

# Dell PowerEdge R470

## 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>8</b>  |
| <b>Chapter 2: PowerEdge R470 system configurations and features.....</b> | <b>9</b>  |
| System configurations - front view for PowerEdge R470 system.....        | 10        |
| Left Control Panel (LCP)- Secondary view.....                            | 14        |
| Right Control Panel (RCP) - Primary view.....                            | 15        |
| System configurations - rear view for PowerEdge R470 system.....         | 16        |
| System configurations - inside view for PowerEdge R470 system.....       | 20        |
| Locating the Express Service Code and Service Tag.....                   | 21        |
| System information label.....                                            | 22        |
| Rail sizing and rack compatibility matrix.....                           | 25        |
| <b>Chapter 3: Technical specifications.....</b>                          | <b>26</b> |
| Chassis dimensions .....                                                 | 27        |
| System weight.....                                                       | 28        |
| Processor specifications.....                                            | 28        |
| PSU specifications.....                                                  | 28        |
| Cooling fan specifications.....                                          | 30        |
| Supported operating systems.....                                         | 31        |
| System battery specifications.....                                       | 31        |
| Expansion card riser specifications.....                                 | 31        |
| Memory specifications.....                                               | 32        |
| Storage controller specifications.....                                   | 33        |
| Drives.....                                                              | 33        |
| GPU Specifications.....                                                  | 33        |
| Ports and connectors specifications.....                                 | 34        |
| NIC port specifications.....                                             | 34        |
| USB ports specifications.....                                            | 34        |
| Serial connector specifications.....                                     | 34        |
| Video ports specifications.....                                          | 34        |
| Video specifications.....                                                | 34        |
| Environmental specifications.....                                        | 35        |
| Particulate and gaseous contamination specifications.....                | 36        |
| Thermal restriction matrix.....                                          | 37        |
| Thermal air restrictions.....                                            | 40        |
| <b>Chapter 4: Initial system setup and configuration.....</b>            | <b>42</b> |
| Setting up the system.....                                               | 42        |
| iDRAC configuration.....                                                 | 42        |
| Options to set up iDRAC IP address.....                                  | 42        |
| Options to log in to iDRAC.....                                          | 43        |
| Resources to install operating system.....                               | 43        |
| Options to download drivers and firmware .....                           | 44        |
| Options to download and install OS drivers .....                         | 44        |

|                                                                                       |           |
|---------------------------------------------------------------------------------------|-----------|
| Downloading drivers and firmware.....                                                 | 44        |
| <b>Chapter 5: Pre-operating system management applications.....</b>                   | <b>46</b> |
| System Setup.....                                                                     | 46        |
| System BIOS.....                                                                      | 47        |
| iDRAC Settings.....                                                                   | 47        |
| Device Settings.....                                                                  | 47        |
| Boot Manager.....                                                                     | 47        |
| PXE boot.....                                                                         | 47        |
| <b>Chapter 6: Minimum to POST and system management configuration validation.....</b> | <b>48</b> |
| Minimum configuration to POST .....                                                   | 48        |
| <b>Chapter 7: Configuration validation.....</b>                                       | <b>49</b> |
| <b>Chapter 8: Disassembly and reassembly.....</b>                                     | <b>50</b> |
| Safety instructions.....                                                              | 50        |
| Before working inside your system .....                                               | 51        |
| After working inside your system.....                                                 | 51        |
| Recommended tools.....                                                                | 52        |
| Optional front bezel.....                                                             | 52        |
| Removing the front bezel.....                                                         | 52        |
| Installing the front bezel.....                                                       | 53        |
| System cover.....                                                                     | 53        |
| Removing the system cover.....                                                        | 53        |
| Installing the system cover.....                                                      | 54        |
| Air shroud.....                                                                       | 55        |
| Removing the air shroud.....                                                          | 55        |
| Installing the air shroud.....                                                        | 56        |
| Cooling fans.....                                                                     | 57        |
| Removing a cooling fan.....                                                           | 57        |
| Installing a cooling fan.....                                                         | 58        |
| Drive backplane cover.....                                                            | 59        |
| Removing the drive backplane cover.....                                               | 59        |
| Installing the drive backplane cover.....                                             | 60        |
| Drives.....                                                                           | 61        |
| Removing an EDSFF E3.S drive blank.....                                               | 61        |
| Installing an EDSFF E3.S drive blank.....                                             | 62        |
| Removing an EDSFF E3.S drive carrier.....                                             | 63        |
| Removing an EDSFF E3.S drive from the drive carrier.....                              | 63        |
| Installing an EDSFF E3.S drive into the drive carrier.....                            | 64        |
| Installing an EDSFF E3.S drive carrier.....                                           | 65        |
| Removing a 2.5-inch drive blank.....                                                  | 66        |
| Installing a 2.5-inch drive blank.....                                                | 67        |
| Removing a 2.5-inch drive carrier.....                                                | 67        |
| Removing a 2.5-inch drive from the drive carrier.....                                 | 68        |
| Installing a 2.5-inch drive into the drive carrier.....                               | 69        |
| Installing a 2.5-inch drive carrier.....                                              | 70        |
| Removing a 3.5-inch drive blank.....                                                  | 71        |

|                                                                     |     |
|---------------------------------------------------------------------|-----|
| Installing a 3.5-inch drive blank.....                              | 72  |
| Removing a 3.5-inch drive carrier.....                              | 72  |
| Removing a 3.5-inch drive from the drive carrier.....               | 73  |
| Installing a 3.5-inch drive into the drive carrier.....             | 74  |
| Installing a 3.5-inch drive carrier.....                            | 75  |
| Rear Drives.....                                                    | 76  |
| Removing the rear 2 x EDSFF E3.S module.....                        | 76  |
| Installing the rear 2 x EDSFF E3.S module.....                      | 77  |
| Drive backplane.....                                                | 78  |
| Drive backplane.....                                                | 78  |
| Removing the 2.5-inch drive backplane module.....                   | 79  |
| Installing the 2.5-inch drive backplane module.....                 | 80  |
| Removing the EDSFF E3.S backplane module.....                       | 81  |
| Installing the EDSFF E3.S backplane module.....                     | 82  |
| Side wall brackets.....                                             | 83  |
| Removing the side wall bracket.....                                 | 83  |
| Installing the side wall bracket.....                               | 84  |
| Middle bracket.....                                                 | 85  |
| Removing the cables from the middle bracket .....                   | 85  |
| Installing the cables into the middle bracket .....                 | 86  |
| Cable routing.....                                                  | 87  |
| System memory.....                                                  | 104 |
| System memory guidelines.....                                       | 104 |
| General memory module installation guidelines.....                  | 106 |
| Removing a memory module.....                                       | 106 |
| Installing a memory module.....                                     | 107 |
| Processor and heat sink.....                                        | 108 |
| Removing the processor and heat sink module.....                    | 108 |
| Removing the processor.....                                         | 110 |
| Installing the processor.....                                       | 112 |
| Installing the processor and heat sink module.....                  | 115 |
| PERC cards.....                                                     | 117 |
| Removing the fPerc module.....                                      | 117 |
| Installing the fPerc module.....                                    | 118 |
| Expansion cards and expansion card risers.....                      | 119 |
| Expansion card installation guidelines.....                         | 120 |
| Removing the rear expansion card risers.....                        | 129 |
| Installing the rear expansion card risers.....                      | 132 |
| Removing an expansion card from the expansion card riser.....       | 135 |
| Installing an expansion card into the expansion card riser.....     | 140 |
| Removing the rear expansion card riser blank.....                   | 146 |
| Installing the rear expansion card riser blank.....                 | 147 |
| M.2 SSD module.....                                                 | 148 |
| Removing the M.2 NVMe SSD module from the M.2 Interposer board..... | 148 |
| Installing the M.2 NVMe SSD module in the M.2 Interposer board..... | 149 |
| Removing the M.2 NVMe SSD module.....                               | 153 |
| Installing the M.2 NVMe SSD module.....                             | 155 |
| Optional M.2 Interposer board.....                                  | 157 |
| Removing the M.2 Interposer board.....                              | 157 |
| Installing the M.2 Interposer board.....                            | 159 |

|                                                                        |     |
|------------------------------------------------------------------------|-----|
| Optional BOSS-N1 DC-MHS module.....                                    | 164 |
| Removing the BOSS-N1 DC-MHS card carrier blank.....                    | 164 |
| Installing the BOSS-N1 DC-MHS card carrier blank.....                  | 164 |
| Removing the front BOSS-N1 DC-MHS module.....                          | 165 |
| Installing the front BOSS-N1 DC-MHS module.....                        | 167 |
| Removing the rear BOSS-N1 DC-MHS module.....                           | 170 |
| Installing the rear BOSS-N1 DC-MHS module.....                         | 171 |
| Optional OCP NIC card.....                                             | 173 |
| Removing the front OCP NIC card.....                                   | 173 |
| Installing the front OCP NIC card.....                                 | 175 |
| Removing the front OCP NIC cage.....                                   | 176 |
| Installing the front OCP NIC cage.....                                 | 178 |
| Removing the rear OCP NIC card.....                                    | 179 |
| Installing the rear OCP NIC card.....                                  | 181 |
| Datcenter-Secure Control Module (DC-SCM).....                          | 182 |
| Removing the DC-SCM board.....                                         | 182 |
| Installing the DC-SCM board.....                                       | 183 |
| Restoring the system using Easy Restore.....                           | 184 |
| Manually update the Service Tag.....                                   | 185 |
| Attic board.....                                                       | 185 |
| Removing the Attic board.....                                          | 186 |
| Installing the Attic board.....                                        | 186 |
| Internal USB .....                                                     | 187 |
| Removing the internal USB .....                                        | 187 |
| Installing the Internal USB .....                                      | 188 |
| System battery.....                                                    | 189 |
| Replacing the system battery.....                                      | 189 |
| Intrusion switch.....                                                  | 191 |
| Removing the intrusion switch module.....                              | 191 |
| Installing the intrusion switch module.....                            | 192 |
| Power supply unit.....                                                 | 193 |
| Removing a power supply unit.....                                      | 193 |
| Installing a power supply unit.....                                    | 194 |
| Removing a power supply unit blank.....                                | 195 |
| Installing a power supply unit blank.....                              | 195 |
| DB9+RJ45 module.....                                                   | 196 |
| Removing the DB9+RJ45 module.....                                      | 196 |
| Installing the DB9+RJ45 module.....                                    | 197 |
| Trusted Platform Module.....                                           | 198 |
| Initializing TPM 2.0 for users.....                                    | 198 |
| HPM board.....                                                         | 199 |
| Removing the HPM board.....                                            | 199 |
| Installing the HPM board.....                                          | 200 |
| Control panel.....                                                     | 201 |
| Removing the Right Control Panel (RCP) - Primary.....                  | 201 |
| Installing the Right Control Panel (RCP) - Primary.....                | 202 |
| Removing the Left Control Panel (LCP)- Secondary KVM/Quick Sync.....   | 203 |
| Installing the Left Control Panel (LCP)- Secondary KVM/Quick Sync..... | 204 |

## **Chapter 9: Upgrade Kits..... 207**

|                                                                    |            |
|--------------------------------------------------------------------|------------|
| Processor upgrade kit components.....                              | 207        |
| Processor upgrade guidelines.....                                  | 208        |
| BOSS-N1 DCHMS module kit.....                                      | 209        |
| M.2 Interposer kit.....                                            | 209        |
| PERC module kit.....                                               | 210        |
| <b>Chapter 10: System diagnostics and indicator codes.....</b>     | <b>215</b> |
| Power LED indicators.....                                          | 215        |
| System health and system ID indicator codes.....                   | 216        |
| iDRAC Direct LED indicator codes.....                              | 216        |
| iDRAC Quick Sync 2 indicator codes.....                            | 217        |
| NIC indicator codes.....                                           | 217        |
| Power supply unit indicator codes.....                             | 218        |
| Drive indicator codes.....                                         | 219        |
| Using system diagnostics.....                                      | 221        |
| Dell Embedded System Diagnostics.....                              | 221        |
| <b>Chapter 11: Jumpers and connectors.....</b>                     | <b>222</b> |
| HPM board jumpers and connectors .....                             | 222        |
| HPM board jumper settings.....                                     | 224        |
| Disabling a forgotten password.....                                | 224        |
| <b>Chapter 12: Getting Help.....</b>                               | <b>226</b> |
| Recycling or End-of-Life service information.....                  | 226        |
| Contacting Dell Technologies.....                                  | 226        |
| Accessing system information by using MyDell.....                  | 226        |
| QR code for PowerEdge R470 system resources.....                   | 227        |
| Receiving automated support with Secure Connect Gateway (SCG)..... | 227        |
| <b>Chapter 13: Documentation resources.....</b>                    | <b>228</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.

# PowerEdge R470 system configurations and features

The PowerEdge R470 system is a 1U server that supports:

- One Intel® Xeon 6 processor E- core with up to 144 cores or One Intel® Xeon 6 processor P- core with up to 86 Cores with R1S option.
- 16 DIMM slots
- Two redundant AC or DC power supply units
- Up to 16 x EDSFF E3.S Gen5 NVMe front drives or Up to 8 x EDSFF E3.S Gen5 NVMe front drives or Up to 10 x 2.5-inch SAS/SATA or Up to 8 x 2.5-inch SAS/SATA front drives or Up to 8 x 2.5-inch NVMe front drives or Up to 4 x 3.5 - inch SAS/SATA front drives.
- Up to 2 x EDSFF E3.S Gen5 NVMe rear drives

**NOTE:** For more information about how to hot swap NVMe PCIe SSD device, see the *Dell Express Flash NVMe PCIe SSD User's Guide* at [Dell Support](#) page > **Browse all products** > **Infrastructure** > **Data Center Infrastructure** > **Storage Adapters & Controllers** > **Dell PowerEdge Express Flash NVMe PCIe SSD** > **Select This Product** > **Documentation** > **Manuals and Documents**.

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

**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:** This document provides a comprehensive list of product features. However, features marked with an asterisk (\*) may not be available at launch but introduced in future updates. Please note that this document does not confirm the availability or release timeline of any feature. For the most accurate and up-to-date information on feature availability, please refer to the product configurator page on [dell.com](#).

## Topics:

- [System configurations - front view for PowerEdge R470 system](#)
- [System configurations - rear view for PowerEdge R470 system](#)
- [System configurations - inside view for PowerEdge R470 system](#)
- [Locating the Express Service Code and Service Tag](#)
- [System information label](#)
- [Rail sizing and rack compatibility matrix](#)

# System configurations - front view for PowerEdge R470 system

## Front views of R470

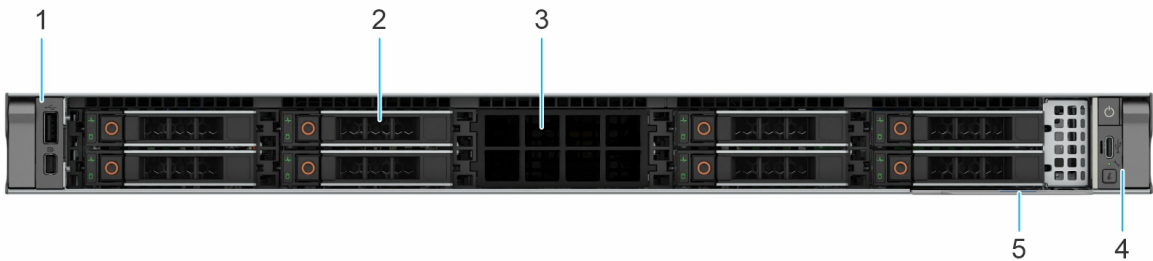


Figure 1. Front view of 8 x 2.5 inch -drive system

Table 1. The table shows the list of components in front view of the system.

| Item | Ports, panels, and slots             | Icon  | Description                                                                                                                                             |
|------|--------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Left control panel (LCP) - Secondary | N/A   | Contains the USB port and Mini-Displayport.<br><b>NOTE:</b> LCP - Secondary KVM module is optional, and LCP blank is default in the left control panel. |
| 2    | 2.5 inch drives                      | N/A   | Enables you to install drives that are supported on your system.                                                                                        |
| 3    | Drive blank                          | Blank | Blank filler for the storage drive slot                                                                                                                 |
| 4    | Right control panel (RCP) - Primary  | N/A   | Contains the system health LED, system ID, power button, Type-C USB port, and the host status LED.                                                      |
| 5    | Express Service Tag                  | N/A   | The Express Service Tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address                               |

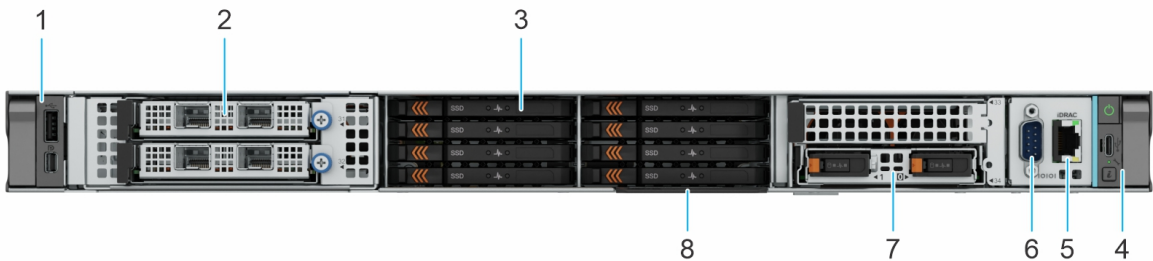
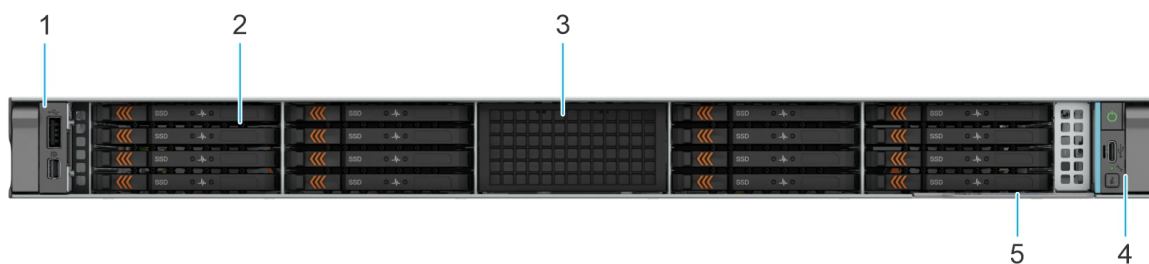


Figure 2. Front view of 8 x EDSFF E3.S -drive system with front I/O



**Table 2. The table shows the list of components in front view of the system.**

| Item | Ports, panels, and slots                                                                                                                                      | Icon  | Description                                                                                                               |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------|
| 1    | Left control panel (LCP) - Secondary<br><br><b>i</b> <b>NOTE:</b> LCP - Secondary KVM module is optional, and LCP blank is default in the left control panel. | N/A   | Contains the USB port and Mini-Displayport.                                                                               |
| 2    | OCP NIC (Primar/Secondary)<br><b>i</b> <b>NOTE:</b> Primary OCP is on slot 32 at the bottom                                                                   | N/A   | Enables you to install Primary/secondary OCP based on riser configurations on slots 31/32                                 |
| 3    | EDSFF E3.S drives                                                                                                                                             | N/A   | Enables you to install drives that are supported on your system.                                                          |
| 4    | Right control panel (RCP) - Primary                                                                                                                           | N/A   | Contains the system health LED, system ID, power button, Type-C USB port, and the host status LED.                        |
| 5    | Dedicated iDRAC Ethernet port                                                                                                                                 | N/A   | Enables you to access iDRAC.                                                                                              |
| 6    | Serial COM port                                                                                                                                               | IOIOI | Enables you to connect a serial device to the system.                                                                     |
| 7    | BOSS-N1 DC-MHS module                                                                                                                                         | N/A   | BOSS module for internal system boot.                                                                                     |
| 8    | Express Service Tag                                                                                                                                           | N/A   | The Express Service Tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address |



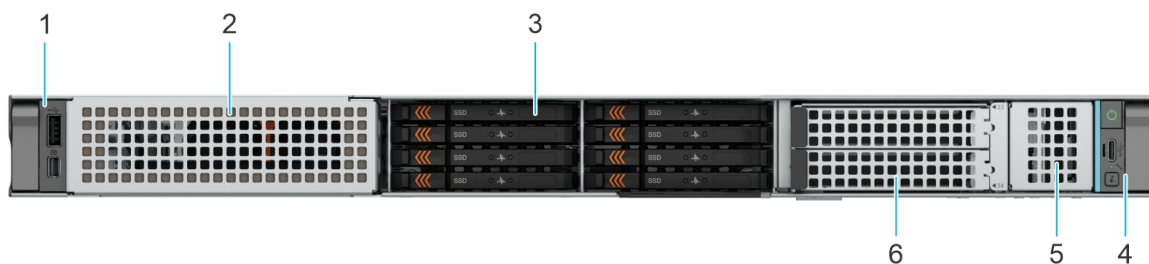
**Figure 3. Front view of 16 x EDSFF E3.S -drive system with front I/O**

**Table 3. The table shows the list of components in front view of the system.**

| Item | Ports, panels, and slots                                                                                                                                      | Icon | Description                                                      |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------|
| 1    | Left control panel (LCP) - Secondary<br><br><b>i</b> <b>NOTE:</b> LCP - Secondary KVM module is optional, and LCP blank is default in the left control panel. | N/A  | Contains the USB port and Mini-Displayport.                      |
| 2    | EDSFF E3.S drives                                                                                                                                             | N/A  | Enables you to install drives that are supported on your system. |

**Table 3. The table shows the list of components in front view of the system. (continued)**

| Item | Ports, panels, and slots            | Icon  | Description                                                                                                               |
|------|-------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------|
| 3    | Drive blank                         | Blank | Blank filler for the storage drive slot                                                                                   |
| 4    | Right control panel (RCP) - Primary | N/A   | Contains the system health LED, system ID, power button, Type-C USB port, and the host status LED.                        |
| 5    | Express Service Tag                 | N/A   | The Express Service Tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address |



**Figure 4. Front view of 8 x EDSFF E3.S -drive system with rear I/O**

**Table 4. The table shows the list of components in front view of the system.**

| Item | Ports, panels, and slots             | Icon | Description                                                                                                                                             |
|------|--------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Left control panel (LCP) - Secondary | N/A  | Contains the USB port and Mini-Displayport.<br><b>NOTE:</b> LCP - Secondary KVM module is optional, and LCP blank is default in the left control panel. |
| 2    | PCIe blank                           | N/A  | Blank filler for the PCIe expansion riser slot                                                                                                          |
| 3    | EDSFF E3.S drives                    | N/A  | Enables you to install drives that are supported on your system.                                                                                        |
| 4    | Right control panel (RCP) - Primary  | N/A  | Contains the system health LED, system ID, power button, Type-C USB port, and the host status LED.                                                      |
| 5    | Blank                                | N/A  | Blank filler for the DB9 slot                                                                                                                           |
| 6    | PCIe blank                           | N/A  | Blank filler for the PCIe expansion riser slot                                                                                                          |



Figure 5. Front view of 10 x 2.5 inch -drive system with rear I/O

Table 5. The table shows the list of components in front view of the system.

| Item | Ports, panels, and slots             | Icon | Description                                                                                                                                             |
|------|--------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Left control panel (LCP) - Secondary | N/A  | Contains the USB port and Mini-Displayport.<br><b>NOTE:</b> LCP - Secondary KVM module is optional, and LCP blank is default in the left control panel. |
| 2    | 2.5 inch drives                      | N/A  | Enables you to install drives that are supported on your system.                                                                                        |
| 3    | Right control panel (RCP) - Primary  | N/A  | Contains the system health LED, system ID, power button, Type-C USB port, and the host status LED.                                                      |
| 4    | Express Service Tag                  | N/A  | The Express Service Tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address                               |



Figure 6. Front view of 4 x 3.5 inch -drive system with rear I/O

Table 6. The table shows the list of components in front view of the system.

| Item | Ports, panels, and slots             | Icon | Description                                                                                                                                             |
|------|--------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Left control panel (LCP) - Secondary | N/A  | Contains the USB port and Mini-Displayport.<br><b>NOTE:</b> LCP - Secondary KVM module is optional, and LCP blank is default in the left control panel. |
| 2    | 3.5 inch drives                      | N/A  | Enables you to install drives that are supported on your system.                                                                                        |

**Table 6. The table shows the list of components in front view of the system. (continued)**

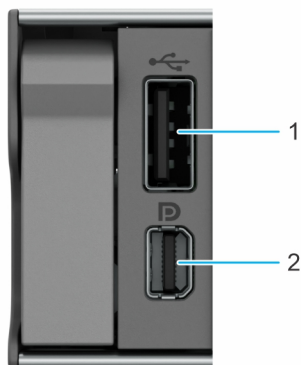
| Item | Ports, panels, and slots            | Icon | Description                                                                                                               |
|------|-------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------|
| 3    | Right control panel (RCP) - Primary | N/A  | Contains the system health LED, system ID, power button, Type-C USB port, and the host status LED.                        |
| 4    | Express Service Tag                 | N/A  | The Express Service Tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address |

## Left Control Panel (LCP)- Secondary view

The R470 system has three options for Left Control Panel (LCP)- Secondary panel as shown below. The default option is the blank.



**Figure 7. Left Control Panel (LCP)- Secondary panel - blank module**



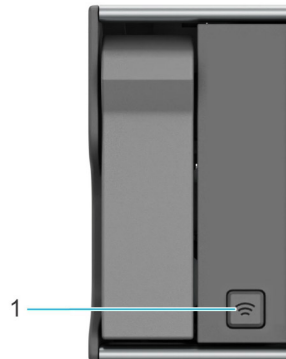
**Figure 8. Left Control Panel (LCP)- Secondary panel - KVM module**

**Table 7. Left Control Panel (LCP)- Secondary panel - KVM module (optional)**

| Item | Indicator, button, or connector | Icon                                                                                | Description                                                                                       |
|------|---------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 1    | USB 2.0-compliant port          |  | The USB port is 4-pin, 2.0-compliant. This port enables you to connect USB devices to the system. |

**Table 7. Left Control Panel (LCP)- Secondary panel - KVM module (optional) (continued)**

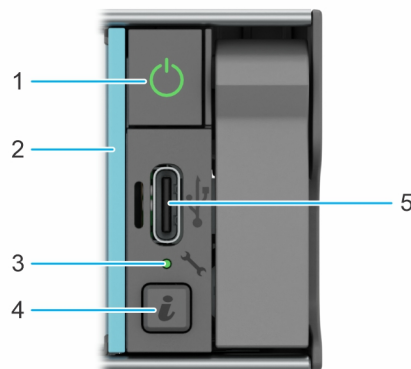
| Item | Indicator, button, or connector | Icon                                                                              | Description                                            |
|------|---------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------|
| 2    | Mini-Displayport                |  | Enables you to connect a display device to the system. |



**Figure 9. Left Control Panel (LCP) - Secondary panel - Quick Sync 2.0 (optional)**

1. Quick Sync 2.0 button

## Right Control Panel (RCP) - Primary view



**Figure 10. Right Control Panel (RCP) - Primary**

**Table 8. Right Control Panel (RCP) - Primary**

| Item | Indicator or button                   | Icon                                                                                | Description                                                                                                                                                                                                    |
|------|---------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Power button                          |  | Indicates if the system is powered on or off. Press the power button to manually power on or off the system<br><b>NOTE:</b> Press the power button to gracefully shut down an ACPI-compliant operating system. |
| 2    | System health and System ID indicator | N/A                                                                                 | Indicates the status of the system.                                                                                                                                                                            |
| 3    | iDRAC Direct LED indicator            |  | The iDRAC Direct LED indicator lights up to indicate that the iDRAC Direct port is actively connected to a device.                                                                                             |
| 4    | System ID button                      |  | System ID allows user to physically locate the system..                                                                                                                                                        |

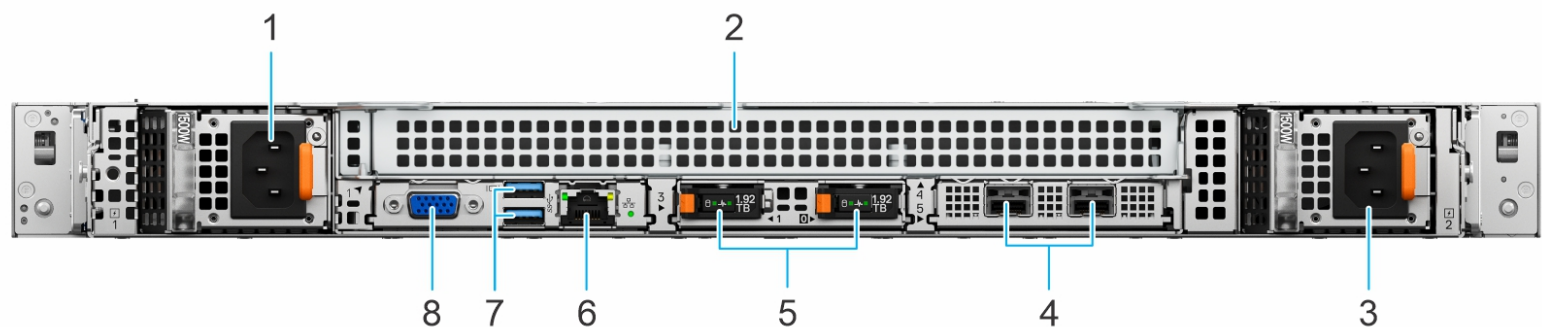
**Table 8. Right Control Panel (RCP) - Primary (continued)**

| Item | Indicator or button                   | Icon                                                                              | Description                                                                                                                                                                                                                                                                                                                                                                                                          |
|------|---------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5    | Host/iDRAC Direct port (Type - C USB) |  | <p>The iDRAC Direct port (Type - C USB) enables you to access the iDRAC direct Type - C USB features. For more information, see the <a href="#">iDRAC manuals</a>.</p> <p><b>NOTE:</b> You can configure iDRAC Direct by using a USB to Type - C USB cable, which you can connect to your laptop or tablet. Cable length should not exceed 3 feet (0.91 meters). Performance could be affected by cable quality.</p> |

**Table 9. System health and system ID indicator codes**

| System health and system ID indicator code | Condition                                                                                                                                      |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Solid blue                                 | Indicates that the system is powered on, is healthy, and system ID mode is not active. Press the system ID button to switch to system ID mode. |
| Blinking blue                              | Indicates that the system ID mode is active. Press the system ID button to switch to system health mode.                                       |
| Blinking amber                             | Indicates that the system is experiencing a fault. Check the System Event Log for specific error messages. <a href="#">PowerEdge Manuals</a> . |

## System configurations - rear view for PowerEdge R470 system



**Figure 11. Rear view of the system with 8 x 2.5 inch drive system**

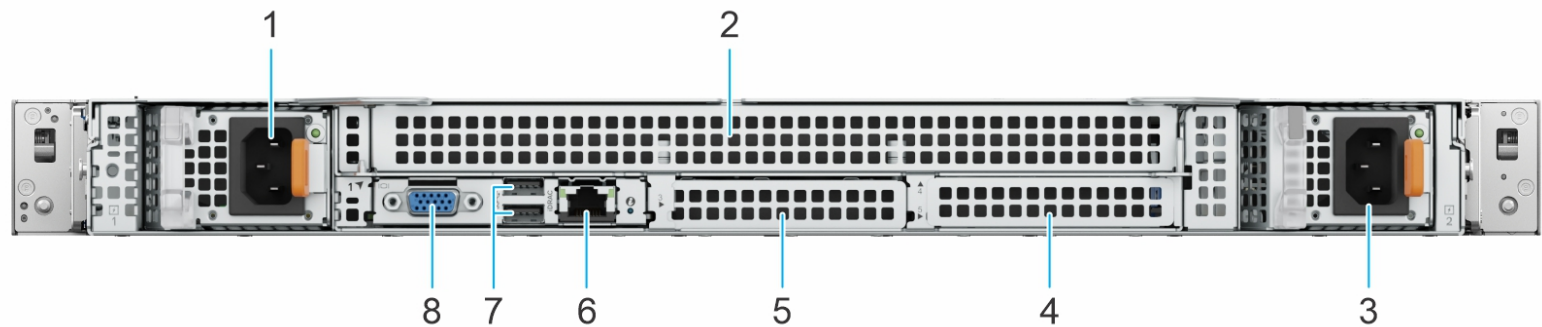
Right Control Panel (RCP) - Primary

**Table 10. Rear view of the system with 8 x 2.5-inch drive system**

| Item | Ports, panels, or slots         | Icon                                                                                | Description                                                                                                          |
|------|---------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| 1    | Power supply unit (PSU1)        |  | PSU1 is the primary PSU of the system.                                                                               |
| 2    | PCIe expansion card riser blank | N/A                                                                                 | Blank filler for the PCIe expansion riser slot                                                                       |
| 3    | Power supply unit (PSU2)        |  | PSU2 is the secondary PSU of the system.                                                                             |
| 4    | OCP NIC card                    | N/A                                                                                 | The OCP NIC card supports OCP 3.0. The NIC ports are integrated on the OCP card which is connected to the HPM board. |
| 5    | BOSS-N1 DC-MHS module           | N/A                                                                                 | BOSS module for internal system boot.                                                                                |

**Table 10. Rear view of the system with 8 x 2.5-inch drive system (continued)**

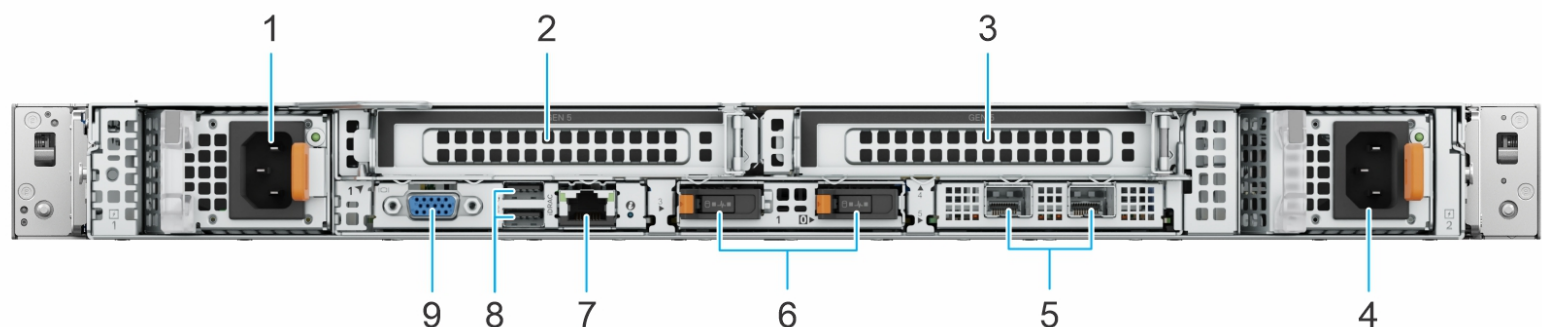
| Item | Ports, panels, or slots | Icon                                                                              | Description                                                                                                                          |
|------|-------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 6    | iDRAC dedicated port    |  | Enables you to remotely access iDRAC. when the front iDRAC port is connected with the network, the rear iDRAC port is auto disabled. |
| 7    | USB 3.0 port            |  | The USB port is 9-pin and 3.0-compliant. This port enables you to connect USB devices to the system.                                 |
| 8    | VGA port                |  | Enables you to connect a display device to the system.                                                                               |



**Figure 12. Rear view of the system with 8 x EDSFF E3.S drive system with front I/O**

**Table 11. Rear view of the system with 8 x EDSFF E3.S drive system with front I/O**

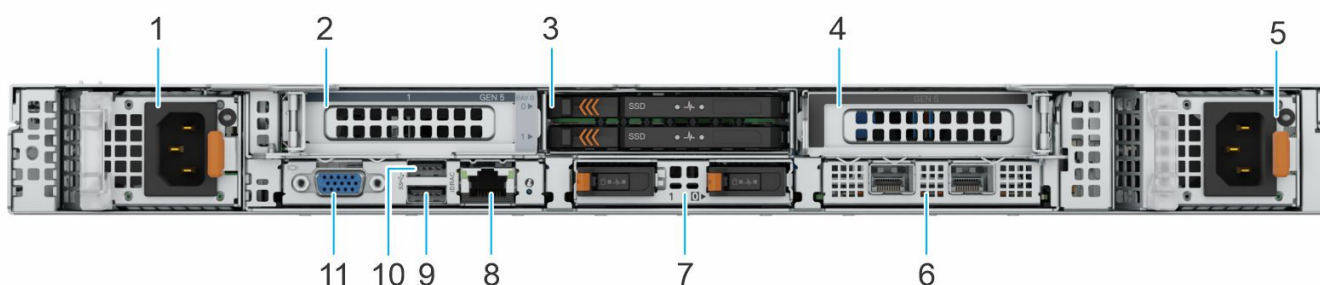
| Item | Ports, panels, or slots         | Icon                                                                                | Description                                                                                                                          |
|------|---------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Power supply unit (PSU1)        |  | PSU1 is the primary PSU of the system.                                                                                               |
| 2    | PCIe expansion card riser blank | N/A                                                                                 | Blank filler for the PCIe expansion riser slot.                                                                                      |
| 3    | Power supply unit (PSU2)        |  | PSU2 is the secondary PSU of the system.                                                                                             |
| 4    | OCP blank                       | N/A                                                                                 | Blank filler for the OCP card slot.                                                                                                  |
| 5    | BOSS-N1 blank                   | N/A                                                                                 | Blank filler for the BOSS-N1 module slot.                                                                                            |
| 6    | iDRAC dedicated port            |  | Enables you to remotely access iDRAC. when the front iDRAC port is connected with the network, the rear iDRAC port is auto disabled. |
| 7    | USB 3.0 port                    |  | The USB port is 9-pin and 3.0-compliant. This port enables you to connect USB devices to the system.                                 |
| 8    | VGA port                        |  | Enables you to connect a display device to the system.                                                                               |



**Figure 13. Rear view of the system with 8 x EDSFF E3.S drive system with rear I/O**

**Table 12. Rear view of the system with 8 x EDSFF E3.S drive system with rear I/O**

| Item | Ports, panels, or slots         | Icon                                                                              | Description                                                                                                                          |
|------|---------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Power supply unit (PSU1)        |  | PSU1 is the primary PSU of the system.                                                                                               |
| 2    | PCIe expansion card riser blank | N/A                                                                               | Blank filler for the PCIe expansion riser slot.                                                                                      |
| 3    | PCIe expansion card riser blank | N/A                                                                               | Blank filler for the PCIe expansion riser slot.                                                                                      |
| 4    | Power supply unit (PSU2)        |  | PSU2 is the secondary PSU of the system.                                                                                             |
| 5    | OCP NIC card                    | N/A                                                                               | The OCP NIC card supports OCP 3.0. The NIC ports are integrated on the OCP card which is connected to the HPM board.                 |
| 6    | BOSS-N1 DC-MHS module           | N/A                                                                               | BOSS module for internal system boot.                                                                                                |
| 7    | iDRAC dedicated port            |  | Enables you to remotely access iDRAC. when the front iDRAC port is connected with the network, the rear iDRAC port is auto disabled. |
| 8    | USB 3.0 port                    |  | The USB port is 9-pin and 3.0-compliant. This port enables you to connect USB devices to the system.                                 |
| 9    | VGA port                        |  | Enables you to connect a display device to the system.                                                                               |



**Figure 14. Rear view of the system with 4 x 3.5-inch drive system with rear 2 x EDSFF E3.S drives**

**Table 13. Rear view of the system with 4 x 3.5-inch drive system with rear 2 x EDSFF E3.S drives**

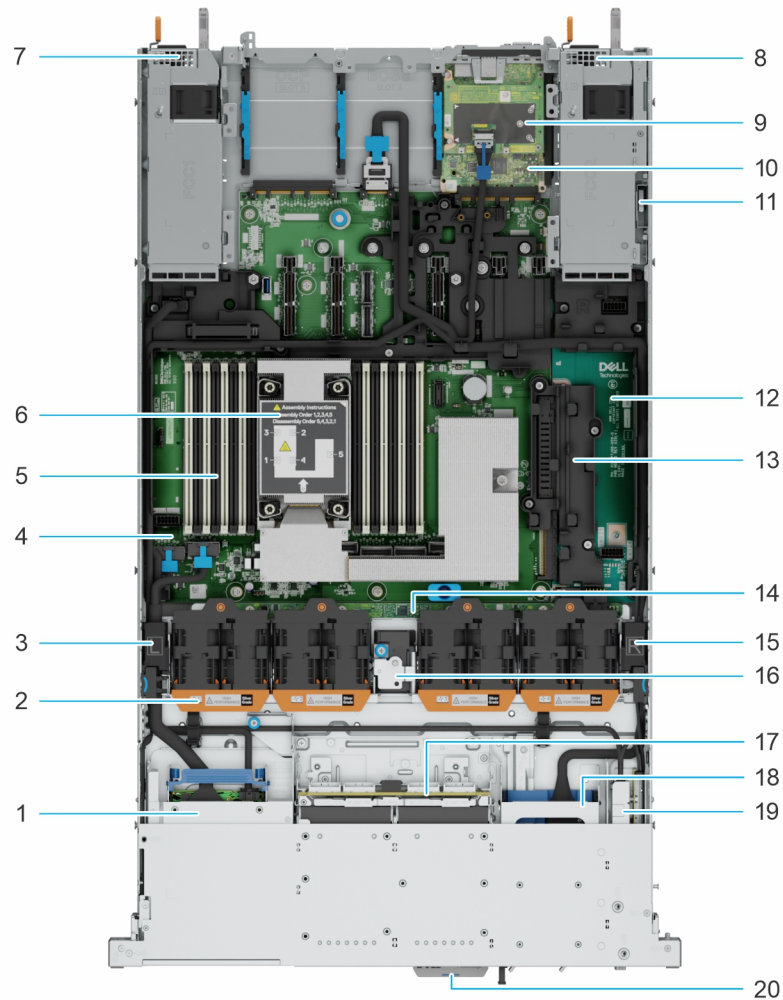
| Item | Ports, panels, or slots         | Icon                                                                                | Description                                                      |
|------|---------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1    | Power supply unit (PSU1)        |  | PSU1 is the primary PSU of the system.                           |
| 2    | PCIe expansion card riser blank | N/A                                                                                 | Blank filler for the PCIe expansion riser slot.                  |
| 3    | EDSFF E3.S drives               | N/A                                                                                 | Enables you to install drives that are supported on your system. |
| 4    | PCIe expansion card riser blank | N/A                                                                                 | Blank filler for the PCIe expansion riser slot.                  |
| 5    | Power supply unit (PSU2)        |  | PSU2 is the secondary PSU of the system.                         |



**Table 13. Rear view of the system with 4 x 3.5-inch drive system with rear 2 x EDSFF E3.S drives (continued)**

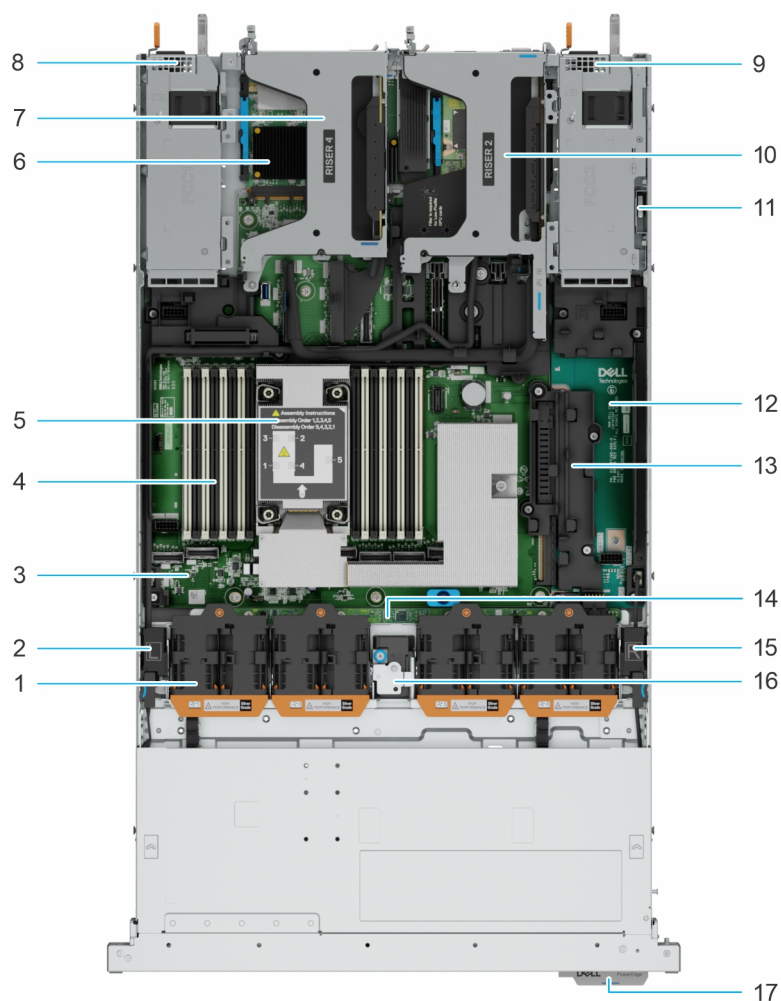
| Item | Ports, panels, or slots | Icon                                                                              | Description                                                                                                                          |
|------|-------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 6    | OCP NIC card            | N/A                                                                               | The OCP NIC card supports OCP 3.0. The NIC ports are integrated on the OCP card which is connected to the HPM board.                 |
| 7    | BOSS-N1 DC-MHS module   | N/A                                                                               | BOSS module for internal system boot.                                                                                                |
| 8    | iDRAC dedicated port    |  | Enables you to remotely access iDRAC. when the front iDRAC port is connected with the network, the rear iDRAC port is auto disabled. |
| 9    | USB 3.0 port            |  | The USB port is 9-pin and 3.0-compliant. This port enables you to connect USB devices to the system.                                 |
| 10   | USB 3.0 port            |  | The USB port is 9-pin and 3.0-compliant. This port enables you to connect USB devices to the system.                                 |
| 11   | VGA port                |  | Enables you to connect a display device to the system.                                                                               |

# System configurations - inside view for PowerEdge R470 system



**Figure 15. Inside the system with front I/O configuration**

- |                                                |                                  |
|------------------------------------------------|----------------------------------|
| 1. Front OCP                                   | 2. Cooling fan                   |
| 3. Cable clip                                  | 4. Host Processor Module (HPM)   |
| 5. DIMM slots                                  | 6. Processor heatsink (remote)   |
| 7. PSU 2                                       | 8. PSU 1                         |
| 9. Attic board                                 | 10. DC-SCM module                |
| 11. Intrusion switch                           | 12. Power interposer board (PIB) |
| 13. PIB bracket                                | 14. Fan board                    |
| 15. Cable clip                                 | 16. Middle cable bracket         |
| 17. Drive backplane                            | 18. Front BOSS-N1                |
| 19. Front serial port and dedicated iDRAC port | 20. Express Service Tag          |



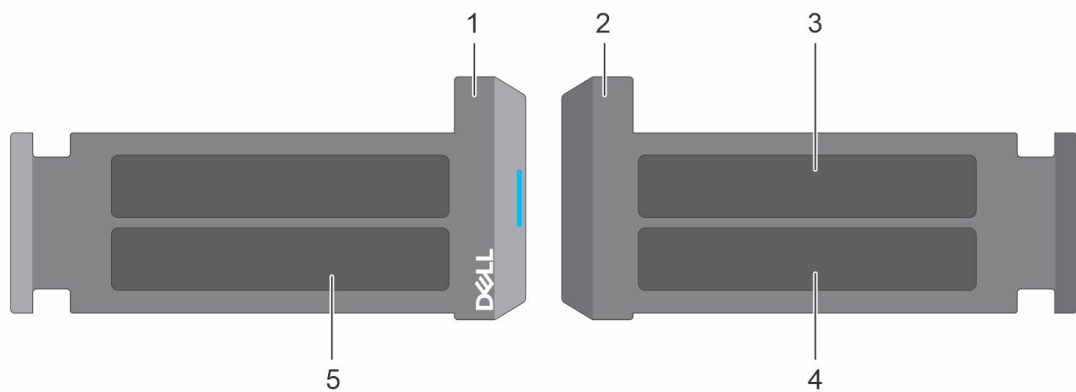
**Figure 16. Inside the system with rear I/O configuration**

- |                                |                                  |
|--------------------------------|----------------------------------|
| 1. Cooling fan                 | 2. Cable clip                    |
| 3. Host Processor Module (HPM) | 4. DIMM slots                    |
| 5. Processor heatsink (remote) | 6. Rear OCP module               |
| 7. PCIe riser 4                | 8. PSU 2                         |
| 9. PSU 1                       | 10. PCIe riser 2                 |
| 11. Intrusion switch           | 12. Power interposer board (PIB) |
| 13. PIB bracket                | 14. Fan board                    |
| 15. Cable clip                 | 16. Middle cable bracket         |
| 17. Express Service Tag        |                                  |

## 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 on the front 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.

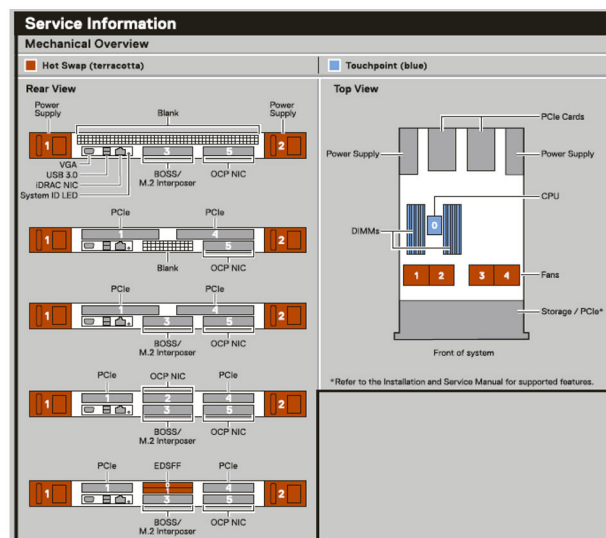


**Figure 17. Locating the Express Service Code and Service tag**

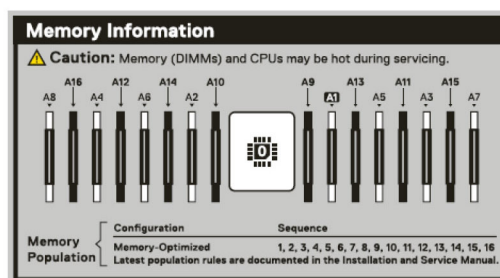
1. Express Service Tag (front view)
2. Express Service Tag (rear view)
3. OMM (not applicable)
4. Password MAC address
5. Service Tag, Express Service Code, My Dell QRL label

## System information label

The system information label is located on the back side of the system cover and/or on the top of the system.



**Figure 18. Mechanical overview**



**Figure 19. Memory information**

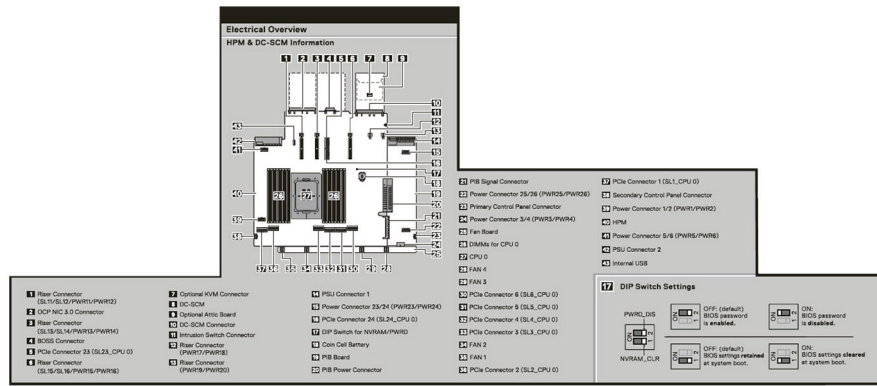


Figure 20. Electrical overview

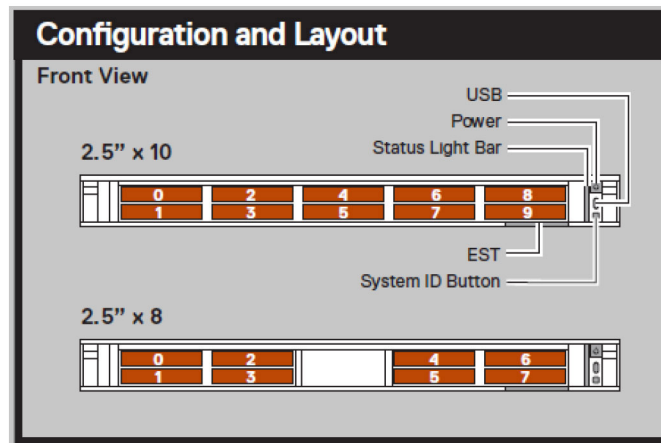


Figure 21. Configuration and Layout 8 x 2.5 inch drives

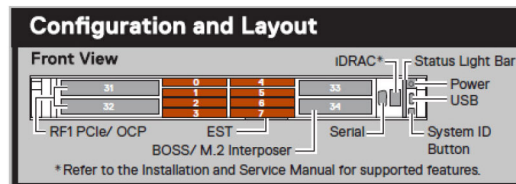


Figure 22. Configuration and Layout 8 x E3.s drives

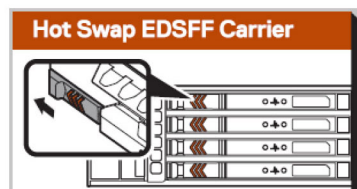


Figure 23. Hot swap EDSFF carrier

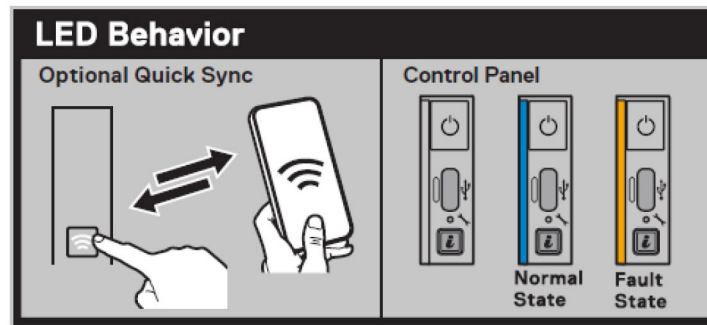


Figure 24. LED behavior 8 x 2.5 inch drives

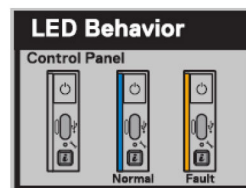


Figure 25. LED behavior E3.s drives

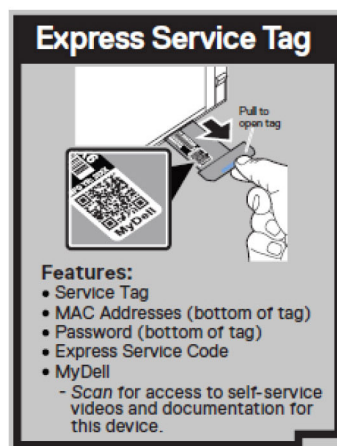


Figure 26. Express Service Tag for 8 x 2.5 inch drive system

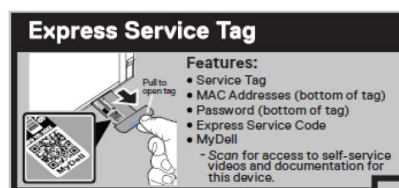


Figure 27. Express Service Tag for 8 x E3.s drive system



Figure 28. Caution



Figure 29. QRL

## Rail sizing and rack compatibility matrix

For specific information about the rail solutions compatible with your system, see the *Dell Enterprise Systems Rail Sizing and Rack Compatibility Matrix* available at [rail-rack-matrix](#).

The document provides the information that is listed below:

- Specific details about rail types and their functionalities.
- Rail adjustability range for various types of rack mounting flanges.
- Rail depth with and without cable management accessories.
- Types of racks that are supported for various types of rack mounting flanges.

# Technical specifications

The technical and environmental specifications of your system are outlined in this chapter.

**Topics:**

- Chassis dimensions
- System weight
- Processor specifications
- PSU specifications
- Cooling fan specifications
- Supported operating systems
- System battery specifications
- Expansion card riser specifications
- Memory specifications
- Storage controller specifications
- Drives
- GPU Specifications
- Ports and connectors specifications
- Video ports specifications
- Environmental specifications



# Chassis dimensions

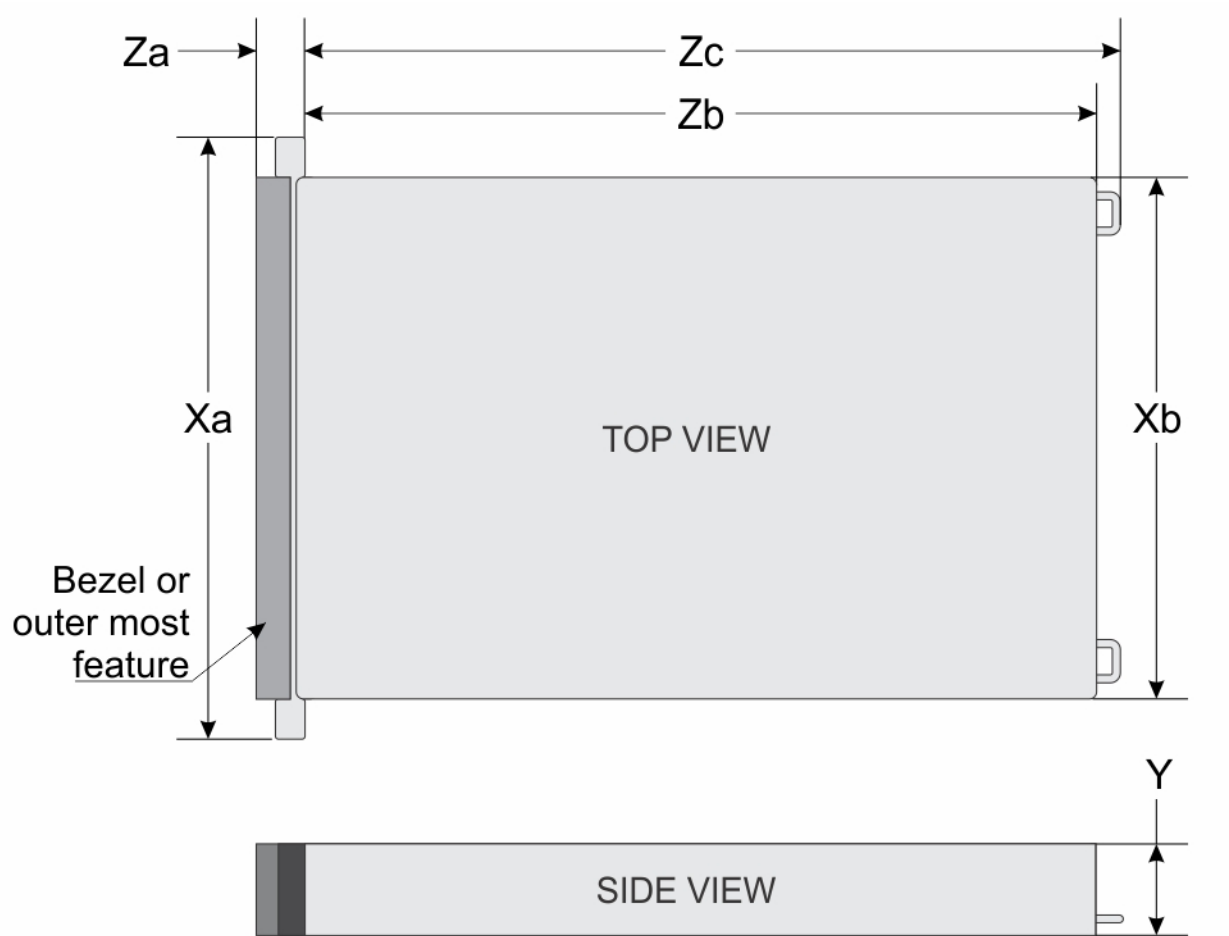


Figure 30. Chassis dimensions

Table 14. PowerEdge R470 chassis dimensions

| Drives                                        | Xa                   | Xb                     | Y                     | Za                                    | Zb                                           | Zc                                             |
|-----------------------------------------------|----------------------|------------------------|-----------------------|---------------------------------------|----------------------------------------------|------------------------------------------------|
| 8 x E3.S EDSFF drives Front I/O configuration | 482.0 mm (19 inches) | 434.0 mm (17.1 inches) | 42.8 mm (1.69 inches) | 43.3 mm (1.7 inches)                  | 750.57 mm (29.55 inches)<br>Ear to rear wall | 786.141 mm (30.95 inches)<br>Ear to PSU handle |
| 8 x 2.5-inch drives                           | 482.0 mm (19 inches) | 434.0 mm (17.1 inches) | 42.8 mm (1.69 inches) | With bezel<br>30.78 mm (1.21 inches)  | 750.57 mm (29.55 inches)<br>Ear to rear wall | 786.141 mm (30.95 inches)<br>Ear to PSU handle |
| 10 x 2.5-inch drives                          |                      |                        |                       | Without bezel<br>29.0 mm (1.14inches) |                                              |                                                |
| 4 x 3.5-inch drives                           |                      |                        |                       |                                       |                                              |                                                |
| 16 x E3.S EDSFF drives                        |                      |                        |                       |                                       |                                              |                                                |

- NOTE:** Zb is the nominal rear wall external surface where the HPM board I/O connectors reside.
- NOTE:** Front bezel is not supported on systems with front I/O configuration.

# System weight

Table 15. PowerEdge R470 system weight

| System configuration     | Maximum weight (with all drives/SSDs) |
|--------------------------|---------------------------------------|
| 8 x E3.S EDSFF           | 19.11 kg (42.13 lbs)                  |
| 16 x E3.S EDSFF          | 17.66 kg (38.93 lbs)                  |
| 8 x 2.5-inch SAS/SATA    | 17.03 kg (37.54 lbs)                  |
| 10 x 2.5 - inch SAS/SATA | 17.53 kg (38.64 lbs)                  |
| 4 x 3.5 - inch SAS/SATA  | 18.78 kg (41.40 lbs)                  |

Table 16. PowerEdge R470 weight handling recommendations

| Chassis weight | Description                     |
|----------------|---------------------------------|
| 40–70 lbs      | Recommend two people to lift.   |
| 70–120 lbs     | Recommend three people to lift. |
| ≥ 121 lbs      | Recommend to use a server-lift. |

# Processor specifications

Table 17. PowerEdge R470 processor specifications

| Supported processor     | Number of processors supported                                                                                                                                          |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Intel® Xeon 6 processor | One<br> <b>NOTE:</b> R470 supports both Intel® E- Core and Intel® P- Core processors |

Table 18. Minimum Firmware requirement for Intel® Xeon® 6 E-core processor and Intel® Xeon® 6 P-core processor

| Processors                      | IDRAC      | BIOS  | FPGA        |
|---------------------------------|------------|-------|-------------|
| Intel® Xeon® 6 E-core processor | 1.10.17.00 | 1.1.3 | 106.102.000 |
| Intel® Xeon® 6 P-core processor | 1.20.25.00 | 1.2.6 | 107.102.000 |

# PSU specifications

The PowerEdge R470 system supports up to two AC or DC power supply units (PSUs).

Table 19. PSU specifications

| PSU              | Class    | Heat dissipation (maximum) (BTU/hr) | Frequency (Hz) | AC Voltage |           |       | DC Voltage |             |       | Current (A) |
|------------------|----------|-------------------------------------|----------------|------------|-----------|-------|------------|-------------|-------|-------------|
|                  |          |                                     |                | 200—240 V  | 100—120 V | 277 V | 240 V      | - (48—60) V | 336 V |             |
| 800 W mixed mode | Platinum | 3000                                | 50/60          | 800 W      | 800 W     | N/A   | N/A        | N/A         | N/A   | 9.2—4.5 A   |

**Table 19. PSU specifications (continued)**

| PSU                | Class    | Heat dissipation (maximum) (BTU/hr) | Frequency (Hz) | AC Voltage |           |       | DC Voltage |             |        | Current (A) |
|--------------------|----------|-------------------------------------|----------------|------------|-----------|-------|------------|-------------|--------|-------------|
|                    |          |                                     |                | 200—240 V  | 100—120 V | 277 V | 240 V      | - (48—60) V | 336 V  |             |
|                    | Titanium | 3000                                | 50/60          | 800 W      | 800 W     | N/A   | N/A        | N/A         | N/A    | 9.2—4.5 A   |
|                    | N/A      | 3000                                | N/A            | N/A        | N/A       | N/A   | 800 W      | N/A         | N/A    | 3.7 A       |
| 1100 W             | Titanium | 4100                                | 50/60          | 1100 W     | 1050 W    | N/A   | N/A        | N/A         | N/A    | 12—6.1 A    |
|                    | Platinum | 4100                                | 50/60          | 1100 W     | 1050 W    | N/A   | N/A        | N/A         | N/A    | 12—6.1 A    |
|                    | N/A      | 4100                                | N/A            | N/A        | N/A       | N/A   | 1100 W     | N/A         | N/A    | 5.1 A       |
| 1400 W -48 VDC*    | Titanium | 5310                                | N/A            | N/A        | N/A       | N/A   | N/A        | 1400 W      | N/A    | 33 A        |
| 1500 W 227 VAC*    | Titanium | 5625                                | 50/60          | N/A        | N/A       | N/A   | 1500 W     | N/A         | N/A    | 6.1 A       |
|                    | N/A      | 5625                                | N/A            | N/A        | N/A       | N/A   | N/A        | N/A         | 1500 W | 4.91 A      |
| 1500 W mixed mode  | Titanium | 5625                                | 50/60          | 1500 W     | 1050 W    | N/A   | N/A        | N/A         | N/A    | 12—8.2 A    |
|                    | N/A      | 5625                                | N/A            | N/A        | N/A       | N/A   | 1500 W     | N/A         | N/A    | 6.8 A       |
| 1800 W mixed mode* | Titanium | 6750                                | 50/60          | 1800 W     | 1050 W    | N/A   | N/A        | N/A         | N/A    | 9.8—8.2 A   |
|                    | N/A      | 6750                                | N/A            | N/A        | N/A       | N/A   | 1800 W     | N/A         | N/A    | 8.2 A       |

**NOTE:** If a system with AC 1500 W PSUs operates at low line 100-120 Vac, then the power rating per PSU is degraded to 1050 W..

**NOTE:** Heat dissipation is calculated using the PSU wattage rating.

**NOTE:** When selecting or upgrading the system configuration, to ensure optimum power utilization, verify the system power consumption with the Enterprise Infrastructure Planning Tool available at [calc](#) .



**Figure 31. PSU power cables**

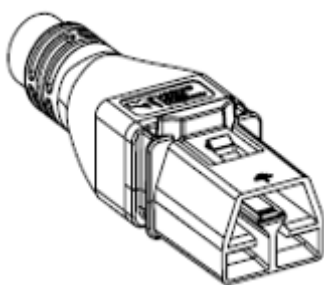


Figure 32. APP 2006G1 power cable



Figure 33. LOTES APOWA048 power cable

Table 20. PSU power cables

| Form factor     | Output             | Power cable      |
|-----------------|--------------------|------------------|
| Redundant 60 mm | 800 W mixed mode   | C13              |
|                 | 1100 W mixed mode  | C13              |
|                 | 1400 W -48v DC*    | LOTES APOWA048   |
|                 | 1500 W mixed mode  | C13              |
|                 | 1500w 277v*        | APP2006G1/2006G3 |
|                 | 1800 W mixed mode* | C13              |

**NOTE:** \*Feature not available at product launch in June, 2025. Please refer to the product configurator page on Dell.com to confirm feature availability.

## Cooling fan specifications

The PowerEdge R470 system supports up to four sets of 2 fan module standard (STD) cooling fans or high performance (HPR) silver cooling fans .

**Table 21. Cooling fan specifications**

| Fan type                           | Abbreviation | Also known as | Label color | Label image                                                                         |
|------------------------------------|--------------|---------------|-------------|-------------------------------------------------------------------------------------|
| Standard (STD) fans                | STD          | STD           | No label    |  |
| High performance (HPR) silver fans | HPR SLVR     | HPR           | Silver      |  |

## Supported operating systems

The PowerEdge R470 system supports the following operating systems:

- Canonical Ubuntu Server LTS
- RedHat Enterprise Linux
- SUSE Linux Enterprise Server
- VMware ESXi
- Windows Server
- Windows Server Datacenter

For specifications and interoperability details, see [OS support](#).

## System battery specifications

The PowerEdge R470 system uses one CR 2032 3.0-V lithium coin cell battery.

## Expansion card riser specifications

The PowerEdge R470 system supports PCI express (PCIe) slots on risers. On the front I/O configuration, the R470 supports up to two Full Height (FH) PCIe slots. On the rear I/O configuration, the R470 supports up to two FH or two Low Profile (LP) PCIe slots on the riser.

**Table 22. Expansion card slots are supported on the HPM board**

| PCIe slot                         | Expansion card riser | Processor connection | Height | Length | Slot width |
|-----------------------------------|----------------------|----------------------|--------|--------|------------|
| Slot 3<br>(Optional rear BOSS-N1) | N/A                  | Processor 0          | N/A    | N/A    | x4         |
| Slot 5<br>(Optional OCP)          | N/A                  | Processor 0          | N/A    | N/A    | x16        |
| Slot 31                           | RF1d (front OCP)     | Processor 0          | N/A    | N/A    | x16        |

**Table 22. Expansion card slots are supported on the HPM board (continued)**

| PCIe slot                            | Expansion card riser | Processor connection | Height      | Length      | Slot width |
|--------------------------------------|----------------------|----------------------|-------------|-------------|------------|
| Slot 32                              | RF1d (front OCP)     | Processor 0          | N/A         | N/A         | x16        |
| Slot 34<br>(Optional front BOSS-N1)  | N/A                  | Processor 0          | N/A         | N/A         | x4         |
| Slot 1                               | R2q                  | Processor 0          | Full Height | Half Length | x16        |
| Slot 4                               | R4b                  | Processor 0          | Full Height | Half Length | x16        |
| Slot 34<br>(Optional front BOSS-N1 ) | N/A                  | Processor 0          | N/A         | N/A         | x4         |
| Slot 1                               | R2k                  | Processor 0          | Low profile | Half Length | x16        |
| Slot 2 (Flop OCP)                    | R2k                  | Processor 0          | N/A         | N/A         | x16        |
| Slot 4                               | R4a                  | Processor 0          | Low Profile | Half Length | x16        |
| Slot 1                               | R2v                  | Processor 0          | Low Profile | Half Length | x16        |
| Slot 2 (Flop OCP)                    | R2v                  | Processor 0          | N/A         | N/A         | x16        |

## Memory specifications

The PowerEdge R470 system supports the following memory specifications for optimized operation.

**Table 23. Memory specifications**

| DIMM type | Rank | Capacity | Single Processor                |                         |                                 |                         |
|-----------|------|----------|---------------------------------|-------------------------|---------------------------------|-------------------------|
|           |      |          | Intel® Xeon 6 E- core processor |                         | Intel® Xeon 6 P- core processor |                         |
|           |      |          | Minimum system capacity         | Maximum system capacity | Minimum system capacity         | Maximum system capacity |
| RDIMM     | 1 R  | 16 GB    | N/A                             | N/A                     | 16 GB                           | 128 GB                  |
|           | 2 R  | 32 GB    | 32 GB                           | 256 GB                  | 32 GB                           | 512 GB                  |
|           |      | 64 GB    | 512 GB                          | 1 TB                    | 256 GB                          | 1 TB                    |
|           |      | 96 GB    | N/A                             | N/A                     | 768 GB                          | 1.5 TB                  |
|           |      | 128 GB   | N/A                             | N/A                     | 1 TB                            | 2 TB                    |
|           | 8 R  | 256 GB*  | N/A                             | N/A                     | 4 TB                            | 4 TB                    |

**NOTE:** For Intel® Xeon 6 E- core processor 32GB could be 1DIMM per CPU or 1 DIMM per channel.

**NOTE:** For Intel® Xeon 6 P- core processor - series processor, 16 GB and 32GB could be 1DIMM per CPU with limited features.

**NOTE:** 16 GB and 96 GB memory are supported only in on Intel® Xeon 6 P- core processors .

**NOTE:** DIMM mixing configurations are not allowed. All DIMM slots must be populated with the exact same DIMMs (one Dell PN).

**Table 24. Memory module sockets**

| Memory module sockets | Speed                                 |
|-----------------------|---------------------------------------|
| 16, 288-pin           | 6400 MT/s (1DPC)<br>5200 MT/s (2 DPC) |

**NOTE:** Memory DIMM slots are not hot pluggable.

**NOTE:** The processor may reduce the performance of the rated DIMM speed.

**NOTE:**

\*Feature not available at product launch in June, 2025. Please refer to the product configurator page on Dell.com to confirm feature availability.

