

# Dell EMC PowerEdge C6520

## 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.

<b>Chapter 1: About this document.....</b>	<b>6</b>
<b>Chapter 2: Dell EMC PowerEdge C6520 system overview.....</b>	<b>7</b>
Inside the sled .....	7
Rear view of the sled.....	8
Network ports indicator codes.....	9
Sled to hard drive mapping.....	10
C6400 chassis options and drive enumerations.....	11
Locating the Express Service Code and Service Tag.....	15
System information label.....	16
<b>Chapter 3: Initial system setup and configuration.....</b>	<b>19</b>
Setting up the system.....	19
iDRAC configuration.....	19
Options to set up iDRAC IP address.....	19
Options to log in to iDRAC.....	20
Resources to install operating system.....	21
Options to download firmware .....	21
Options to download and install OS drivers .....	22
Downloading drivers and firmware.....	22
<b>Chapter 4: Installing and removing system components.....</b>	<b>23</b>
Safety instructions.....	23
Before working inside your system.....	23
After working inside your system.....	24
Recommended tools.....	24
Sled.....	24
Sled installation guidelines.....	24
Removing a sled .....	25
Installing a sled .....	26
Air shroud.....	28
Removing the air shroud.....	28
Installing the air shroud .....	28
Support bracket.....	29
Removing the support bracket.....	29
Installing the support bracket.....	30
Expansion cards.....	31
Expansion card installation guidelines.....	32
Removing the expansion card riser 1.....	37
Installing the expansion card riser 1.....	37
Removing the expansion card riser 2.....	38
Installing the expansion card riser 2.....	39
Removing an expansion cards.....	40
Installing an expansion card.....	43

Removing the riser card.....	46
Installing the riser card.....	47
LOM riser card.....	49
Removing the LOM.....	49
Installing the LOM .....	50
M.2 SSD module.....	51
Removing the M.2 riser.....	51
Installing the M.2 riser.....	51
Removing the M.2 SSD module.....	52
Installing the M.2 SSD module.....	53
Linking board and PCIe cable.....	54
Removing the linking board and PCIe cable.....	54
Installing the linking board and PCIe cable.....	55
System memory.....	56
System memory guidelines.....	56
General memory module installation guidelines.....	57
Removing a memory module.....	58
Installing a memory module.....	59
Processor and heat sink module.....	60
Removing a processor and heat sink module.....	60
Removing the processor from the processor and heat sink module .....	62
Installing the processor into a processor and heat sink module .....	64
Installing the processor and heat sink module.....	67
Optional OCP card.....	69
Removing the OCP filler.....	69
Installing an OCP card.....	70
Removing an OCP card.....	71
Installing the OCP card filler.....	72
System battery .....	73
Replacing the system battery.....	73
System board.....	75
Removing the system board.....	75
Installing the system board .....	77
Trusted Platform Module.....	80
Upgrading the Trusted Platform Module.....	80
Initializing TPM for users.....	81
Initializing the TPM 1.2 for users.....	81
Initializing the TPM 2.0 for users.....	81
<b>Chapter 5: Upgrade Kits.....</b>	<b>82</b>
<b>Chapter 6: Jumpers and connectors.....</b>	<b>83</b>
System board connectors.....	83
System board jumper settings.....	83
Disabling a forgotten password.....	84
<b>Chapter 7: System diagnostics and indicator codes.....</b>	<b>85</b>
Using system diagnostics.....	85
Dell Embedded System Diagnostics.....	85

<b>Chapter 8: Getting help</b> .....	<b>87</b>
Recycling or End-of-Life service information.....	87
Contacting Dell Technologies.....	87
Accessing system information by using QRL.....	87
Quick Resource Locator for PowerEdge C6520 system.....	88
Receiving automated support with SupportAssist .....	88
 <b>Chapter 9: Documentation resources</b> .....	 <b>89</b>

# About this document

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

# Dell EMC PowerEdge C6520 system overview

The Dell EMC PowerEdge C6520 system is a half-width sled that supports:

- 3<sup>rd</sup> Generation Intel Xeon Scalable processors with up to 40 cores
- 16 DDR4 DIMM slots

**NOTE:** PowerEdge C6520 does not support SAS Expander Backplane configuration.

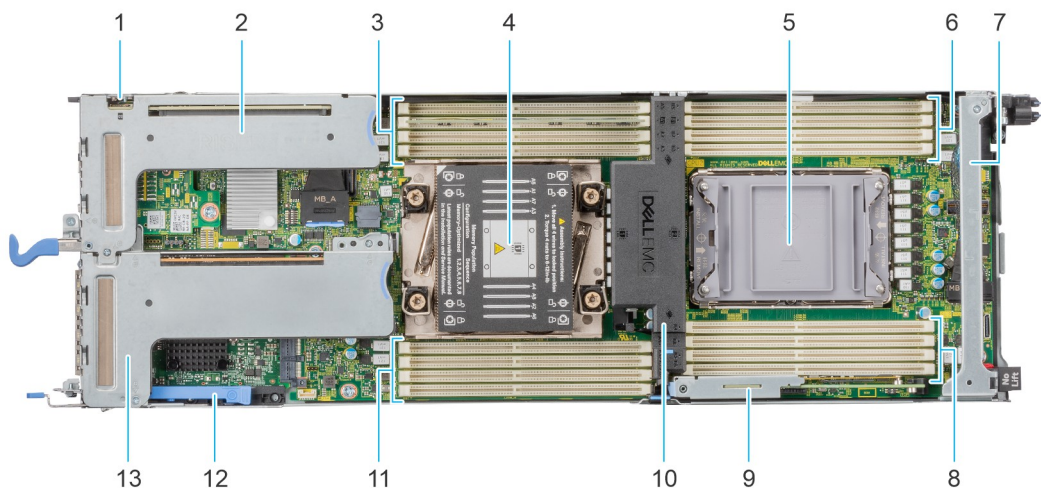
**CAUTION:** Do not install GPUs, network cards, or other PCIe devices on your system that are not validated and tested by Dell. Damage caused by unauthorized and invalidated hardware installation will null and void the system warranty.

**NOTE:** For more information, see the *Dell EMC PowerEdge C6520 Technical Specifications* on the product documentation page.

## Topics:

- Inside the sled
- Rear view of the sled
- Network ports indicator codes
- Sled to hard drive mapping
- C6400 chassis options and drive enumerations
- Locating the Express Service Code and Service Tag
- System information label

## Inside the sled



**Figure 1. Inside view of the PowerEdge C6520 sled**

- |   |  |
|---|--|
| 1. uSD card slot                          | 2. Expansion card riser 1 (R1a or R1b)   |
| 3. Memory module sockets for processor 1  | 4. Processor and heat sink module 1      |
| 5. Processor and heat sink module 2 blank | 6. Memory module sockets for processor 2 |
| 7. Support bracket                        | 8. Memory module sockets for processor 2 |
| 9. M.2 riser                              | 10. Air shroud                           |

**NOTE:** Supports M.2 SATA card/BOSS card S1V5

- 11. Memory module sockets for processor 1
- 13. Expansion card riser 2 (R2)

- 12. OCP 3.0 card retention latch

## Rear view of the sled

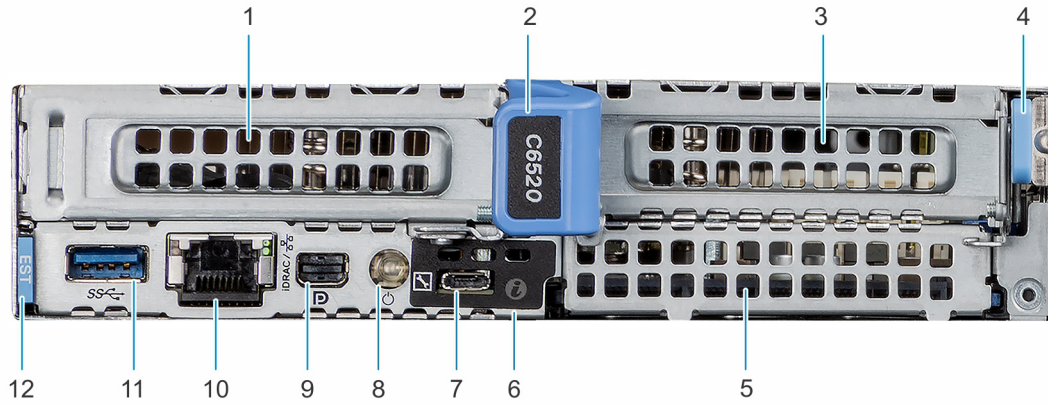


Figure 2. Rear view of the sled

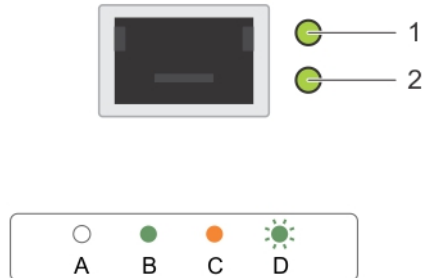
Table 1. Rear view of the sled

Item	Ports, panels, or slots	Icon	Description
1	PCIe expansion card riser 1 (R1a or R1b)	N/A	Enables you to connect PCI Express expansion cards.
2	Sled release handle	N/A	Enables you to remove the sled from the enclosure.
3	PCIe expansion card riser 2 (R2)	N/A	Enables you to connect PCI Express expansion cards.
4	Sled release lock	N/A	Enables you to remove the sled from the enclosure.
5	OCP 3.0	N/A	This port supports OCP 3.0. The NIC ports are integrated on the OCP card which is connected to the system board.
6	System identification LED		The System Identification(ID) LED is available on the back of the system. Press the system ID button on the front of the enclosure to identify a system in a rack.
7	iDRAC Direct port (Micro-AB USB)		Enables you to remotely access iDRAC. For more information, see the iDRAC User's Guide at <a href="http://www.dell.com/poweredgemanuals">www.dell.com/poweredgemanuals</a> .
8	Sled power button	N/A	Enables you to power on the sled while accessing it from the rear.
9	Mini-DisplayPort		Enables you to connect a display device to the system.
10	iDRAC or NIC or RJ45 port		The NIC ports that are integrated on the system board provide network connectivity. These NIC ports can also be shared with iDRAC when iDRAC network settings is set to shared mode. or Enables you to remotely access iDRAC. For more information, see the iDRAC User's Guide at <a href="http://www.dell.com/poweredgemanuals">www.dell.com/poweredgemanuals</a> .
11	USB 3.0 port		This port is USB 3.0-compliant.
12	Information tag	N/A	The Information tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address, and so on. If you have opted for the secure default access to iDRAC, then the Information tag will also contain the iDRAC secure default password.



**NOTE:** For more information, see the *Dell EMC PowerEdge C6520 Technical Specifications* on the product documentation page.

## Network ports indicator codes



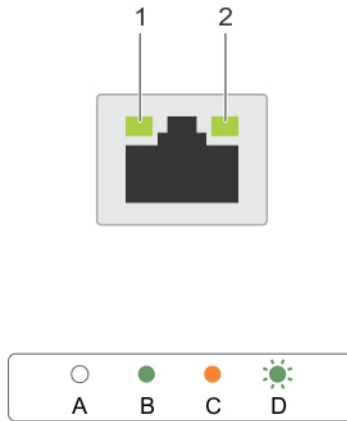
**Figure 3. LAN indicators on the QSFP OCP card**

1. Link indicator
2. Activity indicator

**Table 2. QSFP port on OCP card indicator codes**

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

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



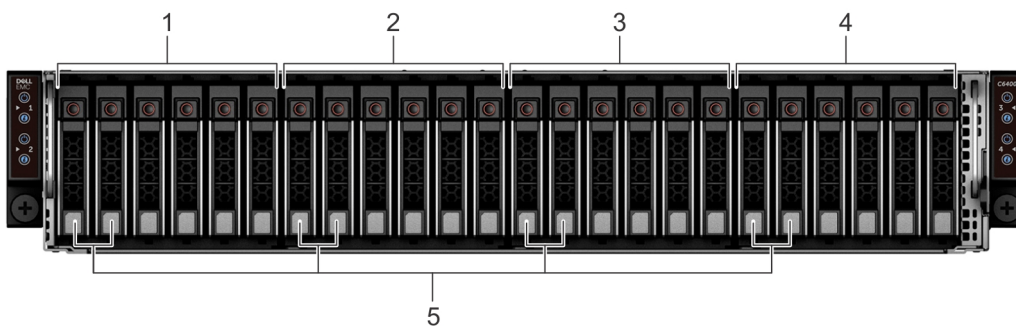
**Figure 4. Ethernet port indicator codes**

1. Speed indicator
2. Link and activity indicator

**Table 3. Ethernet port indicator codes**

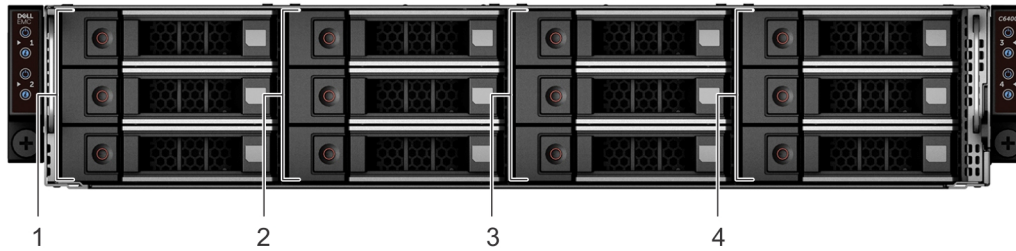
Convention	Status	Condition
A	Link and activity indicators are off	The NIC is not connected to the network.
B	Link indicator is green	The NIC is connected to a valid network at its maximum port speed.
C	Link indicator is amber	The NIC is connected to a valid network at less than its maximum port speed.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

## Sled to hard drive mapping



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

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



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

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

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

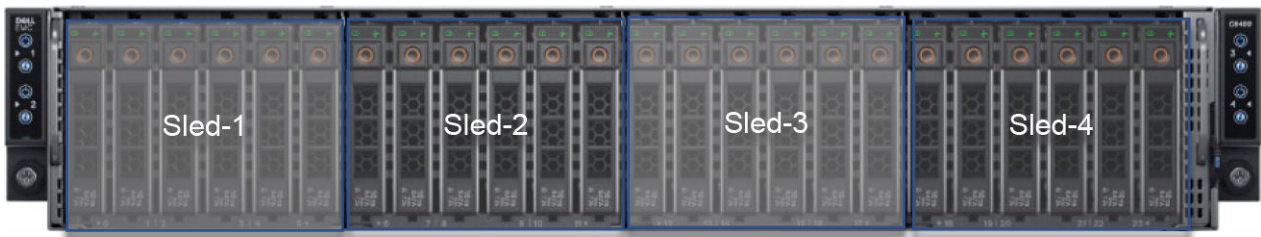
## C6400 chassis options and drive enumerations

### C6400 chassis - 24 x 2.5-inch NVMe drive configuration

The C6400 chassis with 24 x 2.5-inch NVMe drive configuration supports NVMe backplane and up to six NVMe drives per sled and a total of 24 NVMe drives per chassis.

**NOTE:**

- The NVMe backplane supports only NVMe drives, It does not support SAS/SATA drives.
- The NVMe backplane is PCIe Gen4 capable and can support both Gen4 and Gen3 NVMe drives. It is not recommended to install all Gen3 drives on the NVMe backplane since each drive gets only x2 Gen4 lanes (compared to x4 Gen3 lanes in the existing NVMe backplane), which impact the drive read/write performance.
- For Gen3 drive installation, It is recommended to install up to eight NVMe drives for 24 x 2.5-inch NVMe backplane.



**Figure 7. C6400 chassis - 24 x 2.5-inch NVMe backplane with four C6520 sleds, each up to 6 NVMe drives**

### C6400 chassis - 24 x 2.5-inch SAS/SATA drive configuration

The C6400 chassis with 24 x 2.5-inch SAS/SATA drive configuration supports SAS/SATA backplane and up to six SAS/SATA drives per C6520 sled and a total of 24 SAS/SATA drives per chassis.

**NOTE:**

- The chassis is optimized for High-Performance Computing (HPC), High Performance Data Analytics (HPDA), Saas/IaaS, Financial Modeling, vSAN.
- Using an M.2 boot drive in each C6520 sled enables use of front 2.5-inch drives entirely for application data.
- An NVMe PCI card can be used in the LP slot in each C6520 to provide high performance storage for say writes/cache.



Figure 8. C6400 chassis - 24 x 2.5-inch SAS/SATA backplane with four C6520 sleds, each up to 6 SAS/SATA drives

C6400 chassis - 24 x 2.5-inch SAS/SATA backplane - Drive enumeration

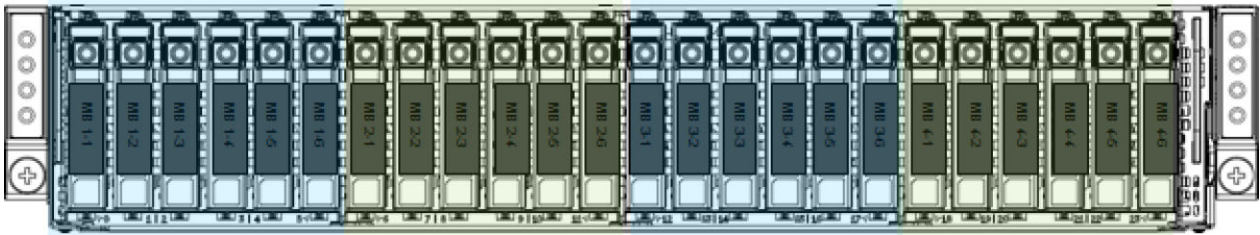


Figure 9. 2.5-inch drives (24) with four C6520 sleds



Figure 10. 2.5-inch drives (24) with three C6520 sleds

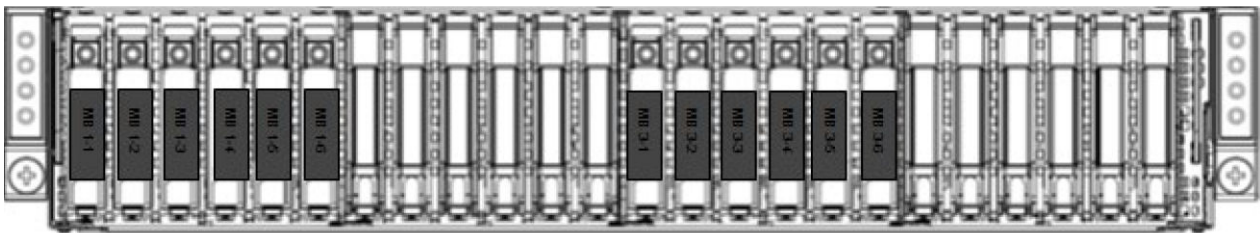


Figure 11. 2.5-inch drives (24) with two C6520 sleds (Sleds 1 and 3)

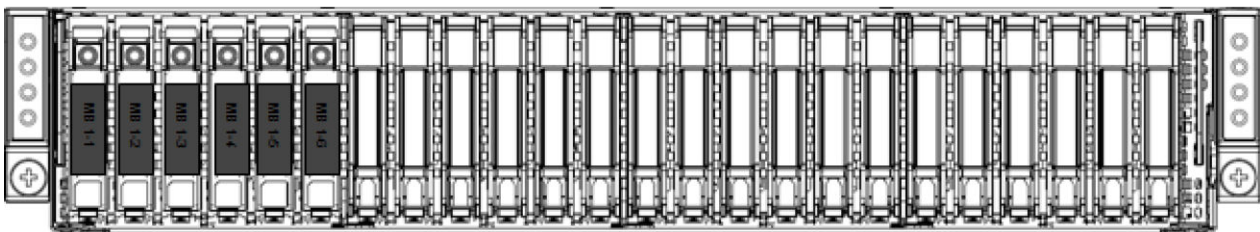


Figure 12. 2.5-inch drives (24) with one C6520 sled

### C6400 chassis - 24 x 2.5-inch SAS/SATA/ 8 x 2.5-inch NVMe drive configuration

The C6400 chassis with 24 x 2.5-inch SAS/SATA or NVMe backplane drive configuration enables a total of 24 x 2.5-inch drives and up to 6 drives per C6520 sled. Each sled has two universal drive slots which can use NVMe drives or SAS/SATA drives; rest of the 4 drive slots can be SAS/SATA drives.

- The chassis is optimized for High-Performance Computing (HPC), High Performance Data Analytics (HPDA), SaaS/IaaS, Financial Modeling, HCI, vSAN, HPDA, SDS.
- Using an M.2 boot drive in each C6520 sled enables use of front 2.5-inch drives entirely for application data.

The C6400 chassis with NVMe backplane supports the following configurations:

- One to four C6520 sleds, each with up to 2 x 2.5-inch NVMe SSDs and 4 x 2.5-inch SAS/SATA drives.
- First two drives for each sled can be NVMe or SAS/SATA drives. The rest of the drives can be SAS or SATA drives only.

**NOTE:**

### C6400 chassis - 24 x 2.5-inch SAS/SATA/ 8 x 2.5-inch NVMe drive configuration - Drive enumeration

The below images shows the each C6520 sled with only first two drive slots can be populated with NVMe drives (or SAS/SATA drives). The rest of the slots for each sled only support SAS/SATA drives.

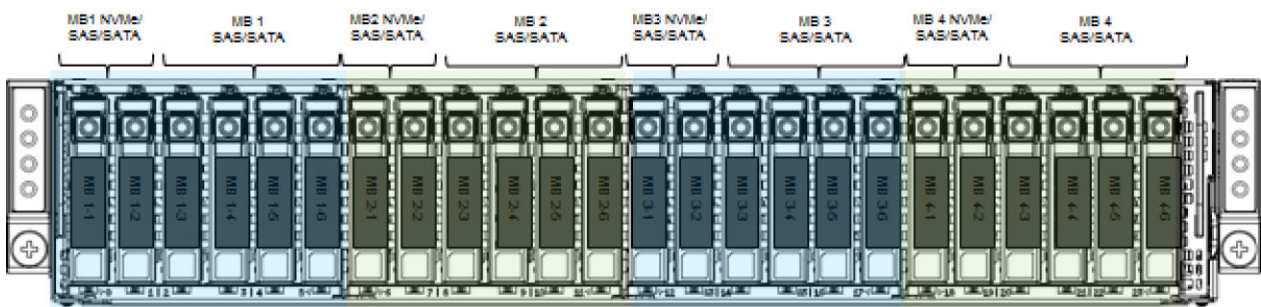


Figure 13. 2.5-inch NVMe backplane chassis with four C6520 sleds, each up to 2 NVMe drives

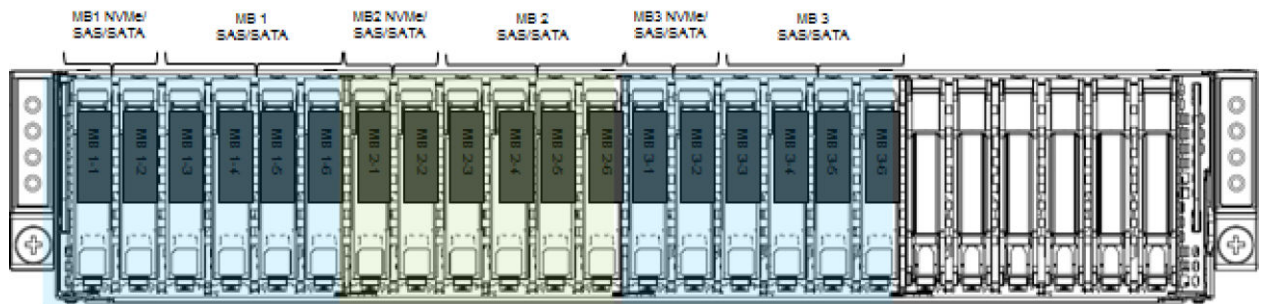


Figure 14. 2.5-inch NVMe backplane chassis with three C6520 sleds, each up to 2 NVMe drives

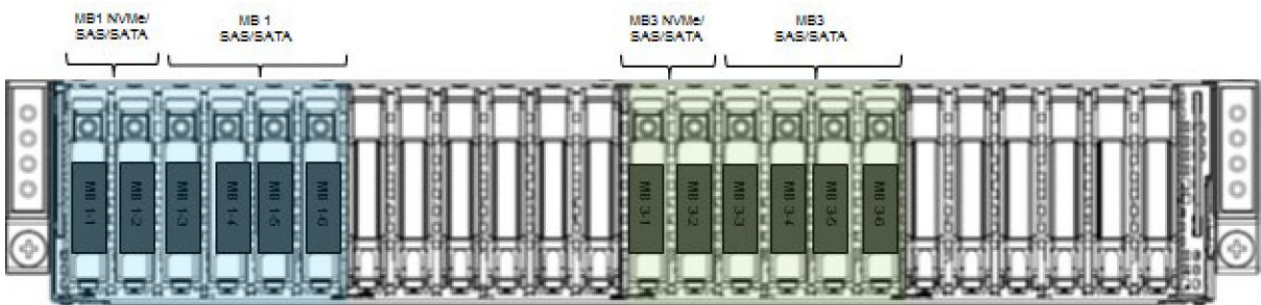
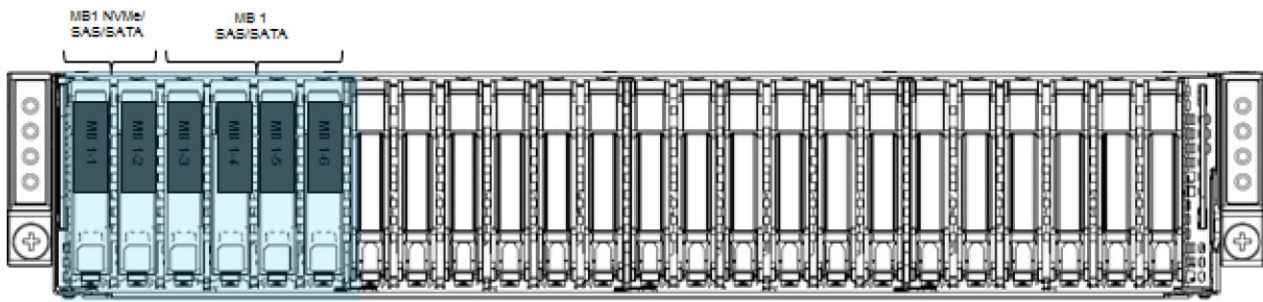


Figure 15. 2.5-inch NVMe backplane chassis with two C6520 sleds, each up to 2 NVMe drives

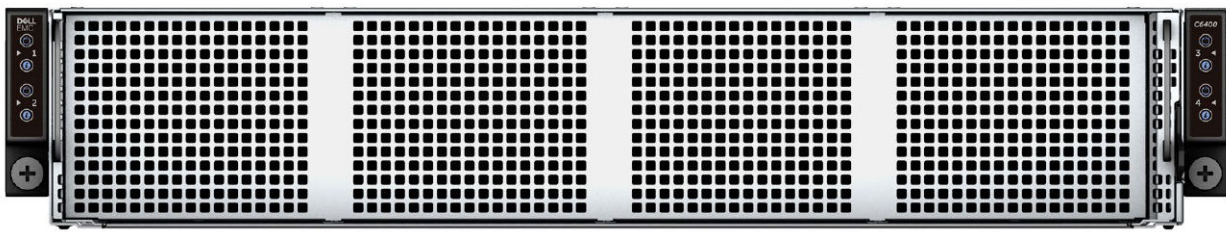


**Figure 16. 2.5-inch NVMe backplane chassis with one C6520 sled with up to 2 NVMe drives**

### C6400 chassis - No backplane

The C6400 chassis with No-backplane configuration is optimized for use cases that require little to no local storage and primarily use external storage. Each C6520 sled in this chassis can still be optionally configured with a local M.2 boot drive. This chassis does not come with a drive backplane and no front drives are supported for any C6520 sled. Not having a drive backplane maximizes air flow to the C6520 sleds, hence this configuration is the most thermally flexible among all chassis options.

