8	iDRAC Direct micro USB port		Enables you to connect a portable device to the sled.
9	OCP or OPA card slot	N/A	Enables you to connect Open Compute Project (OCP) or Omni-Path Architecture (OPA) expansion cards. For more information, see the <i>Dell EMC PowerEdge C6420 Technical Specifications</i> on the product documentation page.
10	EST pull out tab	N/A	This tab has the unique Express Service Code, Service Tag, and MAC address labels.
11	System id indicator		The System Identification (ID) LED is available on the back of the system. Press the system ID button on the front of the enclosure to identify a system in a rack.
12	USB 3.0 port (2)		The USB ports are 9-pin and 3.0-compliant. These ports enable you to connect USB devices to the system.

## Network ports indicator codes



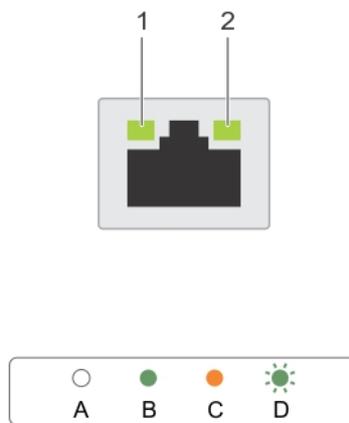
**Figure 3. LAN indicators on the QSFP OCP card**

1. Link indicator
2. Activity indicator

**Table 3. QSFP port on OCP card indicator codes**

Connection State	QSFP Upper green LED	QSFP Lower green LED
No link/Not Connected	Off	Off
InfiniBand Physical Link - No Logical Link	Green	Off
InfiniBand Logical Link - No Traffic	Green	Green
InfiniBand Logical Link - Traffic	Green	Blink
InfiniBand Physical Link Issue	Blink	Green
Ethernet Link - No Traffic	Green	Green
Ethernet - Traffic	Green	Blink

**NOTE:** The LED blink speed varies according to the traffic bandwidth.



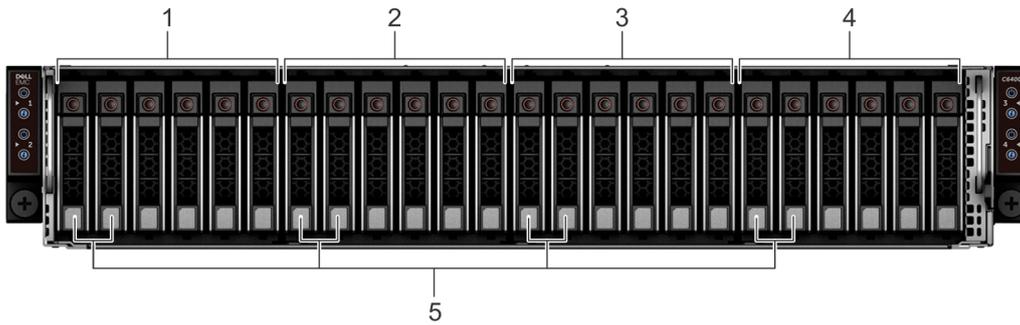
**Figure 4. Ethernet port indicator codes**

1. Speed indicator
2. Link and activity indicator

**Table 4. Ethernet port indicator codes**

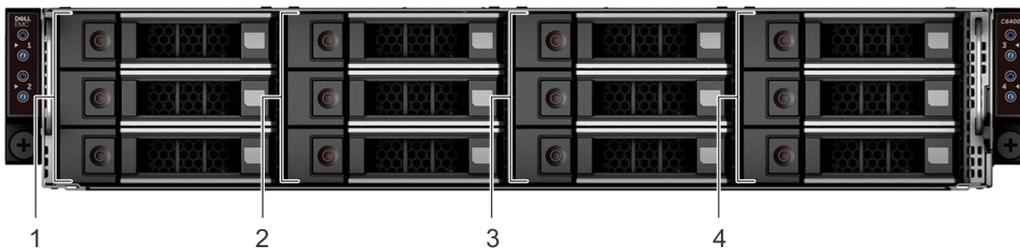
Convention	Status	Condition
A	Link and activity indicators are off	The NIC is not connected to the network.
B	Link indicator is green	The NIC is connected to a valid network at its maximum port speed.
C	Link indicator is amber	The NIC is connected to a valid network at less than its maximum port speed.
D	Activity indicator is flashing green	Network data is being sent or received.

# Sled to hard drive mapping



**Figure 5. Sled to drive mapping for 24 x 2.5-inch drive configuration**

- 1. Drives 0–5 mapped to sled 1
- 2. Drives 6–11 mapped to sled 2
- 3. Drives 12–17 mapped to sled 3
- 4. Drives 18–23 mapped to sled 4
- 5. (Optional) NVMe hard drive location



**Figure 6. Sled to drive mapping for 12 x 3.5-inch drive configuration**

- 1. Drives 0–2 mapped to sled 1
- 2. Drives 3–5 mapped to sled 2
- 3. Drives 6–8 mapped to sled 3
- 4. Drives 9–11 mapped to sled 4

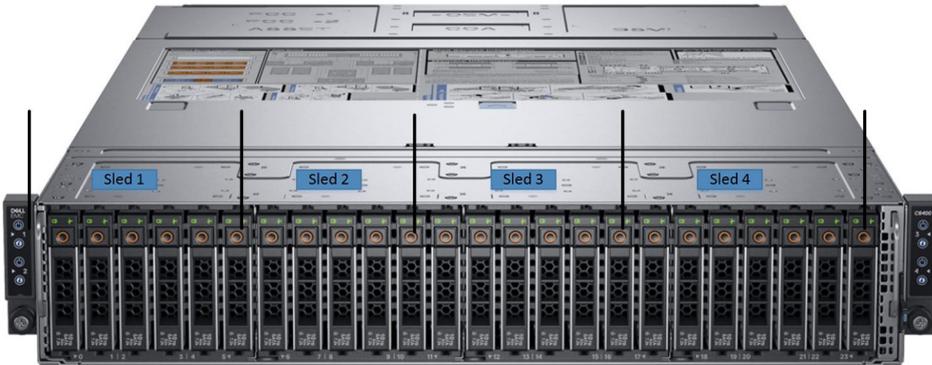
**NOTE:** The warranty of the drives are linked to the Service Tag of the corresponding sled.

## Expander zoning

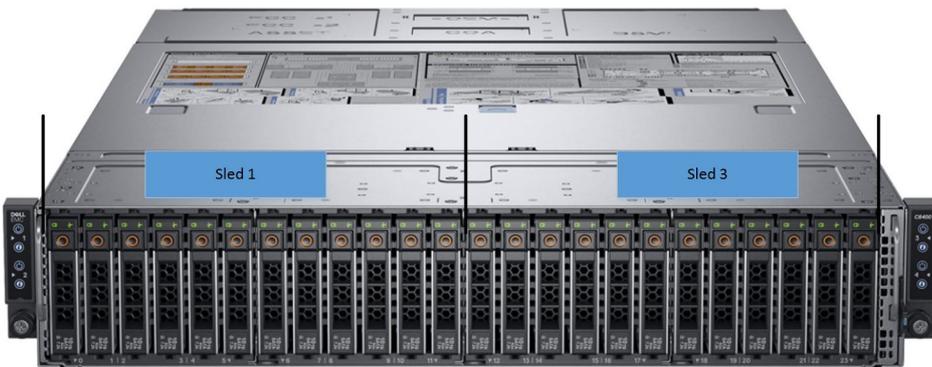
A SAS expander board allows higher, single-volume hard drive configurations. An integrated expander device expands each sleds hard drive footprint.

The Dell EMC PowerEdge C6400 enclosure supports four sled access to a single expander controller at the same time. The enclosure provides two expander zoning options:

- Up to 6 SAS/SATA device of each sled in Split Mode (6+6+6+6)



- Up to 12 SAS/SATA device of sled 1 and sled 3 in Zoning Mode (12+12)

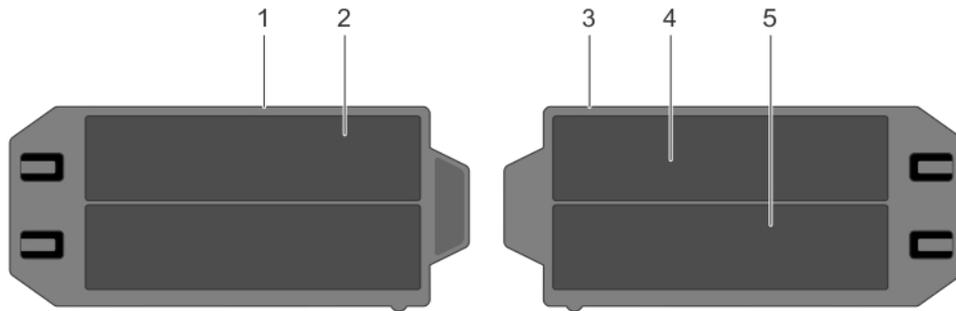


**NOTE:**

- Install expander firmware 2.07 or later to support these configurations
- The expander mode works only with a PERC card, and is not supported by the onboard SATA controller.

## Locating the Service Tag of your system

Your system is identified by a unique Express Service Code and Service Tag number. The Express Service Code and Service Tag are found on the back of the sled by pulling out the EST tag. This information is used by Dell to route support calls to the appropriate personnel.



**Figure 7. Locating the Service Tag of your system**

1. information tag (top view)
2. Express Service Tag label
3. information tag (bottom view)
4. network MAC address information label
5. iDRAC MAC address information label

# System information label

## System board information

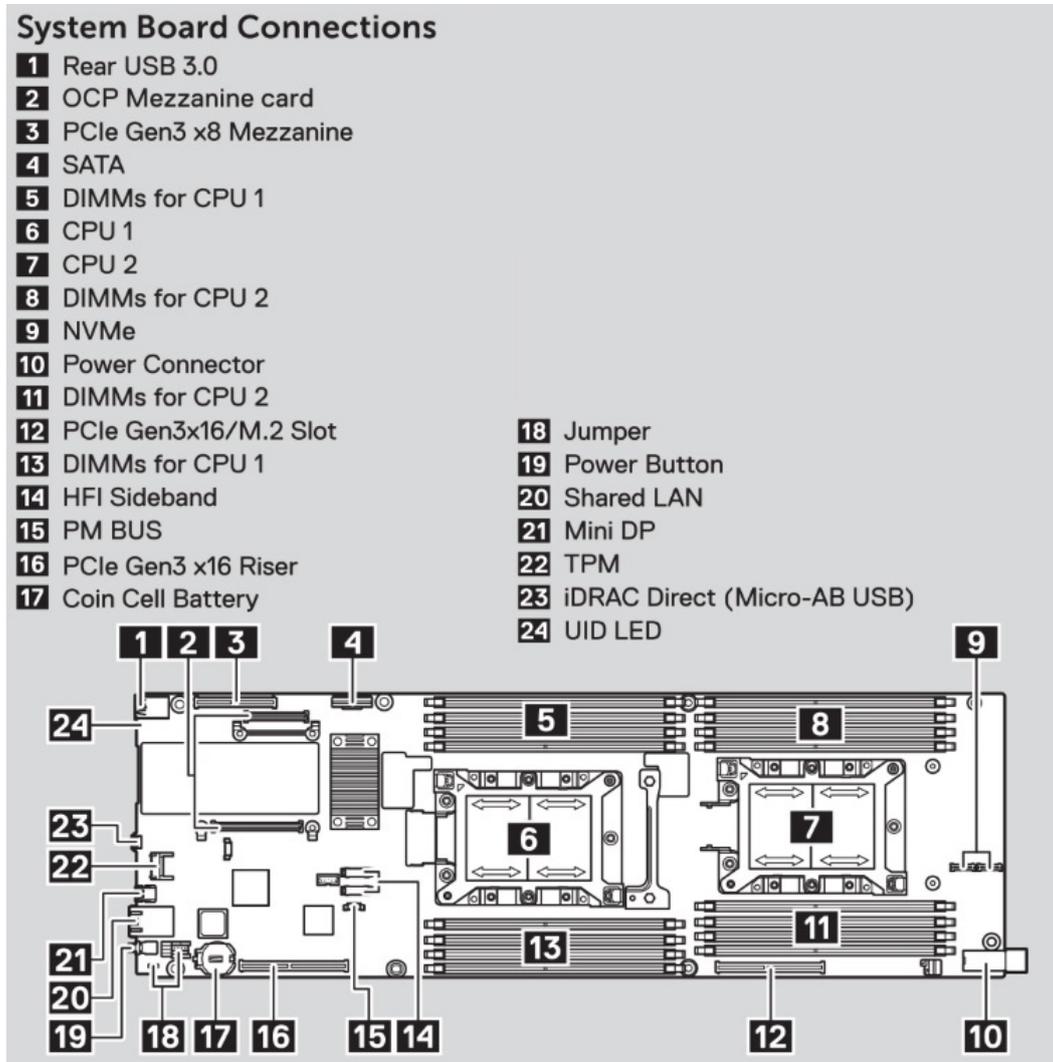


Figure 8. System board connections

## Mechanical overview

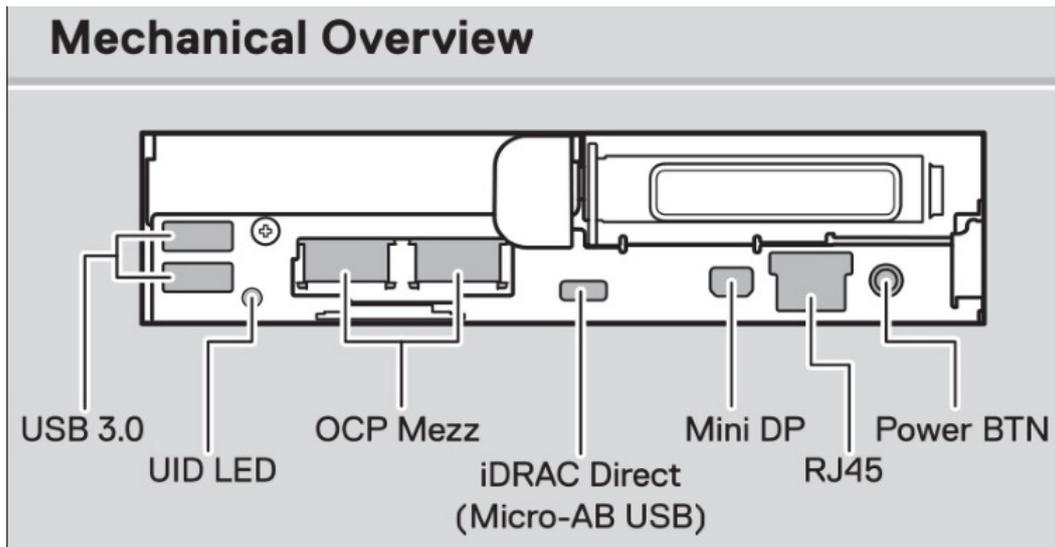


Figure 9. Mechanical overview

## Memory information

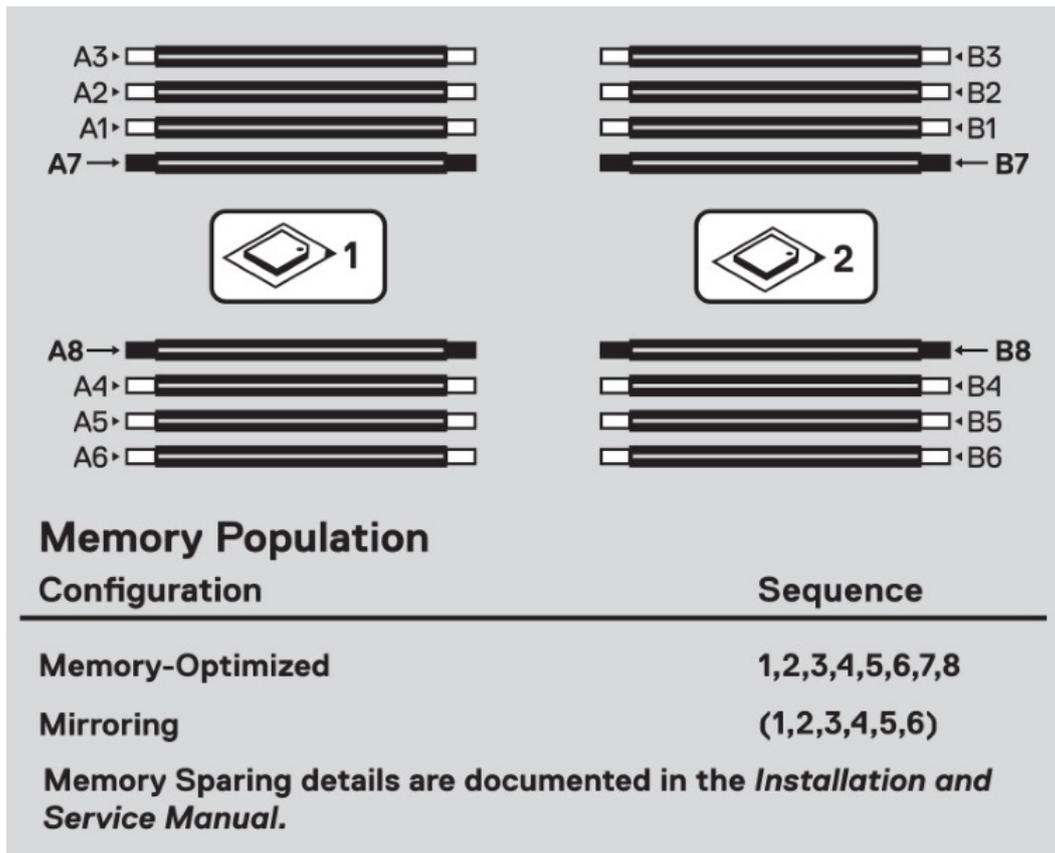


Figure 10. Memory information

## Jumper settings

Jumper Settings		
Jumper	Setting	Description
 PWRD_EN	 (default)	BIOS password is enable.
		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 setting cleared at system boot.

Figure 11. Jumper settings

# 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](http://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 C6420 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.

 **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
<b>iDRAC Settings utility</b>	<i>Dell Integrated Dell Remote Access Controller User's Guide</i> at <a href="http://www.dell.com/poweredgemanuals">www.dell.com/poweredgemanuals</a>
<b>Dell Deployment Toolkit</b>	<i>Dell Deployment Toolkit User's Guide</i> at <a href="http://www.dell.com/openmanagemanuals">www.dell.com/openmanagemanuals</a> > OpenManage Deployment Toolkit
<b>Dell Lifecycle Controller</b>	<i>Dell Lifecycle Controller User's Guide</i> at <a href="http://www.dell.com/poweredgemanuals">www.dell.com/poweredgemanuals</a>

## Interfaces Document/Section

**iDRAC Direct and Quick Sync 2 (optional)** See *Dell Integrated Dell Remote Access Controller User's Guide* at [www.dell.com/poweredge/manuals](http://www.dell.com/poweredge/manuals)

**NOTE:** To access iDRAC, ensure that you connect the ethernet cable to the iDRAC9 dedicated network port. You can also access iDRAC through the shared LOM mode, if you have opted for a system that has the shared LOM mode enabled.

## Log in to iDRAC

You can log in to iDRAC as:

- iDRAC user
- Microsoft Active Directory user
- Lightweight Directory Access Protocol (LDAP) user

The default user name and password are `root` and `calvin`.

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

**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/poweredge/manuals](http://www.dell.com/poweredge/manuals).

You can also access iDRAC by using RACADM. For more information, see the *RACADM Command Line Interface Reference Guide* at [www.dell.com/poweredge/manuals](http://www.dell.com/poweredge/manuals).

## 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	<a href="http://www.dell.com/idracmanuals">www.dell.com/idracmanuals</a>
Lifecycle Controller	<a href="http://www.dell.com/idracmanuals">www.dell.com/idracmanuals</a> > Lifecycle Controller
OpenManage Deployment Toolkit	<a href="http://www.dell.com/openmanagemanuals">www.dell.com/openmanagemanuals</a> > OpenManage Deployment Toolkit
Dell certified VMware ESXi	<a href="http://www.dell.com/virtualizationsolutions">www.dell.com/virtualizationsolutions</a>
Installation and How-to videos for supported operating systems on PowerEdge systems	<a href="#">Supported Operating Systems for Dell EMC PowerEdge systems</a>

## 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	<a href="http://www.dell.com/support/home">www.dell.com/support/home</a>
Using Dell Remote Access Controller Lifecycle Controller (iDRAC with LC)	<a href="http://www.dell.com/idracmanuals">www.dell.com/idracmanuals</a>
Using Dell Repository Manager (DRM)	<a href="http://www.dell.com/openmanagemanuals">www.dell.com/openmanagemanuals</a> > Repository Manager

**Table 6. Firmware and drivers (continued)**

<b>Methods</b>	<b>Location</b>
Using Dell OpenManage Essentials	<a href="http://www.dell.com/openmanagemanuals">www.dell.com/openmanagemanuals</a> > OpenManage Essentials
Using Dell OpenManage Enterprise	<a href="http://www.dell.com/openmanagemanuals">www.dell.com/openmanagemanuals</a> > OpenManage Enterprise
Using Dell Server Update Utility (SUU)	<a href="http://www.dell.com/openmanagemanuals">www.dell.com/openmanagemanuals</a> > Server Update Utility
Using Dell OpenManage Deployment Toolkit (DTK)	<a href="http://www.dell.com/openmanagemanuals">www.dell.com/openmanagemanuals</a> > OpenManage Deployment Toolkit
Using iDRAC virtual media	<a href="http://www.dell.com/idracmanuals">www.dell.com/idracmanuals</a>

## 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](http://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.

# Installing and removing enclosure components

## Topics:

- Safety instructions
- Before working inside your system
- After working inside your system
- Recommended tools
- Dell EMC PowerEdge C6420 sled
- PERC battery
- Air shroud
- System memory
- Support bracket
- Linking board and PCIe cable
- Processor and heat sink module
- Expansion cards
- M.2 SSD module
- Mezzanine and OCP cards
- System battery
- System board
- Trusted Platform Module

## 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, including all attached peripherals.
2. Disconnect the system from the electrical outlet and disconnect the peripherals.