## Storage controller specifications

The PowerEdge R470 system supports the following controller cards:

**Table 25. Storage controller cards**

| Supported storage controller cards                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Internal controllers <ul style="list-style-type: none"> <li>PERC H365i DC-MHS Front</li> <li>PERC H965i DC-MHS Front</li> <li>PERC H365i adapter</li> <li>PERC H965i adapter</li> </ul> |
| External controllers <ul style="list-style-type: none"> <li>PERC H965e</li> <li>HBA 465e</li> </ul>                                                                                     |
| Internal boot <ul style="list-style-type: none"> <li>Boot Optimized Storage Subsystem (BOSS-N1 DC-MHS)</li> <li>M.2 interposer with up to 2 x M.2 NVMe SSDs</li> <li>USB</li> </ul>     |
| Software RAID <ul style="list-style-type: none"> <li>N/A</li> </ul>                                                                                                                     |

## Drives

The PowerEdge R470 system supports:

- 8 x EDSFF E3.S hot-swappable NVMe drives.
- Up to 16 x EDSFF E3.S hot-swappable NVMe drives.
- 8 x 2.5-inch hot-swappable SAS/SATA drives.
- 10 x 2.5-inch hot-swappable SAS/SATA drives with four universal ports.
- 4 x 3.5-inch hot-swappable SAS/SATA drives with 2 x EDSFF E3.S hot-swappable rear drives.

**NOTE:** For more information about how to hot swap NVMe PCIe SSD U.2 device, see the *Dell Express Flash NVMe PCIe SSD User's Guide* at [Dell Support](#) page > **Browse all Products** > **Data Center Infrastructure** > **Storage Adapters & Controllers** > **Dell PowerEdge Express Flash NVMe PCIe SSD** > **Documentation** > **Manuals and Documents**.

## GPU Specifications

The Dell PowerEdge R470 system supports

- Up to four NVIDIA L4 24 GB 72 W Low Profile or Full Height card.

## Ports and connectors specifications

### NIC port specifications

The PowerEdge R470 system supports Network Interface Controller (NIC) ports embedded on the optional Open Compute Project (OCP) cards.

**NOTE:** The OCP NIC card is installed at the front or rear of the system, depending on the system I/O configuration.

**Table 26. NIC port specification for the system**

| Feature                                   | Specifications                       |
|-------------------------------------------|--------------------------------------|
| Datacenter-Secure Control Module (DC-SCM) | 1GB x 1                              |
| OCP 3.0 card                              | 25 GbE x 2 , 25 GbE x 4 ,100 GbE x 2 |

### USB ports specifications

**Table 27. PowerEdge R470 USB specifications**

| Front                                                          |                | Rear                    |              | Internal                        |              |
|----------------------------------------------------------------|----------------|-------------------------|--------------|---------------------------------|--------------|
| USB port type                                                  | No. of ports   | USB port type           | No. of ports | USB port type                   | No. of ports |
| USB 2.0-compliant port                                         | One (Optional) | USB 3.1-compliant ports | Two          | Internal USB 3.1-compliant port | One          |
| Type-C USB 2.0-compliant port dual-mode host/iDRAC Direct port | One            |                         |              |                                 |              |

### Serial connector specifications

The PowerEdge R470 system supports one optional card type connector, which is a 9 - pin connector, Data Terminal Equipment (DTE), 16550-compliant .

The optional serial connector card is available only in front I/O configuration.

Top USB port on DC-SCM supports external DB9 Dongle.

### Video ports specifications

The PowerEdge R470 system supports one DB-15 VGA port (optional) on the rear I/O board and one Mini Display (mDP) port (optional) on the Left Control Panel (LCP) .

**NOTE:** Both ports cannot be used together. The mDP port overrides the VGA port.

### Video specifications

The PowerEdge R470 system supports integrated Matrox G200 graphics controller with 16 MB of video frame buffer.



**Table 28. Supported video resolution options**

| Resolution  | Refresh rate (Hz) | Color depth (bits) |
|-------------|-------------------|--------------------|
| 1024 x 768  | 60                | 8, 16, 32          |
| 1280 x 800  | 60                | 8, 16, 32          |
| 1280 x 1024 | 60                | 8, 16, 32          |
| 1360 x 768  | 60                | 8, 16, 32          |
| 1440 x 900  | 60                | 8, 16, 32          |
| 1600 x 900  | 60                | 8, 16, 32          |
| 1600 x 1200 | 60                | 8, 16, 32          |
| 1680 x 1050 | 60                | 8, 16, 32          |
| 1920 x 1080 | 60                | 8, 16, 32          |
| 1920 x 1200 | 60                | 8, 16, 32          |

## Environmental specifications

**NOTE:** For additional information about environmental certifications, refer to the Product Environmental Datasheet located with the Documentation on [Dell Support](#).

**Table 29. Continuous Operation Specifications for ASHRAE A2**

| Temperature                                           | Allowable continuous operations                                                   |
|-------------------------------------------------------|-----------------------------------------------------------------------------------|
| Temperature range for altitudes <= 900 m (<= 2953 ft) | 10–35°C (50–95°F) with no direct sunlight on the equipment                        |
| Humidity percent range (non-condensing at all times)  | 8% RH with -12°C minimum dew point to 80% RH with 21°C (69.8°F) maximum dew point |
| Operational altitude de-rating                        | Maximum temperature is reduced by 1°C/300 m (33.8°F/984 Ft) above 900 m (2953 Ft) |

**Table 30. Continuous Operation Specifications for ASHRAE A3**

| Temperature                                           | Allowable continuous operations                                                   |
|-------------------------------------------------------|-----------------------------------------------------------------------------------|
| Temperature range for altitudes <= 900 m (<= 2953 ft) | 5–40°C (41–104°F) with no direct sunlight on the equipment                        |
| Humidity percent range (non-condensing at all times)  | 8% RH with -12°C minimum dew point to 85% RH with 24°C (75.2°F) maximum dew point |
| Operational altitude de-rating                        | Maximum temperature is reduced by 1°C/175 m (33.8°F/574 Ft) above 900 m (2953 Ft) |

**Table 31. Continuous Operation Specifications for ASHRAE A4**

| Temperature                                           | Allowable continuous operations                                                   |
|-------------------------------------------------------|-----------------------------------------------------------------------------------|
| Temperature range for altitudes <= 900 m (<= 2953 ft) | 5–45°C (41–113°F) with no direct sunlight on the equipment                        |
| Humidity percent range (non-condensing at all times)  | 8% RH with -12°C minimum dew point to 90% RH with 24°C (75.2°F) maximum dew point |
| Operational altitude de-rating                        | Maximum temperature is reduced by 1°C/125 m (33.8°F/410 Ft) above 900 m (2953 Ft) |

**Table 32. Common Environmental Specifications for ASHRAE A2, A3, and A4**

| Temperature                                                                | Allowable continuous operations                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum temperature gradient (applies to both operation and non-operation) | 20°C in an hour* (36°F in an hour) and 5°C in 15 minutes (41°F in 15 minutes), 5°C in an hour* (9°F in an hour) for tape<br><i>i</i> <b>NOTE:</b> * - Per ASHRAE thermal guidelines for tape hardware, these are not instantaneous rates of temperature change. |
| Non-operational temperature limits                                         | -40 to 65°C (-40 to 149°F)                                                                                                                                                                                                                                      |
| Non-operational humidity limits                                            | 5% to 95% RH with 27°C (80.6°F) maximum dew point                                                                                                                                                                                                               |
| Maximum non-operational altitude                                           | 12,000 meters (39,370 feet)                                                                                                                                                                                                                                     |
| Maximum operational altitude                                               | 3,048 meters (10,000 feet)                                                                                                                                                                                                                                      |

**Table 33. Maximum vibration specifications**

| Maximum vibration | Specifications                                                                |
|-------------------|-------------------------------------------------------------------------------|
| Operating         | 0.21 G <sub>rms</sub> at 5 Hz to 500 Hz for 10min (all x, y, and z axes)      |
| Storage           | 1.38 G <sub>rms</sub> at 7 Hz to 250 Hz for 15 minutes (all six sides tested) |

**Table 34. Maximum shock pulse specifications**

| Maximum shock pulse | Specifications                                                                                                                                       |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating           | Six consecutively executed shock pulses in the positive and negative x, y, and z axis of 6 G for up to 11 ms.                                        |
| Storage             | Six consecutively executed shock pulses in the positive and negative x, y, and z axis (one pulse on each side of the system) of 71 G for up to 2 ms. |

## Particulate and gaseous contamination specifications

The following table defines the limitations that help avoid any equipment damage or failure from particulates and gaseous contamination. If the levels of particulates or gaseous pollution exceed the specified limitations and result in equipment damage or failure, you must rectify the environmental conditions. Remediation of environmental conditions is the responsibility of the customer.

**Table 35. Particulate contamination specifications**

| Particulate contamination                                             | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Air filtration: Conventional Data Center only                         | <p>Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit</p> <p><i>i</i> <b>NOTE:</b> Filtering room air with a MERV8 filter, as specified in ANSI/ASHRAE Standard 127, is a recommended method for achieving the necessary environmental conditions.</p> <p><i>i</i> <b>NOTE:</b> Air entering the data center must have MERV11 or MERV13 filtration.</p> <p><i>i</i> <b>NOTE:</b> This condition applies to data center environments only. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor.</p> |
| Walk-Up Edge Data Center or Cabinet (sealed, closed loop environment) | <p>Filtration is not required for cabinets that are anticipated to be opened six times or less per year. Class 8 per ISO 1466-1 filtration as defined above is required otherwise.</p> <p><i>i</i> <b>NOTE:</b> In environments commonly above ISA-71 Class G1 or that may have known challenges, special filters may be required.</p>                                                                                                                                                                                                                                                                                                                    |

**Table 35. Particulate contamination specifications (continued)**

| Particulate contamination                                     | Specifications                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Conductive dust: data center and non-data center environments | <p>Air must be free of conductive dust, zinc whiskers, or other conductive particles.</p> <p><b>NOTE:</b> Conductive dust, which can interfere with equipment operation, can originate from various sources, including manufacturing processes and zinc whiskers that may develop on the plating of raised floor tiles.</p> <p><b>NOTE:</b> This condition applies to data center and non-data center environments.</p> |
| Corrosive dust: data center and non-data center environments  | <ul style="list-style-type: none"> <li>Air must be free of corrosive dust.</li> <li>Residual dust present in the air must have a deliquescent point less than 60% relative humidity.</li> </ul> <p><b>NOTE:</b> This condition applies to data center and non-data center environments.</p>                                                                                                                             |

**Table 36. Gaseous contamination specifications**

| Gaseous contamination        | Specifications                | Notes             |
|------------------------------|-------------------------------|-------------------|
| Copper coupon corrosion rate | ISA-71 Class G1: <300 Å/month | Per ANSI/ISA71.04 |
| Silver coupon corrosion rate | ISA-71 Class G1: <200 Å/month | Per ANSI/ISA71.04 |

## Thermal restriction matrix

**Table 37. Label reference**

| Label        | Description                            |
|--------------|----------------------------------------|
| STD          | Standard                               |
| HPR (Silver) | High performance Silver (HPR SLVR) fan |
| HPR (Gold)   | High performance Gold (HPR GOLD) fan   |
| HSK          | Heat sink                              |
| LP           | Low profile                            |
| FH           | Full height                            |
| DLC          | Direct Liquid Cooling                  |

**Table 38. Processor and heat sink matrix**

| Heat sink  | Processor TDP |
|------------|---------------|
| Extend HSK | <=250 W       |
| Remote HSK | >250 W        |

**NOTE:** The configuration's ambient temperature is dictated by its critical component. For example, if the processor's ambient temperature is 35°C, the DIMM is 35°C, and the GPU is 30°C, the configuration's ambient temperature can only be 30°C.

**Table 39. Thermal restriction matrix (non-GPU)**

| Configuration                |       |       | 8 x EDSFF E3.S NVMe | 16 x EDSFF E3.S NVMe | 8 x 2.5 inch SAS/SATA/ NVMe | 10 x 2.5 inch SAS/SATA | 4 x 3.5 inch SAS/SATA with rear 2 x EDSFF E3.S NVMe | Ambient temperature |
|------------------------------|-------|-------|---------------------|----------------------|-----------------------------|------------------------|-----------------------------------------------------|---------------------|
| Storage configuration number |       |       | C01-1/2/3 , C06-01  | C05-01               | C02-1/2/3/5/6               | C04-1/2                | C03-01                                              |                     |
| Riser configuration          |       |       | RC-2/3/4/56/7       | RC-7                 | RC-0/6/8                    | RC-6/7                 | RC-1                                                |                     |
| Air shroud type              |       |       | EXT/Remote          | EXT/Remote           | EXT/Remote                  | EXT/Remote             | EXT/Remote                                          |                     |
| Processor                    | TDP   | Cores | Fan                 |                      |                             |                        |                                                     |                     |
| 6780E                        | 330 W | 144   | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            | 35°C                |
| 6766E                        | 250 W | 144   | STD                 | STD                  | STD                         | HPR SLVR               | STD                                                 | 35°C                |
| 6756E                        | 225 W | 128   | STD                 | STD                  | STD                         | STD                    | STD                                                 | 35°C                |
| 6746E                        | 250 W | 112   | STD                 | STD                  | STD                         | HPR SLVR               | STD                                                 | 35°C                |
| 6740E                        | 250 W | 96    | STD                 | STD                  | STD                         | HPR SLVR               | STD                                                 | 35°C                |
| 6731E                        | 250 W | 96    | STD                 | STD                  | STD                         | HPR SLVR               | STD                                                 | 35°C                |
| 6710E                        | 205 W | 64    | STD                 | STD                  | STD                         | STD                    | STD                                                 | 35°C                |
| 6787P                        | 350 W | 86    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            | 35°C                |
| 6767P                        | 350 W | 64    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            | 35°C                |
| 6747P                        | 330 W | 48    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            | 35°C                |
| 6737P                        | 270 W | 32    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            | 35°C                |
| 6730P                        | 250 W | 32    | STD                 | STD                  | STD                         | HPR SLVR               | STD                                                 | 35°C                |
| 6527P                        | 255 W | 24    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            | 35°C                |
| 6724P                        | 210 W | 16    | STD                 | STD                  | STD                         | STD                    | STD                                                 | 35°C                |
| 6517P                        | 190 W | 16    | STD                 | STD                  | STD                         | STD                    | STD                                                 | 35°C                |
| 6505P                        | 150 W | 12    | STD                 | STD                  | STD                         | STD                    | STD                                                 | 35°C                |
| 6507P                        | 150 W | 8     | STD                 | STD                  | STD                         | STD                    | STD                                                 | 35°C                |
| 6781P                        | 350 W | 80    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            | 35°C                |
| 6761P                        | 350 W | 64    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            | 35°C                |
| 6741P                        | 300 W | 48    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            | 35°C                |
| 6731P                        | 245 W | 32    | STD                 | STD                  | STD                         | STD                    | STD                                                 | 35°C                |
| 6521P                        | 225 W | 24    | STD                 | STD                  | STD                         | STD                    | STD                                                 | 35°C                |
| 6511P                        | 150 W | 16    | STD                 | STD                  | STD                         | STD                    | STD                                                 | 35°C                |

 **NOTE:** Extended heatsink and shroud can support CPU TDP up to 250 W.

**Table 40. Thermal restriction matrix (GPU)**

| Configuration                |       |       | 8 x EDSFF E3.S NVMe | 16 x EDSFF E3.S NVMe | 8 x 2.5 inch SAS/SATA/ NVMe | 10 x 2.5 inch SAS/SATA | 4 x 3.5 inch SAS/SATA with rear 2 x EDSFF E3.S NVMe | Ambient temperature |
|------------------------------|-------|-------|---------------------|----------------------|-----------------------------|------------------------|-----------------------------------------------------|---------------------|
| Storage configuration number |       |       | C01-1/2/3 , C06-01  | C05-01               | C02-1/2/3/5/6               | C04-1/2                | C03-01                                              |                     |
| Riser configuration          |       |       | RC-2/3/4/56/7       | RC-7                 | RC-0/6/8                    | RC-6/7                 | RC-1                                                |                     |
| Air shroud type              |       |       | EXT/Remote          | EXT/Remote           | EXT/Remote                  | EXT/Remote             | EXT/Remote                                          |                     |
| Processor                    | TDP   | Cores | Fan                 |                      |                             |                        |                                                     | 35°C                |
| 6780E                        | 330 W | 144   | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            |                     |
| 6766E                        | 250 W | 144   | STD                 | STD                  | STD                         | HPR SLVR               | STD                                                 |                     |
| 6756E                        | 225 W | 128   | STD                 | STD                  | STD                         | STD                    | STD                                                 |                     |
| 6746E                        | 250 W | 112   | STD                 | STD                  | STD                         | HPR SLVR               | STD                                                 |                     |
| 6740E                        | 250 W | 96    | STD                 | STD                  | STD                         | HPR SLVR               | STD                                                 |                     |
| 6731E                        | 250 W | 96    | STD                 | STD                  | STD                         | HPR SLVR               | STD                                                 |                     |
| 6710E                        | 205 W | 64    | STD                 | STD                  | STD                         | STD                    | STD                                                 |                     |
| 6787P                        | 350 W | 86    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            |                     |
| 6767P                        | 350 W | 64    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            |                     |
| 6747P                        | 330 W | 48    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            |                     |
| 6737P                        | 270 W | 32    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            |                     |
| 6730P                        | 250 W | 32    | STD                 | STD                  | STD                         | HPR SLVR               | STD                                                 |                     |
| 6527P                        | 255 W | 24    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            |                     |
| 6724P                        | 210 W | 16    | STD                 | STD                  | STD                         | STD                    | STD                                                 |                     |
| 6517P                        | 190 W | 16    | STD                 | STD                  | STD                         | STD                    | STD                                                 |                     |
| 6505P                        | 150 W | 12    | STD                 | STD                  | STD                         | STD                    | STD                                                 |                     |
| 6507P                        | 150 W | 8     | STD                 | STD                  | STD                         | STD                    | STD                                                 |                     |
| 6781P                        | 350 W | 80    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            |                     |
| 6761P                        | 350 W | 64    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            |                     |
| 6741P                        | 300 W | 48    | HPR SLVR            | HPR SLVR             | HPR SLVR                    | HPR SLVR               | HPR SLVR                                            |                     |
| 6731P                        | 245 W | 32    | STD                 | STD                  | STD                         | STD                    | STD                                                 |                     |
| 6521P                        | 225 W | 24    | STD                 | STD                  | STD                         | STD                    | STD                                                 |                     |
| 6511P                        | 150 W | 16    | STD                 | STD                  | STD                         | STD                    | STD                                                 |                     |

- NOTE:** Extended heatsink and shroud can support CPU TDP up to 250 W.
- NOTE:** Remote heatsink and HPR SLVR fan is required for 350 W CPU TDP supporting at 35°C ambient temperature.
- NOTE:** System can support CPU TDP up to 250 W with extended heatsink and STD fan in 8x EDSFF E3.S cold aisle config and 8 x 2.5- inch SAS/SATA(NVMeRAID/direct) config at 35°C ambient temperature.
- NOTE:** System can support CPU TDP up to 225 W with extended heatsink and STD fan in 10 x 2.5-inch SAS/SATA config at 35°C ambient temperature.

# Thermal air restrictions

## ASHRAE A3 environment

### 8 x EDSFF E3.S Configuration (Cold Aisle Front I/O)

- CPU > 225 W is not supported.
- 128G or greater capacity RDIMMs are not supported.
- GPU cards are not supported.
- DPU is not supported.
- Two PSUs are required in redundant mode. System performance may be reduced in the event of a PSU failure.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- 85 C active optics or DAC is required.

### 16 x EDSFF E3.S Configuration

- CPU > 225 W is not supported.
- 128G or greater capacity RDIMMs are not supported.
- GPU cards are not supported.
- DPU is not supported.
- Two PSUs are required in redundant mode. System performance may be reduced in the event of a PSU failure.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- 85 C active optics or DAC is required.

### 8 x 2.5-inch Configuration SAS/SATA; NVMe RAID/direct

- CPU > 225 W is not supported.
- 128G or greater capacity RDIMMs are not supported.
- GPU cards are not supported.
- DPU is not supported.
- Two PSUs are required in redundant mode. System performance may be reduced in the event of a PSU failure.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- 85 C active optics or DAC is required.

### 10 x 2.5-inch Configuration SAS/SATA

- CPU > 185 W is not supported.
- 128G or greater capacity RDIMMs are not supported.
- GPU cards are not supported.
- DPU is not supported.
- Two PSUs are required in redundant mode. System performance may be reduced in the event of a PSU failure.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- 85 C active optics or DAC is required.

### 4 x 3.5-inch Configuration with rear 2 x EDSFF E3.S drives

- CPU > 185 W is not supported.
- 128G or greater capacity RDIMMs are not supported.
- GPU cards are not supported.
- DPU is not supported.
- Two PSUs are required in redundant mode. System performance may be reduced in the event of a PSU failure.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- 85 C active optics or DAC is required.

## ASHRAE A4 environment

### 8 x EDSFF E3.S Configuration (Cold Aisle Front I/O)

- CPU > 185 W is not supported.
- 128G or greater capacity RDIMMs are not supported.
- BOSS-N1 DC-MHS is not supported at the rear of the system..
- GPU cards are not supported.

- DPU is not supported.
- Two PSUs are required in redundant mode. System performance may be reduced in the event of a PSU failure.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- 85 C active optics or DAC is required.

#### 16 x EDSFF E3.S Configuration

- CPU > 185 W is not supported.
- 128G or greater capacity RDIMMs are not supported.
- BOSS-N1 DC-MHS is not supported..
- GPU cards are not supported.
- DPU is not supported.
- Two PSUs are required in redundant mode. System performance may be reduced in the event of a PSU failure.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- 85 C active optics or DAC is required.

#### 8 x 2.5-inch Configuration SAS/SATA; NVMe RAID/direct

- CPU > 185 W is not supported.
- 128G or greater capacity RDIMMs are not supported.
- BOSS-N1 DC-MHS is not supported..
- GPU cards are not supported.
- DPU is not supported.
- Two PSUs are required in redundant mode. System performance may be reduced in the event of a PSU failure.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- 85 C active optics or DAC is required.

#### 10 x 2.5-inch Configuration SAS/SATA; NVMe RAID/direct

- CPU > 165 W is not supported.
- 128G or greater capacity RDIMMs are not supported.
- BOSS-N1 DC-MHS is not supported..
- GPU cards are not supported.
- DPU is not supported.
- Two PSUs are required in redundant mode. System performance may be reduced in the event of a PSU failure.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- 85 C active optics or DAC is required.

#### 4 x 3.5-inch Configuration with rear 2 x EDSFF E3.S drives

- CPU > 165 W is not supported.
- 128G or greater capacity RDIMMs are not supported.
- BOSS-N1 DC-MHS is not supported..
- GPU cards are not supported.
- DPU is not supported.
- Two PSUs are required in redundant mode. System performance may be reduced in the event of a PSU failure.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- 85 C active optics or DAC is required.

 **NOTE:** There are no specific restrictions for ASHRAE A2 environment.

## Additional Restriction

For rear I/O configurations with 25 Gb and above, 25Gb PCIe/OCP cards require DAC or 85 C active optics.

85 C active optics are SFP28 and QSFP+

# Initial system setup and configuration

This section describes the tasks for initial setup and configuration of the Dell 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. Install the system into the rack. For more information, see the rail installation and cable management accessory guides relevant to your rail and cable management solution at [PowerEdge Manuals](#).
3. Connect the peripherals to the system and the system to the electrical outlet.
4. Power on the system.

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 [Pre-operating system management applications](#) chapter.

## 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 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 41. Interfaces to set up iDRAC IP address**

| Interface              | Documentation links                                                                                                                                                                                                                                                                |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| iDRAC Settings utility | Integrated Dell Remote Access Controller User's Guide at <a href="#">iDRAC Manuals</a> or for system-specific Integrated Dell Remote Access Controller User's Guide, go to <a href="#">PowerEdge Manuals</a> > <b>Product Support</b> page of your system > <b>Documentation</b> . |



**Table 41. Interfaces to set up iDRAC IP address (continued)**

| Interface    | Documentation links                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |  <b>NOTE:</b> To determine the most recent iDRAC release for your platform and for the latest documentation version, see KB article <a href="#">KB305325</a> .                                                                                                                                                                                                                                                                                       |
| iDRAC Direct | Integrated Dell Remote Access Controller User's Guide at <a href="#">iDRAC Manuals</a> or for system-specific Integrated Dell Remote Access Controller User's Guide, go to <a href="#">PowerEdge Manuals</a> > <b>Product Support</b> page of your system > <b>Documentation</b> .<br> <b>NOTE:</b> To determine the most recent iDRAC release for your platform and for the latest documentation version, see KB article <a href="#">KB305325</a> . |

 **NOTE:** To access iDRAC, ensure that you connect the USB 2.0 Type-C cable to the iDRAC dedicated port on the front of the system.

## 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, the default username is `root` and enter the iDRAC secure default password available on back of the Information Tag. If you opted for legacy password, use the iDRAC legacy username and password - `root` and `calvin`, the iDRAC default password will be blank on the information tag. Then you will be prompted and required to create a password of your choice before proceeding. 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](#)

 **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article [KB78115](#).

You can also access iDRAC using command-line protocol - RACADM. For more information, see the [Integrated Dell Remote Access Controller RACADM CLI Guide](#).

You can also access iDRAC using automation tool - Redfish API. For more information, see the [Integrated Dell Remote Access Controller User's Guide Redfish API Guide](#).

## 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 that are provided in the table below. For information about how to install the operating system, see the documentation links provided in the table below.

**Table 42. Resources to install the operating system**

| Resource | Documentation links                                                                                                                                                                                                                                               |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| iDRAC    | <a href="#">Integrated Dell Remote Access Controller User's Guide</a> or for system-specific Integrated Dell Remote Access Controller User's Guide, go to <a href="#">PowerEdge Manuals</a> > <b>Product Support</b> page of your system > <b>Documentation</b> . |

**Table 42. Resources to install the operating system (continued)**

| Resource             | Documentation links                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |  <b>NOTE:</b> To determine the most recent iDRAC release for your platform and for the latest documentation version, see KB article at <a href="#">KB78115</a> .                                                                                                                                                                                                                                                                                                                                                                                             |
| Lifecycle Controller | Dell Lifecycle Controller User's Guide at <a href="#">iDRAC Manuals</a> or for system-specific Dell Lifecycle Controller User's Guide , go to <a href="#">PowerEdge Manuals</a> > <b>Product Support</b> page of your system > <b>Documentation</b> . Dell Technologies recommends using Lifecycle Controller to install the OS, since all required drivers are installed on the system.<br> <b>NOTE:</b> To determine the most recent iDRAC release for your platform and for the latest documentation version, see KB article at <a href="#">KB78115</a> . |

 **NOTE:** For more information about installation and how-to videos for operating systems that are supported on PowerEdge systems, see [Supported Operating Systems for Dell PowerEdge systems](#).

## Options to download drivers and firmware

You can download the 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 43. Options to download firmware**

| Option                                                                              | Documentation link            |
|-------------------------------------------------------------------------------------|-------------------------------|
| Using Integrated Dell Remote Access Controller Lifecycle Controller (iDRAC with LC) | <a href="#">idrac manuals</a> |
| Using iDRAC virtual media                                                           | <a href="#">idrac manuals</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 44. Options to download and install OS drivers**

| Option              | Documentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dell support site   | <a href="#">Downloading drivers and firmware</a> section.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| iDRAC virtual media | Integrated Dell Remote Access Controller User's Guide or for system specific, go to <a href="#">Integrated Dell Remote Access Controller User's Guide</a> > <b>Product Support</b> page of your system > <b>Documentation</b> .<br> <b>NOTE:</b> To determine the most recent iDRAC release for your platform and for latest documentation version, see <a href="#">iDRAC versions and release notes</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 [Drivers](#).
2. Enter the Service Tag of the system in the **Enter a Dell Service Tag, Dell 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.

# Pre-operating system management applications

You can manage basic settings and features of a system without booting to the operating system by using the system firmware.

## Options to manage the pre-operating system applications

You can use any one of the following options to manage the pre-operating system applications:

- System Setup
- Boot Manager
- Preboot Execution Environment (PXE)

### Topics:

- [System Setup](#)
- [Boot Manager](#)
- [PXE boot](#)

## System Setup

Using the **System Setup** option, you can configure the BIOS settings, iDRAC settings, and device settings of the system.

You can access system setup by using any one of the following interfaces:

- Graphical User interface — To access go to iDRAC Dashboard, click **Configurations > BIOS Settings**.
- Text browser — To enable the text browser, use the Console Redirection.

To view

**System Setup**, power on the system, press F2, and click **System Setup Main Menu**.

 **NOTE:** If the operating system begins to load before you press F2, wait for the system to finish booting, and then restart the system and try again.

The options on the **System Setup Main Menu** screen are described in the following table:

**Table 45. System Setup Main Menu**

| Option                      | Description                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>System BIOS</b>          | Enables you to configure the BIOS settings.                                                                                                                                                                                                                                                                                                               |
| <b>iDRAC Settings</b>       | Enables you to configure the iDRAC settings. The iDRAC utility is an interface to set up and configure the iDRAC parameters . You can enable or disable various iDRAC parameters by using the iDRAC utility. For more information about this utility, <i>Integrated Dell Remote Access Controller User's Guide</i> at <a href="#">PowerEdge Manuals</a> . |
| <b>Device Settings</b>      | Enables you to configure device settings for devices such as storage controllers or network cards.                                                                                                                                                                                                                                                        |
| <b>Service Tag Settings</b> | Enables you to configure the System Service Tag.                                                                                                                                                                                                                                                                                                          |

## System BIOS

See the common options of the System BIOS here: [Support for General Solution Resources | Documentation | Dell US > Manuals and Documents > Set up BIOS on 17th Generation Dell PowerEdge Servers.](#)

## iDRAC Settings

The iDRAC settings is an interface to set up and configure the iDRAC parameters by using UEFI. You can enable or disable various iDRAC parameters by using the iDRAC settings.

 **NOTE:** Accessing some of the features on the iDRAC settings needs the iDRAC Enterprise License upgrade.

For more information about using iDRAC, see *Dell Integrated Dell Remote Access Controller User's Guide* at [iDRAC Manuals](#).

## Device Settings

**Device Settings** enables you to configure device parameters such as storage controllers or network cards.

## Boot Manager

The **Boot Manager** option enables you to select boot options and diagnostic utilities.

To enter **Boot Manager**, power on the system and press F11.

**Table 46. Boot Manager details**

| Option                         | Description                                                                                                                                                                                                                                 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Continue Normal Boot</b>    | The system attempts to boot to devices starting with the first item in the boot order. If the boot attempt fails, the system continues with the next item in the boot order until the boot is successful or no more boot options are found. |
| <b>One-shot UEFI Boot Menu</b> | Enables you to access the boot menu, where you can select a one-time boot device to boot from.                                                                                                                                              |
| <b>Launch System Setup</b>     | Enables you to access System Setup.                                                                                                                                                                                                         |
| <b>System Utilities</b>        | Enables you to launch the System Utilities menu such as Launch Diagnostics, BIOS update File Explorer, Reboot System.                                                                                                                       |

## PXE boot

You can use the Preboot Execution Environment (PXE) option to boot and configure the networked systems remotely.

To access the **PXE boot** option, boot the system and then press F12 during POST instead of using standard Boot Sequence from BIOS Setup. It does not pull any menu or allows managing of network devices.

# Minimum to POST and system management configuration validation

This section describes the minimum to POST system requirement and system management configuration validation of the Dell system.

## Topics:

- [Minimum configuration to POST](#)

## Minimum configuration to POST

The components listed below are the minimum configuration to POST:

- One processor
- One memory modules (DIMM) in slot A1
  1. Only 32 GB allowed for 1DIMM per one Intel® Xeon® 6 processor E- core processor, with limited features.
  2. Only 16 GB or 32 GB allowed for 1DIMM per one Intel® Xeon® 6 processor P- core processor, with limited features.
- One power supply unit
- Host Processor Module (HPM)
- Fan board
- Power Interposer board (PIB)
- DC-SCM
- Intrusion cable kit

 **NOTE:** The HPM was formerly called as system board.

## Configuration validation

The new generation of Dell systems have added interconnect flexibility and advanced iDRAC management features to collect precise system configuration information and report configuration errors.

When the system is powered on, information about installed cables, risers, backplanes, power supplies, floating card (fPERC, adapter PERC, BOSS), and processor is obtained from the CPLD and backplane memory maps are analyzed. This information forms a unique configuration, which is compared with one of the qualified configurations that are stored in a table maintained by iDRAC.

One or more sensors are assigned to each of the configuration elements. During POST, any configuration validation error is logged in the System Event Log (SEL) log. The reported events are categorized in the configuration validation error table.

**Table 47. Configuration validation error**

| Error          | Description                                                                                                                                 | Possible cause and recommendations                                                                                             | Example                                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Config Error   | A configuration element within the closest match contains something that is unexpected and does not match any Dell qualified configuration. | Wrong configuration                                                                                                            | Config Error: Backplane cable CTRS_SRC_SA1 and BP-DST_SA1   |
|                |                                                                                                                                             | The element reported in HWC8010 errors are assembled incorrectly. Verify element (cable, risers, etc) placement in the system. | Config Error : SL Cable PLANAR_SL2 and CTRL_DST_PA1         |
| Config Missing | iDRAC found a configuration element missing within the closest match detected.                                                              | Missing or damaged cable, device, or part                                                                                      | Config Missing: Float card front PERC/HBA, adapter PERC/HBA |
|                |                                                                                                                                             | Missing element or cable is reported in HWC8010 error logs. Install the missing element (cable, risers, etc).                  | Config Missing : SL cable PLANAR_SL8 and CTRL_DST_PA1       |
| Comm Error     | A configuration element is not responding to iDRAC using the management interface while running an inventory check.                         | System management sideband communication                                                                                       | Comm Error: Backplane 2                                     |
|                |                                                                                                                                             | Unplug AC Power, reseal the element and replace the element if the problem persists.                                           |                                                             |

# Disassembly and reassembly

## Topics:

- Safety instructions
- Before working inside your system
- After working inside your system
- Recommended tools
- Optional front bezel
- System cover
- Air shroud
- Cooling fans
- Drive backplane cover
- Drives
- Removing a 3.5-inch drive blank
- Installing a 3.5-inch drive blank
- Removing a 3.5-inch drive carrier
- Removing a 3.5-inch drive from the drive carrier
- Installing a 3.5-inch drive into the drive carrier
- Installing a 3.5-inch drive carrier
- Rear Drives
- Drive backplane
- Side wall brackets
- Middle bracket
- Cable routing
- System memory
- Processor and heat sink
- PERC cards
- Expansion cards and expansion card risers
- M.2 SSD module
- Optional M.2 Interposer board
- Optional BOSS-N1 DC-MHS module
- Optional OCP NIC card
- Datacenter-Secure Control Module (DC-SCM)
- Attic board
- Internal USB
- System battery
- Intrusion switch
- Power supply unit
- DB9+RJ45 module
- Trusted Platform Module
- HPM board
- Control panel

## Safety instructions

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



-  **CAUTION:** Ensure that two or more people lift the system horizontally from the box and place it on a flat surface, rack lift, or into the rails.
-  **WARNING:** Opening or removing the system cover while the system is powered on may expose you to a risk of electric shock.
-  **WARNING:** Do not operate the system without the cover for a duration exceeding five minutes. Operating the system without the system cover can result in component damage.
-  **CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.
-  **NOTE:** It is recommended that you always use an antistatic mat and antistatic strap while working on components inside the system.
-  **CAUTION:** To ensure proper operation and cooling, all system bays and fans must always be populated with a component or a blank.
-  **NOTE:** Only use certified Optical Fiber Transceiver Class I Laser Products.
-  **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.

## Before working inside your system

### Prerequisites

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

### Steps

1. Power off the system and all attached peripherals.
2. Disconnect the system from the electrical outlet and disconnect the peripherals.
3. If applicable, remove the system from the rack.  
For more information, see the *Rail Installation Guide* relevant to your rail solutions at [PowerEdge manuals](#).
4. Remove the system cover.  
 **NOTE:** While removing the hot-swappable components from the front or rear of the system, do not remove the system cover.

## After working inside your system

### Prerequisites

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

### Steps

1. Replace the system cover.
2. If applicable, install the system into the rack.  
For more information, see the *Rail Installation Guide* relevant to your system at [PowerEdge manuals](#).
3. Reconnect the peripherals and connect the system to the electrical outlet, and then power on the system.

## Recommended tools

You may need some or all of the following tools to perform the removal and installation procedures:

- Key to the bezel lock. The key is required only if your system includes a bezel.
- Phillips 1 screwdriver
- Phillips 2 screwdriver
- Torx T6 screwdriver
- Torx T30 screwdriver
- Plastic scribe
- 1/4-inch flat blade screwdriver
- Wrist grounding strap connected to the ground
- ESD mat
- Needle-nose pliers

## Optional front bezel

### Removing the front bezel

#### Prerequisites

1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Keep the bezel key handy.

 **NOTE:** The bezel key is part of the bezel package.

#### Steps

1. Rotate the key clockwise to unlock the bezel.
2. Press the release button, and disengage the left end of the bezel.
3. Unhook the right end, and remove the bezel.



**Figure 34. Removing the front bezel**

**NOTE:** The front bezel is not available on a front I/O configuration system.

#### Next steps

Replace front bezel.

## Installing the front bezel

#### Prerequisites

1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Locate and remove the bezel key.

**NOTE:** The bezel key is part of the bezel package.

#### Steps

1. Align and insert the tabs on the bezel into the slots on the system.
2. Press the bezel until the release button clicks in place.
3. Rotate the key anti-clockwise to lock the bezel.



Figure 35. Installing the front bezel

## System cover

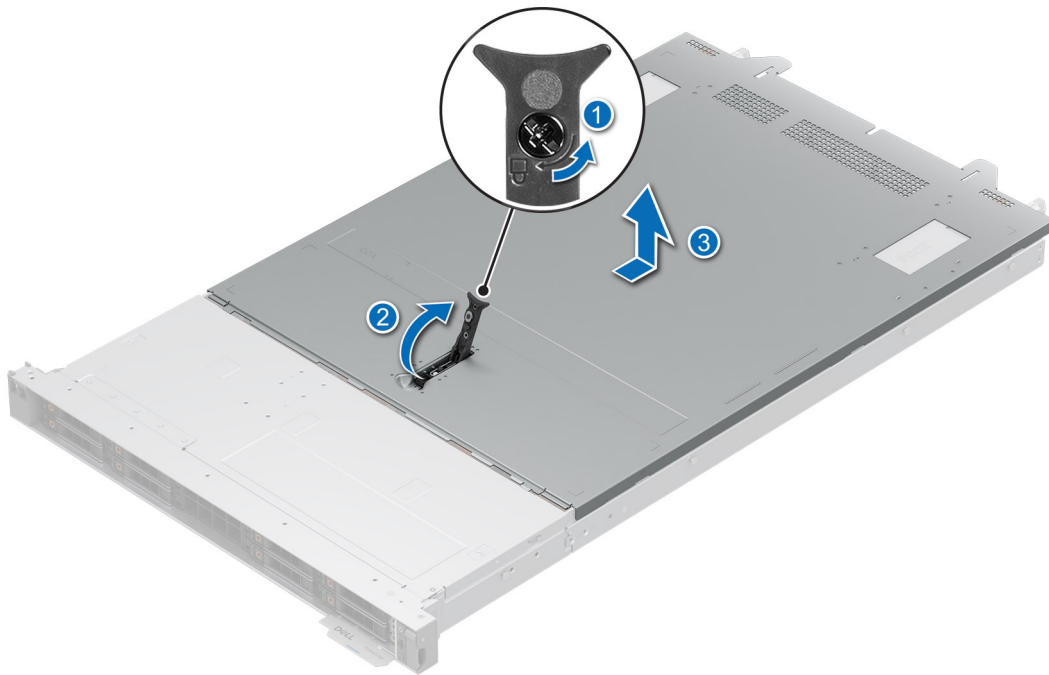
### Removing the system cover

#### Prerequisites

1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Power off the system, and any attached peripherals.
3. Disconnect the system from the electrical outlet and peripherals.

### Steps

1. Using a 1/4-inch flat head or a Phillips 2 screwdriver, rotate the lock counterclockwise to the unlocked position.
2. Lift the release latch until the system cover slides back.
3. Lift the cover from the system.



**Figure 36. Removing the system cover**

### Next steps

Replace the system cover.

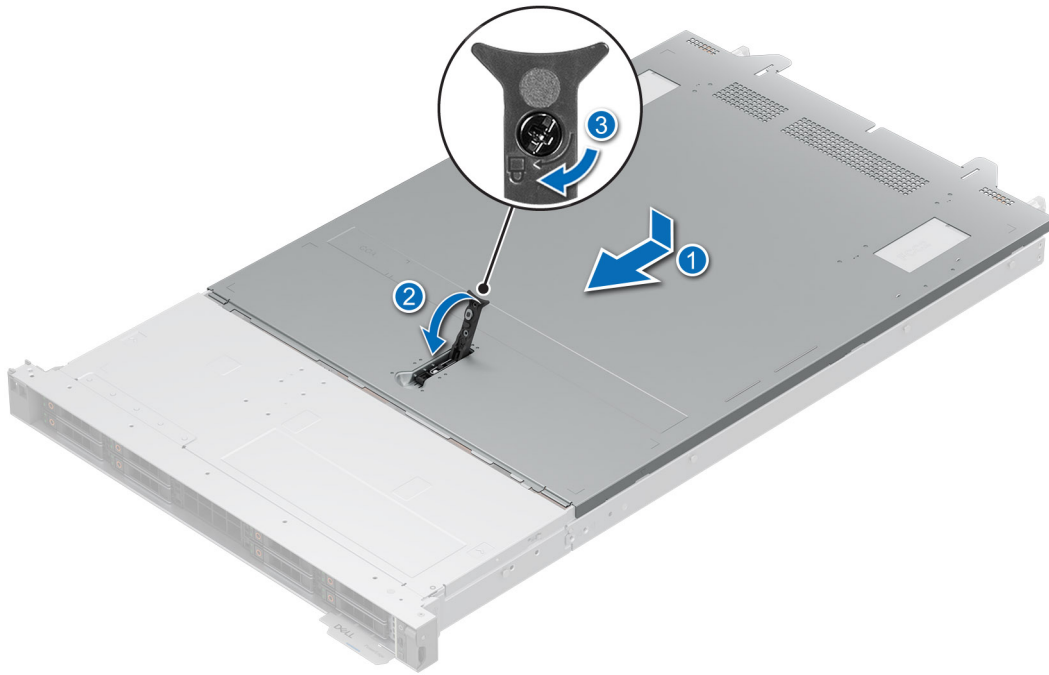
## Installing the system cover

### Prerequisites

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

### Steps

1. Align the tabs on the system cover with the guide slots on the system and slide the system cover.
2. Close the system cover release latch.
3. Using a 1/4-inch flat head or Phillips 2 screwdriver, rotate the lock clockwise to the lock position.



**Figure 37. Installing the system cover**

#### **Next steps**

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

## **Air shroud**

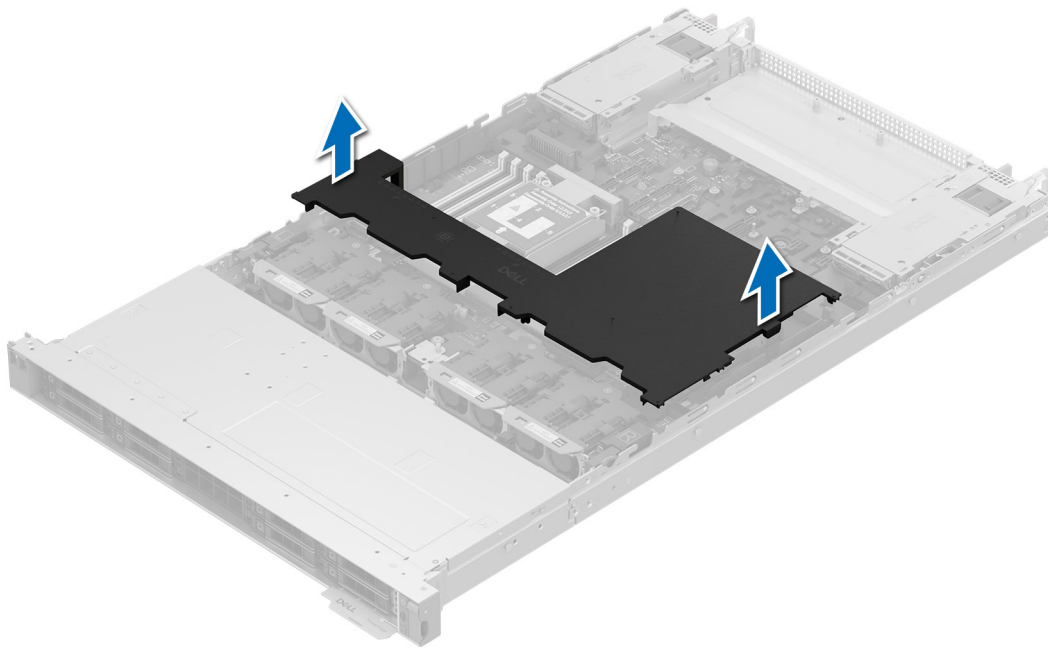
### **Removing the air shroud**

#### **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 system cover](#)

#### **Steps**

Holding the sides lift the air shroud out of the system.



**Figure 38. Removing the air shroud**

#### **Next steps**

Replace the air shroud.

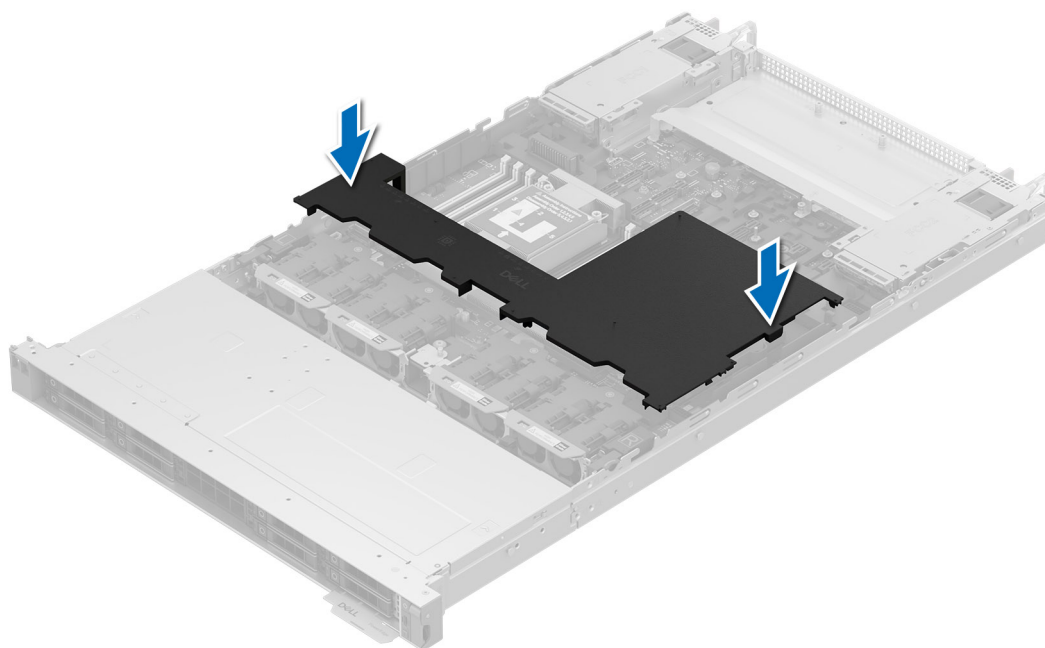
## **Installing the air shroud**

#### **Prerequisites**

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

#### **Steps**

Align and lower the air shroud till it is firmly seated in the system .



**Figure 39. Installing the air shroud**

#### **Next steps**

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

## **Cooling fans**

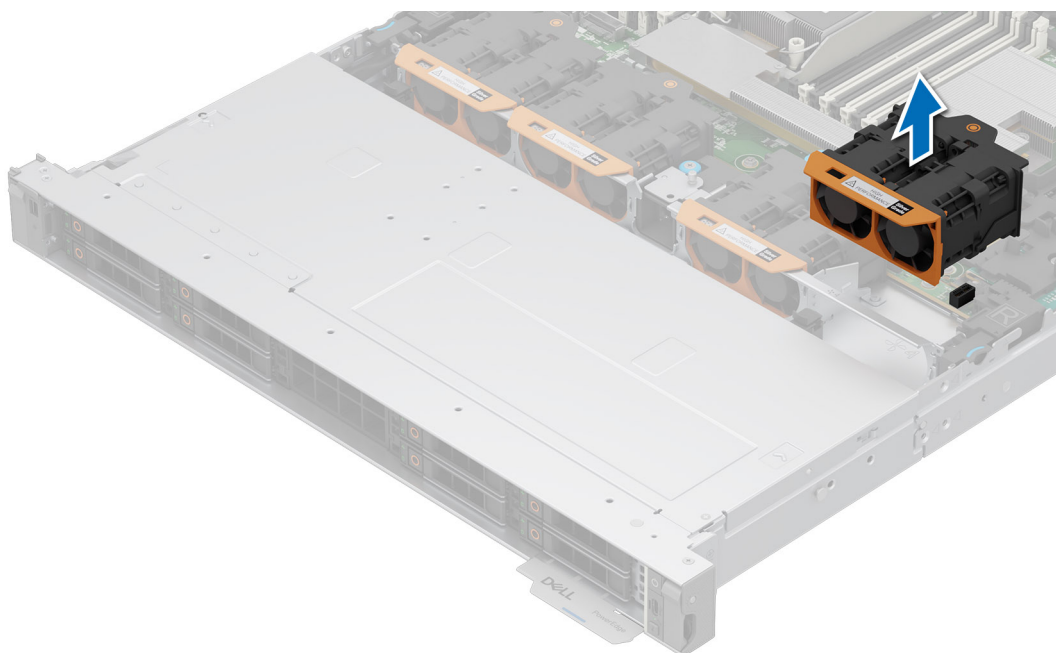
### **Removing a cooling fan**

#### **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 system cover](#)

#### **Steps**

Holding the orange and black edges on the fan module, lift the cooling fan module to disconnect from the connector on the fan board.



**Figure 40. Removing a cooling fan**

#### **Next steps**

[Replace a cooling fan.](#)

## **Installing a cooling fan**

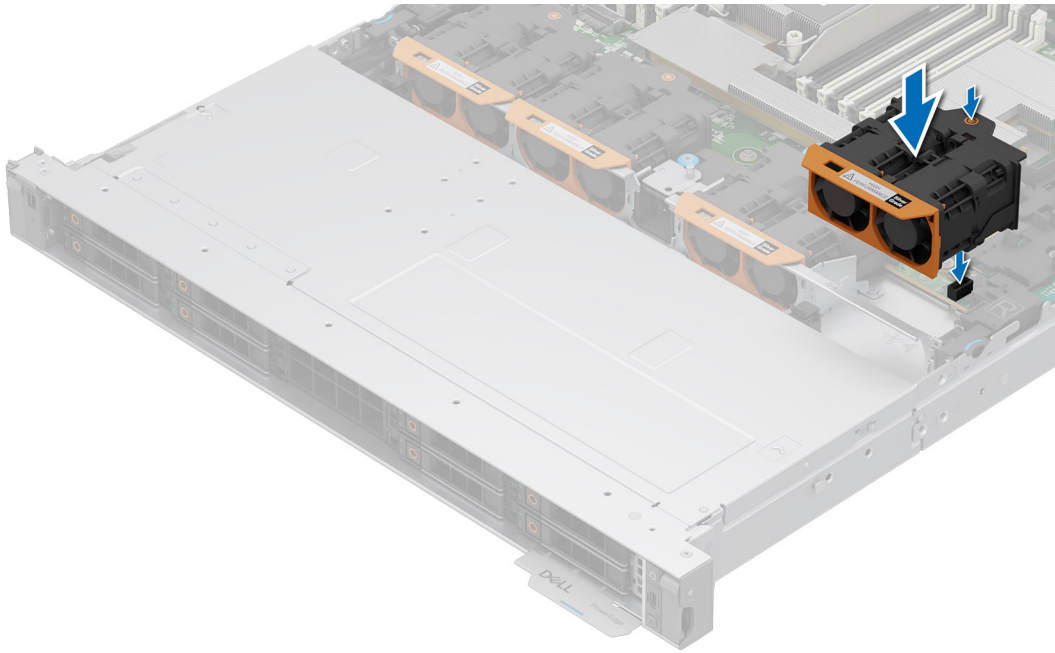
#### **Prerequisites**

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

#### **Steps**

1. Align and lower the cooling fan onto the connector on the fan board.
2. Press the orange touch point on the cooling fan module until it is firmly connected.





**Figure 41. Installing a cooling fan**

#### **Next steps**

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

## **Drive backplane cover**

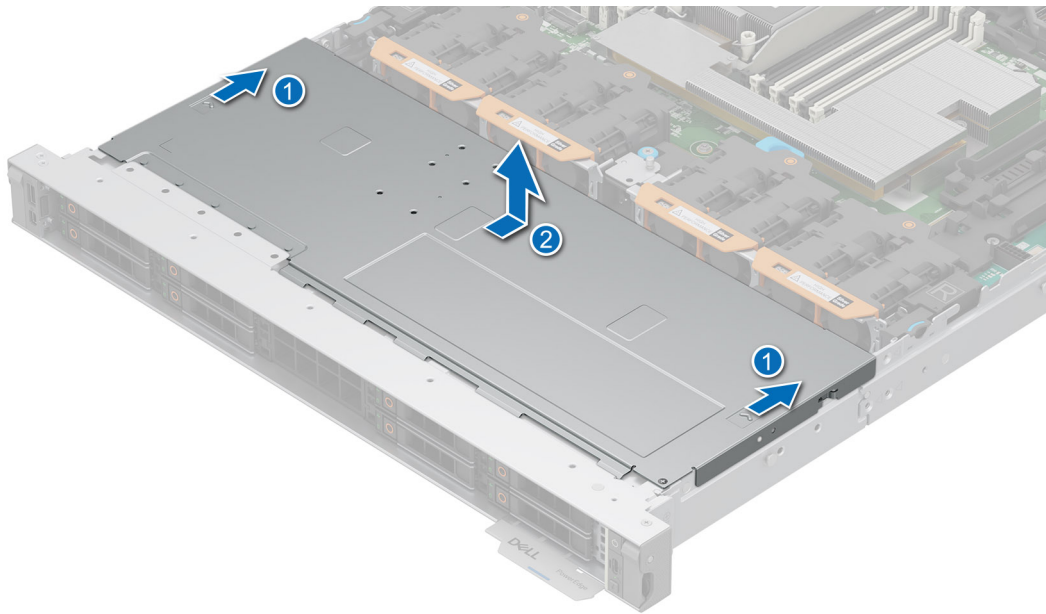
### **Removing the drive backplane cover**

#### **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 system cover](#) .

#### **Steps**

1. Slide the drive backplane cover in the direction of the arrows marked on the drive backplane cover.
2. Lift the drive backplane cover from the system.



**Figure 42. Removing the drive backplane cover**

#### Next steps

1. [Replace the drive backplane cover.](#)
2. [Replace the system cover](#)

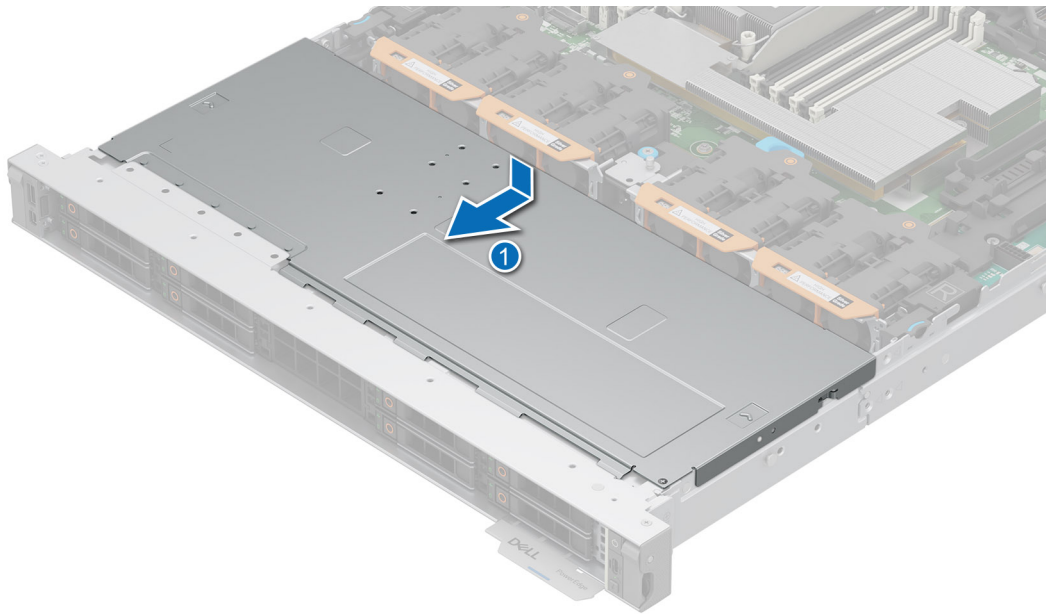
## Installing the drive backplane cover

#### 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 system cover](#).

#### Steps

1. Align the drive backplane cover with the guide slots on the system.
2. Slide the drive backplane cover to the front of the system until the drive backplane cover fits into place.



**Figure 43. Installing the drive backplane cover**

#### Next steps

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

## Drives

### Removing an EDSFF E3.S drive blank

#### Prerequisites

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

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

#### Steps

Lift the release button, and slide the drive blank out of the drive slot.



**Figure 44. Removing an EDSFF E3.S drive blank**

#### **Next steps**

1. [Replace the EDSFF E3.S drive blank.](#)

## **Installing an EDSFF E3.S drive blank**

#### **Prerequisites**

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

#### **Steps**

Slide the drive blank into the drive slot until the release button clicks into place.



**Figure 45. Installing an EDSFF E3.S drive blank**

## Removing an EDSFF E3.S drive carrier

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Using the management software, prepare the drive for removal. If the drive is online, the green activity or fault indicator flashes while the drive is turning off. When the drive indicators are off, the drive is ready for removal. For more information, see the storage controller documentation.

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

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

### Steps

1. Lift the release button to open the drive carrier release handle.
  2. Holding the drive carrier release handle, slide the drive carrier out of the drive slot.
- NOTE:** If you are not replacing the drive immediately, install an EDSFF E3.S drive blank in the empty drive slot to maintain proper system cooling.

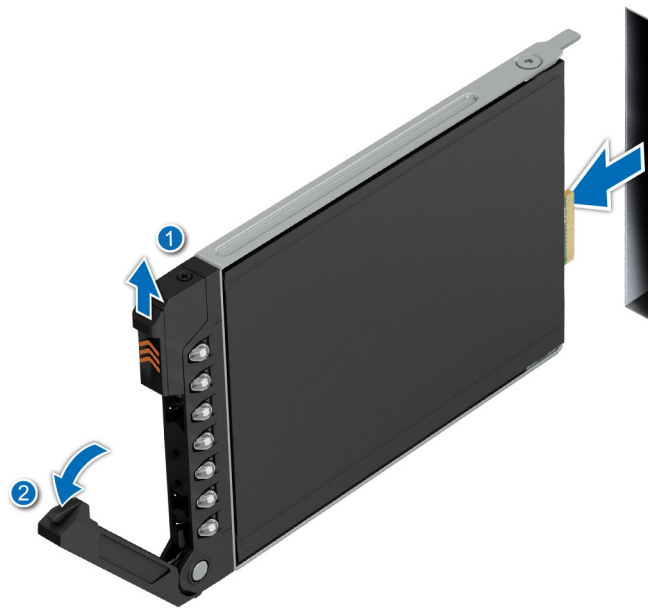


Figure 46. Removing an EDSFF E3.S drive carrier

### Next steps

Replace the [EDSFF E3.S drive](#) or install the [EDSFF E3.S drive blank](#).

## Removing an EDSFF E3.S drive from the drive carrier

### Prerequisites

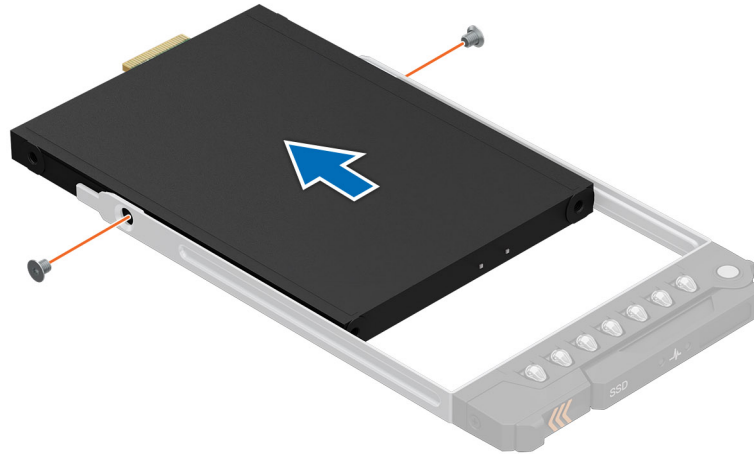
1. Follow the safety guidelines listed in the [Safety instructions](#).
2. [Remove the drive carrier](#).

### Steps

1. Using a Torx 6 screwdriver, remove the screws from the slide rails on the drive carrier.



2. Lift the drive out of the drive carrier.



**Figure 47. Removing an EDSFF E3.S drive from the drive carrier**

### Next steps

Install an EDSFF E3.S drive into the drive carrier.

## Installing an EDSFF E3.S drive into the drive carrier

### Prerequisites

1. Follow the safety guidelines listed in the [Safety instructions](#).
2. [Remove an EDSFF E3.S drive carrier](#).

### Steps

1. Insert the drive into the drive carrier with the drive connector facing towards the rear of the carrier.
2. Align the screw holes on the drive with the screw holes on the drive carrier.
3. Using a Torx 6 screwdriver, secure the drive to the drive carrier with the screws.



**NOTE:** When installing a drive into the drive carrier, ensure that the screws are torqued to 4 in-lbf.



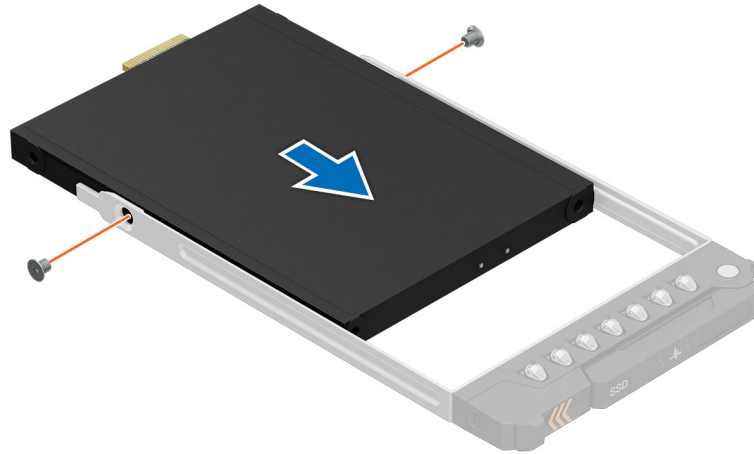


Figure 48. Installing an EDSFF E3.S drive into the drive carrier

#### Next steps

1. [Install the drive carrier.](#)

## Installing an EDSFF E3.S drive carrier

#### Prerequisites

-  **CAUTION:** Before removing or installing a drive while the system is running, see the [Storage Controller Manuals](#) documentation for the storage controller card to ensure that the host adapter is configured correctly to support drive removal and insertion.
-  **CAUTION:** Combining SAS and SATA drives in the same RAID volume is not supported.
-  **CAUTION:** When installing a drive, ensure that the adjacent drives are fully installed. Inserting a drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.
-  **NOTE:** Ensure that the drive carrier's release handle is in the open position before inserting the carrier into the slot.
-  **CAUTION:** To prevent data loss, ensure that your operating system supports hot-swap drive installation. See the documentation supplied with your operating system.
-  **CAUTION:** When a replacement hot swappable drive is installed and the system is powered on, the drive automatically begins to rebuild. Ensure that the replacement drive is blank or contains data that you wish to overwrite. Any data on the replacement drive is immediately lost after the drive is installed.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Remove the drive carrier or remove the drive blank when you want to assemble the drive into the system.

#### Steps

1. Slide the drive carrier into the drive slot and push until the drive connects with the backplane.
2. Close the drive carrier release handle to lock the drive in place.

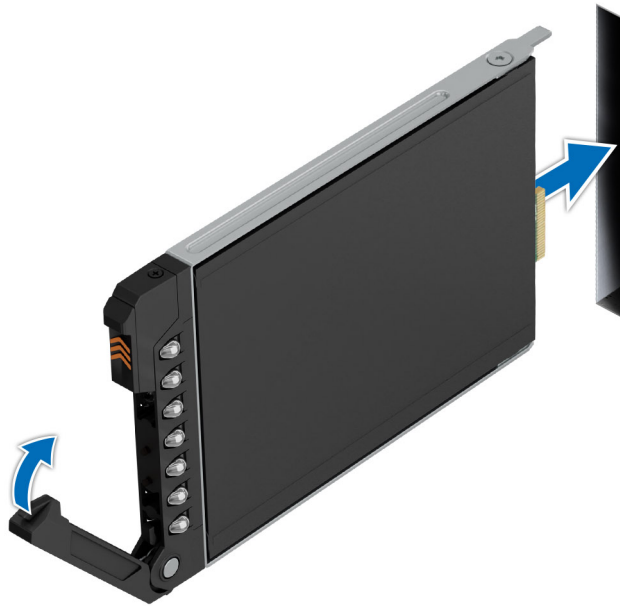


Figure 49. Installing an EDSFF E3.S drive carrier

## Removing a 2.5-inch drive blank

### Prerequisites

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

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

### Steps

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

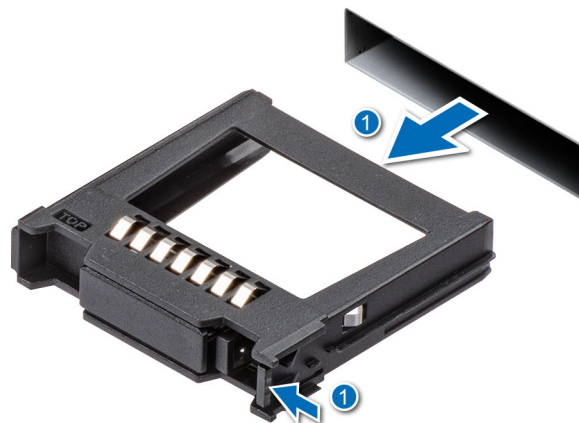


Figure 50. Removing a 2.5-inch drive blank

### Next steps

1. [Replace the 2.5-inch drive blank.](#)



## Installing a 2.5-inch drive blank

### Prerequisites

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

### Steps

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

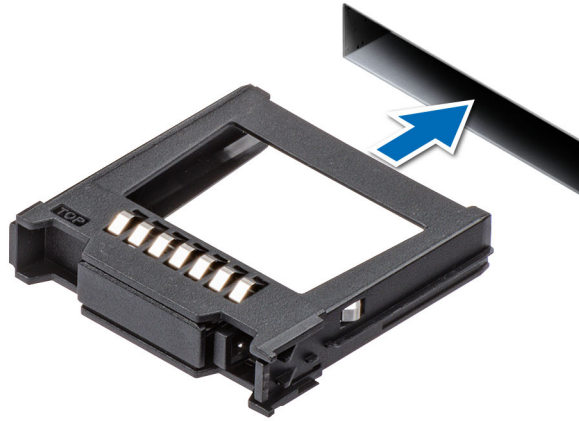


Figure 51. Installing a 2.5-inch drive blank

## Removing a 2.5-inch drive carrier

### Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Using the management software, prepare the drive for removal. If the drive is online, the green activity or fault indicator flashes while the drive is turning off. When the drive indicators are off, the drive is ready for removal. For more information, see the storage controller documentation.

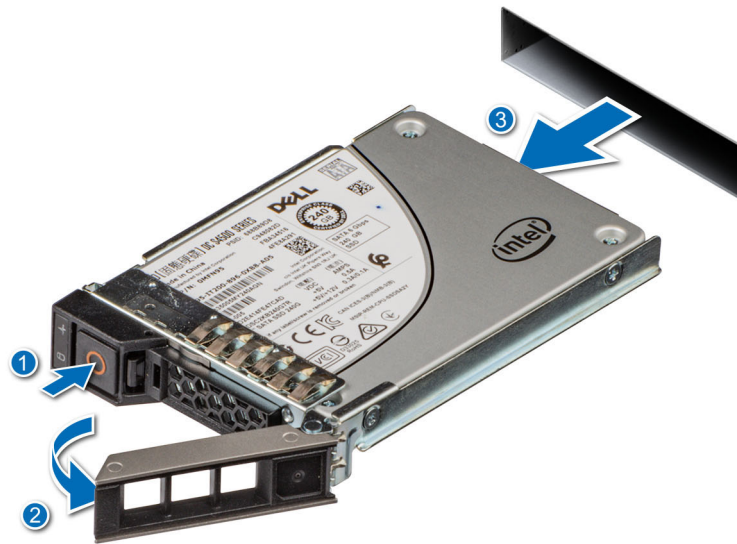
**CAUTION:** Before attempting to remove or install a drive while the system is running, see the documentation for the storage controller card to ensure that the host adapter is configured correctly to support drive removal and insertion.

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

### Steps

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

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



**Figure 52. Removing a 2.5-inch drive carrier**

### Next steps

Replace the 2.5-inch drive or install the 2.5-inch drive blank.

## Removing a 2.5-inch drive from the drive carrier

### Prerequisites

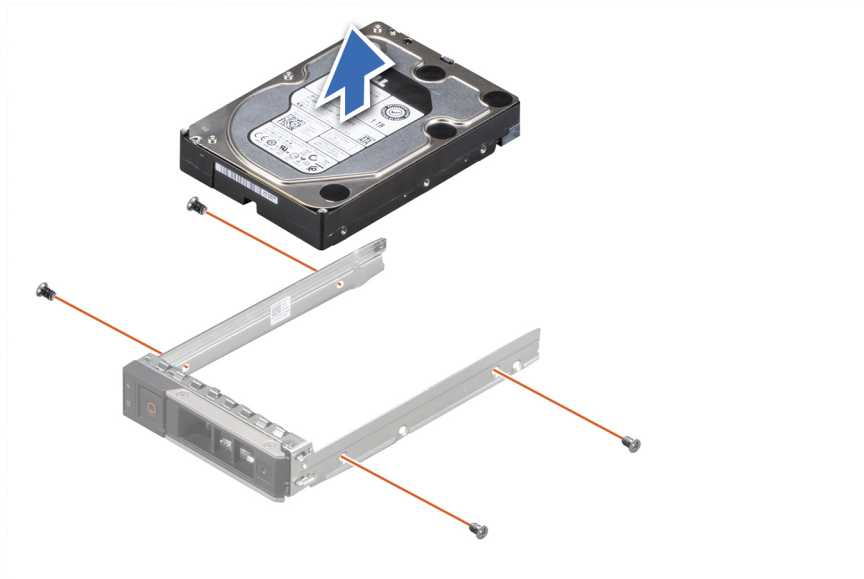
1. Follow the safety guidelines listed in the [Safety instructions](#).
2. [Remove the drive carrier](#).

### Steps

1. Using a Phillips #1 screwdriver, remove the screws from the slide rails on the drive carrier.

**NOTE:** If the hard drive or SSD carrier has a Torx screw, use Torx 6 (for 2.5-inch drive) screwdriver to remove the drive.

2. Lift the drive out of the drive carrier.



**Figure 53. Removing the 2.5-inch drive from the drive carrier**

### Next steps

Install a 2.5-inch drive into the drive carrier.

## Installing a 2.5-inch drive into the drive carrier

### Prerequisites

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

### Steps

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

 **NOTE:** If the hard drive or SSD carrier has a Torx screw, use Torx 6 (for 2.5-inch drive) screwdriver to install the drive. 

