

Dell PowerEdge R760xd2

Installation and Service Manual

Notes, cautions, and warnings

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

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

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

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About this document

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

PowerEdge R760xd2 system overview

The PowerEdge R760xd2 system is a 2U server that supports:

- Up to two 4th Generation Intel Xeon Scalable processors with up to 32 cores
- 16 DIMM slots
- Two redundant AC or DC power supply units
- Up to 24 x 3.5 inch SAS/SATA (HDD/SSD front and middle) drives or Up to 4 x 3.5 inch SAS/SATA (HDD/SSD) rear drives or Up to 4 x 2.5 inch NVMe rear drives with 3.5 inch to 2.5 inch adapter in 3.5 inch carrier or Up to 2 x 2.5 inch NVMe rear drives or 4 x E3.S NVMe SSD 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 <https://www.dell.com/support> > **Browse all Products** > **Data Center Infrastructure** > **Storage Adapters & Controllers** > **Dell PowerEdge Express Flash NVMe PCIe SSD** > **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.

Topics:

- [Front view of the system](#)
- [Rear view of the system](#)
- [Inside the system](#)
- [Locating the Express Service Code and Service Tag](#)
- [System information labels](#)
- [Rail sizing and rack compatibility matrix](#)

Front view of the system

Front view of 24 x 3.5-inch drive system with mid bay closed



Front view of 24 x 3.5-inch drive system with mid bay open

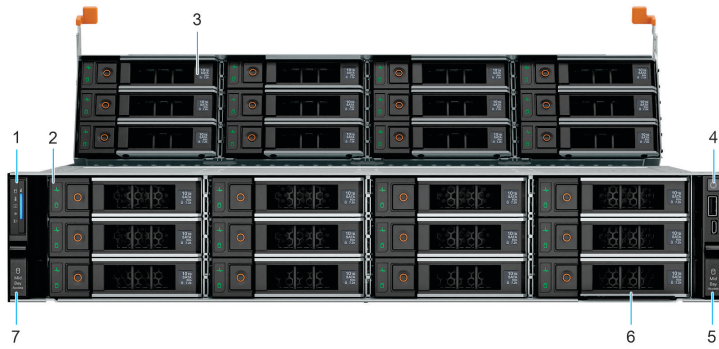


Table 1. Features available on the front of the system

Item	Ports, panels, and slots	Icon	Description
1	Left control panel	N/A	Contains the system health, system ID, and the status LED indicator.
2	Drive	N/A	Enables you to install drives that are supported on your system. i NOTE: For drive slot numbers, see the system information label section.
3	Drive	N/A	Enables you to install drives that are supported on your system. i NOTE: For drive slot numbers, see the system information label section.
4	Right control panel	N/A	Contains the power button, USB port and iDRAC Direct (Micro-AB USB) port
5	Mid Bay Access	N/A	Used to access the mid drive bay
6	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, and so on. If you have opted for the secure default access to iDRAC, the Information tag will also contain the iDRAC secure default password.
7	Mid Bay Access	N/A	Used to access the mid drive bay

i **NOTE:** For more information about the ports, see the [Technical Specifications](#) section.

Left control panel view

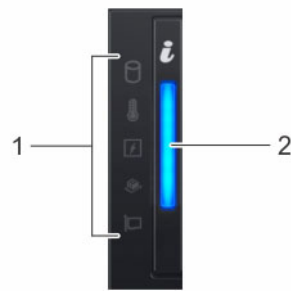


Figure 1. Left control panel

Table 2. Left control panel

Item	Indicator, button, or connector	Icon	Description
1	Status LED indicators	NA	Indicates the status of the system. For more information, see the status LED indicators section.
2	System health and system ID indicator	<i>i</i>	Indicates the status of the system. For more information, see the system health and system id indicators section.

NOTE: For more information about the indicator codes, see the [system diagnostics and indicator codes](#) section.

Right control panel view

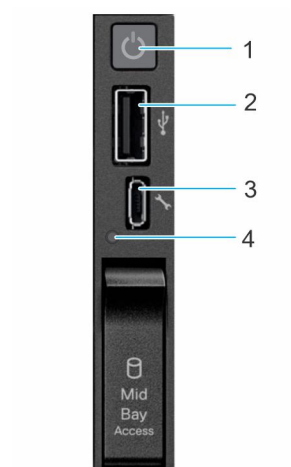



Figure 2. Right control panel

Table 3. Right control panel

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. NOTE: Press the power button to gracefully shut down an ACPI-compliant operating system.
2	USB 2.0-compliant port		The USB port is a 4-pin connector and 2.0-compliant. This port enables you to connect USB devices to the system.

Table 3. Right control panel (continued)

Item	Indicator or button	Icon	Description
3	iDRAC Direct port (Micro-AB USB)		The iDRAC Direct port (Micro-AB USB) enables you to access the iDRAC direct Micro-AB USB features. For more information, see the https://www.dell.com/idracmanuals . NOTE: 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.
4	iDRAC Direct LED indicator	N/A	The iDRAC Direct LED indicator lights up to indicate that the iDRAC Direct port is actively connected to a device.

NOTE: For more information about the ports, see the [Technical Specifications](#) section.

Rear view of the system

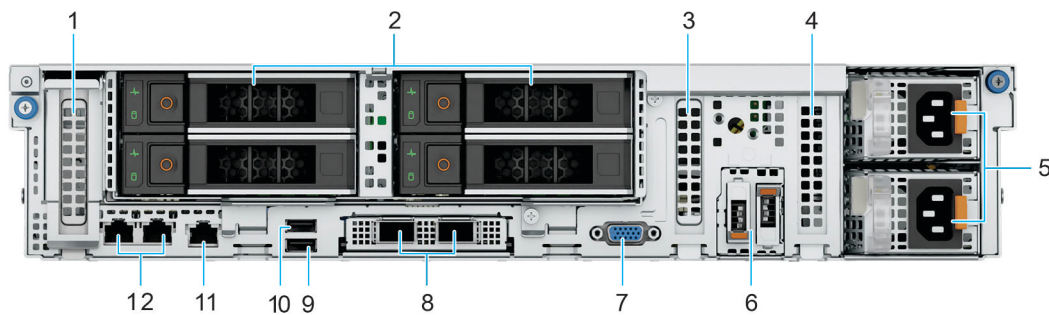






Figure 3. Rear view of 3 x PCIe Low Profile Slots with 4 x 3.5 inch SAS/SATA or 4 x 2.5 inch NVMe Drives

Table 4. Features available at the rear of the system

Item	Ports, panels, or slots	Icon	Description
1	PCIe expansion card slot 1	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
2	Rear drive module	N/A	Enables you to install rear drives that are supported on your system.
3	PCIe expansion card slot 4	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
4	PCIe expansion card slot 5	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.

Table 4. Features available at the rear of the system (continued)

Item	Ports, panels, or slots	Icon	Description
5	PSU	N/A	Primary and secondary power supply units
6	BOSS-N1 module	N/A	BOSS-N1 module for internal system boot.
7	VGA port		Enables you to connect a display device to the system.
8	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 system board.
9	USB 3.0 port		This port is USB 3.0-compliant.
10	USB 2.0 port		This port is USB 2.0-compliant.
11	Dedicated iDRAC Ethernet port	iDRAC	Enables you to remotely access iDRAC. For more information, see the <i>Integrated Dell Remote Access Controller User's Guide</i> at www.dell.com/poweredgemanuals .
12	NIC ports		The NIC ports that are integrated on the system board provide network connectivity.

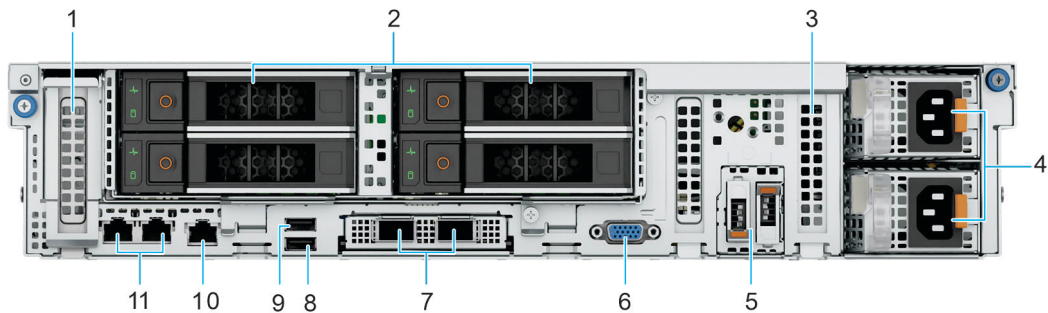






Figure 4. Rear view of 2 x PCIe Low Profile Slots and 4 x 3.5 inch SAS/SATA Drives with 1 CPU

Table 5. Features available at the rear of the system

Item	Ports, panels, or slots	Icon	Description
1	PCIe expansion card slot 1	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
2	Rear drive module	N/A	Enables you to install rear drives that are supported on your system.

Table 5. Features available at the rear of the system (continued)

Item	Ports, panels, or slots	Icon	Description
3	PCIe expansion card slot 5	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
4	PSU	N/A	Primary and secondary power supply units
5	BOSS-N1 module	N/A	BOSS-N1 module for internal system boot.
6	VGA port		Enables you to connect a display device to the system.
7	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 system board.
8	USB 3.0 port		This port is USB 3.0-compliant.
9	USB 2.0 port		This port is USB 2.0-compliant.
10	Dedicated iDRAC Ethernet port	iDRAC	Enables you to remotely access iDRAC. For more information, see the <i>Integrated Dell Remote Access Controller User's Guide</i> at www.dell.com/poweredgemanuals .
11	NIC ports		The NIC ports that are integrated on the system board provide network connectivity.

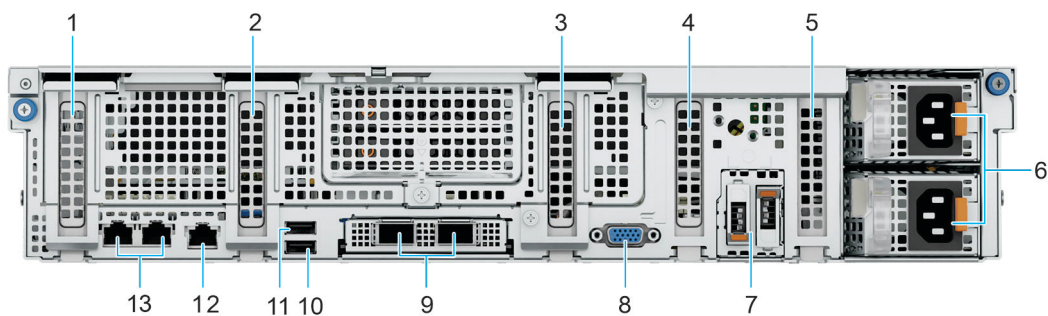






Figure 5. Rear view of 5 x PCIe Low Profile Slots

Table 6. Features available at the rear of the system

Item	Ports, panels, or slots	Icon	Description
1	PCIe expansion card slot 1	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.

Table 6. Features available at the rear of the system (continued)

Item	Ports, panels, or slots	Icon	Description
			more information, see the Expansion card installation guidelines section.
2	PCIe expansion card slot 2	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
3	PCIe expansion card slot 3	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
4	PCIe expansion card slot 4	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
5	PCIe expansion card slot 5	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
6	PSU	N/A	Primary and secondary power supply units
7	BOSS-N1 module	N/A	BOSS-N1 module for internal system boot.
8	VGA port		Enables you to connect a display device to the system.
9	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 system board.
10	USB 3.0 port		This port is USB 3.0-compliant.
11	USB 2.0 port		This port is USB 2.0-compliant.
12	Dedicated iDRAC Ethernet port	iDRAC	Enables you to remotely access iDRAC. For more information, see the <i>Integrated Dell Remote Access Controller User's Guide</i> at www.dell.com/poweredgemanuals .
13	NIC ports		The NIC ports that are integrated on the system board provide network connectivity.

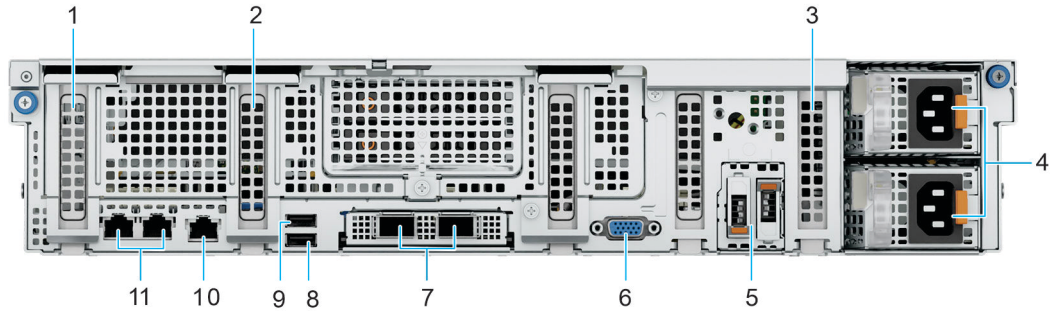


Figure 6. Rear view of 3 x PCIe Low Profile Slots with 1 CPU

Table 7. Features available at the rear of the system





Item	Ports, panels, or slots	Icon	Description
1	PCIe expansion card slot 1	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
2	PCIe expansion card slot 2	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
3	PCIe expansion card slot 5	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
4	PSU	N/A	Primary and secondary power supply units
5	BOSS-N1 module	N/A	BOSS-N1 module for internal system boot.
6	VGA port		Enables you to connect a display device to the system.
7	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 system board.
8	USB 3.0 port		This port is USB 3.0-compliant.
9	USB 2.0 port		This port is USB 2.0-compliant.
10	Dedicated iDRAC Ethernet port	iDRAC	Enables you to remotely access iDRAC. For more information, see the <i>Integrated Dell Remote Access Controller User's</i>

Table 7. Features available at the rear of the system (continued)

Item	Ports, panels, or slots	Icon	Description
			Guide at www.dell.com/poweredgemanuals .
11	NIC ports		The NIC ports that are integrated on the system board provide network connectivity.

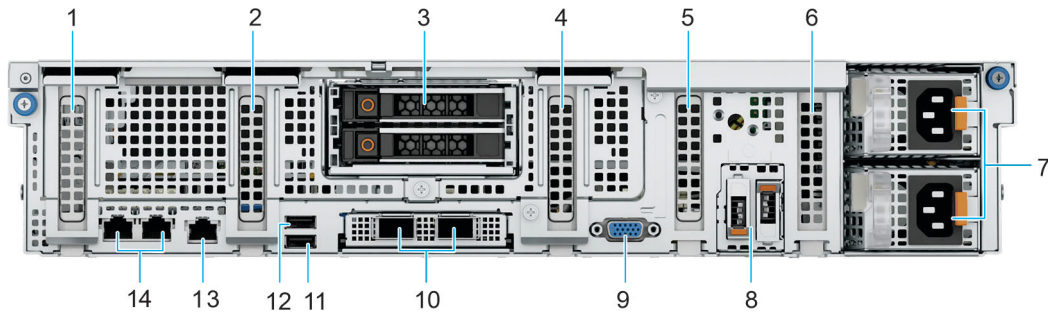






Figure 7. Rear view of 5 x PCIe Low Profile Slots and 2 x 2.5 inch NVMe Drives

Table 8. Features available at the rear of the system

Item	Ports, panels, or slots	Icon	Description
1	PCIe expansion card slot 1	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
2	PCIe expansion card slot 2	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
3	Rear drive module	N/A	Enables you to install rear drives that are supported on your system.
4	PCIe expansion card slot 3	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
5	PCIe expansion card slot 4	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
6	PCIe expansion card slot 5	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For

Table 8. Features available at the rear of the system (continued)

Item	Ports, panels, or slots	Icon	Description
			more information, see the Expansion card installation guidelines section.
7	PSU	N/A	Primary and secondary power supply units
8	BOSS-N1 module	N/A	BOSS-N1 module for internal system boot.
9	VGA port		Enables you to connect a display device to the system.
10	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 system board.
11	USB 3.0 port		This port is USB 3.0-compliant.
12	USB 2.0 port		This port is USB 2.0-compliant.
13	Dedicated iDRAC Ethernet port	iDRAC	Enables you to remotely access iDRAC. For more information, see the <i>Integrated Dell Remote Access Controller User's Guide</i> at www.dell.com/poweredge/manuals .
14	NIC ports		The NIC ports that are integrated on the system board provide network connectivity.

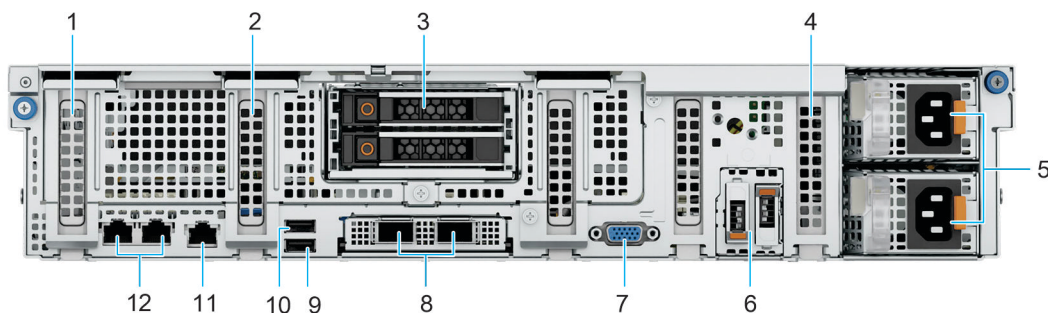






Figure 8. Rear view of 3 x PCIe Low Profile Slots and 2 x 2.5 inch NVMe Drives with 1 CPU

Table 9. Features available at the rear of the system

Item	Ports, panels, or slots	Icon	Description
1	PCIe expansion card slot 1	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.

Table 9. Features available at the rear of the system (continued)

Item	Ports, panels, or slots	Icon	Description
2	PCIe expansion card slot 2	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
3	Rear drive module	N/A	Enables you to install rear drives that are supported on your system.
4	PCIe expansion card slot 5	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
5	PSU	N/A	Primary and secondary power supply units
6	BOSS-N1 module	N/A	BOSS-N1 module for internal system boot.
7	VGA port		Enables you to connect a display device to the system.
8	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 system board.
9	USB 3.0 port		This port is USB 3.0-compliant.
10	USB 2.0 port		This port is USB 2.0-compliant.
11	Dedicated iDRAC Ethernet port	iDRAC	Enables you to remotely access iDRAC. For more information, see the <i>Integrated Dell Remote Access Controller User's Guide</i> at www.dell.com/poweredgemanuals .
12	NIC ports		The NIC ports that are integrated on the system board provide network connectivity.

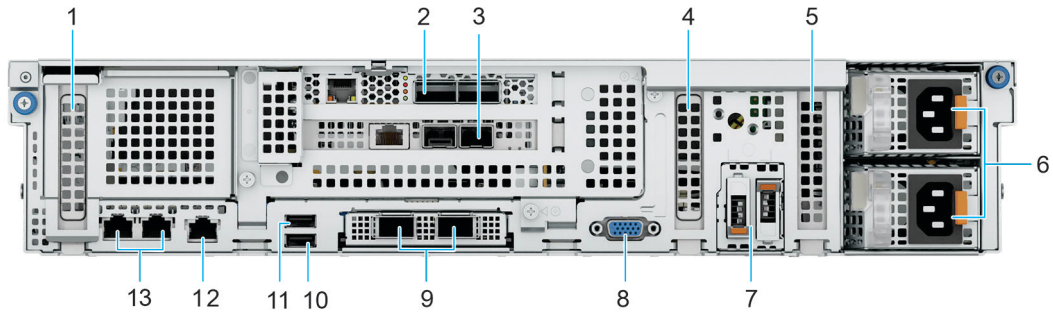


Figure 9. Rear view of 3 x PCIe Low Profile Slots and 2 x PCIe FH/FL Slots

Table 10. Features available at the rear of the system





Item	Ports, panels, or slots	Icon	Description
1	PCIe expansion card slot 1	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
2	PCIe expansion card slot - Riser slot 2	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
3	PCIe expansion card slot - Riser slot 3	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
4	PCIe expansion card slot 4	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
5	PCIe expansion card slot 5	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
6	PSU	N/A	Primary and secondary power supply units
7	BOSS-N1 module	N/A	BOSS-N1 module for internal system boot.
8	VGA port		Enables you to connect a display device to the system.
9	OCP NIC card	N/A	The OCP NIC card supports OCP 3.0. The NIC ports are integrated on the OCP card

Table 10. Features available at the rear of the system (continued)

Item	Ports, panels, or slots	Icon	Description
			which is connected to the system board.
10	USB 3.0 port		This port is USB 3.0-compliant.
11	USB 2.0 port		This port is USB 2.0-compliant.
12	Dedicated iDRAC Ethernet port	iDRAC	Enables you to remotely access iDRAC. For more information, see the <i>Integrated Dell Remote Access Controller User's Guide</i> at www.dell.com/poweredgemanuals .
13	NIC ports		The NIC ports that are integrated on the system board provide network connectivity.

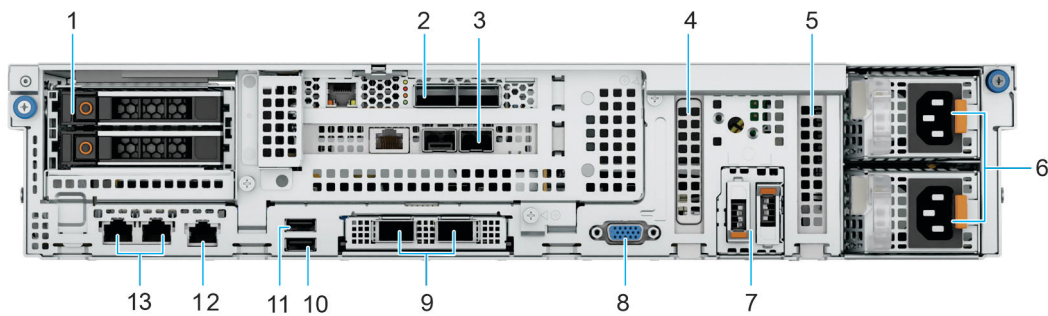






Figure 10. Rear view of 2 x PCIe Low Profile Slots and 2 x PCIe x16 FH/FL Slots with 2 x 2.5 inch NVMe Drives

Table 11. Features available at the rear of the system

Item	Ports, panels, or slots	Icon	Description
1	Rear drive module	N/A	Enables you to install rear drives that are supported on your system.
2	PCIe expansion card slot - Riser slot 2	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
3	PCIe expansion card slot - Riser slot 3	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
4	PCIe expansion card slot 4	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For

Table 11. Features available at the rear of the system (continued)

Item	Ports, panels, or slots	Icon	Description
			more information, see the Expansion card installation guidelines section.
5	PCIe expansion card slot 5	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
6	PSU	N/A	Primary and secondary power supply units
7	BOSS-N1 module	N/A	BOSS-N1 module for internal system boot.
8	VGA port		Enables you to connect a display device to the system.
9	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 system board.
10	USB 3.0 port		This port is USB 3.0-compliant.
11	USB 2.0 port		This port is USB 2.0-compliant.
12	Dedicated iDRAC Ethernet port	iDRAC	Enables you to remotely access iDRAC. For more information, see the <i>Integrated Dell Remote Access Controller User's Guide</i> at www.dell.com/poweredgemanuals .
13	NIC ports		The NIC ports that are integrated on the system board provide network connectivity.

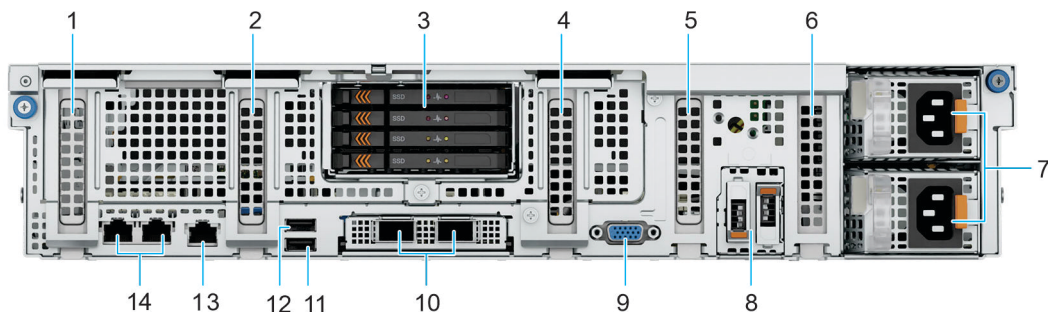


Figure 11. Rear view of 5 x PCIe Low-Profile-Slots with 4 x-E3.S-NVMe Drives

Table 12. Features available at the rear of the system





Item	Ports, panels, or slots	Icon	Description
1	PCIe expansion card slot - slot 1	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
2	PCIe expansion card slot - slot 2	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
3	Rear drive module	N/A	Enables you to install rear drives that are supported on your system.
4	PCIe expansion card slot - slot 3	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
5	PCIe expansion card slot - slot 4	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
6	PCIe expansion card slot - slot 5	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
7	PSU	N/A	Primary and secondary power supply units
8	BOSS-N1 module	N/A	BOSS-N1 module for internal system boot.
9	VGA port		Enables you to connect a display device to the system.
10	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 system board.
11	USB 3.0 port		This port is USB 3.0-compliant.
12	USB 2.0 port		This port is USB 2.0-compliant.
13	Dedicated iDRAC Ethernet port	iDRAC	Enables you to remotely access iDRAC. For more information, see the <i>Integrated Dell Remote Access Controller User's</i>

Table 12. Features available at the rear of the system (continued)

Item	Ports, panels, or slots	Icon	Description
			Guide at www.dell.com/poweredgemanuals .
14	NIC ports		The NIC ports that are integrated on the system board provide network connectivity.

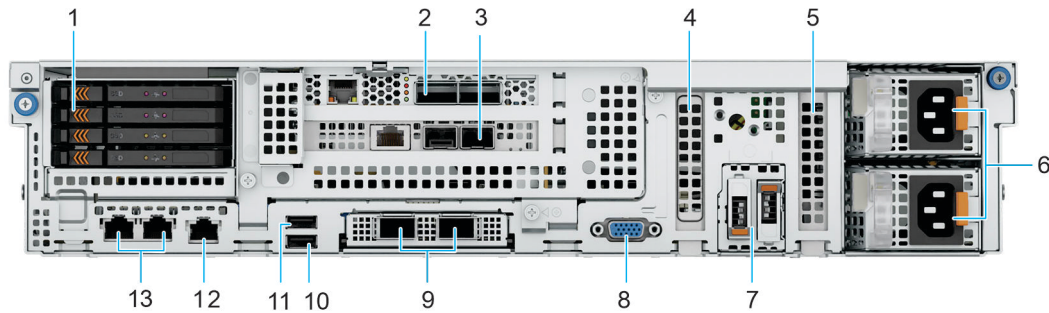







Figure 12. Rear view of 2 x PCIe Low-Profile Slots and 2 x PCIe x16 FH/FL-Slots with 4 x E3.S NVMe Drives

Table 13. Features available at the rear of the system

Item	Ports, panels, or slots	Icon	Description
1	Rear drive module	N/A	Enables you to install rear drives that are supported on your system.
2	PCIe expansion card slot - Riser slot 2	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
3	PCIe expansion card slot - Riser slot 3	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
4	PCIe expansion card slot 4	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
5	PCIe expansion card slot 5	N/A	The expansion card riser enables you to connect PCI Express expansion cards. For more information, see the Expansion card installation guidelines section.
6	PSU	N/A	Primary and secondary power supply units

Table 13. Features available at the rear of the system (continued)

Item	Ports, panels, or slots	Icon	Description
7	BOSS-N1 module	N/A	BOSS-N1 module for internal system boot.
8	VGA port		Enables you to connect a display device to the system.
9	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 system board.
10	USB 3.0 port		This port is USB 3.0-compliant.
11	USB 2.0 port		This port is USB 2.0-compliant.
12	Dedicated iDRAC Ethernet port	iDRAC	Enables you to remotely access iDRAC. For more information, see the <i>Integrated Dell Remote Access Controller User's Guide</i> at www.dell.com/poweredgemanuals .
13	NIC ports		The NIC ports that are integrated on the system board provide network connectivity.

 **NOTE:** For more information about the ports, see the [Technical Specifications](#) section.

Inside the system

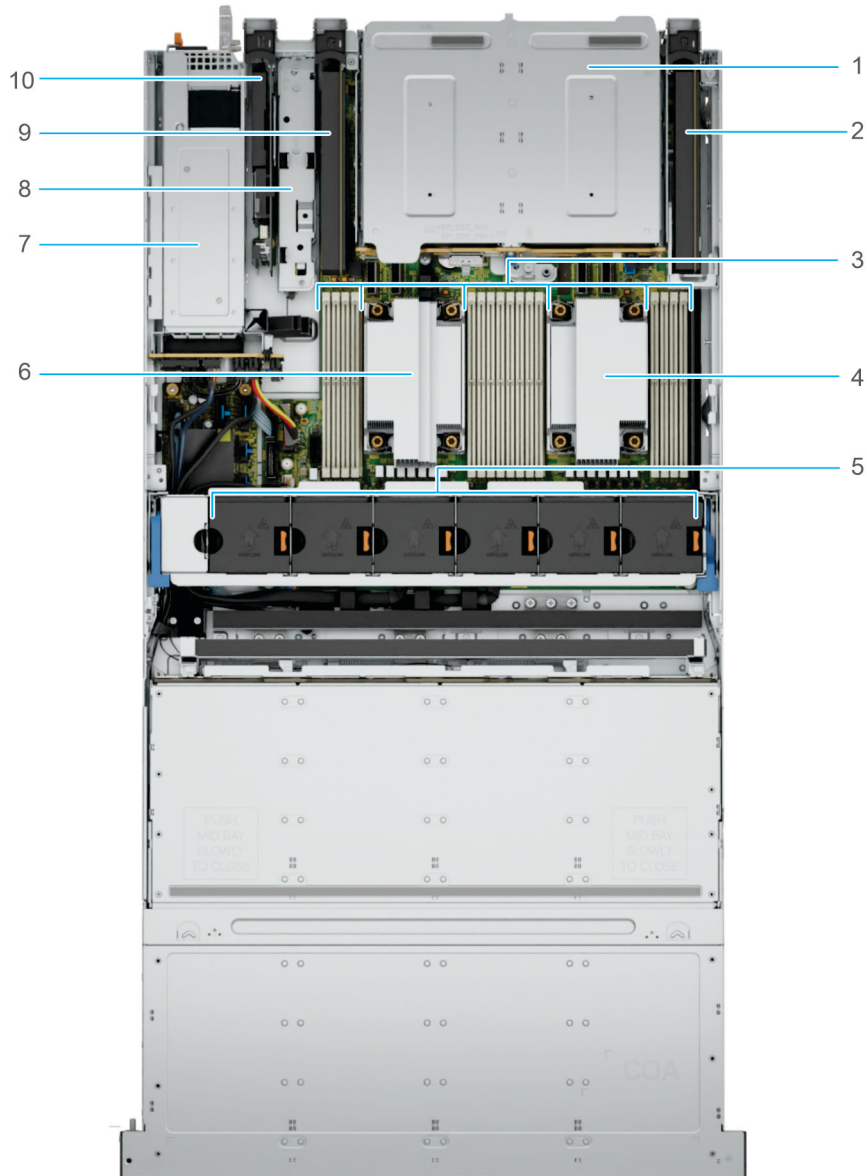


Figure 13. Inside view of the system - 3 x PCIe Low Profile Slots with 4 x 3.5 inch SAS/SATA or 4 x 2.5 inch NVMe Drives

- 1. Rear drive module
- 2. PCIe expansion slot 1
- 3. DIMM slots
- 4. Processor 1 heatsink
- 5. Cooling fan assembly
- 6. Processor 2 heatsink
- 7. PSU
- 8. BOSS N1 module
- 9. PCIe expansion slot 4
- 10. PCIe expansion slot 5

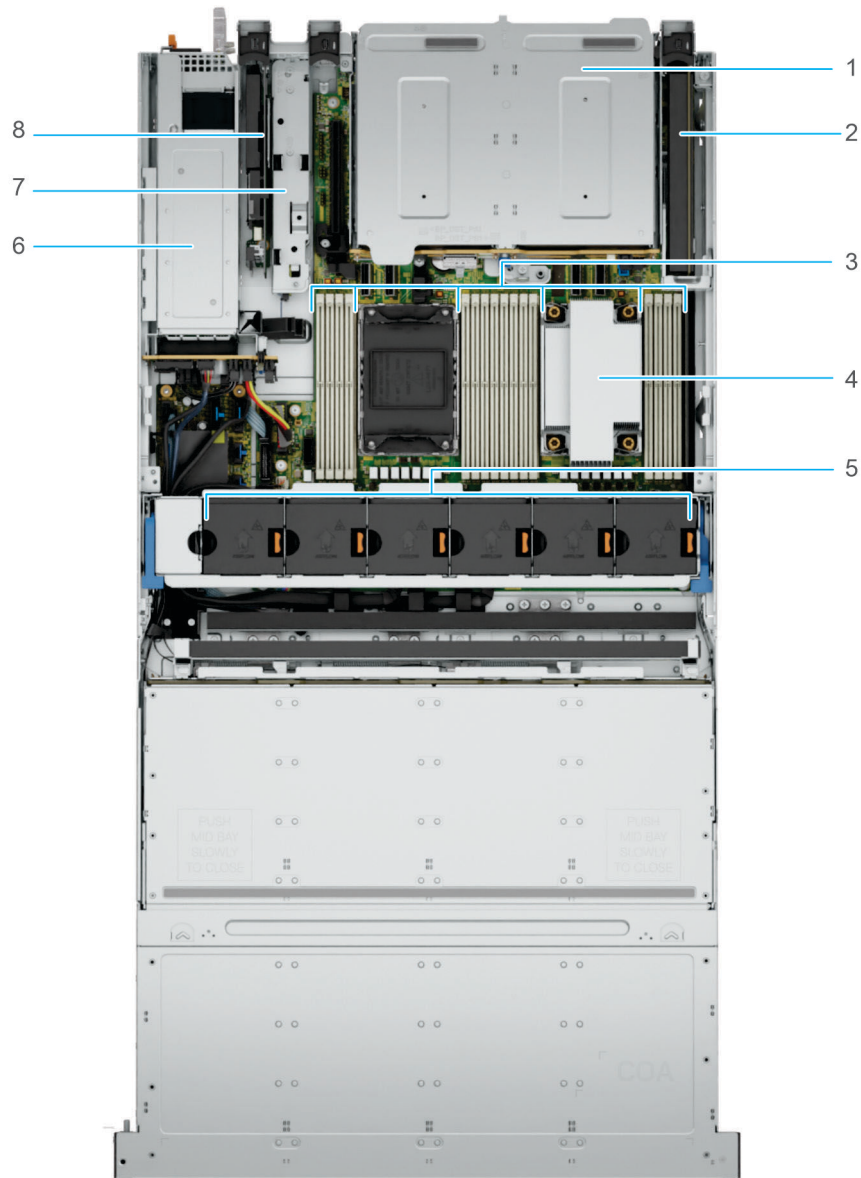


Figure 14. Inside view of the system - 2 x PCIe Low Profile Slots and 4 x 3.5 inch SAS/SATA Drives with 1 CPU

- | | |
|-------------------------|--------------------------|
| 1. Rear drive module | 2. PCIe expansion slot 1 |
| 3. DIMM slots | 4. Processor 1 heatsink |
| 5. Cooling fan assembly | 6. PSU |
| 7. BOSS N1 module | 8. PCIe expansion slot 5 |

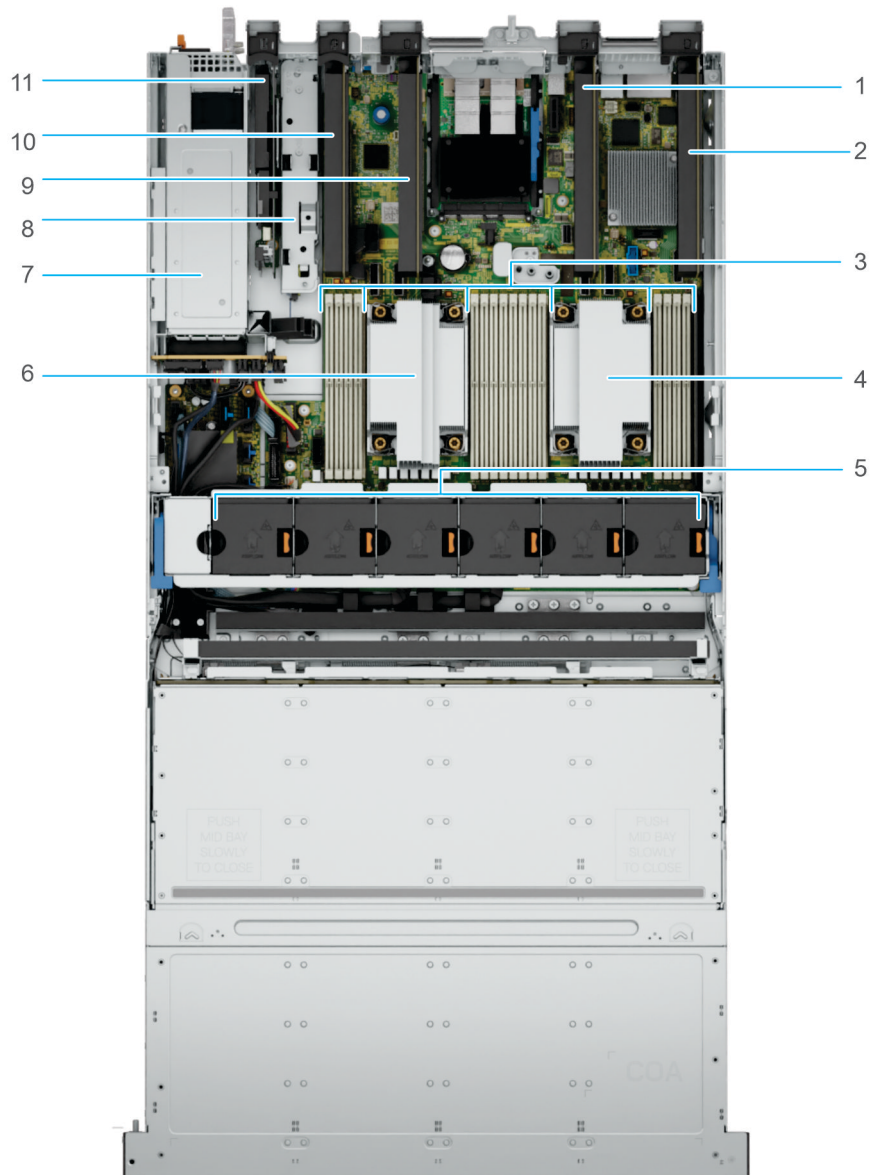


Figure 15. Inside view of the system - 5 x PCIe Low Profile slots

- | | |
|---------------------------|---------------------------|
| 1. PCIe expansion slot 2 | 2. PCIe expansion slot 1 |
| 3. DIMM slots | 4. Processor 1 heatsink |
| 5. Cooling fan assembly | 6. Processor 2 heatsink |
| 7. PSU | 8. BOSS N1 module |
| 9. PCIe expansion slot 3 | 10. PCIe expansion slot 4 |
| 11. PCIe expansion slot 5 | |

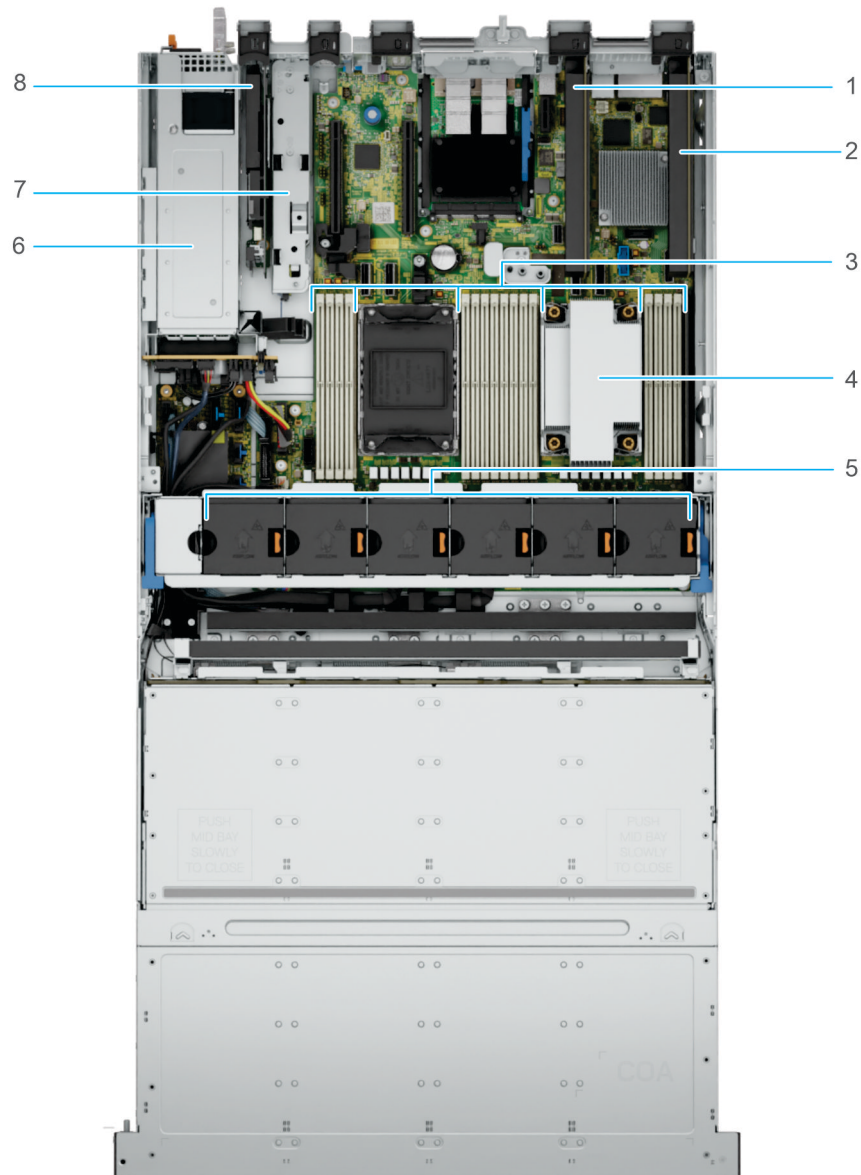


Figure 16. Inside view of the system - 3 x PCIe Low Profile slots with 1 CPU

- | | |
|--------------------------|--------------------------|
| 1. PCIe expansion slot 2 | 2. PCIe expansion slot 1 |
| 3. DIMM slots | 4. Processor 1 heatsink |
| 5. Cooling fan assembly | 6. PSU |
| 7. BOSS N1 module | 8. PCIe expansion slot 5 |

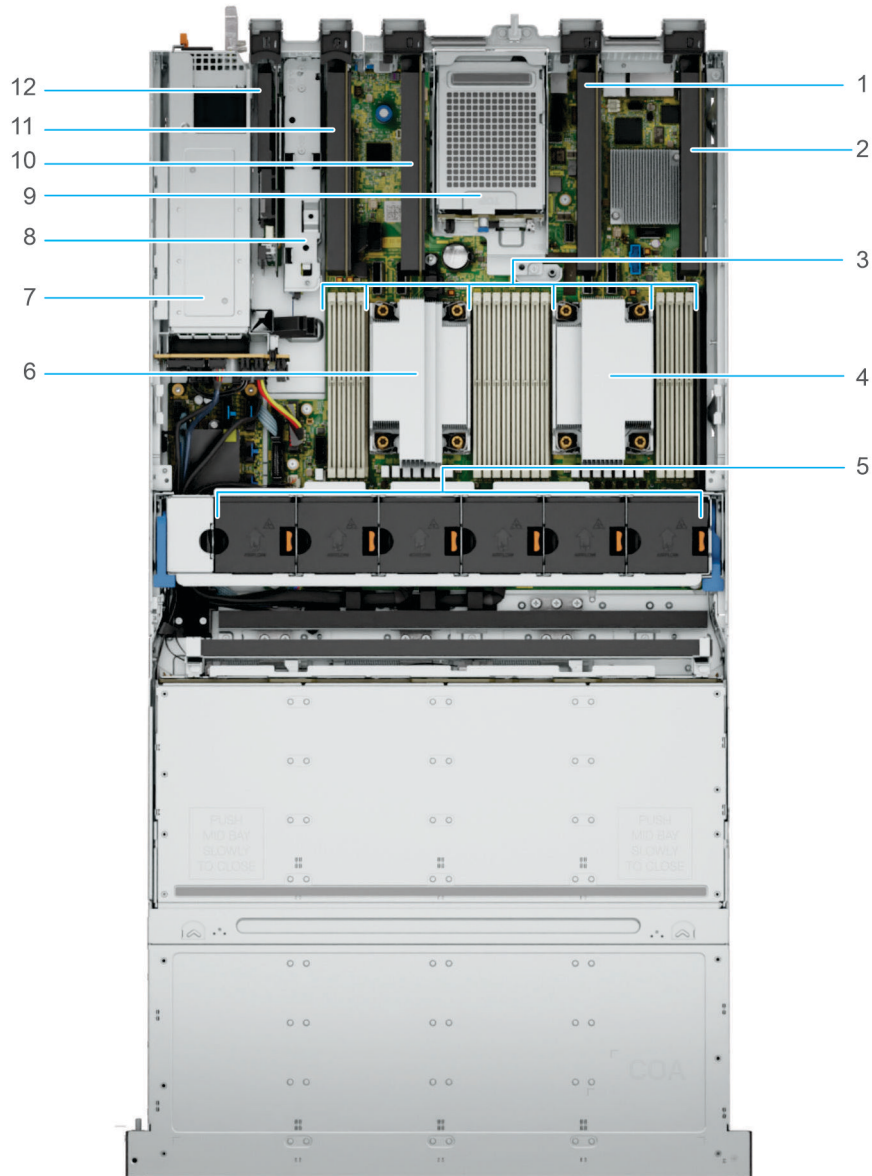


Figure 17. Inside view of the system - 5 x PCIe Low Profile Slots with 2 x 2.5 inch NVMe drives

- | | |
|---------------------------|---------------------------|
| 1. PCIe expansion slot 2 | 2. PCIe expansion slot 1 |
| 3. DIMM slots | 4. Processor 1 heatsink |
| 5. Cooling fan assembly | 6. Processor 2 heatsink |
| 7. PSU | 8. BOSS N1 module |
| 9. Rear drive module | 10. PCIe expansion slot 3 |
| 11. PCIe expansion slot 4 | 12. PCIe expansion slot 5 |

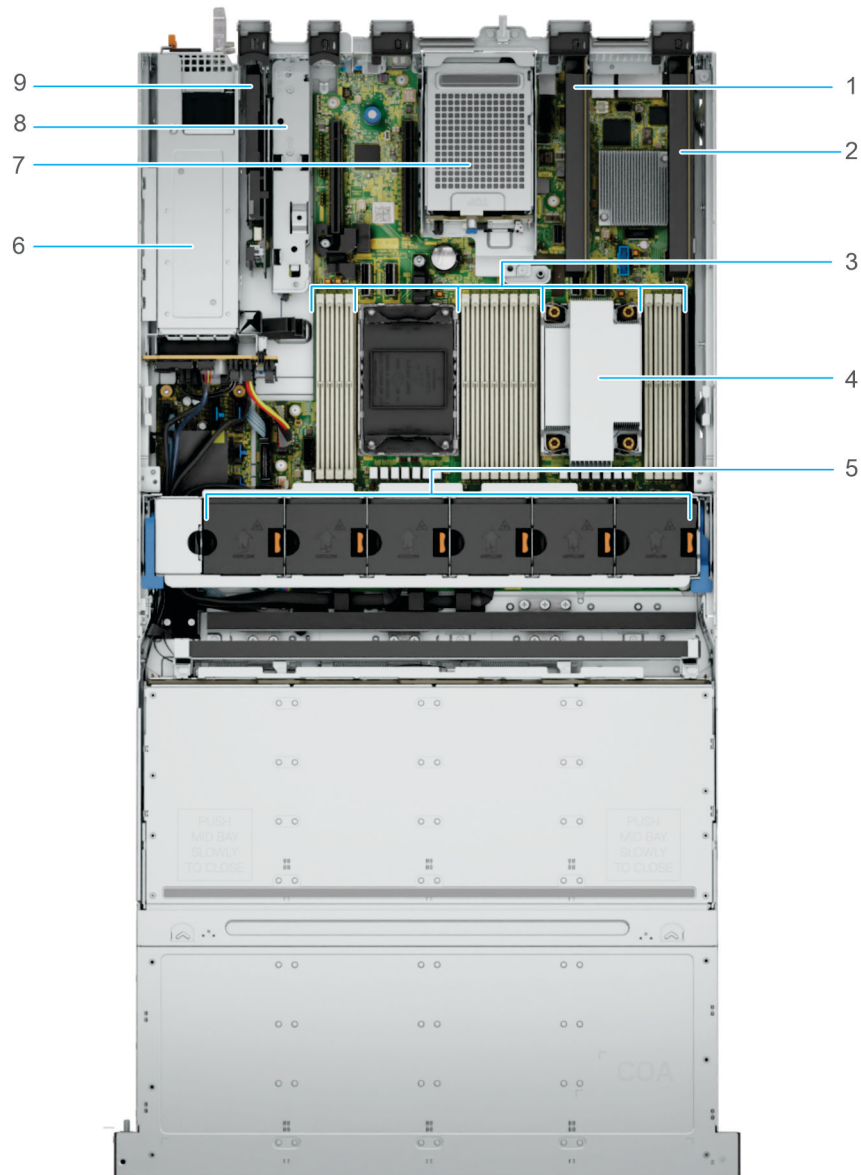


Figure 18. Inside view of the system - 3 x PCIe Low Profile Slots and 2 x 2.5 inch NVMe drives with 1 CPU

- | | |
|--------------------------|--------------------------|
| 1. PCIe expansion slot 2 | 2. PCIe expansion slot 1 |
| 3. DIMM slots | 4. Processor 1 heatsink |
| 5. Cooling fan assembly | 6. PSU |
| 7. Rear drive module | 8. BOSS N1 module |
| 9. PCIe expansion slot 5 | |

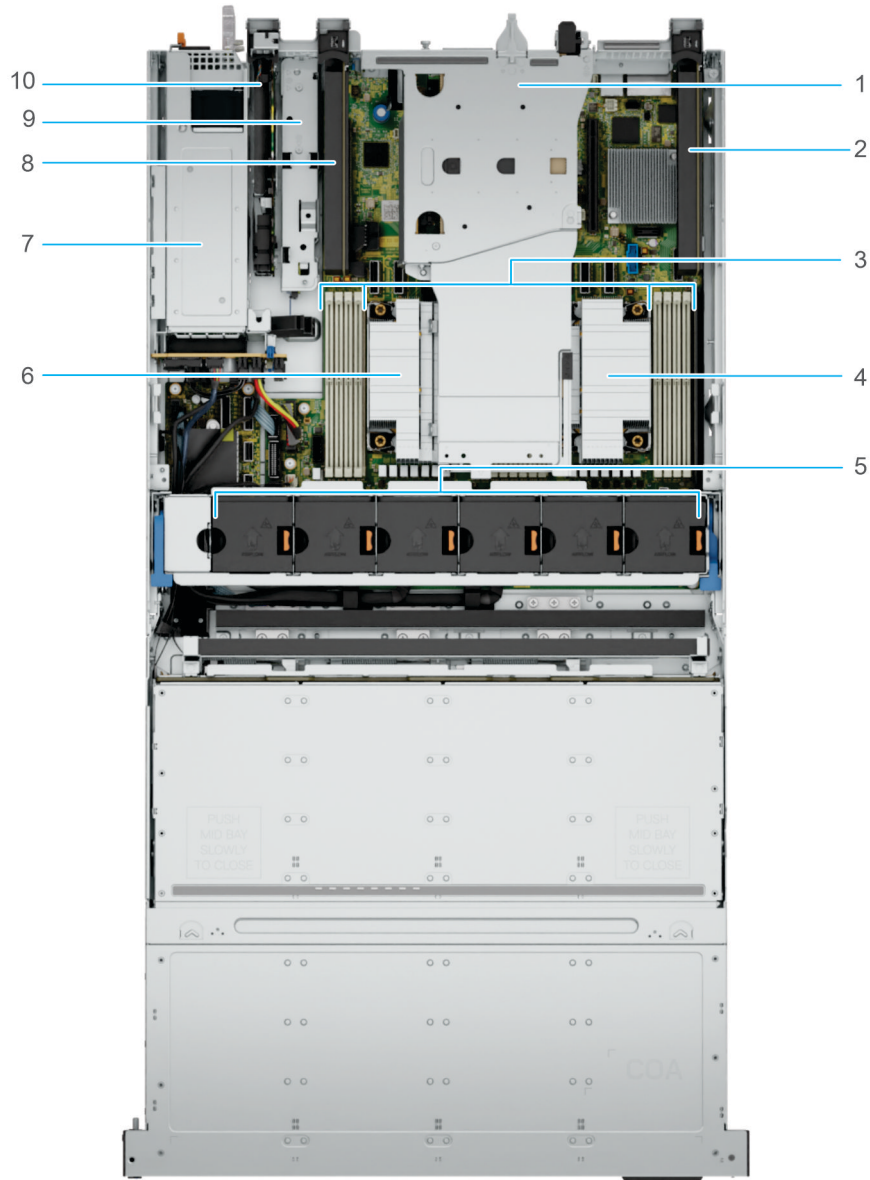


Figure 19. Inside view of the system - 3 x PCIe Low Profile Slots and 2 x PCIe FH/FL Riser

- | | |
|----------------------------------|---------------------------|
| 1. PCIe FH/FL Riser slot 2 and 3 | 2. PCIe expansion slot 1 |
| 3. DIMM slots | 4. Processor 1 heatsink |
| 5. Cooling fan assembly | 6. Processor 2 heatsink |
| 7. PSU | 8. PCIe expansion slot 4 |
| 9. BOSS N1 module | 10. PCIe expansion slot 5 |

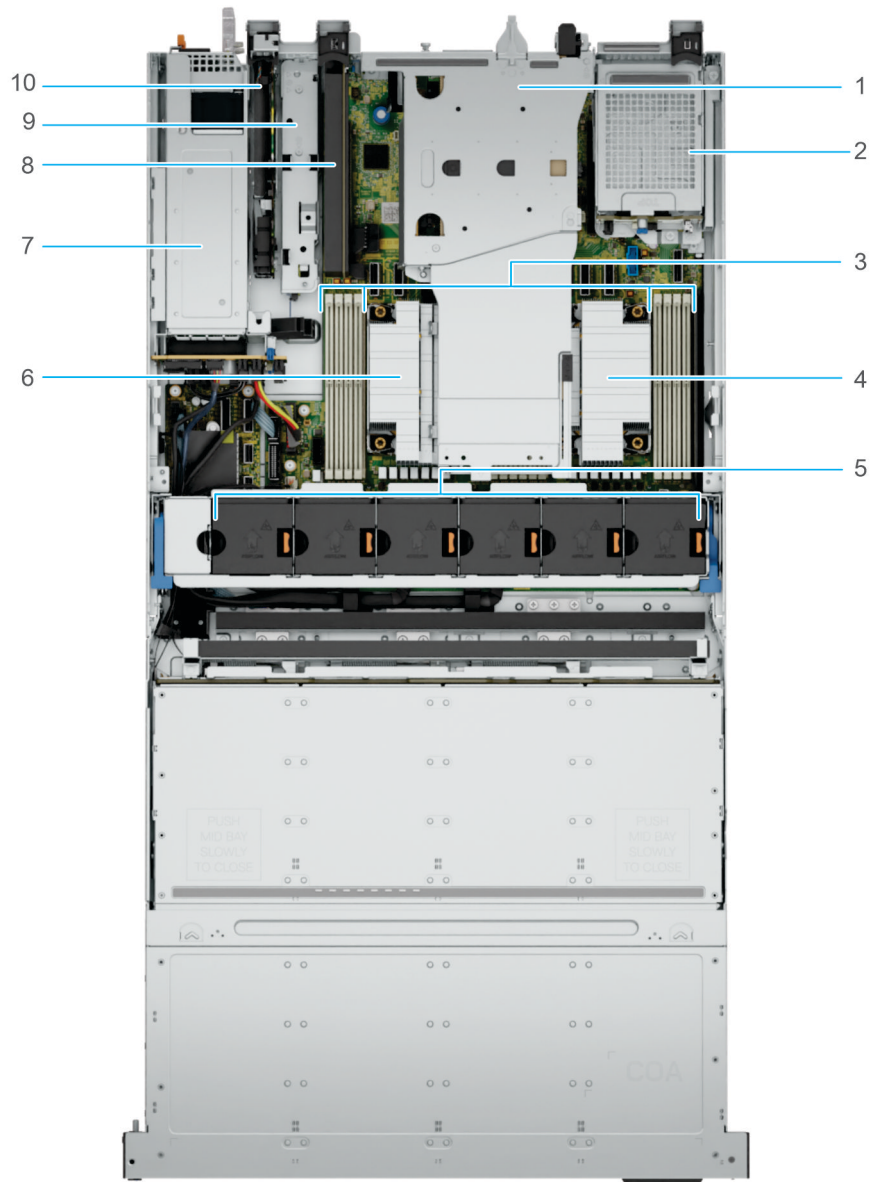


Figure 20. Inside view of the system - 2 x PCIe Low Profile Slots and 2 x PCIe FH/FL Riser with 2 x 2.5 inch NVMe drives

- | | |
|----------------------------------|---------------------------|
| 1. PCIe FH/FL Riser slot 2 and 3 | 2. Rear drive module |
| 3. DIMM slots | 4. Processor 1 heatsink |
| 5. Cooling fan assembly | 6. Processor 2 heatsink |
| 7. PSU | 8. PCIe expansion slot 4 |
| 9. BOSS N1 module | 10. PCIe expansion slot 5 |

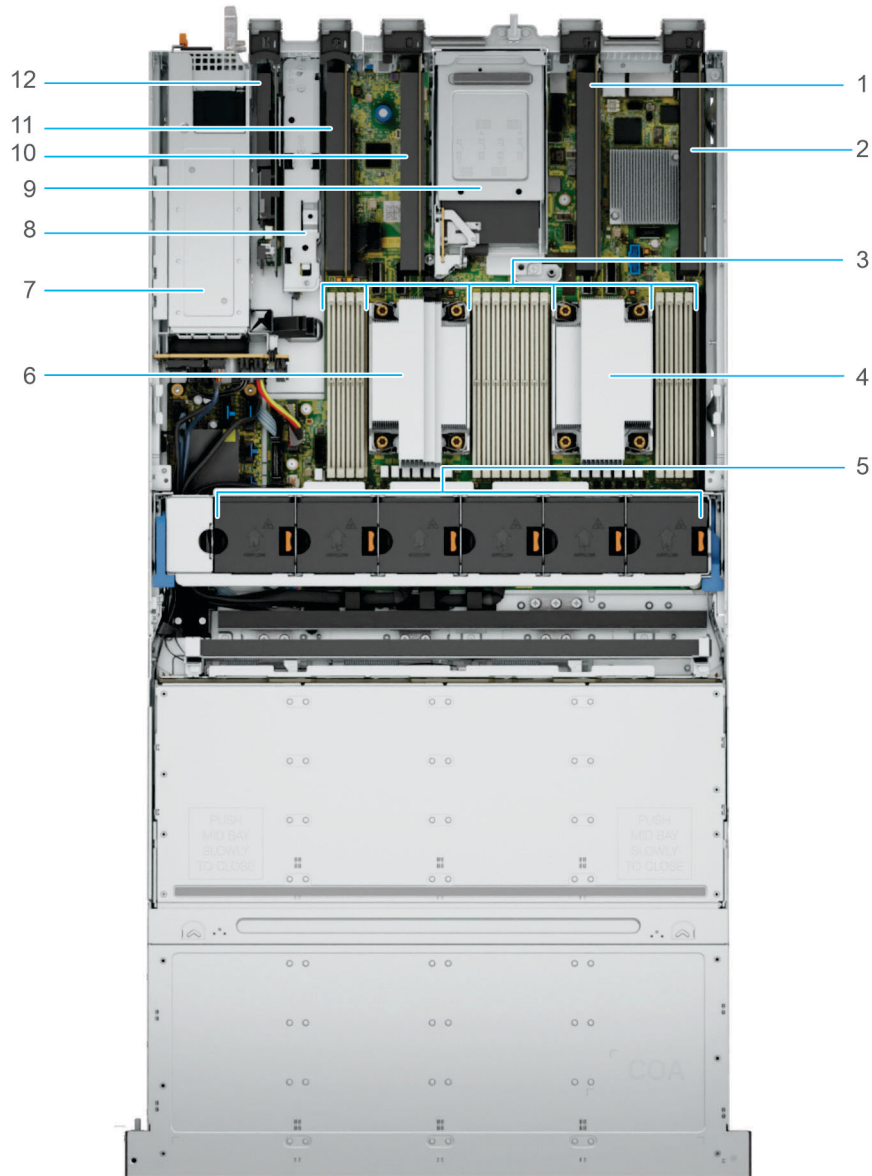


Figure 21. Inside view of the system - 5 x PCIe Low-Profile Slots with 4 x E3.S NVMe Drives

- | | |
|---------------------------|---------------------------|
| 1. PCIe expansion slot 2 | 2. PCIe expansion slot 1 |
| 3. DIMM slots | 4. Processor 1 heatsink |
| 5. Cooling fan assembly | 6. Processor 2 heatsink |
| 7. PSU | 8. BOSS N1 module |
| 9. Rear drive module | 10. PCIe expansion slot 3 |
| 11. PCIe expansion slot 4 | 12. PCIe expansion slot 5 |

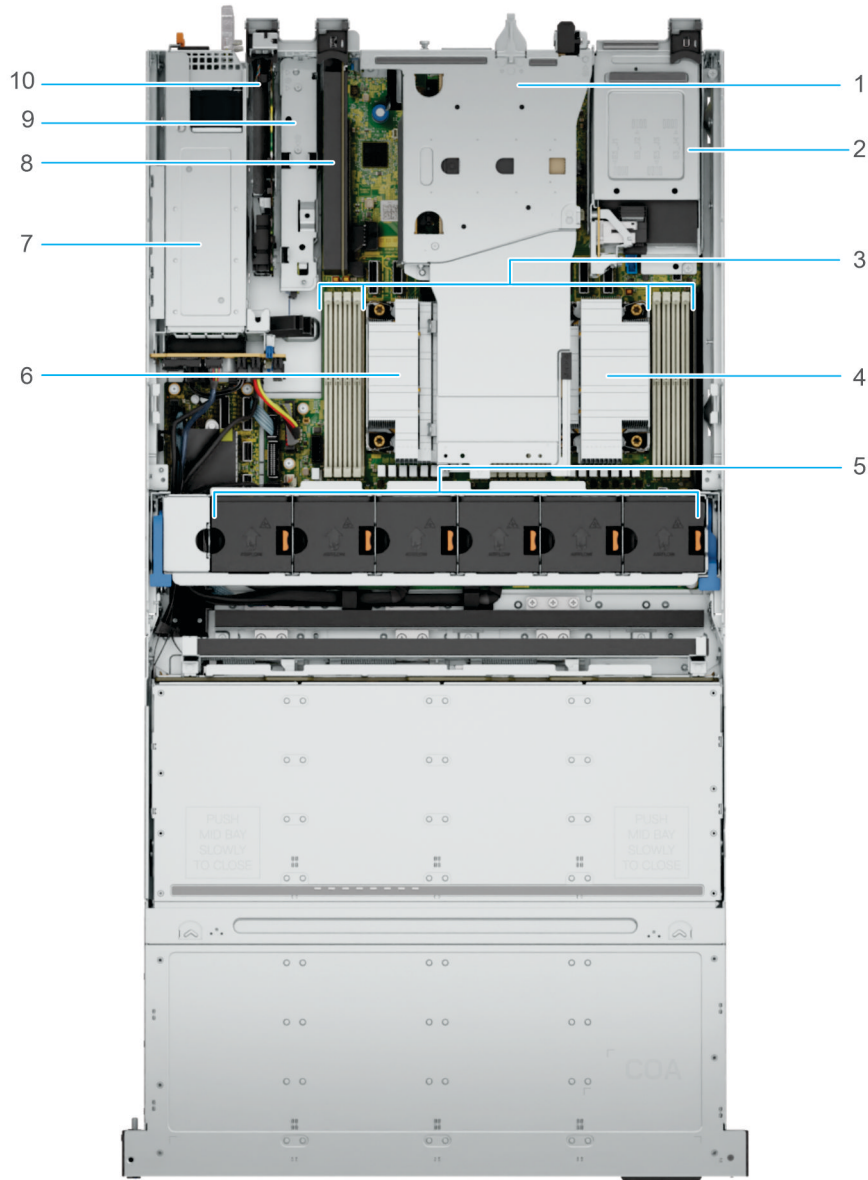


Figure 22. Inside view of the system - 2 x PCIe Low Profile Slots and 2 x PCIe FH/FL Riser with 4 x E3.S NVMe Drives

- | | |
|----------------------------------|---------------------------|
| 1. PCIe FH/FL Riser slot 2 and 3 | 2. Rear drive module |
| 3. DIMM slots | 4. Processor 1 heatsink |
| 5. Cooling fan assembly | 6. Processor 2 heatsink |
| 7. PSU | 8. PCIe expansion slot 4 |
| 9. BOSS N1 module | 10. PCIe expansion slot 5 |

Locating the Express Service Code and Service Tag

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

The information tag is located on the front of the system that includes system information such as the Service Tag, Express Service Code, Manufacture date, NIC, MAC address, QRL label, and so on. If you have opted for the secure default access to iDRAC, the Information tag also contains the iDRAC secure default password. If you have opted for iDRAC Quick Sync 2, the Information tag also contains the OpenManage Mobile (OMM) label, where administrators can configure, monitor, and troubleshoot the PowerEdge servers.

