

# Dell EMC PowerEdge MX740c

## 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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# About this document


This document provides an overview about the PowerEdge MX740c system, information about installing and replacing components, technical specifications, diagnostic tools, and guidelines to be followed while installing certain components.

The PowerEdge MX740c is compatible with the PowerEdge MX7000 enclosure. For more information about the enclosure, refer to the *Installation and Service Manual* for the PowerEdge MX7000 at [www.dell.com/poweredgemanuals](http://www.dell.com/poweredgemanuals).

# PowerEdge MX740c sled overview

The Dell EMC PowerEdge MX740c is a single width compute sled and supports:

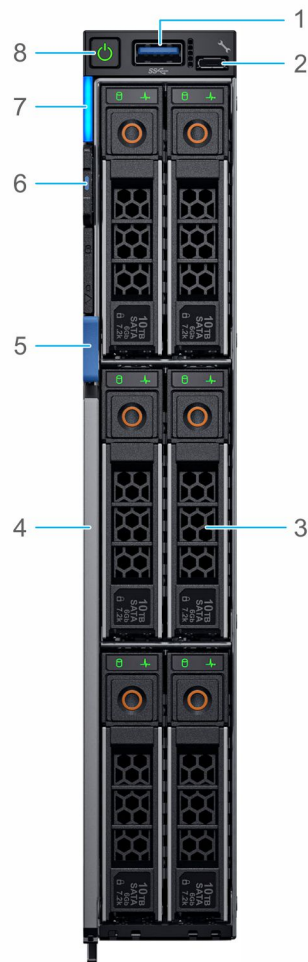
- Up to two Intel Xeon Scalable processors.
- Up to 24 DIMM slots.
- Up to six 2.5-inch SAS, SATA (HDD/SSD), or NVMe drives.

 **NOTE:** All instances of SAS, NVMe, SATA HDDs, and SSDs are referred to as drives in this document, unless specified otherwise.

## Topics:

- [Front view of the system](#)
- [Inside the system](#)
- [Locating the Service Tag of your system](#)
- [System information label](#)

# Front view of the system



**Figure 1. Front view of the 6 drive configuration**

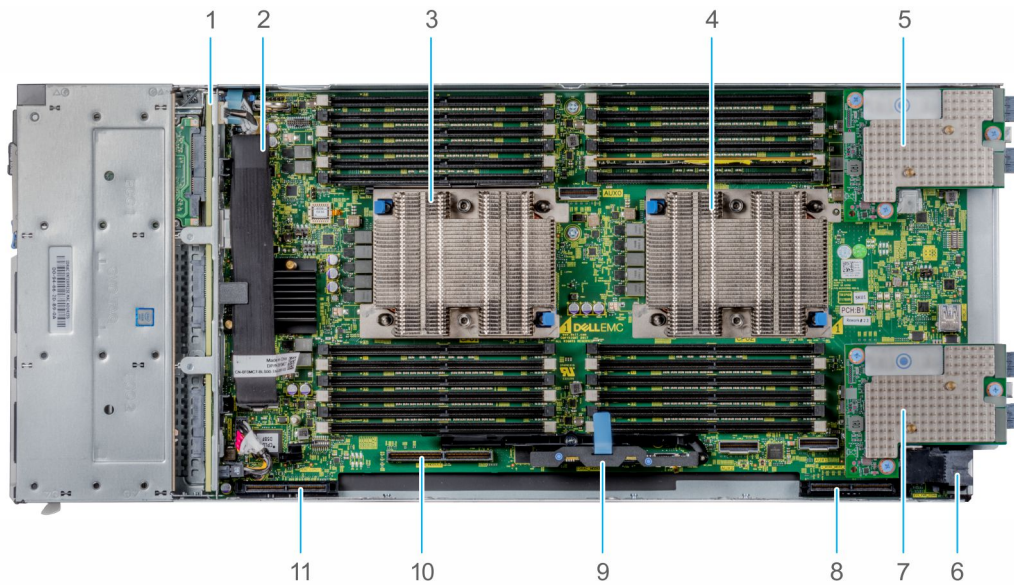
- 1. USB 3.0 port
- 2. iDRAC direct port
- 3. Drives
- 4. Release handle
- 5. Release handle button
- 6. Information tag
- 7. System health and System ID indicator
- 8. Power button

For more information, see the *Dell EMC PowerEdge MX740c Technical Specifications* on the product documentation page.

## Inside the system

**NOTE:** Components that are hot swappable have orange touch points and the components that are not hot swappable have blue touch points.



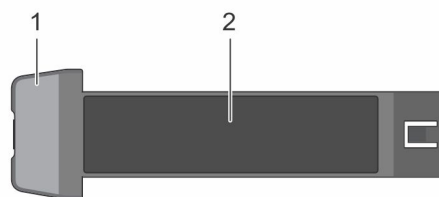


**Figure 2. Inside the system**

1. Backplane
2. Backplane cable
3. Processor 1 (heat sink)
4. Processor 2 (heat sink)
5. Mezzanine card A1
6. Power connector
7. Mezzanine card B1
8. Mini Mezzanine connector
9. iDRAC card
10. BOSS connector
11. PERC connector

## Locating the Service Tag of your system

The System Information Tab contains the system's unique Express Service Code and Service Tag. This information is used by Dell EMC to identify system configuration, warranty terms, and to route support calls to the appropriate personnel. A Quick Resource Locator (QRL) label on the System Information Tab links to a web page that shows the exact factory configuration and specific warranty purchased.



**Figure 3. Locating Service Tag of your system**

1. Information tag
2. Service tag

# System information label

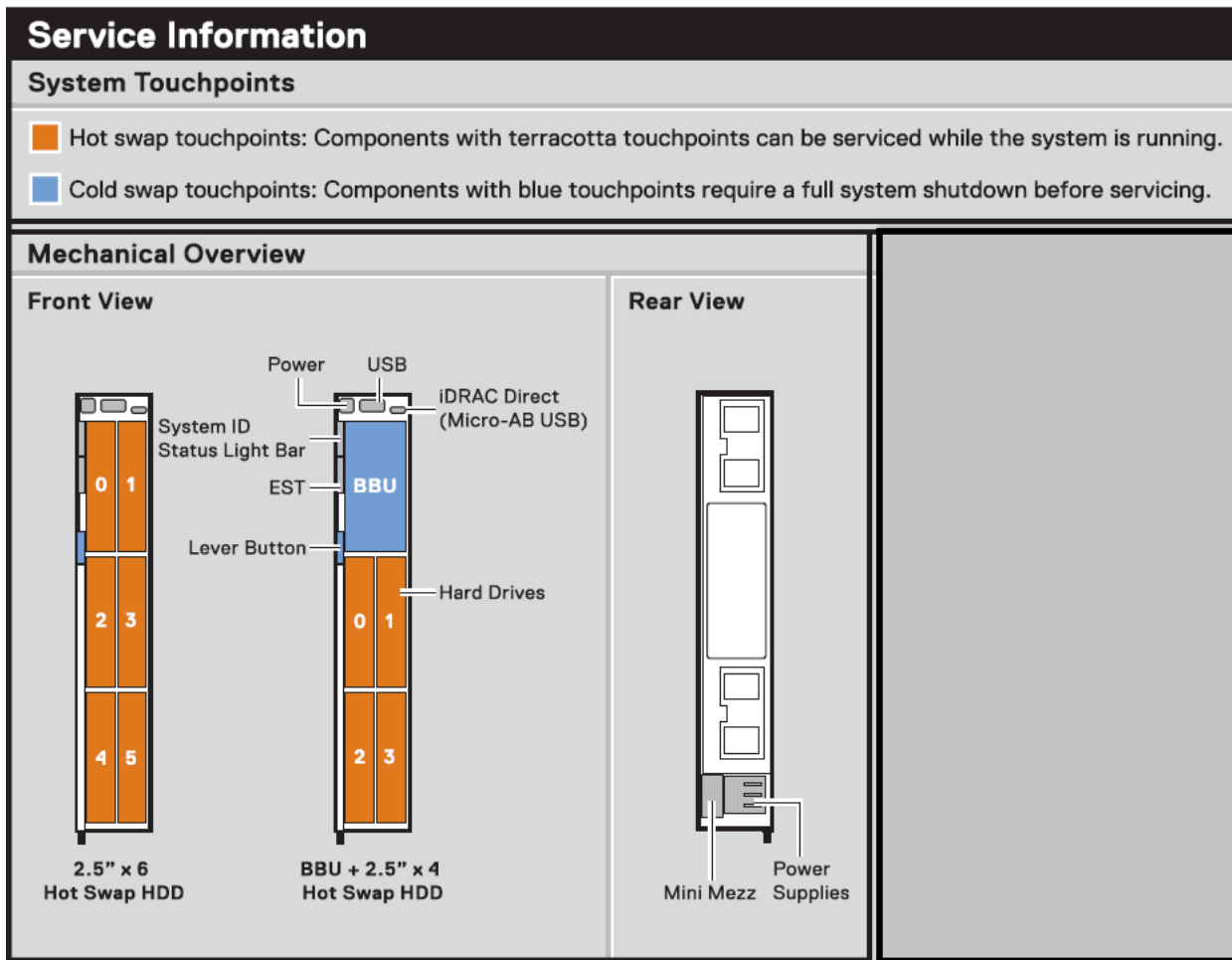


Figure 4. Mechanical overview

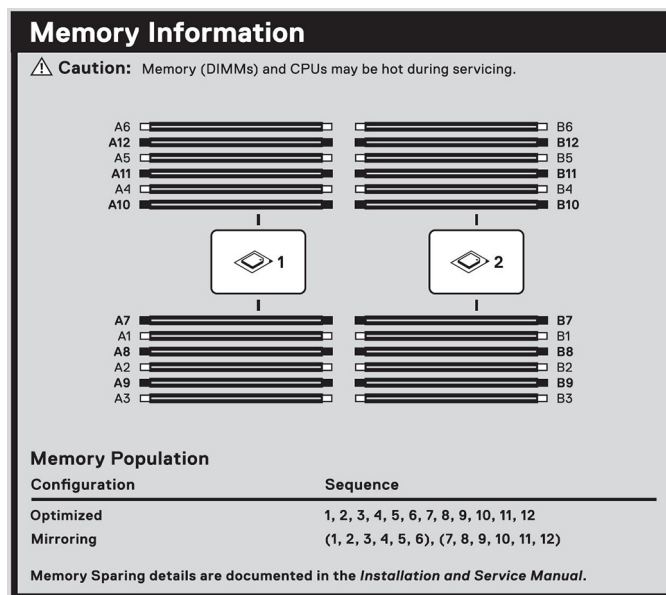


Figure 5. Memory information

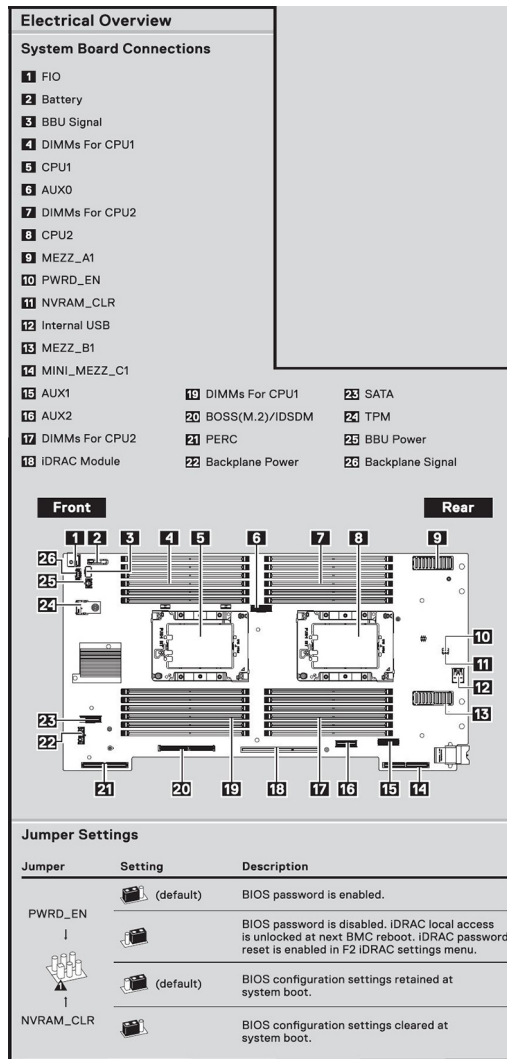


Figure 6. System board

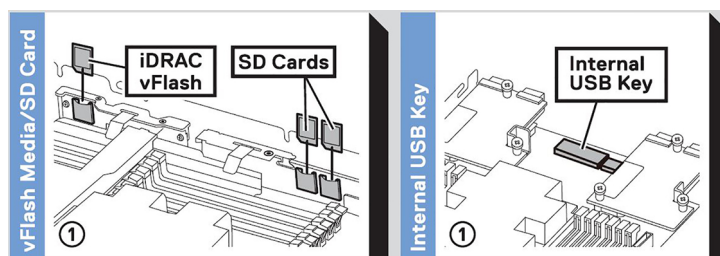


Figure 7. Removal of iDSMD and Internal USB memory key(optional)

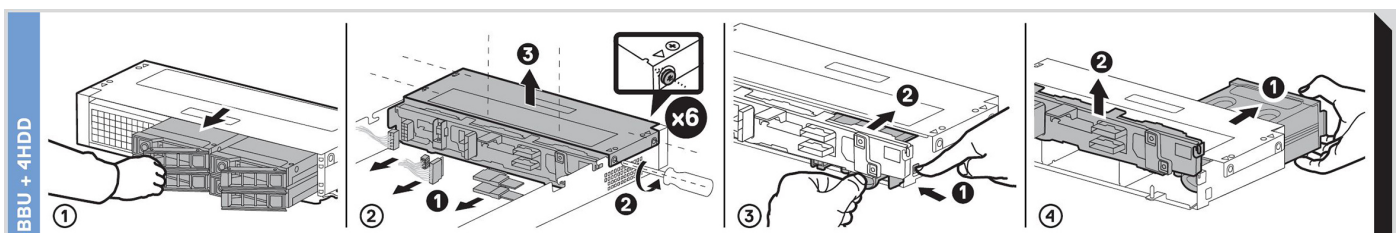


Figure 8. Removal of BBU module and drive cage

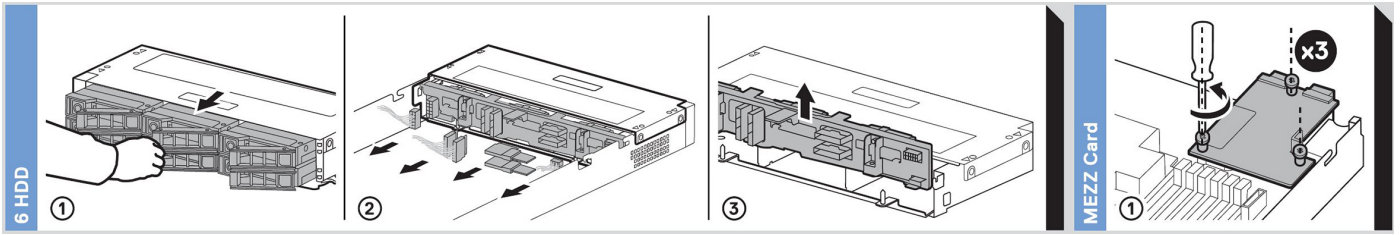


Figure 9. Removal of backplane and Mezzanine card

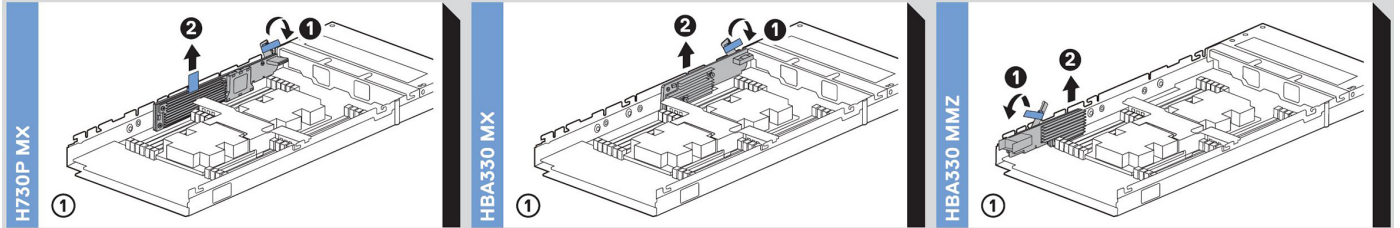


Figure 10. Removal of PERC cards and Mini Mezzanine card

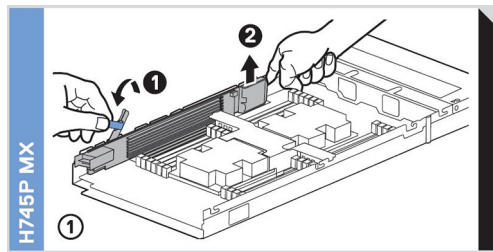


Figure 11. Removal of Jumbo PERC card

# Initial system setup and configuration

## Topics:


- [Setting up your system](#)
- [iDRAC configuration](#)
- [Options to install the operating system](#)

## Setting up your system


Complete the following steps to set up your system:

### Steps

1. Unpack the system.
2. Remove the I/O connector cover from the system connectors.

 **CAUTION:** While installing the system, ensure that it is properly aligned with the slot on the enclosure to prevent damage to the system connectors.

3. Install the system in the enclosure.
4. Turn on the enclosure.

 **NOTE:** Wait for the enclosure to initialize before you press the power button.

5. Press the power button on the system.

Alternatively, you can also turn on the system by using iDRAC:

- For more information, see the [Log in to iDRAC](#)
- Open OpenManage Enterprise modular (OME modular), after the iDRAC is configured on the OME. For more information, see the OME-modular User's Guide at [Dell.com/manuals](http://Dell.com/manuals).

## 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

You must configure the initial network settings based on your network infrastructure to enable the communication to and from iDRAC.

You can set up the IP address by using one of the following interfaces:

Interfaces	Document/Section
<b>iDRAC Settings utility</b>	See <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>	See <i>Dell Deployment Toolkit User's Guide</i> at <a href="http://www.dell.com/openmanagemanuals">www.dell.com/openmanagemanuals</a> > OpenManage Deployment Toolkit

Interfaces	Document/Section
Dell Lifecycle Controller	See <i>Dell Lifecycle Controller User's Guide</i> at <a href="http://www.dell.com/poweredgemanuals">www.dell.com/poweredgemanuals</a>
OME Modular	See <i>Dell OpenManagement Enterprise Modular User's Guide</i> at <a href="http://www.dell.com/openmanagemanuals">www.dell.com/openmanagemanuals</a>
iDRAC Direct	See <i>Dell Integrated Dell Remote Access Controller User's Guide</i> at <a href="http://www.dell.com/poweredgemanuals">www.dell.com/poweredgemanuals</a>

## Log in to iDRAC

You can log in to iDRAC as:

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

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

**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.

**NOTE:** The Intel Quick Assist Technology (QAT) on the Dell EMC PowerEdge MX740c is supported with chipset integration and is enabled through an optional license. The license files are enabled on the sleds through iDRAC.

For more information about drivers, documentation, and white papers on the Intel QAT, see <https://01.org/intel-quickassist-technology>.

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

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

## Options to install the operating system

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

**Table 1. 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>
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 PowerEdge Systems</a>

**NOTE:** Virtual Media is optional for integrated Dell Remote Access Controllers (iDRAC) with an Enterprise license (iDRAC 7, 8 and 9) or module (iDRAC 6). It allows the usage of software image files (ISO-files), which can be used for installing operating systems or updating servers.

## Methods to download firmware and drivers

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

**Table 2. 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
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 system components

## Topics:


- Safety instructions
- Before working inside your sled
- After working inside your sled
- Recommended tools
- PowerEdge MX740c sled
- System cover
- Air shroud
- Drives
- Drive backplane
- Cable routing
- Drive cage
- Battery backup unit
- Control panel
- System memory
- Processors and heat sinks
- iDRAC card
- PERC card
- Optional Internal dual SD module
- M.2 BOSS module
- Mezzanine card
- Optional internal USB memory key
- 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 sled

## Prerequisites

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

## Steps

1. Power off the sled.
2. Remove the sled from the enclosure.
3. If applicable install the I/O connector cover.

 **CAUTION: To prevent damage to the I/O connectors on the system, ensure that you cover the connectors when you remove the system from the enclosure.**

4. Remove the system cover.

# After working inside your sled

## Prerequisites


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

## Steps

1. Install the system cover.
2. If installed, remove the I/O connector cover on the system.

 **CAUTION: To prevent damage to the I/O connectors, do not touch the connectors or the connector pins.**

3. Install the sled in the enclosure.
4. Power on the sled.

 **NOTE:** Ability to power on the sled requires iDRAC to fully initialize first.

# Recommended tools

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

- Phillips #1 and Phillips #2 screwdrivers
- Torx T15 and T30 screwdrivers
- Wrist grounding strap

# PowerEdge MX740c sled

The PowerEdge MX740c sled is a server unit that is installed into the PowerEdge MX7000 enclosure.

# Removing the sled from enclosure

## Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Power off the sled.

## Steps

1. Press the blue release button on the sled to release the sled handle.

2. Holding the sled handle, slide the sled out of the enclosure.

**i** **NOTE:** Support the system with both hands while sliding it out of the enclosure.

**i** **NOTE:** Removing the sled with the enclosure powered on is supported if you shut down the sled before removal.



**Figure 12. Removing the sled from enclosure**

3. Install the I/O connector cover on the sled.

**⚠ CAUTION:** To protect the I/O connector pins, install the I/O connector cover every time a sled is removed from the enclosure.



**Figure 13. Installing the I/O connector cover on sled**

**i** **NOTE:** The color of the I/O connector cover may differ.

**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 or performance loss.

### Next steps

1. Install the sled or the sled blank into the enclosure.

## Installing the sled into enclosure

### Prerequisites

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

**CAUTION:** To prevent damage to the I/O connectors, do not touch the connectors or the connector pins.

### Steps

1. Remove the I/O connector cover from the I/O connector(s) and store for future use.

**CAUTION:** To protect the I/O connector pins, install the I/O connector cover every time a sled is removed from the enclosure.



**Figure 14. Removing the I/O connector cover from sled**

**NOTE:** The color of the I/O connector cover may differ.

2. Press the blue release button on the sled to release the sled handle.
3. Holding the sled with both hands, align the sled with the compute sled-bay in the enclosure.
4. Slide the sled into the enclosure, until the sled handle is in the lock position.
5. Push the sled handle inwards so that it locks into place to secure the sled in the enclosure.



**Figure 15. Installing the sled into enclosure**

#### **Next steps**

1. Power on the sled.

## **System cover**

The system cover protects the components inside the system and helps in maintaining air flow inside the system.

## **Removing the system cover**

#### **Prerequisites**

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Power off the sled.
3. [Remove the sled from the enclosure](#).
4. Place the sled on the flat surface with the top cover facing upwards.

#### **Steps**

1. Press the blue release tab on the system cover and slide the cover towards the rear of the system.
2. Hold the cover on both sides, and lift the cover away from the system.