## After working inside your system

### Prerequisites

Follow the safety guidelines listed in [Safety instructions](#).

### Steps

1. Install the sled into the enclosure.
2. Reconnect the peripherals and connect the system to the electrical outlet.
3. Power on the attached peripherals and then power on the system.

## Recommended tools

You need the following tools to perform the removal and installation procedures:

- Phillips #1 screwdriver
- Phillips #2 screwdriver
- 1/4 inch flat head screwdriver
- Wrist grounding strap
- ESD mat

## Dell EMC PowerEdge C6420 sled

### Sled Installation Guidelines

 **NOTE:** Ensure to install a sled blank in all the empty slots. Operating the enclosure without a blank results in overheating.

 **NOTE:** For optimized thermal operation, ensure to follow the sled population sequence mentioned below:

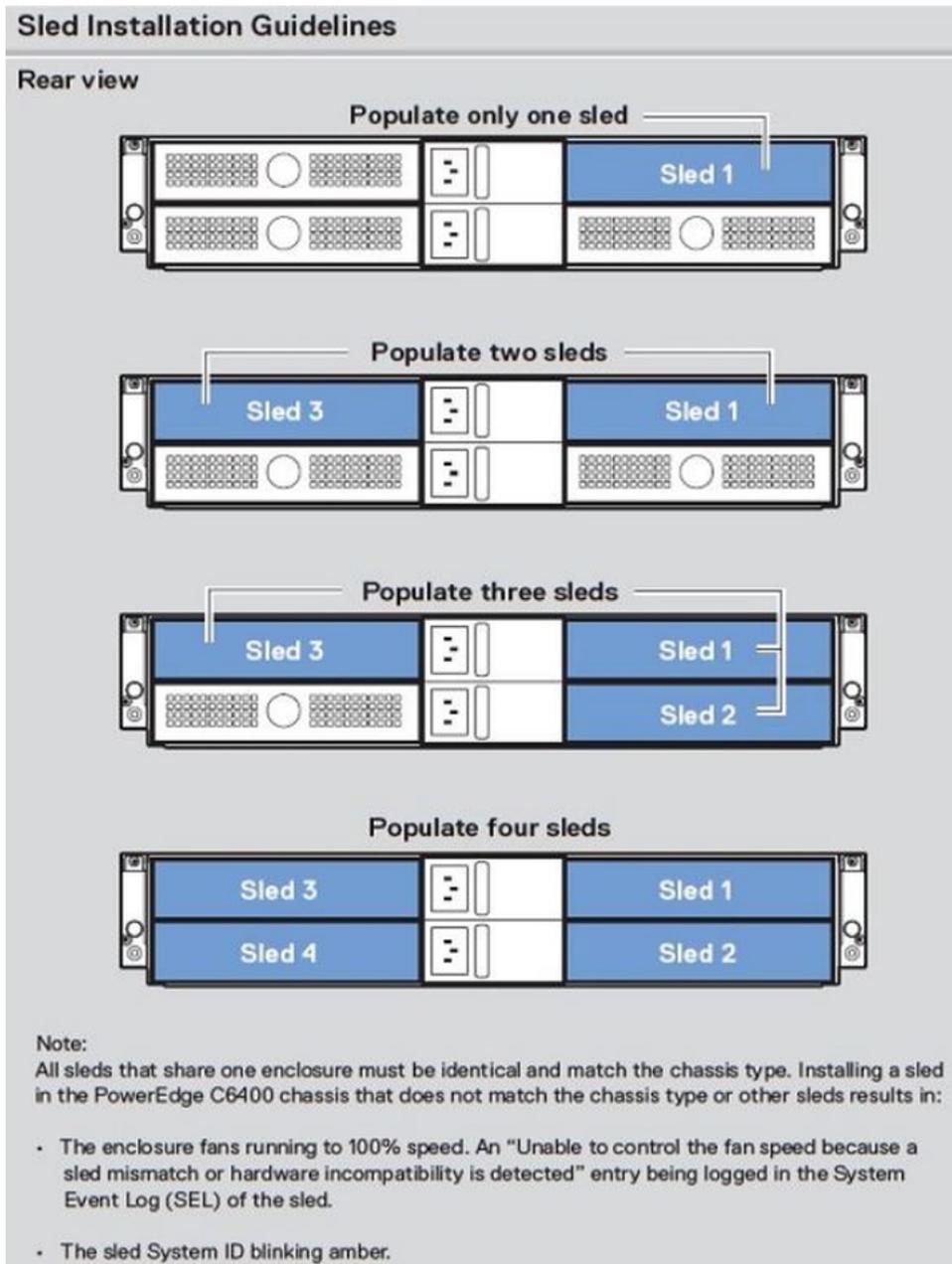


Figure 12. Sled Installation Guidelines

## Removing a sled

### Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions](#).

**NOTE:** For optimized thermal performance, see [Sled installation guidelines](#).

**NOTE:** The procedure to remove a sled blank or a sled are the same.

### Steps

Press the retaining latch and using the sled pull handle, slide the sled out of the enclosure horizontally.

**CAUTION:** Ensure that the sled is supported with both hands while it is being slid out.

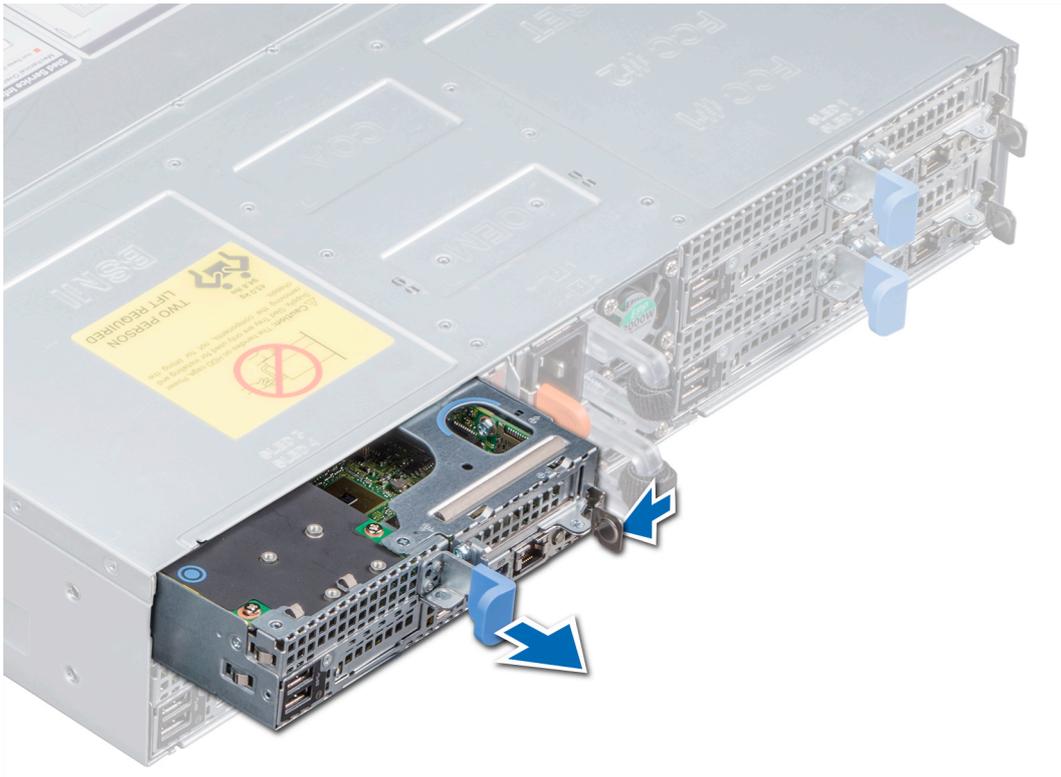


Figure 13. Removing a sled

**CAUTION:** If you are permanently removing the sled, install a sled blank promptly. Operating the enclosure without a blank, for an extended time can result in overheating.

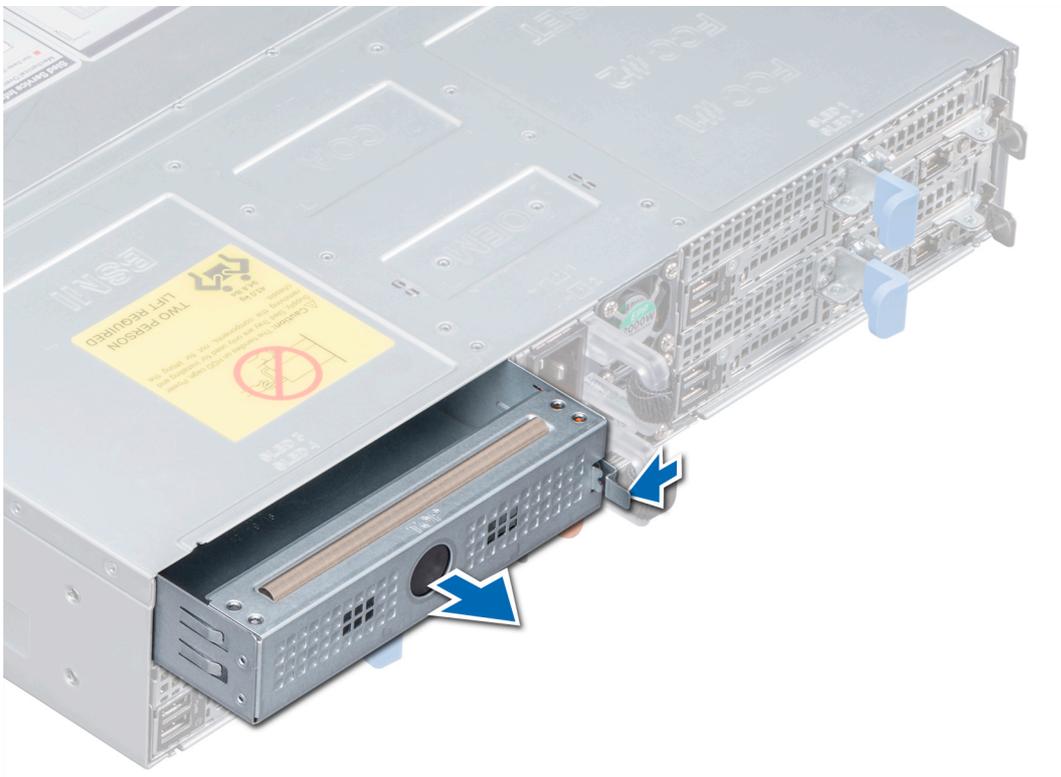


Figure 14. Removing a sled blank

## Next steps

1. Install the sled or Install a sled blank.

# Installing a sled

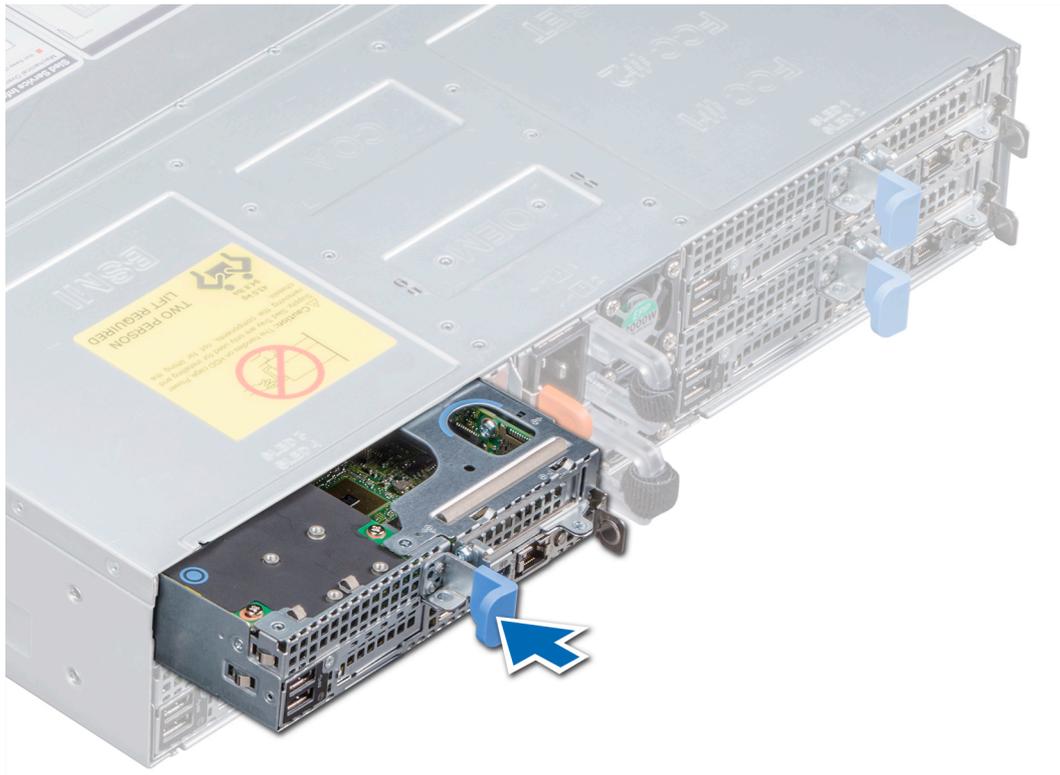
## Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions](#).

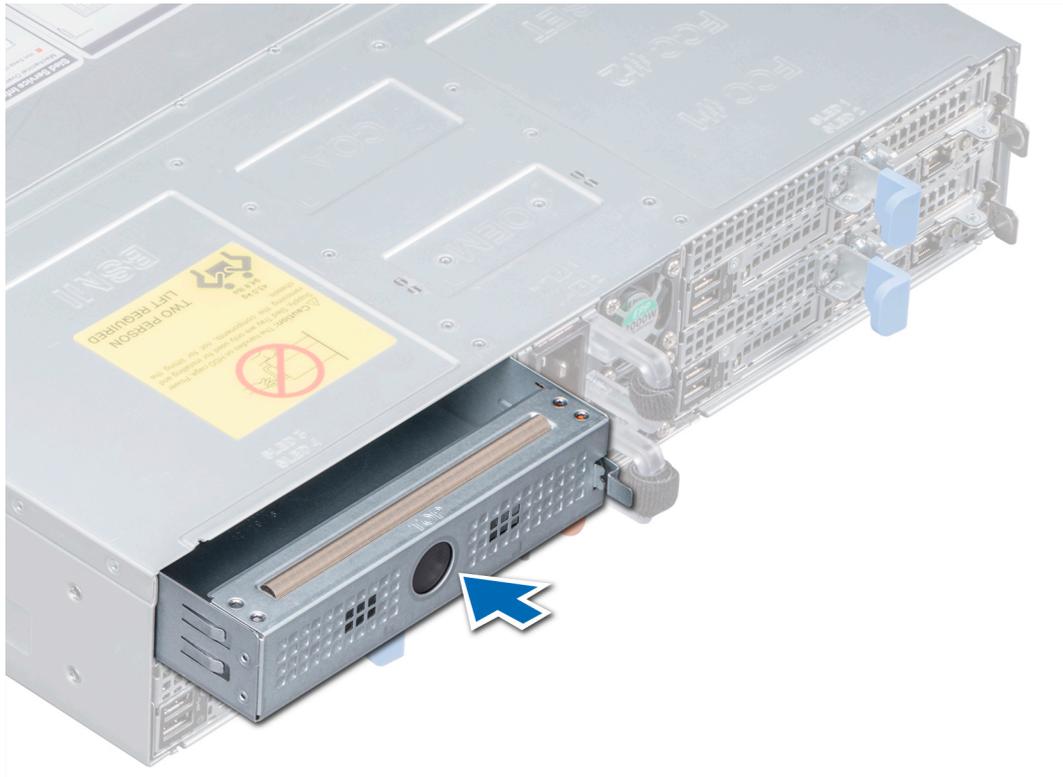
 **NOTE:** For optimized thermal performance, see [Sled installation guidelines](#).

## Steps

1. Align the sled to the enclosure horizontally to insert the sled into the enclosure.



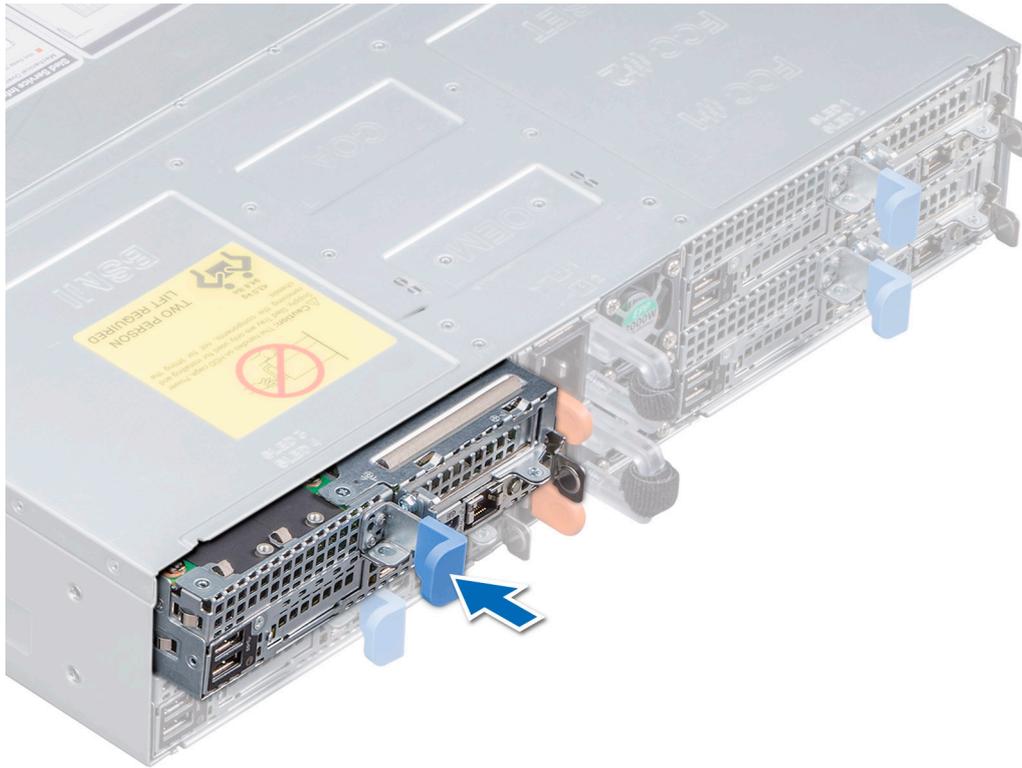
**Figure 15. Installing a sled**



**Figure 16. Installing a sled blank**

2. Push the blue retention latch to slide the sled into the enclosure, and stop the sled at a distance of 20-30 mm before complete insertion of the sled as shown in the image below.

**CAUTION:** To avoid any damages to the pins on the sled, do not force the sled into the enclosure. Follow the two-position insertion and gently slide the sled into the enclosure.



**Figure 17. Stop the sled at a distance of 20-30 mm before complete insertion**

3. Slide the blue retention latch gently, until the sled locks into the place.

#### Next steps

1. Follow the procedure listed in [After working inside your enclosure](#).

**NOTE:** To add the Service Tag of the system board to match the Service Tag of the physical node, contact Dell Technical Support.

## PERC battery

### Removing the PERC battery

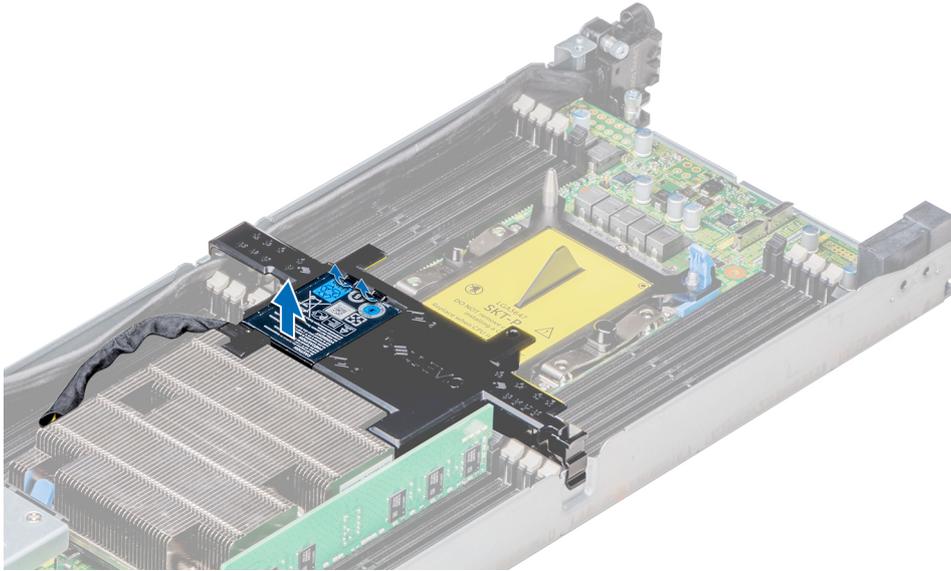
#### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. Remove the sled from the enclosure.
4. If applicable, disconnect the battery cable from the PERC card.