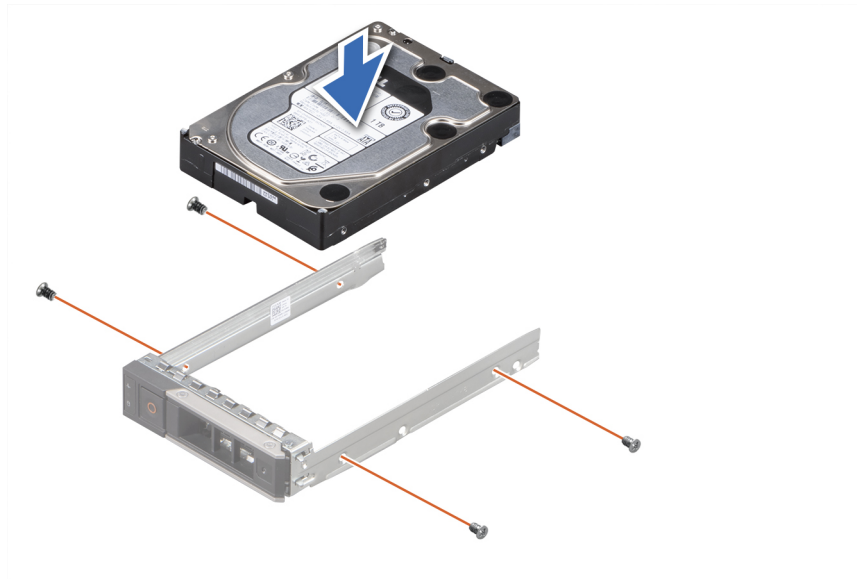


Figure 54. Installing a drive into the drive carrier

### Next steps

1. [Install the drive carrier.](#)

## Installing a 2.5-inch drive carrier

### Prerequisites

- CAUTION:** Before removing or installing a drive while the system is running, see the [Storage Controller Manuals](#) documentation for the storage controller card to ensure that the host adapter is configured correctly to support drive removal and insertion.
- CAUTION:** Combining SAS and SATA drives in the same RAID volume is not supported.
- CAUTION:** When installing a drive, ensure that the adjacent drives are fully installed. Inserting a drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.
- NOTE:** Ensure that the drive carrier's release handle is in the open position before inserting the carrier into the slot.
- CAUTION:** To prevent data loss, ensure that your operating system supports hot-swap drive installation. See the documentation supplied with your operating system.
- CAUTION:** When a replacement hot swappable drive is installed and the system is powered on, the drive automatically begins to rebuild. Ensure that the replacement drive is blank or contains data that you wish to overwrite. Any data on the replacement drive is immediately lost after the drive is installed.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Remove the drive carrier or remove the drive blank when you want to assemble the drive into the system.

### Steps

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

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

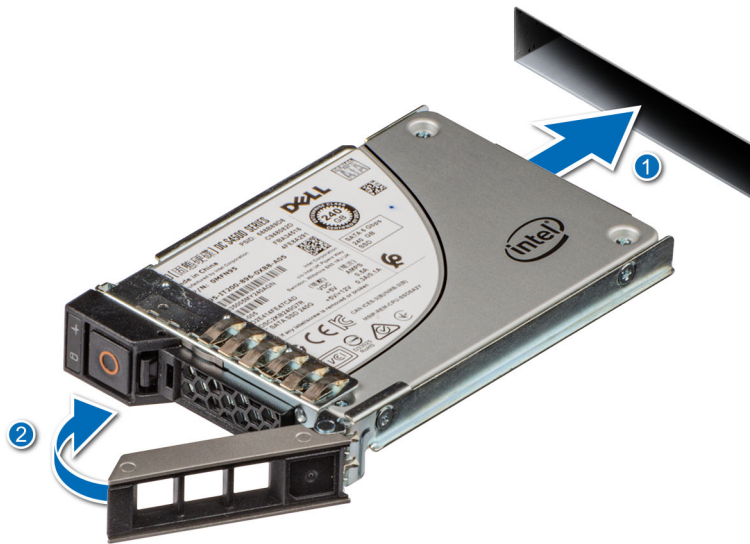


Figure 55. Installing a 2.5-inch drive carrier

## Removing a 3.5-inch drive blank

### Prerequisites

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

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

### Steps

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

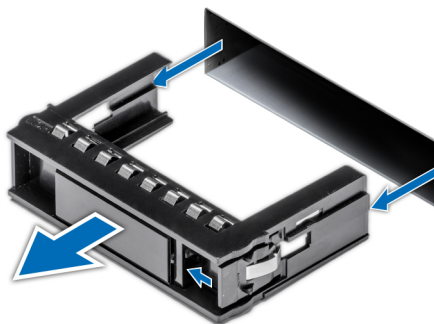


Figure 56. Removing a 3.5-inch drive blank

### Next steps

1. [Replace the 3.5-inch drive blank](#).

# Installing a 3.5-inch drive blank

## Prerequisites

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

## Steps

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

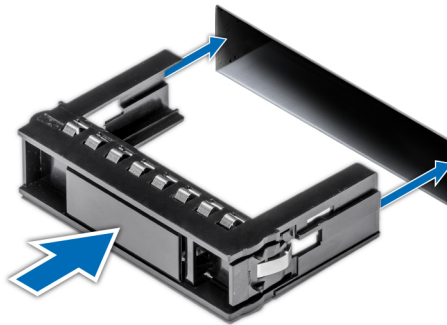


Figure 57. Installing a 3.5-inch drive blank

## Next steps

1. If removed, [install the front bezel](#).

# Removing a 3.5-inch drive carrier

## Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. [remove the front bezel](#).
3. Using the management software, prepare the drive for removal. If the drive is online, the green activity or fault indicator flashes while the drive is turning off. When the drive indicators are off, the drive is ready for removal. For more information, see the storage controller documentation.

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

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

## Steps

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

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



Figure 58. Removing a 3.5-inch drive carrier

#### Next steps

Replace the 3.5-inch drive or install the 3.5-inch drive blank.

## Removing a 3.5-inch drive from the drive carrier

#### Prerequisites

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

#### Steps

1. Using a Phillips #1 screwdriver, remove the screws from the slide rails on the drive carrier.

**NOTE:** If the hard drive or SSD carrier has a Torx screw, use Torx 6 (for 3.5-inch drive) screwdriver to remove the drive.

2. Lift the drive out of the drive carrier.



**Figure 59. Removing the 3.5-inch drive from the drive carrier**

#### Next steps

Install a 3.5-inch drive into the drive carrier.

## Installing a 3.5-inch drive into the drive carrier

#### Prerequisites

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

#### Steps

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

**NOTE:** If the hard drive or SSD carrier has a Torx screw, use Torx 6 (for 3.5-inch drive) screwdriver to install the drive.





Figure 60. Installing a drive into the drive carrier

#### Next steps

1. [Install the drive carrier.](#)

## Installing a 3.5-inch drive carrier

#### Prerequisites

- ⚠ **CAUTION:** Before removing or installing a drive while the system is running, see the [Storage Controller Manuals](#) documentation for the storage controller card to ensure that the host adapter is configured correctly to support drive removal and insertion.
- ⚠ **CAUTION:** Combining SAS and SATA drives in the same RAID volume is not supported.
- ⚠ **CAUTION:** When installing a drive, ensure that the adjacent drives are fully installed. Inserting a drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.
- ℹ **NOTE:** Ensure that the drive carrier's release handle is in the open position before inserting the carrier into the slot.
- ⚠ **CAUTION:** To prevent data loss, ensure that your operating system supports hot-swap drive installation. See the documentation supplied with your operating system.
- ⚠ **CAUTION:** When a replacement hot swappable drive is installed and the system is powered on, the drive automatically begins to rebuild. Ensure that the replacement drive is blank or contains data that you wish to overwrite. Any data on the replacement drive is immediately lost after the drive is installed.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. [remove the front bezel.](#)
3. Remove the drive carrier or remove the drive blank when you want to assemble the drive into the system.

#### Steps

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

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



**Figure 61. Installing a 3.5-inch drive carrier**

#### Next steps

install the front bezel.

## Rear Drives

### Removing the rear 2 x EDSFF E3.S module

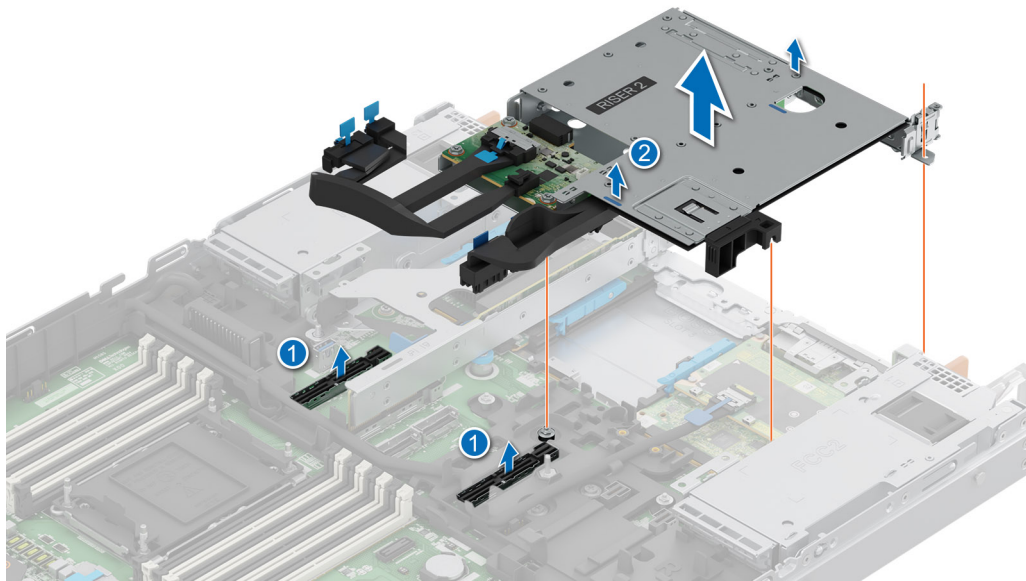
#### Prerequisites

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 system cover](#).
4. [Remove the rear EDSFF E3.S drives](#).
5. Disconnect the power cable and other required cables, observe the cable routing.

**NOTE:** See [cable routing](#) section.

#### Steps

1. Disconnect the cables of rear drive module from the system.
2. Holding the edges lift the rear drive module away from the system



**Figure 62. Removing the rear 2 x EDSFF E3.S module**

#### Next steps

1. [Replace the rear 4 x EDSFF E3.S module.](#)

## Installing the rear 2 x EDSFF E3.S module

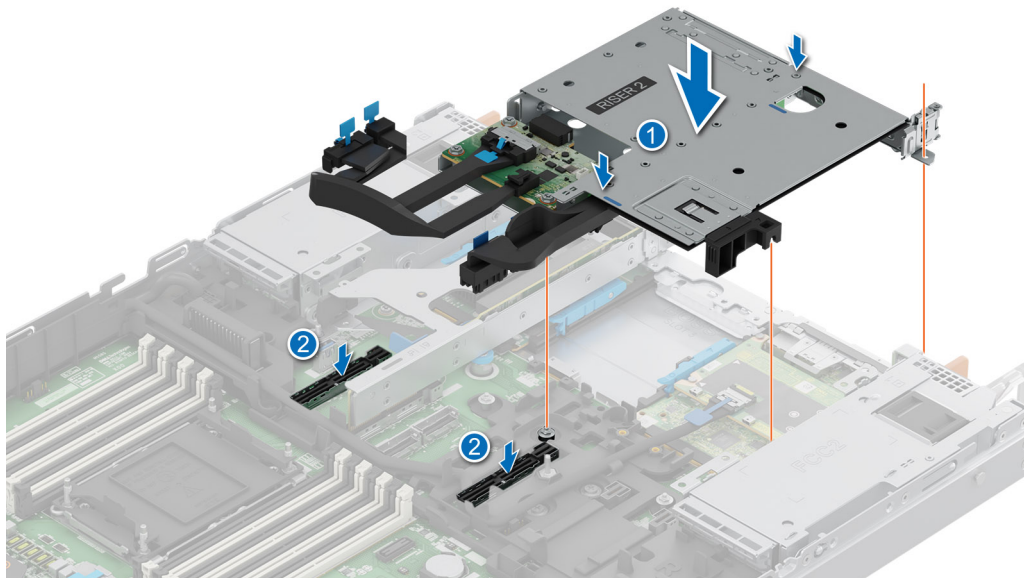
#### Prerequisites

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 system cover](#).
4. [Remove the rear EDSFF E3.S drives](#).
5. Disconnect the power cable and other required cables, observe the cable routing.

**NOTE:** See [cable routing](#) section.

#### Steps

1. Align the slot on the rear drive module with the guide on the system.
2. Lower and press the rear drive module until firmly seated.



**Figure 63. Installing the rear 2 x EDSFF E3.S module**

### Next steps

1. Connect all the cables, and ensure that all the cables are routed through the respective cable clip.

**NOTE:** See [cable routing](#) section.

2. install the rear EDSFF E3.S drives.
3. Install the system cover.
4. Follow the procedure listed in [After working inside your system](#).

## Drive backplane

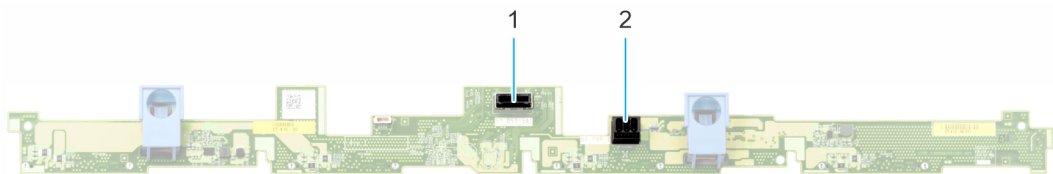
This is a service technician replaceable part only.

## Drive backplane

Depending on your system configuration, the drive backplanes that are supported are listed here:

**Table 48. Supported backplane options**

| System         | Supported drive backplanes          |
|----------------|-------------------------------------|
| PowerEdge R470 | EDSFF E3.S (x8) NVMe backplane      |
|                | EDSFF E3.S (x2) NVMe rear backplane |
|                | 2.5 inch (x8) SAS/SATA backplane    |
|                | 2.5 inch (x10) SAS/SATA backplane   |
|                | 3.5 inch (x4) SAS/SATA backplane    |

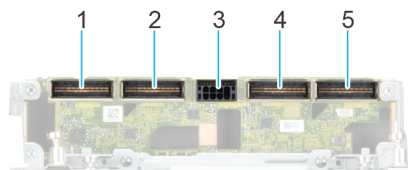


**Figure 64. 8 x 2.5-inch drive backplane**

1. BP\_DST\_SA1 (PERC to backplane)
2. BP\_PWR\_1 (backplane power cable to HPM board)



**Figure 65. 10 x 2.5-inch drive backplane**



**Figure 66. EDSFF E3.S NVMe drive backplane**

- |                                                                         |                                                                         |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 1. BP_DST_PA2 (PCIe/NVMe connector, connecting to SL8 on the HPM board) | 2. BP_DST_PB2 (PCIe/NVMe connector, connecting to SL7 on the HPM board) |
| 3. BP_PWR_CTRL_1 (connecting to power cable on the HPM board)           | 4. BP_DST_PA1 (PCIe/NVMe connector, connecting to SL4 on the HPM board) |
| 5. BP_DST_PB1 (PCIe/NVMe connector, connecting to SL3 on the HPM board) |                                                                         |

## Removing the 2.5-inch drive backplane 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 system cover](#).
4. [Remove the air shroud](#).
5. [Remove the drive backplane cover](#).
6. If installed [Remove the front bezel](#).
7. [Remove the 2.5-inch drives](#).
8. Disconnect the power cable and other required cables, observe the cable routing.

 **NOTE:** See [cable routing](#) section.

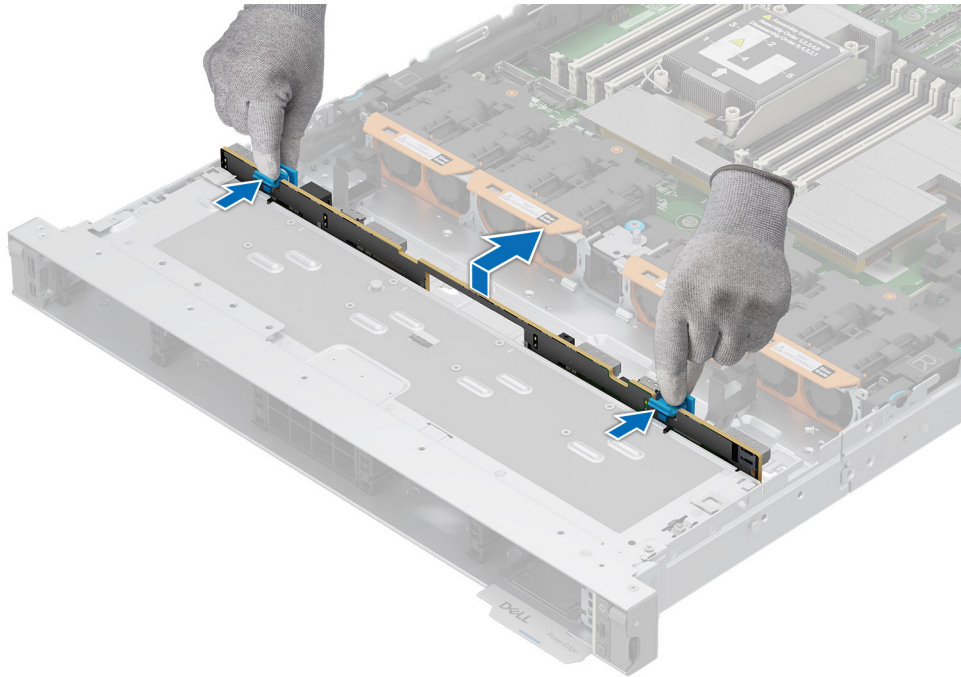
### About this task



[Click here to view the video.](#)

### Steps

1. Pinch and press the release clips on the backplane to disengage it from the system.
2. Lift it towards the rear of the system to remove the backplane.



**Figure 67. Removing the 2.5 inch drive backplane module**

#### Next steps

1. [Replace the 2.5-inch drive backplane module.](#)

## Installing the 2.5-inch drive backplane 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 system cover.](#)
4. [Remove the air shroud.](#)
5. [Remove the drive backplane cover.](#)
6. If installed [Remove the front bezel.](#)
7. [Remove the 2.5-inch drives.](#)
8. Disconnect the power cable and other required cables, observe the cable routing.

 **NOTE:** See [cable routing](#) section.

#### About this task

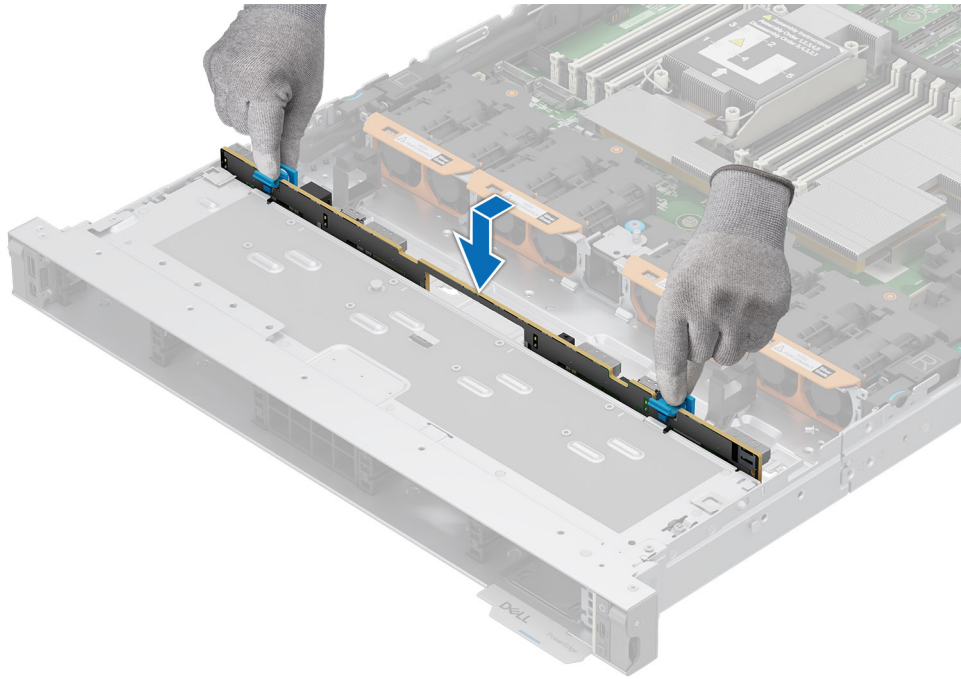


[Click here to view the video.](#)

#### Steps

1. Align the 2.5-inch drive backplane module with the notches on the system.
2. Pinch and press the release clips on the backplane.
3. Lower the backplane into the system till firmly seated.





**Figure 68. Installing the 2.5-inch drive backplane module**

### Next steps

1. Connect all the cables, and ensure that all the cables are routed through the respective cable clip.

**NOTE:** See [cable routing](#) section.

2. [install the 2.5-inch drives.](#)
3. If removed [Install the front bezel.](#)
4. [Install the drive backplane cover.](#)
5. [Install the air shroud.](#)
6. [Install the system cover](#)
7. Follow the procedure listed in [After working inside your system.](#)

## Removing the EDSFF E3.S backplane module

### Prerequisites

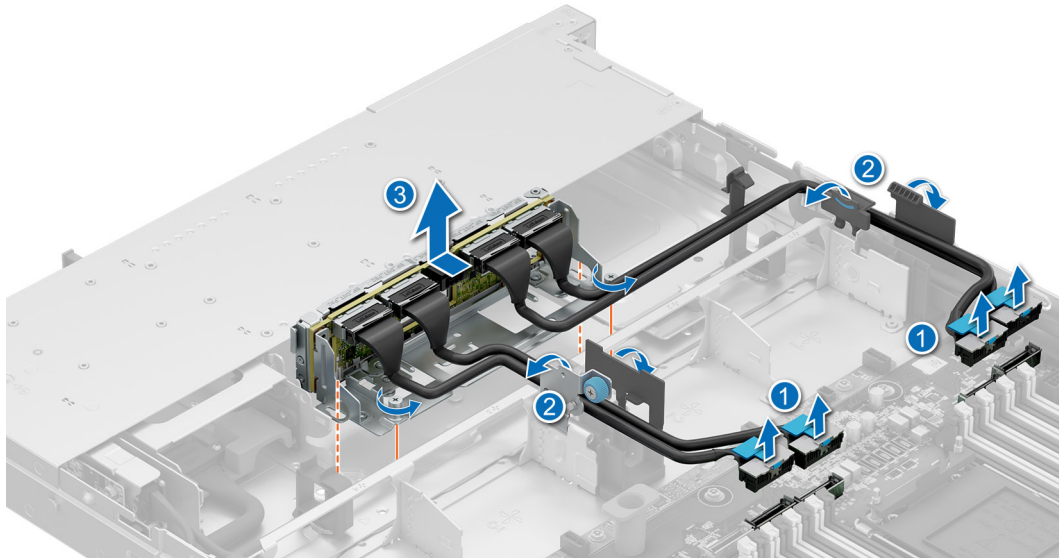
1. Follow the safety guidelines listed in the [Safety instructions.](#)
2. Follow the procedure listed in the [Before working inside your system.](#)
3. [Remove the system cover.](#)
4. [Remove the air shroud.](#)
5. [Remove the drive backplane cover.](#)
6. If installed [remove the front bezel.](#)
7. [Remove the EDSFF E3.S drives.](#)
8. Disconnect the power cable and other required cables, observe the cable routing.

**NOTE:** See [cable routing](#) section.

### Steps

1. Using a Phillips 2 screwdriver, loosen the captive screws on the EDSFF E3.S backplane module.
2. Slide the EDSFF E3.S backplane module towards the front of the server and lift it to remove from the system.

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



**Figure 69. Removing the EDSFF E3.S backplane module**

#### Next steps

1. [Replace the EDSFF E3.S backplane module.](#)

## Installing the EDSFF E3.S backplane 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 system cover](#).
4. [Remove the air shroud](#).
5. [Remove the drive backplane cover](#).
6. If installed [Remove the front bezel](#).
7. [Remove the EDSFF E3.S drives](#).
8. Disconnect the power cable and other required cables, observe the cable routing.

**NOTE:** See [cable routing](#) section.

#### Steps

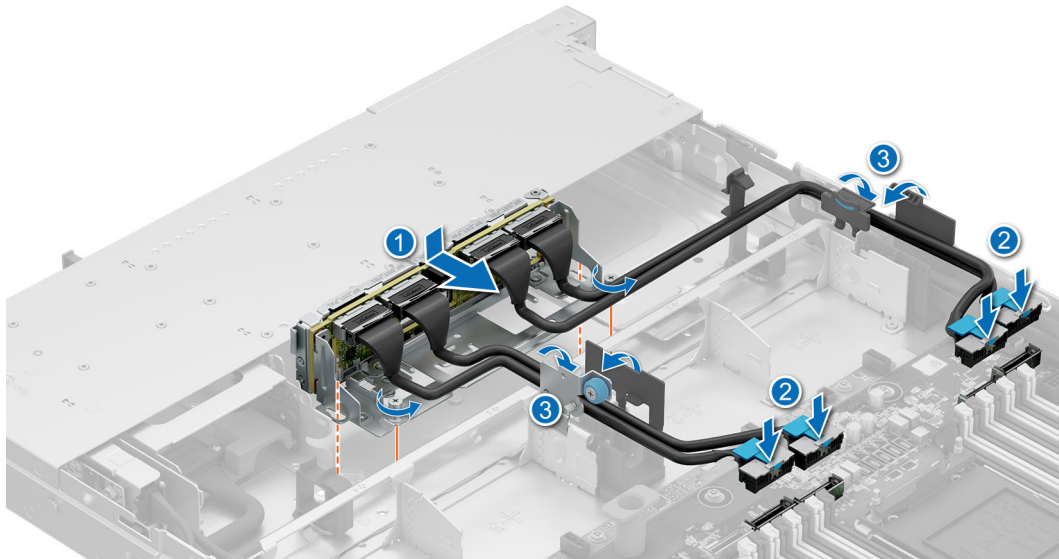
1. Align the EDSFF E3.S backplane module with the guide pin on the backplane bracket and position it from the top down, ensuring proper alignment.

**NOTE:** Locate and place the EDSFF E3.S backplane module on the unlocked position line.

2. Push the module towards the rear of the server until it is secured in place.
3. Using a Phillips 2 screwdriver, tighten the captive screws to secure the module.

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





**Figure 70. Installing the EDSFF E3.S backplane module**

### Next steps

1. Connect all the cables, and ensure that all the cables are routed through the respective cable clip.

**NOTE:** See [cable routing](#) section.

2. [install the EDSFF E3.S drives](#) .
3. If removed [Install the front bezel](#).
4. [Install the drive backplane cover](#).
5. [Install the air shroud](#).
6. [Install the system cover](#)
7. Follow the procedure listed in [After working inside your system](#).

## Side wall brackets

### Removing the side wall bracket

There are two side wall brackets on either side of the system. The procedure to remove is similar.

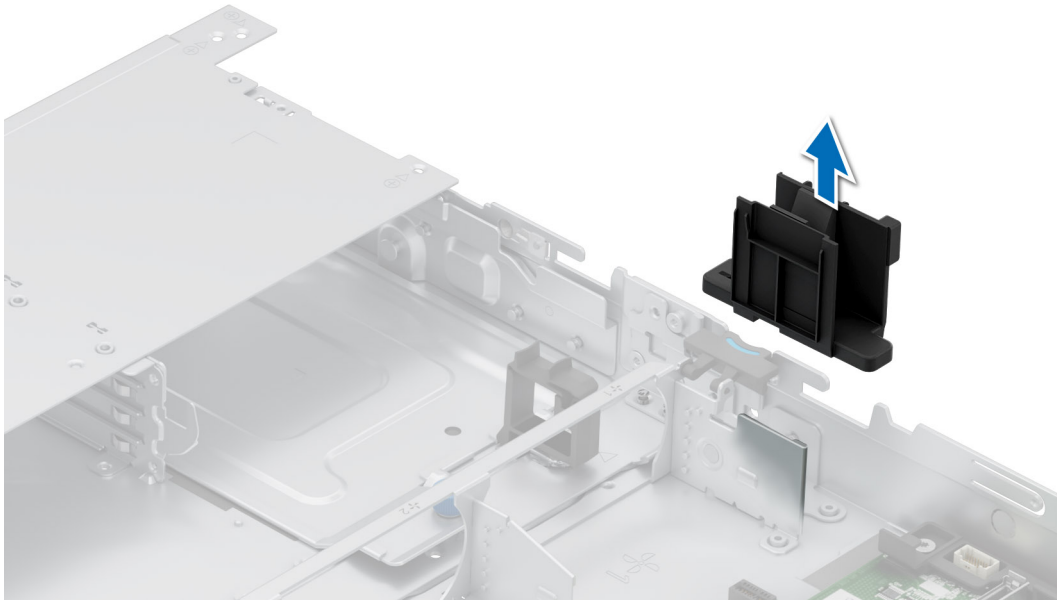
#### Prerequisites

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 system cover](#).

**NOTE:** Ensure that you note the routing of the cables as you remove them from the system board. Route the cables properly when you replace them to prevent the cables from being pinched or crimped.

#### Steps

1. Press the side tabs to release the side wall cable holder.  
**NOTE:** Move the cables out of the side wall cable holder.
2. Press the center tab to release the bracket from the chassis, and lift it away from the system.



**Figure 71. Removing the side wall bracket**

#### Next steps

1. [Replace the side wall bracket.](#)

## Installing the side wall bracket

There are two side wall brackets on either side of the system. The procedure to install is similar.

#### 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 system cover](#).

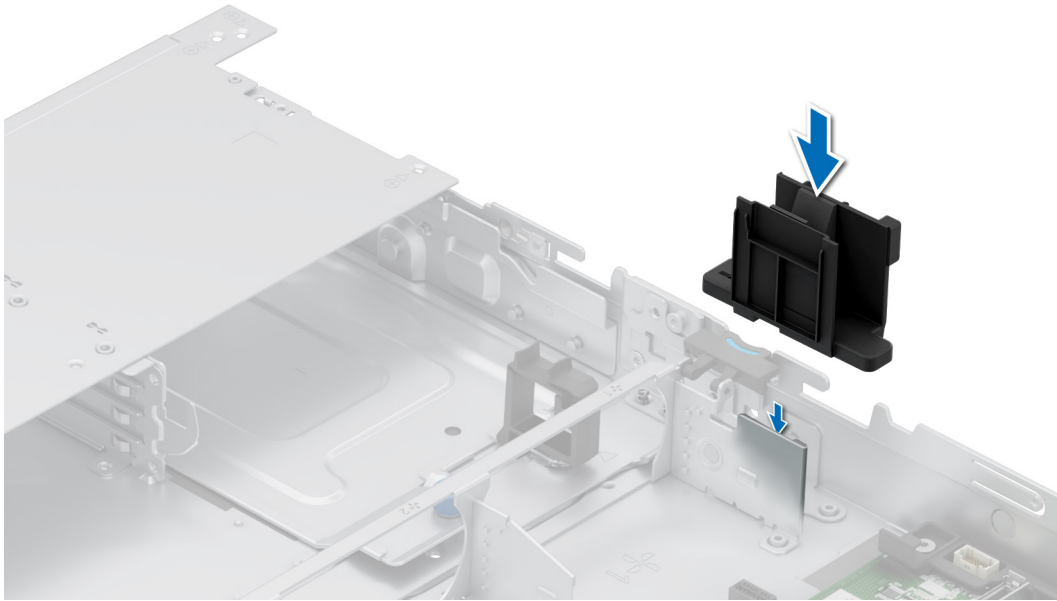
**NOTE:** Ensure that you note the routing of the cables as you remove them from the system board. Route the cables properly when you replace them to prevent the cables from being pinched or crimped.

#### Steps

1. Align the guide slots on the side wall bracket with the guides on the system and slide until the cover is seated firmly.

**NOTE:** Route the cables through the side wall cable holder.

2. Close the side wall cable holder until the holder clicks into place.



**Figure 72. Installing the side wall bracket**

#### Next steps

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

## Middle bracket

### Removing the cables from the middle bracket

#### Prerequisites

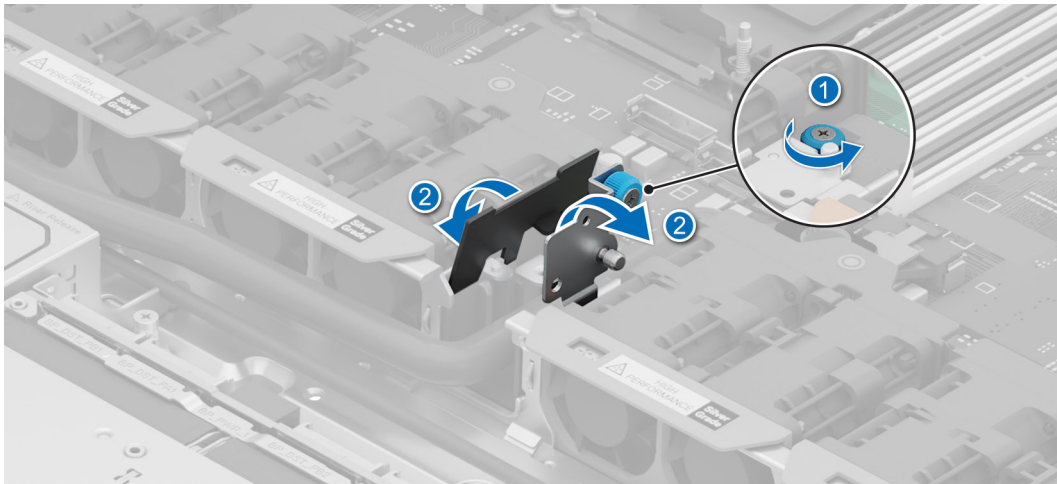
1. Follow the safety guidelines listed in the [Safety instructions.](#)
2. Follow the procedure listed in the [Before working inside your system.](#)

**NOTE:** Ensure that you note the routing of the cables as you remove them from the system board. Route the cables properly when you replace them to prevent the cables from being pinched or crimped.

#### Steps

1. Loosen the captive screw using a Phillips 2 screwdriver.
2. Open the middle metal cover and the middle cable holder.

**NOTE:** Remove the cables sequentially from top to bottom.



**Figure 73. Removing the middle bracket**

### Next steps

## Installing the cables into the middle bracket

### Prerequisites

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

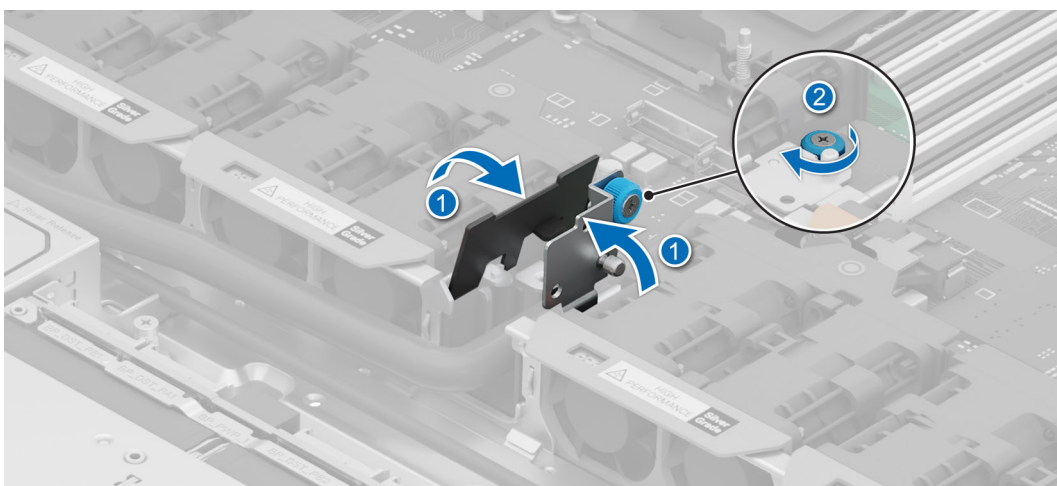
**i NOTE:** Ensure that you note the routing of the cables as you remove them from the system board. Route the cables properly when you replace them to prevent the cables from being pinched or crimped.

### Steps

1. Open the middle metal cover and the middle cable holder.

**i NOTE:** Route the cables through the middle cable holder.

2. Close the middle cable holder and the metal cover, and fasten the captive screw using a Phillips 2 screwdriver.



**Figure 74. Installing the middle bracket**

Next steps

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

Cable routing

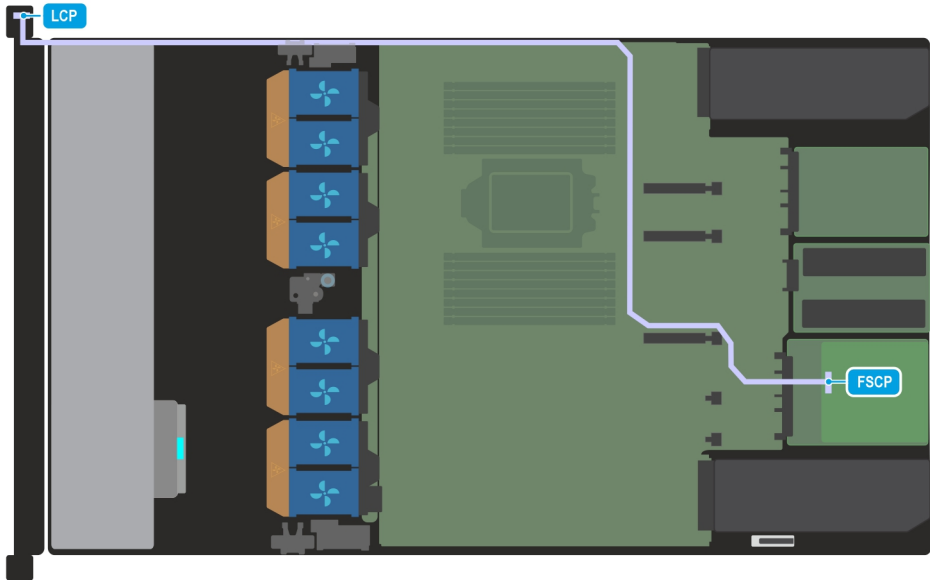
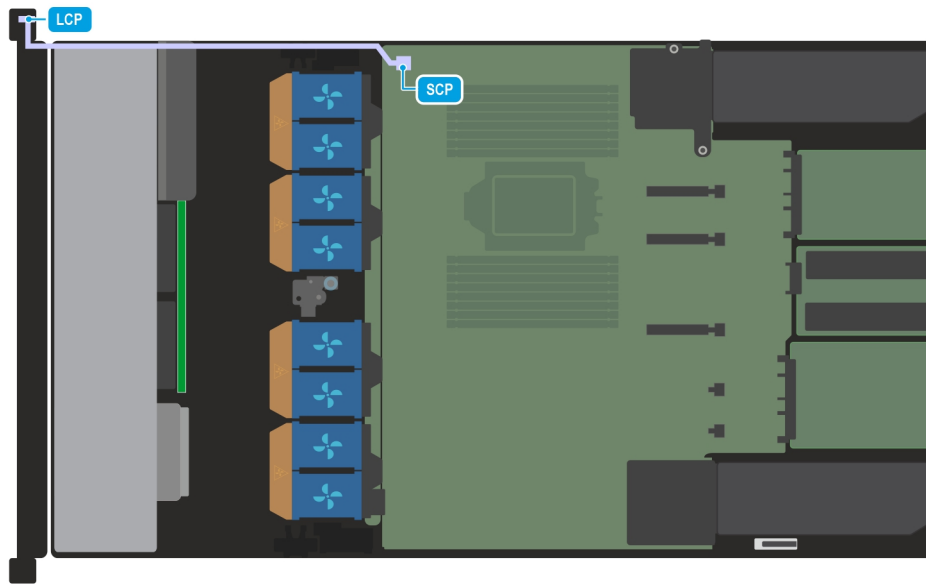


Figure 75. Attic Board to Left Control Panel (LCP) - Secondary (KVM module)

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

Table 49. Attic Board to Left Control Panel (LCP) - Secondary

| Order | From                                | To                                   |
|-------|-------------------------------------|--------------------------------------|
| 1     | Attic_fSCP (Attic signal connector) | Left Control Panel (LCP) - Secondary |

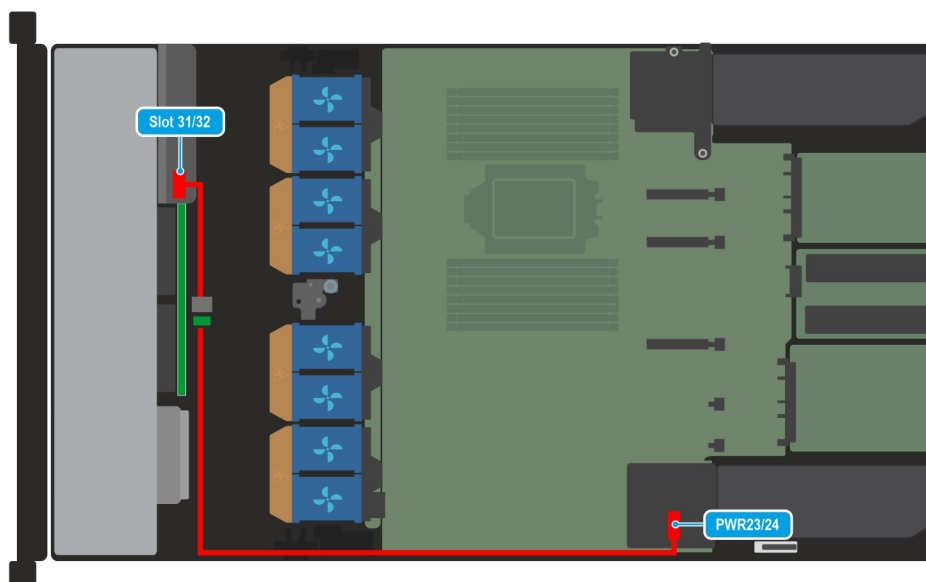


**Figure 76. Left Control Panel (LCP) - Secondary (Quick Sync module)**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**Table 50. Left Control Panel (LCP) - Secondary (Quick Sync)**

| Order | From                | To                                   |
|-------|---------------------|--------------------------------------|
| 1     | SCP (HPM connector) | Left Control Panel (LCP) - Secondary |



**Figure 77. DPU - RF1c**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

Table 51. DPU - RF1c

| Order | From                               | To                     |
|-------|------------------------------------|------------------------|
| 1     | HPM_PWR23_24 (HPM power connector) | Slot31/32 (Riser RF1c) |

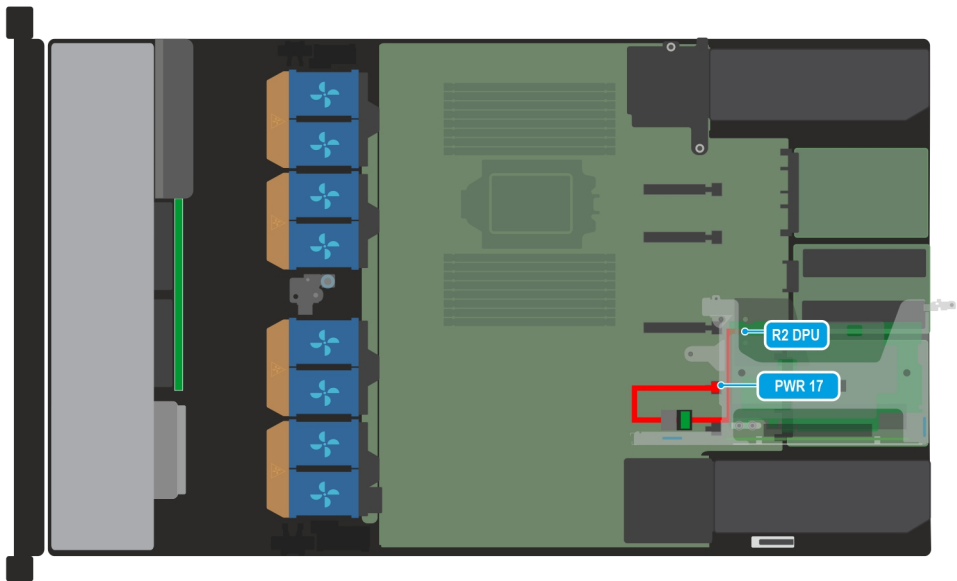


Figure 78. DPU - R2

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

Table 52. DPU - R2

| Order | From                                  | To                       |
|-------|---------------------------------------|--------------------------|
| 1     | HPM_PWR17/PWR18 (HPM power connector) | Slot2 (Riser R2q or R2t) |

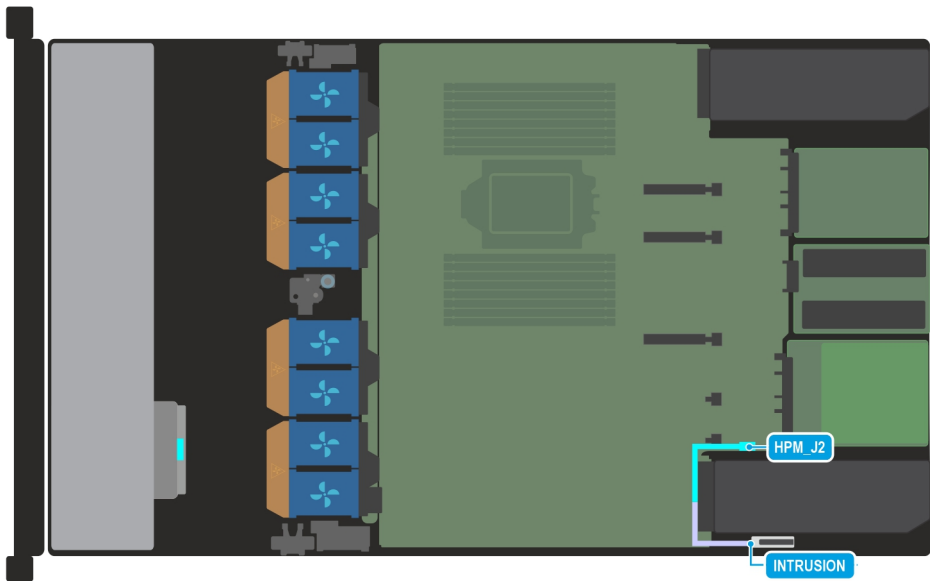
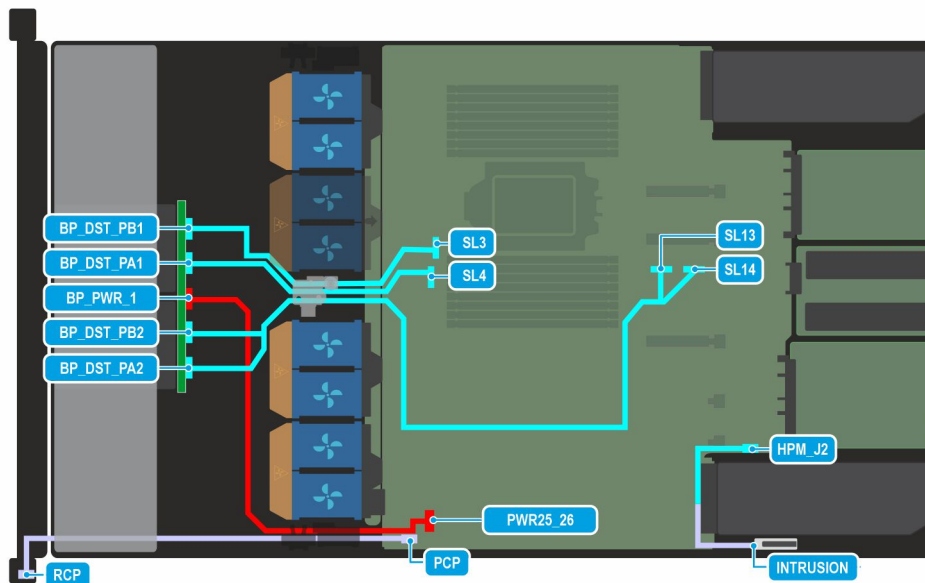


Figure 79. Intrusion Switch

**Table 53. Intrusion Switch**

| Order | From                          | To        |
|-------|-------------------------------|-----------|
| 1     | HPM_J2 (HPM signal connector) | Intrusion |



**Figure 80. C01-01-RC0 : 8 x EDSFF E3.S (G5x4 NVMe Direct Connect)**

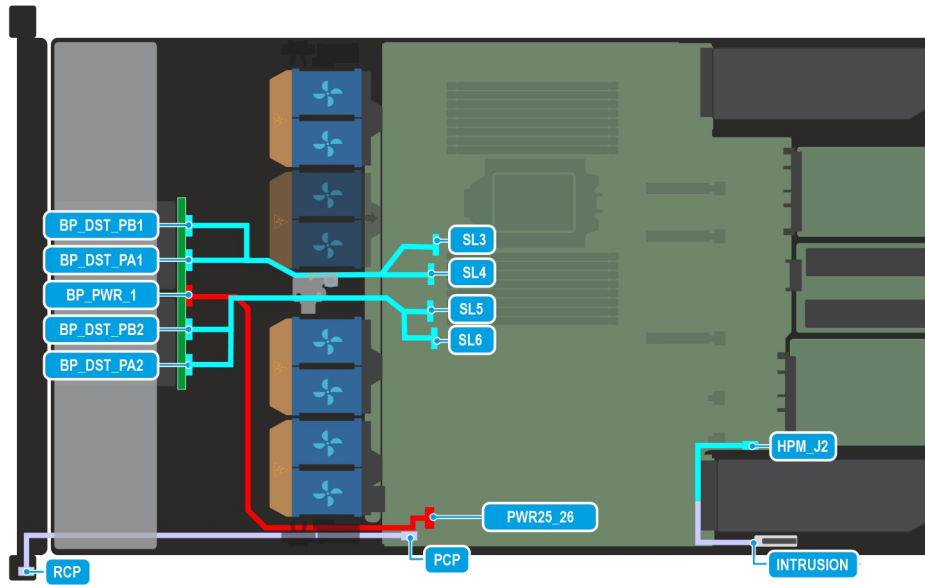
**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**NOTE:** The intrusion switch connects to the J2 connector through the additional dongle cable.

**Table 54. C01-01-RC0 : 8 x EDSFF E3.S (G5x4 NVMe Direct Connect)**

| Order | From                                                  | To                                                 |
|-------|-------------------------------------------------------|----------------------------------------------------|
| 1     | HPM_PCP (signal connector on HPM)                     | Right Control Panel - Primary (RCP)                |
| 2     | HPM_J2 (signal connector on HPM for intrusion switch) | Intrusion (Intrusion)                              |
| 3     | HPM_SL3_SL4 (signal connector on HPM)                 | BP_DST_PB1/BP_DST_PA1 (backplane signal connector) |
| 4     | HPM_SL13/SL14 (signal connector on HPM)               | BP_DST_PB2/BP_DST_PA2 (backplane signal connector) |
| 5     | PWR25/PWR26 (power connector on HPM)                  | BP_PWR_1(backplane power connector)                |





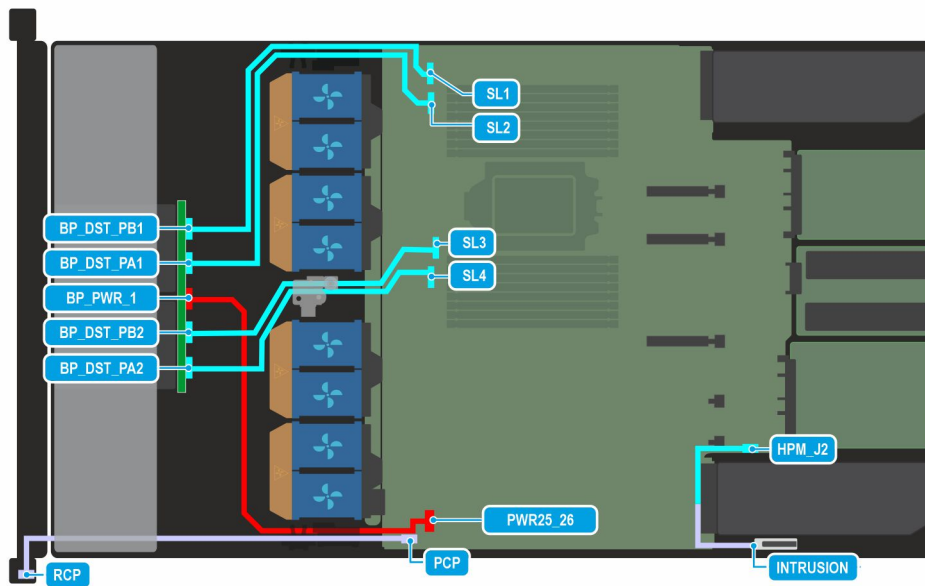
**Figure 81. C01-02 : 8 x EDSFF E3.S (G5x4 NVMe Direct Connect)**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**NOTE:** The intrusion switch connects to the J2 connector through the additional dongle cable.

**Table 55. C01-02 : 8 x EDSFF E3.S (G5x4 NVMe Direct Connect)**

| Order | From                                                  | To                                                 |
|-------|-------------------------------------------------------|----------------------------------------------------|
| 1     | HPM_PCP (signal connector on HPM)                     | Right Control Panel - Primary (RCP)                |
| 2     | HPM_J2 (signal connector on HPM for intrusion switch) | Intrusion (Intrusion)                              |
| 3     | HPM_SL3_SL4 (signal connector on HPM)                 | BP_DST_PB1/BP_DST_PA1 (backplane signal connector) |
| 4     | HPM_SL5/SL6 (signal connector on HPM)                 | BP_DST_PB2/BP_DST_PA2 (backplane signal connector) |
| 5     | PWR25/PWR26 (power connector on HPM)                  | BP_PWR_1(backplane power connector)                |



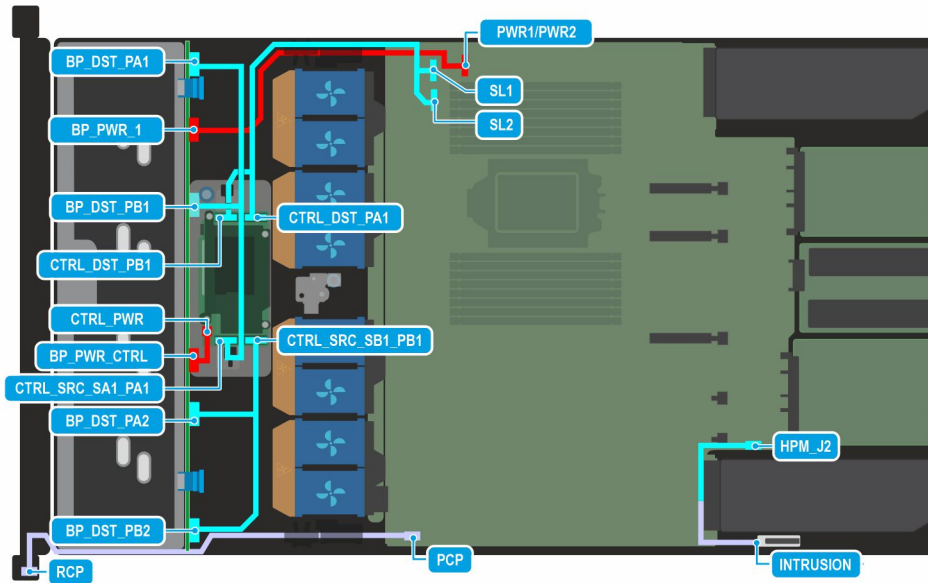
**Figure 82. C01-03-RC3: 8 x EDSFF E3.S (G5x4 NVMe Direct Connect)**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**NOTE:** The intrusion switch connects to the J2 connector through the additional dongle cable.

**Table 56. C01-03-RC3: 8 x EDSFF E3.S (G5x4 NVMe Direct Connect)**

| Order | From                                                  | To                                                 |
|-------|-------------------------------------------------------|----------------------------------------------------|
| 1     | HPM_PCP (signal connector on HPM)                     | Right Control Panel - Primary (RCP)                |
| 2     | HPM_J2 (signal connector on HPM for intrusion switch) | Intrusion (Intrusion)                              |
| 3     | HPM_SL1_SL2 (signal connector on HPM)                 | BP_DST_PB1(backplane signal connector)             |
| 4     | HPM_SL3_SL4 (signal connector on HPM)                 | BP_DST_PB2/BP_DST_PA2 (backplane signal connector) |
| 5     | PWR25/PWR26 (power connector on HPM)                  | BP_PWR_1(backplane power connector)                |



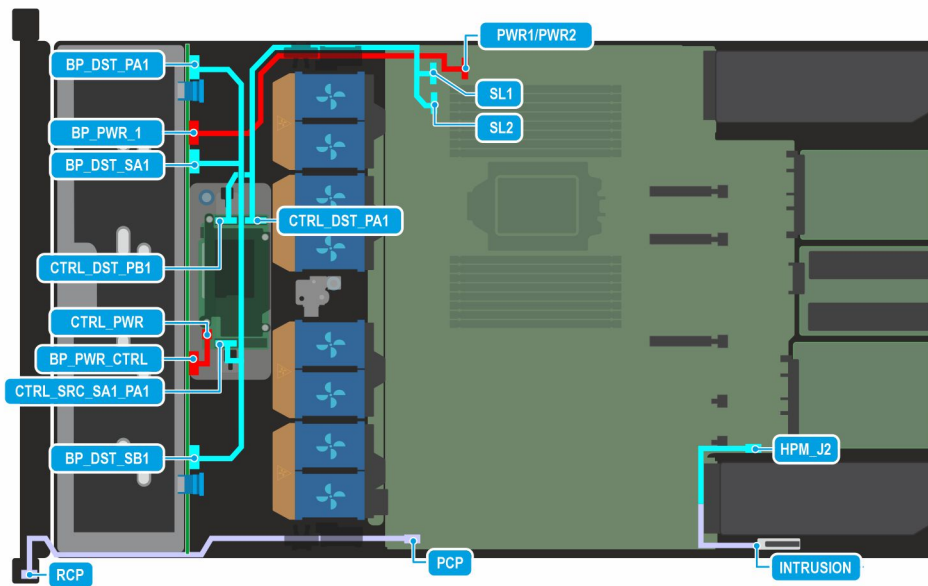
**Figure 83. C02-02: 8 x 2.5-inch NVMe (RAID)**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**NOTE:** The intrusion switch connects to the J2 connector through the additional dongle cable.

**Table 57. C02-02: 8 x 2.5-inch NVMe (RAID)**

| Order | From                                                  | To                                                 |
|-------|-------------------------------------------------------|----------------------------------------------------|
| 1     | HPM_PCP (signal connector on HPM)                     | Right Control Panel - Primary (RCP)                |
| 2     | HPM_J2 (signal connector on HPM for intrusion switch) | Intrusion (Intrusion)                              |
| 3     | HPM_SL1_SL2 (signal connector on HPM)                 | CTRL_DST_PA1/CTRL_DST_PB1 (fPERC signal connector) |
| 4     | CTRL_PWR (fPERC power connector)                      | BP_PWR_CTRL(backplane power connector)             |
| 5     | CTRL_SRC_SA1_PA1(signal connector on fPERC)           | BP_DST_PA1/BP_DST_PB1(backplane signal connector)  |
| 6     | CTRL_SRC_SB1_PB1(signal connector on fPERC)           | BP_DST_PA2/BP_DST_PB2(backplane signal connector)  |
| 7     | HPM_PWR1_2(HPM power connector)                       | BP_PWR_1(backplane power connector)                |



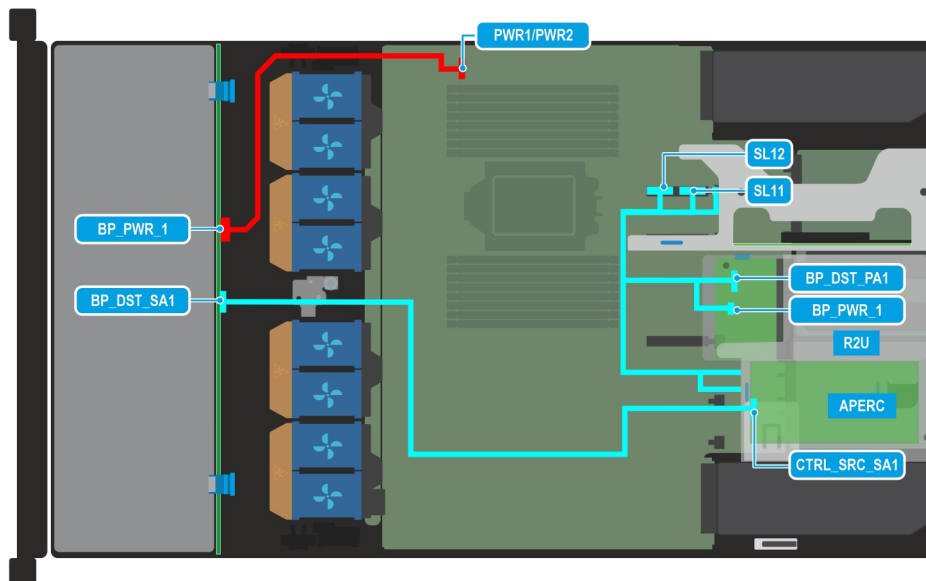
**Figure 84. C02-05-: 8 x 2.5-inch SAS/SATA (RAID)**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**NOTE:** The intrusion switch connects to the J2 connector through the additional dongle cable.

**Table 58. C02-05-: 8 x 2.5-inch SAS/SATA (RAID)**

| Order | From                                                  | To                                                 |
|-------|-------------------------------------------------------|----------------------------------------------------|
| 1     | HPM_PCP (signal connector on HPM)                     | Right Control Panel - Primary (RCP)                |
| 2     | HPM_J2 (signal connector on HPM for intrusion switch) | Intrusion (Intrusion)                              |
| 3     | HPM_SL1_SL2 (signal connector on HPM)                 | CTRL_DST_PA1/CTRL_DST_PB1 (fPERC signal connector) |
| 4     | CTRL_PWR (fPERC power connector)                      | BP_PWR_CTRL(backplane power connector)             |
| 5     | CTRL_SRC_SA1_PA1(signal connector on fPERC)           | BP_DST_SA1/BP_DST_SB1(backplane signal connector)  |
| 6     | HPM_PWR1_2(HPM power connector)                       | BP_PWR_1(backplane power connector)                |

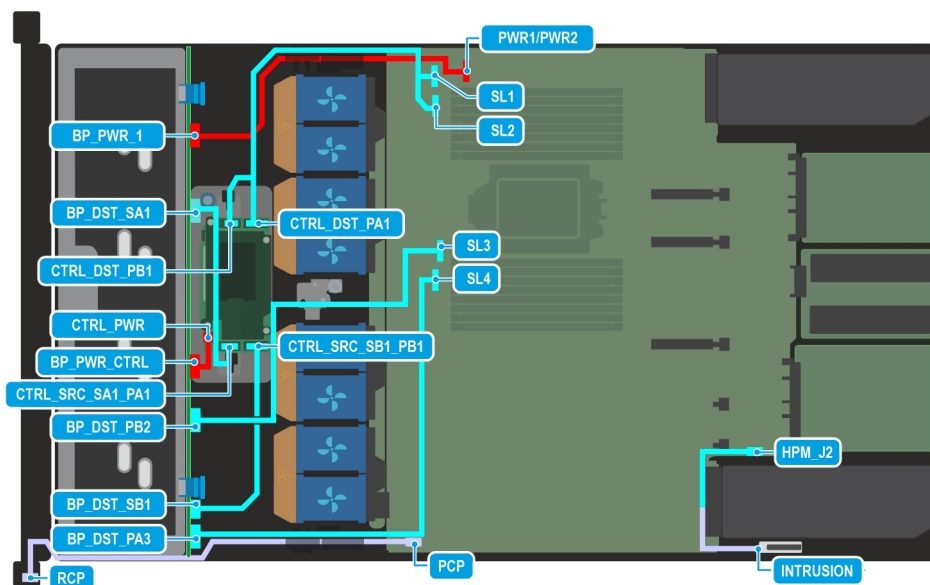


**Figure 85. C03-01-: 4 x 5.5-inch SAS/SATA + Rear 2 x E3.S EDSFF**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**Table 59. C03-01: 4 x 5.5-inch SAS/SATA + Rear 2 x E3.S EDSFF**

| Order | From                                     | To                                                                        |
|-------|------------------------------------------|---------------------------------------------------------------------------|
| 1     | HPM_PWR1_2 (power connector on HPM)      | BP_PWR_1 (backplane power connector)                                      |
| 2     | CTRL_SRC_SA1 (signal connector on APERC) | BP_DST_SA1(backplane signal connector)                                    |
| 3     | HPM_SL12_SL11 (signal connector on HPM)  | BP_DST_PA1/BP_PWR_1 (backplane signal/power connector) + R2u (rear riser) |



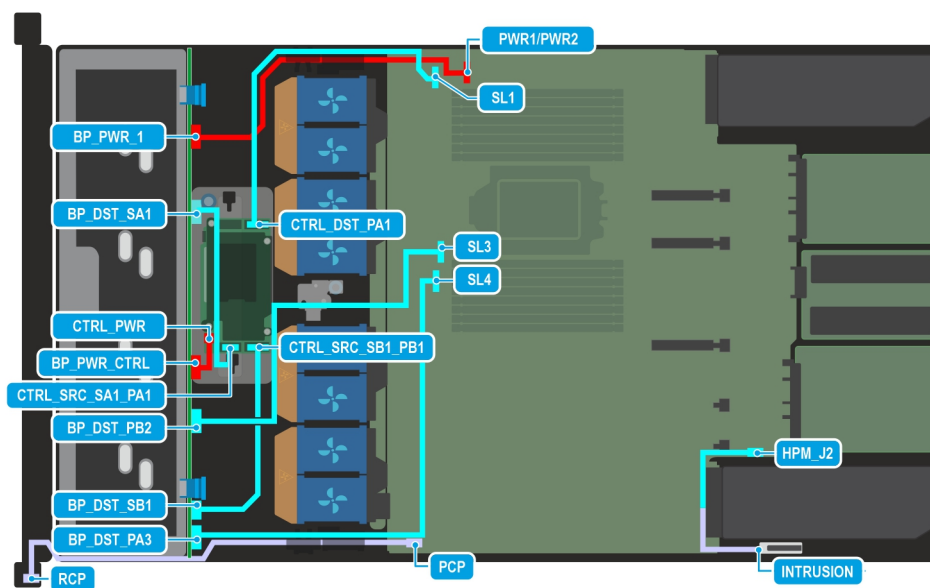
**Figure 86. C04-01-: 10x2.5-inch (SAS4/SATA with 4 Universal slots)**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**NOTE:** The intrusion switch connects to the J2 connector through the additional dongle cable.

**Table 60. C04-01--: 10x2.5-inch (SAS4/SATA with 4 Universal slots)**

| Order | From                                                  | To                                                 |
|-------|-------------------------------------------------------|----------------------------------------------------|
| 1     | HPM_PCP (signal connector on HPM)                     | Right Control Panel - Primary (RCP)                |
| 2     | HPM_J2 (signal connector on HPM for intrusion switch) | Intrusion (Intrusion)                              |
| 3     | HPM_SL1_SL2 (signal connector on HPM)                 | CTRL_DST_PA1/CTRL_DST_PB1 (fPERC signal connector) |
| 4     | CTRL_SRC_SA1_PA1(signal connector on fPERC)           | BP_DST_SA1(backplane signal connector)             |
| 5     | CTRL_PWR (fPERC power connector)                      | BP_PWR_CTRL(backplane power connector)             |
| 6     | HPM_SL3 (signal connector on HPM)                     | BP_DST_PB2 (backplane signal connector)            |
| 7     | CTRL_SRC_SB1_PB1(signal connector on fPERC)           | BP_DST_SB1(backplane signal connector)             |
| 8     | HPM_SL4 (signal connector on HPM)                     | BP_DST_PA3 (backplane signal connector)            |
| 9     | HPM_J2 (signal connector on HPM for intrusion switch) | Intrusion (Dongle)                                 |
| 10    | HPM_PWR1_2(HPM power connector)                       | BP_PWR_1(backplane power connector)                |



**Figure 87. C04-02--: 10x2.5-inch (SAS4/SATA with 4 Universal slots)**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

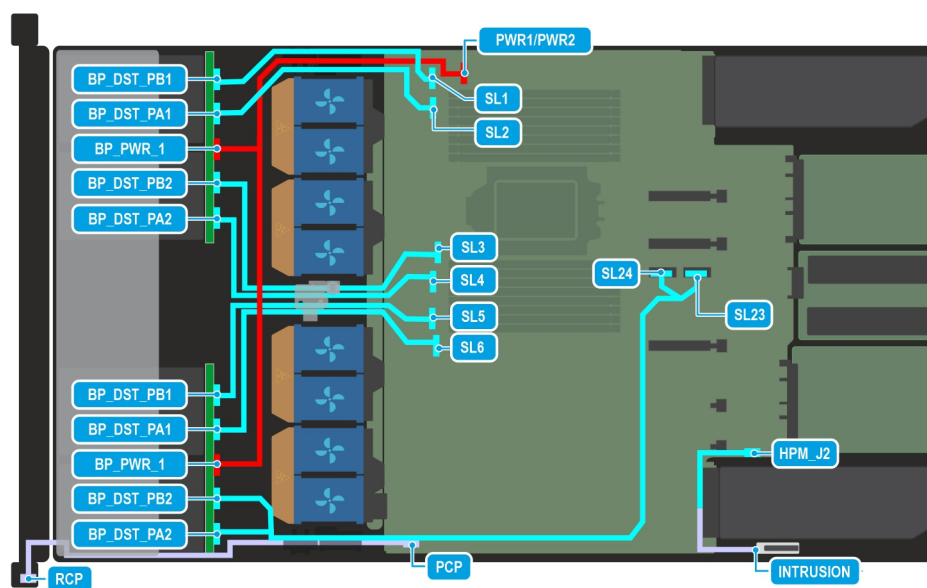
**NOTE:** The intrusion switch connects to the J2 connector through the additional dongle cable.

**Table 61. C04-02--: 10x2.5-inch (SAS4/SATA with 4 Universal slots)**

| Order | From                                                  | To                                  |
|-------|-------------------------------------------------------|-------------------------------------|
| 1     | HPM_PCP (signal connector on HPM)                     | Right Control Panel - Primary (RCP) |
| 2     | HPM_J2 (signal connector on HPM for intrusion switch) | Intrusion (Intrusion)               |

**Table 61. C04-02-: 10x2.5-inch (SAS4/SATA with 4 Universal slots) (continued)**

| Order | From                                                  | To                                      |
|-------|-------------------------------------------------------|-----------------------------------------|
| 3     | HPM_SL1 (signal connector on HPM)                     | CTRL_DST_PA1 (fPERC signal connector)   |
| 4     | CTRL_SRC_SA1_PA1(signal connector on fPERC)           | BP_DST_SA1(backplane signal connector)  |
| 5     | CTRL_PWR (fPERC power connector)                      | BP_PWR_CTRL(backplane power connector)  |
| 6     | HPM_SL3 (signal connector on HPM)                     | BP_DST_PB2 (backplane signal connector) |
| 7     | CTRL_SRC_SB1_PB1(signal connector on fPERC)           | BP_DST_SB1(backplane signal connector)  |
| 8     | HPM_SL4 (signal connector on HPM)                     | BP_DST_PA3 (backplane signal connector) |
| 9     | HPM_J2 (signal connector on HPM for intrusion switch) | Intrusion (Dongle)                      |
| 10    | HPM_PWR1_2(HPM power connector)                       | BP_PWR_1(backplane power connector)     |



**Figure 88. C05-01-: 16 x E3.S EDSFF NVMe**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

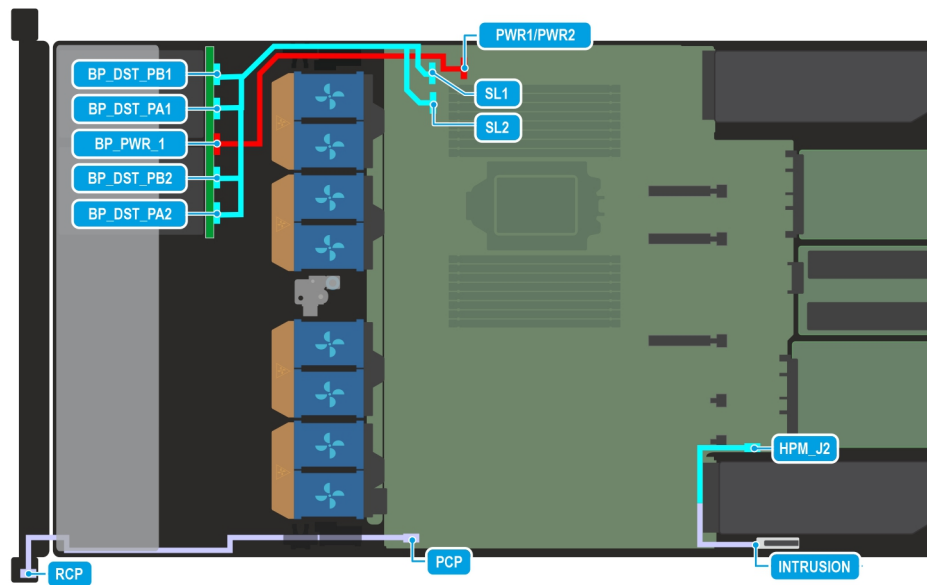
**NOTE:** The intrusion switch connects to the J2 connector through the additional dongle cable.