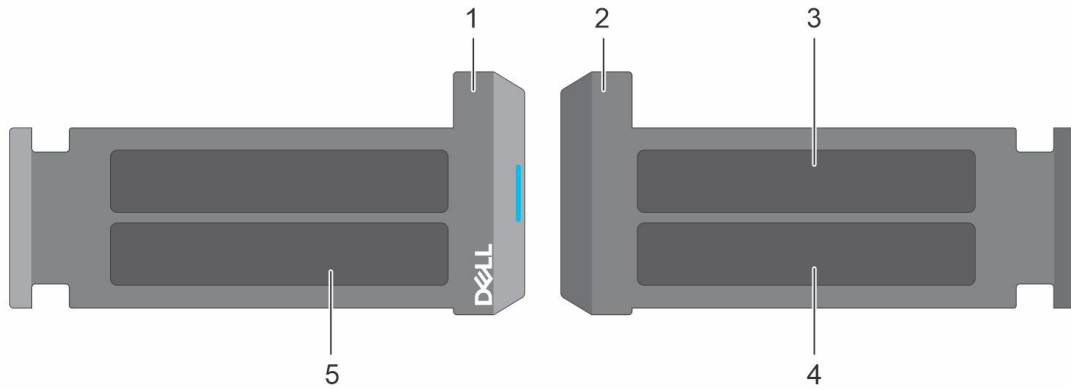


Figure 23. Locating the Express Service Code and Service tag

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

System information labels

The system information label is located on the back side of the system cover.

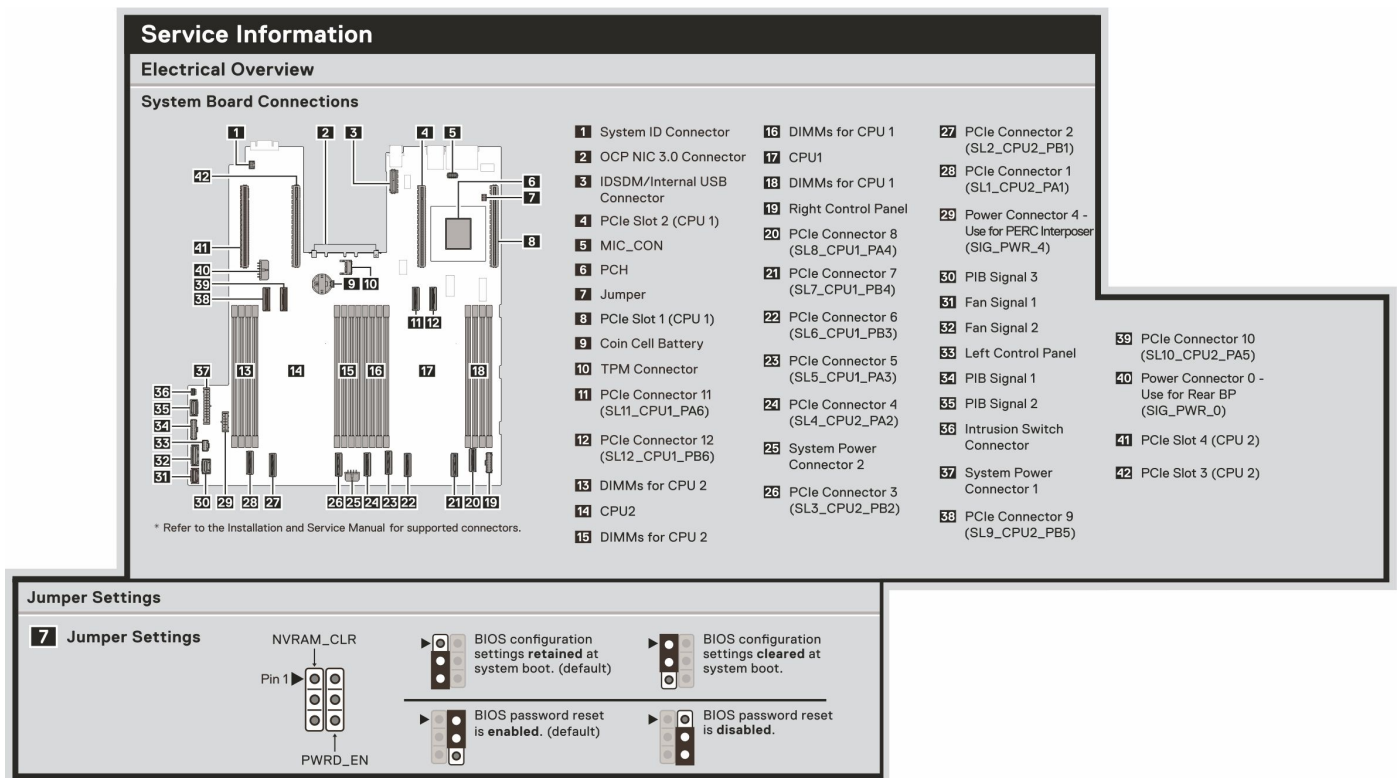


Figure 24. Service information

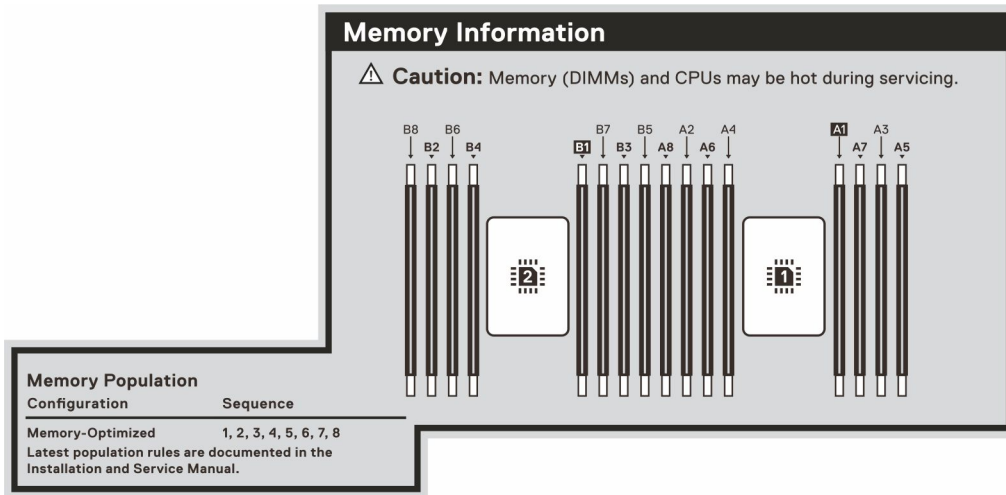


Figure 25. Memory information

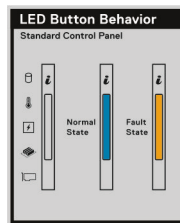


Figure 26. LED behavior



Figure 27. Icon legend

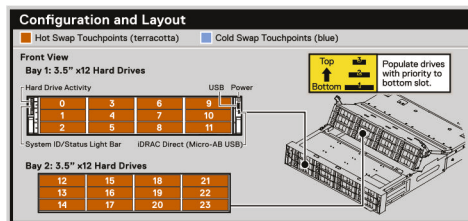


Figure 28. Configuration and layout

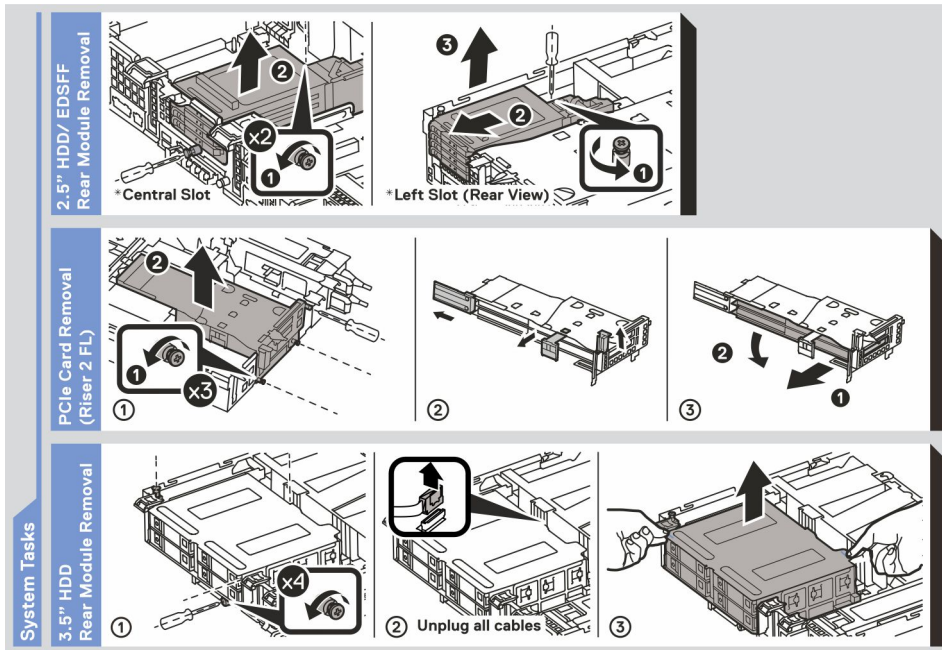


Figure 29. System tasks

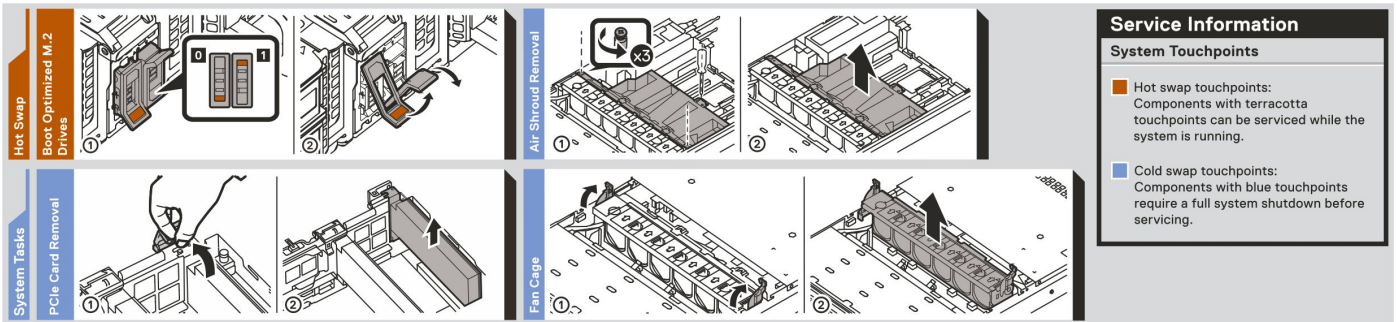


Figure 30. System tasks 2

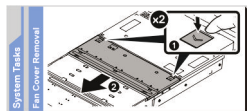


Figure 31. System tasks 3

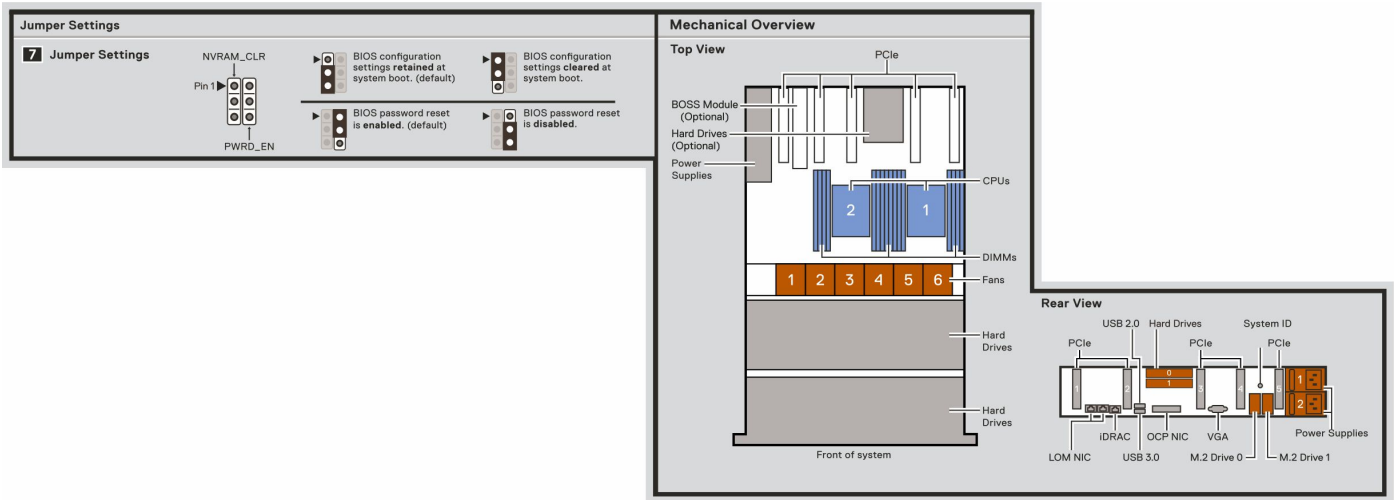


Figure 32. Mechanical overview

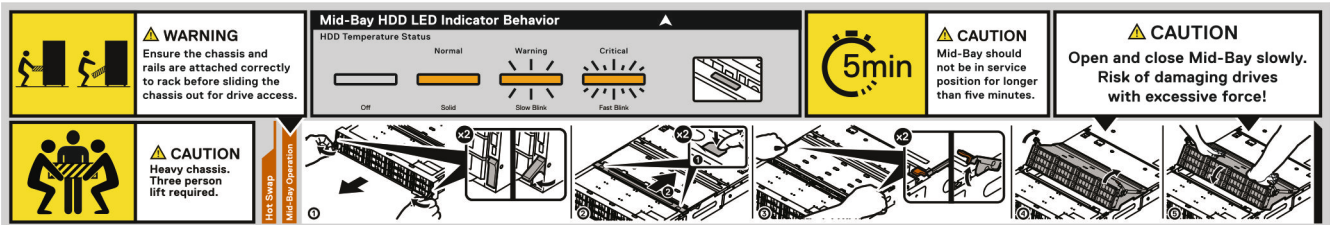


Figure 33. Mid bay operation

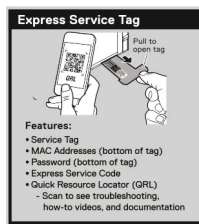


Figure 34. Express service tag

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 https://i.dell.com/sites/csdocuments/Business_solutions_engineering-Docs_Documents/en/rail-rack-matrix.pdf.

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 supported for various types of rack mounting flanges.

Technical specifications

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

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
- Ports and connectors specifications
- Video specifications
- Environmental specifications

Chassis dimensions

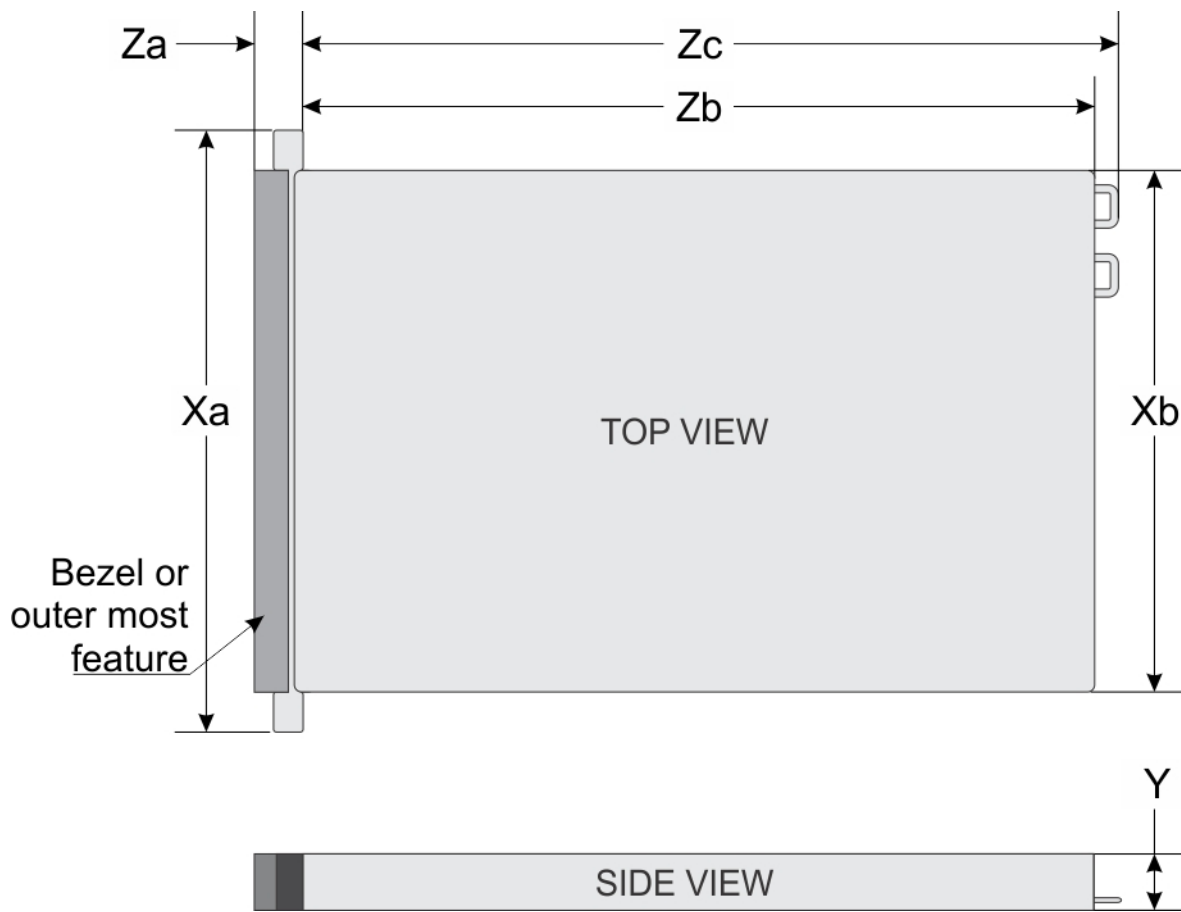


Figure 35. Chassis dimensions

Table 14. PowerEdge R760xd2 chassis dimensions

Drives	Xa	Xb	Y	Za	Zb	Zc
12 drives	481.6 mm (18.960 inches)	448.0 mm (17.637 inches) CC: 434.0 mm (17.08 inches)	86.8 mm (3.417 inches)	35 mm (1.378 inches)	837.0 mm (32.952 inches) Ear to PSU Surface	872.74 mm (34.36 inches) Ear to PSU handle

NOTE: Zb is the nominal rear wall external surface where the system board I/O connectors reside.

NOTE: Xb is unique to this system and has two values for the Storage module (SM) and the Compute Module (CC) .

System weight

Table 15. PowerEdge R760xd2 system weight

System configuration	Maximum weight (with all drives/SSDs)
A server with fully populated drives	46.3 kg (102.07 pounds)
A server without drives and PSU installed	23.72 kg (52.29 pounds)

Processor specifications

Table 16. PowerEdge R760xd2 processor specifications

Supported processor	Number of processors supported
4 th Generation Intel Xeon Scalable processors	Up to two

PSU specifications

The PowerEdge R760xd2 system supports up to two AC or DC power supply units (PSUs).

Table 17. PSU specifications

PSU	Class	Heat dissipation (maximum) (BTU/hr)	Frequency (Hz)	Voltage	AC		DC	Current (A)
					High line 200–240 V	Low line 100–120 V		
700 W	Titanium	2625	50/60	200 — 240 V AC	700 W	NA	NA	4.1
	NA		NA	240 V DC	NA	NA	700 W	3.4
1100 W	Titanium	4125	50/60	100 — 240 V AC	1100 W	1050 W	NA	12 — 6.3
	NA		NA	240 V DC	NA	NA	1100 W	5.2
1400 W	Platinum	5250	50/60	100 — 240 V AC	1400 W	1050 W	NA	12 - 8
	NA		NA	240 V DC	NA	NA	1400 W	6.6
1800 W	Titanium	6610	50/60	200 — 240 V AC	1800 W	NA	NA	10
	NA		NA	240 V DC	NA	NA	1800 W	8.2
1100 W DC	NA	4265	NA	-48 — (-60) V DC	NA	NA	1100 W	27

NOTE: This system is also designed to connect to the IT power systems with a phase-to-phase voltage not exceeding 240 V.

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 Dell Energy Smart Solution Advisor available at [Dell.com/ESSA](https://www.dell.com/ESSA).

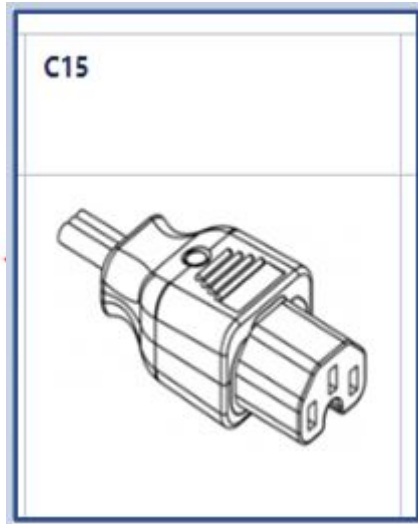


Figure 36. PSU power cord

Table 18. PSU power cords

Form factor	Output	Power cord
Redundant 60 mm	700 W	C13
	1100 W	
	1400 W	
	1100 W DC	-48Vdc connector
	1800 W	C15

Cooling fan specifications

The PowerEdge R760xd2 system supports up to 6 standard (STD) cooling fans.

Table 19. Cooling fan specifications

Fan type	Abbreviation	Label color	Label image
Standard (STD) fans	STD	No label	

Supported operating systems

The PowerEdge R760xd2 system supports the following operating systems:

- Canonical Ubuntu Server LTS
- Microsoft Windows Server with Hyper-V
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server
- VMware ESXi

For more information, go to www.dell.com/ossupport.

System battery specifications

The PowerEdge R760xd2 system uses one CR 2032 3.0-V lithium coin cell battery.

Expansion card riser specifications

Table 20. Expansion card slots supported on the system board

-	With Regular shroud	Config 1 Sas_SATA	Config 1 NVME	Config 2a_2b_2c	Config 3a_riser_FL	Config 3b_3C_riser_FL
Slot-1	Half Length, Low Profile	X16	X16	X16	X16	-
Slot-2	Half Length, Low Profile	-	-	X16	-	-
Slot-2	Full Length, Full Height	-	-	-	X16	X16
Slot-2	Half Length, Full Height	-	-	-	-	-
Slot-3	Half Length, Low Profile	-	-	X16	-	-

Table 20. Expansion card slots supported on the system board (continued)

-	With Regular shroud	Config 1 Sas_SATA	Config 1 NVME	Config 2a_2b_2c	Config 3a_riser_FL	Config 3b_3C_riser_FL
Slot-3	Full Length, Full Height	-	-	-	X16	X16
Slot-3	Half Length, Full Height	-	-	-	-	-
Slot-4	Half Length, Low Profile	X16	X16	X16	X16	X16
Slot-5	Half Length, Low Profile	X16	X16	X16	X16	X16

Memory specifications


The PowerEdge R760xd2 system supports the following memory specifications for optimized operation.

Table 21. Memory specifications

DIMM type	DIMM rank	DIMM capacity	Single processor		Dual processors	
			Minimum system capacity	Maximum system capacity	Minimum system capacity	Maximum system capacity
RDIMM	Single rank	16 GB	16 GB	128 GB	32 GB	256 GB
	Dual rank	32 GB	32 GB	256 GB	64 GB	512 GB
		64 GB	64 GB	512 GB	128 GB	1 TB

Table 22. Memory module sockets

Memory module sockets	Speed
16, 288-pin	4800 MT/s

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

Storage controller specifications

The PowerEdge R760xd2 system supports the following controller cards:

Table 23. Storage controller cards

Supported storage controller cards
Internal controllers <ul style="list-style-type: none"> • PERC H755 • PERC H965i • PERC H355
External controllers <ul style="list-style-type: none"> • H965e • HBA355e
Internal Boot <ul style="list-style-type: none"> • Boot Optimized Storage Subsystem (BOSS-N1): HWRAID 2 x M.2 NVMe SSDs
SAS Hot Bus Adapters (HBA)

Table 23. Storage controller cards (continued)

Supported storage controller cards
<ul style="list-style-type: none"> HBA355i HBA465i

Drives

The PowerEdge R760xd2 system supports:

Front Drives

- 24 x 3.5-inch hot-swappable SAS,SATA drives.

Rear Drives

- 4 x 3.5 inch SAS,SATA or 2.5 inch NVMe (with 3.5" to 2.5" Adapter in 3.5" carrier) drives
- 2 x 2.5-inch NVMe drives
- 4 x E3.S NVMe drives

i **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 <https://www.dell.com/support> > **Browse all Products** > **Infrastructure** > **Data Center Infrastructure** > **Storage Adapters & Controllers** > **Dell PowerEdge Express Flash NVMe PCIe SSD** > **Documentation** > **Manuals and Documents.**

Ports and connectors specifications

NIC port specifications

The PowerEdge R760xd2 system supports up to two 10/100/1000 Mbps Network Interface Controller (NIC) ports embedded on the LAN on Motherboard (LOM) and integrated on the optional Open Compute Project (OCP) card.

Table 24. NIC port specification for the system

Feature	Specifications
LOM	1 Gb x 2
OCP card (OCP 3.0)	1 GbE x 4, 10 GbE x 2, 10 GbE x 4 , 25 GbE x 2, 25 GbE x 4

USB ports specifications

Table 25. PowerEdge R760xd2 USB specifications

Front		Rear		Internal (Optional)	
USB port type	No. of ports	USB port type	No. of ports	USB port type	No. of ports
USB 2.0-compliant port	One	USB 2.0-compliant port	One	Internal USB 3.0-compliant port	One
iDRAC Direct port (Micro-AB USB 2.0-compliant port)	One	USB 3.0-compliant ports	One		

i **NOTE:** The micro USB 2.0 compliant port can only be used as an iDRAC Direct or a management port.

VGA ports specifications

The PowerEdge R760xd2 system supports DB-15 VGA port on rear of the system

Video specifications

The PowerEdge R760xd2 system supports integrated Matrox G200 graphics controller with 16 MB of video frame buffer.

Table 26. 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 www.dell.com/support/home.

Table 27. Continuous Operation Specifications for ASHRAE A2

-	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 28. Continuous Operation Specifications for ASHRAE A3

-	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 29. Continuous Operation Specifications for ASHRAE A4

-	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 30. Common Environmental Specifications for ASHRAE A2, A3, and A4

-	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* (41°F in an hour) for tape <i>i</i> NOTE: * - Per ASHRAE thermal guidelines for tape hardware, these are not instantaneous rates of temperature change.
Non-operational temperature limits	-40 to 65°C (-104 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 31. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.21 G _{rms} at 5 Hz to 500 Hz (all operation orientations)
Storage	1.88 G _{rms} at 10 Hz to 500 Hz for 15 minutes (all six sides tested)

Table 32. 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.

Thermal air restrictions

Fresh air environment

- Two PSUs are required in redundant mode. Single PSU failure is not supported.
- BOSS-N1 (M.2) module is not supported.
- GPU and FPGA are not supported.
- Rear storage module is not supported.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- OCP card with transmission rate higher than 25G is not supported.
- OCP transceiver spec less than or equal to 70°C (158°F) is not supported.

ASHRAE A3 environment

- Two PSUs are required in redundant mode. Single PSU failure is not supported.
- BOSS-N1 (M.2) module is not supported.

- GPU and FPGA are not supported.
- Rear storage module is not supported.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- OCP card with transmission rate higher than 25G is not supported.
- OCP transceiver spec less than or equal to 70°C (158°F) is not supported.

ASHRAE A4 environment

- Two PSUs are required in redundant mode. Single PSU failure is not supported.
- BOSS-N1 (M.2) module is not supported.
- GPU and FPGA are not supported.
- CPU TDP equal or greater than 185 W are not supported.
- Rear storage module is not supported.
- OCP card with transmission rate higher than 25G is not supported.
- OCP transceiver spec less than or equal to 70°C (158°F) is not supported.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.

Thermal restriction matrix

Table 33. Processor and heat sink matrix

Heat sink	Configuration No
2U HSK	Configuration 1, Configuration 2 and Configuration 3

NOTE: All GPU/FGPA cards require 2U L-type HSK and GPU shroud.

Table 34. Label reference

Label	Description
STD	Standard
LP	Low profile
FH	Full height

Table 35. Thermal restriction matrix

Configuration		Configuration 1 24 x 3.5 inch SAS/SATA		Configuration 2 24 x 3.5 inch SAS/SATA	Configuration 3 24 x 3.5 inch SAS/SATA	Ambient temperature
Rear storage		4 x 3.5 inch SAS/SATA	4 x 2.5 inch NVMe in Carrier Adapter	2 x 2.5 inch	2 x 2.5 inch	
CPU TDP/ cTDP	125 W	STD Fan 2U STD HSK	STD Fan 2U STD HSK	STD Fan 2U STD HSK	STD Fan 2U STD HSK	35°C (95°F)
	150 W	STD Fan 2U STD HSK	STD Fan 2U STD HSK	STD Fan 2U STD HSK	STD Fan 2U STD HSK	35°C (95°F)
	165 W	NA	NA	STD Fan 2U STD HSK	STD Fan 2U STD HSK	35°C (95°F)
	185 W	NA	NA	STD Fan 2U STD HSK	STD Fan 2U STD HSK	35°C (95°F)

- NOTE:** DDR5 DIMM blank is required for Configuration 3.
- NOTE:** HDD blank is required for all configurations.
- NOTE:** Restrict HDD capacity up to 7.68TB of 2 x 2.5 inch and 4 x 2.5 inch rear storage
- NOTE:** System cannot support same type of 2.5 inch drive in front and rear storage (4 x 2.5 inch) when using 2.5 inch HDD adapter in Config 1
- NOTE:** System can support PCIe card with cooling Tier equal or lower than Tier 5 (300LFM at 55°C) requirement .
- NOTE:** Need optical transceiver with higher temperature spec (>85°C) supporting in rear OCP.
- NOTE:** Need to restrict PERC H965e support to slot 3 for configuration 2.

Table 36. GPU/FPGA thermal restriction matrix

Configuration		Configuration 1 24 x 3.5 inch SAS/SATA		Configuration 2 24 x 3.5 inch SAS/SATA	Configuration 3 24 x 3.5 inch SAS/SATA	Ambient temperature
		4 x 3.5 inch SAS/SATA	4 x 2.5 inch NVMe in Carrier Adapter	2 x 2.5 inch	2 x 2.5 inch	
CPU TDP/ cTDP	125 W	NA	NA	NA	STD Fan 2U STD HSK	30°C (86°F)
	150 W	NA	NA	NA	STD Fan 2U STD HSK	30°C (86°F)
	165 W	NA	NA	NA	STD Fan 2U STD HSK	30°C (86°F)
	185 W	NA	NA	NA	STD Fan 2U STD HSK	30°C (86°F)

- NOTE:** Can support GPU in Configuration 3 Only .
- NOTE:** Support LP A2 GPU up to 30°C (86°F) ambient.
- NOTE:** DDR5 DIMM blank is required for Configuration 3.
- NOTE:** HDD blank is required for all configurations.
- NOTE:** Restrict HDD capacity up to 7.68TB of 2 x 2.5 inch and 4 x 2.5 inch rear storage
- NOTE:** System cannot support same type of 2.5 inch drive in front and rear storage (4 x 2.5 inch) when using 2.5 inch HDD adapter in Configuration 1
- NOTE:** Need to restrict PERC H965e support to slot 3 for configuration 2.

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


Unpack the system.

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.

 **NOTE:** To access iDRAC, ensure that you connect the ethernet cable to the iDRAC dedicated network port or use the iDRAC Direct port by using the micro USB (type AB) cable.

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* at www.dell.com/idracmanuals.

NOTE: To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article <https://www.dell.com/support/article/sln000178115>.

You can also access iDRAC using command-line protocol - RACADM. For more information, see the *Integrated Dell Remote Access Controller RACADM CLI Guide* available at <https://www.dell.com/idracmanuals>.

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* available at <https://developer.dell.com>.

Resources to install operating system

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

Table 37. Resources to install the operating system

Resource	Documentation links
iDRAC	<i>Integrated Dell Remote Access Controller User's Guide</i> at https://www.dell.com/idracmanuals or for system specific <i>Integrated Dell Remote Access Controller User's Guide</i> , go to https://www.dell.com/poweredgemanuals > Product Support page of your system > Documentation . NOTE: To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article at https://www.dell.com/support/article/sln000178115 .
Lifecycle Controller	<i>Dell Lifecycle Controller User's Guide</i> at https://www.dell.com/idracmanuals or for system specific <i>Dell Lifecycle Controller User's Guide</i> , go to https://www.dell.com/poweredgemanuals > Product Support page of your system > Documentation . Dell recommends using Lifecycle Controller to install the OS, since all required drivers are installed on the system. NOTE: To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article at https://www.dell.com/support/article/sln000178115 .
OpenManage Deployment Toolkit	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Dell certified VMware ESXi	www.dell.com/virtualizationsolutions

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

Options to download drivers and firmware

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

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

Table 38. Options to download firmware

Option	Documentation link
Using Integrated Dell Remote Access Controller Lifecycle Controller (iDRAC with LC)	www.dell.com/idracmanuals
Using Dell Repository Manager (DRM)	www.dell.com/openmanagemanuals > Repository Manager
Using Dell Server Update Utility (SUU)	www.dell.com/openmanagemanuals > Server Update Utility


Table 38. Options to download firmware (continued)

Option	Documentation link
Using Dell OpenManage Deployment Toolkit (DTK)	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Using iDRAC virtual media	www.dell.com/idracmanuals

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 39. Options to download and install OS drivers

Option	Documentation
Dell support site	Downloading drivers and firmware section.
iDRAC virtual media	<i>Integrated Dell Remote Access Controller User's Guide</i> at https://www.dell.com/idracmanuals or for system specific <i>Integrated Dell Remote Access Controller User's Guide</i> , go to https://www.dell.com/poweredgemanuals > Product Support page of your system > Documentation .  NOTE: To determine the most recent iDRAC release for your platform and for latest documentation version, see https://www.dell.com/support/article/sln000178115 .

Downloading drivers and firmware


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

Prerequisites

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

Steps

1. Go to www.dell.com/support/drivers.
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
- Dell Lifecycle Controller
- Boot Manager
- Preboot Execution Environment (PXE)

Topics:

- [System Setup](#)
- [Dell Lifecycle Controller](#)
- [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 40. System Setup Main Menu

Option	Description
System BIOS	Enables you to configure the BIOS settings.
iDRAC Settings	Enables you to configure the iDRAC settings. The iDRAC settings utility is an interface to set up and configure the iDRAC parameters by using UEFI (Unified Extensible Firmware Interface). You can enable or disable various iDRAC parameters by using the iDRAC settings utility. For more information about this utility, see <i>Integrated Dell Remote Access Controller User's Guide</i> available at https://www.dell.com/idracmanuals .

Table 40. System Setup Main Menu (continued)

Option	Description
Device Settings	Enables you to configure device settings for devices such as storage controllers or network cards.
Service Tag Settings	Enables you to configure the System Service Tag.

System Information

To view the **System Information** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > System Information**.

Table 41. System Information details

Option	Description
System Model Name	Specifies the system model name.
System BIOS Version	Specifies the BIOS version installed on the system.
System Management Engine Version	Specifies the current version of the Management Engine firmware.
System Service Tag	Specifies the system Service Tag.
System Manufacturer	Specifies the name of the system manufacturer.
System Manufacturer Contact Information	Specifies the contact information of the system manufacturer.
System CPLD Version	Specifies the current version of the system Complex Programmable Logic Device (CPLD) firmware.
UEFI Compliance Version	Specifies the UEFI compliance level of the system firmware.

Memory Settings

To view the **Memory Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Memory Settings**.

Table 42. Memory Settings details

Option	Description
System Memory Size	Specifies the size of the system memory.
System Memory Type	Specifies the type of memory installed in the system.
System Memory Speed	Specifies the speed of the system memory.
Video Memory	Specifies the size video memory.
System Memory Testing	Specifies whether the system memory tests are run during system boot. The two options available are Enabled and Disabled . This option is set to Disabled by default.
Memory Operating Mode	This field selects the memory operating mode. This feature is active only if a valid memory configuration is detected. When Optimizer Mode is enabled, the DRAM controllers operate independently in 64-bit mode and provide optimized memory performance. When Dell Fault Resilient Mode (FRM) is enabled, a percentage of the total installed memory is configured to create a fault resilient zone starting from lowest system memory address for use by select hypervisors for host virtualization resilience. Specify the FRM percentage by using the Fault Resilient Mode Memory Size[%] feature. When Dell NUMA Fault Resilient Mode (FRM) is enabled, a percentage of the installed memory in every NUMA node is configured to create a fault resilient zone for use by select

Table 42. Memory Settings details (continued)

Option	Description
	hypervisors for host virtualization resilience. Specify the FRM percentage by using the Fault Resilient Mode Memory Size[%] feature.
Current State of Memory Operating Mode	Specifies the current state of the memory operating mode.
Fault Resilient Mode Memory Size[%]	Select to define the percent of total memory size that must be used by the fault resilient mode, when selected in the Memory Operating mode. When Fault Resilient Mode is not selected, this option is grayed out and not used by Fault Resilient Mode.
Node Interleaving	Enables or disables the Node interleaving option. Specifies if the Non-Uniform Memory Architecture (NUMA) is supported. If this field is set to Enabled , memory interleaving is supported if a symmetric memory configuration is installed. If the field is set to Disabled , the system supports NUMA (asymmetric) memory configurations. This option is set to Disabled by default.
ADDDC Settings	Enables or disables ADDDC Setting feature. When Adaptive Double DRAM Device Correction (ADDDC) is enabled, failing DRAMs are dynamically mapped out. When set to Enabled it can impact the system performance under certain workloads. This feature is applicable for x4 DIMMs only. This option is set to Enabled by default.
Memory training	<p>When option is set to Fast and memory configuration is not changed, the system uses previously saved memory training parameters to train the memory subsystems and system boot time is also reduced. If memory configuration is changed, the system automatically enables Retrain at Next boot to force one-time full memory training steps, and then go back to Fast afterward.</p> <p>When option is set to Retrain at Next boot, the system performs the force one-time full memory training steps at next power on and boot time is slowed on next boot.</p> <p>When option is set to Enable, the system performs the force full memory training steps on every power on and boot time is slowed on every boot.</p>
DIMM Self Healing (Post Package Repair) on Uncorrectable Memory Error	Enables or disables Post Packing Repair (PPR) on uncorrectable memory error. This option is set to Enabled by default.
Correctable Error Logging	Enables or disables correctable error logging. This option is set to Disabled by default.
Memory Map Out	This option controls DIMMs slots on the system. This option is set to Enabled by default. It allows to disable system installed DIMMs.

Processor Settings

To view the **Processor Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Processor Settings**.

Table 43. Processor Settings details

Option	Description
Logical Processor	Each processor core supports up to two logical processors. If this option is set to Enabled , the BIOS displays all the logical processors. If this option is set to Disabled , the BIOS displays only one logical processor per core. This option is set to Enabled by default.
CPU Interconnect Speed	Enables you to govern the frequency of the communication links among the processors in the system.

Table 43. Processor Settings details (continued)

Option	Description
	<p>NOTE: The standard and basic bin processors support lower link frequencies.</p> <p>The options available are Maximum data rate, 16 GT/s, 14.4 GT/s, and 12.8 GT/s. This option is set to Maximum data rate by default.</p> <p>Maximum data rate indicates that the BIOS runs the communication links at the maximum frequency supported by the processors. You can also select specific frequencies that the processors support, which can vary.</p> <p>For best performance, you should select Maximum data rate. Any reduction in the communication link frequency affects the performance of non-local memory access and cache coherency traffic. In addition, it can slow access to non-local I/O devices from a particular processor.</p> <p>However, if power saving considerations outweigh performance, reduce the frequency of the processor communication links. Before reducing the frequency, you must localize the memory and I/O access to the nearest NUMA node to minimize the impact to system performance.</p>
Virtualization Technology	Enables or disables the virtualization technology for the processor. This option is set to Enabled by default.
Kernel DMA Protection	This option is set to Disabled by default. When option is set to Enabled , BIOS and Operating System will enable direct memory access protection for DMA capable peripheral devices using virtualization technology.
Directory Mode	Enables or disables the directory mode. This option is set to Enabled by default.
Adjacent Cache Line Prefetch	Optimizes the system for applications that need high utilization of sequential memory access. This option is set to Enabled by default. You can disable this option for applications that need high utilization of random memory access.
Hardware Prefetcher	Enables or disables the hardware prefetcher. This option is set to Enabled by default.
DCU Streamer Prefetcher	Enables or disables the Data Cache Unit (DCU) streamer prefetcher. This option is set to Enabled by default.
DCU IP Prefetcher	Enables or disables the Data Cache Unit (DCU) IP prefetcher. This option is set to Enabled by default.
Sub NUMA Cluster	Enables or disables the Sub NUMA Cluster. This option is set to Disabled by default.
MADT Core Enumeration	Specifies the MADT Core Enumeration. This option is set to default in Round Robin . Linear option supports industry core enumeration whereas, Round Robin option supports Dell optimized core enumeration.
UMA Based Clustering	It is a read-only field and displays as Quadrant , when Sub NUMA Cluster is disabled or displays as Disabled , when Sub NUMA Cluster is either 2-way or 4-way.
UPI Prefetch	Enables you to get the memory read started early on DDR bus. The Ultra Path Interconnect (UPI) Rx path spawns the speculative memory that is read to Integrated Memory Controller (iMC) directly. This option is set to Enabled by default.

Table 43. Processor Settings details (continued)

Option	Description
XPT Prefetch	This option is set to Enabled by default.
LLC Prefetch	Enables or disables the LLC Prefetch on all threads. This option is set to Enabled by default.
Dead Line LLC Alloc	Enables or disables the Dead Line LLC Alloc. This option is set to Enabled by default. You can enable this option to enter the dead lines in LLC or disable the option to not enter the dead lines in LLC.
Directory AtoS	Enables or disables the Directory AtoS. AtoS optimization reduces remote read latencies for repeat read accesses without intervening writes. This option is set to Disabled by default.
AVX P1	Enables you to reconfigure the processor Thermal Design Power (TDP) levels during POST based on the power and thermal delivery capabilities of the system. TDP verifies the maximum heat the cooling system is must dissipate. This option is set to Normal by default. NOTE: This option is only available on certain stock keeping units (SKUs) of the processors.
Dynamic SST-Performance Profile	Enables you to reconfigure the processor using Dynamic or Static Speed Select Technology. This option is set to Disabled by default.
SST-Performance Profile	Enables you to reconfigure the processor using Speed Select Technology.
Intel SST-BF	Enables Intel SST-BF. This option is displayed if Performance Per Watt (operating system) or Custom (when OSPM is enabled) system profiles are selected. This option is set to Disabled by default.
Intel SST-CP	Enables Intel SST-CP. This option is displayed if Performance Per Watt (operating system) or Custom (when OSPM is enabled) system profiles are selected. This option is displayed and selectable for each system profile mode. This option is set to Disabled by default.
x2APIC Mode	Enables or disables x2APIC mode. This option is set to Enabled by default. NOTE: For two processors 64 cores configuration, x2APIC mode is not switchable if 256 threads are enabled (BIOS settings: All CCD, cores, and logical processors enabled).
AVX ICCP Pre-Grant License	Enables or disables AVX ICCP Pre-Grant License. This option is set to Disabled by default.
AVX ICC Pre-Grant Level	Enables you to select between the different AVX ICC transition levels offered by Intel. This option is set to 128 heavy by default.
Dell Controlled Turbo	
Dell Controlled Turbo Setting	Controls the turbo engagement. Enable this option only when System Profile is set to Performance or Custom , and CPU Power Management is set to Performance . This item can be selected for each system profile mode. This option is set to Disabled by default. NOTE: Depending on the number of installed processors, there might be up to two processor listings.

Table 43. Processor Settings details (continued)

Option	Description
Dell AVX Scaling Technology	Enables you to configure the Dell AVX scaling technology. This option is set to 0 by default. Enter the value from 0 to 12 bins. The value that is entered decreases the Dell AVX Scaling Technology frequency when the Dell-controlled Turbo feature is enabled.
Number of Cores per Processor	Controls the number of enabled cores in each processor. This option is set to All by default.
CPU Physical Address Limit	Limit CPU physical address to 46 bits to support older Hyper-V. If enabled, automatically disables TME-MT. This option is set to Enabled by default.
AMP Prefetch	This option enables one of the Mid-Level Cache (MLC) AMP hardware Prefetcher. This option is set to Disabled by default.
Homeless Prefetch	This option allows L1 Data Cache Unit (DCU) to prefetch, when the Fill Buffers (FB) is full. Auto maps to hardware default setting. This option is set to Auto by default.
Uncore Frequency RAPL	This setting controls whether the Running Average Power Limit (RAPL) balancer is enabled or not. If enabled, it activates the uncore power budgeting. This option is set to Enabled by default.
Processor Core Speed	Specifies the maximum core frequency of the processor.
Processor Bus Speed	Specifies the bus speed of the processor. i NOTE: The processor bus speed option displays only when both processors are installed.
Local Machine Check Exception	Enables or disables the local machine check exception. This is an extension of the MCA Recovery mechanism providing the capability to deliver Uncorrected Recoverable (UCR) Software Recoverable Action Required (SRAR) errors to one or more specific logical processors threads receiving previously poisoned or corrupted data. When enabled, the UCR SRAR Machine Check Exception is delivered only to the affected thread rather than broadcast to all threads in the system. The feature supports operating system recovery for cases of multiple recoverable faults that are detected close, which would otherwise result in a fatal machine check event. The feature is available only on Advanced RAS processors. This option is set to Enabled by default.
CPU Crash Log Support	This field controls Intel CPU Crash Log feature for collection of previous crash data from shared SRAM of Out-of-Band Management Service Module at post reset. This option is set to Disabled by default.
PROCESSOR n	i NOTE: Depending on the number of processors, there might be up to n processors listed. The following settings are displayed for each processor:

Table 44. Processor n details

Option	Description
Family-Model-Stepping	Specifies the family, model, and stepping of the processor as defined by Intel.
Brand	Specifies the brand name.
Level 2 Cache	Specifies the total L2 cache.

Table 44. Processor n details (continued)

Option	Description
Level 3 Cache	Specifies the total L3 cache.
Number of Cores	Specifies the number of cores per processor.
Microcode	Specifies the processor microcode version.

SATA Settings

To view the **SATA Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > SATA Settings**.

Table 45. SATA Settings details

Option	Description
Embedded SATA	Enables the embedded SATA option to be set to Off , AHCI mode , or RAID modes . This option is set to AHCI Mode by default. <i>i</i> NOTE: <ol style="list-style-type: none"> You might also need to change the Boot Mode setting to UEFI. Otherwise, you should set the field to Non-RAID mode. No ESXi and Ubuntu OS support under RAID mode.
Security Freeze Lock	Sends Security Freeze Lock command to the embedded SATA drives during POST. This option is applicable only for AHCI Mode. This option is set to Enabled by default.
Write Cache	Enables or disables the command for the embedded SATA drives during POST. This option is applicable only for AHCI Mode. This option is set to Disabled by default.
Port n	Sets the drive type of the selected device. For AHCI Mode , BIOS support is always enabled.

Table 46. Port n

Options	Descriptions
Model	Specifies the drive model of the selected device.
Drive Type	Specifies the type of drive attached to the SATA port.
Capacity	Specifies the total capacity of the drive. This field is undefined for removable media devices such as optical drives.

NVMe Settings

This option sets the NVMe drive mode. If the system contains NVMe drives that you want to configure in a RAID array, you must set both this field and the Embedded SATA field on the SATA settings menu to RAID Mode. You may also need to change the Boot Mode setting to UEFI.

To view the **NVMe Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > NVMe Settings**.

Table 47. NVMe Settings details

Option	Description
NVMe Mode	Enables or disables the boot mode. The option is set to Non-RAID mode by default.
BIOS NVMe Driver	Sets the drive type to boot the NVMe driver. The available options are Dell Qualified Drives and All Drives . This option is set to Dell Qualified Drives by default.

Boot Settings

You can use the **Boot Settings** screen to set the boot mode to either **BIOS** or **UEFI**. It also enables you to specify the boot order. The **Boot Settings** only support **UEFI** mode.

- **UEFI:** The Unified Extensible Firmware Interface (UEFI) is a new interface between operating systems and platform firmware. The interface consists of data tables with platform related information, boot and runtime service calls that are available to the operating system and its loader. The following benefits are available when the **Boot Mode** is set to **UEFI**:
 - Support for drive partitions larger than 2 TB.
 - Enhanced security (e.g., UEFI Secure Boot).
 - Faster boot time.

 **NOTE:** You must use only the UEFI boot mode in order to boot from NVMe drives.

- **BIOS:** The **BIOS Boot Mode** is the legacy boot mode. It is maintained for backward compatibility.

To view the **Boot Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Boot Settings**.

Table 48. Boot Settings details




Option	Description
Boot Mode	Enables you to set the boot mode of the system. If the operating system supports UEFI, you can set this option to UEFI. Setting this field to BIOS allows compatibility with non-UEFI operating systems. This option is set to UEFI by default.  CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.  NOTE: Setting this field to UEFI disables the BIOS Boot Settings menu.
Boot Sequence Retry	Enables or disables the Boot sequence retry feature or resets the system. When this option is set to Enabled and the system fails to boot, the system re-attempts the boot sequence after 30 seconds. When this option is set to Reset and the system fails to boot, the system reboots immediately. This option is set to Enabled by default.
Hard-disk Failover	Enables or disables the Hard-disk failover. This option is set to Disabled by default.
Generic USB Boot	Enables or disables the generic USB boot placeholder. This option is set to Disabled by default.
Hard-disk Drive Placeholder	Enables or disables the Hard-disk drive placeholder. This option is set to Disabled by default.
Clean all Sysprep variables and order	When this option is set to None , BIOS will do nothing. When set to Yes , BIOS will delete variables of SysPrep #### and SysPrepOrder this option is a onetime option, will reset to none when deleting variables. This setting is only available in UEFI Boot Mode . This option is set to None by default.
UEFI Boot Settings	Specifies the UEFI boot sequence. Enables or disables UEFI Boot options.  NOTE: This option controls the UEFI boot order. The first option in the list will be attempted first.

Table 49. UEFI Boot Settings


Option	Description
UEFI Boot Sequence	Enables you to change the boot device order.
Boot Option Enable/Disable	Enables you to select the enabled or disabled boot devices

Choosing system boot mode


System Setup enables you to specify one of the following boot modes for installing your operating system:

- UEFI boot mode (the default), is an enhanced 64-bit boot interface. If you have configured your system to boot to UEFI mode, it replaces the system BIOS.

1. From the **System Setup Main Menu**, click **Boot Settings**, and select **Boot Mode**.
2. Select the UEFI boot mode you want the system to boot into.

 **CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.**

3. After the system boots in the specified boot mode, proceed to install your operating system from that mode.

 **NOTE:** Operating systems must be UEFI-compatible to be installed from the UEFI boot mode. DOS and 32-bit operating systems do not support UEFI and can only be installed from the BIOS boot mode.

 **NOTE:** For the latest information about supported operating systems, go to www.dell.com/ossupport.

Network Settings

To view the **Network Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Network Settings**.


 **NOTE:** Network Settings are not supported in BIOS boot mode.

Table 50. Network Settings details

Option	Description
UEFI PXE Settings	Enables you to control the configuration of the UEFI PXE device.
Number of PXE Devices	This field specifies the number of PXE devices. This option is set to 4 by default.
PXE Device n (n = 1 to 4)	Enables or disables the device. When enabled, a UEFI PXE boot option is created for the device.
PXE Device n Settings (n = 1 to 4)	Enables you to control the configuration of the PXE device.
UEFI HTTP Settings	Enables you to control the configuration of the UEFI HTTP device.
HTTP Device n (n = 1 to 4)	Enables or disables the device. When enabled, a UEFI HTTP boot option is created for the device.
HTTP Device n Settings (n = 1 to 4)	Enables you to control the configuration of the HTTP device.
UEFI iSCSI Settings	Enables you to control the configuration of the iSCSI device.
iSCSI Initiator Name	Specifies the name of the iSCSI initiator in IQN format.
iSCSI Device1	Enables or disables the iSCSI device. When disabled, a UEFI boot option is created for the iSCSI device automatically. This is set to Disabled by default.
iSCSI Device1 Settings	Enables you to control the configuration of the iSCSI device.
UEFI NVMe-oF Settings	Enables you to control the configuration of the NVMe-oF devices.
NVMe-oF	Enables or disables the NVMe-oF feature. When enabled, it allows to configure the host and target parameters needed for fabric connection. This is set to Disabled by default.
NVMe-oF Host NQN	This field specifies the name of the NVMe-oF host NQN. Allowed input is in the following format: nqn.yyyy-mm.<Reserved Domain Name>:<Unique String>. Leave it empty to use system generated value with following format: nqn.1988-11.com.dell:<Model name>.<Model number>.<Service Tag>.
NVMe-oF Host Id	This field specifies a 16 bytes value of the NVMe-oF host identifier that uniquely identifies this host with the controller in the NVM subsystem. Allowed input is a hexadecimal-encoded string in this format: 00112233-4455-6677-8899-aabbccddeeff. Leave it empty to use system generated value. A value of all FF is not allowed.
Host Security Key Path	This field specifies the Host security key path.

Table 50. Network Settings details (continued)

Option	Description
NVMe-oF SubSystem Settings	This field controls the parameters for the NVMe-oF subsystem n connections.

Table 51. PXE Device n Settings details

Option	Description
Interface	Specifies NIC interface used for the PXE device.
Protocol	Specifies Protocol used for PXE device. This option is set to IPv4 or IPv6 . This option is set to IPv4 by default.
VLAN	Enables Vlan for PXE device. This option is set to Enabled or Disabled . This option is set to Disabled by default.
VLAN ID	Shows the Vlan ID for the PXE device
VLAN Priority	Shows the Vlan Priority for the PXE device.

Table 52. HTTP Device n Settings details

Option	Description
Interface	Specifies NIC interface used for the HTTP device.
Protocol	Specifies Protocol used for HTTP device. This option is set to IPv4 or IPv6 . This option is set to IPv4 by default.
VLAN	Enables Vlan for HTTP device. This option is set to Enable or Disable . This option is set to Disable by default.
VLAN ID	Shows the Vlan ID for the HTTP device
Vlan Priority	Shows the Vlan Priority for the HTTP device.
DHCP	Enables or disables DHCP for this HTTP device. This option is set to Enabled by default.
IP Address	Specifies IP address for the HTTP device.
Subnet Mask	Specifies subnet mask for the HTTP device.
Gateway	Specifies gateway for the HTTP device.
DNS info via DHCP	Enables or disables DNS Information from DHCP. This option is set to Enabled by default.
Primary DNS	Specifies the primary DNS server IP address for the HTTP Device.
Secondary DNS	Specifies the secondary DNS server IP address for the HTTP Device.
URI (will obtain from DHCP server if not specified)	Obtain URI from the DHCP server if not specified
TLS Authentication Configuration	Specifies the option for TLS authentication configuration.

Table 53. iSCSI Device1 Settings screen details

Option	Description
Connection 1	Enables or disables the iSCSI connection. This option is set to Disabled by default.
Connection 2	Enables or disables the iSCSI connection. This option is set to Disabled by default.
Connection 1 Settings	Enables you to control the configuration for the iSCSI connection.
Connection 2 Settings	Enables you to control the configuration for the iSCSI connection.
Connection Order	Enables you to control the order for which the iSCSI connections will be attempted.

Table 54. TLS Authentication Configuration screen details

Option	Description
TLS Authentication Mode	View or modify the device's boot TLS Authentication Mode. This option is set to One Way by default. None means the HTTP server and the client will not authenticate each other for this boot.
Root Certificate Configuration	Import, delete, or export the root certificate.

Table 55. NVMe-oF SubSystem Settings screen details

Option	Description
NVMe-oF SubSystem n (n = 1 to 4)	Enables or disables NVMe-oF SubSystem. This option is set to Disabled by default.
NVMe-oF SubSystem n Settings (n = 1 to 4)	Enables you to control the configuration of the NVMe-oF SubSystem, if Enabled .

Table 56. NVMe-oF SubSystem n Settings

Option	Description
Interface	NIC interface used for NVMe-oF connections. This option is set to Embedded NIC 1 Port 1 Partition 1 by default.
Transport Type	This field sets the value of transport type for NVMe-oF connection. This option is set to TCP by default.
Protocol	This field sets the value of protocol type for NVMe-oF connection. This option is set to IPv4 by default.
VLAN	Enables or disables VLAN for this NVMe-oF connections. This option is set to Disabled by default.
VLAN Id	Specifies the VLAN Id for this NVMe-oF connection. This option is set to 1 by default.
VLAN Priority	Specifies the VLAN priority for this NVMe-oF connection. This option is set to 0 by default.
Retry Count	Specifies the retry count for this NVMe-oF connection. This option is set to 3 by default.
Timeout	Specifies the time out for this NVMe-oF connection. This option is set to 10000 by default.
DHCP	Enables and disables the DHCP for this NVMe-oF connection. This option is set to Disabled by default.
Host IP Address	Specifies the Host IP Address for this NVMe-oF connection.
Host Subnet Mask	Specifies the Host Subnet Mask for this NVMe-oF connection.
Host Gateway	Specifies the Host Gateway for this NVMe-oF connection.
NVMe-oF Subsystem info via DHCP	Enables and disables the NVMe-oF subsystem's DHCP for this connection. This option is set to Disabled by default.
NVMe-oF Subsystem NQN	Specifies the NVMe-oF subsystem's NQN for this connection.
NVMe-oF Subsystem Address	Specifies the NVMe-oF subsystem's IP address for this connection.
NVMe-oF Subsystem Port	Specifies the NVMe-oF subsystem's port for this connection. This option is set to 4420 by default.
NVMe-oF Subsystem NID	Specifies the NamespaceID (NID) for this NVMe-oF connection.
NVMe-oF Subsystem Controller ID	Specifies the NVMe-oF subsystem's Controller ID for this connection. This option is set to 0 by default.

Table 56. NVMe-oF SubSystem n Settings (continued)

Option	Description
Security	Enables or disables the security option for this NVMe-oF connection. This option is set to Disabled by default.
Authentication Type	Specifies the authentication type for this NVMe-oF connection. This option is set to None by default.
SecurityKeyPath	Specifies the Securitykeypath for this NVMe-oF connection.

Integrated Devices

To view the **Integrated Devices** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Integrated Devices**.

Table 57. Integrated Devices details

Option	Description
User Accessible USB Ports	Configures the user accessible USB ports. Selecting Only Back Ports On disables the front USB ports; selecting All Ports Off disables all front and back USB ports.; selecting All Ports Off (Dynamic) disables all front and back USB ports during POST, and front ports can be enabled or disabled dynamically by authorized user without resetting the system. This option is set to All Ports On by default. The USB keyboard and mouse still function in certain USB ports during the boot process, depending on the selection. After the boot process is complete, the USB ports will be enabled or disabled as per the setting.
iDRAC Direct USB Port	The iDRAC Direct USB port is managed by iDRAC exclusively with no host visibility. This option is set to ON or OFF . When set to OFF , iDRAC does not detect any USB devices installed in this managed port. This option is set to On by default.
Integrated Network Card 1	Enables or disables the integrated network card 1. When this option is set to Enabled , the card is not available to the operating system. This option is set to On by default. NOTE: If set to Disabled (operating system), the Integrated NICs might still be available for shared network access by iDRAC.
Embedded NIC1 and NIC2	Enables or disables the OS interface of the Embedded NIC1 and NIC2 controller. If set to Disabled (OS) , the NIC may still be available for shared network access by the embedded management controller. Configure the Embedded NIC1 and NIC2 option by using the NIC management utilities of the system. This option is set to Enabled by default.
I/OAT DMA Engine	Enables or disables the I/O Acceleration Technology (I/OAT) option. I/OAT is a set of DMA features designed to accelerate network traffic and lower CPU utilization. Enable only if the hardware and software support the feature. This option is set to Disabled by default.
Internal USB Port	Enables or disables the internal USB port. This option is set to On or Off . This option is set to On by default.
Internal SD Card Port	Enables or disables the internal SD card port of the Internal Dual SD Module (IDSDM). This option is set to On by default.
Internal SD Card Redundancy	Configures the redundancy mode of the Internal Dual SD Module (IDSDM). When set to Mirror Mode , data is written on both SD cards. After failure of either card and replacement of the failed card, the data of the active card is copied to the offline card during the system boot.