**CAUTION:** Do not hold the battery cable and lift the battery out.

#### Steps

Holding the cable end of the battery, lift the battery out of the air shroud.



**Figure 18. Removing the PERC battery**

**Next steps**

1. [Install the PERC battery.](#)

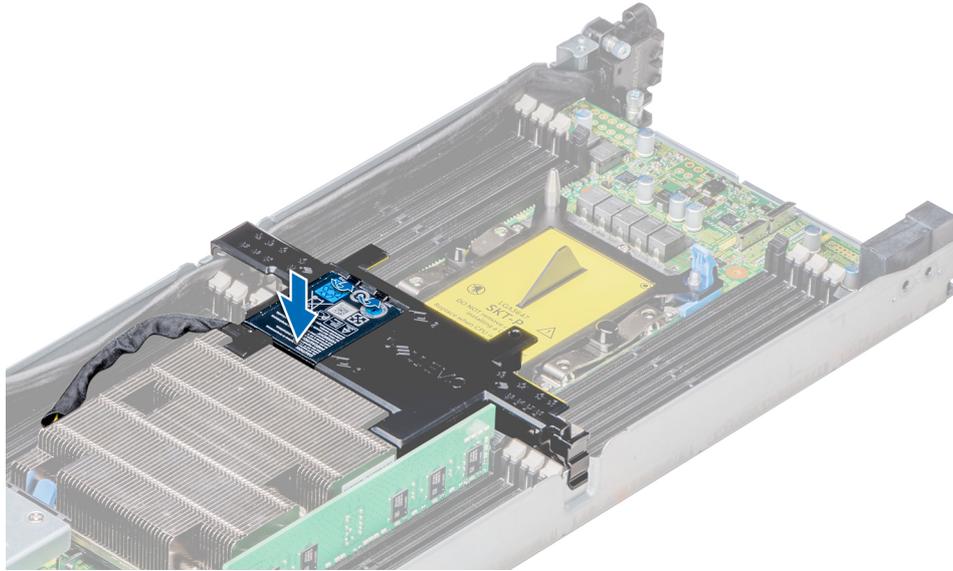
## Installing the PERC battery

**Prerequisites**

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [After working inside your system](#).
3. Install the sled from the enclosure.
4. If applicable, connect the battery cable from the PERC card.

**Steps**

1. Align and insert the non cable end of the PERC battery into the battery slot on the air shroud.
2. Press the battery until it locks into place.



**Figure 19. Installing the PERC battery**

### **Next steps**

1. If disconnected, connect the battery cable to the PERC card.
2. Follow the procedure listed in [After working inside your system](#).

## **Air shroud**

### **Removing the air shroud**

#### **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 battery cable from the PERC card.

#### **Steps**

1. Press the clip on the air shroud to release the shroud from the sled.
2. Remove the shroud by rotating the shroud and releasing the hinge from the slot on the system.

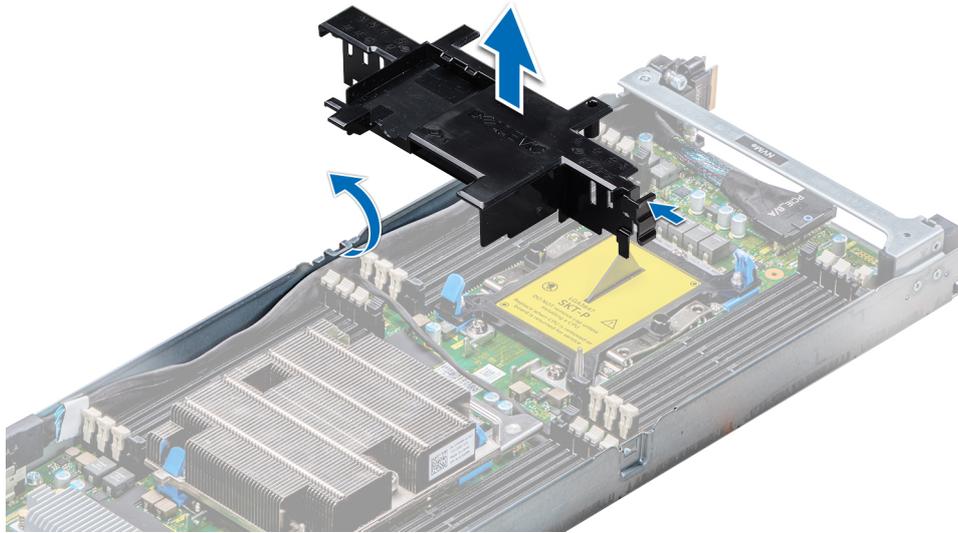


Figure 20. Removing the air shroud

### Next steps

1. [Install the air shroud.](#)

## Installing the air shroud

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

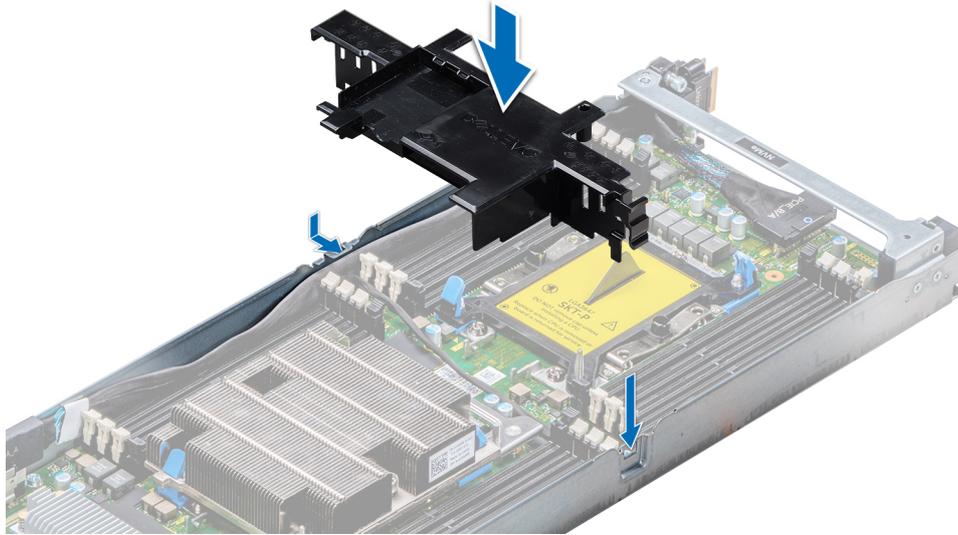
### Steps

1. Insert the air shroud into the sled, aligning the shroud hinge with slot on the sled.

**i** **NOTE:** Ensure that both the SATA cables are routed through the air shroud cable guide slot behind the air shroud latches.

**i** **NOTE:** Ensure that neither of the cables are pinched or pressed under the air shroud.

2. Press the air shroud until the locks click into place.



**Figure 21. Installing the air shroud**

**Next steps**

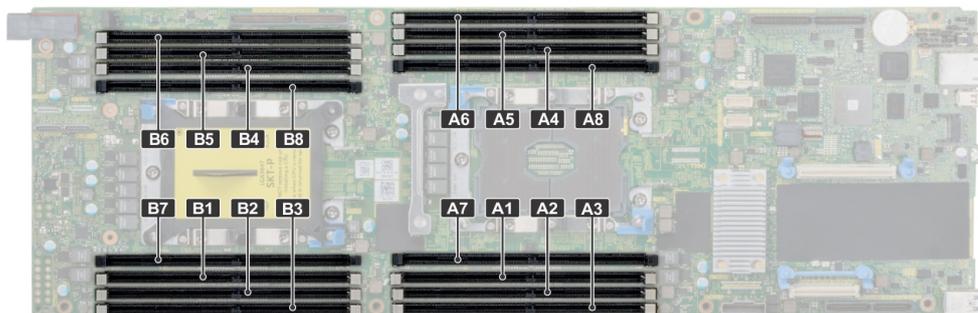
1. If disconnected, connect the battery cable to the PERC card.
2. Follow the procedure listed in [After working inside your system.](#)

## System memory

### System memory guidelines

The PowerEdge system supports DDR4 registered DIMMs (RDIMMs) and Load Reduced DIMMs (LRDIMMs). System memory holds the instructions that are executed by the processor.

Your system contains 16 memory sockets that are split into two sets of 8 sockets, one set per processor. Each 8-socket set is organized into channels. In each channel, the release tabs of the first socket are marked white, the second socket black.



**Figure 22. Memory socket locations**

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	Slots A3	Slots A8 and A4	Slots A5	Slots A6

**Table 7. Memory channels (continued)**

Processor	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
Processor 2	Slots B1 and B7	Slots B2	Slots B3	Slots B8 and B4	Slots B5	Slots B6

## 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 frequencies 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

 **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.
- 64 GB LRDIMMs that are DDP (Dual Die Package) LRDIMMs must not be mixed with 128 GB LRDIMMs that are TSV (Through Silicon Via/3DS) LRDIMMs.
- 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 single-processor systems, sockets A1 to A8 are available.
  - For dual-processor systems, sockets A1 to A8 and sockets B1 to B8 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.

 **NOTE:** 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.

 **NOTE:** 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.

 **NOTE:** 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 one 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, 3, 4, 5, 6, 7, 8.

## Mode-specific guidelines

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

**Table 8. Memory operating modes**

Memory Operating Mode	Description
<b>Optimizer Mode</b>	The <b>Optimizer Mode</b> if enabled, the DRAM controllers operate independently in the 64-bit mode and provide optimized memory performance.
<b>Mirror Mode</b>	The <b>Mirror Mode</b> 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.
<b>Single Rank Spare Mode</b>	<b>Single Rank Spare Mode</b> 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.
<b>Multi Rank Spare Mode</b>	<p><b>Multi Rank Spare Mode</b> 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.</p> <p>With single rank memory sparing enabled, the system memory available to the operating system is reduced by one rank per channel.</p> <p>For example, in a dual-processor configuration with sixteen 16 GB single-rank memory modules, the available system memory is: <math>3/4</math> (ranks/channel) <math>\times</math> 16 (memory modules) <math>\times</math> 16 GB = 192 GB, and not 16 (memory modules) <math>\times</math> 16 GB = 256 GB. For multi rank sparing, the multiplier changes to <math>1/2</math> (ranks/channel).</p> <p> <b>NOTE:</b> To use memory sparing, this feature must be enabled in the BIOS menu of System Setup.</p> <p> <b>NOTE:</b> Memory sparing does not offer protection against a multi-bit uncorrectable error.</p>
<b>Dell Fault Resilient Mode</b>	<p>The <b>Dell Fault Resilient Mode</b> 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.</p> <p> <b>NOTE:</b> This feature is only supported in Gold and Platinum Intel processors.</p> <p> <b>NOTE:</b> Memory configuration has to be of same size DIMM, speed, and rank.</p>

### 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.

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

**Table 9. Memory population rules**

Processor	Configuration	Memory population	Memory population information
Single processor	Optimizer (Independent channel) population order	1, 2, 4, 5	Odd amount of DIMMs per processor allowed.
	Mirror population order	{1, 2, 3, 4, 5, 6}	Mirroring is supported with 6 DIMMs per processor

**Table 9. Memory population rules (continued)**

Processor	Configuration	Memory population	Memory population information
	Single rank sparing population order	1, 2, 3, 4, 5, 6, 7, 8	Populate in this order, odd amount per processor allowed. Requires two ranks or more per channel.
	Multi rank sparing population order	1, 2, 3, 4, 5, 6, 7, 8	Populate in this order, odd amount per processor allowed. Requires three ranks or more per channel.
	Fault resilient population order	{1, 2, 3, 4, 5, 6}	Supported with 6 DIMMs per processor.
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{4}, B{4}, A{5}, B{5}	Odd amount of DIMMs per processor allowed.
	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

The procedure for removing a DIMM module and an NVDIMM-N module is identical.

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).

 **CAUTION:** To prevent data loss and potential damage to your system, ensure that your system, LEDs on system, LEDs on NVDIMM-N and LEDs on NVDIMM-N battery are turned off before removing the NVDIMM-N battery.

3. [Remove the air shroud](#).

 **WARNING:** Allow the memory modules to cool after you power off the system. Handle the memory modules by the card edges and avoid touching the components or metallic contacts on the memory module.

 **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.

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.

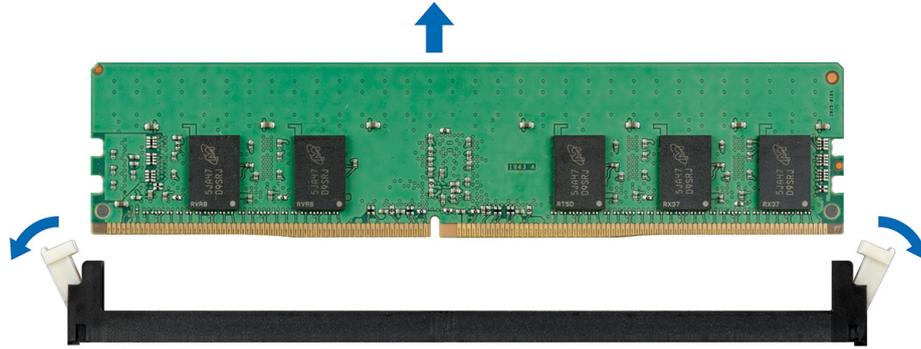


Figure 23. Removing a memory module

### Next steps

1. [Install the memory module.](#)

**CAUTION:** 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.

## Installing a memory module

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

### Steps

1. Locate the appropriate memory module socket.

**CAUTION:** Handle each memory module only by the 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.

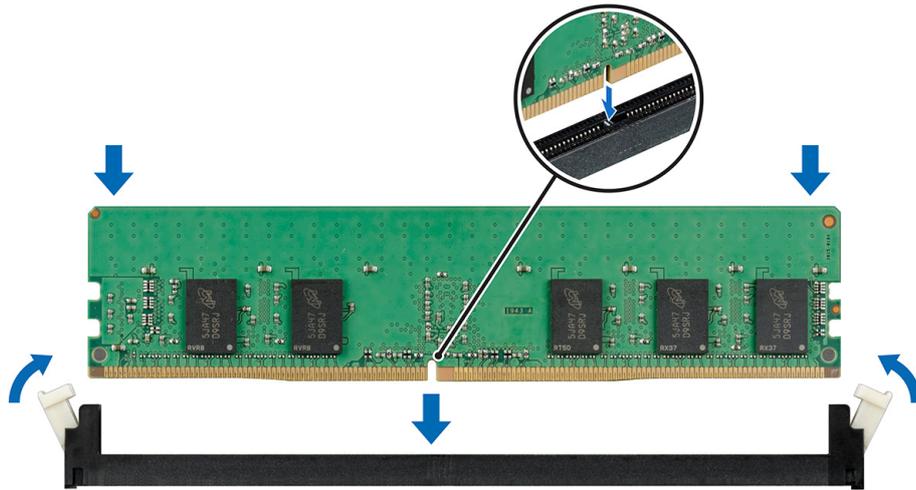


Figure 24. Installing a memory module

### 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.

## Support bracket

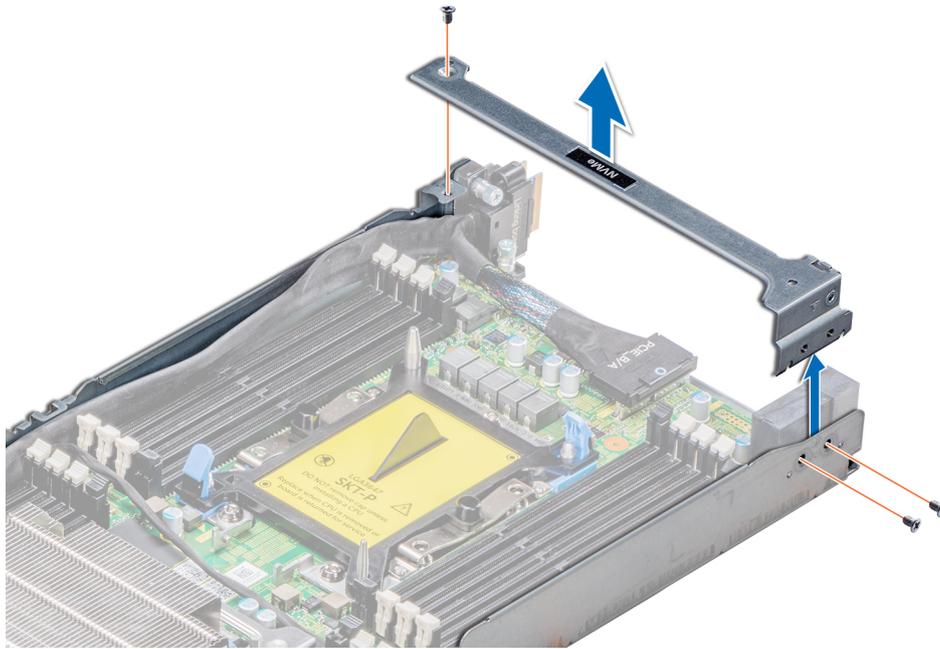
### Removing the support bracket

#### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your system.](#)

#### Steps

Using the Phillips #1 screwdriver, remove the screws that secure the support bracket and lift the bracket away from the sled.



**Figure 25. Removing the support bracket**

#### **Next steps**

1. [Install the support bracket.](#)

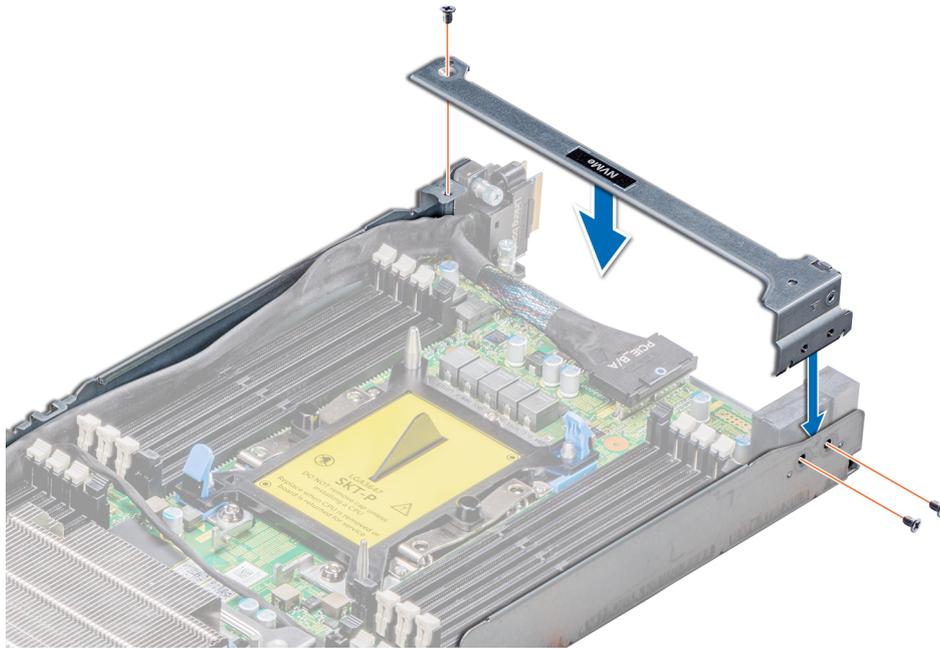
## **Installing the support bracket**

#### **Prerequisites**

1. Follow the safety guidelines listed in [Safety instructions](#).

#### **Steps**

1. Place the support bracket in the sled.
2. Using a Phillips #1 screwdriver, replace the screws to secure the bracket in place.



**Figure 26. Installing the support bracket**

#### Next steps

1. [Install the sled into the enclosure.](#)
2. Follow the procedure listed in [After working inside your system.](#)

## Linking board and PCIe cable

### Removing the linking board and PCIe cables

#### Prerequisites

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

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 support bracket.](#)

#### Steps

1. Press the release clip on the PCIe\_A cable connector to disconnect the cable. See the [System board connector](#) for more information.
2. Press the release clip on the PCIe\_B cable connector to disconnect the cable. See the [System board connector](#) for more information.
3. If connected, disconnect the SATA cable from the x16 M.2 riser.
4. Using the Phillips #1 screwdriver, loosen the captive screws on the linking board and lift the board up along with the cables.