**Table 62. C05-01-: 16 x E3.S EDSFF NVMe**

| Order | From                                                  | To                                                 |
|-------|-------------------------------------------------------|----------------------------------------------------|
| 1     | HPM_PCP (signal connector on HPM)                     | Right Control Panel - Primary (RCP)                |
| 2     | HPM_J2 (signal connector on HPM for intrusion switch) | Intrusion (Intrusion)                              |
| 3     | HPM_SL1/SL2 (signal connector on HPM)                 | BP_DST_PB1/BP_DST_PA1 (backplane signal connector) |
| 4     | HPM_SL3/SL4 (signal connector on HPM)                 | BP_DST_PB2/BP_DST_PA2 (backplane signal connector) |
| 5     | HPM_SL5/SL6 (signal connector on HPM)                 | BP_DST_PB1/BP_DST_PA1 (backplane signal connector) |

**Table 62. C05-01-: 16 x E3.S EDSFF NVMe (continued)**

| Order | From                                    | To                                                 |
|-------|-----------------------------------------|----------------------------------------------------|
| 6     | HPM_SL23/SL24 (signal connector on HPM) | BP_DST_PB2/BP_DST_PA2 (backplane signal connector) |
| 7     | HPM_PWR1_2(HPM power connector)         | BP_PWR_1(backplane power connector)                |



**Figure 89. C06-01-: 8 x E3.S EDSFF NVMe - Hot Aisle**

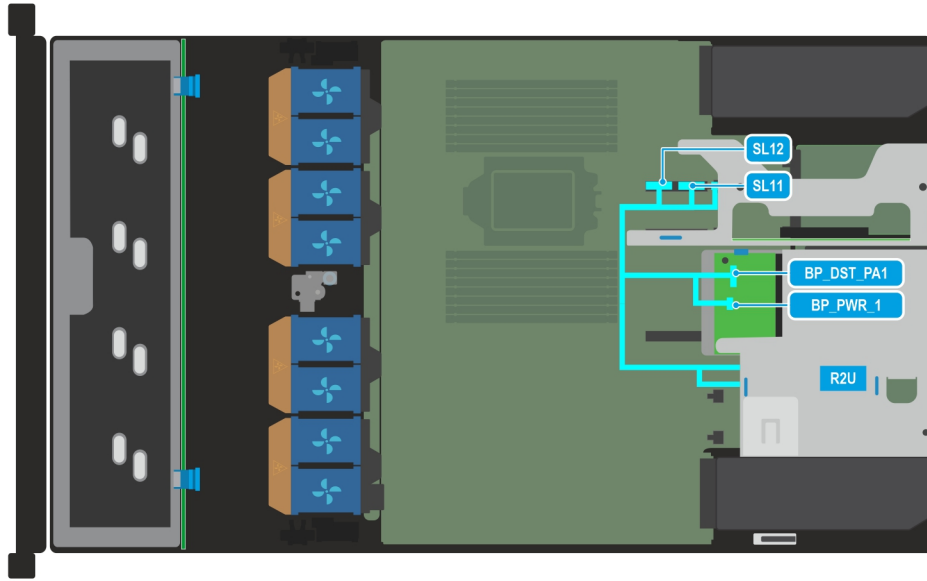
**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**NOTE:** The intrusion switch connects to the J2 connector through the additional dongle cable.

**Table 63. C06-01-: 8 x E3.S EDSFF NVMe - Hot Aisle**

| Order | From                                                  | To                                                                       |
|-------|-------------------------------------------------------|--------------------------------------------------------------------------|
| 1     | HPM_PCP (signal connector on HPM)                     | Right Control Panel - Primary (RCP)                                      |
| 2     | HPM_J2 (signal connector on HPM for intrusion switch) | Intrusion (Intrusion)                                                    |
| 3     | HPM_SL1/SL2 (signal connector on HPM)                 | BP_DST_PB1/BP_DST_PA1/BP_DST_PB2/BP_DST_PA2 (backplane signal connector) |
| 4     | HPM_PWR1_2(HPM power connector)                       | BP_PWR_1(backplane power connector)                                      |



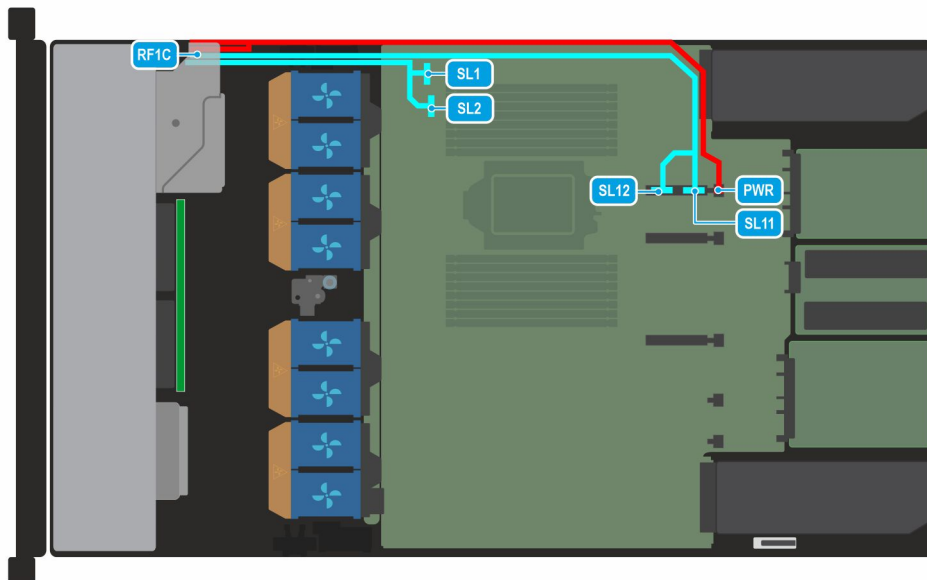


**Figure 90. RC1**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**Table 64. RC1**

| Order | From                                 | To                                                                           |
|-------|--------------------------------------|------------------------------------------------------------------------------|
| 1     | HPM_SL12/SL11 (HPM signal connector) | BP_DST_PA1/BP_PWR_1/R2u (backplane signal and power connector on rear riser) |



**Figure 91. RC2**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

Table 65. RC2

| Order | From                                 | To                 |
|-------|--------------------------------------|--------------------|
| 1     | HPM_SL12/SL11 (HPM signal connector) | Rf1a (front riser) |
| 2     | HPM_SL12/SL11 (HPM signal connector) | Rf1c (front riser) |

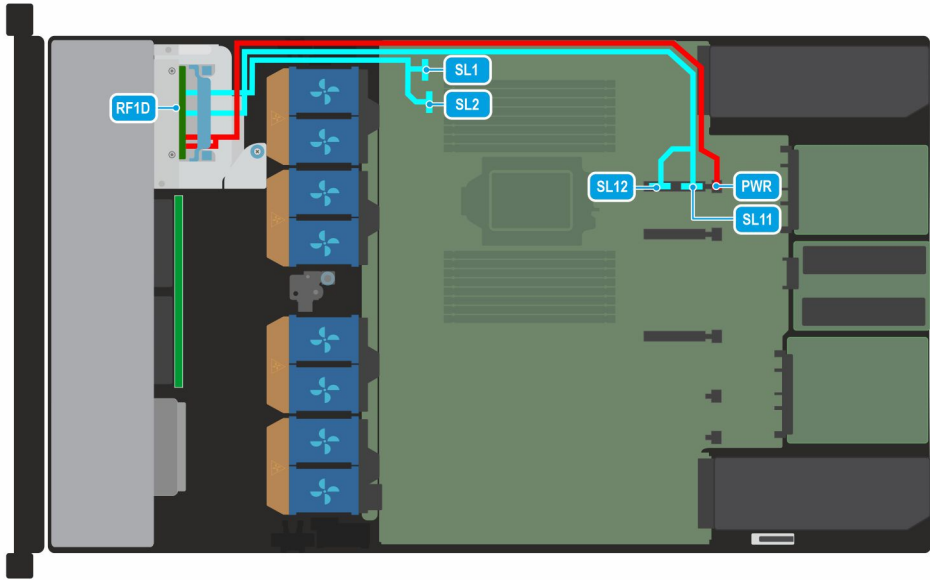
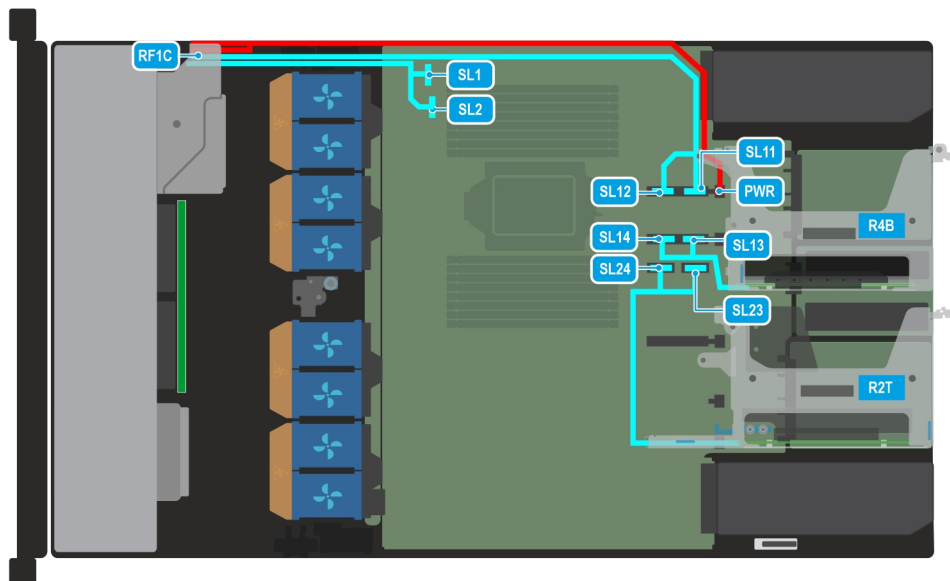


Figure 92. RC 3

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

Table 66. RC3

| Order | From                                 | To                                         |
|-------|--------------------------------------|--------------------------------------------|
| 1     | HPM_SL1/SL2 (HPM signal connector)   | OCP Slot 31( Riser RF1b)                   |
| 2     | HPM_SL11/SL12 (HPM signal connector) | OCP Slot 32/OCP PWR Sot 31/OCP PWR Slot 32 |

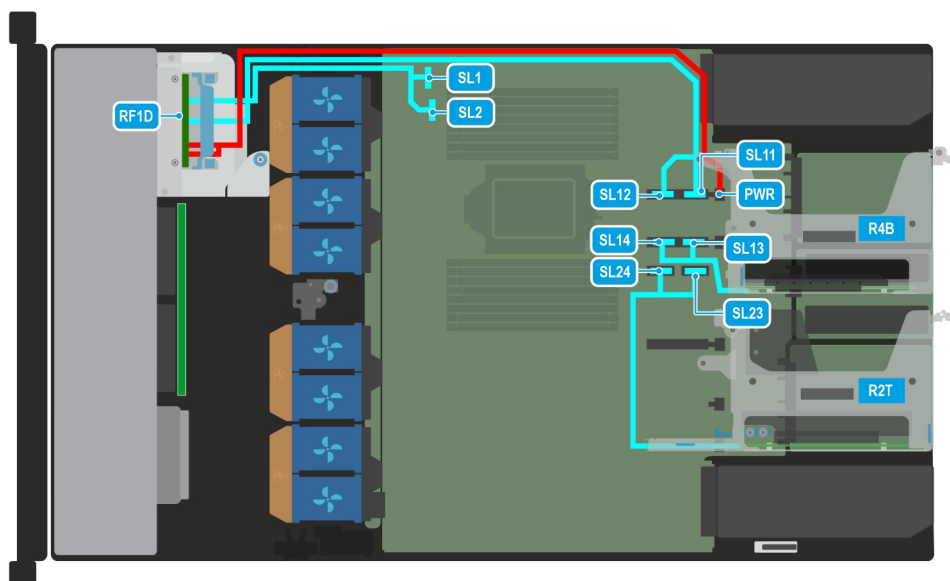


**Figure 93. RC 4**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**Table 67. RC4**

| Order | From                                 | To                   |
|-------|--------------------------------------|----------------------|
| 1     | HPM_SL1/SL2 (HPM signal connector)   | RF1a ( front riser ) |
| 2     | HPM_SL11/SL12 (HPM signal connector) | RF1c ( front riser ) |
| 3     | HPM_SL13/SL14 (HPM signal connector) | R4b (rear riser )    |
| 4     | HPM_SL23/SL24 (HPM signal connector) | R2t (rear riser )    |



**Figure 94. RC 5**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

Table 68. RC5

| Order | From                                 | To                |
|-------|--------------------------------------|-------------------|
| 1     | HPM_SL13/SL14 (HPM signal connector) | R4b (rear riser ) |
| 2     | HPM_SL11/SL12 (HPM signal connector) | R2q (rear riser ) |

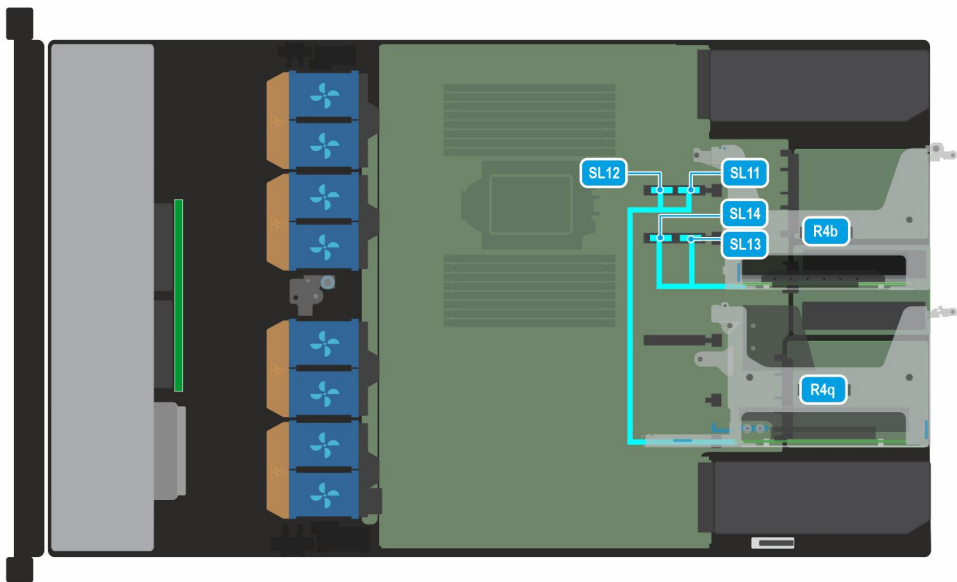
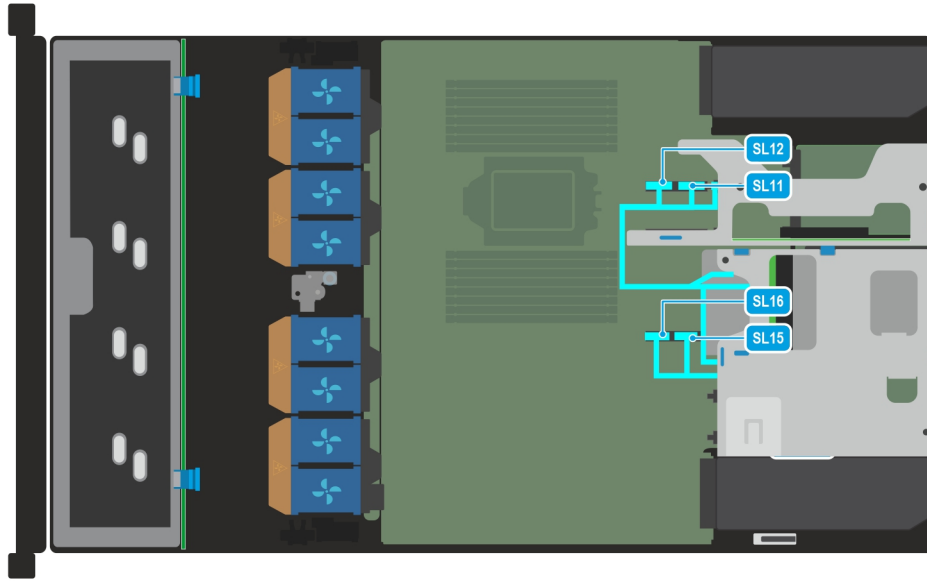


Figure 95. RC6

Table 69. RC6

| Order | From                                 | To          |
|-------|--------------------------------------|-------------|
| 1     | HPM_SL13/SL14 (HPM signal connector) | Riser (R4b) |
| 2     | HPM_SL11/SL12 (HPM signal connector) | Riser (R2q) |

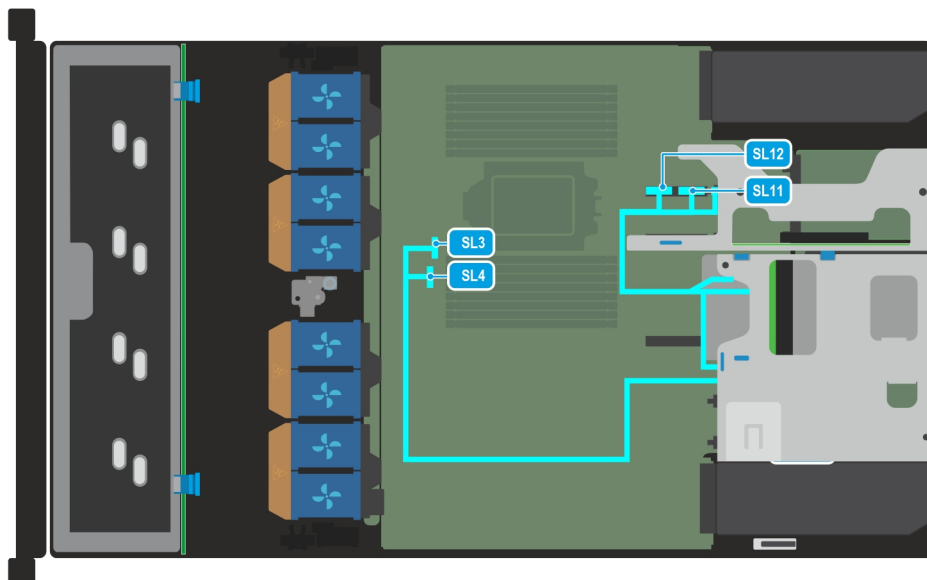


**Figure 96. RC 7**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

**Table 70. RC7**

| Order | From                                 | To                      |
|-------|--------------------------------------|-------------------------|
| 1     | HPM_SL11/SL12 (HPM signal connector) | Riser (R2k-OCP/R2k-PWR) |
| 2     | HPM_SL15/SL16 (HPM signal connector) | Riser (R2k)             |



**Figure 97. RC 8**

**NOTE:** Follow the sequential order as shown in the table to remove the cables, to install the cables follow the reverse sequential order.

Table 71. RC8

| Order | From                                 | To              |
|-------|--------------------------------------|-----------------|
| 1     | HPM_SL11/SL12 (HPM signal connector) | Riser (R2v-OCP) |
| 2     | HPM_SL3/SL4 (HPM signal connector)   | Riser (R2v)     |

# System memory

## System memory guidelines

The PowerEdge R470 system supports DDR5 registered DIMMs (RDIMMs). System memory holds the instructions that are started by the processor.

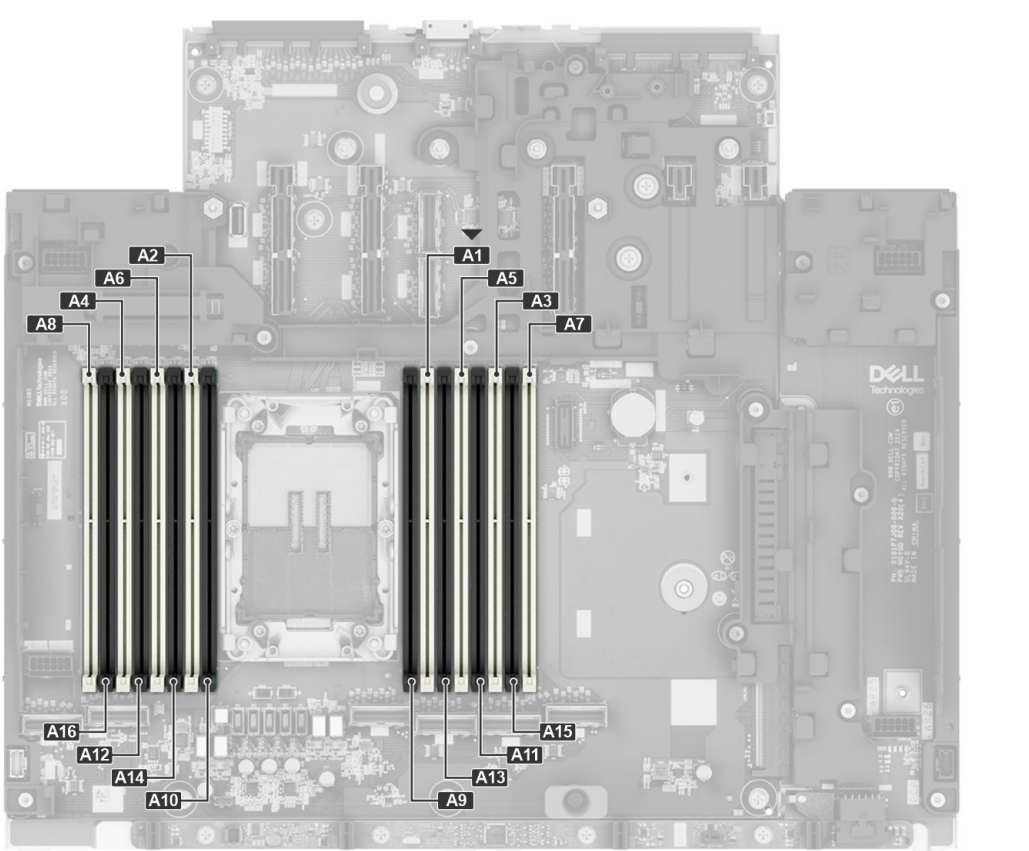


Figure 98. Memory channels

Memory channels are organized as follows:

Table 72. Memory channels

| Processor   | Channel A       | Channel B        | Channel C        | Channel D        | Channel E        | Channel F        | Channel G        | Channel H        |
|-------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Processor 1 | Slots A1 and A9 | Slots A5 and A13 | Slots A3 and A11 | Slots A7 and A15 | Slots A2 and A10 | Slots A6 and A14 | Slots A4 and A12 | Slots A8 and A16 |

**Table 73. Supported memory matrix**

| DIMM type | Rank | Capacity | DIMM rated voltage and speed | Operating Speed                 |                          |                                 |                          |
|-----------|------|----------|------------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|           |      |          |                              | Intel® Xeon 6 E- core processor |                          | Intel® Xeon 6 P- core processor |                          |
|           |      |          |                              | 1 DIMM per channel (DPC)        | 2 DIMM per channel (DPC) | 1 DIMM per channel (DPC)        | 2 DIMM per channel (DPC) |
| RDIMM     | 1R   | 16 GB    | DDR5 (1.1 V), 6400 MT/s      | N/A                             | N/A                      | Up to 6400 MT/s                 | N/A                      |
|           | 2 R  | 32 GB    | DDR5 (1.1 V), 6400 MT/s      | Up to 6400 MT/s                 | N/A                      | Up to 6400 MT/s                 | Up to 5200 MT/s          |
|           |      | 64 GB    | DDR5 (1.1 V), 6400 MT/s      | Up to 6400 MT/s                 | Up to 5200 MT/s          | Up to 6400 MT/s                 | Up to 5200 MT/s          |
|           |      | 96 GB    | DDR5 (1.1 V), 6400 MT/s      | N/A                             | N/A                      | Up to 6400 MT/s                 | Up to 5200 MT/s          |
|           |      | 128 GB   | DDR5 (1.1 V), 6400 MT/s      | N/A                             | N/A                      | Up to 6400 MT/s                 | Up to 5200 MT/s          |
|           | 8 R  | 256 GB*  | DDR5 (1.1 V), 6400 MT/s      | N/A                             | N/A                      | N/A                             | Up to 5200 MT/s          |

**NOTE:** The processor may reduce the performance of the rated DIMM speed.

**NOTE:** Maximum DIMM transfer speed support dependent on CPU SKU and DIMM population.

**NOTE:** On Intel® Xeon 6 E- core processor the following are supported:.

- 1, 8 or 16 DIMMs
- 32 GB DIMMs are supported only in 1 DPC configuration or 1 DIMM per CPU configuration
- 64 GB DIMMs are supported in 1 DPC or 2 DPC
- Maximum of 16 DIMMs are supported only with 64 GB memory module

**NOTE:** On Intel® Xeon 6 P- core processor the following are supported:.

- 1, 4, 8, 12 or 16 DIMMs
- 256 GB DIMMs are not supported in 8 DIMM configuration
- 16 GB and 32 GB DIMMs are supported in 1 DIMM per CPU configuration
- 32 GB and 64 GB DIMMs are supported in 4 DIMMs per CPU configuration
- Only 32 GB memory is supported in 12 DIMMs per CPU configuration
- 16 GB memory is not supported in 16 DIMMs per CPU configuration
- Memory mirroring and Fault Resilient Mode(FRM) is supported in 8 or 16 DIMMs per CPU configuration

**NOTE:** One DIMM per CPU configuration has limited features.

**NOTE:** \*Feature not available at product launch in June, 2025. Please refer to the product configurator page on Dell.com to confirm feature availability.

# 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 configuration fails 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 6400 MT/s or lower, speed depending on the following factors:

- System profile selected (for example, Performance, Performance Per Watt Optimized (OS), or Custom [can be run at high speed or lower])
- Maximum supported DIMM speed of the processors
- Only DDR5- 6400 MT/s RDIMMs supported

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

The following are the recommended guidelines for installing memory modules:

- All DIMMs must be DDR5.
- DIMM mixing configurations is not supported. All DIMM slots must be populated with the exact same DIMMs.
- Populate memory module sockets only if a processor is installed.
- For single-processor systems, sockets A1 to A16 are available.

In **Optimizer Mode**, the DRAM controllers operate independently in the 64-bit mode and provide optimized memory performance.

Table 74. Memory population rules

| Processor        | Memory population                                                                                     | Memory population information        |
|------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------|
| Single processor | A{1}, A{2}, A{3}, A{4}, A{5}, A{6}, A{7}, A{8}, A{9}, A{10}, A{11}, A{12}, A{13}, A{14}, A{15}, A{16} | 1, 4, 8, 12 or 16 DIMMs are allowed. |

- Populate all the sockets with white release tabs first, followed by the sockets with black release tabs.
- Unbalanced or odd memory configurations result in a performance loss, and the system may not identify the memory modules being installed. Always populate memory channels identically with equal DIMMs for the best performance.
- Supported RDIMM configurations are 1, 4, 8, 12 or 16 DIMMs per processor.

## Removing 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 system cover](#).
4. [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:** For proper system cooling, memory module blanks must be installed in any memory socket that is not populated. Remove the memory module blanks only if you intend to install the memory module in these sockets. DIMM blanks are only required when the CPU TDP is greater than 250 W. CPU with TDP less that 250 W do not require DIMM blanks.

### Steps

1. Locate the appropriate memory module socket.
2. 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.

3. Lift the memory module away from the system.



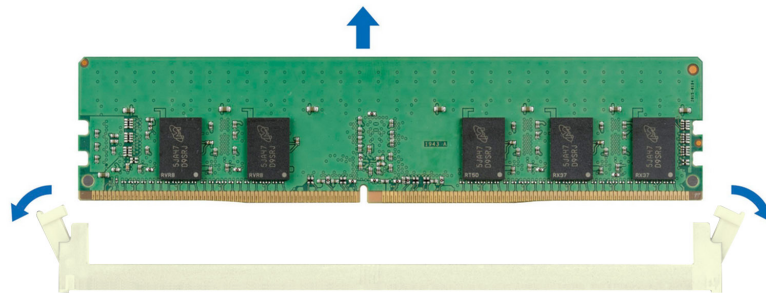


Figure 99. Removing a memory module

### Next steps

Replace the memory module.

## 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 system cover](#).
4. [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.

**NOTE:** Ensure that the socket ejector latches are fully open before installing the memory module.

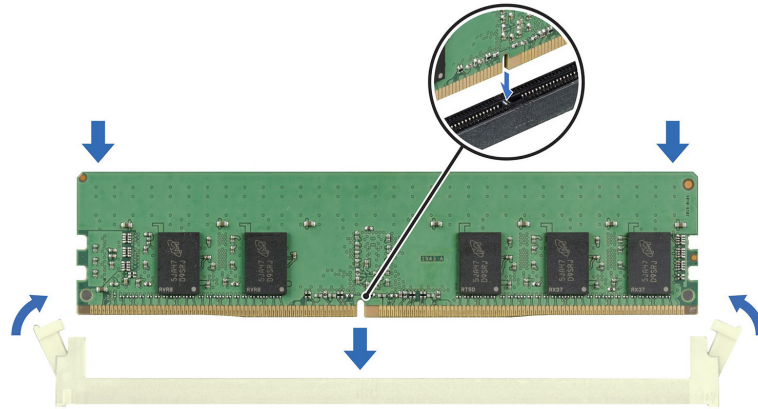
2. Align the edge connector of the memory module with the alignment key of the memory module socket, and insert the memory module in the socket.

**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 memory module socket levers align with the levers on the other sockets that have memory modules that are installed.



**Figure 100. Installing a memory module**

### Next steps

1. Follow the procedure listed in [After working inside your system](#).
2. To verify that the memory module has been installed properly, press **F2** during reboot and click **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.
3. If the **System Memory Size** is incorrect, one or more of the memory modules may not be installed properly. Shut down the system and ensure that the memory modules are firmly seated in the correct sockets.
4. Run the system memory test in system diagnostics.

## Processor and heat sink

This is a service technician replaceable part only.

## Removing the 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](#).

**NOTE:** The heat sink and processor are hot to touch for some time after the system has been powered off. Allow the heat sink and processor to cool down before handling them.

3. [Remove the system cover](#).
4. [Remove the air shroud](#).
5. The system supports different types of heatsinks and the procedure to remove them are similar.

**NOTE:** The heat sink and processor are hot to touch for some time after the system has been powered off. Allow the heat sink and processor to cool down before handling them.

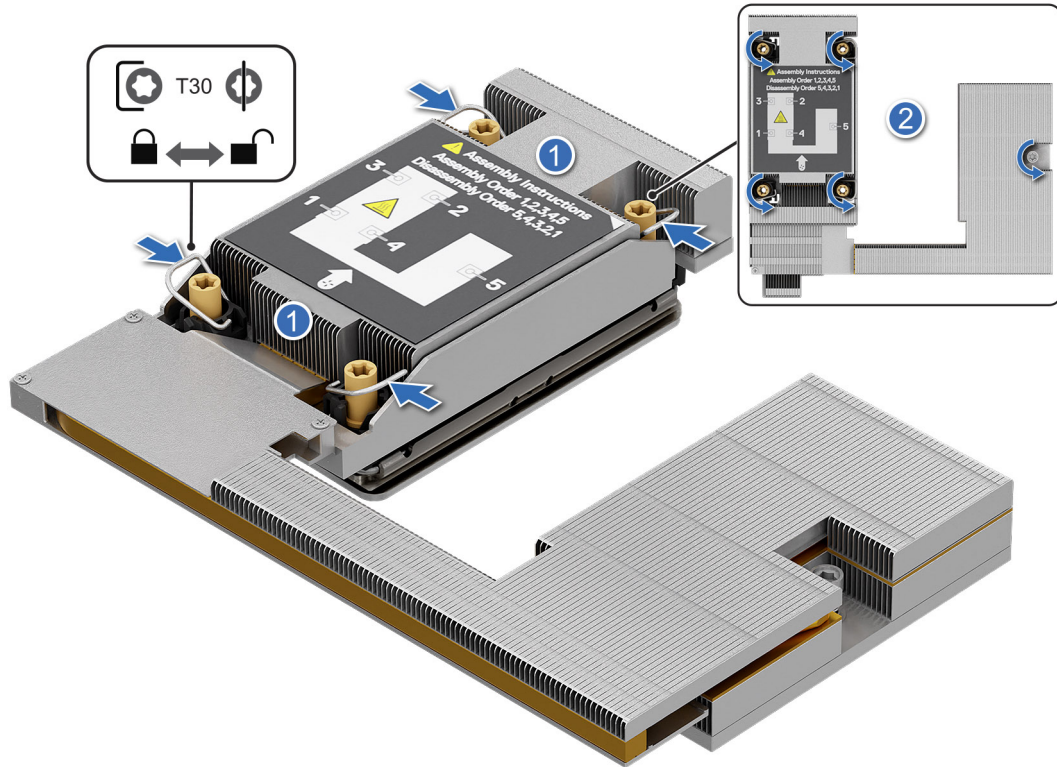
### Steps

1. Ensure all four anti-tilt wires are in the locked position (outward position), and then using a Torx T30 screwdriver, loosen the captive nuts on the processor heat sink module (PHM) in the order that is mentioned below:
  - a. Loosen the first nut three turns.

- b. Loosen the nut diagonally opposite to the nut you loosened first.
- c. Repeat the procedure for the remaining two nuts.
- d. Return to the first nut and loosen it completely.
- e. For the remote heatsink we need to loosen the fifth nut before lifting the module from the system.

**NOTE:** Ensure that the anti-tilt wires on the PHM are in locked position when loosening the captive nuts.

2. Set all the anti-tilt wires to unlocked position (inward position).



**Figure 101. Removing the processor heat sink module**

3. Lift the PHM from the system and set the PHM aside with the processor side facing up.

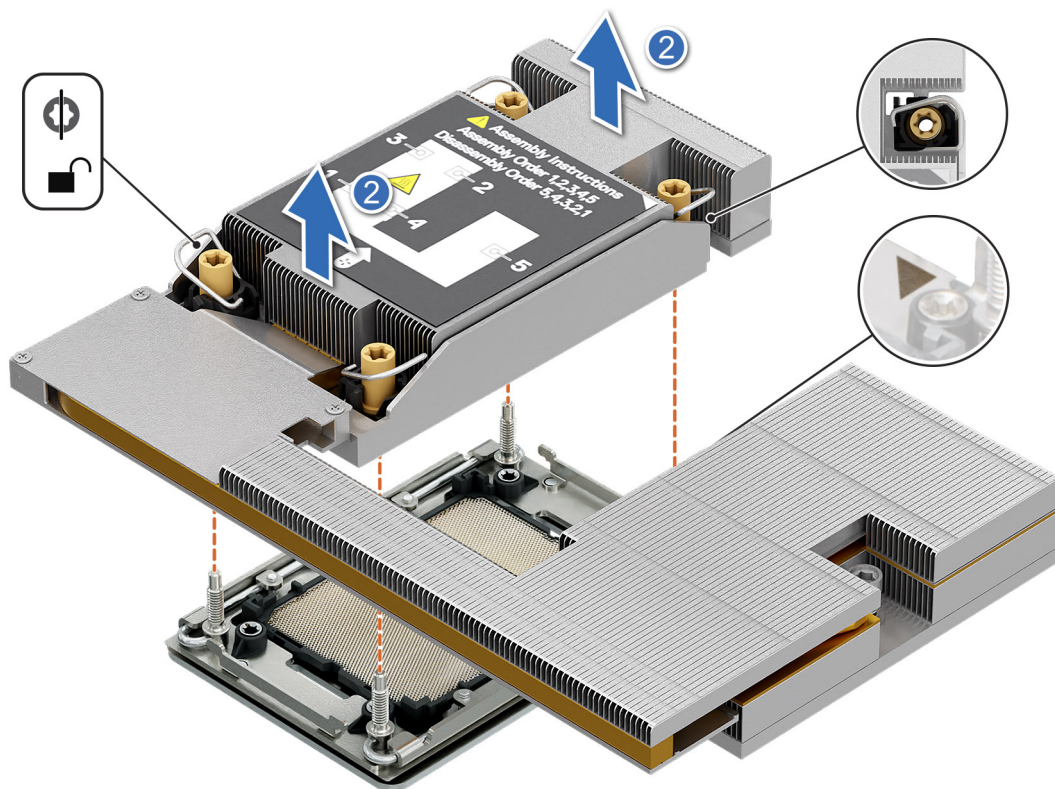


Figure 102. Removing a heat sink

### Next steps

If you are removing a faulty heat sink, [replace the heat sink](#), if not, [remove the processor](#).

## Removing the processor

### Prerequisites

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

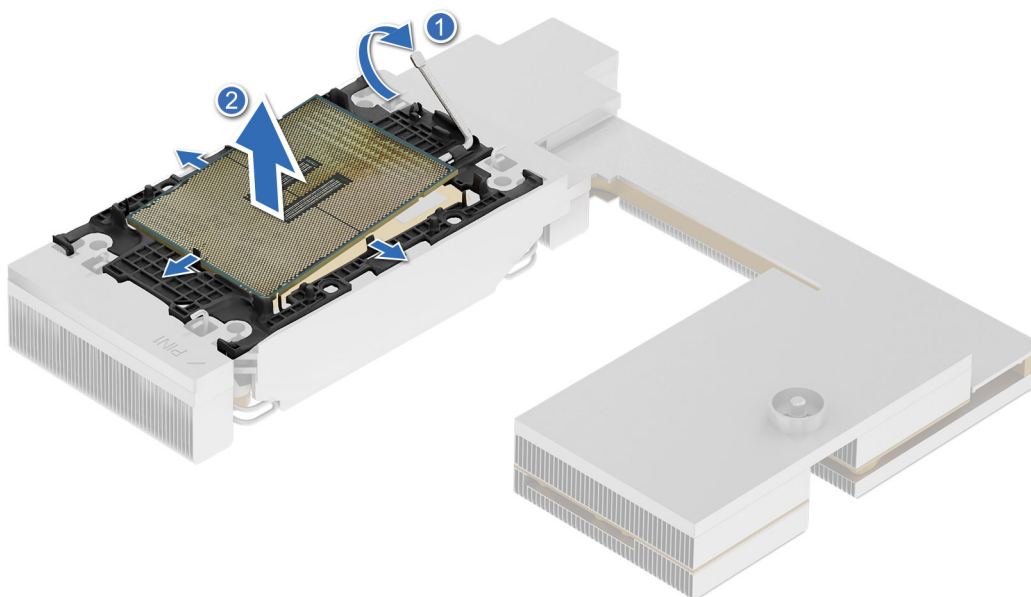
1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in the [Before working inside your system](#).
3. [Remove the processor heat sink module](#).

**CAUTION:** You may find the CMOS battery loss or CMOS checksum error that is displayed during the first instance of powering on the system after the processor or system board replacement which is expected. To fix this, go to setup option to configure the system settings.

### Steps

1. Place the heat sink with the processor side facing up.
2. Using your thumb, lift the thermal interface material (TIM) break lever to release the processor from the TIM and retaining clip.
3. Holding the processor by the edge, lift the processor away from the retaining clip.

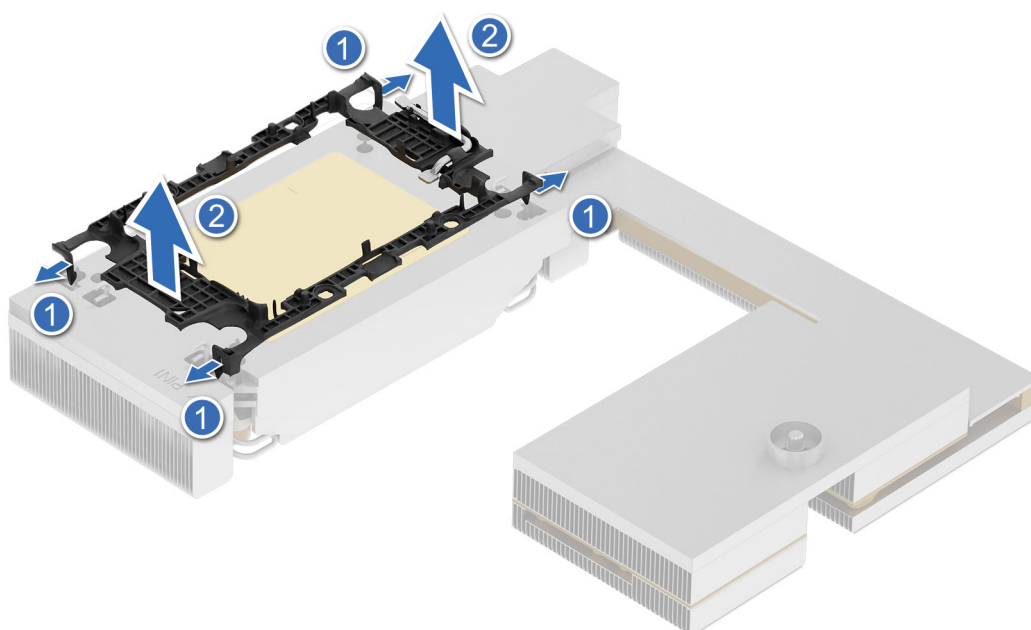
**NOTE:** Ensure to hold the retaining clip to the heat sink as you lift the TIM break lever.



**Figure 103. Removing the processor**

**NOTE:** Ensure to return the TIM break lever on the retaining clip 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 104. Removing the retaining clip**

### Next steps

Replace the processor.

# Installing the processor

## 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 processor heat sink module](#).

## Steps

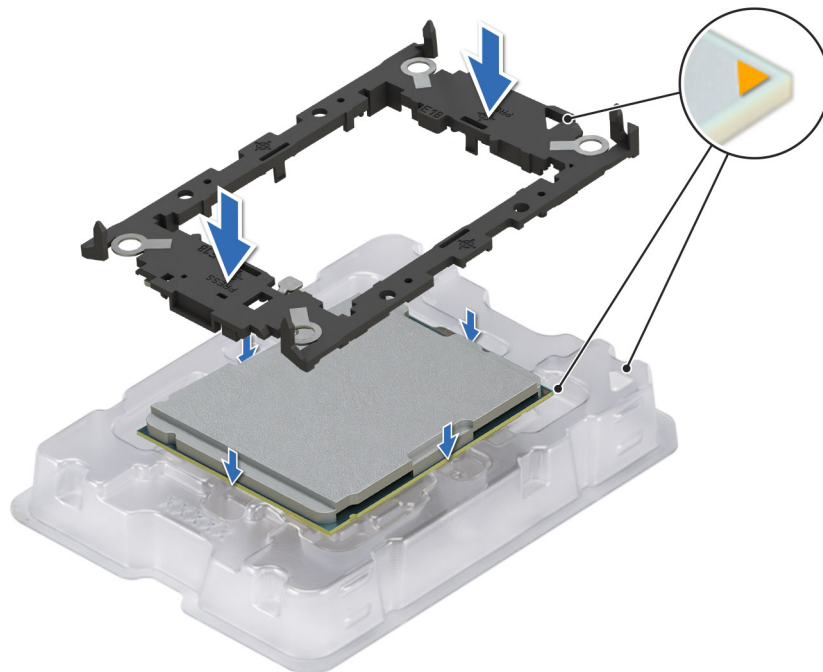
1. Place the processor in the processor tray.

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

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

**NOTE:** Ensure 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.

**NOTE:** Before you install the heat sink, ensure to place the processor and retaining clip in the tray.

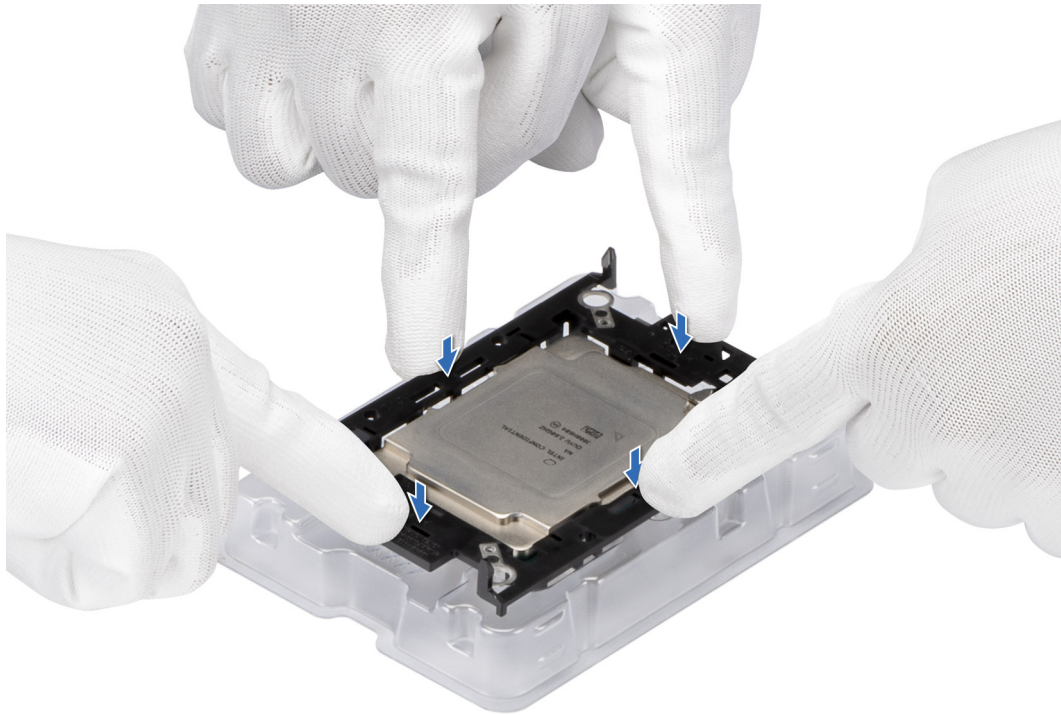


**Figure 105. Installing the retaining clip**

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

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



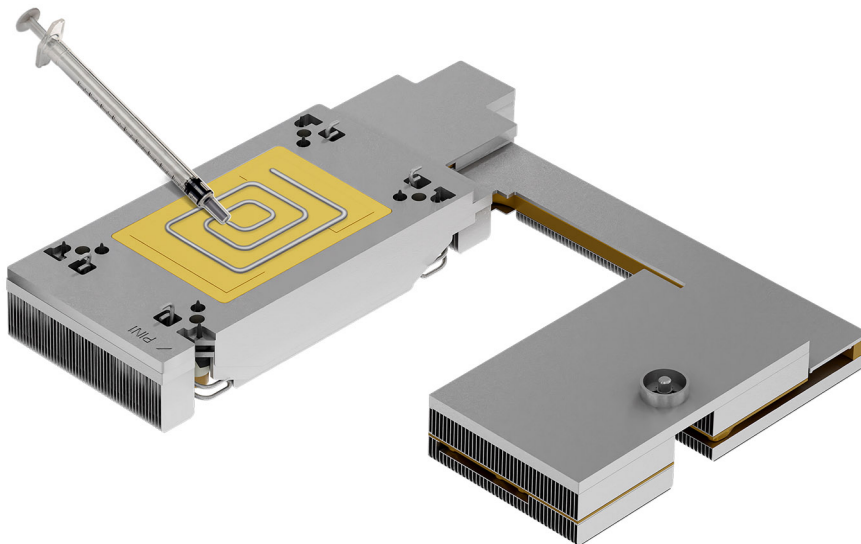


**Figure 106. Press the retaining clip on the four sides**

4. If you are using an existing heat sink, remove the thermal grease from the heat sink by using a clean lint-free cloth.
5. Apply the thermal grease in a thin spiral design on the bottom of the heat sink.

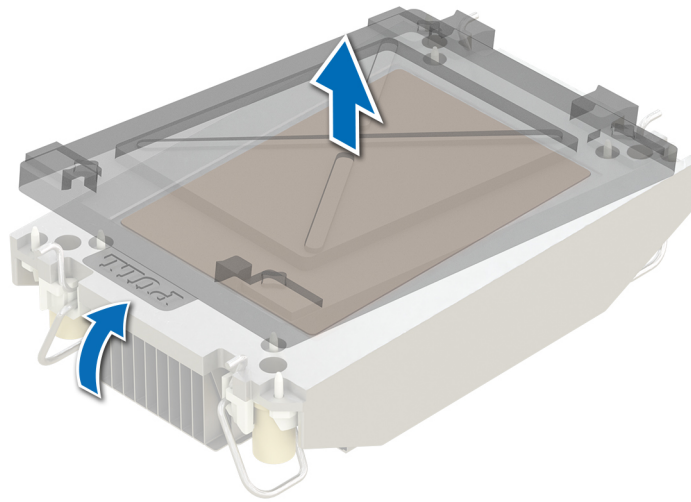
**CAUTION:** Applying too much thermal grease can result in excess grease coming in contact with and contaminating the processor socket.

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



**Figure 107. Applying thermal grease**

6. For a new heat sink, pull and remove the plastic cover from the base of the heat sink.



**Figure 108. Removing the cover**

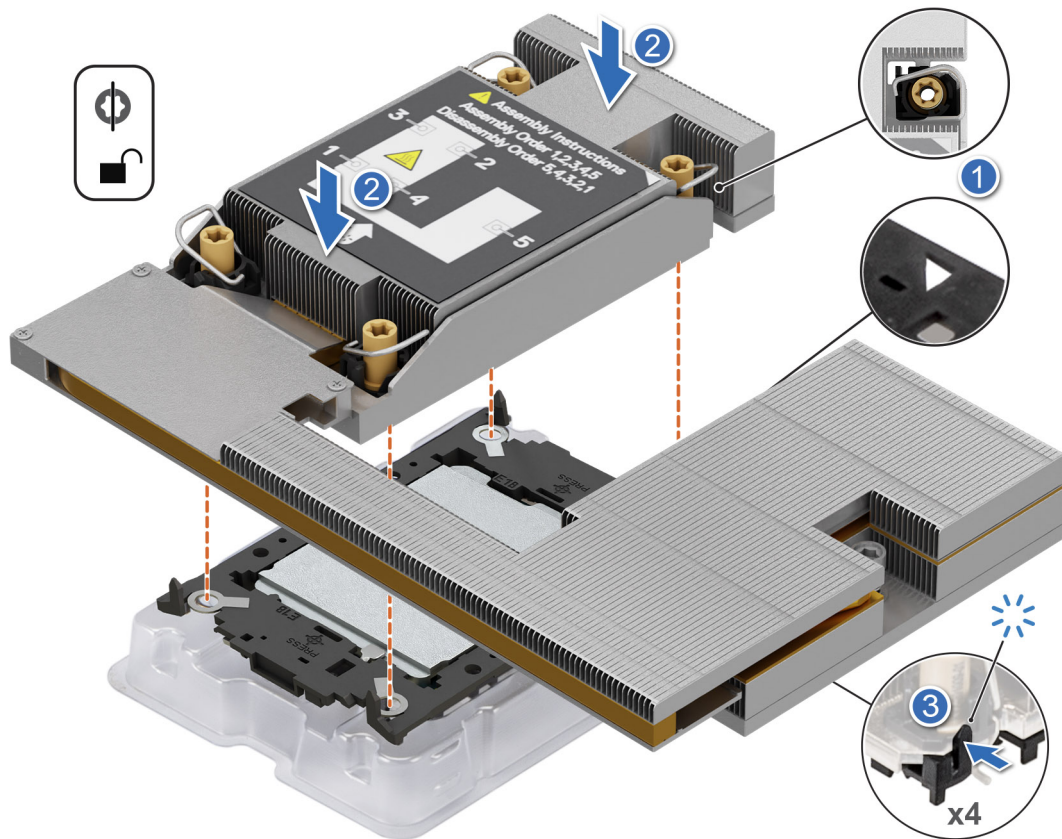
7. Place the heat sink on the processor and press the base of the heat sink until the retaining clip locks onto the heat sink at all the four corners.

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

**NOTE:**

- Ensure latching features on retaining clip, and heat sink are aligned during assembly.
- 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 retaining clip.





**Figure 109. Installing the heat sink onto the processor**

### Next steps

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

## Installing the processor and heat sink module

### Prerequisites

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

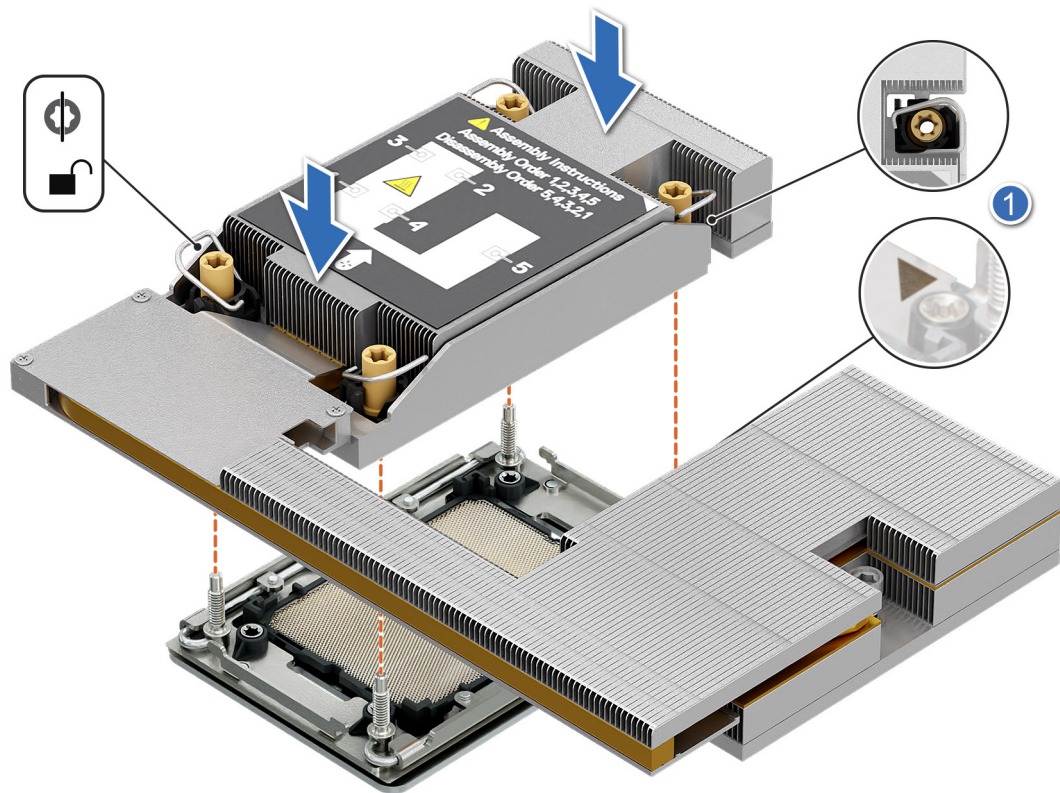
1. Follow the safety guidelines listed in the [Safety instructions.](#)
2. Follow the procedure listed in the [Before working inside your system.](#)
3. If installed, remove the processor dust cover.
4. The system supports different to types of heatsinks and the procedure to install them are similar.

### 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 HPM board, and then place the processor heat sink module (PHM) on the processor socket.

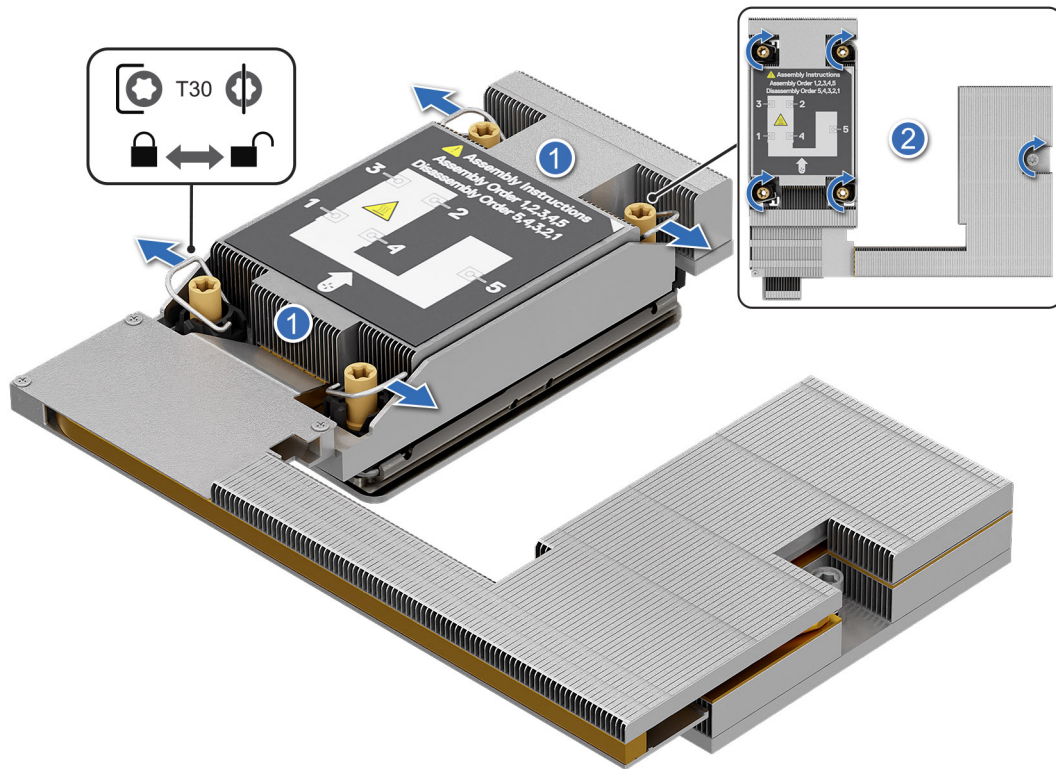
**CAUTION:** To avoid damaging the fins on the heat sink, do not press down on the heat sink fins.

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



**Figure 110. Installing the processor heat sink**

3. Set the anti-tilt wires to the locked position (outward position), and then using the Torx T30 screwdriver, tighten the captive nuts (8 in-lbf) on the heat sink in the order below or as shown on the heatsink module:
  - a. In a random order, tighten the first nut three turns.
  - b. Tighten the nut diagonally opposite to the nut that you tighten first.
  - c. Repeat the procedure for the remaining two nuts.
  - d. Return to the first nut to tighten it completely.
  - e. Check all the nuts to ensure they are firmly secured.



**Figure 111.** Set the anti-tilt wires to the locked position and tightening the nuts

#### Next steps

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

## PERC cards

### Removing the fPerc module

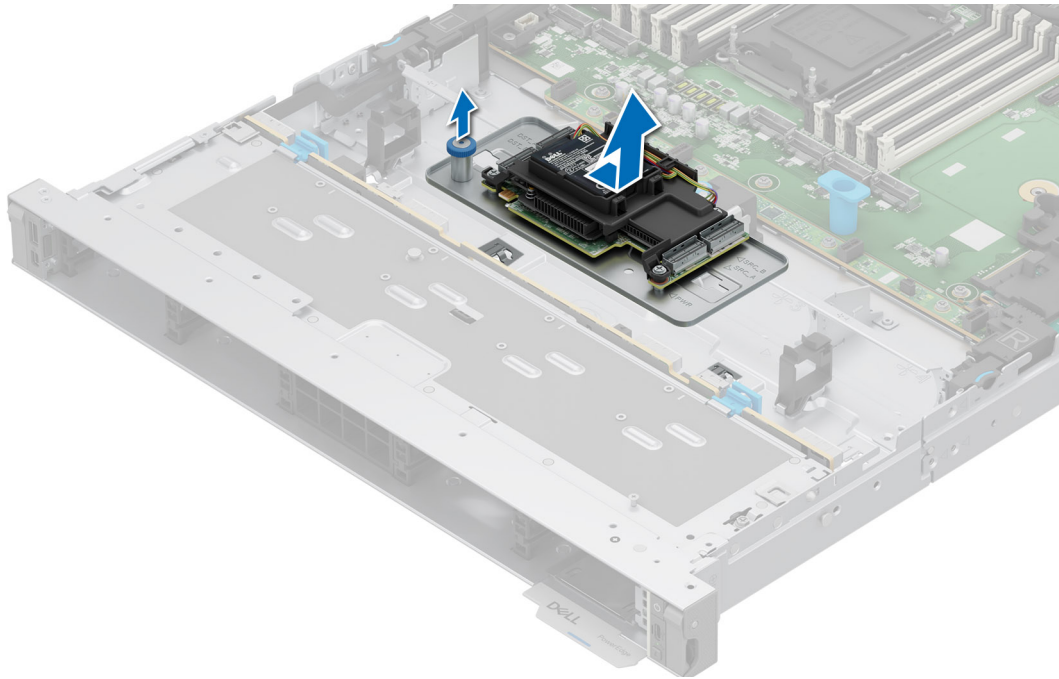
#### Prerequisites

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 system cover](#).
4. [Remove the air shroud](#).
5. [Remove the drive backplane cover](#).
6. Disconnect the power cable and other required cables, observe the cable routing.

**NOTE:** See [cable routing](#) section.

#### Steps

1. Pull the plunger to disengage the fPERC module from the system.
2. Slide the fPERC module towards the right of the system and lift it from the system.



**Figure 112. Removing the fPerc module**

#### Next steps

1. [Replace the fPERC module.](#)

## Installing the fPerc module

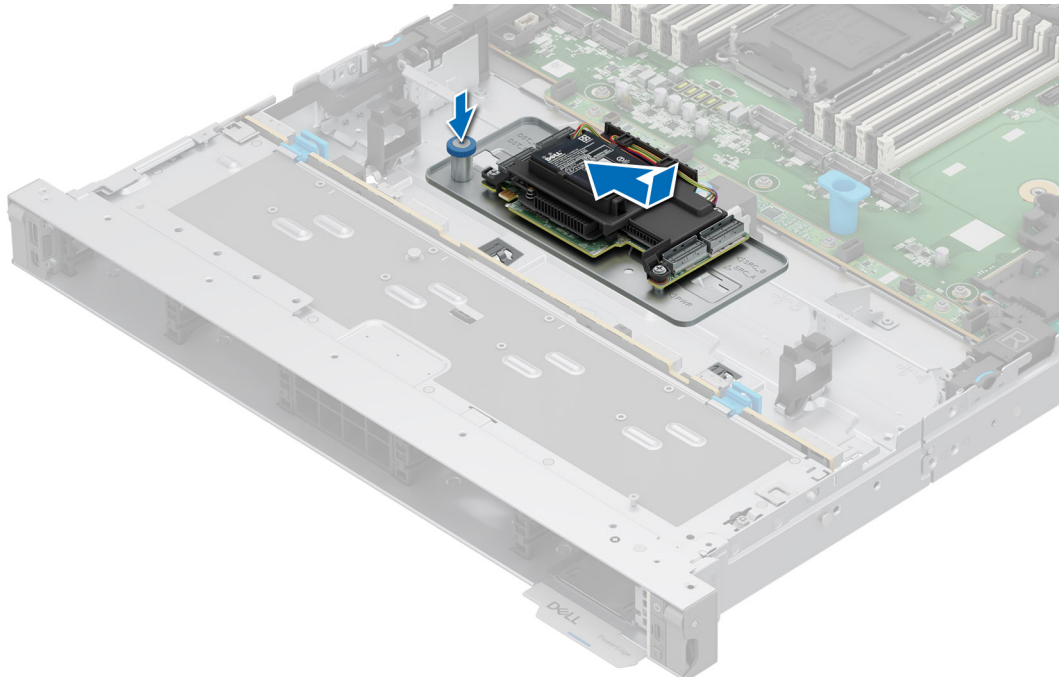
#### Prerequisites

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 system cover.](#)
4. [Remove the air shroud.](#)
5. [Remove the drive backplane cover.](#)
6. Disconnect the power cable and other required cables, observe the cable routing.

**NOTE:** See [cable routing](#) section.

#### Steps

1. Insert the fPER module at an angle and place it flat when it is below the backplane connectors.
2. Slide the fPERC module towards the left of the system and ensure the plunger locks in place.



**Figure 113. Installing the fPerc module**

#### Next steps

1. Connect all the cables, and ensure that all the cables are routed through the respective cable clip.

**NOTE:** See [cable routing](#) section.

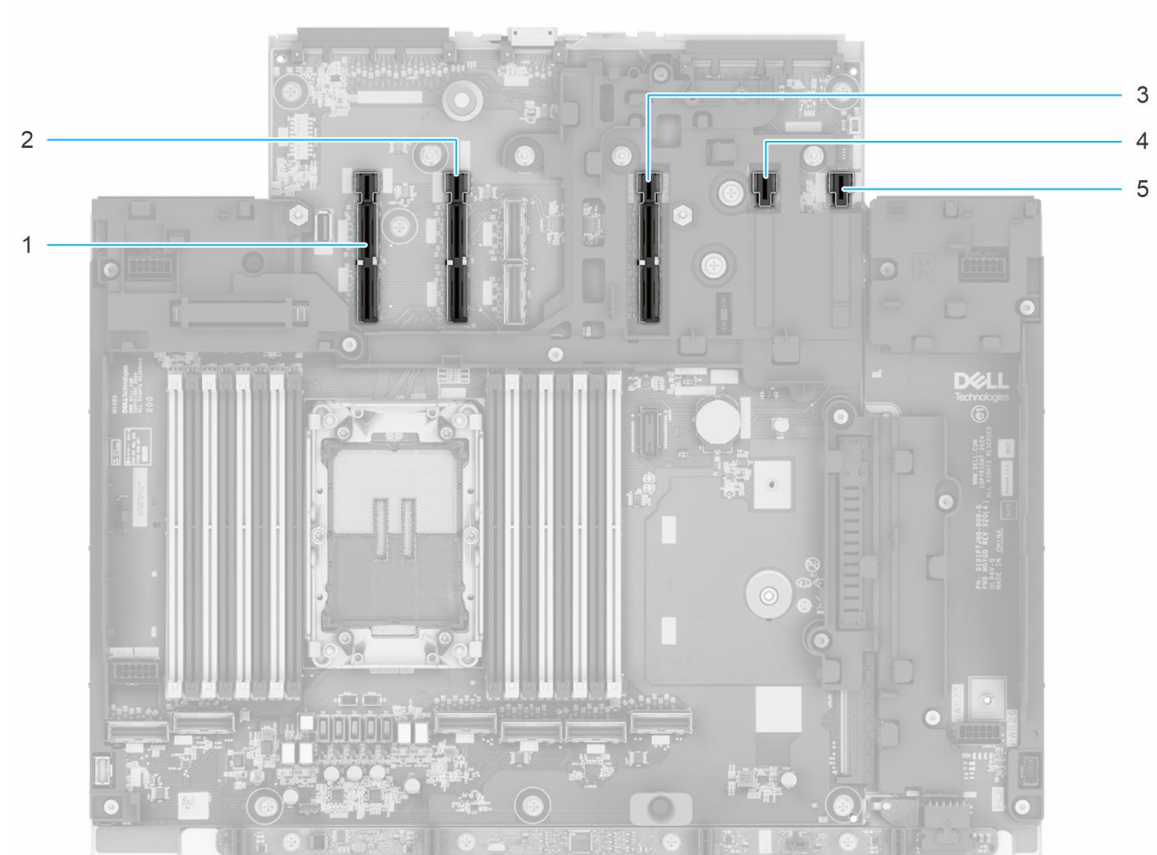
2. [Install the drive backplane cover.](#)
3. [Install the air shroud.](#)
4. [Install the system cover](#)
5. Follow the procedure listed in [After working inside your system.](#)

## Expansion cards and expansion card risers

**NOTE:** When an expansion card is not supported or missing, the iDRAC logs an event. This does not prevent your system from booting. However, if a F1/F2 pause occurs with an error message, see *Troubleshooting expansion cards* section in the *PowerEdge Servers Troubleshooting Guide* at [PowerEdge manuals](#).

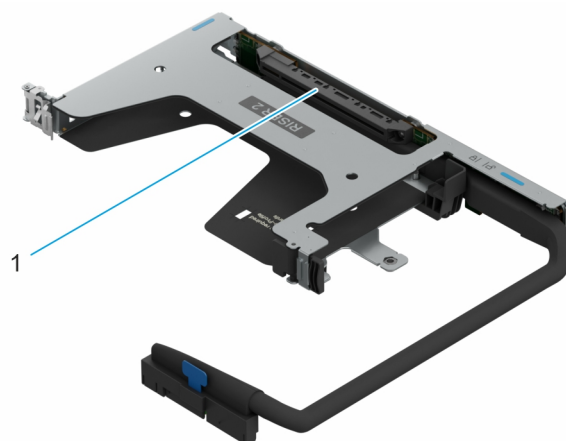


## Expansion card installation guidelines



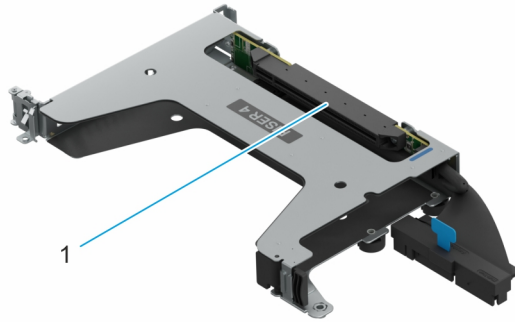
**Figure 114. Expansion card riser slot connectors**

1. Riser connector (SL11/SL12/PWR11/PWR12)
2. Riser connector (SL13/SL14/PWR13/PWR14)
3. Riser connector (SL15/SL16/PWR15/PWR16)
4. Riser connector (PWR17/PWR18)
5. Riser connector (PWR19/PWR20)



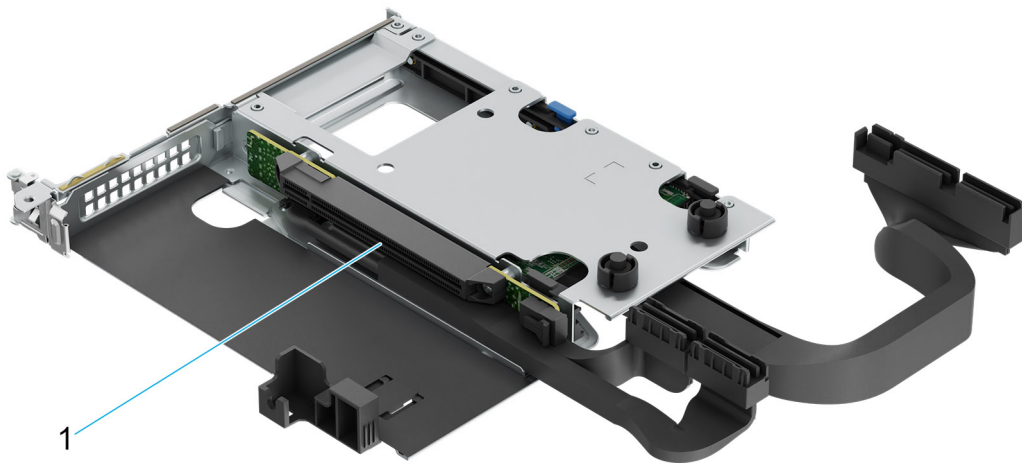
**Figure 115. Rear Riser 2 (R2q)**

1. Slot 1



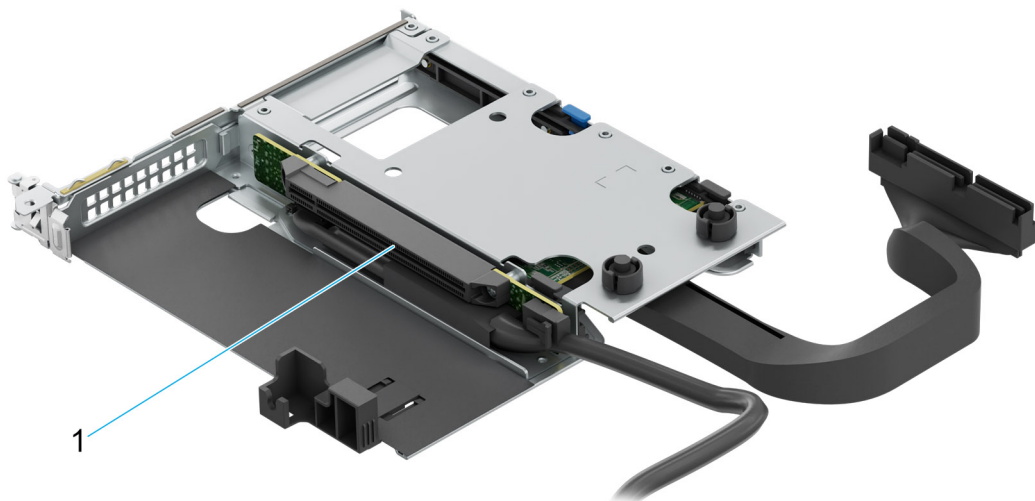
**Figure 116. Riser 4 (R4b)**

1. Slot 4



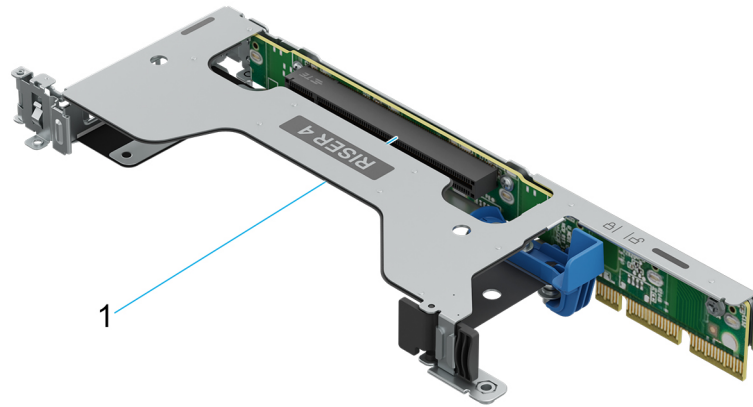
**Figure 117. Riser 2 (R2k)**

1. Slot 1



**Figure 118. Riser 2 (R2v)**

1. Slot 1



**Figure 119. Riser 4 (R4a)**

1. Slot 4

**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 75. Expansion card riser configurations**

| Riser Configurations (RC)                                  | Expansion card risers | PCIe Slots | Form factor | Controlling processor | Slot's electrical bandwidth/ physical connector |
|------------------------------------------------------------|-----------------------|------------|-------------|-----------------------|-------------------------------------------------|
| RC 0: No Riser                                             | OCP                   | 5          | OCP         | Processor 0           | PCIe Gen5 x16 (OCP 4C+ connector)               |
|                                                            | Rear BOSS-N1          | 3          | BOSS-N1     | Processor 0           | PCIe Gen3 x4 (1C connector)                     |
| RC 1 (rear):<br>1x16LP(G5) +<br>1x16OCP(G5) +<br>1x8LP(G5) | R2u                   | 1          | Low Profile | Processor 0           | PCIe Gen5 x8 (x16 connector)                    |
|                                                            | R4a                   | 4          | Low Profile | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |
|                                                            | BOSS-N1               | 3          | BOSS-N1     | Processor 0           | PCIe Gen4 x4 (1C connector)                     |
|                                                            | OCP                   | 5          | OCP         | Processor 0           | PCIe Gen5 x16 (OCP 4C+ connector)               |
| RC 2 (rear):<br>2x16LP(G5) + Front<br>BOSS                 | Rf1c                  | 31         | Full Height | Processor 0           | PCIe Gen5 x8 (x16 connector)                    |
|                                                            | Rf1c                  | 32         | Full Height | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |
|                                                            | BOSS-N1               | 34         | BOSS-N1     | Processor 0           | PCIe Gen4 x4 (1C connector)                     |
| RC 3 (front):<br>2x16OCP(G5)                               | RF1d                  | 31         | OCP         | Processor 0           | PCIe Gen5 x16 (OCP 4C+ connector)               |



**Table 75. Expansion card riser configurations (continued)**

| Riser Configurations (RC)                                     | Expansion card risers  | PCIe Slots | Form factor | Controlling processor | Slot's electrical bandwidth/ physical connector |
|---------------------------------------------------------------|------------------------|------------|-------------|-----------------------|-------------------------------------------------|
|                                                               |                        | 32         | OCP         | Processor 0           | PCIe Gen5 x16 (OCP 4C+ connector)               |
|                                                               | BOSS-N1                | 34         | BOSS-N1     | Processor 0           | PCIe Gen3 x4 (1C connector)                     |
| RC 4 (rear):<br>2x16LP(G5) + Front BOSS +                     | Rf1c                   | 31         | Full Height | Processor 0           | PCIe Gen5 x8 (x16 connector)                    |
|                                                               | Rf1c                   | 32         | Full Height | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |
|                                                               | BOSS-N1                | 34         | BOSS-N1     | Processor 0           | PCIe Gen3 x4 (1C connector)                     |
|                                                               | R2t                    | 1          | Full Height | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |
| RC 5 (rear):<br>4x16LP(G5) + Front BOSS +2 x16 FLOP OCP(G5)   | Rf1d                   | 31         | OCP         | Processor 0           | PCIe Gen5 x8 (x16 connector)                    |
|                                                               | Rf1d                   | 32         | OCP         | Processor 0           | PCIe Gen5 x8 (x16 connector)                    |
|                                                               | BOSS-N1                | 34         | BOSS-N1     | Processor 0           | PCIe Gen3 x4 (1C connector)                     |
|                                                               | R2t                    | 1          | Full Height | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |
|                                                               | R4b                    | 4          | Full Height | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |
| RC 6 (rear):<br>2x16LP(G5) + 1x16OCP(G5) + 1 x8/x16 OCP(G5)   | R2q                    | 1          | Full Height | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |
|                                                               | R4b                    | 4          | Full Height | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |
|                                                               | BOSS-N1                | 3          | BOSS-N1     | Processor 0           | PCIe Gen3 x4 (1C connector)                     |
|                                                               | OCP                    | 5          | OCP         | Processor 0           | PCIe Gen5 x16 (OCP 4C+ connector)               |
| RC 7 (rear):<br>2x16LP(G5) + 1x16OCP(G5) + 1 x16 FLOP OCP(G5) | R2k                    | 1          | Low Profile | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |
|                                                               |                        | 2          | OCP         |                       |                                                 |
|                                                               | BOSS (Optional)        | 3          | BOSS-N1     | Processor 0           | PCIe Gen5 x16 (OCP 4C+ connector)               |
|                                                               | R4a                    | 4          | Low Profile | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |
|                                                               | Onboard OCP (Optional) | 5          | OCP         | Processor 0           | PCIe Gen5 x16 (OCP 4C+ connector)               |
| RC 8 (rear):<br>2x16LP(G5) +                                  | R2v                    | 1          | Low Profile | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |

**Table 75. Expansion card riser configurations (continued)**

| Riser Configurations (RC)        | Expansion card risers  | PCIe Slots | Form factor | Controlling processor | Slot's electrical bandwidth/ physical connector |
|----------------------------------|------------------------|------------|-------------|-----------------------|-------------------------------------------------|
| 1x16OCP(G5) + 1 x16 FLOP OCP(G5) |                        | 2          | OCP         |                       | PCIe Gen5 x16 (OCP 4C+ connector)               |
|                                  | BOSS (Optional)        | 3          | BOSS-N1     | Processor 0           | PCIe Gen4 x4 (1C connector)                     |
|                                  | R4a                    | 4          | Low Profile | Processor 0           | PCIe Gen5 x16 (x16 connector)                   |
|                                  | Onboard OCP (Optional) | 5          | OCP         | Processor 0           | PCIe Gen5 x16 (OCP 4C+ connector)               |

**NOTE:** The system supports either Front I/O configuration (system with front risers) or Rear I/O configuration (system with rear risers).