The C6400 chassis with No-backplane a good fit for use cases such as HPC, High Frequency Trading, SaaS/laaS with external storage, Hadoop data node with external HDFS storage (such as Isilon).



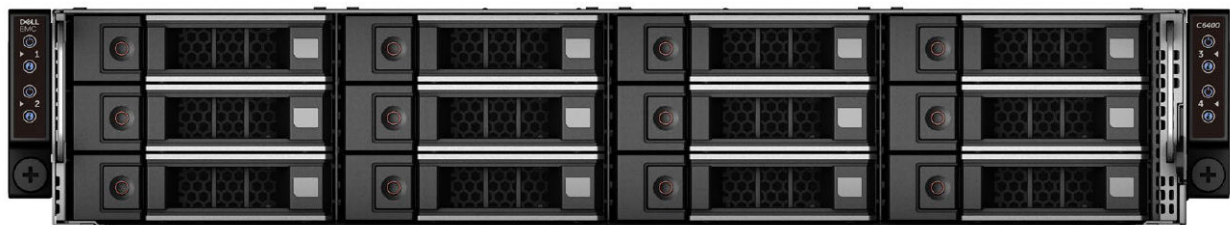
**Figure 17. C6400 chassis - No backplane**

### C6400 chassis - 12 x 3.5-inch Direct Backplane drive configuration

The C6400 chassis with 12 x 3.5-inch direct backplane enables a total of 12 drives and up to 3 drives per C6520 sled.

**NOTE:**

- The chassis is optimized for high performance compute and cost effective large capacity storage.
- Using an M.2 boot drive in each C6520 sled enables use of front 3.5-inch drives entirely for application data.
- an NVMe PCI card can be used in the LP slot in each C6520 to provide high performance storage for say writes/cache. This makes the C6400 chassis with a 3.5-inch backplane a good fit for use cases such as Software Defined Storage, Hyper Converged Infrastructure, High Performance Computing nodes that need large storage.



**Figure 18. C6400 chassis - 12 x 3.5-inch Direct backplane**

### C6400 chassis - 3.5-inch Direct backplane chassis - Drive enumeration



Figure 19. 3.5-inch drives (12) with four 1U sleds



Figure 20. 3.5-inch drives (12) with three 1U sleds

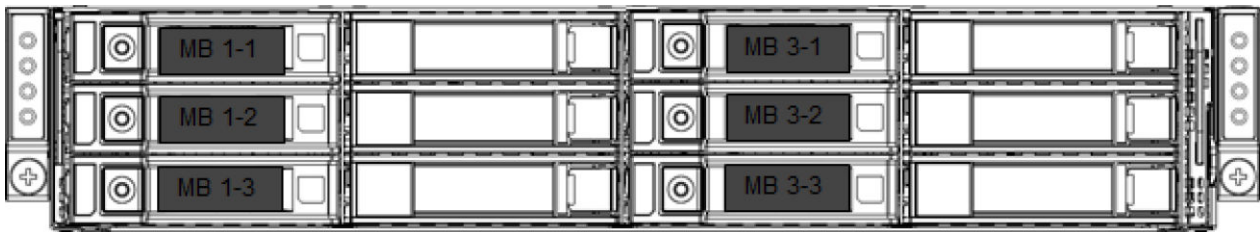


Figure 21. 3.5-inch drives (12) with two 1U sleds

## Locating the Express Service Code and Service Tag

The unique Express Service Code and Service Tag are used to identify the system.

The information tag is located on the front of the system rear of the system that includes system information such as the Service Tag, Express Service Code, Manufacture date, NIC, MAC address, QRL label, and so on.



Figure 22. Locating the Service Tag of your system

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

The Mini Enterprise Service Tag (MEST) label is located on the rear of the system that includes the Service Tag (ST), Express Service Code (Exp Svc Code), and Manufacture Date (Mfg. Date). The Exp Svc Code is used by Dell EMC to route support calls to the appropriate personnel.

Alternatively, the Service Tag information is located on a label on the left wall of the chassis.

## System information label

### Electrical Overview

**System Board Connections**

<ul style="list-style-type: none"> <li><b>1</b> Rear USB 3.0 Connector</li> <li><b>2</b> PCIe Gen 4 x16 Slot 1 / SNAPI</li> <li><b>3</b> NPIO 2 SATA Connector (NPIO2_PCH_SA0)</li> <li><b>4</b> Coin Cell Battery</li> <li><b>5</b> DIMMs for CPU 1 Channels A, B, C, D</li> <li><b>6</b> CPU 1</li> <li><b>7</b> DIMMs for CPU 1 Channels E, F, G, H</li> <li><b>8</b> DIMMs for CPU 2 Channels A, B, C, D</li> <li><b>9</b> CPU2</li> <li><b>10</b> DIMMs for CPU 2 Channels E, F, G, H</li> <li><b>11</b> Slimline Connector 1 (SL1_CPU2_PA0)</li> <li><b>12</b> Slimline Connector 2 (SL2_CPU2_PB0)</li> <li><b>13</b> NPIO 3 PCIe Connector (NPIO3_CPU2_PB0)</li> </ul>	<ul style="list-style-type: none"> <li><b>14</b> Power Connector</li> <li><b>15</b> BOSS Card / SATA M.2 Connector</li> <li><b>16</b> PCIe Gen 4 x16 Slot 2</li> <li><b>17</b> TPM Connector</li> <li><b>18</b> Leak Sensor Connector</li> <li><b>19</b> OCP NIC 3.0 Connector</li> <li><b>20</b> BCM5720 on LOM card BTB</li> <li><b>21</b> Password Enable Jumper</li> <li><b>22</b> NVRAM Clear Jumper</li> <li><b>23</b> UID LED</li> <li><b>24</b> iDRAC Direct (Micro-AB USB)</li> <li><b>25</b> Power Button</li> <li><b>26</b> Mini DP Connector</li> <li><b>27</b> Shared LAN</li> </ul>
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Scan to see hardware servicing and software setup videos, how-to's, and documentation.

Quick Resource Locator

Dell.com/QRL/Server/PEC6520

### Jumper Settings

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

Figure 23. System board connections and Jumper settings



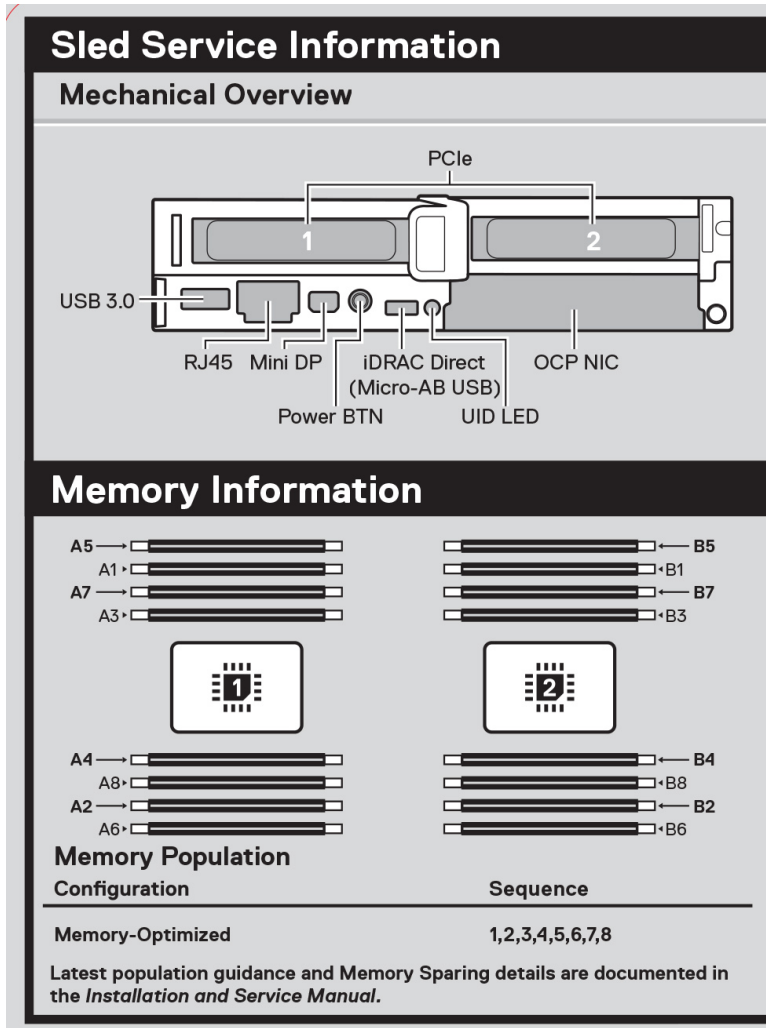


Figure 24. Mechanical Overview and Memory information

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

**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 came with the product.

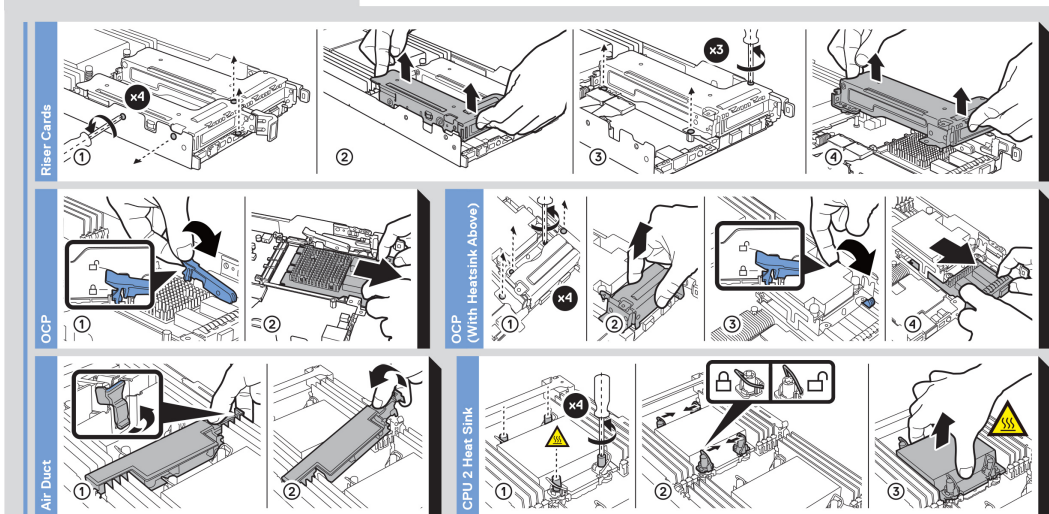


Figure 25. System tasks: Riser cable, OCP and Air shroud

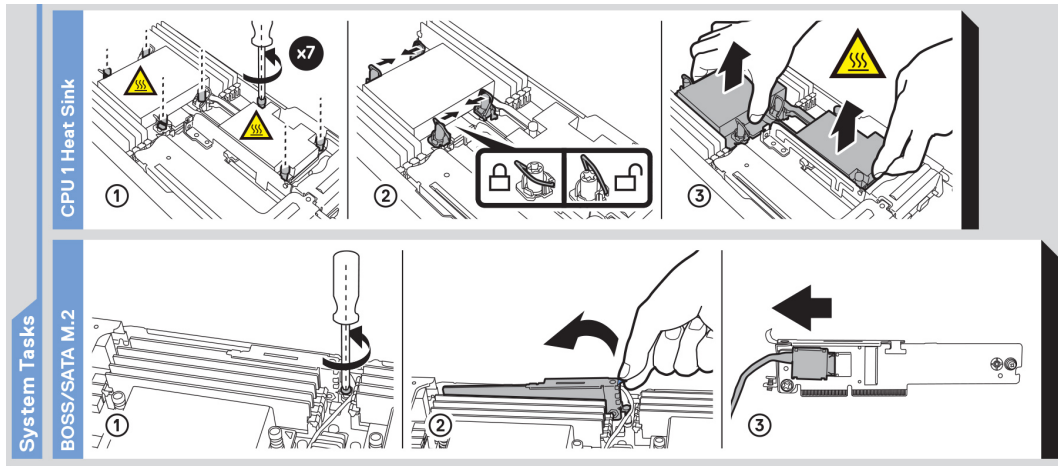


Figure 26. System tasks: Processor 1 heat sink and BOSS / SATA M.2

# Initial system setup and configuration

This section describes the tasks for initial setup and configuration of the Dell EMC system. The section also provides general steps to set up the system and the reference guides for detailed information.

## Topics:


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

## Setting up the system


Perform the following steps to set up the 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. Power on the enclosure.


 **NOTE:** Wait for the enclosure to initialize before powering on the enclosure.

5. Power on the sled.

Alternatively, you can also power on the system by using iDRAC by any of the below :

- For more information about powering on the system using iDRAC, see the [Options to log in to iDRAC](#).
- Open OpenManage Enterprise-Modular (OME-M 1.3 or later versions), after the iDRAC is configured on the OME. For more information, see the *OME-Modular User's Guide* at <https://www.dell.com/poweredgemanuals>.

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


 **NOTE:** For information about managing the basic settings and features of the system, see the *Dell EMC PowerEdge C6520 BIOS and UEFI Reference Guide* on the product documentation page.

## iDRAC configuration

The Integrated Dell Remote Access Controller (iDRAC) is designed to make you more productive as a system administrator and improve the overall availability of Dell EMC servers. iDRAC alerts you to system issues, helps you to perform remote management, and reduces the need for physical access to the system.

### Options to set up iDRAC IP address

To enable communication between your system and iDRAC, you must first configure the network settings based on your network infrastructure. The network settings option is set to **DHCP**, by default.

 **NOTE:** For static IP configuration, you must request for the settings at the time of purchase.

You can set up the iDRAC IP address using one of the interfaces in the table below. For information about setting up iDRAC IP address, see the documentation links provided in the table below.

**Table 4. Interfaces to set up iDRAC IP address**

Interface	Documentation links
iDRAC Settings utility	<p><i>Integrated Dell Remote Access Controller User's Guide</i> at <a href="https://www.dell.com/idracmanuals">https://www.dell.com/idracmanuals</a> or for system specific <i>Integrated Dell Remote Access Controller User's Guide</i>, go to <a href="https://www.dell.com/poweredgemanuals">https://www.dell.com/poweredgemanuals</a> &gt; <b>Product Support</b> page of your system &gt; <b>Documentation</b>.</p> <p><b>NOTE:</b> To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article <a href="https://www.dell.com/support/article/sln308699">https://www.dell.com/support/article/sln308699</a>.</p>
OpenManage Deployment Toolkit	<p><i>Dell EMC OpenManage Deployment Toolkit User's Guide</i> available at <a href="https://www.dell.com/openmanagemanuals">https://www.dell.com/openmanagemanuals</a> &gt; Open Manage Deployment Toolkit.</p>
iDRAC Direct	<p><i>Integrated Dell Remote Access Controller User's Guide</i> at <a href="https://www.dell.com/idracmanuals">https://www.dell.com/idracmanuals</a> or for system specific <i>Integrated Dell Remote Access Controller User's Guide</i>, go to <a href="https://www.dell.com/poweredgemanuals">https://www.dell.com/poweredgemanuals</a> &gt; <b>Product Support</b> page of your system &gt; <b>Documentation</b>.</p> <p><b>NOTE:</b> To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article <a href="https://www.dell.com/support/article/sln308699">https://www.dell.com/support/article/sln308699</a>.</p>
Lifecycle Controller	<p><i>Lifecycle Controller User's Guide</i> at <a href="https://www.dell.com/idracmanuals">https://www.dell.com/idracmanuals</a> or for system specific <i>Lifecycle Controller User's Guide</i>, go to <a href="https://www.dell.com/poweredgemanuals">https://www.dell.com/poweredgemanuals</a> &gt; <b>Product Support</b> page of your system &gt; <b>Documentation</b>.</p> <p><b>NOTE:</b> To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article <a href="https://www.dell.com/support/article/sln308699">https://www.dell.com/support/article/sln308699</a>.</p>

**NOTE:** To access iDRAC, ensure that you connect the ethernet cable to the iDRAC dedicated network port or use the iDRAC Direct port by using the USB cable. You can also access iDRAC through the shared mode, if the system is set it to share iDRAC port with OS as an OS NIC or shared LOM mode enabled.

## Options to log in to iDRAC

To log in to the iDRAC Web User Interface, open a browser and enter the IP address.

You can log in to iDRAC as:

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

In the login screen displayed, if you have opted for secure default access to iDRAC, enter the iDRAC secure default password available on back of the Information Tag. If you have not opted for secure default access to iDRAC, enter the default user name and password – `root` and `calvin`. You can also log in by using your Single Sign-On or Smart Card.

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

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

**NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article <https://www.dell.com/support/article/sln308699>.



You can also access iDRAC using command-line protocol - RACADM. For more information, see the *iDRAC with Lifecycle Controller RACADM CLI Guide* available at [www.dell.com/idracmanuals](http://www.dell.com/idracmanuals).


You can also access iDRAC using automation tool - Redfish API. For more information, see the *iDRAC9 with Lifecycle Controller Redfish API Guide* available at <https://www.dell.com/idracmanuals>.

## Resources to install operating system

If the system is shipped without an operating system, you can install a supported operating system by using one of the resources provided in the table below. For information about how to install the operating system, see the documentation links provided in the table below.

**Table 5. Resources to install the operating system**

Resource	Documentation links
iDRAC	<i>Integrated Dell Remote Access Controller User's Guide</i> at <a href="https://www.dell.com/idracmanuals">https://www.dell.com/idracmanuals</a> or for system specific <i>Integrated Dell Remote Access Controller User's Guide</i> , go to <a href="https://www.dell.com/poweredgemanuals">https://www.dell.com/poweredgemanuals</a> > <b>Product Support</b> page of your system > <b>Documentation</b> .  <b>NOTE:</b> To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article at <a href="https://www.dell.com/support/article/sln308699">https://www.dell.com/support/article/sln308699</a> .
Lifecycle Controller	<i>Lifecycle Controller User's Guide</i> at <a href="https://www.dell.com/idracmanuals">https://www.dell.com/idracmanuals</a> or for system specific <i>Lifecycle Controller User's Guide</i> , go to <a href="https://www.dell.com/poweredgemanuals">https://www.dell.com/poweredgemanuals</a> > <b>Product Support</b> page of your system > <b>Documentation</b> . Dell recommends using Lifecycle Controller to install the OS, since all required drivers are installed on the system.  <b>NOTE:</b> To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article at <a href="https://www.dell.com/support/article/sln308699">https://www.dell.com/support/article/sln308699</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>

 **NOTE:** For more information about Installation and How-to videos for supported operating systems on PowerEdge system, see [Supported Operating Systems for Dell EMC PowerEdge systems](#).

## Options to download firmware

You can download firmware from the Dell support site. For information about downloading firmware, see the [Downloading drivers and firmware](#) section.

You can also choose any one of the following options to download the firmware. For information about how to download the firmware, see the documentation links provided in the table below.


**Table 6. Options to download firmware**

Option	Documentation link
Using Integrated 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 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>

## Options to download and install OS drivers

You can choose any one of the following options to download and install OS drivers. For information about how to download or install OS drivers, see the documentation links provided in the table below.

**Table 7. Options to download and install OS drivers**

Option	Documentation
Dell EMC support site	<a href="#">Downloading drivers and firmware</a> section.
iDRAC virtual media	<i>Integrated Dell Remote Access Controller User's Guide</i> at <a href="https://www.dell.com/idracmanuals">https://www.dell.com/idracmanuals</a> or for system specific <i>Integrated Dell Remote Access Controller User's Guide</i> , go to <a href="https://www.dell.com/poweredgemanuals">https://www.dell.com/poweredgemanuals</a> > <b>Product Support</b> page of your system > <b>Documentation</b> .  <b>NOTE:</b> To determine the most recent iDRAC release for your platform and for latest documentation version, see <a href="https://www.dell.com/support/article/sln308699">https://www.dell.com/support/article/sln308699</a> .


## Downloading drivers and firmware

It is recommended that you download and install the latest BIOS, drivers, and systems management firmware on the system.

### Prerequisites

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

### Steps

1. Go to [www.dell.com/support/drivers](http://www.dell.com/support/drivers).
2. Enter the Service Tag of the system in the **Enter a Dell Service Tag, Dell EMC Product ID or Model** field, and then press Enter.  
 **NOTE:** If you do not have the Service Tag, click **Browse all products**, and navigate to your product.
3. On the displayed product page, click **Drivers & Downloads**.  
On the **Drivers & Downloads** page, all drivers that are applicable to the 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 system
- After working inside your system
- Recommended tools
- Sled
- Air shroud
- Support bracket
- Expansion cards
- LOM riser card
- M.2 SSD module
- Linking board and PCIe cable
- System memory
- Processor and heat sink module
- Optional OCP card
- System battery
- System board
- Trusted Platform Module

## Safety instructions

**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.

**NOTE:** While replacing faulty storage controller, FC, or NIC card with the same type of card, after you power on the system; the new card automatically updates to the same firmware and configuration of the faulty one. For more information about the Part replacement configuration, see the *Lifecycle Controller User's Guide* at <https://www.dell.com/idracmanuals>.

## Before working inside your system

### Prerequisites

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

### Steps

1. Power off the sled.
2. Remove the sled from the enclosure.

# After working inside your system

## Prerequisites

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

## Steps

1. If applicable, remove the I/O connector cover from the system connectors. Install the sled into the enclosure.
2. Reconnect the peripherals and connect the system to the electrical outlet, and then power on the system.

## Recommended tools


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


- Phillips #1 screwdriver
- Phillips #2 screwdriver
- 5 mm hex nut screwdriver
- Plastic scribe
- 1/4-inch flat blade screwdriver
- Wrist grounding strap connected to the ground
- ESD mat
- Needle-nose pliers

## Sled

### Sled installation guidelines

 **CAUTION:** Ensure that the chassis does not have a mixed architecture of PowerEdge C6420, PowerEdge C6525 and PowerEdge C6520 sled configurations.