Table 57. Integrated Devices details (continued)

Option	Description
	When Internal SD Card Redundancy is set to Disabled , only the primary SD card is visible to the operating system. This option is set to Disabled by default.
Internal SD Primary Card	By default, the primary SD card is selected to be SD Card 1. If SD Card 1 is not present, then the controller selects SD Card 2 to be the primary SD card.
Embedded Video Controller	<p>Enables or disables the use of Embedded Video Controller as the primary display. When set to Enabled, the Embedded Video Controller will be the primary display even if add-in graphic cards are installed. When set to Disabled, an add-in graphics card is used as the primary display. BIOS will output displays to both the primary add-in video and the embedded video during POST and preboot environment. The embedded video will then be disabled right before the operating system boots. This option is set to Enabled by default.</p> <p>i NOTE: When there are multiple add-in graphic cards installed in the system, the first card discovered during PCI enumeration is selected as the primary video. You might have to rearrange the cards in the slots in order to control which card is the primary video.</p>
I/O Snoop HoldOff Response	Selects the number of cycles PCI I/O can withhold snoop requests, from the CPU, to allow time to complete its own write to LLC. This setting can help improve performance on workloads where throughput and latency are critical. The options available are 256 Cycles, 512 Cycles, 1K Cycles, 2K Cycles, 4K Cycles, 8K Cycles, 16K Cycles, 32K Cycles, 64K Cycles and 128K Cycles . This option is set to 2K Cycles by default.
Current State of Embedded Video Controller	Displays the current state of the embedded video controller. The Current State of Embedded Video Controller option is a read-only field. If the Embedded Video Controller is the only display capability in the system (that is, no add-in graphics card is installed), then the Embedded Video Controller is automatically used as the primary display even if the Embedded Video Controller setting is set to Disabled .
SR-IOV Global Enable	Enables or disables the BIOS configuration of Single Root I/O Virtualization (SR-IOV) devices. This option is set to Disabled by default.
OS Watchdog Timer	If your system stops responding, this watchdog timer aids in the recovery of your operating system. When this option is set to Enabled , the operating system initializes the timer. When this option is set to Disabled (the default), the timer does not have any effect on the system.
Empty Slot Unhide	Enables or disables the root ports of all the empty slots that are accessible to the BIOS and operating system. This option is set to Disabled by default.
Slot Disablement	Enables or disables or boot driver disables the available PCIe slots on your system. The slot disablement feature controls the configuration of the PCIe cards installed in the specified slot. Slots must be disabled only when the installed peripheral card prevents booting into the operating system or causes delays in system startup. If the slot is disabled, both the Option ROM and UEFI drivers are disabled. Only slots that are present on the system will be available for control. When this option is set to boot driver disabled, both the Option ROM and UEFI driver from the slot will not run during POST. The system will not boot from the card and its pre-boot services will not be available. However, the card is available to the operating system.
	Slot n: Enables or disables or only the boot driver is disabled for the PCIe slot n. This option is set to Enabled by default.
Slot Bifurcation	Auto Discovery Bifurcation Settings allows Platform Default Bifurcation, Auto Discovery of Bifurcation , and Manual bifurcation Control .
	This option is set to Platform Default Bifurcation by default. The slot bifurcation field is accessible when set to Manual bifurcation Control and

Table 57. Integrated Devices details (continued)

Option	Description
	<p>is grayed out when set to Platform Default Bifurcation and Auto Discovery of Bifurcation.</p> <p>i NOTE: The slot bifurcation supports on PCIe slot only, does not support slot type from Paddle card to Riser and Slimline connector to Riser.</p>

Serial Communication

To view the **Serial Communication** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Serial Communication**.

i **NOTE:** PowerEdge R760xd2 system does not support the serial COM port.

Table 58. Serial Communication details

Option	Description
Serial Port Address	<p>Enables you to set the port address for serial devices. This option is set to either COM1 or COM2 for the serial device (COM1=0x3F8,COM2=0x2F8) and set to COM1 by default.</p> <p>i NOTE: You can use only Serial Device 2 for the Serial Over LAN (SOL) feature. To use console redirection by SOL, configure the same port address for console redirection and the serial device.</p> <p>i NOTE: Every time the system boots, the BIOS syncs the serial MUX setting that is saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS setup utility may not always revert the serial MUX setting to the default setting of Serial Device 1.</p>
External Serial Connector	<p>Enables you to associate the External Serial Connector to Serial Device 1, Serial Device 2, or the Remote Access Device by using this option. This option is set to Serial Device 1 by default.</p> <p>i NOTE: Only Serial Device 2 can be used for Serial Over LAN (SOL). To use console redirection by SOL, configure the same port address for console redirection and the serial device.</p> <p>i NOTE: Every time the system boots, the BIOS syncs the serial MUX setting saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS setup utility may not always revert this setting to the default setting of Serial Device 1.</p>
Failsafe Baud Rate	<p>Specifies the failsafe baud rate for console redirection. The BIOS attempts to determine the baud rate automatically. This failsafe baud rate is used only if the attempt fails, and the value must not be changed. This option is set to 115200 by default.</p>
Remote Terminal Type	<p>Sets the remote console terminal type. This option is set to VT100/VT220 by default.</p>
Redirection After Boot	<p>Enables or disables the BIOS console redirection when the operating system is loaded. This option is set to Enabled by default.</p>

System Profile Settings

To view the **System Profile Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > System Profile Settings**.

Table 59. System Profile Settings details

Option	Description
System Profile	<p>Sets the system profile. If you set the System Profile option to a mode other than Performance Per Watt (DAPC), the BIOS automatically sets the rest of the options. You can only change the rest of the options if the mode is set to Custom. This option is set to Performance Per Watt (DAPC) by default. Other options include Custom, Performance, Performance Per Watt (OS) and Workstation Performance.</p> <p>i NOTE: All the parameters on the system profile setting screen are available only when the System Profile option is set to Custom.</p>
Intel Optimized Power Mode	When set to Enabled , processor is tuned for lower power consumption. Also sets C1E to Enabled, sets CPU Power Management to System DBPM mode, sets Energy Efficient Policy to Performance, and sets Uncore Frequency to Dynamic.
CPU Power Management	Sets the CPU power management. This option is set to System DBPM (DAPC) by default. Other option includes Maximum Performance, OS DBPM .
Memory Frequency	Sets the speed of the system memory. You can select Maximum Performance , Maximum Reliability or a specific speed. This option is set to Maximum Performance by default.
Turbo Boost	Enables or disables the processor to operate in the turbo boost mode. This option is set to Enabled by default.
Energy Efficient Turbo	Energy Efficient Turbo (EET) is a mode of operation where a processor's core frequency is adjusted within the turbo range based on workload. This option is set to Enabled by default.
C1E	Enables or disables the processor to switch to a minimum performance state when it is idle. This option is set to Enabled by default.
C-States	Enables or disables the processor to operate in all available power states. C States allow the processor to enter lower power states when idle. When set to Enabled (OS controlled) or when set to Autonomous (if hardware controlled is supported), the processor can operate in all available Power States to save power, but may increase memory latency and frequency jitter. This option is set to Enabled by default.
Memory Patrol Scrub	Sets the memory patrol scrub mode. This option is set to Standard by default.
Memory Refresh Rate	Sets the memory refresh rate to either 1x or 2x. This option is set to 1x by default.
Uncore Frequency	Enables you to select the Uncore Frequency option. Dynamic mode enables the processor to optimize power resources across cores and uncores during runtime. The optimization of the uncore frequency to either save power or optimize performance is influenced by the setting of the Energy Efficiency Policy option.
Energy Efficient Policy	Enables you to select the Energy Efficient Policy option. The CPU uses the setting to manipulate the internal behavior of the processor and determines whether to target higher performance or better power savings. This option is set to Balanced Performance by default.
Monitor/Mwait	<p>Enables the Monitor/Mwait instructions in the processor. This option is set to Enabled for all system profiles, except Custom by default.</p> <p>i NOTE: This option can be disabled when System Profile is set to Custom.</p> <p>i NOTE: When C States is set to Enabled in the Custom mode, changing the Monitor/Mwait setting does not impact the system power or performance.</p>
Workload Profile	This option allows the user to specify the targeted workload of a server. It allows optimization of performance based on the workload type. This option is set to Not Configured by default.
CPU Interconnect Bus Link Power Management	Enables or disables the CPU Interconnect Bus Link Power Management. This option is set to Enabled by default.
PCI ASPM L1 Link Power Management	Enables or disables the PCI ASPM L1 Link Power Management . This option is set to Enabled by default.

System Security

To view the **System Security** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > System Security**.

Table 60. System Security details

Option	Description
CPU AES-NI	Improves the speed of applications by performing encryption and decryption by using the Advanced Encryption Standard Instruction Set (AES-NI). This option is set to Enabled by default.
System Password	Sets the system password. This option is set to Enabled by default and is read-only if the password jumper is not installed in the system.
Setup Password	Sets the setup password. This option is read-only if the password jumper is not installed in the system.
Password Status	Locks the system password. This option is set to Unlocked by default.
TPM Information	Indicates the type of Trusted Platform Module, if present.

Table 61. TPM 2.0 security information


Option	Description
TPM Information	
TPM Security	 NOTE: The TPM menu is available only when the TPM module is installed. Enables you to control the reporting mode of the TPM. When set to Off, the presence of the TPM is not reported to the OS. When set to On, the presence of the TPM is reported to the OS. The TPM Security option is set to Off by default.
	When TPM 2.0 is installed, the TPM Security option is set to On or Off . This option is set to Off by default.
TPM Information	Indicates the type of Trusted Platform Module, if present.
TPM Firmware	Indicates the firmware version of the TPM.
TPM Hierarchy	Enables, disables, or clears the storage and endorsement hierarchies. When set to Enabled , the storage and endorsement hierarchies can be used.
	When set to Disabled , the storage and endorsement hierarchies cannot be used.
	When set to Clear , the storage and endorsement hierarchies are cleared of any values, and then reset to Enabled .
TPM Advanced Settings	TPM PPI Bypass Provision When set to Enabled , allows the Operating System to bypass Physical Presence Interface (PPI) prompts when issuing PPI Advanced Configuration and Power interface (ACPI) provisioning operations.
	TPM PPI Bypass Clear When set to Enabled allows the Operating System to bypass Physical Presence Interface (PPI) prompts when issuing PPI Advanced Configuration and Power Interface (ACPI) clear operations.
	TPM2 Algorithm Selection Allows the user to change the cryptographic algorithms used in the Trusted Platform Module (TPM). The available options are dependent on the TPM firmware. To enable TPM2 Algorithm Selection, Intel(R) TXT technology must be disabled. The TPM2 Algorithm Selection option supports SHA1, SHA128, SHA256, SHA512 and SM3 by detecting the TPM module. This option is set to SHA1 by default.

Table 62. System Security details


Option	Description
Intel(R) TXT	Enables you to set the Intel Trusted Execution Technology (TXT) option. To enable the Intel TXT option, virtualization technology and TPM Security must be enabled with Pre-boot measurements. This option is set to Off by default. It is set On for Secure Launch (Firmware Protection) support on Windows 2022.
Memory Encryption	Enables or disables the Intel Total Memory Encryption (TME) and Multi-Tenant (Intel® TME-MT). When option is set to Disabled , BIOS disables both TME and MK-TME technology. When option is set to Single Key BIOS enables the TME technology. When option is set to Multiple Keys , BIOS enables the TME-MT technology. This option is set to Disabled by default.
TME Encryption Bypass	Allows the option to bypass the Intel Total Memory Encryption. This option is set to Disabled by default.
Intel(R) SGX	Enables you to set the Intel Software Guard Extension (SGX) option. To enable the Intel SGX option, processor must be SGX capable, memory population must be compatible (minimum x8 identical DIMM1 to DIMM8 per CPU socket, not support on persistent memory configuration), memory operating mode must be set at optimizer mode, memory encryption must be enabled and node interleaving must be disabled. This option is set to Off by default. When this option is to Off , BIOS disables the SGX technology. When this option is to On , BIOS enables the SGX technology.
SGX Package Info In-Band Access	Enables you to access the Intel Software Guard Extension (SGX) package info in-band option. This option is set to Off by default.
PPMRR Size	Sets the PPMRR size.
SGX QoS	Enables or disables the SGX quality of service.
Select Owner EPOCH input type	Enables you to select Change to New random Owner EPOCHs or Manual User Defined Owner EPOCHs . Each EPOCH is 64-bit. After generating new EPOCH by selecting Change to New random Owner EPOCHs , the selection reverts back to Manual User Defined Owner EPOCHs .
	Software Guard Extensions Epoch n: Sets the Software Guard Extensions Epoch values.
Enable writes to SGXLEPUBKEYHASH[3:0] from OS/SW	Enables or disables the Enable writes to SGXLEPUBKEYHASH[3:0] from OS/SW.
	SGX LE Public Key Hash0: Sets the bytes from 0-7 for SGX Launch Enclave Public Key Hash.
	SGX LE Public Key Hash1: Sets the bytes from 8-15 for SGX Launch Enclave Public Key Hash.
	SGX LE Public Key Hash2: Sets the bytes from 16-23 for SGX Launch Enclave Public Key Hash.
	SGX LE Public Key Hash3: Sets the bytes from 24-31 for SGX Launch Enclave Public Key Hash.
Enable/Disable SGX Auto MP Registration Agent	Enables are disables the SGX Auto MP Registration. The MP registration agent is responsible to register the platform.
SGX Factory Reset	Enables you to reset the SGX option to factory settings. This option is set to Off by default.
Power button:	Enables or disables the power button on the front of the system. This option is set to Enabled by default.
AC Power Recovery	Sets how the system behaves after AC power is restored to the system. This option is set to Last by default.  NOTE: The host system will not power on up until iDRAC Root of Trust (RoT) is completed, host power on will be delayed by minimum 90 seconds after the AC applied.

Table 62. System Security details (continued)


Option	Description
AC Power Recovery Delay	Sets the time delay for the system to power up after AC power is restored to the system. This option is set to Immediate by default. When this option is set to Immediate , there is no delay for power up. When this option is set to Random , the system creates a random delay for power up. When this option is set to User Defined , the system delay time is manually to power up.
User Defined Delay (120 s to 600 s)	Sets the User Defined Delay option when the User Defined option for AC Power Recovery Delay is selected. The actual AC recovery time needs to add iDRAC root of trust time (around 50 seconds).
UEFI Variable Access	Provides varying degrees of securing UEFI variables. When set to Standard (the default), UEFI variables are accessible in the operating system per the UEFI specification. When set to Controlled , selected UEFI variables are protected in the environment and new UEFI boot entries are forced to be at the end of the current boot order.
In-Band Manageability Interface	When set to Disabled , this setting hides the Management Engine's (ME), HECI devices, and the system's IPMI devices from the operating system. This prevents the operating system from changing the ME power capping settings, and blocks access to all in-band management tools. All management should be managed through out-of-band. This option is set to Enabled by default.  NOTE: BIOS update requires HECI devices to be operational and DUP updates require IPMI interface to be operational. This setting needs to be set to Enabled to avoid updating errors.
SMM Security Mitigation	Enables or disables the UEFI SMM security migration protections. It is set to Disabled by default.
Secure Boot	Enables Secure Boot, where the BIOS authenticates each pre-boot image by using the certificates in the Secure Boot Policy. Secure Boot is set to Disabled by default.
Secure Boot Policy	When Secure Boot policy is set to Standard , the BIOS uses the system manufacturer's key and certificates to authenticate pre-boot images. When Secure Boot policy is set to Custom , the BIOS uses the user-defined key and certificates. Secure Boot policy is set to Standard by default.
Secure Boot Mode	Configures how the BIOS uses the Secure Boot Policy Objects (PK, KEK, db, dbx). If the current mode is set to Deployed Mode , the available options are User Mode and Deployed Mode . If the current mode is set to User Mode , the available options are User Mode , Audit Mode , and Deployed Mode . Below are the details of different boot modes available in the Secure Boot Mode option. User Mode In User Mode , PK must be installed, and BIOS performs signature verification on programmatic attempts to update policy objects. The BIOS allows unauthenticated programmatic transitions between modes. Audit mode In Audit Mode , PK is not present. BIOS does not authenticate programmatic update to the policy objects and transitions between modes. The BIOS performs a signature verification on pre-boot images and logs the results in the image Execution Information Table, but executes the images whether they pass or fail verification. Audit Mode is useful for programmatic determination of a working set of policy objects. Deployed Mode Deployed Mode is the most secure mode. In Deployed Mode , PK must be installed and the BIOS performs signature verification on programmatic attempts to update policy objects. Deployed Mode restricts the programmatic mode transitions.


Table 62. System Security details (continued)

Option	Description
Secure Boot Policy Summary	<p>Specifies the list of certificates and hashes that secure boot uses to authenticate images. Below are the list of options available on the Secure Boot Policy Summary screen:</p> <ol style="list-style-type: none"> 1. Platform Key (PK) 2. Key Exchange Key (KEK) Database Entries 3. Authorized Signature Database (db) Entries <p>The options above are described through the following fields:</p> <ul style="list-style-type: none"> • Type • Issuer • Subject • Signature Owner GUID <ol style="list-style-type: none"> 4. Forbidden Signature Database (dbx) Entries
Secure Boot Custom Policy Settings	<p>Configures the Secure Boot Custom Policy. To enable this option, set the Secure Boot Policy to Custom option. Below are the list of options available on the Secure Boot Custom Policy Settings screen:</p> <ol style="list-style-type: none"> 1. Platform Key (PK) 2. Key Exchange Key (KEK) Database 3. Authorized Signature Database (db) 4. Forbidden Signature Database (dbx) 5. Delete All Policy Entries (PK, KEK, db, and dbx) 6. Restore Default Policy Entries (PK, KEK, db, and dbx) 7. Export Firmware Hash Values

Creating a system and setup password

Prerequisites


Ensure that the password jumper is enabled. The password jumper enables or disables the system password and setup password features. For more information, see the System board jumper settings section.

 **NOTE:** If the password jumper setting is disabled, the existing system password and setup password are deleted and you need not provide the system password to boot the system.

Steps

1. To enter System Setup, press F2 immediately after turning on or rebooting your system.
2. On the **System Setup Main Menu** screen, click **System BIOS > System Security**.
3. On the **System Security** screen, verify that **Password Status** is set to **Unlocked**.
4. In the **System Password** field, type your system password, and press Enter or Tab.
Use the following guidelines to assign the system password:
 - A password can have up to 32 characters.

A message prompts you to reenter the system password.
5. Reenter the system password, and click **OK**.
6. In the **Setup Password** field, type your setup password and press Enter or Tab.
A message prompts you to reenter the setup password.
7. Reenter the setup password, and click **OK**.
8. Press Esc to return to the System BIOS screen. Press Esc again.
A message prompts you to save the changes.

 **NOTE:** Password protection does not take effect until the system reboots.

Using your system password to secure your system

About this task

If you have assigned a setup password, the system accepts your setup password as an alternate system password.

Steps

1. Turn on or reboot your system.
2. Type the system password and press Enter.

Next steps

When **Password Status** is set to **Locked**, type the system password and press Enter when prompted at reboot.

NOTE: If an incorrect system password is typed, the system displays a message and prompts you to reenter your password. You have three attempts to type the correct password. After the third unsuccessful attempt, the system displays an error message that the system has stopped functioning and must be turned off. Even after you turn off and restart the system, the error message is displayed until the correct password is entered.

Deleting or changing system and setup password

Prerequisites

NOTE: You cannot delete or change an existing system or setup password if the **Password Status** is set to **Locked**.

Steps

1. To enter System Setup, press F2 immediately after turning on or restarting your system.
2. On the **System Setup Main Menu** screen, click **System BIOS > System Security**.
3. On the **System Security** screen, ensure that **Password Status** is set to **Unlocked**.
4. In the **System Password** field, alter or delete the existing system password, and then press Enter or Tab.
5. In the **Setup Password** field, alter or delete the existing setup password, and then press Enter or Tab.
If you change the system and setup password, a message prompts you to reenter the new password. If you delete the system and setup password, a message prompts you to confirm the deletion.
6. Press Esc to return to the **System BIOS** screen. Press Esc again, and a message prompts you to save the changes.
7. Select **Setup Password**, change, or delete the existing setup password and press Enter or Tab.

NOTE: If you change the system password or setup password, a message prompts you to reenter the new password. If you delete the system password or setup password, a message prompts you to confirm the deletion.

Operating with setup password enabled

If **Setup Password** is set to **Enabled**, type the correct setup password before modifying the system setup options.

If you do not type the correct password in three attempts, the system displays the following message:

```
Invalid Password! Number of unsuccessful password attempts: <x> System Halted! Must power down.
```

Even after you power off and restart the system, the error message is displayed until the correct password is typed. The following options are exceptions:




- If **System Password** is not set to **Enabled** and is not locked through the **Password Status** option, you can assign a system password. For more information, see the System Security Settings screen section.
- You cannot disable or change an existing system password.

NOTE: You can use the password status option with the setup password option to protect the system password from unauthorized changes.

Redundant OS Control

To view the **Redundant OS Control** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Redundant OS Control**.



Table 63. Redundant OS Control details

Option	Description
Redundant OS Location	Enables you to select a backup disk from the following devices:
Redundant OS State	<p> NOTE: This option is disabled if Redundant OS Location is set to None.</p> <p>When set to Visible, the backup disk is visible to the boot list and OS. When set to Hidden, the backup disk is disabled and is not visible to the boot list and OS. This option is set to Visible by default.</p> <p> NOTE: BIOS disables the device in hardware, so it is not accessed by the OS.</p>
Redundant OS Boot	<p> NOTE: This option is disabled if Redundant OS Location is set to None or if Redundant OS State is set to Hidden.</p> <p>When set to Enabled, BIOS boots to the device specified in Redundant OS Location. When set to Disabled, BIOS preserves the current boot list settings. This option is set to Disabled by default.</p>

Miscellaneous Settings

To view the **Miscellaneous Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Miscellaneous Settings**.

Table 64. Miscellaneous Settings details


Option	Description
System Time	Enables you to set the time on the system.
System Date	Enables you to set the date on the system.
Time Zone	Enables you to select required Time Zone.
Daylight Savings Time	Enables or disables Daylight Savings Time. This option is set to Disabled by default.
Asset Tag	Specifies the asset tag and enables you to modify it for security and tracking purposes.
Keyboard NumLock	<p>Enables you to set whether the system boots with the NumLock enabled or disabled. This option is set to On by default.</p> <p> NOTE: This option does not apply to 84-key keyboards.</p>
F1/F2 Prompt on Error	Enables or disables the F1/F2 prompt on error. This option is set to Enabled by default. The F1/F2 prompt also includes keyboard errors.
Load Legacy Video Option ROM	<p>This option determines whether the system BIOS will load legacy video (INT 10h) option ROM from the video controller. This option is set to Disabled by default.</p> <p> NOTE: This option cannot be set to Enabled, when the Boot mode is UEFI and Secure Boot is enabled.</p>
Dell Wyse P25/P45 BIOS Access	Enables or disables the Dell Wyse P25/P45 BIOS Access. This option is set to Enabled by default.
Power Cycle Request	Enables or disables the Power Cycle Request. This option is set to None by default.

Dell Lifecycle Controller

Dell Lifecycle Controller (LC) provides advanced embedded systems management capabilities including system deployment, configuration, update, maintenance, and diagnosis. LC is delivered as part of the iDRAC out-of-band solution and Dell system embedded Unified Extensible Firmware Interface (UEFI) applications.

Embedded system management

The Dell Lifecycle Controller provides advanced embedded system management throughout the lifecycle of the system. The Dell Lifecycle Controller is started during the boot sequence and functions independently of the operating system.

 **NOTE:** Certain platform configurations may not support the full set of features provided by the Dell Lifecycle Controller.

For more information about setting up the Dell Lifecycle Controller, configuring hardware and firmware, and deploying the operating system, see the Dell Lifecycle Controller documentation at <https://www.dell.com/idracmanuals>.

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 65. Boot Manager details

Option	Description
Continue Normal Boot	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.
One-shot UEFI Boot Menu	Enables you to access boot menu, where you can select a one-time boot device to boot from.
Launch System Setup	Enables you to access System Setup.
Launch Lifecycle Controller	Exits the Boot Manager and invokes the Dell Lifecycle Controller program.
System Utilities	Enables you to launch 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

This section describes the minimum to POST system requirement of the Dell system.

Topics:

- [Minimum configuration to POST](#)
- [Configuration validation](#)

Minimum configuration to POST

The components that are listed below are the minimum configuration to POST:

- One processor in processor socket 1
- One memory module (DIMM) in slot A1
- One power supply unit in PSU 1
- PIB
- System board + FIO card (Right control panel)

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 that is 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)/LifeCycle (LC) log. The reported events are categorized in the configuration validation error table.

Table 66. 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_SL7 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/HBAadapter 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

Table 66. Configuration validation error (continued)

Error	Description	Possible cause and recommendations	Example
Comm Error	A configuration element is not responding to iDRAC using the management interface while running an inventory check.	System management sideband communication Unplug AC Power, reset the element and replace the element if the problem persists.	Comm Error: Backplane 2

Error messages

This section describes the error messages that are displayed on the screen during POST or captured in the system event log (SEL)/LifeCycle (LC) log.

Table 67. Error message HWC8010

Error code	HWC8010
Message	The System Configuration Check operation that is resulted in the following issue involving the indicated component type
Arguments	Riser, floating card (fPERC, adapter PERC, BOSS), backplane, processor, cable, or other components
Detailed Description	The issue that is identified in the message is observed in the System Configuration Check operation.
Recommended Response Action	Do the following and retry the operation: <ol style="list-style-type: none"> 1. Disconnect the input power. 2. Check for proper cable connection and component placement. If the issue persists, contact the service provider.
Category	System Health (HWC = Hardware Config)
Severity	Critical
Trap/EventID	2329

Table 68. Error message HWC8011


Error code	HWC8011
Message	The System Configuration Check operation that is resulted in multiple issues involving the indicated component type
Arguments	Riser, floating card (fPERC, adapter PERC, BOSS), backplane, processor, cable, or other components
Detailed Description	Multiple issues are observed in the System Configuration Check operation.
Recommended Response Action	Do the following and retry the operation: <ol style="list-style-type: none"> 1. Disconnect the input power. 2. Check for proper cable connection and component placement. If the issue persists, contact the service provider.
Category	System Health (HWC = Hardware Config)
Severity	Critical


Installing and removing system components

Topics:


- Safety instructions
- Before working inside your system
- After working inside your system
- Recommended tools
- Fan cover
- System cover
- Mid drive bay
- Rear drive bay
- Air shroud
- Cooling fans
- Fan board
- Sidewall cable clip
- Intrusion switch
- Power interposer board (PIB)
- SAS expander card
- Drives
- Drive backplane
- Cable routing
- System memory
- Processor and heat sink module
- Expansion cards
- PERC card
- Optional BOSS-N1 module
- System battery
- Optional internal USB card
- Optional OCP card
- Trusted Platform Module
- Power supply units
- Control panel
- System board


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: While replacing the hot swappable PSU, after next server boot, the new PSU automatically updates to the same firmware and configuration of the replaced one. For updating to the latest firmware and changing the configuration, see the *Lifecycle Controller User's Guide* at <https://www.dell.com/idracmanuals>.

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

Before working inside your system

Prerequisites

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

Steps

1. Power off the 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 www.dell.com/poweredge manuals.
4. 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 www.dell.com/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:

- Phillips 1 screwdriver
- Phillips 2 screwdriver
- Torx T8 screwdriver
- Torx T30 screwdriver
- 5 mm hex nut screwdriver
- Plastic scribe
- 1/4-inch flat blade screwdriver
- Wrist grounding strap connected to the ground

- ESD mat
- Needle-nose pliers

You need the following tools to assemble the cables for a DC power supply unit:

- AMP 90871-1 hand-crimping tool or equivalent
- Tyco Electronics 58433-3 or equivalent
- Wire-stripper pliers to remove insulation from size 10 AWG solid or stranded, insulated copper wire

i **NOTE:** Use alpha wire part number 3080 or equivalent (65/30 stranding).

Fan cover

Removing the fan cover

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#)
3. If installed, remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* at www.dell.com/poweredgemanuals.

Steps

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

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

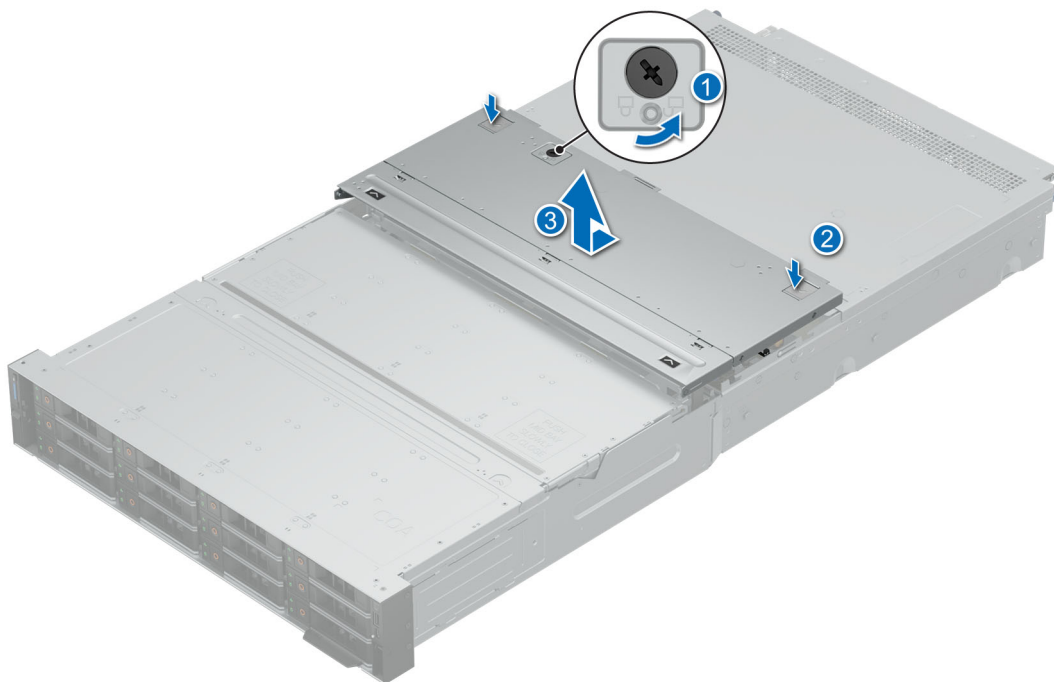


Figure 37. Removing the fan cover

Next steps

Install the fan cover.


Installing the fan cover

Prerequisites

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

Steps

1. Align the tabs on the system cover with the guide slots on the system.
2. Slide the cover towards the rear of the system, until the system cover locks in place.
3. Using a 1/4 inch flat head or Phillips #2 screwdriver, turn the lock clockwise to the lock position.

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

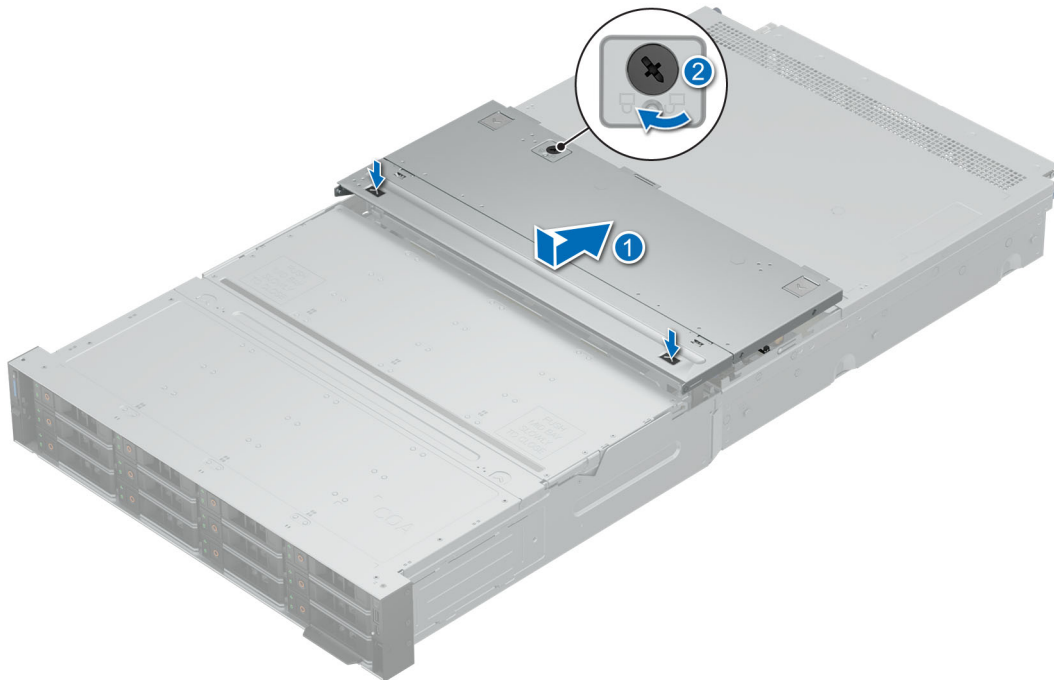


Figure 38. Installing fan cover

Next steps

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

System cover

Removing the rear system cover

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#)

Steps

1. Loosen the two thumbscrews at the rear of the system.

2. Press the release tabs on the system cover, and slide the cover towards the rear of the system.
3. Lift the cover from the system.

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

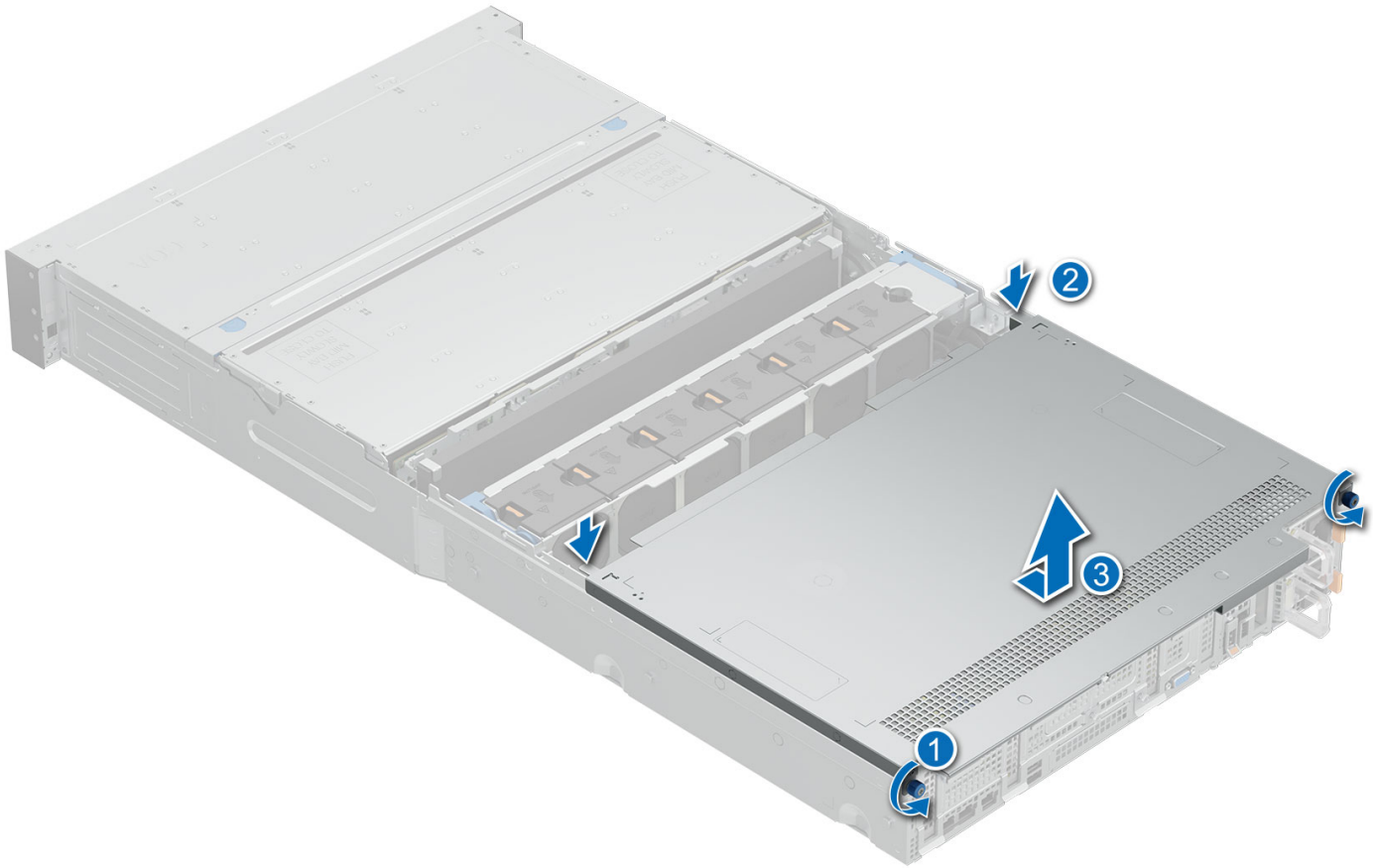


Figure 39. Removing the rear system cover

Next steps

1. [Install the rear system cover](#)

Installing the rear system cover

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#)

Steps

1. Align the tabs on the system cover with the guide slots on the system.
2. Slide the cover towards the front of the system, until the system cover locks in place.
3. Tighten the two thumbscrews at the rear of the system.

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



Figure 40. Installing rear system cover

Next steps

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

Mid drive bay

Removing the mid bay cover and opening the mid bay

Prerequisites

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

Steps

1. Release the mid drive bay access levers in the front of the system.
2. Press the release tabs and slide the cover towards the rear of the system.
3. Lift the cover from the system.
4. Rotate the orange release levers on the drive bay to unlock position.
5. Holding the release levers lift the mid bay up to the service position.

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

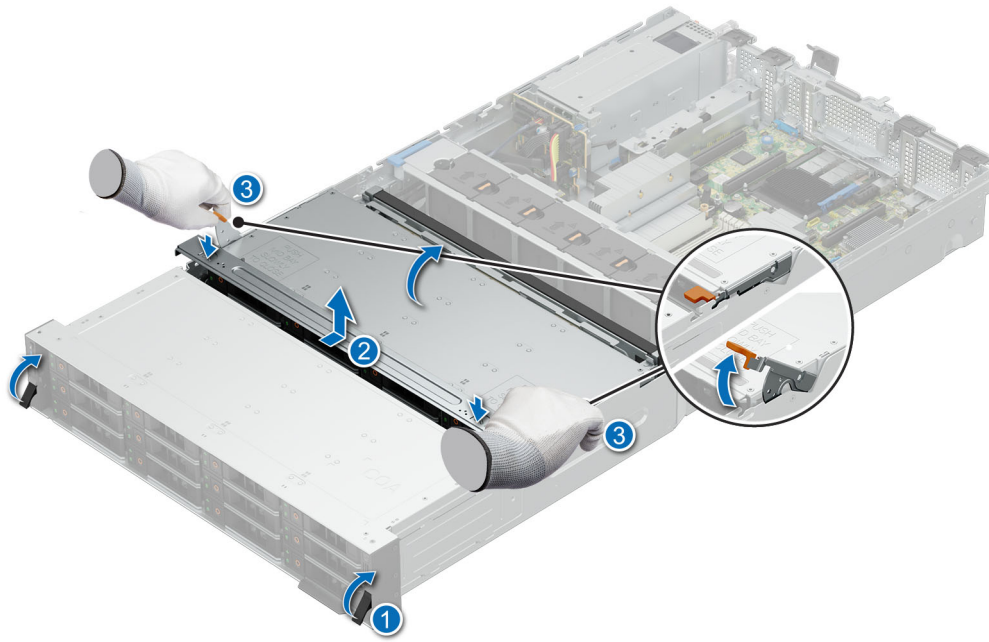


Figure 41. Removing the mid bay cover and opening the mid bay

CAUTION: Do not reinstall the mid bay cover while the bay is at service position.

CAUTION: Mid bay should not be in service position for more than five minutes. The HDD temperature LED will blink fast when temperature is critical, at this point close the mid bay and allow system to reach normal temperature.

CAUTION: Open and close mid bay slowly. Risk of damaging drives with excessive force.

Next steps

Closing the midbay and installing the mid bay cover.

Closing the mid bay and installing the mid bay cover

Prerequisites

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

Steps

1. Gently press down on the mid bay to close it.
2. Rotate the orange levers to lock position to secure the mid bay.
3. Align the mid bay cover to the guide rails and slide towards the front of the system till it clicks in place.
4. Close the mid bay access levers in the front of the system.

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

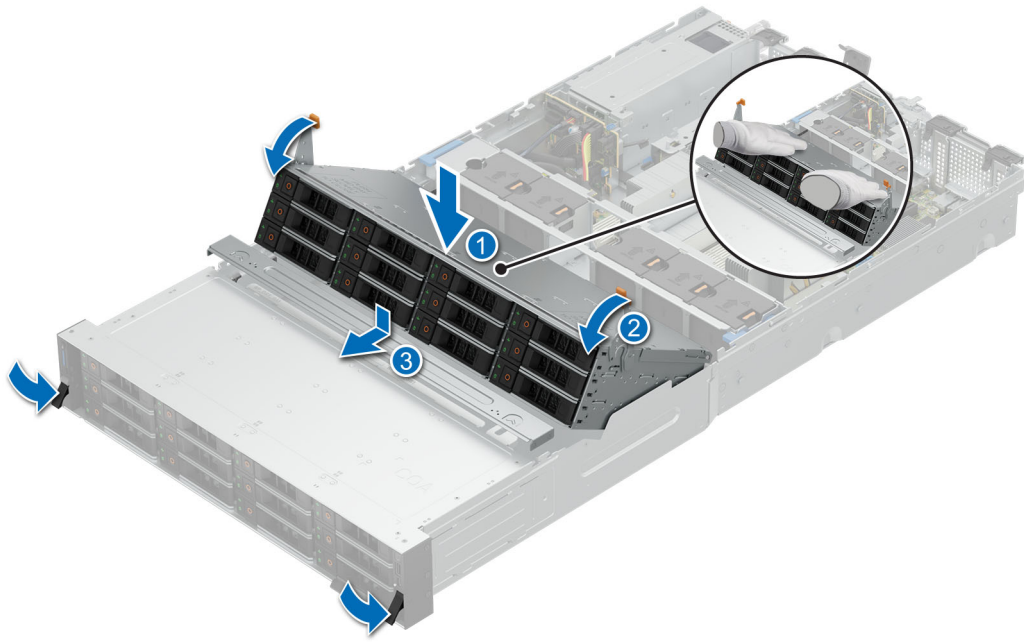


Figure 42. Closing the mid bay and installing the mid bay cover

Next steps

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

Rear drive bay

Removing the rear SAS/SATA or NVMe drive bay

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).
6. [Remove the air shroud](#)

Steps

Loosen the four captive screws and lift the drive bay from the system.

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

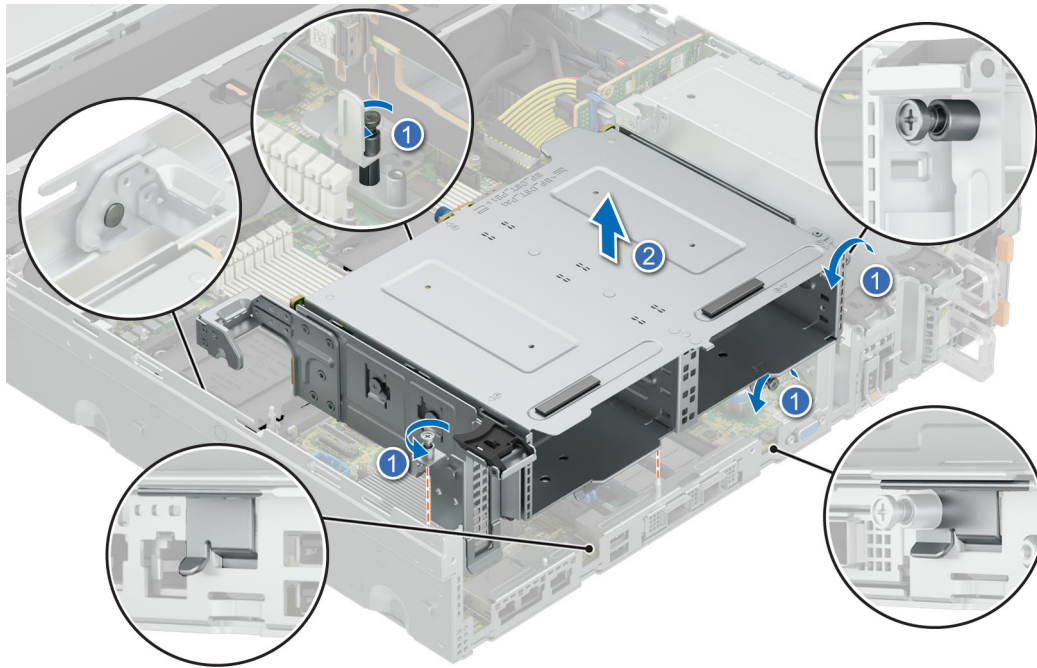


Figure 43. Removing the rear SAS/SATA or NVMe drive bay

Next steps

Install the rear SAS/SATA or NVMe drive bay.

Installing the rear SAS/SATA or NVMe drive bay

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).
6. [Remove the air shroud](#)

Steps

1. Align the drive bay to the guide pin and inset in the system.
2. Tighten the four captive screws to secure the drive bay in place.

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

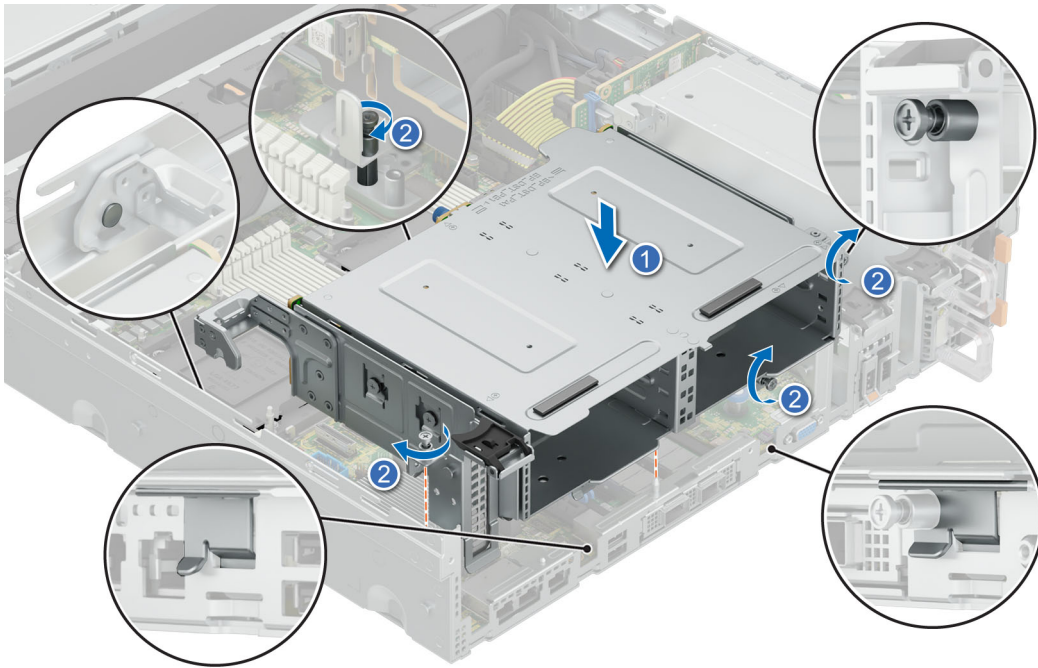


Figure 44. Installing the rear SAS/SATA or NVMe drive bay

Next steps

1. Install the air shroud.
2. Install the cooling fan assembly.
3. Install the rear system cover.
4. Install the fan cover.
5. Follow the procedure listed in [After working inside your system](#).

Removing the rear NVMe drive bay

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).
6. [Remove the air shroud](#)

Steps

Loosen the two captive screws and lift the drive bay from the system.

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

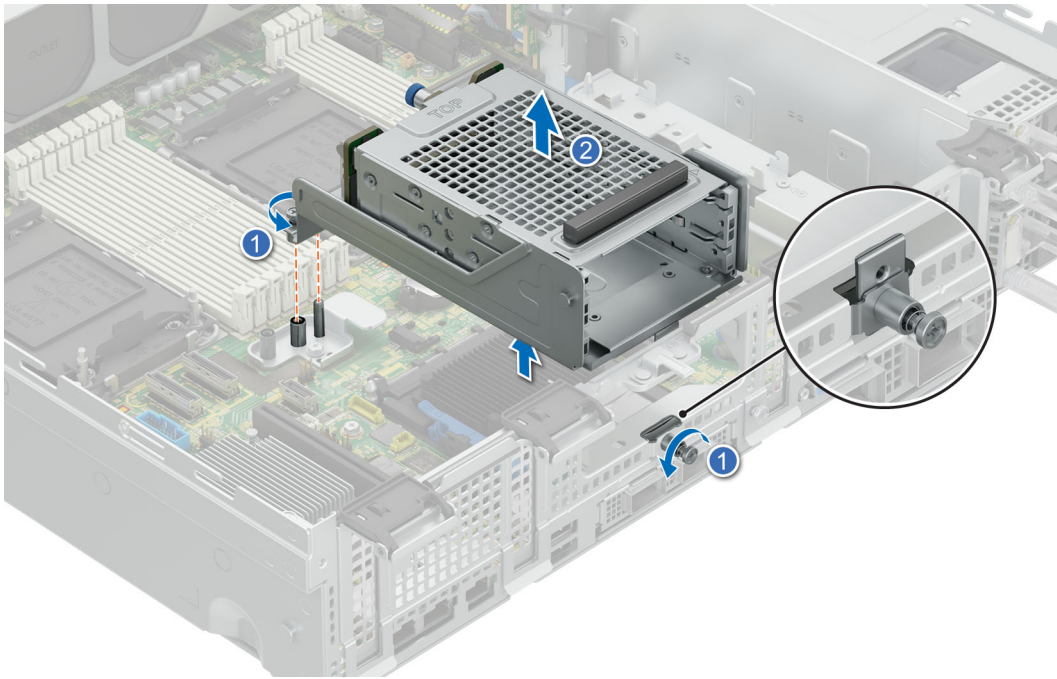


Figure 45. Removing the rear NVMe drive bay

Next steps

Install the rear NVMe drive bay.

Installing the rear NVMe drive bay

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).
6. [Remove the air shroud](#)

Steps

1. Align the drive bay to the guide pin and inset in the system.
2. Tighten the two captive screws to secure the drive bay in place.

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

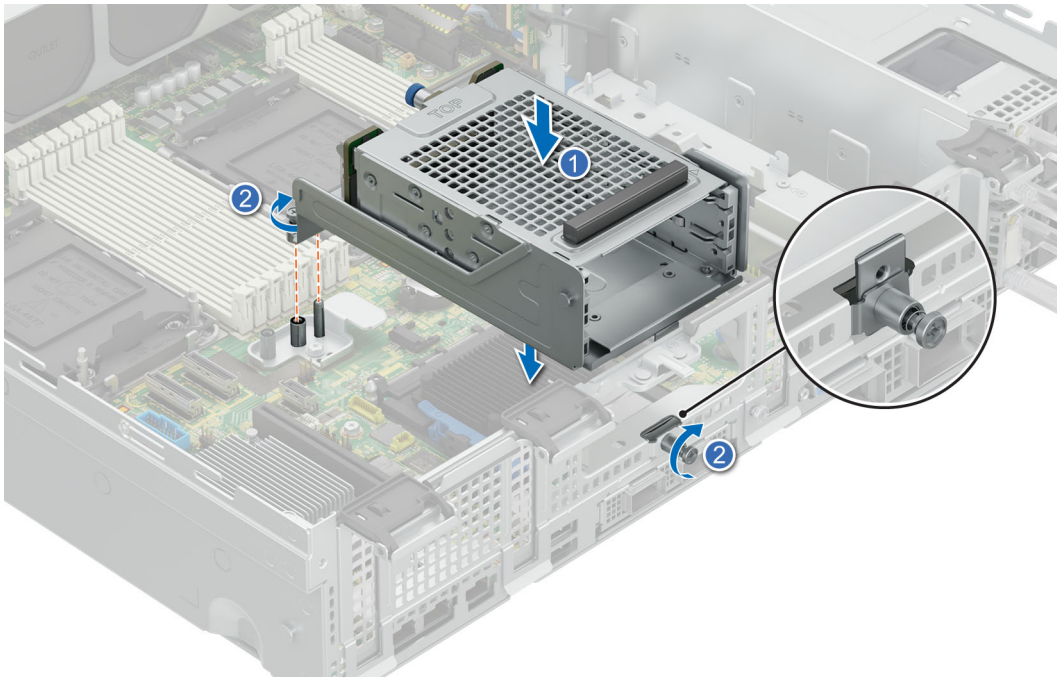


Figure 46. Installing the rear NVMe drive bay

Next steps

1. Install the air shroud,
2. Install the cooling fan assembly.
3. Install the rear system cover.
4. Install the fan cover
5. Follow the procedure listed in [After working inside your system](#).

Removing the rear E3.S middle drive bay

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#) .
5. [Remove the cooling fan assembly](#) .
6. [Remove the air shroud](#)

Steps

Loosen the two captive screws and lift the drive bay from the system.

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

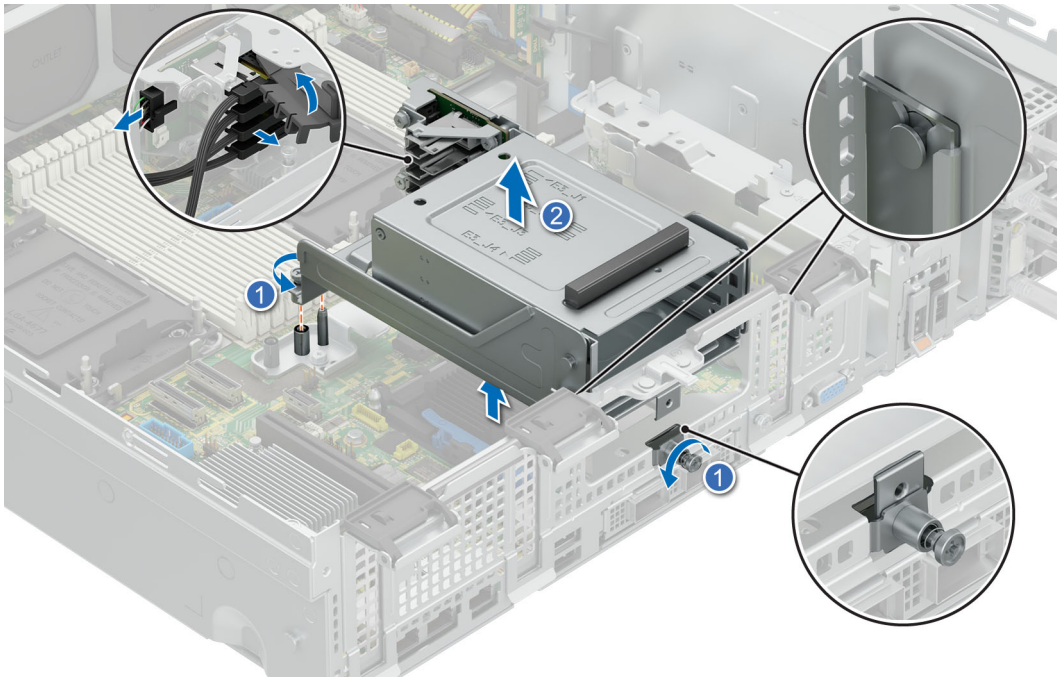


Figure 47. Removing the rear E3.S middle drive bay

NOTE: The cable clip needs to be removed before the cables can be disconnected. Keep the cable clip safe.

Next steps

Install the rear E3.S middle drive bay.

Installing the rear E3.S middle drive bay

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).
6. [Remove the air shroud](#)

Steps

1. Align the drive bay to the three guide pins and inset in the system.
2. Tighten the two captive screws to secure the drive bay in place.

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

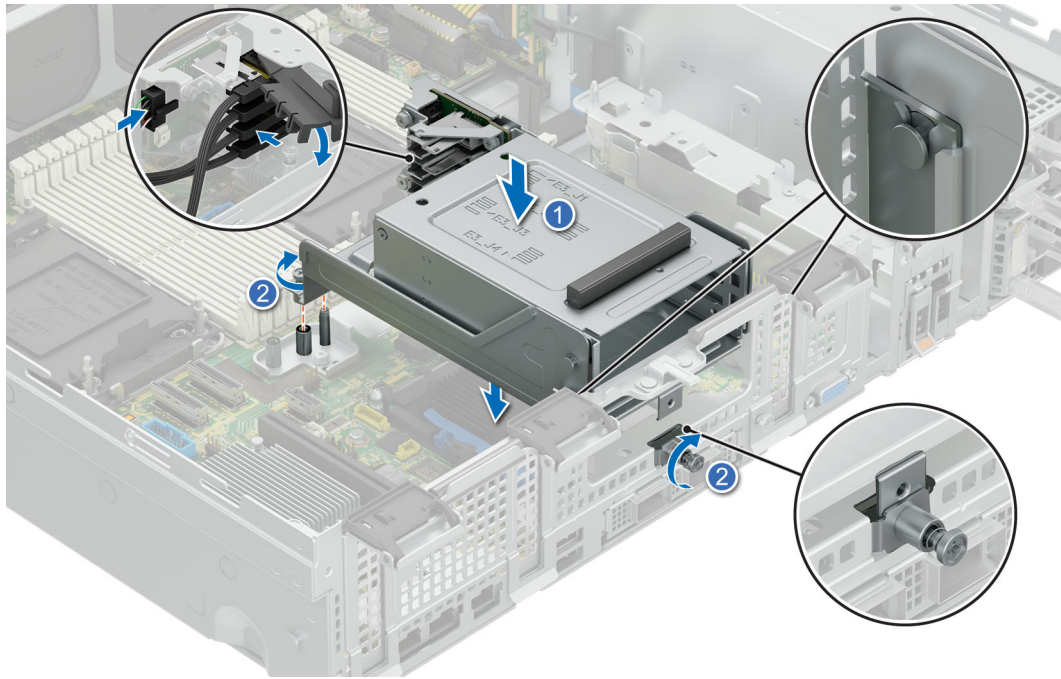


Figure 48. Installing the rear E3.S middle drive bay

NOTE: Use the cable clip to secure the cables in place.

Next steps

1. Install the air shroud,
2. Install the cooling fan assembly.
3. Install the rear system cover.
4. Install the fan cover
5. Follow the procedure listed in [After working inside your system](#).

Removing the rear E3.S left drive bay

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).

Steps

Loosen the captive screw and slide the drive bay out the system.

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

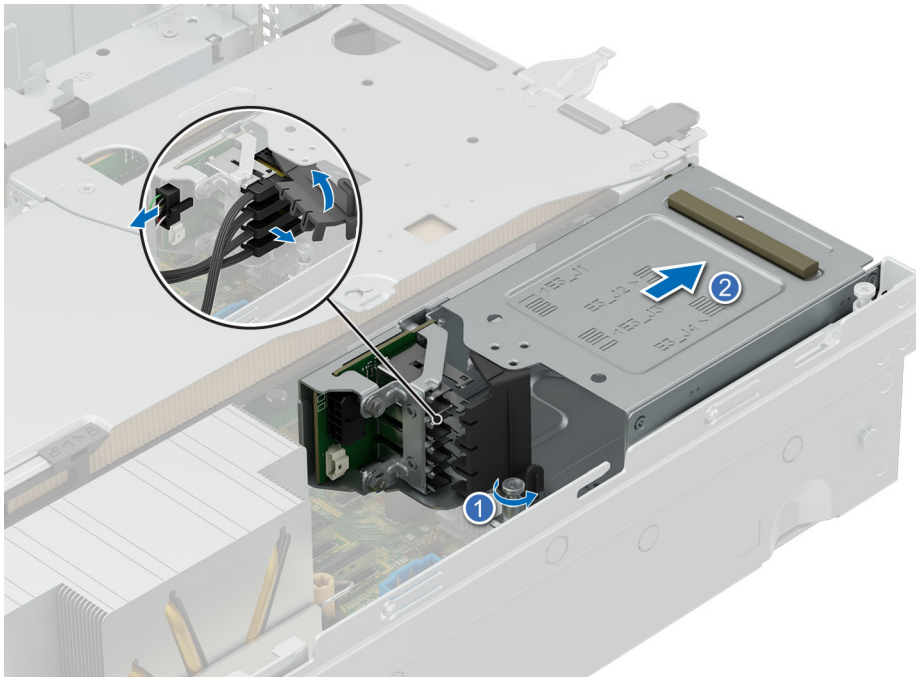


Figure 49. Removing the rear E3.S left drive bay

NOTE: Slide the drive cage out and remove the cable clip before the cables are disconnected. Keep the cable clip safe.

Next steps

Install the rear E3.S left drive bay.

Installing the rear E3.S left drive bay

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).

Steps

Slide the drive bay into the system and tighten the captive screw to secure it in place.

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

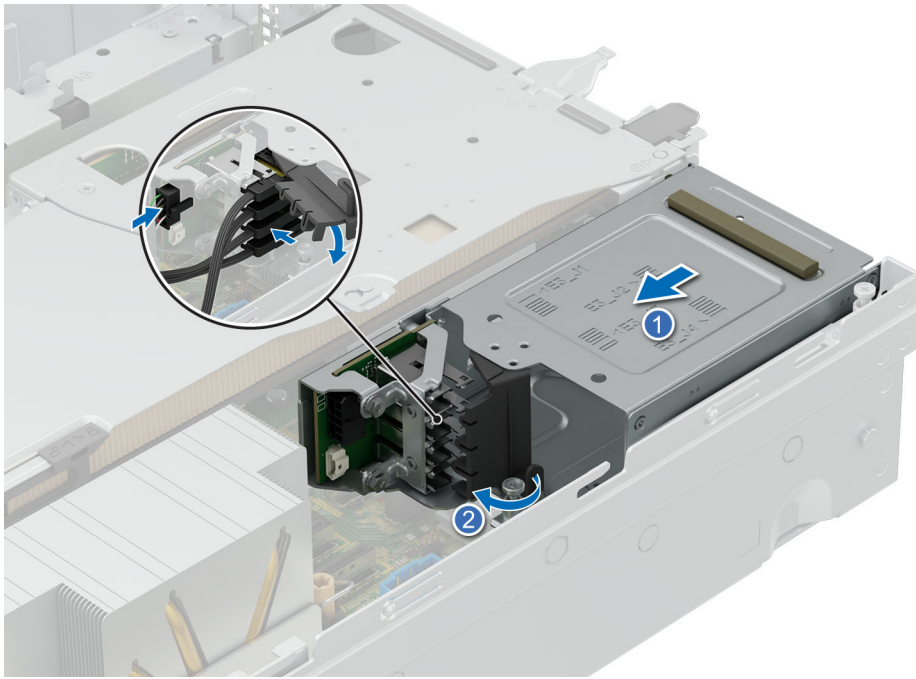


Figure 50. Installing the rear E3.S left drive bay

NOTE: Connect the cables and secure them with the cable clip before inserting the drive bay into the system.