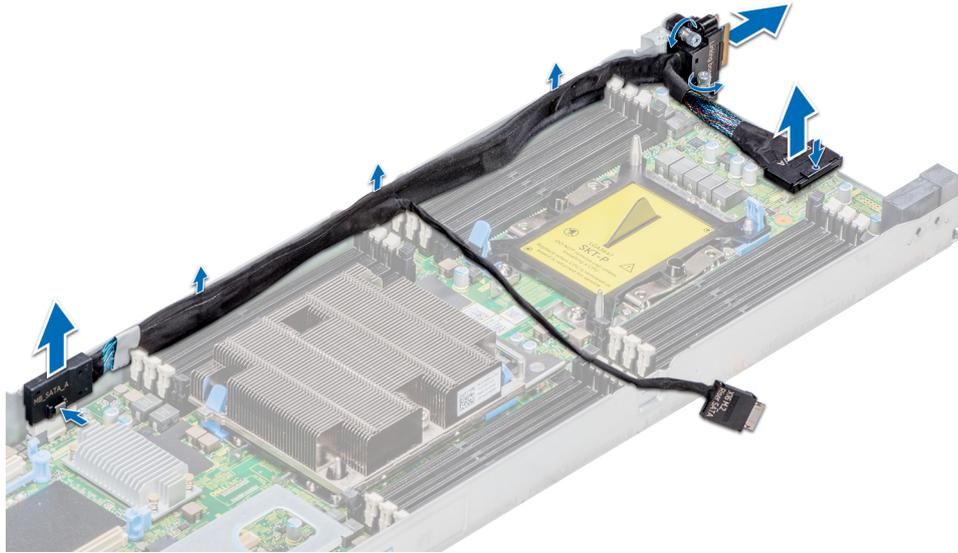


Figure 27. Removing the linking board and SATA cable

### Next steps

1. Install the linking board and PCIe cables.

## Installing the linking board and PCIe cables

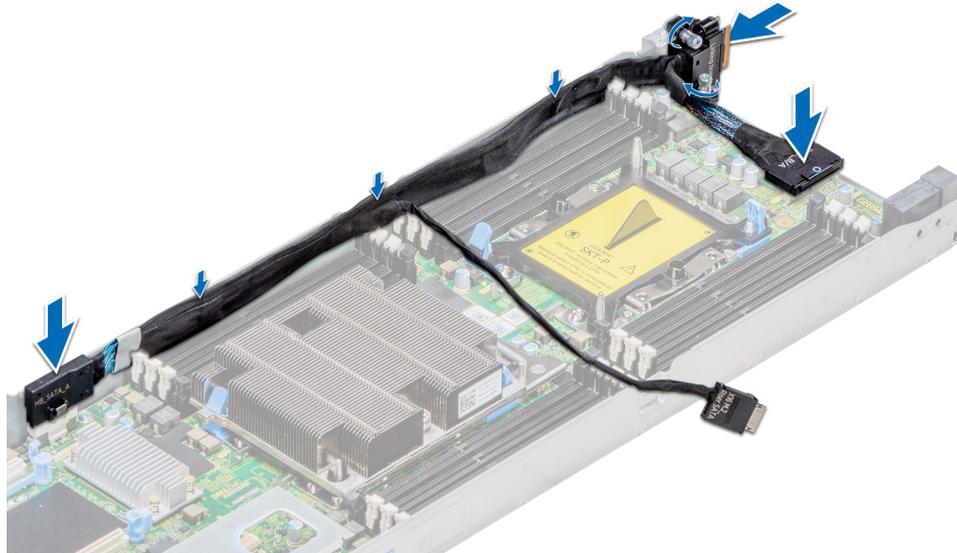
### Prerequisites

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

1. Follow the safety guidelines listed in [Safety instructions](#).

### Steps

1. Insert the PCIe\_A connector into the connector on the system board, press the connector until it locks into place.
2. Insert and press the PCIe\_B connector into the connector on the system board, press the connector until it locks into place.
3. If disconnected, reconnect the SATA cable to the x16 M.2 riser.
4. Using the Phillips #1 screwdriver, tighten the captive screws on the linking board to secure the board to the sled.



**Figure 28. Installing the linking board and SATA cable**

**Next steps**

1. Install the support bracket.
2. Install the air shroud.
3. Follow the procedure listed in [After working inside your system.](#)

## Processor and heat sink module

**CAUTION:** This is a Field Replaceable Unit (FRU). Removal and installation procedures must be performed only by Dell certified service technicians.

**NOTE:** In a sled which has been configured with mixed CPUs – a fabric processor installed in the CPU2 socket and a non-fabric processor installed in the CPU1 socket, you must connect the external Omnipath link cables to Port 2 on the OCP carrier card.

Use the following procedure when:

- Removing and installing a heat sink
- Replacing a processor

**Table 10. Supported heat sinks**

Heat sink	Dimensions	Design
CPU 1, standard heat sink	Length =108 mm (4.25 inches), Width =88 mm (3.46 inches), Height =24.8 mm (0.97 inches)	2 heat pipes
CPU 1, extended heat sink	Length =108 mm (4.25 inches), Width =96 mm (3.77 inches), Height =24.8 mm (0.97 inches)	2 heat pipes
CPU 2, standard heat sink	Length =108 mm (4.25 inches), Width =88 mm (3.46 inches), Height =24.8 mm (0.97 inches)	3 heat pipes

# Removing a processor and heat sink module

## Prerequisites

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

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [After working inside your system](#).
3. [Remove the sled from the enclosure](#).
4. [Remove the air shroud](#).
5. If installed, disconnect the fabric cable from the fabric processor.

 **NOTE:** The process to remove a processor heat sink module (PHM) is identical for a fabric and a nonfabric processor.

## Steps

1. Using a Torx #T30 screwdriver, loosen the screws on the heat sink in the order mentioned below:
  - a. Loosen the first screw three turns.
  - b. Loosen the second screw completely.
  - c. Return to the first screw and loosen it completely.
2. Pushing both blue retention clips simultaneously, lift the PHM processor and heat sink module
3. Set the PHM aside with the processor side facing up.

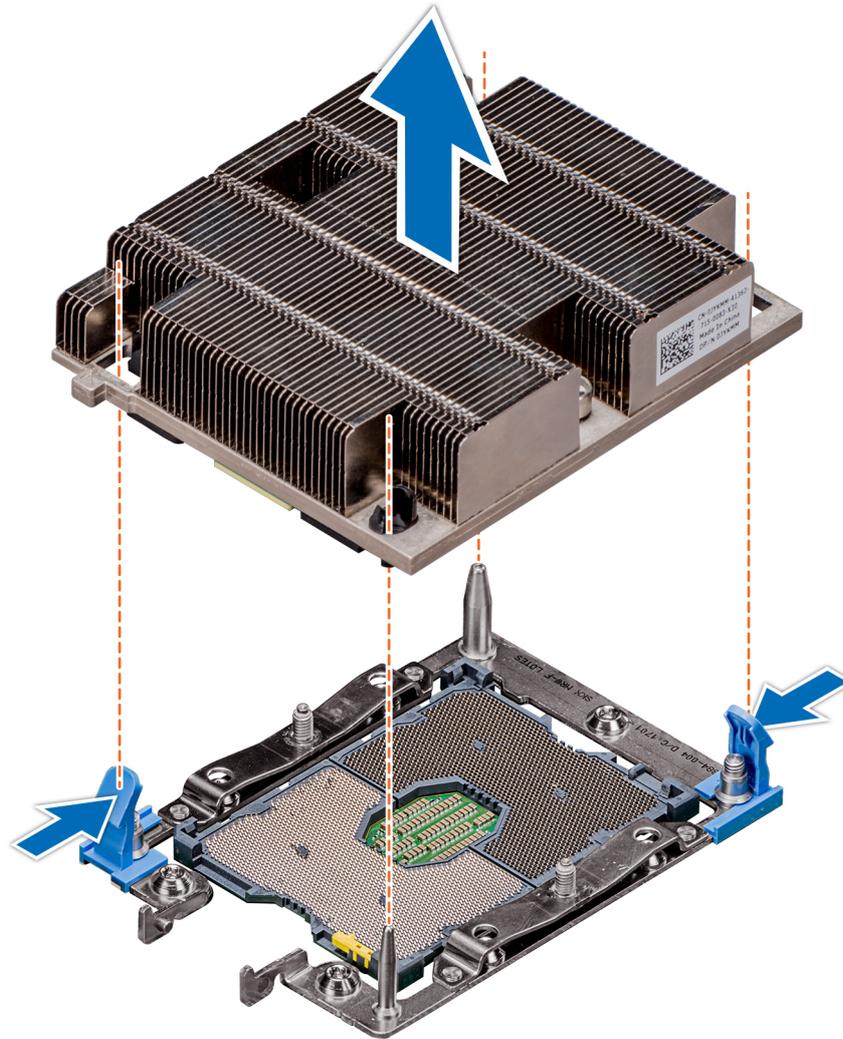


Figure 29. Removing the processor and heat sink module

#### Next steps

1. Install the processor and heat sink module.

## 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.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. If installed, remove the CPU dust cover.

#### 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.

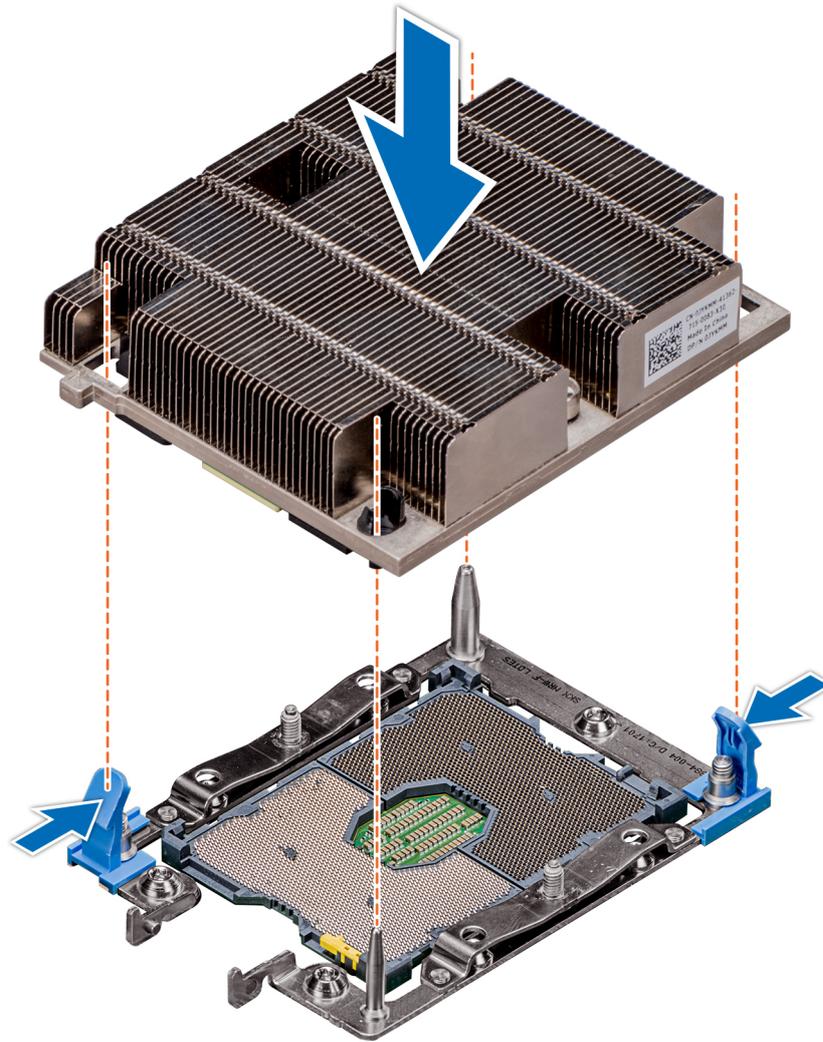
**NOTE:** Ensure that the PHM is held parallel to the system board to prevent damaging the components.

2. Push the blue retention clips inward to allow the heat sink to drop into place.
3. 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, following the procedure described in step 2.
- c. Secure the PHM to the system board, following the replacement instructions listed in this step above. 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 30. Installing a processor and heat sink module**

#### Next steps

1. [Install the air shroud.](#)
2. Connect the fabric cable to the fabric processor.
3. Follow the procedure listed in [After working inside your system.](#)

# Removing the fabric processor from the processor heat sink module

## Prerequisites

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

**i NOTE:** This procedure is only for replacing a heat sink or a processor. This procedure should not be followed while 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 fabric cable from the processor](#).
5. [Remove the processor and heat sink module](#).

## Steps

1. Place the heat sink with the processor contact side facing up.
2. Insert the flat blade screwdriver into the release slot and twist (do not pry) the screwdriver to break the seal created by the thermal paste.
3. Push the retaining clips on the processor bracket to unlock the bracket from the heat sink.
4. Lift the bracket and the processor away from the heat sink, and place the processor side down on the processor tray.
5. Flex the outer edges of the bracket close to the fabric connector to release the bracket from the processor.

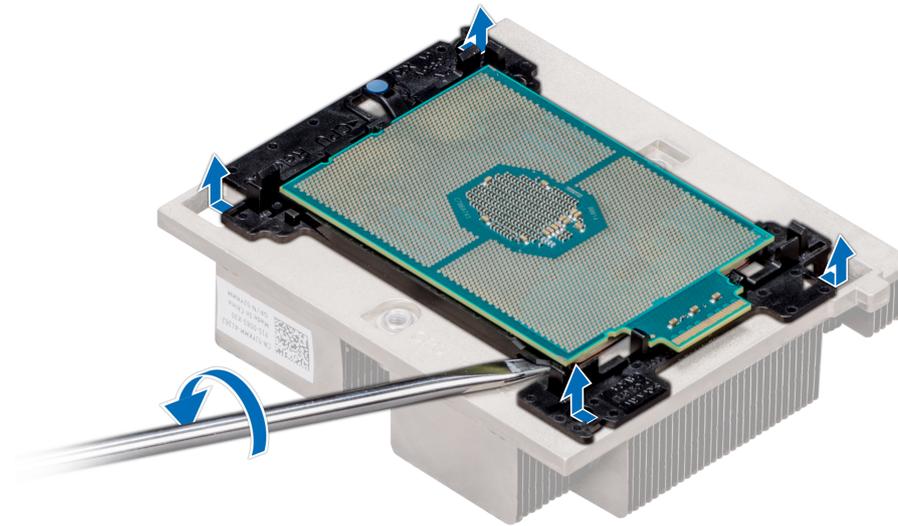
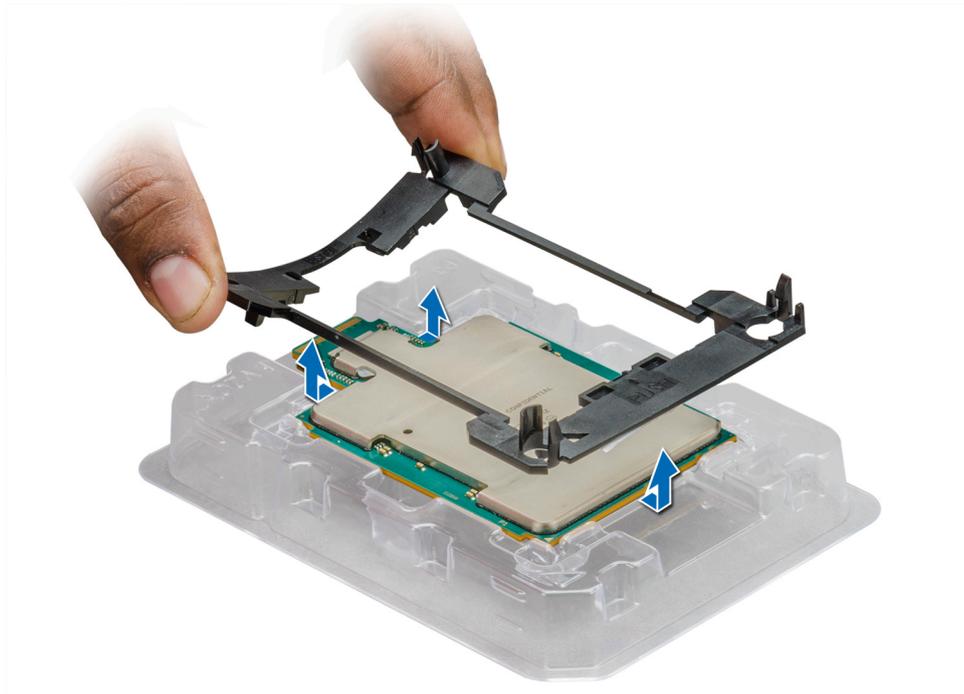


Figure 31. Loosening the processor bracket



**Figure 32. Removing the processor bracket**

#### Next steps

1. Install the fabric processor into the processor heat sink module.

## Installing the fabric processor into the processor heat sink module

#### Prerequisites

- i** **NOTE:** In a sled which has been configured with mixed CPUs – a fabric processor installed in the CPU2 socket and a non-fabric processor installed in the CPU1 socket, you must connect the external Omnipath link cables to Port 2 on the OCP carrier card.

Follow the safety guidelines listed in [Safety instructions](#).

#### Steps

1. Ensure that the processor is in the CPU tray.  
**i** **NOTE:** Ensure that pin 1 indicator on the CPU tray is aligned with the pin 1 indicator on the processor.
2. Flex the outer edges of the bracket around the processor, close to the fabric connector, ensuring that the processor is locked into the clips on the bracket.
3. Press the other end of the bracket to ensure that the clip is locked on to the processor.  
**i** **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.



**Figure 33. Installing the processor bracket**

4. If you are using an existing heat sink, remove the thermal grease from the heat sink by using a clean lint-free cloth.

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

5. Use the thermal grease syringe included with your processor kit to apply the grease in a quadrilateral design on the top of the processor.

**NOTE:** The thermal grease syringe is intended for single use only. Dispose the syringe after you use it.

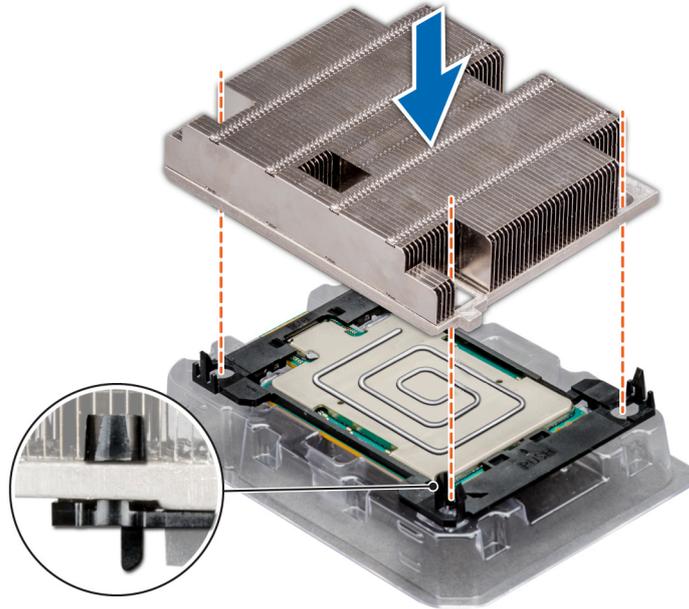


**Figure 34. Applying thermal grease on top of the processor**

6. Place the heat sink on the processor and push down until the bracket locks onto the heat sink.

**NOTE:**

- Ensure that the two guide pin holes on the bracket match the guide holes on the heat sink.
- 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 on the processor and bracket.



**Figure 35. Installing the heat sink onto the processor**

**Next steps**

1. [Install the processor and heat sink module.](#)
2. Follow the procedure listed in [After working inside your system.](#)

## Removing the non-fabric processor from the processor and heat sink module

**Prerequisites**

**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.

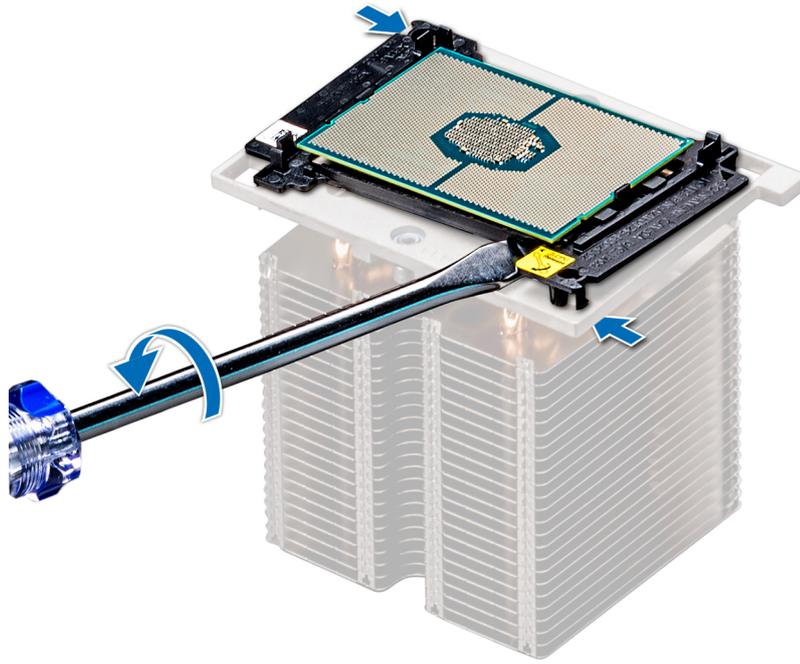


Figure 36. Loosening the processor bracket

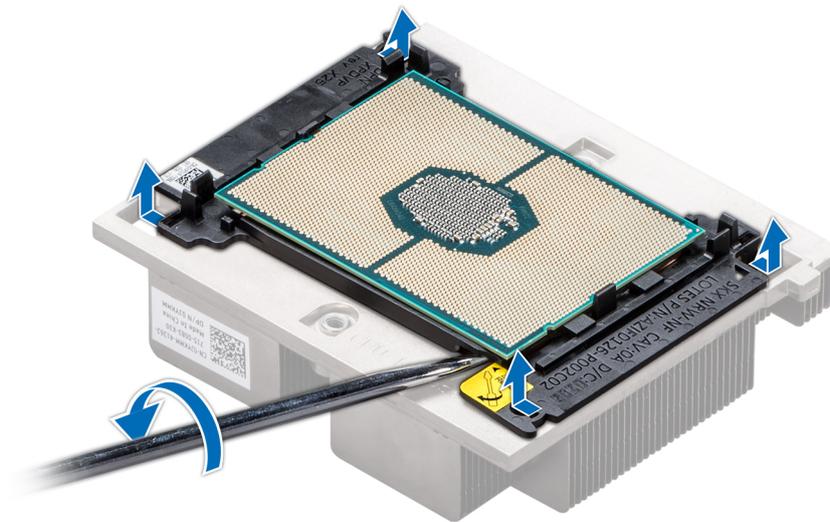
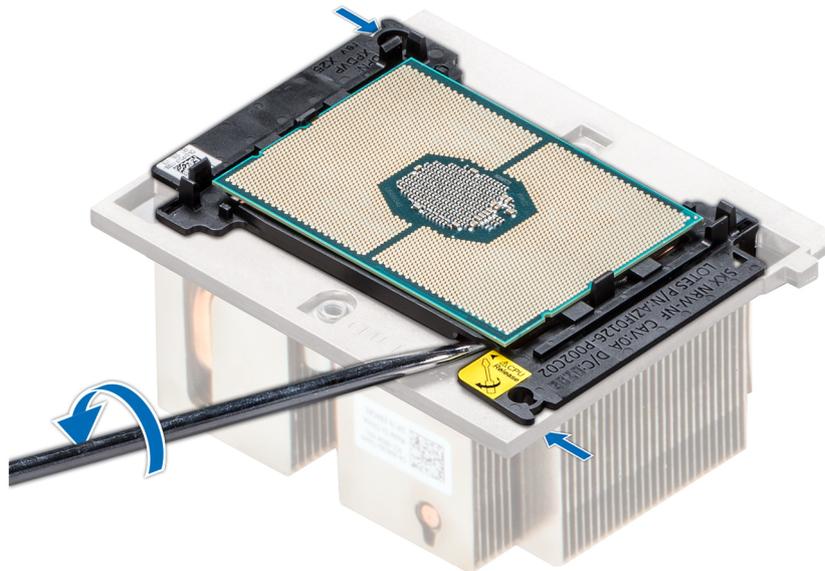


Figure 37. Loosening the processor bracket



**Figure 38. 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 39. Removing the processor bracket**

#### **Next steps**

1. Install the processor into the processor and heat sink module..
2. Install the non-fabric processor into the processor and heat sink module.