**Table 76. RC0: No Riser**

| Card type              | Slot priority | Maximum number of cards |
|------------------------|---------------|-------------------------|
| Nvidia (OCP: 100 Gb)   | 5             | 1                       |
| Broadcom (OCP: 100 Gb) | 5             | 1                       |
| Broadcom (OCP: 100 Gb) | 5             | 1                       |
| Broadcom (OCP: 25 Gb)  | 5             | 1                       |
| Nvidia (OCP: 25 Gb)    | 5             | 1                       |
| Santino (BOSS-N1)      | 3             | 1                       |
| FOXCONN (Front PERC12) | INT           | 1                       |

**Table 77. RC1. R2u+R4a**

| Card type             | Slot priority | Maximum number of cards |
|-----------------------|---------------|-------------------------|
| Broadcom (OCP: 200Gb) | 5             | 1                       |
| Nvidia (OCP: 100Gb)   | 5             | 1                       |
| Broadcom (OCP: 100Gb) | 5             | 1                       |
| Broadcom (OCP: 100Gb) | 5             | 1                       |
| Broadcom (OCP: 25Gb)  | 5             | 1                       |
| Broadcom (OCP: 25Gb)  | 5             | 1                       |
| Nvidia (OCP: 25Gb)    | 5             | 1                       |
| Broadcom (OCP: 25Gb)  | 5             | 1                       |
| Intel (OCP: 10Gb)     | 5             | 1                       |
| Intel (OCP: 10Gb)     | 5             | 1                       |
| Broadcom (OCP: 10Gb)  | 5             | 1                       |
| Broadcom (OCP: 10Gb)  | 5             | 1                       |
| Intel (OCP: 1Gb)      | 5             | 1                       |
| Broadcom (OCP: 1Gb)   | 5             | 1                       |

**Table 77. RC1. R2u+R4a (continued)**

| Card type                  | Slot priority | Maximum number of cards |
|----------------------------|---------------|-------------------------|
| Santino (BOSS)             | 3             | 1                       |
| Santino (BOSS)             | 3             | 1                       |
| Wistron (BOSS)             | 3             | 1                       |
| Wistron (BOSS)             | 3             | 1                       |
| Wistron (BOSS)             | 3             | 1                       |
| Wistron (BOSS)             | 3             | 1                       |
| FOXCONN (PERC Adapter12)   | 1             | 1                       |
| FOXCONN (PERC Adapter12)   | 1             | 1                       |
| FOXCONN (PERC Adapter12)   | 1             | 1                       |
| Nvidia (GPU)               | 4             | 1                       |
| Marvell (HBA: FC64)        | 4             | 1                       |
| QLogic (HBA: FC32)         | 4             | 1                       |
| FOXCONN (External Adapter) | 4             | 1                       |
| FOXCONN (External Adapter) | 4             | 1                       |

**Table 78. RC2. RF1c**

| Card type                  | Slot priority | Maximum number of cards |
|----------------------------|---------------|-------------------------|
| Nvidia (DPU: 200Gb)        | 31            | 1                       |
| Mellanox (DPU: 200Gb)      | 31            | 1                       |
| Santino (BOSS)             | 34            | 1                       |
| Santino (BOSS)             | 34            | 1                       |
| Wistron (BOSS)             | 34            | 1                       |
| Wistron (BOSS)             | 34            | 1                       |
| Nvidia (GPU)               | 31, 32        | 2                       |
| Broadcom (NIC: 200Gb)      | 31, 32        | 2                       |
| Broadcom (NIC: 200Gb)      | 31, 32        | 2                       |
| Intel (NIC: 100Gb)         | 31, 32        | 2                       |
| Nvidia (NIC: 100Gb)        | 31, 32        | 2                       |
| Broadcom (NIC: 100Gb)      | 31, 32        | 2                       |
| Broadcom (NIC: 100Gb)      | 31, 32        | 2                       |
| Marvell (HBA: FC64)        | 31, 32        | 2                       |
| Emulex (HBA: FC64)         | 31, 32        | 2                       |
| QLogic (HBA: FC32)         | 31, 32        | 2                       |
| Emulex (HBA: FC32)         | 31, 32        | 2                       |
| FOXCONN (External Adapter) | 31, 32        | 1                       |
| FOXCONN (External Adapter) | 31, 32        | 1                       |
| FOXCONN (External Adapter) | 31, 32        | 1                       |
| FOXCONN (External Adapter) | 31, 32        | 1                       |

**Table 79. RC 3: RF1d**

| Card type              | Slot priority | Maximum number of cards |
|------------------------|---------------|-------------------------|
| Nvidia (OCP: 100 Gb)   | 32, 31        | 2                       |
| Broadcom (OCP: 100 Gb) | 32, 31        | 2                       |
| Broadcom (OCP: 100 Gb) | 32, 31        | 2                       |
| Broadcom (OCP: 25 Gb)  | 32, 31        | 2                       |
| Nvidia (OCP: 25 Gb)    | 32, 31        | 2                       |
| Santino (BOSS-N1)      | 34            | 1                       |

**Table 80. RC4. RF1c+R2t+R4b**

| Card type                  | Slot priority | Maximum number of cards |
|----------------------------|---------------|-------------------------|
| Nvidia (DPU: 200Gb)        | 1             | 1                       |
| Mellanox (DPU: 200Gb)      | 1             | 1                       |
| Santino (BOSS)             | 34            | 1                       |
| Santino (BOSS)             | 34            | 1                       |
| Wistron (BOSS)             | 34            | 1                       |
| Wistron (BOSS)             | 34            | 1                       |
| Nvidia (GPU)               | 31, 32, 1, 4  | 4                       |
| Broadcom (NIC: 200Gb)      | 31, 32, 1, 4  | 4                       |
| Broadcom (NIC: 200Gb)      | 31, 32, 1, 4  | 4                       |
| Intel (NIC: 100Gb)         | 31, 32, 1, 4  | 4                       |
| Nvidia (NIC: 100Gb)        | 31, 32, 1, 4  | 4                       |
| Broadcom (NIC: 100Gb)      | 31, 32, 1, 4  | 4                       |
| Broadcom (NIC: 100Gb)      | 31, 32, 1, 4  | 4                       |
| Marvell (HBA: FC64)        | 31, 32, 1, 4  | 4                       |
| Emulex (HBA: FC64)         | 31, 32, 1, 4  | 4                       |
| QLogic (HBA: FC32)         | 31, 32, 1, 4  | 4                       |
| Emulex (HBA: FC32)         | 31, 32, 1, 4  | 4                       |
| FOXCONN (External Adapter) | 31, 32, 1, 4  | 1                       |
| FOXCONN (External Adapter) | 31, 32, 1, 4  | 1                       |
| FOXCONN (External Adapter) | 31, 32, 1, 4  | 1                       |
| FOXCONN (External Adapter) | 31, 32, 1, 4  | 1                       |

**Table 81. RC5. RF1d+R2t+R4b**

| Card type             | Slot priority | Maximum number of cards |
|-----------------------|---------------|-------------------------|
| Nvidia (DPU: 200Gb)   | 1             | 1                       |
| Mellanox (DPU: 200Gb) | 1             | 1                       |
| Broadcom (OCP: 200Gb) | 32, 31        | 2                       |
| Nvidia (OCP: 100Gb)   | 32, 31        | 2                       |
| Broadcom (OCP: 100Gb) | 32, 31        | 2                       |
| Broadcom (OCP: 100Gb) | 32, 31        | 2                       |

**Table 81. RC5. RF1d+R2t+R4b (continued)**

| Card type                  | Slot priority | Maximum number of cards |
|----------------------------|---------------|-------------------------|
| Broadcom (OCP: 25Gb)       | 32, 31        | 2                       |
| Broadcom (OCP: 25Gb)       | 32, 31        | 2                       |
| Nvidia (OCP: 25Gb)         | 32, 31        | 2                       |
| Broadcom (OCP: 25Gb)       | 32, 31        | 2                       |
| Intel (OCP: 10Gb)          | 32, 31        | 2                       |
| Intel (OCP: 10Gb)          | 32, 31        | 2                       |
| Broadcom (OCP: 10Gb)       | 32, 31        | 2                       |
| Broadcom (OCP: 10Gb)       | 32, 31        | 2                       |
| Intel (OCP: 1Gb)           | 32, 31        | 2                       |
| Broadcom (OCP: 1Gb)        | 32, 31        | 2                       |
| Santino (BOSS)             | 34            | 1                       |
| Santino (BOSS)             | 34            | 1                       |
| Wistron (BOSS)             | 34            | 1                       |
| Wistron (BOSS)             | 34            | 1                       |
| Nvidia (GPU)               | 1, 4          | 2                       |
| Broadcom (NIC: 200Gb)      | 1, 4          | 2                       |
| Broadcom (NIC: 200Gb)      | 1, 4          | 2                       |
| Intel (NIC: 100Gb)         | 1, 4          | 2                       |
| Nvidia (NIC: 100Gb)        | 1, 4          | 2                       |
| Broadcom (NIC: 100Gb)      | 1, 4          | 2                       |
| Broadcom (NIC: 100Gb)      | 1, 4          | 2                       |
| Marvell (HBA: FC64)        | 1, 4          | 2                       |
| Emulex (HBA: FC64)         | 1, 4          | 2                       |
| QLogic (HBA: FC32)         | 1, 4          | 2                       |
| Emulex (HBA: FC32)         | 1, 4          | 2                       |
| FOXCONN (External Adapter) | 1, 4          | 1                       |
| FOXCONN (External Adapter) | 1, 4          | 1                       |
| FOXCONN (External Adapter) | 1, 4          | 1                       |
| FOXCONN (External Adapter) | 1, 4          | 1                       |

**Table 82. RC 6: R2q+R4b**

| Card type              | Slot priority | Maximum number of cards |
|------------------------|---------------|-------------------------|
| Nvidia (OCP: 100 Gb)   | 5             | 1                       |
| Broadcom (OCP: 100 Gb) | 5             | 1                       |
| Broadcom (OCP: 100 Gb) | 5             | 1                       |
| Broadcom (OCP: 25 Gb)  | 5             | 1                       |
| Nvidia (OCP: 25 Gb)    | 5             | 1                       |
| Santino (BOSS-N1)      | 3             | 1                       |

**Table 82. RC 6: R2q+R4b (continued)**

| Card type              | Slot priority | Maximum number of cards |
|------------------------|---------------|-------------------------|
| FOXCONN (Front PERC12) | INT           | 1                       |
| Nvidia (GPU)           | 1, 4          | 2                       |
| Nvidia (NIC: 100 Gb)   | 1, 4          | 2                       |
| Broadcom (NIC: 100 Gb) | 1, 4          | 2                       |

**Table 83. RC 7: R2k+R4a**

| Card type                  | Slot priority | Maximum number of cards |
|----------------------------|---------------|-------------------------|
| Broadcom (OCP: 200 Gb)     | 5, 2          | 2                       |
| Intel (OCP: 100 Gb)        | 5, 2          | 2                       |
| Nvidia (OCP: 100 Gb)       | 5, 2          | 2                       |
| Broadcom (OCP: 100 Gb)     | 5, 2          | 2                       |
| Broadcom (OCP: 100 Gb)     | 5, 2          | 2                       |
| Broadcom (OCP: 25 Gb)      | 5, 2          | 2                       |
| Broadcom (OCP: 25 Gb)      | 5, 2          | 2                       |
| Intel (OCP: 25 Gb)         | 5, 2          | 2                       |
| Nvidia (OCP: 25 Gb)        | 5, 2          | 2                       |
| Intel (OCP: 25 Gb)         | 5, 2          | 2                       |
| Broadcom (OCP: 25 Gb)      | 5, 2          | 2                       |
| Intel (OCP: 10 Gb)         | 5, 2          | 2                       |
| Intel (OCP: 10 Gb)         | 5, 2          | 2                       |
| Broadcom (OCP: 10 Gb)      | 5, 2          | 2                       |
| Broadcom (OCP: 10 Gb)      | 5, 2          | 2                       |
| Intel (OCP: 1 Gb)          | 5, 2          | 2                       |
| Broadcom (OCP: 1 Gb)       | 5, 2          | 2                       |
| Santino (BOSS)             | 3             | 1                       |
| Wistron (BOSS)             | 3             | 1                       |
| FOXCONN (Front PERC12)     | INT           | 1                       |
| FOXCONN (Front PERC12)     | INT           | 1                       |
| Nvidia (GPU)               | 1, 4          | 2                       |
| Marvell (HBA: FC64)        | 1, 4          | 2                       |
| QLogic (HBA: FC32)         | 1, 4          | 2                       |
| FOXCONN (External Adapter) | 1, 4          | 2                       |
| FOXCONN (External Adapter) | 1, 4          | 2                       |

**Table 84. RC 8: R2v+R4a**

| Card type              | Slot priority | Maximum number of cards |
|------------------------|---------------|-------------------------|
| Broadcom (OCP: 200 Gb) | 5, 2          | 2                       |
| Intel (OCP: 100 Gb)    | 5, 2          | 2                       |
| Nvidia (OCP: 100 Gb)   | 5, 2          | 2                       |

**Table 84. RC 8: R2v+R4a (continued)**

| Card type                  | Slot priority | Maximum number of cards |
|----------------------------|---------------|-------------------------|
| Broadcom (OCP: 100 Gb)     | 5, 2          | 2                       |
| Broadcom (OCP: 100 Gb)     | 5, 2          | 2                       |
| Broadcom (OCP: 25 Gb)      | 5, 2          | 2                       |
| Broadcom (OCP: 25 Gb)      | 5, 2          | 2                       |
| Intel (OCP: 25 Gb)         | 5, 2          | 2                       |
| Nvidia (OCP: 25 Gb)        | 5, 2          | 2                       |
| Intel (OCP: 25 Gb)         | 5, 2          | 2                       |
| Broadcom (OCP: 25 Gb)      | 5, 2          | 2                       |
| Intel (OCP: 10 Gb)         | 5, 2          | 2                       |
| Intel (OCP: 10 Gb)         | 5, 2          | 2                       |
| Broadcom (OCP: 10 Gb)      | 5, 2          | 2                       |
| Broadcom (OCP: 10 Gb)      | 5, 2          | 2                       |
| Intel (OCP: 1 Gb)          | 5, 2          | 2                       |
| Broadcom (OCP: 1 Gb)       | 5, 2          | 2                       |
| Santino (BOSS)             | 3             | 1                       |
| Wistron (BOSS)             | 3             | 1                       |
| FOXCONN (Front PERC12)     | INT           | 1                       |
| FOXCONN (Front PERC12)     | INT           | 1                       |
| Nvidia (GPU)               | 1, 4          | 2                       |
| Marvell (HBA: FC64)        | 1, 4          | 2                       |
| QLogic (HBA: FC32)         | 1, 4          | 2                       |
| FOXCONN (External Adapter) | 1, 4          | 2                       |
| FOXCONN (External Adapter) | 1, 4          | 2                       |

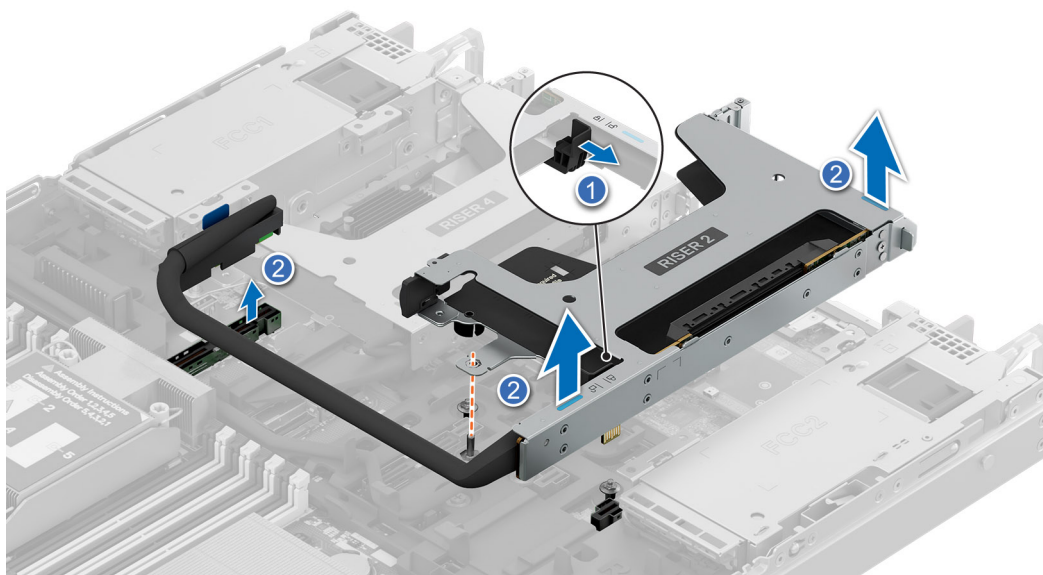
## Removing the rear expansion card risers

### 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 system cover](#)
4. If applicable, disconnect the cables from the expansion card or HPM board.

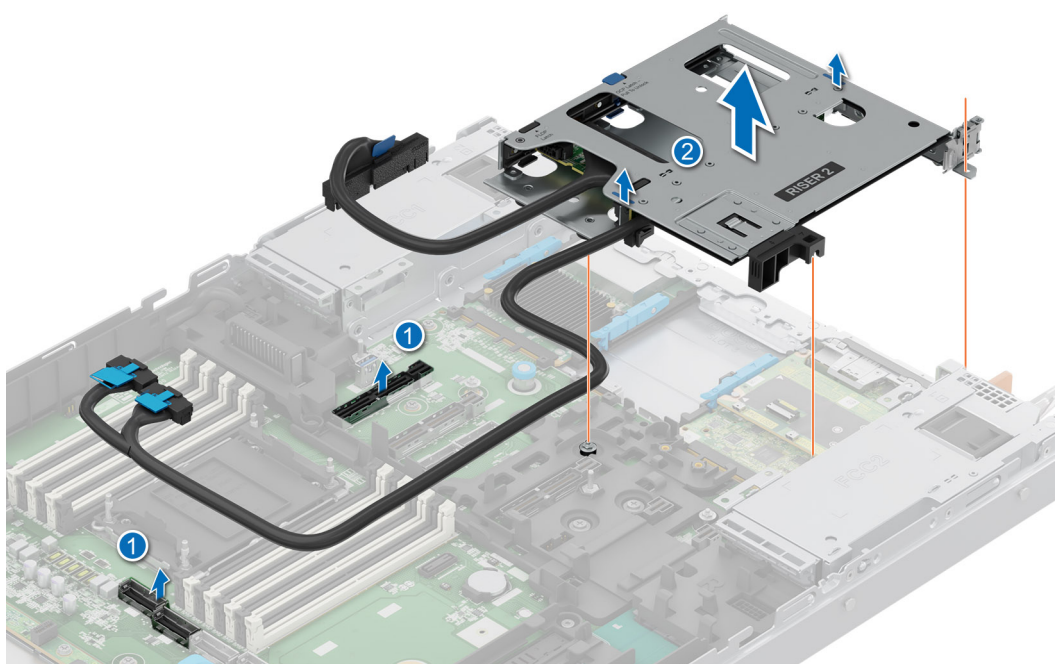
### Steps

1. For Riser 2q, disconnect the cable from the connector and unlock the riser latch. Lift the expansion card riser to disengage it from the riser connector, and carefully remove it from the guide pin.



**Figure 120. Removing the rear expansion card riser 2q (R2q)**

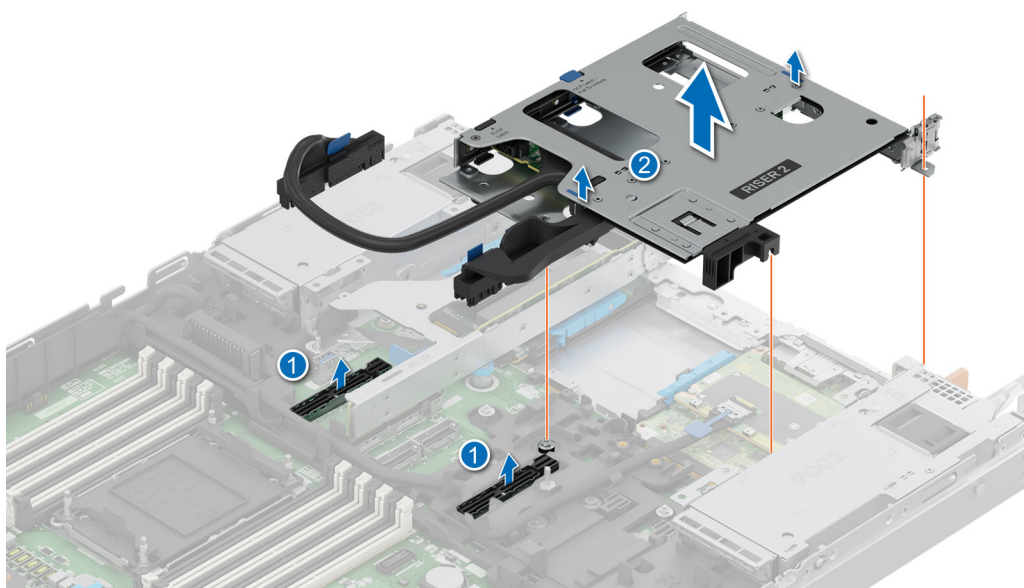
2. For Riser 2v, disconnect the cable from the connector. Lift the expansion card riser to disengage it from the connector and guide pin on the HPM board. Carefully remove the riser from the system.



**Figure 121. Removing the rear expansion card riser 2v (R2v)**

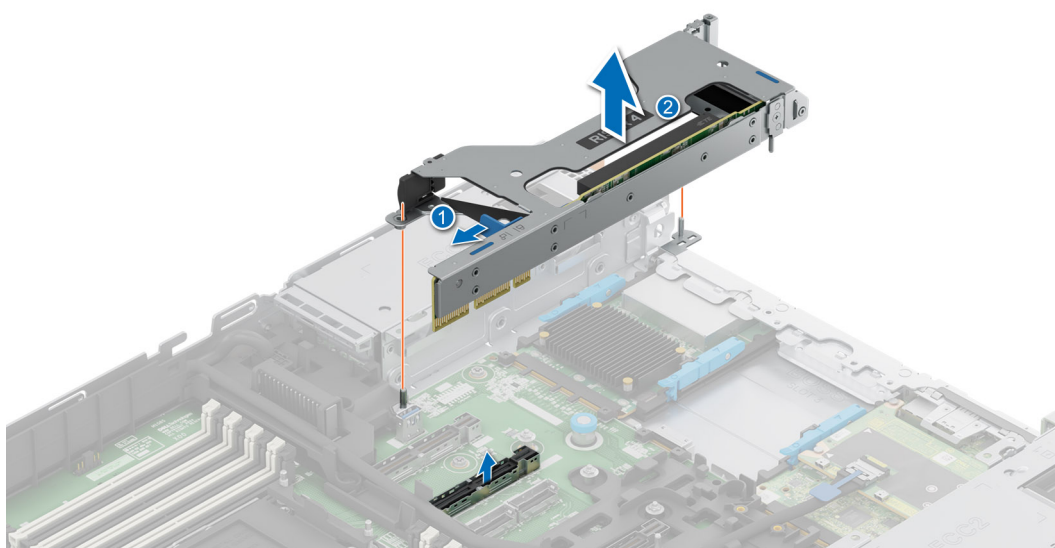
3. For Riser 2k, disconnect the cable from the connector. Lift the expansion card riser to disengage it from the connector and guide pin on the HPM board. Carefully remove the riser from the system.





**Figure 122. Removing the rear expansion card riser 2k (R2k)**

4. For Riser 4a, unlock the riser latch. Lift the expansion card riser to disengage it from the connector and guide pin on the HPM board. Carefully remove the riser from the system.



**Figure 123. Removing the rear expansion card riser 4a (R4a)**

5. For Riser 4b, disconnect the cable from the connector. Lift the expansion card riser to disengage it from the connector and guide pin on the HPM board. Carefully remove the riser from the system.

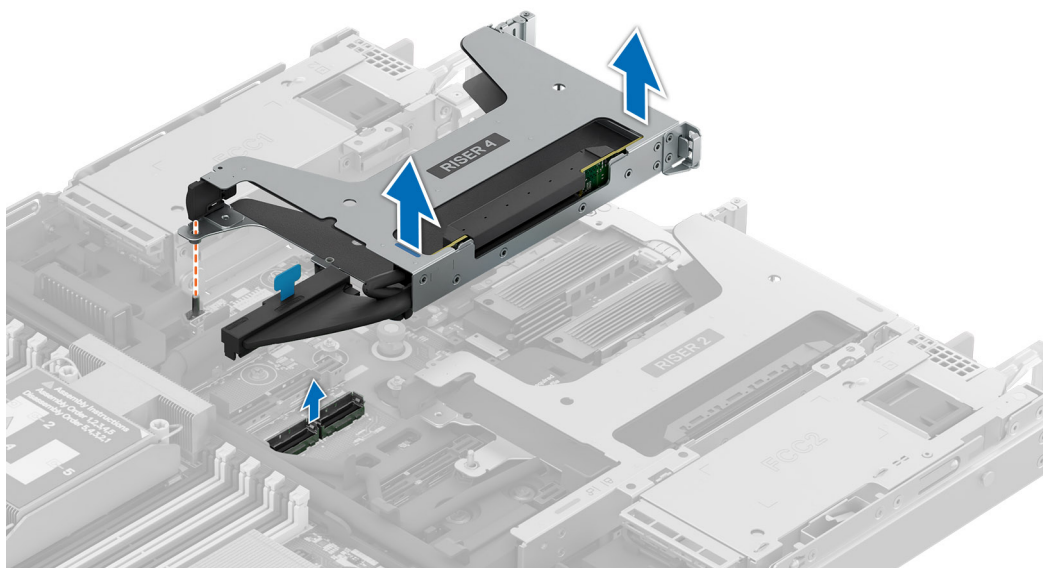


Figure 124. Removing the rear expansion card riser 4b (R4b)

### Next steps

1. Follow the procedure listed in [After working inside your system](#).
2. [Replace the rear expansion card risers](#)
3. [Replace the system cover](#).

## Installing the rear expansion card risers

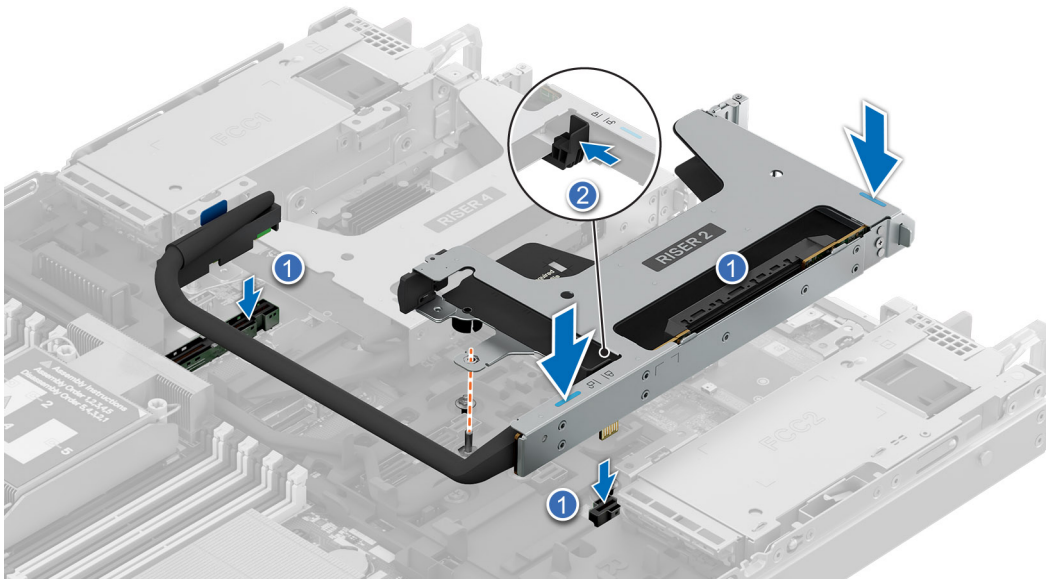
### Prerequisites

1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in the [Before working inside your system](#).
3. If removed, [install the expansion cards into the rear expansion card risers](#).

**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.

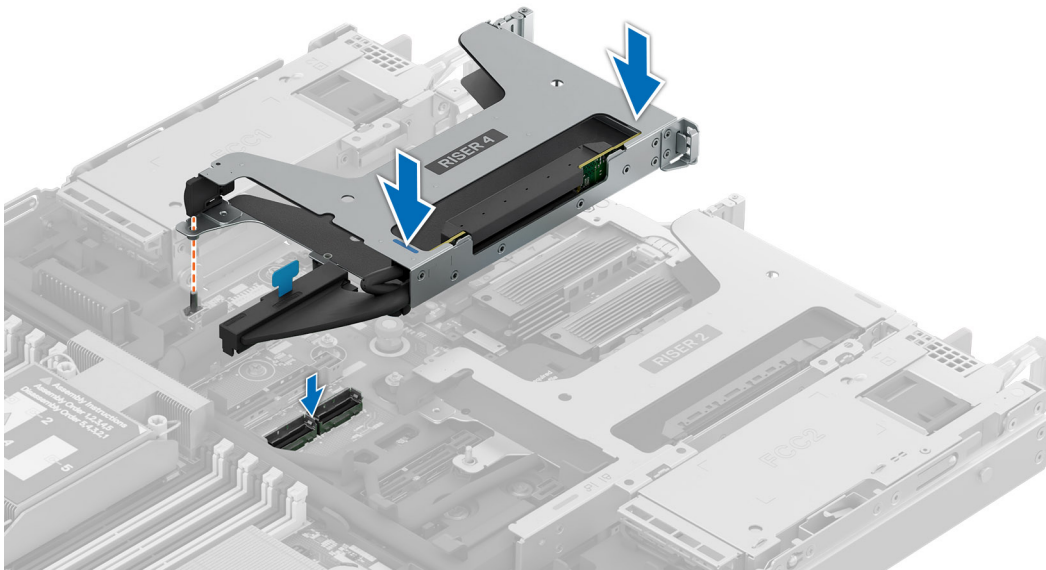
### Steps

1. For Riser 2q, ensure the riser latch is unlocked, align the riser with the connector and guide pin, lower it into place, press to ensure the riser is fully seated on the connector, and then push the riser latch to lock.



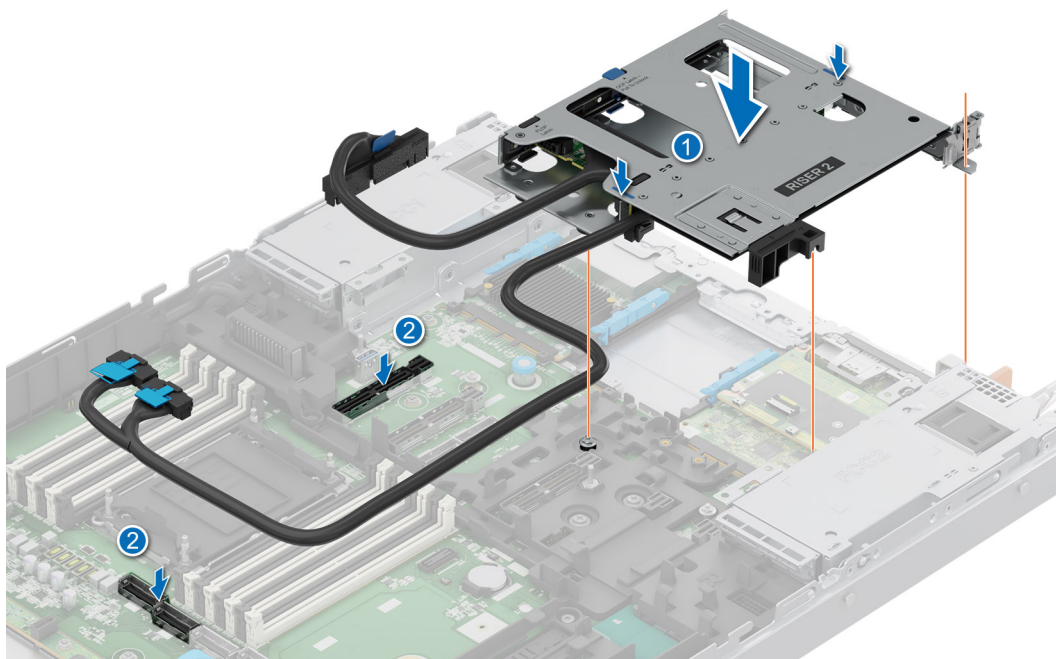
**Figure 125. Installing the rear expansion card riser 2q (R2q)**

2. For Riser 4b, reconnect the cable first to the connector. Align the expansion card riser with the connector and the riser guide pin on the HPM board. Lower the expansion card riser into place until the expansion card riser connector is fully seated in the connector. Press the touch points (indicated by blue line) to ensure proper engagement.



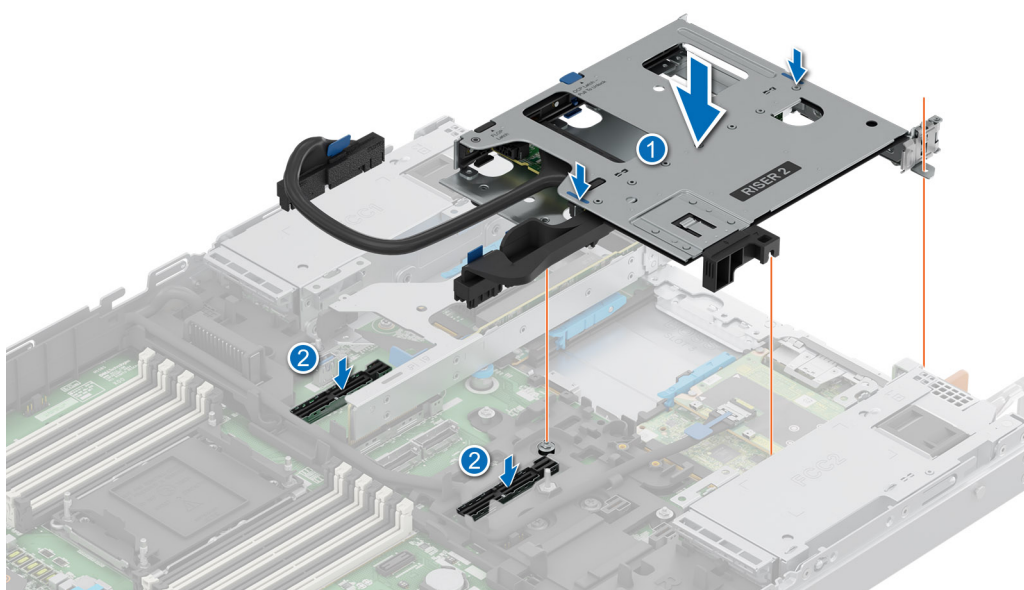
**Figure 126. Installing the rear expansion card riser 4b (R4b)**

3. For Riser 2v, align the expansion card riser with the three riser guide pin on the HPM board. Lower the expansion card riser into place until the expansion card riser is fully seated. Press the touch points (indicated by blue line) to ensure proper engagement and connect the riser cables to the connectors on the HPM board.



**Figure 127. Installing the rear expansion card riser 2v (R2v)**

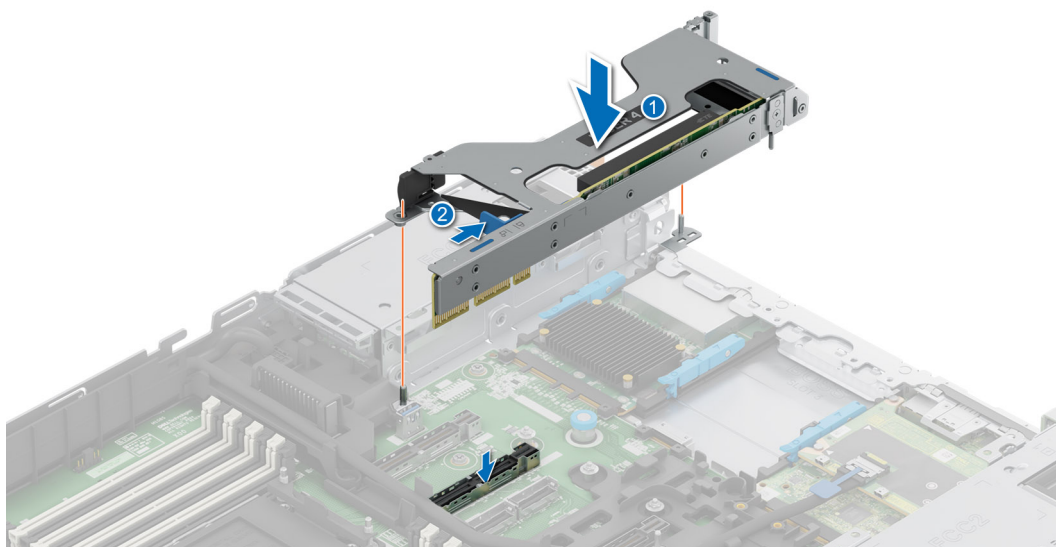
4. For Riser 2k, align the expansion card riser with the three riser guide pin on the HPM board. Lower the expansion card riser into place until the expansion card riser connector is fully seated. Press the touch points (indicated by blue line) to ensure proper engagement and connect the riser cable to the connector on the HPM board.



**Figure 128. Installing the rear expansion card riser 2k (R2k)**

5. For Riser 4a, ensure the riser latch is unlocked. Align the expansion card riser with the connector and the riser guide pin on the HPM board. Lower the expansion card riser into place until the expansion card riser connector is fully seated in the connector. Push the touch point to ensure secure engagement into connector, then lock the latch.





**Figure 129. Installing the rear expansion card riser 4a (R4a)**

### Next steps

1. If required, reconnect the cables to the expansion card or HPM board.
2. Follow the procedure listed in [After working inside your system](#).

## Removing an expansion card from the expansion card riser

### Prerequisites

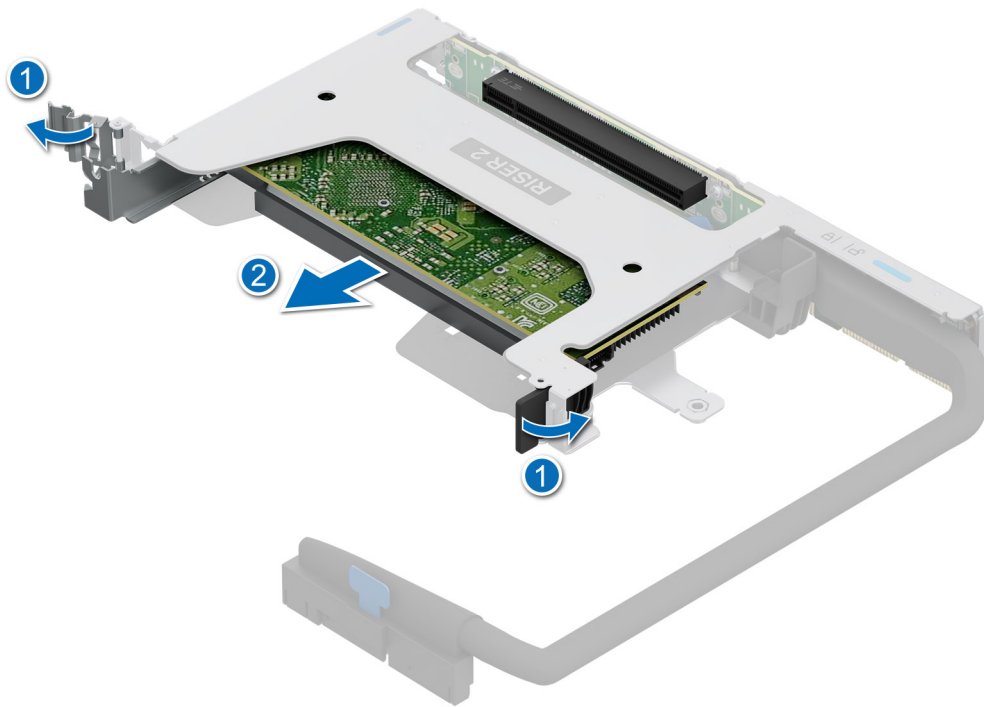
1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. If applicable, disconnect the cables from the expansion card.
4. [remove the rear expansion card riser](#).

### Steps

1. For Riser 2q.
  - a. Tilt and open the retention latches on both ends of the riser.
 

i

**NOTE:** If a low-profile GPU is installed, a GPU blank will be installed.
  - b. Hold the expansion card by its edges and pull the card until the card edge connector disengages from the expansion card connector on the riser.

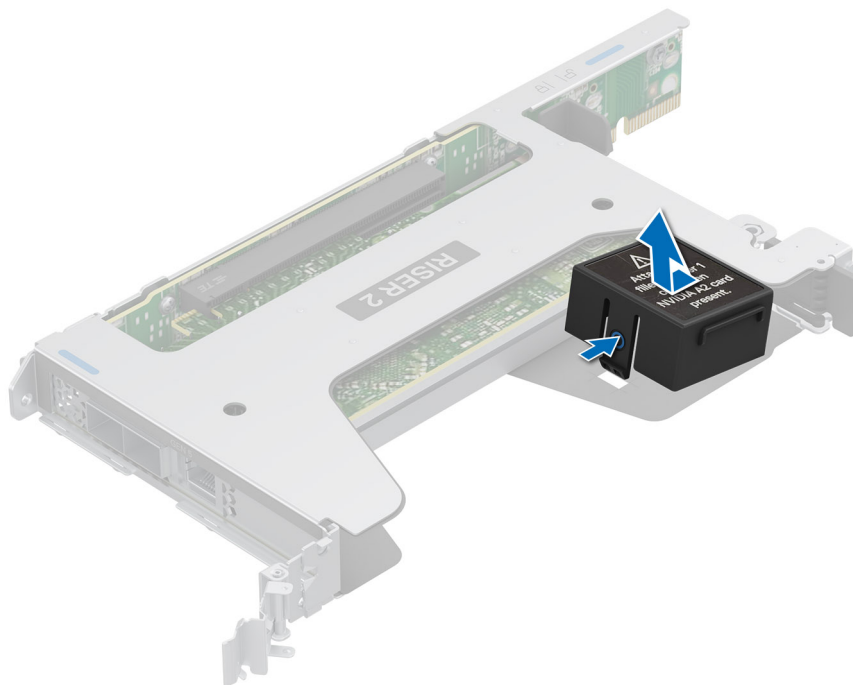


**Figure 130. Removing expansion card from the rear expansion card riser 2q**

2. GPU Blank:

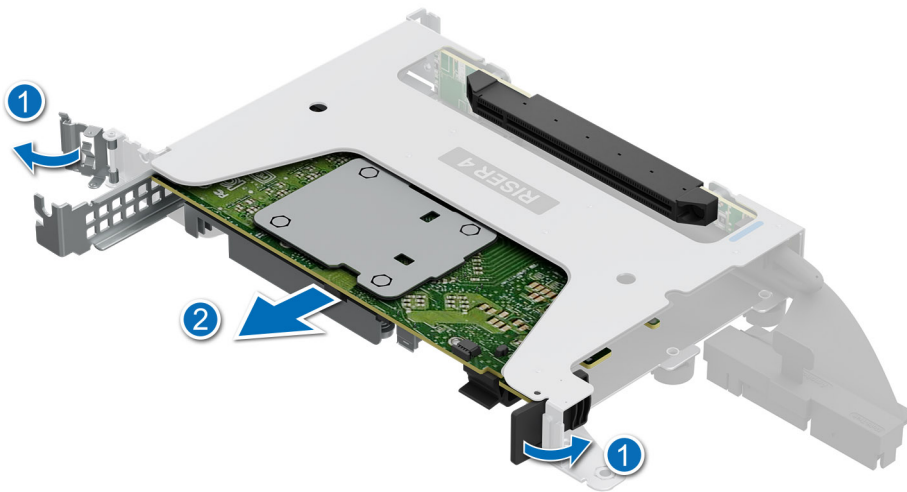
- a. Pull and lift the expansion card retention latch lock to open.

**NOTE:** If a low-profile card is installed, the LP GPU blank will be installed on the riser wall to secure the card properly and should be removed from the wall before removing the expansion card.



**Figure 131. Removing GPU blank from the rear expansion card riser 2q**

- b. Hold the expansion card by its edges and pull the card until the card edge connector disengages from the expansion card connector on the riser.



**Figure 132. Removing expansion card from the rear expansion card riser 4b**

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

- a. Tilt and open the retention latches on both ends of the riser.

**NOTE:** If a low-profile GPU is installed, GPU blank will be installed.

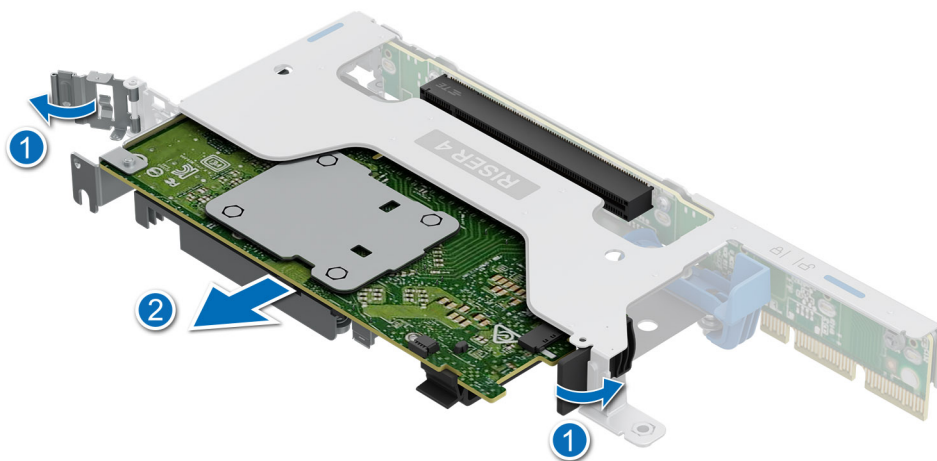
- b. Hold the expansion card by its edges and pull the card until the card edge connector disengages from the expansion card connector on the riser.

3. For Riser 4a:

- a. Pull and lift up the expansion card retention latch lock to open at both the ends.

- b. Hold the expansion card by its edges and pull the card until the card edge connector disengages from the expansion card connector on the riser.

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

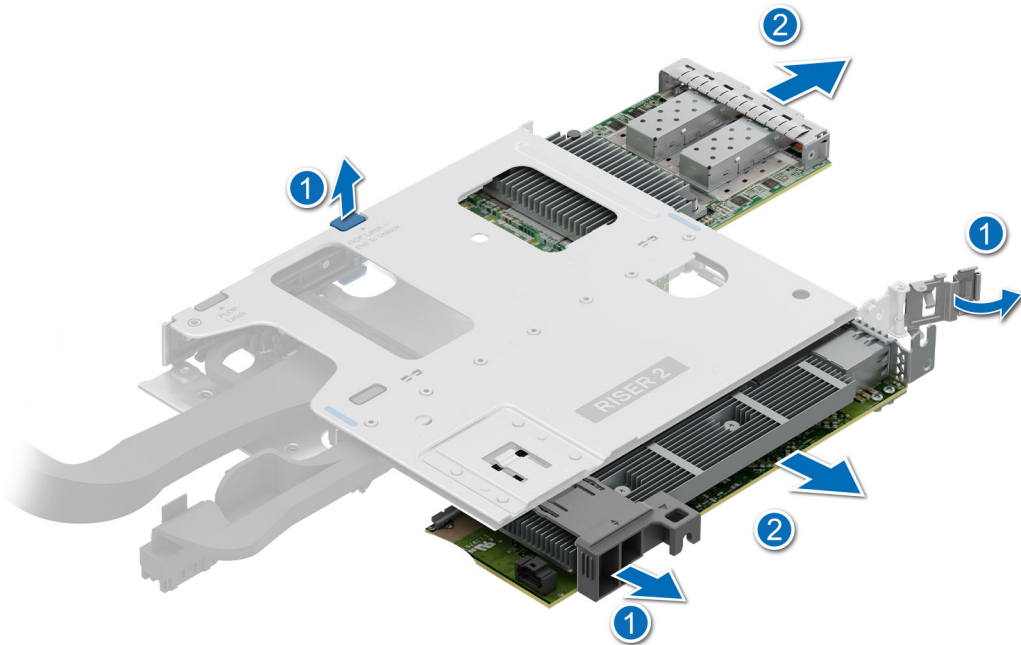


**Figure 133. Removing expansion card from the rear expansion card riser 4a**

4. For riser 2v or 2k:

- a. To remove the expansion card, pull and open the retention latch lock to open. Hold the expansion card by its edges and pull the card until the card edge connector disengages from the expansion card connector on the riser.
- b. To remove the OCP NIC card, pull the blue latch to disengage the OCP NIC card. Pull the OCP NIC card away from the system.

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



**Figure 134. Removing an expansion card from the rear expansion card riser 2v or 2k**

5. If the expansion card is not going to be replaced on risers, install a PCIe blank and close the card holder on both ends of the riser.

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



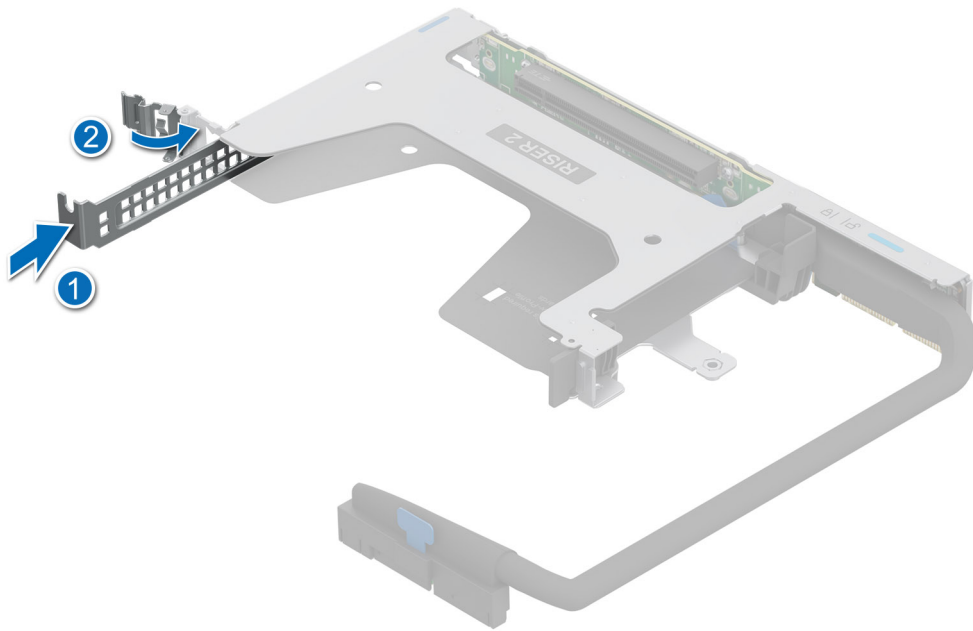


Figure 135. Installing the PCIe blank for riser 2q

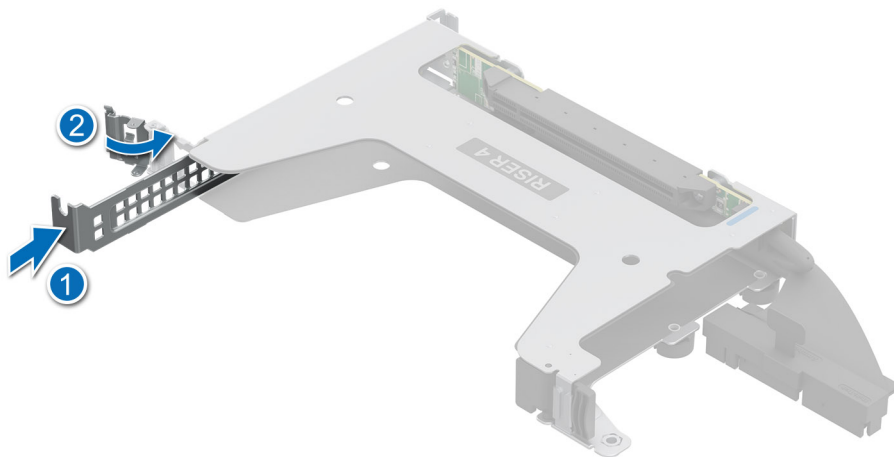
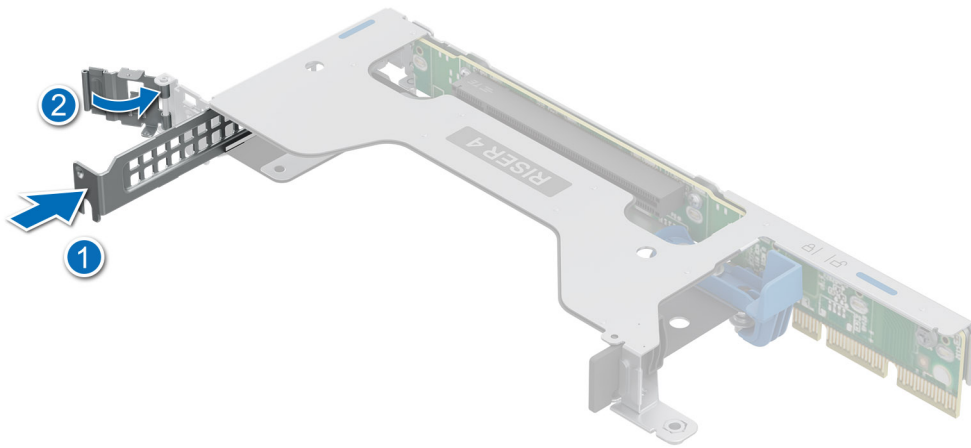
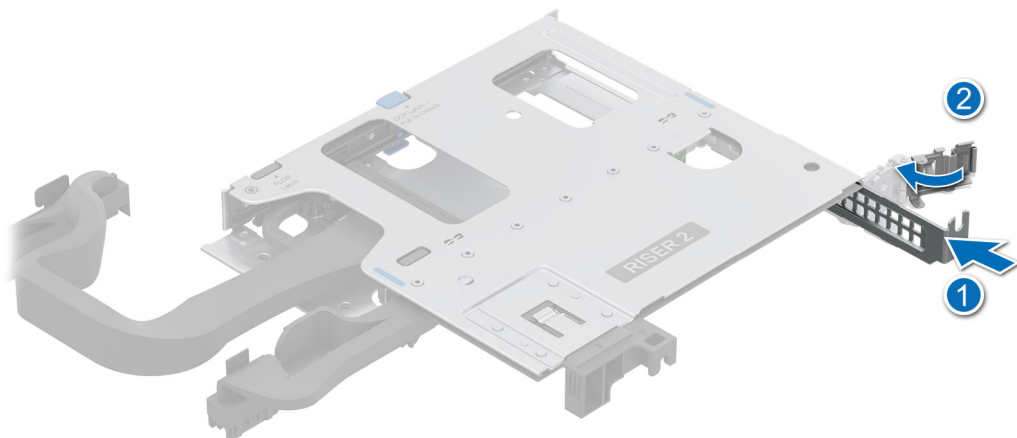


Figure 136. Installing the PCIe blank for riser 4b



**Figure 137. Installing the PCIe blank for riser 4a**



**Figure 138. Installing the PCIe blank for riser 2v or 2k**

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

### Next steps

If applicable, [install an expansion card into the expansion card riser](#).

## Installing an expansion card into the expansion card riser

### 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 system cover
4. remove the rear expansion card riser.
5. If installing a new expansion card, unpack it and prepare the card for installation.

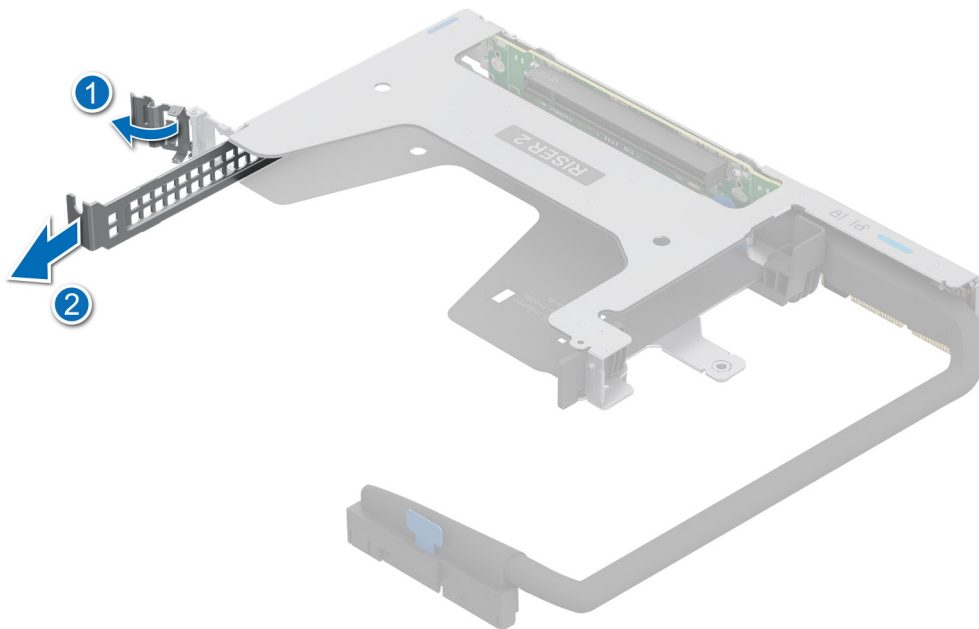
**i NOTE:** For instructions, see the documentation accompanying the card.

**⚠ 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.

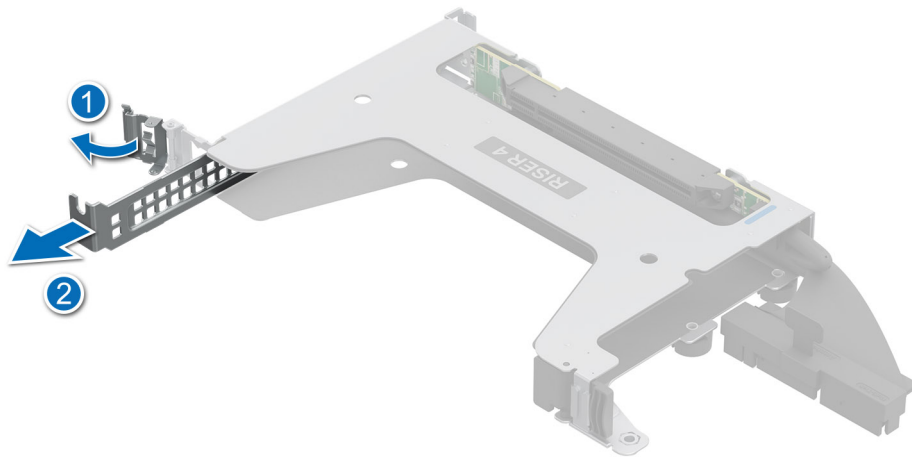
#### Steps

1. Pull and lift up the expansion card retention latch lock to open.
2. If installed, remove the PCIe blank from the risers.

**i NOTE:** Store the PCIe blank for future use. PCIe blank must be installed in empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The blank also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

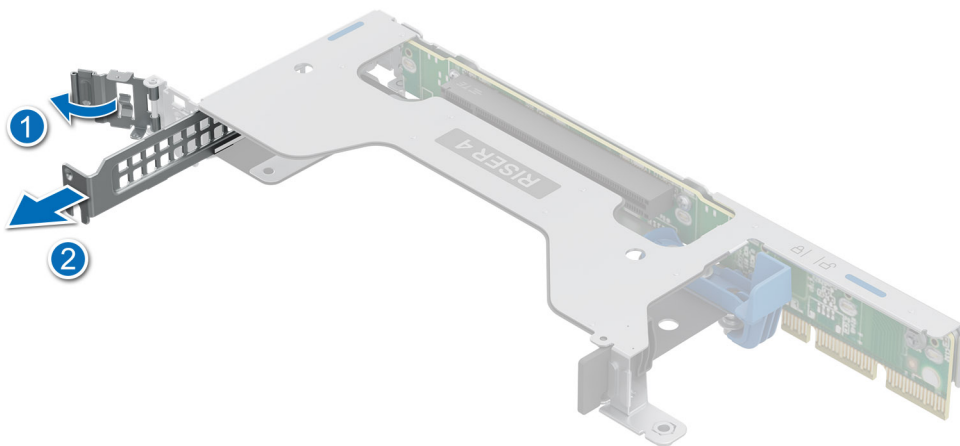


**Figure 139. Removing the PCIe blank for the riser 2q**



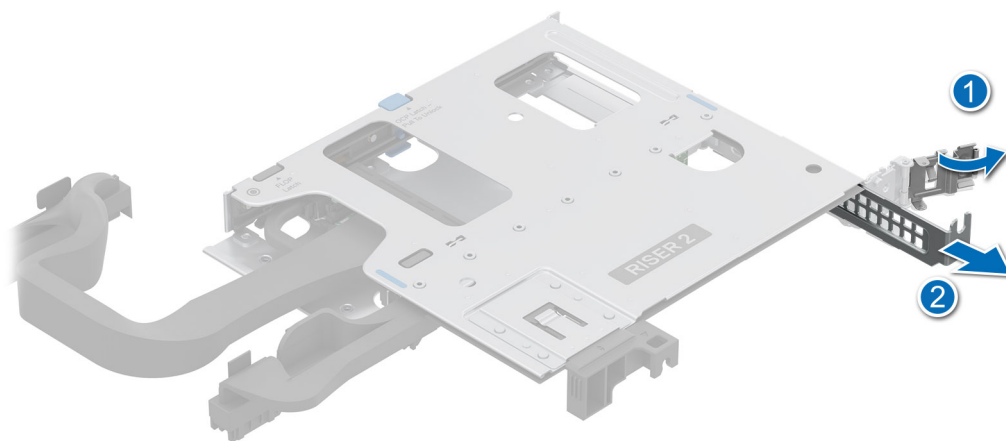
**Figure 140. Removing the PCIe blank for the riser 4b**

Open the retention latch and remove the PCIe blank..



**Figure 141. Removing the PCIe blank for the riser 4a**

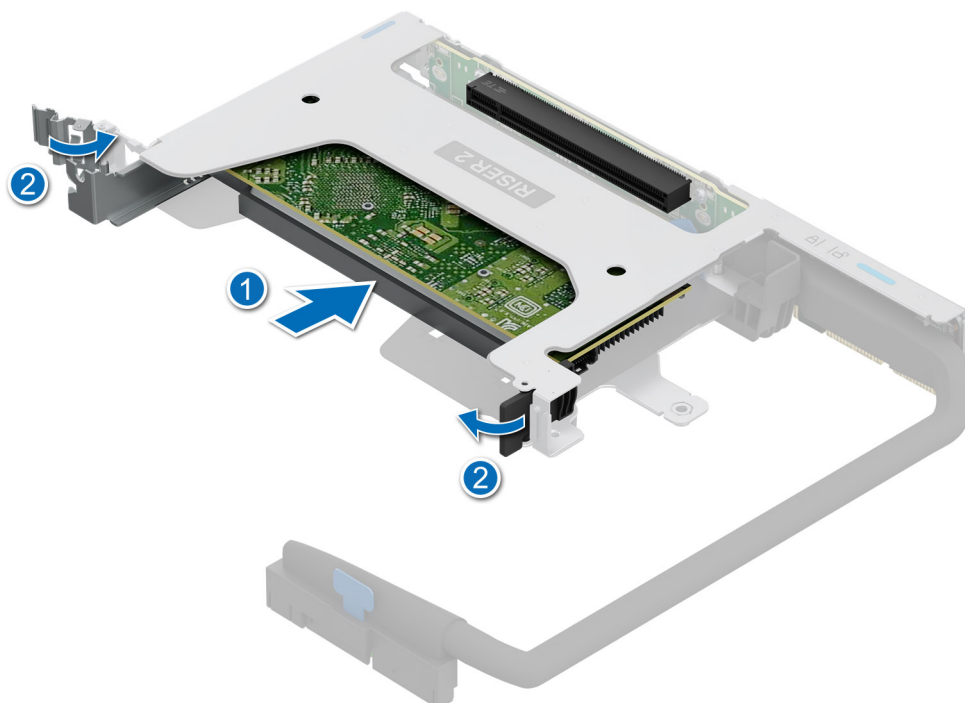
Open the retention latch and remove the PCIe blank..



**Figure 142. Removing the PCIe blank for the riser 2v or 2k**

Open the retention latch and remove the PCIe blank..

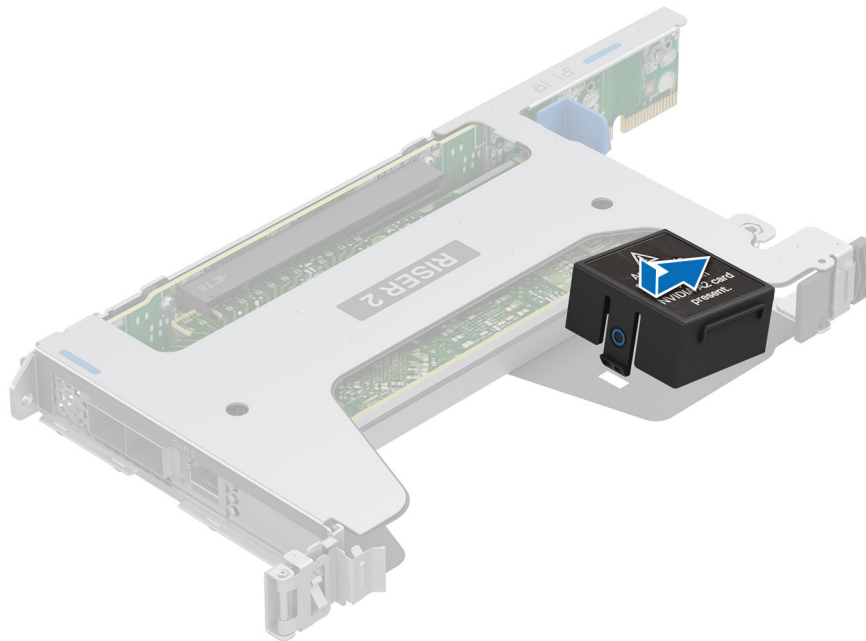
3. For riser 2q:
  - a. Hold the card by the edges, and align the card edge connector with the expansion card connector on the riser.
  - b. Insert the card edge connector firmly into the expansion card connector until the card is fully seated.
  - c. Align and slide the card holder guides into the slots on the riser until seated.
  - d. Close the expansion card retention latch on both ends of the riser.



**Figure 143. Installing an expansion card into the riser 2q**

- e. If installing a Low Profile card, align the LP GPU blank on the Riser 2b wall and ensure the blank hook is securely fixed in place.

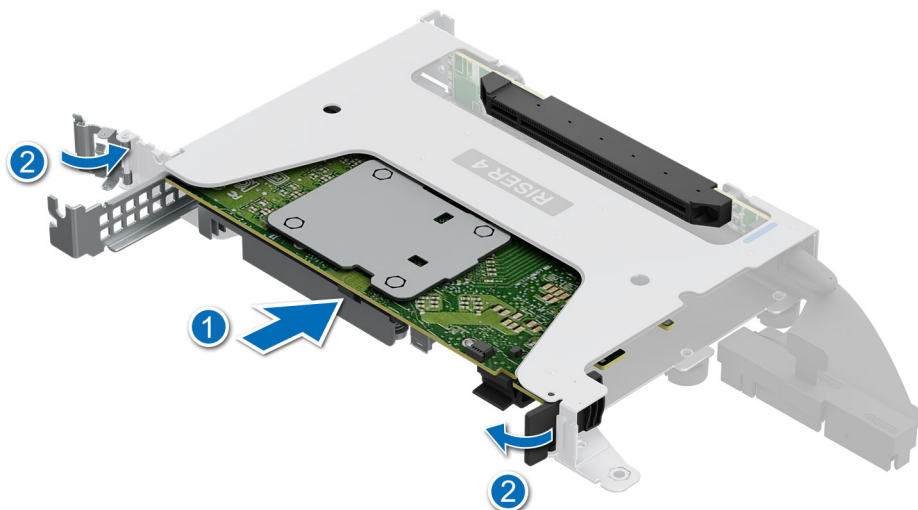
**NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.