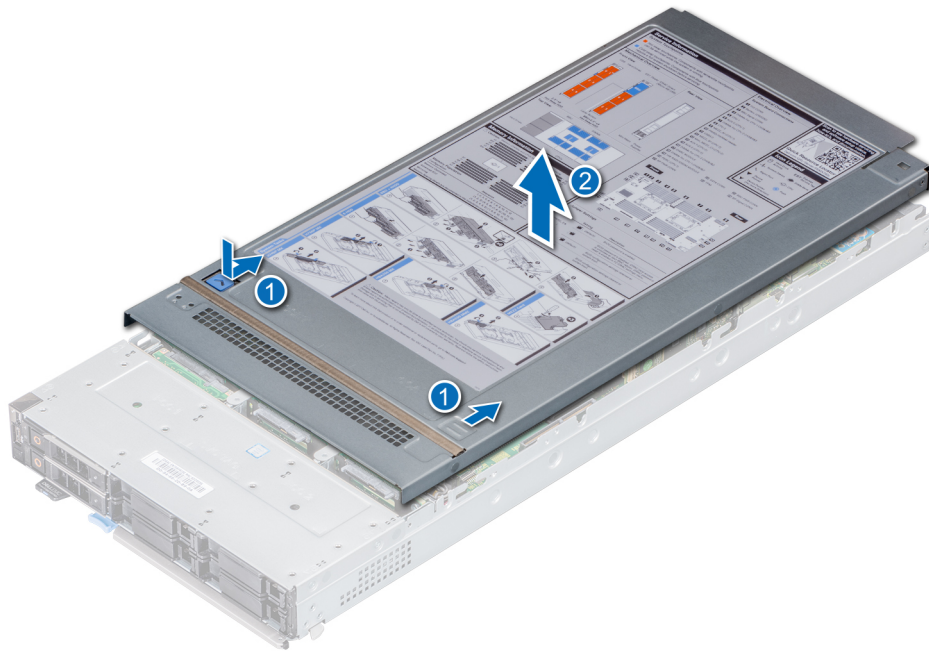


Figure 16. Removing system cover

#### Next steps

1. [Replace the system cover.](#)

## Installing system cover

#### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.

#### Steps

1. Align the tabs on the system cover with the guide slots on the system.
2. Slide the cover towards the front of the system.



**Figure 17. Installing system cover**

**Next steps**

1. [Install the sled into the enclosure.](#)
2. Turn on the sled.

# Air shroud

The air shroud aerodynamically directs the airflow across the entire system. The airflow passes air through all the critical parts of the system thus allowing increased cooling preventing overheating.

## Removing air shroud

### Prerequisites

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

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

### Steps

Hold both the edges of the air shroud and lift it out of the system.

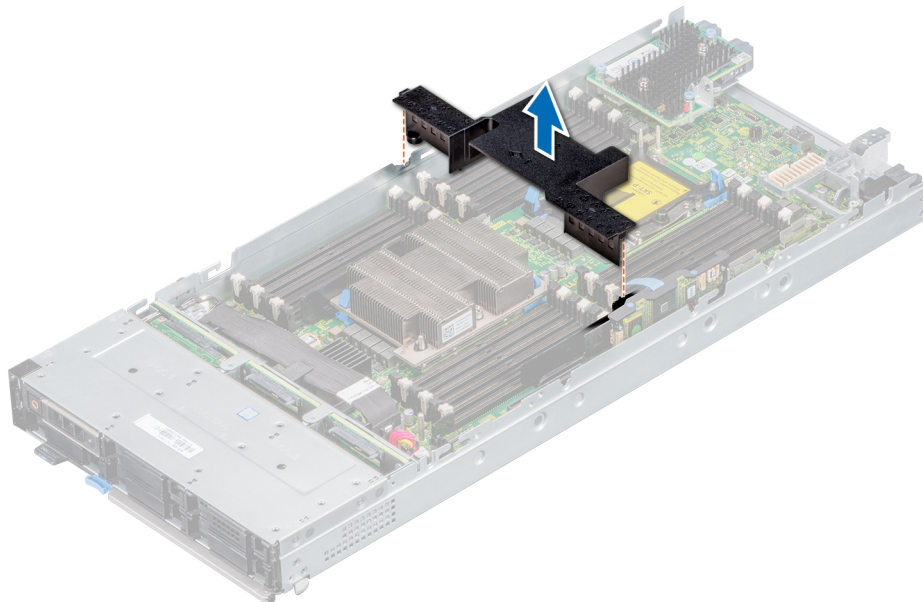


Figure 18. Removing air shroud

### Next steps

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

## Installing air shroud

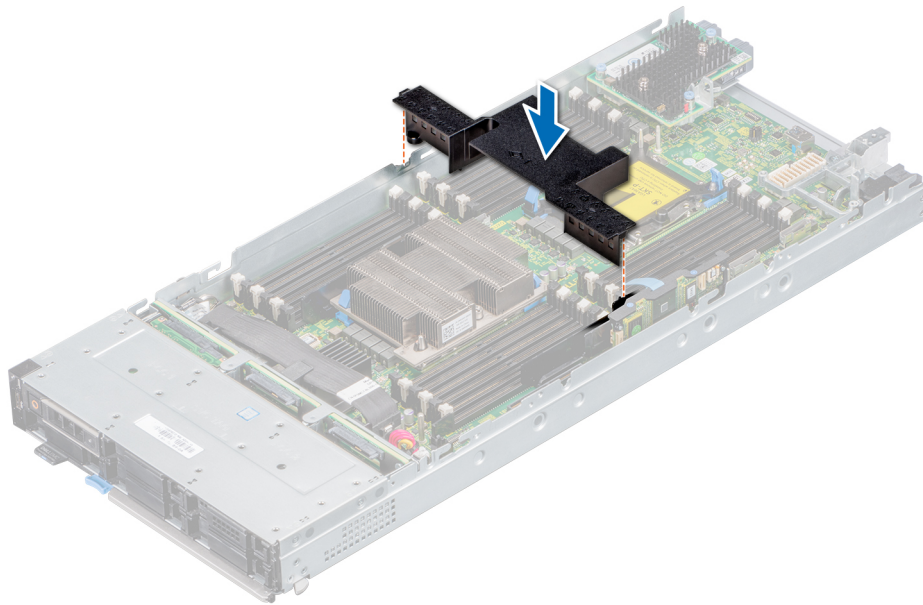
### Prerequisites

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

### Steps

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

**NOTE:** When firmly seated, the memory socket and processor numbers marked on the air shroud aligns with the respective memory socket and processor numbers marked on the system.



**Figure 19. Installing air shroud**

#### Next steps

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

## Drives

Your system supports 2.5-inch SAS/SATA SSD, NVMe drives and PCIe SSDs. The drives or SSDs are supplied in a hot-swappable drive carriers that fit in the drive bays and these drives connect to the system board through the drive backplane.

**CAUTION:** Before attempting to remove or install a drive while the system is running, see the documentation to ensure that the host adapter is configured correctly to support hot-swap drive removal and insertion.

**CAUTION:** Do not turn off or restart your system while the drive is being formatted. Doing so can cause a drive failure.

When you format a drive, allow enough time for the formatting to be complete. The high-capacity drives can take a long time to format.

## Removing drive blank

#### Prerequisites

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

**CAUTION:** Mixing drive blanks from previous generations of PowerEdge servers is not supported

**CAUTION:** To maintain proper system cooling, all empty drive slots must have drive blanks installed.

#### Steps

Press the release button and slide the drive blank out of the drive slot.



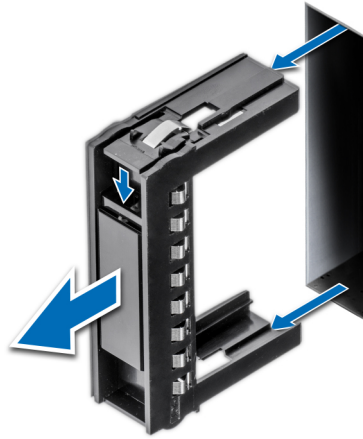


Figure 20. Removing drive blank

#### Next steps

1. [Install a drive](#) or a [drive blank](#).

## Installing drive blank

#### Prerequisites

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

**CAUTION:** Mixing drive blanks from previous generations of PowerEdge servers is not supported.

#### Steps

Insert the drive blank into the drive slot and push the blank until the release button clicks into place.



Figure 21. Installing drive blank

## Removing drive carrier

#### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Using the management software, prepare the drive for removal.

If the drive is online, the green activity or fault indicator flashes while the drive is turning off. When the drive indicators are off, the drive is ready for removal. For more information, see the documentation for the storage controller.

**CAUTION:** Before attempting to remove or install a drive while the system is running, see the documentation for the storage controller card to ensure that the host adapter is configured correctly to support drive removal and insertion.

**CAUTION:** Mixing drive carriers from previous generations or other platforms of PowerEdge servers is not supported.

**CAUTION:** To prevent data loss, ensure that your operating system supports hot-swap drive installation. See the documentation supplied with your operating system.

**CAUTION:** To maintain proper system cooling, all empty drive bays must have drive blanks installed.

**WARNING:** Ensure that you back up your data, before removing a drive. For more information about preparing your drive for removal and supported RAID redundancy, see the Troubleshooting guide of your system at [www.dell.com/poweredgemanuals](http://www.dell.com/poweredgemanuals).

### Steps

1. Press the release button to open the release handle.
2. Holding the handle, slide the drive carrier out of the drive slot.

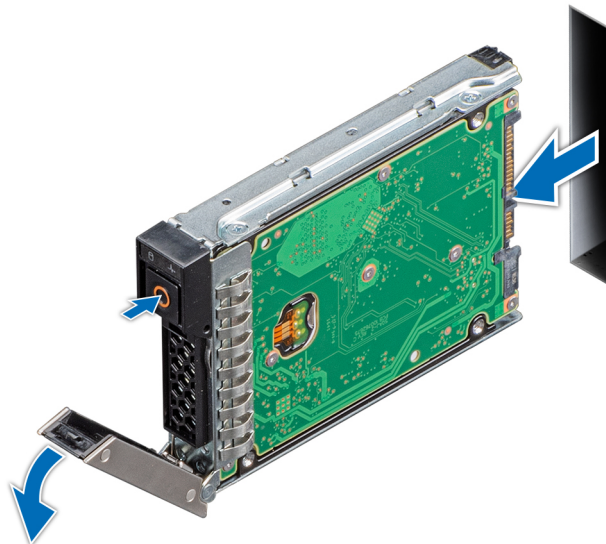


Figure 22. Removing drive carrier

### Next steps

1. [Replace the drive carrier](#) or a [drive blank](#).

## Installing drive carrier

### Prerequisites

**CAUTION:** Before attempting to remove or install a drive while the system is running, see the documentation for the storage controller card to ensure that the host adapter is configured correctly to support drive removal and insertion.

**CAUTION:** Mixing drive carriers from previous generations of PowerEdge servers is not supported.

- ⚠ **CAUTION:** Combining SAS and SATA drives in the same RAID volume is not supported.
- ⚠ **CAUTION:** When installing a drive carrier, ensure that the adjacent drives are fully installed. Inserting a drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.
- ⚠ **CAUTION:** To prevent data loss, ensure that your operating system supports hot-swap drive installation. See the documentation supplied with your operating system.
- ⚠ **CAUTION:** When a replacement hot swappable drive is installed and the system is powered on, the drive automatically begins to rebuild. Ensure that the replacement drive is blank or contains data that you wish to overwrite. Any data on the replacement drive is immediately lost after the drive is installed.

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

### Steps

1. Press the release button on the front of the drive carrier to open the release handle.
2. Insert the drive carrier into the drive slot and slide until the drive carrier connects with the backplane.
3. Close the release handle of the drive carrier to lock the drive in place.

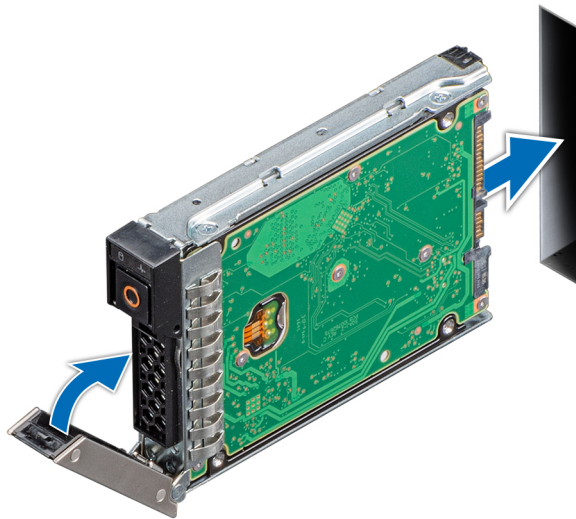


Figure 23. Installing drive carrier

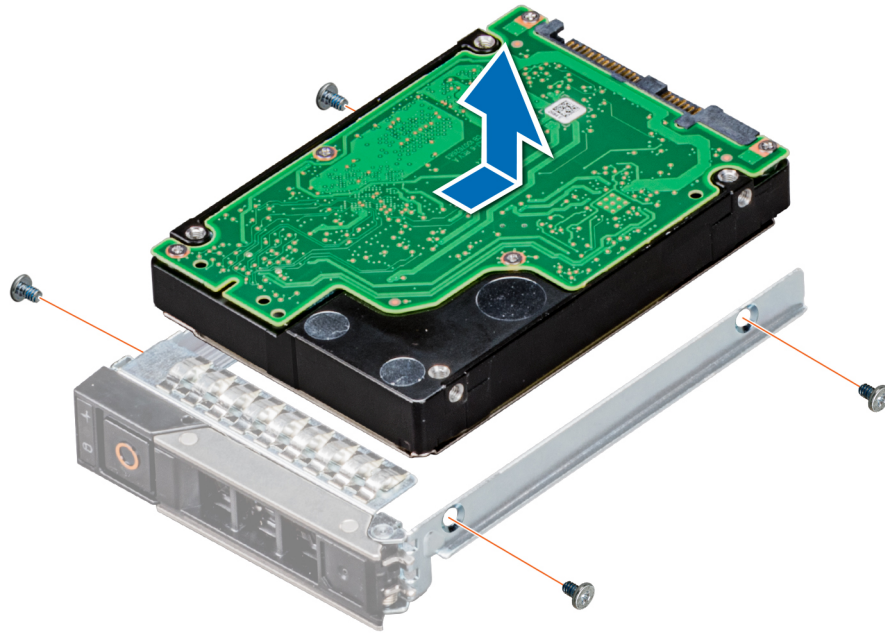
## Removing a drive from drive carrier

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. [Remove the drive carrier](#).

### Steps

1. Using the Phillips #1 screwdriver, remove the screws from the slide rails on the drive carrier.
2. Lift the drive out of the drive carrier.



**Figure 24. Removing a drive from drive carrier**

#### **Next steps**

1. Replace the drive into the drive carrier.

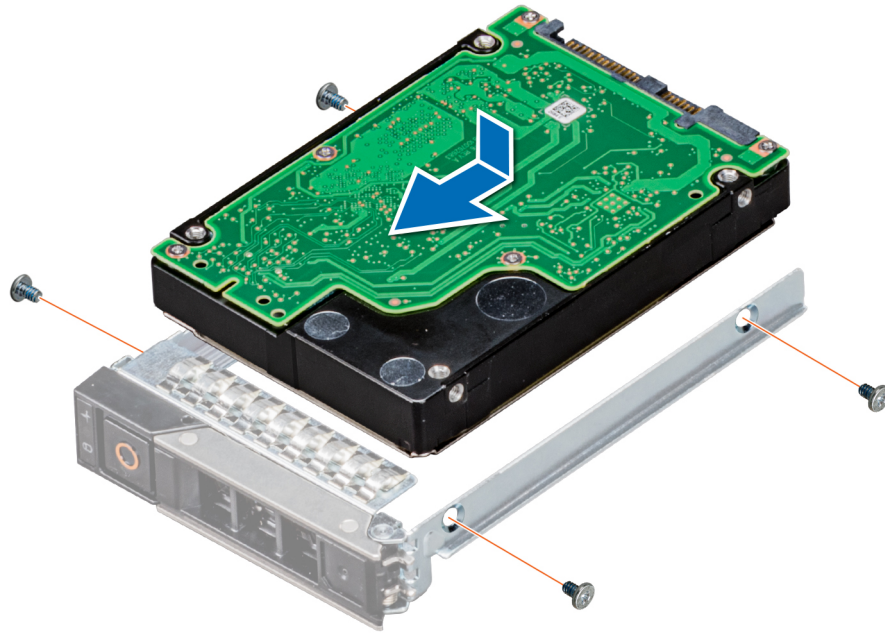
## **Installing a drive into drive carrier**

#### **Prerequisites**

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

#### **Steps**

1. Insert the drive into the drive carrier, with the connector end of the drive towards the back of the carrier.
2. Align the screw holes on the drive with the screw holes on the drive carrier.
3. Using the Phillips #1 screwdriver, replace the screws to secure the drive to the drive carrier.

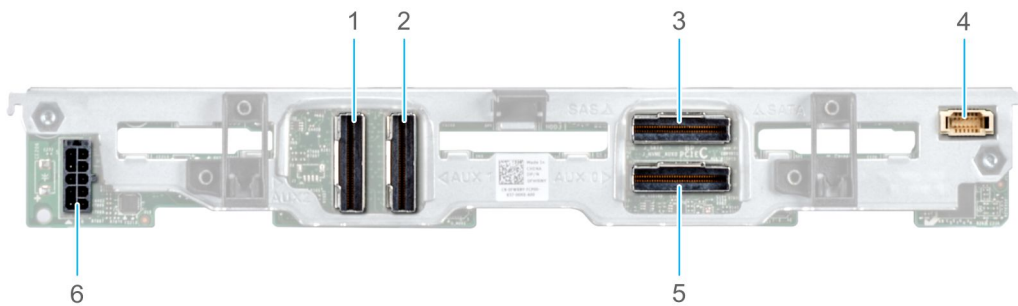


**Figure 25. Installing a drive into drive carrier**

## Drive backplane

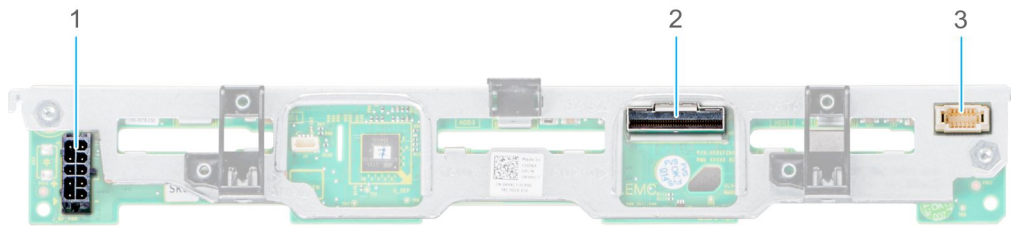
Depending on the configuration, your system supports:

- 2.5 inch (x6) Universal backplane
- 2.5 inch (x6) SAS/SATA backplane
- 2.5 inch (x4) Universal backplane



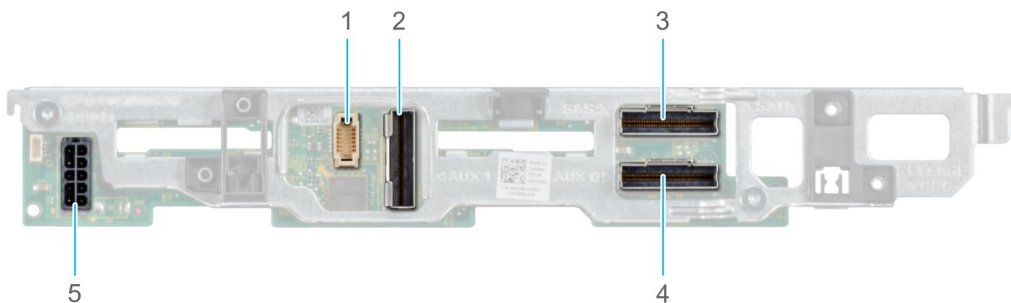
**Figure 26. 6 x 2.5-inch universal backplane**

1. AUX 2 cable connector
2. AUX 1 cable connector
3. SAS/SATA connector
4. Signal cable connector
5. AUX 0 cable connector
6. Power cable connector



**Figure 27. 6 x 2.5-inch SAS/SATA backplane**

1. Power cable connector
2. SAS/SATA connector
3. Signal cable connector



**Figure 28. 4 x 2.5-inch universal backplane**

1. Signal cable connector
2. AUX 1 cable connector
3. SAS/SATA connector
4. AUX 0 cable connector
5. Power cable connector

## Removing drive backplane

### Prerequisites

**CAUTION:** To prevent damage to the drives and the drive backplane, you must remove the drives from the system before removing the drive backplane. For more information, see [Removing a drive carrier](#).

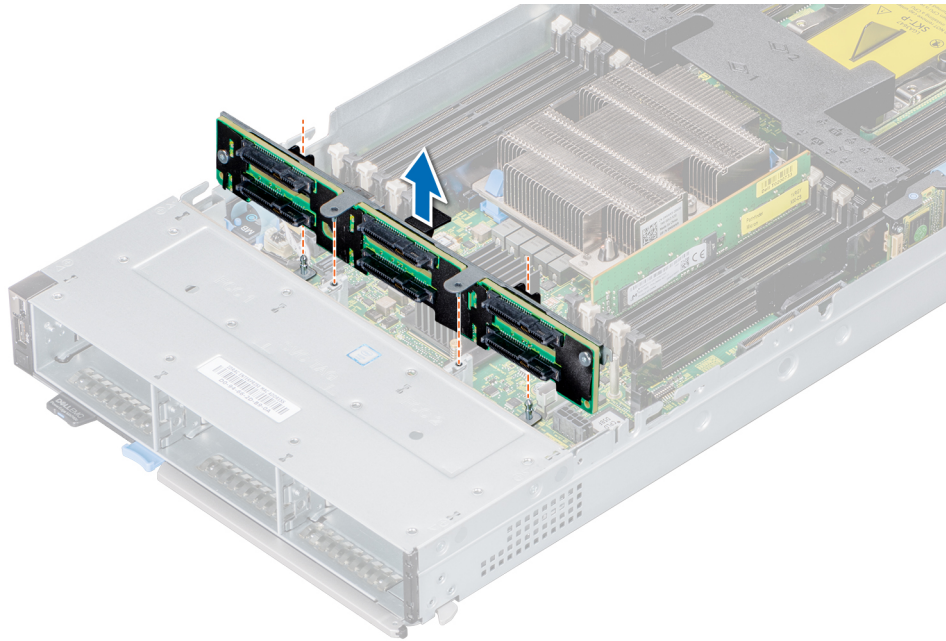
**CAUTION:** Temporarily label drives before you remove the drive so that you can replace them in the same slots.

**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 sled](#).
3. Disconnect the cables connected to the backplane.
4. [Remove the drives](#).

### Steps

1. Hold the drive backplane by the edges and lift it upwards to disengage the backplane from the guide pins.
2. Lift the backplane out of the sled.



