Dell EMC PowerEdge XR2

Installation and Service Manual

Regulatory Model: E48S Series
Regulatory Type: E48S001
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Rev. A10

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.

Contents

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Dell EMC PowerEdge XR2 overview

The PowerEdge XR2 is a 1U, dual socket rack system with 8 x 2.5-inch drives and supports up to:

- Two Intel ® Xeon ® Processor Scalable Family processors
- 16 DIMM slots
- Integrated M.2 module
- Optional M.2 based Boot Optimized Storage Solution module
- Two redundant power supply units (PSU)

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

Topics:

Front view of the system

The front view of the system displays the features available on the front of the system.

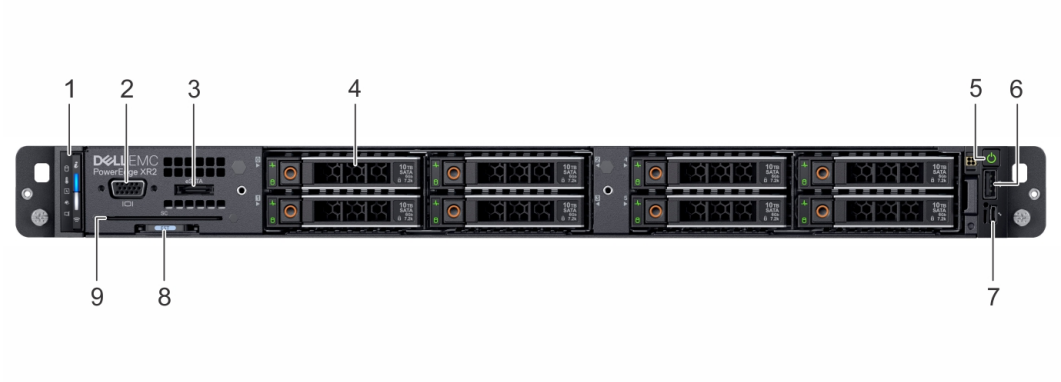

Figure 1. Front view of the system

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 and system ID, status LED, and the iDRAC Quick Sync 2 (wireless) indicator. **NOTE:** The iDRAC Quick Sync 2 indicator is available only on certain configurations. • Status LED: Enables you to identify any failed hardware components. There are up to five status LEDs and an overall system health LED (Chassis health and system ID) bar. For more information, see the Status LED indicators section.

Table 1. Features available on the front of the system (continued)

Item	Ports, panels, and slots	Icon	Description
			• Quick Sync 2 (wireless): Indicates a Quick Sync enabled system. The Quick Sync feature is optional. This feature allows management of the system by using mobile devices. This feature aggregates hardware or firmware inventory and various system level diagnostic and error information that can be used in troubleshooting the system. For more information, see the Integrated Dell Remote Access Controller User's Guide at www.dell.com/idracmanuals.
2	VGA port		Use the VGA port to connect a display to the system. For more information about the supported VGA port, see the Technical specifications section. **NOTE:** The rear VGA port overrides the front VGA port when both the ports are connected.
3	eSATA port		The port enables you to connect external storage devices to the system.
4	Drive slots	N/A	Enable you to install drives that are supported on your system. For more information about drives, see the Technical specifications section.
5	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.
6	USB port		The USB port is 4-pin, USB 2.0-compliant. The port enables you to connect USB devices to the system.
7	iDRAC Direct port		The iDRAC Direct port is micro USB 2.0-compliant. This port enables you to access the iDRAC Direct features. For more information, see the *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals.
8	Information tag	N/A	The Information tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address, and so on. If you have opted for the secure default access to iDRAC, the Information tag also contains the iDRAC secure default password.
9	Common Access Card (CAC) Or Smart Card Reader	N/A	Allows for an extra form of authentication for data encryption.

Left control panel view

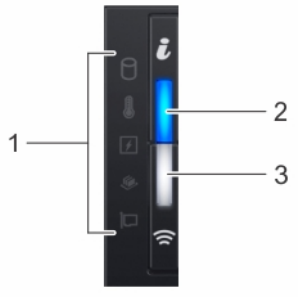

Figure 2. Left control panel with optional iDRAC Quick Sync 2.0 indicator

Table 2. Left control panel

Item	Indicator, button, or connector	Icon	Description
1	Status LED indicators	N/A	Indicate the status of the system. For more information, see the Status LED indicators on page 10 section.
2	System health and system ID indicator		Indicates the system health and enables you to locate a particular system within a rack.
3	iDRAC Quick Sync 2 wireless indicator (optional)		Indicates if the iDRAC Quick Sync 2 wireless option is activated. The Quick Sync 2 feature allows management of the system using mobile devices. This feature aggregates hardware/firmware inventory and various system level diagnostic/error information that can be used in troubleshooting the system. You can access system inventory, Dell Lifecycle Controller logs or system logs, system health status, and also configure iDRAC, BIOS, and networking parameters. You can also launch the virtual Keyboard, Video, and Mouse (KVM) viewer and virtual Kernel-based Virtual Machine (KVM), on a supported mobile device. For more information, see the Integrated Dell Remote Access Controller User's Guide at www.dell.com/poweredgemanuals

Status LED indicators

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

Figure 3. Status LED indicators

Table 3. Status LED indicators and descriptions

Icon	Description	Condition	Corrective action
	Drive indicator	The indicator turns solid amber if there is a drive error.	• 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: • A cooling fan has been removed or has failed. • System cover, air shroud, memory module blank, or back filler bracket is removed. • Ambient temperature is too high. • External airflow is obstructed. If the problem persists, see Getting help.

Table 3. Status LED indicators and descriptions (continued)

Icon	Description	Condition	Corrective action
	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 Getting help.
	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 Getting help.
	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 Getting help.

System health and system ID indicator codes

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

Figure 4. System health and system ID indicators

Table 4. System health and system ID indicator codes

System health and system ID indicator code	Condition
Solid blue	Indicates that the system is turned on, system is healthy, and system ID mode is not active. Press the system health and system ID button 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 or the LCD panel, if available on the bezel, for specific error messages. For more information about error messages, see the *Event and Error Message Reference Guide for 14th Generation Dell EMC PowerEdge Servers* at www.dell.com/qrl.

iDRAC Quick Sync 2 indicator codes

iDRAC Quick Sync 2 module (optional) is located on the left control panel of your system.

Figure 5. iDRAC Quick Sync 2 indicators

Table 5. iDRAC Quick Sync 2 indicators and descriptions

iDRAC Quick Sync 2 indicator code	Condition	Corrective action
Off (default state)	Indicates that the iDRAC Quick Sync 2 feature is turned off. Press the iDRAC Quick Sync 2 button to turn on the iDRAC Quick Sync 2 feature.	If the LED fails to turn on, reseat the left control panel flex cable and check. If the problem persists, see the Getting help section.
Solid white	Indicates that iDRAC Quick Sync 2 is ready to communicate. Press the iDRAC Quick Sync 2 button to turn off.	If the LED fails to turn off, restart the system. If the problem persists, see the Getting help section.
Blinks white rapidly	Indicates data transfer activity.	If the indicator continues to blink indefinitely, see the Getting help section.
Blinks white slowly	Indicates that firmware update is in progress.	If the indicator continues to blink indefinitely, see the Getting help section.
Blinks white five times rapidly and then turns off	Indicates that the iDRAC Quick Sync 2 feature is disabled.	Check if iDRAC Quick Sync 2 feature is configured to be disabled by iDRAC. If the problem persists, see the Getting help section. For more information, see *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/idracmanuals or *Dell OpenManage Server Administrator User's Guide* atwww.dell.com/openmanagemanuals .
Solid amber	Indicates that the system is in fail-safe mode.	Restart the system. If the problem persists, see the Getting help section.
Blinking amber	Indicates that the iDRAC Quick Sync 2 hardware is not responding properly.	Restart the system. If the problem persists, see the Getting help section.

Right control panel view

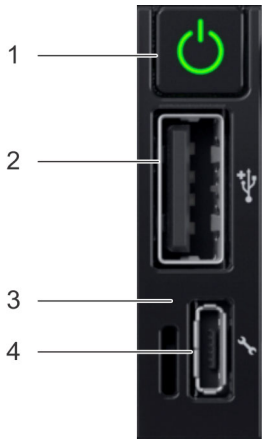

Figure 6. Right control panel

Table 6. 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

Table 6. Right control panel (continued)

Item	Indicator or button	Icon	Description
			down an ACPI-compliant operating system.
2	USB port		The USB port is 4-pin, USB 2.0-compliant. This port enables you to connect USB devices to the system.
3	iDRAC Direct LED	N/A	The iDRAC Direct LED indicator lights up to indicate that the iDRAC Direct port is actively connected to a device.
4	iDRAC Direct port (Micro-AB USB)		The iDRAC Direct (Micro-AB USB) port enables you to access the iDRAC Direct (Micro-AB) features. For more information, see the iDRAC User's Guide at https://www.dell.com/idracmanuals.