# Installing the non-fabric processor into a processor and heat sink module

## Prerequisites

**i** **NOTE:** In a sled which has been configured with mixed CPUs – a fabric processor installed in the CPU2 socket and a non-fabric processor installed in the CPU1 socket, you must connect the external Omnipath link cables to Port 2 on the OCP carrier card.

Follow the safety guidelines listed in [Safety instructions](#).

## Steps

1. Place the processor in the processor tray.

**i** **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.

**i** **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.

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



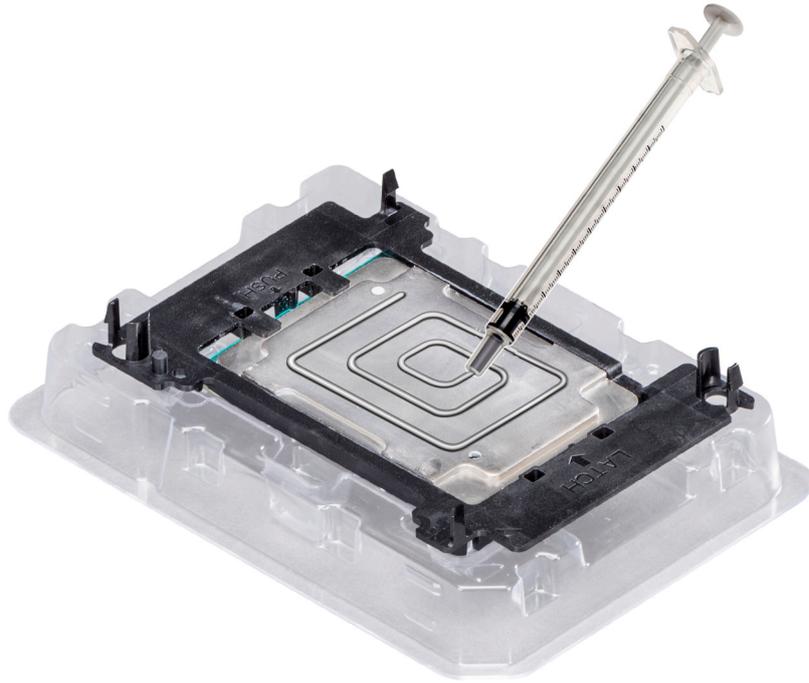
**Figure 40. Installing the processor bracket**

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.**

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



**Figure 41. 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 42. 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.](#)

## Removing the fabric and sideband cables

### Prerequisites

**NOTE:** The procedure to remove the carrier card is similar to removing an OCP card.

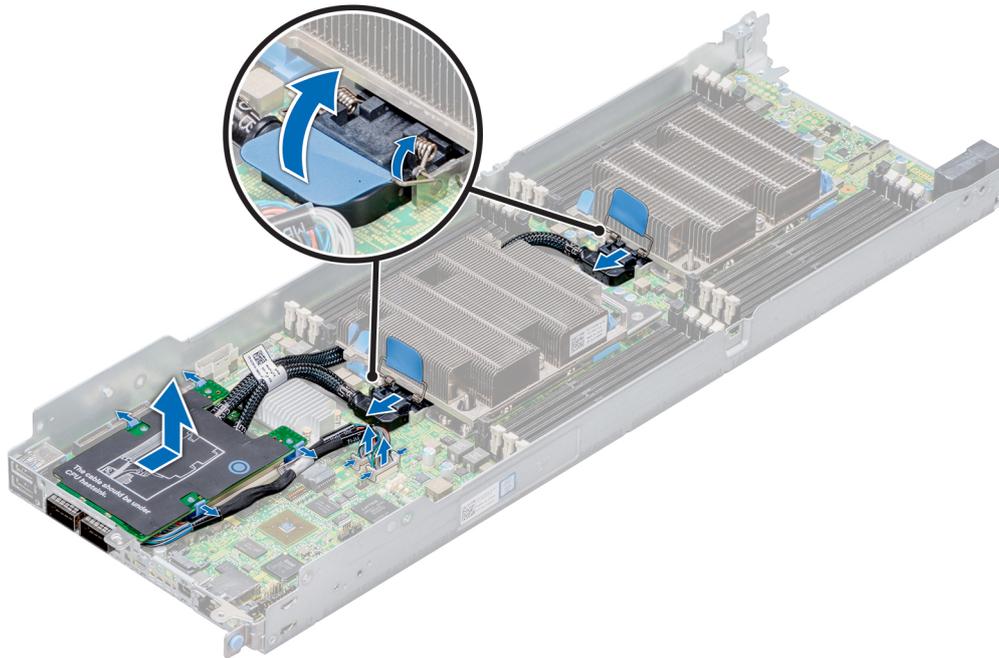
**NOTE:** Route the fabric cable for CPU 2 under the heat sink of CPU1.

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. Pull the blue pull tab on the locking bar up to release the connector from the lock on the processor base plate.

2. To disengage and release the fabric connector, pull the connector away from the processor.
3. Pressing the connector clips, release the side band cable from the connector and lift the cable away.



**Figure 43. Removing the fabric and sideband cables**

### Next steps

1. Install the fabric and sideband cables.

## Installing the fabric and sideband cables

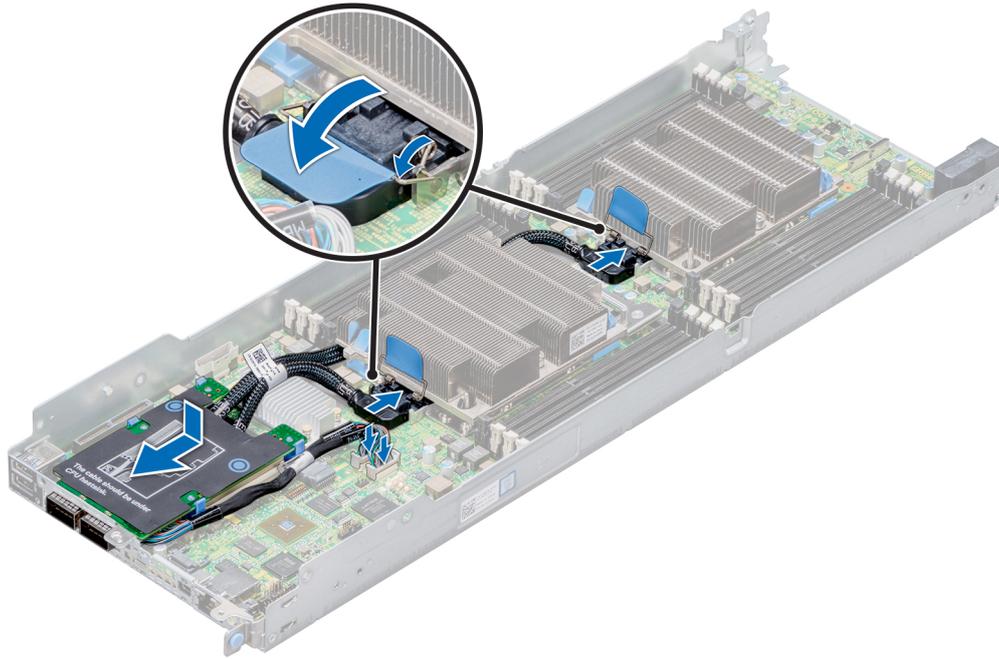
### Prerequisites

- NOTE:** In a sled which has been configured with mixed CPUs – a fabric processor installed in the CPU2 socket and a non-fabric processor installed in the CPU1 socket, you must connect the external Omnipath link cables to Port 2 on the OCP carrier card.
- NOTE:** The procedure to install the carrier card is similar to installing an OCP card.
- NOTE:** Route the fabric cable for CPU2 under the heat sink of CPU1.

1. Follow the safety guidelines listed in [Safety instructions](#).

### Steps

1. Align the notches on the fabric connector with the guide pins on the processor base plate.
2. Push the connector toward the processor, until the connector is engaged with the edge connector on the processor.
3. Push the locking bar down to secure the fabric connector in place.
4. Insert the side band cable into the respective connector, and press down to lock the connector.



**Figure 44. Installing the fabric and sideband cables**

**Next steps**

1. [Install the air shroud.](#)
2. Follow the procedure listed in [After working inside your system.](#)

## Expansion cards

**NOTE:** A missing or an unsupported expansion card riser logs a System Event Log (SEL) event. This does not prevent your system from powering on and no BIOS, POST messages or F1 or F2 pause is displayed.

## PCIe slot priority

**Table 11. Supported expansion options**

Riser	Slot number	Form Factor	Controlling processor	Slot's Electrical Bandwidth/ Physical Connector	Power
LP PCIe Slot (Slot 4)	1	Low profile	Processor 1 SKL/SKL-F/CLX	PCIe Gen3 x16 (x16 connector)	75 W
Storage Slot (DCS Mezz Slot) (Slot 1)	1	Mezzanine	Processor 1 SKL/SKL-F/CLX	PCIe Gen3 x8 (Through Bridge Board)	25 W
OCP Mezz Slot (Slot 3)	1	Mezzanine	Processor 1 SKL/CLX	PCIe Gen3 x16	25 W
OCP Mezz Slot (Slot 3)	1	Mezzanine	Processor 1 SKL-F	OCP MEZZ occupied by SKL-F QSFP carrier card	25 W

**NOTE:** For the expansion bus specification see the PowerEdge C6420 Technical Specs at [https://www.dell.com/support/manuals/poweredge-c6420](#)

**Table 12. Supported expansion cards**

Card type	Form factor	Link width	Slot priority	Maximum number of cards
Intel-Kerby Flat mezzanine network card	Mezzanine	x8	3	1
Broadcom 25G SFP network card	Mezzanine	x8	3	1
H730P Mini controller card	Mezzanine	x8	1	1
H330 SAS controller adapter	Mezzanine	x8	1	1
HBA330 MINI controller adapter	Mezzanine	x8	1	1
12-GB SAS LPF HBA controller adapter	LP	x8	4	1
HBA355e HBA external adapter	LP	x8	4	1
PM1725 1.6 HHHL NVME controller card	LP	x8	4	1
PM1725A 3.2 HHHL NVME controller card	LP	x8	4	1
PM1725A 6.4 HHHL NVME controller card	LP	x8	4	1
Mellanox dual port EDR PCIE network card	LP	x16	4	1
Mellanox 100G dual port QSF network card	LP	x16	4	1
Mellanox single port EDR PCIE network card	LP	x16	4	1
Mellanox single port FDR PCIE network card	LP	x8	4	1
Intel X16 OPA network card	LP	x16	4	1
Mellanox 100G dual port QSF network card	LP	x16	4	1
Intel 40G dual port QSFP network card	LP	x8	4	1
Intel 10G Base-T dual port network card	LP	x4	4	1
Intel 10GBTV2 network card	LP	x4	4	1
57414 25G dual port PCIE network card	LP	x8	4	1
Intel 10G dual port FVL SFP+ network card	LP	x8	4	1
57402 10G dual port PCIE network card	LP	x8	4	1
57406 10G dual port PCIE network card	LP	x8	4	1
QLogic 25G dual port SFP network card	LP	x8	4	1
Mellanox 25G dual port SFP network card	LP	x8	4	1

**Table 12. Supported expansion cards (continued)**

<b>Card type</b>	<b>Form factor</b>	<b>Link width</b>	<b>Slot priority</b>	<b>Maximum number of cards</b>
Mellanox 10G dual port SFP network card	LP	x8	4	1
Mellanox 40G dual port QSF network card	LP	x8	4	1
SF80X 10G dual port network card	LP	x8	4	1
Intel 10G Base-T quad port network card	LP	x8	4	1
Intel 1-GB dual port V3 network card	LP	x4	4	1
Intel 10G dual port SFP+ V2 network card	LP	x8	4	1
Broadcom 1G dual port network card	LP	x1	4	1
QLogic 10G dual port network card	LP	x8	4	1
QLogic 10G dual port V2 network card	LP	x8	4	1
QLogic 10G dual port SFP network card	LP	x8	4	1
QLogic 10G dual port SFP V2 network card	LP	x8	4	1
QLogic 25G quad port network card	LP	x8	4	1
QLogic 25G dual port SFP network card	LP	x8	4	1
QLogic dual port SFP V2 network card	LP	x8	4	1
BOSS card	LP	x8	5	1
Intel 25G dual port SFP network card	LP	x8	4	1
Mellanox single port PCIE network card	LP	x8	4	1
Intel 10G dual port FVL SFP+ network card (CRD,NTWK,10G,SFP+,DP FVL,LP,V2)	LP	x8	4	1
Broadcom, 25G,PCIE,Dual port , card,Network CRD,NTWK,PCIE,DP,25G,57414,LP2	LP	x8	4	1
SATA X8 M.2 card	N/A			X8 PCIe Adapter (PCIe Bus Reserve for ESI)
SATA X16 M.2 card	N/A			X16 PCIe Adapter (PCIe Bus Reserve for ESI)
Intel 60-W FPGA card	LP	x16	4	1
Intel 70-W FPGA card	LP	x16	4	1
PM1725B 1.6 HHHH NVME card	LP	x8	4	1
PM1725B 3.2 HHHH NVME card	LP	x8	4	1
PM1725B 6.4 HHHH NVME card	LP	x8	4	1
P4800X 750GB HHHH PCIE card	LP	x8	4	1

# Removing the expansion card riser assembly

## Prerequisites

**NOTE:** Install an expansion card filler bracket over an empty expansion 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.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).

## Steps

1. Remove the screws that secure the expansion card riser assembly.
2. Lift the expansion card riser assembly out of the sled.

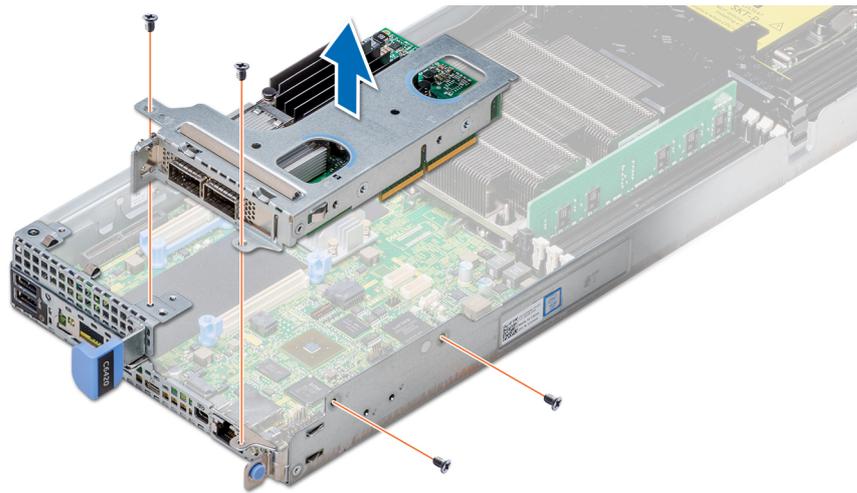


Figure 45. Removing the expansion card riser assembly

## Next steps

1. [Install the expansion card riser assembly](#).

# Installing the expansion card riser assembly

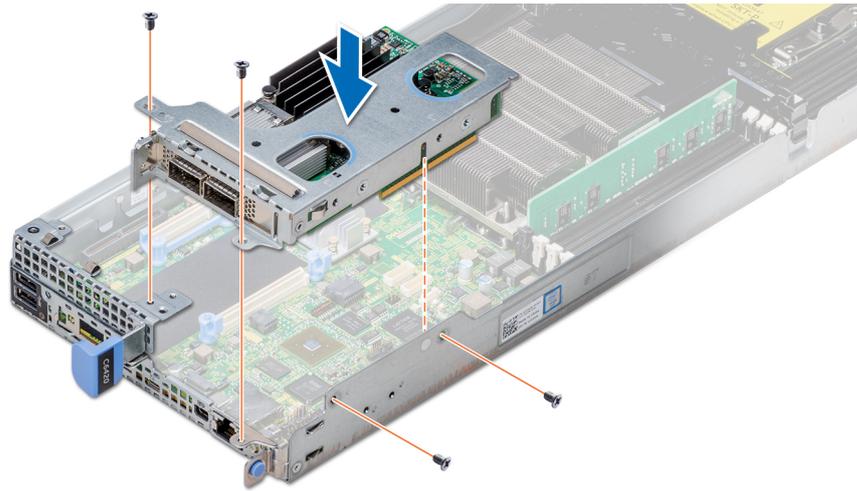
## Prerequisites

**NOTE:** You must install an expansion card filler bracket over an empty expansion 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.

1. Follow the safety guidelines listed in [Safety instructions](#).

## Steps

1. Place the expansion card assembly into the system board assembly.
2. Align the riser card connector with the connector on the system board, and press the expansion card riser assembly into place.
3. Using the Phillips #2 screwdriver, tighten the screws that secure the expansion card riser assembly.



**Figure 46. Installing the expansion card riser assembly**

### Next steps

1. Follow the procedure listed in [After working inside your system](#).

## Removing an expansion 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 assembly](#).

### Steps

1. Remove the screw that secures the expansion card to the assembly.
2. Hold the expansion card by its edges, and carefully remove it from the riser card.

**i NOTE:** Install an expansion card filler bracket over an empty expansion 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.

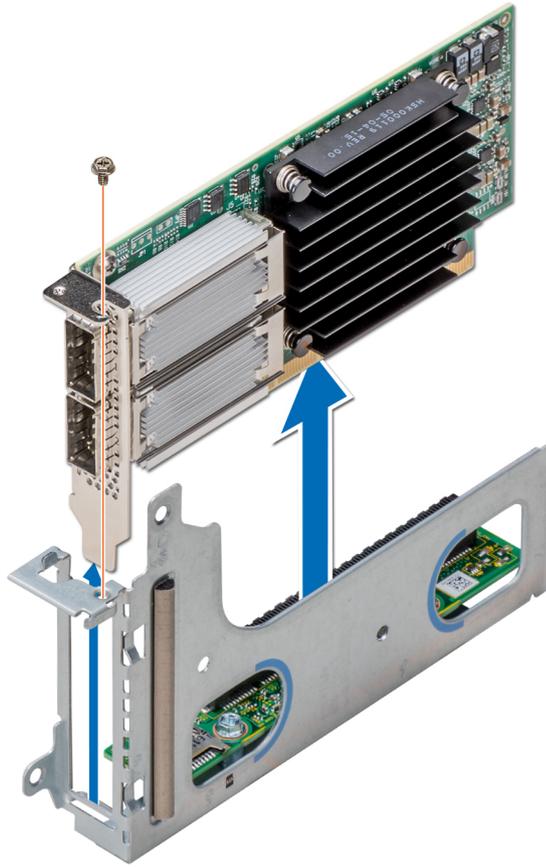


Figure 47. Removing an expansion card

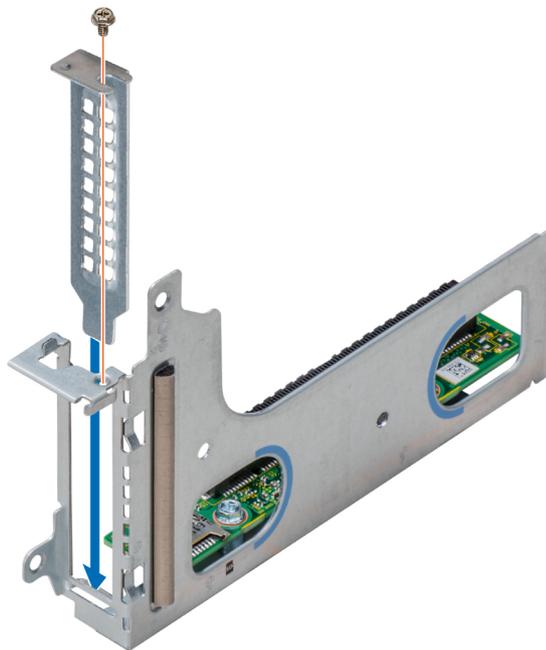


Figure 48. Installing the expansion card filler bracket

### Next steps

Install the expansion card or install the expansion card filler bracket.