Next steps

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

Air shroud

Removing the air shroud

Prerequisites

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

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#)
4. [Remove the cooling fan assembly](#)
5. [Remove the rear system cover](#)

Steps

1. Loosen the three captive screws.
2. Lift up the air shroud.

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

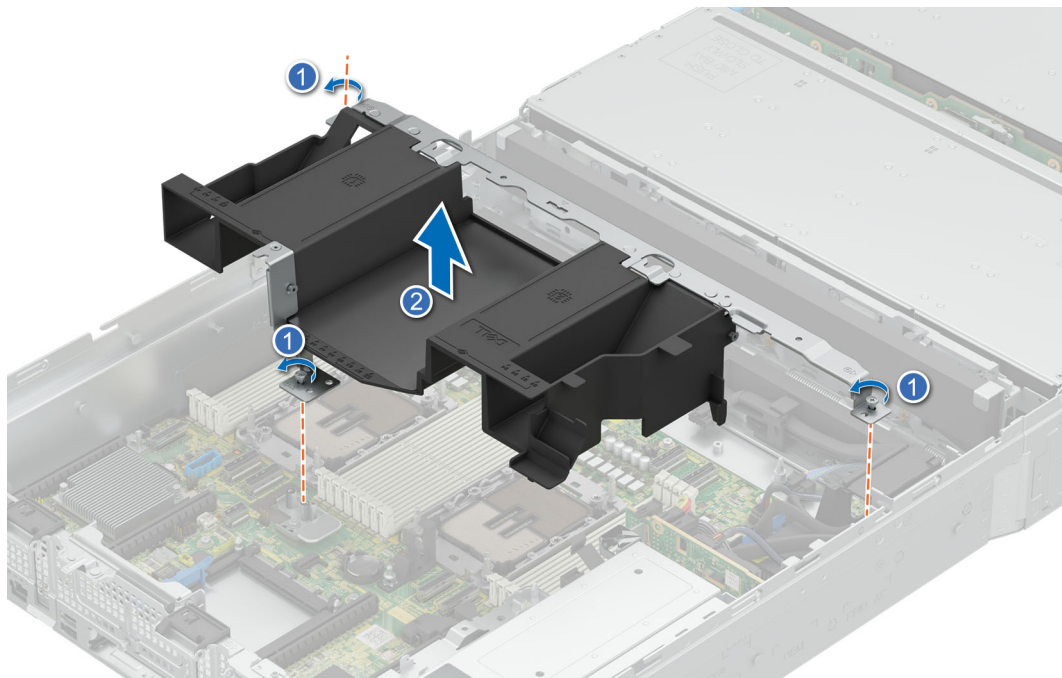


Figure 51. Removing air shroud

Next steps

[Install the air shroud.](#)

Installing the air shroud

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#)

4. Remove the cooling fan assembly
5. Remove the rear system cover

Steps

1. Align the air shroud with the guides pin the system.

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

2. Lower the air shroud into the system until it is firmly seated.
3. Tighten the three captive screws.

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

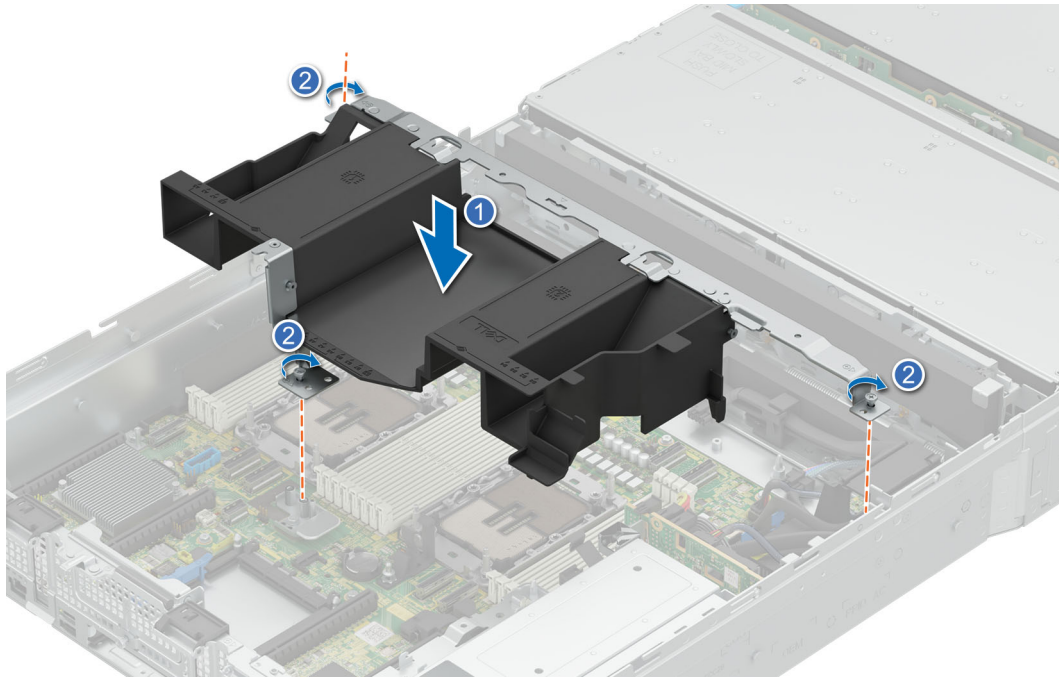


Figure 52. Installing air shroud

Next steps

1. Install the cooling fan assembly
2. Install the rear system cover
3. Install the fan cover
4. Follow the procedure listed in [After working inside your system.](#)

Cooling fans

Removing the cooling fan assembly

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working on your system .](#)
3. [Remove the fan cover.](#)
4. [Remove the rear system cover](#)

Steps

1. Lift up the blue release levers to unlock position.
2. Holding the blue release levers of the cooling fan cage lift it up from the system.

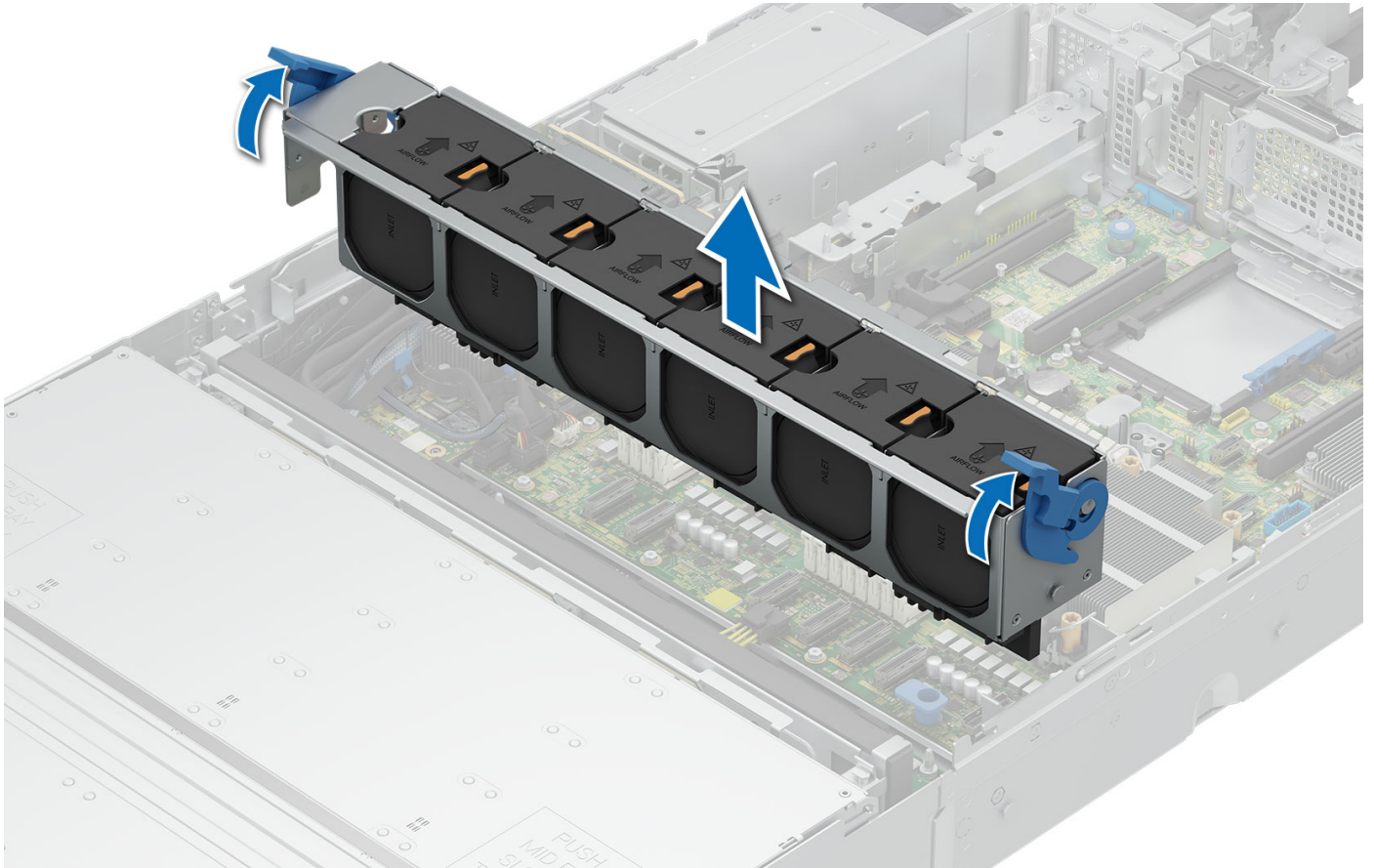


Figure 53. Removing the cooling fan assembly

Next steps

Replace the cooling fan assembly.

Installing the cooling fan assembly

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#)

Steps

1. Holding the blue release lever of the cooling fan cage, align the guide rails with the guides on the system.
2. Lower the cooling fan cage assembly into the system until seated firmly.
3. Lower the blue release lever and press to lock the cooling fan cage assembly into the system..

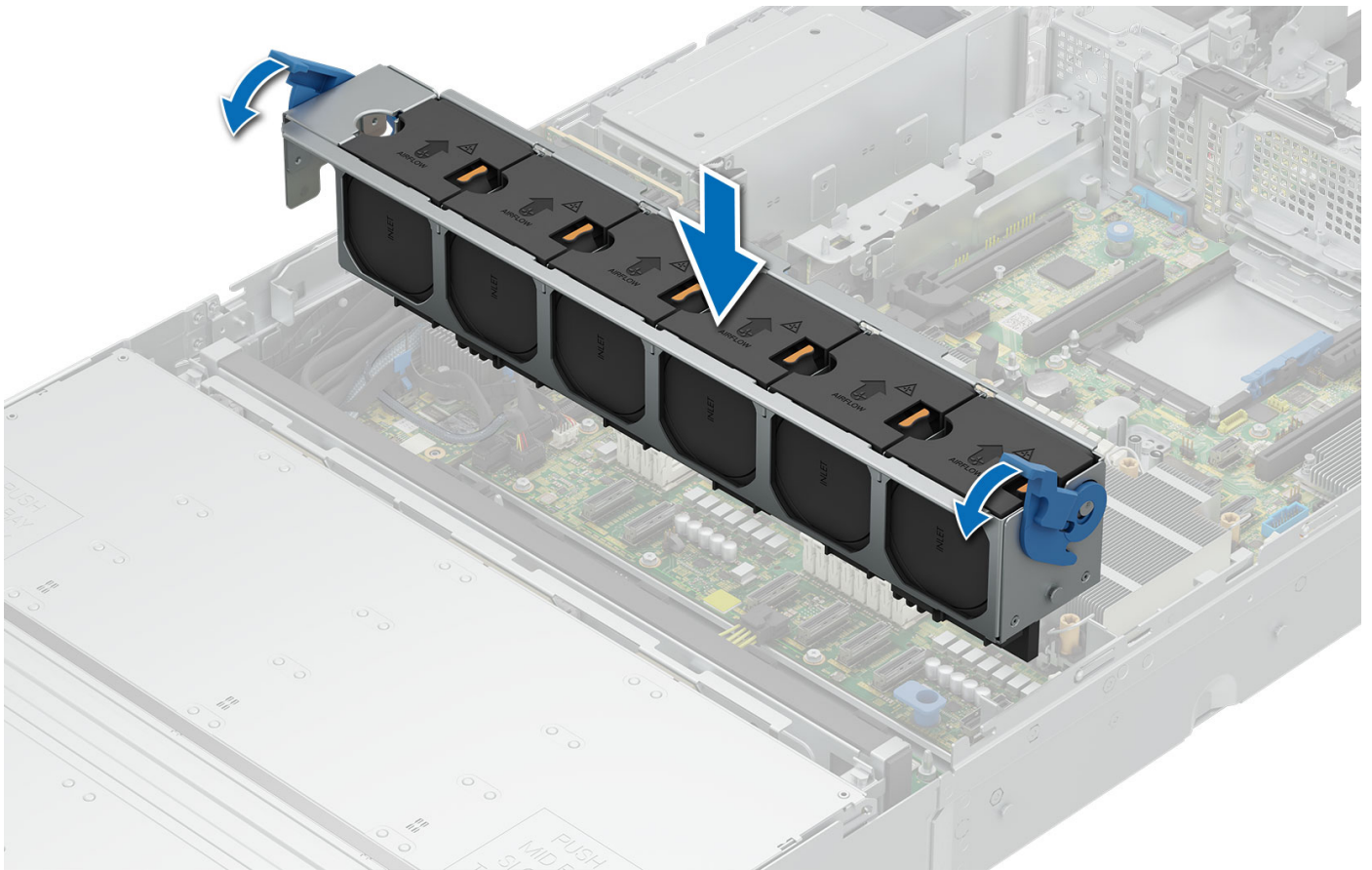


Figure 54. Installing the cooling fan assembly

Next steps

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

Removing the cooling fan

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#)

Steps

Press the orange release tab and lift the cooling fan from the cooling fan cage.

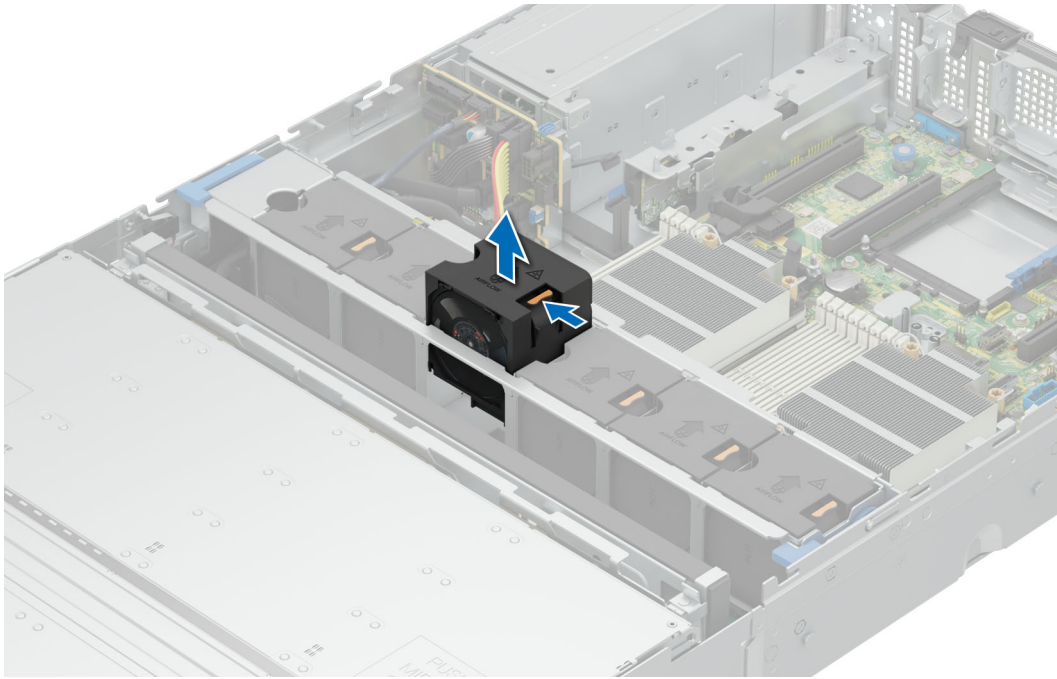


Figure 55. Removing cooling fan

Next steps

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

Installing a cooling fan

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#)

Steps

Lower the cooling fan into the cooling fan cage, until the orange release tab clicks into place.

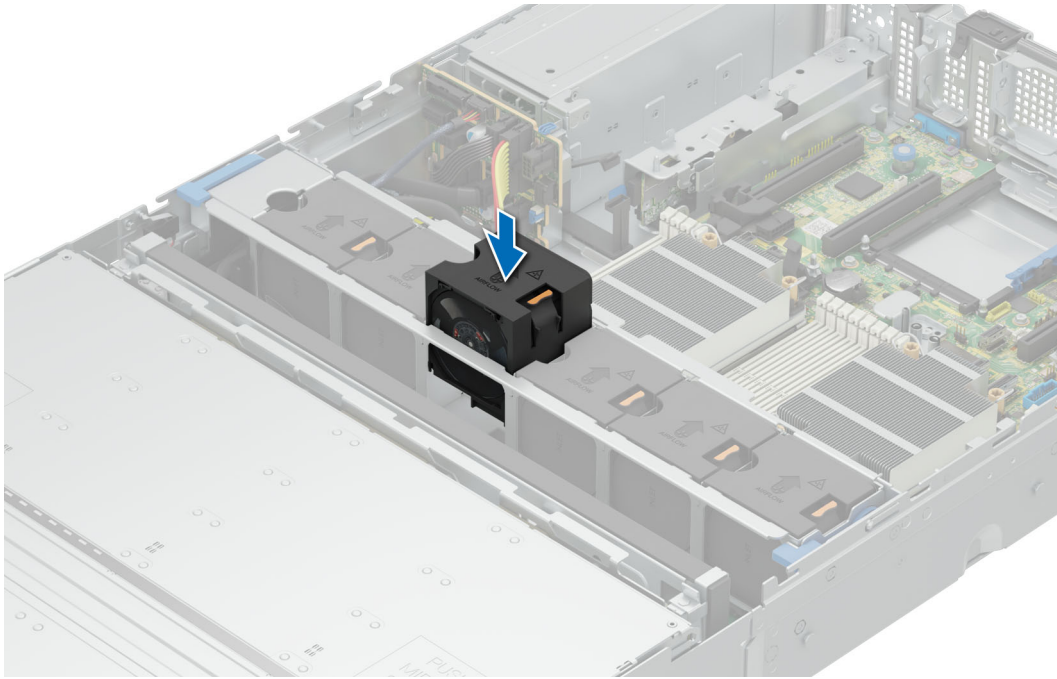


Figure 56. Installing a cooling fan

Next steps

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

Fan board

Removing the fan board

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).

Steps

1. Loosen and remove the five screws securing the fan board.
2. Lift the fan board up to remove from the system.

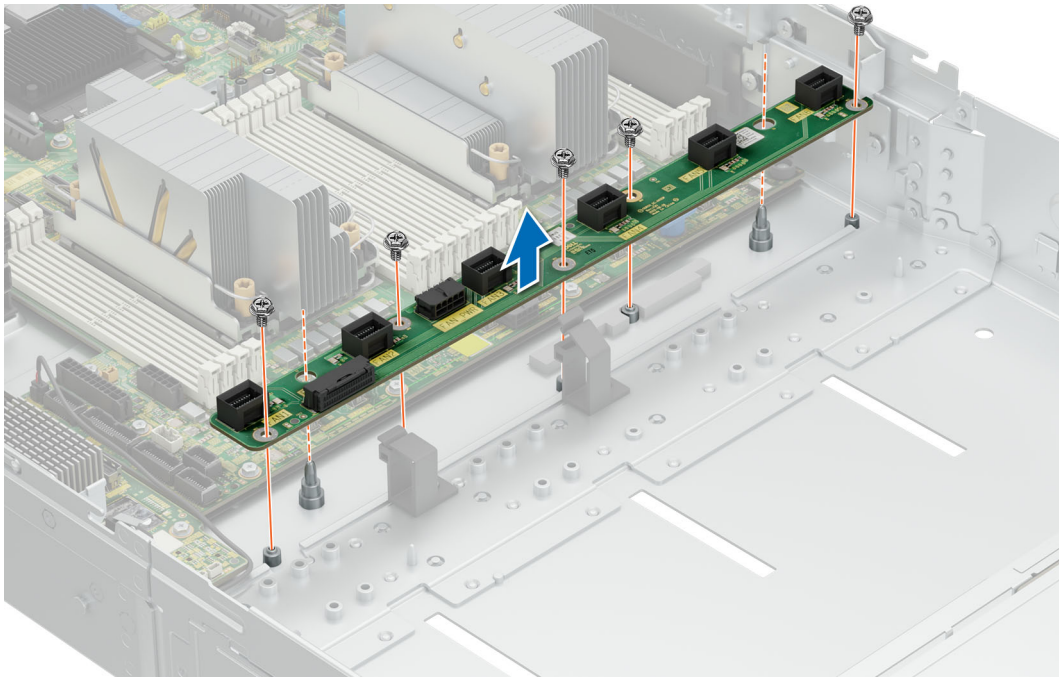


Figure 57. Removing the fan board

Next steps

Install the fan board .

Installing the fan board

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).

Steps

1. Align the fan board to the guide pins and insert it in the system.
2. Replace and tighten the five screws to secure the fan board to the system.

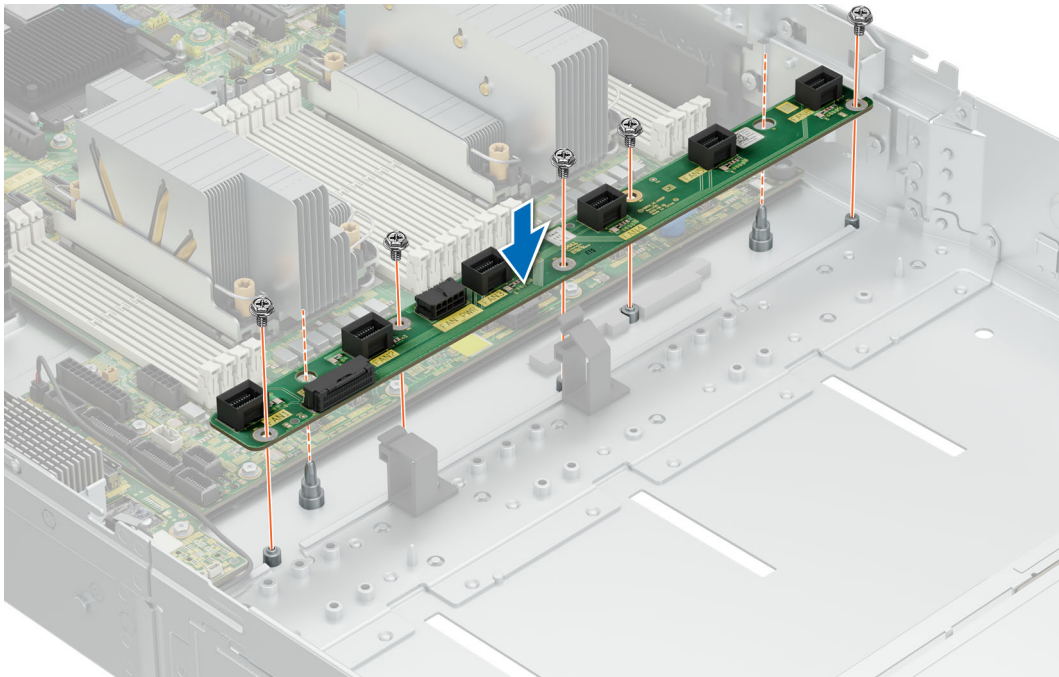


Figure 58. Installing the fan board

Next steps

1. [Install the cooling fan assembly.](#)
2. [Install the rear system cover .](#)
3. [Install the fan cover .](#)
4. Follow the procedure listed in [After working inside your system.](#)

Sidewall cable clip

Removing the sidewall cable clip

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working on your system .](#)
3. [Remove the fan cover.](#)
4. [Remove the rear system cover.](#)
5. [Remove the cooling fan assembly.](#)

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. Move the cables out of the side wall cable clip
2. Loosen and remove the two screws securing the sidewall cable clip and lift up from the system.

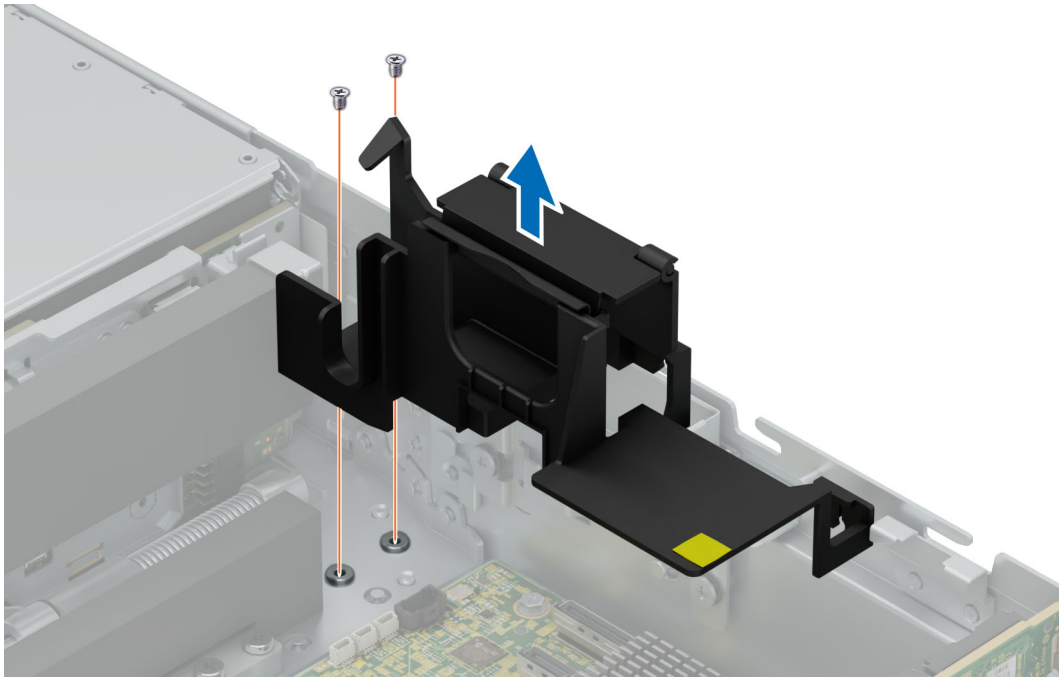


Figure 59. Removing the sidewall cable clip

Next steps

Install the sidewall cable clip .

Installing the sidewall cable clip

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).

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. Place the sidewall cable clip in the system and tighten the two screws to secure it.
2. Route the cables through the side wall cable clip.

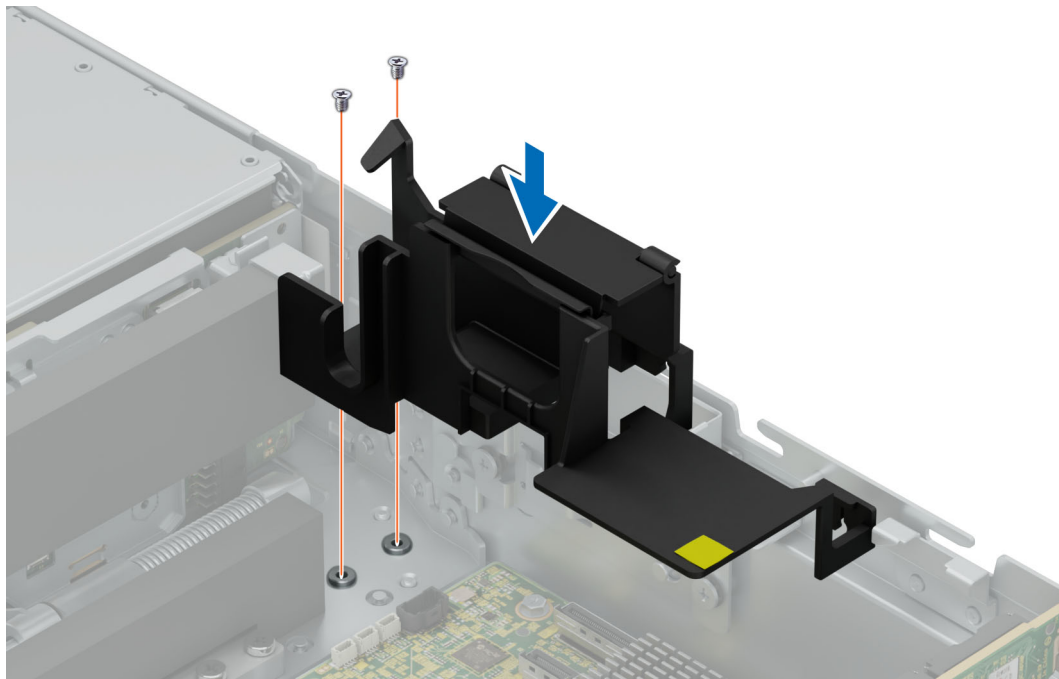


Figure 60. Installing the sidewall cable clip

Next steps

1. [Install the cooling fan assembly.](#)
2. [Install the rear system cover .](#)
3. [Install the fan cover .](#)
4. Follow the procedure listed in [After working inside your system.](#)



Intrusion switch

Removing the intrusion switch

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working on your system .](#)
3. [Remove the fan cover](#)
4. [Remove the rear system cover](#)
5. [Remove the air shroud](#)

Steps

1. Disconnect and remove the intrusion switch cable from the system board.
 **NOTE:** Observe the routing of the cable as you remove it from the system. Route the cable properly when you replace it to prevent the cable from being pinched or crimped.
2. Loosen and remove the single screw to remove the intrusion switch from the chassis wall.
 **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.

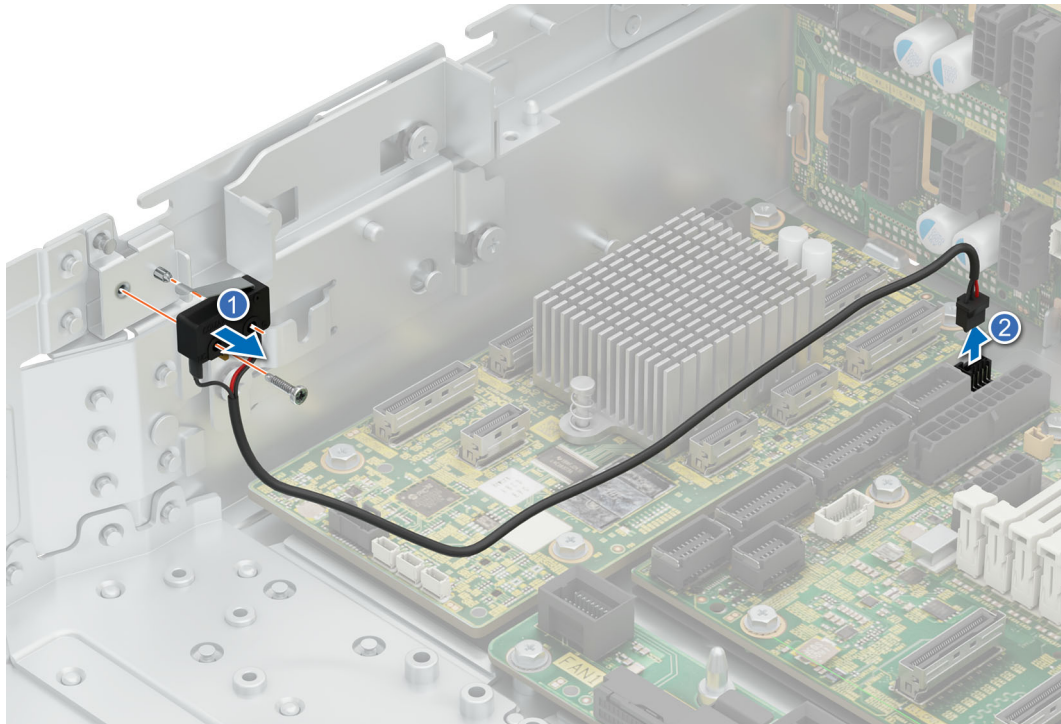


Figure 61. Removing the intrusion switch

Next steps

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

Installing the intrusion switch

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#)
4. [Remove the rear system cover](#)
5. [Remove the air shroud](#)

Steps

1. Align and slide intrusion switch into the guide in the system.
2. Tighten the screw to secure the intrusion switch to the chassis wall.

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

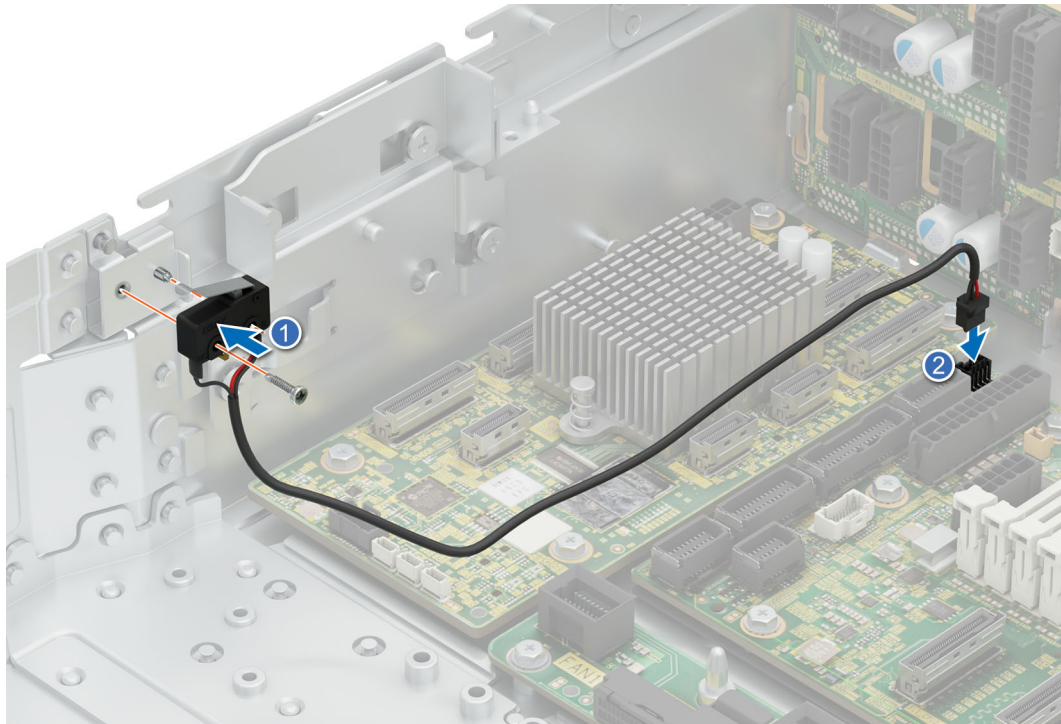


Figure 62. Installing the intrusion switch

3. Connect the intrusion switch cable to the connector on the system board.

NOTE: Route the cable properly when you replace it to prevent the cable from being pinched or crimped.

Next steps

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

Removing the mid drive bay intrusion switch

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working on your system .](#)
3. [Remove the cover and open mid drive bay](#)

Steps

1. Disconnect and remove the intrusion switch cable from the mid bay drive backplane.

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

2. Loosen and remove the single screw to remove the intrusion switch from the front drive bay backplane bracket.

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

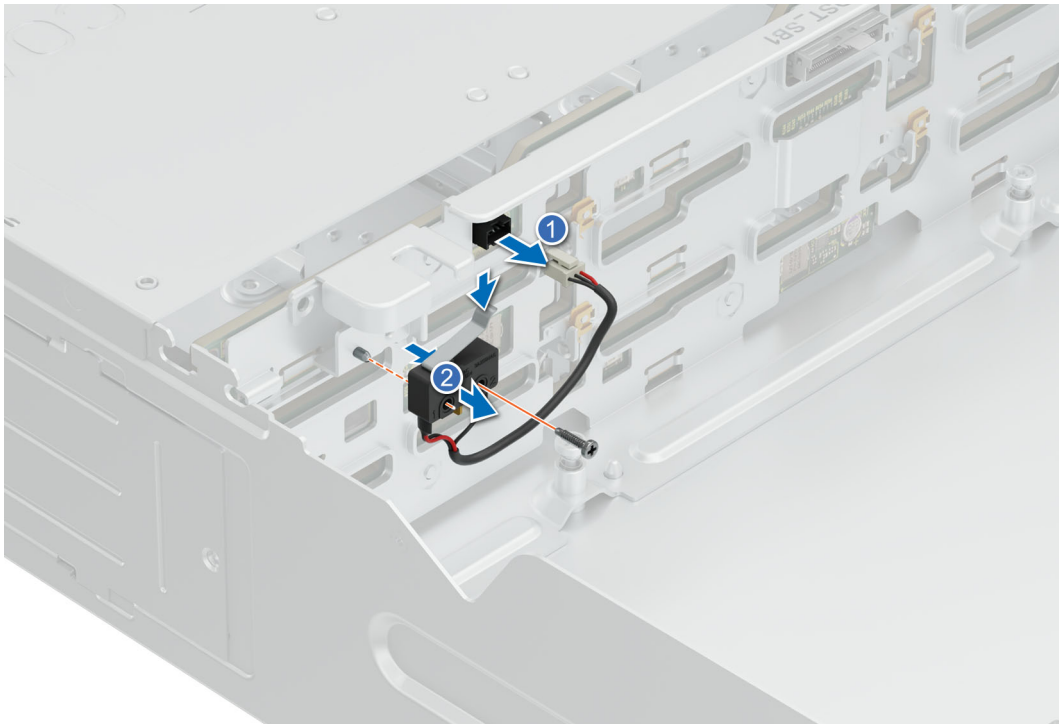


Figure 63. Removing the mid drive bay intrusion switch

Next steps

1. [Install the mid drive bay intrusion switch](#)

Installing the mid drive bay intrusion switch

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the cover and open mid drive bay](#)

Steps

1. Align and slide intrusion switch into the guide on the front drive bay backplane bracket.
2. Tighten the screw to secure the intrusion power on to the bracket.

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

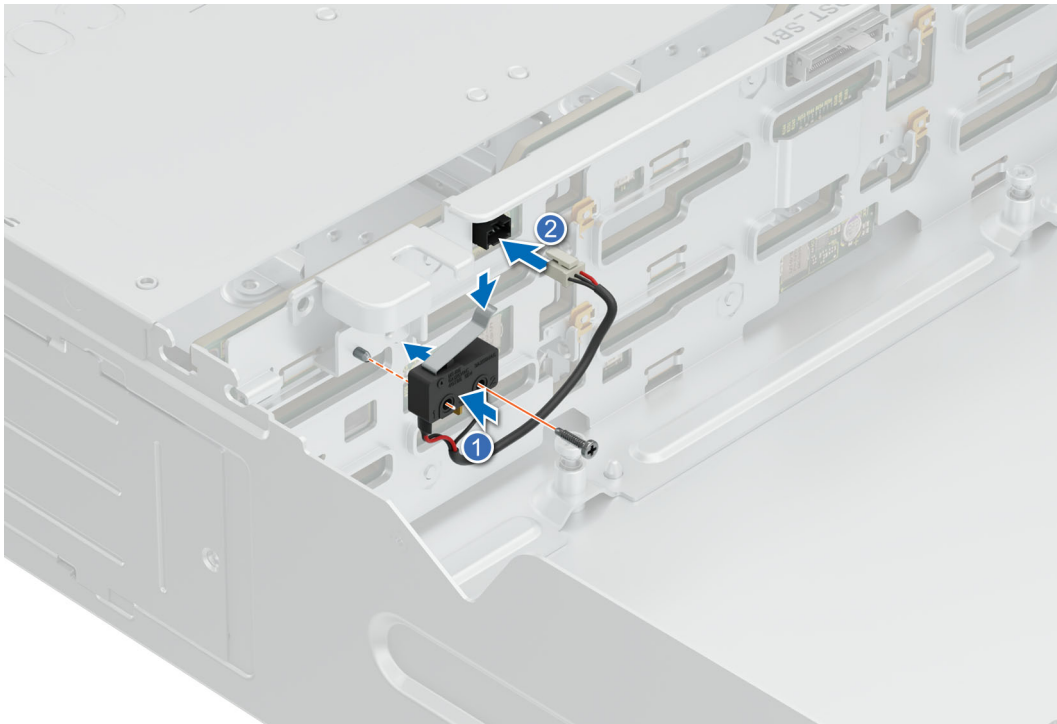


Figure 64. Installing the mid drive bay intrusion switch

3. Connect the intrusion switch cable to the connector on the system board.

NOTE: Route the cable properly when you replace it to prevent the cable from being pinched or crimped.

Next steps

1. Install the mid drive bay intrusion switch
2. Close the mid drive bay and install the cover
3. Follow the procedure listed in [After working inside your system](#).

Power interposer board (PIB)

Removing the PIB

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. Remove the fan cover.
4. Remove the rear system cover.
5. Remove the air shroud.
6. Remove the power supply.

Steps

Pull back the retention clip and lift up the PIB from the guide hooks.

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

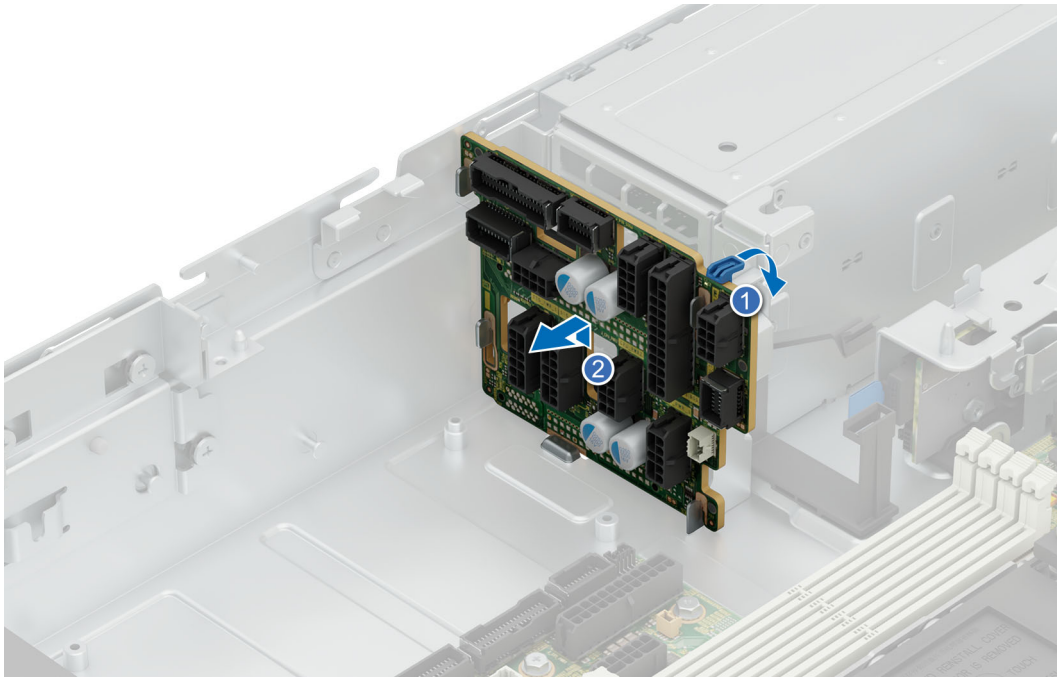


Figure 65. Removing the PIB

Next steps

Install the PIB .

Installing the PIB

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the air shroud](#).
6. [Remove the power supply](#).

Steps

1. Align the guide slots on the PIB with the hooks on the system.
2. Slide PIB in to the hooks and push back firmly for retention clip to click in place .

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

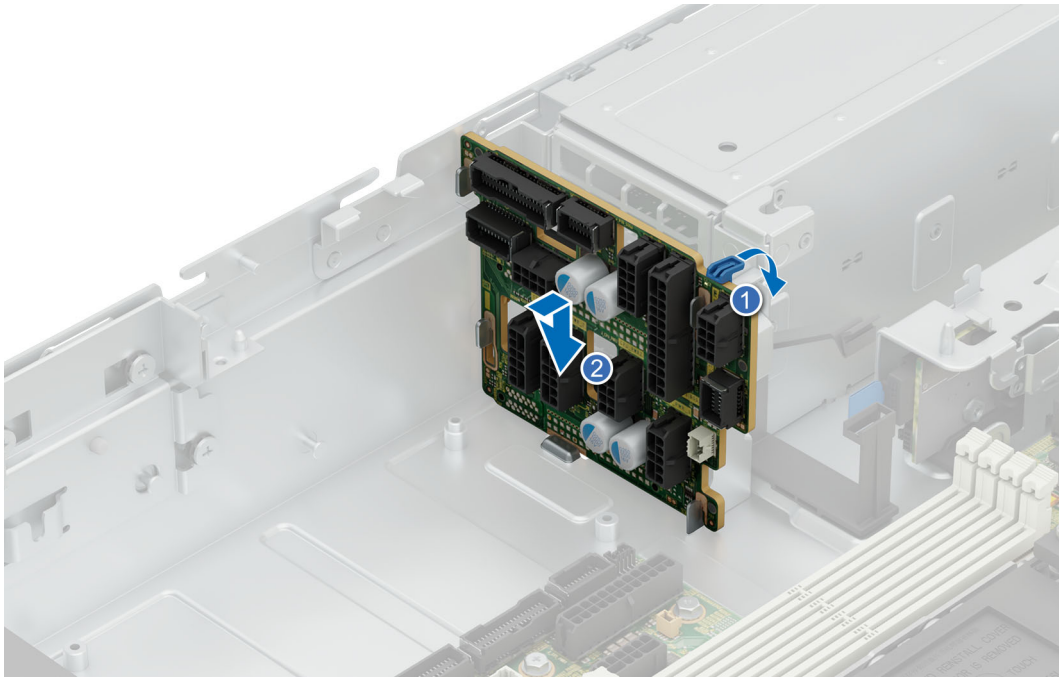


Figure 66. Installing the PIB

Next steps

1. [Install the power supply.](#)
2. [Install the air shroud .](#)
3. [Install the rear system cover .](#)
4. [Install the fan cover .](#)
5. Follow the procedure listed in [After working inside your system.](#)

SAS expander card

Removing the SAS expander card

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working on your system .](#)
3. [Remove the fan cover.](#)
4. [Remove the rear system cover.](#)
5. [Remove the cooling fan assembly.](#)
6. [Remove the air shroud](#)

Steps

1. Loosen and remove the four screws securing the SAS expander card.
2. Lift the card up from the system.

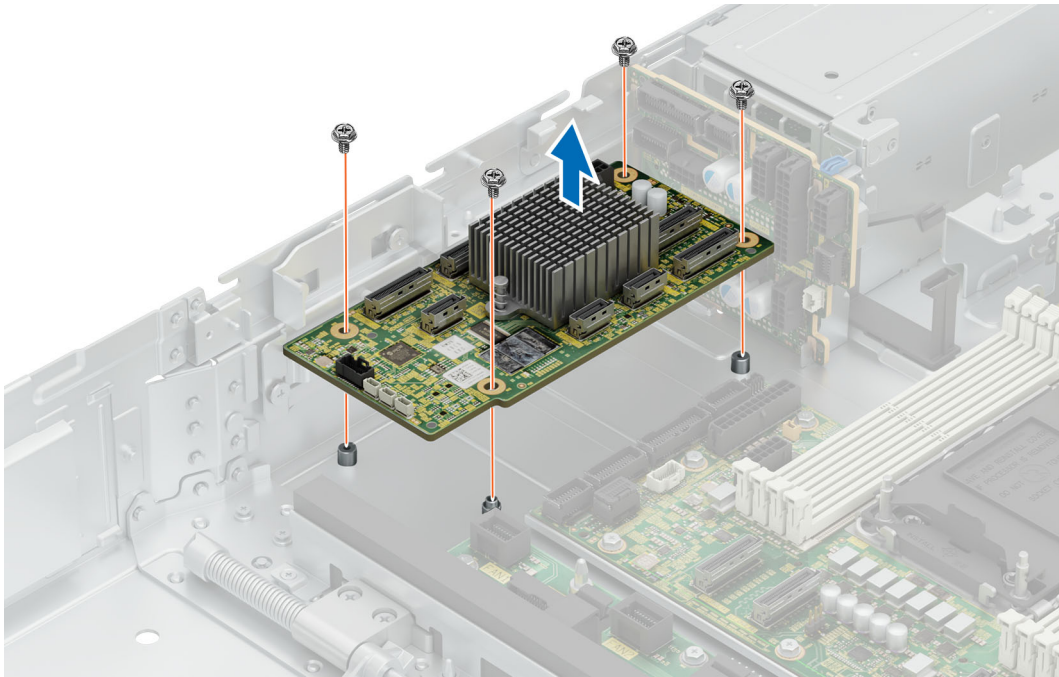


Figure 67. Removing the SAS expander card

Next steps

Install SAS expander card .

Installing the SAS expander card

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).
6. [Remove the air shroud](#)

Steps

1. Align the card to the four screw mounts and place in the system.
2. Insert and tighten the four screws to secure card in place.

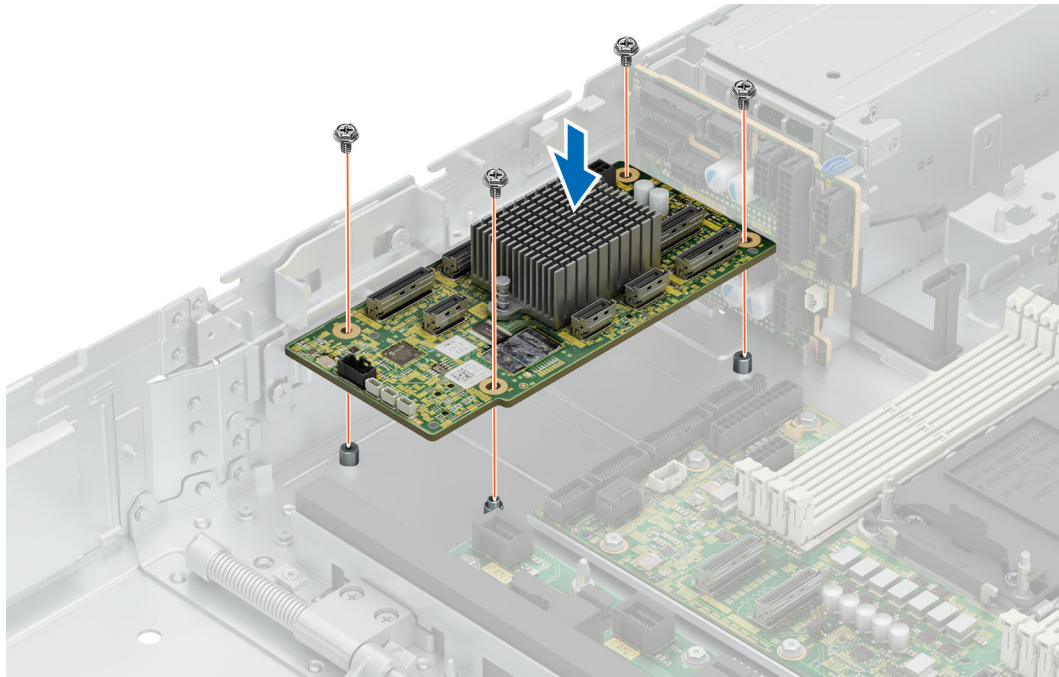


Figure 68. Installing the SAS expander card

Next steps

1. [Install the air shroud](#)
2. [Install cooling fan assembly](#)
3. [Install the rear system cover](#) .
4. [Install the fan cover](#) .
5. Follow the procedure listed in [After working inside your system](#).

Drives

Removing a drive blank

Prerequisites

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

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

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

Steps

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

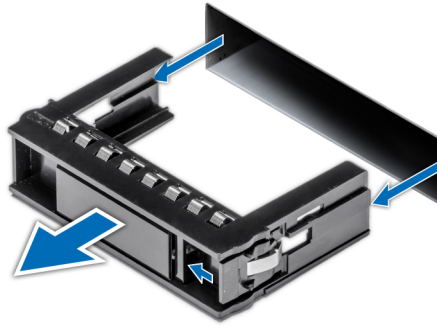


Figure 69. Removing a drive blank

Next steps

Install the hard drive blank.

Installing a drive blank

Prerequisites

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

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

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

Steps

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

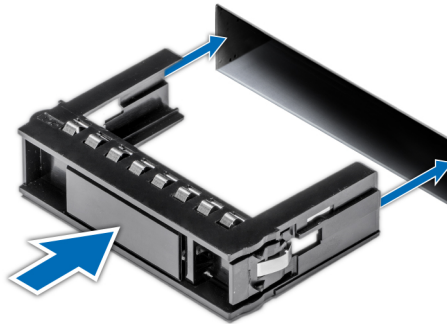


Figure 70. Installing a drive blank

Removing a drive carrier

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. Using the management software, prepare the drive for removal.

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

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

CAUTION: Mixing drives from previous generations of PowerEdge servers is not supported.

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.

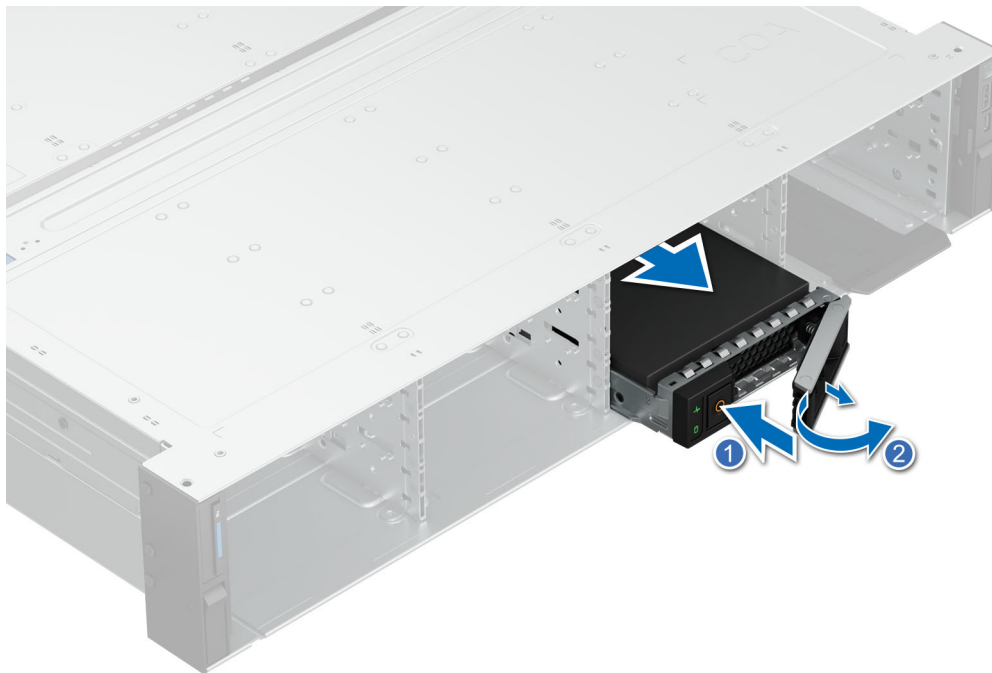


Figure 71. Removing a drive carrier

Next steps

1. [installing a hard drive carrier](#)
2. If you are not replacing the drive immediately, [Install a hard drive blank](#) in the empty drive slot to maintain proper system cooling.


Removing the drive from the drive carrier

Prerequisites

CAUTION: Mixing drives from previous generations of PowerEdge servers is not supported.

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 Torx screw, use Torx 6 (for 2.5-inch drive) or Torx 8 (for 3.5-inch drive) screwdriver to remove the drive. 

2. Lift the drive out of the drive carrier.

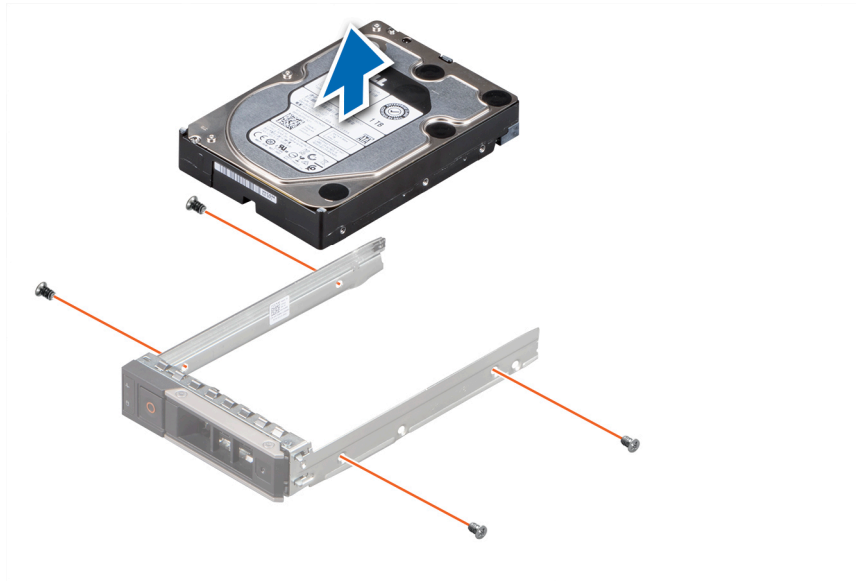


Figure 72. Removing the drive from the drive carrier

Next steps


If applicable, [Install a drive in to the drive carrier.](#)

Installing a drive into the drive carrier

Prerequisites

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

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 screws 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 Torx screw, use Torx 6 (for 2.5-inch drive) or Torx 8 (for 3.5-inch drive) screwdriver to install the drive. 

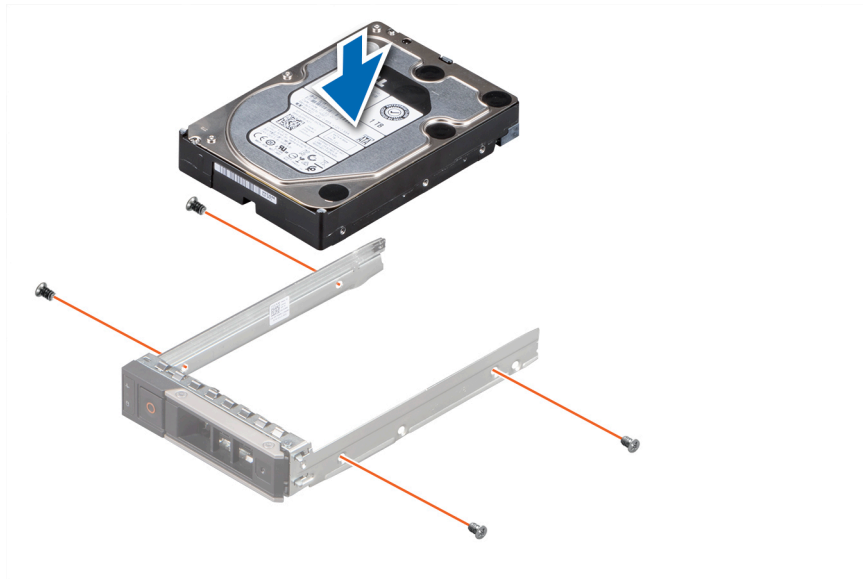


Figure 73. Installing a drive into the drive carrier

Next steps

Install a hard drive carrier.

Installing a drive carrier

Prerequisites

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

CAUTION: Mixing drives from previous generations of PowerEdge servers is not supported.

CAUTION: Combining SAS and SATA drives in the same RAID volume is not supported.

CAUTION: When installing a drive, ensure that the adjacent drives are installed correctly. Inserting a drive carrier and attempting to lock its handle next to an incorrectly installed carrier can damage the incorrectly installed carrier's shield spring, making it unusable.

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

NOTE: When a replacement hot swappable drive is installed while the system is powered on, the drive automatically begins to rebuild. Ensure that the replacement drive is blank. Any data on the replacement drive is immediately lost once the drive is installed.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. If installed, [Remove the hard drive blank](#).

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.

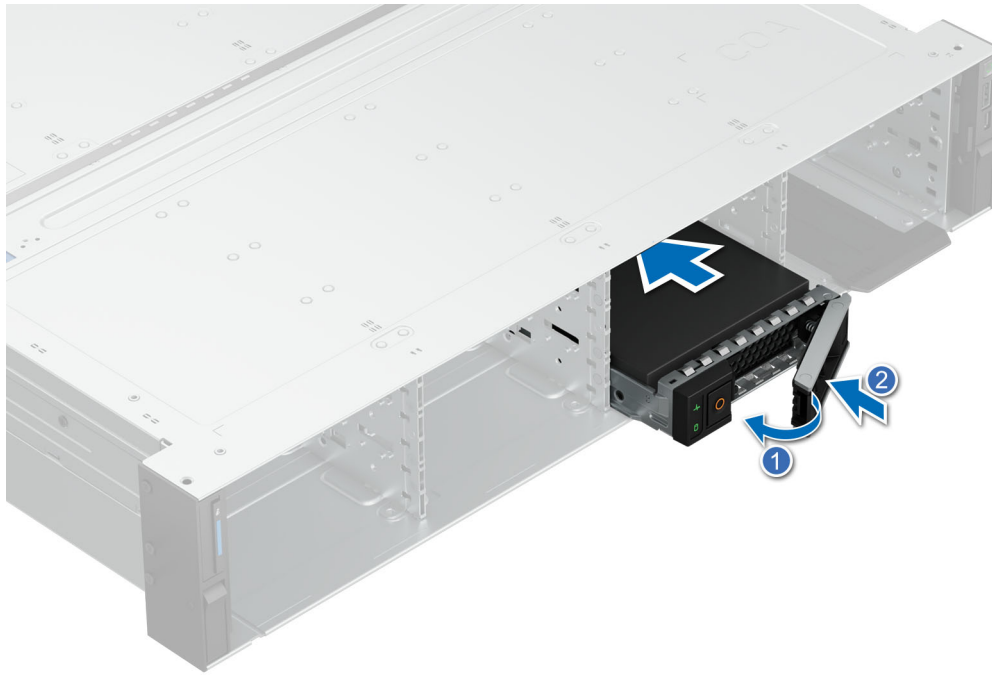


Figure 74. Installing a drive carrier


Removing a 2.5-inch drive from a 3.5-inch drive adapter

Prerequisites

i **NOTE:** A 2.5-inch drive is installed in a 3.5-inch drive adapter, which is then installed in the 3.5-inch drive carrier.

Steps

1. Using a Phillips #2 screwdriver, remove the screws from the side of the 3.5-inch drive adapter.

i **NOTE:** If the 2.5-inch drive has Torx screw, use Torx 6 screwdriver to remove the drive from a 3.5-inch drive adapter. 

2. Remove the 2.5-inch drive from the 3.5-inch drive adapter.

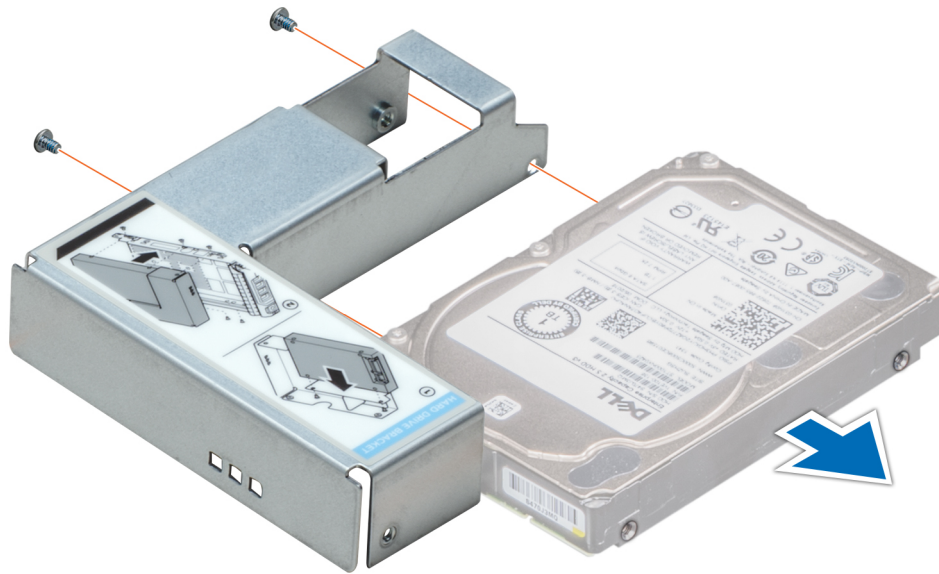


Figure 75. Removing a 2.5 inch drive from a 3.5-inch drive adapter

Next steps

Install 2.5 inch hard drive in to a 3.5 inch adapter


Installing a 2.5-inch drive into a 3.5-inch drive adapter

Prerequisites

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

Steps

1. Align the screw holes on the 2.5-inch drive with the screw holes on the 3.5-inch drive adapter.
2. Using a Phillips #2 screwdriver, secure the 2.5-inch drive to the 3.5-inch drive adapter.

NOTE: If the 2.5-inch drive has Torx screw, use Torx 6 screwdriver to install the drive to a 3.5-inch drive adapter. 

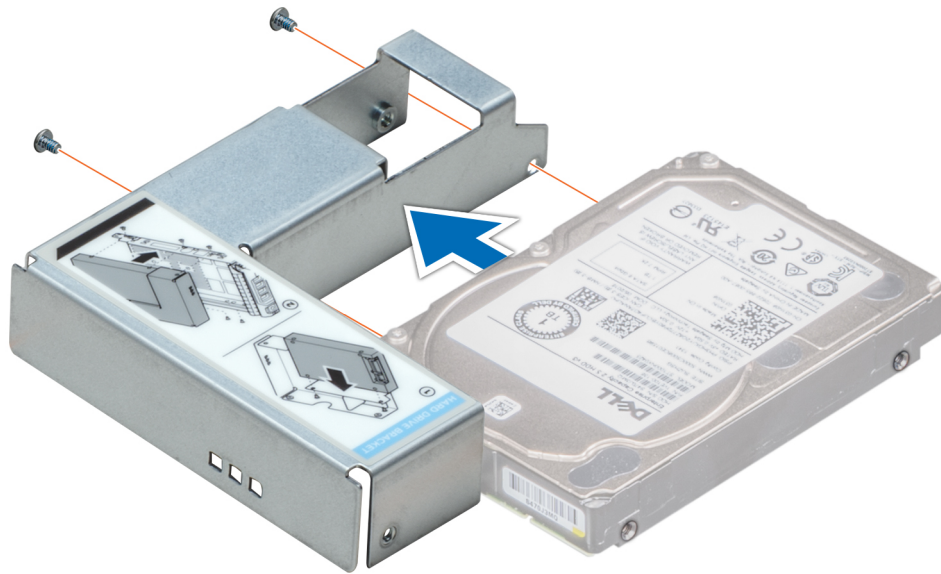


Figure 76. Installing a 2.5-inch drive into a 3.5-inch drive adapter



Figure 77. 3.5 inch adapter for rear 2.5 inch drives

NOTE: The 3.5 inch adapters for the rear 2.5 inch drives carry a label shown in the above image. Do not use the adapters for the front and mid drive bays on the rear drive bay.