Drive indicator codes

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

Figure 7. Drive indicators on the drive and the mid drive tray backplane

1. Drive activity LED indicator
2. Drive status LED indicator
3. Drive capacity label

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

Table 7. Drive indicator codes

Drive status indicator code	Condition
Flashes green twice per second	Identifying drive or preparing for removal.
Off	Drive ready for removal.

Table 7. Drive indicator codes (continued)

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

Back view of the system

The back view of the system displays the features available on the back of the system.

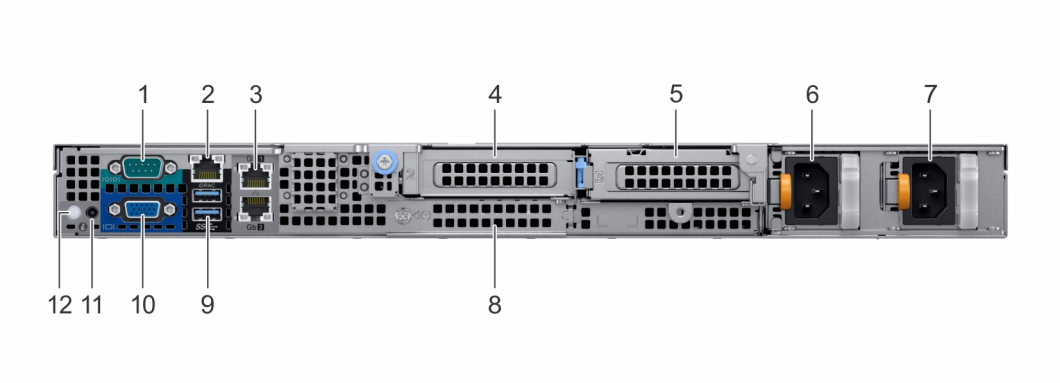

Figure 8. Back view of the system

Table 8. Back panel features of XR2

Item	Features	Icon	Description
1	Serial port		Use the serial port to connect a serial device to the system. For more information about the supported serial port, see the Technical specifications section.
2	iDRAC9 Enterprise port	iDRAC	Use the iDRAC9 dedicated network port to securely access the embedded iDRAC on a separate management network, see the Integrated Dell Remote Access Controller User's Guide at www.dell.com/idracmanuals.
3	Ethernet ports (2)		Use the Ethernet ports to connect Local Area Networks (LANs) to the system. For more information about the supported Ethernet ports, see the Technical specifications section.
4	Low profile riser right slot(Riser 1, PCIe slot 2)	N/A	Use the card slot to connect half-height PCIe expansion card on low profile riser.
5	Low profile riser left slot(Riser 2, PCIe slot 3)	N/A	Use the card slot to connect half-height PCIe expansion card on low profile riser.
6	Power supply unit (PSU1)	N/A	For more information about the PSU configurations, see the Technical specifications section.

Table 8. Back panel features of XR2 (continued)

Item	Features	Icon	Description
7	Power supply unit (PSU2)	N/A	For more information about the PSU configurations, see the Technical specifications section.
8	LOM riser slot(PCIe slot 1)	N/A	Use the LOM riser slot to connect more NIC.
9	USB 3.0 port (2)		Use the USB 3.0 port to connect USB devices to the system. These ports are 4-pin, USB 3.0-compliant.
10	VGA port		Use the VGA port to connect a display to the system. For more information about the supported VGA port, see the Technical specifications section.
11	System status indicator cable port	N/A	Enables you to connect the status indicator cable and view system status when the CMA is installed.
12	System identification button		Press the system ID button: • To locate a particular system within a rack. • To turn the system ID on or off. To reset iDRAC, press and hold the button for more than 15 seconds. **NOTE:** • To reset iDRAC using system ID, ensure that the system ID button is enabled in the iDRAC setup. • If the system stops responding during POST, press and hold the system ID button (for more than five seconds) to enter the BIOS progress mode.

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.

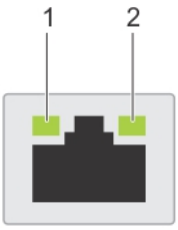

Figure 9. NIC indicator codes

1. Link LED indicator
2. Activity LED indicator

Table 9. NIC indicator codes

Status	Condition
Link and activity indicators are off.	The NIC is not connected to the network.
Link indicator is green, and activity indicator is blinking green.	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.	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.	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.	The NIC is connected to a valid network at less than its maximum port speed, and data is not being sent or received.

Table 9. NIC indicator codes (continued)

Status	Condition
Link indicator is blinking green, and activity is off.	NIC identify is enabled through the NIC configuration utility.

Power supply unit indicator codes

AC power supply units (PSUs) have an illuminated translucent handle that serves as an indicator. The indicator shows whether power is present or if a power fault has occurred.

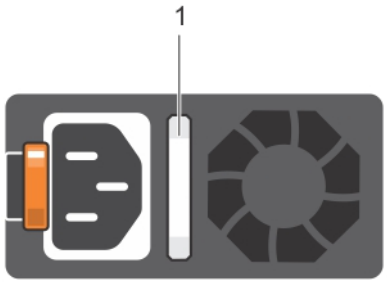

Figure 10. AC PSU status indicator

1. AC PSU status indicator/handle

Table 10. AC PSU status indicator codes

Power indicator codes	Condition
Green	A valid power source is connected to the PSU, and the PSU is operational.
Blinking amber	Indicates a problem with the PSU.
Not illuminated	Power is not connected to the PSU.
Blinking green	When the firmware of the PSU is being updated, the PSU handle blinks green. **CAUTION: Do not disconnect the power cord, or unplug the PSU when updating firmware. If firmware update is interrupted, the PSUs do not function.**
Blinking green and turns off	When hot-plugging a PSU, the PSU handle blinks green five times at a rate of 4 Hz and turns off. This indicates a PSU mismatch concerning 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 turn the system on.** **CAUTION: When correcting a PSU mismatch, replace only the PSU with the blinking indicator. Swapping the PSU to make a matched pair can result in an error condition and unexpected system shutdown. To change from a high output configuration to a low output configuration or conversely, you must turn off the system.** **CAUTION: AC PSUs support both 240 V and 120 V input voltages except for Titanium PSUs, which support only 240 V. When two identical PSUs receive different input voltages, they can output different wattages, and trigger a mismatch.** **CAUTION: If two PSUs are used, they must be of the same type, and have the same maximum output power.** **CAUTION: Combining AC and DC PSUs is not supported and triggers a mismatch.**

LCD panel

The LCD panel provides system information, status, and error messages to indicate if the system is functioning correctly or requires attention. The LCD panel can also be used to configure or view the system's iDRAC IP address. 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**..

The LCD panel is available only on the optional front bezel. The optional front bezel is hot pluggable.

The statuses and conditions of the LCD panel are outlined here:

- The LCD backlight is white during normal operating conditions.
- When the system needs attention, the LCD backlight turns amber, and displays an error code followed by descriptive text.

  NOTE: If the system is connected to a power source and an error is detected, the LCD turns amber regardless of whether the system is turned on or off.
- When the system turns off and there are no errors, LCD enters the standby mode after five minutes of inactivity. Press any button on the LCD to turn it on.
- If the LCD panel stops responding, remove the bezel and reinstall it.

  If the problem persists, see Getting help.
- The LCD backlight remains off if LCD messaging is turned off using the iDRAC utility, the LCD panel, or other tools.

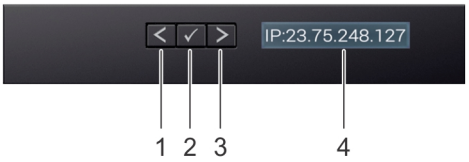

Figure 11. LCD panel features

Table 11. LCD panel features

Item	Button or display	Description
1	Left	Moves the cursor back in one-step increments.
2	Select	Selects the menu item highlighted by the cursor.
3	Right	Moves the cursor forward in one-step increments. During message scrolling: • Press and hold the right button to increase scrolling speed. • Release the button to stop. **NOTE:** The display stops scrolling when the button is released. After 45 seconds of inactivity, the display starts scrolling.
4	LCD display	Displays system information, status, and error messages or iDRAC IP address.

Viewing Home screen

The **Home** screen displays user-configurable information about the system. This screen is displayed during normal system operation when there are no status messages or errors. When the system turns off and there are no errors, LCD enters the standby mode after five minutes of inactivity. Press any button on the LCD to turn it on.

Steps

1. To view the **Home** screen, press one of the three navigation buttons (Select, Left, or Right).
2. To navigate to the **Home** screen from another menu, complete the following steps:
   a. Press and hold the navigation button until the up arrow is displayed.
   b. Navigate to the **Home** icon using the up arrow .

c. Select the **Home** icon.
d. On the **Home** screen, press the **Select** button to enter the main menu.

Setup menu

NOTE: When you select an option in the **Setup** menu, you must confirm the option before proceeding to the next action.

Option	Description
iDRAC	Select **DHCP** or **Static IP** to configure the network mode. If **Static IP** is selected, the available fields are **IP**, **Subnet (Sub)**, and **Gateway (Gtw)**. Select **Setup DNS** to enable DNS and to view domain addresses. Two separate DNS entries are available.
Set error	Select **SEL** to view LCD error messages in a format that matches the IPMI description in the SEL. This enables you to match an LCD message with an SEL entry. Select **Simple** to view LCD error messages in a simplified user-friendly description. 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**.
Set home	Select the default information to be displayed on the **Home** screen. See View menu section for the options and option items that can be set as the default on the **Home** screen.