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

 **NOTE:** For optimized thermal operation, do not mix single processor and dual processor sleds within the same chassis.

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



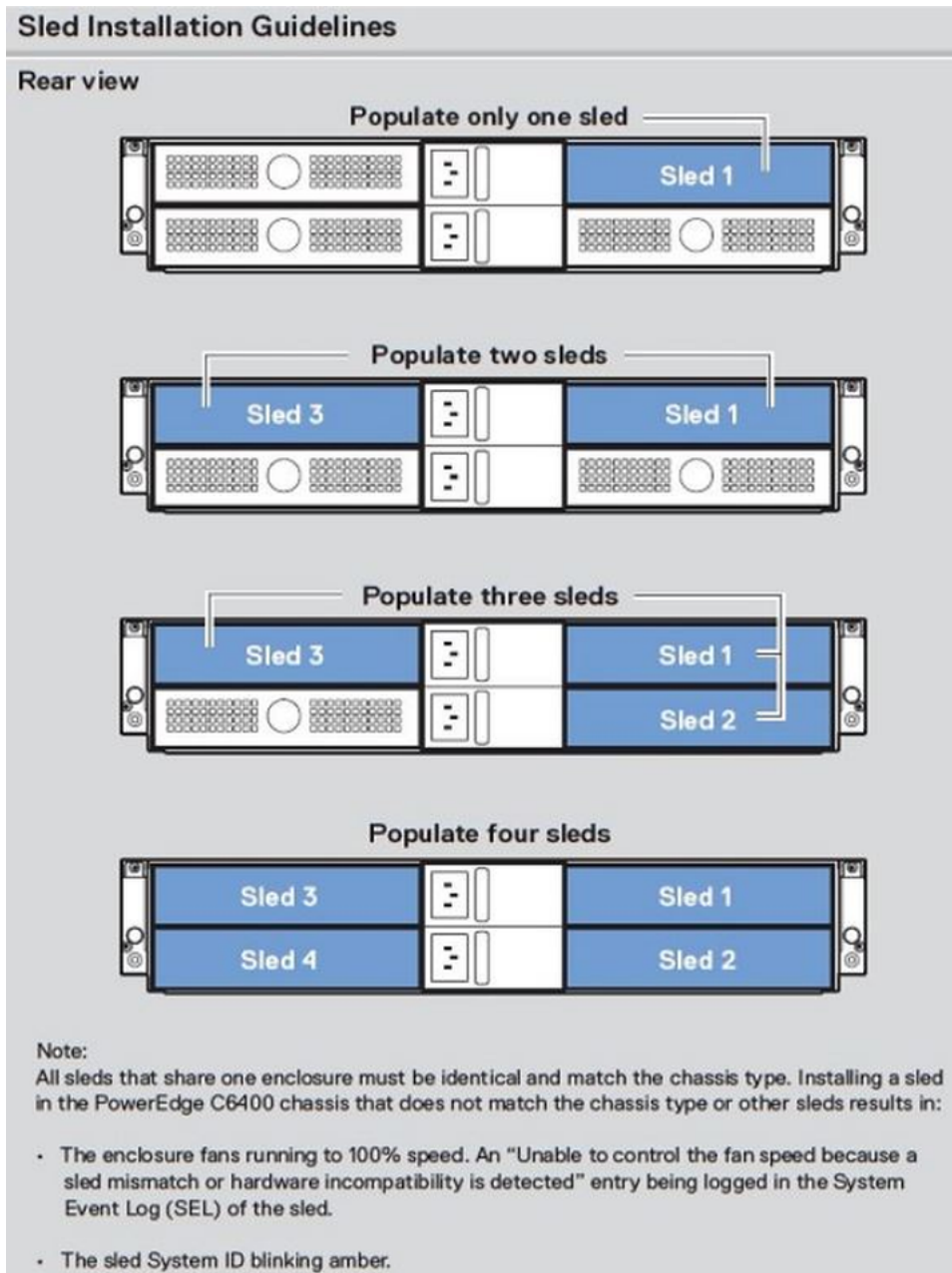


Figure 27. Sled Installation Guidelines

## Removing a sled

### Prerequisites

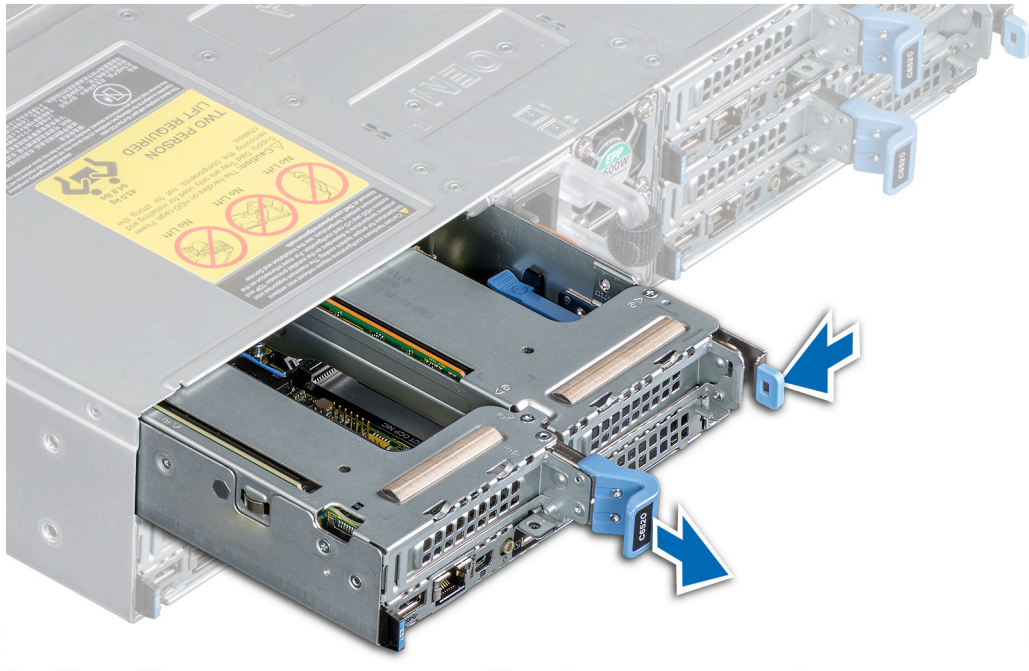
Follow the safety guidelines listed in [Safety Instructions](#).

**NOTE:** The procedure to remove a sled blank or a sled is similar.

### Steps

1. Holding the sled handle, press the retention latch on the sled to release the sled.
2. Slide the sled out of the enclosure.

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



**Figure 28. Removing a sled**

**Next steps**

Replace the sled.

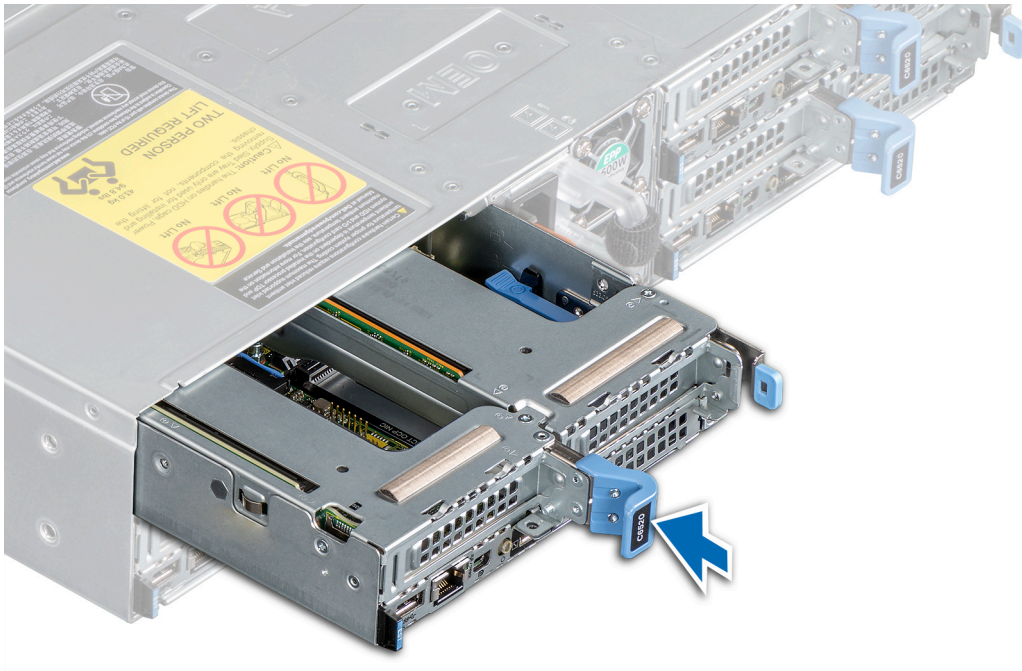
## Installing a sled

**Prerequisites**

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

**Steps**

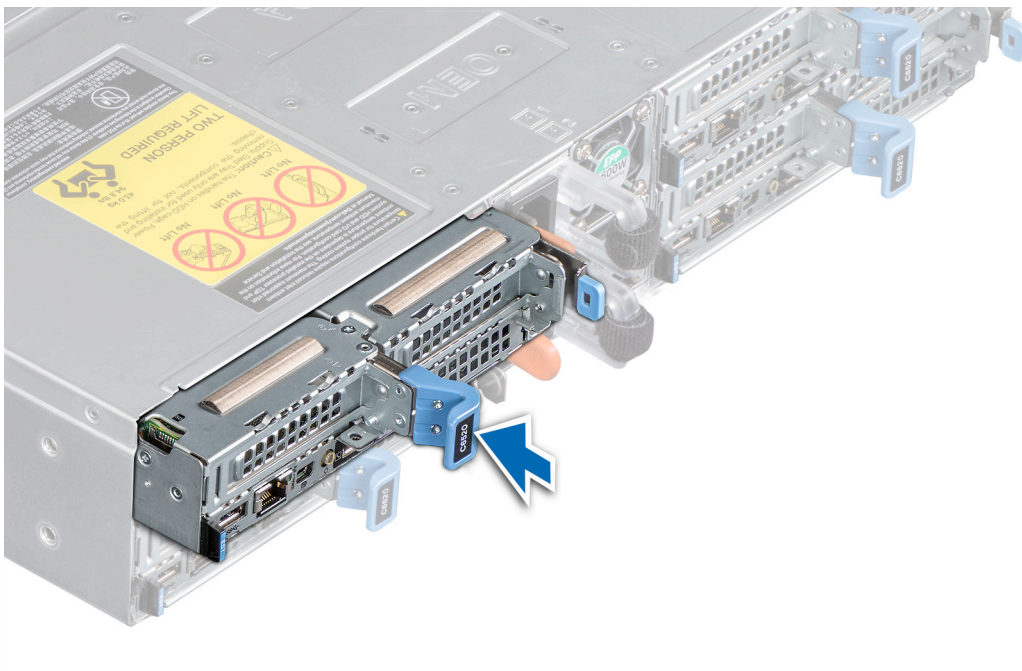
1. Holding the sled with both hands, align the sled with the sled-bay in the enclosure.



**Figure 29. Installing a sled**

2. Insert the sled into the enclosure. Using the sled handle, slide the sled and stop at 20-30mm before completing the insertion of the sled as shown in the image below.

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



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

3. Using the sled handle, slide the sled until it locks into place.

# Air shroud

## Removing the 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 system](#).

### Steps

1. Press the blue clip and lift the air shroud.
2. Disengage the air shroud hook from the slot on the chassis and remove the air shroud.

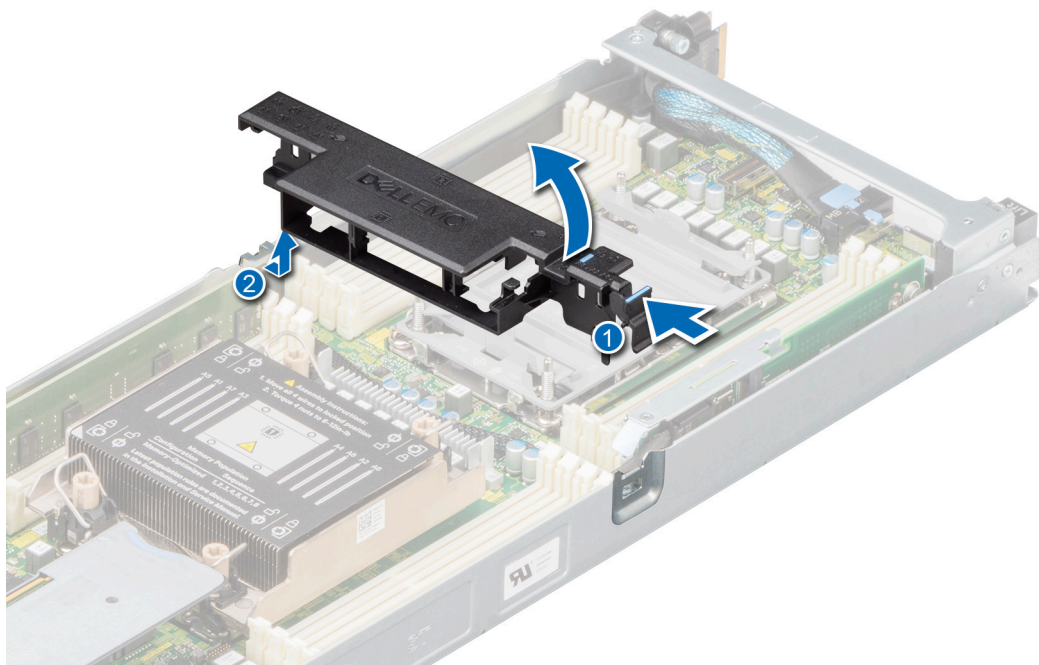


Figure 31. Removing the air shroud

### Next steps

Install the air shroud.

## Installing the air shroud

### Prerequisites

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

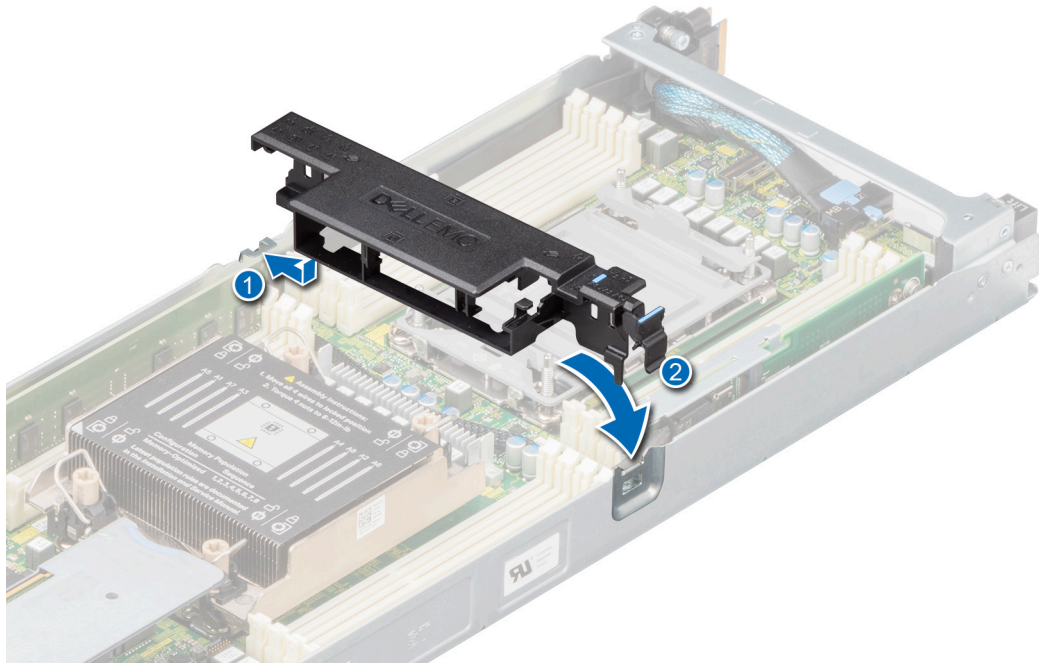
### Steps

1. Insert the hook on the air shroud into the slot on the chassis.

**NOTE:** Ensure that the SATA cables are routed behind the air shroud clip.

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

2. Lower the air shroud until the blue clip locks in place.



**Figure 32. Installing the air shroud**

### Next steps

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

## Support bracket

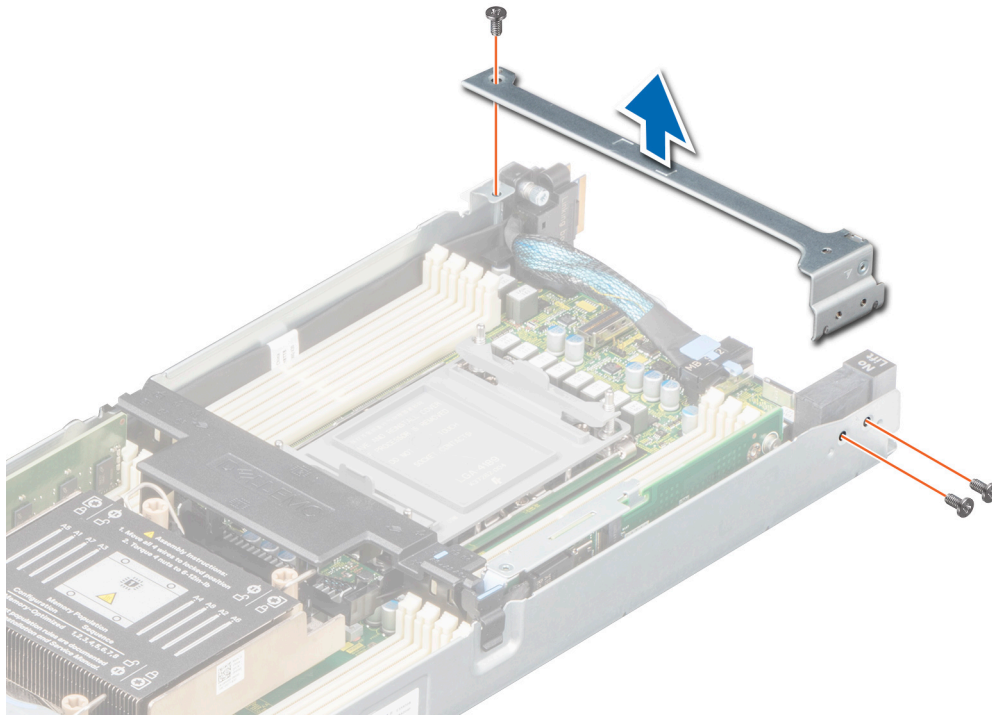
### Removing the support bracket

#### Prerequisites

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

#### Steps

1. Using the Phillips #1 screwdriver, remove the screws that secure the support bracket to the chassis.



**Figure 33. Removing the support bracket**

2. Remove the support bracket from the chassis.

#### **Next steps**

Replace the support bracket.

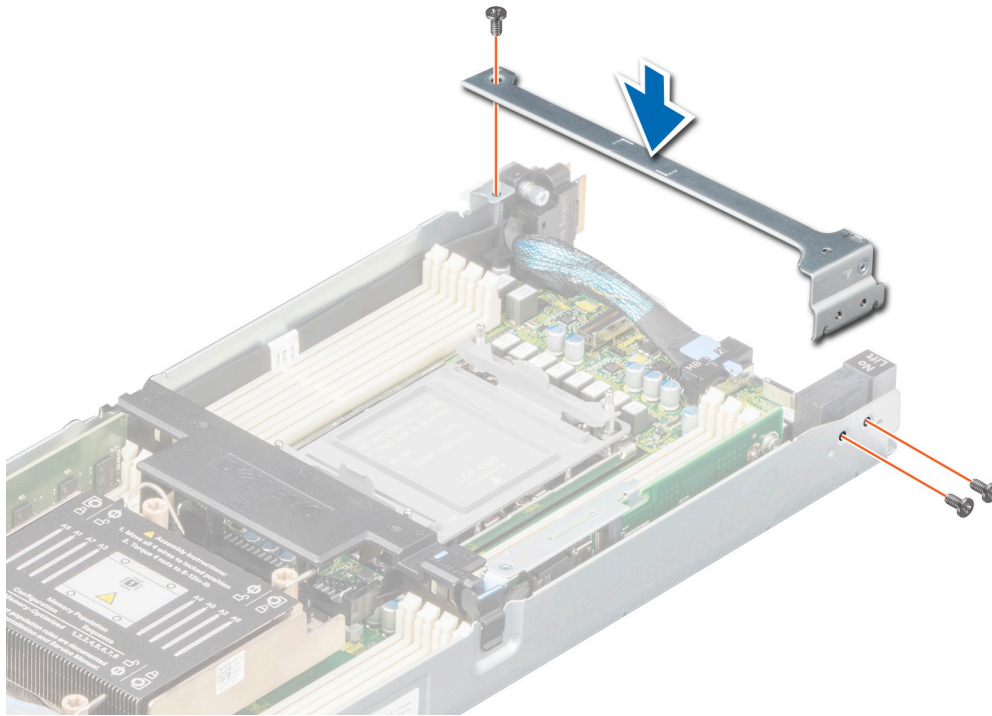
## **Installing the support bracket**

#### **Prerequisites**

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

#### **Steps**

1. Align the support bracket with the stand off on the chassis.
2. Using a Phillips #1 screwdriver, tighten the screws that secure the support bracket to the chassis.



**Figure 34. Installing the support bracket**

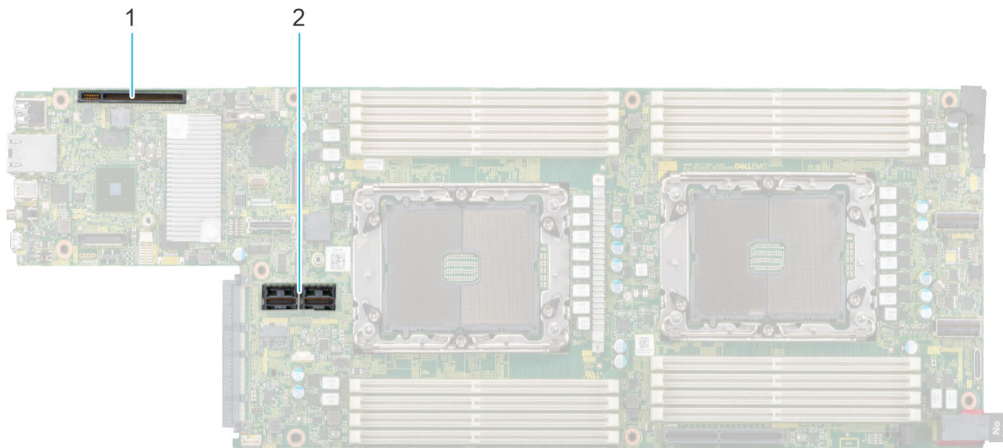
### Next steps

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

## Expansion cards

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

## Expansion card installation guidelines



**Figure 35. Expansion card slot connectors**

1. Riser 1a or Riser 1a with support for SNAP I/O modules (Slot 1)
2. Riser 2b (Slot 2)

The following table describes the expansion card riser configurations:

**Table 8. Expansion card riser configurations**

Configurations	Expansion card risers	PCIe Slots	Controlling processor	Height	Length	Slot width	Supported configurations
Config1. with 1x LP	R1a	1	Processor 1 and 2	Low Profile	Half length	x16	<ul style="list-style-type: none"> <li>● 12 x 3.5-inch drives</li> <li>● 24 x 2.5-inch drives</li> <li>● 8 x 2.5-inch NVMe drives</li> <li>● 24 x 2.5-inch NVMe drives</li> <li>● No backplane</li> </ul>
Config2. with 2x LP	R1a	1	Processor 1 and 2	Low Profile	Half length	x16	<ul style="list-style-type: none"> <li>● 12 x 3.5-inch drives</li> <li>● 24 x 2.5-inch drives</li> <li>● 8 x 2.5-inch NVMe drives</li> <li>● 24 x 2.5-inch NVMe drives</li> <li>● No backplane</li> </ul>
	R2b	2		Low Profile	Half length	x16	
Config3. with 1x LP	R1b	1	Processor 1 and 2	Low Profile	Half length	x8 + x8	<ul style="list-style-type: none"> <li>● 8 x 2.5-inch NVMe drives</li> <li>● No backplane</li> </ul>
Config4. with 1x LP	R1b	1	Processor 1 and 2	Low Profile	Half length	x8 + x8	<ul style="list-style-type: none"> <li>● 8 x 2.5-inch NVMe drives</li> <li>● No backplane</li> </ul>
	R2b	2		Low Profile	Half length	x16	