**Figure 144. Installing GPU blank on the rear expansion card riser 2q**

4. For riser 4b:
  - a. Hold the card by the edges, and align the card edge connector with the expansion card connector on the riser.
  - b. Insert the card edge connector firmly into the expansion card connector until the card is fully seated.
  - c. Align and slide the card holder guides into the slots on the riser until seated.
  - d. Close the expansion card retention latch on both ends of the riser.

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

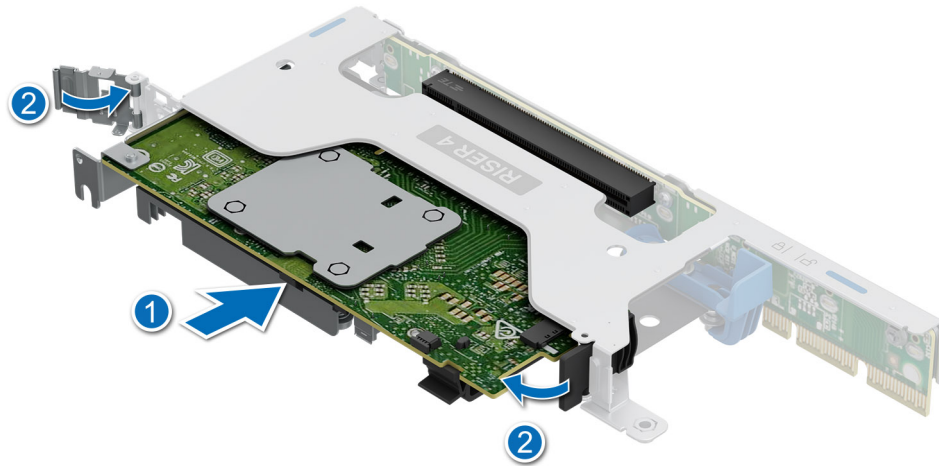


**Figure 145. Installing an expansion card into the riser 4b**

5. For riser 4a:

- a. Hold the card by the edges, and align the card edge connector with the expansion card connector on the riser.
- b. Insert the card edge connector firmly into the expansion card connector until the card is fully seated.
- c. Align and slide the card holder guides into the slots on the riser until seated.
- d. Close the expansion card retention latch on both ends of the riser.

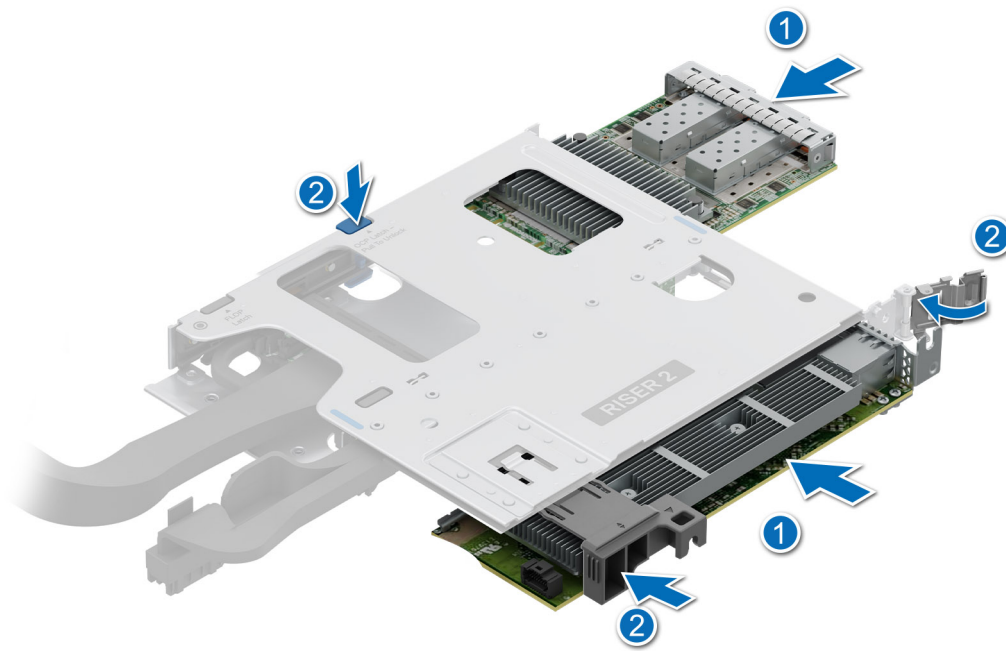
**NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.



**Figure 146. Installing an expansion card into the riser 4a**

6. For riser 2v or 2k
  - a. To install the expansion card, hold the card by the edges, and align the card edge connector with the expansion card connector on the riser. Insert the card edge connector firmly into the expansion card connector until the card is fully seated. Align and slide the card holder guides into the slots on the riser until seated. Close the expansion card retention latches on the riser.
  - b. To install the OCP, align and insert the OCP NIC card into the the system. Push until the OCP NIC card is connected to the connector on the riser. Press the blue release to lock the OCP into the riser.

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



**Figure 147. Installing an expansion card into the riser 2v or 2k**

#### Next steps

1. If applicable, connect the cables to the expansion card.
2. [install the rear expansion card riser](#).
3. [Replace the system cover](#).
4. Follow the procedure listed in the [After working inside your system](#).
5. Install any device drivers required for the card as described in the documentation for the card.

## Removing the rear expansion card riser blank

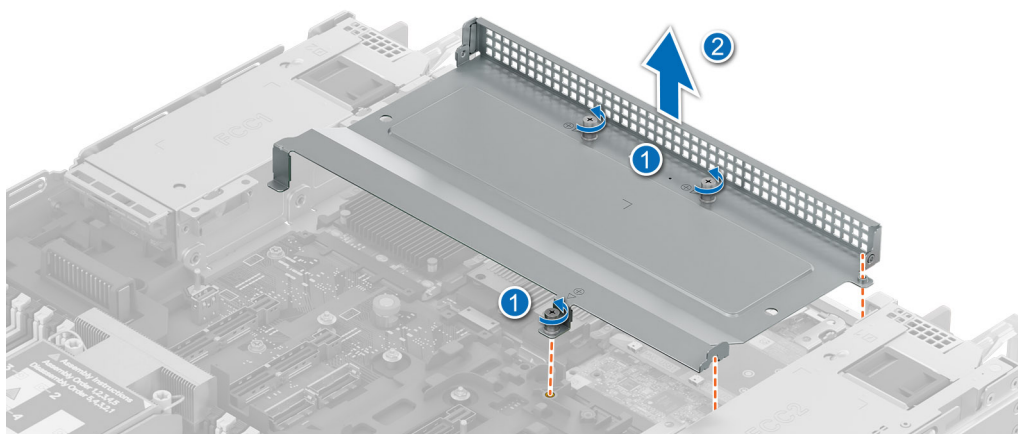
#### Prerequisites

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 system cover](#).

#### Steps

Using Phillips 2 screwdriver, loosen the 3 thumb screws securing the riser blank, then lift it up and away from the HPM board.





**Figure 148. Removing the rear expansion card riser blank**

### Next steps

1. [Replace the rear expansion card risers](#)
2. [Replace the system cover.](#)

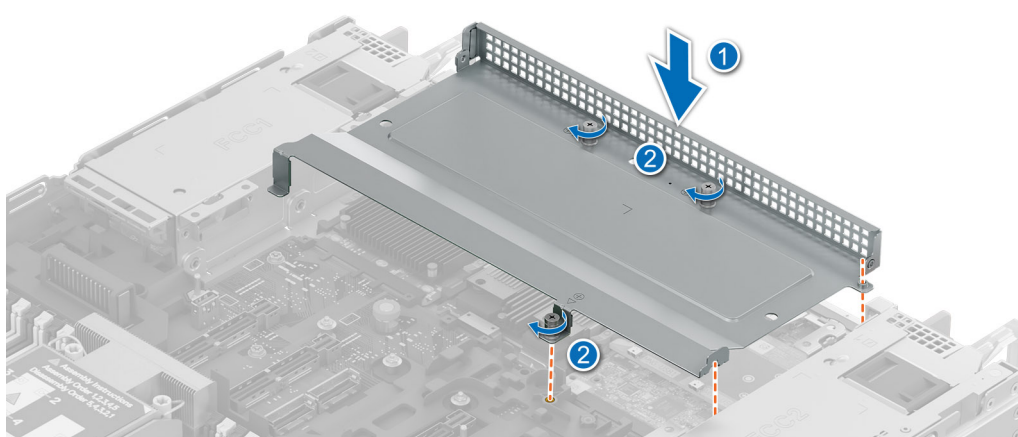
## Installing the rear expansion card riser blank

### 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 system cover.](#)

### Steps

Align the riser blank with the blank alignment guide pin and T-pin, then use a Phillips 2 screwdriver to fasten the 3 thumb screws.



**Figure 149. Installing the rear expansion card riser blank**

### Next steps

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

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

## M.2 SSD module

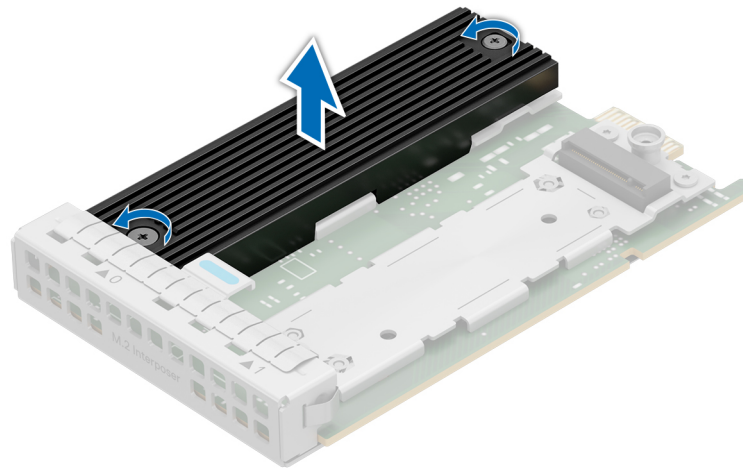
### Removing the M.2 NVMe SSD module from the M.2 Interposer board

#### 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 M.2 Interposer board .](#)

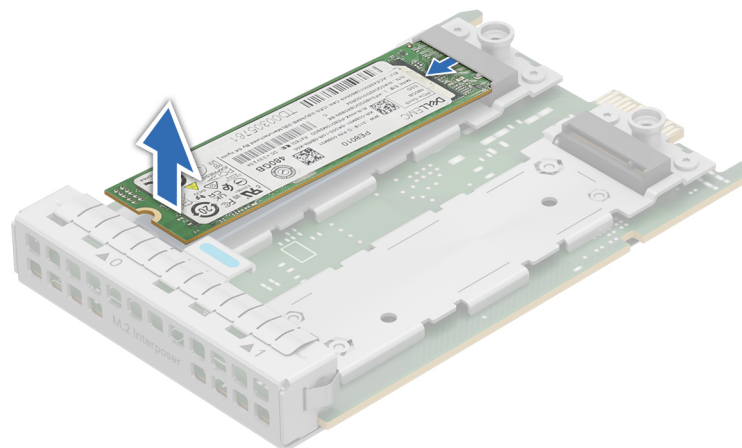
#### Steps

1. Using the Phillips 1 screwdriver, loosen the captive screws securing the top cover of the M.2 Interposer board. Tilt the top cover from the side and lift the top cover out of the M.2 Interposer board.



**Figure 150. Loosen the top cover captive screws**

2. Lift the M.2 NVMe SSD module to disconnect from the M.2 Interposer board.



**Figure 151. Removing the M.2 NVMe SSD from the board**

### Next steps

1. [Replace the M.2 NVMe SSD module in the M.2 Interposer board.](#)

## Installing the M.2 NVMe SSD module in the M.2 Interposer board

### 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 M.2 Interposer board](#) .

### Steps

1. Remove the thermal pads on the top cover and bottom cover of the M.2 Interposer board, when replacing the M.2 NVMe SSD module in the M.2 Interposer board.

**NOTE:** The thermal pad that has been removed cannot be reused for installing the M.2 NVMe SSD module. You must use new thermal pads for the installation.

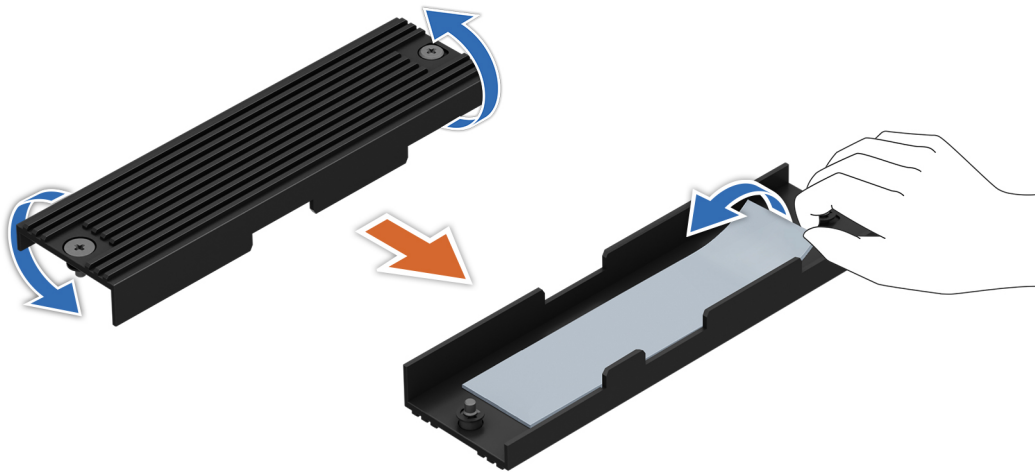


Figure 152. Removing the thermal pad from the top cover

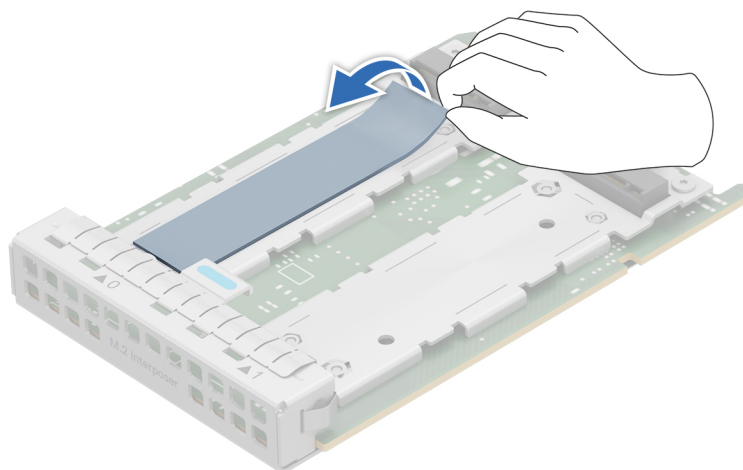


Figure 153. Removing the thermal pad from the board from the slot0

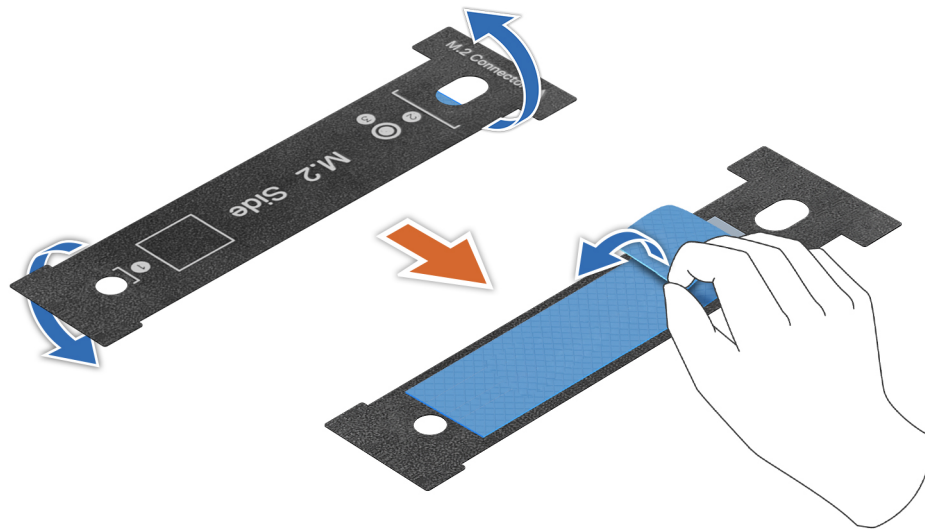


Figure 154. Removing the blue film from the new thermal pad

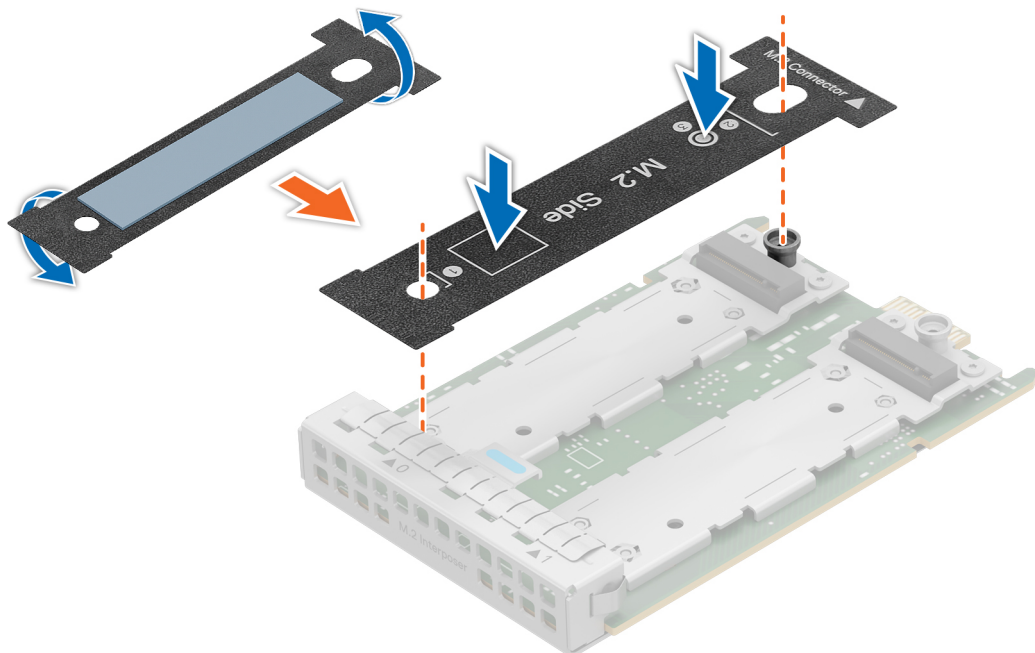
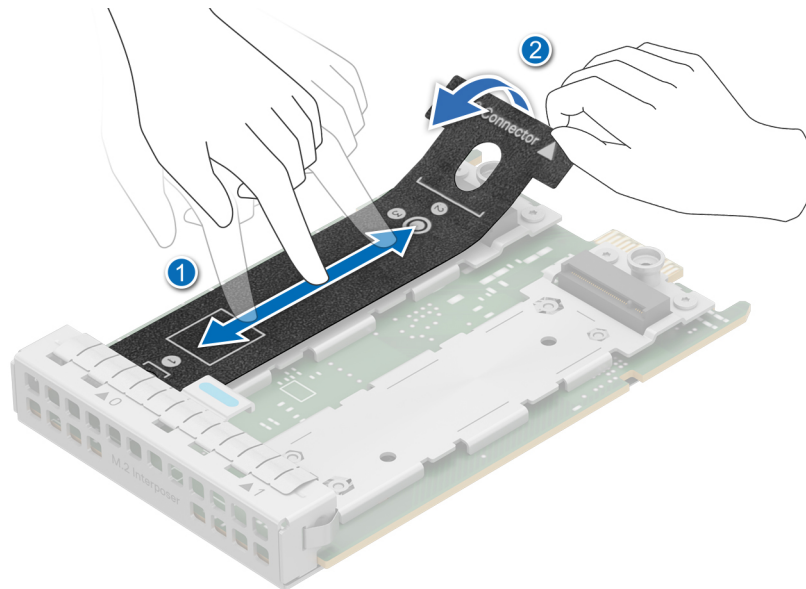


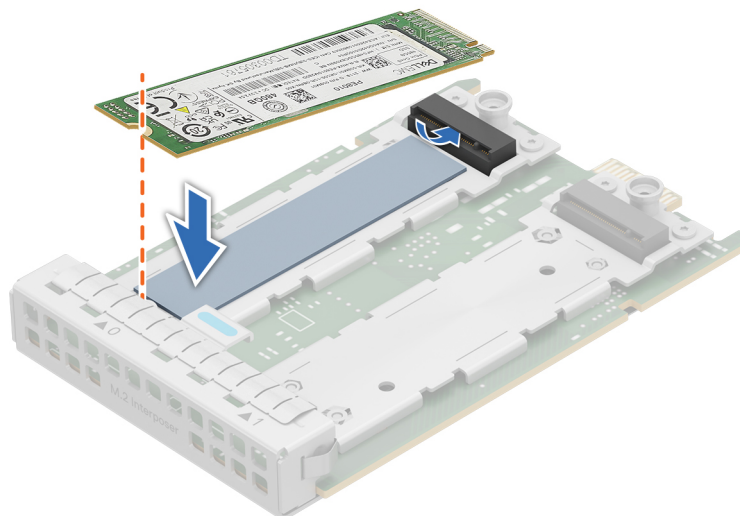
Figure 155. Flipping and installing the new thermal pad on the board



**Figure 156. Pasting the new thermal pad on the board and removing the black mylar**

2. Align the M.2 NVMe SSD module at an angle with the M.2 Interposer board.
3. Insert the M.2 NVMe SSD module until it is firmly seated in the M.2 Interposer board.

**NOTE:** Press the M.2 NVMe SSD module until it adheres to the thermal pad.



**Figure 157. Installing the new M.2 NVMe SSD module**

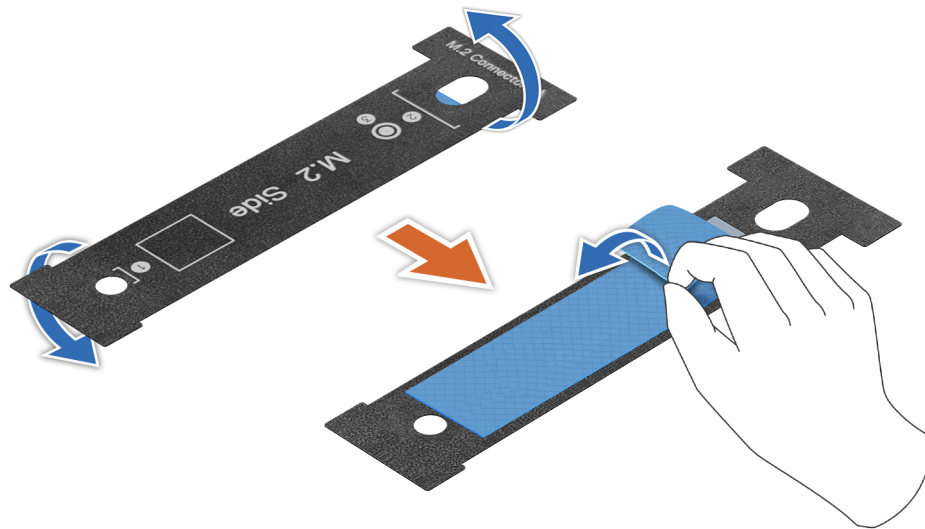


Figure 158. Removing the blue film from another thermal pad

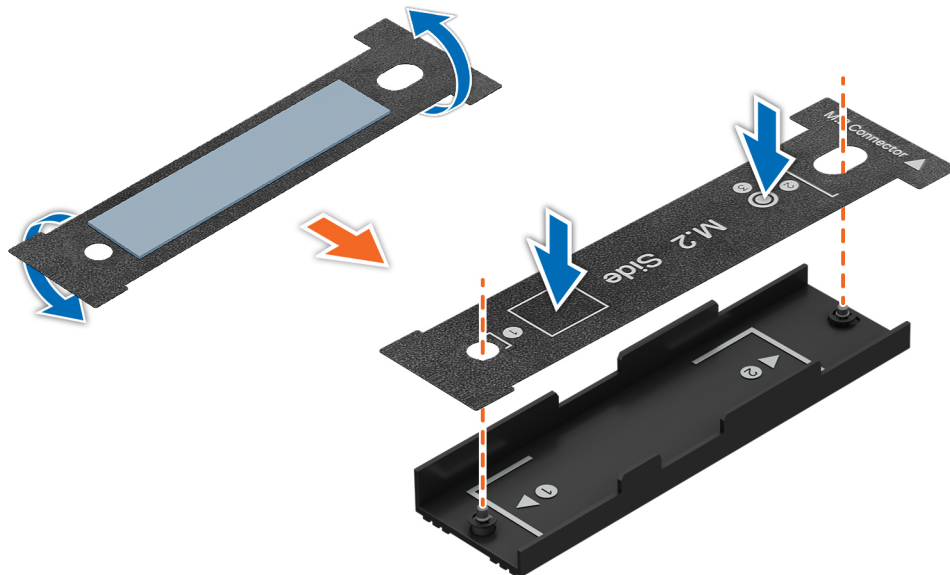
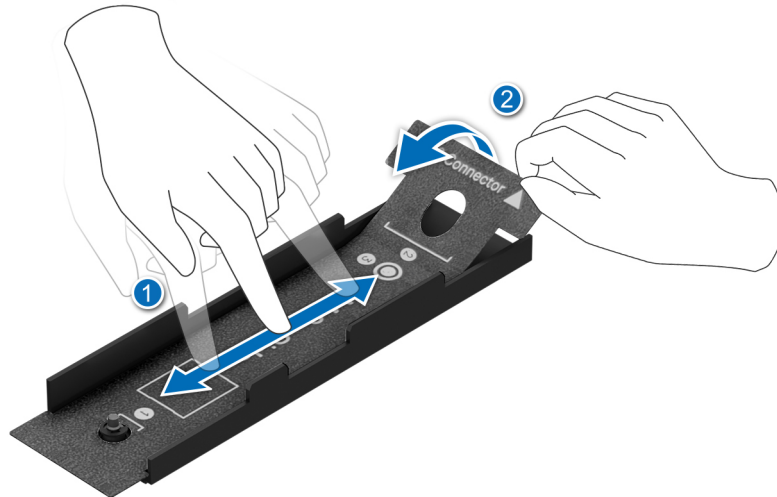


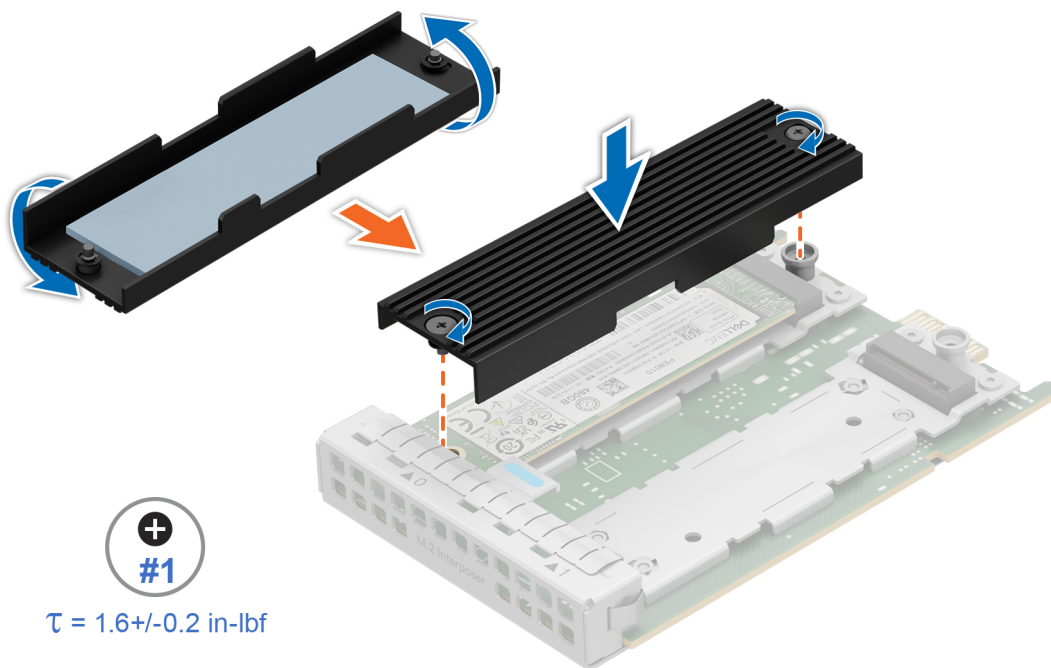
Figure 159. Installing the new thermal pad inside the top cover





**Figure 160. Pasting the new thermal pad inside the top cover and removing the black mylar from the thermal pad**

4. Flip the top cover and install it on the M.2 Interposer board. Using the Phillips 1 screwdriver, tighten the captive screws on the M.2 Interposer board top cover.



**Figure 161. Installing the top cover**

## Removing the M.2 NVMe SSD module

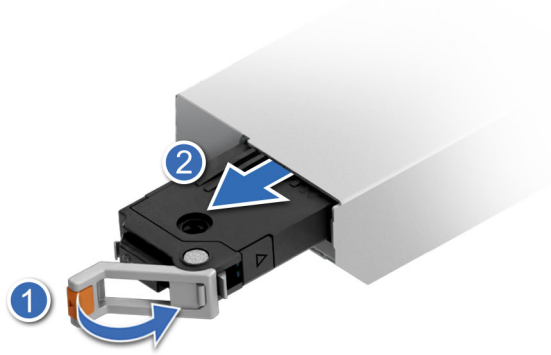
### Prerequisites

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

## Steps

1. Pull and lift the BOSS-N1 card carrier retention latch lock to open.

2. Slide the BOSS-N1 card carrier out.



**Figure 162. Removing the BOSS-N1 card carrier**

3. Using the Phillips 1 screwdriver, loosen the captive screws securing the top cover of the BOSS-N1 card carrier.

**NOTE:** Follow the sequence to loosen the captive screws. First, loosen the screw at the connector end, and then the screw at the front handle end.



**Figure 163. Loosen the top cover captive screws**

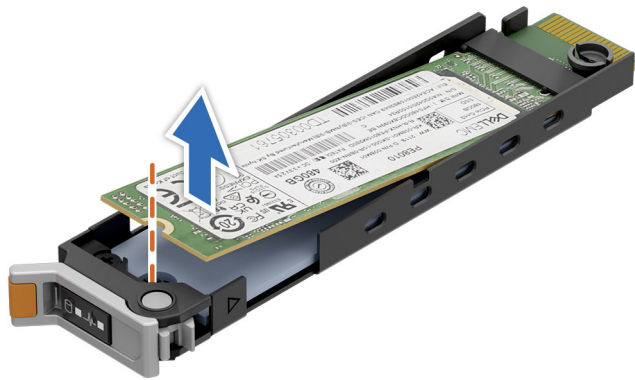
4. Tilt the top cover from the side and lift the top cover out of the BOSS-N1 card carrier.



**Figure 164. Removing the top cover**



5. Lift the M.2 NVMe SSD module to disconnect from the BOSS-N1 card carrier connector.



**Figure 165. Removing the M.2 NVMe SSD module**

**NOTE:** For information about Thermal pad and BOSS-N1 card carrier replacement, go to [PowerEdge Manuals > Rack Servers > PowerEdge R470 > Select This Product > Documentation > Manuals and Documents > BOSS-N1 DC-MHS M.2 NVMe SSD Card Installation and Replacement Tech Sheet](#).

#### Next steps

1. [Replace the M.2 NVMe SSD module.](#)

## Installing the M.2 NVMe SSD module

#### Prerequisites

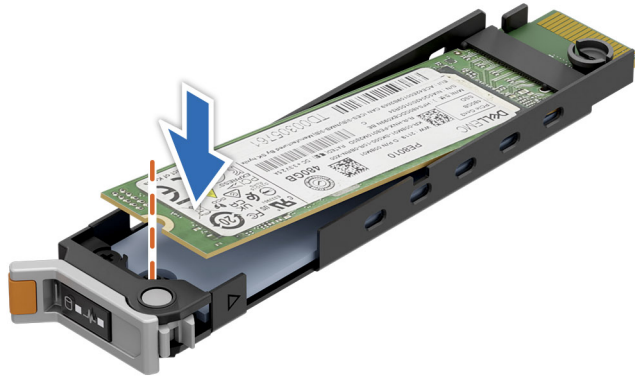
1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. Replace the thermal pads on the top and bottom cover of the BOSS-N1 card carrier, when replacing the M.2 NVMe SSD module.

**NOTE:** For information about Thermal pad and BOSS-N1 card carrier replacement, go to [PowerEdge Manuals > Rack Servers > PowerEdge R470 > Select This Product > Documentation > Manuals and Documents > BOSS-N1 DC-MHS M.2 NVMe SSD Card Installation and Replacement Tech Sheet](#).

#### Steps

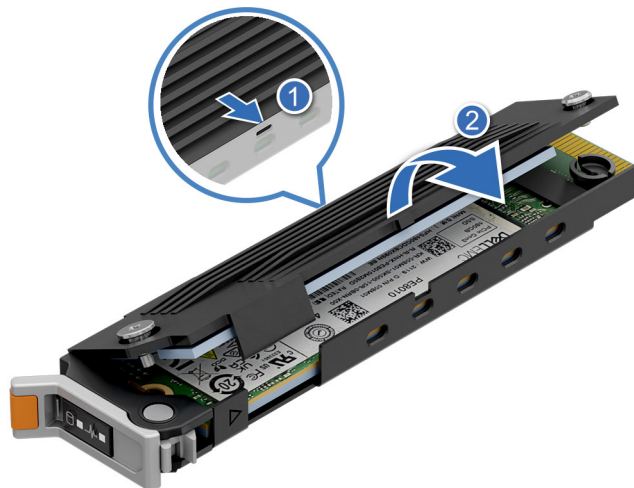
1. Align the M.2 NVMe SSD module at an angle with the BOSS-N1 card carrier connector.
2. Insert the M.2 NVMe SSD module until it is firmly seated in the BOSS-N1 card carrier connector.

**NOTE:** Press the M.2 NVMe SSD card until it adheres to the thermal pad.



**Figure 166. Installing the M.2 NVMe SSD module**

3. Align at an angle, place the top cover hook into the slot on the bottom cover of the BOSS-N1 card carrier.
4. Press the opposite side of the top cover until firmly seated.



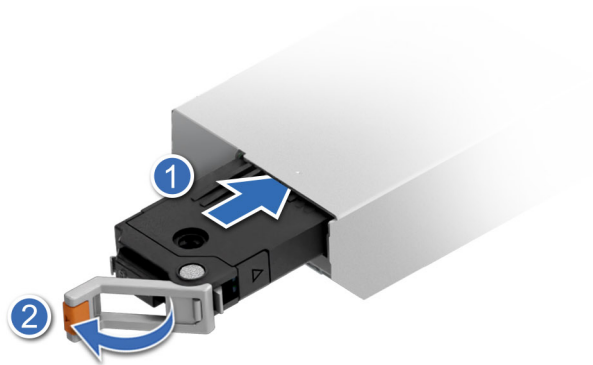
**Figure 167. Installing the top cover**

5. Using the Phillips 1 screwdriver, tighten the captive screws on the BOSS-N1 card carrier top cover.
- NOTE:** Follow the sequence to tighten the captive screws. First, tighten the screw available at the front handle end, and then the screw at the connector end.



**Figure 168. Tighten the top cover captive screws**

6. Slide the BOSS-N1 card carrier into the BOSS-N1 module slot.
7. Close the BOSS-N1 card carrier release latch to lock the carrier in place.



**Figure 169. Installing the BOSS-N1 card carrier**

## Optional M.2 Interposer board

This is a service technician replaceable part only.

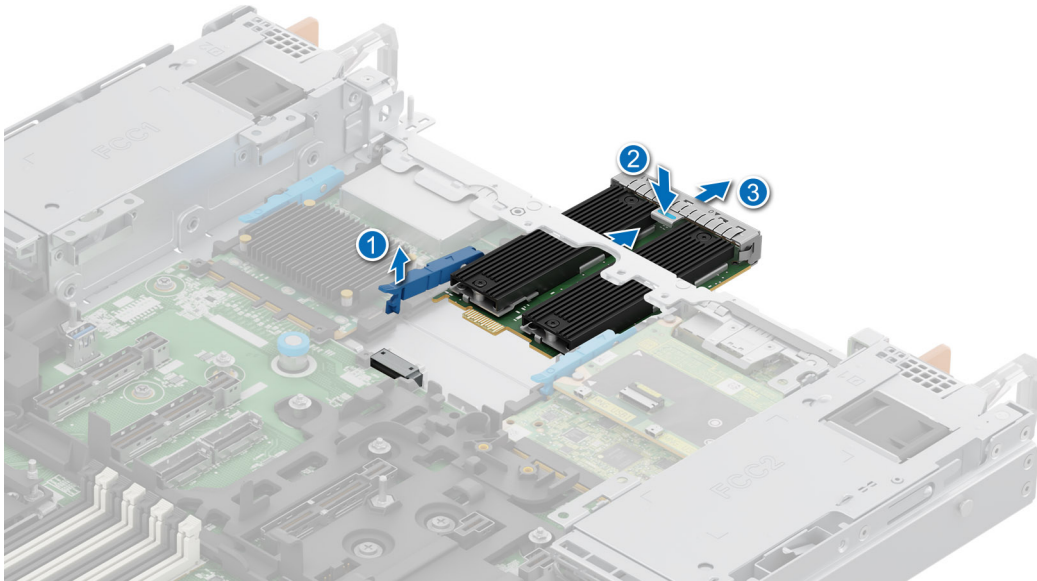
### Removing the M.2 Interposer board

#### 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 rear expansion card riser](#) or [remove the rear expansion card riser blanks](#).

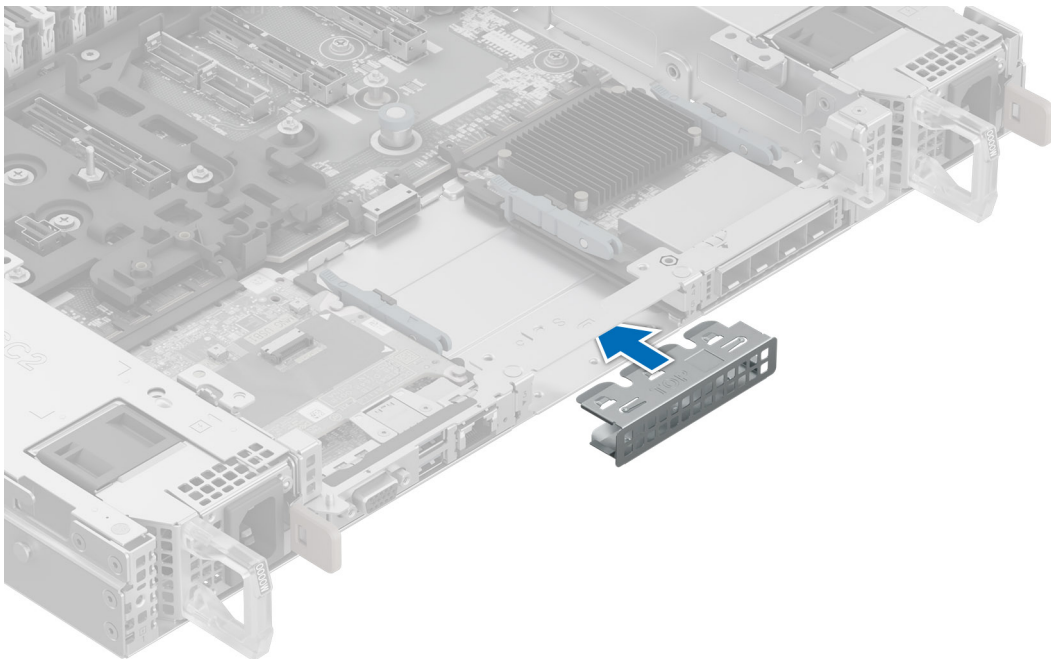
#### Steps

1. Open the blue latch to disengage the M.2 Interposer board.
2. Press and hold the push point on the card to push the M.2 Interposer board towards the rear of the system, disconnecting it from the connector on the HPM board.
3. Slide the M.2 Interposer board out of the slot on the system.



**Figure 170. Removing the M.2 Interposer board**

4. If you do not plan to replace the M.2 Interposer board, install a filler bracket.



**Figure 171. Installation of filler bracket**

#### Next steps

- Remove the M.2 NVMe SSD module from the M.2 Interposer board.

**NOTE:** If a new M.2 Interposer board is being installed, the M.2 NVMe SSD modules must be removed from the existing M.2 Interposer board and added to the new board.

- Replace the the M.2 Interposer board

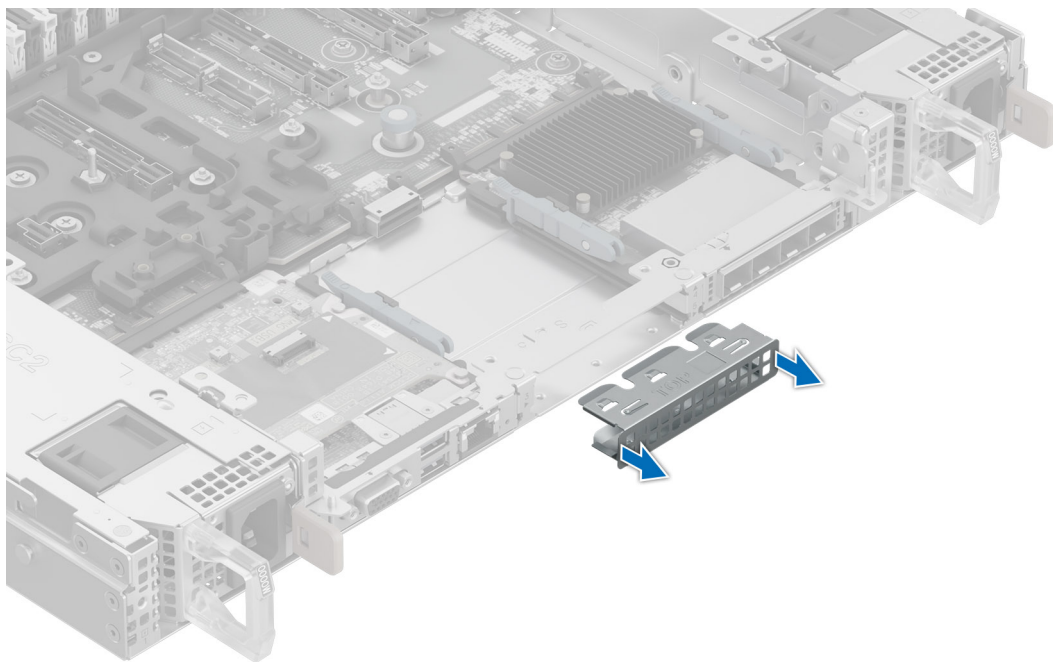
# Installing the M.2 Interposer board

## 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 rear expansion card riser](#) or [remove the rear expansion card riser blanks](#).
- NOTE:** If a new M.2 Interposer board is being installed, the M.2 NVMe SSD modules must be removed from the existing M.2 Interposer board and added to the new board.

## Steps

1. If installed, remove the filler bracket.
- NOTE:** Store the filler bracket for future use. Filler brackets must be installed in empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.



**Figure 172. Removal of filler bracket**

2. Remove the thermal pads from the top cover and from the bottom of the M.2 Interposer board, when replacing the M.2 Interposer board.

**CAUTION:** If you are not using the slot 1, peel off the protective film and the thermal pad on the slot 1.

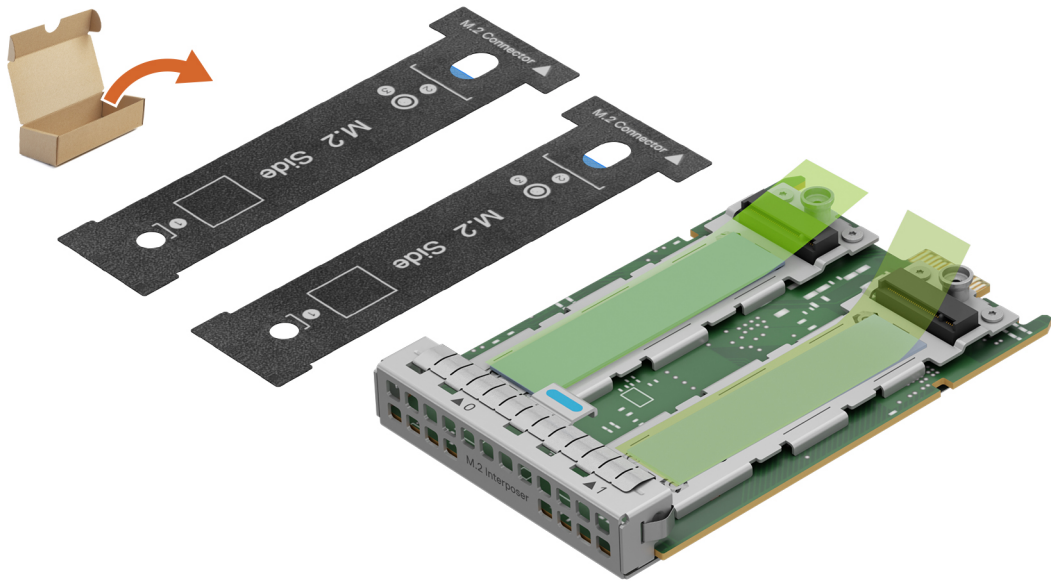


Figure 173. Kit contents

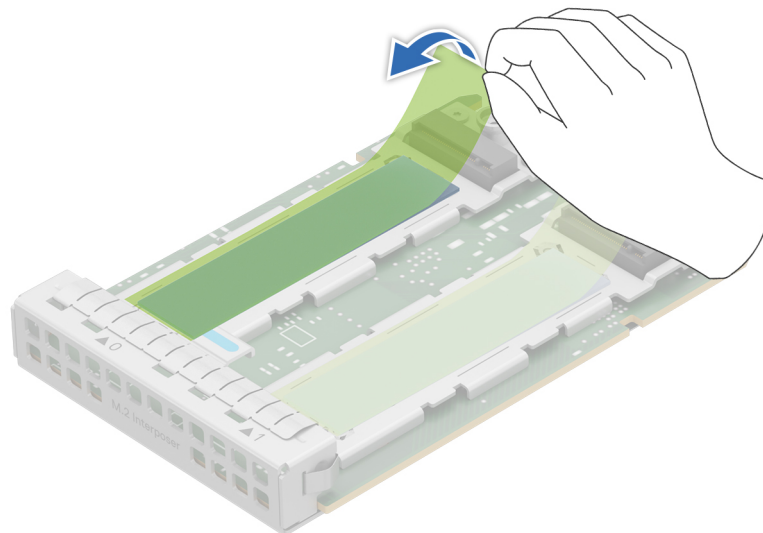


Figure 174. Removing the protective film from the thermal pad



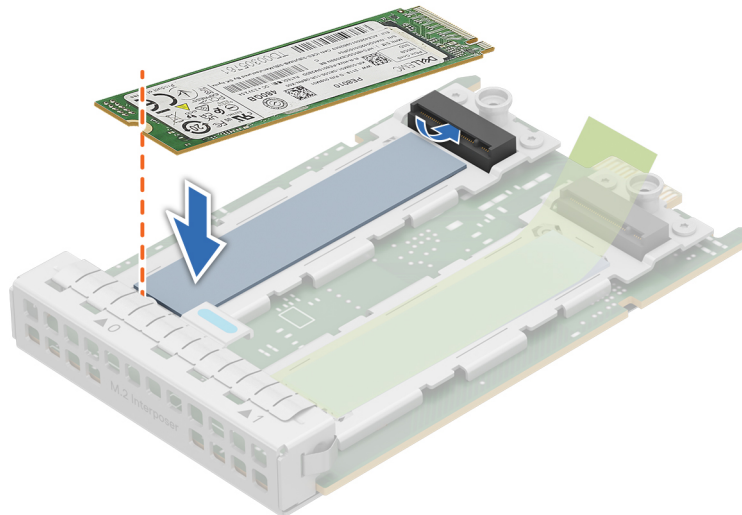


Figure 175. Installing the SSD

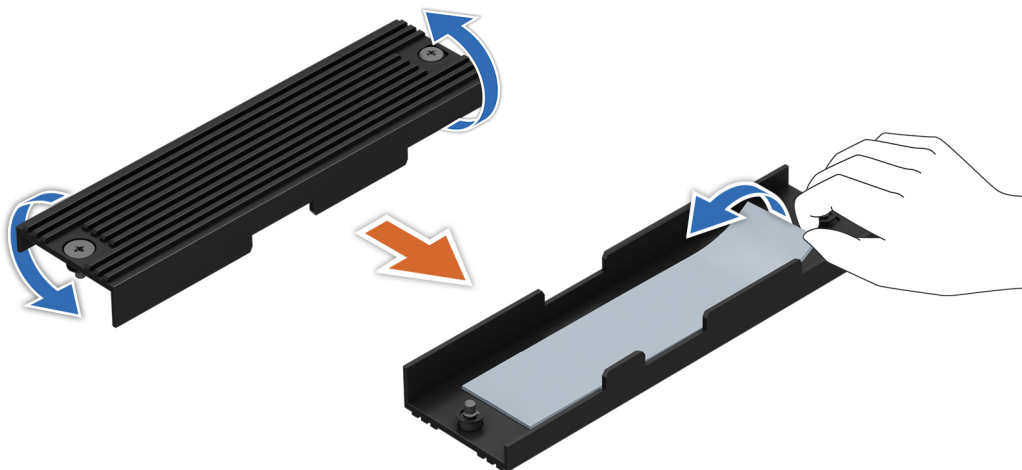


Figure 176. Flipping the top cover and removing the thermal pad from the top cover

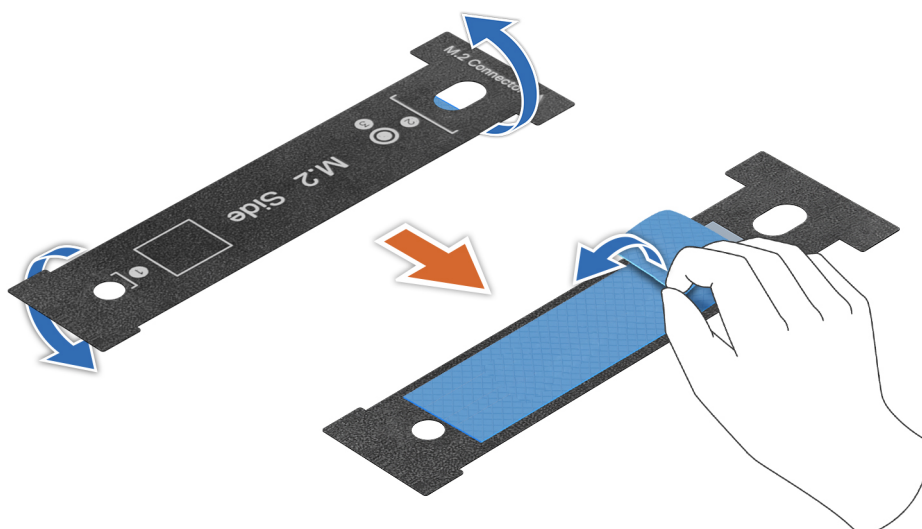


Figure 177. Removing the blue film from the new thermal pad

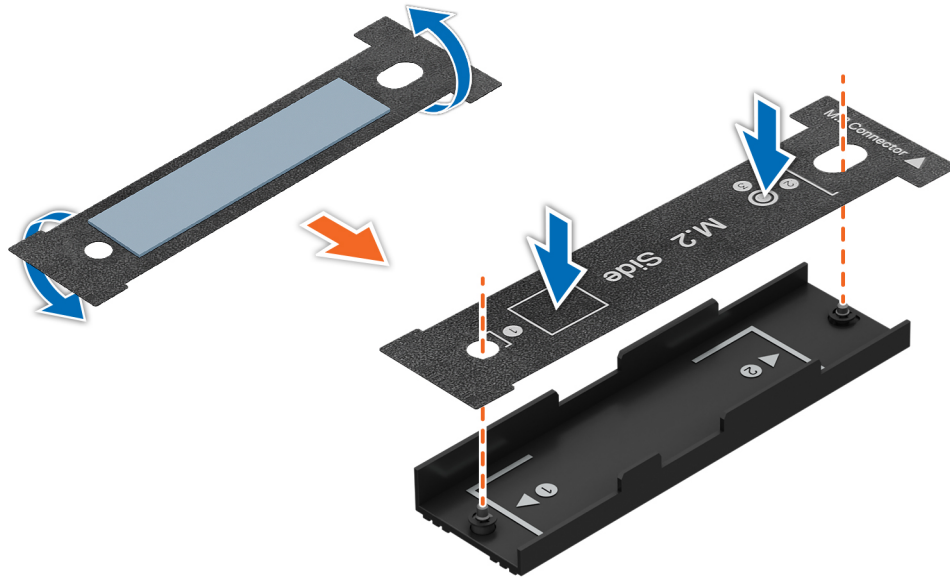


Figure 178. Installing the new thermal pad inside the top cover

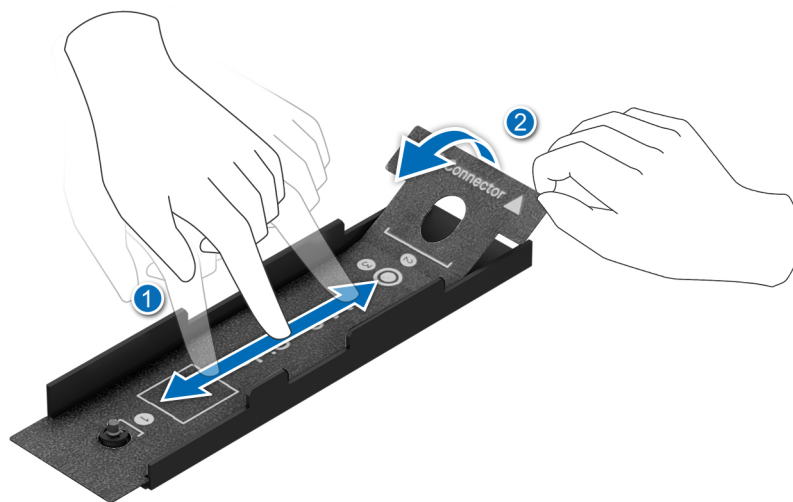
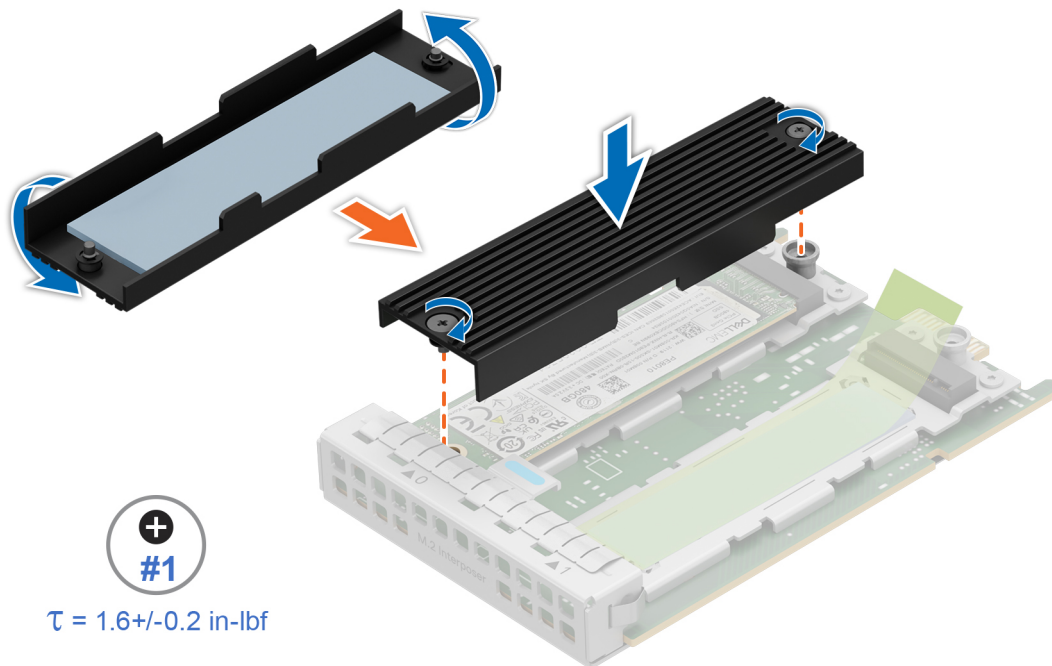


Figure 179. Pasting the new thermal pad inside the top cover and removing the black mylar

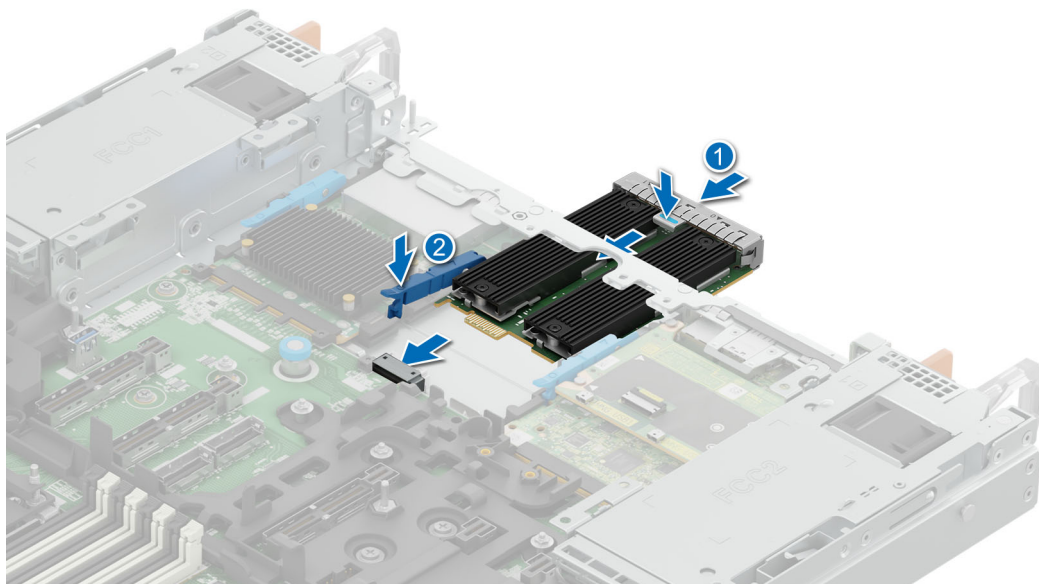




**Figure 180. Installing the top cover on the M.2 Interposer board**

3. Open the blue latch on the system board.
4. Slide the M.2 Interposer board into the slot in the system.
5. Push until the M.2 Interposer board is connected to the connector on the system board.
6. Close the blue latch to lock the M.2 Interposer board to the system.

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



**Figure 181. Installing the M.2 Interposer board**

#### Next steps

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

# Optional BOSS-N1 DC-MHS module

This is a service technician replaceable part only.

## Removing the BOSS-N1 DC-MHS card carrier blank

### Prerequisites

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

### Steps

Press and pull the BOSS-N1 DC-MHS card carrier blank out from the BOSS-N1 DC-MHS controller.



Figure 182. Removing the BOSS-N1 DC-MHS card carrier blank

### Next steps

1. [Replace the BOSS-N1 DC-MHS card carrier blank](#) or install BOSS-N1 DC-MHS card carrier.

## Installing the BOSS-N1 DC-MHS card carrier blank

### Prerequisites

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

### Steps

Align the blank with the BOSS-N1 DC-MHS controller bay and push it into the bay until it clicks into place.



Figure 183. Installing the BOSS-N1 DC-MHS card carrier blank

## Removing the front BOSS-N1 DC-MHS module

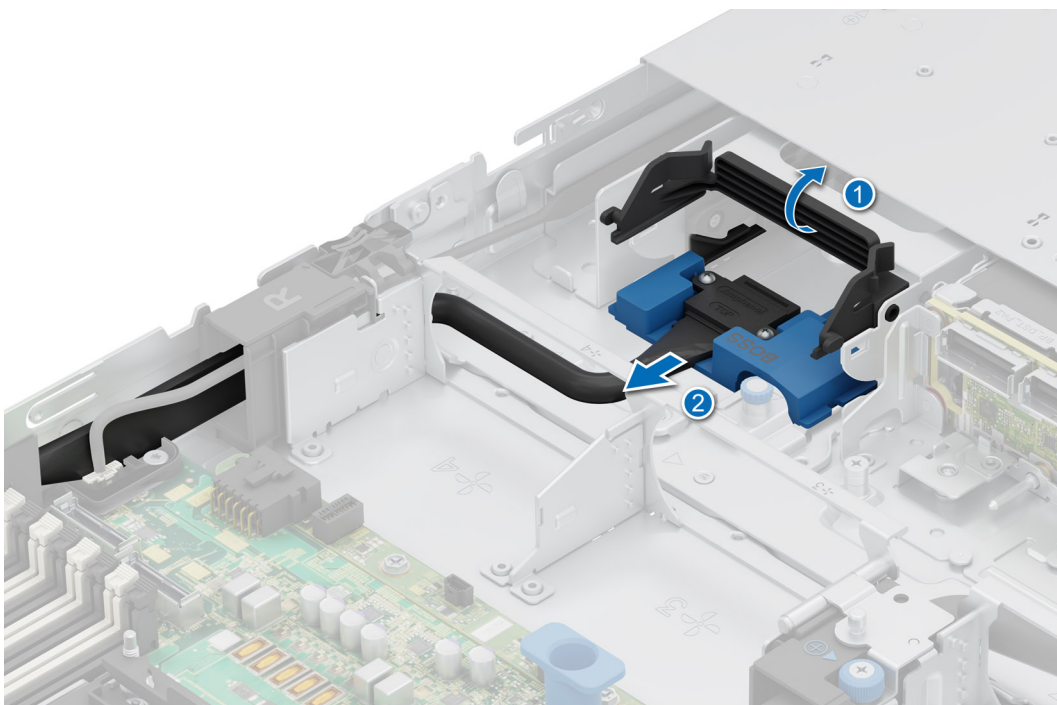
### Prerequisites

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 system cover](#).
4. [Remove the drive backplane cover](#).
5. Disconnect the cables from the HPM board, observe the cable routing.

 **NOTE:** See [cable routing](#) section for more information.

### Steps

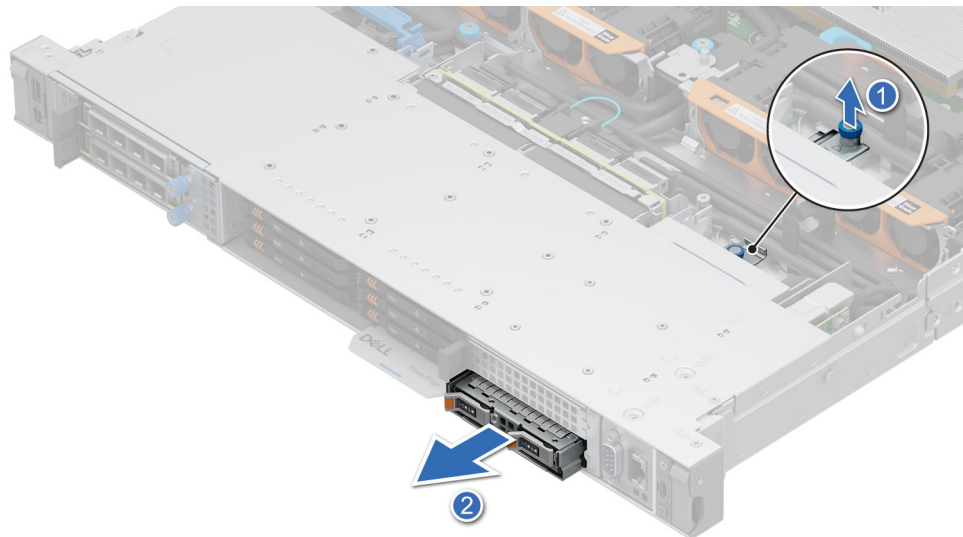
1. Press both ends of the cable holder and tilt the BOSS-N1 DC-MHS module cable holder. Disconnect the cable from the BOSS module.



**Figure 184. Removing an BOSS-N1 DC-MHS cable from the system**

2. Lift the plunger and slide the BOSS-N1 DC-MHS module tray out of the system.

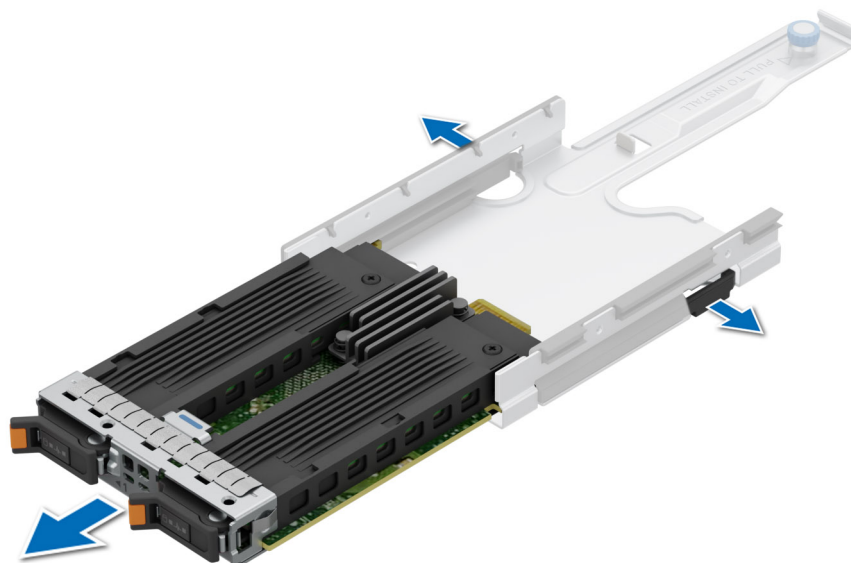
 **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.



**Figure 185. Removing an BOSS-N1 DC-MHS module tray from the system**

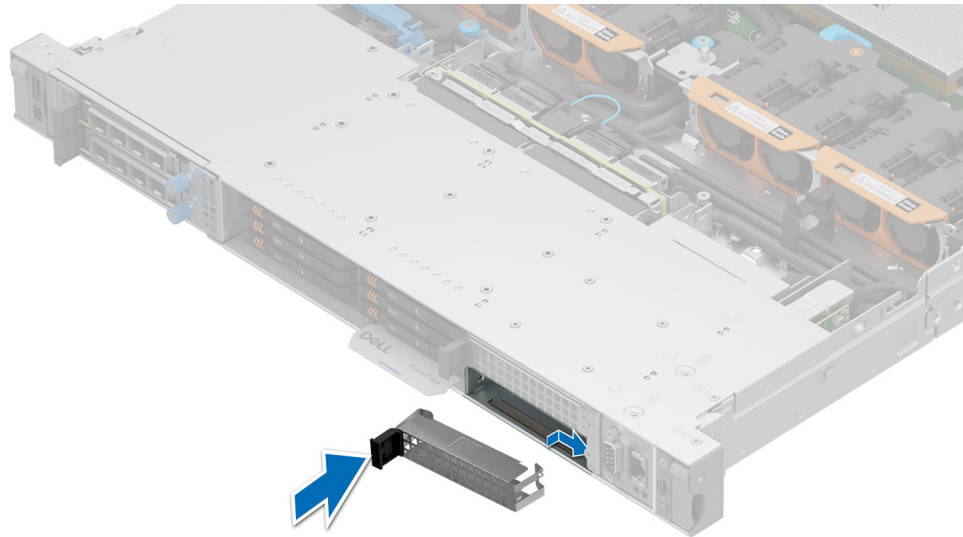
3. Disconnect the BOSS cable connector from the connectors on the HPM board.
4. Push the clips outward and slide out the BOSS-N1 DC-MHS module from the tray.

**NOTE:** For easier uninstallation, flip the entire module upside down to access both side clips.



**Figure 186. Removing an BOSS-N1 DC-MHS module from tray**

5. If the BOSS-N1 DC-MHS module is not going to be replaced, install a filler.



**Figure 187. Installing an BOSS-N1 DC-MHS module filler bracket**

### Next steps

Replace the front BOSS-N1 DC-MHS module .

## Installing the front BOSS-N1 DC-MHS module

### Prerequisites

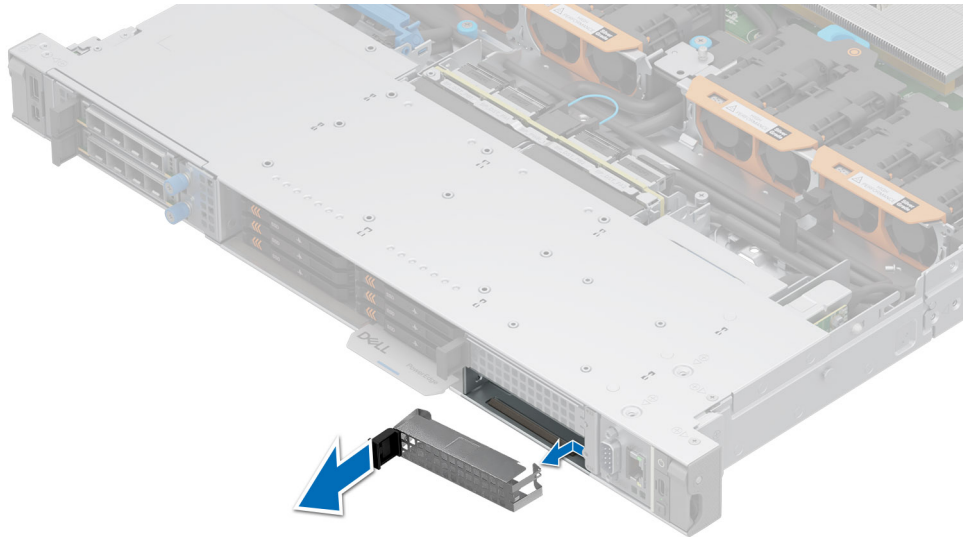
1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Remove the system cover](#).
4. [Remove the drive backplane cover](#).
5. Disconnect the cables from the HPM board, observe the cable routing.

**NOTE:** See [cable routing](#) section for more information.

**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.

### Steps

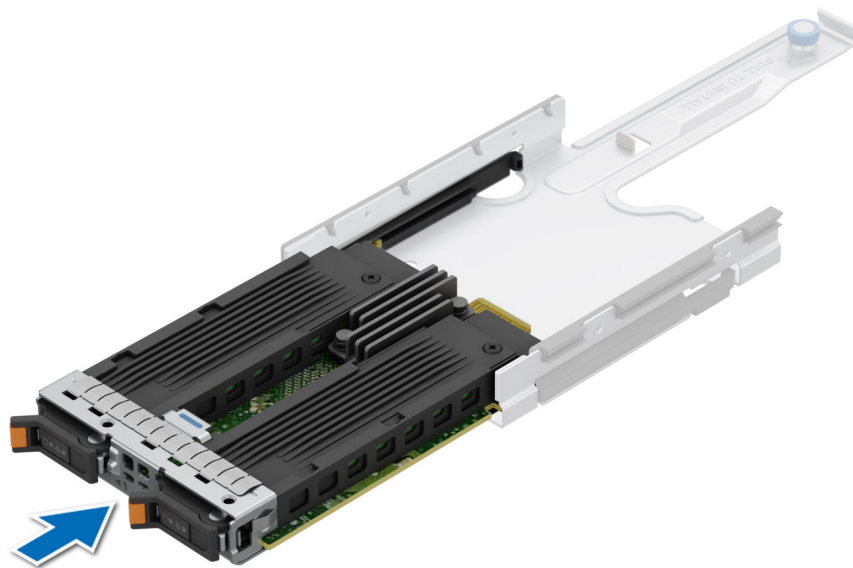
1. If installed, remove the filler bracket.



**Figure 188. Removing an BOSS-N1 DC-MHS module filler bracket**

2. Align and slide the BOSS-N1 DC-MHS module into the tray until it is firmly seated.

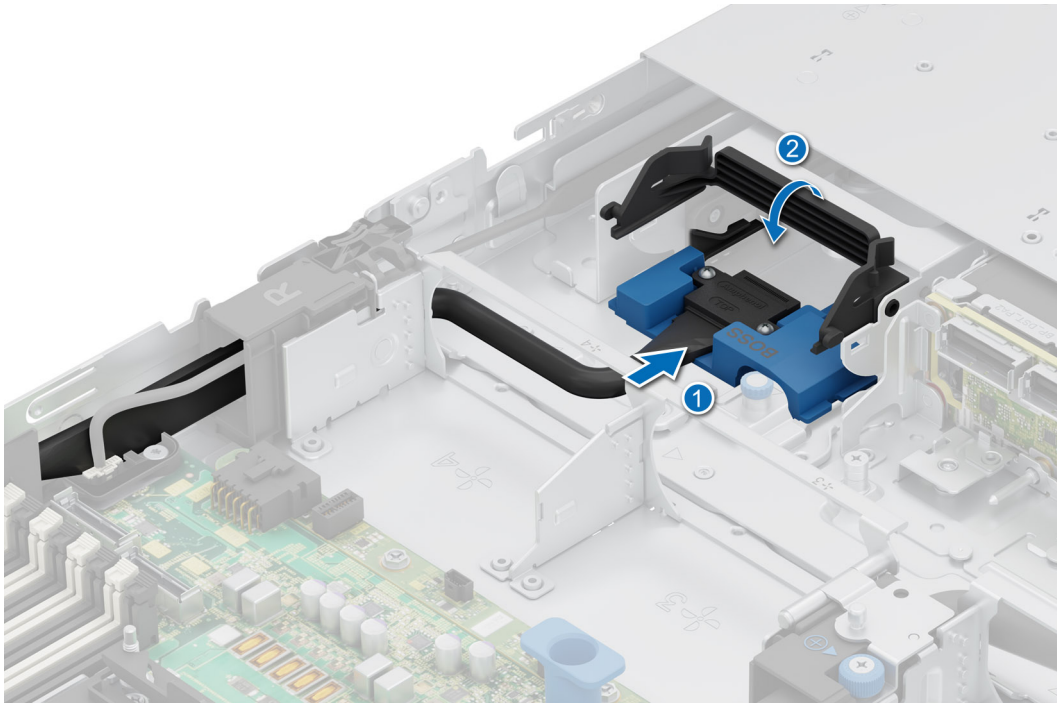
**NOTE:** Make sure that the metallic tray is in unlock position before sliding the BOSS module into the tray.