View menu

NOTE: When you select an option in the **View** menu, you must confirm the option before proceeding to the next action.

Option	Description
iDRAC IP	Displays the **IPv4** or **IPv6** addresses for iDRAC9. Addresses include **DNS** (**Primary** and **Secondary**), **Gateway**, **IP**, and **Subnet** (IPv6 does not have Subnet).
MAC	Displays the MAC addresses for **iDRAC**, **iSCSI**, or **Network** devices.
Name	Displays the name of the **Host**, **Model**, or **User String** for the system.
Number	Displays the **Asset tag** or the **Service tag** for the system.
Power	Displays the power output of the system in BTU/hr or Watts. The display format can be configured in the **Set home** submenu of the **Setup** menu.
Temperature	Displays the temperature of the system in Celsius or Fahrenheit. The display format can be configured in the **Set home** submenu of the **Setup** menu.

Locating the Service Tag of your system

You can identify your system using the unique Express Service Code and Service Tag. Pull out the information tag in front of the system to view the Express Service Code and Service Tag. Alternatively, the information may be on a sticker on the chassis of the system. The mini Enterprise Service Tag (EST) is found on the back of the system. This information is used by Dell to route support calls to the appropriate personnel.

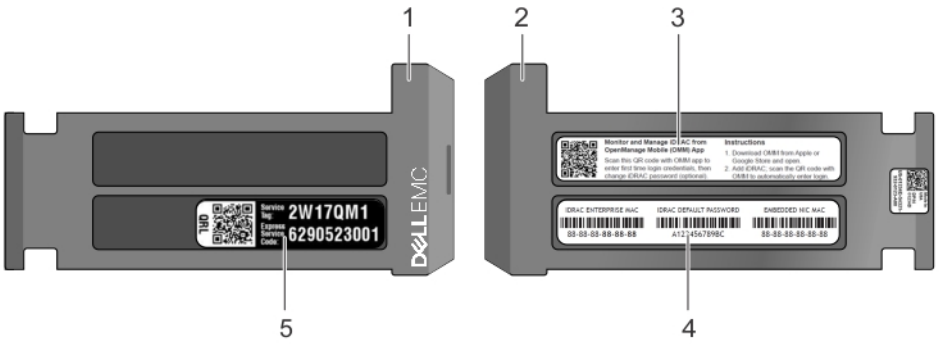

Figure 12. Locating Service Tag of your system

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

System Information Label

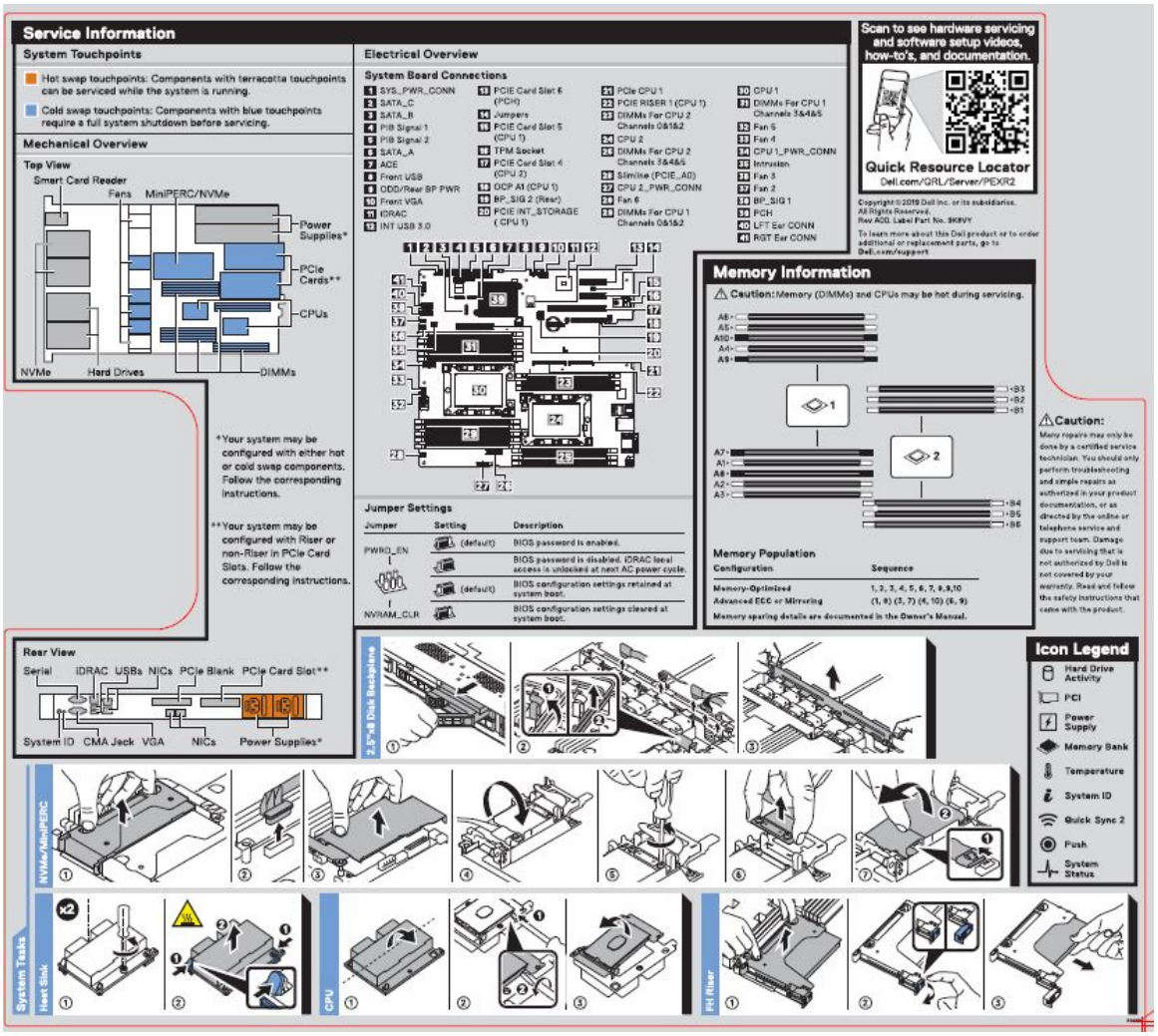

Figure 13. Service and Memory Information Label

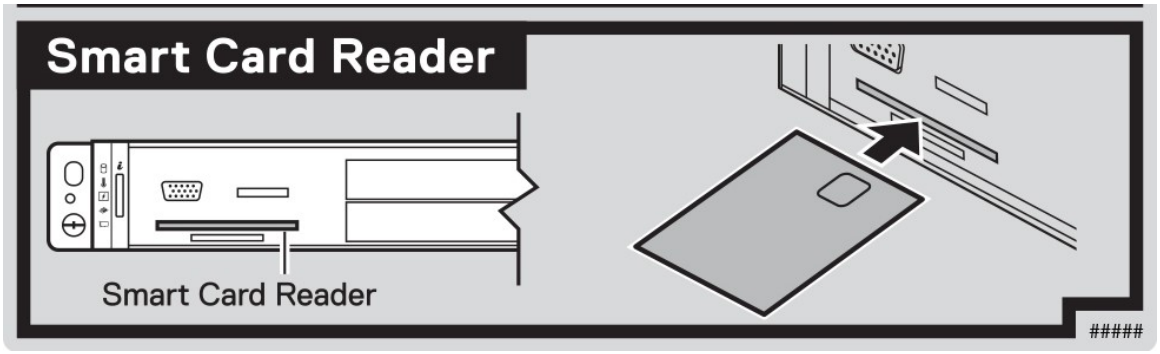

Figure 14. Smart Card Reader label

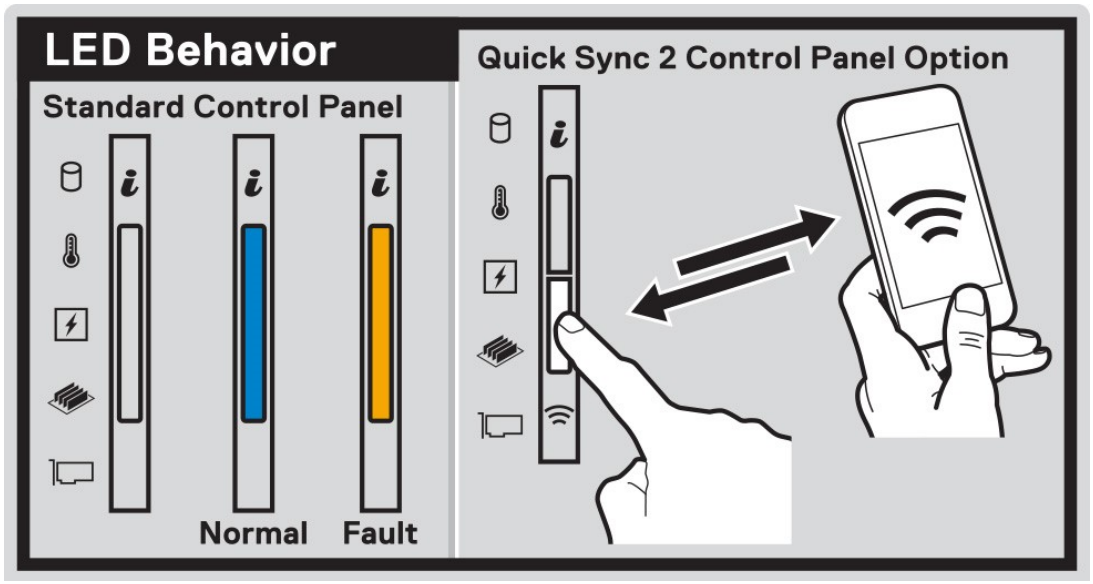

Figure 15. LED behavior and Quick sync 2 control panel label

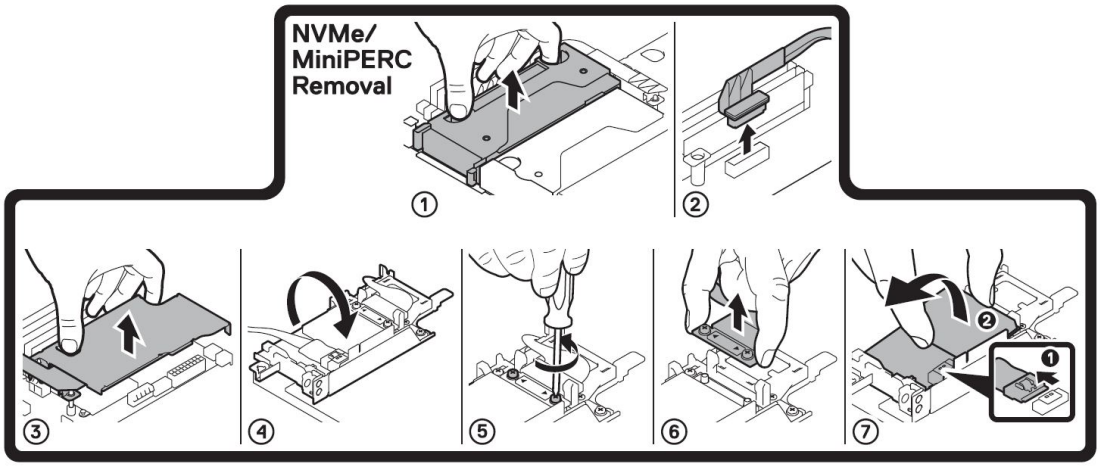

Figure 16. NVME/MiniPERC Removal

2

Documentation resources

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

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

- From the Dell EMC support site:
  1. Click the documentation link that is provided in the Location column in the table.
  2. Click the required product or product version.

     NOTE: To locate the product name and model, see the front of your system.
  3. On the Product Support page, click **Manuals & documents**.
- Using search engines:
  - Type the name and version of the document in the search box.

Table 12. Additional documentation resources for your system

Task	Document	Location
Setting up your system	For more information about installing and securing the system into a rack, see the Rail Installation Guide included with your rack solution. For information about setting up your system, see the *Getting Started Guide* document that is shipped with your system.	www.dell.com/poweredgemanuals