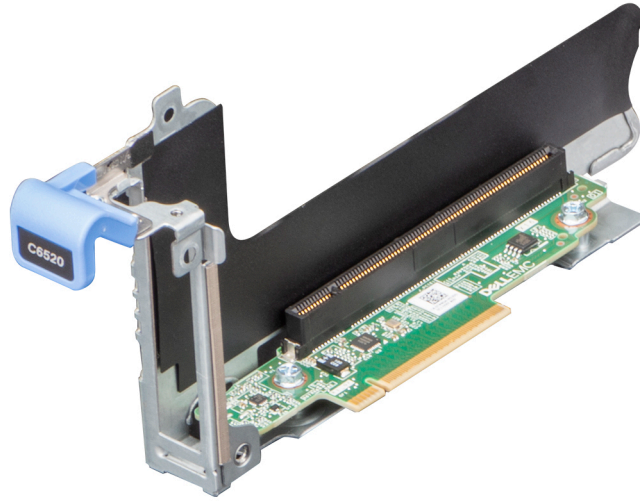


Figure 36. Riser 1a- Slot 1, x16, LP-HL

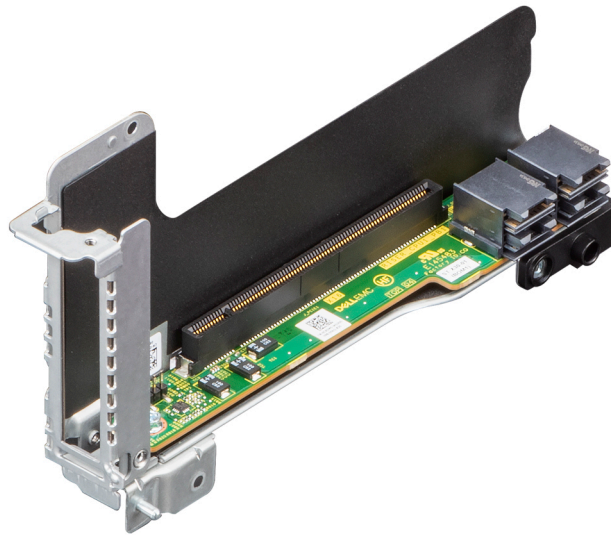


Figure 37. Riser 2b- Slot 2, x16, LP-HL

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

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

**Table 9. Configuration 1: R1a**

Card type	Slot priority	Maximum number of cards
Foxconn (PERC HBA355I Adapter)	1	1
Broadcom (NIC: 25G)	1	1
Broadcom (NIC: 10G)	1	1
Intel (NIC: 10G)	1	1
Broadcom (NIC: 25G)	1	1
Intel (NIC: 1G)	1	1
Mellanox (NIC: 100Gb)	1	1
Intel (NIC: 25Gb)	1	1
Mellanox (NIC: 25Gb)	1	1
SolarFlare (NIC: 25Gb)	1	1
Mellanox (NIC: HDR100 VPI)	1	1
Mellanox (NIC: HDR VPI)	1	1
Intel (OCP: 100Gb)	Integrated slot	1
Broadcom (OCP: 25Gb)	Integrated slot	1
Intel (OCP: 25Gb)	Integrated slot	1
Marvell (OCP: 25Gb)	Integrated slot	1
Mellanox (OCP: 25Gb)	Integrated slot	1
QLogic (OCP: 25Gb)	Integrated slot	1
Broadcom (OCP: 10Gb)	Integrated slot	1
QLogic (OCP: 10Gb)	Integrated slot	1
Intel (OCP: 10Gb)	Integrated slot	1
Broadcom (OCP: 1Gb)	Integrated slot	1
Intel (OCP: 1Gb)	Integrated slot	1
Dell External PERC Adapter	1	1
Dell BOSS M.2 Module	Integrated slot	1
Intel (PCIe SSD AIC)	1	1
Samsung (PCIe SSD AIC)	1	1
Nvidia (GPU: T4 16 GB)	1	1
Nvidia (GPU: A2 16 GB) LP	1	1

**Table 10. Configuration 2: R1a+R2b**

Card type	Slot priority	Maximum number of cards
Foxconn (PERC HBA355I Adapter)	1	1
Broadcom (NIC: 25G)	1, 2	2
Broadcom (NIC: 10G)	1, 2	2
Intel (NIC: 10G)	1, 2	2

**Table 10. Configuration 2: R1a+R2b (continued)**

Card type	Slot priority	Maximum number of cards
Broadcom (NIC: 25G)	1, 2	2
Intel (NIC: 1G)	1, 2	2
Mellanox (NIC: 100Gb)	1, 2	2
Intel (NIC: 25Gb)	1, 2	2
Mellanox (NIC: 25Gb)	1, 2	2
SolarFlare (NIC: 25Gb)	1, 2	2
Mellanox (NIC: HDR100 VPI)	1, 2	2
Mellanox (NIC: HDR VPI)	1, 2	2
Intel (OCP: 100Gb)	Integrated slot	1
Broadcom (OCP: 25Gb)	Integrated slot	1
Intel (OCP: 25Gb)	Integrated slot	1
Marvell (OCP: 25Gb)	Integrated slot	1
Mellanox (OCP: 25Gb)	Integrated slot	1
QLogic (OCP: 25Gb)	Integrated slot	1
Broadcom (OCP: 10Gb)	Integrated slot	1
QLogic (OCP: 10Gb)	Integrated slot	1
Intel (OCP: 10Gb)	Integrated slot	1
Broadcom (OCP: 1Gb)	Integrated slot	1
Intel (OCP: 1Gb)	Integrated slot	1
Dell External PERC Adapter	1	1
Dell BOSS M.2 Module	Integrated slot	1
Intel (PCIe SSD AIC)	1	1
Samsung (PCIe SSD AIC)	1	1
Nvidia (GPU: T4 16 GB)	2	1
Nvidia (GPU: A2 16 GB) LP	2	1

**Table 11. Configuration 3: R1b**

Card type	Slot priority	Maximum number of cards
Mellanox (NIC: 100Gb)	1	1
Mellanox (NIC: HDR100 VPI)	1	1
Mellanox (NIC: HDR VPI)	1	1
Intel (OCP: 100Gb)	Integrated slot	1
Broadcom (OCP: 25Gb)	Integrated slot	1
Intel (OCP: 25Gb)	Integrated slot	1
Marvell (OCP: 25Gb)	Integrated slot	1
Mellanox (OCP: 25Gb)	Integrated slot	1
QLogic (OCP: 25Gb)	Integrated slot	1
Broadcom (OCP: 10Gb)	Integrated slot	1

**Table 11. Configuration 3: R1b (continued)**

Card type	Slot priority	Maximum number of cards
QLogic (OCP: 10Gb)	Integrated slot	1
Intel (OCP: 10Gb)	Integrated slot	1
Broadcom (OCP: 1Gb)	Integrated slot	1
Intel (OCP: 1Gb)	Integrated slot	1
Dell BOSS M.2 Module	Integrated slot	1

**Table 12. Configuration 4: R1b+R2b**

Card type	Slot priority	Maximum number of cards
Broadcom (NIC: 25G)	2	2
Broadcom (NIC: 10G)	2	2
Intel (NIC: 10G)	2	2
Broadcom (NIC: 25G)	2	2
Intel (NIC: 1G)	2	2
Mellanox (NIC: 100Gb)	1	2
Intel (NIC: 25Gb)	2	2
Mellanox (NIC: 25Gb)	2	2
SolarFlare (NIC: 25Gb)	2	2
Mellanox (NIC: HDR100 VPI)	2	2
Mellanox (NIC: HDR VPI)	2	2
Intel (OCP: 100Gb)	Integrated slot	1
Broadcom (OCP: 25Gb)	Integrated slot	1
Intel (OCP: 25Gb)	Integrated slot	1
Marvell (OCP: 25Gb)	Integrated slot	1
Mellanox (OCP: 25Gb)	Integrated slot	1
QLogic (OCP: 25Gb)	Integrated slot	1
Broadcom (OCP: 10Gb)	Integrated slot	1
QLogic (OCP: 10Gb)	Integrated slot	1
Intel (OCP: 10Gb)	Integrated slot	1
Broadcom (OCP: 1Gb)	Integrated slot	1
Intel (OCP: 1Gb)	Integrated slot	1
Dell BOSS M.2 Module	Integrated slot	1
Intel (PCIe SSD AIC)	2	1
Samsung (PCIe SSD AIC)	2	1
Nvidia (GPU: T4 16 GB)	2	1
Nvidia (GPU: A2 16 GB) LP	2	1

# Removing the expansion card riser 1

## Prerequisites

**NOTE:** Install an expansion card filler bracket over an empty expansion slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Remove the air shroud](#).
4. If applicable disconnect the cables.

**NOTE:** The procedure to remove a riser 1a or 1b is similar.

## Steps

1. Using a Phillips #1 screwdriver, remove the screws that secure the expansion card riser 1.
2. Holding the blue touch point and handle, lift the expansion card riser from the riser connector on the system board.

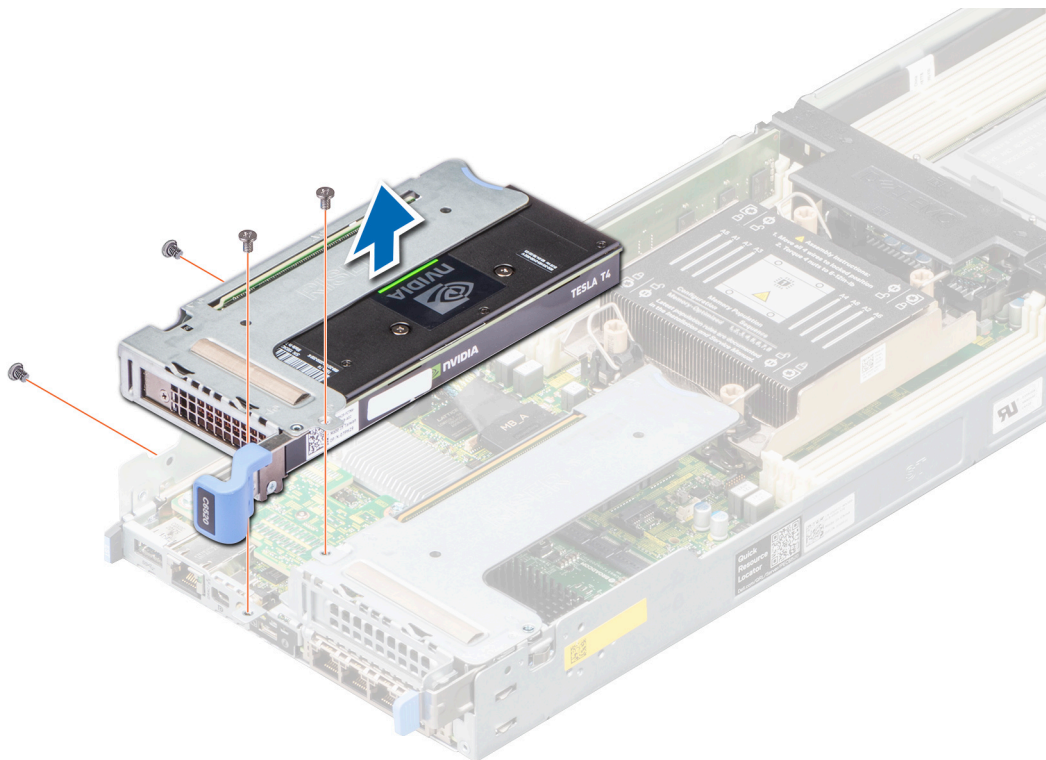


Figure 38. Removing the expansion card riser 1

## Next steps

Replace the expansion card riser 1.

# Installing the expansion card riser 1

## Prerequisites

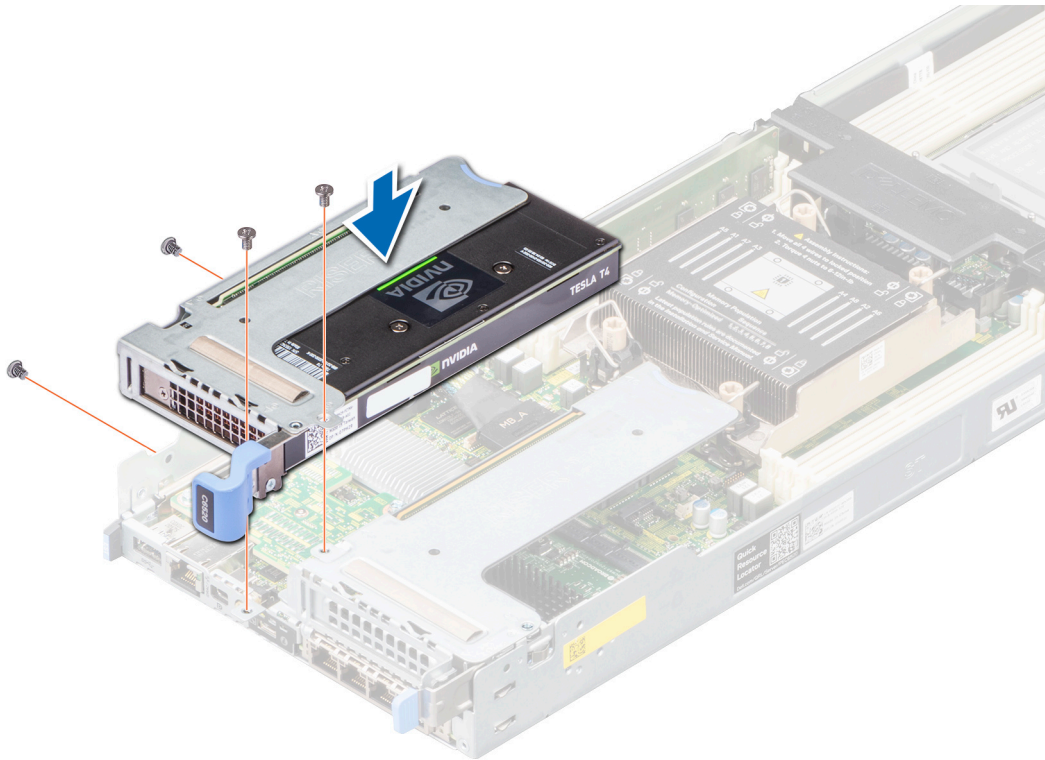
**NOTE:** You must install an expansion card filler bracket over an empty expansion slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Remove the air shroud](#).
4. If applicable, reconnect the cables.

**i** **NOTE:** The procedure to install a riser 1a or 1b is similar.

### Steps

1. Align the screw holes on the riser with the screw holes on the chassis.
2. Lower the riser firmly until the riser card is fully seated in the slot.
3. Using a Phillips #1 screwdriver, tighten the screws that secure the expansion card riser 1 on to the system board.



**Figure 39. Installing the expansion card riser 1**

### Next steps

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

## Removing the expansion card riser 2

### Prerequisites

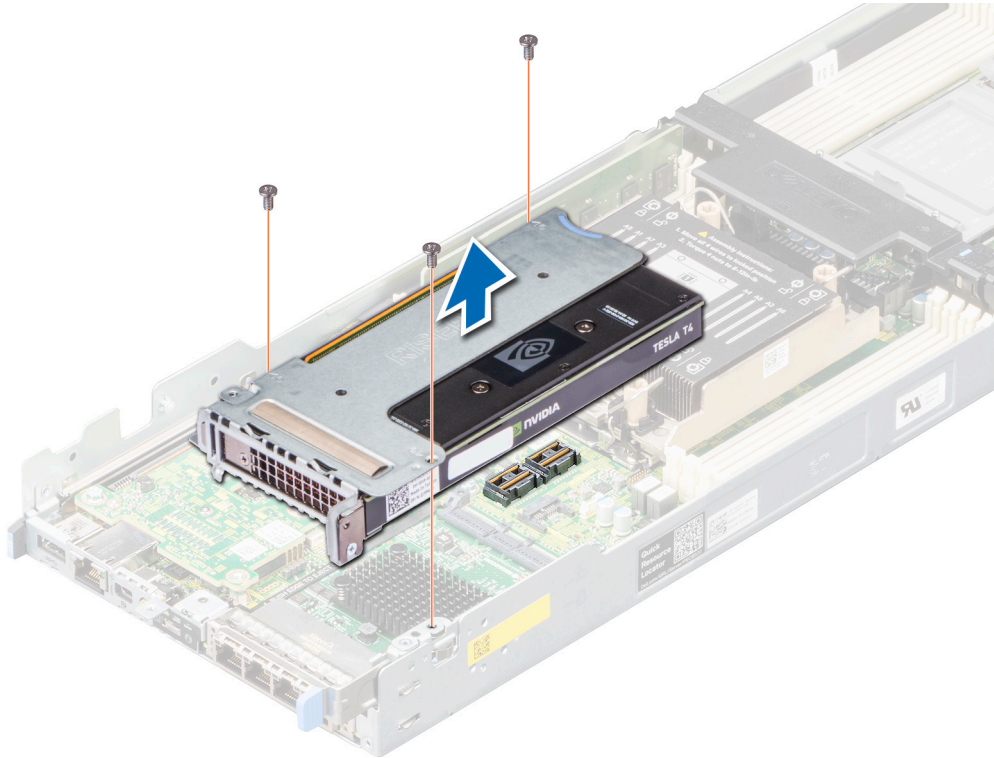
**i** **NOTE:** Install an expansion card filler bracket over an empty expansion slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

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

### Steps

1. Using Phillips #1 screwdriver, remove the screws that secure the expansion card riser 2.

2. Holding the blue touch point and handle, lift the expansion card riser from the riser connector on the system board.



**Figure 40. Removing the expansion card riser 2**

### Next steps

Replace the expansion card riser 2.

## Installing the expansion card riser 2

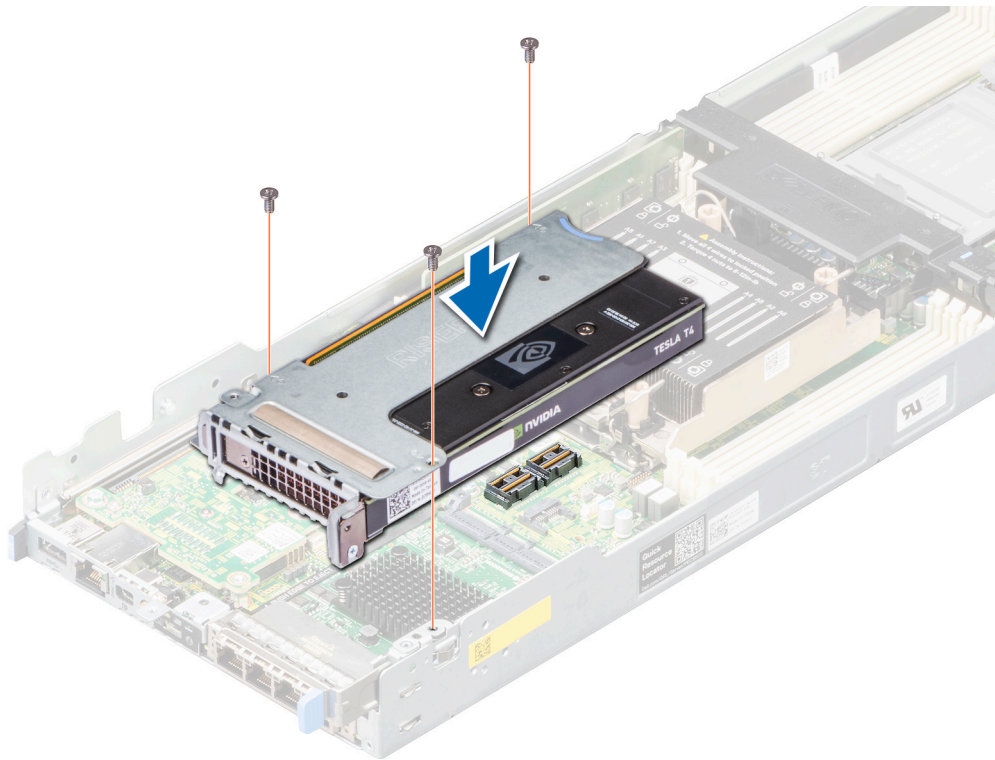
### Prerequisites

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

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

### Steps

1. Align the screw holes on the riser with the screw holes on the chassis.
2. Lower the riser firmly until the riser card is fully seated in the slot.
3. Using a Phillips #1 screwdriver, tighten the screws that secure the expansion card riser 2 on to the system board.



**Figure 41. Installing the expansion card riser 2**

### Next steps

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

## Removing an expansion cards

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your system.](#)
3. [Remove the expansion card riser 1a or 1b](#) and [Remove the expansion card riser 2.](#)

### Steps

1. Using a Phillips #2 screwdriver, remove the screw that secures the expansion card to the riser.
2. Holding the expansion card by its edges, remove it from the riser slots.

**i** **NOTE:** Install an expansion card filler bracket over an empty expansion slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.



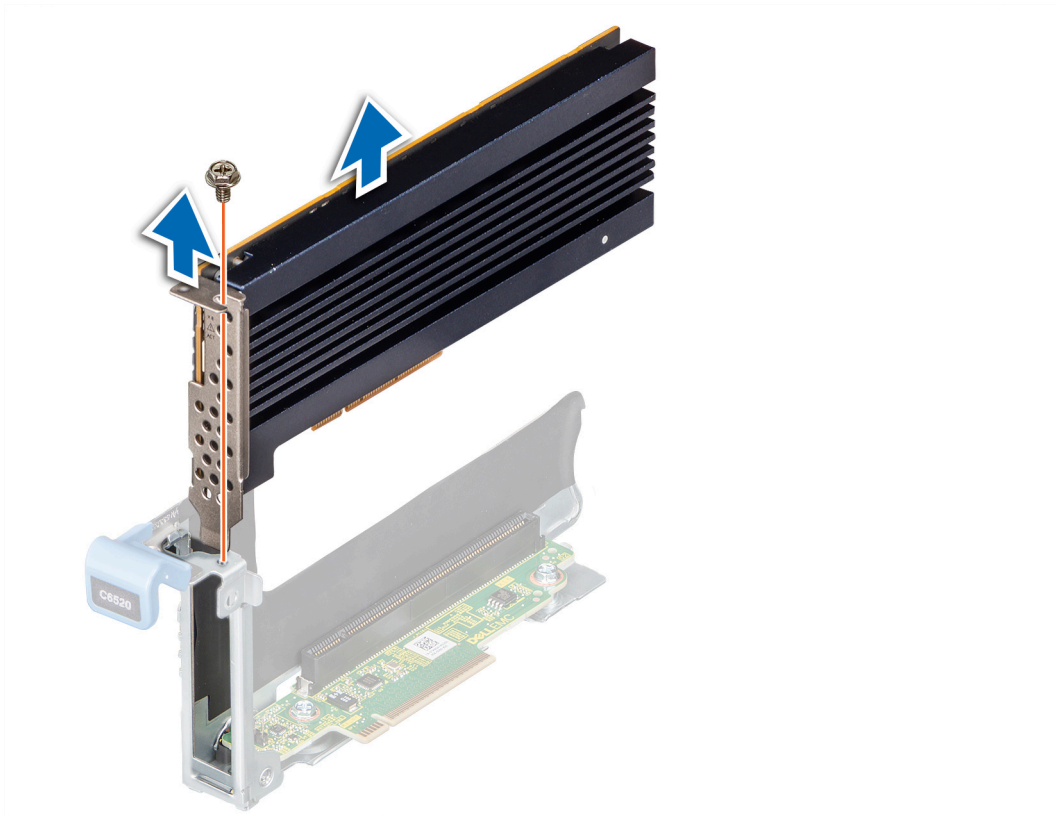


Figure 42. Removing an expansion card from riser 1

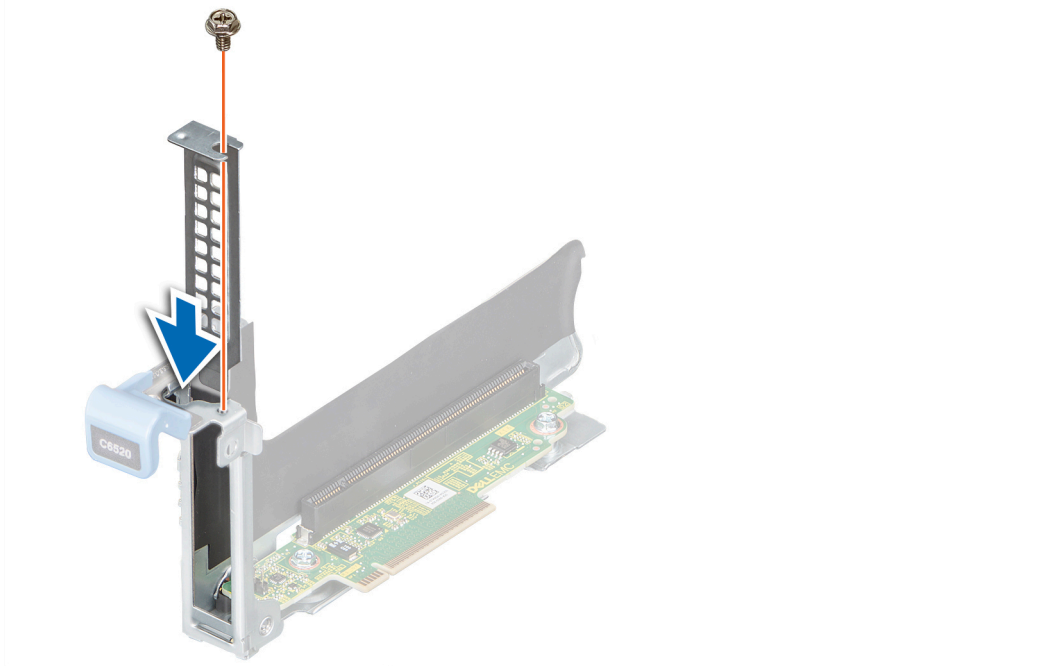


Figure 43. Removing an expansion card from riser 2

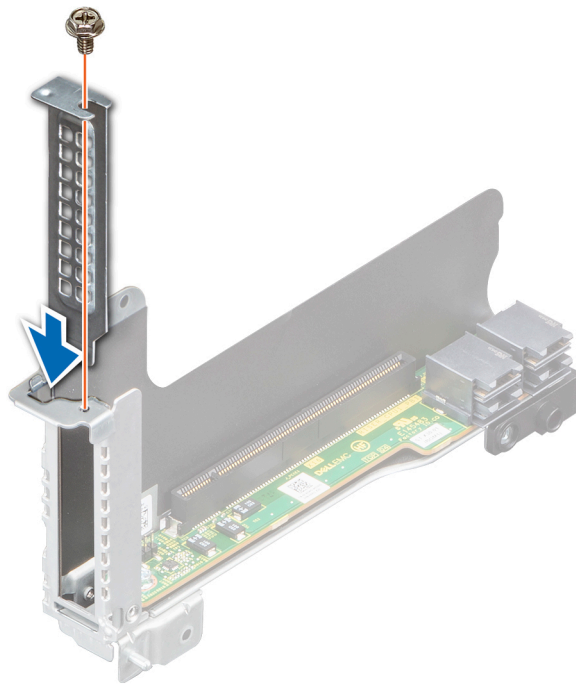
3. If the expansion card is not going to be replaced, install a filler bracket and close the card retention latch.