Removing a 3.5-inch drive adapter from a 3.5-inch drive carrier

Prerequisites

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

Steps

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

NOTE: If the 3.5-inch drive has Torx screw, use Torx 6 screwdriver to remove the drive from a 3.5-inch drive adapter. 

2. Lift the 3.5-inch drive adapter out of the 3.5-inch drive carrier.

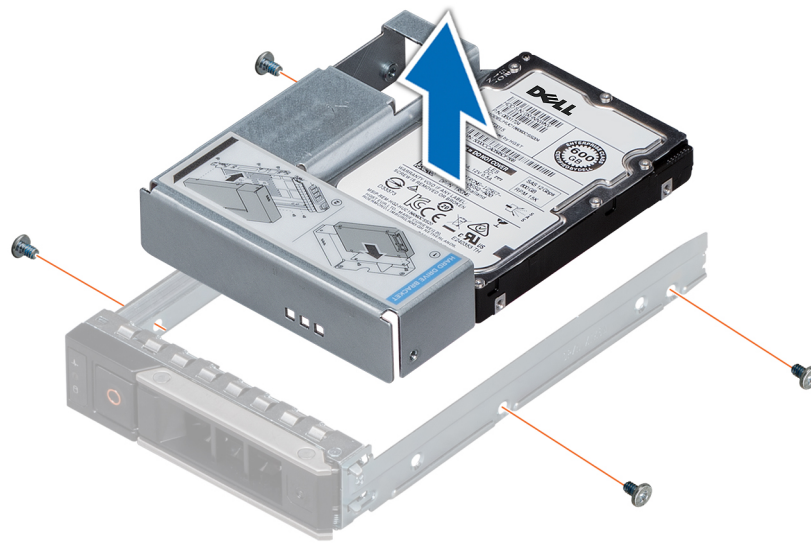


Figure 78. Removing a 3.5-inch drive adapter from a 3.5-inch drive carrier

Next steps

Install a 3.5 inch drive adapter into a 3.5 inch drive carrier



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

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. [Install the 2.5 inch drive into 3.5 inch drive adapter](#).

Steps

1. Insert the 3.5-inch drive adapter into the 3.5-inch drive carrier with the connector end of the drive toward the back of the 3.5-inch drive carrier.
2. Align the screw holes on the 3.5-inch drive adapter with the holes on the 3.5-inch drive carrier.
3. Using a Phillips #1 screwdriver, secure the 3.5-inch drive adapter to the 3.5-inch carrier.

 **NOTE:** If the 3.5-inch drive has Torx screw, use Torx 6 screwdriver to install the drive to a 3.5-inch drive adapter. 

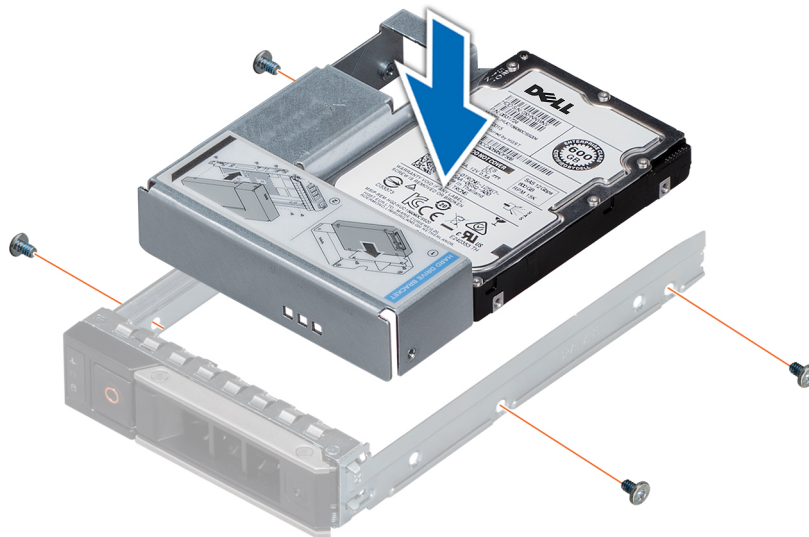


Figure 79. Installing a 3.5-inch drive adapter into the 3.5-inch drive carrier

Next steps

1. Install the 3.5 inch drive carrier in to the system.

Removing a E3.S drive

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. Using the management software, prepare the drive for removal.

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

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

CAUTION: Mixing drives from previous generations of PowerEdge servers is not supported.

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

Steps

1. Slide the release latch to open the drive 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.

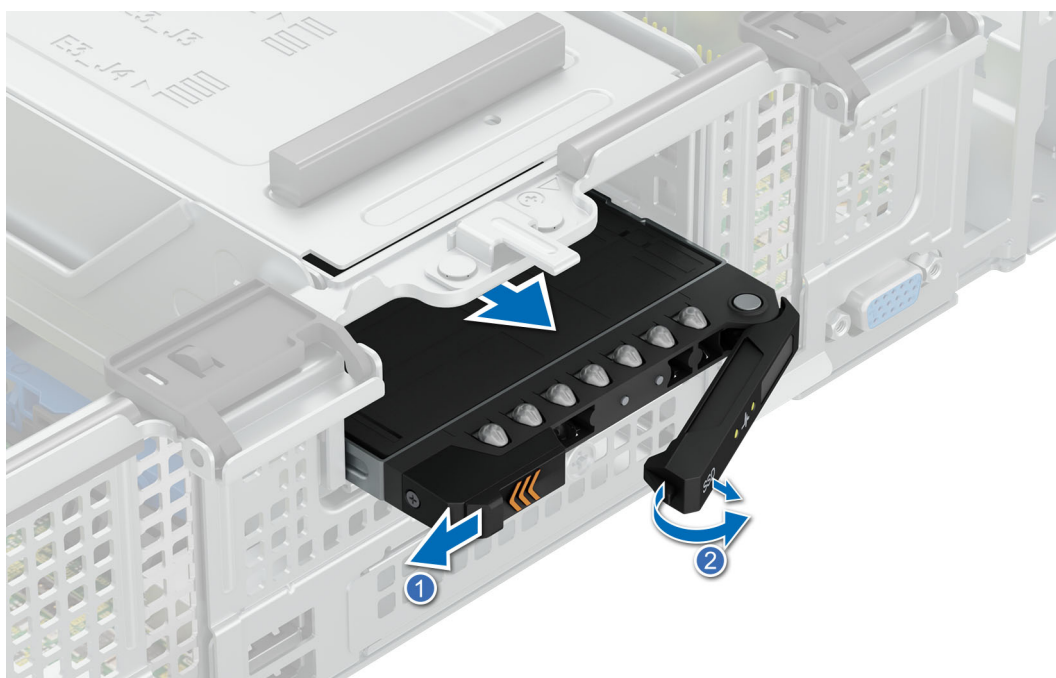


Figure 80. Removing a E3.S drive

Next steps

1. [Install a E3.S drive](#)

Installing a E3.S drive

Prerequisites

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

CAUTION: Mixing drives from previous generations of PowerEdge servers is not supported.

CAUTION: Combining SAS and SATA drives in the same RAID volume is not supported.

CAUTION: When installing a drive, ensure that the adjacent drives are installed correctly. Inserting a drive carrier and attempting to lock its handle next to an incorrectly installed carrier can damage the incorrectly installed carrier's shield spring, making it unusable.

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

NOTE: When a replacement hot swappable drive is installed while the system is powered on, the drive automatically begins to rebuild. Ensure that the replacement drive is blank. Any data on the replacement drive is immediately lost once the drive is installed.

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

Steps

1. Slide the release latch on the front of the drive to open the release handle.
2. Insert and slide the drive into the drive slot.

3. Close the drive 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.

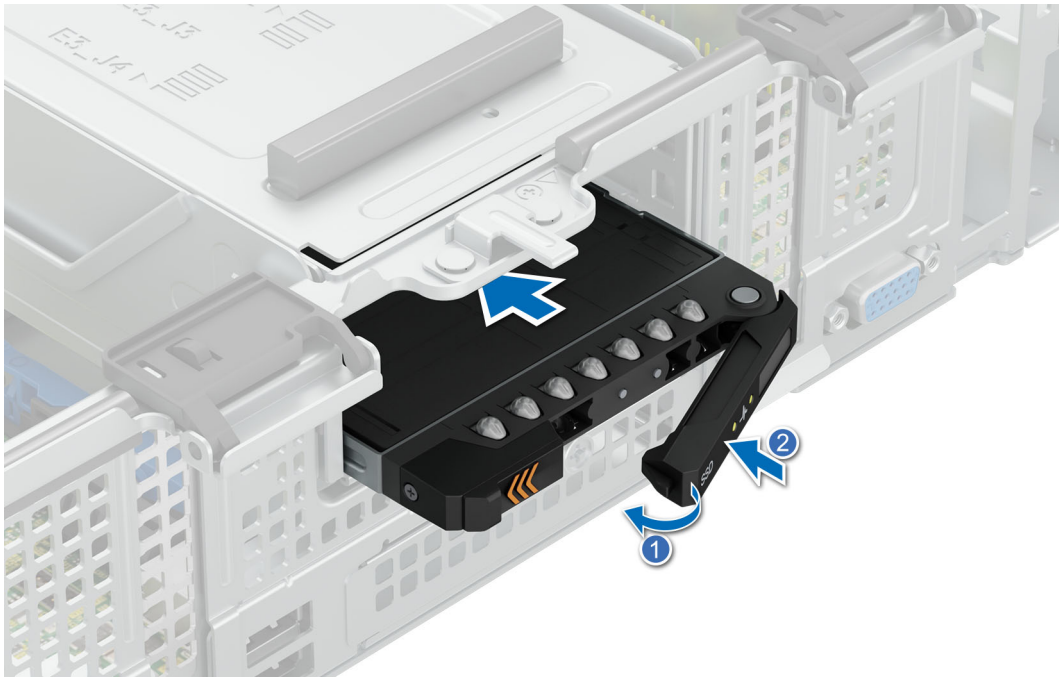


Figure 81. Installing an E3.S drive

Drive backplane

This is a service technician replaceable part only.

Drive backplane guidelines

Depending on your system configuration, the drive backplanes supported in PowerEdge R760xd2 are listed here:

Table 69. Supported backplane options for PowerEdge R760xd2 system

System	Supported backplane options
PowerEdge R760xd2	3.5-inch (x12) SAS/SATA/SSD backplane (front and mid)
	3.5-inch (x4) SAS/SATA/SSD backplane (rear)
	2.5-inch (x2) NVMe backplane (rear)

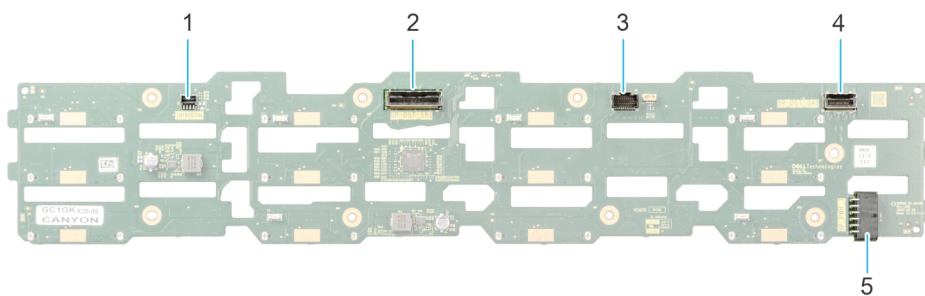


Figure 82. 12 x 3.5-inch SAS/SATA/SSD drive backplane

- 1. Intrusion switch cable connector
- 2. SAS/SATA cable connector (BP DST SB1)

- 3. P2 connector
- 5. Power connector (BP_PWR1)
- 4. SAS/SATA cable connector (BP SAS SA1)

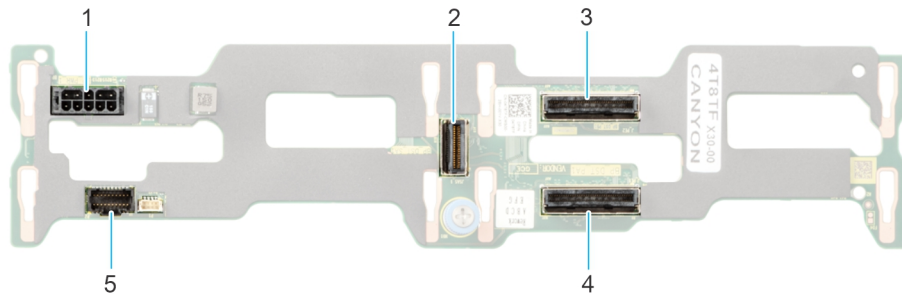


Figure 83. 4 x 3.5-inch SAS/SATA/SSD drive backplane (rear)

- 1. Power connector (BP_PWR1)
- 2. SAS cable connector (J_SAS_1)
- 3. SAS/SATA cable connector (BP SAS PB1)
- 4. SAS/SATA cable connector (BP SAS PA1)
- 5. P2 connector

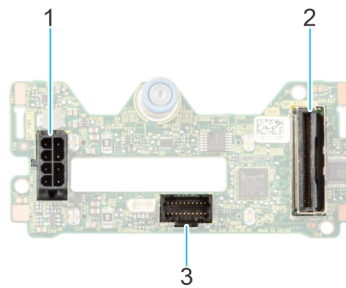


Figure 84. 2 x 2.5-inch NVMe drive backplane (rear)

- 1. Power connector (BP_PWR1)
- 2. SAS cable connector (BP_DST)
- 3. P2 connector

Removing the front drive bay backplane

Prerequisites

CAUTION: Note the number of each drive and temporarily label them before you remove the drive so that you can replace them in the same location.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. Remove the drives.
4. [Removing the mid drive bay and cover](#).
5. Disconnect the cables from the backplane.

Steps

1. Loosen the three captive screws and lift up the backplane bracket.
2. Loosen and remove the eight screws to remove the backplane from the bracket.

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

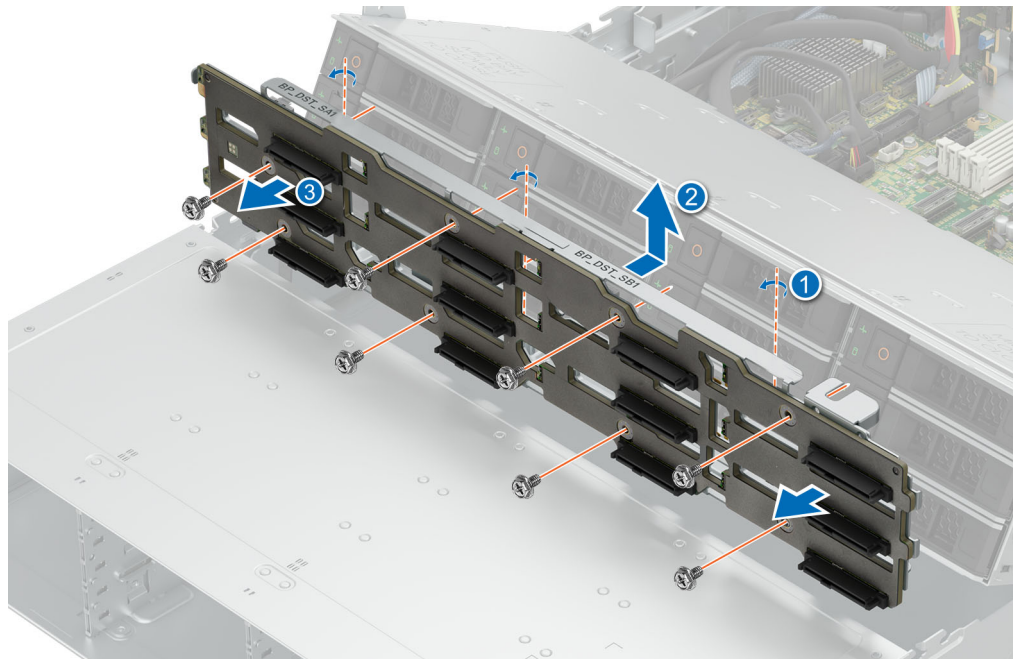


Figure 85. Removing front drive bay backplane

Next steps

Install the front drive bay backplane .

Installing the front drive bay backplane

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. Remove the drives.
4. [Removing the mid drive bay and cover](#).
5. Disconnect the cables from the backplane.

Steps

1. Install and tighten the eight screws to secure the backplane to the bracket.
2. Align and insert the backplane bracket to the guide pins on the chassis floor.
3. Tighten the three captive screws to secure the backplane bracket.

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

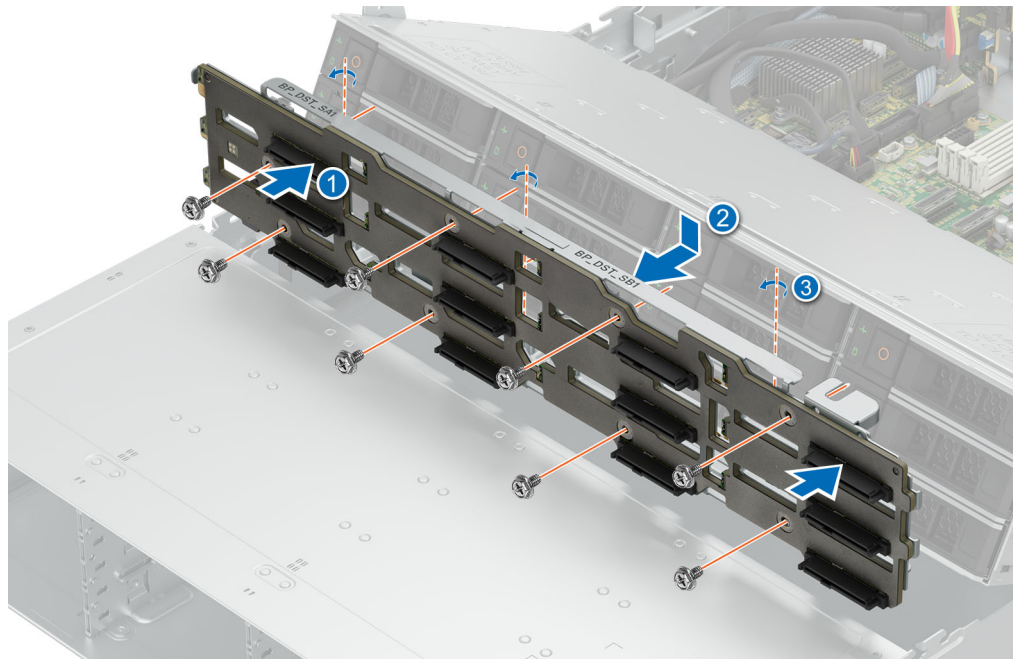


Figure 86. Installing front drive bay backplane

Next steps

1. Connect all the cables to the backplane.
2. [Install the mid bay and cover](#)
3. Install the drives back into their original locations.
4. Follow the procedure listed in [After working inside your system](#).

Removing the damper

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#)
4. [Remove the cooling fan assembly](#)
5. [Remove the rear system cover](#)

Steps

Pinch the release latches and lift up the damper.

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

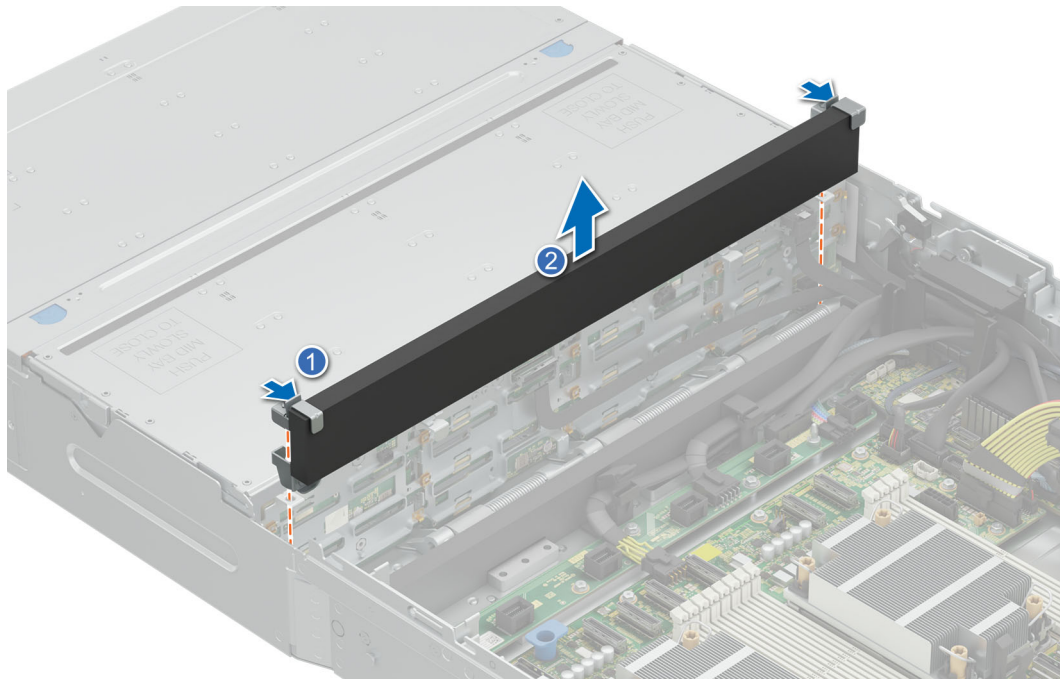


Figure 87. Removing damper

Next steps

Install the damper.

Removing mid drive bay backplane

Prerequisites

CAUTION: Note the number of each drive and temporarily label them before you remove the drive so that you can replace them in the same location.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. Remove the installed drives.
4. [Remove the fan cover](#)
5. [Remove the rear system cover](#)
6. [Remove the cooling fan assembly](#)
7. [Remove the damper](#)
8. Disconnect the cables from the backplane

Steps

1. Pull the release latches to lift up the backplane bracket from the guide hooks.
2. Loosen and remove the eight screws to remove the backplane from the bracket.

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

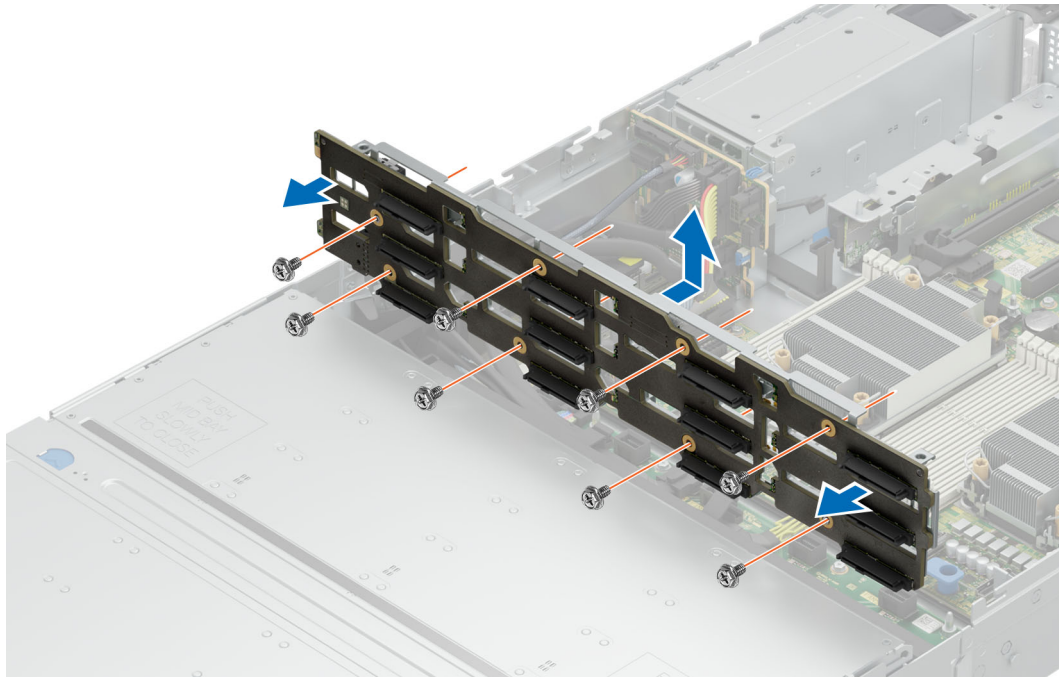


Figure 88. Removing mid drive bay backplane

Next steps

Install the mid drive bay backplane.

Installing the mid drive bay backplane

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#)
4. [Remove the rear system cover](#)
5. [Remove the cooling fan assembly](#)
6. [Remove the damper](#)
7. Remove the drives.

Steps

1. Install and tighten the eight screws to secure the backplane to the bracket.
2. Align the slots on the bracket to the guide hooks and insert it till it clicks in place.

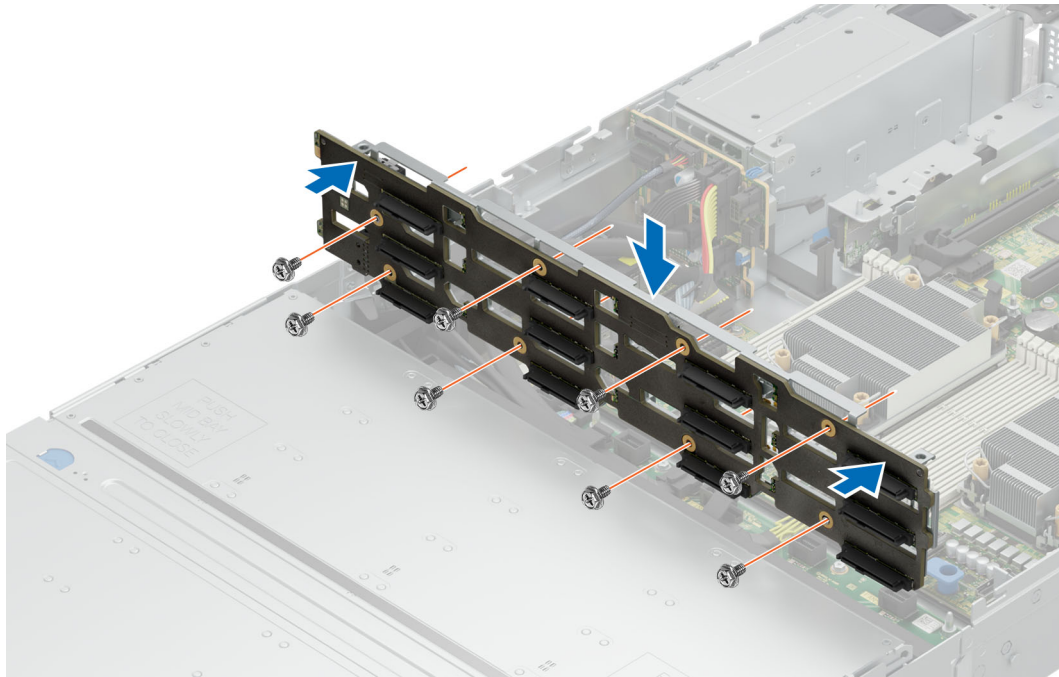


Figure 89. Installing mid drive bay backplane

Next steps

1. Connect all the cables to the backplane.
2. [Install the damper](#)
3. [Install the cooling fan assembly](#)
4. [Install the rear system cover](#)
5. [Install the fan cover](#)
6. Install the drives back into their original locations.
7. Follow the procedure listed in [After working inside your system](#).

Installing the damper

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#)
4. [Remove the cooling fan assembly](#)
5. [Remove the rear system cover](#)

Steps

Align the damper to the guides and inset it vertically till it clicks in place.

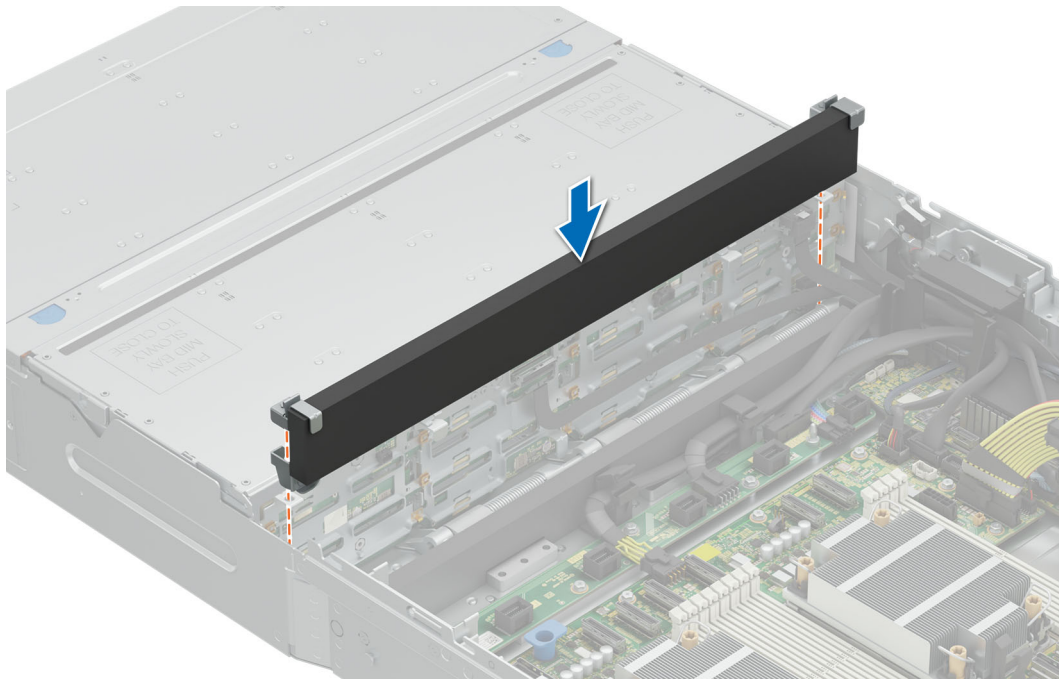


Figure 90. Installing the damper

Next steps

1. Install the cooling fan assembly
2. Install the rear system cover
3. Install the fan cover
4. Follow the procedure listed in [After working inside your system](#).

Removing the rear SAS/SATA drive backplane

Prerequisites

CAUTION: To prevent damage to the drives and backplane, you must remove the drives from the system before removing the backplane.

CAUTION: You must note the number of each hard drive and temporarily label them before removal so that you can replace them in the same locations.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#)
3. Remove the fan cover.
4. Remove the rear system cover .
5. Remove the cooling fan assembly .
6. Remove the air shroud

Steps

Loosen the captive screw and lift up the backplane from the guide hooks on the drive cage.

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

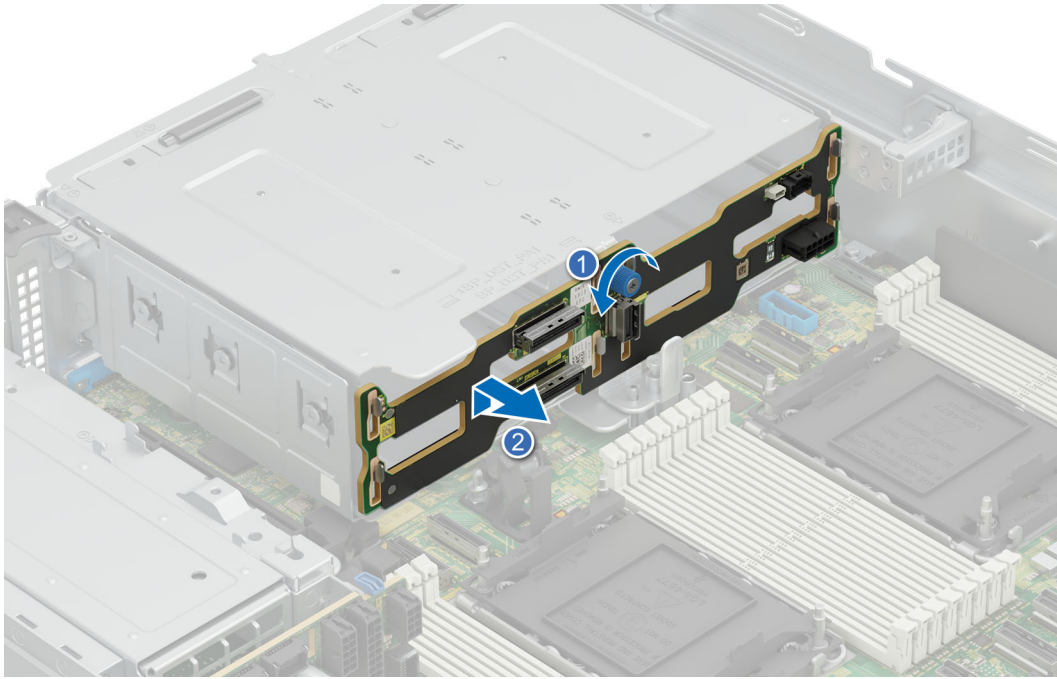


Figure 91. Removing the rear drive backplane

Next steps

Install the SAS/SATA backplane.

Installing the rear SAS/SATA drive backplane

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#)
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#) .
5. [Remove the cooling fan assembly](#) .
6. [Remove the air shroud](#)

Steps

1. Align the slots on the backplane to the guide hooks and insert the backplane.
2. Tighten the captive screw to secure it to the drive bay.

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

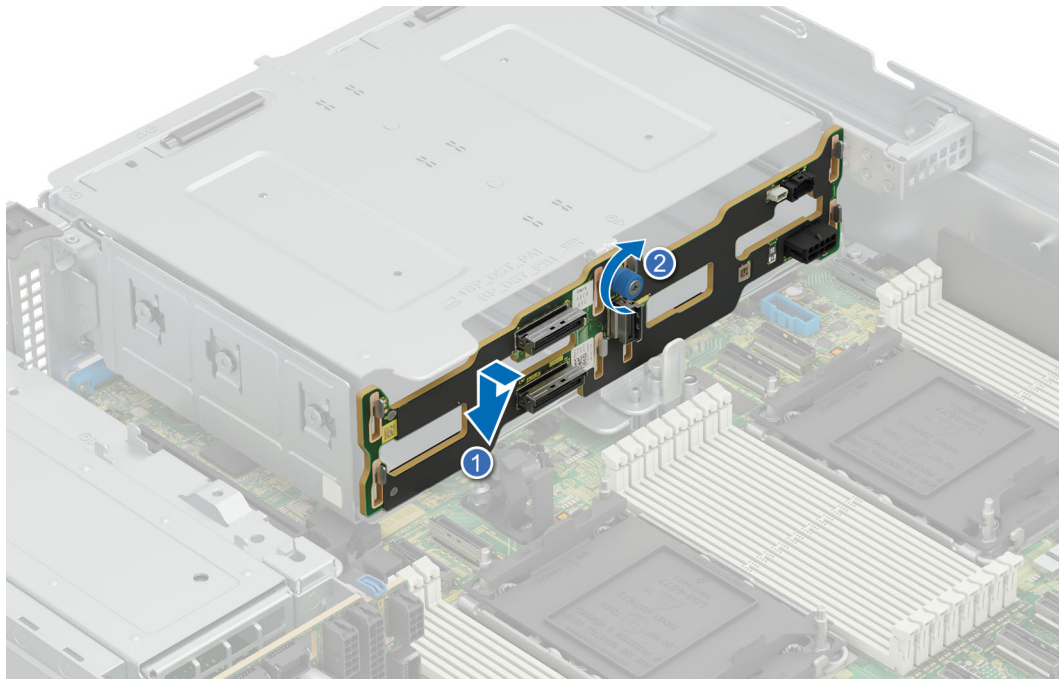


Figure 92. Installing the rear drive backplane

Next steps

1. [Install the air shroud](#),
2. [Install the cooling fan assembly](#).
3. [Install the rear system cover](#).
4. [Install the fan cover](#)
5. Install the drives back into their original locations.
6. Follow the procedure listed in [After working inside your system](#).

Removing the rear NVMe drive backplane

Prerequisites

CAUTION: To prevent damage to the drives and backplane, you must remove the drives from the system before removing the backplane.

CAUTION: You must note the number of each hard drive and temporarily label them before removal so that you can replace them in the same locations.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#)
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).
6. [Remove the air shroud](#).

Steps

Pull back on the plunger to release the backplane from the drive cage and lift it up from the guide hooks.

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

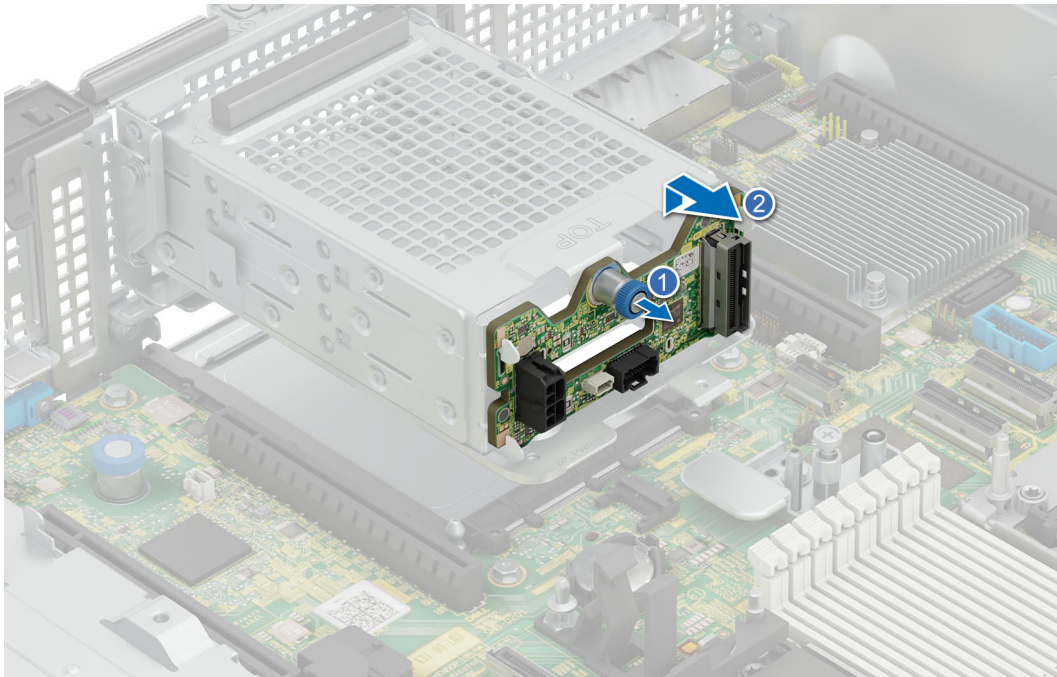


Figure 93. Removing the rear drive backplane

Next steps

Install NVMe backplane.

Installing the rear NVMe drive backplane

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).
6. [Remove the air shroud](#).

Steps

Align the slots on the backplane to the guide hooks on the drive cage and slide it down for the plunger to lock in place.

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

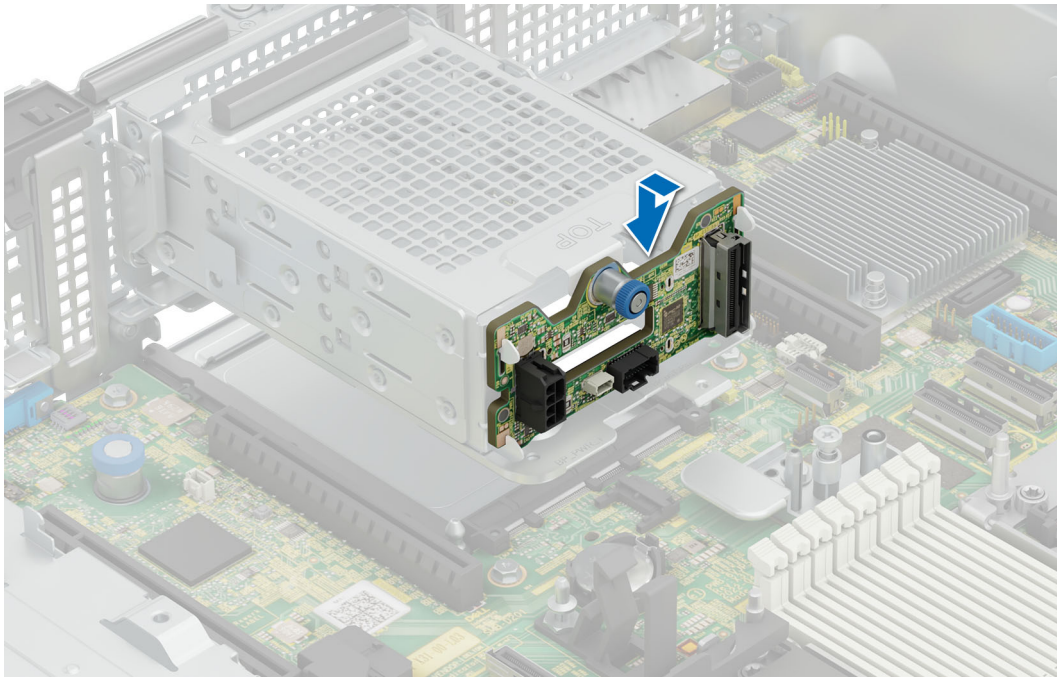


Figure 94. Installing the rear drive backplane

Next steps

1. Install the air shroud,
2. Install the cooling fan assembly.
3. Install the rear system cover.
4. Install the fan cover
5. Install the drives back into their original locations.
6. Follow the procedure listed in [After working inside your system.](#)

Cable routing

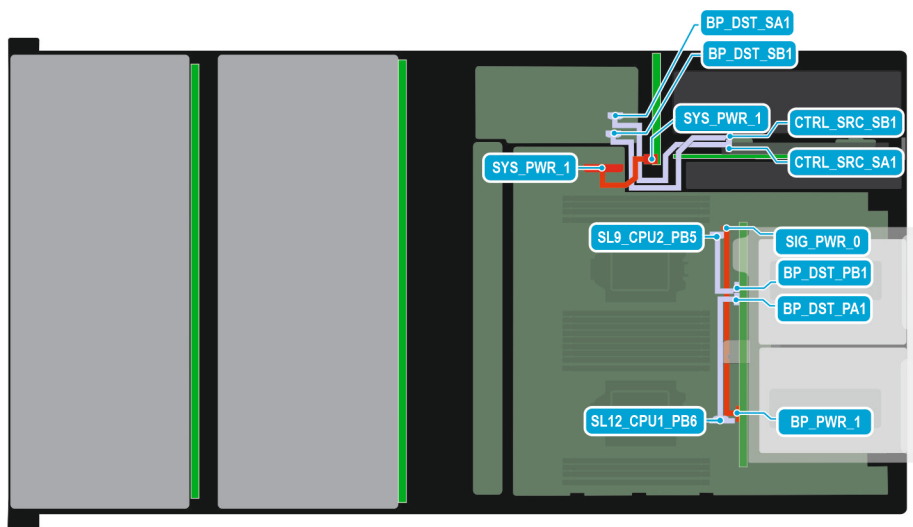


Figure 95. Configuration 0: NVMe - 2 x 12 x 3.5 inch SAS/SATA with rear 4 x 3.5 inch NVMe/SAS/SATA and single PERC card

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. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
2	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
3	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
4	SIG_PWR_0 (system board power connector)	BP_PWR_1 (backplane power connector)
5	SL12_CPU1_PB6 (signal connector on system board)	BP_DST_PA1 (rear backplane signal connector)
6	SL9_CPU2_PB5 (signal connector on system board)	BP_DST_PB1 (rear backplane signal connector)

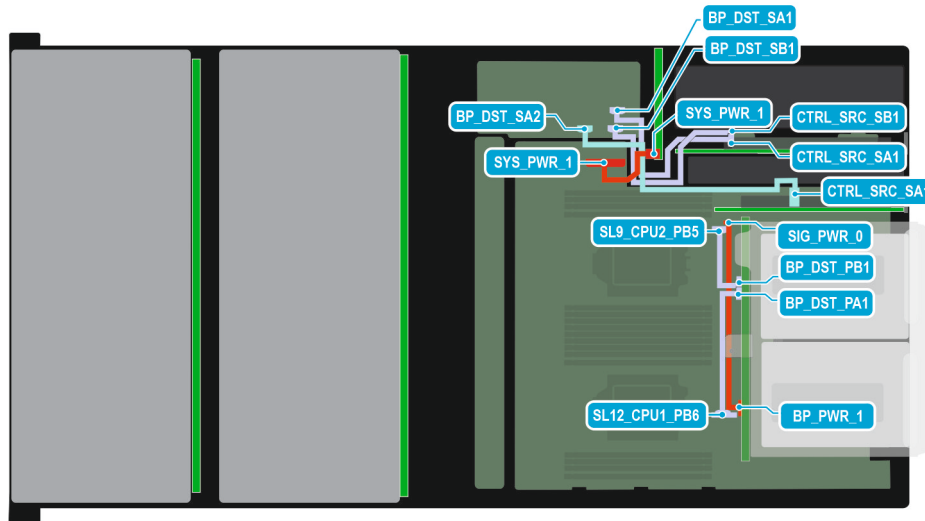


Figure 96. Configuration 1: NVMe - 2 x 12 x 3.5 inch SAS/SATA with rear 4 x 3.5 inch NVMe/SAS/SATA and second PERC card

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. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
2	CTRL_SRC_SA1 (second adapter PERC controller connector)	BP_DST_SA2 (SAS expander card signal connector)
3	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
4	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
5	SIG_PWR_0 (system board power connector)	BP_PWR_1 (backplane power connector)

Table 71. Connector descriptions for SAS/SATA/NVMe (continued)

Order	From	To
6	SL12_CPU1_PB6 (signal connector on system board)	BP_DST_PA1 (rear backplane signal connector)
7	SL9_CPU2_PB5 (signal connector on system board)	BP_DST_PB1 (rear backplane signal connector)

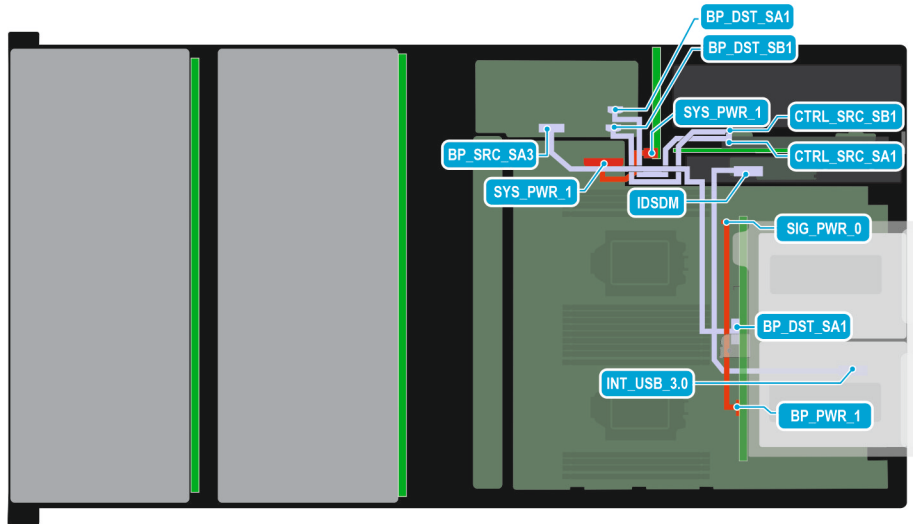


Figure 97. Configuration 2: SAS - 2 x 12 x 3.5 inch SAS/SATA with rear 4 x 3.5 inch NVMe/SAS/SATA and single PERC card

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

Table 72. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
2	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
3	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
4	INT USB 3.0 (Interposer)	INT USB 3.0 (system board connector)
5	SIG_PWR_0 (system board power connector)	BP_PWR_1 (backplane power connector)
6	BP_SRC_SA3 (SAS expander card signal connector)	BP_DST_SA1 (rear backplane signal connector)

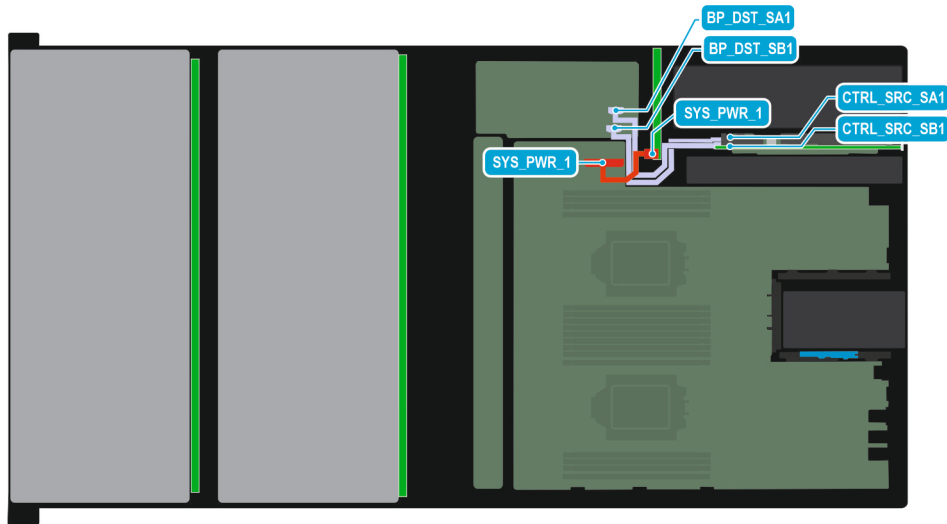


Figure 98. Configuration 3: - 2 x 12 x 3.5 inch SAS/SATA and single PERC card

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

Table 73. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
2	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
3	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)

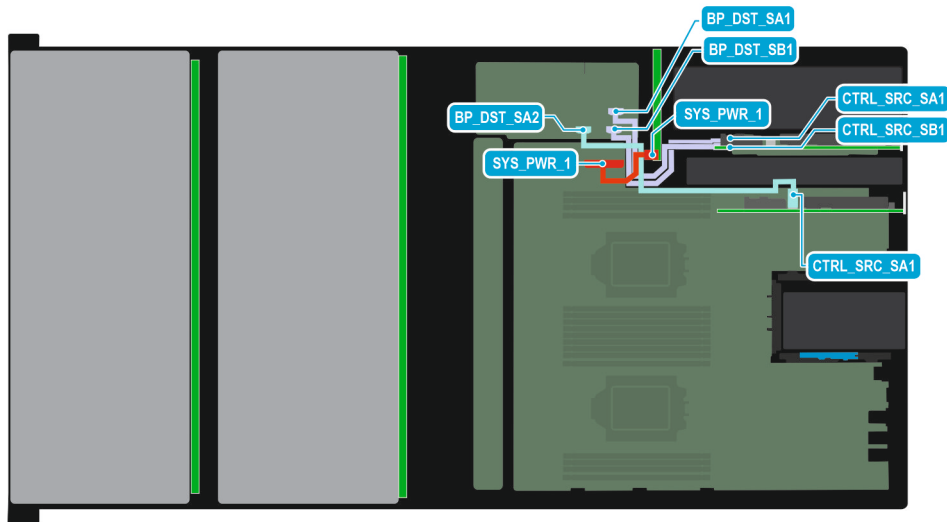


Figure 99. Configuration 4: - 2 x 12 x 3.5 inch SAS/SATA and second PERC card

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

Table 74. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
2	CTRL_SRC_SA1 (second adapter PERC controller connector)	BP_DST_SA2 (SAS expander card signal connector)
3	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
4	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)

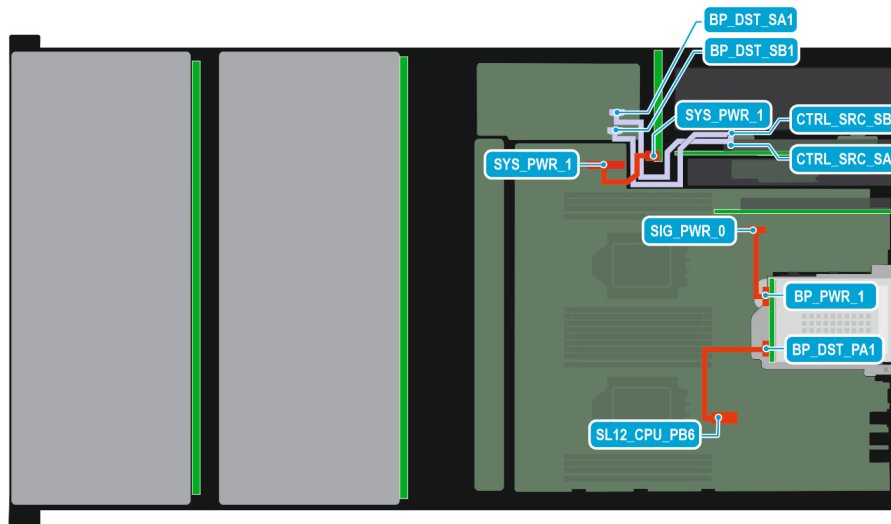


Figure 100. Configuration 5: - 2 x 12 x 3.5 inch SAS/SATA with rear 2 x 2.5 inch NVMe and single PERC card

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

Table 75. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
2	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
3	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
4	SL12_CPU1_PB6 (signal connector on system board)	BP_DST_PA1 (Rear backplane signal connector)
5	SIG_PWR_0 (system board power connector)	BP_PWR_1 (rear backplane power connector)

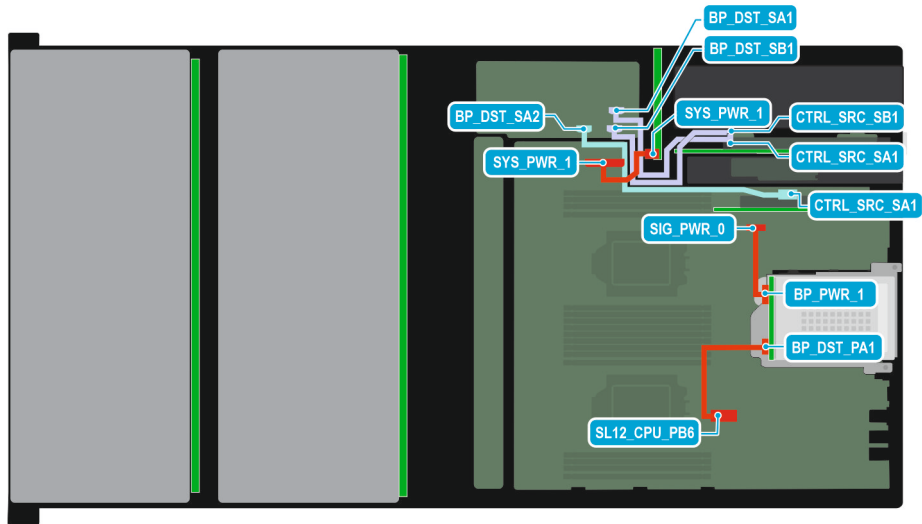


Figure 101. Configuration 6: - 2 x 12 x 3.5 inch SAS/SATA with rear 2 x 2.5 inch NVMe and second PERC card

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

Table 76. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
2	CTRL_SRC_SA1 (second adapter PERC controller connector)	BP_DST_SA2 (SAS expander card signal connector)
3	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
4	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
5	SL12_CPU1_PB6 (signal connector on system board)	BP_DST_PA1 (Rear backplane signal connector)
6	SIG_PWR_0 (system board power connector)	BP_PWR_1 (rear backplane power connector)

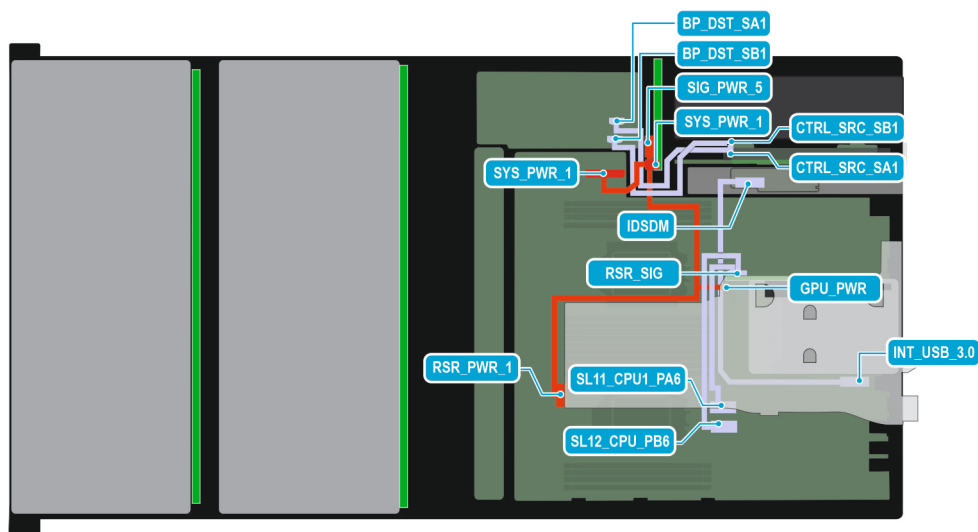


Figure 102. Configuration 7: - 2 x 12 x 3.5 inch SAS/SATA with FL/FH Riser and single PERC card

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

Table 77. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	RSR_SIG (Riser signal connector)	SL11_CPU1_PA6 (signal connector on system board) , SL12_CPU1_PB6 (signal connector on system board)
2	SIG_PWR_5 (PIB power connector)	GPU PWR (GPU power connector) , RISER_PWR_1 (Riser power connector)
3	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
4	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
5	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
6	INT USB 3.0 (Interposer)	INT USB 3.0 (system board connector)

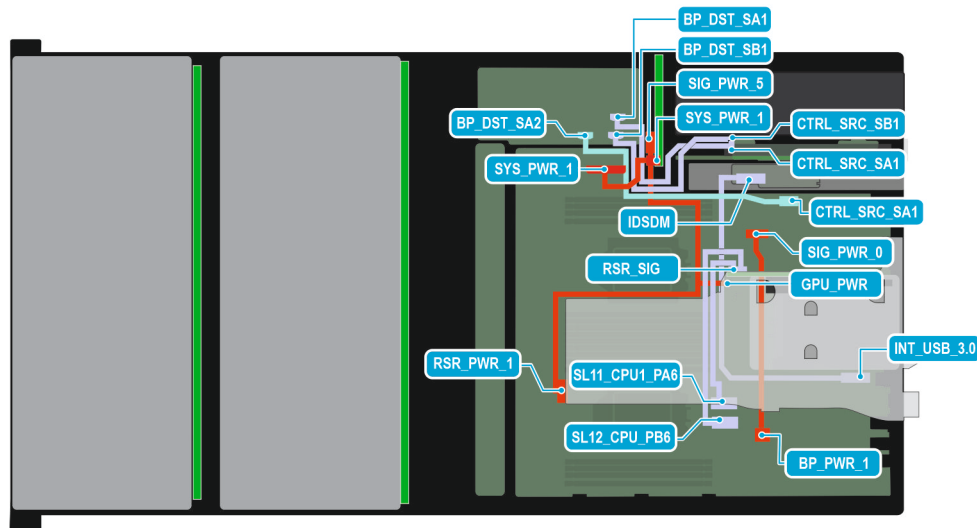


Figure 103. Configuration 8: - 2 x 12 x 3.5 inch SAS/SATA with FL/FH Riser and second PERC card

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

Table 78. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	RSR_SIG (Riser signal connector)	SL11_CPU1_PA6 (signal connector on system board) , SL12_CPU1_PB6 (signal connector on system board)
2	SIG_PWR_5 (PIB power connector)	GPU PWR (GPU power connector) , RISER_PWR_1 (Riser power connector)
3	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
4	CTRL_SRC_SA1 (second adapter PERC controller connector)	BP_DST_SA2 (SAS expander card signal connector)
5	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)

Table 78. Connector descriptions for SAS/SATA/NVMe (continued)

Order	From	To
6	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
7	INT USB 3.0 (Interposer)	INT USB 3.0 (system board connector)

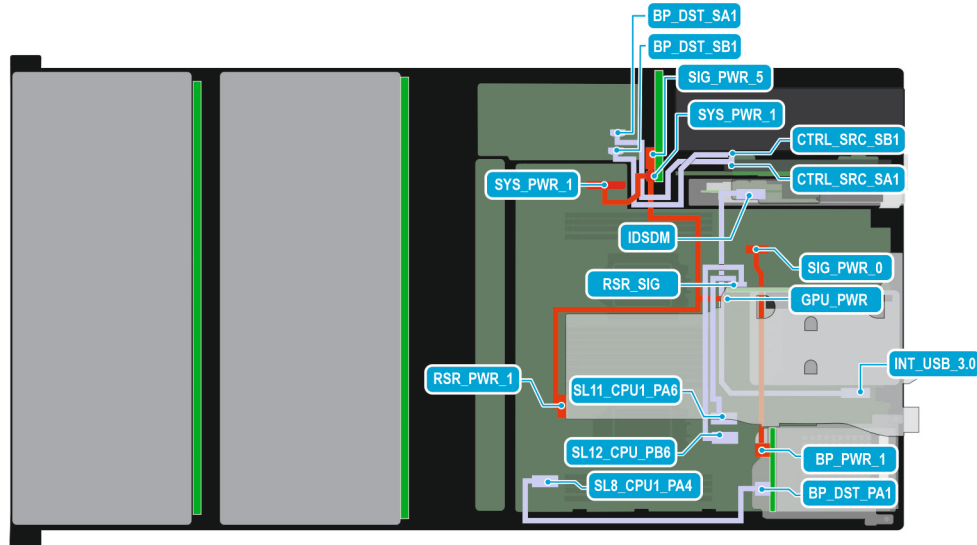


Figure 104. Configuration 9: - 2 x 12 x 3.5 inch SAS/SATA with FL/FH Riser, rear 2 x 2.5 inch NVMe and single PERC card

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

Table 79. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SL8_CPU1_PA4 (system board signal connector)	BP_DST_PA1 (rear backplane signal connector)
2	SIG_PWR_0 (system board power connector)	BP_PWR_1 (rear backplane power connector)
3	RSR_SIG (Riser signal connector)	SL11_CPU1_PA6 (signal connector on system board) , SL12_CPU1_PB6 (signal connector on system board)
4	SIG_PWR_5 (PIB power connector)	GPU_PWR (GPU power connector) , RISER_PWR_1 (Riser power connector)
5	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
6	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
7	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
8	INT USB 3.0 (Interposer)	INT USB 3.0 (system board connector)

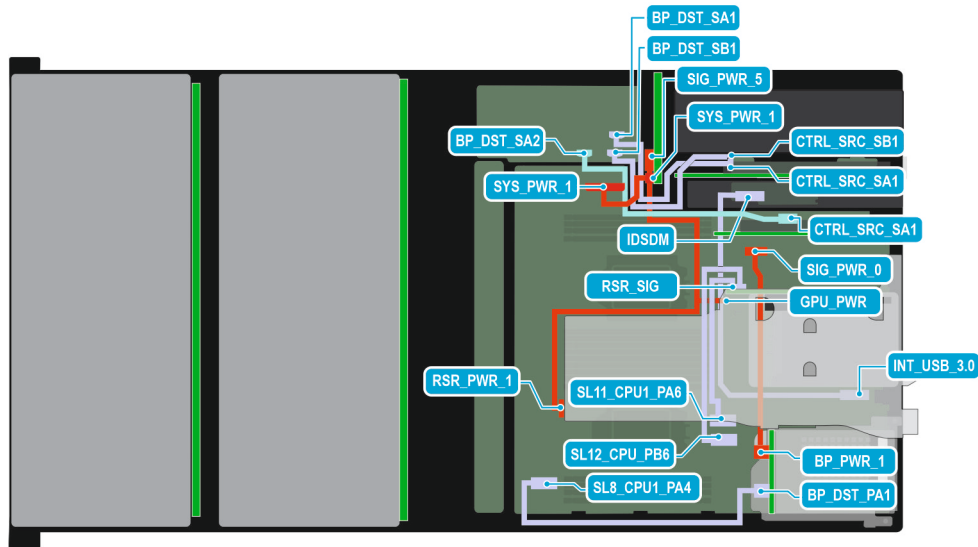


Figure 105. Configuration 10: - 2 x 12 x 3.5 inch SAS/SATA with FL/FH Riser, rear 2 x 2.5 inch NVMe and second PERC card