Configuring your system	For information about the iDRAC features, configuring and logging in to iDRAC, and managing your system remotely, see the Integrated Dell Remote Access Controller User's Guide. For information about understanding Remote Access Controller Admin (RACADM) subcommands and supported RACADM interfaces, see the RACADM CLI Guide for iDRAC. For information about Redfish and its protocol, supported schema, and Redfish Eventing are implemented in iDRAC, see the Redfish API Guide. For information about iDRAC property database group and object descriptions, see the Attribute Registry Guide.	www.dell.com/poweredgemanuals
	For information about earlier versions of the iDRAC documents, see the iDRAC documentation.	www.dell.com/idracmanuals

Table 12. Additional documentation resources for your system (continued)

Task	Document	Location	
	To identify the version of iDRAC available on your system, on the iDRAC web interface, click **?** > **About**.		
	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, using, and troubleshooting Dell OpenManage Essentials, see the Dell OpenManage Essentials User's Guide.	www.dell.com/openmanagemanuals > OpenManage Essentials	
	For information about installing, using, and troubleshooting Dell OpenManage Enterprise, see the Dell OpenManage Enterprise User's Guide.	www.dell.com/openmanagemanuals > OpenManage Enterprise	
	For information about installing and using Dell SupportAssist, see the Dell EMC SupportAssist 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 that are generated by the system firmware and agents that monitor system	www.dell.com/qrl	

Table 12. Additional documentation resources for your system (continued)

Task	Document	Location
	components, see the Error Code Lookup.	
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide.	www.dell.com/poweredgemanuals

3

PowerEdge XR2 technical specifications

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

Topics:

System dimensions

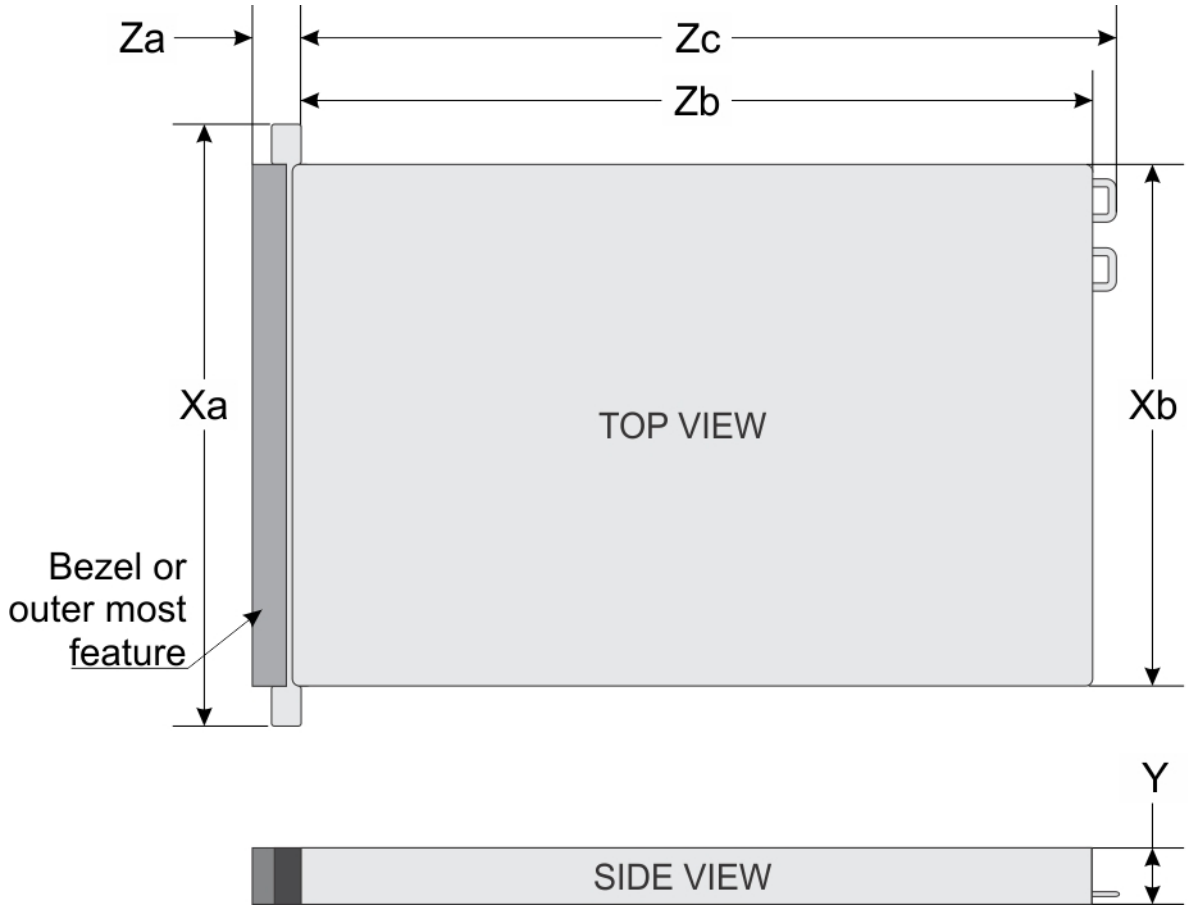

Figure 17. Dimensions of the PowerEdge XR2 system

Table 13. Dimensions of the PowerEdge XR2 system

Xa	Xb	Y	Za (with bezel)	Za (without bezel)	Zb	Zc
482.6 mm (19 inches)	434.0 mm (17.08 inches)	42.8 mm (1.68 inches)	63.15 mm (2.46 inches)	33.9 mm (1.32 inches)	514.35 mm (20.06 inches)	547.4 mm (21.35 inches)

Chassis weight

Table 14. Chassis weight

System	Maximum weight (with all drives/SSDs)
8 x 2.5 inch drive system	13.00 Kg (28 lb)

Processor specifications

The PowerEdge XR2 system supports up to two Intel Xeon Processor Scalable Family processors.