**Figure 29. Removing drive backplane**

#### **Next steps**

1. [Replace the drive backplane.](#)

## **Installing drive backplane**

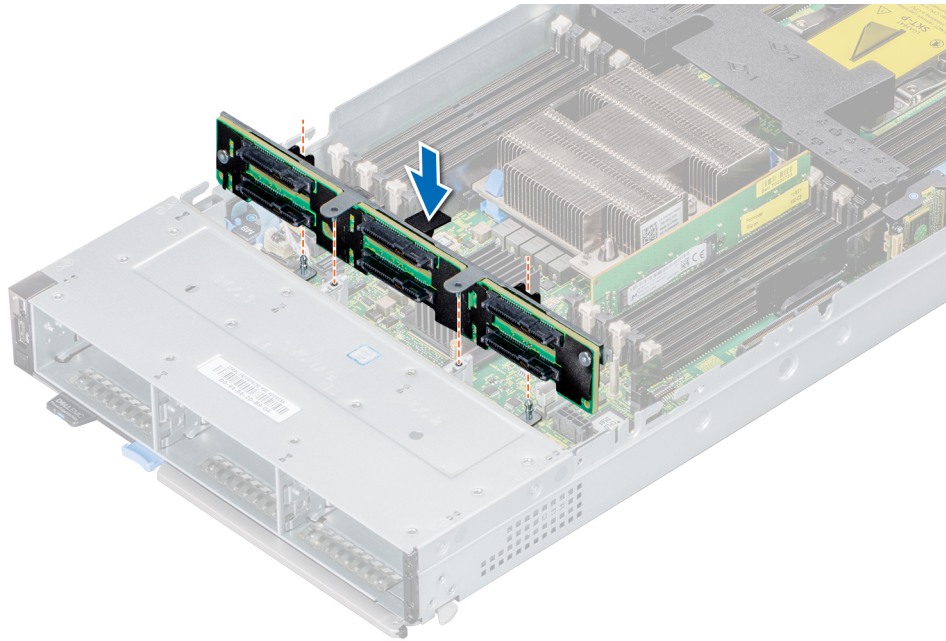
#### **Prerequisites**

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

#### **Steps**

1. Verify backplane connector pins are not bent and then connect the signal cable to the backplane.
2. Align the guide pins on the drive backplane with the sled.
3. Lower the drive backplane, until it is fully seated.

**NOTE:** To install the backplane, ensure the two pins on the backplane tab seat into the two slots on the system chassis.

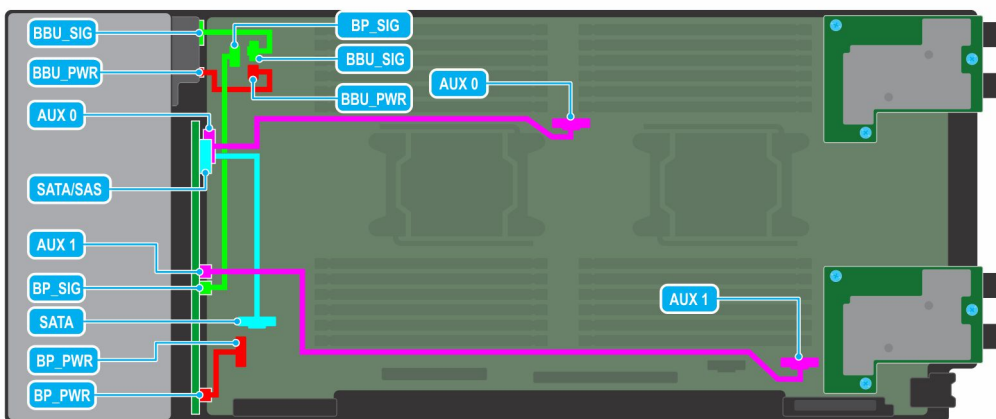


**Figure 30. Installing drive backplane**

**Next steps**

1. Connect the incoming power cable to the backplane and then verify both power and signal cable connections are fully seated to the backplane and system board.
2. Connect the integrated cable to the backplane and system board if there is no PERC card installed in the system.
3. [Install the drives.](#)
4. Follow the procedure listed in [After working inside the sled.](#)

## Cable routing



**Figure 31. Cable routing - 4 x 2.5-inch backplane BBU cabling.**



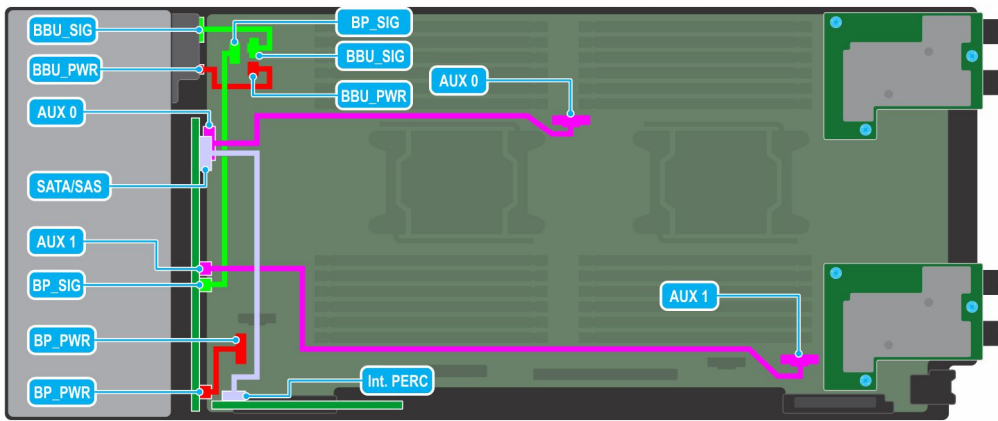


Figure 32. Cable routing - 4 x 2.5-inch backplane with internal PERC card

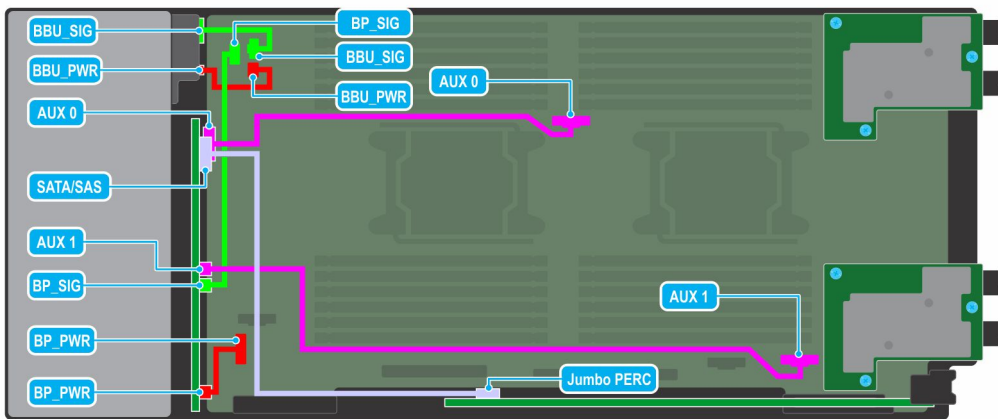


Figure 33. Cable routing - 4 x 2.5 PCIe backplane with Jumbo PERC card

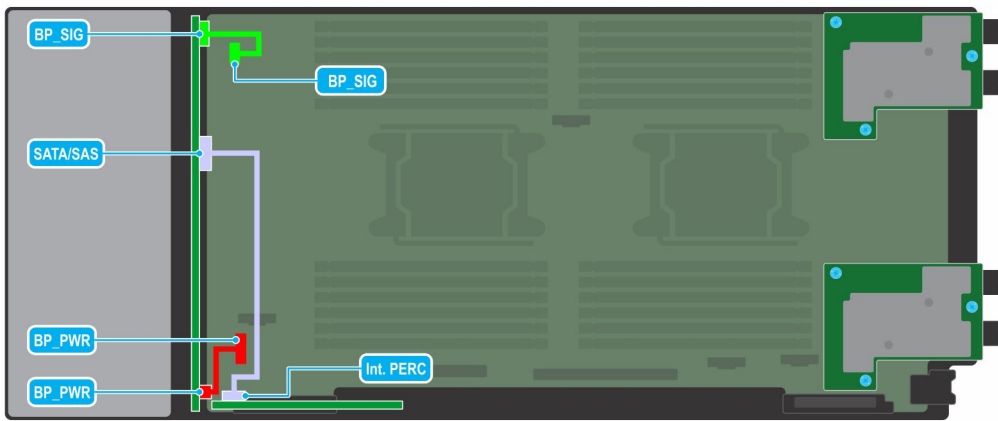


Figure 34. Cable routing - 6 x 2.5-inch SAS/SATA backplane with internal PERC card

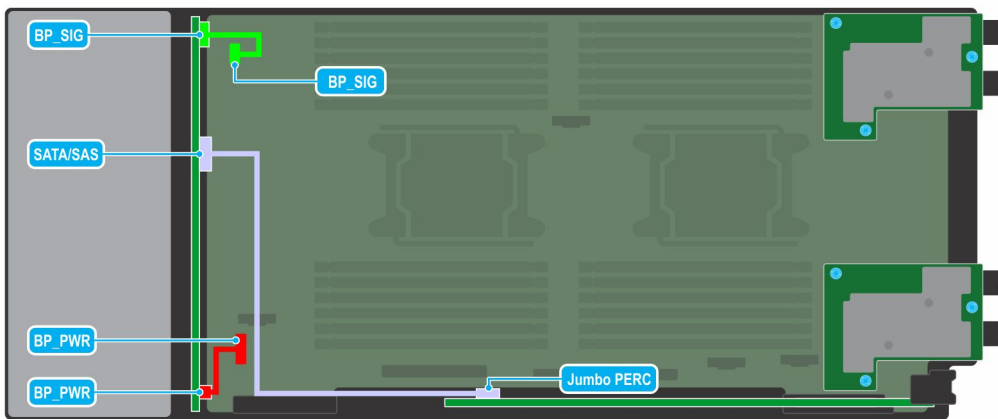


Figure 35. Cable routing - 6 x 2.5-inch SAS/SATA backplane with Jumbo PERC card

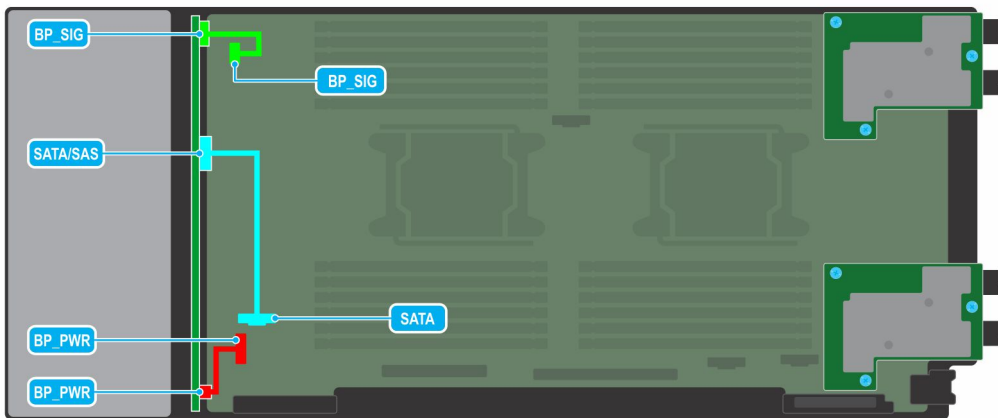


Figure 36. Cable routing - 6 x 2.5-inch SAS/SATA backplane SATA cabling

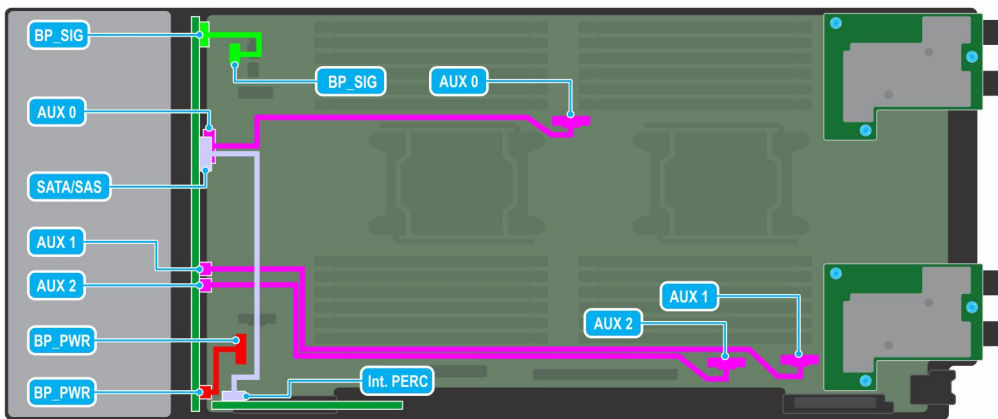


Figure 37. Cable routing - 6 x 2.5-inch backplane with internal PERC card

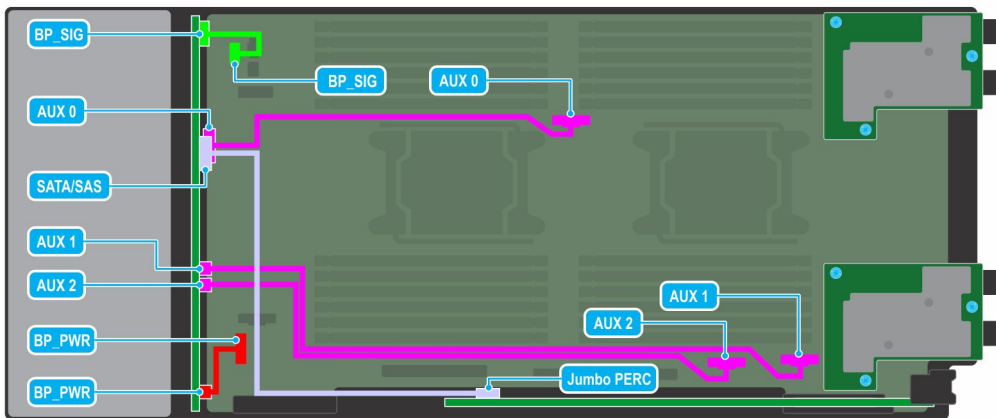


Figure 38. Cable routing - 6 x 2.5-inch backplane with Jumbo PERC card

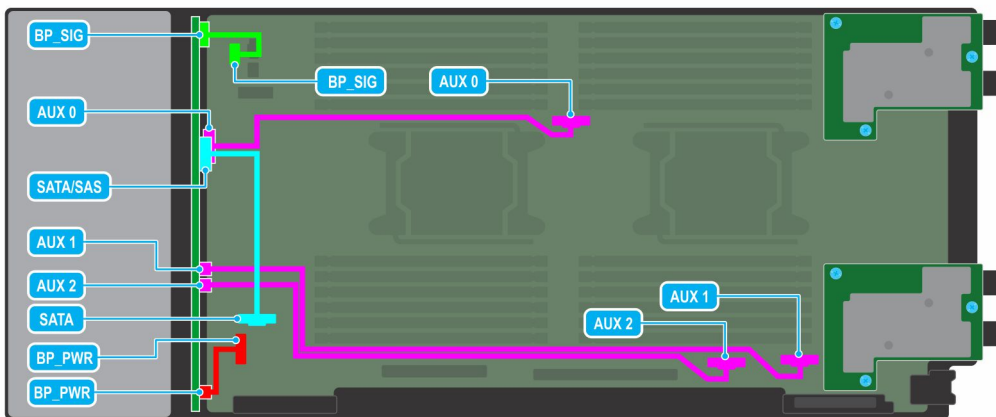


Figure 39. Cable routing - 6 x 2.5-inch backplane SATA cabling

## Drive cage

The drive cage contains the drives and the battery backup unit module.

## Removing the drive cage

### Prerequisites

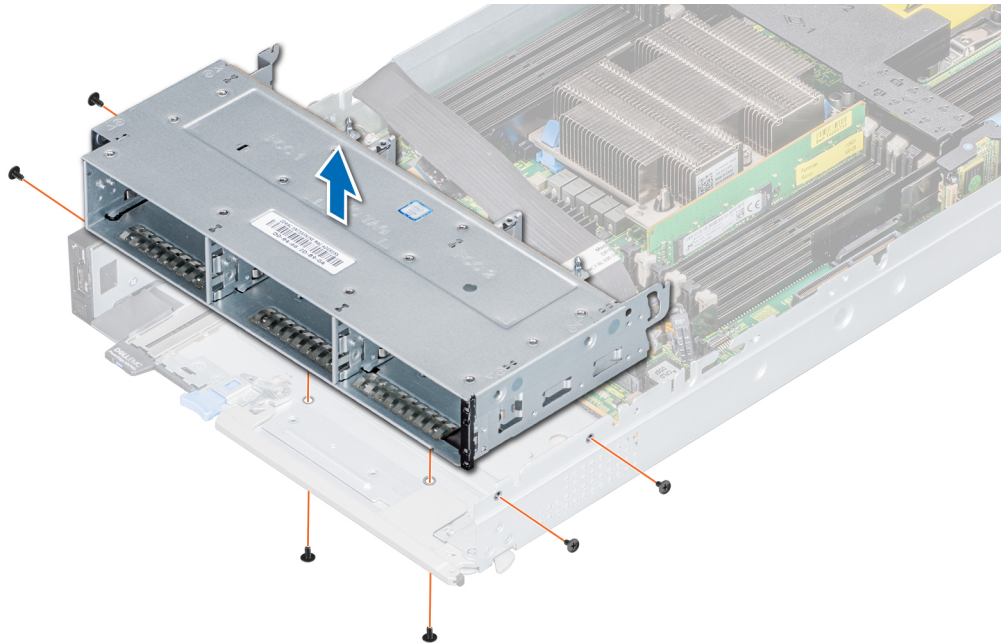
- ⚠ **CAUTION:** To prevent damage to the drives and backplane, you must remove the drives from the system before removing the backplane.
- ⚠ **CAUTION:** Temporarily label drives before you remove the drives so that you can replace them in the same slots.

**NOTE:** Observe the routing of the cables on the chassis as you remove them from the system. You must route these cables properly when you replace them to prevent the cables from being pinched or crimped.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your sled](#).
3. Disconnect the cables connected to the backplane.
4. [Remove the drives](#)
5. [Remove the drive backplane](#).

### Steps

1. Using the Phillips #1 screwdriver, remove the screws that secure the drive cage to the sled.
2. Lift the drive cage away from the sled.



**Figure 40. Removing the drive cage**

### Next steps

1. [Replace the drive cage](#).

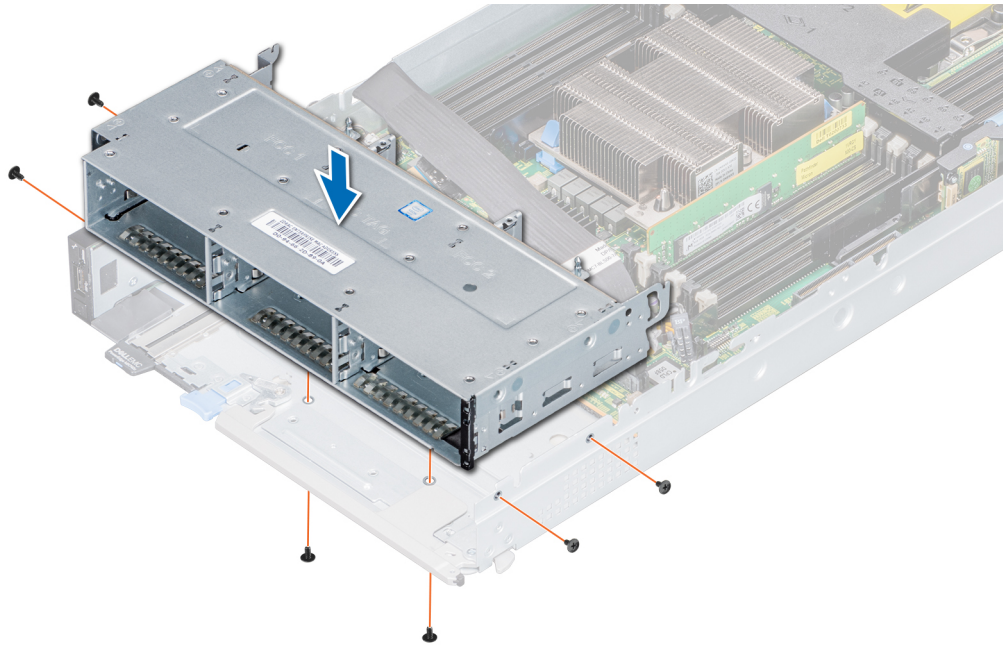
## Installing the drive cage

### Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).

### Steps

1. Place the drive cage into the system, aligning with the screw holes on the system.
2. Using the Phillips #1 screwdriver, secure the drive cage in place with screws.



**Figure 41. Installing the drive cage**

#### **Next steps**

1. [Install the drive backplane.](#)
2. [Install the drives.](#)
3. Follow the procedure listed in [After working inside your sled.](#)

## **Battery backup unit**

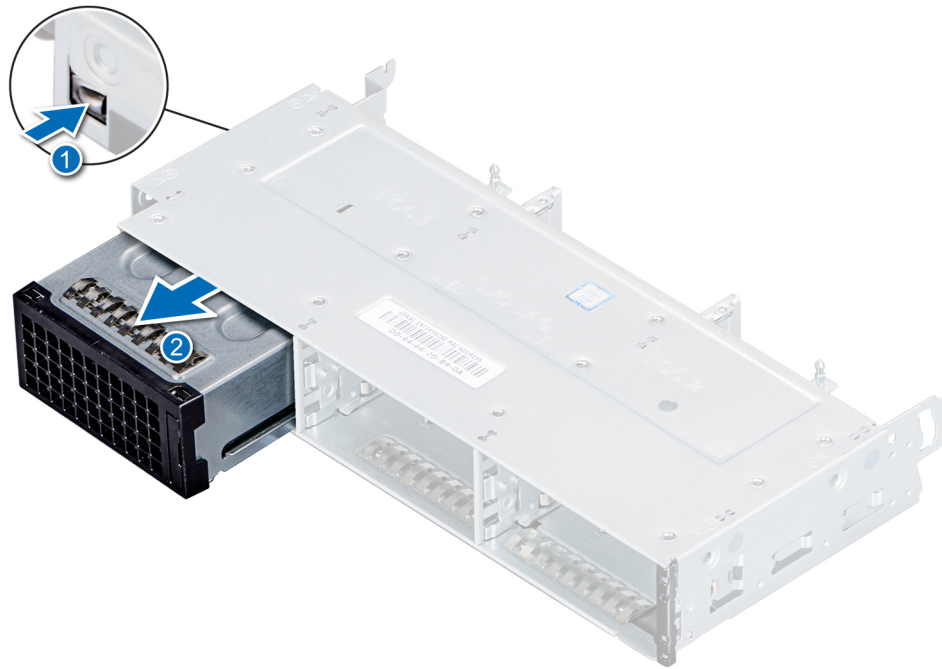
### **Removing the battery backup unit**

#### **Prerequisites**

1. Follow the safety guidelines listed in [Safety Instructions.](#)
2. Follow the procedure listed in [Before working inside your sled.](#)
3. [Remove the drives.](#)
4. Disconnect the battery backup unit (BBU) cable from the system board.
5. Disconnect the backplane cables.
6. [Remove the drive cage.](#)
7. [Remove the drive backplane.](#)

#### **Steps**

1. Press the latch on the side of the drive cage to release the BBU module.
2. Holding the BBU module by the edges, slide the BBU module out of the system.