**Figure 189. Installing the BOSS-N1 DC-MHS module into the tray**

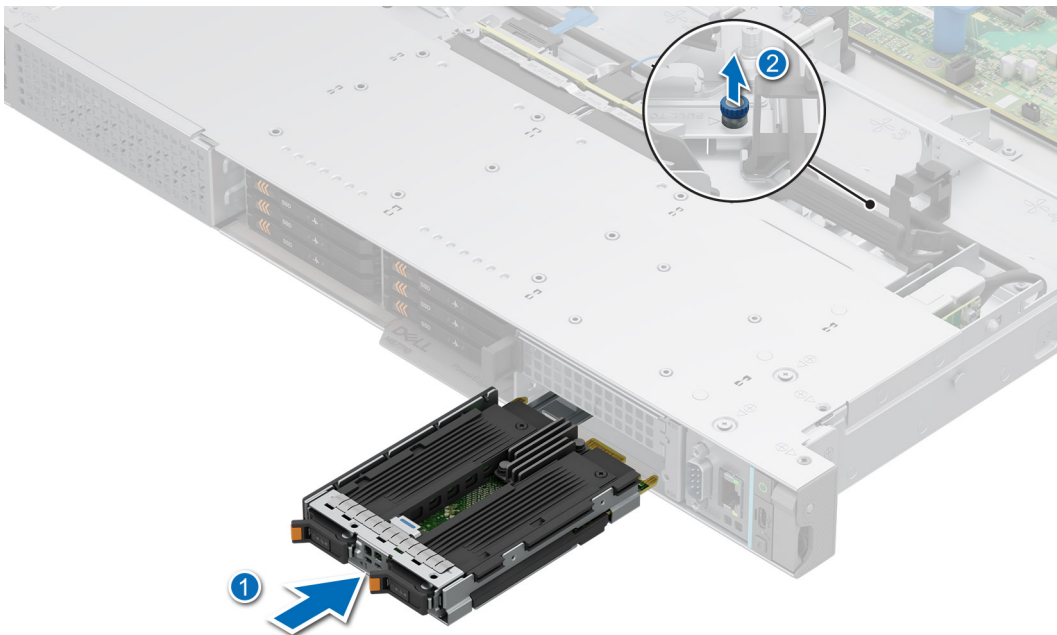
3. Reconnect the BOSS module cable connector on the HPM board on one side and reconnect the another side cable to the connector on the BOSS module cable. Tilt the cable holder to secure the BOSS-N1 DC-MHS module cable into the system.





**Figure 190. Reconnecting the cable connectors**

4. Align and slide the BOSS-N1 DC-MHS module tray into the system until the plunger presses the stop point.
5. Pull up and slide the plunger to secure it in the hole on the system.



**Figure 191. Installing the BOSS-N1 DC-MHS module tray into system**

#### Next steps

1. Route and connect the cables, taking care not to damage them.

**NOTE:** See [cable routing](#) section for more information.

2. Install the M.2 NVMe SSD module
3. Install the drive backplane cover.
4. Install the system cover.
5. Follow the procedure listed in the [After working inside your system](#).

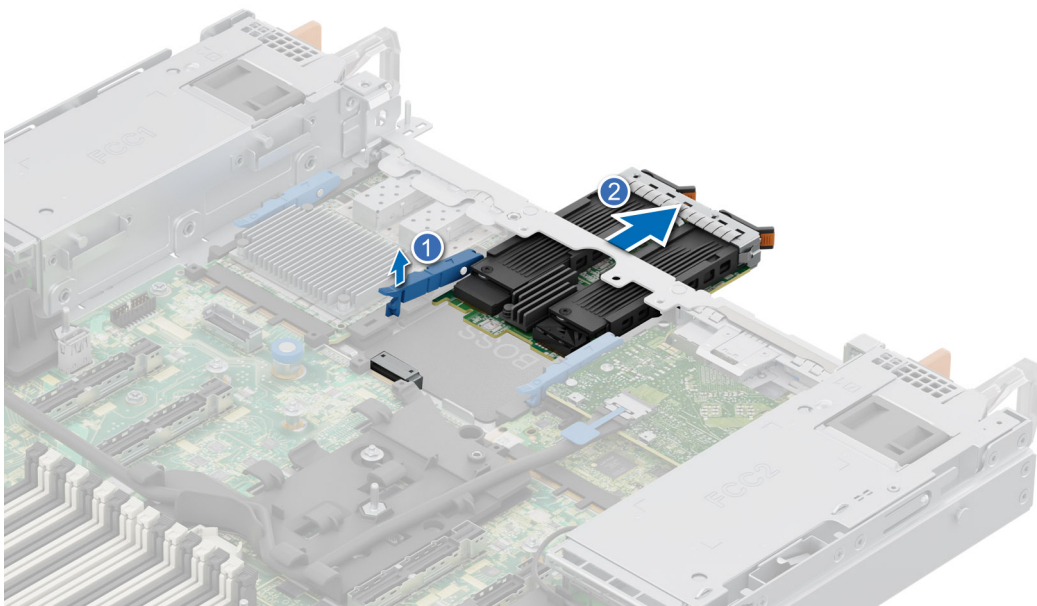
## Removing the rear BOSS-N1 DC-MHS module

### 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 system cover](#)
4. [Remove the rear expansion card riser](#) or [Remove the rear expansion card riser blank](#)
5. [Remove the M.2 NVMe SSD module](#).

### Steps

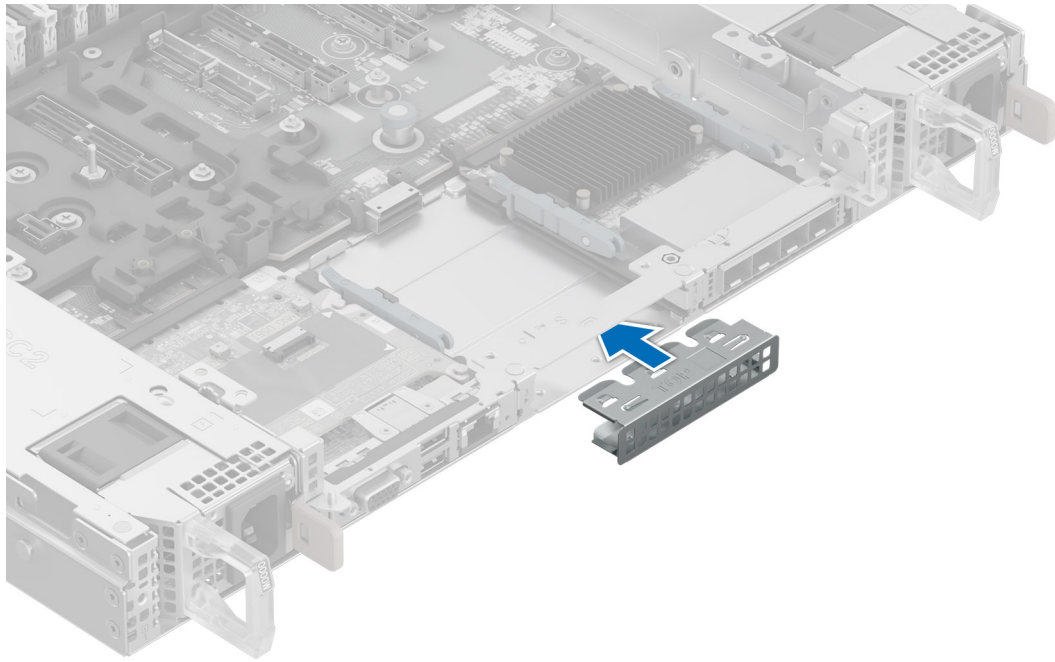
1. Open the blue latch to disengage the BOSS-N1 DC-MHS module.
2. Push the BOSS-N1 DC-MHS module towards the rear end of the system to disconnect from the connector on the HPM board.
3. Slide the BOSS-N1 DC-MHS module out of the slot on the system.



**Figure 192. Removing the rear BOSS-N1 DC-MHS**

4. If the BOSS-N1 DC-MHS module is not going to be replaced, install a filler bracket.





**Figure 193. Installation of filler bracket**

#### Next steps

1. [Replace the rear BOSS-N1 DC-MHS module.](#)

## Installing the rear BOSS-N1 DC-MHS module

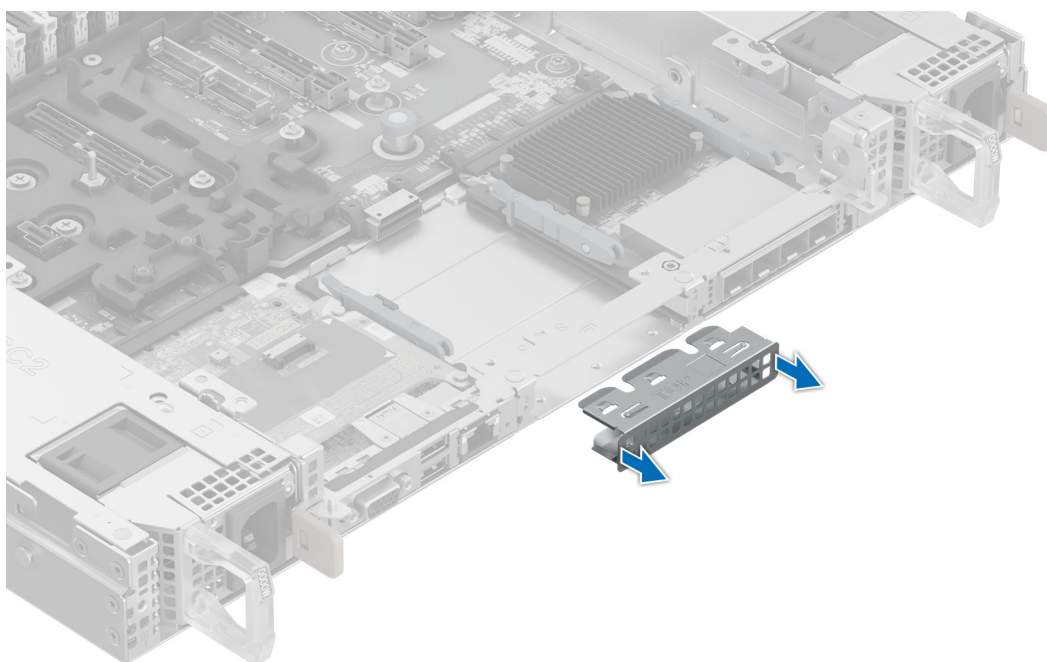
#### Prerequisites

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 system cover](#)
4. [Remove the rear expansion card riser](#) or [remove the rear expansion card riser blanks](#)
5. [Remove the M.2 NVMe SSD module](#).

#### Steps

1. If installed, remove the filler bracket.

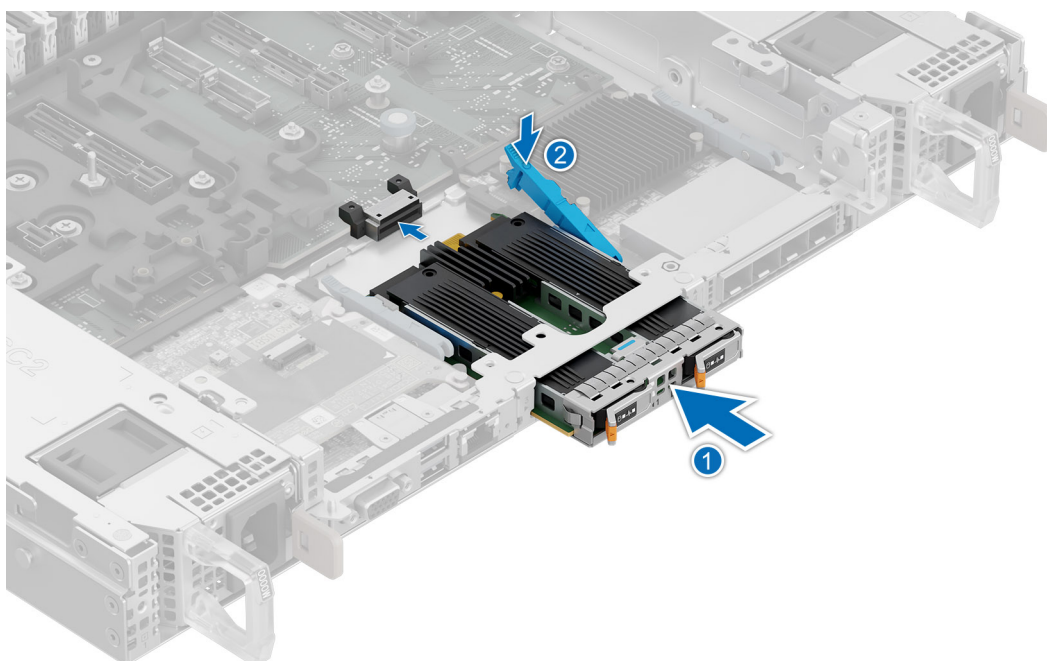
**i NOTE:** Store the filler bracket for future use. Filler brackets must be installed in empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the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



**Figure 194. Removal of filler bracket**

2. Open the blue latch on the HPM board.
3. Slide the BOSS-N1 DC-MHS module into the slot in the system.
4. Push until the BOSS-N1 DC-MHS module is connected to the connector on the HPM board.
5. Close the blue latch to lock the BOSS-N1 DC-MHS module to the system.

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



**Figure 195. Installing the BOSS-N1 DC-MHS module**

### Next steps

1. Install the M.2 NVMe SSD module.
2. Install the rear expansion card riser or install the rear expansion card riser blanks
3. Follow the procedure listed in the [After working inside your system](#).

## Optional OCP NIC card

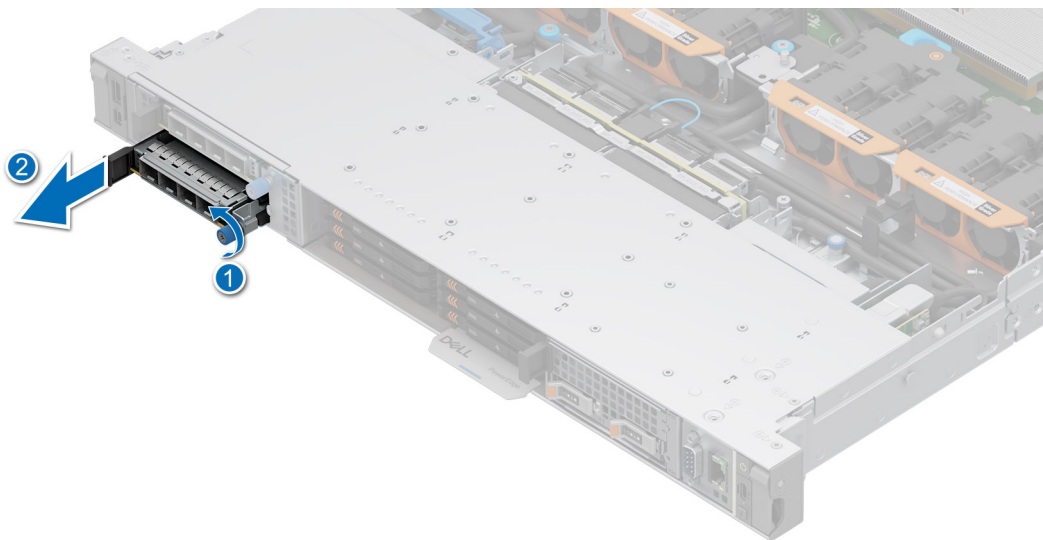
### Removing the front OCP NIC card

#### Prerequisites

#### Steps

1. Using the Phillips 2 screwdriver, loosen the captive screw on the OCP NIC card tray.
2. Pull and slide the OCP NIC card tray out from the OCP NIC cage.

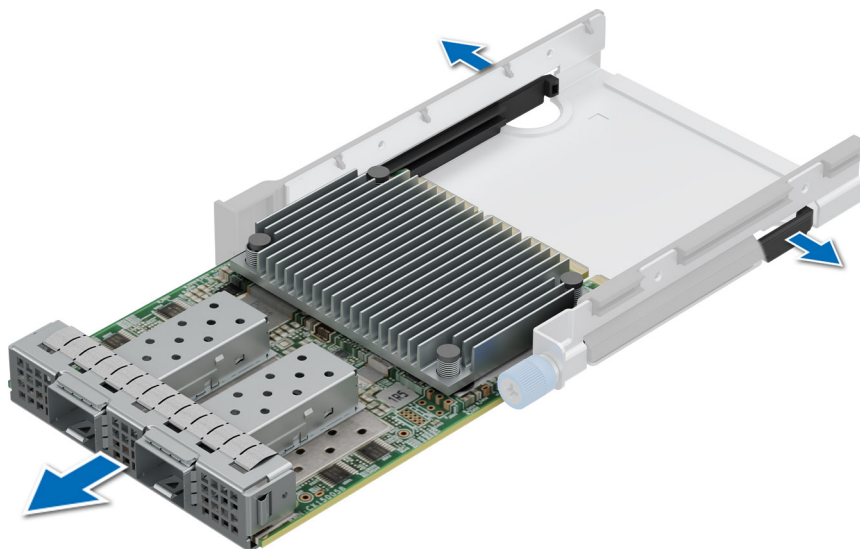
 **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.



**Figure 196. Removing the OCP NIC card tray from the OCP NIC cage**

3. Push the clips outward, then pull and slide the OCP NIC card out from its tray.

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

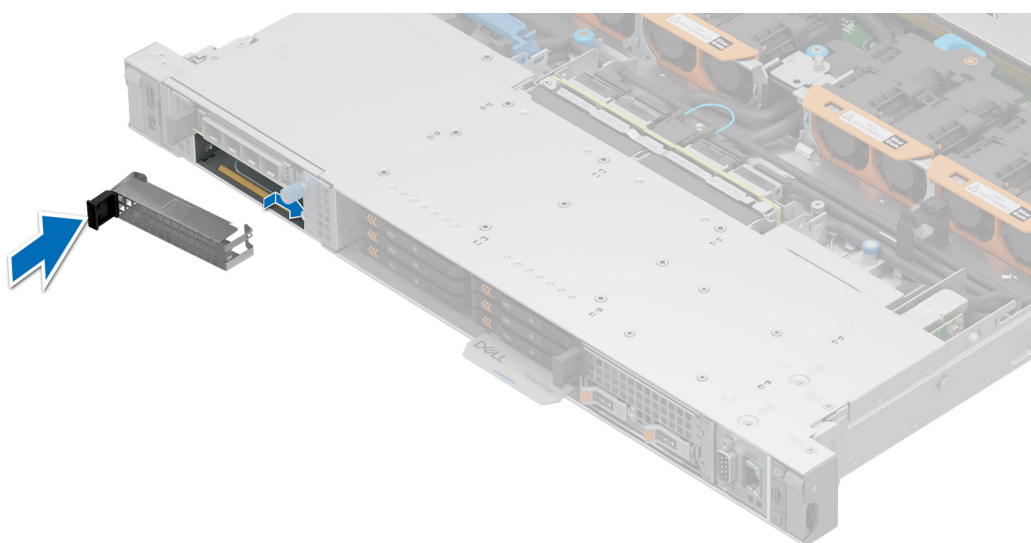


**Figure 197. Removing the OCP NIC card from the tray**

4. **NOTE:** Install the OCP blank if the OCP card is not being replaced.

Align the OCP blank in the OCP slot and slide it in till firmly seated.

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



**Figure 198. Installing the front OCP blank**

### Next steps

Replace the front OCP NIC card.

# Installing the front OCP NIC card

## Prerequisites

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

**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.

## Steps

1. Align and slide the OCP NIC card into the OCP NIC card tray

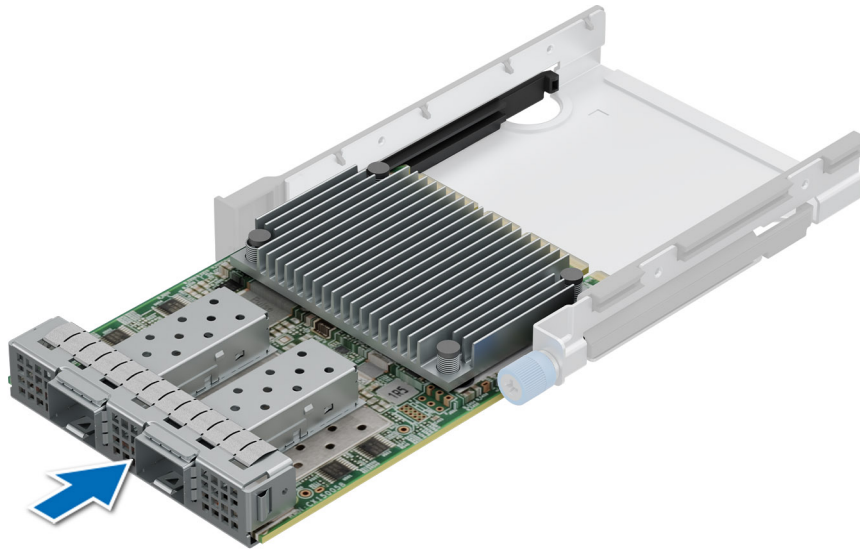
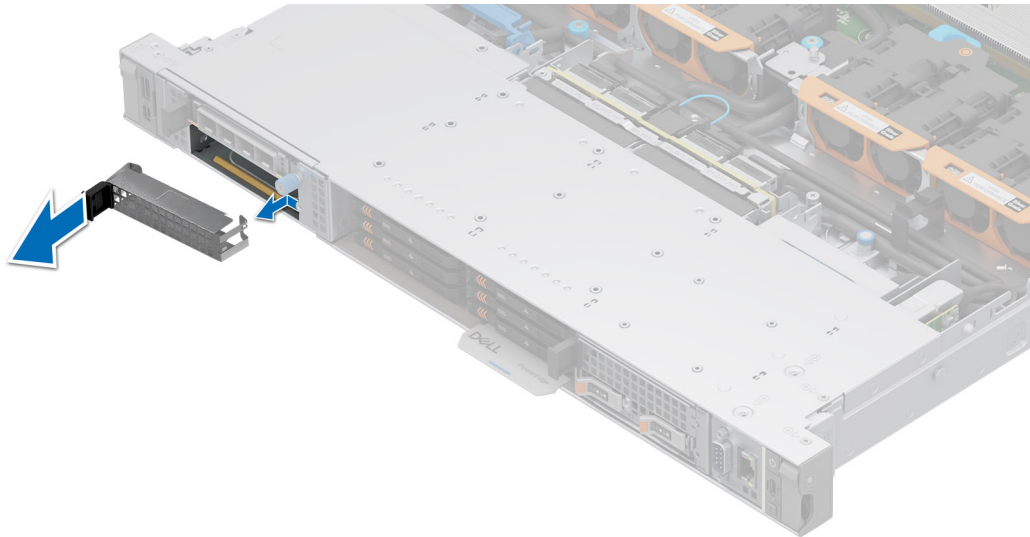


Figure 199. Installing the OCP NIC card into the OCP NIC card tray

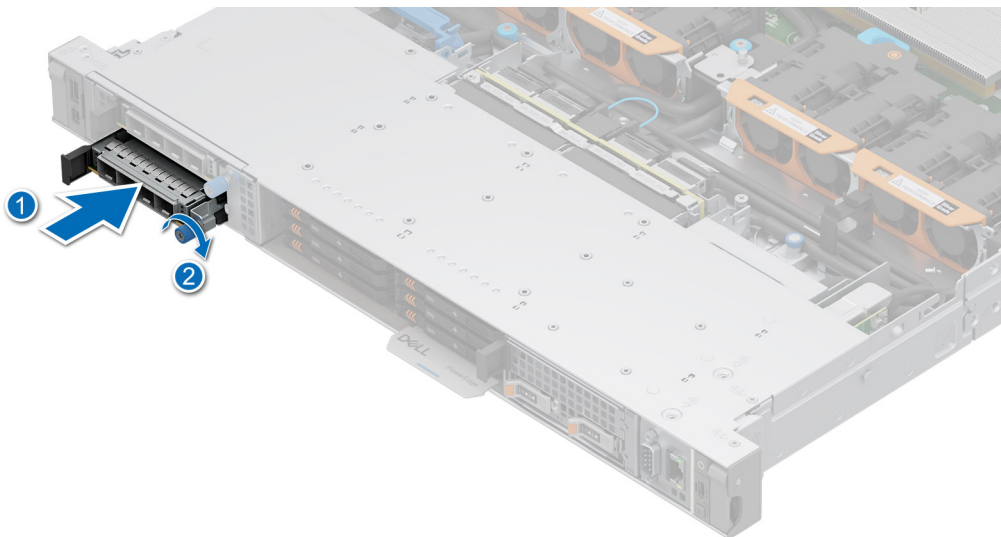
2. **NOTE:** If applicable remove the OCP NIC blank.

Pull out the OCP NIC blank to remove from the system.



**Figure 200. Removing the OCP NIC blank**

3. Align and slide the OCP NIC card tray into the OCP NIC cage.
4. Using a Phillips 2 screwdriver, tighten the captive screw to secure the OCP NIC card tray in the cage.



**Figure 201. Installing the OCP NIC tray into the OCP NIC cage**

### Next steps

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

## Removing the front OCP NIC cage

### 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 system cover](#).
4. [Remove the ir shroud](#).
5. [Remove the drive backplane cover](#).
6. If installed [Remove the expansion card riser](#).
7. [Remove the front OCP NIC card](#).



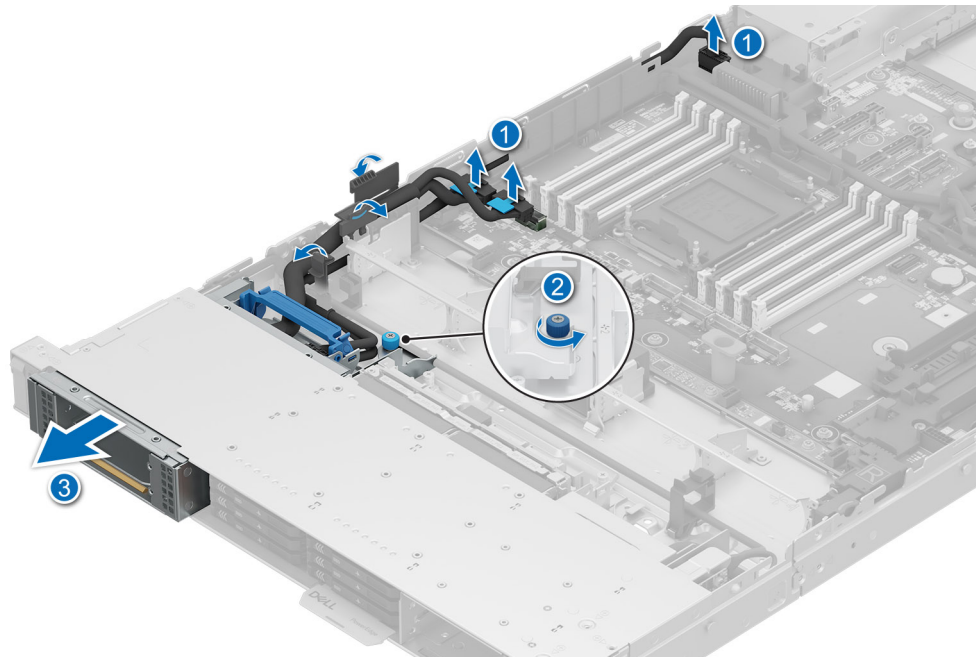
8. Disconnect the cables routing from the left side wall bracket and middle cable bracket from their connectors on the HPM board.

**NOTE:** See [cable routing](#) section for more information.

### Steps

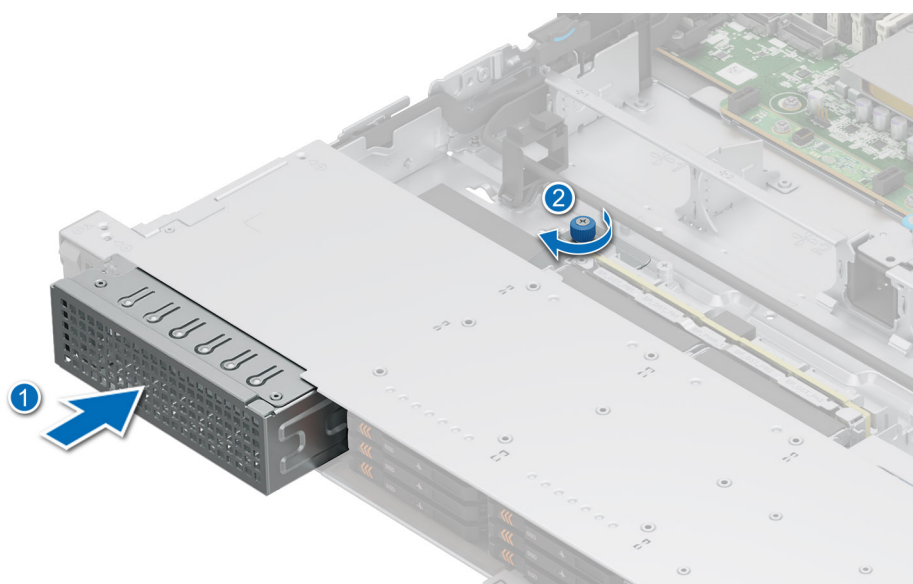
1. Using the Phillips 2 screwdriver, loosen the thumb screw on the OCP NIC cage.
2. Pull and slide the OCP NIC cage out from the front of the system.

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



**Figure 202. Removing an OCP NIC cage from front of the system**

3. If the OCP NIC cage is not being replaced, install a filler tray into the system and secure it by tightening the captive screw using a Phillips 2 screwdriver.



**Figure 203. Installing an OCP NIC card filler bracket**

## Next steps

Replace the front OCP NIC cage.

# Installing the front OCP NIC cage

## Prerequisites

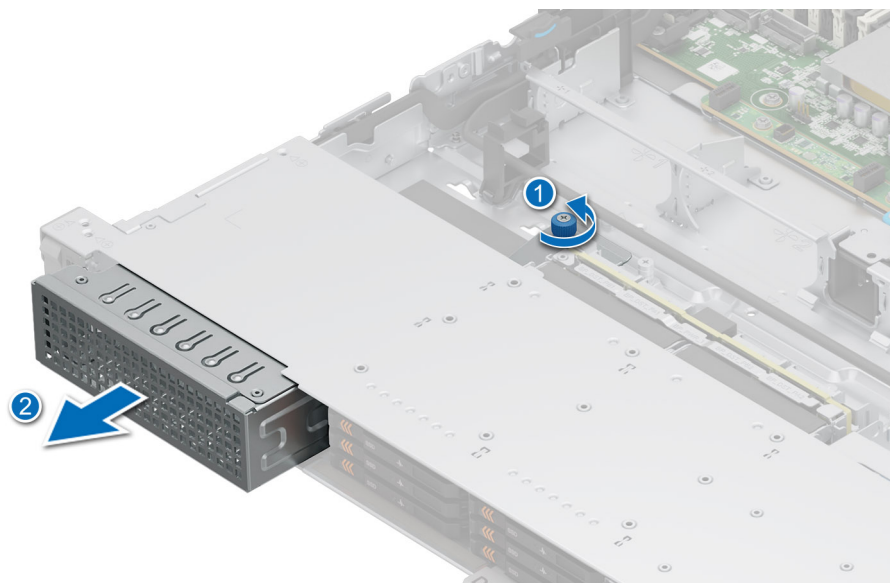
1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in the [Before working inside your system](#).
3. [Remove the system cover](#).
4. [Remove the ir shroud](#).
5. [Remove the drive backplane cover](#).
6. If installed [Remove the expansion card riser](#).
7. [Remove the front OCP NIC card](#).
8. Disconnect the cables routing from the left side wall bracket and middle cable bracket from their connectors on the HPM board.

**NOTE:** See [cable routing](#) section for more information.

**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.

## Steps

1. If installed, remove the filler bracket from the front of the system by loosening the captive screw with a Phillips 2 screwdriver and then pulling the OCP NIC filler bracket out.

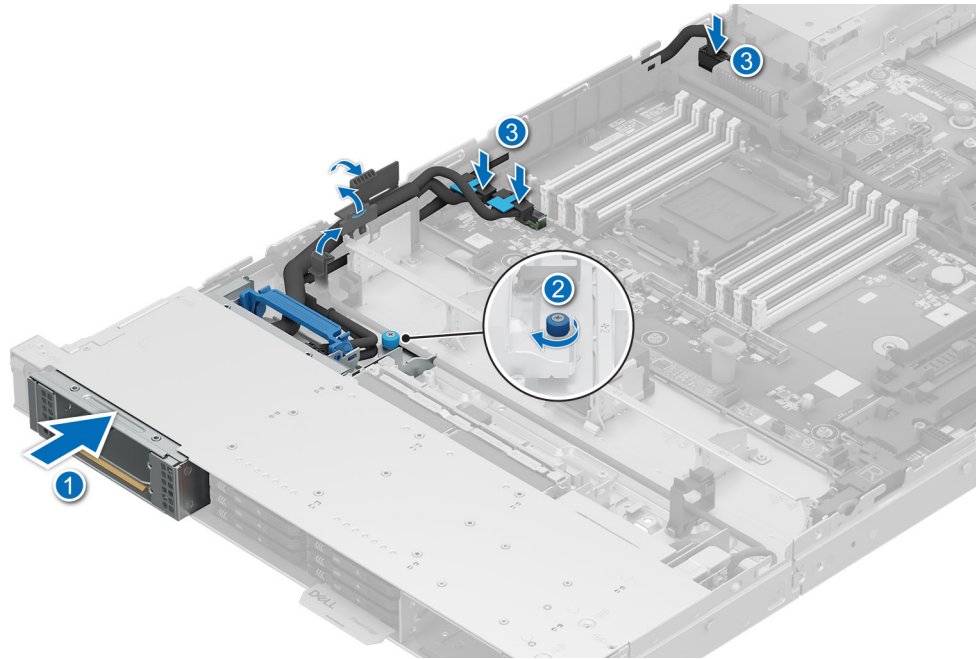


**Figure 204. Removing an OCP NIC card filler bracket**

2. Push and slide the OCP NIC cage into the front of the system.
3. Using the Phillips 2 screwdriver, tighten the thumb screw on the OCP NIC cage.

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





**Figure 205. Installing an OCP NIC cage to front of the system**

#### Next steps

Replace the front OCP NIC card.

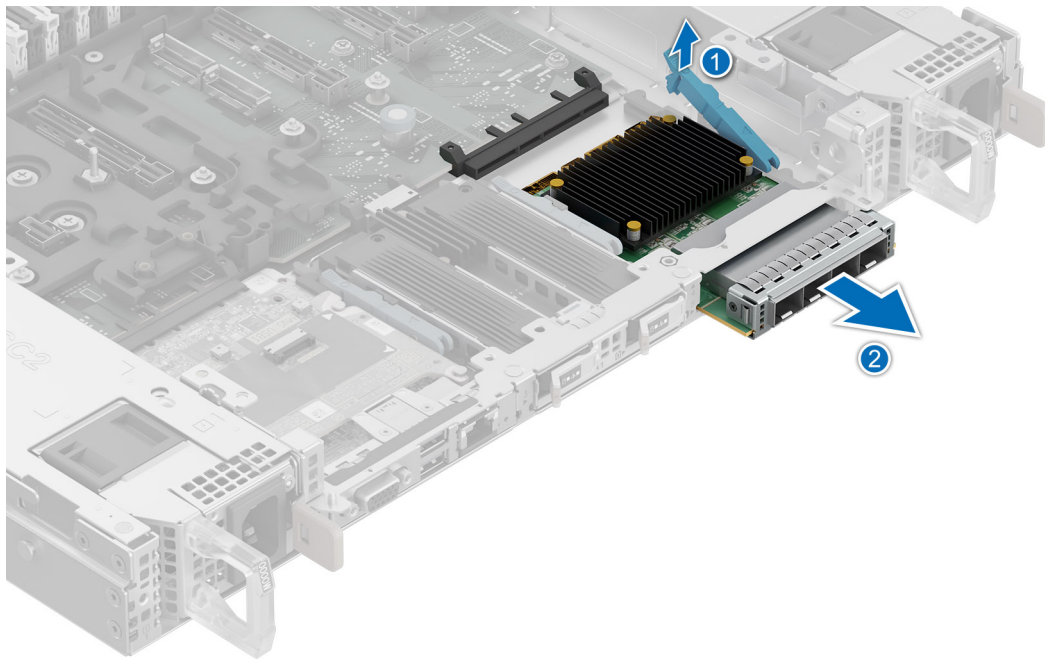
## Removing the rear OCP NIC card

#### 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 system cover](#).
4. If installed [Remove the rear expansion card riser](#) or [remove the rear expansion card riser blanks](#)

#### Steps

1. Open the blue latch to disengage the OCP NIC card.
2. Push the OCP NIC card towards the rear end of the system to disconnect from the connector on the HPM board.
3. Slide the OCP NIC card out of the slot on the system.

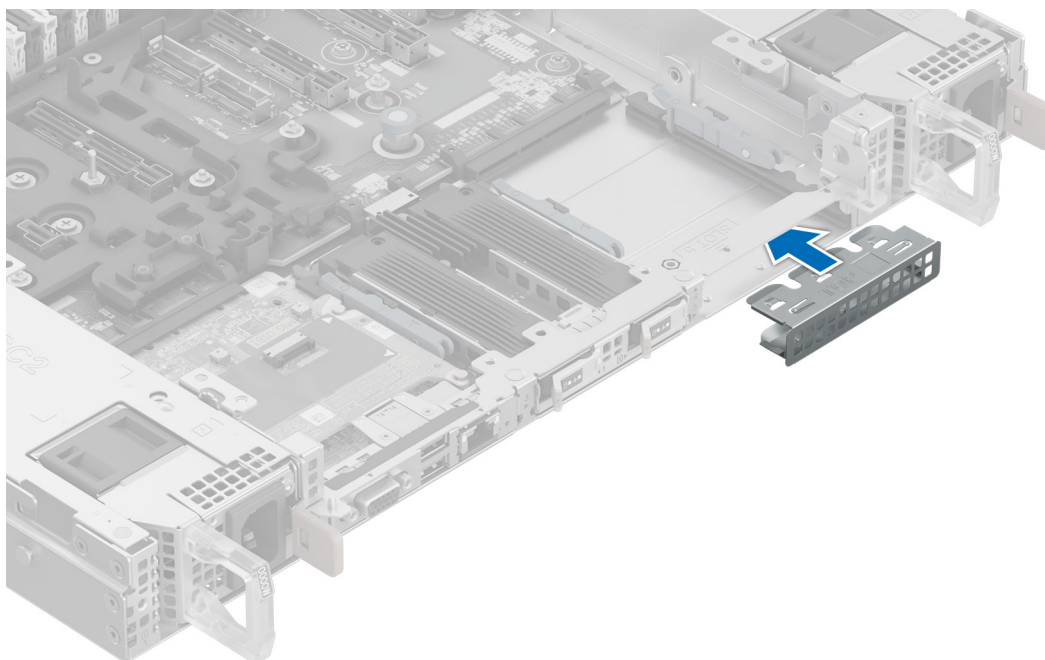


**Figure 206. Removing the rear OCP NIC card**

4. **NOTE:** If the OCP NIC card is not going to be replaced, install a filler bracket

Align and slide in the OCP filler in the slot till firmly seated .

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



**Figure 207. Installation of filler bracket**

## Next steps

1. [Replace the rear OCP NIC card.](#)

# Installing the rear OCP NIC card

## Prerequisites

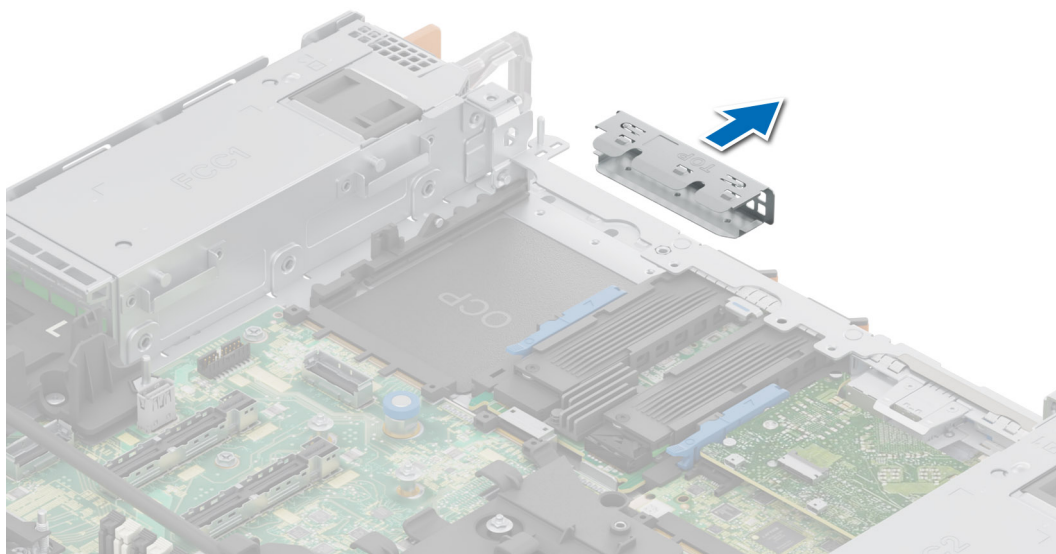
1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in the [Before working inside your system](#).
3. [Remove the rear expansion card riser](#) or [Remove the rear expansion card riser blanks](#)

**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.

## Steps

1. If installed, remove the filler bracket.

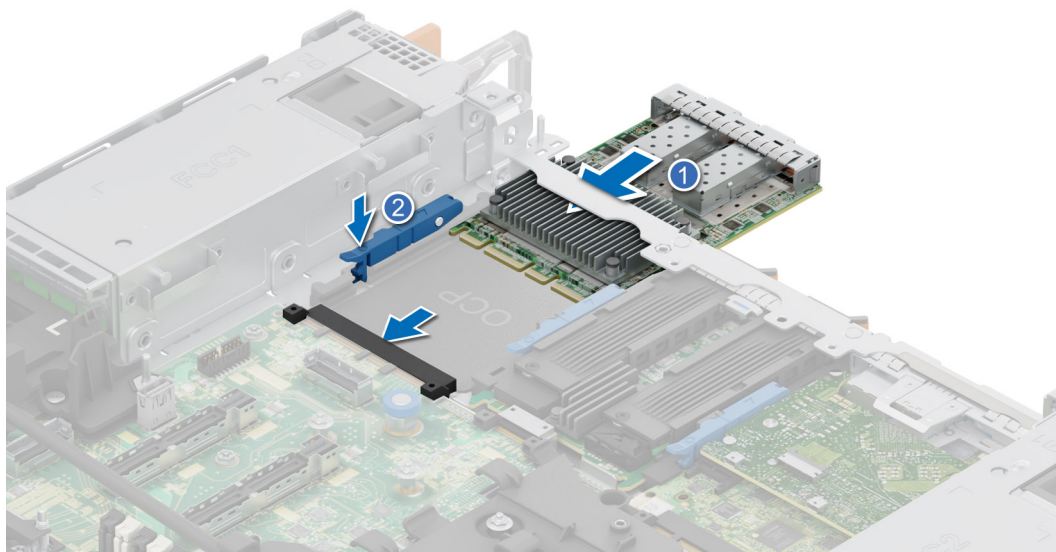
**NOTE:** Store the filler bracket for future use. Filler brackets must be installed in empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.



**Figure 208. Removal of filler bracket**

2. Open the blue latch on the HPM board.
3. Slide the OCP NIC card into the slot in the system.
4. Push until the OCP NIC card is connected to the connector on the HPM board.
5. Close the blue latch to lock the OCP NIC card to the system.

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



**Figure 209. Installing the rear OCP NIC card**

### Next steps

1. Route and connect the cables, taking care not to damage them.

**NOTE:** See [cable routing](#) section for more information.

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

## Datcenter-Secure Control Module (DC-SCM)

This is a service technician replaceable part only.

### Removing the DC-SCM board

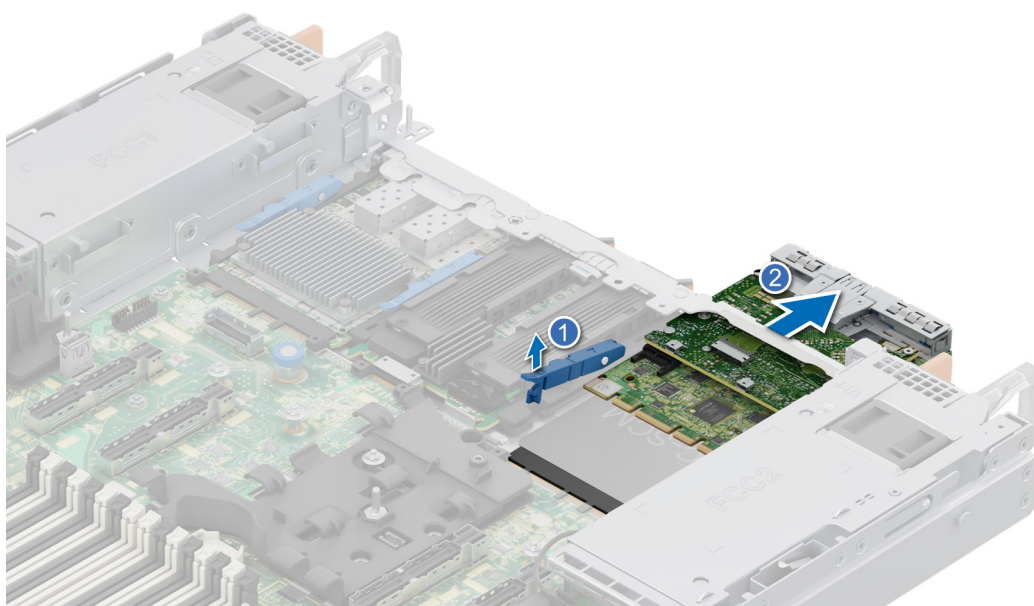
#### Prerequisites

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 system cover](#).
4. If installed [Remove the rear expansion card riser](#) or [remove the rear expansion card riser blanks](#)

**NOTE:** If the optional KVM module is installed kindly make note of the cable routing, see figure.61 under [Cable routing](#).

#### Steps

1. Open the blue latch to disengage the DC-SCM board.
2. Push the DC-SCM board towards the rear end of the system to disconnect from the connector on the HPM board.
3. Slide the DC-SCM board out of the slot on the system.



**Figure 210. Removing the DC-SCM board**

### Next steps

**NOTE:** If a new DC-SCM board is being installed the Attic board must be removed from the existing DC-SCM board and installed on the new one.

1. [Replace the DC-SCM board.](#)

## Installing the DC-SCM board

### 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 system cover](#).
4. If installed [Remove the rear expansion card riser](#) or [Remove the rear expansion card riser blanks](#)

**NOTE:** If a new DC-SCM board is being installed the Attic board must be removed from the existing DC-SCM board and installed on the new one.

**NOTE:** If the optional KVM module is installed kindly make note of the cable routing, see figure.61 under [Cable routing](#).

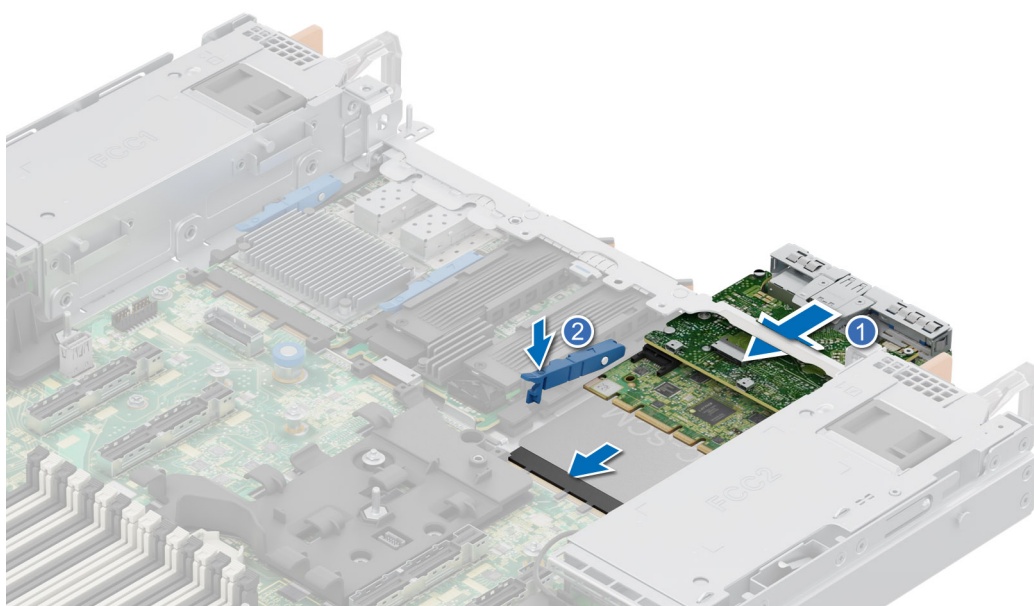
**CAUTION:** Do not install GPUs, network cards, or other PCIe devices on your system that are not validated and tested by Dell. Damage caused by unauthorized and invalidated hardware installation will null and void the system warranty.

### Steps

1. Open the blue latch on the HPM board.
2. Slide the DC-SCM board into the slot in the system.
3. Push until the DC-SCM board is connected to the connector on the HPM board.
4. Close the blue latch to lock the DC-SCM board to the system.

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





**Figure 211. Installing the DC-SCM board**

### Next steps

1. If removed [Install the rear expansion card riser](#) or [install the rear expansion card riser blanks](#)
2. Power on the system.
3. Ensure that you perform the following steps:
  - a. Use the Easy Restore feature to restore the BIOS and Service Tag. See the [Restoring the system 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. Install BIOS and iDRAC version updates, Diagnostics, and OS Driver Pack and OS Collector.
  - d. Re-enable the Trusted Platform Module (TPM). See the [Initializing TPM](#) section.
4. Follow the procedure listed in [After working inside your system](#).

## Restoring the system using Easy Restore

The Easy Restore feature restores the server service tag and BIOS configuration data after replacing the Datacenter-Secure Control Module (DC-SCM). System configuration data is automatically maintained in a backup flash device within the system. If the BIOS detects a new DC-SCM during server boot, the system prompts the user to restore the backup system configuration data.

### About this task

For more information about the Easy Restore feature, see Open BMC configuration Users Guide at [Support for Open Server Manager | Documentation | Dell India](#).

When the DC-SCM is booted for the first time, it presents a screen with settings it can restore, below is a list of options/steps available:

### Steps

1. To restore the system configuration data, press **Y**
2. To skip restore for this boot, press **N**
3. Enter BIOS setup to manually restore Service Tag, press **F2**

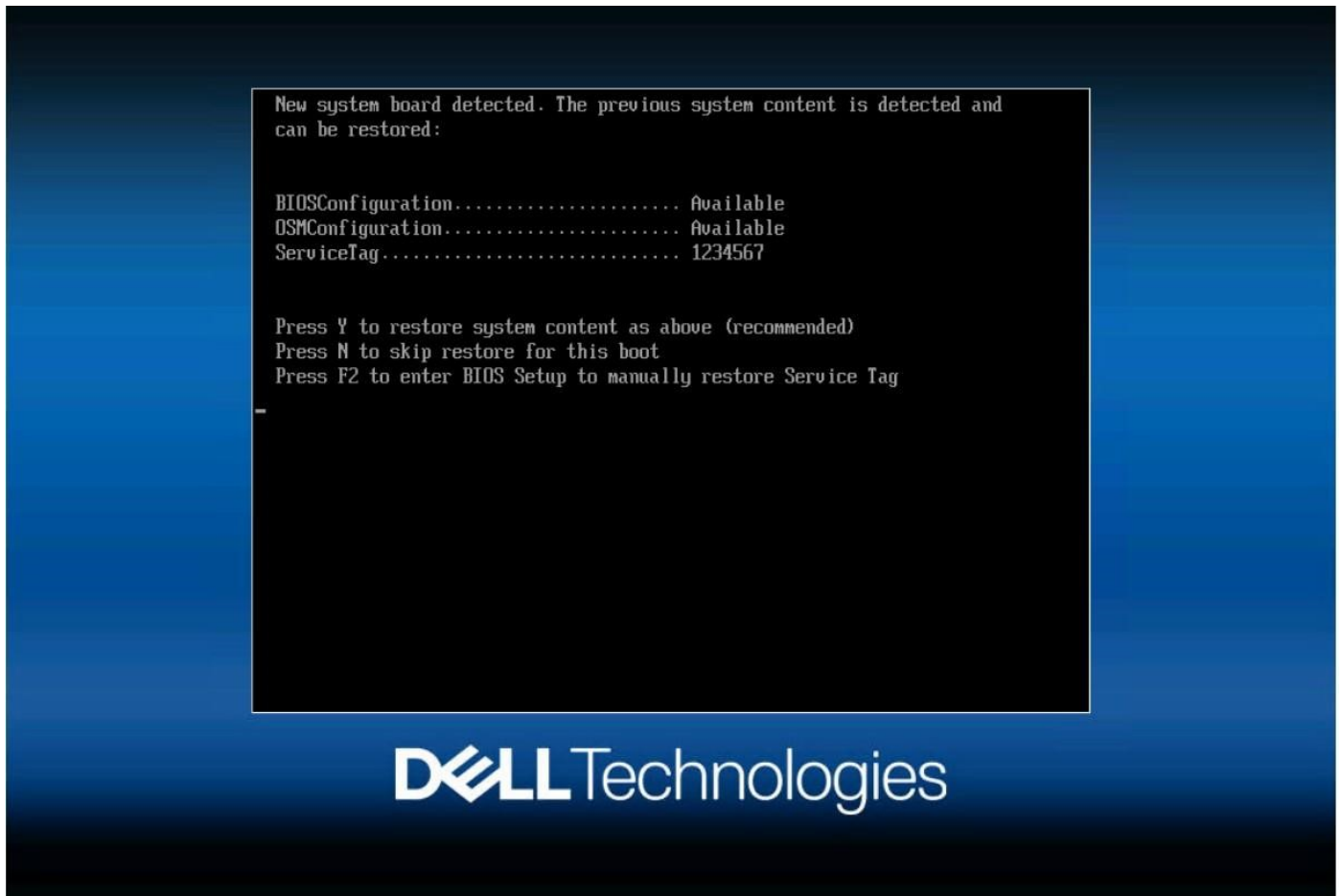


Figure 212. Easy Restore

## Manually update the Service Tag

After replacing a HPM 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. Incorrectly entered service tag will lead to HPM board replacement.

5. Click **OK**.

## Attic board

This is a service technician replaceable part only.

## Removing the Attic board

### 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 system cover](#).
4. If installed [Remove the rear expansion card riser](#) or [remove the rear expansion card riser blanks](#)
5. [Remove the DC-SCM board](#).

**NOTE:** If the optional KVM module is installed, note the cable routing (see Figure 61) [Cable routing](#).

### Steps

1. Using the Phillips 1 screwdriver, loosen the captive screws securing the attic board to the DC-SCM board.
2. Tilt and lift the Attic board from the DC-SCM guide pins.

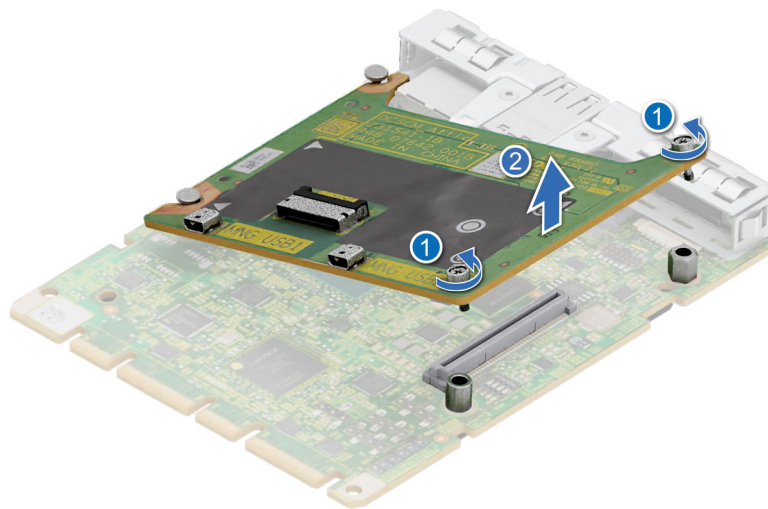


Figure 213. Removing the Attic board

### Next steps

1. [Replace the Attic board](#).

## Installing the Attic board

### 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 system cover](#).
4. If installed [Remove the rear expansion card riser](#) or [remove the rear expansion card riser blanks](#)
5. [Remove the DC-SCM board](#).

**NOTE:** If the optional KVM module is installed, note the cable routing (see Figure 61) under [Cable routing](#).

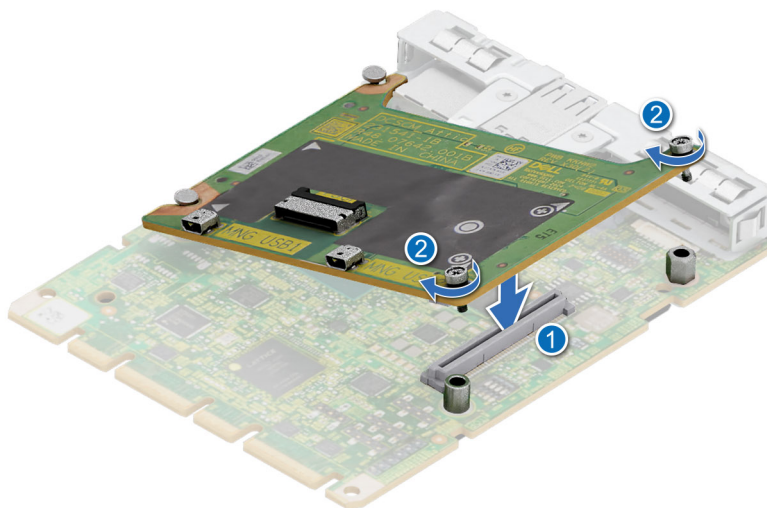
**CAUTION:** Do not install GPUs, network cards, or other PCIe devices on your system that are not validated and tested by Dell. Damage caused by unauthorized and invalidated hardware installation will null and void the system warranty.



### Steps

1. Align the Attic board at an angle with the guide pins on the DC-SCM board.
2. Press until the Attic board is connected to the connector on the DC-SCM board.
3. Using a Phillips 1 screwdriver, tighten the captive screws.

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



**Figure 214. Installing the Attic board**

### Next steps

1. [Install the DC-SCM board.](#)
2. If removed [Install the rear expansion card riser](#) or [install the rear expansion card riser blanks](#)
3. Follow the procedure listed in [After working inside your system.](#)

## Internal USB

This is a service technician replaceable part only.

## Removing the internal USB

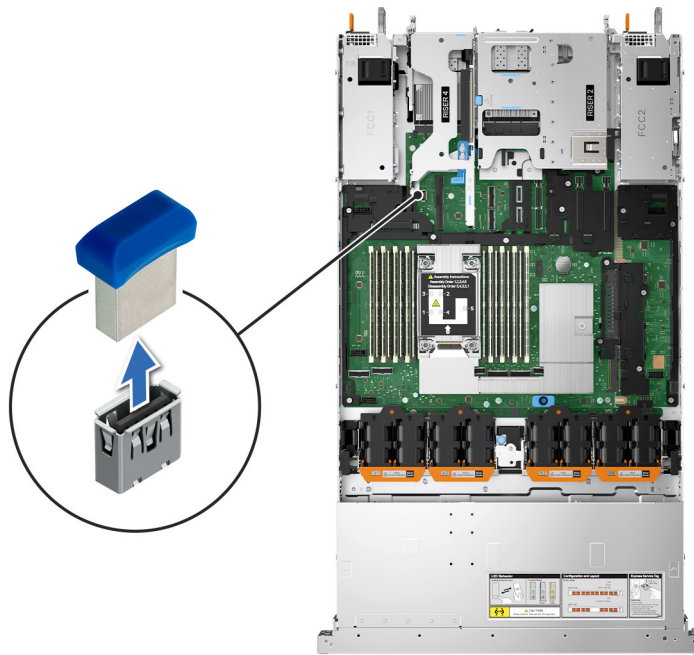
### Prerequisites

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

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

### Steps

Lift the internal USB card to disconnect from the connector on the HPM board.



**Figure 215. Removing the internal USB card**

#### Next steps

1. [Replace the internal USB card.](#)

## Installing the Internal USB

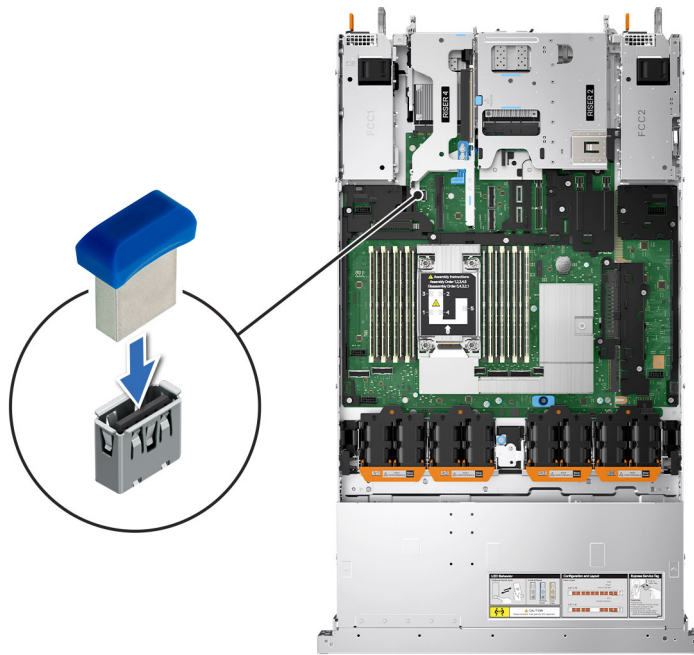
#### Prerequisites

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 system cover.](#)

#### Steps

Align the internal USB card with the USB port on the HPM board and press firmly until it is properly seated.

 **NOTE:** For information about the exact location of USB on HPM board, see [HPM board jumpers and connectors](#) section.



**Figure 216. Installing the internal USB card**

#### Next steps

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

## System battery

This is a service technician replaceable part only.

## Replacing the system battery

#### Prerequisites

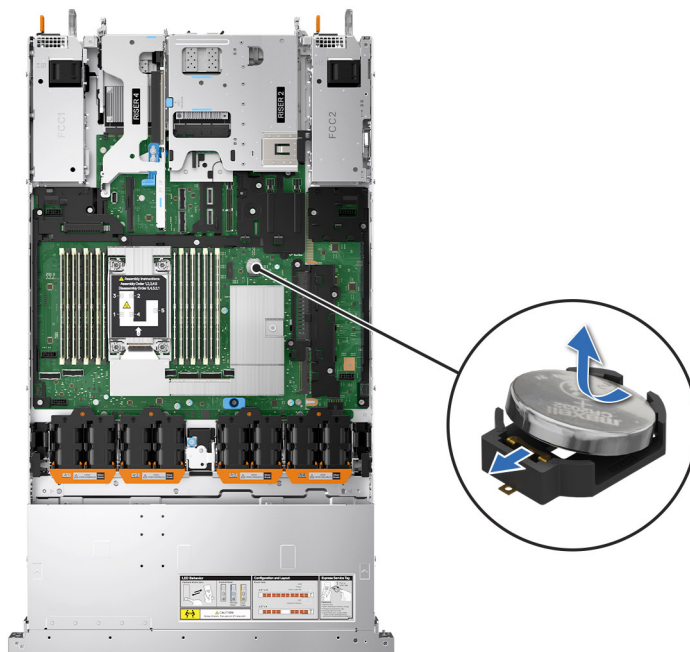
**⚠ WARNING:** There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type that is recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions. See the Safety instructions that came with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

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

#### Steps

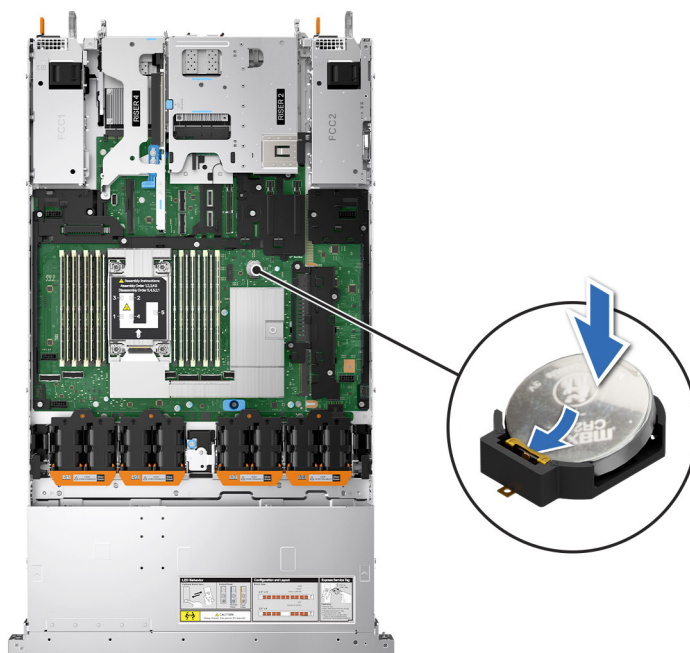
1. Press and hold the battery socket retention latch, for the battery to pop out.

**i NOTE:** If the battery does not pop out, then lift it out of the socket.



**Figure 217. Removing the system battery**

2. To install a new system battery, hold the battery with the positive side facing up at an angle and slide it under the battery holder socket latch.
3. Press the battery into the connector until it snaps into place.



**Figure 218. Installing the system battery**

#### Next steps

1. [Install the air shroud.](#)
2. [Install the system cover.](#)
3. Follow the procedure listed in [After working inside your system.](#)
4. 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, check the time and date at least an hour after installing the battery.
- e. Enter the System Setup and if the time and date are still incorrect, see [Getting help](#) section.

## Intrusion switch

This is a service technician replaceable part only.

### Removing the intrusion switch 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 system cover](#).
  4. If installed [Remove the rear expansion card riser](#) or [remove the rear expansion card riser blanks](#)
-  **NOTE:** Ensure that you note the routing of the cable as you remove it from the HPM board. See figure.62 under [Cable routing](#) for more information.

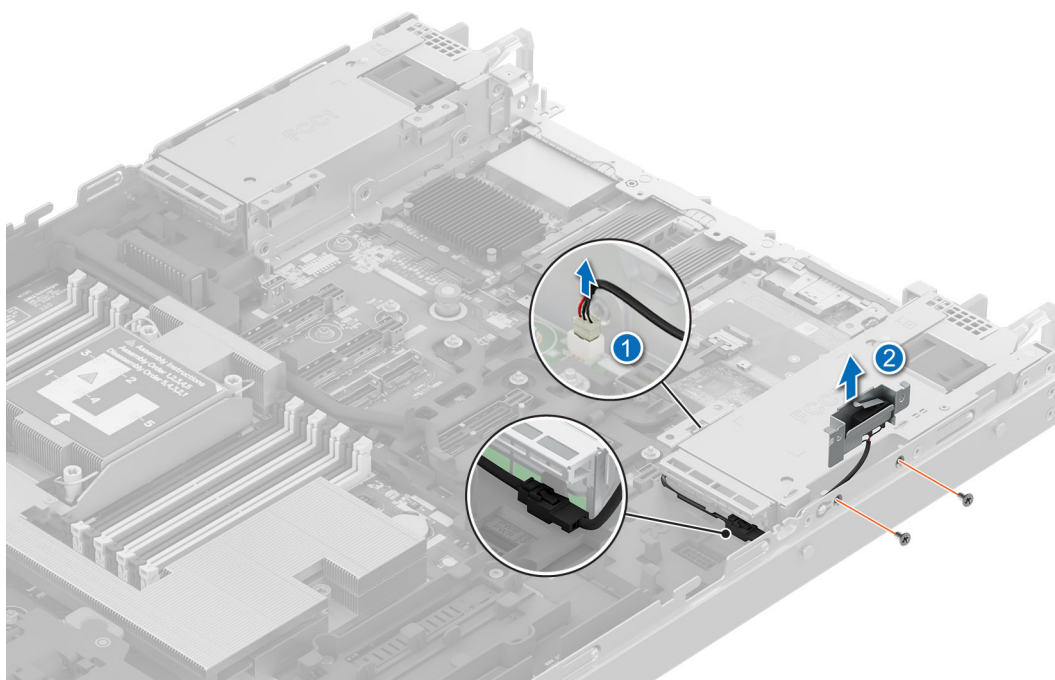
#### Steps

1. Using a Phillips 1 screwdriver, loosen the screws on the intrusion switch module.
2. Disconnect the intrusion switch cable and the dongle cable.

 **NOTE:** Detach the dongle cable from the intrusion switch and keep it safe to be used when replacing with the new intrusion switch.
3. Disconnect the dongle cable in the J slot connector on the HPM board.

 **NOTE:** The intrusion switch cable is connected to the dongle cable, which in turn is connected to the HPM board.
4. Lift the intrusion switch module along with dongle cable out of the system.

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



**Figure 219. Removing the intrusion switch module**

#### Next steps

1. [Replace the intrusion switch module.](#)

## Installing the intrusion switch module

#### Prerequisites

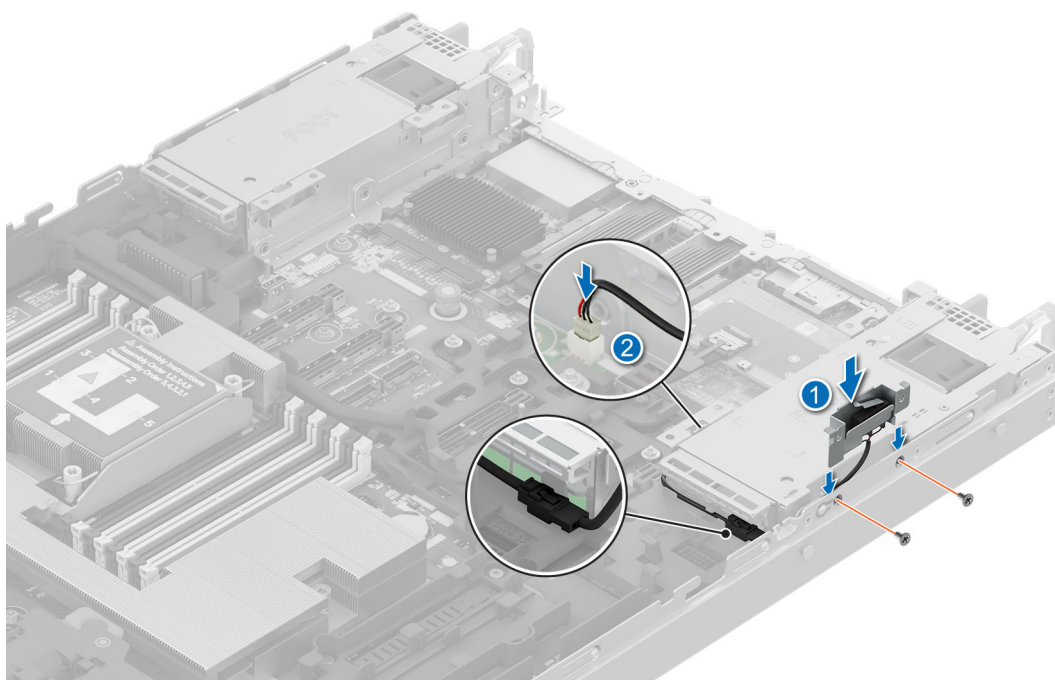
1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Remove the system cover](#).
4. If installed [Remove the rear expansion card riser](#) or [remove the rear expansion card riser blanks](#)

**NOTE:** Route the cable properly when you replace it to prevent the cable from being pinched or crimped. See figure.62 under [Cable routing](#) for more information.

#### Steps

1. Align and place the intrusion switch module into the system.
2. Using a Phillips 1 screwdriver, tighten the screws to secure the intrusion switch module to the system chassis.
3. Connect the dongle cable and the intrusion switch cable.
4. Reconnect the dongle cable to the J slot connector on the HPM board.