GPU specifications

The PowerEdge XR2 system supports one low profile, 75 W(single wide) GPU.

NOTE: Due to thermal limitations, the GPU is only supported in Riser 2.

NOTE: Due to thermal limitations, the GPU is only supported with Performance Fans.

Supported Operating Systems

The PowerEdge XR2 supports the following operating systems:

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

For more information on the specific versions and additions, see https://www.dell.com/support/home/Drivers/SupportedOS/oth-r440-xr.

PSU specifications

The PowerEdge XR2 system supports the following AC and DC power supplies units (PSU):

Table 15. PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage
550 W AC	Platinum	2108 BTU/hr	50/60 Hz	115–230 V AC
600 W DC	NA	2016 BTU/hr	NA	-48 V DC

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

NOTE: This system is also designed to connect to the IT power systems with a phase-to-phase voltage not exceeding 230 V for an AC power supply unit.

System battery specifications

The PowerEdge XR2 system supports CR 2032 3.0-V lithium coin cell system battery.

Expansion bus specifications

The PowerEdge XR2 system supports PCI express (PCIe) generation four expansion cards, which must be installed on the system board using expansion card risers. The XR2 system supports four types of expansion card risers.

Table 16. PCIe expansion card riser configurations

Expansion card riser	PCIe slots on the riser	Height	Length	Link
LOM riser	Slot 1	Unique to Dell	Unique to Dell	x8
Right riser	Slot 2	Low Profile	Half Length	x16

Table 16. PCIe expansion card riser configurations (continued)

Expansion card riser	PCIe slots on the riser	Height	Length	Link
	Slot 2	Full Height	Half Length	x16
Internal riser	Slot-integrated	Platform specific	Platform specific	x8
Left riser	Slot 3	Low Profile	Half Length	x16

Memory specifications

The PowerEdge XR2 system supports 16 DDR4 registered DIMM (RDIMMs) slots. Supported memory bus frequencies are 2666 MT/s, 2400 MT/s, 2133 MT/s, and 1866 MT/s.

Table 17. Memory specifications

DIMM type	DIMM rank	DIMM capacity	Single processor		Dual processors	
			Minimum RAM	Maximum RAM	Minimum RAM	Maximum RAM
RDIMM	Single rank	8 GB	8 GB	80 GB	16 GB	128 GB
RDIMM	Dual rank	16 GB	16 GB	160 GB	32 GB	256 GB
RDIMM	Dual rank	32 GB	32 GB	320 GB	64 GB	512 GB
LRDIMM	Quad rank	64 GB	64 GB	640 GB	128 GB	1024 GB
LRDIMM	Quad rank	128 GB	128 GB	1024 GB	256 GB	2048 GB

Storage controller specifications

The Dell EMC PowerEdge XR2 system supports:

- **Internal controllers**: PowerEdge Expandable RAID Controller (PERC) H330, H730P, HBA330
- **Boot Optimized Storage Subsystem (BOSS)**: HWRAID 2 x M.2 SSDs 480 GB with 6 Gbps
  - x8 connector using PCIe gen 2.0 x2 lanes, available only in the low-profile and half-height form factor
- **On board controller**: Software RAID (SWRAID) S140

Drive specifications

Drives

The PowerEdge XR2 system supports:

- Up to 8 x 2.5-inch drives with drive adapter, internal, hot swappable SAS, SATA SSDs
- Up to 4 x 2.5-inch drives with drive adapter, internal, hot swappable NVMe drives

Ports and connectors specifications

Common Access Card (CAC)

The integrated Common Access Card (CAC) reader or Smart card reader allows for an additional form of authentication for data encryption. The PowerEdge XR2 system supports one CAC on the front panel.

USB ports

The PowerEdge XR2 system supports:

- USB 2.0-compliant port on the front panel
- USB 3.0-compliant port on the back panel

The following table provides more information about the USB specifications:

Table 18. USB specifications

Front panel	Back panel	Internal USB
• One USB 2.0-compliant port • One iDRAC Direct (Micro-AB USB) port	• Two USB 3.0-compliant port	• One internal USB 2.0 port on the FIO board

eSATA port

The PowerEdge XR2 system supports one eSATA port on the front panel of the system.

NIC ports

The PowerEdge XR2 system supports two 1 Gbps Network Interface Controller (NIC) ports on the back panel.

Serial connector

The serial connector connects a serial device to the system. The PowerEdge XR2 system supports one serial connector on the back panel, which is a 9-pin connector, Data Terminal Equipment (DTE), 16550-compliant.

VGA ports

The Video Graphic Array (VGA) port enables you to connect the system to a VGA display. The PowerEdge XR2 system supports two 15-pin VGA ports on the front and back panels .

Internal Dual MicroSD Module

The PowerEdge XR2 system supports two optional flash memory card slots with an internal dual MicroSD module.

NOTE: One card slot is dedicated for redundancy.

Video specifications

The PowerEdge XR2 system supports Matrox G200eR2 graphics card with 16 MB capacity.

Table 19. Supported video resolution options

Resolution	Refresh rate (Hz)	Color depth (bits)
640 x 480	60, 70	8, 16, 32
800 x 600	60, 75, 85	8, 16, 32
1024 x 768	60, 75, 85	8, 16, 32
1152 x 864	60, 75, 85	8, 16, 32
1280 x 1024	60, 75	8, 16, 32
1440 x 900	60	8, 16, 32

Environmental specifications

NOTE: For additional information about environmental certifications, please refer to the Product Environmental Datasheet located with the Manuals & Documents on www.dell.com/poweredgemanuals

Table 20. Temperature specifications

Temperature	Specifications
Storage	–40°C–70°C (–40°F–158°F) per Mil-Std 810G Method 501.6, Proc 1
Continuous operation (for altitude less than 950 m or 3117 ft)	5°C–45°C (41°F–104°F), with no direct sunlight on the equipment
Fresh air	For information about fresh air, see Expanded Operating Temperature section.
Excursion temperature	55°C per Mil-Std 810G Method 501.6 Proc II **NOTE:** Configuration restrictions will apply. For more information, contact DellEMC sales support representative.
Maximum temperature gradient (operating and storage)	20°C/h (68°F/h)

Table 21. Relative humidity specifications

Relative humidity	Specifications
Storage	5% to 95% RH with 33°C (91°F) maximum dew point Atmosphere must be noncondensing at all times.
Operating	5% to 85% relative humidity with 29°C (842°F) maximum dew point

Table 22. Maximum vibration specifications

Maximum vibration	Specifications
Operating	Random vibration per Mil-Std 810G method 514.7, 0.00220783 g^2/Hz at 10 Hz to 500 Hz (overall 1.04 $_{rms}$), all 3 axes, 1 hour per axis
Storage	Mil-Std 810G Procedure I, Cat 4, Fig 514.7 C-1 (US highway truck vibration), 1 hour per axes

Table 23. Maximum shock specifications

Maximum shock	Specifications
Operating	Mil-Std 810G method 516.7, Proc I, 40G, 11 ms, 3 shocks in +/- directions in 3 axes (total 18 shocks)
Storage	Mil-Std 810G method 516.7, Proc I, 40G, 11 ms, 3 shocks in +/- directions in 3 axes (total 18 shocks)

Table 24. Maximum altitude specifications

Maximum altitude	Specifications
Operating	Mil-Std 810G method 500.6, Proc. II, air carriage, 15,000 ft for 1 hour after stabilization
Storage	Mil-Std 810G method 500.6, Proc. I, 40,000 ft for 1 hour after stabilization

Standard operating temperature

Table 25. Standard operating temperature specifications

Standard operating temperature	Specifications
Continuous operation (for altitude less than 950 m or 3117 ft)	+5°C–45°C (41°F–113°F) with no direct sunlight on the equipment **NOTE:** The 150W CPU support is only up to 35°C. **NOTE:** GPU continuous operation is supported up to 30°C. **NOTE:** GPU continuous operation is supported up to 45°C with optional fan booster kit.

Expanded operating temperature

Table 26. Expanded operating temperature specifications

Expanded operating temperature	Specifications
Continuous operation	5°C to 45°C at 5% to 85% RH with 29°C dew point. **NOTE:** Outside the standard operating temperature (10°C to 35°C), the system can operate continuously in temperatures as low as 5°C and as high as 45°C. For temperatures between 35°C and 45°C, de-rate maximum allowable temperature by 1°C per 175 m above 950 m (1°F per 319 ft).
≤ 1% of annual operating hours	–5°C to 55°C at 5% to 90% RH with 29°C dew point. **NOTE:** Outside the standard operating temperature (10°C to 35°C), the system can operate down to –5°C or up to 55°C for a maximum of 1% of its annual operating hours. **NOTE:** GPU expanded operating temperatures is up to 37°C for selected configurations. **NOTE:** GPU expanded operating temperatures is up to 50°C for selected configurations with optional fan booster kit. For temperatures between 45°C and 55°C, de-rate maximum allowable temperature by 1°C per 125 m above 950 m (1°F per 228 ft).