**Figure 42. Removing the BBU module**

#### **Next steps**

1. [Replace the BBU in the cage.](#)
2. [Replace the BBU module.](#)

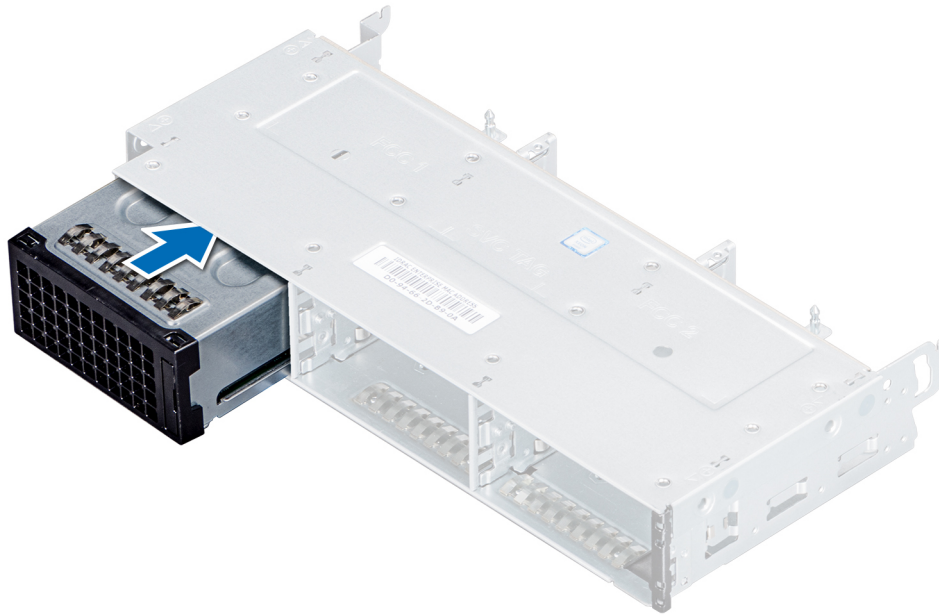
## **Installing the battery backup unit**

#### **Prerequisites**

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside your sled](#).
3. [Install the BBU into the BBU cage.](#)
4. [Install the drive cage.](#)
5. [Install the backplane.](#)

#### **Steps**

1. Route the cable on the battery backup unit (BBU) through the front end of the drive cage.
2. Align and slide the BBU until it firmly locks in place with the drive cage.



**Figure 43. Installing the BBU**

3. Connect the BBU cables to the connector on the system board.

#### **Next steps**

1. Follow the procedure listed in the [After working inside your sled](#).
2. [Replace the drive carrier](#) or a [drive blank](#).

## **Removing the BBU from the BBU cage**

#### **Prerequisites**

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in the [Before working inside your sled](#).
3. [Remove the BBU module](#).

#### **Steps**

1. Using a Phillips #1 screwdriver, loosen the captive screw securing the BBU to the BBU cage.
2. Lift and slide the BBU out of the BBU cage.





**Figure 44. Removing the BBU from the BBU cage**

#### **Next steps**

1. [Install the BBU into the BBU cage.](#)

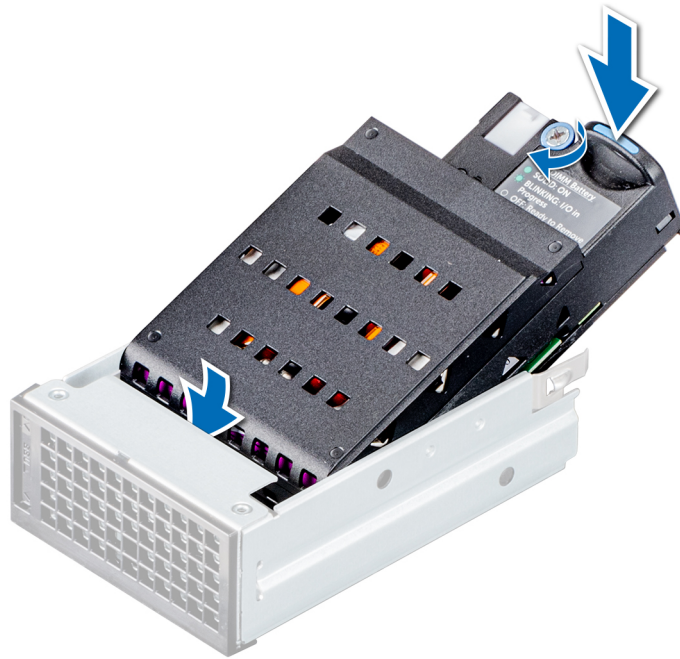
## **Installing the BBU into the BBU cage**

#### **Prerequisites**

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

#### **Steps**

1. Align and slide the BBU into the BBU cage.
2. Using a Phillips #1 screwdriver, tighten the captive screw to secure the BBU to the BBU cage.



**Figure 45. Installing the BBU into the BBU cage**

#### **Next steps**

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

## **Control panel**

The control panel allows you to manually control the inputs to the sled.

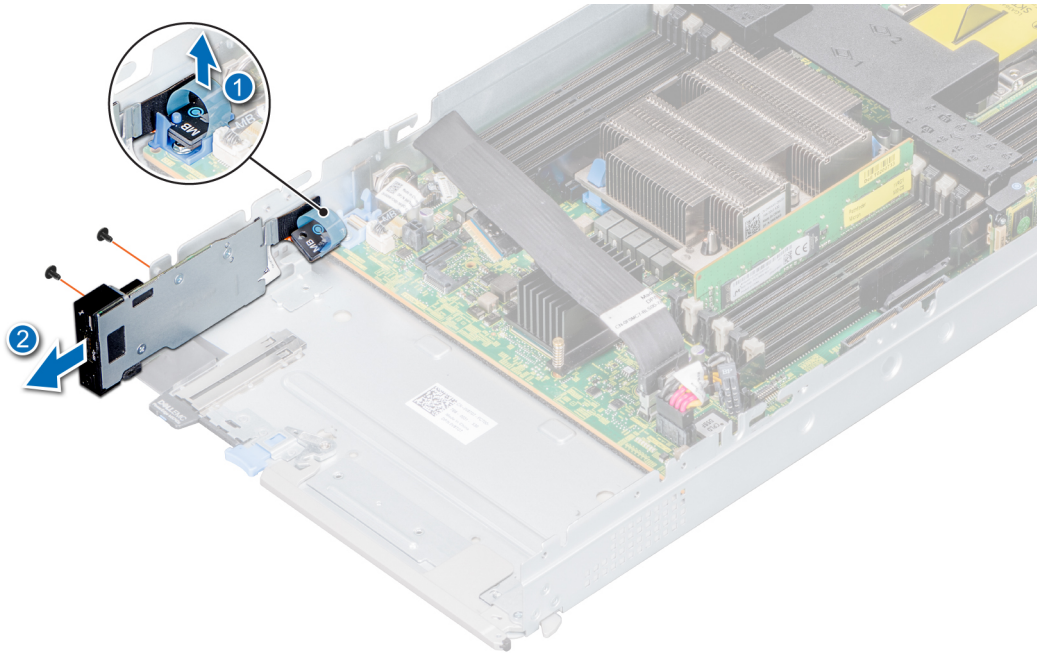
## **Removing the control panel**

#### **Prerequisites**

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).
3. [Remove the drives](#).
4. [Remove the drive cage](#).

#### **Steps**

1. Pull the blue strap to disconnect the control panel cable connected to the system board.
2. Using a Phillips #1 screwdriver, remove the screws that secure the control panel to the system.
3. Slide the control panel out of the system.



**Figure 46. Removing the control panel**

#### **Next steps**

1. [Install the control panel.](#)

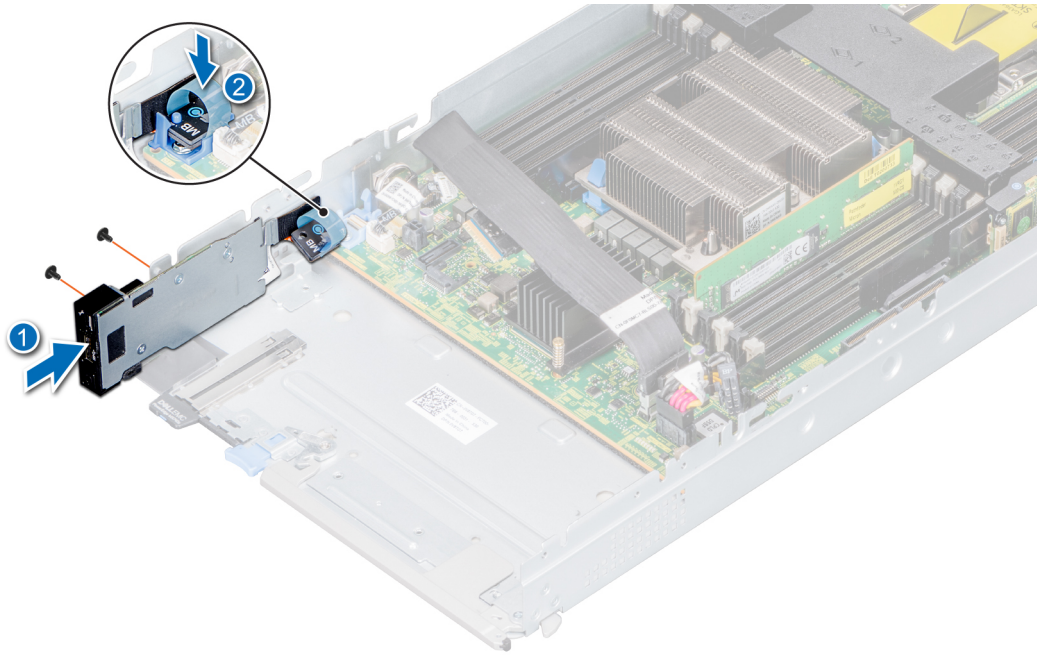
## **Installing the control panel**

#### **Prerequisites**

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

#### **Steps**

1. Align control panel with the slots on the system and slide it in.
2. Connect the control panel cable to the connector on the system board.
3. Using a Phillips #1 screwdriver, secure the control panel to the system with the screws.



**Figure 47. Installing the control panel**

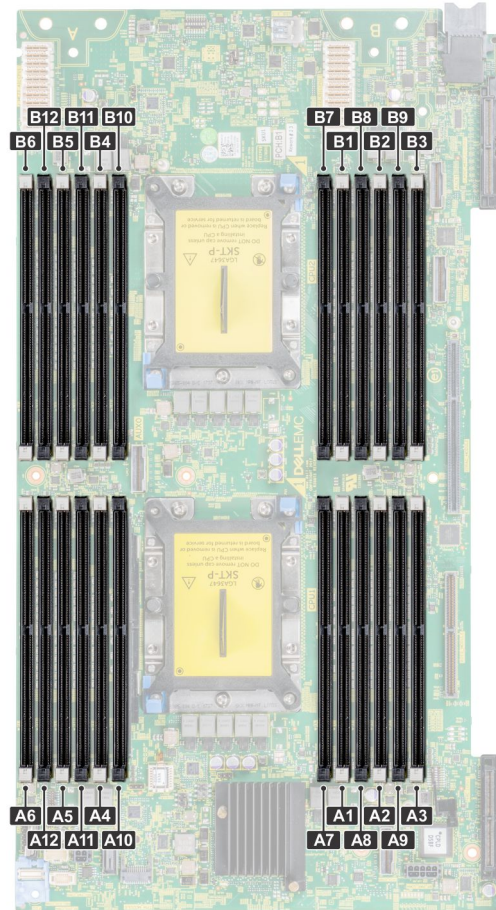
### **Next steps**

1. [Install the drive cage.](#)
2. [Install the drives.](#)
3. Follow the procedure listed in the [After working inside your sled.](#)

## **System memory**

The system supports DDR4 registered DIMMs (RDIMMs), load reduced DIMMs (LRDIMMs), Non-Volatile DIMMs (NVDIMM-Ns), and Intel Optane Data Center Persistent Memory Modules (DCPMMs). System memory holds the instructions that are executed by the processor.

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



**Figure 48. System memory layout**

Memory channels are organized as follows:

**Table 3. Memory channels**

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

**Table 4. Memory population**

DIMM Type	DIMM Ranking	Voltage	Operating Frequency (in MT/s)
RDIMM	1R / 2R	1.2 V	2933, 2666
LRDIMM	4R / 8R	1.2 V	2666 , 3200*

**NOTE:** 3200\*-Memory speed will be limited to 2933MT/s due to processor limitations.

## General memory module installation guidelines

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

The memory bus may operate at frequency can be 3200 MT/s\*, 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.
- Maximum supported DIMM speed of the processors.
- Maximum supported speed of the DIMMs

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

**i** **NOTE:** 3200\*-Memory speed will be limited to 2933MT/s due to processor limitations.

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 A12 are available.
  - For dual-processor systems, sockets A1 to A12 and sockets B1 to B12 are available.
- Populate all the sockets with white release tabs first, followed by the black release tabs.
- When mixing memory modules with different capacities, populate the sockets with memory modules with the highest capacity first.

**i** **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.

**i** **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.

**i** **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 systems is not supported.
- Unbalanced memory configurations will result in a performance loss so always populate memory channels identically with identical DIMMs for best performance.
- Populate six identical memory modules per processor (one DIMM per channel) at a time to maximize performance.

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

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

## NVDIMM-N memory module installation guidelines

The following are the recommended guidelines for installing NVDIMM-N memory modules:

- Each system supports memory configurations with 1, 2, 4, 6, or 12 NVDIMM-Ns.
- Supported configurations have dual processors and a minimum of 12x RDIMMs.
- Maximum of 12 NVDIMM-Ns can be installed on each system.
- NVDIMM-Ns or RDIMMs must not be mixed with LRDIMMs.

- DDR4 NVDIMM-Ns must be populated only on the black release tabs on processor 1 and 2.
- All slots on configurations 3, 6, 9, and 12 can be used, but a maximum of 12 NVDIMM-Ns can be installed in a system.

**i** **NOTE:** NVDIMM-N memory slots are not hot-pluggable.

For more information about the supported NVDIMM-N configurations, see the *NVDIMM-N User Guide* at [www.dell.com/poweredgemanuals](http://www.dell.com/poweredgemanuals).

**Table 5. Supported NVDIMM-N for dual processor configurations (continued)**

Configuration	Description	Memory population rules	
		RDIMMs	NVDIMM-N
Configuration 1	12x 16 GB RDIMMs, 1x NVDIMM-N	Processor1 {A1, 2, 3, 4, 5, 6} Processor2 {B1, 2, 3, 4, 5, 6}	Processor1 {A7}
Configuration 2	12x 32 GB RDIMMs, 1x NVDIMM-N	Same for all 12x RDIMM configurations. See Configuration 1.	Processor1 {A7}
Configuration 3	23x 32 GB RDIMMs, 1x NVDIMM-N	Processor1 {A1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12} Processor2 {B1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11}	Processor2 {B12}
Configuration 4	12x 16 GB RDIMMs, 2x NVDIMM-Ns	Same for all 12x RDIMM configurations. See Configuration 1.	Processor1 {A7} Processor2 {B7}
Configuration 5	12x 32 GB RDIMMs, 2x NVDIMM-Ns	Same for all 12x RDIMM configurations. See Configuration 1.	Processor1 {A7} Processor2 {B7}
Configuration 6	22x 32 GB RDIMMs, 2x NVDIMM-Ns	Processor1 {A1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11} Processor2 {B1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11}	Processor1 {A12} Processor2 {B12}
Configuration 7	12x 16 GB RDIMMs, 4x NVDIMM-Ns	Same for all 12x RDIMM configurations. See Configuration 1.	Processor1 {A7, A8} Processor2 {B7, B8}
Configuration 8	22x 32 GB RDIMMs, 4x NVDIMM-Ns	Same for all 12x RDIMM configurations. See Configuration 1.	Processor1 {A7, A8} Processor2 {B7, B8}
Configuration 9	20x 32 GB RDIMMs, 4x NVDIMM-Ns	Processor1 {A1, 2, 3, 4, 5, 6, 7, 8, 9, 10} Processor2 {B1, 2, 3, 4, 5, 6, 7, 8, 9, 10}	Processor1 {A11, 12} Processor2 {B11, 12}
Configuration 10	12x 16 GB RDIMMs, 6x NVDIMM-Ns	Same for all 12x RDIMM configurations. See Configuration 1.	Processor1 {A7, 8, 9} Processor2 {B7, 8, 9}
Configuration 11	12x 32 GB RDIMMs, 6x NVDIMM-Ns	Same for all 12x RDIMM configurations. See Configuration 1.	Processor1 {A7, 8, 9} Processor2 {B7, 8, 9}
Configuration 12	18x 32 GB RDIMMs, 6x NVDIMM-Ns	Processor1 {1, 2, 3, 4, 5, 6, 7, 8, 9}	Processor1 {A10, 11, 12} Processor2 {B10, 11, 12}

**Table 5. Supported NVDIMM-N for dual processor configurations**

Configuration	Description	Memory population rules	
		RDIMMs	NVDIMM-N
		Processor2 {1, 2, 3, 4, 5, 6, 7, 8, 9}	
Configuration 13	12x 16 GB RDIMMs, 12x NVDIMM-Ns	Same for all 12x RDIMM configurations. See Configuration 1.	Processor1 {A7, 8, 9, 10, 11, 12} Processor2 {B7, 8, 9, 10, 11, 12}
Configuration 14	12x 32 GB RDIMMs, 12x NVDIMM-Ns	Same for all 12x RDIMM configurations. See Configuration 1.	Processor1 {A7, 8, 9, 10, 11, 12} Processor2 {B7, 8, 9, 10, 11, 12}

## DCPMM installation guidelines

The following are the recommended guidelines for installing data center persistent memory module (DCPMM) memory modules:

- Each system supports maximum of one DCPMM memory module per channel.
- NOTE:** If two different DCPMM capacities are mixed, an F1/F2 warning is displayed as the configuration is not supported.
- DCPMM can be mixed with RDIMM, LRDIMM, and 3DS LRDIMM.
- Mixing of DDR4 DIMM types (RDIMM, LRDIMM, and 3DS LRDIMM), within channels, for Integrated Memory Controller (iMC), or across sockets are not supported.
- Mixing of DCPMM operating modes (App Direct, Memory Mode) is not supported.
- If only one DIMM is populated on a channel, it should always go to the first slot in that channel (white slot).
- If a DCPMM and a DDR4 DIMM are populated on the same channel, always plug DCPMM on second slot (black slot).
- If the DCPMM is configured in Memory Mode, the recommended DDR4 to DCPMM capacity ratio is 1:4 to 1:16 per iMC.
- DCPMMs' cannot be mixed with other DCPMMs capacities or NVDIMMs.
- Mixing different capacities of RDIMMs and LRDIMMs are not allowed when DCPMM is installed.
- DCPMMs of different capacities are not allowed.

For more information about the supported DCPMM configurations, see the *Dell EMC DCPMM User 's Guide* at [https://www.dell.com/support/home/products/server\\_int/server\\_int\\_poweredge](https://www.dell.com/support/home/products/server_int/server_int_poweredge).

**Table 6. 1 socket DCPMM configurations**

No. of CPUs in the Server	DCPMM Population	DRAM Population	DRAM Capacity (GB)	DCPMM Capacity (GB)	Operating system Memory in Memory Mode (GB)	Total Memory (GB)	Total Memory per CPU (GB)	Ratio DRAM to Optane Memory	Requires an M or L CPU	Supported in App Direct Mode	Supported in Memory Mode
1	128 GB x 2	16 GB x 4	64	256	256	320	320	1 : 4	No	Yes	Yes
1	128 GB x 1	16 GB x 6	96	128	N/A	224	224	1 : 1.3	No	Yes	No
1	128 GB x 2	16 GB x 6	96	256	N/A	352	352	1 : 2.7	No	Yes	No
1	128 GB x 4	16 GB x 6	96	512	512	608	608	1 : 5.3	No	Yes	Yes
1	128 GB x 6	16 GB x 6	96	768	768	864	864	1 : 8	No	Yes	Yes



**Table 6. 1 socket DCPMM configurations**


No. of CPUs in the Server	DCPM M Population	DRAM Population	DRAM Capacity (GB)	DCPM M Capacity (GB)	Operating system Memory in Memory Mode (GB)	Total Memory (GB)	Total Memory per CPU (GB)	Ratio DRAM to Optane Memory	Requires an M or L CPU	Supported in App Direct Mode	Supported in Memory Mode
1	128 GB x 1	32 GB x 6	192	128	N/A	320	320	1: 0.7	No	Yes	No
1	128 GB x 2	32 GB x 6	192	256	N/A	448	448	1: 1.3	No	Yes	No
1	128 GB x 4	32 GB x 6	192	512	N/A	704	704	1: 2.7	No	Yes	No
1	128 GB x 6	32 GB x 6	192	768	768	960	960	1: 4	No	Yes	Yes
1	128 GB x 1	64 GB x 6	384	128	N/A	512	512	1: 0.3	No	Yes	No

**Table 7. 2 socket DCPMM configurations**

No. of CPUs in the Server	DCPM M Population	DRAM Population	DRAM Capacity (GB)	DCPM M Capacity (GB)	Operating system Memory in Memory Mode (GB)	Total Memory (GB)	Total Memory per CPU (GB)	Ratio DRAM to Optane Memory	Requires an M or L CPU	Supported in App Direct Mode	Supported in Memory Mode
2	128 GB x 1	16 GB x 12	192	128	N/A	320	160	1: 0.7	No	Yes	No
2	128 GB x 2	16 GB x 12	192	256	N/A	448	224	1: 1.3	No	Yes	No
2	128 GB x 4	16 GB x 8	128	512	512	640	320	1: 4	No	Yes	Yes
2	128 GB x 4	16 GB x 12	192	512	N/A	704	352	1: 2.7	No	Yes	No
2	128 GB x 8	16 GB x 12	192	1,024	1,024	1,216	608	1: 5.3	No	Yes	Yes
2	128 GB x 12	16 GB x 12	192	1,536	1,536	1,728	864	1: 8	No	Yes	Yes
2	128 GB x 1	32 GB x 12	384	128	N/A	512	256	1: 0.3	No	Yes	No
2	128 GB x 2	32 GB x 12	384	256	N/A	640	320	1: 0.7	No	Yes	No
2	128 GB x 4	32 GB x 12	384	512	N/A	896	448	1: 1.3	No	Yes	No
2	128 GB x 8	32 GB x 12	384	1,024	N/A	1,408	704	1: 2.7	No	Yes	No
2	128 GB x 12	32 GB x 12	384	1,536	1,536	1,920	960	1: 4	No	Yes	Yes
2	128 GB x 4	64 GB x 12	768	512	N/A	1,280	640	1: 0.7	No	Yes	No
2	128 GB x 8	64 GB x 12	768	1,024	N/A	1,792	896	1: 1.3	No	Yes	No

**Table 7. 2 socket DCPMM configurations**


No. of CPUs in the Server	DCPMM Population	DRAM Population	DRAM Capacity (GB)	DCPMM Capacity (GB)	Operating system Memory in Memory Mode (GB)	Total Memory (GB)	Total Memory per CPU (GB)	Ratio DRAM to Optane Memory	Requires an M or L CPU	Supported in App Direct Mode	Supported in Memory Mode
2	128 GB x 12	64 GB x 12	768	1,536	N/A	2,304	1,152	1 : 2	L SKU	Yes	No
2	128 GB x 12	128 GB x 12	1,536	1,536	N/A	3,072	1,536	1 : 1	L SKU	Yes	No
2	512 GB x 8	32 GB x 12	384	4,096	4,096	4,480	2,240	1 : 10.7	L SKU	Yes	Yes
2	512 GB x 12	32 GB x 12	384	6,144	6,144	6,528	3,264	1 : 16	L SKU	Yes	Yes
2	512 GB x 8	64 GB x 12	768	4,096	4,096	4,864	2,432	1 : 5.3	L SKU	Yes	Yes
2	512 GB x 12	64 GB x 12	768	6,144	6,144	6,912	3,456	1 : 8	L SKU	Yes	Yes
2	512 GB x 12	128 GB x 12	1,536	6,144	6,144	7,680	3,840	1 : 4	L SKU	Yes	Yes
2	256 GB x 8	16 GB x 12	192	2,048	2,048	2,240	1,120	1 : 10.7	L SKU	Yes	Yes
2	256 GB x 8	32 GB x 12	384	2,048	2,048	2,432	1,216	1 : 5.3	L SKU	Yes	Yes
2	256 GB x 12	32 GB x 12	384	3,072	3,072	3,456	1,728	1 : 8	L SKU	Yes	Yes
2	256 GB x 8	64 GB x 12	768	2,048	N/A	2,816	1,408	1 : 2.7	L SKU	Yes	No
2	256 GB x 12	64 GB x 12	768	3,072	3,072	3,840	1,920	1 : 4	L SKU	Yes	Yes
2	256 GB x 12	128 GB x 12	1,536	3,072	N/A	4,608	2,304	1 : 2	L SKU	Yes	No

 **NOTE:** There are limited configurations available for Dual Socket Servers with only one CPU populated.

## Mode-specific guidelines

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

**Table 8. Memory operating modes (continued)**

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>NOTE:</b> DCPMM supports only Optimizer mode.
<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.