**NOTE:** The intrusion switch cable is connected to the dongle cable, which in turn is connected to the HPM board.



**Figure 220. Installing the intrusion switch module**

#### Next steps

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

## Power supply unit

### Removing a power supply unit

#### Prerequisites

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

1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Disconnect the power cable from the power outlet and from the PSU that you intend to remove.
3. Remove the cable from the strap on the PSU handle.
4. Unlatch and lift or remove the optional cable management accessory if it interferes with the PSU removal.

**NOTE:** For information about the cable management when the PSU is removed or installed while the system is in a rack, see the system's cable management arm documentation at [PowerEdge Manuals](#).

#### Steps

Press the release latch and holding the PSU handle, slide the PSU out of the bay.





**Figure 221. Removing a power supply unit**

#### Next steps

1. [Replace the PSU](#) or [install the PSU blank](#).

## Installing a power supply unit

#### Prerequisites

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

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

3. If required, [Remove the PSU blank](#).

#### Steps

Slide the PSU into the PSU bay until the release latch snaps into place.



**Figure 222. Installing a power supply unit**



### Next steps

1. If you have unlatched or removed the cable management accessory, reinstall or relatch it. For information about the cable management when the PSU is removed or installed while the system is in the rack, see the system's cable management accessory documentation at [PowerEdge Manuals](#).
2. Connect the power cable to the PSU, and plug the cable into a power outlet.

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

**NOTE:** When installing hot swapping, or hot adding a new PSU, wait for 15 seconds for the system to recognize the PSU and determine its status. The PSU redundancy may not occur until discovery is complete. The PSU status indicator turns green to indicate that the PSU is functioning properly.

## Removing a power supply unit blank

### Prerequisites

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

### Steps

Pull the blank out of the system.

**CAUTION:** For proper system cooling, the PSU blank must be installed in the second PSU bay in a non-redundant configuration. Remove the PSU blank only if you are installing a second PSU.

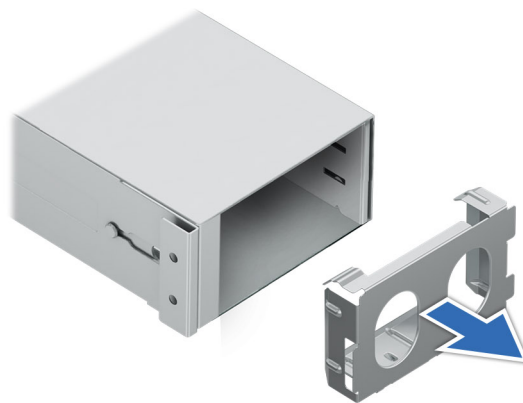


Figure 223. Removing a power supply unit blank

### Next steps

1. [Replace the PSU blank](#) or [install the PSU](#).

## Installing a power supply unit blank

### Prerequisites

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

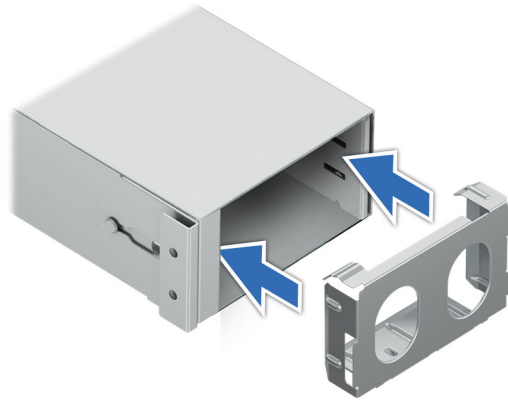
**NOTE:** Install the power supply unit (PSU) blank only in the second PSU bay.

2. If required, [Remove the PSU](#), or [Remove the power supply blank](#).

### Steps

Align the PSU blank with the PSU bay and push it into the PSU bay until it clicks into place.

 **NOTE:** Make sure that the "Top" mark on the PSU blank is on the upper side.



**Figure 224. Installing a power supply unit blank**

## DB9+RJ45 module

This is a service technician replaceable part only.

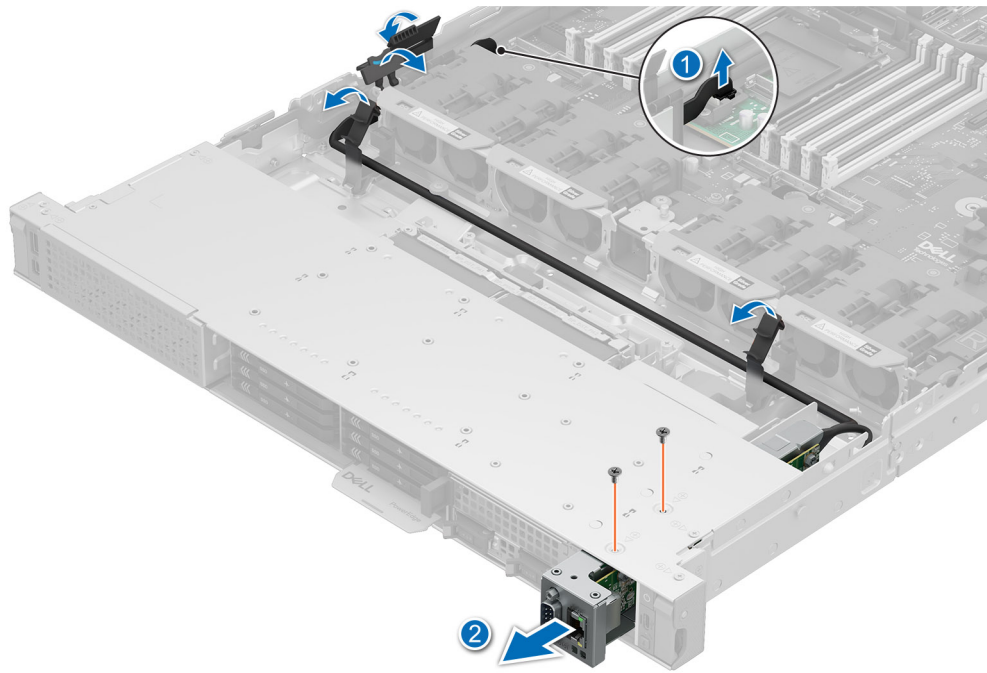
## Removing the DB9+RJ45 module

### 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 system cover](#).
4. [Remove the air shroud](#).
5. [Remove the backplane cover](#)

### Steps

1. Disconnect the DB9+RJ45 port cable from the HPM board.
2. Using Phillips 2 screwdriver, remove the screws on the DB9+RJ45 module. Slide the module out of the system.



**Figure 225. Disconnecting the DB9+RJ45 module**

#### Next steps

1. [Replace the DB9+RJ45 module.](#)

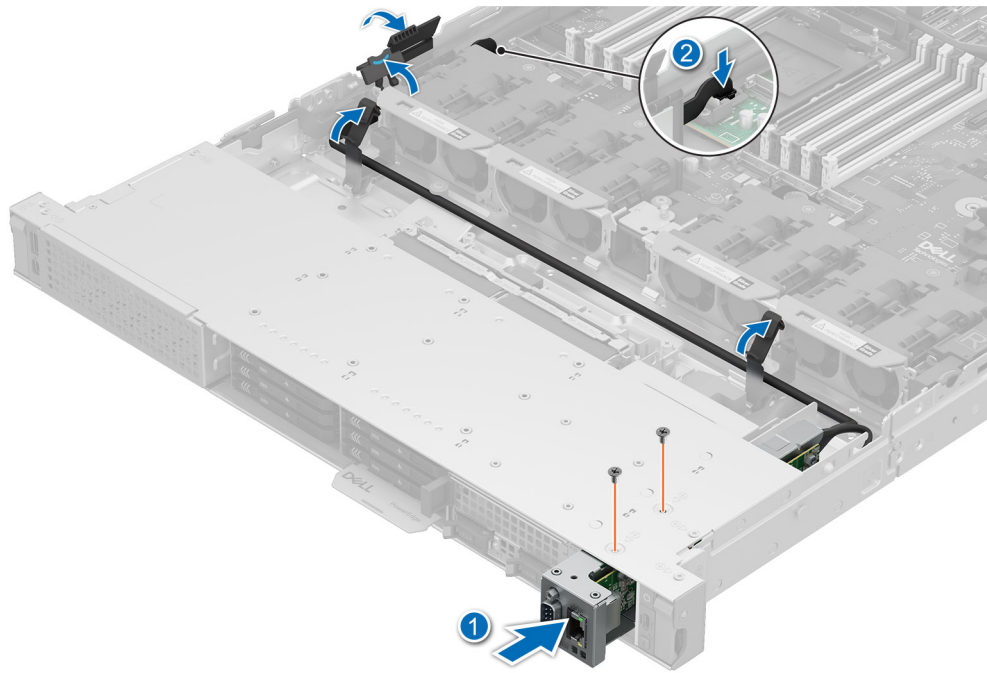
## Installing the DB9+RJ45 module

#### 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 system cover.](#)
4. [Remove the air shroud.](#)
5. [Remove the backplane cover](#)

#### Steps

1. Align the hole on the module with the screw hole on the system.
2. Route the DB9+RJ45 cable through the side bracket. Reconnect the DB9+RJ45 cable on the HPM board.
3. Using the Phillips 2 screwdriver, secure the DB9+RJ45 module to the system with the screws.



**Figure 226. Installing the DB9+RJ45 port**

### Next steps

1. Route and connect the cables, taking care not to damage them.

**NOTE:** See [cable routing](#) section for more information.

2. [Install the backplane cover](#)
3. [Install the air shroud.](#)
4. [Install the system cover.](#)
5. Follow the procedure listed in [After working inside your system.](#)

## Trusted Platform Module

TPM is soldered down to the DC-SCM.

If the Trusted Platform Module (TPM) is identified as the root cause of the problem, a full DC-SCM replacement is necessary.

For more information on TPM see [Trusted Platform Module \(TPM\) Summary](#).

## Initializing TPM 2.0 for users

### Steps

1. Initialize the TPM.
  - a. While booting your system, press F2 to enter System Setup.
  - b. On the **System Setup Main Menu** screen, click **System BIOS > System Security Settings**.
  - c. From the **TPM Security** option, select **On**.
  - d. Save the settings.
  - e. Restart your system.
2. The **TPM Status** changes to **Enabled, Activated**.

# HPM board

This is a service technician replaceable part only.

 **NOTE:** System board is known as Host Processor Module (HPM) board.

## Removing the HPM 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 HPM board, you must supply the recovery key when you restart your system or program before you can access the encrypted data on your drives.

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 following components:
  - a. [Air shroud](#)
  - b. [Cooling fans](#)
  - c. [Memory modules](#)
  - d. [Rear expansion card risers](#) or [rear expansion card riser blanks](#)
  - e. [Processor and heat sink module](#)
  - f. [Rear OCP](#) if installed
  - g. [Rear BOSS-N1 DC-MHS](#) if installed
  - h. [DC-SCM](#)
  - i. [Internal USB memory key \(if installed\)](#) if installed
  - j. [Power supply units \(PSU\)](#)
  - k. Disconnect all the cables from the HPM board and make note of all the cable connections.

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

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

### Steps

1. Using the HPM board holder and plunger, slide the HPM board towards the front of the system.
2. Securely hold the holder and plunger to carefully lift the HPM board out of the chassis.

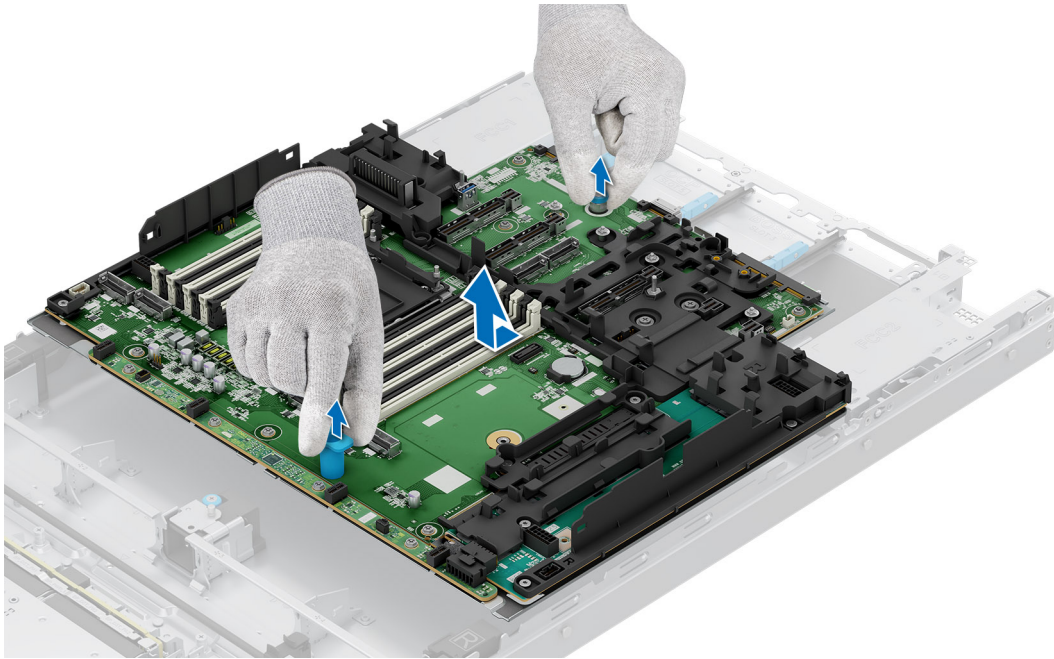


Figure 227. Removing the HPM board

### Next steps

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

## Installing the HPM board

### Prerequisites

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 HPM board, remove all the components that are listed in the removing the HPM board section.

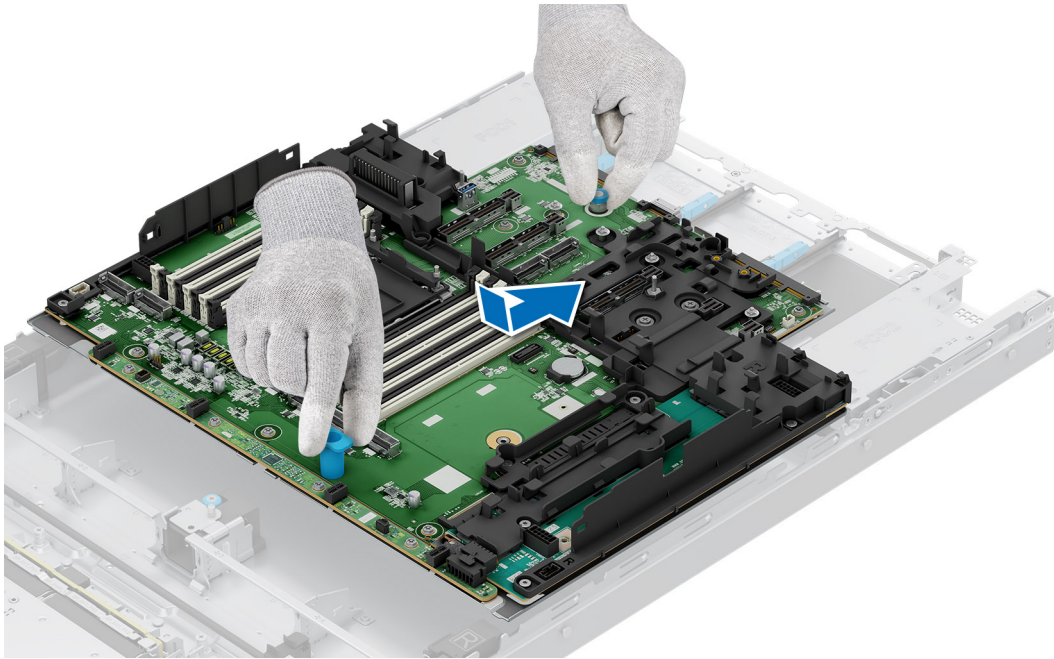
### Steps

1. Unpack the new HPM 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 HPM board into the chassis.

2. Holding the HPM board holder and plunger, align and lower the HPM board into the system.
3. Slide the HPM board towards the rear of the chassis until the connectors are firmly seated in the slots.



**Figure 228. Installing the HPM board**

### Next steps

1. Replace the following components:
  - a. [Internal USB memory key](#) if removed
  - b. [Rear OCP card](#) if removed
  - c. [Rear BOSS-N1 DC-MHS](#) if removed
  - d. [DC-SCM](#)
  - e. [Processor and heat sink module](#)
  - f. [Memory modules](#)
  - g. [Rear expansion card risers](#) or [rear expansion card riser blanks](#)
  - h. [Cooling fans](#)
  - i. [Power supply units \(PSU\)](#)
  - j. [Air shroud](#)
2. Reconnect all cables to the HPM board.

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

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

## Control panel

This is a service technician replaceable part only.

## Removing the Right Control Panel (RCP) - Primary

### 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 drive backplane cover](#).



### Steps

1. Disconnect the right control panel cable from the connectors on the HPM board.
2. Using the Phillips 1 screwdriver, remove the two screws that secure the right/primary control panel to the system.
3. Remove the cable cover away from the system.
4. Holding the right /primary control panel, slide it out of the system.

**NOTE:** Observe the routing of the cable assembly as you remove the right control panel from the system.

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

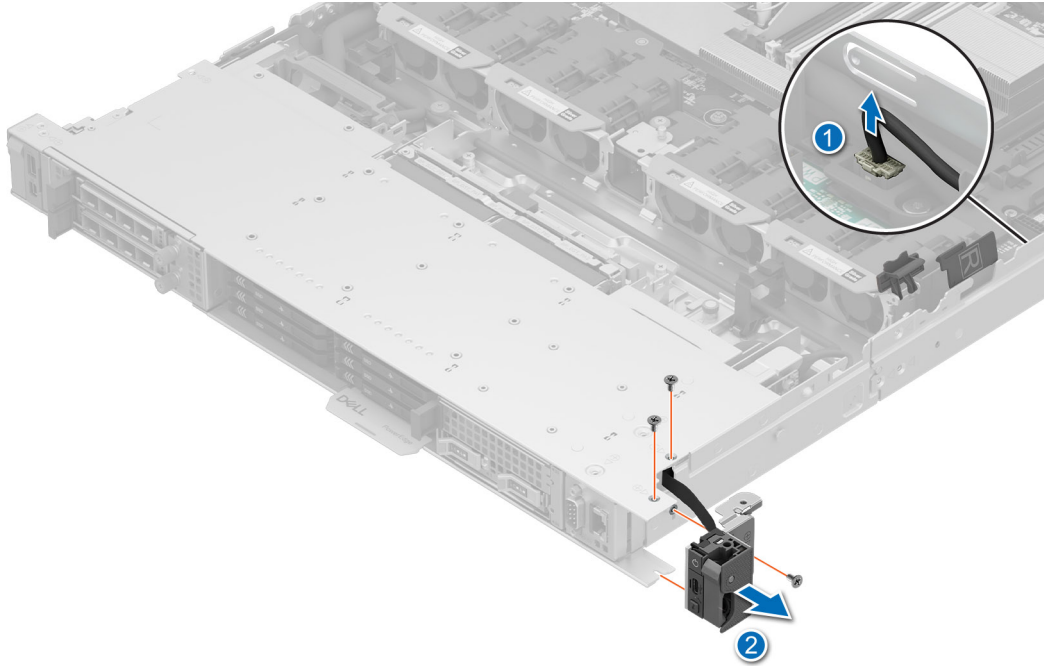


Figure 229. Removing the right control panel

### Next steps

1. [Replace the right/primary control panel.](#)

## Installing the Right Control Panel (RCP) - Primary

### 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 drive backplane cover.](#)

### Steps

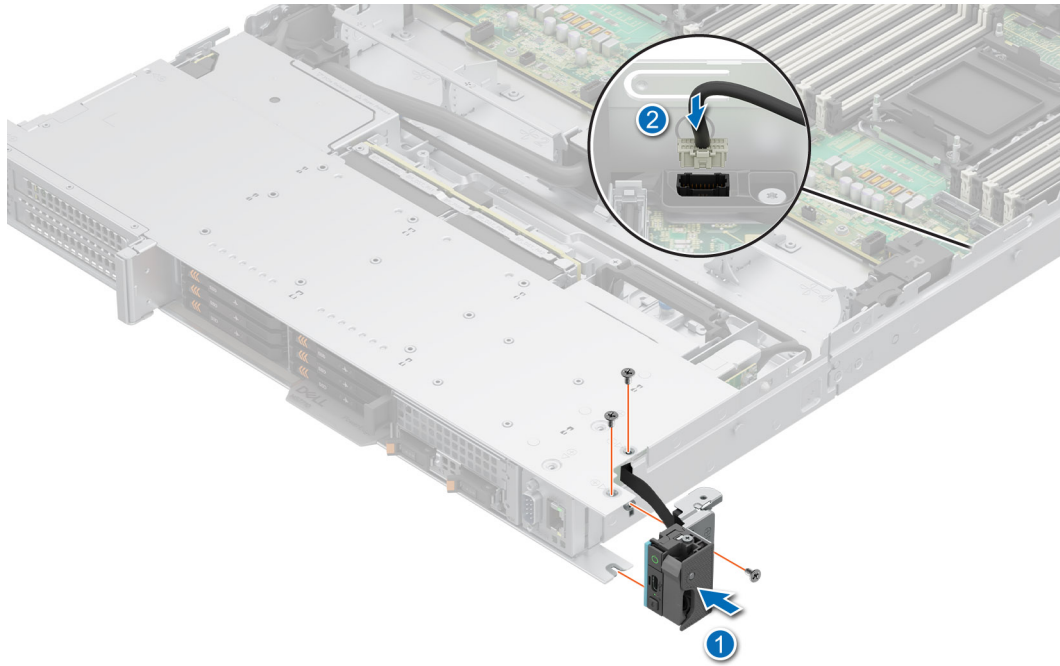
1. Align and slide the right/primary control panel into the slot on the system.
2. Route the right/primary control panel cable through the side wall of the system.

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

3. Connect the right/primary control panel cable to the connectors on the HPM board.
4. Using the Phillips 1 screwdriver, tighten the screws that secure the right control panel and the cable cover to the system.

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





**Figure 230. Installing the right control panel**

#### Next steps

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

## Removing the Left Control Panel (LCP)- Secondary KVM/Quick Sync

#### Prerequisites

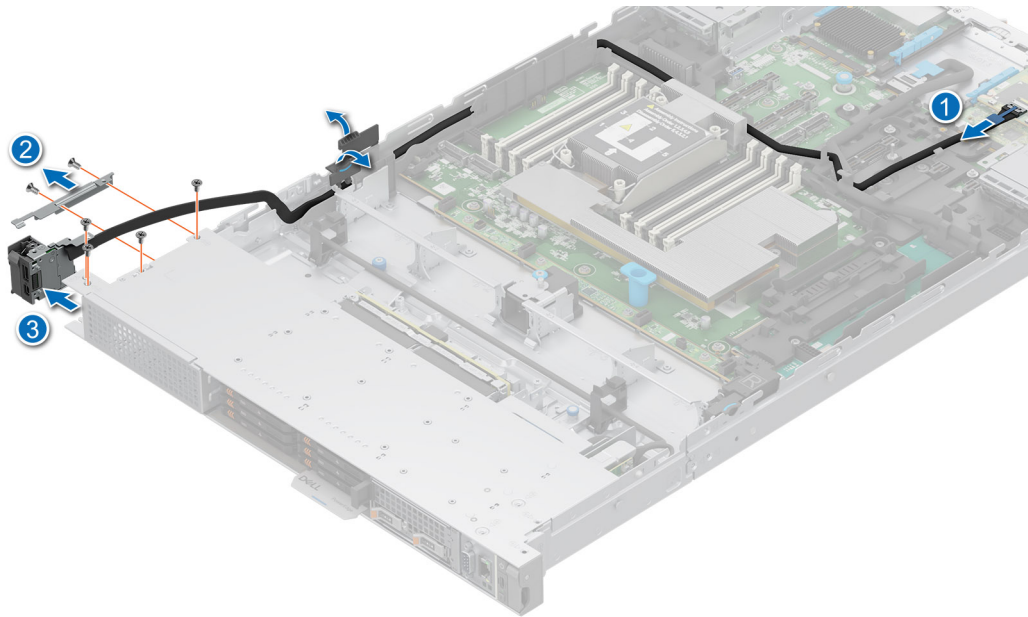
1. Follow the safety guidelines listed in the [Safety instructions.](#)
2. Follow the procedure listed in the [Before working inside your system.](#)
3. [Remove the drive backplane cover.](#)

#### Steps

1. Disconnect the control panel cable from the connector on the HPM/Attic board.
2. Using the Phillips 1 screwdriver, remove the screws that secure the KVM or Quick Sync left/secondary control panel and the cable cover to the system.
3. Remove the cable cover away from the system.
4. Holding the cable, slide the KVM/Quick Sync left control panel out of the system.

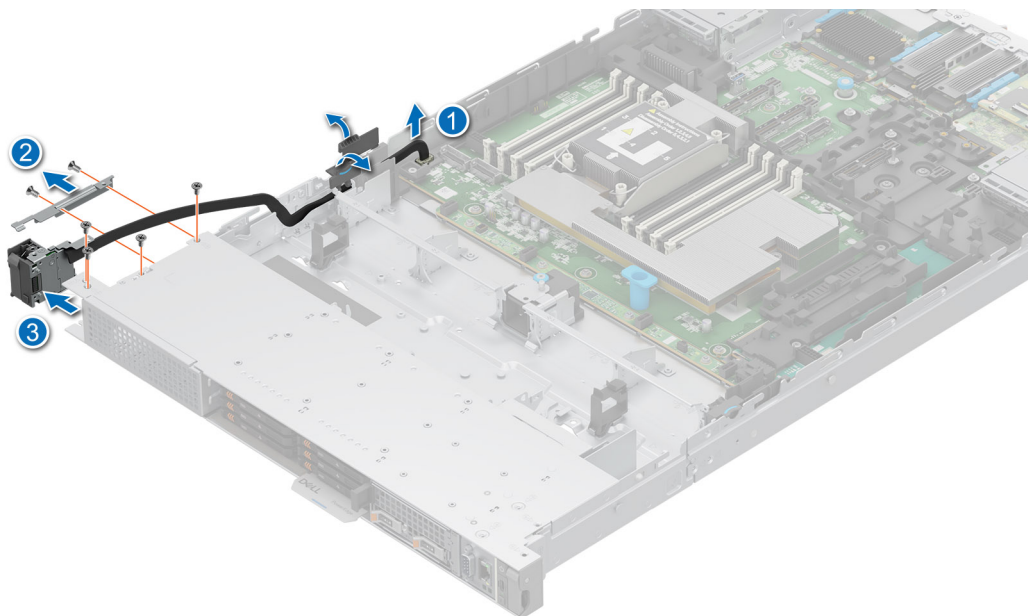
**NOTE:** Observe the routing of the cable as you remove the KVM left control panel from the system.

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



**Figure 231. Removing the KVM left control panel**

5. Disconnect the control panel cable from the connector on the HPM board.



**Figure 232. Removing the Quick Sync left control panel**

#### Next steps

1. Replace the KVM/Quick Sync left control panel.

## Installing the Left Control Panel (LCP)- Secondary KVM/Quick Sync

#### Prerequisites

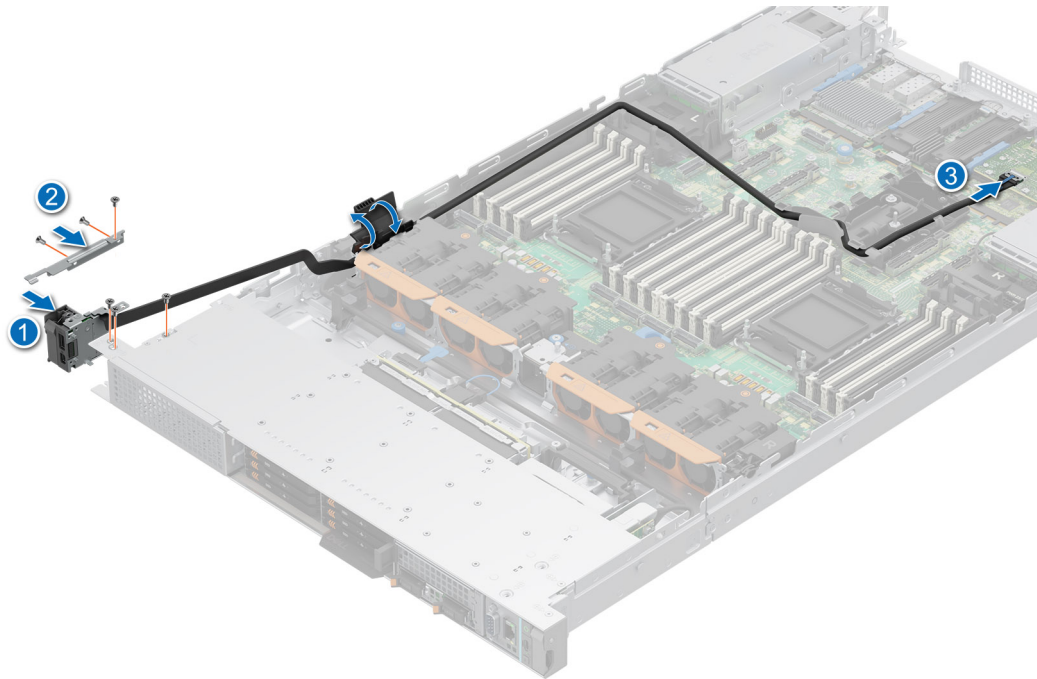
1. Follow the safety guidelines listed in the [Safety instructions](#).
2. Follow the procedure listed in the [Before working inside your system](#).

3. Remove the drive backplane cover.

#### Steps

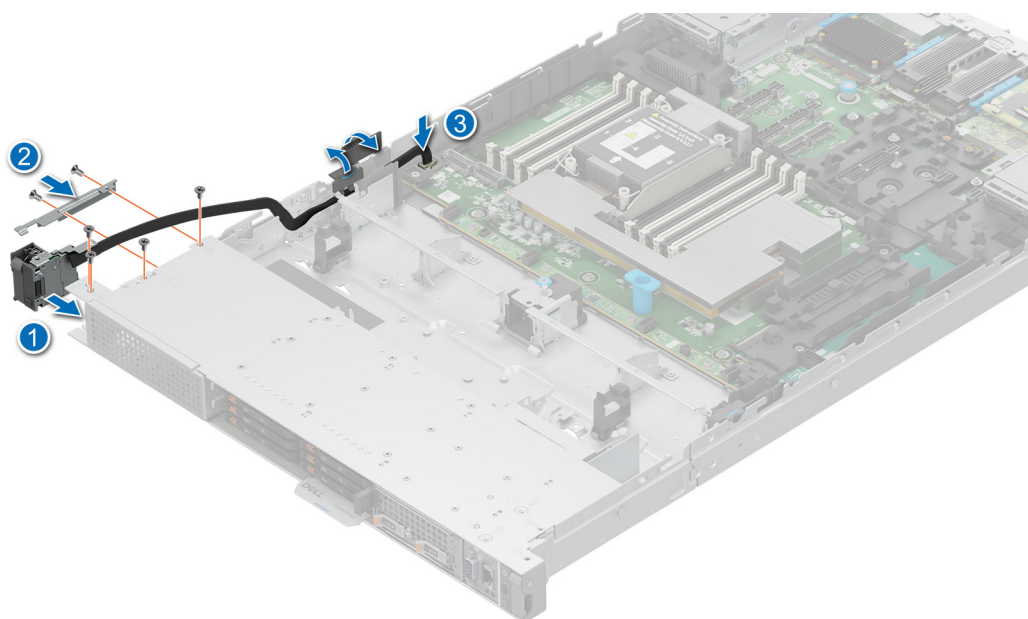
1. Align and slide the KVM/Quick Sync left control panel in the slot on the system.
2. Route the KVM/Quick Sync left control panel cable through the side wall of the system.  
**NOTE:** Route the cable properly to prevent the cable from being pinched or crimped.
3. Align and slide the KVM/Quick Sync left control panel cable cover in the slot on the system.
4. Connect the KVM/Quick Sync left control panel cable to the connector on the HPM/Attic board .
5. Using the Phillips 1 screwdriver, tighten the screws to secure the KVM/Quick Sync left control panel and the cable cover to the system.

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



**Figure 233. Installing the KVM left control panel**

6. Connect the control panel cable from the connector on the HPM board.



**Figure 234. Installing the Quick Sync left control panel**

**Next steps**

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

## Upgrade Kits

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

**Table 85. Upgrade kits**

| Kits           | Related links to service instructions              |
|----------------|----------------------------------------------------|
| Memory         | See <a href="#">Installing a memory module</a>     |
| SSD            | See <a href="#">Installing a drive</a>             |
| Processor      | See <a href="#">Installing a processor</a>         |
| Power supplies | See <a href="#">Installing a power supply unit</a> |
| Cables         | See <a href="#">Cable routing</a>                  |

### Topics:

- [Processor upgrade kit components](#)
- [BOSS-N1 DCHMS module kit](#)
- [M.2 Interposer kit](#)
- [PERC module kit](#)

## Processor upgrade kit components

The system supports only one processor.

Before you begin the installation or removal process, follow the [safety guidelines](#) and [before working inside the system](#) instructions.

**Table 86. Processor upgrade kit components matrix**

| System configuration                                            | CPU | Air Shroud                                    | Heatsink                                   | FAN                              |
|-----------------------------------------------------------------|-----|-----------------------------------------------|--------------------------------------------|----------------------------------|
| 8 x EDSFF E3.S drives                                           | 1   | 1 x Remote air shroud for remote heatsink     | 1 x Remote heatsink for CPU TDP > 250 W    | 4 x VHP fan for CPU TDP > 250 W  |
|                                                                 |     | 1 x Extended air shroud for extended heatsink | 1 x Extended heatsink for CPU TDP <= 250 W | 4 x STD fan for CPU TDP <= 250 W |
| 8 x 2.5 - inch SAS/ SATA/NVMe Drives                            | 1   | 1 x Remote air shroud for remote heatsink     | 1 x Remote heatsink for CPU TDP > 250 W    | 4 x VHP fan for CPU TDP > 250 W  |
|                                                                 |     | 1 x Extended air shroud for extended heatsink | 1 x Extended heatsink for CPU TDP <= 250 W | 4 x STD fan for CPU TDP <= 250 W |
| 10 x 2.5 - inch SAS/ SATA drives with 4 universal slots         | 1   | 1 x Remote air shroud for remote heatsink     | 1 x Remote heatsink for CPU TDP > 225 W    | 4 x VHP fan for CPU TDP > 225 W  |
|                                                                 |     | 1 x Extended air shroud for extended heatsink | 1 x Extended heatsink for CPU TDP <= 225 W | 4 x STD fan for CPU TDP <= 225 W |
| 4 x 3.5 - inch SAS/ SATA drives with 2 x EDSFF E3.S rear drives | 1   | 1 x Remote air shroud for remote heatsink     | 1 x Remote heatsink for CPU TDP > 225 W    | 4 x VHP fan for CPU TDP > 225 W  |
|                                                                 |     | 1 x Extended air shroud for extended heatsink | 1 x Extended heatsink for CPU TDP <= 225 W | 4 x STD fan for CPU TDP <= 225 W |
| 16 x EDSFF E3.S drives                                          | 1   | 1 x Remote air shroud for remote heatsink     | 1 x Remote heatsink for CPU TDP > 225 W    | 4 x VHP fan for CPU TDP > 225 W  |

**Table 86. Processor upgrade kit components matrix (continued)**

| System configuration   | CPU | Air Shroud                                    | Heatsink                                   | FAN                              |
|------------------------|-----|-----------------------------------------------|--------------------------------------------|----------------------------------|
|                        |     | 1 x Extended air shroud for extended heatsink | 1 x Extended heatsink for CPU TDP <= 225 W | 4 x STD fan for CPU TDP <= 225 W |
| 8 x EDSFF E3.S drives* | 1   | 1 x Remote air shroud for remote heatsink     | 1 x Remote heatsink for CPU TDP > 225 W    | 4 x VHP fan for CPU TDP > 225 W  |
|                        |     | 1 x Extended air shroud for extended heatsink | 1 x Extended heatsink for CPU TDP <= 225 W | 4 x STD fan for CPU TDP <= 225 W |

**NOTE:** \*Feature not available at product launch in June, 2025. Please refer to the product configurator page on Dell.com to confirm feature availability.

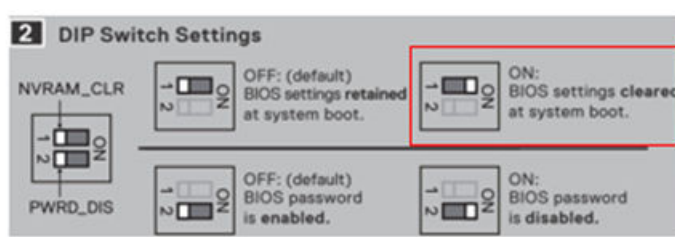
For installation procedures of the Heatsink and Processor see: [Processor and heat sink](#) section.

**NOTE:** The install procedure for the remote and extended heatsinks are the same. The remote heatsink has five captive screws to be secured whereas the extended heatsink has only four.

## Processor upgrade guidelines

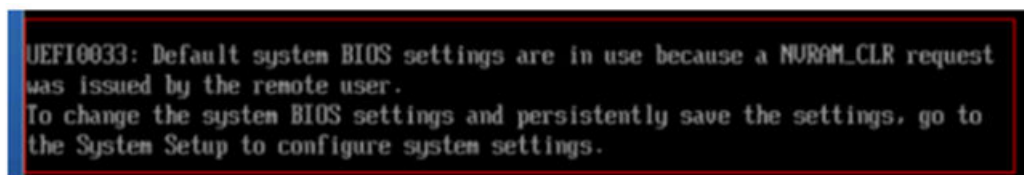
### Procedure to clear NVRM and switch between Intel® Xeon® E-Core processor and Intel® Xeon® P-core processor

- Before the processor replacement, ensure that the system has been upgraded to the latest BIOS, iDRAC, and FPGA version. See [Processor specifications](#) for more details.
- Power off the system and follow the below steps to clear the NVRAM
  - Remove the power cords from all the power supply units.
  - Remove the [system cover](#), [air shrouds](#), and all the [rear risers](#) (if applicable).
  - Replace the Intel® Xeon® E-Core processor with the Intel® Xeon® P-core processor. For processor installation, see [Processor and heat sink](#).
  - Toggle the DIP switch 1 to 'ON' state as shown below. For the DIP switch location on the HPM board see, [HPM board jumpers and connectors](#).



**Figure 235. Image showing the 'ON' state**

- Replace the [system cover](#), [the air shrouds](#), and all the [rear risers](#) (if applicable).
- Connect the power cords to the power supply units, and power on the system.
- When the system displays the **UEFI0033** message on the BIOS post screen as below, power off the system and disconnect the power cords from the all the power supply units.

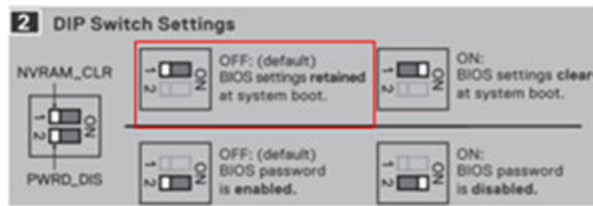


**Figure 236. BIOS POST screen**

- Remove the [system cover](#), [air shrouds](#), and all the [rear risers](#) (if applicable).



- i. Toggle the DIP switch 1 to “Off” state as shown below. For the DIP switch location on the HPM board see [HPM board jumpers and connectors](#) .



**Figure 237. Image showing the 'OFF' state**

- j. Replace the [system cover](#), the [air shrouds](#), and all the [rear risers](#) (if applicable).
- k. Connect the power cords to all the power supply units, power on the system and boot normally.

**NOTE:** The process is the same when replacing an Intel® Xeon® P-Core processor with an Intel® Xeon® E-Core processor.

## BOSS-N1 DCHMS module kit

The BOSS-N1 DCHMS module supports up to two M.2 NVMe SSDs. On the PowerEdge R470 BOSS-N1 DCHMS modules are supported at the front and rear.

Before you begin the installation or removal process, follow the [safety guidelines](#) and [before working inside the system](#) instructions.

**Table 87. BOSS-N1 DCHMS module kit components - Front**

| Components in kit                    | R470 (quantity) |
|--------------------------------------|-----------------|
| BOSS-N1 DCHMS controller card module | 1               |
| BOSS-N1 DCHMS card carrier           | 2               |
| BOSS-N1 DCHMS front tray             | 1               |
| M.2 NVMe SSD                         | 2               |
| M.2 NVMe SSD capacity label          | 2               |
| BOSS-N1 DCHMS card carrier blank     | 1               |
| BOSS-N1 DCHMS PCIe cable with holder | 1               |

**Table 88. BOSS-N1 DCHMS module kit components - Rear**

| Components in kit                    | R470 (quantity) |
|--------------------------------------|-----------------|
| BOSS-N1 DCHMS controller card module | 1               |
| BOSS-N1 DCHMS card carrier           | 2               |
| M.2 NVMe SSD                         | 2               |
| M.2 NVMe SSD capacity label          | 2               |
| BOSS-N1 DCHMS card carrier blank     | 1               |

For installation procedures of the BOSS-N1 DCHMS modules see: [Optional BOSS-N1 DC-MHS module](#) section.

**NOTE:** See [cable routing](#) section, for more information about connecting the BOSS cables to HPM board connectors.

## M.2 Interposer kit

The M.2 interposer module supports up to two M.2 NVMe SSDs. On the PowerEdge R470 M.2 Interposer modules are supported at the front and rear.

Before you begin the installation or removal process, follow the [safety guidelines](#) and [before working inside the system](#) instructions.

**Table 89. M.2 Interposer module kit components - Front**

| Components in kit                     | R470 (quantity) |
|---------------------------------------|-----------------|
| M.2 Interposer controller card module | 1               |
| M.2 Interposer front tray             | 1               |
| M.2 NVMe SSD                          | 1 or 2          |
| M.2 NVMe SSD capacity label           | 1 or 2          |
| M.2 Interposer PCIe cable with holder | 1               |

**Table 90. M.2 Interposer module kit components - Rear**

| Components in kit                     | R470 (quantity) |
|---------------------------------------|-----------------|
| M.2 Interposer controller card module | 1               |
| M.2 NVMe SSD                          | 1 or 2          |
| M.2 NVMe SSD capacity label           | 1 or 2          |

For installation procedures of the BOSS-N1 DCHMS modules see: [Optional M.2 Interposer board](#) section.

 **NOTE:** See [cable routing](#) section, for more information about connecting the cables to HPM board connectors.

## PERC module kit

Before you begin the installation or removal process, follow the [safety guidelines](#) and [before working inside the system](#) instructions.

**Table 91. PERC module kit components - Front**

| Components in kit | R470 (quantity) |
|-------------------|-----------------|
| Tray              | 1               |
| H965i Front       | 1               |
| Shroud            | 1               |
| Screw 3 x 8.5 mm  | 4               |
| PCIE cable        | 1               |
| PERC cable        | 2               |
| Power cable       | 2               |

**Table 92. PERC upgrade Kit cable connections**

| Backplane configuration | Riser configuratio | Upgrade from: | Upgrade to: | Disconnect and remove card or cables from the connector (cable marking):                                                             | Replace with the card or cables (cable marking):                                                                        |
|-------------------------|--------------------|---------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 8 x 2.5-inch NVMe       | RC 0               | Onboard PCIe  | H965i front | <ul style="list-style-type: none"> <li>• PCIe cable 1 (HPM_SL1/SL2 – BP_DST_PA1/ BP_DST</li> <li>• PCIe cable 2 (HPM_SL3/</li> </ul> | <ul style="list-style-type: none"> <li>• Add H965i card</li> <li>• PCIe cable1 (HPM_SL1/SL2 – CTRL_DST_PA 1/</li> </ul> |



**Table 92. PERC upgrade Kit cable connections (continued)**

| Backplane configuration | Riser configuratio | Upgrade from: | Upgrade to: | Disconnect and remove card or cables from the connector (cable marking):                                                                                       | Replace with the card or cables (cable marking):                                                                                                                                                                                                                                                                        |
|-------------------------|--------------------|---------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                    |               |             | SL4 – BP_DST_PA2/ BP_DST_PB2)                                                                                                                                  | CTRL_DST_PB 1)<br><ul style="list-style-type: none"> <li>PERC cable 1 (CTRL_SRC_S A1_PA1 – BP_DST_PA1/ BP_DST_PB1)</li> <li>PERC cable 2 (CTRL_SRC_P B1 – BP_DST_PA2/ BP_DST_PB2)</li> <li>PERC power cable (CTRL_PWR – BP_PWR_CTRL)</li> </ul>                                                                         |
| 8 x 2.5-inch NVMe       | RC 6               | Onboard PCIe  | H965i front | <ul style="list-style-type: none"> <li>PCIe cable 1 (HPM_SL1/SL2 – BP_DST_PA1/ BP_DST</li> <li>PCIe cable 2 (HPM_SL3/ SL4 – BP_DST_PA2/ BP_DST_PB2)</li> </ul> | <ul style="list-style-type: none"> <li>Add H965i card</li> <li>PCIe cable1 (HPM_SL1/SL2 – CTRL_DST_PA 1/ CTRL_DST_PB 1)</li> <li>PERC cable 1 (CTRL_SRC_S A1_PA1 – BP_DST_PA1/ BP_DST_PB1)</li> <li>PERC cable 2 (CTRL_SRC_P B1 – BP_DST_PA2/ BP_DST_PB2)</li> <li>PERC power cable (CTRL_PWR – BP_PWR_CTRL)</li> </ul> |
| 8 x 2.5-inch NVMe       | RC 0               | Onboard PCIe  | H365i front | <ul style="list-style-type: none"> <li>PCIe cable 1 (HPM_SL1/SL2 – BP_DST_PA1/ BP_DST</li> <li>PCIe cable 2 (HPM_SL3/ SL4 – BP_DST_PA2/ BP_DST_PB2)</li> </ul> | <ul style="list-style-type: none"> <li>Add H365i card</li> <li>PCIe cable1 (HPM_SL1 CTRL_DST_PA 1)</li> <li>PERC cable 1 (CTRL_SRC_S A1_PA1 – BP_DST_PA1/ BP_DST_PB1)</li> <li>PERC cable 2 (CTRL_SRC_P B1 – BP_DST_PA2/ BP_DST_PB2)</li> </ul>                                                                         |

**Table 92. PERC upgrade Kit cable connections (continued)**

| Backplane configuration | Riser configuratio | Upgrade from: | Upgrade to: | Disconnect and remove card or cables from the connector (cable marking):                                                                                       | Replace with the card or cables (cable marking):                                                                                                                                                                                                                                                                    |
|-------------------------|--------------------|---------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                    |               |             |                                                                                                                                                                | <ul style="list-style-type: none"> <li>PERC power cable (CTRL_PWR – BP_PWR_CTRL)</li> </ul>                                                                                                                                                                                                                         |
| 8 x 2.5-inch NVMe       | RC 0               | Onboard PCIe  | H365i front | <ul style="list-style-type: none"> <li>PCIe cable 1 (HPM_SL1/SL2 – BP_DST_PA1/ BP_DST)</li> <li>PCIe cable 2 (HPM_SL3/SL4 – BP_DST_PA2/ BP_DST_PB2)</li> </ul> | <ul style="list-style-type: none"> <li>Add H365i card</li> <li>PCIe cable1 (HPM_SL1 CTRL_DST_PA1)</li> <li>PERC cable 1 (CTRL_SRC_SA1_PA1 – BP_DST_PA1/ BP_DST_PB1)</li> <li>PERC cable 2 (CTRL_SRC_PB1 – BP_DST_PA2/ BP_DST_PB2)</li> <li>PERC power cable (CTRL_PWR – BP_PWR_CTRL)</li> </ul>                     |
| 8 x 2.5-inch NVMe       | RC 0, RC 6, RC 8   | H365i front   | H965i front | <ul style="list-style-type: none"> <li>PCIe cable1 (HPM_SL1 CTRL_DST_PA1)</li> </ul>                                                                           | <ul style="list-style-type: none"> <li>Add H965i card</li> <li>PCIe cable1 (HPM_SL1/SL2 – CTRL_DST_PA1/ CTRL_DST_PB1)</li> <li>PERC cable 1 (CTRL_SRC_SA1_PA1 – BP_DST_PA1/ BP_DST_PB1)</li> <li>PERC cable 2 (CTRL_SRC_PB1 – BP_DST_PA2/ BP_DST_PB2)</li> <li>PERC power cable (CTRL_PWR – BP_PWR_CTRL)</li> </ul> |
| 8 x 2.5-inch SATA       | RC 6, RC 8         | H365i front   | H965i front | <ul style="list-style-type: none"> <li>PCIe cable1 (HPM_SL1 CTRL_DST_PA1)</li> </ul>                                                                           | <ul style="list-style-type: none"> <li>Add H965i card</li> <li>PCIe cable1 (HPM_SL1/SL2 – CTRL_DST_PA1/)</li> </ul>                                                                                                                                                                                                 |

**Table 92. PERC upgrade Kit cable connections (continued)**

| Backplane configuration                   | Riser configuratio | Upgrade from: | Upgrade to: | Disconnect and remove card or cables from the connector (cable marking):              | Replace with the card or cables (cable marking):                                                                                                                                                                                                                                                              |
|-------------------------------------------|--------------------|---------------|-------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           |                    |               |             |                                                                                       | CTRL_DST_PB 1)<br><ul style="list-style-type: none"> <li>PERC cable 2 (CTRL_SRC_P B1 – BP_DST_PA2/ BP_DST_PB2)</li> <li>PERC Cable (BP_DST_SA1- BP_DST_SA1/ BP_DST_SB1</li> <li>PERC power cable (CTRL_PWR – BP_PWR_CTR L)</li> </ul>                                                                         |
| 10 x 2.5-inch SATA with 4 Universal ports | RC 6               | H365i front   | H965i front | <ul style="list-style-type: none"> <li>PCIe cable1 (HPM_SL1 CTRL_DST_PA 1)</li> </ul> | <ul style="list-style-type: none"> <li>Add H965i card</li> <li>PCIe cable1 (HPM_SL1/SL2 – CTRL_DST_PA 1/ CTRL_DST_PB 1)</li> <li>PERC cable 2 (CTRL_SRC_P B1 – BP_DST_PA2/ BP_DST_PB2)</li> <li>PERC Cable (BP_DST_SA1- BP_DST_SA1/ BP_DST_SB1</li> <li>PERC power cable (CTRL_PWR – BP_PWR_CTR L)</li> </ul> |
| 10 x 2.5-inch SATA with 4 Universal ports | RC 7               | H365i front   | H965i front | <ul style="list-style-type: none"> <li>PCIe cable1 (HPM_SL1 CTRL_DST_PA 1)</li> </ul> | <ul style="list-style-type: none"> <li>Add H965i card</li> <li>PCIe cable1 (HPM_SL1/SL2 – CTRL_DST_PA 1/ CTRL_DST_PB 1)</li> <li>PCIe cable (HPM_SL1 - CTRL_DST_PA 1)</li> <li>PERC cable (CTRL_SRC_S A1_PA1 - BP_DST_SA1)</li> </ul>                                                                         |

**Table 92. PERC upgrade Kit cable connections (continued)**

| Backplane configuration | Riser configuratio | Upgrade from: | Upgrade to: | Disconnect and remove card or cables from the connector (cable marking): | Replace with the card or cables (cable marking):                                                                                                                                                                                                                                                               |
|-------------------------|--------------------|---------------|-------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                    |               |             |                                                                          | <ul style="list-style-type: none"> <li>• PERC cable 2 (CTRL_SRC_P B1 – BP_DST_PA2/ BP_DST_PB2)</li> <li>• PCIe cable (HPM_SL3 - BP_DST_PB2)</li> <li>• PERC cable (CTRL_SRC_S B1_PB1- BP_DST_SB1)</li> <li>• PCIe cable (HPM_SL4 - BP_DST_PA3)</li> <li>• PERC power cable (CTRL_PWR – BP_PWR_CTRL)</li> </ul> |

For installation procedures of the PERC modules see: [PERC cards](#) section.

 **NOTE:** See [cable routing](#) section,for more information on connecting the PERC cables to HPM board connectors. )

# System diagnostics and indicator codes

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

## Topics:

- [Power LED indicators](#)
- [System health and system ID indicator codes](#)
- [iDRAC Direct LED indicator codes](#)
- [iDRAC Quick Sync 2 indicator codes](#)
- [NIC indicator codes](#)
- [Power supply unit indicator codes](#)
- [Drive indicator codes](#)
- [Using system diagnostics](#)

## Power LED indicators

**NOTE:** The indicators display solid amber if any error occurs.



Figure 238. Power LED indicators

Table 93. Power button LED

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

# System health and system ID indicator codes

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



Figure 239. System health and system ID indicator

Table 94. System health and system ID indicator codes

| System health and system ID indicator code | Condition                                                                                                                                                        |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Solid blue                                 | Indicates that the system is powered on, is healthy, and system ID mode is not active. Press the system health and system ID button to switch to system ID mode. |
| Blinking blue                              | Indicates that the system ID mode is active. Press the system health and system ID button to switch to system health mode.                                       |
| Solid amber                                | Indicates that the system is in fail-safe mode. If the problem persists, see the <a href="#">Getting help</a> section.                                           |
| Blinking amber                             | Indicates that the system is experiencing a fault. Check the System Event Log for specific error messages. <a href="#">EEMI guide</a>                            |

## iDRAC Direct LED indicator codes

The iDRAC Direct LED indicator lights up to indicate that the port is connected and is being used as a part of the iDRAC subsystem.

You can configure iDRAC Direct by using a USB to micro USB (type AB) cable, which you can connect to your laptop or tablet. Cable length should not exceed 3 feet (0.91 meters). Performance could be affected by cable quality. The following table describes iDRAC Direct activity when the iDRAC Direct port is active:

Table 95. iDRAC Direct LED indicator codes

| iDRAC Direct LED indicator code                             | Condition                                                    |
|-------------------------------------------------------------|--------------------------------------------------------------|
| Solid green for two seconds                                 | Indicates that the laptop or tablet is connected.            |
| Blinking green (on for two seconds and off for two seconds) | Indicates that the laptop or tablet connected is recognized. |
| LED Indicator off                                           | Indicates that the laptop or tablet is unplugged.            |

# iDRAC Quick Sync 2 indicator codes

iDRAC Quick Sync 2 module (optional) is located on the left control panel front IO panel of the system.

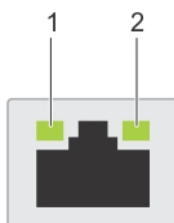


**Table 96. iDRAC Quick Sync 2 indicators and descriptions**

| iDRAC Quick Sync 2 indicator code                   | Condition                                                                                                                                     | Corrective action                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Off (default state)                                 | Indicates that the iDRAC Quick Sync 2 feature is powered off. Press the iDRAC Quick Sync 2 button to power on the iDRAC Quick Sync 2 feature. | If the LED fails to power on, reseal the left control panel flex cable and check. If the problem persists, see the <a href="#">Getting help</a> section.                                                                                                                                |
| Solid white                                         | Indicates that iDRAC Quick Sync 2 is ready to communicate. Press the iDRAC Quick Sync 2 button to power off.                                  | If the LED fails to power off, restart the system. If the problem persists, see the <a href="#">Getting help</a> section.                                                                                                                                                               |
| Blinks white rapidly                                | Indicates data transfer activity.                                                                                                             | If the indicator continues to blink indefinitely, see the <a href="#">Getting help</a> section.                                                                                                                                                                                         |
| Blinks white slowly                                 | Indicates that firmware update is in progress.                                                                                                | If the indicator continues to blink indefinitely, see the <a href="#">Getting help</a> section.                                                                                                                                                                                         |
| Blinks white five times rapidly and then powers off | Indicates that the iDRAC Quick Sync 2 feature is disabled.                                                                                    | Check if iDRAC Quick Sync 2 feature is configured to be disabled by iDRAC. If the problem persists, see the <a href="#">Getting help</a> section. <a href="#">PowerEdge manuals</a> or <i>Dell OpenManage Server Administrator User's Guide</i> at <a href="#">OpenManage Manuals</a> . |
| Solid amber                                         | Indicates that the system is in fail-safe mode.                                                                                               | Restart the system. If the problem persists, see the <a href="#">Getting help</a> section.                                                                                                                                                                                              |
| Blinking amber                                      | Indicates that the iDRAC Quick Sync 2 hardware is not responding properly.                                                                    | Restart the system. If the problem persists, see the <a href="#">Getting help</a> section.                                                                                                                                                                                              |

## NIC indicator codes

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



**Figure 240. NIC indicator codes**

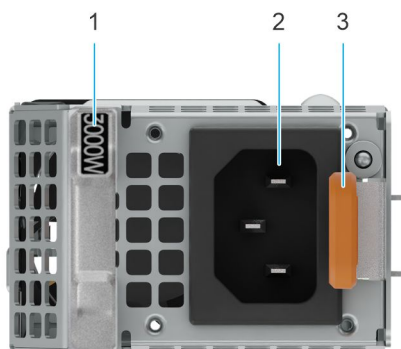
1. Link LED indicator
2. Activity LED indicator

**Table 97. NIC indicator codes**

| NIC indicator codes                                                | Condition                                                                                                                           |
|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Link and activity indicators are off.                              | Indicates that the NIC is not connected to the network.                                                                             |
| Link indicator is green, and activity indicator is blinking green. | Indicates that the NIC is connected to a valid network at its maximum port speed, and data is being sent or received.               |
| Link indicator is amber, and activity indicator is blinking green. | Indicates that the NIC is connected to a valid network at less than its maximum port speed, and data is being sent or received.     |
| Link indicator is green, and activity indicator is off.            | Indicates that the NIC is connected to a valid network at its maximum port speed, and data is not being sent or received.           |
| Link indicator is amber, and activity indicator is off.            | Indicates that the NIC is connected to a valid network at less than its maximum port speed, and data is not being sent or received. |
| Link indicator is blinking green, and activity is off.             | Indicates that the NIC identity is enabled through the NIC configuration utility.                                                   |

## Power supply unit indicator codes

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



**Figure 241. AC PSU status indicator**

1. AC PSU handle
2. Socket
3. Release latch

**Table 98. AC and DC PSU status indicator codes**

| Power indicator codes          | Condition                                                                                                                                                                                                                                                                                                                                |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Green                          | Indicates that a valid power source is connected to the PSU and the PSU is operational.                                                                                                                                                                                                                                                  |
| Blinking amber                 | Indicates an issue with the PSU.                                                                                                                                                                                                                                                                                                         |
| Not powered on                 | Indicates that the power is not connected to the PSU.                                                                                                                                                                                                                                                                                    |
| Blinking green                 | Indicates that the firmware of the PSU is being updated.<br><div> <div>⚠</div> <div><b>CAUTION: Do not disconnect the power cord or unplug the PSU when updating firmware. If firmware update is interrupted, the PSUs will not function.</b></div> </div>                                                                               |
| Blinking greens and powers off | When hot-plugging a PSU, it blinks green five times at a rate of 4 Hz and powers off. This indicates a PSU mismatch due to efficiency, feature set, health status, or supported voltage.<br><div> <div>⚠</div> <div><b>CAUTION: If two PSUs are installed, both the PSUs must have the same type of label; for example,</b></div> </div> |



**Table 98. AC and DC PSU status indicator codes (continued)**

| Power indicator codes | Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | <p><b>Extended Power Performance (EPP) label. Mixing PSUs from previous generations of PowerEdge servers is not supported, even if the PSUs have the same power rating. This results in a PSU mismatch condition or failure to power on the system.</b></p> <p>⚠ <b>CAUTION:</b> If two PSUs are used, they must be of the same type and have the same maximum output power.</p> <p>⚠ <b>CAUTION:</b> When correcting a PSU mismatch, replace the PSU with the blinking indicator. Swapping the PSU to make a matched pair can result in an error condition and an unexpected system shutdown. To change from a high output configuration to a low output configuration or vice versa, you must power off the system.</p> <p>⚠ <b>CAUTION:</b> AC PSUs support both 240 V and 120 V input voltages with the exception of Titanium PSUs, which support only 240 V. When two identical PSUs receive different input voltages, they can output different wattages, and trigger a mismatch.</p> |

## Drive indicator codes

The LEDs on the drive carrier indicate the state of each drive. SAS/SATA drive carrier has two LEDs: an activity LED (green) and a status LED (bicolor, green/amber). The activity LED blinks whenever the drive is accessed. The LEDs on the EDSFF E3.S drive have two LEDs: an activity LED (green) and a locate/fault LED (blue/amber). The activity LED blinks whenever the drive is accessed



**Figure 242. SAS/SATA Drive indicators**

1. Drive activity LED indicator
2. Drive status LED indicator
3. Drive capacity label

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

**NOTE:** Drive status indicator behavior is managed by Storage Spaces Direct. Not all drive status indicators may be used.

**Table 99. Drive indicator codes**

| Drive status indicator code   | Condition                                                              |
|-------------------------------|------------------------------------------------------------------------|
| Blinks green twice per second | Indicates that the drive is being identified or preparing for removal. |
| Not powered on                | Indicates that the drive is ready for removal.                         |

**Table 99. Drive indicator codes (continued)**

| Drive status indicator code                                                                    | Condition                                                                                                                                                               |
|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                | <b>NOTE:</b> The drive status indicator remains off until all drives are initialized after the system is powered on. Drives are not ready for removal during this time. |
| Blinks green, amber, and then powers off                                                       | Indicates that there is an unexpected drive failure.                                                                                                                    |
| Blinks amber four times per second                                                             | Indicates that the drive has failed.                                                                                                                                    |
| Blinks green slowly                                                                            | Indicates that the drive is rebuilding.                                                                                                                                 |
| Solid green                                                                                    | Indicates that the drive is online.                                                                                                                                     |
| Blinks green for three seconds, amber for three seconds, and then powers off after six seconds | Indicates that the rebuild has stopped.                                                                                                                                 |



**Figure 243. EDSFF E3.S drive indicators**

1. Drive activity LED indicator
2. Drive status LED indicator
3. Drive capacity label

## EDSFF E3.S drive led codes

E3.S hard drives have Green LED and Blue/Amber LED.

- Green LED shows : Drive power status , Activity
- Blue/Amber LED shows: Drive Fault, Locate

EDSFF indicator behavior

**Table 100. EDSFF indicator behavior**

| Pattern Name | Description                                       | Blue Element            | Amber Element           |
|--------------|---------------------------------------------------|-------------------------|-------------------------|
| Locate       | This device is being identified.                  | ON (1 sec ON 1 sec OFF) | OFF                     |
| Fault        | The device is in a fault condition.               | OFF                     | ON (2 sec ON 1 sec OFF) |
| N/A          | This device does not have fault or locate device. | OFF                     | OFF                     |

**NOTE:** Locate behavior overrides Fault state.

Green LED

The green LED is driven and controlled by the device. The two functions for this LED are defined as follows:

- Power: This function indicates that the device has power and has no issues with its power regulation. Once the green LED is ON, it shall either remain ON or blink at the activity frequency unless the device determines power is no longer within its operating range.
- Activity: This function indicates if the device is being used.

**Table 101. LED and device state per function for Green LED**

| Function/Device state                              | LED state |
|----------------------------------------------------|-----------|
| Power ON/Device is powered, no activity occurring. | ON        |

**Table 101. LED and device state per function for Green LED (continued)**

| Function/Device state                                              | LED state               |
|--------------------------------------------------------------------|-------------------------|
| Activity/Device is powered, host initiated I/O activity occurring. | 4 Hz nominal blink rate |
| Power OFF/Device is not powered.                                   | OFF                     |

## 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

## System diagnostic controls

**Table 102. System diagnostic controls**

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

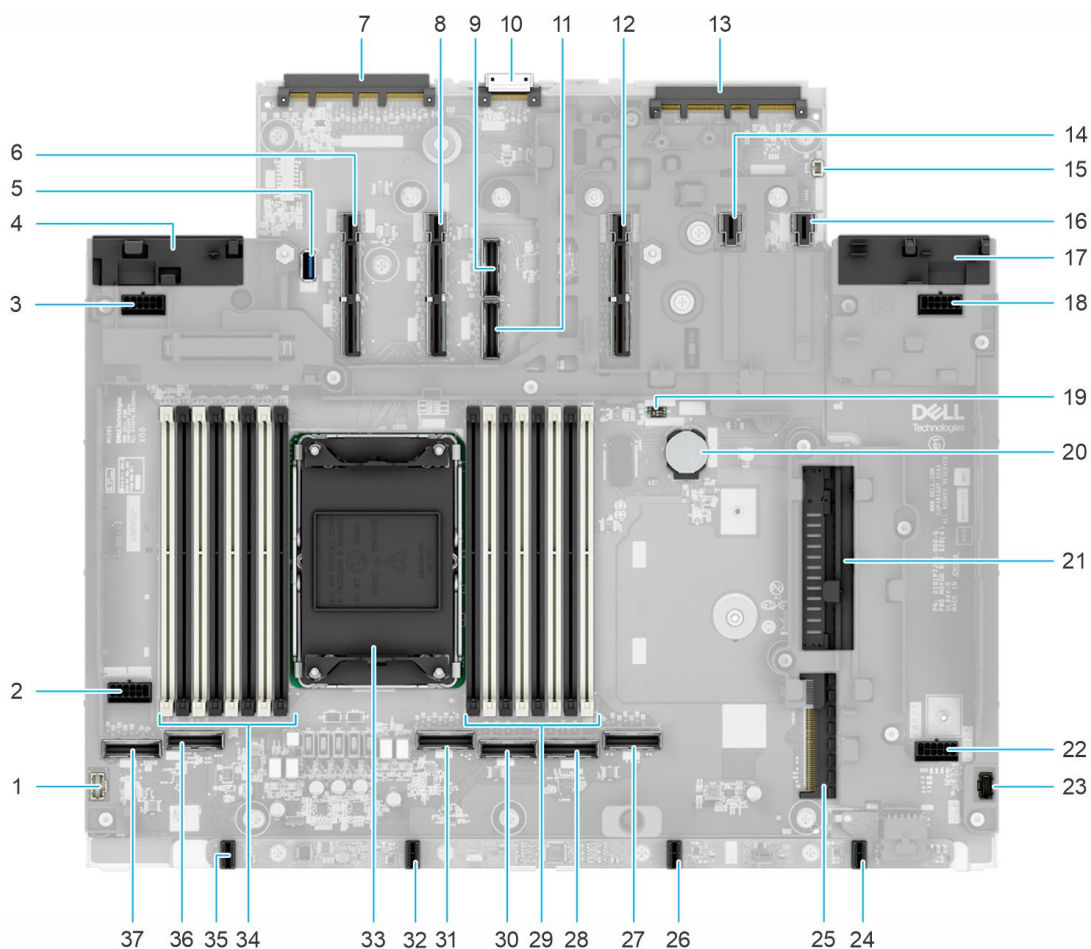
# Jumpers and connectors

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

## Topics:

- [HPM board jumpers and connectors](#)
- [HPM board jumper settings](#)
- [Disabling a forgotten password](#)

## HPM board jumpers and connectors



**Figure 244. HPM board jumpers and connectors**

**Table 103. HPM board jumpers and connectors**

| Item | Connector                       |
|------|---------------------------------|
| 1    | Left control panel connector    |
| 2    | Power connector 1/2 (PWR1/PWR2) |

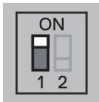
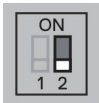
**Table 103. HPM board jumpers and connectors (continued)**

| Item | Connector                               |
|------|-----------------------------------------|
| 3    | Power connector 5/6(PWR5/PWR6)          |
| 4    | PSU connector 2                         |
| 5    | Internal USB                            |
| 6    | Riser connector (SL11/SL12/PWR11/PWR12) |
| 7    | OCP NIC 3.0 connector                   |
| 8    | Riser connector (SL13/SL14/PWR13/PWR14) |
| 9    | PCIe connector 23 (SL23_CPU0)           |
| 10   | BOSS connector                          |
| 11   | PCIe connector 24 (SL24_CPU0)           |
| 12   | Riser connector (SL15/SL16/PWR15/PWR16) |
| 13   | DC-SCM connector                        |
| 14   | Riser connector (PWR17/PWR18)           |
| 15   | Intrusion switch connector              |
| 16   | Riser connector (PWR19/PWR20)           |
| 17   | PSU 1 connector                         |
| 18   | Power connector 23/24(PWR23/PWR24)      |
| 19   | DIP switch                              |
| 20   | Coin cell battery                       |
| 21   | PIB power connector                     |
| 22   | Power connector 25/26(PWR25/PWR26)      |
| 23   | Right control panel connector           |
| 24   | Fan 4                                   |
| 25   | PIB signal connector                    |
| 26   | Fan 3                                   |
| 27   | PCIe connector 6 (SL6_CPU0)             |
| 28   | PCIe connector 5 (SL5_CPU0)             |
| 29   | DIMM slots                              |
| 30   | PCIe connector 4 (SL4_CPU0)             |
| 31   | PCIe connector 3 (SL3_CPU0)             |
| 32   | Fan 2                                   |
| 33   | CPU 0                                   |
| 34   | DIMM slots                              |
| 35   | Fan 1                                   |
| 36   | PCIe connector 2 (SL2_CPU0)             |
| 37   | PCIe connector 1 (SL1_CPU0)             |

# HPM board jumper settings

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

**Table 104. HPM board jumper settings**

| Jumper    | Setting                                                                           | Description                                                   |
|-----------|-----------------------------------------------------------------------------------|---------------------------------------------------------------|
| NVRAM_CLR |  | OFF (default): The BIOS settings are retained at system boot. |
|           |  | ON: The BIOS settings cleared at system boot.                 |
| PWRD_DIS  |  | OFF (default): The BIOS password is enabled.                  |
|           |  | ON: The BIOS password is disabled.                            |

**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

1. Power off the system, and all the attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover.
3. Move the DIP switch (PWRD\_DIS) on the HPM board from OFF position to ON position.
4. Replace the system cover.
  - NOTE:** The existing passwords are not disabled (erased) until the system boots the DIP switch in the ON position. . However, before you assign a new system and/or setup password, you must move the DIP switch back to OFF position
  - NOTE:** If you assign a new system and/or setup password with he DIP switch in ON position, the system disables the new password(s) the next time it boots.
5. Reconnect the system and all the attached peripherals.
6. Power off the system.
7. Remove the system cover.
8. Move the DIP switch (PWRD\_DIS) on the HPM board from ON position to OFF position.

9. Replace the system cover.
10. Reconnect the system to the electrical outlet and power on the system, and all the attached peripherals.
11. Assign a new system and/or setup password.

## Getting Help

### Topics:

- [Recycling or End-of-Life service information](#)
- [Contacting Dell Technologies](#)
- [Accessing system information by using MyDell](#)
- [Receiving automated support with Secure Connect Gateway \(SCG\)](#)

## 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 [How to Recycle](#) 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 [Dell Support](#).
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 MyDell

You can use the MyDell label located on the Express service tag in the front of the PowerEdge system, to access information about PowerEdge R470 system.

### Prerequisites

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

The MyDell 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 support and sales teams.

#### Steps

1. Go to [PowerEdge Manuals](#), and navigate to your specific product or
2. Use your smart phone or tablet to scan the model-specific MyDell Quick Resource (QR) code on your system.

## QR code for PowerEdge R470 system resources



Figure 245. QR code for PowerEdge R470 system

## Receiving automated support with Secure Connect Gateway (SCG)

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

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

The available benefits vary depending on the Dell Service entitlement purchased for your device. For more information about Secure Connect Gateway (SCG), go to [secureconnectgateway](#).

## 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 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 105. Additional documentation resources for your system**

| Task                                                             | Document                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Location                                   |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Setting up your system                                           | For more information about installing and securing the system into a rack, see the Rail Installation Guide included with your rail solution.<br><br>For information about setting up your system, see the <i>Getting Started Guide</i> document that is shipped with your system.                                                                                                                                                                                                                                                                                                                                       | <a href="#">PowerEdge manuals</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.<br><br>For information about understanding Remote Access Controller Admin (RACADM) subcommands and supported RACADM interfaces, see the RACADM CLI Guide for OSM.<br><br>For information about Redfish and its protocol, supported schema, and Redfish Eventing implemented in iDRAC, see the Redfish API Guide.<br><br>For information about iDRAC property database group and object descriptions, see the Attribute Registry Guide. | <a href="#">PowerEdge manuals</a>          |
|                                                                  | For information about installing the operating system, see the operating system documentation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <a href="#">Operating System Manuals</a>   |
|                                                                  | For information about updating drivers and firmware, see the Methods to download firmware and drivers section in this document.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <a href="#">Drivers</a>                    |
| Working with the Dell PowerEdge RAID controllers (if applicable) | For information about understanding the features of the Dell PowerEdge RAID controllers (PERC), Software RAID controllers,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <a href="#">Storage Controller Manuals</a> |

**Table 105. Additional documentation resources for your system (continued)**

| Task                                   | Document                                                                                                                 | Location                          |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
|                                        | or BOSS card and deploying the cards, see the Storage controller documentation.                                          |                                   |
| Understanding event and error messages | <a href="#">EEMI guide</a>                                                                                               | <a href="#">QRL</a>               |
| Troubleshooting your system            | For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide. | <a href="#">PowerEdge manuals</a> |