NOTE: When operating in the expanded temperature range, system performance may be impacted.

NOTE: When operating in the expanded temperature range, ambient temperature warnings may be reported on the LCD panel and in the System Event Log.

Expanded operating temperature restrictions

- Do not perform cold start below -15C Per IEC 60945.
- The operating temperature specified is for a maximum altitude of 950 m.

- Redundant power supplies are required.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W require engineering analysis to see if they can be supported. For more information or support on non-Dell validated components, contact the OEM sales team.

Particulate and gaseous contamination specifications

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

Table 27. Particulate contamination specifications

Particulate contamination	Specifications
Air filtration	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit. **NOTE:** This condition applies to data center environments only. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor. **NOTE:** Air entering the data center must have MERV11 or MERV13 filtration.
Conductive dust	Air must be free of conductive dust, zinc whiskers, or other conductive particles. **NOTE:** This condition applies to data center and non-data center environments.
Corrosive dust	• Air must be free of corrosive dust. • Residual dust present in the air must have a deliquescent point less than 60% relative humidity. **NOTE:** This condition applies to data center and non-data center environments.

Table 28. Gaseous contamination specifications

Gaseous contamination	Specifications
Copper coupon corrosion rate	<300 Å/month per Class G1 as defined by ANSI/ISA71.04-1985.
Silver coupon corrosion rate	<200 Å/month as defined by AHSRAE TC9.9.

NOTE: Maximum corrosive contaminant levels measured at ≤50% relative humidity.

4

Initial system setup and configuration

Topics:

Setting up your system

Perform the following steps to set up your system:

Steps

1. Unpack the system.
2. Install the system into the rack. For more information about installing the system into the rack, see the *Rail Installation Guide* at www.dell.com/poweredgemanuals.
3. Connect the peripherals to the system.
4. Connect the system to its electrical outlet.
5. Power on the system by pressing the power button or by using iDRAC.
6. Power on the attached peripherals.

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

iDRAC configuration

The Integrated Dell Remote Access Controller (iDRAC) is designed to make system administrators more productive and improve the overall availability of Dell systems. iDRAC alerts administrators about system issues and enables them to perform remote system management. This reduces the need for physical access to the system.

Options to set up iDRAC IP address

To enable communication between your system and iDRAC, you must first configure the network settings based on your network infrastructure.

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

This option is set to **DHCP** by Default. You can set up the IP address by using one of the following interfaces:

Interfaces	Document/Section
iDRAC Settings utility	*Dell Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals
Dell Deployment Toolkit	*Dell Deployment Toolkit User's Guide* at www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Dell Lifecycle Controller	*Dell Lifecycle Controller User's Guide* at www.dell.com/poweredgemanuals
CMC Web interface	*Dell Chassis Management Controller Firmware User's Guide* at www.dell.com/openmanagemanuals > Chassis Management Controllers
Server LCD panel	LCD panel section

Interfaces	Document/Section
iDRAC Direct and Quick Sync 2 (optional)	See *Dell Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals

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

Log in to iDRAC

You can log in to iDRAC as:

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

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

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

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

NOTE: The Intel Quick Assist Technology (QAT) on the Dell EMC PowerEdge XR2 is supported with chipset integration and is enabled through an optional license. The license files are enabled on the sleds through iDRAC.

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

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

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

Options to install the operating system

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

Table 29. Resources to install the operating system

Resources	Location
iDRAC	www.dell.com/idracmanuals
Lifecycle Controller	www.dell.com/idracmanuals > Lifecycle Controller
OpenManage Deployment Toolkit	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Dell certified VMware ESXi	www.dell.com/virtualizationsolutions
Installation and How-to videos for supported operating systems on PowerEdge systems	Supported Operating Systems for Dell EMC PowerEdge systems

Methods to download firmware and drivers

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

Table 30. Firmware and drivers

Methods	Location
From the Dell EMC support site	www.dell.com/support/home
Using 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 OpenManage Essentials	www.dell.com/openmanagemanuals > OpenManage Essentials
Using Dell OpenManage Enterprise	www.dell.com/openmanagemanuals > OpenManage Enterprise
Using Dell Server Update Utility (SUU)	www.dell.com/openmanagemanuals > Server Update Utility
Using Dell OpenManage Deployment Toolkit (DTK)	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Using iDRAC virtual media	www.dell.com/idracmanuals

Downloading drivers and firmware

Dell EMC recommends that you download and install the latest BIOS, drivers, and systems management firmware on your system.

Prerequisites

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

Steps

1. Go to www.dell.com/support/home.
2. In the **Drivers & Downloads** section, type the Service Tag of your system in the **Enter a Service Tag or product ID** box, and then click **Submit**.

   NOTE: If you do not have the Service Tag, select **Detect Product** to allow the system to automatically detect the Service Tag, or click **View products**, and navigate to your product.

3. Click **Drivers & Downloads**.
   The drivers that are applicable to your system are displayed.
4. Download the drivers to a USB drive, CD, or DVD.

5

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.

Topics:

Options to manage the pre-operating system applications

Your system has the following options to manage the pre-operating system applications:

- System Setup
- Dell Lifecycle Controller
- Boot Manager
- Preboot Execution Environment (PXE)

System Setup

By using the **System Setup** screen, you can configure the BIOS settings, iDRAC settings, and device settings of your system.

NOTE: Help text for the selected field is displayed in the graphical browser by default. To view the help text in the text browser, press F1.

You can access system setup by one of the following:

- Standard graphical browser—The browser is enabled by default.
- Text browser—The browser is enabled by using Console Redirection.

Viewing System Setup

To view the **System Setup** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

System Setup details

The **System Setup Main Menu** screen details are explained as follows:

Option	Description
System BIOS	Enables you to configure 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 *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals.
Device Settings	Enables you to configure device settings.
Service Tag Settings	Enables you to configure service tag settings.

System BIOS

You can use the **System BIOS** screen to edit specific functions such as boot order, system password, and setup password, set the SATA and PCIe NVMe RAID mode, and enable or disable USB ports.

Viewing System BIOS

To view the **System BIOS** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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.

3. On the **System Setup Main Menu** screen, click **System BIOS**.

System BIOS Settings details

About this task

The **System BIOS Settings** screen details are explained as follows:

Option	Description
System Information	Provides information about the system such as the system model name, BIOS version, and Service Tag.
Memory Settings	Provides information and options related to the installed memory.
Processor Settings	Provides information and options related to the processor such as speed and cache size.
SATA Settings	Provides options to enable or disable the integrated SATA controller and ports.
NVMe Settings	Provides options to change the NVMe settings. If the system contains the 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 might also need to change the **Boot Mode** setting to **UEFI**. Otherwise, you should set this field to **Non-RAID** mode.

Option	Description
Boot Settings	Provides options to specify the Boot mode (BIOS or UEFI). Enables you to modify UEFI and BIOS boot settings.
Network Settings	Provides options to manage the UEFI network settings and boot protocols. Legacy network settings are managed from the **Device Settings** menu.
Integrated Devices	Provides options to manage integrated device controllers and ports, specifies related features and options.
Serial Communication	Provides options to manage the serial ports, their related features and options.
System Profile Settings	Provides options to change the processor power management settings, and memory frequency.
System Security	Provides options to configure the system security settings, such as system password, setup password, Trusted Platform Module (TPM) security, and UEFI secure boot. It also manages the power button on the system.
Redundant OS Control	Sets the redundant OS information for redundant OS control.
Miscellaneous Settings	Provides options to change the system date and time.

System Information

You can use the **System Information** screen to view system properties such as Service Tag, system model name, and BIOS version.

Viewing System Information

To view the **System Information** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **System Information**.

System Information details

About this task

The **System Information** screen details are explained as follows:

Option	Description
System Model Name	Specifies the system model name.
System BIOS Version	Specifies the BIOS version installed on the system.

Option	Description
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

You can use the **Memory Settings** screen to view all the memory settings and enable or disable specific memory functions, such as system memory testing and node interleaving.

Viewing Memory Settings

To view the **Memory Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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.

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Memory Settings**.

Memory Settings details

About this task

The **Memory Settings** screen details are explained as follows:

Option	Description
System Memory Size	Specifies the memory size in the system.
System Memory Type	Specifies the type of memory that is installed in the system.
System Memory Speed	Specifies the system memory speed.
System Memory Voltage	Specifies the system memory voltage.