# Installing an expansion card

## Prerequisites

**CAUTION:** Expansion cards can only be installed in the slots on the expansion card riser. Do not attempt to install expansion cards directly into the riser connector on the system board.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Unpack the expansion card and prepare it for installation. For instructions, see the documentation accompanying the card.

## Steps

1. If installed, remove the filler bracket by performing the following steps:
  - a. Remove the screw that secures the filler bracket.
  - b. Hold the filler bracket by its edges, and carefully remove it from the riser card.

**NOTE:** You must install an expansion card filler bracket over an empty expansion 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.
2. Holding the card by its edges, position the card so that the card edge connector aligns with the connector on the riser card.
3. Insert the card edge connector and push the card firmly into the riser card until the card is fully seated.
4. Replace the screw that secures the expansion card.

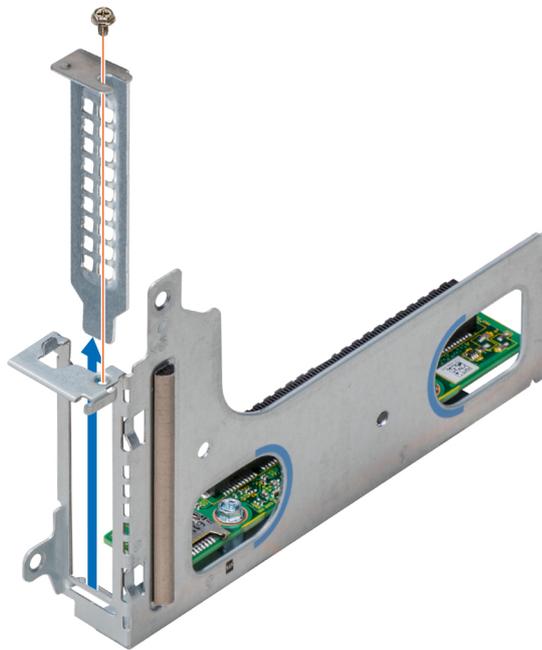
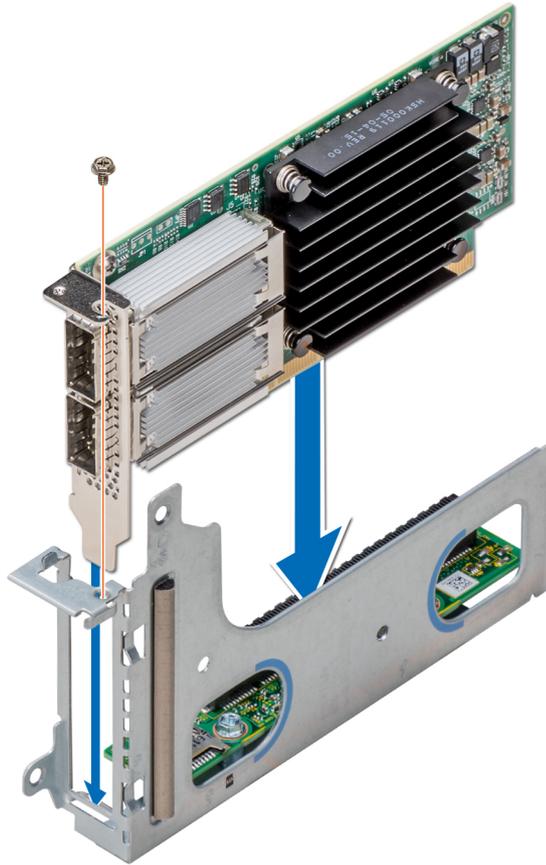


Figure 49. Removing the expansion card filler bracket



**Figure 50. Installing an expansion card**

#### **Next steps**

1. [Install the expansion card riser assembly.](#)
2. Follow the procedure listed in [After working inside your system.](#)

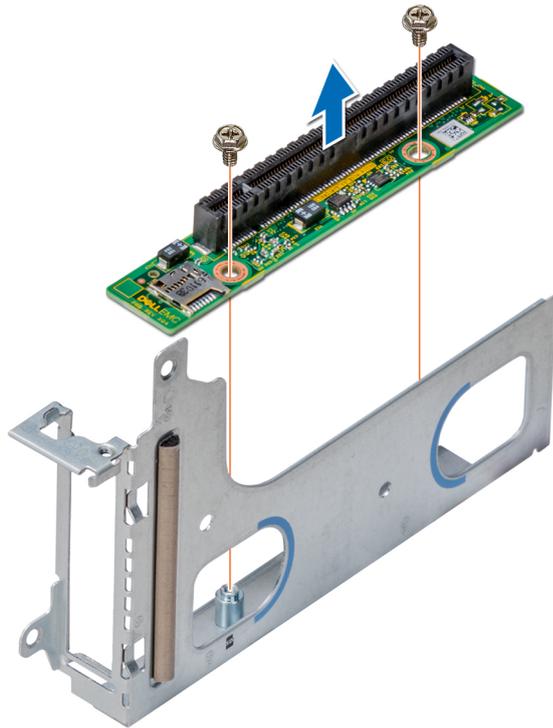
## **Removing the riser card**

#### **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 assembly.](#)
4. If installed, [remove the expansion card.](#)

#### **Steps**

1. Using the Phillips #2 screwdriver, remove the screws that secure the riser card to the expansion card bracket.
2. Lift the riser card away from the expansion card bracket.



**Figure 51. Removing the riser card**

#### **Next steps**

1. [Install the riser card.](#)

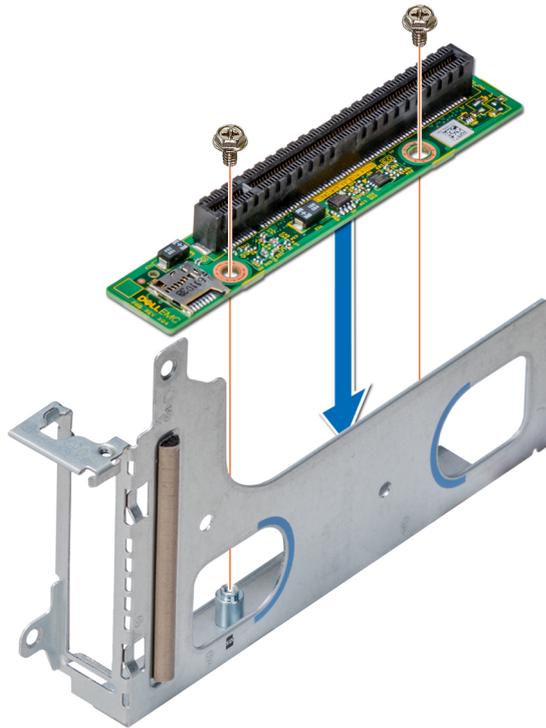
## **Installing the riser card**

#### **Prerequisites**

1. Follow the safety guidelines listed in [Safety instructions](#).

#### **Steps**

1. Place the riser card into the expansion card bracket.
2. Using the Phillips #2 screwdriver, tighten the screws that secure the riser card to the expansion card bracket.



**Figure 52. Installing the riser card**

#### **Next steps**

1. If removed, [install the expansion card](#).
2. [Install the expansion card riser assembly](#).
3. Follow the procedure listed in [After working inside your system](#).

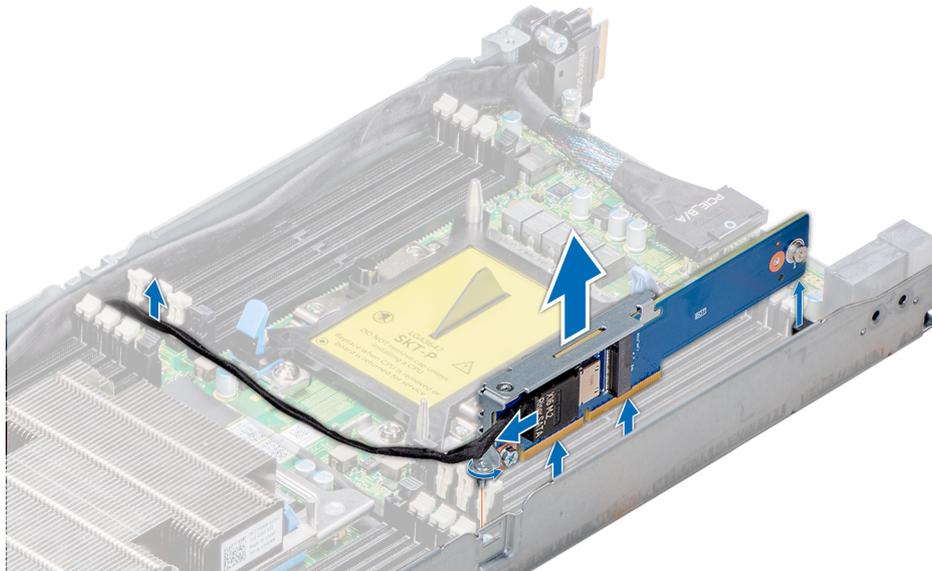
## **Removing the M.2 SATA x16 riser**

#### **Prerequisites**

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).

#### **Steps**

1. Using the Phillips #1 screwdriver, loosen the screw that secures the riser to the sled.
2. Lift the riser up to disengage the riser from the connector on the system board.
3. Disconnect the data cable from the riser.



**Figure 53. Removing the M.2 SATA x16 riser**

#### **Next steps**

1. [Install the M.2 SATA x16 riser.](#)

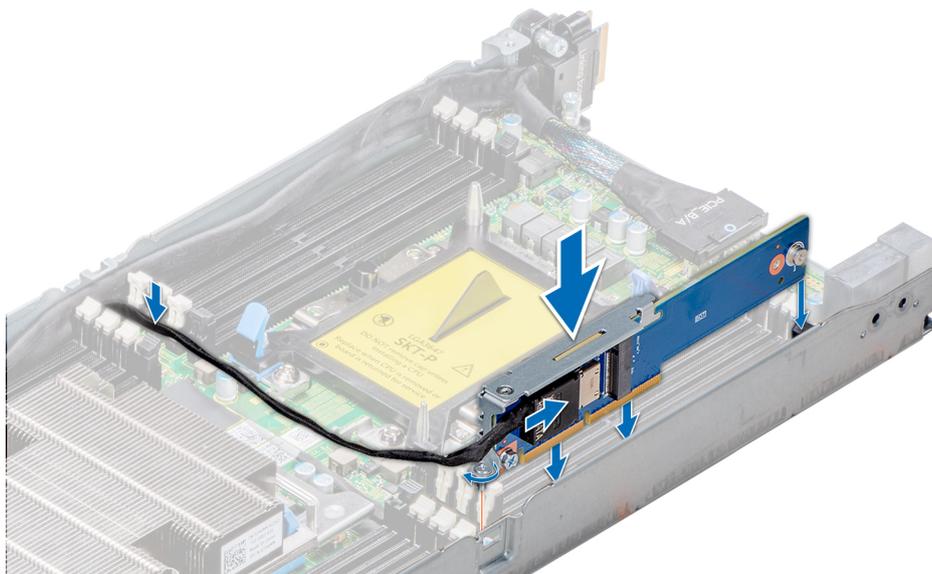
## **Installing the M.2 SATA x16 riser**

#### **Prerequisites**

1. Follow the safety guidelines listed in [Safety instructions](#).

#### **Steps**

1. Connect the data cable to the riser.
2. Insert the keyed end of the M.2 SATA riser into the lock on the system board.
3. Align and insert the edge connector into the connector on the system board.
4. Using the Phillips #2 screwdriver, tighten the screw to secure the riser to the sled.



**Figure 54. Installing the M.2 SATA x16 riser**

### Next steps

1. Follow the procedure listed in [After working inside your system](#).

## Removing the M.2 SATA card

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. If applicable, [remove the expansion card riser assembly](#).
4. [Remove the M.2 x16 riser](#) or [install the M.2 SATA x8 mezzanine card](#).

**NOTE:** The procedure to remove the M.2 SATA x8 mezzanine card is similar to removing a mezzanine card.

### Steps

1. Using the Phillips #1 screwdriver, unscrew the screw that secures the M.2 card to the board.
2. Pull the card out of the connector and lift the card away.

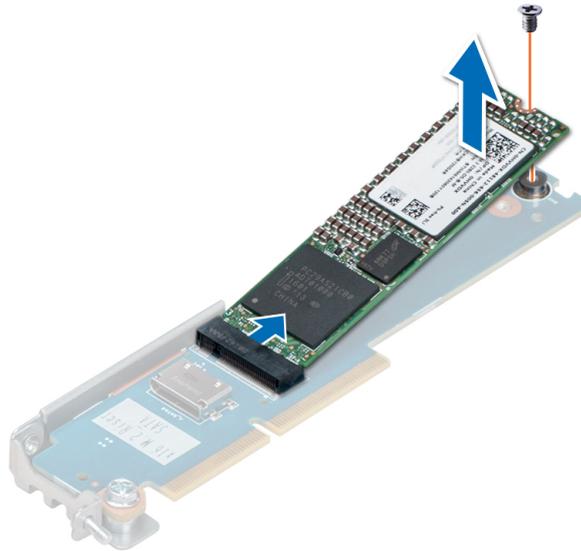


Figure 55. Removing the M.2 SATA card from the M.2 SATA x16 riser

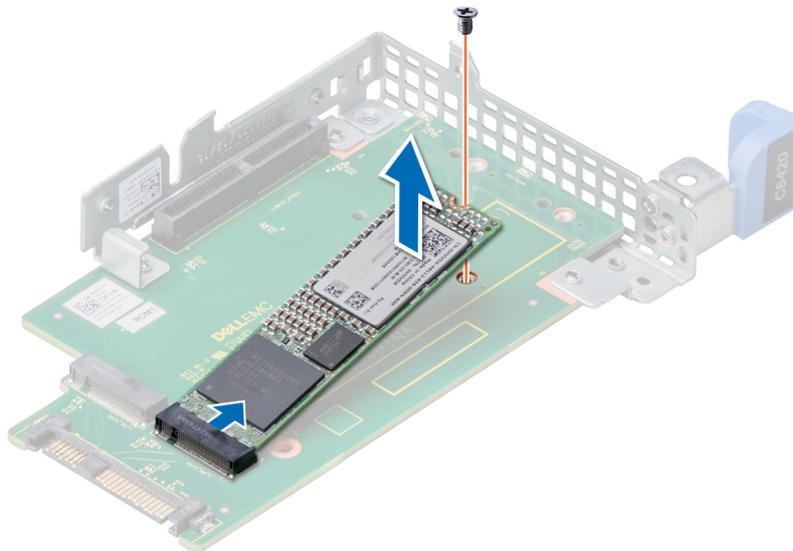


Figure 56. Removing the M.2 SATA card from the x8 mezzanine card

### Next steps

1. Install the M.2 SATA card

## Installing the M.2 SATA card

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

### Steps

1. Insert the edge connector of the M.2 SATA card into the connector on the board, and push the card in.
2. Using the Phillips #1 screwdriver, secure the card in place.

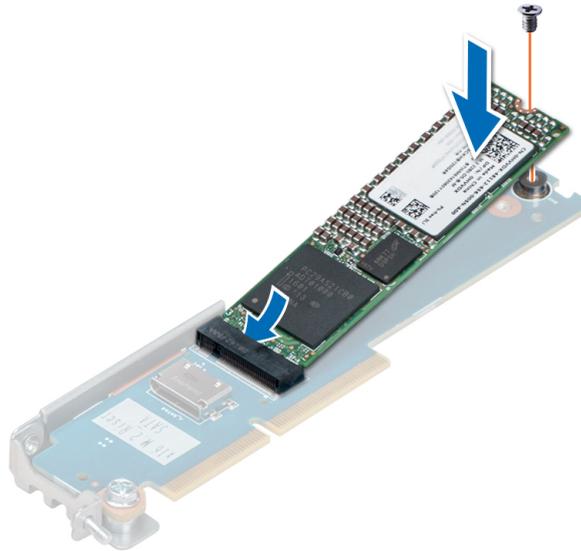


Figure 57. Installing the M.2 SATA card on the SATA x16 riser

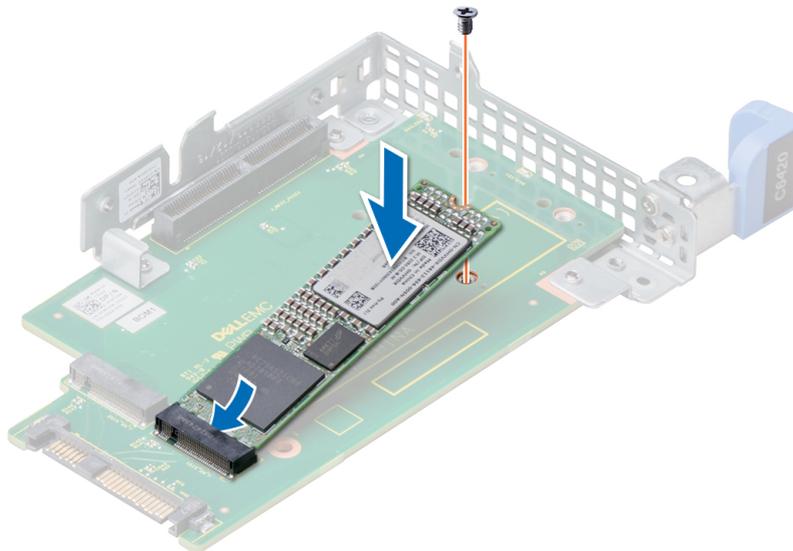


Figure 58. Installing the M.2 SATA card on the SATA x8 mezzanine card

### Next steps

1. If removed, install the expansion card riser assembly.
2. Install the M.2 x16 riser or install the M.2 SATA x8 mezzanine card.  
**NOTE:** The procedure to install the M.2 SATA x8 mezzanine card is similar to installing a mezzanine card.
3. Follow the procedure listed in [After working inside your system](#).

## M.2 SSD module

The BOSS card is a simple RAID solution card designed specifically for booting a server's operating system. The card supports up to two 6 Gbps M.2 SATA drives. The BOSS adapter card has a x8 connector using PCIe gen 2.0 x2 lanes, available only in the low-profile and half-height form factor.

## Removing the M.2 SATA x16 riser

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Remove the sled from the enclosure](#).

### Steps

1. Using the Phillips #1 screwdriver, loosen the screw that secures the riser to the sled.
2. Lift the riser up to disengage the riser from the connector on the system board.
3. Disconnect the data cable from the riser.

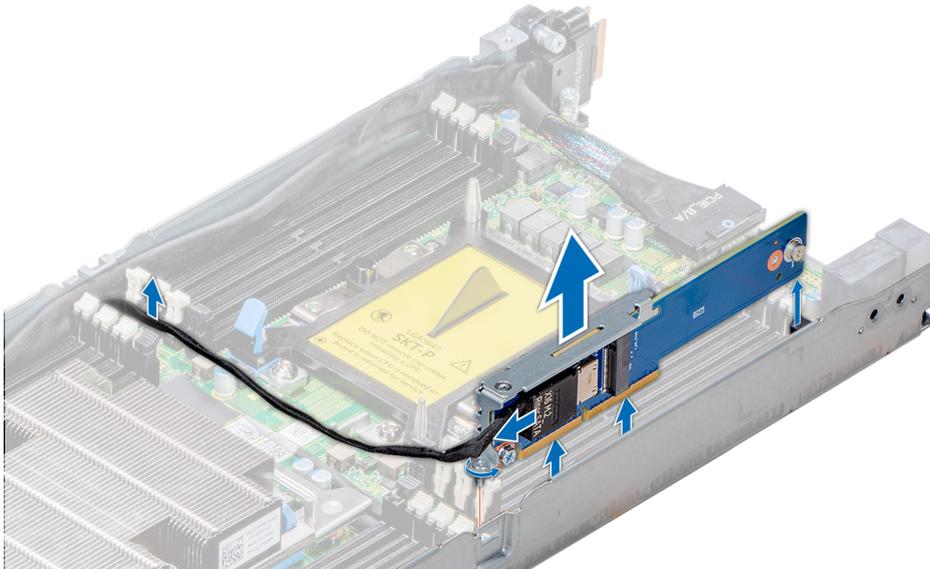


Figure 59. Removing the M.2 SATA x16 riser

### Next steps

[Install the M.2 SATA x16 riser](#).