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

Table 80. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SL8_CPU1_PA4 (system board signal connector)	BP_DST_PA1 (rear backplane signal connector)
2	SIG_PWR_0 (system board power connector)	BP_PWR_1 (rear backplane power connector)
3	RSR_SIG (Riser signal connector)	SL11_CPU1_PA6 (signal connector on system board) , SL12_CPU1_PB6 (signal connector on system board)
4	SIG_PWR_5 (PIB power connector)	GPU PWR (GPU power connector) , RISER_PWR_1 (Riser power connector)
5	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
6	CTRL_SRC_SA1 (second adapter PERC controller connector)	BP_DST_SA2 (SAS expander card signal connector)
7	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
8	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
9	INT USB 3.0 (Interposer)	INT USB 3.0 (system board connector)

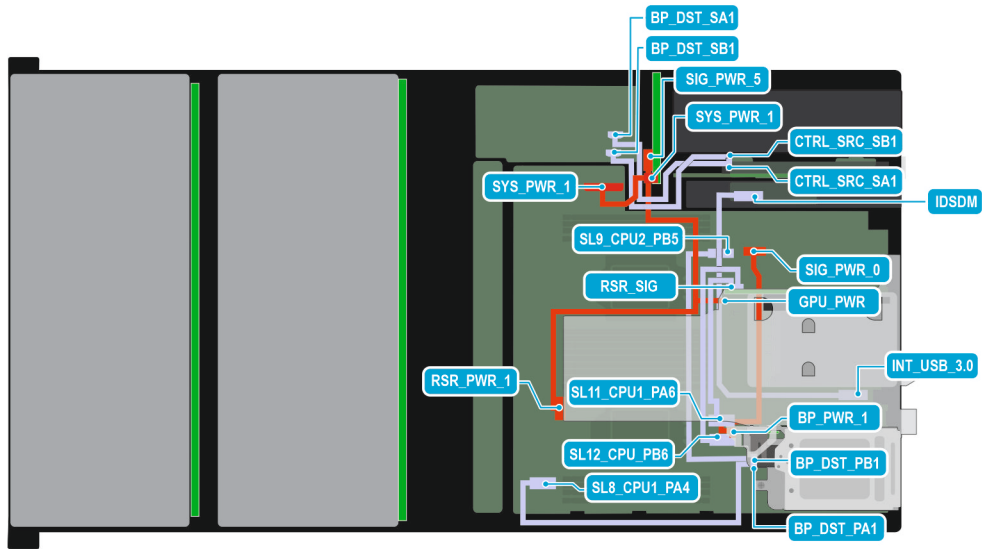


Figure 106. Configuration 11: - 2 x 12 x 3.5 inch SAS/SATA with FL/FH Riser, rear 4 x E3.S and single PERC card

Table 81. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SL8_CPU1_PA4 (system board signal connector)	BP_DST_PA1 (rear backplane signal connector)
2	SL9_CPU2_PB5 (system board signal connector)	BP_DST_PB1 (rear backplane signal connector)
3	SIG_PWR_0 (system board power connector)	BP_PWR_1 (rear backplane power connector)
4	RSR_SIG (Riser signal connector)	SL11_CPU1_PA6 (signal connector on system board) , SL12_CPU1_PB6 (signal connector on system board)
5	SIG_PWR_5 (PIB power connector)	GPU PWR (GPU power connector) , RISER_PWR_1 (Riser power connector)
6	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
7	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
8	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
9	INT USB 3.0 (Interposer)	INT USB 3.0 (system board connector)

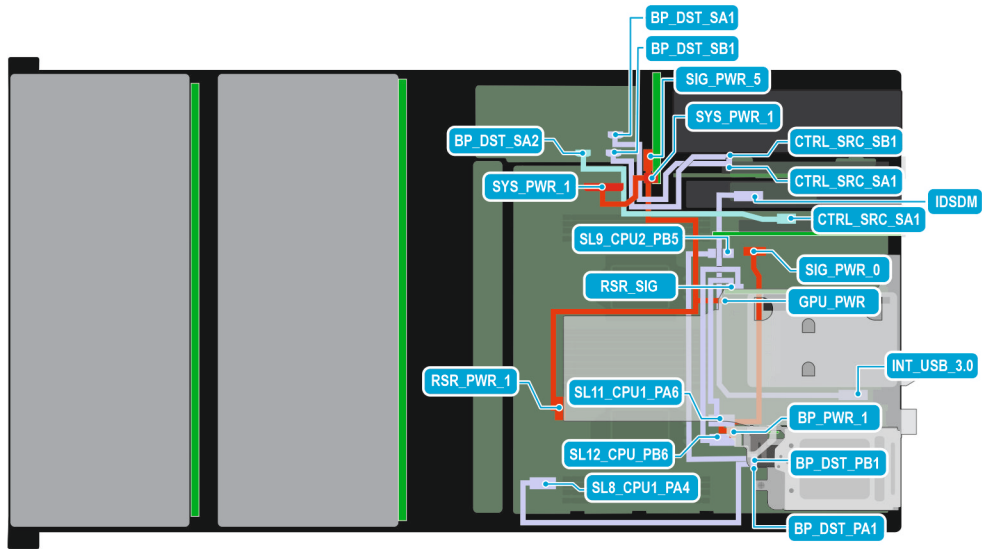


Figure 107. Configuration 12: - 2 x 12 x 3.5 inch SAS/SATA with FL/FH Riser, rear 4 x E3.S and second PERC card

Table 82. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SL8_CPU1_PA4 (system board signal connector)	BP_DST_PA1 (rear backplane signal connector)
2	SL9_CPU2_PB5 (system board signal connector)	BP_DST_PB1 (rear backplane signal connector)
3	SIG_PWR_0 (system board power connector)	BP_PWR_1 (rear backplane power connector)
4	RSR_SIG (Riser signal connector)	SL11_CPU1_PA6 (signal connector on system board) , SL12_CPU1_PB6 (signal connector on system board)
5	SIG_PWR_5 (PIB power connector)	GPU PWR (GPU power connector) , RISER_PWR_1 (Riser power connector)
6	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
7	CTRL_SRC_SA1 (second adapter PERC controller connector)	BP_DST_SA2 (SAS expander card signal connector)
8	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
9	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
10	INT USB 3.0 (Interposer)	INT USB 3.0 (system board connector)

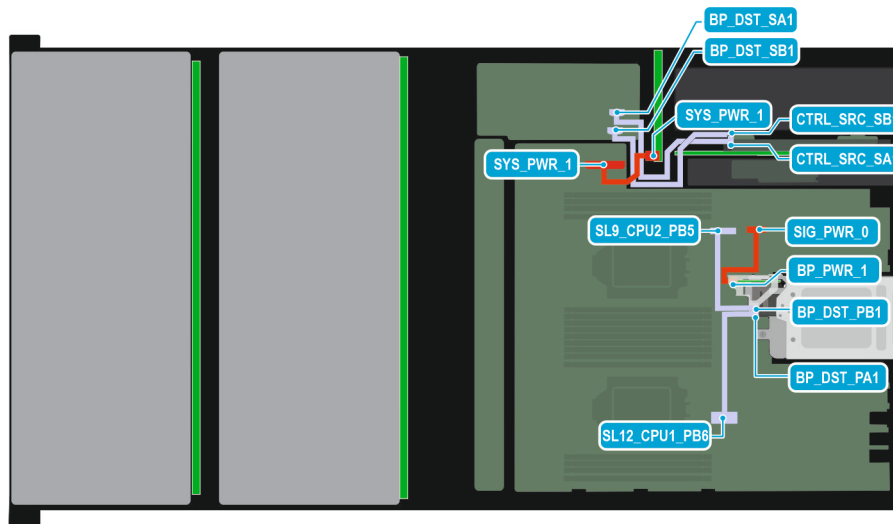


Figure 108. Configuration 13: - 2 x 12 x 3.5 inch SAS/SATA with rear 4 x E3.S and single PERC card

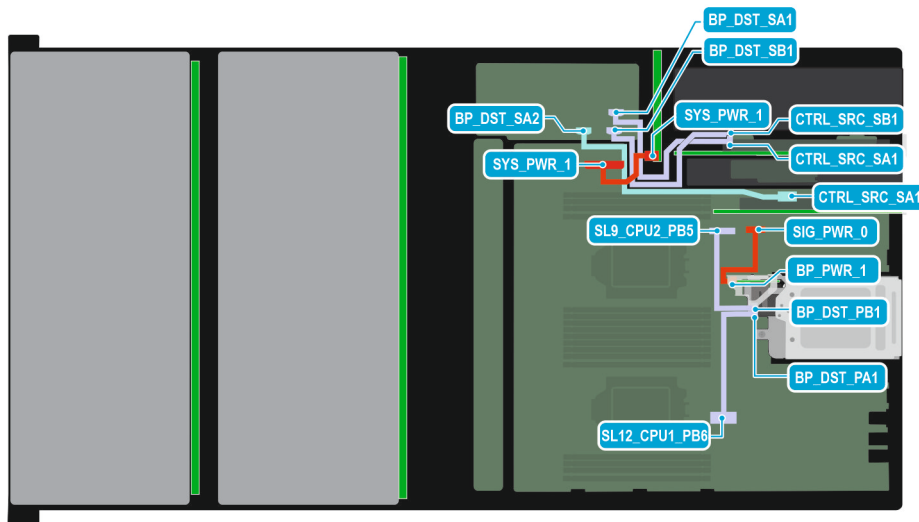


Figure 109. Configuration 14: - 2 x 12 x 3.5 inch SAS/SATA with rear 4 x E3.S and second PERC card

Table 83. Connector descriptions for SAS/SATA/NVMe

Order	From	To
1	SYS_PWR1 (PIB power connector)	SYS_PWR1 (system board power connector)
2	CTRL_SRC_SA1 (second adapter PERC controller connector)	BP_DST_SA2 (SAS expander card signal connector)
3	CTRL_SRC_SB1 (adapter PERC controller connector)	BP_DST_SB1 (SAS expander card signal connector)
4	CTRL_SRC_SA1 (adapter PERC controller connector)	BP_DST_SA1 (SAS expander card signal connector)
5	SL9_CPU2_PB5 (signal connector on system board)	BP_DST_PB1 (Rear backplane signal connector)
6	SL12_CPU1_PB6 (signal connector on system board)	BP_DST_PA1 (Rear backplane signal connector)
7	SIG_PWR_0 (system board power connector)	BP_PWR_1 (rear backplane power connector)

System memory

System memory guidelines

The PowerEdge R760xd2 system supports DDR5 registered DIMMs (RDIMMs).

Your system memory is organized into eight channels per processor (one memory socket per channel), 8 memory sockets per processor and 16 memory sockets per system.

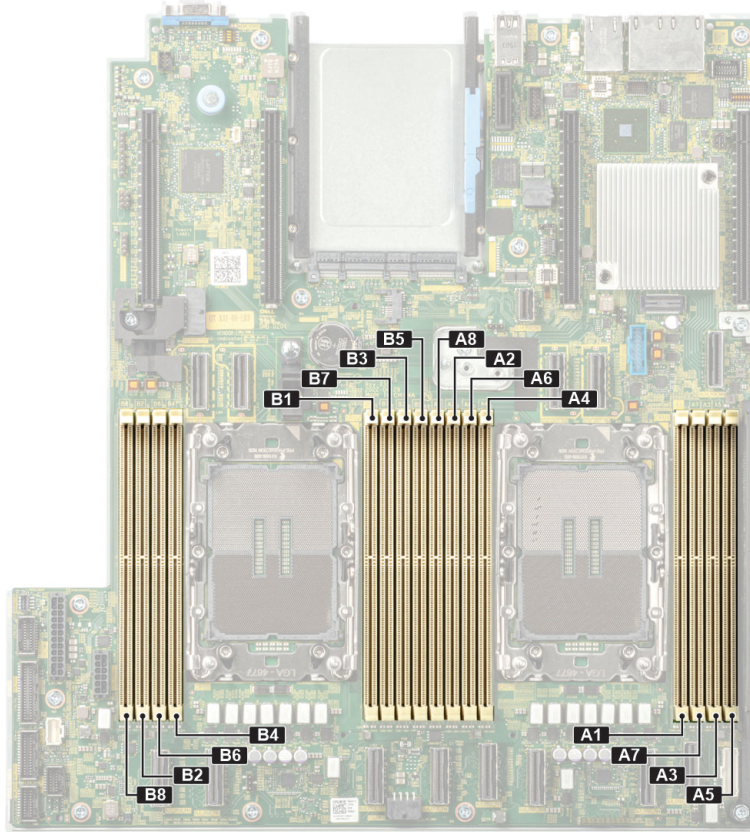


Figure 110. Memory channels

Memory channels are organized as follows:

Table 84. Memory channels

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

Table 85. Supported memory matrix

DIMM type	Rank	Capacity	DIMM rated voltage and speed	Operating Speed
				1 DIMM per channel (DPC)
RDIMM	1 R	16 GB	DDR5 (1.1 V), 4800 MT/s	4800 MT/s
	2 R	32 GB, 64 GB	DDR5 (1.1 V), 4800 MT/s	4800 MT/s

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

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 4800 MT/s 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
- Maximum supported speed of the DIMMs

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

- All DIMMs must be DDR5.
- If memory modules with different speeds are installed, they operate at the speed of the slowest installed memory module(s).
- Populate memory module sockets only if a processor is installed.
 - For single-processor systems, sockets A1 to A8 are available.
 - For dual-processor systems, sockets A1 to A8 and sockets B1 to B8 are available.
 - A minimum of 1 DIMM must be populated for each installed processor.
- In **Optimizer Mode**, the DRAM controllers operate independently in the 64-bit mode and provide optimized memory performance.

Table 86. 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}	1, 2, 4, 6 or 8 DIMMs are allowed.
Dual processor (Start with processor1. Processor 1 and processor 2 population should match)	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}, A{4}, B{4}, A{5}, B{5}, A{6}, B{6}, A{7}, B{7}, A{8}, B{8}	1, 2, 4, 6 or 8 DIMMs per CPU.

- Populate all the sockets with white release tabs first.
- 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 best performance.
- Supported RDIMM configurations are 1, 2, 4, 6, and 8 DIMMs per processor.
- Populate eight equal memory modules per processor (one DIMM per channel) at a time to maximize performance.

NOTE: Equal memory modules refer to DIMMs with identical electrical specification and capacity that may be from different vendors.

Removing a memory module

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#)
3. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* at www.dell.com/poweredge/manuals.
4. Remove the fan cover [Removing the fan cover](#).
5. Remove the rear system cover [removing the rear system cover](#).
6. Remove the air shroud [removing the air shroud](#)

Steps

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

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

NOTE: To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. The memory module blanks compatible with R760xd2 are DDR5 gray color blanks. Remove memory module blanks only if you intend to install memory modules in those sockets..

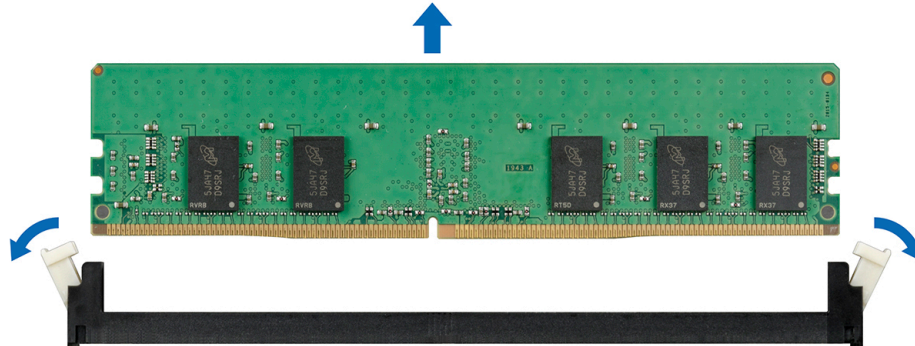


Figure 111. Removing a memory module

Next steps

installing the memory module

Installing a memory module

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#)
3. Remove the system from the rack and place it on an ESD work bench. For more information, see the *Rail Installation Guide* at www.dell.com/poweredge/manuals.
4. Remove the fan cover [Removing the fan cover](#).
5. Remove the rear system cover [removing the rear system cover](#).
6. Remove the air shroud [removing the air shroud](#)

Locate the appropriate memory module socket.

NOTE: The procedure to remove a memory module blank is similar to the procedure to remove a memory module. Retain the removed memory module blank for future use.

Steps

1. Open the ejectors on the memory module socket outward to allow the memory module to be inserted into the socket.
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: Handle each memory module only by the card edges, ensuring not to touch the middle of the memory module or metallic contacts.

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

3. Press the memory module with your thumbs until the ejectors firmly click into place.

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

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

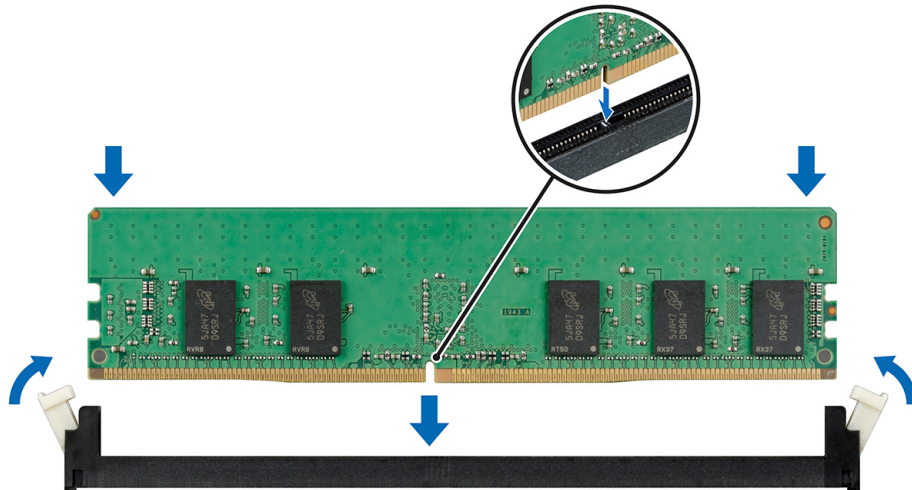


Figure 112. Installing a memory module

Next steps

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

Processor and heat sink module

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](#).
3. [Remove the fan cover](#)
4. [Remove the rear system cover](#).
5. [Remove the air shroud](#)

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.

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).

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

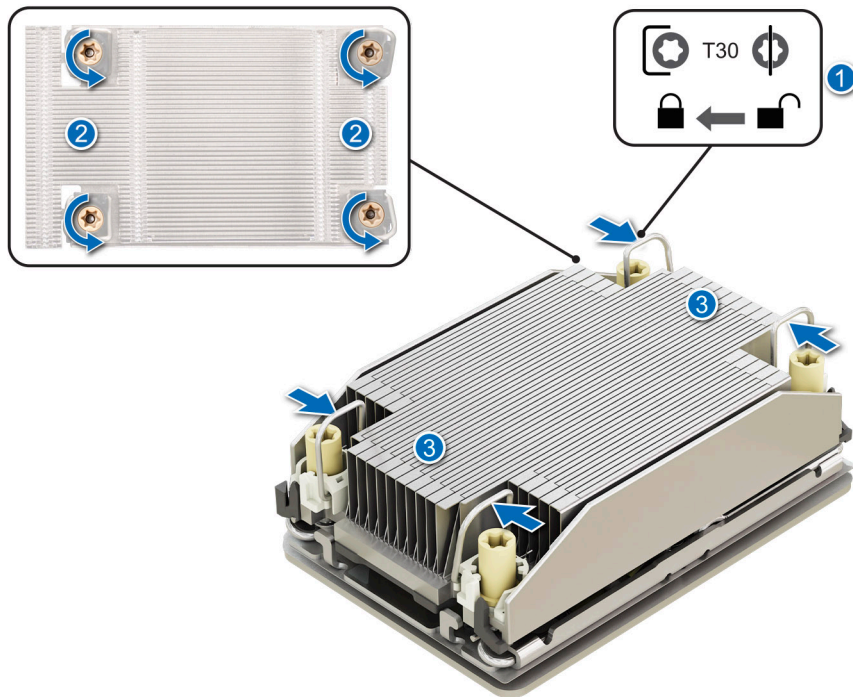


Figure 113. Removing the processor heat sink module

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

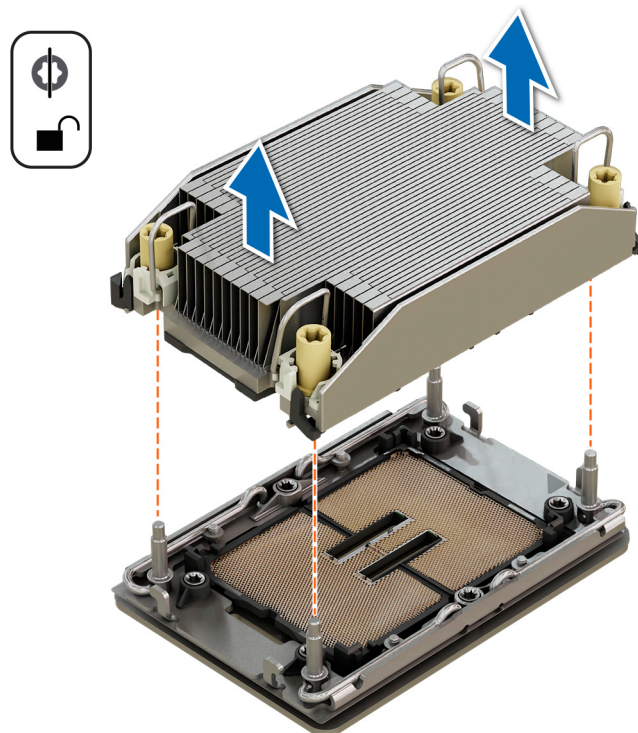


Figure 114. Removing a heat sink

Next steps

If you are removing a faulty heat sink, [install the heatsink](#), 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 fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the air shroud](#)
6. [Remove the processor heatsink 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, simply 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 edges, lift the processor away from the retaining clip.

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

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

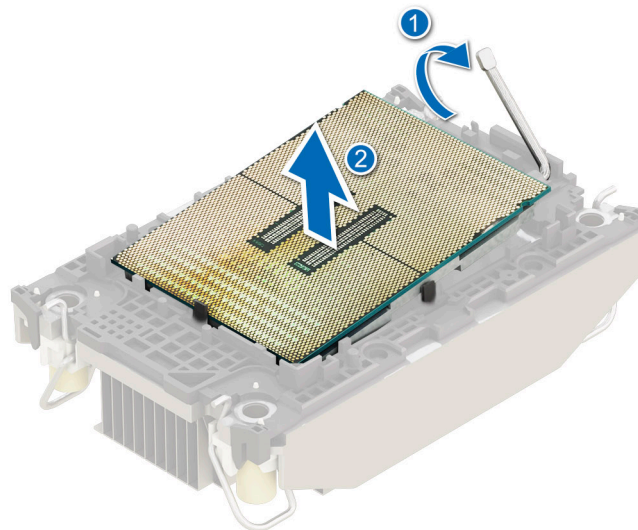


Figure 115. Removing the processor

i NOTE: Ensure to return the TIM break lever back to 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.

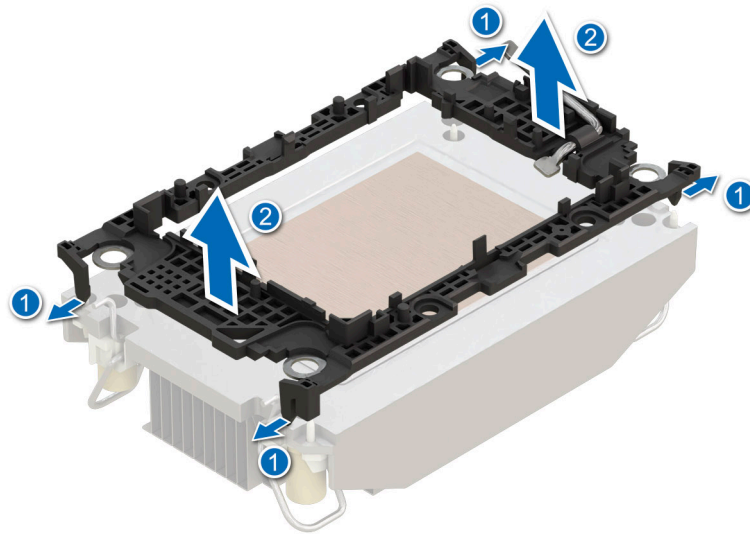


Figure 116. Removing the retaining clip

Next steps

install the processor.

Installing the processor

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 fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the air shroud](#)
6. [Remove the processor heatsink 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.

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

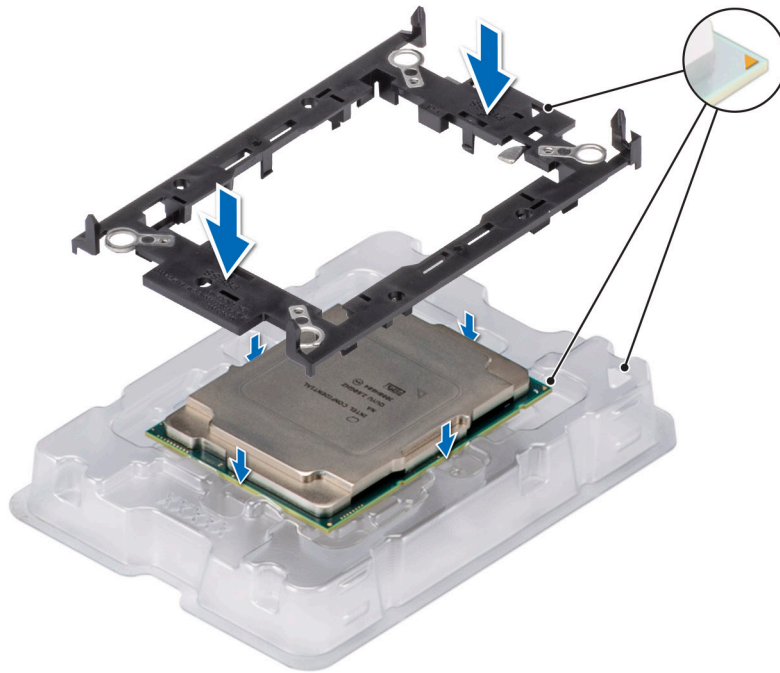


Figure 117. Installing the retaining clip

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

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

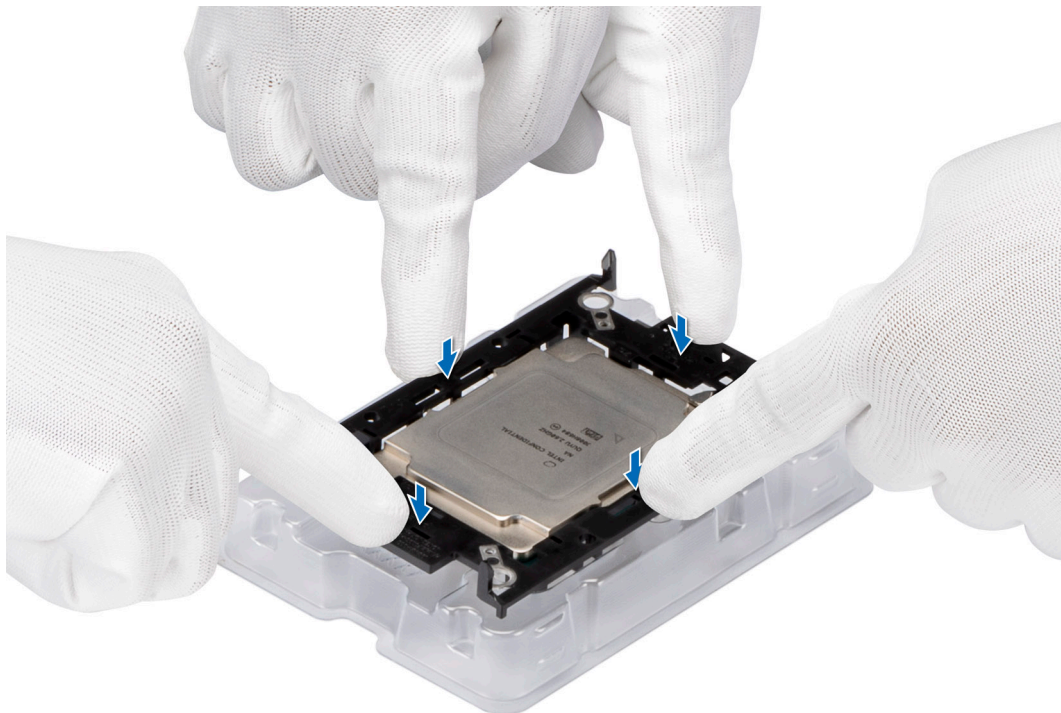


Figure 118. Press the retaining clip on the four sides

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.

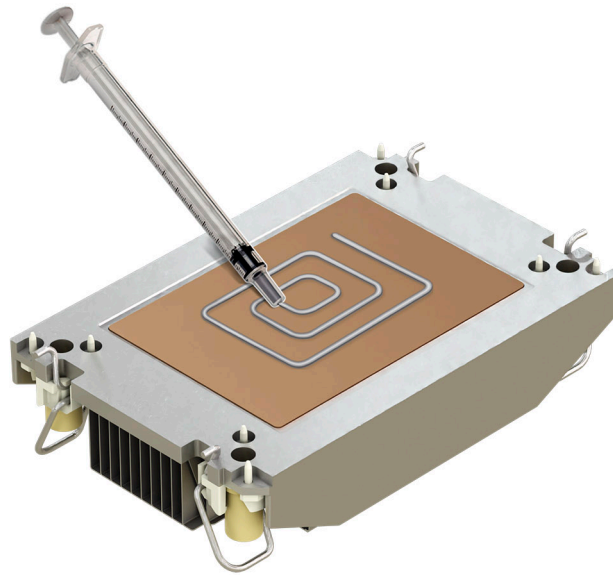


Figure 119. Applying thermal grease

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

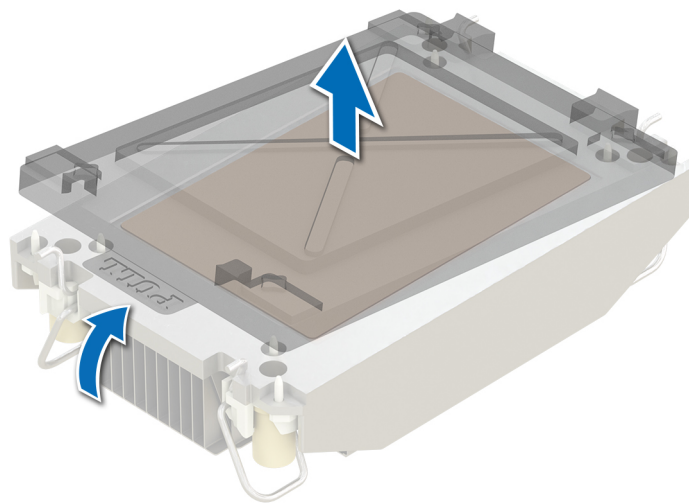


Figure 120. Removing the cover

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.

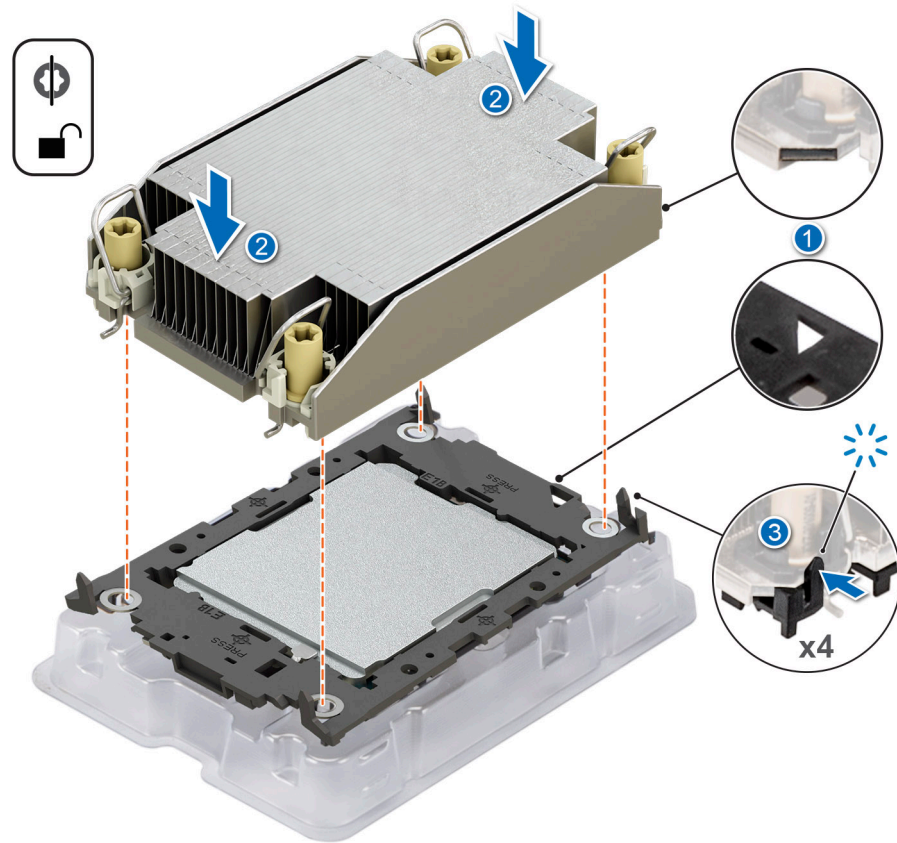


Figure 121. Installing the heat sink onto the processor

Next steps

1. Install processor heatsink module
2. Install the air shroud
3. Install the rear system cover .
4. Install the fan cover .
5. 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 [Before working inside your system.](#)
3. [Remove the fan cover.](#)
4. [Remove the rear system cover.](#)
5. [Remove the air shroud](#)

Steps

1. Set the anti-tilt wires to the unlocked position on the heat sink (inward position).
2. Align the pin 1 indicator of the heat sink to the system board, and then place the processor heat sink module (PHM) on the processor socket.

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

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

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

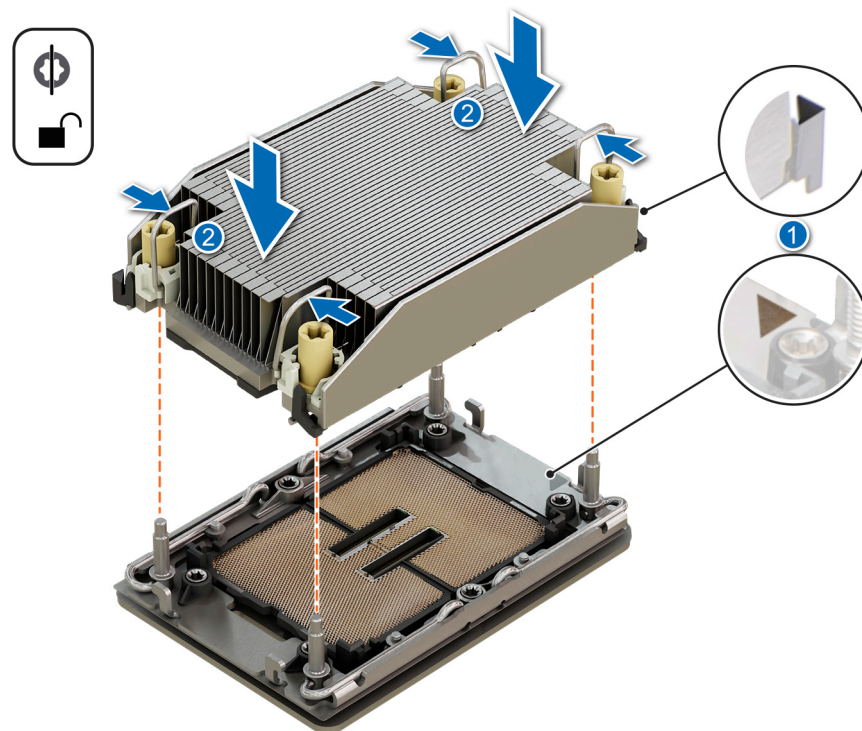


Figure 122. Installing the processor heat sink

3. Set the anti-tilt wires to the locked position (outward position), and then using the Torx T30 screwdriver, tighten the captive nuts (12 in-lbf) on the heat sink in the order below:
 - 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.

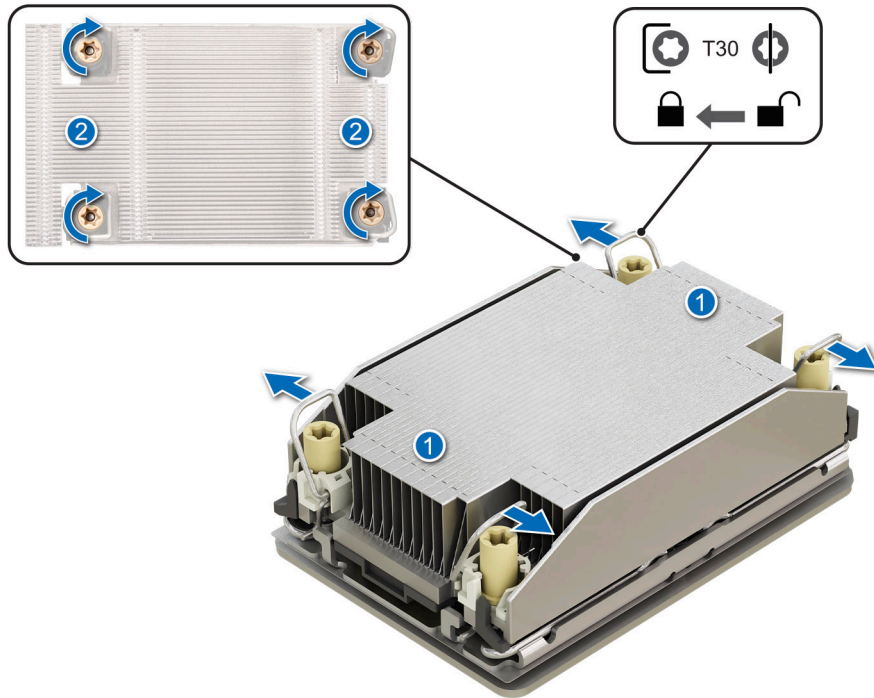


Figure 123. Set the anti-tilt wires to the locked position and tightening the nuts

NOTE: If system has only a single CPU install CPU blank

Next steps

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

Removing the CPU/DIMM blank

Prerequisites

NOTE: Remove the CPU/DIMM blank only if you are installing the processor heat sink module.

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 fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the air shroud](#)
6. .

Steps

Lift up the CPU/DIMM blank to remove from the system.

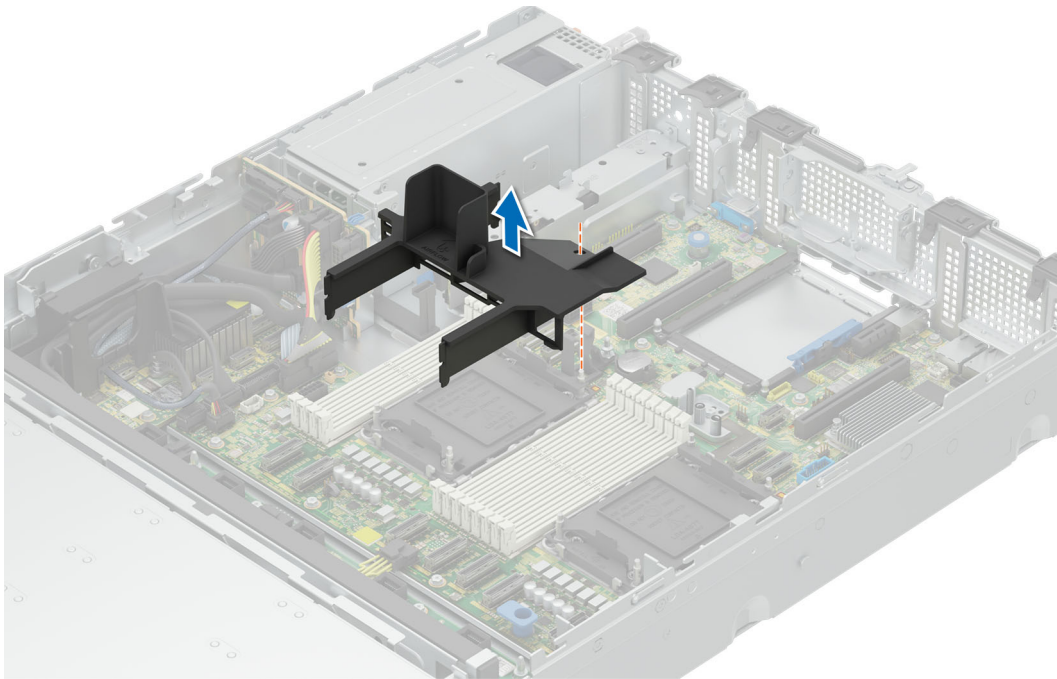


Figure 124. Removing the CPU/DIMM blank

Next steps

Install [CPU/DIMM blank](#) if CPU socket 2 is not populated.

Installing the CPU/DIMM 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 fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the air shroud](#)

Steps

1. Align the CPU/DIMM blank with the DIMM slots on either side of the CPU slot.
2. Insert the blank and secure it with the DIMM retention clips.

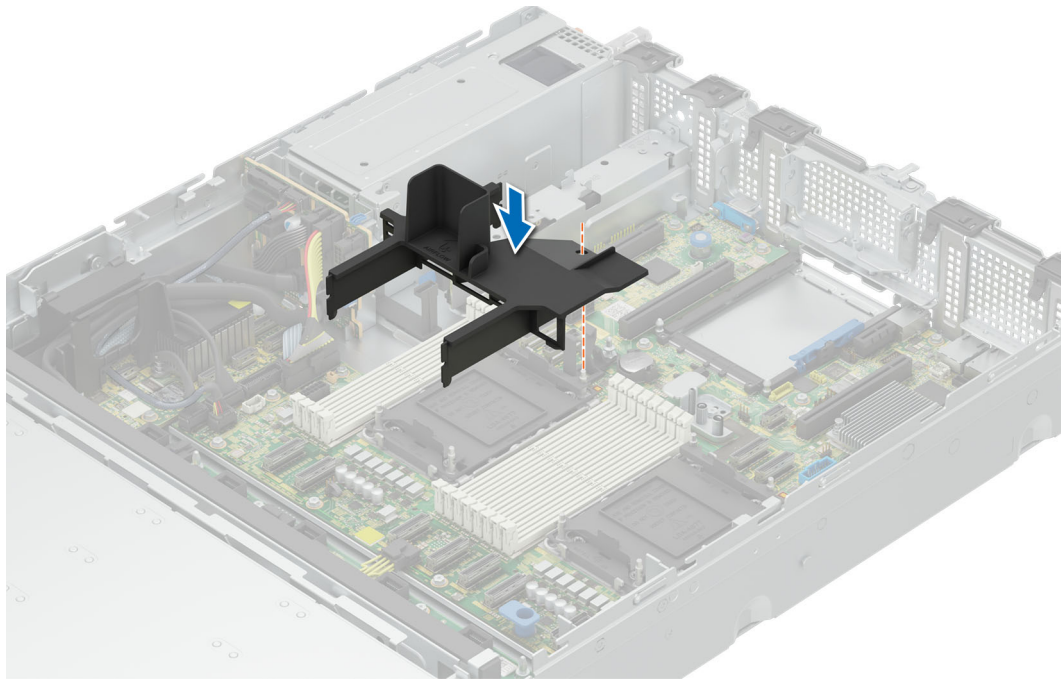


Figure 125. Installing the CPU/DIMM blank

Next steps

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

Expansion cards

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

Expansion card installation guidelines

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 87. Expansion card riser configurations

Configurations	Expansion card risers	PCIe Slot number	Form factor	Controlling processor	Slot's electrical bandwidth/ physical connector
Config 1	No Riser	1	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)
		4	Low Profile	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		5	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)

Table 87. Expansion card riser configurations (continued)

Configurations	Expansion card risers	PCIe Slot number	Form factor	Controlling processor	Slot's electrical bandwidth/ physical connector
Config 2A	No Riser	1	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)
		2	Low Profile	Processor 1	PCIe Gen3/Gen4 x8 (x16 connector)
		3	Low Profile	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		4	Low Profile	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		5	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)
Config2B	No Riser	1	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)
		2	Low Profile	Processor 1	PCIe Gen3/Gen4 x8 (x16 connector)
		3	Low Profile	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		4	Low Profile	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		5	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)
Config 2C	No Riser	1	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)
		2	Low Profile	Processor 1	PCIe Gen3/Gen4 x8 (x16 connector)
		3	Low Profile	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		4	Low Profile	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		5	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)
Config 3A FL	Riser	1	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)
		2	Full Height	Processor 1	PCIe Gen3/Gen4 x8 (x16 connector)
		3	Full Height	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		4	Low Profile	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		5	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)
Config 3B FL	Riser	2	Full Height	Processor 1	PCIe Gen3/Gen4 x8 (x16 connector)
		3	Full Height	Processor 2	PCIe Gen3/4 x16 (x16 connector)

Table 87. Expansion card riser configurations (continued)

Configurations	Expansion card risers	PCIe Slot number	Form factor	Controlling processor	Slot's electrical bandwidth/ physical connector
		4	Low Profile	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		5	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)
Config 3C FL	Riser	2	Full Height	Processor 1	PCIe Gen3/Gen4 x8 (x16 connector)
		3	Full Height	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		4	Low Profile	Processor 2	PCIe Gen3/4 x16 (x16 connector)
		5	Low Profile	Processor 1	PCIe Gen3/4 x16 (x16 connector)

Table 88. Riser configurations: System without riser - Configuration1 SAS/SATA

Card type	Slot Priority	Maximum number of cards
FOXCONN (aPERC 11)	5	1
FOXCONN (aPERC HBA11)	5	1
FOXCONN (aPERC HBA11)	5	1
FOXCONN (aPERC 11)	5	1
FOXCONN (aPERC 12)	5	1
FOXCONN (aPERC HBA12)	5	1
FOXCONN (aPERC HBA11)	1, 4	2
FOXCONN (aPERC HBA11)	1, 4	2
FOXCONN (aPERC 12)	1, 4	2
FOXCONN (aPERC HBA12)	1, 4	2
Intel (NIC:100Gb)	1, 4	2
Intel (NIC:100Gb)	1, 4	2
Mellanox (NIC: 100Gb)	1, 4	2
Mellanox (NIC: 100Gb)	1, 4	2
Broadcom (NIC: 100Gb)	1, 4	2
Intel (NIC:25Gb)	1, 4	2
Intel (NIC:25Gb)	1, 4	2
Mellanox (NIC:25Gb)	1, 4	2
Broadcom (NIC:25Gb)	1, 4	2
Broadcom (HBA:FC64)	1, 4	2
Broadcom (HBA:FC64)	1, 4	2
Broadcom (HBA:FC32)	1, 4	2
Broadcom (HBA:FC32)	1, 4	2
Broadcom (HBA:FC32)	1, 4	2

Table 88. Riser configurations: System without riser - Configuration1 SAS/SATA (continued)

Card type	Slot Priority	Maximum number of cards
Broadcom (HBA:FC32)	1, 4	2
Qlogic (HBA:FC32)	1, 4	2
Marvell (HBA:FC32)	1, 4	2
Broadcom (NIC:10Gb)	1, 4	2
Broadcom (NIC:10Gb)	1, 4	2
Broadcom (NIC:10Gb)	1, 4	2
Intel (NIC:10Gb)	1, 4	2
Intel (NIC:10Gb)	1, 4	2
Intel (NIC:1Gb)	1, 4	2
Intel (NIC:1Gb)	1, 4	2
Broadcom (NIC:1Gb)	1, 4	2
Intel (OCP:25Gb)	Integrated slot	1
Intel (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:25Gb)	Integrated slot	1
Intel (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:10Gb)	Integrated slot	1
Intel (OCP:10Gb)	Integrated slot	1
Broadcom (OCP:1Gb)	Integrated slot	1
Intel (OCP:1Gb)	Integrated slot	1
Broadcom (OCP:1Gb)	Integrated slot	1
FOXCONN (BOSS N1)	Integrated slot	1
FOXCONN (BOSS N1)	Integrated slot	2

Table 89. Riser configurations: System without riser - Configuration1 NVMe

Card type	Slot Priority	Maximum number of cards
FOXCONN (aPERC 11)	4, 5	2
FOXCONN (aPERC HBA11)	4, 5	2
FOXCONN (aPERC HBA11)	4, 5	2
FOXCONN (aPERC 11)	4, 5	2
FOXCONN (aPERC 12)	4, 5	2
FOXCONN (aPERC HBA12)	4, 5	2
FOXCONN (aPERC HBA11)	1, 4	2
FOXCONN (aPERC HBA11)	1, 4	2
FOXCONN (aPERC 12)	1, 4	2
FOXCONN (aPERC HBA12)	1, 4	2
Intel (NIC:100Gb)	1, 4	2
Intel (NIC:100Gb)	1, 4	2

Table 89. Riser configurations: System without riser - Configuration1 NVMe (continued)

Card type	Slot Priority	Maximum number of cards
Mellanox (NIC: 100Gb)	1, 4	2
Mellanox (NIC: 100Gb)	1, 4	2
Broadcom (NIC: 100Gb)	1, 4	2
Intel (NIC:25Gb)	1, 4	2
Intel (NIC:25Gb)	1, 4	2
Mellanox (NIC:25Gb)	1, 4	2
Broadcom (NIC:25Gb)	1, 4	2
Broadcom (HBA:FC64)	1, 4	2
Broadcom (HBA:FC64)	1, 4	2
Broadcom (HBA:FC32)	1, 4	2
Broadcom (HBA:FC32)	1, 4	2
Broadcom (HBA:FC32)	1, 4	2
Broadcom (HBA:FC32)	1, 4	2
Broadcom (HBA:FC32)	1, 4	2
Qlogic (HBA:FC32)	1, 4	2
Marvell (HBA:FC32)	1, 4	2
Broadcom (NIC:10Gb)	1, 4	2
Broadcom (NIC:10Gb)	1, 4	2
Broadcom (NIC:10Gb)	1, 4	2
Intel (NIC:10Gb)	1, 4	2
Intel (NIC:10Gb)	1, 4	2
Intel (NIC:1Gb)	1, 4	2
Intel (NIC:1Gb)	1, 4	2
Broadcom (NIC:1Gb)	1, 4	2
Intel (OCP:25Gb)	Integrated slot	1
Intel (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:25Gb)	Integrated slot	1
Intel (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:10Gb)	Integrated slot	1
Intel (OCP:10Gb)	Integrated slot	1
Broadcom (OCP:1Gb)	Integrated slot	1
Intel (OCP:1Gb)	Integrated slot	1
Broadcom (OCP:1Gb)	Integrated slot	1
FOXCONN (BOSS N1)	Integrated slot	1
FOXCONN (BOSS N1)	Integrated slot	2

Table 90. Riser configurations: System without riser : Configuration 2A,2B and 2C

Card type	Slot Priority	Maximum number of cards
FOXCONN (aPERC 11)	4, 5	2
FOXCONN (aPERC HBA11)	4, 5	2
FOXCONN (aPERC HBA11)	4, 5	2
FOXCONN (aPERC 11)	4, 5	2
FOXCONN (aPERC 12)	4, 5	2
FOXCONN (aPERC HBA12)	4, 5	2
FOXCONN (aPERC HBA11)	1, 3, 4	3
FOXCONN (aPERC HBA11)	1, 3, 4	3
FOXCONN (aPERC 12)	1, 3, 4	3
FOXCONN (aPERC HBA12)	1, 3, 4	3
Intel (NIC:100Gb)	1, 3, 4	3
Intel (NIC:100Gb)	1, 3, 4	3
Mellanox (NIC: 100Gb)	1, 3, 4	3
Mellanox (NIC: 100Gb)	1, 3, 4	3
Broadcom (NIC: 100Gb)	1, 3, 4	3
Intel (NIC:25Gb)	1, 2, 3, 4	4
Intel (NIC:25Gb)	1, 2, 3, 4	4
Mellanox (NIC:25Gb)	1, 2, 3, 4	3
Broadcom (NIC:25Gb)	1, 2, 3, 4	4
Broadcom (HBA:FC64)	1, 2, 3, 4	4
Broadcom (HBA:FC64)	1, 2, 3, 4	4
Broadcom (HBA:FC32)	1, 2, 3, 4	4
Broadcom (HBA:FC32)	1, 2, 3, 4	4
Broadcom (HBA:FC32)	1, 2, 3, 4	4
Broadcom (HBA:FC32)	1, 2, 3, 4	4
Qlogic (HBA:FC32)	1, 2, 3, 4	4
Marvell (HBA:FC32)	1, 2, 3, 4	4
Broadcom (NIC:10Gb)	1, 2, 3, 4	4
Broadcom (NIC:10Gb)	1, 2, 3, 4	4
Broadcom (NIC:10Gb)	1, 2, 3, 4	4
Intel (NIC:10Gb)	1, 2, 3, 4	4
Intel (NIC:10Gb)	1, 2, 3, 4	4
Intel (NIC:1Gb)	1, 2, 3, 4	4
Intel (NIC:1Gb)	1, 2, 3, 4	4
Broadcom (NIC:1Gb)	1, 2, 3, 4	4
Intel (OCP:25Gb)	Integrated slot	1
Intel (OCP:25Gb)	Integrated slot	1

Table 90. Riser configurations: System without riser : Configuration 2A,2B and 2C (continued)

Card type	Slot Priority	Maximum number of cards
Broadcom (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:25Gb)	Integrated slot	1
Intel (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:10Gb)	Integrated slot	1
Intel (OCP:10Gb)	Integrated slot	1
Broadcom (OCP:1Gb)	Integrated slot	1
Intel (OCP:1Gb)	Integrated slot	1
Broadcom (OCP:1Gb)	Integrated slot	1
FOXCONN (BOSS N1)	Integrated slot	1
FOXCONN (BOSS N1)	Integrated slot	2

Table 91. Riser configurations: Configuration 3A - Low Profile, Full Length Riser

Card type	Slot Priority	Maximum number of cards
FOXCONN (aPERC 11)	4, 5	2
FOXCONN (aPERC HBA11)	4, 5	2
FOXCONN (aPERC HBA11)	4, 5	2
FOXCONN (aPERC 11)	4, 5	2
FOXCONN (aPERC 12)	4, 5	2
FOXCONN (aPERC HBA12)	4, 5	2
FOXCONN (aPERC HBA11)	1, 4	2
FOXCONN (aPERC HBA11)	1, 4	2
FOXCONN (aPERC 12)	1, 4	2
FOXCONN (aPERC HBA12)	1, 4	2
Intel (NIC:100Gb)	2, 3	2
Intel (NIC:100Gb)	1, 4	2
Intel (NIC:100Gb)	1, 4	2
Intel (NIC:100Gb)	2, 3	2
Mellanox (NIC: 100Gb)	2, 3	2
Mellanox (NIC: 100Gb)	1, 4	2
Mellanox (NIC: 100Gb)	2, 3	2
Mellanox (NIC: 100Gb)	1, 4	2
Broadcom (NIC: 100Gb)	1, 4	2
Broadcom (NIC: 100Gb)	2, 3	2
Broadcom (NIC:25Gb)	2, 3	2
Intel (NIC:25Gb)	1, 4	2
Intel (NIC:25Gb)	1, 4	2
Intel (NIC:25Gb)	2, 3	2
Intel (NIC:25Gb)	2, 3	2

Table 91. Riser configurations: Configuration 3A - Low Profile, Full Length Riser (continued)

Card type	Slot Priority	Maximum number of cards
Intel (NIC:25Gb)	2, 3	2
Mellanox (NIC:25Gb)	1, 4	2
Mellanox (NIC:25Gb)	2, 3	2
Broadcom (NIC:25Gb)	1, 4	2
Broadcom (NIC:25Gb)	2, 3	2
Broadcom (HBA:FC64)	1, 4	2
Broadcom (HBA:FC64)	1, 4	2
Broadcom (HBA:FC64)	2, 3	2
Broadcom (HBA:FC64)	2, 3	2
Broadcom (HBA:FC32)	1, 4	2
Broadcom (HBA:FC32)	1, 4	2
Qlogic (HBA:FC32)	2, 3	2
Qlogic (HBA:FC32)	2, 3	2
Broadcom (HBA:FC32)	1, 4	2
Broadcom (HBA:FC32)	1, 4	2
Broadcom (HBA:FC32)	2, 3	2
Broadcom (HBA:FC32)	2, 3	2
Broadcom (HBA:FC32)	2, 3	2
Qlogic (HBA:FC32)	1, 4	2
Marvell (HBA:FC32)	1, 4	2
Broadcom (NIC:10Gb)	1, 4	2
Broadcom (NIC:10Gb)	2, 3	2
Broadcom (NIC:10Gb)	1, 4	2
Broadcom (NIC:10Gb)	2, 3	2
Broadcom (NIC:10Gb)	1, 4	2
Broadcom (NIC:10Gb)	2, 3	2
Intel (NIC:10Gb)	1, 4	2
Intel (NIC:10Gb)	2, 3	2
Intel (NIC:10Gb)	2, 3	2
Intel (NIC:10Gb)	2, 3	2
Intel (NIC:10Gb)	2, 3	2
Intel (NIC:10Gb)	1, 4	2
Intel (NIC:10Gb)	1, 4	2
Intel (NIC:1Gb)	2, 3	2
Intel (NIC:1Gb)	1, 4	2
Intel (NIC:1Gb)	1, 4	2
Intel (NIC:1Gb)	2, 3	2

Table 91. Riser configurations: Configuration 3A - Low Profile, Full Length Riser (continued)

Card type	Slot Priority	Maximum number of cards
Broadcom (NIC:1Gb)	1, 4	2
Broadcom (NIC:1Gb)	2, 3	2
Intel (OCP:25Gb)	Integrated slot	1
Intel (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:25Gb)	Integrated slot	1
Intel (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:10Gb)	Integrated slot	1
Intel (OCP:10Gb)	Integrated slot	1
Broadcom (OCP:1Gb)	Integrated slot	1
Intel (OCP:1Gb)	Integrated slot	1
Broadcom (OCP:1Gb)	Integrated slot	1
FOXCONN (BOSS N1)	Integrated slot	1
FOXCONN (BOSS N1)	Integrated slot	2
Pensando (SmartNIC (PCIe))	2	1
Pensando (SmartNIC (PCIe))	2	1
Mellanox (SmartNIC (PCIe))	2	1
NVIDIA (GPU)	3	1
NVIDIA (GPU)	3	1
NVIDIA (GPU)	2, 3	2
NVIDIA (GPU)	2, 3	2
NVIDIA (GPU)	2, 3	2

Table 92. Riser configurations: Configuration 3B and3C - Low Profile, Full Length Riser

Card type	Slot Priority	Maximum number of cards
FOXCONN (aPERC 11)	4, 5	2
FOXCONN (aPERC HBA11)	4, 5	2
FOXCONN (aPERC HBA11)	4, 5	2
FOXCONN (aPERC 11)	4, 5	2
FOXCONN (aPERC 12)	4, 5	2
FOXCONN (aPERC HBA12)	4, 5	2
FOXCONN (aPERC HBA11)	4	1
FOXCONN (aPERC HBA11)	4	1
FOXCONN (aPERC 12)	4	1
FOXCONN (aPERC HBA12)	4	1
Intel (NIC:100Gb)	2, 3	2
Intel (NIC:100Gb)	4	1
Intel (NIC:100Gb)	4	1

Table 92. Riser configurations: Configuration 3B and 3C - Low Profile, Full Length Riser (continued)

Card type	Slot Priority	Maximum number of cards
Intel (NIC:100Gb)	2, 3	2
Mellanox (NIC: 100Gb)	2, 3	2
Mellanox (NIC: 100Gb)	4	1
Mellanox (NIC: 100Gb)	2, 3	2
Mellanox (NIC: 100Gb)	4	1
Broadcom (NIC: 100Gb)	4	1
Broadcom (NIC: 100Gb)	2, 3	2
Broadcom (NIC:25Gb)	2, 3	2
Intel (NIC:25Gb)	4	1
Intel (NIC:25Gb)	4	1
Intel (NIC:25Gb)	2, 3	2
Intel (NIC:25Gb)	2, 3	2
Intel (NIC:25Gb)	2, 3	2
Mellanox (NIC:25Gb)	4	1
Mellanox (NIC:25Gb)	2, 3	2
Broadcom (NIC:25Gb)	4	1
Broadcom (NIC:25Gb)	2, 3	2
Broadcom (HBA:FC64)	4	1
Broadcom (HBA:FC64)	4	1
Broadcom (HBA:FC64)	2, 3	2
Broadcom (HBA:FC64)	2, 3	2
Broadcom (HBA:FC32)	4	1
Broadcom (HBA:FC32)	4	1
Qlogic (HBA:FC32)	2, 3	2
Qlogic (HBA:FC32)	2, 3	2
Broadcom (HBA:FC32)	4	1
Broadcom (HBA:FC32)	4	1
Broadcom (HBA:FC32)	2, 3	2
Broadcom (HBA:FC32)	2, 3	2
Broadcom (HBA:FC32)	2, 3	2
Qlogic (HBA:FC32)	4	1
Marvell (HBA:FC32)	4	1
Broadcom (NIC:10Gb)	4	1
Broadcom (NIC:10Gb)	2, 3	2
Broadcom (NIC:10Gb)	4	1
Broadcom (NIC:10Gb)	2, 3	2
Broadcom (NIC:10Gb)	4	1

Table 92. Riser configurations: Configuration 3B and 3C - Low Profile, Full Length Riser (continued)

Card type	Slot Priority	Maximum number of cards
Broadcom (NIC:10Gb)	2, 3	2
Intel (NIC:10Gb)	4	1
Intel (NIC:10Gb)	2, 3	2
Intel (NIC:10Gb)	2, 3	2
Intel (NIC:10Gb)	2, 3	2
Intel (NIC:10Gb)	2, 3	2
Intel (NIC:10Gb)	4	1
Intel (NIC:10Gb)	4	1
Intel (NIC:1Gb)	2, 3	2
Intel (NIC:1Gb)	4	1
Intel (NIC:1Gb)	4	1
Intel (NIC:1Gb)	2, 3	2
Broadcom (NIC:1Gb)	4	1
Broadcom (NIC:1Gb)	2, 3	2
Intel (OCP:25Gb)	Integrated slot	1
Intel (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:25Gb)	Integrated slot	1
Intel (OCP:25Gb)	Integrated slot	1
Broadcom (OCP:10Gb)	Integrated slot	1
Intel (OCP:10Gb)	Integrated slot	1
Broadcom (OCP:1Gb)	Integrated slot	1
Intel (OCP:1Gb)	Integrated slot	1
Broadcom (OCP:1Gb)	Integrated slot	1
FOXCONN (BOSS N1)	Integrated slot	1
FOXCONN (BOSS N1)	Integrated slot	2
Pensando (SmartNIC (PCIe))	2	1
Pensando (SmartNIC (PCIe))	2	1
Mellanox (SmartNIC (PCIe))	2	1
NVIDIA (GPU)	3	1
NVIDIA (GPU)	3	1
NVIDIA (GPU)	2, 3	2
NVIDIA (GPU)	2, 3	2
NVIDIA (GPU)	2, 3	2

Removing expansion card from the system board

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).

Steps

1. Lift up the expansion card retention latch to open.
2. Hold the expansion card by the edges and lift the card to disconnect it from the system board connector.