Option	Description
Video Memory	Specifies the amount of video memory.
System Memory Testing	Specifies whether the system memory tests are run during system boot. Options are **Enabled** and **Disabled**. This option is set to **Disabled** by default.
Memory Operating Mode	Specifies the memory operating mode. The options available are **Optimizer Mode**, **Single Rank Spare Mode**, **Multi Rank Spare Mode**, and **Mirror Mode**. This option is set to **Optimizer Mode** by default. **NOTE:** The **Memory Operating Mode** option can have different default and available options depending on the memory configuration of your system.
Current State of Memory Operating Mode	Specifies the current state of the memory operating mode.
Node Interleaving	Specifies if 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 this field is set to **Disabled**, the system supports NUMA (asymmetric) memory configurations. This option is set to **Disabled** by default.
ADDDC Setting	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 have some impact to system performance under certain workloads. This feature is applicable for x4 DIMMs only. This option is set to **Enabled** by default.
Native tRFC Timing for 16Gb DIMMs	Enables 16 Gb density DIMMs to operate at their programmed Row Refresh Cycle Time (tRFC). Enabling this feature may improve system performance for some configurations. However, enabling this feature has no effect on configurations with 16 Gb 3DS/TSV DIMMs. This option is set to **Disabled** by default.
Opportunistic Self-Refresh	Enables or disables opportunistic self-refresh feature. This option is set to **Disabled** by default and is not supported when DCPMMs are in the system.
Correctable Error logging	Enables or disables logging of correctable memory threshold error. This option is set to **Enabled** by default.

Processor Settings

You can use the **Processor Settings** screen to view the processor settings and perform specific functions such as enabling virtualization technology, hardware prefetcher, logical processor idling.

Viewing Processor Settings

To view the **Processor Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Processor Settings**.

Processor Settings details

About this task

The **Processor Settings** screen details are explained as follows:

Option	Description
Logical Processor	Enables or disables the logical processors and displays the number of 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. **NOTE:** The standard and basic bin processors support lower link frequencies. The options available are **Maximum data rate**, **10.4 GT/s**, and **9.6 GT/s**. This option is set to **Maximum data rate** by default. Maximum data rate indicates that the BIOS runs the communication links at the maximum frequency that is supported by the processors. You can also select specific frequencies that the processors support, which can vary. For best performance, you should select **Maximum data rate**. Any reduction in the communication link frequency affects the performance of non-local memory accesses and cache coherency traffic. Besides, it can slow access to non-local I/O devices from a particular processor. However, if power-saving considerations outweigh performance, you might want to reduce the frequency of the processor communication links. If you do this, you should localize memory and I/O accesses to the nearest NUMA node to minimize the impact to system performance.
Virtualization Technology	Enables or disables the virtualization technology for the processor. 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.
Software Prefetcher	Enables or disables the software 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	Sub NUMA Clustering (SNC) is a feature for breaking up the LLC into disjoint clusters based on address range, with each cluster bound to a subset of the memory controllers in the system. It improves average latency to the LLC. Enables or disables the Sub NUMA Cluster. This option is set to **Disabled** by default.
UPI Prefetch	Enables you to get the memory that is read started early on DDR bus. The Ultra Path Interconnect (UPI) Rx path will spawn the speculative memory that is read to Integrated Memory Controller (iMC) directly. This option is set to **Enabled** by default.
LLC Prefetch	Enables or disables the LLC Prefetch on all threads. This option is set to **Disabled** 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.
Logical Processor Idling	Enables you to improve the energy efficiency of a system. It uses the operating system core parking algorithm and parks some of the logical processors in the system which in turn allows the corresponding processor cores to transition into a lower power idle state. This option can only be enabled if the operating system supports it. It is set to **Disabled** by default.
Configurable TDP	Enables you to configure the TDP level. The available options are **Nominal**, **Level 1**, and **Level 2**. This option is set to **Nominal** by default. **NOTE:** This option is only available on certain stock keeping units (SKUs) of the processors.
x2APIC Mode	Enables or disables the x2APIC mode. This option is set to **Enabled Disabled** by default.

Option	Description
Number of Cores per Processor	Controls the number of enabled cores in each processor. This option is set to **All** by default.
Processor Core Speed	Specifies the maximum core frequency of the processor.
Processor Bus Speed	Displays the bus speed of the processor.
Processor n	**NOTE:** Depending on the number of processors, there might be up to processors listed. The following settings are displayed for each processor that is installed in the system:

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.
Level 3 Cache	Specifies the total L3 cache.
Number of Cores	Specifies the number of cores per processor.
Maximum Memory Capacity	Specifies the maximum memory capacity per processor.
Microcode	Specifies the microcode.

SATA Settings

You can use the **SATA Settings** screen to view the settings of SATA devices and enable SATA and PCIe NVMe RAID mode on your system.

Viewing SATA Settings

To view the **SATA Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **SATA Settings**.

SATA Settings details

About this task

The **SATA Settings** screen details are explained as follows:

Option	Description
Embedded SATA	Enables the embedded SATA option to be set to **AHCI Mode**, or **RAID Mode**. This option is set to **AHCI Mode** by default.
Security Freeze Lock	Enables you to send **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 set to **Disabled** by default.
Port n	Enables you to set the drive type of the selected device. For **AHCI Mode** or **RAID Mode**, BIOS support is always enabled.

Option	Description
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

The NVMe settings enable you to set the NVMe drives to either **RAID** mode or **Non-RAID** mode.

NOTE: To configure these drives as RAID drives, you must set the NVMe drives and the Embedded SATA option in the **SATA Settings** menu to **RAID** mode. If not, you must set this field to **Non-RAID** mode.

Viewing NVMe Settings

To view the **NVMe Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **NVMe Settings**.

NVMe Settings details

About this task

The NVMe Settings screen details are explained as follows:

Option	Description
NVMe Mode	Enables you to set the NVMe mode. This option is set to **Non RAID** 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.

- **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.

Viewing Boot Settings

To view the **Boot Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Boot Settings**.

Boot Settings details

About this task

The **Boot Settings** screen details are explained as follows:

Option	Description
Boot Mode	Enables you to set the boot mode of the system. **CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.** If the operating system supports **UEFI**, you can set this option to **UEFI**. Setting this field to **BIOS** enables compatibility with non-UEFI operating systems. This option is set to **UEFI** by default. **NOTE:** Setting this field to **UEFI** disables the **BIOS Boot Settings** menu.
Boot Sequence Retry	Enables or disables the **Boot Sequence Retry** feature. If this option is set to **Enabled** and the system fails to boot, the system re-attempts the boot sequence after 30 seconds. This option is set to **Enabled** by default.
Hard-Disk Failover	Specifies the drive that is booted in the event of a drive failure. The devices are selected in the **Hard-Disk Drive Sequence** on the **Boot Option Setting** menu. When this option is set to **Disabled**, only the first drive in the list is attempted to boot. When this option is set to **Enabled**, all drives are attempted to boot in the order selected in the **Hard-Disk Drive Sequence**. This option is not enabled for **UEFI Boot Mode**. This option is set to **Disabled** by default.
Generic USB Boot	Enables or disables the USB boot option. This option is set to **Disabled** by default.

Hard-disk Drive Placeholder	Enables or disables the Hard-disk drive placeholder option. This option is set to **Disabled** by default.
BIOS Boot Settings	Enables or disables BIOS boot options. **NOTE:** This option is enabled only if the boot mode is BIOS.
UEFI Boot Settings	Enables or disables UEFI Boot options. The Boot options include **IPv4 PXE** and **IPv6 PXE**. This option is set to **IPv4** by default. **NOTE:** This option is enabled only if the boot mode is UEFI.
UEFI Boot Sequence	Enables you to change the boot device order.
Boot Options 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:

- BIOS boot mode (the default) is the standard BIOS-level boot interface.
- 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.

Changing boot order

About this task

You may have to change the boot order if you want to boot from a USB key or an optical drive. The following instructions may vary if you have selected **BIOS** for **Boot Mode**.

Steps

1. On the **System Setup Main Menu** screen, click **System BIOS** > **Boot Settings** > **UEFI/BIOS Boot Settings** > **UEFI/BIOS Boot Sequence**.
2. Click **Exit**, and then click **Yes** to save the settings on exit.

Network Settings

You can use the **Network Settings** screen to modify UEFI PXE, iSCSI, and HTTP boot settings. The network settings option is available only in the UEFI mode.

NOTE: BIOS does not control network settings in the BIOS mode. For the BIOS boot mode, the optional Boot ROM of the network controllers handles the network settings.

Viewing Network Settings

To view the **Network Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Network Settings**.

Network Settings screen details

The **Network Settings** screen details are explained as follows:

About this task

Option	Description
UEFI PXE Settings	**Options** / **Description** **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	**Options** / **Description** **HTTP Device (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.
TLS Authentication Configuration	View and/or modify this device's boot TLS authentication mode. **None** means the HTTP server and the client will not authenticate each other for this boot. **One way** means the HTTP server will be

Table 31. UEFI iSCSI Settings screen details

Option	Description
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 by default.
iSCSI Device1 Settings	Enables you to control the configuration of the iSCSI device.

Option	Description
	authenticated by the client, while the client will not be authenticated by the server. This option is set to **None** by default.

Integrated Devices

You can use the **Integrated Devices** screen to view and configure the settings of all integrated devices including the video controller, integrated RAID controller, and the USB ports.

Viewing Integrated Devices

To view the **Integrated Devices** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Integrated Devices**.