**Table 8. Memory operating modes**

Memory Operating Mode	Description
	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 24x 16 GB dual-rank memory modules, the available system memory is: <math>\frac{3}{4}</math> (ranks/channel) <math>\times</math> 24 (memory modules) <math>\times</math> 16 GB = 288 GB, and not 24 (memory modules) <math>\times</math> 16 GB = 384 GB. For multi rank sparing, the multiplier changes to <math>\frac{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, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	<ul style="list-style-type: none"> <li>• DIMMs must be populated in the order specified.</li> <li>• Odd number of DIMM population is allowed</li> <li>• <b>NOTE:</b> Odd number of DIMMs will result in unbalanced memory configurations, which in turn will result in performance loss. It is recommended to populate all memory channels identically with identical DIMMs for best performance.</li> <li>• Optimizer population order is not traditional for 4 and 8 DIMM installations of single processor.</li> </ul>

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

Processor	Configuration	Memory population	Memory population information
			<ul style="list-style-type: none"> <li>○ For 4 DIMMs: A1, A2, A4, A5</li> <li>○ For 8 DIMMs: A1, A2, A4, A5, A7, A8, A10, A11</li> </ul>
	Mirror population order	{1, 2, 3, 4, 5, 6} {7, 8, 9, 10, 11, 12}	Mirroring is supported with 6 or 12 DIMMs per processor.
	Single rank sparing population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	<ul style="list-style-type: none"> <li>● DIMMs must be populated in the order specified.</li> <li>● Requires two ranks or more per channel.</li> </ul>
	Multi rank sparing population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	<ul style="list-style-type: none"> <li>● DIMMs must be populated in the order specified.</li> <li>● Requires three ranks or more per channel.</li> </ul>
	Fault resilient population order	{1, 2, 3, 4, 5, 6} {7, 8, 9, 10, 11, 12}	Supported with 6 or 12 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{3}, B{3}, A{4}, B{4}, A{5}, B{5}, A{6}, B{6}	<p>Odd number of DIMM population per processor is allowed.</p> <p><b>i NOTE:</b> Odd number of DIMMs will result in unbalanced memory configurations, which in turn will result in performance loss. It is recommended to populate all memory channels identically with identical DIMMs for best performance.</p> <p>Optimizer population order is not traditional for 8 and 16 DIMMs installations for dual processor.</p> <ul style="list-style-type: none"> <li>● For 8 DIMMs: A1, A2, A4, A5, B1, B2, B4, B5</li> <li>● For 16 DIMMs:  A1, A2, A4, A5, A7, A8, A10, A11 B1, B2, B4, B5, B7, B8, B10, B11</li> </ul>
	Mirroring population order	A{1, 2, 3, 4, 5, 6}, B{1, 2, 3, 4, 5, 6}, A{7, 8, 9, 10, 11, 12}, B{7, 8, 9, 10, 11, 12}	Mirroring is supported with 6 or 12 DIMMs per processor.
	Single rank sparing population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}, A{4}, B{4}, A{5}, B{5}, A{6}, B{6}	<ul style="list-style-type: none"> <li>● DIMMs must be populated in the order specified.</li> <li>● Requires two ranks or more per channel.</li> </ul>
	Multi rank sparing population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}, A{4}, B{4}, A{5}, B{5}, A{6}, B{6}	<ul style="list-style-type: none"> <li>● DIMMs must be populated in the order specified.</li> <li>● Requires three ranks or more per channel.</li> </ul>
	Fault resilient population order	A{1, 2, 3, 4, 5, 6}, B{1, 2, 3, 4, 5, 6}, A{7, 8, 9, 10, 11, 12}, B{7, 8, 9, 10, 11, 12}	Supported with 6 or 12 DIMMs per processor.

# Removing a memory module

## Prerequisites

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

**ℹ NOTE:** You must follow the thermal restriction while using DIMM blank. For information about thermal restriction, see Thermal restrictions in Technical specification guide.

## Steps

1. Locate the appropriate memory module socket.

**⚠ WARNING:** 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 the memory module from the system.

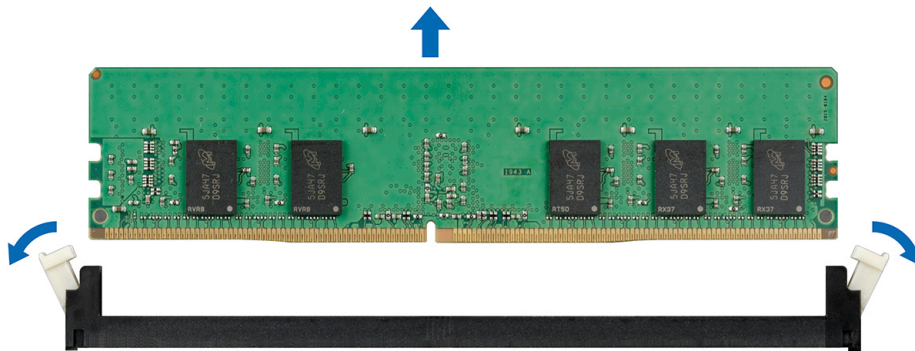


Figure 49. Removing a memory module

## Next steps

1. [Install the memory module](#).
2. 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.

**ℹ NOTE:** When operating your system with single processor, install DIMM blanks in CPU2 memory sockets.

# Installing a memory module

## Prerequisites

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

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

**ℹ NOTE:** You must follow the thermal restriction while using DIMM blank. For information about thermal restriction, see Thermal restrictions matrix in technical specification guide.

## Steps

1. Locate the appropriate memory module socket.

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

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

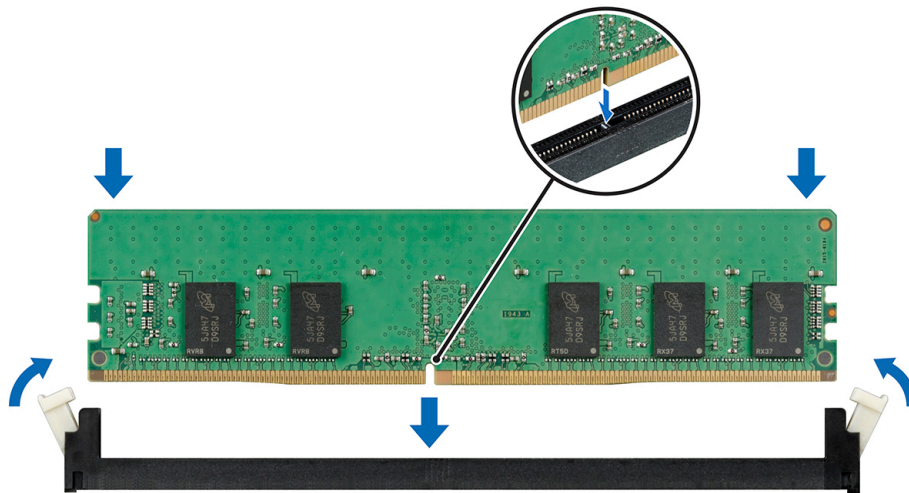
2. Open the ejectors on the memory module socket to allow the memory module to be inserted into the socket.

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 50. Installing a memory module**

## Next steps

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

**NOTE:** If memory size changes in anyway from the previous successful system boot, the system will prompt the end user during POST that the memory configuration has changed.

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.

## Processors and heat sinks

The processor controls memory, peripheral interfaces, and other components of the system. The system can have more than one processor configurations.

The heat sink absorbs the heat generated by the processor, and helps the processor to maintain its optimal temperature level.

# Removing the processor and heat sink module

## Prerequisites

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

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

## Steps

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

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

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

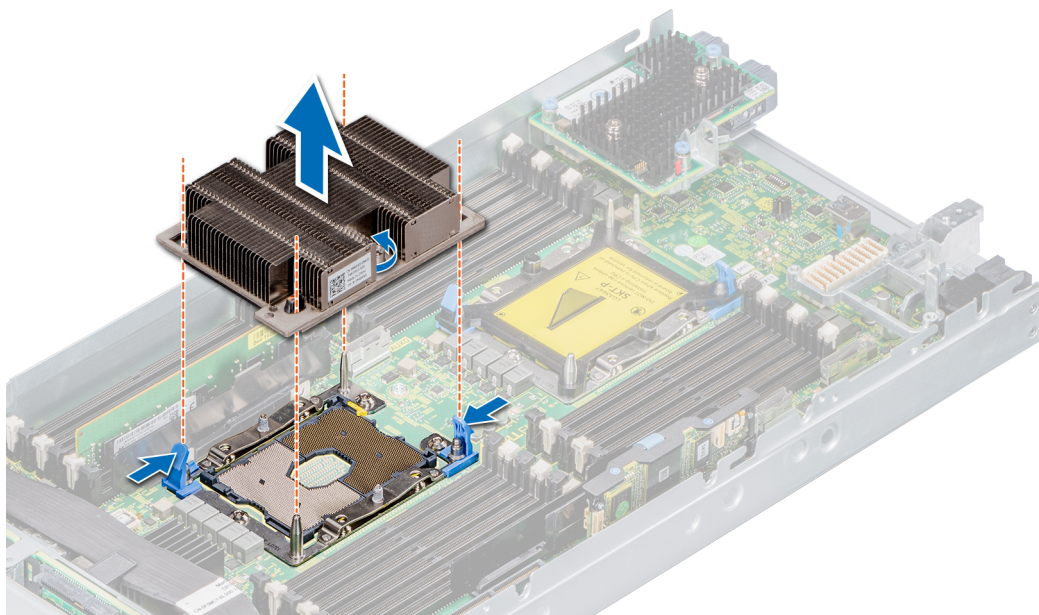


Figure 51. Removing the processor and heat sink module ( PHM )

## Next steps

1. [Install the processor and heat sink module](#).

# Removing the processor from the processor and heat sink module

## Prerequisites

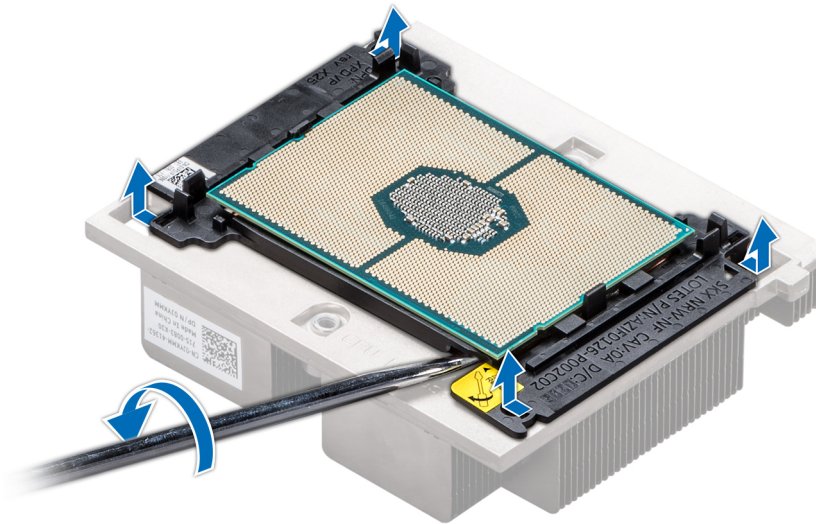
1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside your sled](#).
3. [Remove the air shroud](#).
4. [Remove the processor and heat sink module](#)

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

**NOTE:** This procedure is only needed when replacing a processor or heat sink. This is not needed when replacing system board.

### 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 52. 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.

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





**Figure 53. Removing the processor bracket**

#### Next steps

1. [Install the processor into the processor and heat sink module.](#)

## Installing the processor into a processor and heat sink module

#### Prerequisites

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

#### Steps

1. Place the processor in the processor tray.

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

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

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

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

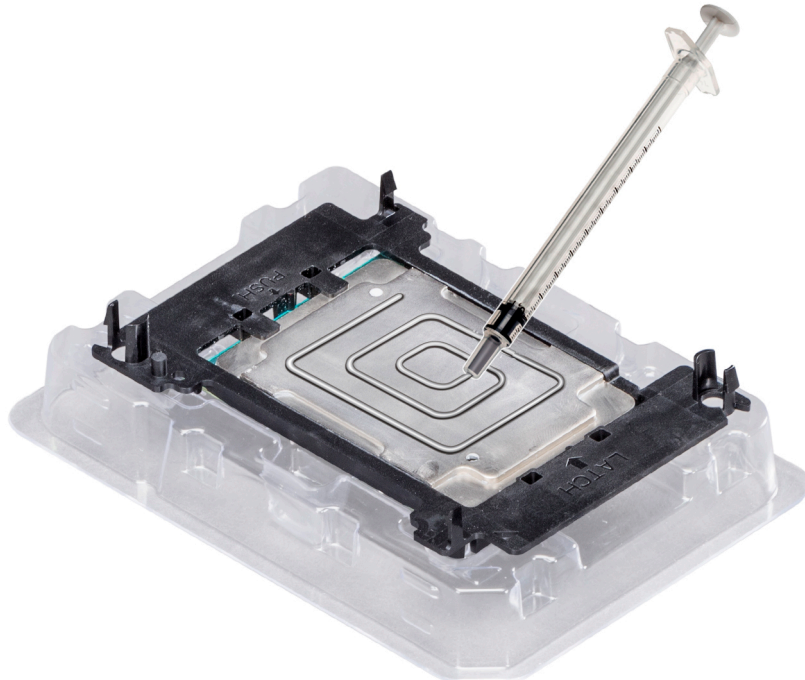


**Figure 54. Installing the processor bracket**

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

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

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



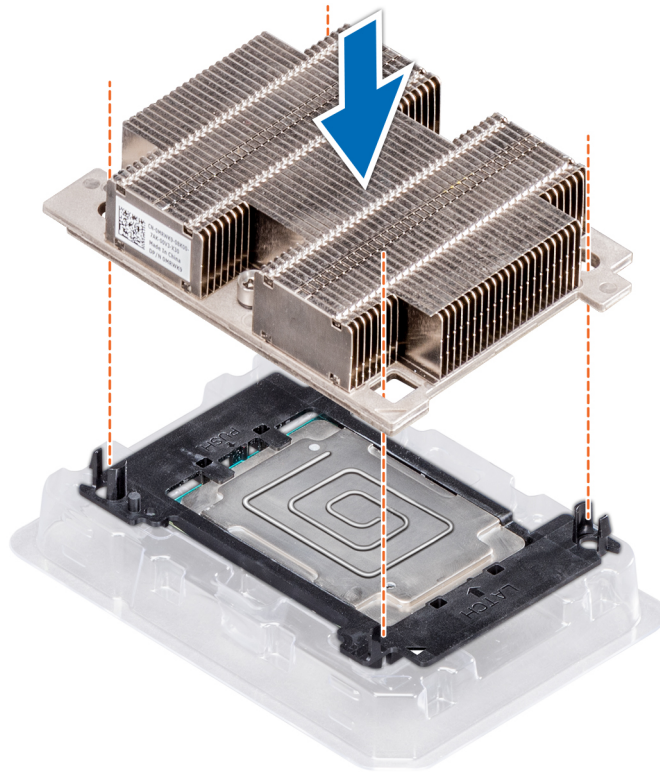
**Figure 55. Applying thermal grease on top of the processor**

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.

**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 56. 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 sled](#).

## 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. Follow the procedure listed in the [Before working inside your sled](#).
3. If installed, remove the processor 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 three 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 step 3 above.

**NOTE:** The processor and heat sink module retention screws should not be tightened to more than 0.11 kgf-m (1.13 N.m or 10+/-0.2 in-lbf).

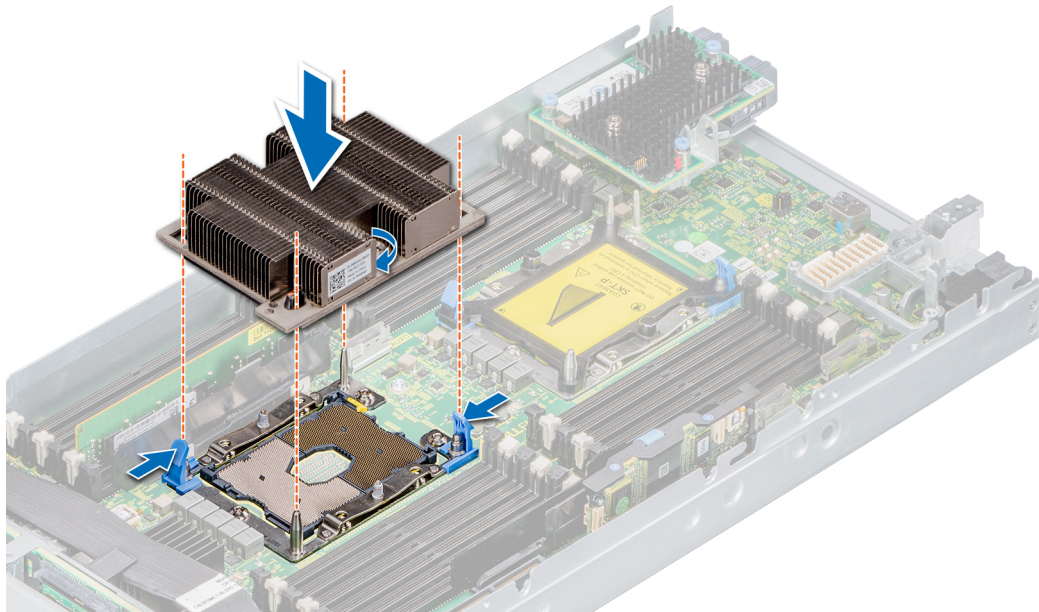


Figure 57. Installing a processor and heat sink module

### Next steps

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

## iDRAC card

In the PowerEdge MX740c, iDRAC is not embedded on the system board. The iDRAC is a separate card unlike other 14G PowerEdge servers. The vFlash card for the PowerEdge MX740c is available on the iDRAC card.

## Removing the iDRAC card

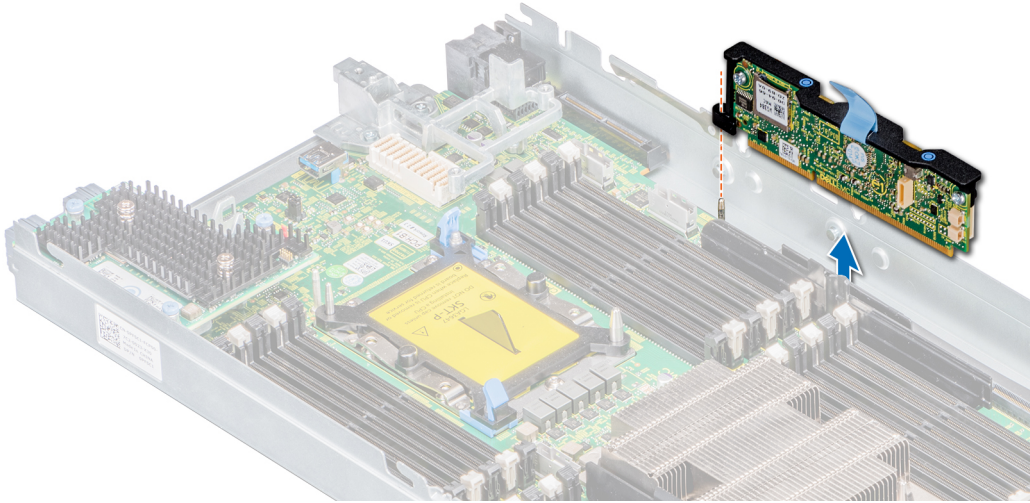
### Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions.](#)
2. Follow the procedure listed in [Before working inside the sled.](#)
3. [Remove the air shroud.](#)

**CAUTION:** If either the system board or iDRAC card fails, it is required to replace both system board and iDRAC card at the same time.

## Steps

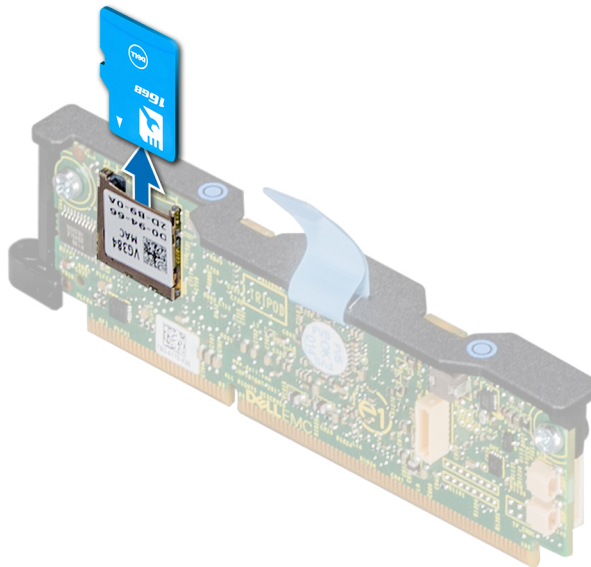
Hold the blue pull tag and lift the iDRAC card away from the system.