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

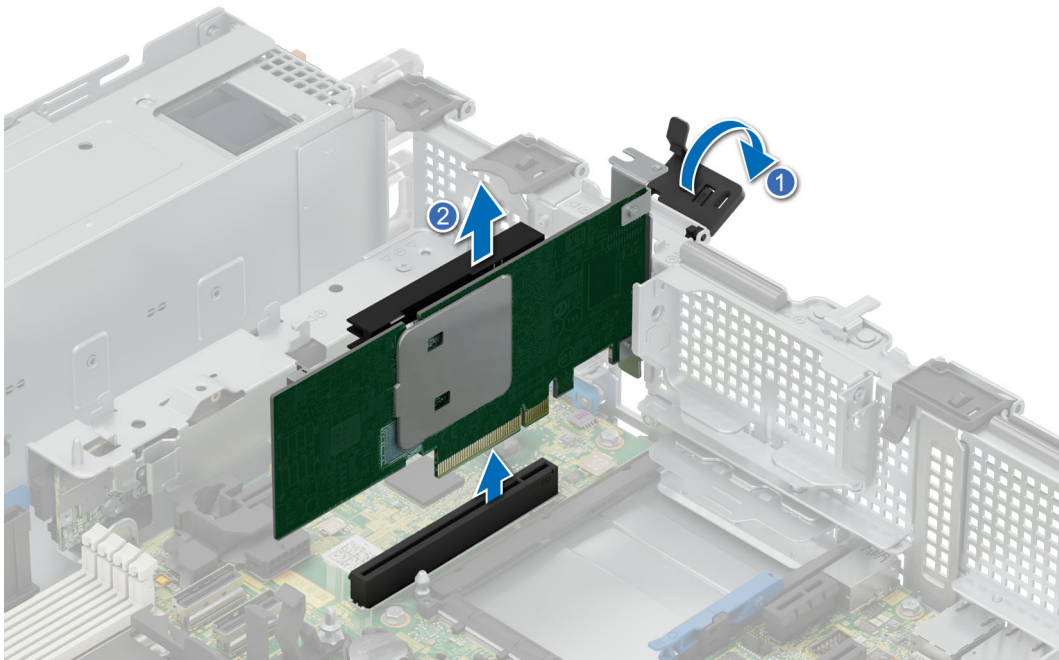


Figure 126. Removing expansion card from system board

3. If the expansion card is not going to be replaced, install a filler bracket by performing the following steps:
 - a. Align the filler bracket with the slot on the system.
 - b. Push the filler bracket downward until firmly seated.
 - c. Close the retention latch by pressing the latch down until the latch snaps into place.

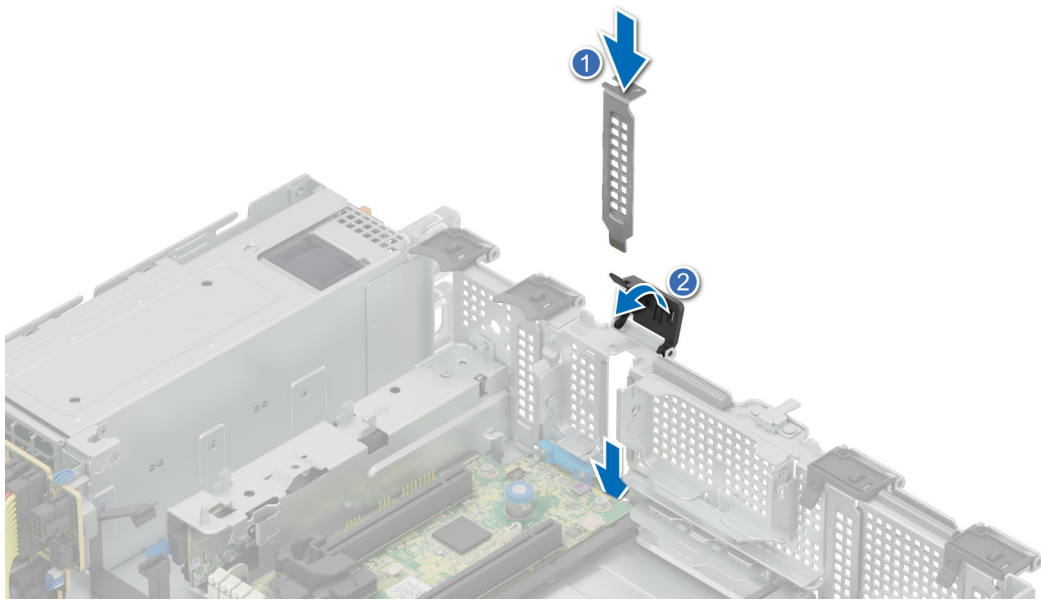


Figure 127. Installing the filler bracket

NOTE: Filler brackets must be installed over empty expansion card slots to maintain FCC certification of the system. The brackets also keep dust out of the system and aid in proper cooling and airflow inside the system.

Next steps

1. [Install an expansion card on system board.](#)

Removing expansion card or GPU from the expansion card riser

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. Disconnect the system from the electrical outlet, and disconnect the peripherals.
4. [Remove the expansion card riser from the system](#)

Steps

1. To remove an expansion card or GPU from a full length riser.
 - a. Open the three retention holders.
 - b. Hold the expansion card or the GPU by its edges, and pull it away 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.

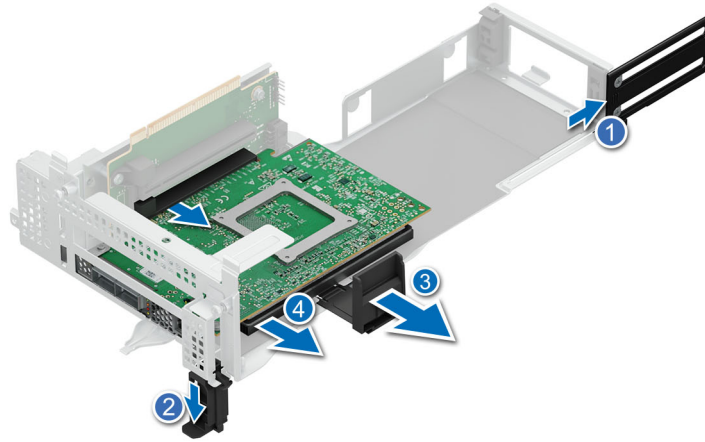


Figure 128. Removing expansion card from full length riser

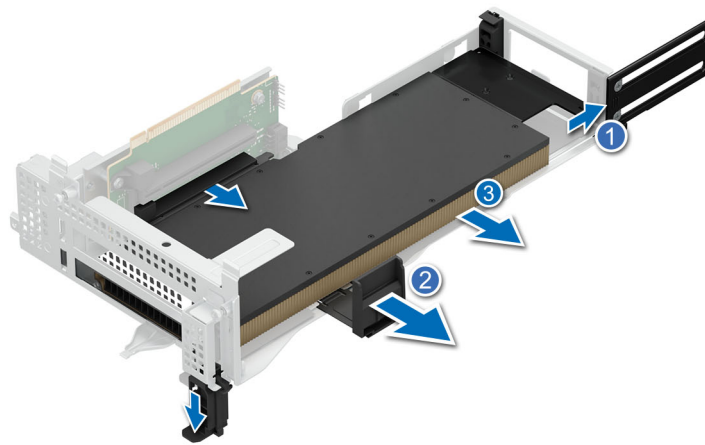


Figure 129. Removing GPU card from full length riser

2. If the expansion card or GPU is not going to be replaced, install a filler bracket.
 - a. Insert the filler bracket in the riser.
 - b. Close the retention holder.

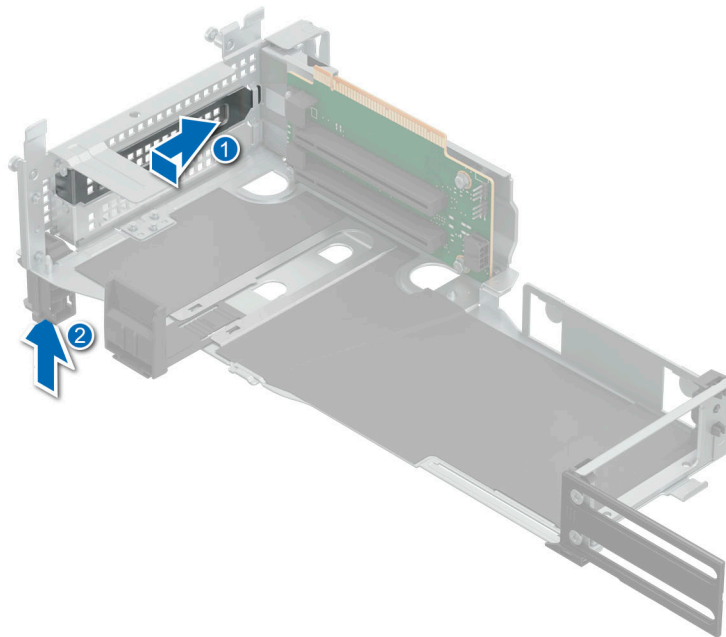


Figure 130. Installing filler bracket for full length riser

Next steps

1. [Replace the expansion card in to the expansion card riser.](#)
2. If you are removing the card permanently, install a metal filler bracket over the empty expansion slot opening and push the expansion card latch.

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

Installing expansion card in to the expansion card riser

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. Disconnect the system from the electrical outlet, and disconnect the peripherals.
4. [Remove the expansion card riser from the system](#)

Steps

1. Open the expansion card retention holder.
2. 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.

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

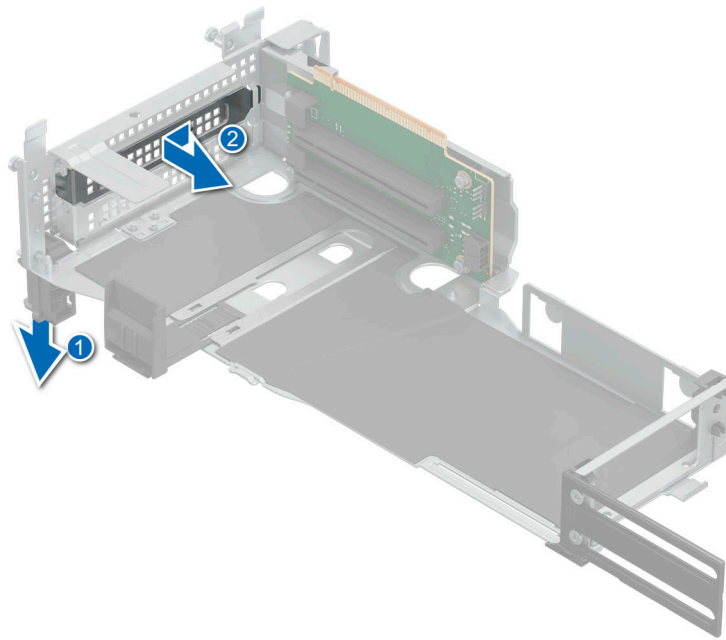


Figure 131. Removing filler bracket from full length riser

3. To Install an expansion card into full length riser.
 - a. Open the three retention holders.
 - b. Insert the card edge connector firmly into the expansion card connector until the card is fully seated.
 - c. Close the three expansion card retention holders for the full length riser and the two holders for the half length riser.

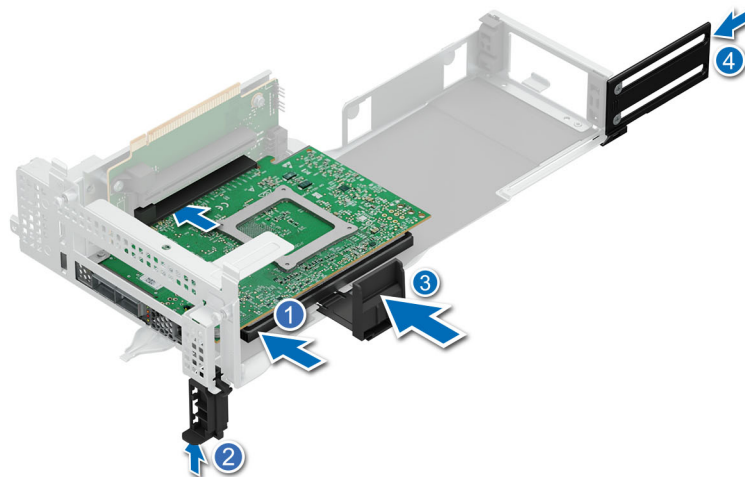


Figure 132. Installing expansion card into full length riser

4. To install a GPU in the full length riser.
 - a. Open the three retention holders.
 - b. Insert the GPU card edge connector firmly into the expansion card connector until the card is fully seated.
 - c. Close the three expansion card retention holders for the full length riser.

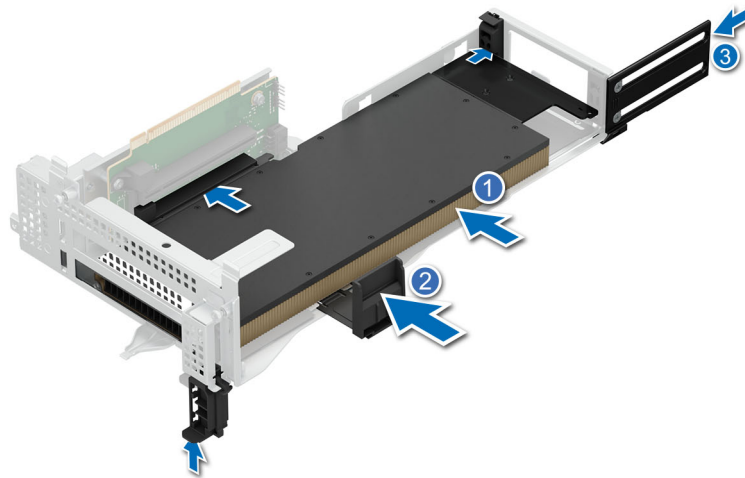


Figure 133. Installing GPU card into full length riser

NOTE: While installing an A30 GPU ensure that the card is seated firmly in the slide in slot of the riser.

Next steps

1. [Install the expansion card riser in the system](#)
2. If applicable, connect the cables to the expansion card.
3. [Install the cooling fan assembly.](#)
4. [Install the rear system cover .](#)
5. [Install the fan cover .](#)
6. Follow the procedure listed in [After working inside your system.](#)

Installing expansion card on the system board

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working on your system .](#)
3. [Remove the fan cover.](#)
4. [Remove the rear system cover.](#)

Steps

1. Unpack the expansion card and prepare it for installation.
For instructions, see the documentation accompanying the card.
2. If you are installing a new card, remove the filler bracket.
 - a. Lift the expansion card retention latch.
 - b. Pull the filler bracket upward out of the system.

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

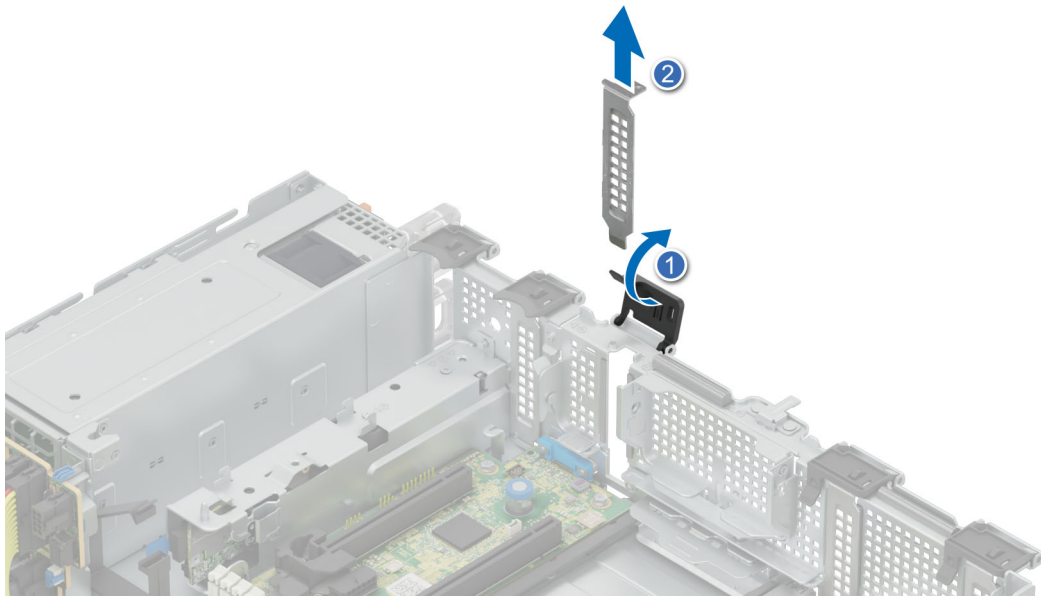


Figure 134. Removing the filler bracket

i NOTE: Store the filler bracket for future use. Filler brackets must be installed in empty expansion card slots to maintain 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.

3. Holding the card on the edges, align the card with the expansion card connector on the system board.
4. Press the expansion card firmly into the expansion card connector on the system board until the card is fully seated.
5. Close the retention latch by pressing the latch down until the latch snaps into place.

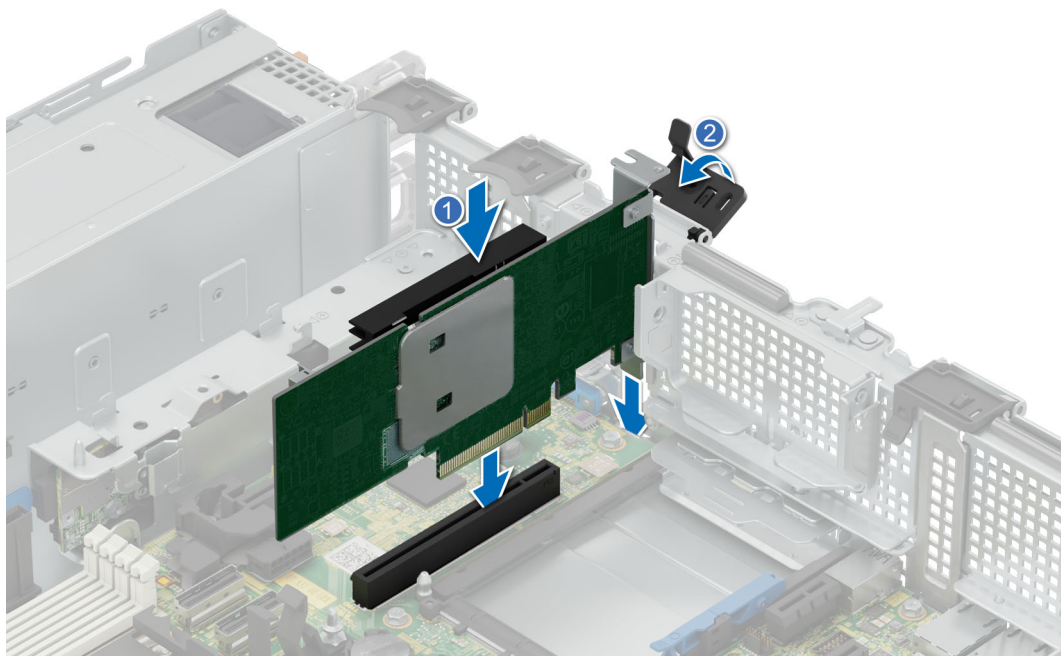


Figure 135. Installing expansion card on system board

Next steps

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

Removing an expansion card riser


Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. Disconnect any cables that are connected to the expansion card.

Steps

Remove the full length riser from the system.

- a. Loosen the three captive screws for the riser.
- b. Lift up the riser from the system.

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

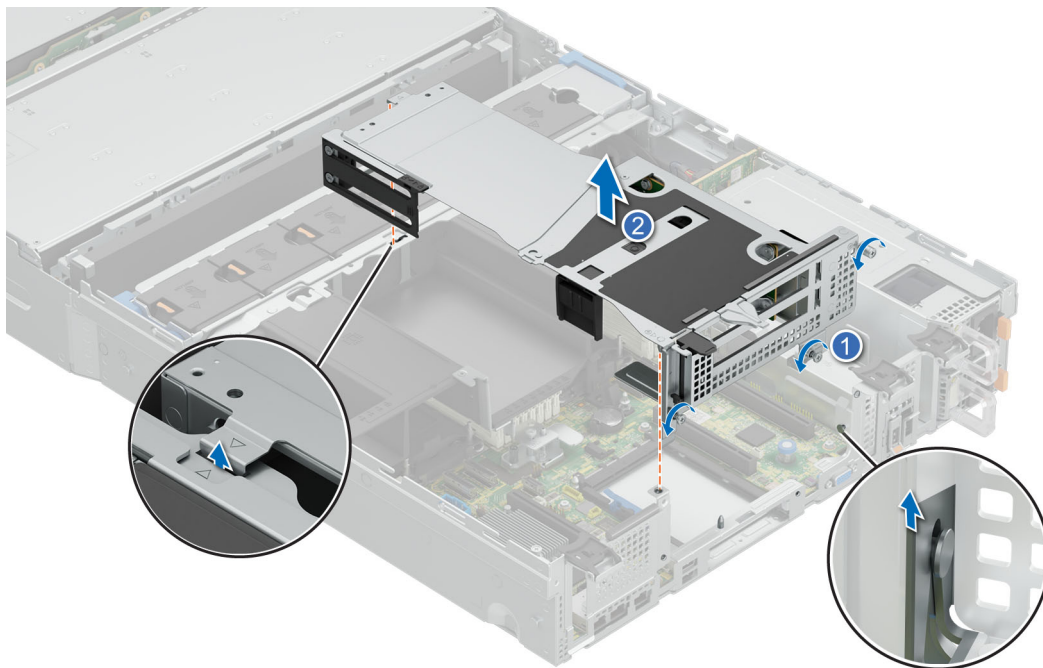


Figure 136. Removing full length riser

Next steps

[Install expansion card risers](#).

Installing an expansion card riser

Prerequisites

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

3. [Remove the fan cover.](#)
4. [Remove the rear system cover.](#)

Steps

1. If removed, install the expansion cards into the expansion card riser.
2. Install full length riser.
 - a. Align the two pins and the dog bone.
 - b. Lower the expansion card riser into place until the expansion card riser connector is fully seated in the connector.
 - c. Tighten the three captive screws.

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

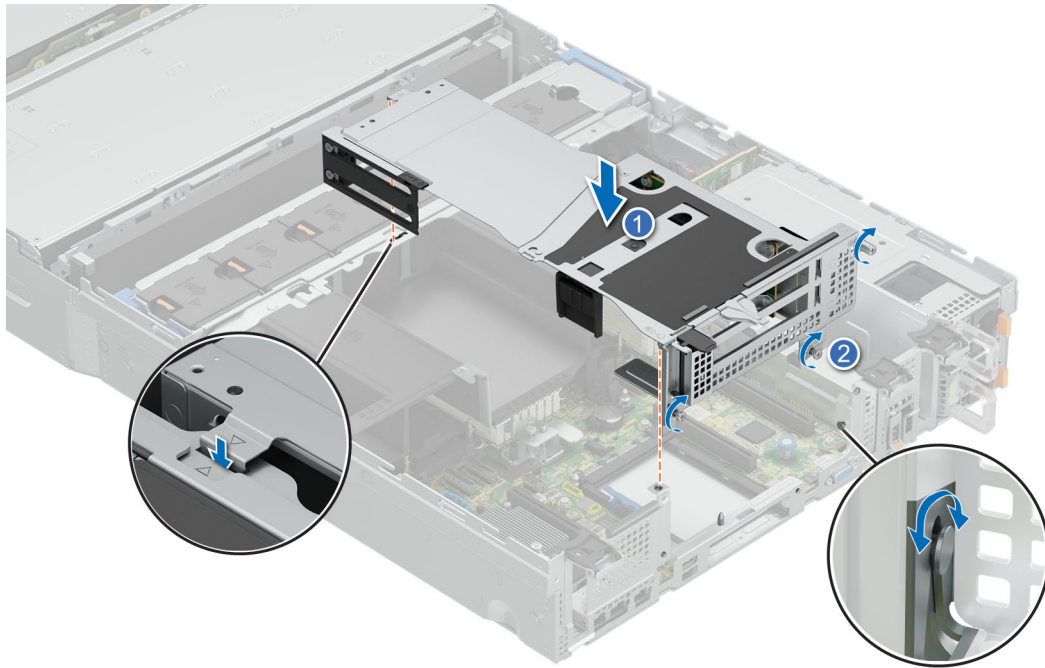


Figure 137. Installing full length riser

Next steps

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

PERC card

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

Removing the adapter PERC

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working on your system .](#)
3. [Remove the fan cover.](#)
4. [Remove the rear system cover.](#)

Steps

1. Removing the adapter PERC 11
 - a. Open the retention latch.
 - b. Hold the adapter PERC 11 by the edges and lift up from the system.

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

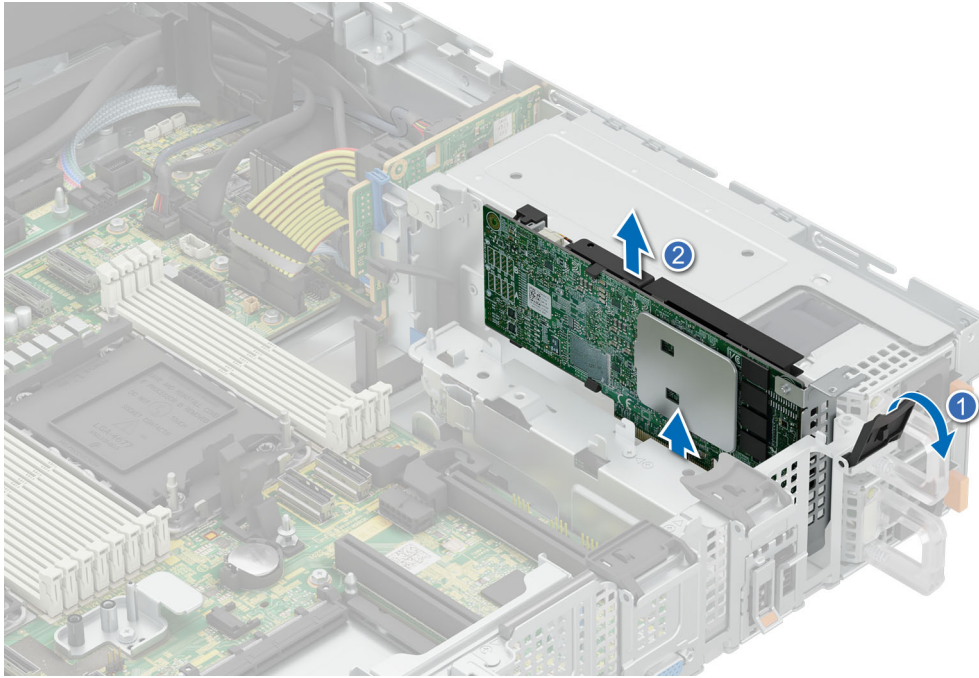


Figure 138. Removing the adapter PERC 11

2. Removing the adapter PERC 12
 - a. Open the retention latch.
 - b. Hold the adapter PERC 12 by the edges and lift up from the system.

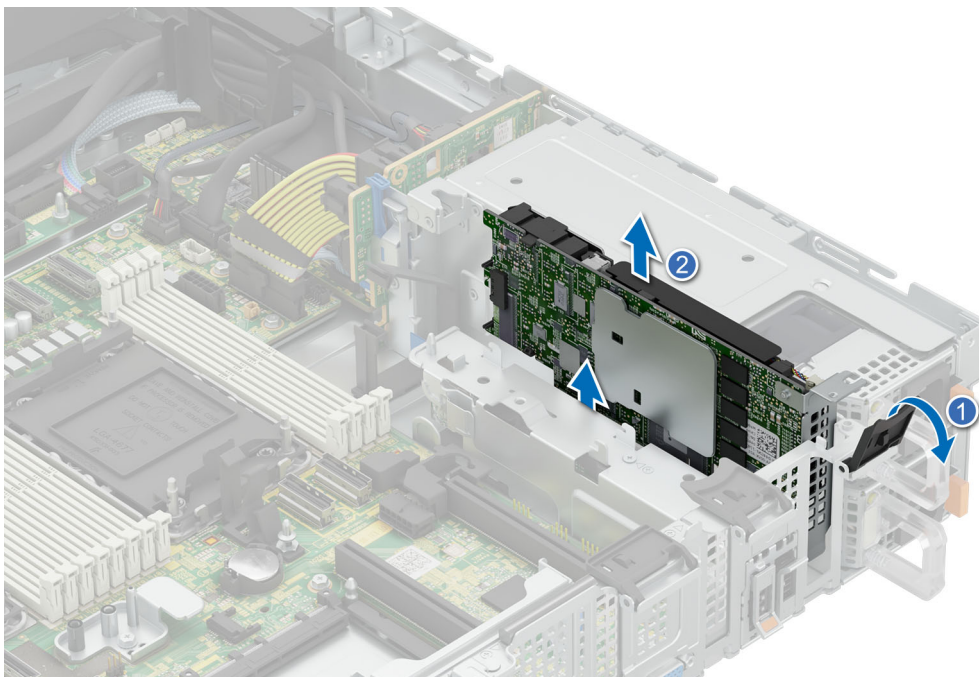


Figure 139. Removing the adapter PERC 12

Next steps

1. Install adapter PERC.

i **NOTE:** Install a blank if the PERC card is not being replaced.

Installing the adapter PERC

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. Remove the blank if installed.

Steps

1. Installing the adapter PERC 11
 - a. Hold the adapter PERC 11 by the edges and Align the connector on the adapter PERC with the connector on the system board.
 - b. Press the adapter PERC card firmly until it is fully seated.
 - c. Close the retention latch firmly till it clicks in place.

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

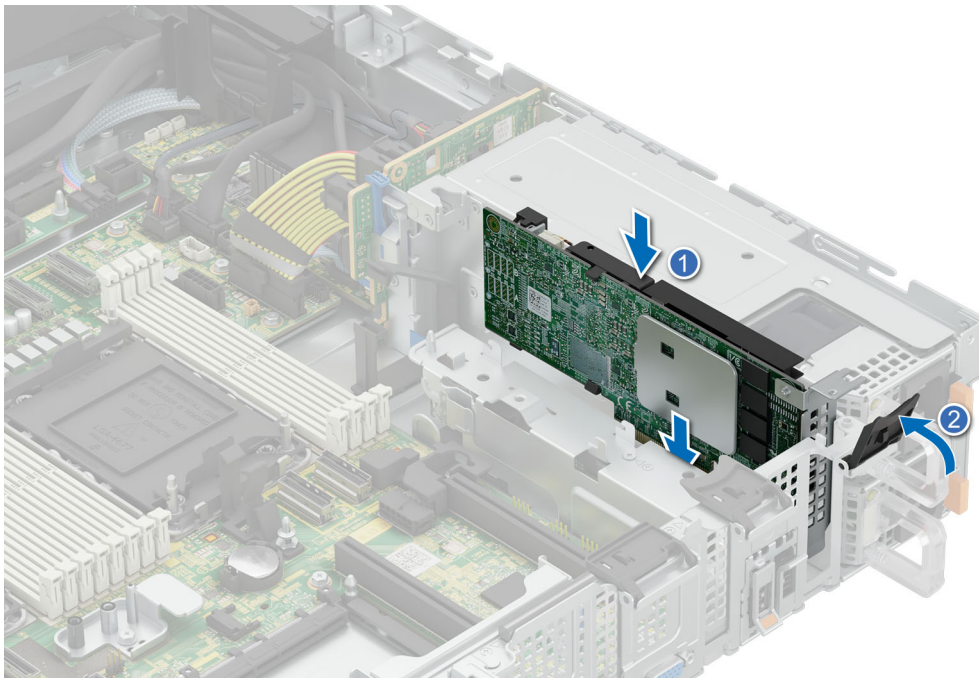


Figure 140. Installing the adapter PERC 11

2. Installing the adapter PERC 12
 - a. Hold the adapter PERC 12 by the edges and Align the connector on the adapter PERC with the connector on the system board.
 - b. Press the adapter PERC card firmly until it is fully seated.
 - c. Close the retention latch firmly till it clicks in place.

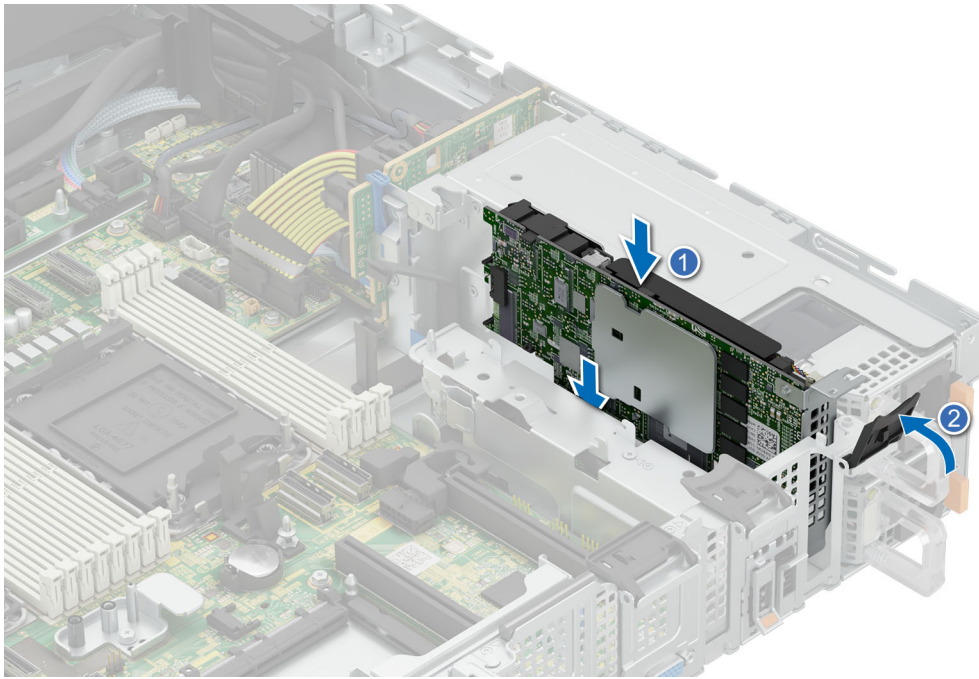


Figure 141. Installing the adapter PERC 12

NOTE: Should assemble PERC card vertically to prevent components touching with chassis and causing damage.

NOTE: PERC interposer has to be installed as PCIe Slot 5 to install adapter PERC on the system.

NOTE: PCIe Slot 5 is the dedicated slot for adapter PERC.

Next steps

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

Removing the PERC interposer

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#)

Steps

1. Disconnect the cables from the system board.
2. Loosen and remove the single screw securing the interposer.
3. Slide the interposer out of the latch and lift up from the system.

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

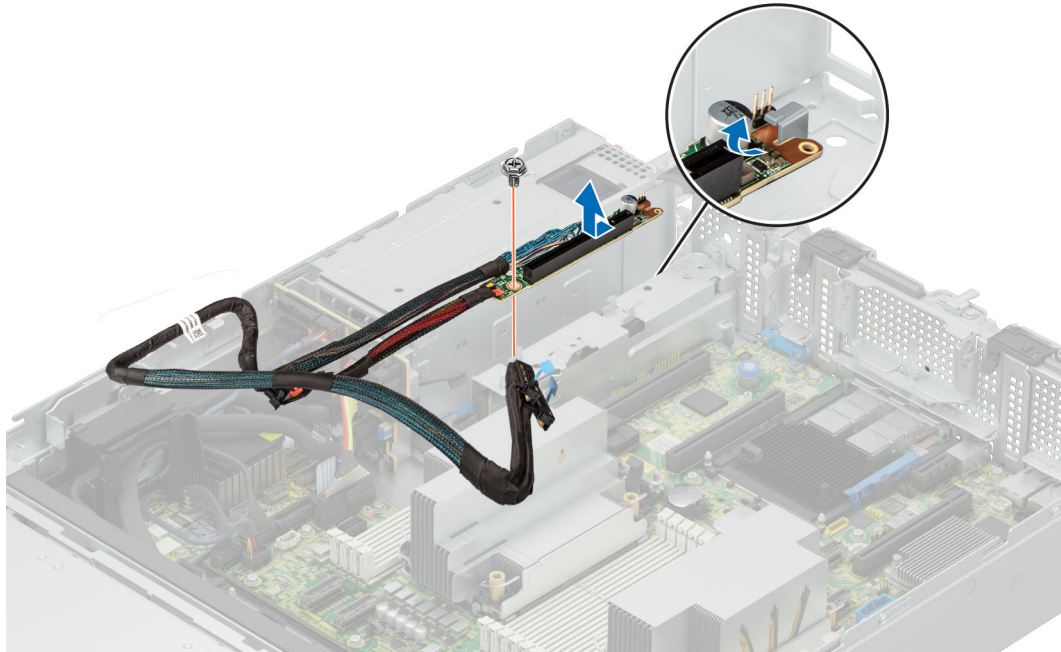


Figure 142. Removing the PERC interposer

Next steps

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

Installing the PERC interposer

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover.](#)
4. [Remove the rear system cover.](#)
5. [Remove the cooling fan assembly](#)

Steps

1. Slide the PERC interposer in to the notch on the system.
2. Insert and tighten the screw to secure the PERC interposer.
3. Connect the cables on to the system board.

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

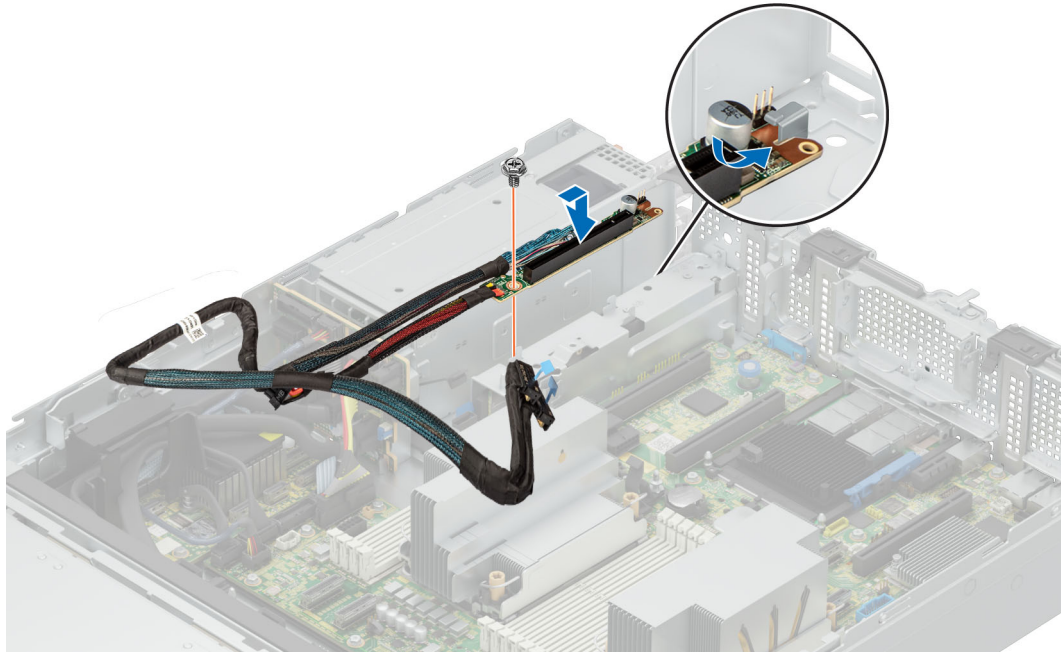


Figure 143. Installing the PERC interposer

Next steps

1. [Install the cooling fan assembly.](#)
2. [Install the rear system cover .](#)
3. [Install the fan cover .](#)
4. Follow the procedure listed in [After working inside your system.](#)

Optional BOSS-N1 module

Removing the BOSS N1 module

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working on your system .](#)
3. [Remove the fan cover](#)
4. [Remove the rear system cover](#)

Steps

1. Disconnect the cables from the BOSS N1 module.
2. Loosen the two screws.
3. Pull the BOSS N1 module out from the rear of the system.

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

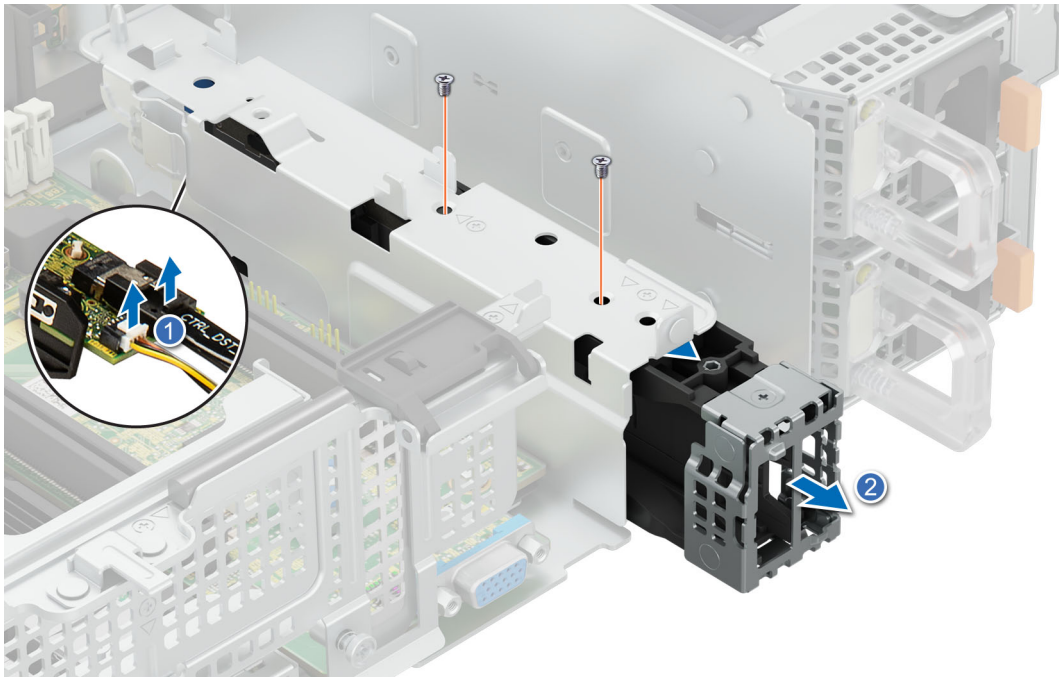


Figure 144. Removing the BOSS N1 module

Next steps

1. [Install the BOSS N1 module.](#)

Installing the BOSS N1 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 fan cover](#)
4. [Remove the rear system cover](#)

Steps

1. Insert the BOSS N1 module.
2. Connect the cables.
3. Tighten the two screws to secure the BOSS N1 module.

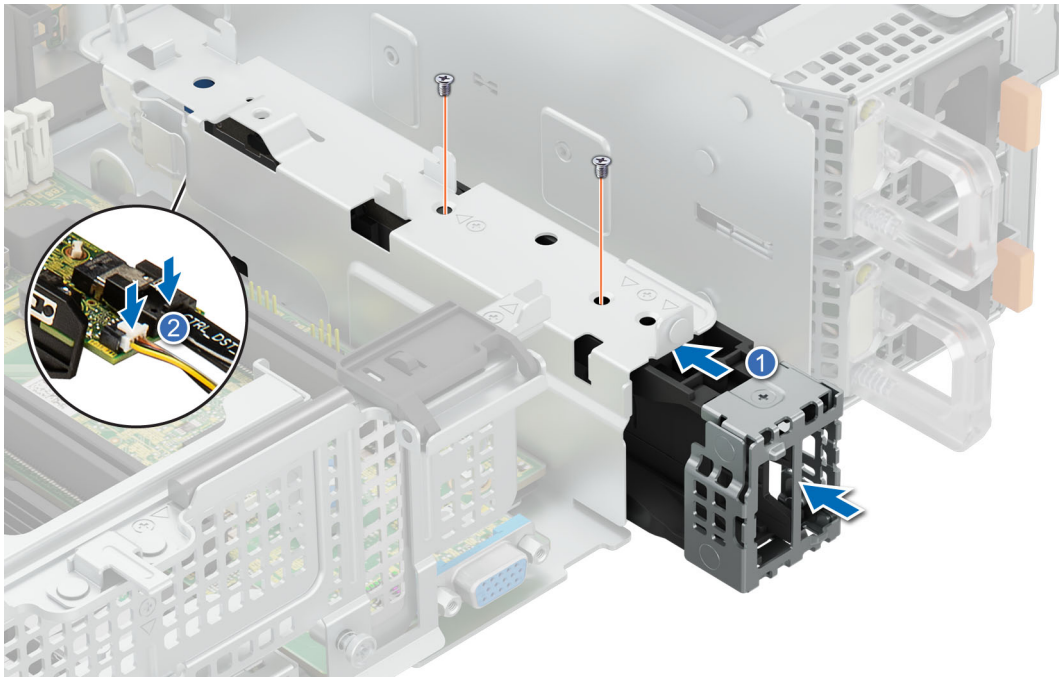


Figure 145. Installing the BOSS N1 module

Next steps

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

Removing the BOSS N1 blank

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working on your system .](#)
3. [Remove the fan cover.](#)
4. [Remove the system cover.](#)

Steps

Loosen the screw and pull the N1 BOSS blank out of the system.

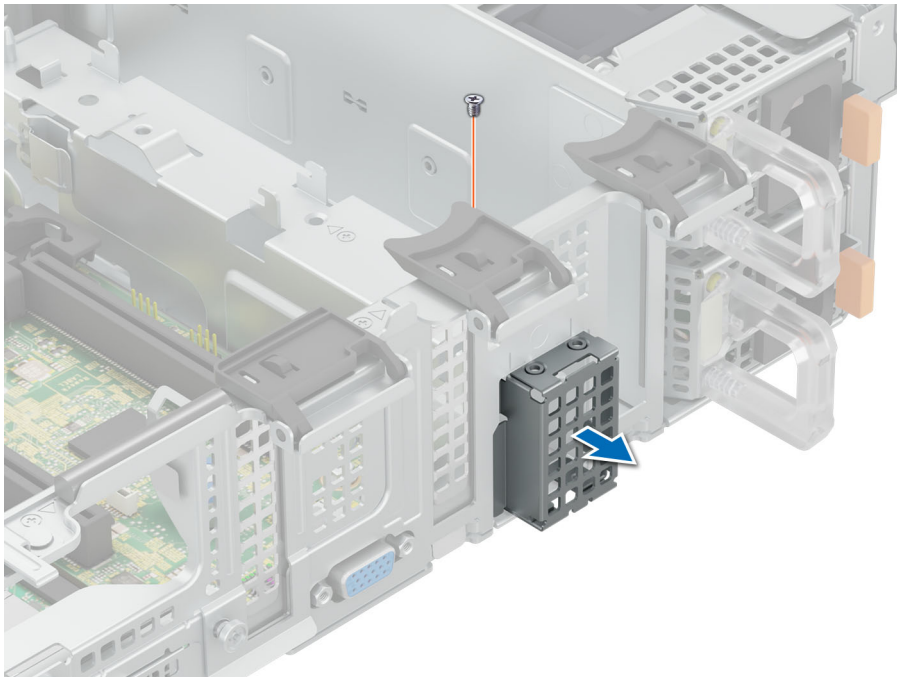


Figure 146. Removing the BOSS N1 blank

Next steps

1. [Install the N1 boss blank.](#)

Installing the BOSS N1 blank

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover.](#)
4. [Remove the system cover.](#)

Steps

Insert the BOSS N1 blank in to the system and tighten the screw to secure it.

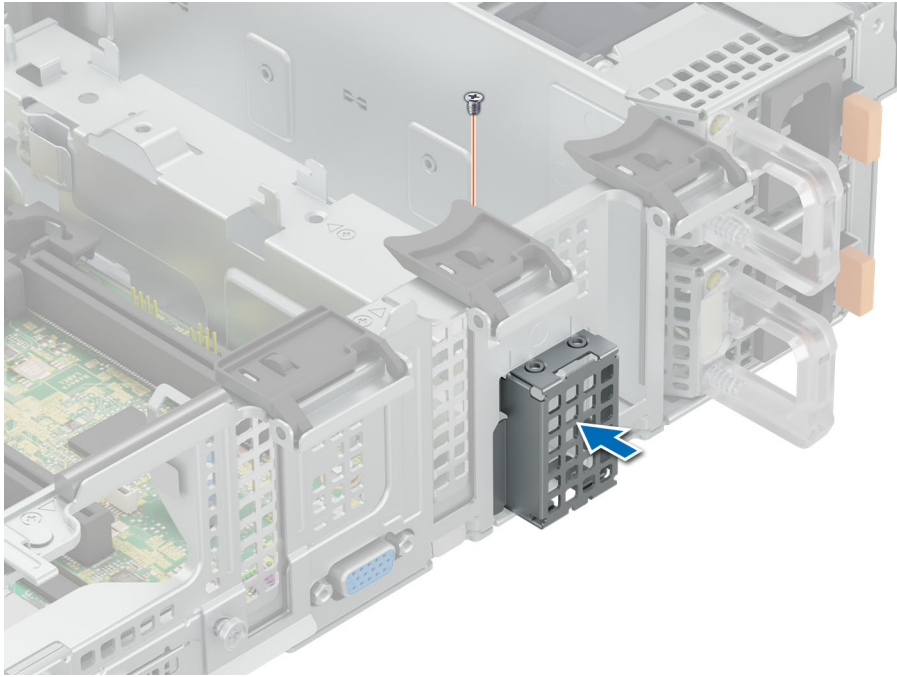


Figure 147. Installing the BOSS N1 blank

Next steps

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

System battery

This is a service technician replaceable part only.

Replacing the system battery

Prerequisites

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

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working on your system .](#)
3. [Remove the fan cover.](#)
4. [Remove the rear system cover.](#)
5. [Remove expansion card riser](#)(if installed)
6. [Remove the air shroud](#)

Steps

1. Locate the battery socket.

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

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

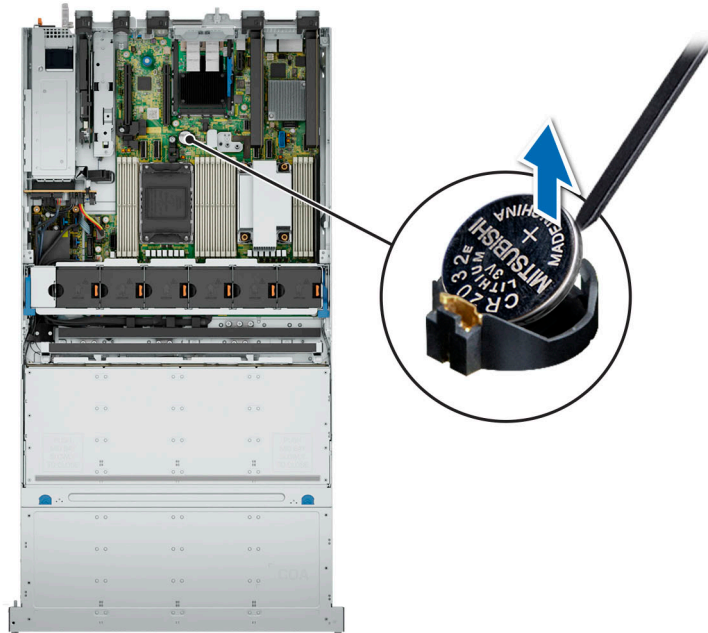


Figure 148. Removing the system battery

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

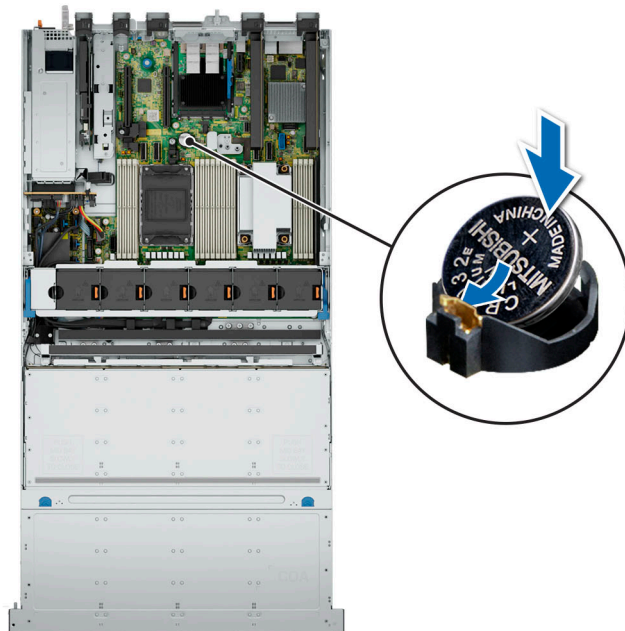


Figure 149. Installing the system battery

Next steps

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

Optional internal USB card

The R760xd2 supports the optional internal USB card in all configurations. For configuration 1 and 3, the USB connector board has to be installed to install the USB card.

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

Removing the optional internal USB card for configuration 2

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).

Steps

Hold the USB card by the edges and lift up to remove from the system board.

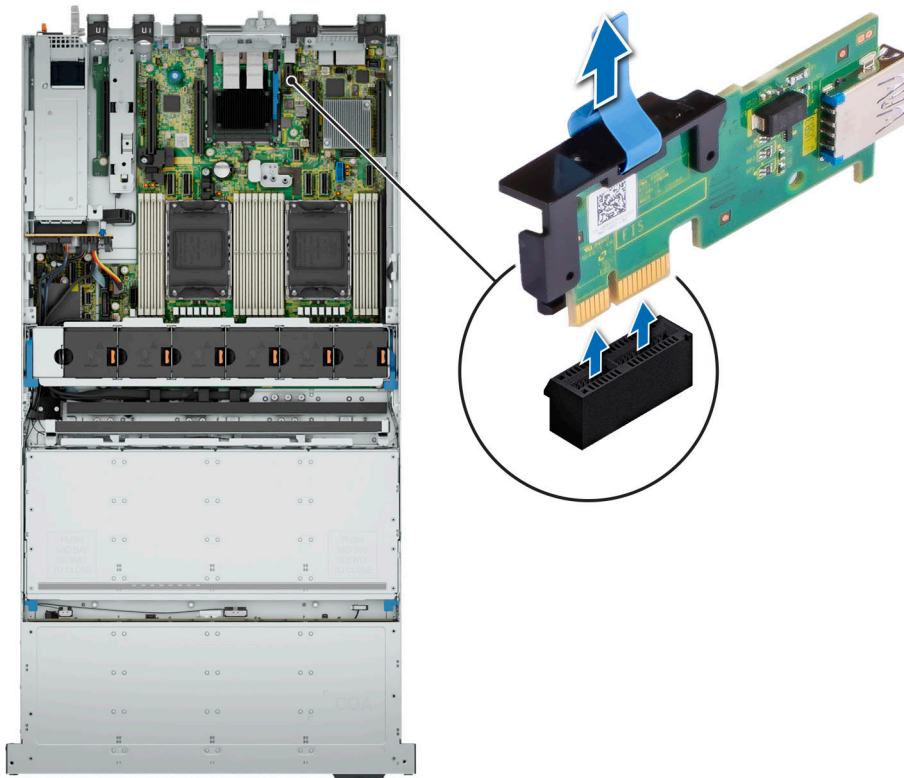


Figure 150. Removing the optional internal USB card

Next steps

Install the optional USB card .

Installing the optional internal USB card for configuration 2

Prerequisites

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

2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).

Steps

1. Align the connector on the internal USB card with the connector on the system board.
2. Press the internal USB card firmly until it is fully seated.

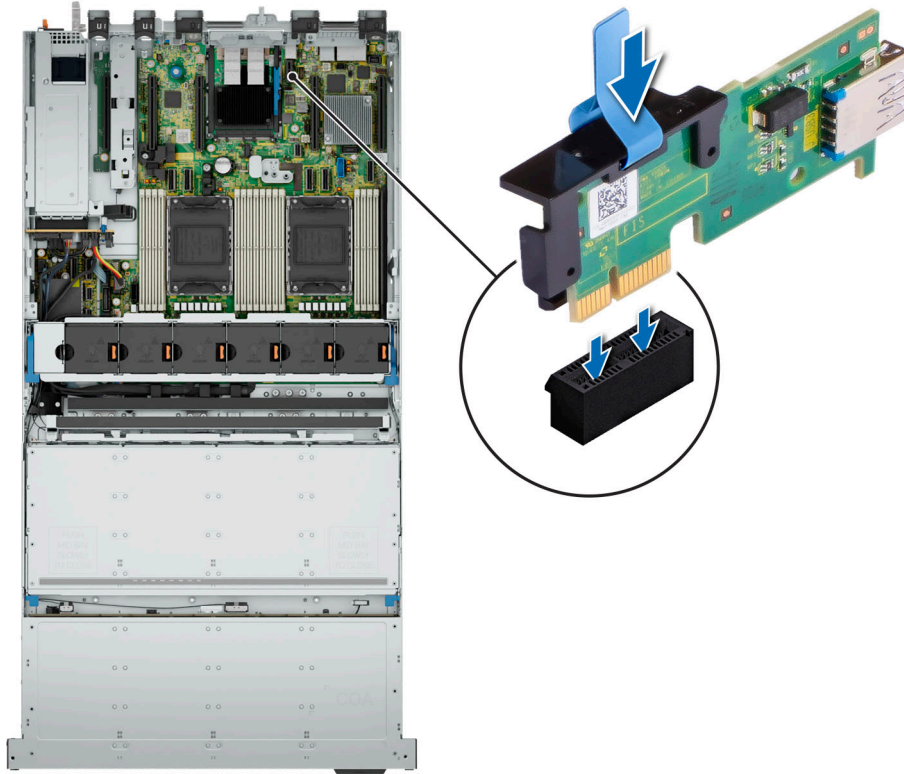


Figure 151. Installing the optional internal USB card

Next steps

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

Removing the optional internal USB card board for configuration 1 and 3

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. If installed [remove rear drive bay](#)

Steps

1. Disconnect the cable from the system board . Make note of the cable routing.

2. Pull the plunger to release the USB board from the chassis.
3. Slide the board out of the notch and lift up.

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

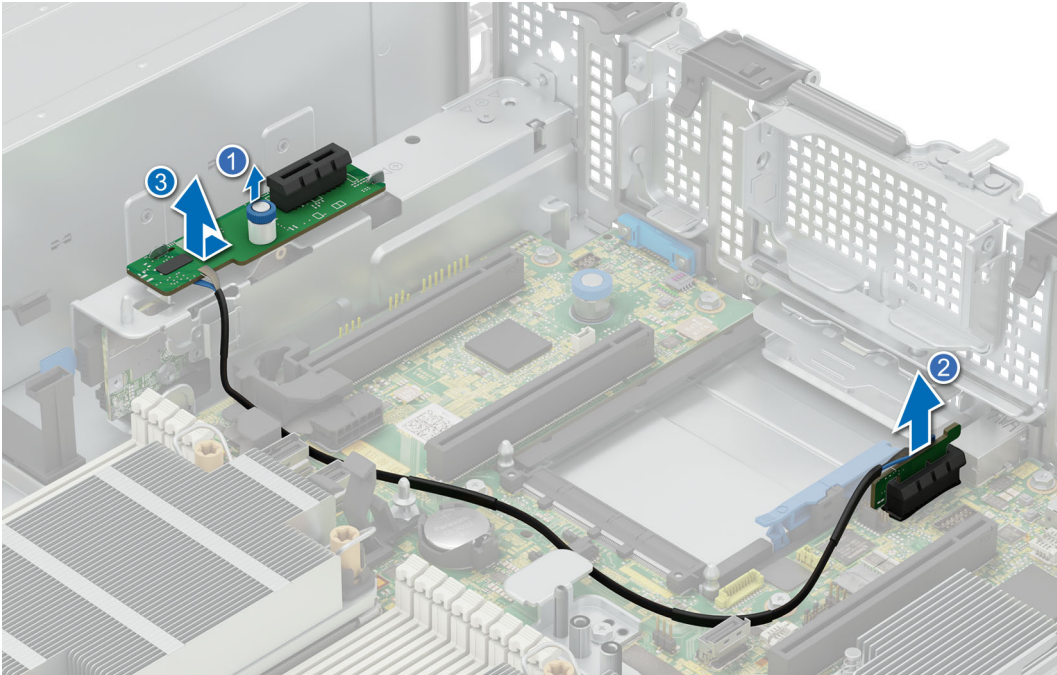


Figure 152. Removing the internal USB card board

Next steps

Install the internal USB card board .

Installing the optional internal USB card board for configuration 1 and 3

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. If installed [remove rear drive bay](#)

Steps

1. Slide the USB connector board in to the retention notch.
2. Press down the board for the plunger to click in place and secure the board.
3. Connect the cable to the system board.

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

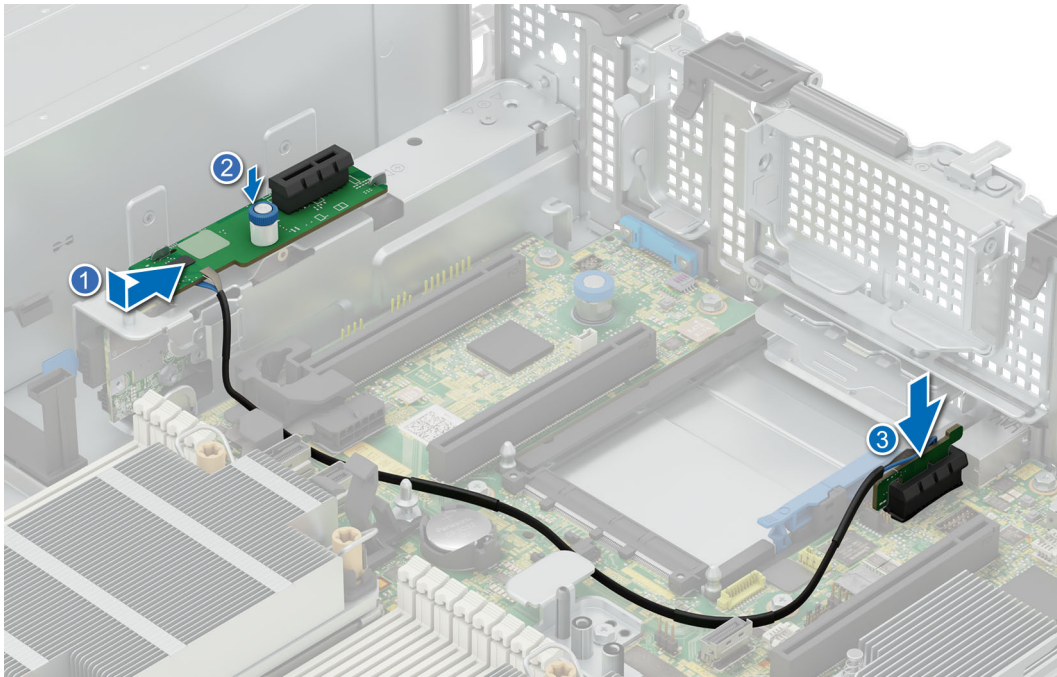


Figure 153. Installing the optional internal USB card board

Next steps

1. If removed [install rear drive bay](#)
2. [Install the rear system cover](#) .
3. [Install the fan cover](#) .
4. Follow the procedure listed in [After working inside your system](#).

Removing the optional internal USB card for configuration 1 and 3

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).

Steps

Hold the USB card by the edges and lift up to remove from the USB board.