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

**i** **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.



**Figure 44. Installing the expansion card filler bracket in riser 1**



**Figure 45. Installing the expansion card filler bracket in riser 2**

### Next steps

Replace the expansion card.

## Installing an expansion card

### Prerequisites

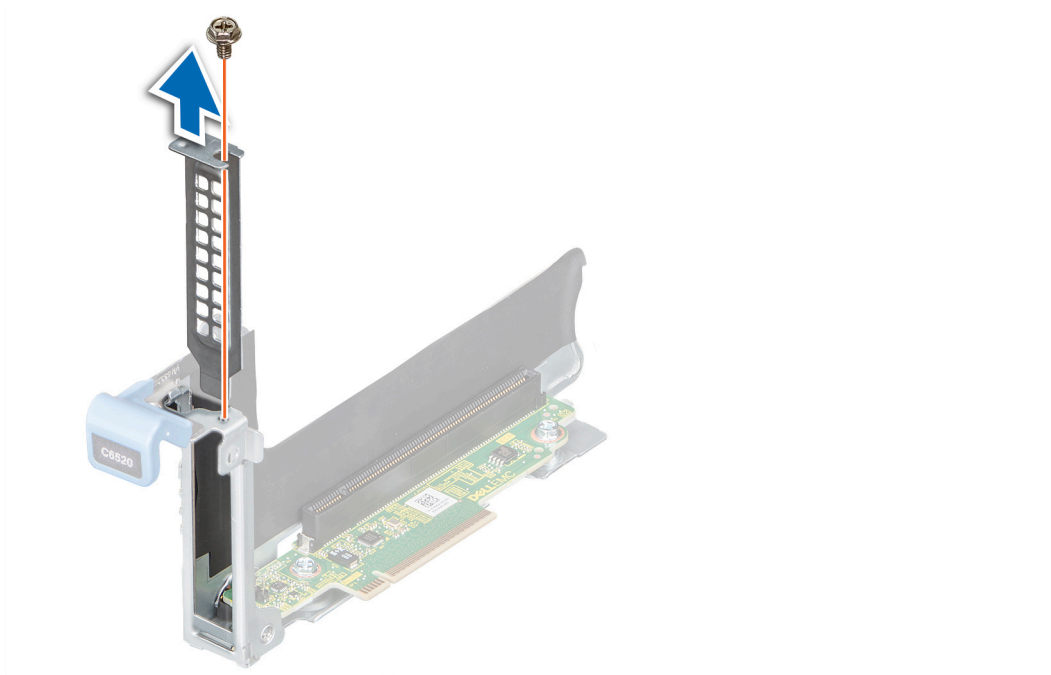
**CAUTION:** Expansion cards can only be installed in the slots on the expansion card riser. Do not attempt to install expansion cards directly into the riser connector on the system board.

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

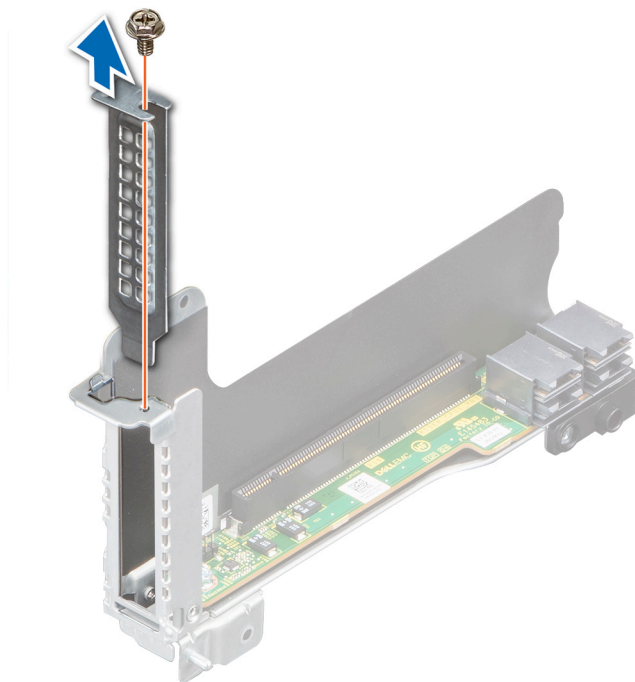
### Steps

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

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



**Figure 46. Removing the expansion card filler bracket for riser 1**



**Figure 47. Removing the expansion card filler bracket for riser 2**

2. Holding the card by its edges, align the card with the slot on the riser.
3. Insert the card firmly until it is fully seated in the slot.
4. Replace the screw that secures the expansion card.

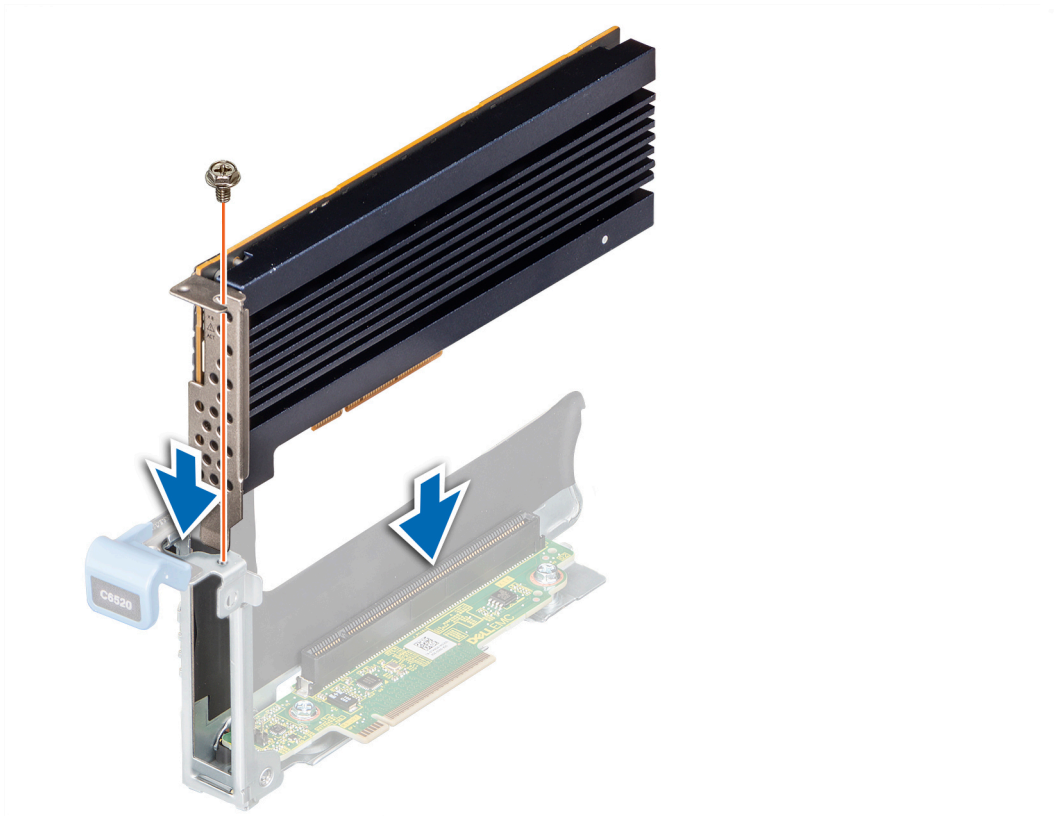


Figure 48. Installing an expansion card in riser 1

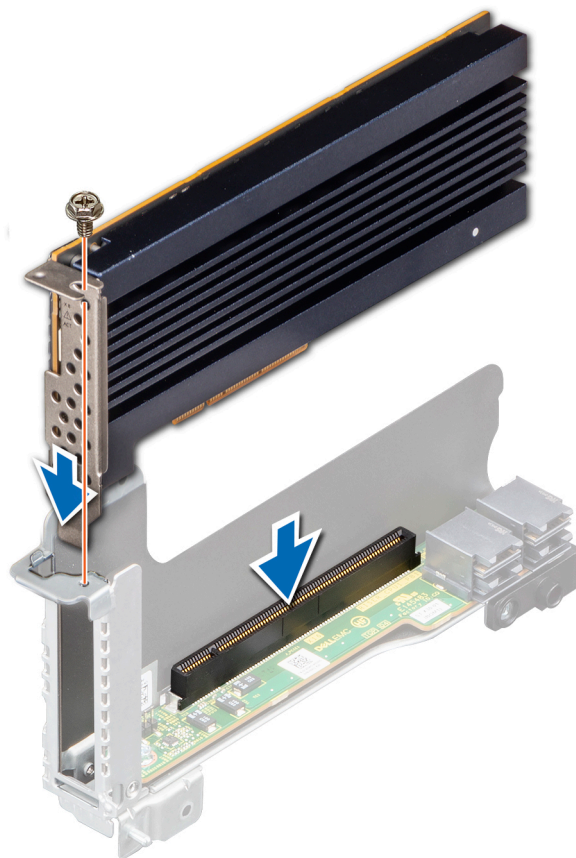


Figure 49. Installing an expansion card in riser 2

### Next steps

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

## Removing the riser card

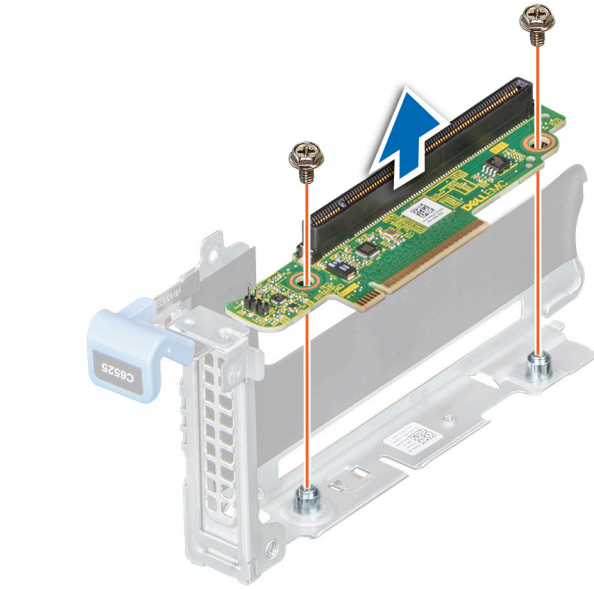
### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your system.](#)
3. [Remove the expansion card riser.](#)
4. If installed, [remove the expansion card.](#)
5. If applicable, disconnect the cable from the riser card.

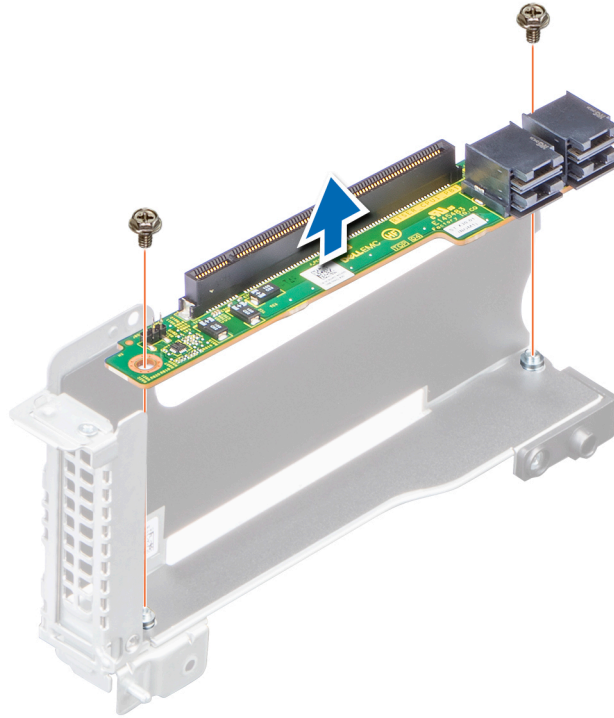
### Steps

1. Using a Phillips #2 screwdriver, remove the screws that secure the riser card to the expansion card riser.
2. Remove the riser card from the expansion card riser.

**i** **NOTE:** The procedure to remove the riser 1B card is similar to removing the riser 1A card.



**Figure 50. Removing the riser card from riser 1**



**Figure 51. Removing the riser card from riser 2**

### Next steps

Replace the riser card.

## Installing the riser card

### Prerequisites

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

### Steps

1. Align and insert the riser card with the screw holes on the riser.
2. Using a Phillips #2 screwdriver, tighten the screws that secure the riser card to the expansion card riser.

**NOTE:** The procedure to install the riser 1B card is similar to installing the riser 1A card.

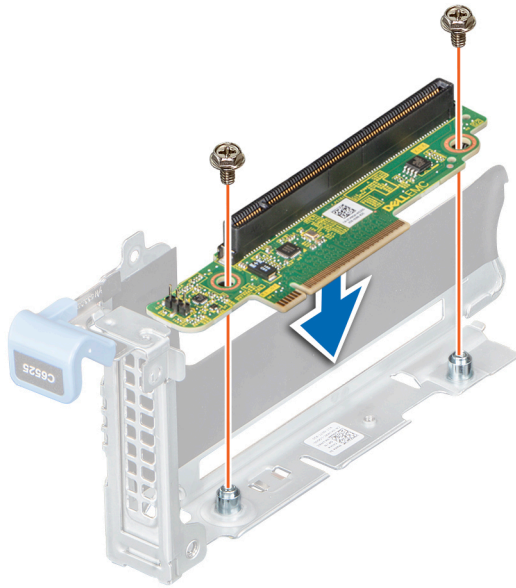


Figure 52. Installing the riser card in riser 1

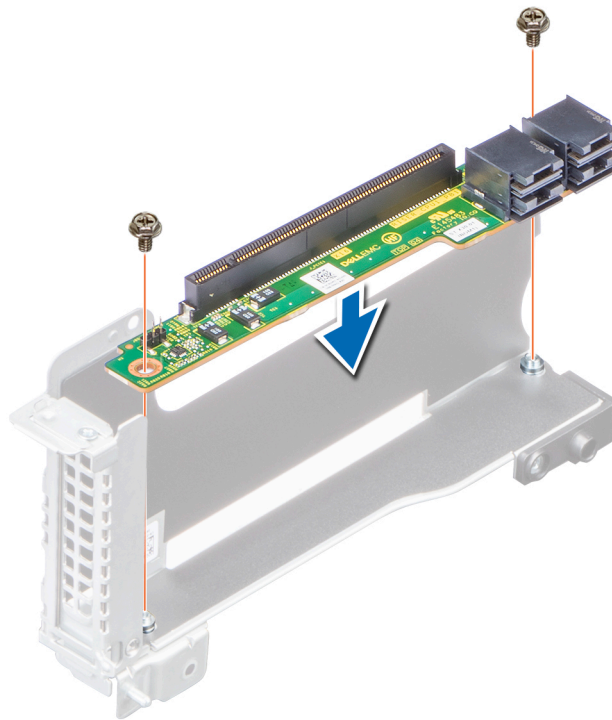


Figure 53. Installing the riser card in riser 2

#### Next steps

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



# LOM riser card

## Removing the LOM

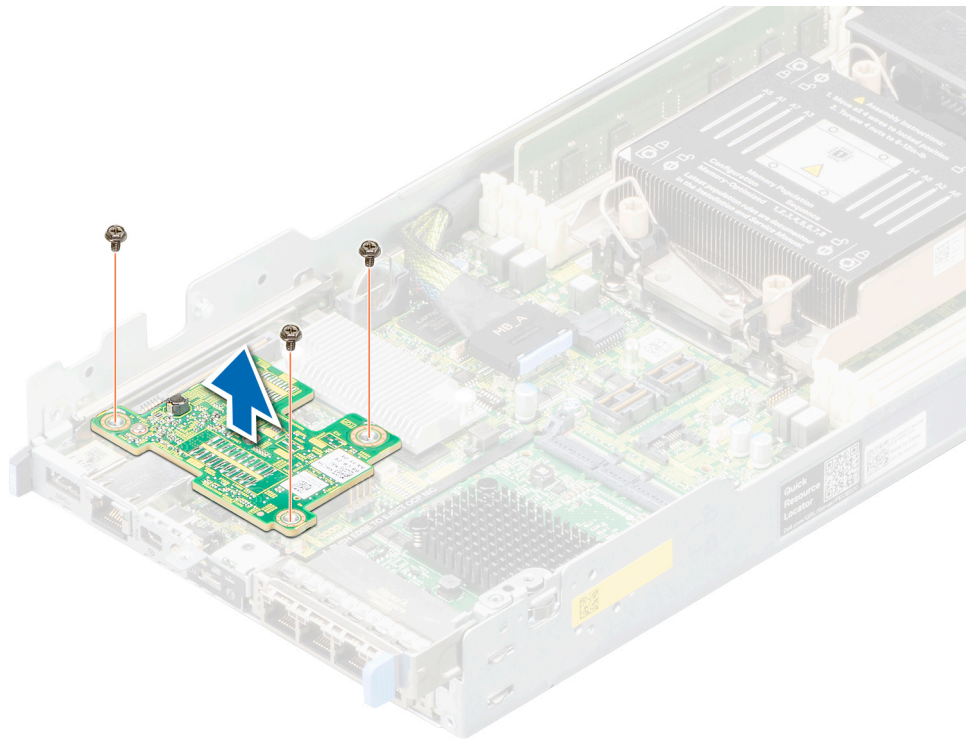
### Prerequisites

**NOTE:** Install an expansion card filler bracket over an empty expansion slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

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

### Steps

1. Using Phillips #1 screwdriver, remove the screws that secure the LOM.
2. Lift the LOM card from the connector on the system board.



**Figure 54. Removing the LOM**

### Next steps

Install the expansion card riser 1.

# Installing the LOM

## Prerequisites

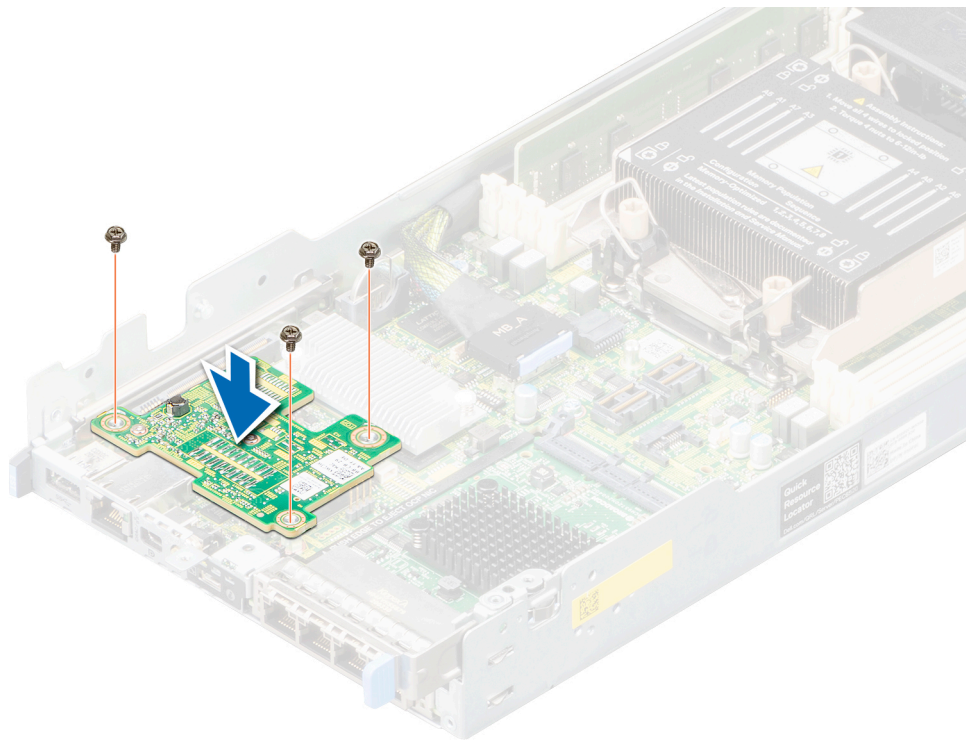
**i NOTE:** You must install an expansion card filler bracket over an empty expansion slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Remove the air shroud](#).
4. [Remove the expansion card riser 1](#).
5. If applicable, reconnect the cables.

**i NOTE:** The procedure to install a riser 1a or 1b is similar.

## Steps

1. Align the screw holes on the LOM with the screw holes on the chassis.
2. Lower the LOM firmly until the LOM card is fully seated in the slot.
3. Using a Phillips #1 screwdriver, tighten the screws that secure the LOM card on to the system board.



**Figure 55. Installing the LOM**

## Next steps

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

# M.2 SSD module

## Removing the M.2 riser

### Prerequisites

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

### Steps

1. Using a Phillips #2 screwdriver, remove the screw that secures the riser to the chassis.
2. Holding the blue tag, lift the riser to disengage the riser from the connector on the system board.
3. Disconnect the SATA cable from the riser.

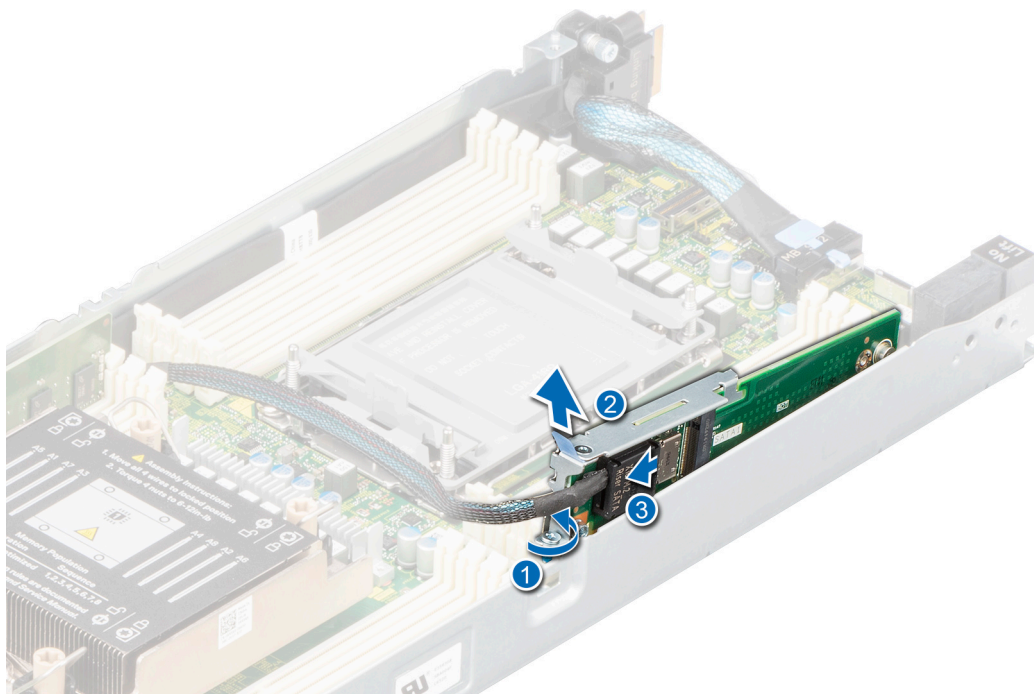


Figure 56. Removing the M.2 riser

### Next steps

Replace the M.2 riser.

## Installing the M.2 riser

### Prerequisites

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

## Steps

1. Connect the SATA cable to the M.2 riser.
2. Align the M.2 riser with the stand off on the system board and insert it firmly until the riser is fully seated in the slot.
3. Using a Phillips #2 screwdriver, tighten the screw that secures the riser to the chassis.

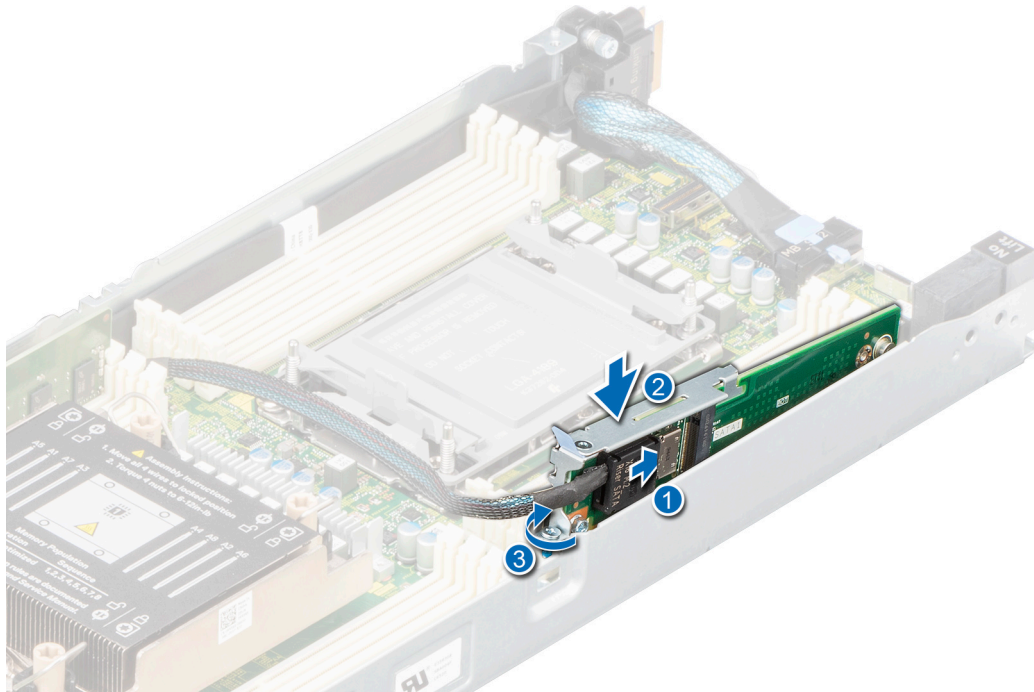


Figure 57. Installing the M.2 riser

## Next steps

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

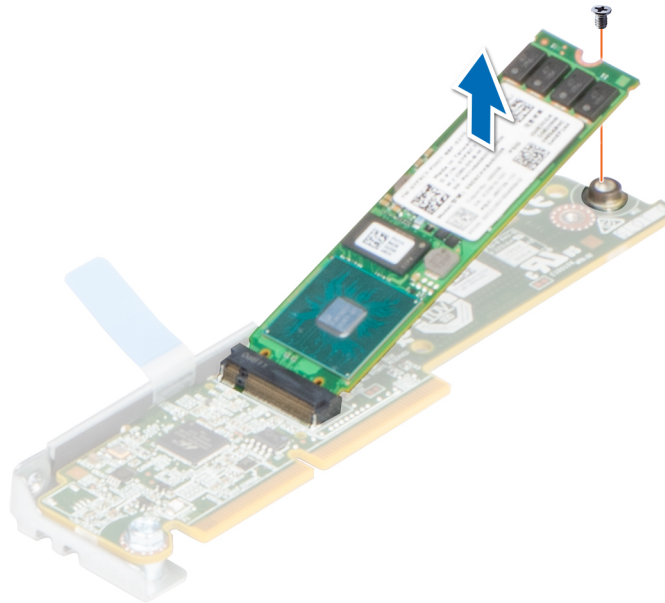
## Removing the M.2 SSD module

### Prerequisites

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

## Steps

1. Using a Phillips #1 screwdriver, remove the screw securing the M.2 SSD module to the M.2 riser.
2. Pull the M.2 SSD module to disconnect from the connector on the M.2 riser.