**Figure 58. Removing the iDRAC**

**NOTE:** The iDRAC module is not swappable with other MX series systems in the MX7000 enclosure.

**NOTE:** The procedure to remove vFlash card is similar to [Removing the MicroSD card](#).



**Figure 59. Removing a vFlash card**

## Next steps

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

## Installing the iDRAC card

### Prerequisites

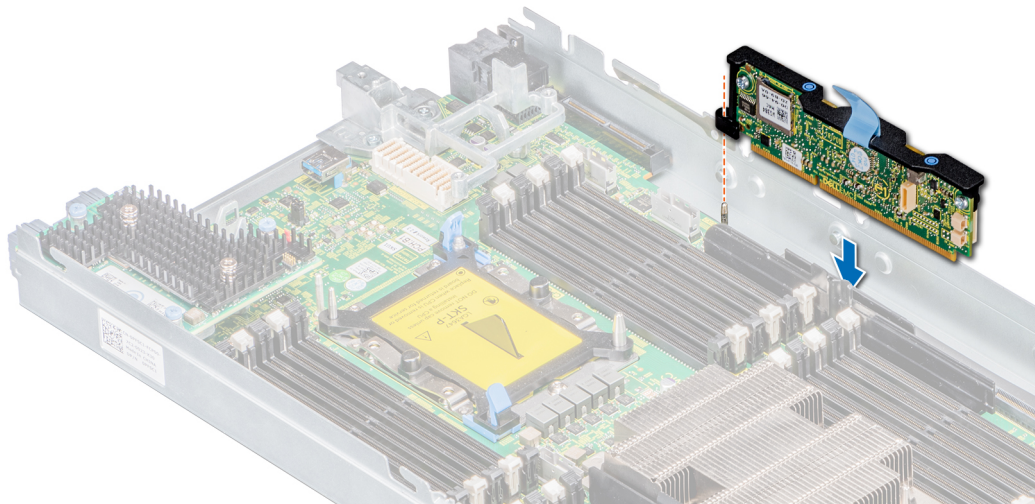
**CAUTION:** To prevent damage to the iDRAC card, you must hold the card only by its edges.

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).

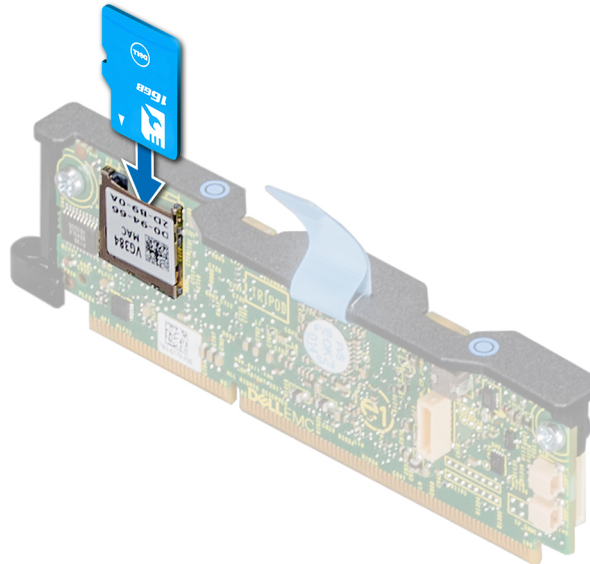
**CAUTION:** If either the system board or iDRAC card fails, it is required to replace both system board and iDRAC card at the same time.

### Steps

1. Align the iDRAC card with the guide pin on the system board.
2. Lower the iDRAC card into place until the iDRAC connector is fully seated.
3. Press the blue touch points till the iDRAC card is firmly seated on the system board connector.



**Figure 60. Installing the iDRAC card**



**Figure 61. Installing a vFlash card**

### Next steps

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

# PERC card

Your system includes dedicated slots on the system board for PERC cards.

## Removing the PERC card

### Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).
3. Disconnect the cable connected to the PERC card.

### Steps

1. Pull the blue pull tag to raise the lever up on the PERC card.
  - NOTE:** For the H730P MX(non-RAID) card, pull the two blue pull tags to raise the lever up. Rest of the procedure to remove the PERC card remains identical to HBA330 MX (non-RAID) card.
  - NOTE:** The MX740c supports both HBA330 MX or H730P MX PERC card.
2. Holding the blue pull tag, lift the PERC card away from the system.

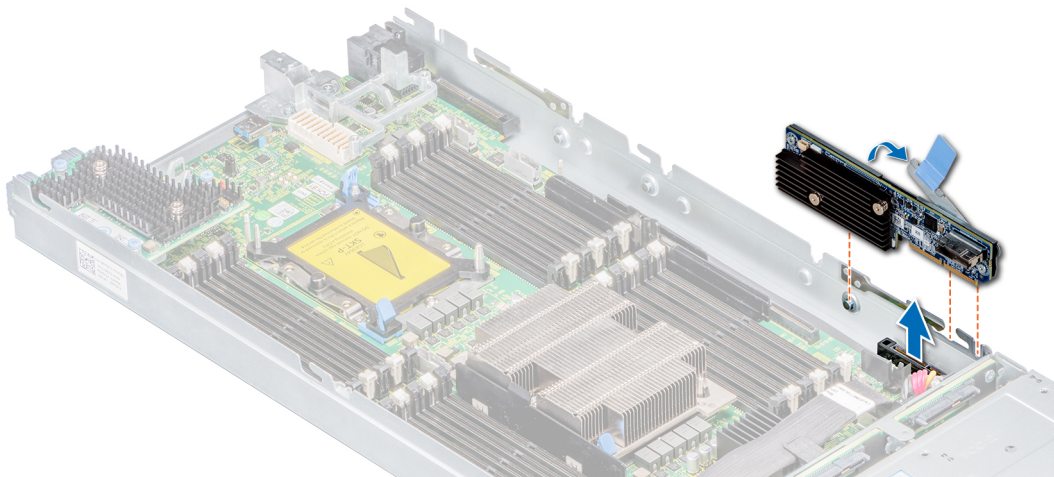


Figure 62. Removing the PERC card (HBA330)

### Next steps

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

## Installing the PERC card

### Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).

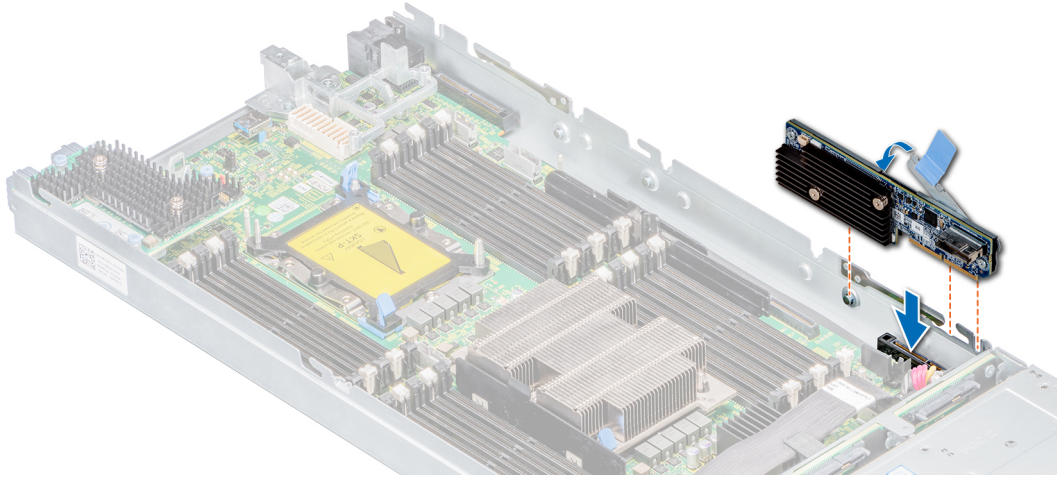
### Steps

1. Pull the blue pull tag to raise the lever up on the PERC card.
2. Align the connector on the PERC card with the connector on the system board.

**NOTE:** The procedure to install the HBA330 MX or a H730P MX PERC card is the same.

**NOTE:** The MX740c supports both HBA330 MX or H730P MX PERC card.

3. Align the guides on the PERC card with the slots on the system.
4. Press the PERC card to firmly seat in the system board connector.



**Figure 63. Installing the PERC card**

5. Close the lever on the PERC card.

#### Next steps

1. Connect the cable to the PERC card.
2. Follow the procedure listed in [After working inside your sled](#).

## Removing the Jumbo PERC card

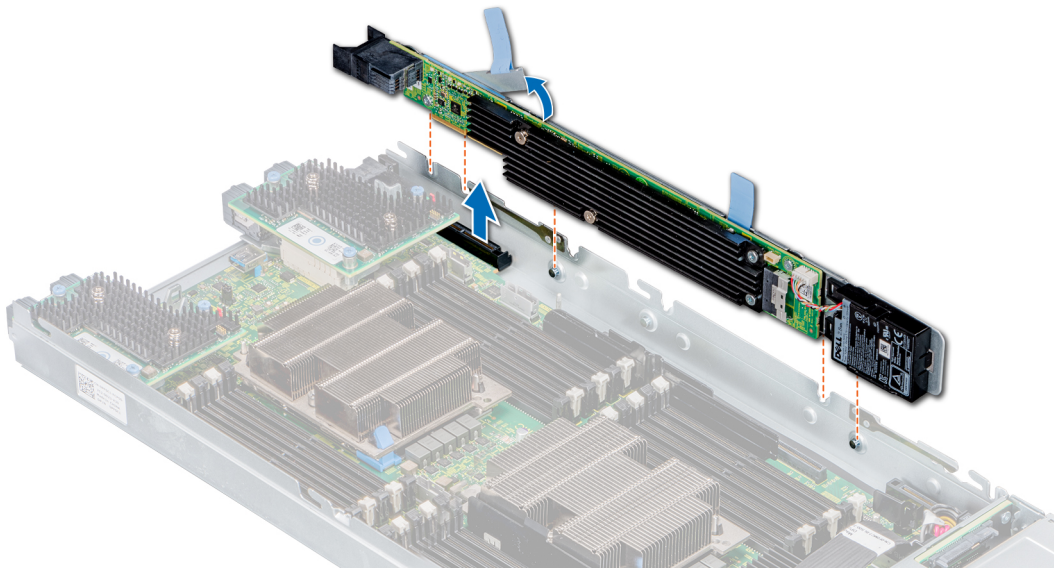
#### Prerequisites

1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in the [Before working inside your sled](#).
3. Disconnect the cable connected to the Jumbo PERC card.

#### Steps

1. Pull the two blue pull tags to raise the lever up on the Jumbo PERC card.
2. Holding both the blue pull tags, lift the Jumbo PERC card away from the system.
3. Install the connector cap on the I/O connector of the Jumbo PERC card.





**Figure 64. Removing the Jumbo PERC card**

- NOTE:** When Jumbo PERC is installed in the mini Mezzanine slot, you cannot install any other controller cards in the mini Mezzanine slot.
- NOTE:** The Jumbo PERC card controls the internal drives, and the storage sled drives mapped to the storage controller.

#### Next steps

1. [Install the Jumbo PERC card.](#)

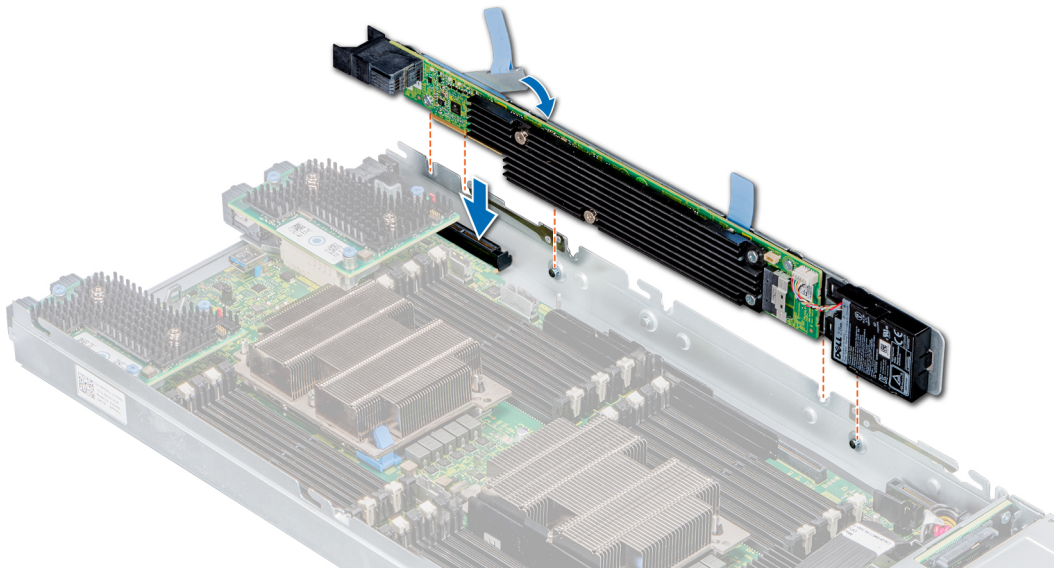
## Installing the Jumbo PERC card

#### Prerequisites

1. Follow the safety guidelines listed in the [Safety instructions](#).
  2. Follow the procedure listed in the [Before working inside your sled](#).
  3. [Remove the iDRAC card](#) before installing the Jumbo PERC card.
- NOTE:** A dual-processor configuration is required to support a Jumbo PERC card.

#### Steps

1. Remove the connector cap on the I/O connector from the Jumbo PERC card.
2. Pull the blue pull tag to raise the lever on the Jumbo PERC card.
3. Align the Jumbo PERC card with the slots on the system board.
4. Press the Jumbo PERC card until it is fully seated.
5. Close the lever on the Jumbo PERC card.



**Figure 65. Installing the Jumbo PERC card**

### Next steps

1. Connect the cable on the Jumbo PERC card.
2. Follow the procedure listed in the [After working inside your sled](#).

## Optional Internal dual SD module

The IDSDM module combines the IDSDM features into a single module.

**NOTE:** The write-protect switch is on the IDSDM module.

## Removing the IDSDM card

### Prerequisites

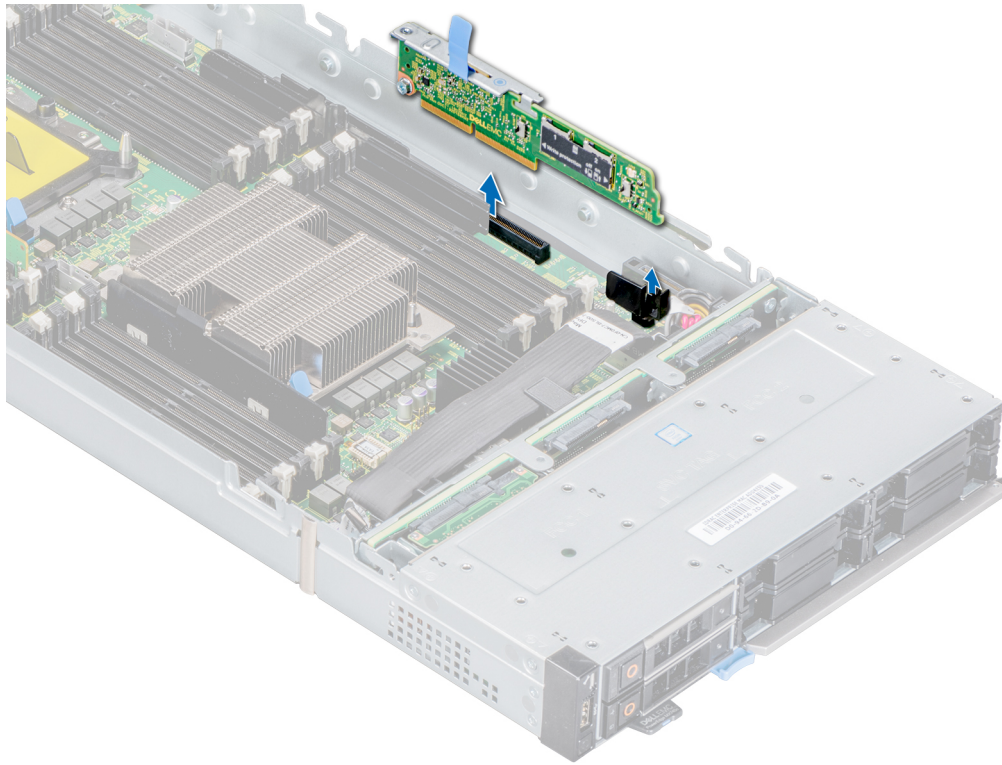
1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).
3. [Remove the air shroud](#).

### Steps

1. Locate the IDSDM card connector on the system board. To locate IDSDM connector, see the [system board jumpers and connectors](#) section.
2. Using the Phillips #2 screwdriver, loosen the retention screw that connects the internal dual SD card (IDSDM) to the system board.

**CAUTION:** To prevent damage to the IDSDM card, you must not tilt the card while lifting it from the system board.

3. Lift the release tab that secures the IDSDM to the system board.
4. Holding both ends of the IDSDM, lift the IDSDM out of the BOSS connector on the system board.



**Figure 66. Removing the IDSDM card**

### Next steps

Install the IDSDM card.

## Installing the IDSDM card

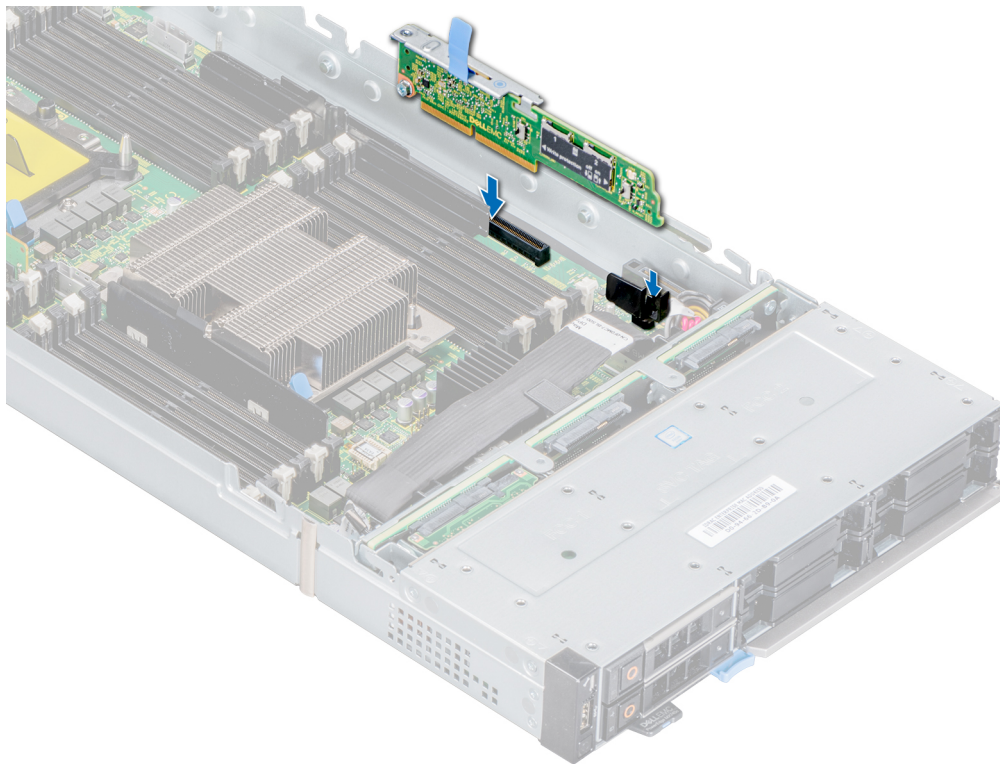
### Prerequisites

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

**CAUTION:** To prevent damage to the IDSDM card, you must hold the card only by its edges.

### Steps

1. Locate the IDSDM card connector on the system board. To locate IDSDM connector, see the [system board jumpers and connectors](#) section.
2. Align the IDSDM card with the connector on the system board.
3. Press the IDSDM card until it is firmly seated on the system board.



**Figure 67. Installing the IDSDM card**

### Next steps

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

## Removing a MicroSD card

### Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).
3. [Remove the IDSDM card](#).

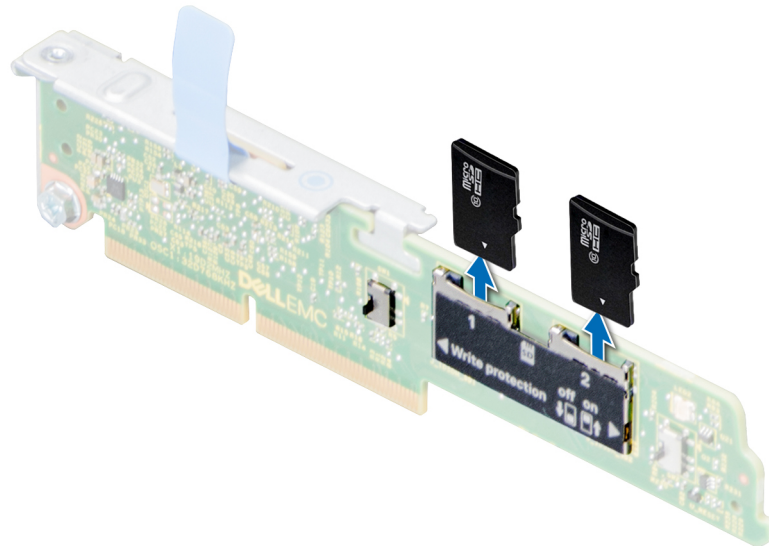
### Steps

1. Locate the MicroSD card slot on the IDSDM card.

**NOTE:** To locate IDSDM slot on the system board, see the [system board jumpers and connectors](#).

2. Press the card to partially release from the slot.
3. Hold the MicroSD card and remove it from the slot.

**NOTE:** Temporarily label each MicroSD card with the corresponding slot number after removal.



**Figure 68. Removing a MicroSD card**

### Next steps

1. [Install a MicroSD card.](#)
2. Follow the procedure listed in [After working inside your sled](#)

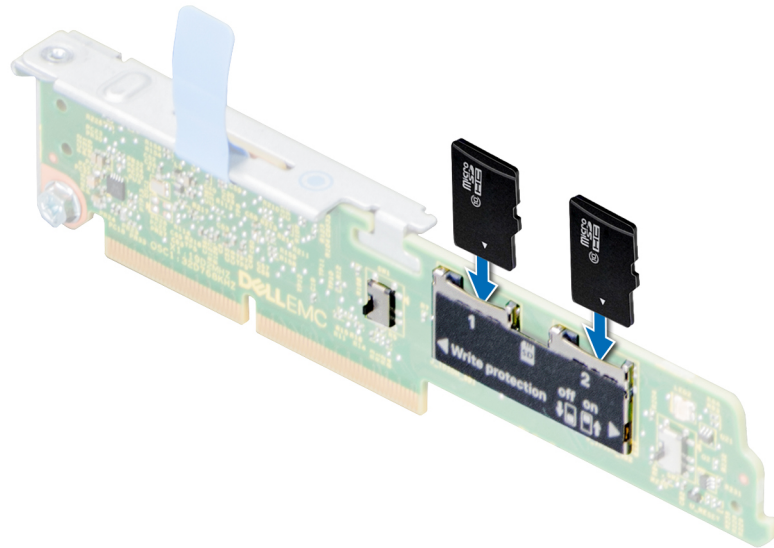
## Installing a MicroSD card

### Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).
  - NOTE:** To use an MicroSD card with your system, ensure that the **Internal SD Card Port** is enabled in System Setup.
  - NOTE:** If reinstalling, ensure that you install the MicroSD cards into the same slots based on the labels you had marked on the cards during removal.