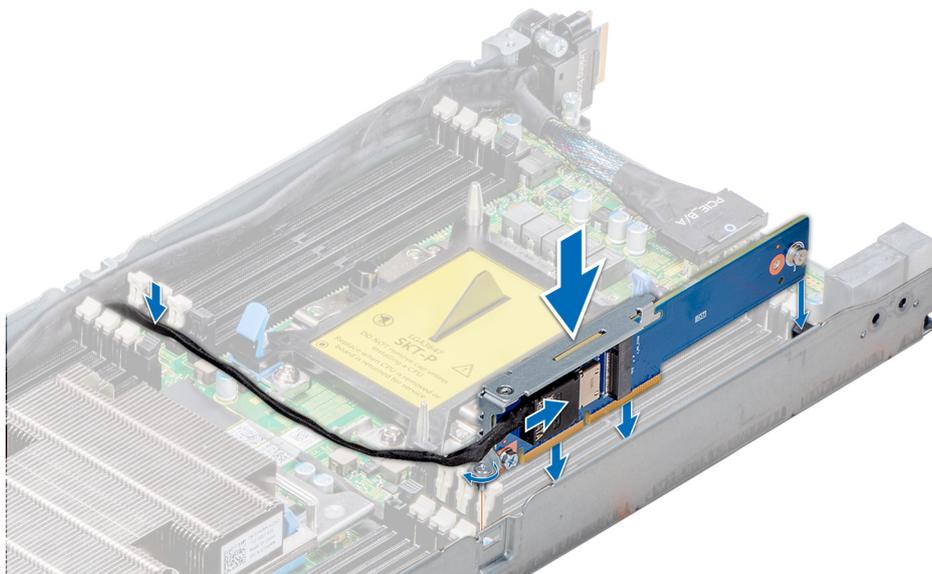
## Installing the M.2 SATA x16 riser

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

### Steps

1. Connect the data cable to the riser.
2. Insert the keyed end of the M.2 SATA riser into the lock on the system board.
3. Align and insert the edge connector into the connector on the system board.
4. Using the Phillips #2 screwdriver, tighten the screw to secure the riser to the sled.



**Figure 60. Installing the M.2 SATA x16 riser**

### Next steps

1. [Install the sled into the enclosure.](#)
2. Follow the procedure listed in [After working inside your system.](#)

## Removing the M.2 SATA 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 sled from the enclosure.](#)
4. If applicable, [remove the expansion card riser assembly.](#)
5. [Remove the M.2 x16 riser or the M.2 SATA x8 mezzanine card.](#)

**NOTE:** The procedure to remove the M.2 SATA x8 mezzanine card is similar to removing a mezzanine card.

### Steps

1. Using the Phillips #1 screwdriver, unscrew the screw that secures the M.2 card to the board.
2. Pull the card out of the connector and lift the card away.

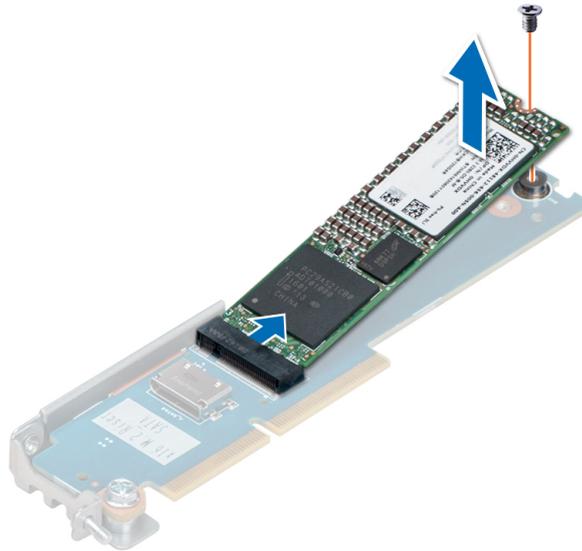


Figure 61. Removing the M.2 SATA card from the M.2 SATA x16 riser

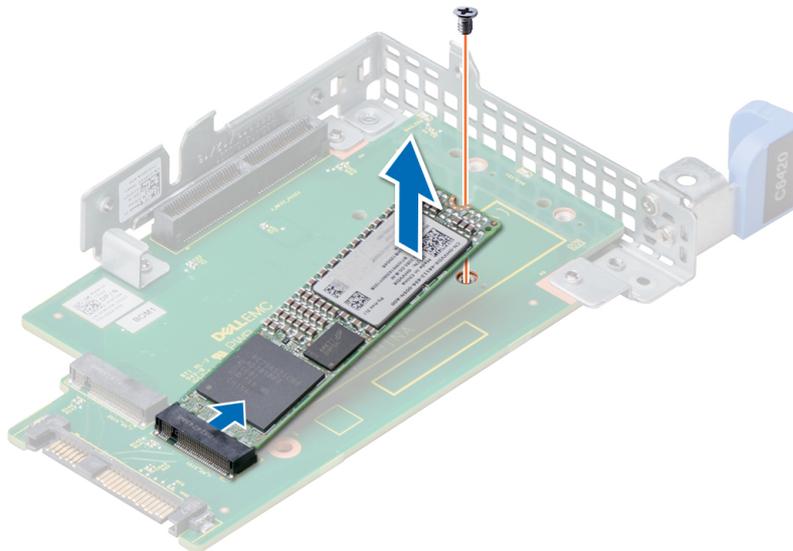


Figure 62. Removing the M.2 SATA card from the x8 mezzanine card

### Next steps

Install the M.2 SATA card.

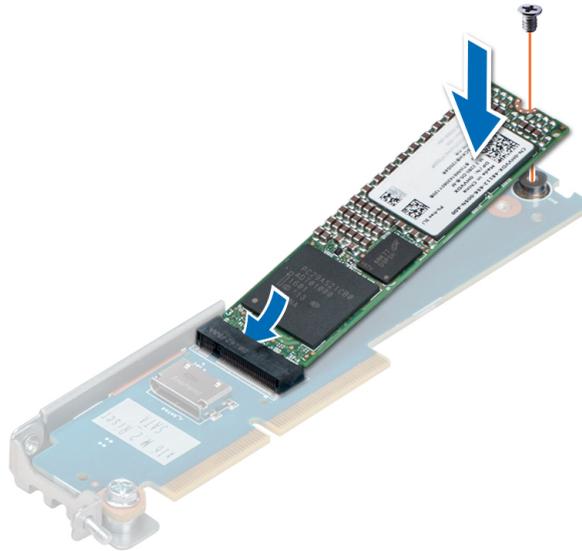
## Installing the M.2 SATA card

### Prerequisites

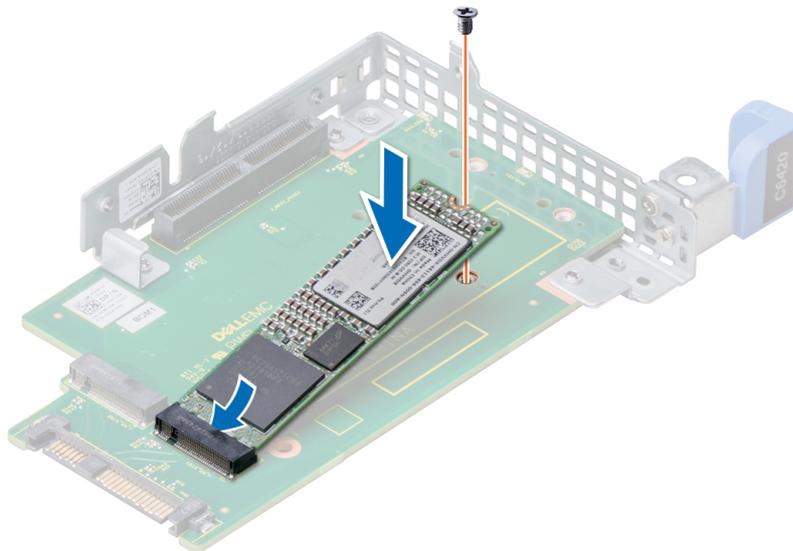
1. Follow the safety guidelines listed in [Safety instructions](#).

### Steps

1. Insert the edge connector of the M.2 SATA card into the connector on the board, and push the card in.
2. Using the Phillips #1 screwdriver, secure the card in place.



**Figure 63. Installing the M.2 SATA card on the SATA x16 riser**



**Figure 64. Installing the M.2 SATA card on the SATA x8 mezzanine card**

### Next steps

1. If removed, install the expansion card riser assembly.
2. Install the M.2 x16 riser or the M.2 SATA x8 mezzanine card.  
**i** **NOTE:** The procedure to install the M.2 SATA x8 mezzanine card is similar to removing a mezzanine card.
3. Install the sled into the enclosure.
4. Follow the procedure listed in [After working inside your system](#).

# Mezzanine and OCP cards

## Removing a mezzanine card

### Prerequisites

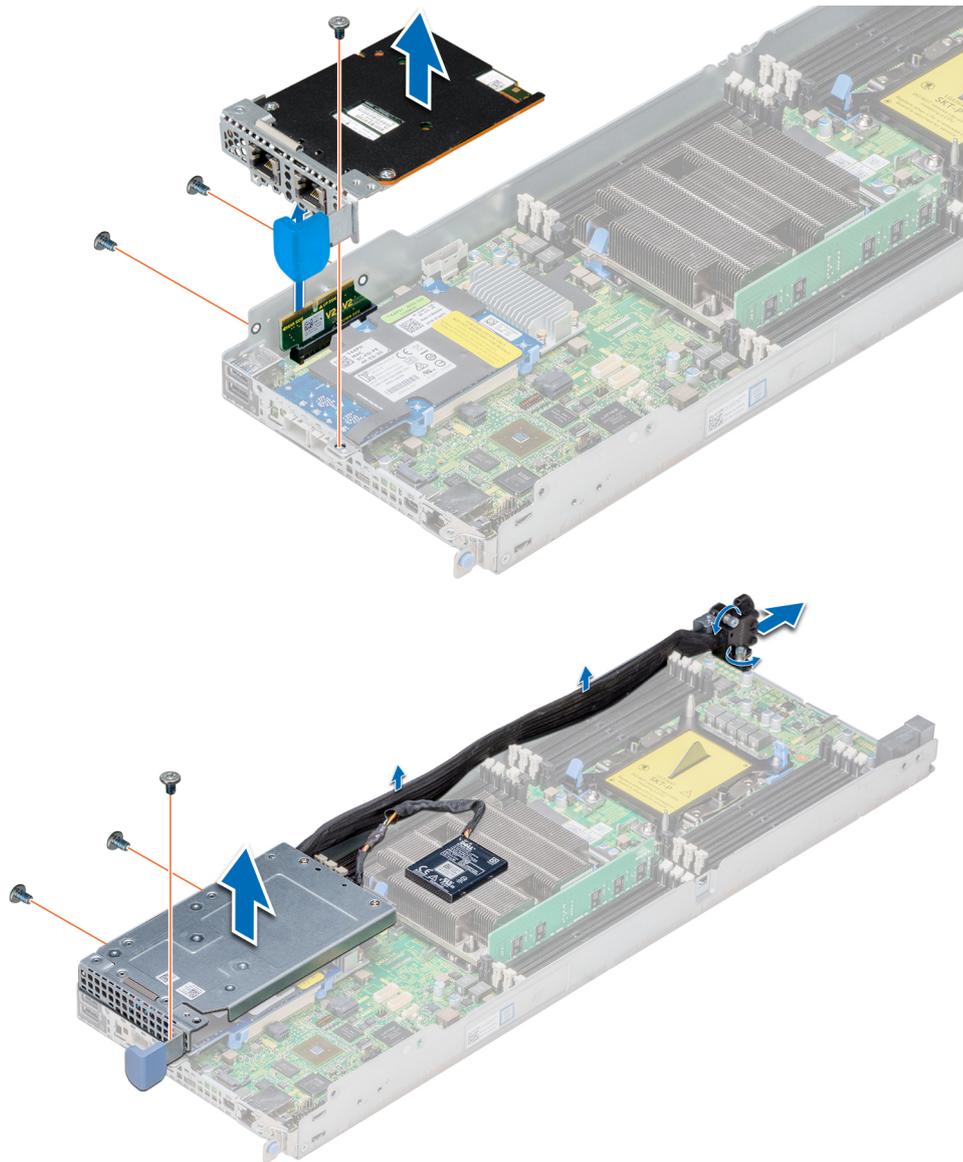
**i** **NOTE:** The procedure to remove the mezzanine blank is similar to the removal of a mezzanine card.

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 assembly](#).

### Steps

1. Remove the screws that secure the mezzanine card to the sled.
2. Lift the mezzanine card out of the sled.

**i** **NOTE:** Install an expansion card filler bracket over an empty expansion 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 65. Removing a mezzanine card**

### Next steps

1. Install the mezzanine card or install the mezzanine card filler bracket.

## Installing a mezzanine card

### Prerequisites

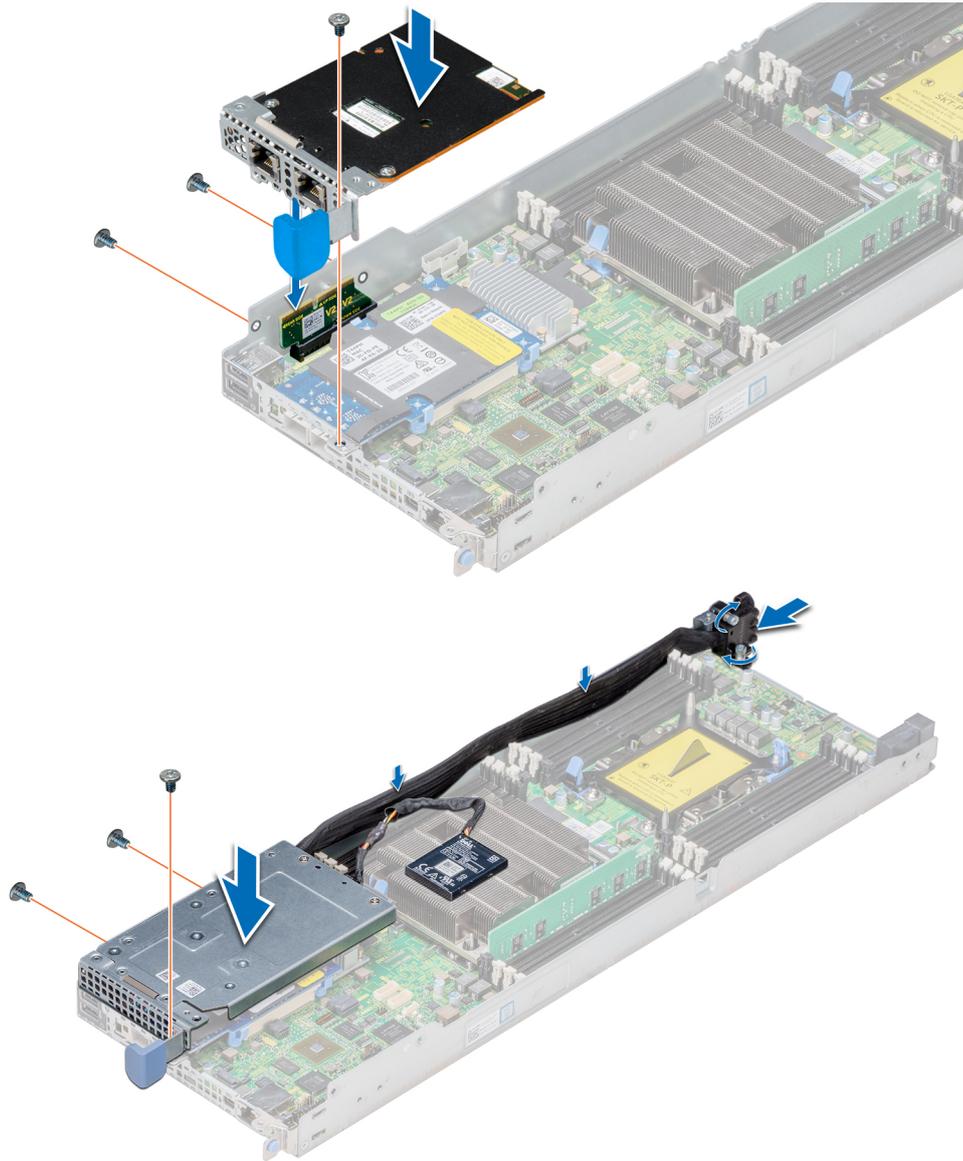
**NOTE:** The procedure to install the mezzanine blank is similar to the removal of a mezzanine card.

1. Follow the safety guidelines listed in [Safety instructions](#).

### Steps

1. Attach and secure the mezzanine card bracket to the mezzanine card.
2. Holding the card by its edges, position the card so that the card edge connector aligns with the connector of the bridge board on the system board.
3. Insert the card edge connector and push the card firmly until the card is fully seated on the bridge board.

- Using the Phillips #2 screwdriver, secure the mezzanine card and bracket assembly to the sled using screws.



**Figure 66. Installing a mezzanine card**

#### **Next steps**

- Install the mezzanine card or install the mezzanine card filler bracket.
- Install the expansion card riser assembly
- Follow the procedure listed in [After working inside your system](#).

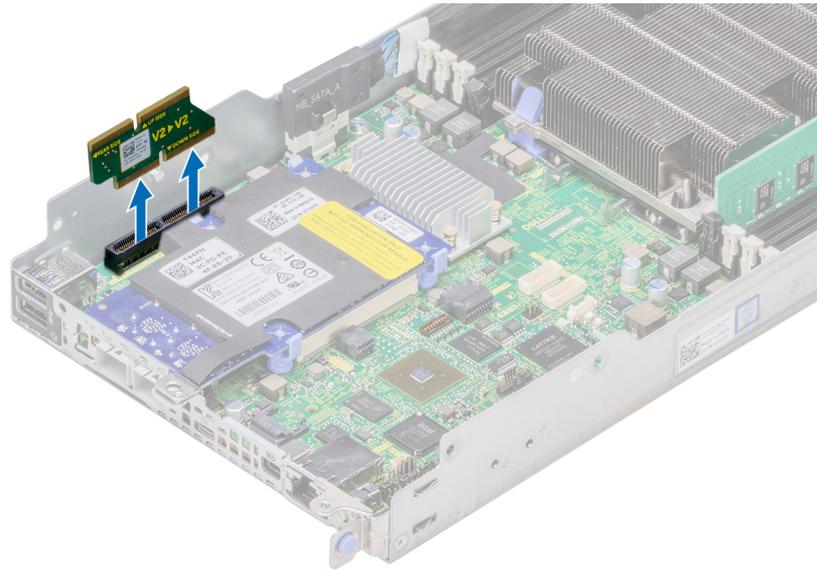
## **Removing the mezzanine card bridge board**

#### **Prerequisites**

- Follow the safety guidelines listed in [Safety instructions](#).
- Follow the procedure listed in [Before working inside your system](#).
- [Remove the expansion card riser assembly](#)
- [Remove the mezzanine card](#).

## Steps

Pull the mezzanine card bridge board away from the mezzanine card slot on the system board.



**Figure 67. Removing the mezzanine card bridge board**

## Next steps

1. [Install the mezzanine card board bridge.](#)

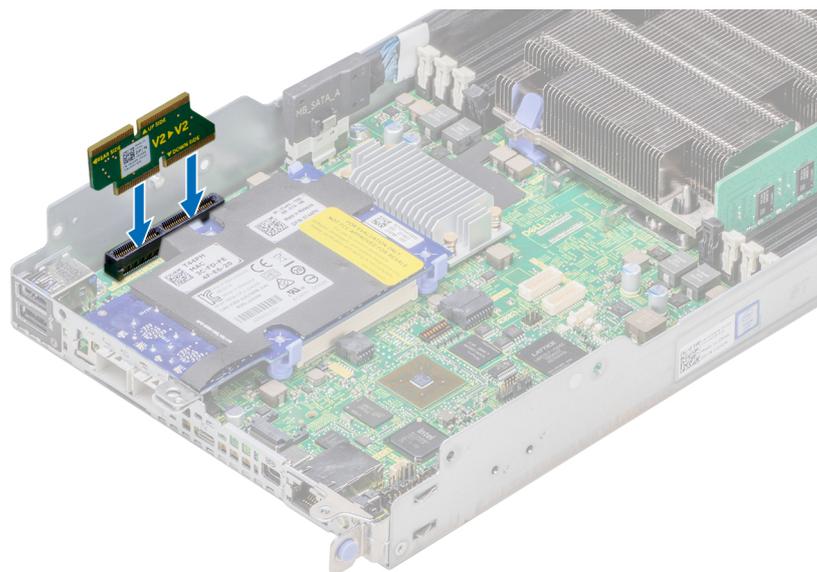
# Installing the mezzanine card bridge board

## Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

## Steps

Insert the mezzanine card bridge board into the mezzanine slot on the system board.



**Figure 68. Installing the mezzanine card bridge board**

### Next steps

1. [Install the mezzanine card.](#)
2. [Install the expansion card riser assembly.](#)
3. Follow the procedure listed in [After working inside your system.](#)

## Removing the OCP card

### Prerequisites

**NOTE:** The procedure to remove the mezzanine blank is similar to the removal of a mezzanine card.

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your system.](#)
3. [Remove the mezzanine card.](#)

### Steps

1. Push the blue retention clips away on one side and release the Open Compute Project (OCP) card. Repeat step 1 to release the card from the clips on the other side.
2. Slide the card toward the front of the sled to disengage the connectors from the chassis and lift the card up.

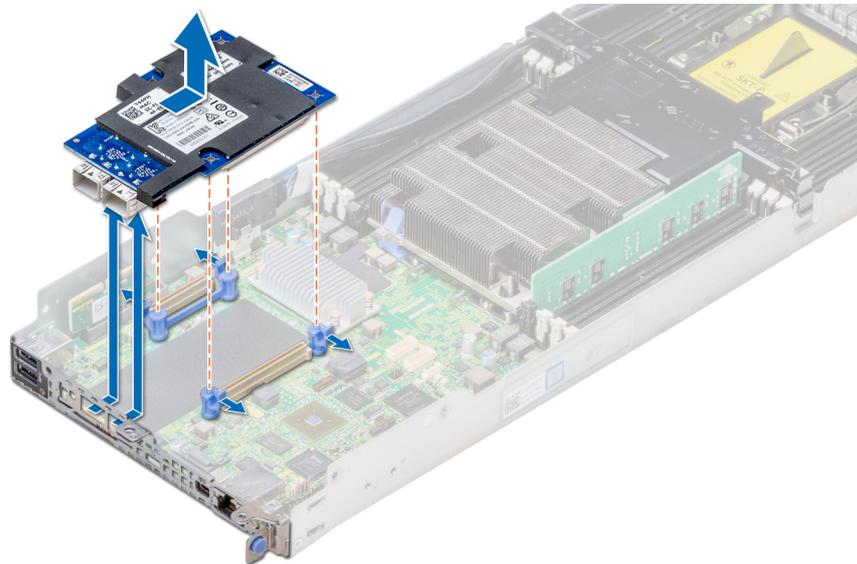


Figure 69. Removing the OCP card

### Next steps

1. [Install the OCP card.](#)

## Installing the OCP card

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)

### Steps

1. Insert the Open Compute Project (OCP) card into the sled, aligning the connector on the card with the connector in the system board.
2. You must also align the holes on the card with the guide pins on the blue retention clips.