**Figure 58. Removing the M.2 SSD module from the M.2 riser**

#### **Next steps**

Replace the M.2 SSD module.

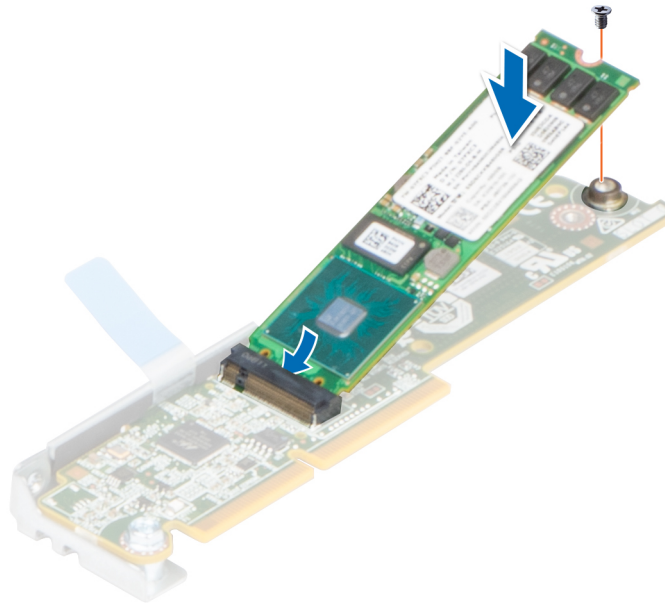
## **Installing the M.2 SSD module**

#### **Prerequisites**

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

#### **Steps**

1. Align the M.2 SSD module at an angle with the connector on the M.2 riser.
2. Insert the M.2 SSD module firmly until it is fully seated in the connector on the M.2 riser.



**Figure 59. Installing the M.2 SSD module on the M.2 riser**

3. Using a Phillips #1 screwdriver, tighten the M.2 SSD module on the M.2 riser with the screw.

#### Next steps

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

## Linking board and PCIe cable

### Removing the linking board and PCIe cable

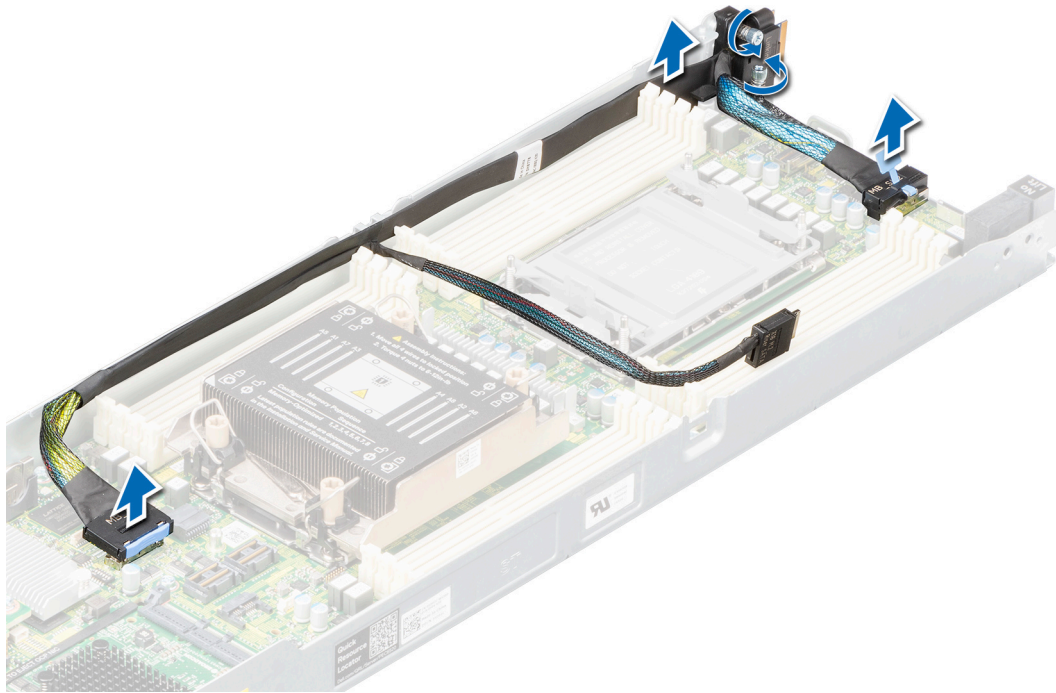
#### Prerequisites

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

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your system.](#)
3. [Remove the air shroud.](#)
4. [Remove the support bracket.](#)
5. [Remove the expansion riser 1.](#)

#### Steps

1. To disconnect the MB cable, press the release button on the MB\_A cable connector and lift it. See the [System board connector](#) for more information.
2. If applicable, disconnect the M.2 riser SATA cable from the M.2 riser.
3. Using a Phillips #2 screwdriver, loosen the captive screws that secure the linking board to the chassis.



**Figure 60. Removing the linking board and PCIe cable**

4. To disengage the linking board connector, lift and push the MB cable towards the front of the sled.
5. Remove the MB cable from the sled.

#### **Next steps**

Replace the linking board and PCIe cable.

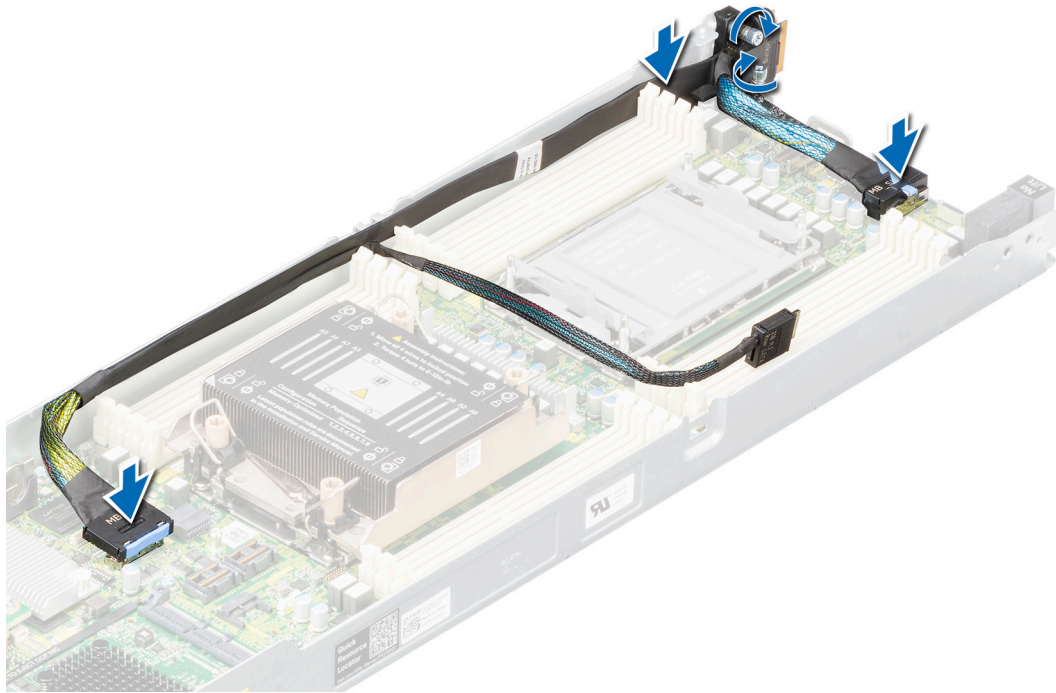
## **Installing the linking board and PCIe cable**

#### **Prerequisites**

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

#### **Steps**

1. Route the MB cable along the chassis wall.
2. Align the linking board connector with the screw holes on the chassis and using a Phillips #2 screwdriver tighten the captive screws to secure the linking board cable connector to the chassis.
3. Connect the MB connectors to the connectors on the system board.



**Figure 61. Installing the linking board and PCIe cable**

4. If applicable, connect the M.2 riser data cable to the M.2 riser.

**Next steps**

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

## System memory

### System memory guidelines

The PowerEdge C6520 system supports DDR4 registered DIMMs (RDIMMs), load reduced DIMMs (LRDIMMs). System memory holds the instructions that are executed by the processor.

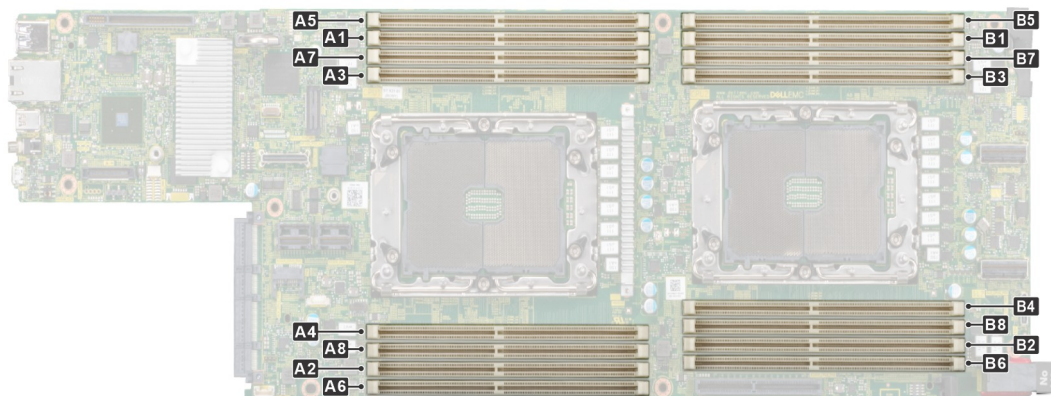
Your system contains 16 memory sockets organized into 8 channels per processor.

Memory channels are organized as follows:

**Table 13. Memory channels**

Processor	Channel A	Channel B	Channel C	Channel D	Channel E	Channel F	Channel G	Channel H
Processor 1	A1	A5	A3	A7	A2	A6	A4	A8
Processor 2	B1	B5	B3	B7	B2	B6	B4	B8





**Figure 62. Memory socket location**

**Table 14. Supported memory matrix**

DIMM type	Rank	Capacity	DIMM rated voltage and speed	DIMMs per Channel (DPC)
RDIMM	1R	8 GB	DDR4 (1.2V), 3200 MT/s	3200 MT/s
	2R	16 GB / 32 GB / 64 GB	DDR4 (1.2V), 3200 MT/s	3200 MT/s
LRDIMM	4R	128 GB	DDR4 (1.2V), 2666 MT/s	2666 MT/s

**NOTE:** Mixing of memory module capacities in a system is not supported.

## 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 speeds of 3200 MT/s, 2933 MT/s, or 2666 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 speed of the DIMMs



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

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

- All DIMMs must be DDR4.
- x4 and x8 DRAM based memory modules can be mixed.
- If memory modules with different speeds are installed, they operate at the speed of the slowest installed memory module(s).
- Populate memory module sockets only if a processor is installed.
  - For single-processor systems, sockets A1 to A8 are available.
  - For dual-processor systems, sockets A1 to A8 and sockets B1 to B8 are available.
- In Optimizer Mode, the DRAM controllers operate independently in the 64-bit mode and provide optimized memory performance.

**Table 15. Memory population rules**


Processor	Configuration	Memory population	Memory population information
Single processor	Optimizer (Independent channel) population order	A{1}, A{2}, A{3}, A{4}, A{5}, A{6}, A{7}, A{8}	1, 2, 3, 4 DIMMs are allowed.
Dual processor (Start with processor 1. Processor 1 and processor 2 population should match)	Optimizer (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}, A{7}, B{7}, A{8}, B{8}	1, 2, 3, 4, 5, 6, 7, 8 DIMMs are supported per system .  <b>NOTE:</b> Optimizer population order is not traditional for 8 and 16 DIMMs installations for dual processor.


- Memory modules of different capacities can be mixed provided other memory population rules are followed.  
 **NOTE:** For example, 8 GB and 16 GB memory modules can be mixed.
- Mixing of more than two memory module capacities in a system is not supported.
- Unbalanced or odd memory configuration results in a performance loss and system may not identify the memory modules being installed, so always populate memory channels identically with equal DIMMs for best performance.
- Supported RDIMM / LRDIMM configurations are 1, 2, 4, 6, 8 DIMMs per processor.
- Populate eight equal memory modules per processor (one DIMM per channel) at a time to maximize performance.  
 **NOTE:** Equal memory modules refer to DIMMs with identical electrical specification and capacity that may be from different vendors.

## Removing a memory module

### Prerequisites

- Follow the safety guidelines listed in the [Safety instructions](#).
- Follow the procedure listed in the [Before working inside your system](#).
- [Remove the air shroud](#).

 **WARNING:** The memory modules are hot to touch for some time after the system has been powered off. Allow the memory modules to cool before handling them.

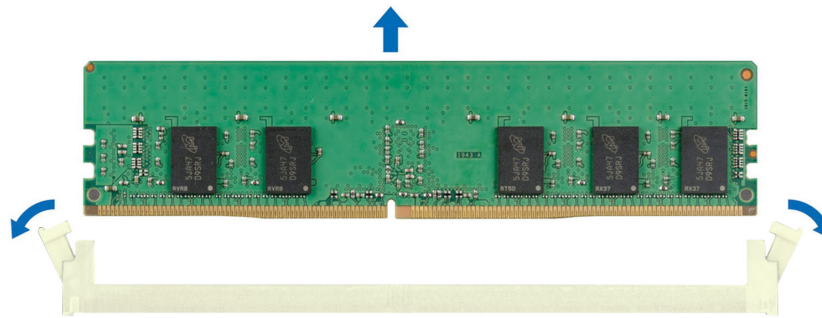
 **NOTE:** To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. Remove memory module blanks only if you intend to install memory modules in those sockets.

### Steps

- Locate the appropriate memory module socket.
- To release the memory module from the socket, simultaneously press the ejectors on both ends of the memory module socket to fully open.

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

- Lift the memory module away from the system.



**Figure 63. Removing a memory module**

#### Next steps

1. [Replace 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.

**NOTE:** When operating your system with single processor, install memory module blanks in processor 2 memory sockets.

## Installing a memory module

#### Prerequisites

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

#### Steps

1. Locate the appropriate memory module socket.

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

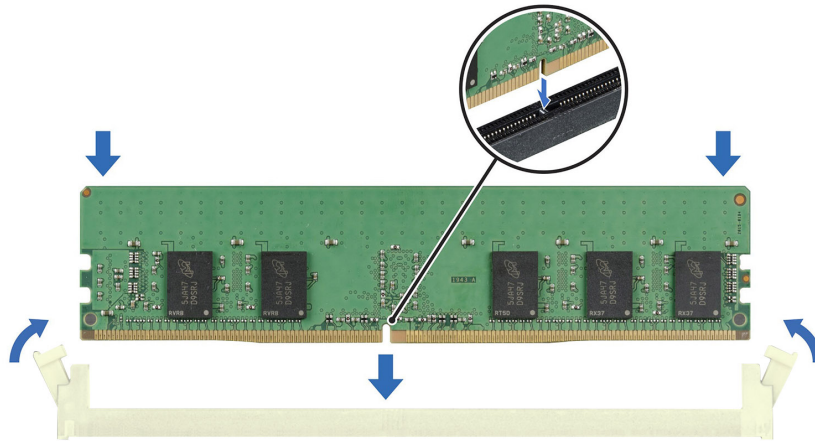
2. Align the edge connector of the memory module with the alignment key of the memory module socket, and insert the memory module in the socket.

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

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

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

3. Press the memory module with your thumbs until the ejectors firmly click into place. When the memory module is properly seated in the socket, the levers on the memory module socket align with the levers on the other sockets that have memory modules installed.



**Figure 64. Installing a memory module**

#### Next steps

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

## Processor and heat sink module

This is a service technician replaceable part only.

## Removing a processor and heat sink module

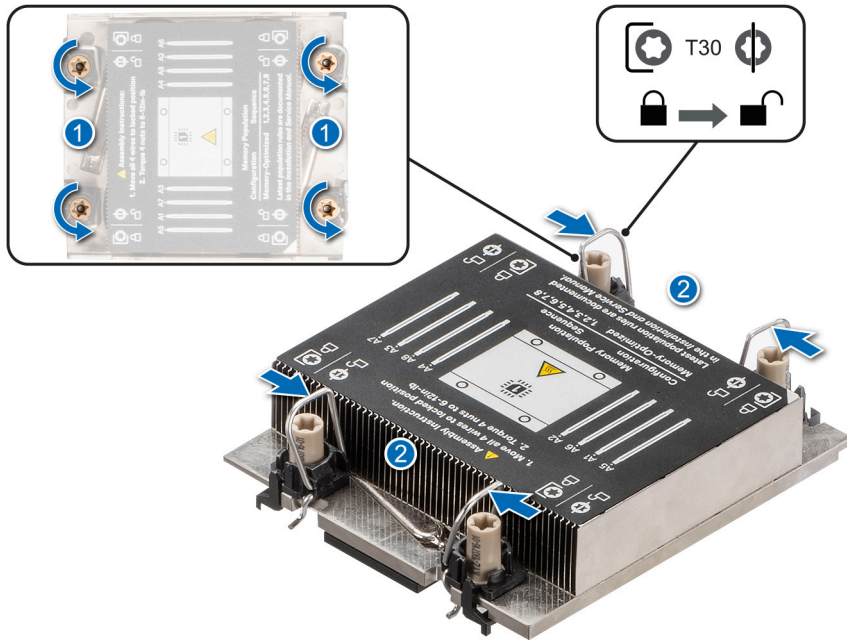
#### Prerequisites

1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in the [Before working inside your system](#).
3. [Remove the air shroud.](#)
  - NOTE:** The heat sink and processor are hot to touch for some time after the system has been powered down. Allow the heat sink and processor to cool down before handling them.

#### Steps

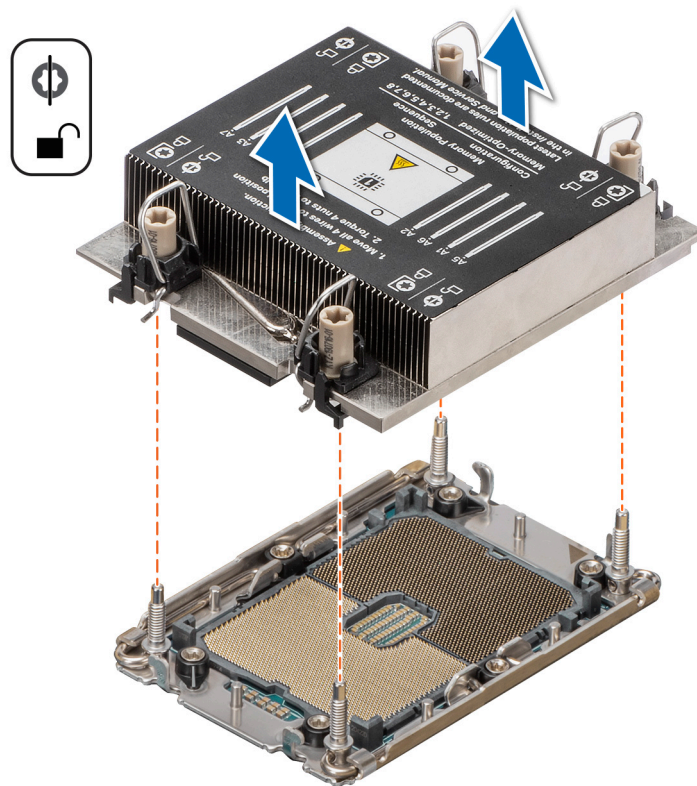
1. Ensure all four Anti-Tilt wires are in the locked position (outward position), and then using a Torx #T30 screwdriver, loosen the screws on the heat sink in the order that is mentioned below:
  - a. Loosen the first screw three turns.
  - b. Loosen the screw diagonally opposite to the screw you loosened first.

- c. Repeat the procedure for the remaining two screws.
  - d. Return to the first screw to loosen it completely.
2. Set the Anti-Tilt wires to the unlocked position (inward position).



**Figure 65. Loosening the screws and set the Anti-Tilt wires to the unlocked position**

3. Lift the processor and heat sink module (PHM) from the system and set the PHM aside with the processor side facing up.



**Figure 66. Removing a processor and heat sink module**

## Next steps

Remove the processor from the processor and heat sink module.

# Removing the processor from the processor and heat sink module

## Prerequisites

**⚠ WARNING:** Remove the processor from the processor and heat sink module (PHM) only if you are replacing the processor or heat sink.

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

**⚠ CAUTION:** An expected CMOS battery loss or CMOS checksum error message may be displayed during the first instance of powering on the system after replacing the processor or system board. To resolve this issue, go to setup option to configure the system settings.

## Steps

1. Place the heat sink with the processor side facing up.
2. Using your thumb lift up the Thermal Interface Material (TIM) break lever to release the processor from the TIM and retaining clip.

**i NOTE:** Ensure to hold the retaining clip to the heat sink as you lift the TIM break lever.

3. Holding the processor by its edges, lift the processor away from the retaining clip, and then place the processor connector side down on the processor tray. Ensure pin 1 marks are aligned.

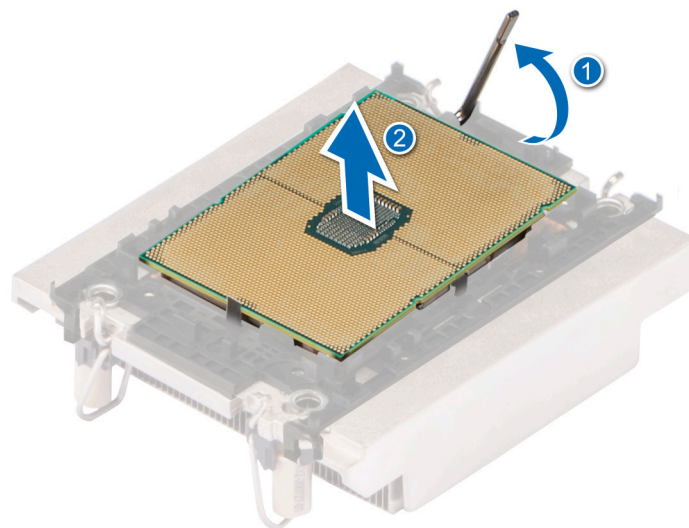
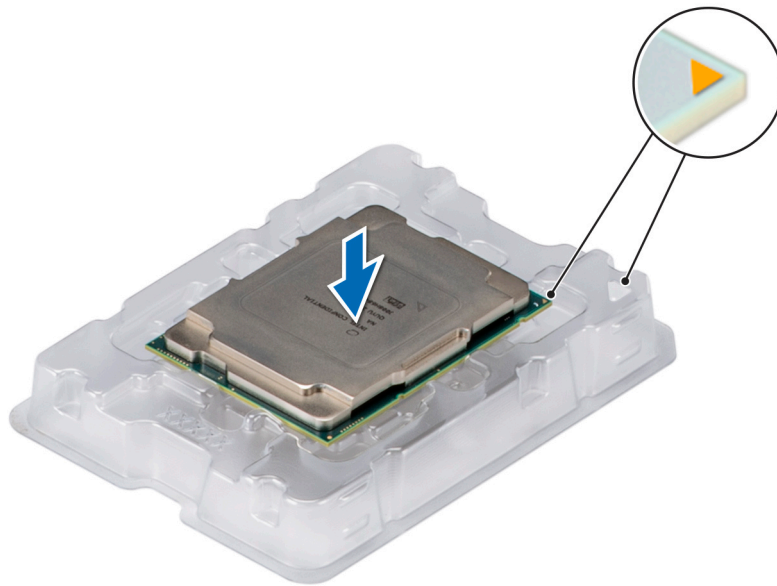


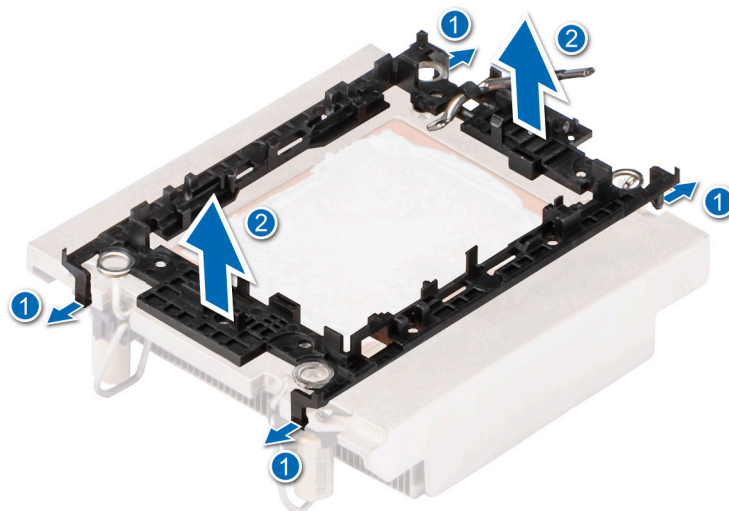
Figure 67. Lift the TIM break lever



**Figure 68. Aligning pin 1 marks of processor with tray**

**NOTE:** Ensure that to return the TIM break lever back to its original position.

4. Using your thumb and index finger, first hold the retaining clip release tab at the pin 1 connector, pull out the tip of the retaining clip release tab, and then lift the retaining clip partially from the heat sink.
5. Repeat the procedure at the remaining three corners of the retaining clip.
6. After all the corners are released from the heat sink, lift the retaining clip from the pin 1 corner of the heat sink.