### Steps

1. Locate the MicroSD card slot on the IDSDM card. Orient the MicroSD card appropriately and place the contact-pin end of the card into the slot.
  - NOTE:** The slot is keyed to ensure correct installation of the card.
2. Press the card into the card slot to lock it into their original location.



**Figure 69. Installing a MicroSD card**

#### **Next steps**

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

## **M.2 BOSS module**

The BOSS card is a simple RAID solution card which supports upto 2 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.

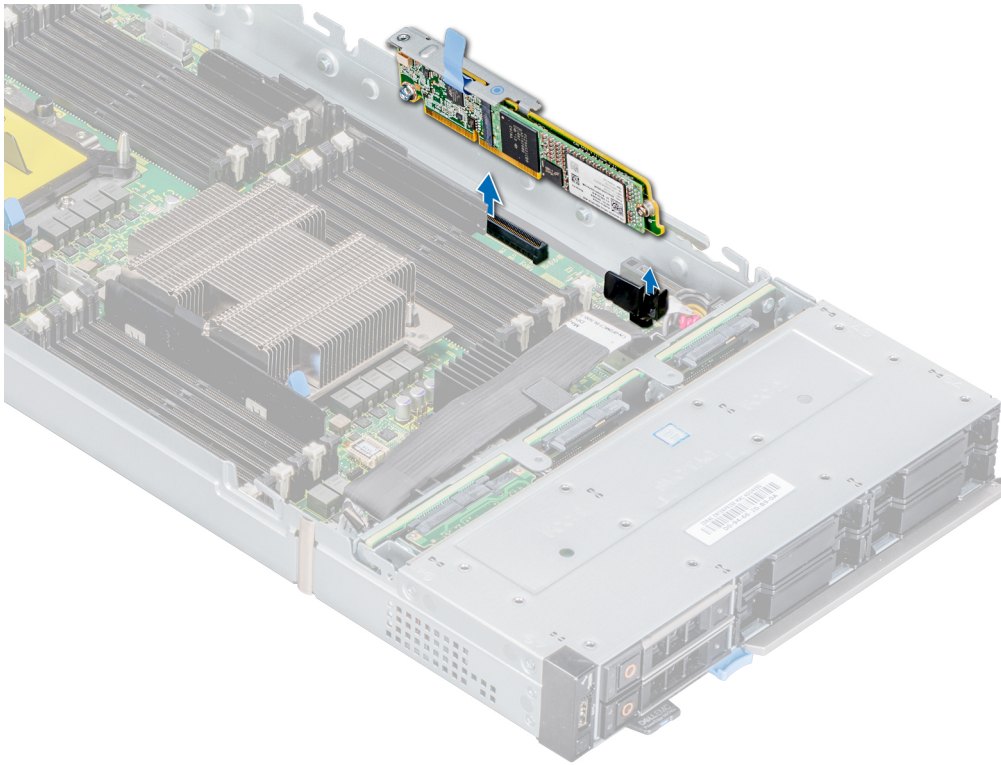
## **Removing the M.2 BOSS module**

#### **Prerequisites**

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

#### **Steps**

Holding the blue tag, lift the M.2 BOSS module away from the system.



**Figure 70. Removing the M.2 BOSS module**

**Next steps**

1. [Install the M.2 BOSS module.](#)

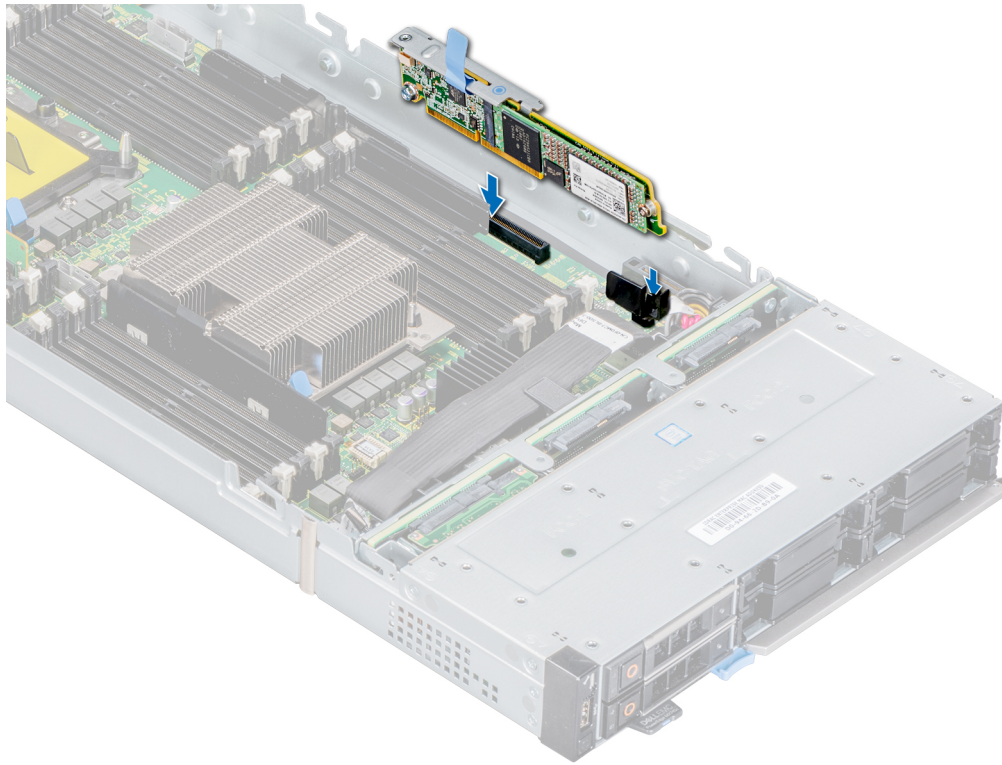
## Installing the M.2 BOSS module

**Prerequisites**

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

**Steps**

1. Align the M.2 BOSS module connector with the connectors on the system board and the guide on the M.2 BOSS module with the guiding slot on the system board.
2. Press the touch point on the M.2 BOSS module until it is firmly seated.



**Figure 71. Installing the M.2 boss module**

### **Next steps**

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

## **Removing the M.2 BOSS card**

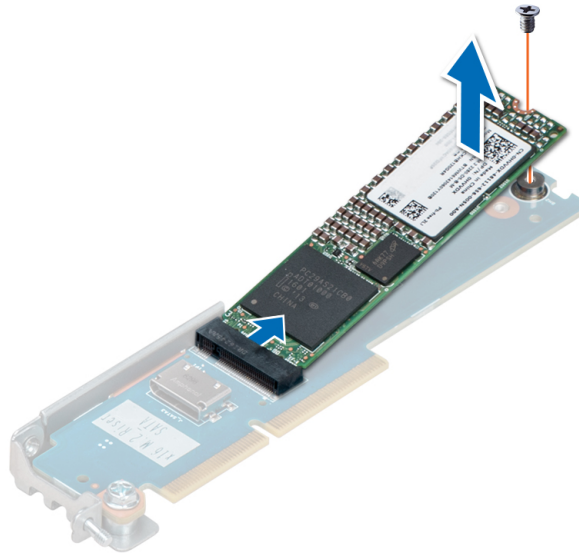
### **Prerequisites**

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

### **Steps**

1. Using the Phillips #1 screwdriver, remove the screw on the M.2 BOSS module.
2. Pull the card out of the connector, and lift the card away from the module.





**Figure 72. Removing the M.2 BOSS card**

### Next steps

1. [Install the M.2 BOSS card.](#)

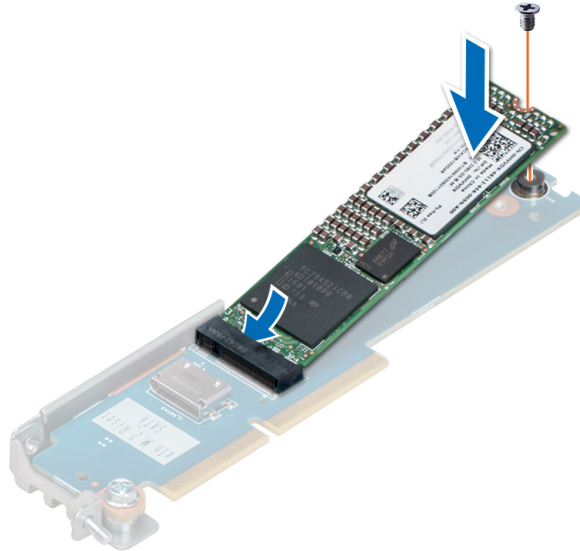
## Installing the M.2 BOSS card

### Prerequisites

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

### Steps

1. Align the M.2 BOSS card at angle of 45 degrees with the SATA connector on the M.2 BOSS module.
2. Press the M.2 BOSS card into the SATA connector until firmly seated in place.
3. Push down the M.2 BOSS card and using Phillips #1 screwdriver, secure the M.2 BOSS card to the module.



**Figure 73. Installing the M.2 BOSS card**

### Next steps

1. [Install the M.2 BOSS module.](#)
2. Follow the procedure listed in the [After working inside your sled.](#)

## Mezzanine card

Your system supports two mezzanine cards:

- PCIe mezzanine card slot A supports fabric A. This card must match the fabric type of I/O modules installed in I/O module bays A1.
- PCIe mezzanine card slot B supports fabric B. This card must match the fabric type of I/O modules installed in I/O module bays B1.

**NOTE:** The Mezzanine B1 card requires processor 2 to be installed.

## Removing the Mezzanine card

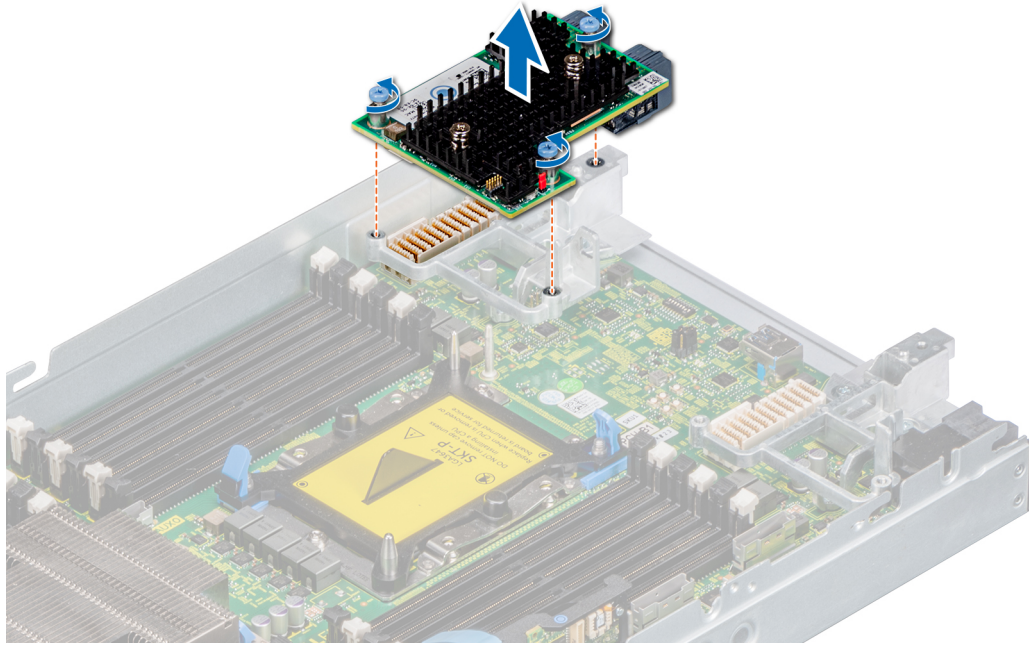
### Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions.](#)
2. Follow the procedure listed in [Before working inside the sled.](#)

### Steps

1. Use the Phillips #2 screwdriver, loosen the captive screws that secure the Mezzanine card to the system.
2. Lift the Mezzanine card out of the sled.

**NOTE:** To prevent damage to Mezzanine card, you must hold the card only by its edges.



**Figure 74. Removing the Mezzanine card**

#### Next steps

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

## Installing the Mezzanine card

#### Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions.](#)
2. Follow the procedure listed in [Before working inside the sled.](#)

**NOTE:** A dual-processor configuration is required to support the Mezzanine B1 card.

#### Steps

1. Align the connector on the Mezzanine card with the connector on the system board.
2. Place the Mezzanine card on the connector and press the blue touch point until it is firmly seated.
3. Use the Phillips #2 screwdriver, tighten the captive screws on the Mezzanine card.

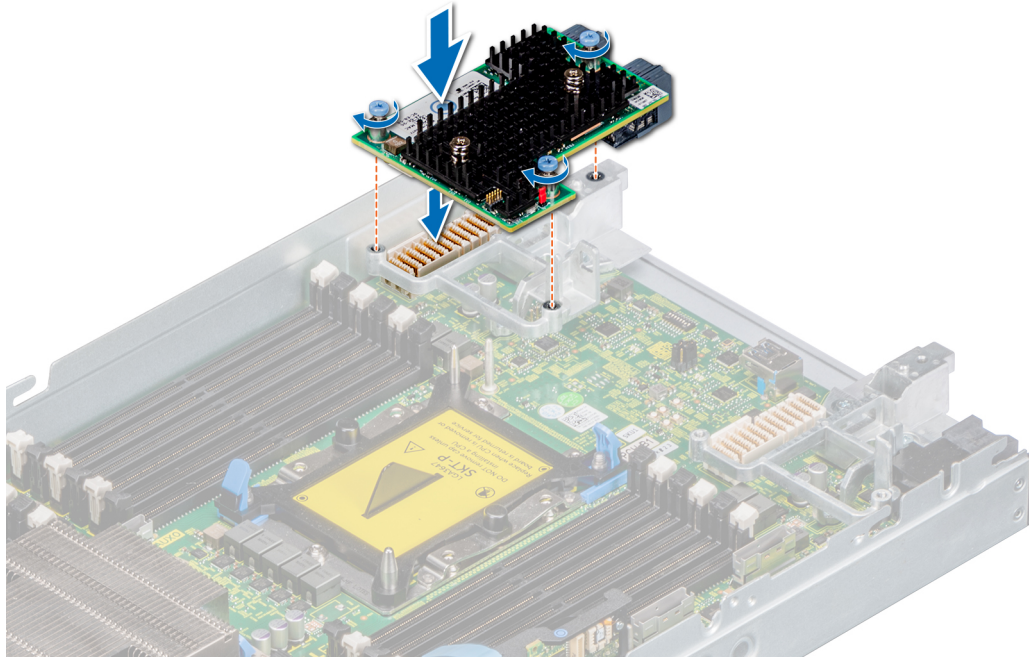


Figure 75. Installing the Mezzanine card

#### Next steps

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

## Removing the mini Mezzanine card

#### Prerequisites

**CAUTION:** To ensure proper system cooling, mini Mezzanine blank must be installed in the mini Mezzanine socket.

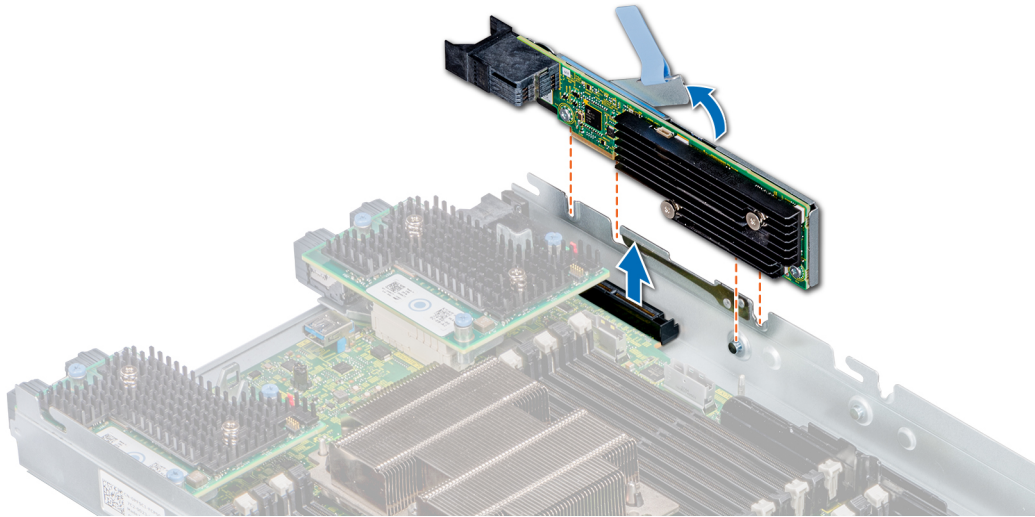
**NOTE:** The removal of the blank is recommended only if you intend to install a mini Mezzanine card in this socket.

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).

**NOTE:** MX740c supports HBA330 MMZ and Fiber channel MMZ which is installed in mini Mezzanine slot.

#### Steps

1. Pull the blue pull tag to raise the lever up of the mini Mezzanine card.
2. Holding the lever and the edge of the mini Mezzanine card, lift the mini Mezzanine card from the system.



**Figure 76. Removing the mini Mezzanine card**

**NOTE:** Install the connector cap on the I/O connector of the mini Mezzanine card, when not installed on system board.

#### Next steps

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

## Installing the mini Mezzanine card

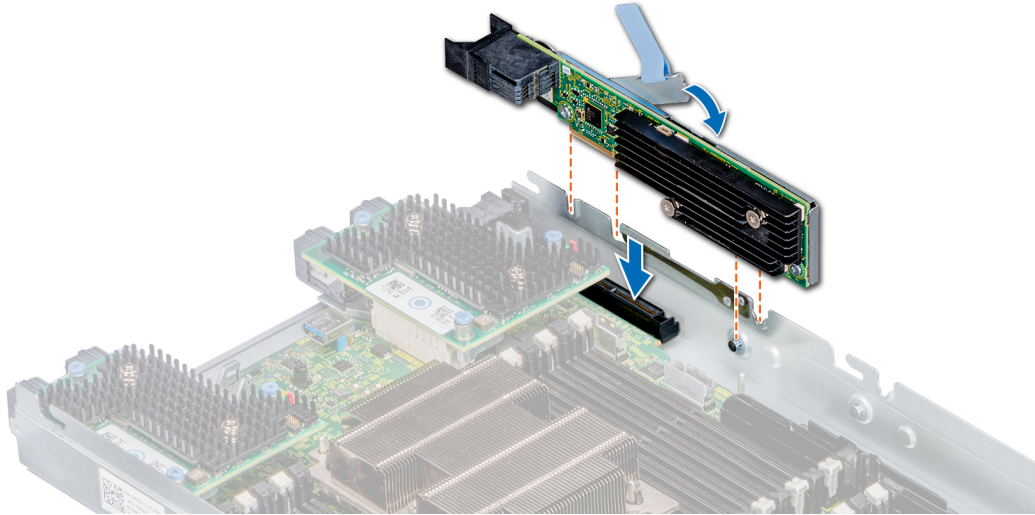
#### Prerequisites

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).

**NOTE:** The mini Mezzanine card is supported only on systems with two processors.

#### Steps

1. Remove the connector cap on the I/O connector of the mini Mezzanine card.
2. Pull the blue pull tag to raise the lever on the mini Mezzanine card.
3. Align the mini Mezzanine card connector with the connector on the system board.
4. Lower the mini Mezzanine card into place, and push the lever down to lock the card in place.



**Figure 77. Installing the mini Mezzanine card**

5. Close the lever on the mini Mezzanine card.

#### **Next steps**

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

## **Removing the mini Mezzanine card blank**

#### **Prerequisites**

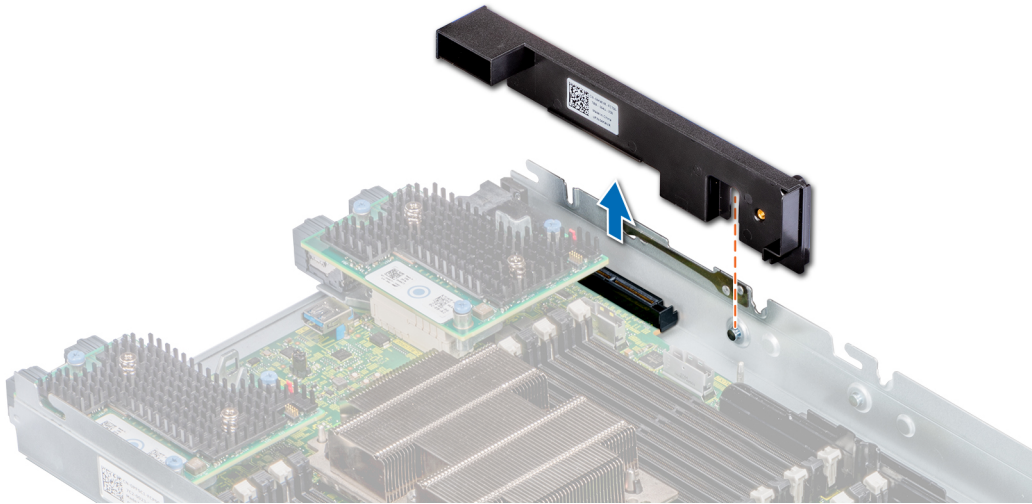
**CAUTION:** To ensure proper system cooling, the mini Mezzanine blank must be installed in the mini Mezzanine socket.

**NOTE:** The removal of the blank is recommended only if you intend to install a mini Mezzanine card in the socket.

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).

#### **Steps**

Lift the mini Mezzanine card blank from the slot to remove it from the system.



**Figure 78. Removing the mini Mezzanine card blank**

**Next steps**

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

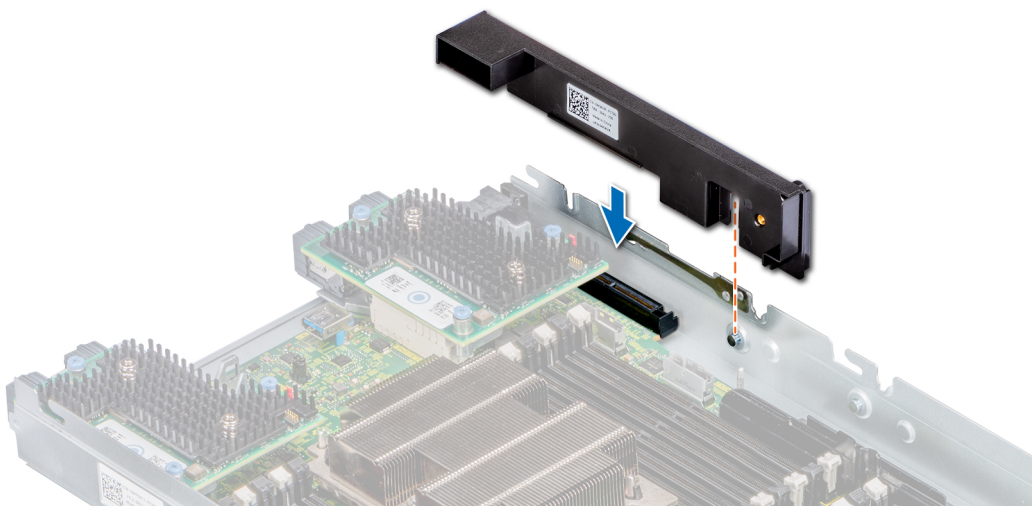
## Installing the mini Mezzanine card blank

**Prerequisites**

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).