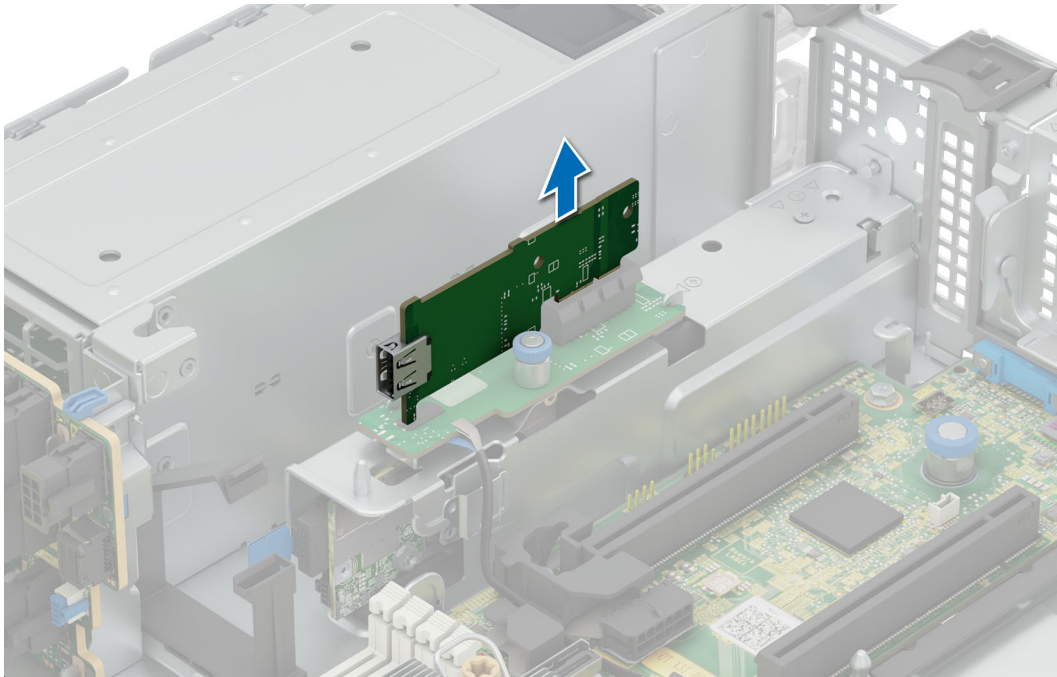


Figure 154. Removing the optional internal USB card

Next steps

Install the optional USB card .

Installing the optional internal USB card for configuration 1 and 3

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).

Steps

1. Align the connector on the internal USB card with the connector on the USB board.
2. Press the internal USB card firmly until it is fully seated.

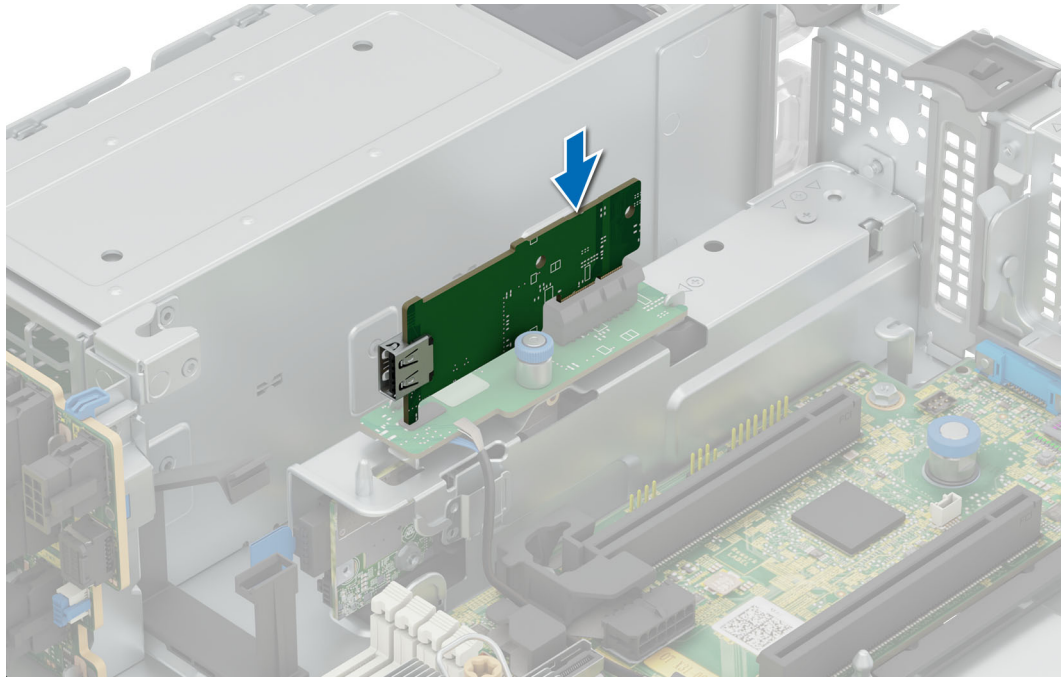


Figure 155. Installing the optional internal USB card

Next steps

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

Optional OCP card

Removing the OCP card

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#)
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#) .
5. [Remove the air shroud](#)
6. [Remove rear drive bay](#) (If installed)

Steps

1. Open the blue latch to disengage the OCP card.
2. Push the OCP card towards the rear end of the system to disconnect from the connector on the system board.
3. Slide the OCP card out of the slot on the system.

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

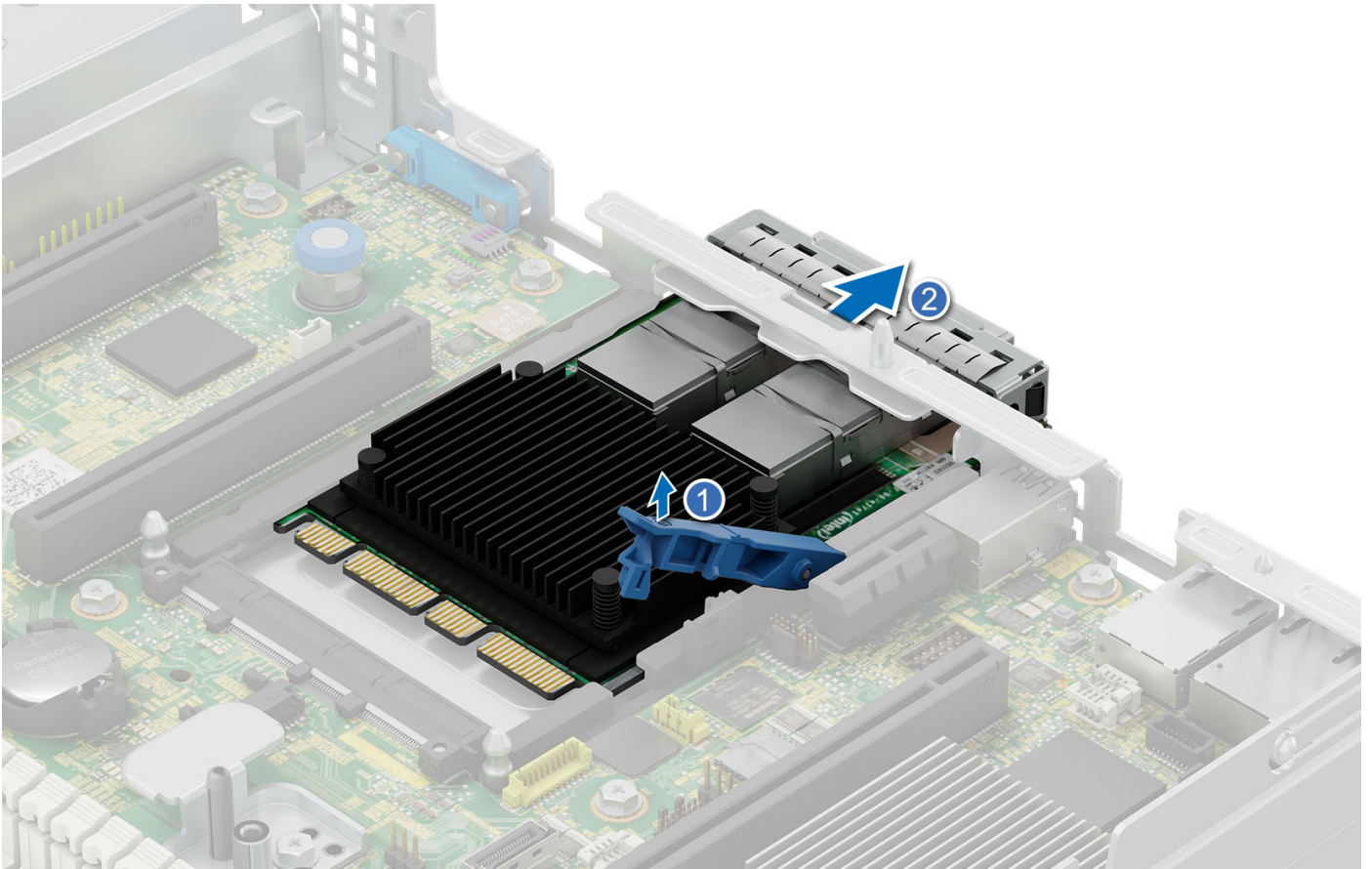


Figure 156. Removing the OCP card

4. If the OCP card is not going to be replaced, install a filler bracket .

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

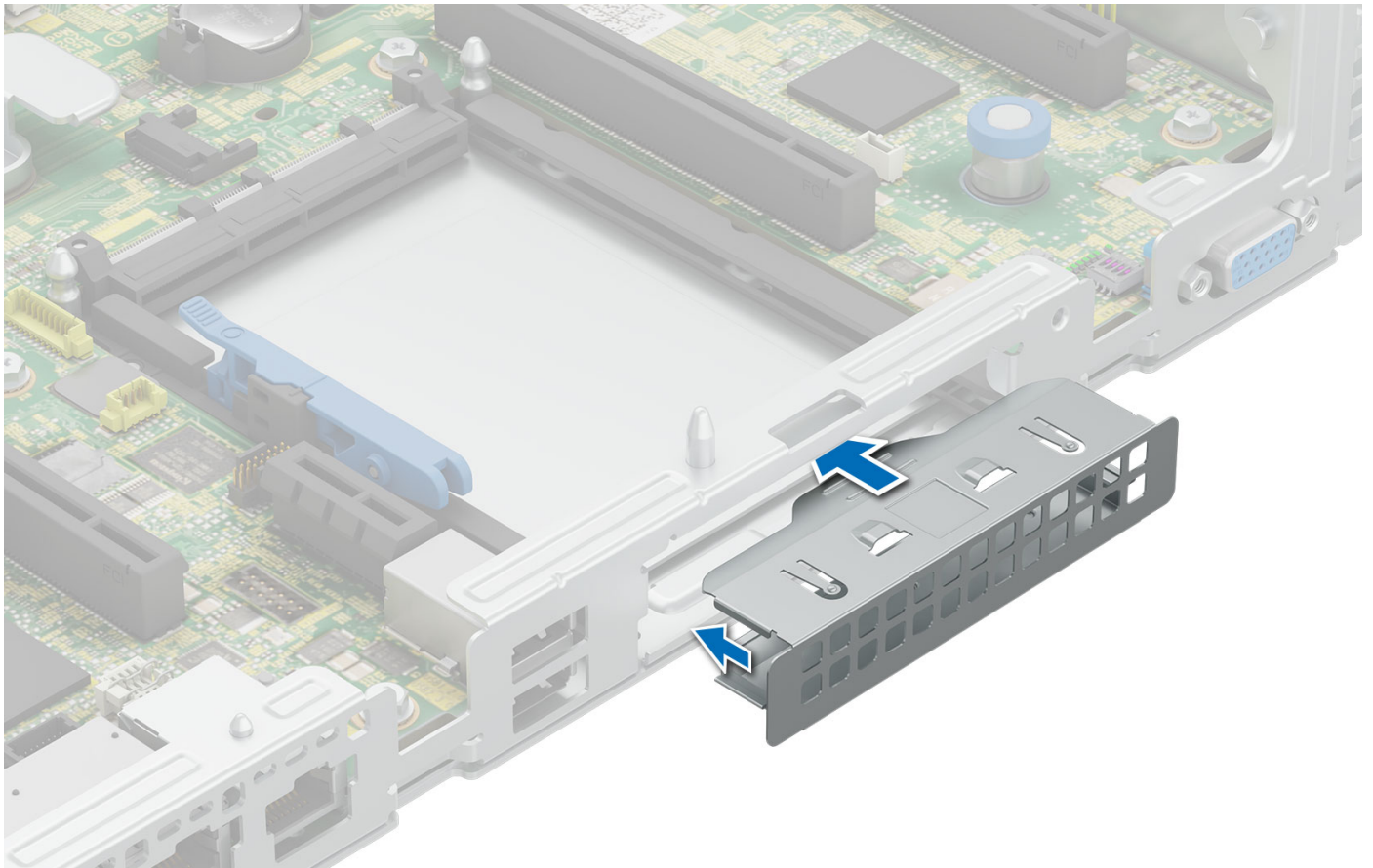


Figure 157. Installation of filler bracket

Next steps

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

Installing the OCP card

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#)
3. [Remove the fan cover.](#)
4. [Remove the rear system cover .](#)
5. [Remove the air shroud](#)

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.

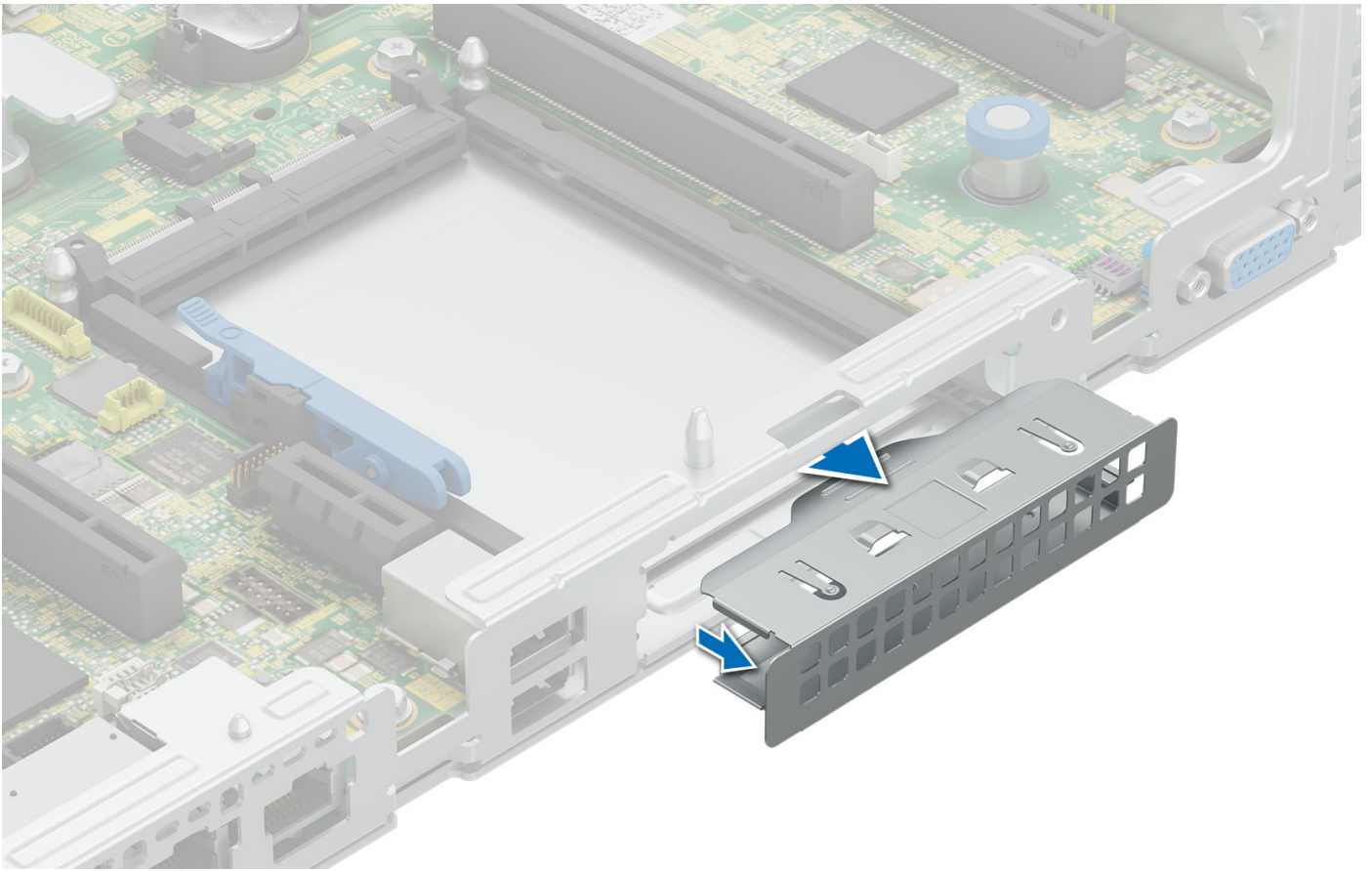


Figure 158. Removal of filler bracket

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

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

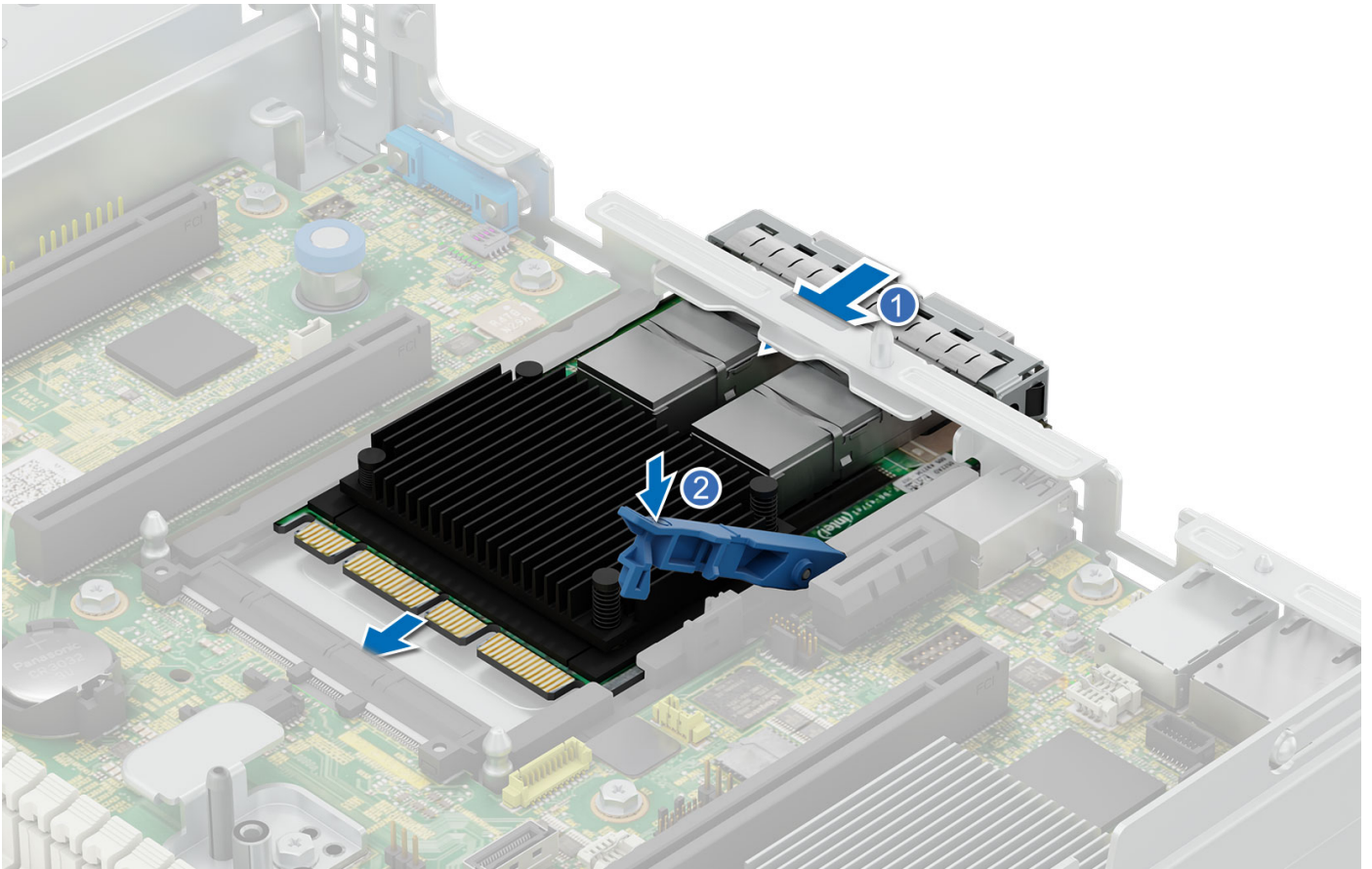


Figure 159. Installing the OCP card

Next steps

1. [Install rear drive bay](#)(If removed)
2. [Install the air shroud](#)
3. [Install the rear system cover](#)
4. [Install the fan cover](#)
5. Follow the procedure listed in [After working inside your system](#).

Trusted Platform Module

This is a service technician replaceable part only.

Upgrading the Trusted Platform Module

Removing the TPM

Prerequisites

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

i NOTE:

- Ensure the operating system is compatible with the TPM version you are installing.
- Ensure that you download and install the latest BIOS firmware on your system.

- Ensure that the BIOS is configured to enable UEFI boot mode.

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

Steps

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

Installing the TPM

Prerequisites

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

Steps

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

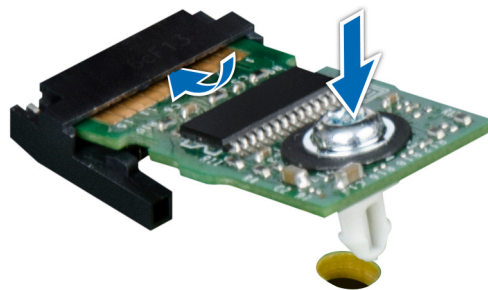


Figure 160. Installing the TPM

Initializing TPM for users

Steps

1. Initialize the TPM.
For more information, see [Initializing the TPM 2.0 for users](#).
2. The **TPM Status** changes to **Enabled, Activated**.

Initializing the TPM 2.0 for users

Steps

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

Power supply units

Hot spare feature

Your system supports the hot spare feature that significantly reduces the power overhead associated with power supply unit (PSU) redundancy.

When the hot spare feature is enabled, one of the redundant PSUs is switched to the sleep state. The active PSU supports 100 percent of the load, thus operating at higher efficiency. The PSU in the sleep state monitors output voltage of the active PSU. If the output voltage of the active PSU drops, the PSU in the sleep state returns to an active output state.

If having both PSUs active is more efficient than having one PSU in the sleep state, the active PSU can also activate the sleeping PSU.

The default PSU settings are as follows:

- If the load on the active PSU is more than 50 percent, then the redundant PSU is switched to the active state.
- If the load on the active PSU falls below 20 percent, then the redundant PSU is switched to the sleep state.

You can configure the hot spare feature by using the iDRAC settings. For more information about iDRAC settings, see the *Integrated Dell Remote Access Controller User's Guide* available at <https://www.dell.com/idracmanuals>.

Removing a power supply unit blank

Prerequisites

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

Steps

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

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

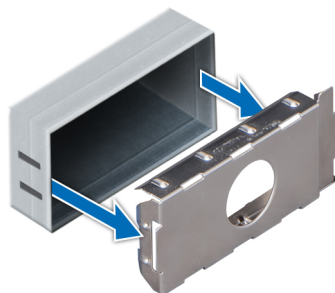


Figure 161. Removing a power supply unit blank

Next steps

1. [Install a power supply blank.](#)
2. Follow the procedure listed in [After working inside your system.](#)

Installing a power supply unit blank

Prerequisites

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

Steps

Align the PSU blank with the PSU bay and push it into the PSU bay until it clicks into place.

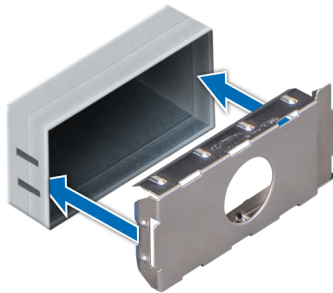


Figure 162. Installing a power supply unit blank

Next steps

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

Removing a power supply unit

The procedure for removing AC and DC PSUs is identical.

Prerequisites

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

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

Steps

Press the orange release latch and slide the PSU out of the system by using the PSU handle.

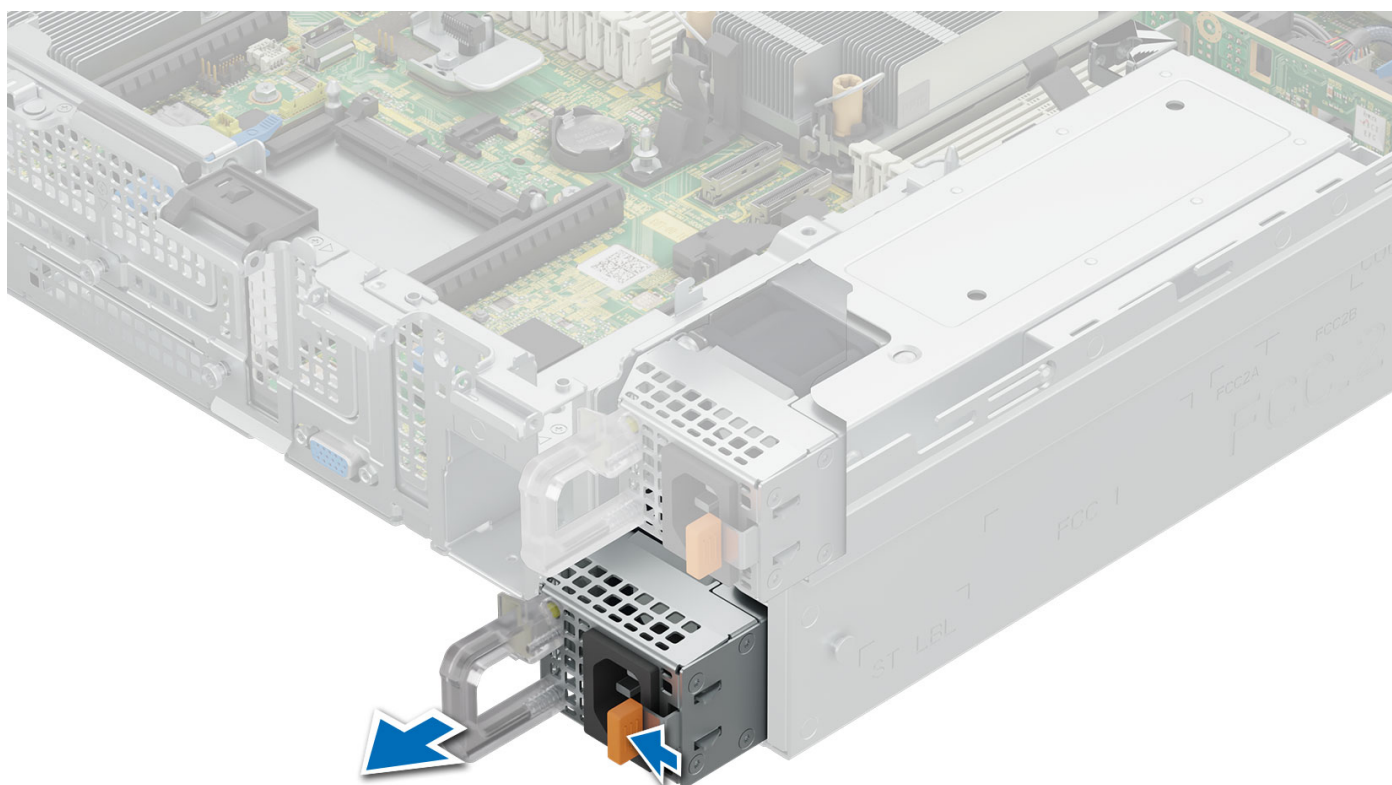


Figure 163. Removing a power supply unit

Next steps

1. Follow the procedure listed in [After working inside your system](#).
2. Install the power supply unit [installing the power supply unit](#)

Installing a power supply unit

The procedure for installing AC and DC PSUs is identical.

Prerequisites

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

Steps

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

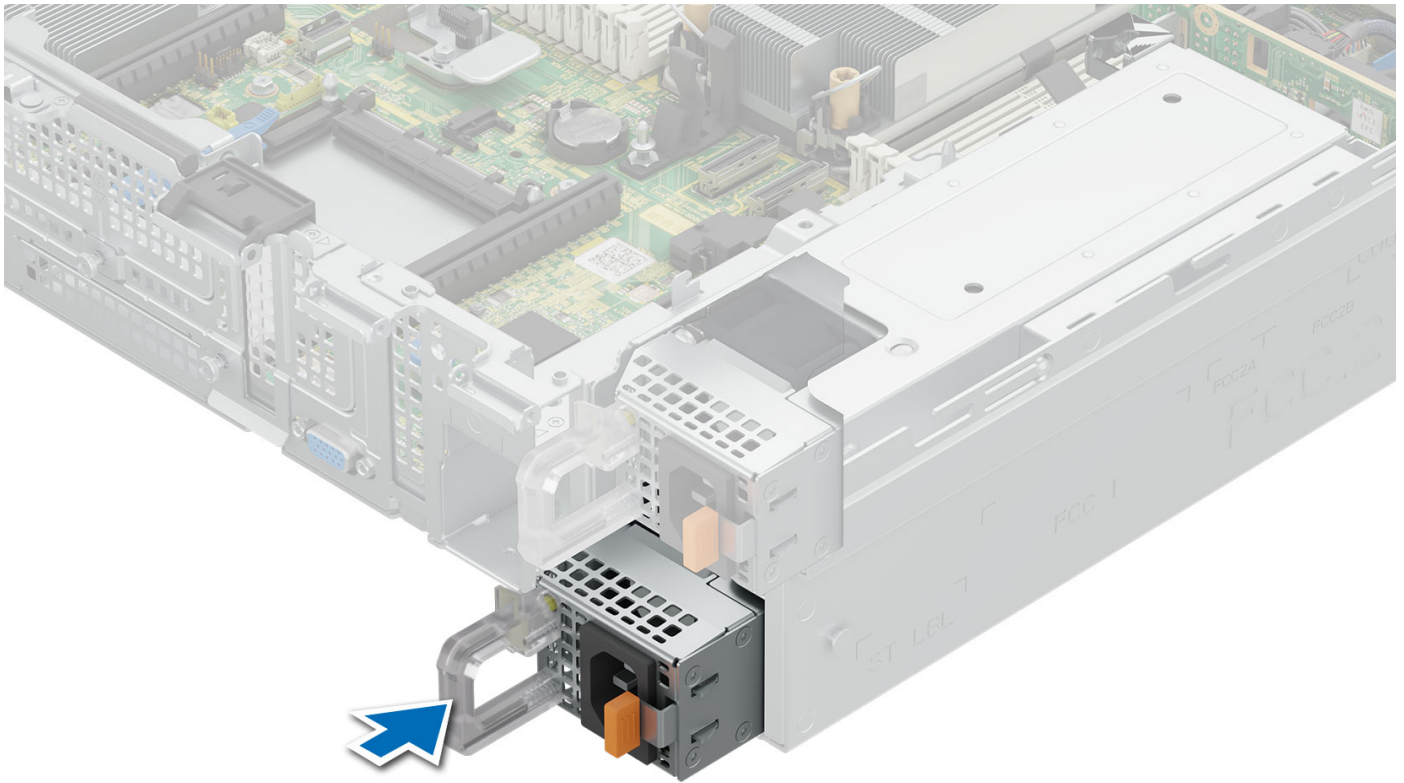


Figure 164. Installing a power supply unit

Next steps

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

CAUTION: When connecting the power cable to the PSU, secure the cable to the PSU with the strap provided on the handle.

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

2. 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

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).

6. Remove the air shroud

Steps

1. Using the T8 Torx screwdriver, remove the screws that secure the right control panel and cable cover to the system.
2. Remove the cable cover away from the system.
3. Disconnect the right control panel cable on the system board.
4. Holding the right control panel and cable assembly, slide the right control panel 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.

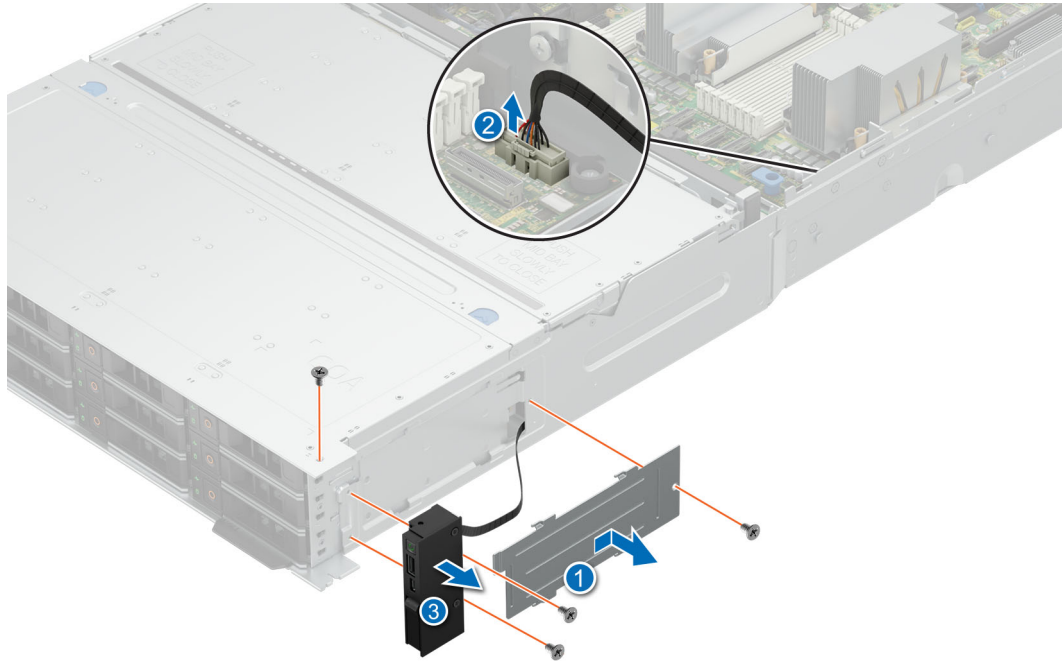


Figure 165. Removing the right control panel

Next steps

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

Installing the right control panel

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover.](#)
4. [Remove the rear system cover.](#)
5. [Remove the cooling fan assembly.](#)
6. [Remove the air shroud](#)

Steps

1. Align and slide the right control panel into the slot on the system.
2. Route the right control panel cable through the side wall of the system.
3. Align and slide the right control panel cable cover in the slot on the system.

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

4. Connect the right control panel cable to the connector on the system board.
5. Using the T8 Torx 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.

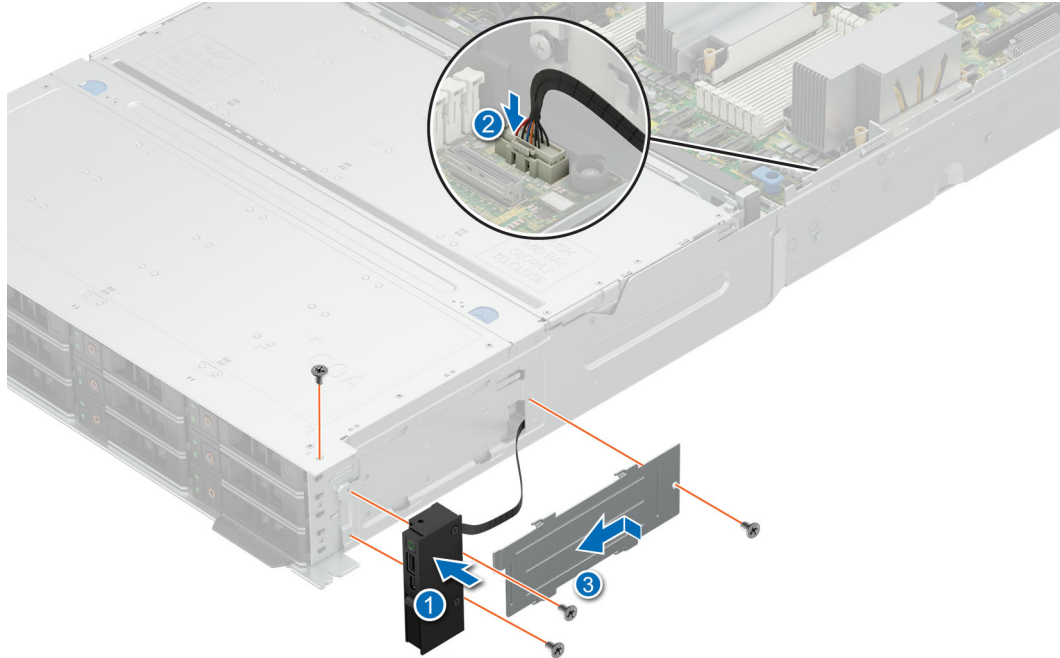


Figure 166. Installing the right control panel

Next steps

1. [Install the air shroud](#)
2. [Install cooling fan assembly](#)
3. [Install the rear system cover](#) .
4. [Install the fan cover](#) .
5. Follow the procedure listed in [After working inside your system](#).

Removing the left control panel

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).
6. [Remove the air shroud](#)

Steps

1. Using the T8 Torx screwdriver, remove the screws that secure the left control panel and the cable cover to the system.
2. Remove the cable cover away from the system.
3. Disconnect the control panel cable from the connector on the system board.
4. Holding the cable, slide the left control panel out of the system.

NOTE: Observe the routing of the cable as you remove the 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.

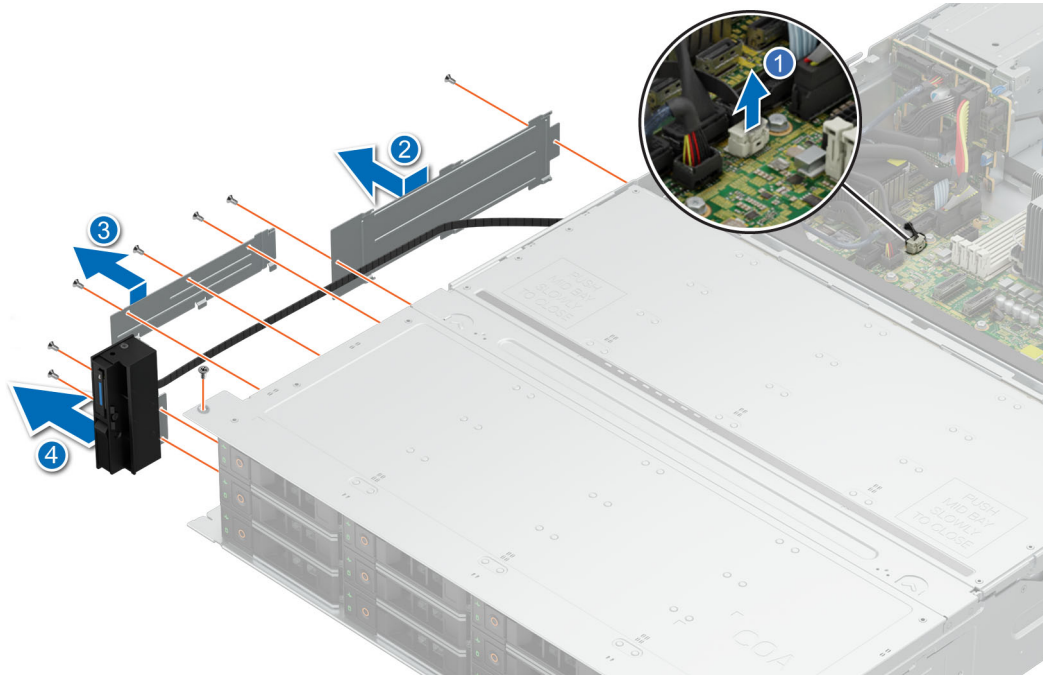


Figure 167. Removing the left control panel

Next steps

1. Install the left control panel.

Installing the left control panel

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. [Remove the fan cover](#).
4. [Remove the rear system cover](#).
5. [Remove the cooling fan assembly](#).
6. [Remove the air shroud](#)

Steps

1. Align and slide the left control panel in the slot on the system.
2. Route the left control panel cable through the side wall of the system.
3. Align and slide the left control panel cable covers in the slot on the system.

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

4. Connect the left control panel cable to the connector on the system board.
5. Using the T8 Torx screwdriver, tighten the screws to secure the 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.

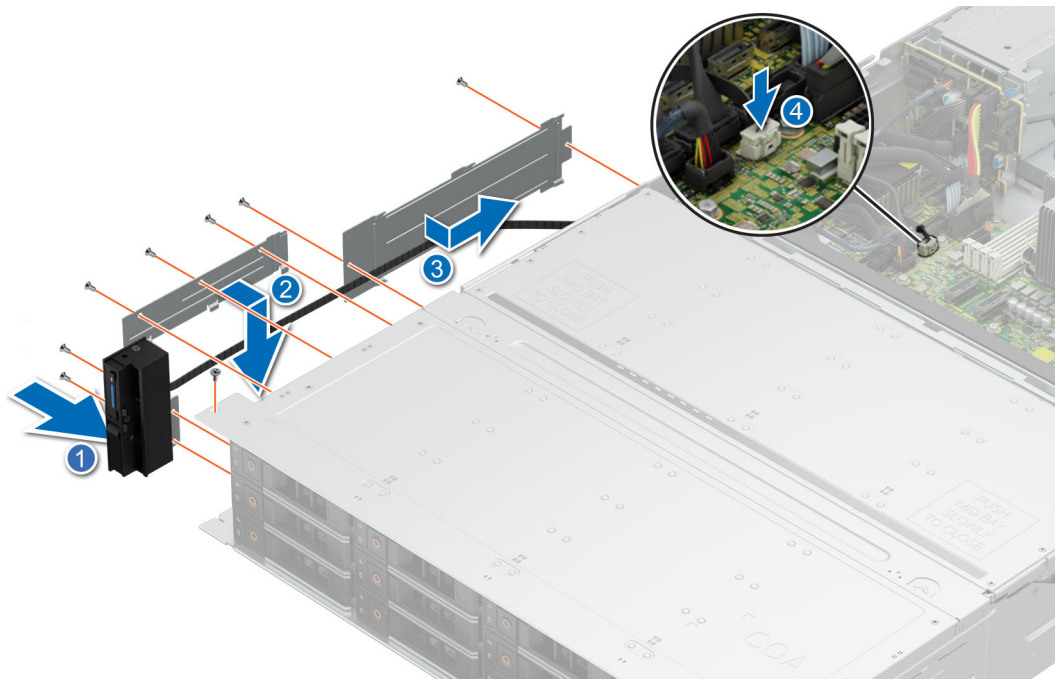


Figure 168. Installing the left control panel

Next steps

1. [Install the air shroud](#)
2. [Install cooling fan assembly](#)
3. [Install the rear system cover](#) .
4. [Install the fan cover](#) .
5. Follow the procedure listed in [After working inside your system](#).

System board

This is a service technician replaceable part only.

Removing the system board

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#) .
3. Remove the following:

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

- a. [Fan cover](#).
- b. [Rear system cover](#).
- c. [Cooling fan assembly](#)
- d. [Air shroud](#)
- e. [Expansion cards and risers](#)(if installed)
- f. [Optional internal USB](#)(if installed)
- g. [Rear drive bay](#)(if installed)
- h. [Optional OCP card](#)(if installed)
- i. [Processor and heatsink module](#)
- j. [Processors blanks](#) (if installed)
- k. [Memory module](#)

Steps

1. Disconnect all cables from the system board.
2. Pull the plunger to release the system board from chassis floor.
3. Hold the system board holder and plunger and then slide it toward the front of the chassis.
4. Incline the system board at an angle, and lift the system board out of the chassis.

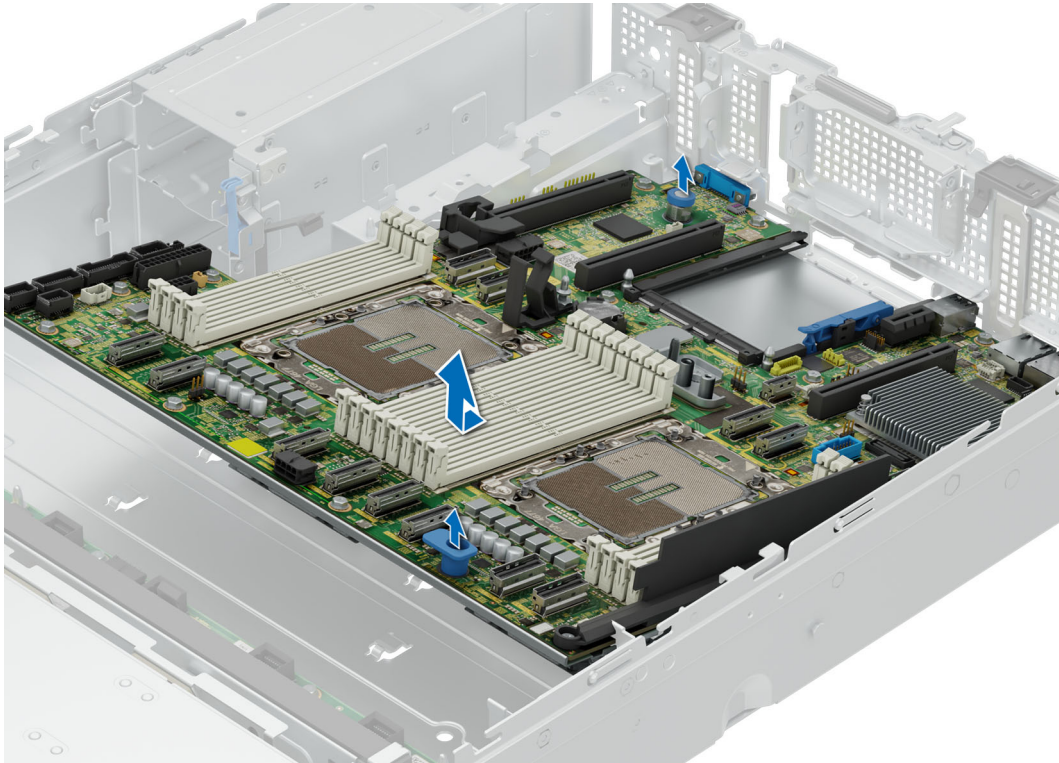


Figure 169. Removing the system board

Next steps

Replace or install the system board.


Installing the system board

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working on your system](#).
3. Remove the following:
 - a. [Fan cover](#).
 - b. [Rear system cover](#).
 - c. [Cooling fan assembly](#)
 - d. [Air shroud](#)
 - e. [Expansion cards and risers](#)(if installed)
 - f. [Optional internal USB](#)(if installed)
 - g. [Rear drive bay](#)(if installed)
 - h. [Optional OCP card](#)(if installed)
 - i. [Processor and heatsink module](#)
 - j. [Processors blanks](#) (if installed)
 - k. [Memory module](#)

Steps

1. Unpack the new system board.

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

2. Holding the system board holder and plunger, push the system board toward the back of the system till it is seated.

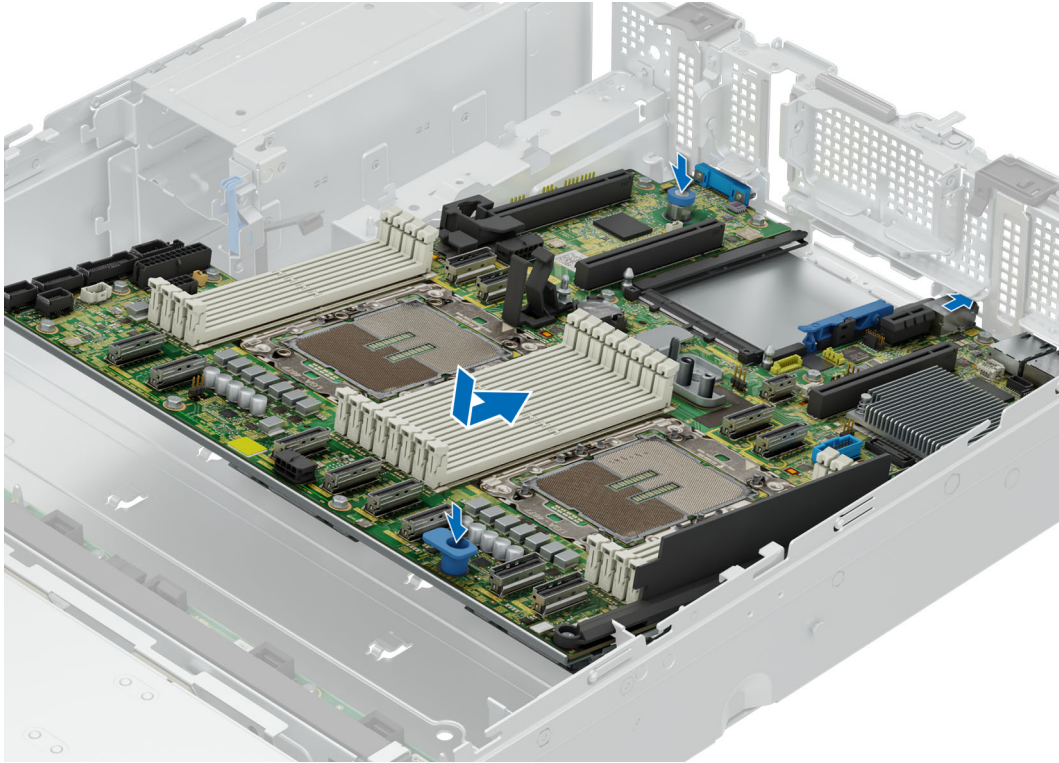



Figure 170. Installing system board

Next steps

1. Replace the following:
 - a. [Trusted Platform Module \(TPM\)](#)
 - b. [Memory module](#)
 - c. [Processor heatsink module](#)
 - d. [Optional OCP card](#)(if removed)
 - e. [Optional internal USB](#)(if removed)
 - f. [Rear drive bay](#)(if installed)
 - g. [Expansion cards and risers](#)
 - h. [Air shroud](#)
 - i. [Cooling fan assembly](#)
2. Reconnect all cables to the system board.

 **NOTE:** Ensure that the cables inside the system are routed along the chassis wall and secured using the cable securing bracket.
3. Install [Rear system cover](#)
4. Install [Fan cover](#)
5. Ensure that you perform the following steps:
 - a. Use the Easy Restore feature to restore the Service Tag. See the [Restoring the system by using the Easy Restore feature](#) section.
 - b. If the service tag is not backed up in the backup flash device, enter the system service tag manually. See the [Manually update the Service Tag](#) by using System Setup section.
 - c. Update the BIOS and iDRAC versions.
 - d. Re-enable the Trusted Platform Module (TPM). See the [Upgrading the Trusted Platform Module](#) section.

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

Restoring the system using Easy Restore

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

About this task


Below is a list of options/steps available:

Steps

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

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

4. Restore data from a previously created **Hardware Server Profile**, press **F10**
5. To restore the system configuration data, press **Y**
6. To use the default configuration settings, press **N**

 **NOTE:** After the restore process is complete, system reboots.

Manually update the Service Tag


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

About this task

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

Steps

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

 **NOTE:** You can enter the service tag only when the **Service Tag** field is empty. Ensure that you enter the correct service tag. Once the service tag is entered, it cannot be updated or changed. Incorrectly entered service tag will lead to system board replacement.

5. Click **OK**.

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 system board help to disable the system and reset the passwords. To install components and cables correctly, you must know the connectors on the system board.

Topics:

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

System board jumpers and connectors

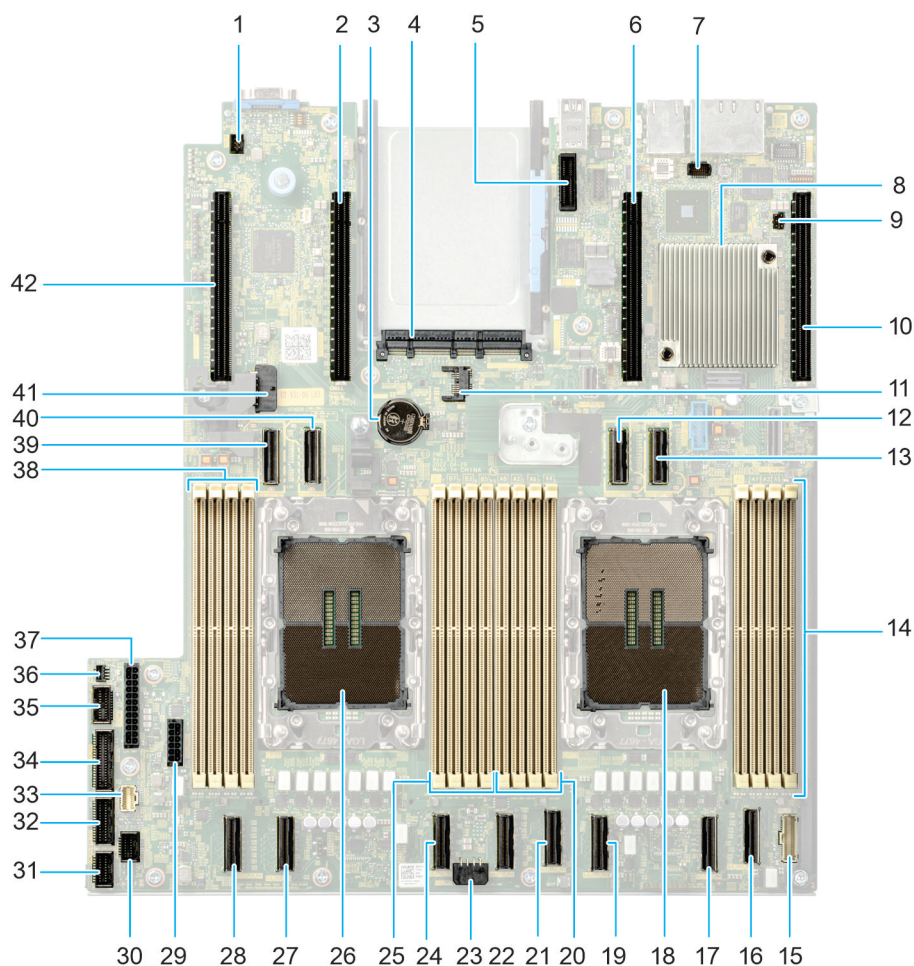


Figure 171. System board jumpers and connectors

Table 93. System board jumpers and connectors

Item	Connector	Description
1.	System ID Connector	System ID Connector
2.	PCIe Slot 3 (CPU 2)	PCIe Slot 3

Table 93. System board jumpers and connectors (continued)

Item	Connector	Description
3.	Coin Cell Battery	Coin Cell Battery
4	OCP NIC Connector	OCP NIC 3.0 connector
5.	Internal USB Connector	Internal USB connector
6.	PCIe Slot 2 (CPU1)	PCIe Slot 2
7.	SNIC	Smart NIC connector
8.	PCH	PCH
9.	PWRD_EN and NVRAM_CLR	Jumper to clear password
10.	PCIe Slot 1 (CPU 1)	PCIe Slot 1
11.	TPM	TPM Connector
12.	PCIe Connector 11 (SL11_CPU1_PA6)	PCIe Connector 11
13.	PCIe Connector 12 (SL12_CPU1_PB6)	PCIe Connector 12
14.	DIMMs for CPU 1	DIMM connectors for Processor 1
15.	Right Control Panel	Right Control Panel connector
16.	PCIe Connector 8 (SL8_CPU1_PA4)	PCIe Connector 8
17.	PCIe Connector 7 (SL7_CPU1_PB4)	PCIe Connector 7
18.	CPU 1	Processor 1
19.	PCIe Connector 6 (SL6_CPU1_PB3)	PCIe Connector 6
20.	DIMMs for CPU 1	DIMM connectors for Processor 1
21.	PCIe Connector 5 (SL5_CPU1_PA3)	PCIe Connector 5
22.	PCIe Connector 4 (SL4_CPU2_PA2)	PCIe Connector 4
23.	System Power Connector 2	System Power Connector
24.	PCIe Connector 3 (SL3_CPU2_PB2)	PCIe Connector 3
25.	DIMMs for CPU 2	DIMM connectors for Processor 2
26.	CPU 2	Processor 2
27.	PCIe Connector 2 (SL2_CPU2_PB1)	PCIe Connector 2
28.	PCIe Connector 1 (SL1_CPU2_PA1)	PCIe Connector 1
29.	SIG_PWR_4	Power connector 4 - Use for PERC Interposer
30.	PIB Signal 3	PIB signal connector
31.	Fan Signal 1	Fan Signal connector
32.	Fan Signal 2	Fan Signal connector
33.	Left Control Panel	Left Control Panel Connector
34.	PIB Signal 1	PIB signal connector
35.	PIB Signal 2	PIB signal connector
36.	Intrusion Switch Connector	Intrusion Switch Connector
37.	System Power Connector 1	System Power Connector
38.	DIMMS for CPU 2	DIMM connectors for Processor 2
39.	PCIe Connector 9 (SL9_CPU2_PB5)	PCIe Connector 9





Table 93. System board jumpers and connectors (continued)

Item	Connector	Description
40.	PCIe Connector 10 (SL10_CPU2_PA5)	PCIe Connector 10
41.	SIG_PWR_0	Power connector 0 for Rear BP
42.	PCIe Slot 4 (CPU 2)	PCIe Slot 4

System board jumper settings

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

Table 94. System board jumper settings

Jumper	Setting	Description
PWRD_EN	 2 4 6 (default)	The BIOS password feature is enabled.
	 2 4 6	The BIOS password feature is disabled. The BIOS password is now disabled, and you are not allowed to set a new password.
NVRAM_CLR	 1 3 5 (default)	The BIOS configuration settings are retained at system boot.
	 1 3 5	The BIOS configuration settings are cleared at system boot.

CAUTION: You should be cautious when changing the BIOS settings. The BIOS interface is designed for advanced users. Any changes in the setting might prevent your system from starting correctly and may even result in data loss.

Disabling a forgotten password

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

Prerequisites

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

Steps

- Power off the system and all attached peripherals. Disconnect the system from the electrical outlet, and disconnect the peripherals.
- [Remove the rear system cover.](#)
- Move the jumper on the system board from pins 2 and 4 to pins 4 and 6.
- [Remove the rear system cover](#)[Remove the rear system cover.](#)
 - NOTE:** The existing passwords are not disabled (erased) until the system boots with the jumper on pins 4 and 6. However, before you assign a new system and/or setup password, you must move the jumper back to pins 2 and 4.
 - NOTE:** If you assign a new system and/or setup password with the jumper on pins 4 and 6, the system disables the new password(s) the next time it boots.
- Reconnect the peripherals and connect the system to the electrical outlet, and then power on the system.
- Power off the system.

7. [Remove the rear system cover.](#)
8. Move the jumper on the system board from pins 4 and 6 to pins 2 and 4.
9. [Remove the rear system cover.](#)
10. Reconnect the peripherals and connect the system to the electrical outlet, and then power on the system.
11. Assign a new system and/or setup password.

System diagnostics and indicator codes


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

The following sections contain information about the chassis LEDs and indicator codes for the PowerEdge R760xd2 system.

Topics:

- [Status LED indicators](#)

Status LED indicators

 **NOTE:** The indicators display solid amber if any error occurs.

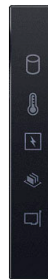


Figure 172. Status LED indicators

Table 95. Status LED indicators and descriptions






Icon	Description	Condition	Corrective action
	Drive indicator	The indicator turns solid amber if there is a drive error.	<ul style="list-style-type: none"> • Check the System Event Log to determine if the drive has an error. • Run the appropriate Online Diagnostics test. Restart the system and run embedded diagnostics (ePSA). • If the drives are configured in a RAID array, restart the system, and enter the host adapter configuration utility program.
	Temperature indicator	The indicator turns solid amber if the system experiences a thermal error (for example, the ambient temperature is out of range or there is a fan failure).	Ensure that none of the following conditions exist: <ul style="list-style-type: none"> • A cooling fan has been removed or has failed. • System cover, air shrouds, or back filler bracket has been removed. • Ambient temperature is too high. • External airflow is obstructed. If the problem persists, see the Getting help section.
	Electrical indicator	The indicator turns solid amber if the system experiences an electrical error (for example, voltage out of range, or a failed power supply unit (PSU) or voltage regulator).	Check the System Event Log or system messages for the specific issue. If it is due to a problem with the PSU, check the LED on the PSU. Reseat the PSU. If the problem persists, see the Getting help section.

Table 95. Status LED indicators and descriptions (continued)

Icon	Description	Condition	Corrective action
	Memory indicator	The indicator turns solid amber if a memory error occurs.	Check the System Event Log or system messages for the location of the failed memory. Reseat the memory module. If the problem persists, see the Getting help section.
	PCIe indicator	The indicator turns solid amber if a PCIe card experiences an error.	Restart the system. Update any required drivers for the PCIe card. Reinstall the card. If the problem persists, see the Getting help section.

System health and system ID indicator codes

The system health and system ID indicator is located on the system for Rear Accessed configuration and control panel of the system for Front Accessed configuration.



Figure 173. System health and system ID indicator

Table 96. 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 Getting help section.
Blinking amber	Indicates that the system is experiencing a fault. Check the System Event Log for specific error messages. For information about the event and error messages generated by the system firmware and agents that monitor system components, go to qrl.dell.com > Look Up > Error Code , type the error code, and then click Look it up .

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 97. 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.

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.

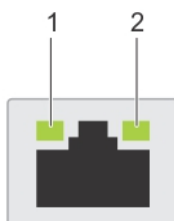


Figure 174. NIC indicator codes

1. Link LED indicator
2. Activity LED indicator

Table 98. 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.

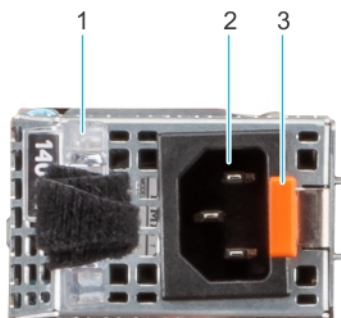


Figure 175. AC PSU status indicator

1. AC PSU handle
2. Socket
3. Release latch

Table 99. 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. ⚠ CAUTION: Do not disconnect the power cord or unplug the PSU when updating firmware. If firmware update is interrupted, the PSUs will not function.
Blinking green 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. ⚠ CAUTION: If two PSUs are installed, both the PSUs must have the same type of label; for example, Extended Power Performance (EPP) label. Mixing PSUs from previous generations of PowerEdge servers is not supported, even if the PSUs have the same power rating. This results in a PSU mismatch condition or failure to power on the system. ⚠ CAUTION: If two PSUs are used, they must be of the same type and have the same maximum output power. ⚠ CAUTION: 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

Table 99. AC and DC PSU status indicator codes (continued)

Power indicator codes	Condition
	<p>output configuration or vice versa, you must power off the system.</p> <p>△ CAUTION: 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. Each 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.



Figure 176. 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 100. 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. NOTE: 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.

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.

Getting help

Topics:

- [Recycling or End-of-Life service information](#)
- [Contacting Dell Technologies](#)
- [Accessing system information by using QRL](#)
- [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 www.dell.com/recyclingworldwide and select the relevant country.

Contacting Dell Technologies

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

Steps

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

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) located on the Express service tag in the front of the R760xd2 system, to access information about PowerEdge R760xd2. There is also another QRL for accessing product information located on the back of the system cover.

Prerequisites

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

The QRL includes the following information about your system:

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

Steps

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

Quick Resource Locator for PowerEdge R760xd2 system



Figure 177. Quick Resource Locator for PowerEdge R760xd2 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 www.dell.com/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 101. Additional documentation resources for your system

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

Table 101. Additional documentation resources for your system (continued)

Task	Document	Location
	For information about installing the operating system, see the operating system documentation.	www.dell.com/operatingsystemmanuals
	For information about updating drivers and firmware, see the Methods to download firmware and drivers section in this document.	www.dell.com/support/drivers
Managing your system	For information about systems management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	www.dell.com/poweredgemanuals
	For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	www.dell.com/openmanagemanuals > OpenManage Server Administrator
	For information about installing and using Dell Secure Connect Gateway, see the Dell Secure Connect Gateway Enterprise User's Guide.	https://www.dell.com/serviceabilitytools
	For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.	www.dell.com/openmanagemanuals
Working with the Dell PowerEdge RAID controllers	For information about understanding the features of the Dell PowerEdge RAID controllers (PERC), Software RAID controllers, or BOSS card and deploying the cards, see the Storage controller documentation.	www.dell.com/storagecontrollermanuals
Understanding event and error messages	For information about the event and error messages generated by the system firmware and agents that monitor system components, go to qrl.dell.com > Look Up > Error Code , type the error code, and then click Look it up .	www.dell.com/qrl
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide.	www.dell.com/poweredgemanuals