**Figure 69. Removing the processor retaining clip**

#### **Next steps**

Replace the processor into a processor and heat sink module (PHM).

# Installing the processor into a processor and heat sink module

## Prerequisites

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

## Steps

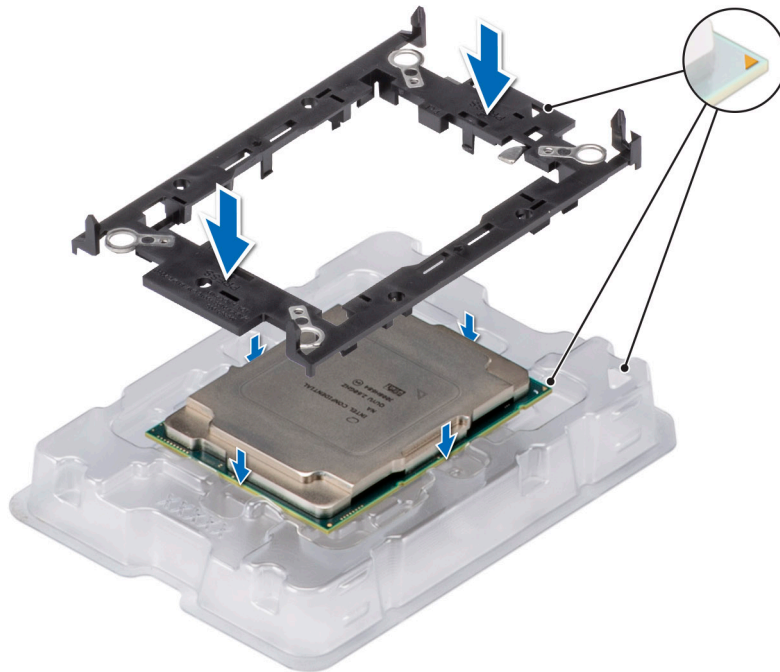
1. Place the processor in the processor tray.

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

2. Place the processor retaining clip on top of the processor that is in the processor tray aligning pin 1 indicator on the processor.

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

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

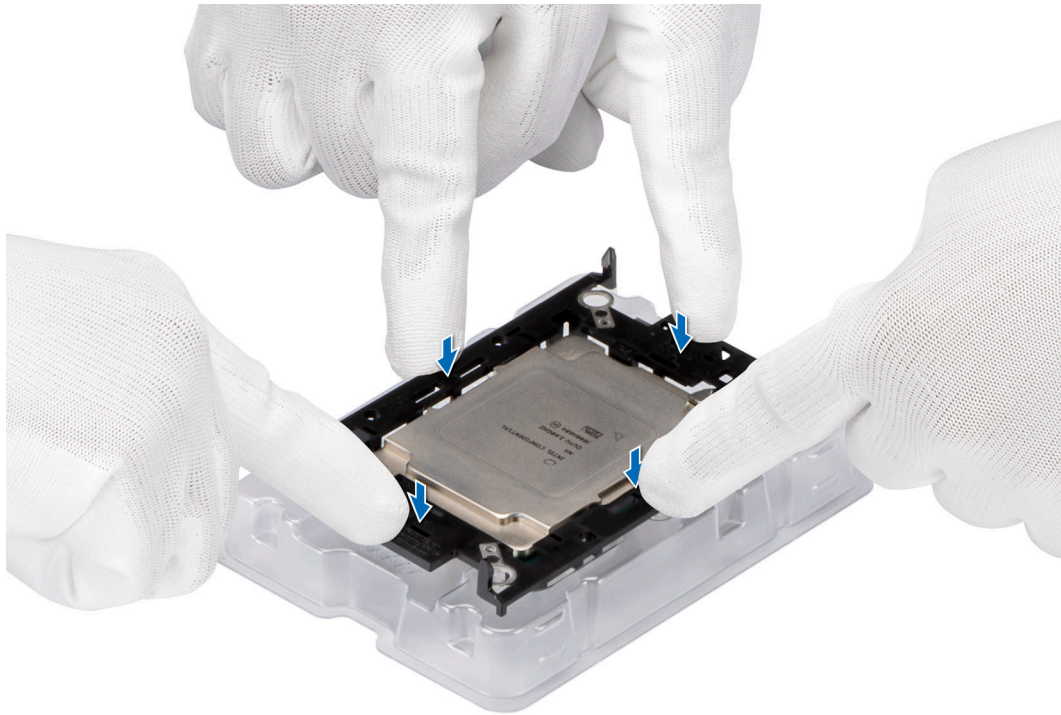


**Figure 70. Installing the processor retaining clip**

3. Align the processor with processor retaining clip by using your fingers to press the retaining clip on all the four sides until it clicks into place.

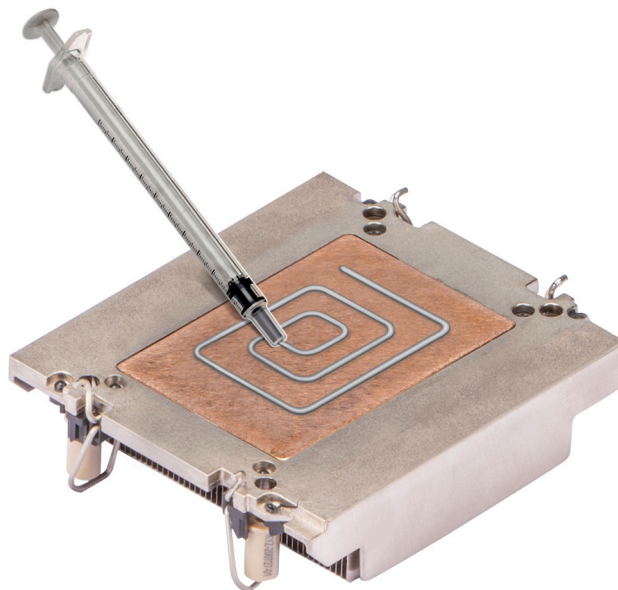
**i** **NOTE:** Ensure that the processor is securely latched to the processor retaining clip.





**Figure 71. Press the retaining clip on the four sides**

4. If you are using an existing heat sink, remove the thermal grease on the heat sink by using a clean lint-free cloth.
5. Use the thermal grease syringe included with your processor kit to apply the grease in a thin spiral on the bottom of the heat sink.

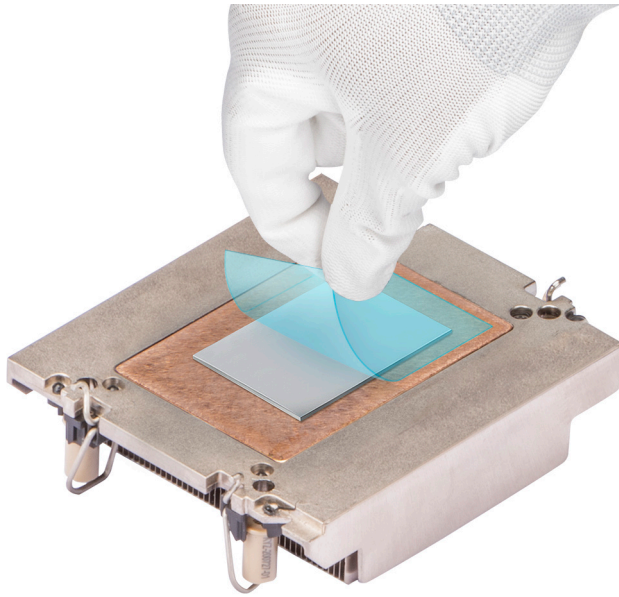


**Figure 72. Applying thermal grease**

**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 of the syringe after you use it.

6. For new heat sink, remove the Thermal Interface Material (TIM) protective film from the base of heat sink.



**Figure 73. Remove the Thermal Interface Material (TIM) protective film**

7. Place the heat sink on the processor and press the heat sink until the retaining clip locks onto the heat sink at all the four corners.

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

**NOTE:** Ensure that the pin 1 indicator on the heat sink is aligned with the pin 1 indicator on the retaining clip before placing the heat sink onto the processor retaining clip.

**NOTE:** Ensure latching features on processor retaining clip and heat sink are aligned during assembly.

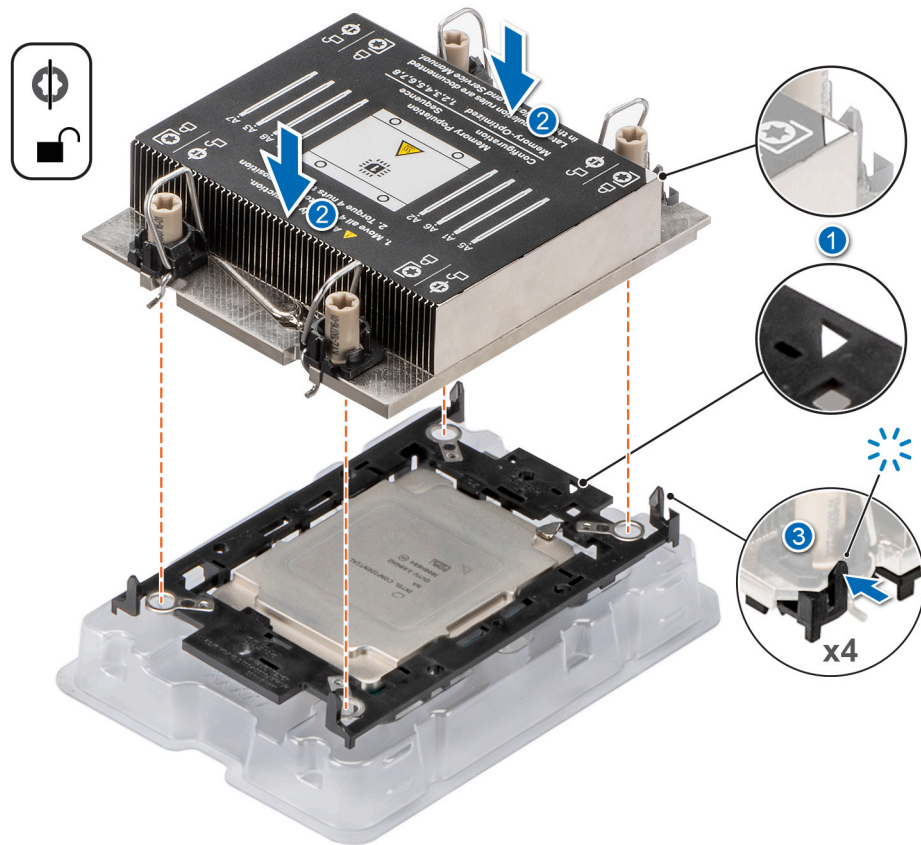


Figure 74. Installing the heat sink onto the processor

### Next steps

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

## Installing the 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.

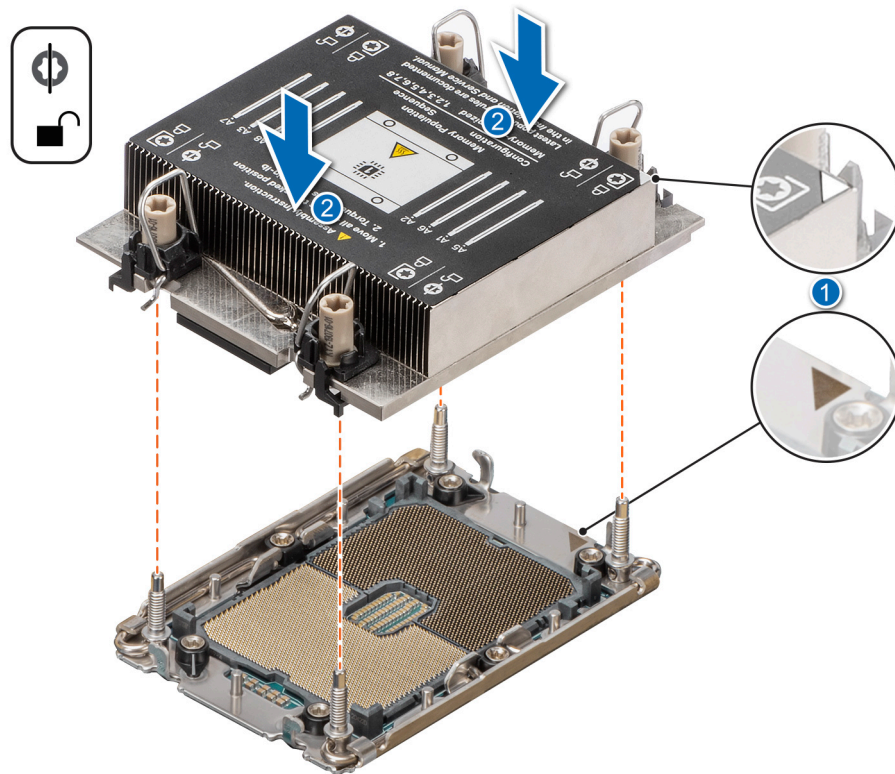
1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Remove the air shroud](#).
4. If installed, remove the processor dust cover.

### Steps

1. Set the Anti-Tilt wires to the unlocked position on the heat sink (inward position).
2. Align the pin 1 indicator of the heat sink to the system board, and then place the processor and heat sink 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 processor and heat sink is held parallel to the system board to prevent damaging the components.



**Figure 75. Installing the processor and heat sink (PHM)**

3. Set the Anti-Tilt wires to the locked position (outward position), and then using the Torx #T30 screwdriver, tighten the screws (8 in-lbf) on the heat sink in the order below:
  - a. Tighten the first screw three turns.
  - b. Tighten the screw diagonally opposite to the screw you tighten first.
  - c. Repeat the procedure for the remaining two screws.
  - d. Return to the first screw to tighten it completely.

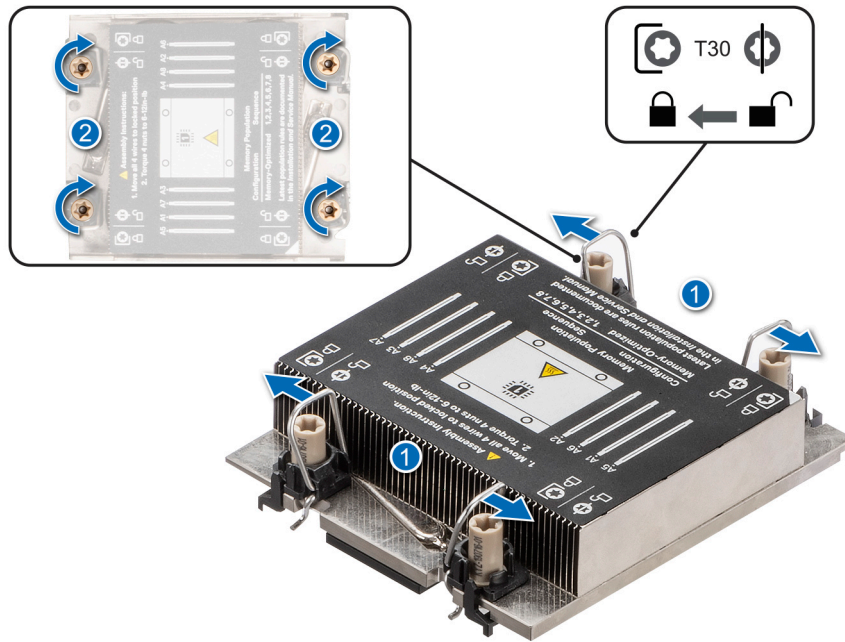


Figure 76. Set the Anti-Tilt wires to the locked position and tightening the screws

### Next steps

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

## Optional OCP card

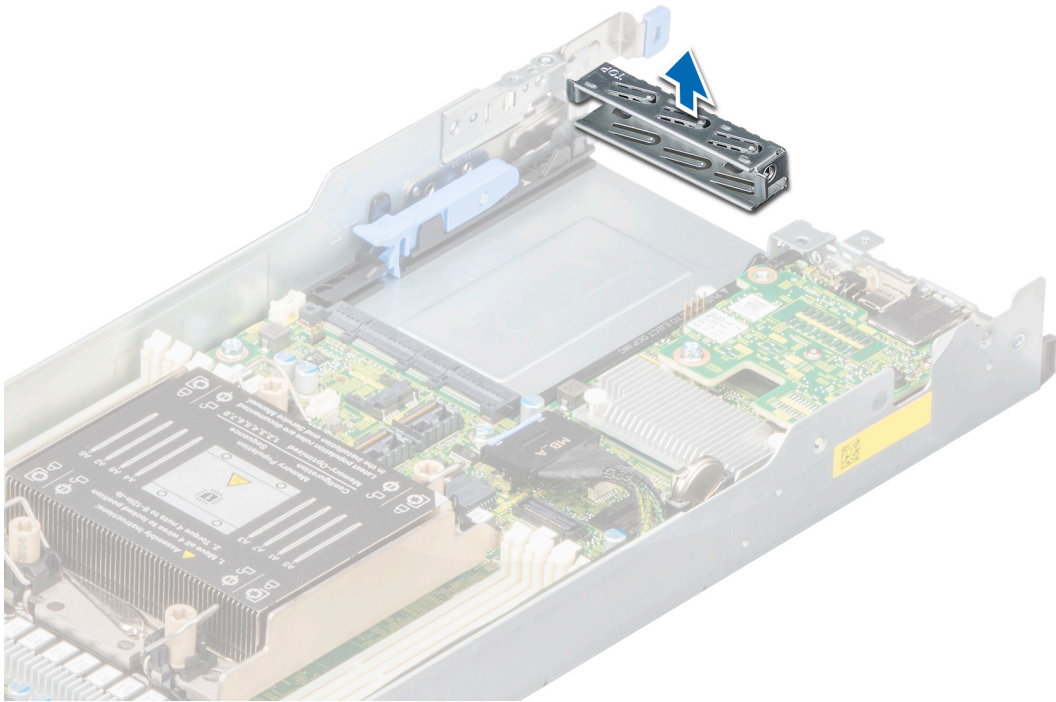
### Removing the OCP filler

#### Prerequisites

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

#### Steps

Hold and lift the OCP filler from the OCP slot on the chassis.



**Figure 77. Removing the OCP card filler**

### Next steps

1. Install the OCP card.
2. Install the expansion card riser 2.
3. Install the expansion card riser 1.

## Installing an OCP card

### Prerequisites

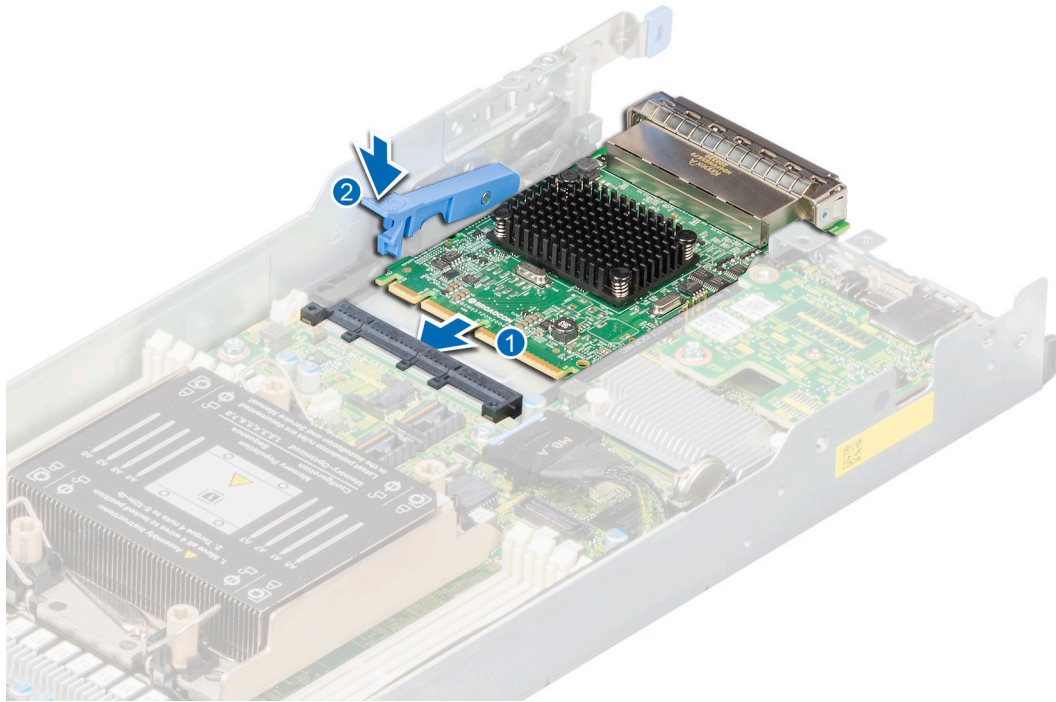
1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Remove the expansion card riser 1](#).
4. [Remove the expansion card riser 2](#).
5. [Remove the OCP filler](#).

### Steps

1. Align and insert the OCP card into the sled. Slide the OCP card and push firmly until it is fully connected to the system board connector.

**NOTE:** Ensure to lift the OCP card retention latch if it is in the lock position.

2. Close the OCP card retention latch to secure the card in place.



**Figure 78. Installing an OCP card**

### Next steps

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

## Removing an OCP card

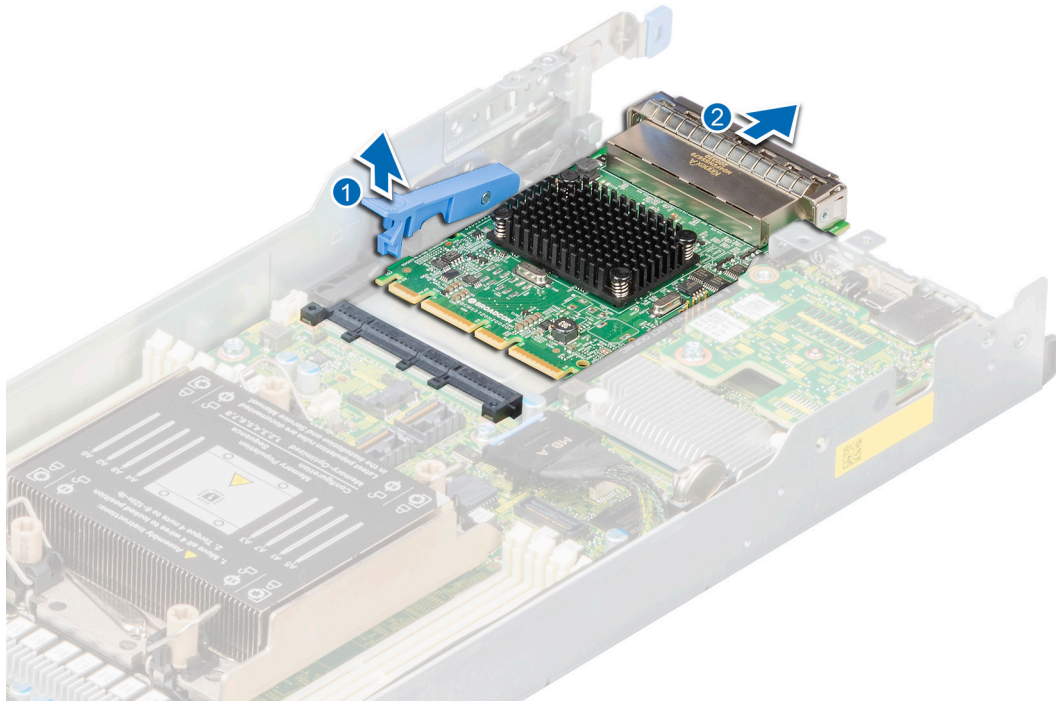
### Prerequisites

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

### Steps

1. Lift the OCP card retention latch.
2. Disengage the OCP card and remove it from the sled.

**NOTE:** Install an expansion card filler bracket over an empty expansion slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.