**Steps**

Align the guiding groove of the card on the slot and push down to insert the mini Mezzanine blank to the system board.



**Figure 79. Installing the mini Mezzanine card blank**

**Next steps**


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

# Optional internal USB memory key

An optional USB memory key installed inside your system can be used as a boot device, security key, or mass storage device. To boot from the USB memory key, configure the USB memory key with a boot image and then specify the USB memory key in the boot sequence in System Setup.

An optional USB memory key can be installed in the internal USB 3.0 port and can be used as a boot device, security key or mass storage device.

The internal USB port is on the system board.

 **NOTE:** To locate the internal USB port on the system board, see the [System board jumpers and connectors](#).

## Replacing the optional internal USB memory key


### Prerequisites

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

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

### Steps

1. Locate the USB port or USB memory key on the system board.

 **NOTE:** To locate the USB port, see the [System board jumpers and connectors](#) section.

2. If installed, remove the USB memory key from the USB port.
3. Place the replacement USB memory key into the USB port.

### Next steps


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

# System battery

The system battery is used for low-level system functions such as powering the real-time and date settings of the system.

## Replacing the system battery - Option A

### Prerequisites

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

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

### Steps

1. Locate the system battery on the system.
2. To remove the battery:
  - a. Push the battery toward the positive side of the battery until the battery disengages from the connector.
  - b. Lift the battery away from the system.





**Figure 80. Removing the system battery**

3. To install a new system battery:
  - a. Hold the battery with the + sign facing the positive side of the battery connector.
  - b. Insert the battery down into the connector and push the positive side of the battery until the battery snaps into place.



**Figure 81. Installing the system battery**

#### **Next steps**

1. Follow the procedure listed in [After working inside your sled](#).
2. Enter the System Setup to confirm that the battery is operating properly.
3. Enter the correct time and date in the System Setup's **Time** and **Date** fields.
4. Exit the System Setup.
5. To test the newly installed battery, remove the system from the enclosure, for at least an hour.
6. Reinstall the system into the enclosure, after an hour.
7. Enter the System Setup and if the time and date are still incorrect, see [Getting help](#).

## Replacing the system battery - Option B

### Prerequisites

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

1. Follow the safety guidelines listed in [Safety Instructions](#).
2. Follow the procedure listed in [Before working inside the sled](#).

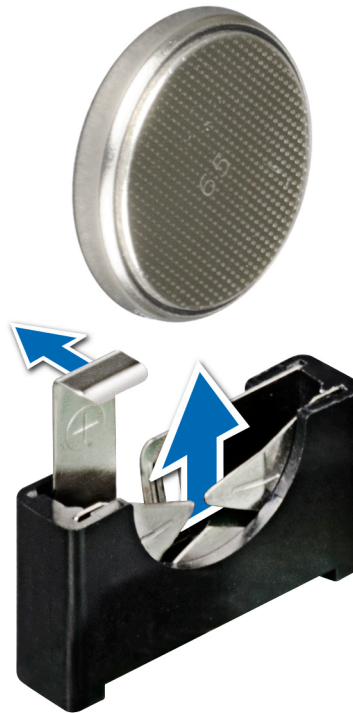
### Steps

1. Locate the system battery on the system.
2. To remove the battery:

- a. Push the battery holder clip.

**i** **NOTE:** Ensure that you do not push the battery holder clip more than 3.2 millimeters, It may damage the battery holder.

- b. Push the battery toward the positive side of the battery until the battery disengages from the connector.
- c. Lift the battery away from the system.



**Figure 82. Removing the system battery**

3. To install a new system battery:

- a. Push the battery lock slightly away.

**i** **NOTE:** Ensure that you do not push the battery holder more that 3.2 millimeters or you might risk damaging the part.

- b. Hold the battery with the + sign facing the positive side of the battery connector.
- c. Insert the battery into the battery socket and push the positive side of the battery until the battery snaps into place.



**Figure 83. Installing the system battery**

#### Next steps

1. Follow the procedure listed in [After working inside your sled](#).
2. Enter the System Setup to confirm that the battery is operating properly.
3. Enter the correct time and date in the System Setup's **Time** and **Date** fields.
4. Exit the System Setup.
5. To test the newly installed battery, remove the system from the enclosure, for at least an hour.
6. Reinstall the system into the enclosure, after an hour.
7. Enter the System Setup and if the time and date are still incorrect, see [Getting help](#).


## System board

A system board (also known as the motherboard) is the main printed circuit board in the system with different connectors used to connect different components or peripherals of the system. A system board provides the electrical connections to the components in the system to communicate.


## Removing the system board

#### Prerequisites

- ⚠ **CAUTION:** If you are using the Trusted Platform Module (TPM) with an encryption key, you may be prompted to create a recovery key during program or System Setup. Be sure to create and safely store this recovery key. If you replace this system board, you must supply the recovery key when you restart your system or program before you can access the encrypted data on your drives.
- ⚠ **CAUTION:** You may find the CMOS battery loss or CMOS checksum error displayed during the first instance of powering on the system after the processor or system board replacement which is expected. To fix this, go to setup option to configure the system settings.


 **NOTE:** It is required to reactivate the licenses after the system board replacement.

 **CAUTION:** If either the system board or iDRAC card fails, it is required to replace the system board and iDRAC card at the same time.

 **CAUTION:** Do not attempt to remove the TPM plug-in module from the system board. After 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.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your sled](#).
3. Remove the following:
  - a. [Air shroud](#)
  - b. [Memory modules](#)
  - c. [Processor\(s\) and heat sink\(s\)](#)
  - d. [Drives](#)
  - e. [Drive backplane](#)
  - f. [Drive cage](#)
  - g. [PERC card](#)
  - h. [IDSDM](#)
  - i. [Mezzanine card](#)
  - j. [Mini Mezzanine card](#)
  - k. [iDRAC card](#)
  - l. [Internal USB key](#)

 **WARNING:** The processor and heat sink can become hot. Be sure that the processor has had sufficient time to cool before handling.

 **WARNING:** The memory modules are hot to touch for some time after the system has been powered down. Allow time for the memory modules to cool before handling them. Handle the memory modules by the card edges and avoid touching the components.

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

 **CAUTION:** Temporarily label the drives before removal so that you can replace them back in their respective slots.

### Steps

1. Disconnect all cables from the system board.
2. Using the Phillips #2 screwdriver, remove all the screws that secure the system board to the chassis.
3. Holding the edges, lift the system board out of the system.

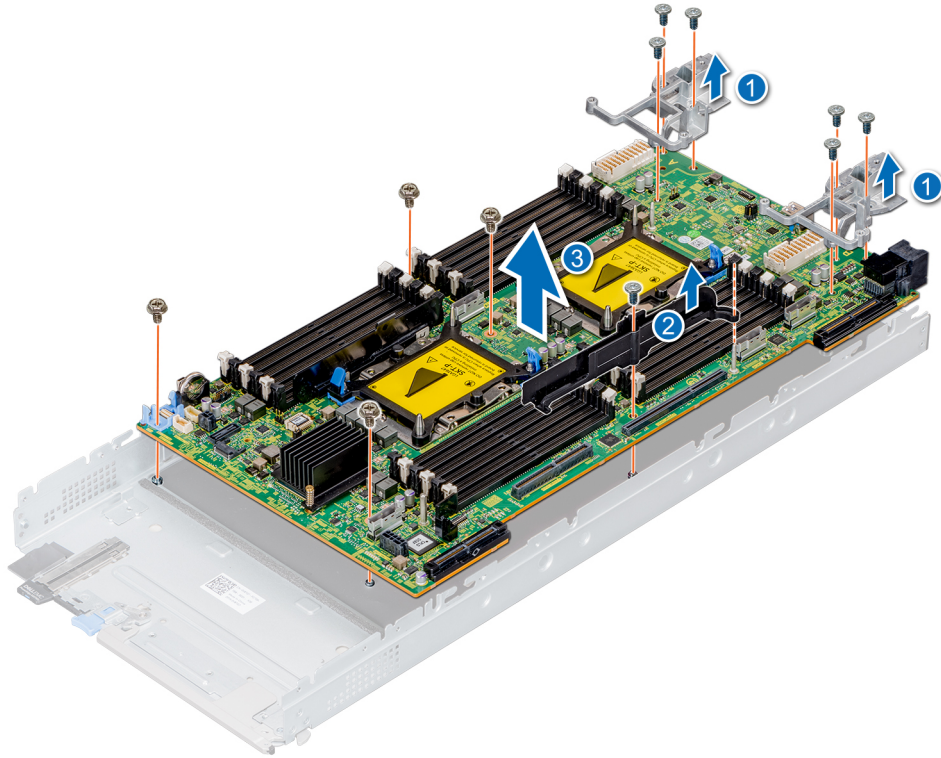


Figure 84. Removing the system board

#### Next steps

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

## Installing the system board

#### Prerequisites

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

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

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

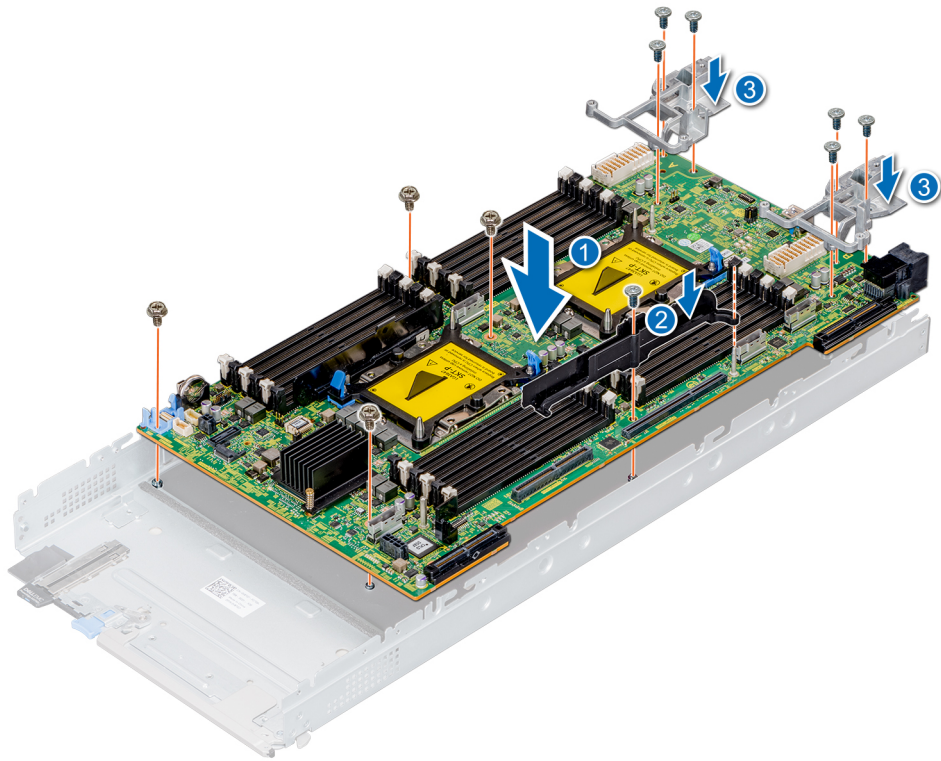
#### Steps

1. Unpack the replacement system board assembly.

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

**NOTE:** It is required to reactivate the licenses after the system board replacement.


2. Holding the system board by the edges, place the system board into the system.
3. Using the Phillips #2 screwdriver, secure the system board to the chassis with the screws.



**Figure 85. Installing the system board**

4. Lower the system board and install the screws to secure the system board to the system.

**Next steps**

1. Install the following:
  - a. [Internal USB key](#)
  - b. [iDRAC card](#)
  - c. [IDSDM](#)
  - d. [Mini Mezzanine card](#)
  - e. [Mezzanine card\(s\)](#)
  - f. [PERC card](#)
  - g. [Drive cage](#)
  - h. [Drive backplane](#)
  - i. [Drives](#)
  -  **NOTE:** Ensure that you reinstall the drives in their original locations.
  - j. [BBU module](#)
  - k. [Memory modules](#)
  - l. [Processor\(s\) and heat sink\(s\)](#)
  - m. [Air shroud](#)
2. Remove the plastic I/O connector cover from the back of the system.
3. Install the sled in the enclosure.
4. Follow the procedure listed in [After working inside your sled](#).
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 [Entering the system Service Tag by using System Setup](#) 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 Integrated Dell Remote Access Controller 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. If BIOS detects a new system board and the Service Tag in the backup flash device, BIOS prompts the user to restore the backup information.

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

## Trusted Platform Module

Trusted Platform Module (TPM) is a dedicated microprocessor designed to secure hardware by integrating cryptographic keys into devices. Software can use a TPM to authenticate hardware devices. Because each TPM chip has a unique and secret RSA key which is embedded during the manufacture of the TPM, it is capable of performing platform authentication operation.

# Upgrading the TPM


## Prerequisites


1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your sled](#).
3. Disconnect the cables.
4. [Remove the drive backplane](#).

### 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:** After 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

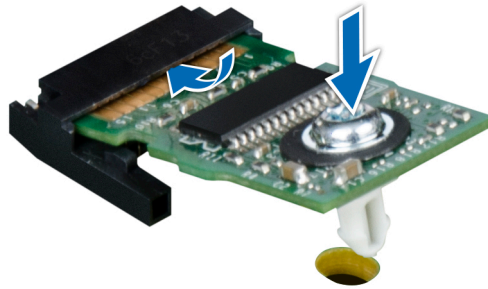
1. Locate the TPM connector on the system board.  
To locate the TPM connector, see [System board jumpers and connectors](#).
2. Press to hold down the module and remove the screw using the security Torx 8-bit shipped with the TPM module.
3. Slide the TPM module out from its connector.
4. Push the plastic 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 86. Installing the TPM**

#### Next steps

1. Install the system board.
2. Install the drive backplane.
3. Follow the procedure listed in *After working inside your sled*.

## Initializing TPM for BitLocker users

#### Steps

Initialize the TPM.

For more information, see <https://technet.microsoft.com/library/cc753140.aspx>.

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.

# Jumpers and connectors

## Topics:

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

## System board jumpers and connectors

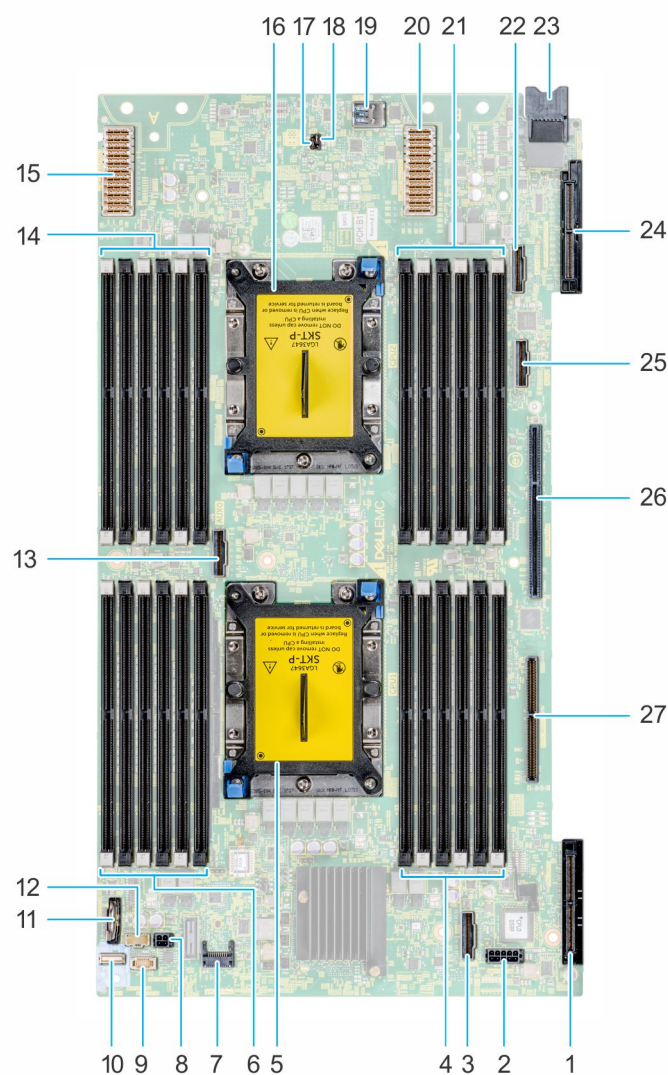


Figure 87. System board jumpers and connectors

Table 10. System board jumpers and connectors

Item	Connector	Description
1.	PERC	PERC card slot



**Table 10. System board jumpers and connectors**

Item	Connector	Description
2.	BP_PWR_CONN	Backplane power connector
3.	SATA_CONN	SATA connector
4.	A1, A2., A3., A7., A8., A9	DIMMS for CPU1
5.	CPU1	Processor 1 (blank)
6.	A4, A5., A6., A10., A11., A12	DIMMS For CPU1
7.	TPM_MODULE	Trusted Platform Module
8.	BBU_PWR_CONN	BBU power connector
9.	BACKPLANE SIGNAL	Backplane signal connector
10.	FIO	Control panel(FIO) connector
11.	BATTERY	System battery
12.	BBU SIGNAL	Battery backup unit signal slot
13.	AUX 0	AUX 0 cable connector
14.	B4, B5., B6., B10., B11., B12	DIMMS for CPU2
15.	MEZZ_A1	Mezzanine card A1
16.	CPU2	Processor 2 (blank)
17.	PWRD_EN	System configuration jumper (enabling or disabling the password settings)
18.	NVRAM_CLR	System configuration jumper (retaining-/ configuration settings)
19.	INTERNAL USB	Internal USB 3.0
20.	MEZZ_B1	Mezzanine card B1
21.	B1, B2., B3., B7., B8., B9	DIMMS for CPU2
22.	AUX1	AUX1 cable connector
23.	POWER CONNECTOR	Power connector
24.	MINI_MEZZ_C1	Mini Mezzanine card C1
25.	AUX2	AUX 2 cable connector
26.	iDRAC	iDRAC module connector
27.	BOSS (M.2)/IDSDM	BOSS (M.2)/IDSDM card connector



## System board jumper settings

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

**Table 11. System board jumper settings**

Jumper	Setting	Description
NVRAM_CLR	 1 2 3 (default)	The BIOS configuration settings are retained at system boot.
	 1 2 3	The BIOS configuration settings are cleared at system boot.

**Table 11. System board jumper settings**

Jumper	Setting	Description
PWRD_EN	 1 2 3 (default)	The BIOS password feature is enabled.
	 1 2 3	The BIOS password feature is disabled. iDRAC local access is unlocked at next AC power cycle. iDRAC password reset is enabled in F2 iDRAC settings menu.

## Disabling a forgotten password

The system's software security features include a system password and a setup password. The password jumper enables these password features or disables them 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 compute sled.
2. Remove the compute sled from chassis.
3. [Remove the system cover.](#)
4. Move the jumper on the system board jumper from pins 2 and 4 to pins 4 and 6.
5. [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.

6. Insert compute sled into chassis and power on the compute sled.
7. Power off the compute sled, Remove the compute sled from chassis.
8. [Remove the system cover.](#)
9. Move the jumper on the system board jumper from pins 4 and 6 to pins 2 and 4.
10. [Install the system cover.](#)
11. Insert the compute sled into chassis and turn the compute sled on.
12. Assign a new system and/or setup password.

# System diagnostics and indicator codes

The diagnostic indicators on the system front panel display system status during system startup.

## Topics:

- [Power button LED](#)
- [Drive indicator codes](#)
- [System health and system ID indicator codes](#)
- [System diagnostics](#)

## Power button LED

The power button LED is located on the front panel of your system.



Figure 88. Power button LED

Table 12. Power button LED

Power button LED indicator code	Condition
Off	System is not operating, regardless of power supply available.
On	System is operating, one or more of the non-standby power supplies are active.
Slowly blinking	System is performing powering on sequence and iDRAC is still booting.

## Drive indicator codes

The LEDs on the drive carrier indicates the state of each drive. Each drive carrier in your system has two LEDs: an activity LED (green) and a status LED (bicolor, green/amber). The activity LED flashes whenever the drive is accessed.



Figure 89. Drive indicators on the drive and the mid drive tray backplane

1. Drive activity LED indicator

2. Drive status LED indicator
3. Drive capacity label

**NOTE:** If the drive is in the Advanced Host Controller Interface (AHCI) mode, the status LED indicator does not turn on.

**Table 13. Drive indicator codes**

Drive status indicator code	Condition
Flashes green twice per second	Identifying drive or preparing for removal.
Off	Drive ready for removal. <b>NOTE:</b> The drive status indicator remains off until all drives are initialized after the system is turned on. Drives are not ready for removal during this time.
Flashes green, amber, and then turns off	Predicted drive failure.
Flashes amber four times per second	Drive failed.
Flashes green slowly	Drive rebuilding.
Solid green	Drive online.
Flashes green for three seconds, amber for three seconds, and then turns off after six seconds	Rebuild stopped.

## System health and system ID indicator codes

The system health and system ID indicator is located on the left control panel of your system.



**Figure 90. System health and system ID indicators**

**Table 14. System health and system ID indicator codes**

System health and system ID indicator code	Condition
Solid blue	Indicates that the system is turned on, system is healthy, and system ID mode is not active. Press the system health and system ID button on left control panel of MX7000 to switch to system ID mode.
Blinking blue	Indicates that the system ID mode is active. Press the system health and system ID button on left control panel of MX7000 to switch to system health mode.
Solid amber	Indicates that the system is in fail-safe mode.
Blinking amber	Indicates that the system is experiencing a fault. Check the System Event Log for specific error messages. For more information about error messages, see the <i>Dell Event and Error Messages Reference Guide</i> at <a href="http://www.dell.com/openmanagemanuals">www.dell.com/openmanagemanuals</a> .

## 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.

## 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>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.



# 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 [Global 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 PowerEdge MX740c system



Figure 91. Quick Resource Locator for PowerEdge MX740c system

## 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 PowerEdgeMX740c system.

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

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

**Table 15. 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> <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 15. Documentation resources**

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 updating drivers and firmware, see the Methods to download firmware and drivers section in this document.	<a href="http://www.dell.com/support/drivers">www.dell.com/support/drivers</a>
Managing your system	For information about systems management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	<a href="https://www.dell.com/poweredgemanuals">https://www.dell.com/poweredgemanuals</a>
	For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	<a href="http://www.dell.com/openmanagemanuals">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">https://www.dell.com/openmanagemanuals</a>
	For information about installing and using Dell SupportAssist, see the Dell EMC SupportAssist Enterprise User's Guide.	<a href="https://www.dell.com/serviceabilitytools">https://www.dell.com/serviceabilitytools</a>
	For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.	<a href="https://www.dell.com/openmanagemanuals">https://www.dell.com/openmanagemanuals</a>
Working with the Dell PowerEdge RAID controllers	For information about understanding the features of the Dell PowerEdge RAID controllers (PERC), Software RAID controllers, or BOSS card and deploying the cards, see the Storage controller documentation.	<a href="http://www.dell.com/storagecontrollermanuals">www.dell.com/storagecontrollermanuals</a>
Understanding event and error messages	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>
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge MX740c system issues, see the Server Troubleshooting Guide.	<a href="https://www.dell.com/poweredgemanuals">https://www.dell.com/poweredgemanuals</a>