3. Push down to lock the card in place.

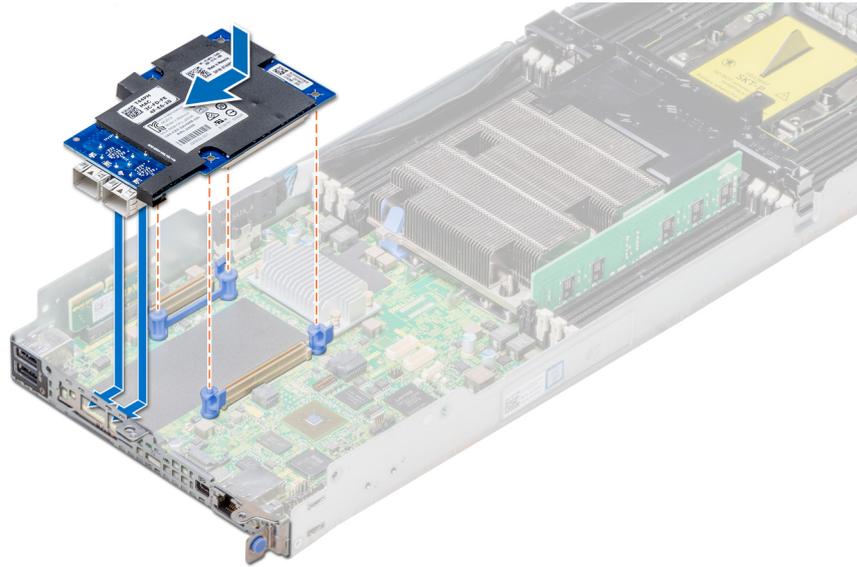


Figure 70. Installing the OCP card

#### Next steps

1. [Install the mezzanine card.](#)
2. Follow the procedure listed in [After working inside your system.](#)

## System battery

### Replacing 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. For more information, see the safety information that shipped with your system.

**ℹ NOTE:** Battery is a Field Replaceable Unit (FRU). Only Dell certified service technicians must remove or install system battery.

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 assembly.](#)

#### Steps

1. Locate the battery socket. For more information, see the [System board connectors](#) section.
2. Insert a plastic scribe at the negative side of the battery connector and lever the battery up, lift the battery out of the socket.

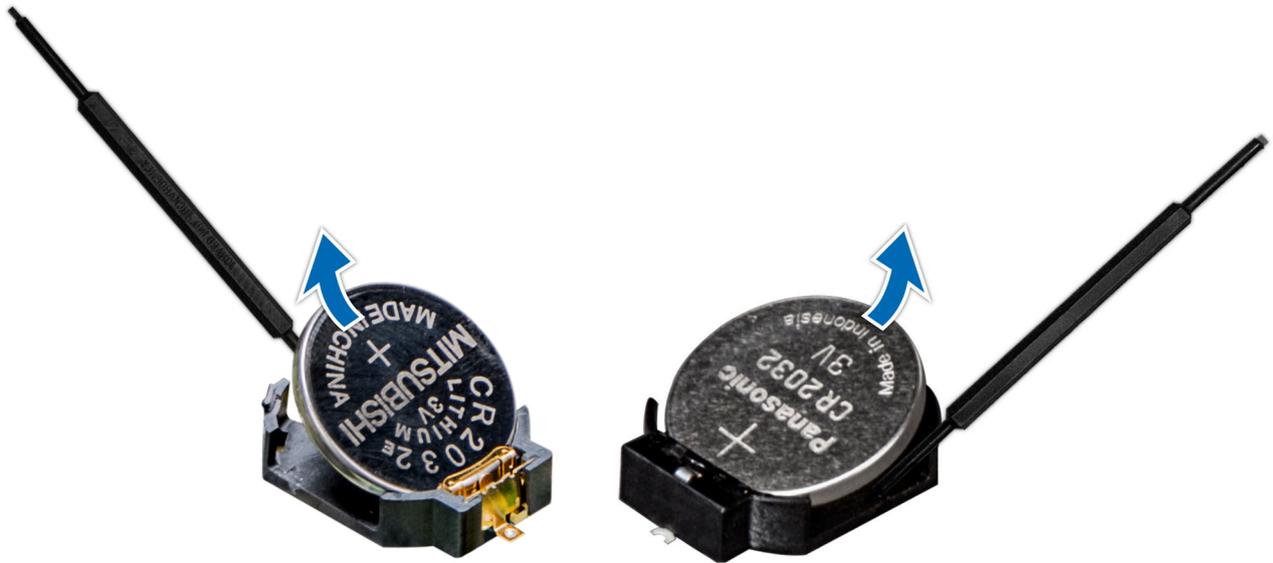


Figure 71. Removing system battery

#### Next steps

1. [Install the system battery.](#)

## Installing the system battery

#### Prerequisites

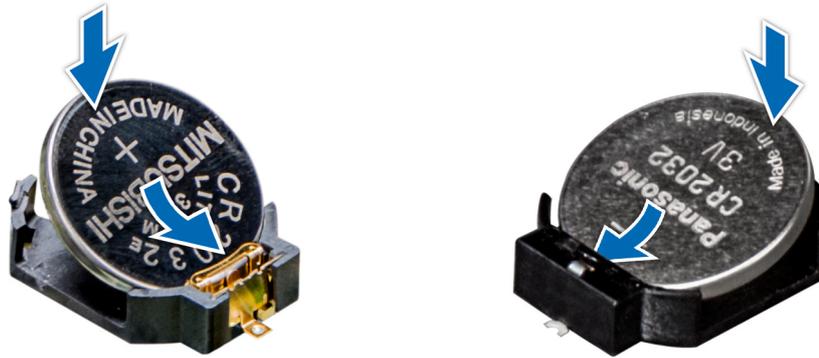
**⚠ WARNING:** There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. For more information, see the safety information that shipped with your system.

**i NOTE:** Battery is a Field Replaceable Unit (FRU). Removal and installation procedures are to be performed only by Dell certified service technicians.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).

#### Steps

1. Locate the battery socket. For more information, see the [System board connectors](#) section.
2. Hold the battery with the "+" facing up and slide it under the securing tabs.
3. Press the battery into the connector until it snaps into place.



**Figure 72. Installing the system battery**

### Next steps

1. If removed, [install the expansion card riser](#).
2. Follow the procedure listed in [After working inside your system](#).
3. While booting, press F2 to enter 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 System Setup.

## System board

### Removing the system board

#### Prerequisites

**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 reinstalled or installed on another system board.

**CAUTION:** To avoid damage to the system board, ensure that the system board does not touch the side walls of the sled chassis, while sliding the system board into the sled.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Remove the sled](#) from the chassis.
4. [Remove the air shroud](#).
5. [Remove the expansion card risers](#).
6. [Remove the processor heat sink module](#).
7. [Remove the memory modules](#).
8. If installed, [remove OCP card](#).
9. If installed, [remove the mezzanine card](#).
10. [Remove the linking board](#)
11. Disconnect all the cables from the system board.
12. Keep the Phillips #1 screwdriver and #4 nut driver ready.

#### Steps

1. Remove the screws that secure the system board to the sled assembly.

**CAUTION:** Do not lift the system board by holding a memory module slot, any other connector, or component.

2. Hold the system board by the edges, and lift the system board away from the sled.

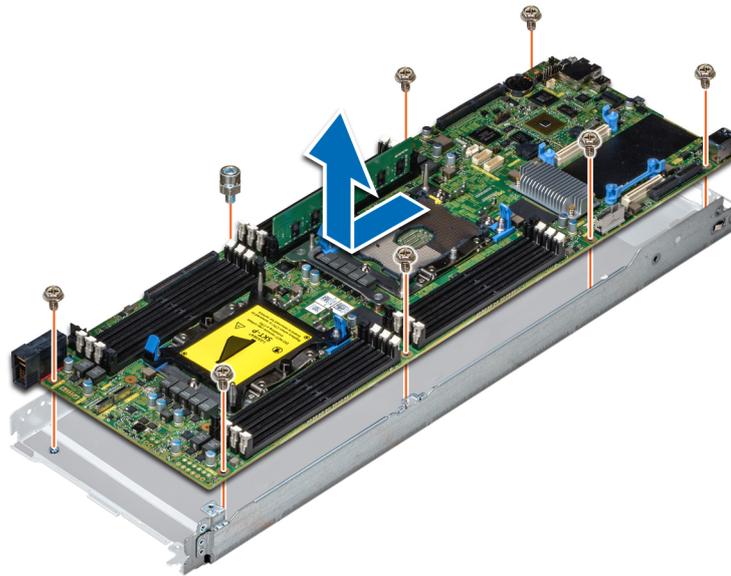


Figure 73. Removing the system board

#### Next steps

1. [Install the system board.](#)

## Installing system board

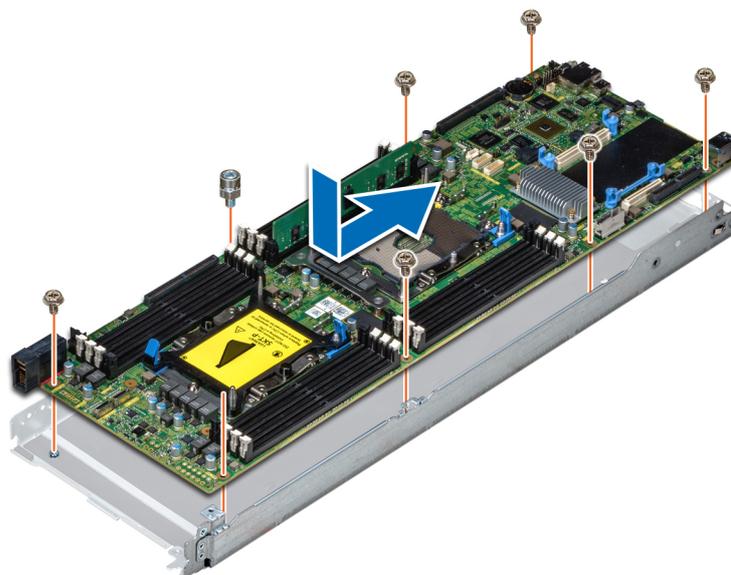
#### Prerequisites

Follow the safety guidelines listed in [Safety instructions](#)

**CAUTION:** To avoid damage to the system board, ensure that the system board does not touch the side walls of the sled chassis, while sliding the system board into the sled.

#### Steps

1. Holding the system board by the edges, slide the system board into the sled.
2. Install the screws that secure the system board to the sled.



**Figure 74. Installing system board**

### Next steps

1. If not installed, install the Trusted Platform Module (TPM). For information about how to install the TPM, see the Installing the Trusted Platform Module section. For more information about the TPM, see the Trusted Platform Module section.
  - NOTE:** The TPM plug-in module that is once installed is attached to the system board and cannot be removed. In the event of a system board replacement, a TPM plug-in module is provided along with the system board for all systems that have a TPM.
2. Replace the following components:
  - a. Air shroud
  - b. Expansion card risers
  - c. Processor heat sink module
  - d. Memory modules
  - e. OCP card
  - f. Mezzanine card
  - g. Linking board
3. Reconnect all cables to the system board.
  - 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 that is 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 Service Tag by using the Easy Restore feature 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 Restoring the Service Tag by using the Easy Restore feature 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/idracmanuals](http://www.dell.com/idracmanuals).

## Restoring the Service Tag by using the Easy Restore feature

By using the Easy Restore feature, you can restore your Service Tag, license, UEFI configuration, and the system configuration data after replacing the system board. All data is automatically backed up in a backup flash device an rSPI card automatically. If

BIOS detects a new system board and the Service Tag in the backup flash device rSPI card, BIOS prompts the user to restore the backup information.

### About this task

 **NOTE:** To enable the easy restore feature, Riser1 must be installed.

### Steps

1. Turn on the system.  
If BIOS detects a new system board, and if the Service Tag is present in the backup flash device rSPI card, BIOS displays the Service Tag, the status of the license, and the **UEFI Diagnostics** version.
2. Perform one of the following steps:
  - Press **Y** to restore the Service Tag, license, and diagnostics information.
  - Press **N** to navigate to the Dell Lifecycle Controller based restore options.
  - Press F10 to restore data from a previously created **Hardware Server Profile**.After the restore process is complete, BIOS prompts to restore the system configuration data.
3. Perform one of the following steps:
  - Press **Y** to restore the Service Tag, license, and diagnostics information.After the restore process is complete, BIOS prompts to restore the system configuration data.
4. Perform one of the following steps:
  - Press **Y** to restore the system configuration data.
  - Press **N** to use the default configuration settings.After the restore process is complete, the system restarts.

## Entering the system Service Tag by using System Setup

If Easy Restore fails to restore the Service Tag, use System Setup to enter the Service Tag.

### Steps

1. Turn on the system.
2. Press F2 to enter System Setup.
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. After the Service Tag is entered, it cannot be updated or changed.
5. Click **OK**.
6. Import your new or existing iDRAC Enterprise license.  
For more information, see the *Integrated Dell Remote Access Controller User's Guide* at [www.dell.com/idracmanuals](http://www.dell.com/idracmanuals).

## Trusted Platform Module

### Upgrading the Trusted Platform Module

#### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).

 **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:** 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. Work with the customer to create and safely store this recovery key. When replacing 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 hard drives.
- 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.



Figure 75. Installing the TPM

4. Replace the screw that secures the TPM to the system board.

### Next steps

1. [Install the system board.](#)
2. Follow the procedure listed in [After working inside your system.](#)

## Initializing TPM for BitLocker users

### Steps

Initialize the TPM.

For more information, see [initializing the TPM for Intel TXT users.](#)

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 Pre-boot 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.

# 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.

## 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
<b>Configuration</b>	Displays the configuration and status information of all detected devices.

<b>Menu</b>	<b>Description</b>
<b>Results</b>	Displays the results of all tests that are run.
<b>System health</b>	Provides the current overview of the system performance.
<b>Event log</b>	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.

# 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 jumper settings](#)
- [System board connectors](#)
- [Disabling forgotten password](#)

## System board jumper settings

For information on resetting the password jumper to disable a password, see the [Disabling a forgotten password](#) section.

## System board connectors

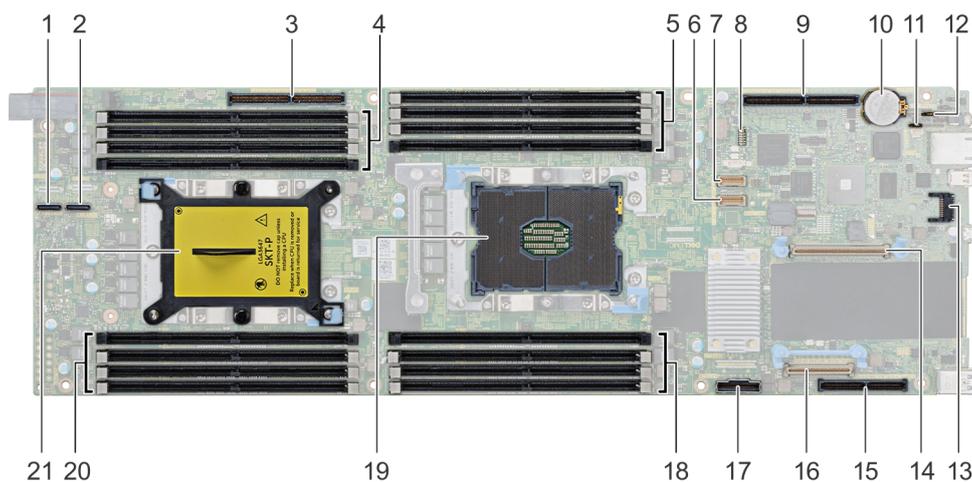


Figure 76. PowerEdge C6420 system board connectors

Table 13. System Board Connectors and Description

Item	Connector	Description
1	PCIe B	NVMe B connector
2	PCIe A	NVMe A connector
3	PCIe Slot 5	Slot 5: x16 PCIe Gen3 from CPU 2
4	DIMM sockets (4)	DIMM B8, DIMM B4, DIMM B5, DIMM B6
5	DIMM sockets (4)	DIMM A8, DIMM A4, DIMM A5, DIMM A6
6	HFI_SB_1	Side band cable 1 for OCP
7	HFI_SB_2	Side band cable 2 for OCP

**Table 13. System Board Connectors and Description (continued)**

Item	Connector	Description
8	LEDs (7)	System board diagnostic LED indicators
9	PCIe Slot 4	Slot 4: x16 PCIe Gen3 CPU 1
10	Batt	System battery
11	PWDCLR	Password clear jumper
12	NVRAMCLR	NVRAM clear jumper
13	PCIe Slot 3	Slot 3: x8 PCIe Gen3 from CPU 1
14	TPM	TPM connector
15	PCIe Slot 1	Slot 1: x8 PCIe Gen3 from CPU 1
16	PCIe Slot 2	Slot 2: x8 PCIe Gen3 from CPU 1
17	SATA_A	SATA cable connector
18	DIMM sockets (4)	DIMM A7, DIMM A1, DIMM A2, DIMM A3
19	CPU 1	CPU socket 1
20	DIMM sockets (4)	DIMM B7, DIMM B1, DIMM B2, DIMM B3
21	CPU 2	CPU socket 2 (with a dust cover)

## 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.

# 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](http://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 [Contact Technical Support](#).
  - b. Enter your system Service Tag in the **Enter your Service Tag** field on the Contact Us webpage.

## 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 Installation 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](http://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 C6400 and C6420 systems



Figure 77. Quick Resource Locator for PowerEdge C6400 and C6420 systems

## 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](http://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](http://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.
- On the Product Support page, click **Manuals & documents**.
- Using search engines:
  - Type the name and version of the document in the search box.

**Table 14. Documentation resources**

Task	Document	Location
Setting up your system	<p>For more information about installing and securing the system into a rack, see the Rail Installation Guide included with your rack solution.</p> <p>For information about setting up your system, see the <i>Getting Started Guide</i> document that is shipped with your system.</p>	<a href="https://www.dell.com/poweredgemanuals">https://www.dell.com/poweredgemanuals</a>
Configuring your system	<p>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.</p> <p>For information about understanding Remote Access Controller Admin (RACADM) subcommands and supported RACADM interfaces, see the RACADM CLI Guide for iDRAC.</p> <p>For information about Redfish and its protocol, supported schema, and Redfish Eventing implemented in iDRAC, see the Redfish API Guide.</p> <p>For information about iDRAC property database group and object descriptions, see the Attribute Registry Guide.</p> <p>For information about Intel QuickAssist Technology, see the Integrated Dell Remote Access Controller User's Guide.</p>	<a href="https://www.dell.com/poweredgemanuals">https://www.dell.com/poweredgemanuals</a>
	<p>For information about earlier versions of the iDRAC documents.</p> <p>To identify the version of iDRAC available on your system, on the iDRAC web interface, click <b>? &gt; About</b>.</p>	<a href="https://www.dell.com/idracmanuals">https://www.dell.com/idracmanuals</a>

**Table 14. Documentation resources (continued)**

Task	Document	Location
	For information about installing the operating system, see the operating system documentation.	<a href="https://www.dell.com/operatingsystemmanuals">https://www.dell.com/operatingsystemmanuals</a>
For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	Managing your system	For information about system management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.  <a href="https://www.dell.com/openmanagemanuals">https://www.dell.com/openmanagemanuals</a> > OpenManage Server Administrator
For information about installing, using, and troubleshooting Dell OpenManage Enterprise, see the Dell OpenManage Enterprise User's Guide.		<a href="https://www.dell.com/openmanagemanuals">www.dell.com/openmanagemanuals</a> > OpenManage Server Administrator
For information about installing and using Dell SupportAssist, see the Dell EMC SupportAssist Enterprise User's Guide.		<a href="https://www.dell.com/openmanagemanuals">https://www.dell.com/openmanagemanuals</a>
For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.		<a href="https://www.dell.com/serviceabilitytools">https://www.dell.com/serviceabilitytools</a>
Working with the Dell PowerEdge RAID controllers		<a href="https://www.dell.com/openmanagemanuals">https://www.dell.com/openmanagemanuals</a>
Understanding event and error messages	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.	<a href="http://www.dell.com/storagecontrollermanuals">www.dell.com/storagecontrollermanuals</a>
	For information about the event and error messages generated by the system firmware and agents that monitor system components, go to <a href="http://qrl.dell.com">qrl.dell.com</a> > <b>Look Up</b> > <b>Error Code</b> , type the error code, and then click <b>Look it up</b> .	<a href="http://www.dell.com/qrl">www.dell.com/qrl</a>

**Table 14. Documentation resources (continued)**

<b>Task</b>	<b>Document</b>	<b>Location</b>
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide.	<a href="https://www.dell.com/poweredgemanuals">https://www.dell.com/poweredgemanuals</a>