**Figure 79. Removing an OCP card**

3. Press down the OCP card retention latch to lock it.

#### **Next steps**

1. Install the OCP filler.
2. Install the expansion card riser 2.
3. Install the expansion card riser 1.

## **Installing the OCP card filler**

#### **Prerequisites**

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

#### **Steps**

Align and insert the OCP filler firmly until it is fully seated.



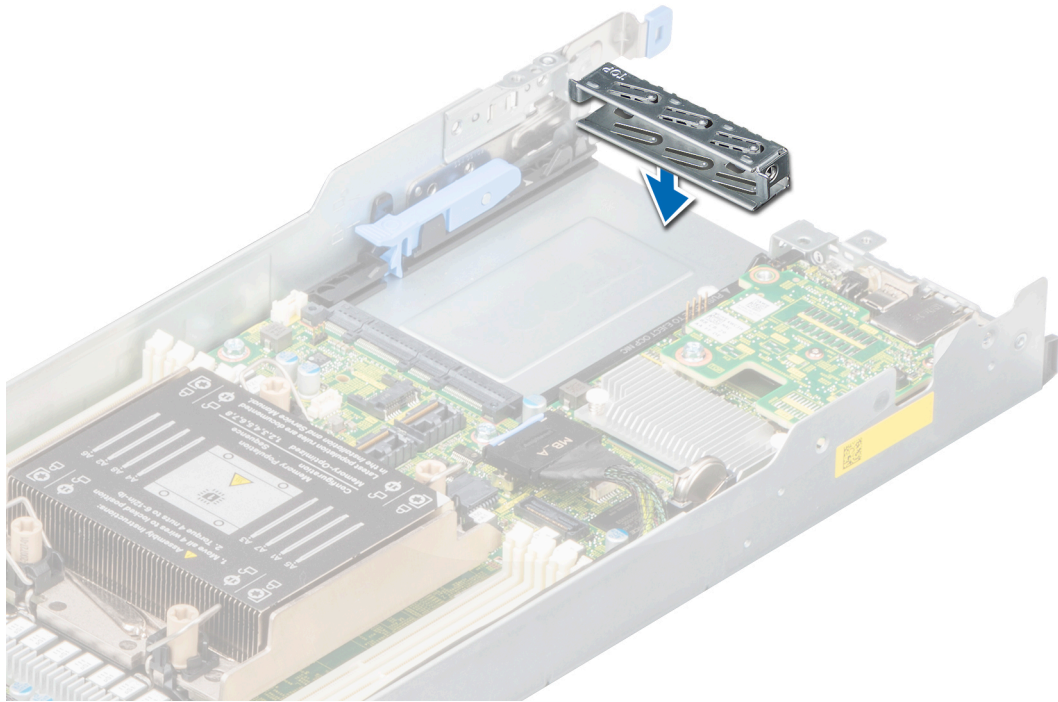


Figure 80. Installing the OCP card filler

#### Next steps

1. [Install the expansion card riser 2.](#)
2. [Install the expansion card riser 1.](#)

## System battery

This is a service technician replaceable part only.

## Replacing the system battery

#### Prerequisites

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

1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Remove the expansion card riser 1.](#)
4. If applicable, disconnect the power or data cables from the expansion card.

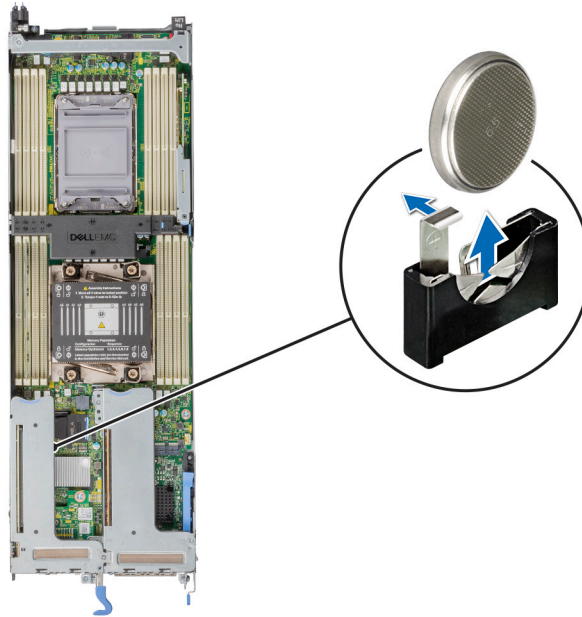
#### Steps

1. To remove the battery:
  - a. Push the battery holder clip away from the battery.

**⚠ CAUTION:** To avoid damage to the battery holder clip, ensure that you do not bend the battery holder clip while installing or removing a battery.

- b. Pull the battery out of the battery holder.

**NOTE:** Ensure that the + side of the battery is facing the battery holder clip.



**Figure 81. Removing the system battery**

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

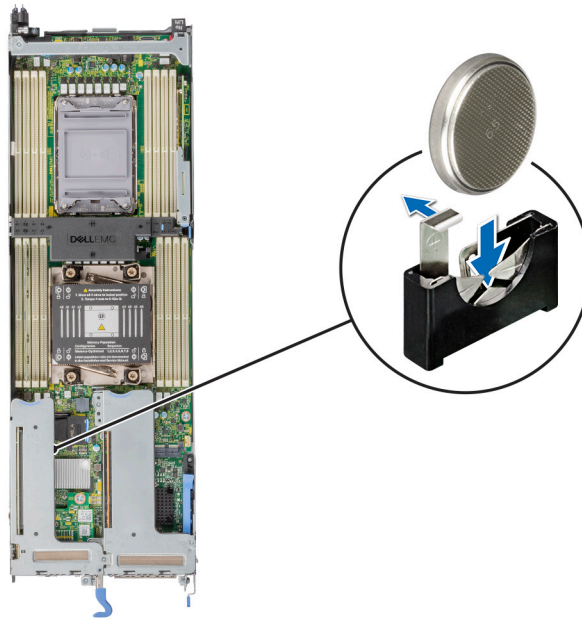
2. To install a new system battery:

- a. Push the battery holder clip away.

**NOTE:** Ensure that the + side of the battery is facing the battery holder clip.

- b. Insert the battery in the battery holder until the battery holder clip snaps into place.

**CAUTION:** To avoid damage to the battery holder clip, ensure that you do not bend the battery holder clip while installing or removing a battery.



**Figure 82. Installing the system battery**

### Next steps

1. If applicable, [Install the expansion card riser 1](#) and connect the cables to the expansion card.
2. Follow the procedure listed in the [After working inside your system](#).
3. Confirm that the battery is operating properly, by performing the following steps:
  - a. Enter the System Setup, while booting, by pressing F2.
  - b. Enter the correct time and date in the System Setup **Time** and **Date** fields.
  - c. **Exit** the System Setup.
  - d. To test the newly installed battery, remove the system from the enclosure for at least an hour.
  - e. Reinstall the system into the enclosure after an hour.
  - f. Enter the System Setup and if the time and date are still incorrect, see [Getting help](#) section.

## System board

This is a service technician replaceable part only.

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

1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. Remove the following components:
  - a. [Sled](#)
  - b. [Air shroud](#)
  - c. [Expansion card risers](#)

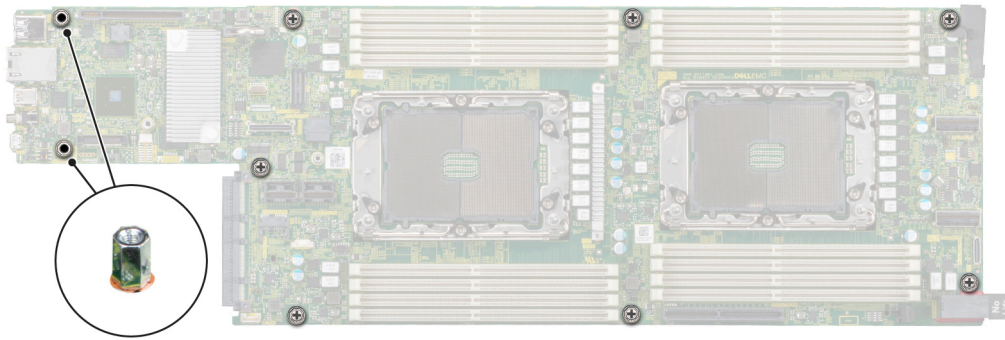
- d. Heat sink module
- e. Processor
- f. Memory modules
- g. If installed, OCP card
- h. Linking board
- i. Disconnect all cables from the system board.

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

### Steps

1. Using a Phillips #1 screwdriver, remove the screws that secure the system board to the chassis.
2. Using a 5mm hex nut driver, remove the standoff screws that secure the system board to the chassis.

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



**Figure 83. System board screws**

3. To disengage the ports from the slots on the chassis, slide the system board toward the front of the chassis.
4. Incline the system board at an angle and lift the system board out of the chassis.

**NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.

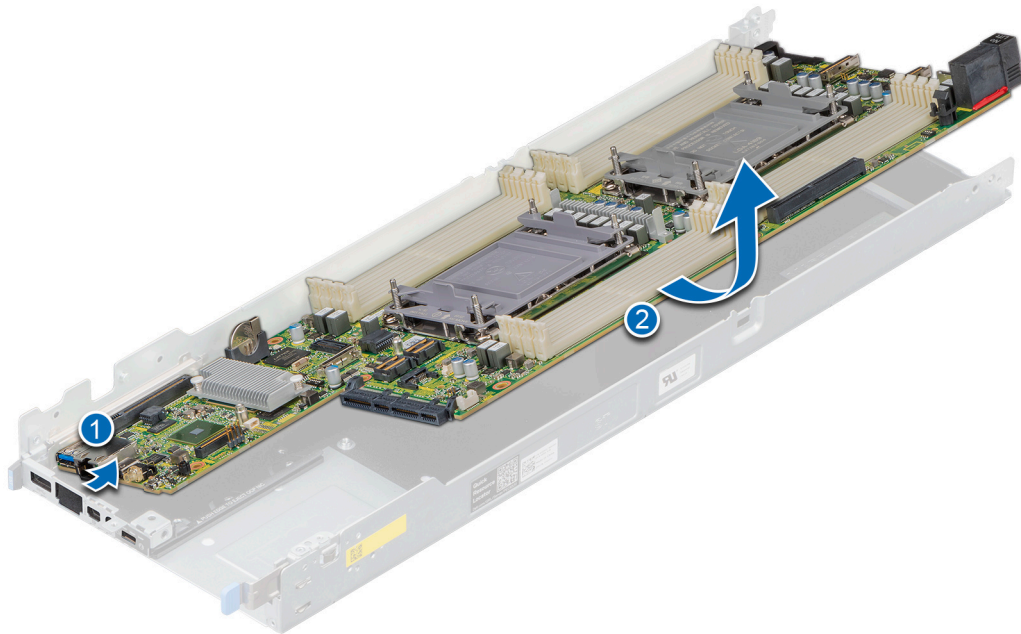


Figure 84. Removing the system board

### Next steps

[Install the system board](#)

## Installing the system board

### Prerequisites

**NOTE:** Before replacing the system board, replace the old iDRAC MAC address label in the Information tag with the iDRAC MAC address label of the replacement system board

1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. If you are replacing the system board, remove all the components that are listed in the [removing the system board](#) section.

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

### Steps

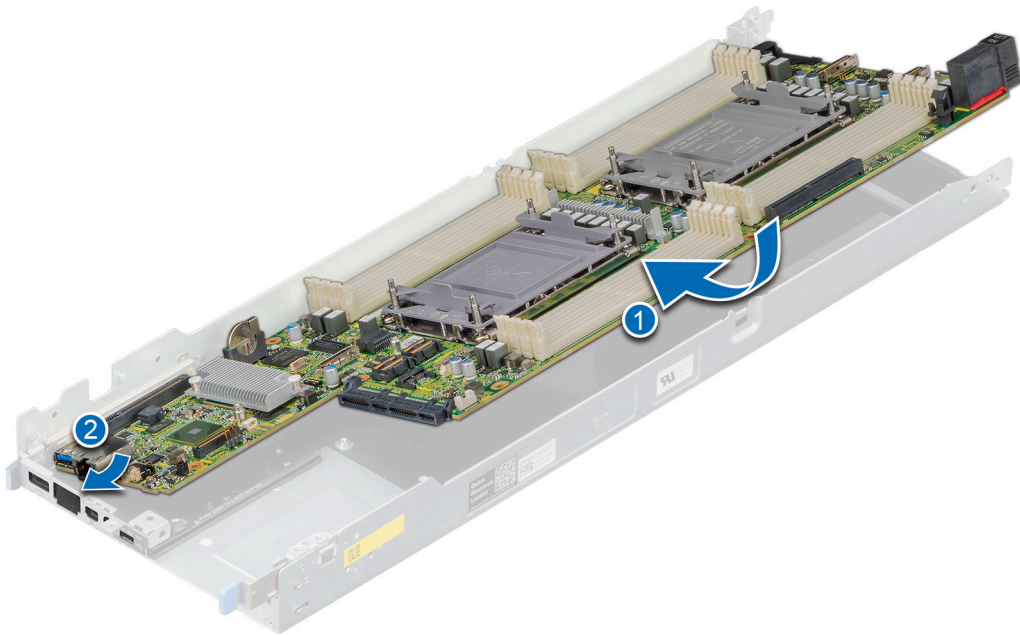
1. Unpack the new system board assembly.

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

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

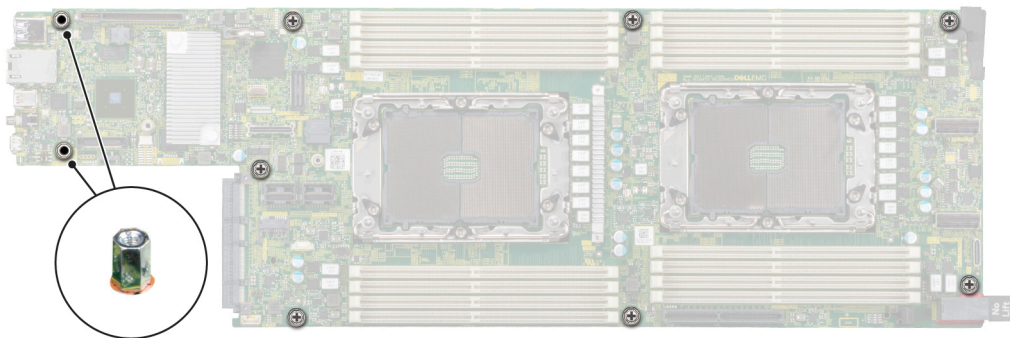
2. Holding the system board by the edges, lower the system board into the chassis.
3. Incline the system board at an angle and align the connectors on the system board with the slots on the rear of the chassis until the connectors are firmly seated in the slots.

**NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.



**Figure 85. Installing the system board**


4. Using a 5mm hex nut driver, secure the standoff screws that secure the system board to the chassis.
5. Using a Phillips #1 screwdriver, tighten the screws that secure the system board to the chassis.



**Figure 86. Tightening the screws on the system board**

**Next steps**

1. Replace the following components:
  - a. [Trusted Platform Module \(TPM\)](#)  
**NOTE:** The TPM Module must be replaced only while installing new system board.
  - b. [Air shroud](#)
  - c. [Expansion card risers](#)
  - d. [Processor](#)
  - e. [Heat sink module](#)
  - f. [Memory modules](#)



- g. OCP card
  - h. Linking board
2. Reconnect all cables to the system board.
    -  **NOTE:** Ensure that the cables inside the system are routed along the chassis wall and secured using the cable securing bracket.
  3. Ensure that you perform the following steps:
    - a. Use the Easy Restore feature to restore the Service Tag. See the [Restoring the system by using the Easy Restore feature](#) section.
    - b. If the service tag is not backed up in the backup flash device, enter the system service tag manually. See the [Manually update the Service Tag by using System Setup](#) section.
    - c. Update the BIOS and iDRAC versions.
      - Re-enable the Trusted Platform Module (TPM). See the [Upgrading the Trusted Platform Module](#) section.
  4. If you are not using Easy restore, import your new or existing iDRAC Enterprise license. For more information, see the *Integrated Dell Remote Access Controller User's Guide* available at <https://www.dell.com/idracmanuals> .
  5. Follow the procedure listed in [After working inside your system](#).

## Restoring the system using Easy Restore

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

### About this task

Below is a list of options/steps available:

- Restore the service tag, license, and diagnostics information, press **Y**
- Navigate to the Lifecycle Controller based restore options, press **N**
- Restore data from a previously created **Hardware Server Profile**, press **F10**
  -  **NOTE:** When the restore process is complete, BIOS prompts to restore the system configuration data.
- Restore data from a previously created **Hardware Server Profile**, press **F10**
- To restore the system configuration data, press **Y**
- To use the default configuration settings, press **N**
-  **NOTE:** After the restore process is complete, system reboots.


## Manually update the Service Tag

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

### About this task

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

### Steps

1. Power on the system.
2. To enter the **System Setup**, press **F2**.
3. Click **Service Tag Settings**.
4. Enter the service tag.
  -  **NOTE:** You can enter the service tag only when the **Service Tag** field is empty. Ensure that you enter the correct service tag. Once the service tag is entered, it cannot be updated or changed.
5. Click **OK**.

# Trusted Platform Module

This is a service technician replaceable part only.


## Upgrading the Trusted Platform Module

### Removing the TPM

#### Prerequisites

##### NOTE:

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

 **CAUTION:** After the TPM plug-in module is installed, it is cryptographically bound to that specific system board. When the system is powered on, any attempt to remove an installed TPM plug-in module breaks the cryptographic binding, and the removed TPM cannot be installed on another system board. Ensure any keys you have stored on the TPM have been securely transferred.

#### Steps

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

### Installing the TPM

#### Steps

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

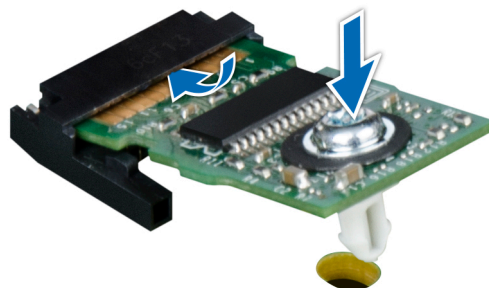


Figure 87. Installing the TPM



## Initializing TPM for users

### Steps

1. Initialize the TPM.  
For more information, see [Initializing the TPM for users](#).
2. The **TPM Status** changes to **Enabled, Activated**.

## Initializing the TPM 1.2 for users

### Steps

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

## Initializing the TPM 2.0 for 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.

## Upgrade Kits

The table lists the available After Point Of Sale [APOS] kits.

**Table 16. Upgrade kits**

Kits	Related links to service instructions
Processors	See <a href="#">Installing the processor</a>
Risers	
Memory modules	See <a href="#">Installing the memory module</a>
Hard drives	
Hard drives SAS/SATA SSD	
Hard drives NVMe SSD	
BOSS M.2	See <a href="#">Installing the M.2 SSD module</a>
PCIe SSD card	See <a href="#">Installing an expansion card into the expansion card riser</a>
Storage controller cards	See <a href="#">Installing an expansion card into the expansion card riser</a>
HBA/CNA (3rd party card)	See <a href="#">Installing an expansion card into the expansion card riser</a>
Network cards	See <a href="#">Installing an expansion card into the expansion card riser</a>
Cables	
Fans	
Heat sink	
Power cords	
Power supplies	
SD cards	
TPM	See <a href="#">Upgrading the Trusted Platform Module</a>
Rail kit	
Sled blank	See <a href="#">Installing the sled blank</a>

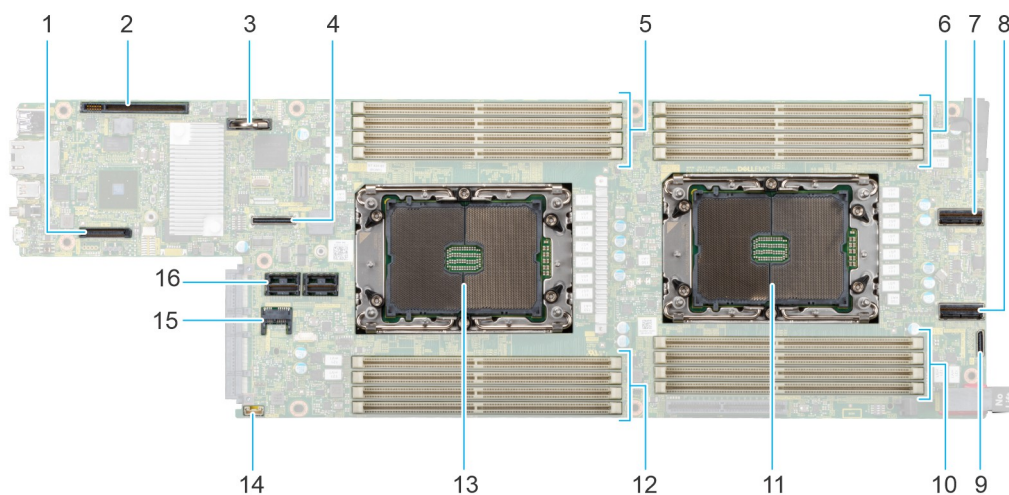
# Jumpers and connectors

This section provides essential and specific information about jumpers and switches. It also describes the connectors on the various boards in the system. Jumpers on the system board help to disable the system and reset the passwords. To install components and cables correctly, you must be able to identify the connectors on the system board.

## Topics:

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

## System board connectors







**Figure 88. System board jumpers and connectors**

- |  |   |
|--|---|
| 1. BCM5720 on LOM card BTB                   | 2. PCIe Gen 4 x16 Slot 1 / SNAPI              |
| 3. Coin cell battery                         | 4. NPIO 2 SATA Connector (NPIO2_PCH_SA0)      |
| 5. DIMMs for processor 1 Channels A, B, C, D | 6. DIMMs for CPU 2 Channels A, B, C, D        |
| 7. Slimline Connector 1 (SL1_CPU2_PA0)       | 8. Slimline Connector 2 (SL2_CPU2_PB0)        |
| 9. NPIO 3 PCIe connector (NPIO3_CPU2_PB0)    | 10. DIMMs for processor 2 channels E, F, G, H |
| 11. Processor 2                              | 12. DIMMs for processor 1 channels E, F, G, H |
| 13. Processor 1                              | 14. Leak Sensor Connector                     |
| 15. TPM Connector                            | 16. PCIe Gen 4 x16 Slot 2                     |

## System board jumper settings

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

**Table 17. 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.
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.

**CAUTION:** Be careful when changing the BIOS settings. The BIOS interface is designed for advanced users. Any change in the setting could prevent your system from starting correctly and you might have potential loss of data.

## Disabling a forgotten password

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

### Prerequisites

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

### Steps

- Power off the compute sled and remove the compute sled from chassis.
- Move the jumper on the system board from pins 1 and 2 to pins 2 and 3.
  - NOTE:** The existing passwords are not disabled (erased) until the system boots with the jumper on pins 2 and 3. However, before you assign a new system and/or setup password, you must move the jumper back to pins 1 and 2.
  - NOTE:** If you assign a new system and/or setup password with the jumper on pins 2 and 3, the system disables the new password(s) the next time it boots.
- Insert compute sled into chassis and power on the compute sled.
- Power off the compute sled and remove the compute sled from chassis.
- Move the jumper on the system board from pins 2 and 3 to pins 1 and 2.
- Insert compute sled into chassis and power on the compute sled.
- Assign a new system and/or setup password.

# System diagnostics and indicator codes

This section describes the diagnostic indicators on the system front panel that displays the system status during system startup.


## Topics:

- [Using system diagnostics](#)

## Using system diagnostics

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

## 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 provide 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 issues encountered during testing

## Running the Embedded System Diagnostics from the Dell Lifecycle Controller

### Steps

1. When the system is booting, 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 start executing the tests on all the detected devices.

## 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.

## System diagnostic controls

Table 18. System diagnostic controls

<b>Menu</b>	<b>Description</b>
<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:

- [Recycling or End-of-Life service information](#)
- [Contacting Dell Technologies](#)
- [Accessing system information by using QRL](#)
- [Receiving automated support with 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.

## Contacting Dell Technologies

Dell provides online and telephone based support and service options. If you do not have an active internet connection, you can find Dell contact information on your purchase invoice, packing slip, bill or Dell product catalog. The availability of services varies depending on the country and product, and some services may not be available in your area. To contact Dell for sales, technical assistance, or customer service issues follow these steps:

### 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 the system Service Tag in the **Enter a Service Tag, Serial Number, Service Request, Model, or Keyword** field.
  - b. Click **Search**.  
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 Global Technical Support:
  - a. Click [Contact Technical Support](#).
  - b. The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell Global Technical Support team.

## Accessing system information by using QRL

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### Prerequisites

Ensure that your smartphone or tablet has a 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
- The system service tag to quickly access the 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 smart phone 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 C6520 system



Figure 89. Quick Resource Locator for PowerEdge C6520 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).



## Documentation resources

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

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

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

**Table 19. Additional documentation resources for your system**

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

**Table 19. Additional documentation resources for your system (continued)**

Task	Document	Location
Managing your system	For information about systems management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	<a href="http://www.dell.com/poweredgemanuals">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 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="http://www.dell.com/openmanagemanuals">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 server issues, see the Server Troubleshooting Guide.	<a href="http://www.dell.com/poweredgemanuals">www.dell.com/poweredgemanuals</a>