Integrated Devices details

About this task

The **Integrated Devices** screen details are explained as follows:

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. 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.
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. **NOTE:** The Internal SD Card Port on the PCIe riser is controlled by Internal USB Port.
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 RAID Controller	Enables or disables the integrated RAID controller. This option is set to **Enabled** by default.
Embedded NIC1 and NIC2	**NOTE:** The Embedded NIC1 and NIC2 options are only available on systems that do not have **Integrated Network Card 1**. Enables or disables the Embedded NIC1 and NIC2 options. If set to **Disabled**, the NIC may still be available for shared network access by the embedded management controller. The embedded NIC1 and NIC2 options are only available on systems that do not have Network Daughter Cards (NDCs). The Embedded NIC1 and NIC2 option is mutually exclusive with the Integrated Network Card 1 option. Configure the Embedded NIC1 and NIC2 option by using the NIC management utilities of the system.

Option	Description
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.
Embedded Video Controller	Enables or disables the use of Embedded Video Controller as the primary display. When set to **Enabled**, the Embedded Video Controller is used as 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 pre-boot environment. The embedded video is disabled before the operating system boots. This option is set to **Enabled** by default. **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 re-arrange the cards in the slots in order to control which card is the primary video.
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 .
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 OS. This option is set to **Disabled** by default.
Memory Mapped I/O above 4 GB	Enables or disables the support for the PCIe devices that need large amounts of memory. Enable this option only for 64-bit operating systems. This option is set to **Enabled** by default.
Memory Mapped I/O Base	When set to **12 TB**, the system maps the MMIO base to 12 TB. Enable this option for an OS that requires 44 bit PCIe addressing. When set to **512 GB**, the system maps the MMIO base to 512 GB, and reduces the maximum support for memory to less than 512 GB. Enable this option only for the 4 GPU DGMA issue. This option is set to **56 TB** by default.
Slot Disablement	Enables or 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 are available for control.

Table 32. Slot Disablement

Option	Description
Slot 1	Enables or disables or only the boot driver is disabled for the PCIe slot 1. This option is set to **Enabled** by default.
Slot 2	Enables or disables or only the boot driver is disabled for the PCIe slot 2. This option is set to **Enabled** by default.
Slot 3	Enables or disables or only the boot driver is disabled for the PCIe slot 3. This option is set to **Enabled** by default.
Slot 4	Enables or disables or only the boot driver is disabled for the PCIe slot 4. This option is set to **Enabled** by default.
Slot 5	Enables or disables or only the boot driver is disabled for the PCIe slot 5. This option is set to **Enabled** by default.

Option	Description

Table 32. Slot Disablement (continued)

Option	Description
Slot 6	Enables or disables or only the boot driver is disabled for the PCIe slot 6. This option is set to **Enabled** by default.

Slot Bifurcation	Allows **Platform Default Bifurcation**, **Auto Discovery of Bifurcation** and **Manual Bifurcation Control**. The default is set to **Platform Default Bifurcation**. The slot bifurcation field is accessible when set to **Manual Bifurcation Control** and is disabled when set to **Platform Default Bifurcation** or **Auto Discovery of Bifurcation**.

Serial Communication

You can use the **Serial Communication** screen to view the properties of the serial communication port.

Viewing Serial Communication

To view the **Serial Communication** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Serial Communication**.

Serial Communication details

About this task

The **Serial Communication** screen details are explained as follows:

Option	Description
Serial Communication	Enables you to select serial communication devices (Serial Device 1 and Serial Device 2) in BIOS. BIOS console redirection can also be enabled, and the port address can be specified. This option is set to **Auto** by default.
Serial Port Address	Enables you to set the port address for serial device. This field sets the serial port address to either **COM1** or **COM2** (COM1=0x3F8, COM2=0x2F8). This option is set to **Serial Device1=COM2 or Serial Device 2=COM1** by default. **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. **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 the serial MUX setting to the default setting of Serial Device 1.

Option	Description
External Serial Connector	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. **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. **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.
Failsafe Baud Rate	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.
Remote Terminal Type	Enables you to set the remote console terminal type. This option is set to **VT100/VT220** by default.
Redirection After Boot	Enables or disables the BIOS console redirection when the operating system is loaded. This option is set to **Enabled** by default.

System Profile Settings

You can use the **System Profile Settings** screen to enable specific system performance settings such as power management.

Viewing System Profile Settings

To view the **System Profile Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **System Profile Settings**.

System Profile Settings details

About this task

The **System Profile Settings** screen details are explained as follows:

Option	Description
System Profile	Sets the system profile. If you set the System Profile option to a mode other than **Custom**, 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 Optimized (DAPC)** by default. DAPC is Dell Active Power Controller.Other options include **Performance Per Watt (OS)**, **Performance**, and **Workstation Performance**. **NOTE:** All the parameters on the system profile setting screen are available only when the **System Profile** option is set to **Custom**.

Option	Description
CPU Power Management	Sets the CPU power management. This option is set to **System DBPM (DAPC)** by default. DBPM is Demand-Based Power Management.
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.
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. This option is set to **Enabled** by default.
Write Data CRC	Enables or disables the Write Data CRC. This option is set to **Disabled** by default.
Memory Patrol Scrub	Sets the memory patrol scrub frequency. 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 **Processor 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.
Number of Turbo Boost Enabled Cores for Processor 1	**NOTE:** If there are two processors installed in the system, you will see an entry for **Number of Turbo Boost Enabled Cores for Processor 2**. Controls the number of turbo boost enabled cores for Processor 1. The maximum number of cores is enabled by default.
Monitor/Mwait	Enables the Monitor/Mwait instructions in the processor. This option is set to **Enabled** for all system profiles, except **Custom** by default. **NOTE:** This option can be disabled only if the **C States** option in the **Custom** mode is set to **disabled**. **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.
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.
Intel Persistent Memory CR QoS	Enables you to select the tunning **Method 1** for QoS knobs and is recommended for 2-2-2 memory configuration in active directory, **Method 2** for QoS knobs and is recommended for other memory configuration in active directory or **Method 3** for QoS knobs and is recommended for 1 DIMM per channel configuration. This option is set to **Disabled** by default.
Intel Persistent Memory Performance Setting	Enables you to select the NVMe performance settings depending on the workload behavior. If this option is set to **BW Optimized**, the performance is optimized for DDR and DDRT bandwidth. If this option is set to **Latency Optimized**, the performance is better DDR latency. This option is set to **BW Optimized** by default.

System Security

You can use the **System Security** screen to perform specific functions such as setting the system password, setup password and disabling the power button.

Viewing System Security

To view the **System Security** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **System Security**.

System Security Settings details

About this task

The **System Security Settings** screen details are explained as follows:

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	Enables you to set the system password. This option is read-only if the password jumper is not installed in the system.
Setup Password	Enables you to set the system setup password. This option is read-only if the password jumper is not installed in the system.
Password Status	Enables you to lock the system password. This option is set to **Unlocked** by default.
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. The **TPM Security** option is set to **Off** by default. You can only modify the TPM Status TPM Activation, and the Intel TXT fields if the **TPM Status** field is set to either **On with Pre-boot Measurements** or **On without Pre-boot Measurements**. When TPM 1.2 is installed, the **TPM Security** option is set to **Off**, **On with Pre-boot Measurements**, or **On without Pre-boot Measurements**.

Table 33. TPM 1.2 security information

Option	Description
TPM Information	Changes the operational state of the TPM. This option is set to **No Change** by default.
TPM Firmware	Indicates the firmware version of the TPM.
TPM Status	Specifies the TPM status.
TPM Command	Controls the Trusted Platform Module (TPM). When set to **None**, no command is sent to the TPM. When set to **Activate**, the TPM is enabled and activated. When set to **Deactivate**, the TPM

Option	Description

Table 33. TPM 1.2 security information (continued)

Option	Description
	is disabled and deactivated. When set to **Clear**, all the contents of the TPM are cleared. This option is set to **None** 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.

Table 34. TPM 2.0 security information

Option	Description
TPM Information	Changes the operational state of the TPM. This option is set to **No Change** by default.
TPM Firmware	Indicates the firmware version of the TPM.
TPM Hierarchy	Enable, disable, or clear 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

This setting is enabled only when TPM Security is set to ON.

Table 35. TPM Advanced Settings Details

Option	Description
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. This option is set to **Disabled** by default.
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) provisioning operations. This option is set to **Disabled** by default.

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.

Power Button

Enables you to set 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.

AC Power Recovery Delay

Enables you to set the time that the system should take to turn on after AC power is restored to the system. This option is set to **Immediate** by default.

Option	Description
User Defined Delay (60 s to 600 s)	Enables you to set the **User Defined Delay** option when the **User Defined** option for **AC Power Recovery Delay** is selected.
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.
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 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	Enables you to configure 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**.

Options	Description
User Mode	In **User Mode**, PK must be installed, and BIOS performs signature verification on programmatic attempts to update policy objects. BIOS allows unauthenticated programmatic transitions between modes.
Audit Mode	In **Audit mode**, PK is not present. BIOS does not authenticate programmatic updates to the policy objects, and transitions between modes. **Audit Mode** is useful for programmatically determining a working set of policy objects. BIOS performs signature verification on pre-boot images. BIOS also logs the results in the image Execution Information Table, but approves the images whether they pass or fail verification.
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.

Secure Boot Policy Summary	Specifies the list of certificates and hashes that secure boot uses to authenticate images.
Secure Boot Custom Policy Settings	Configures the Secure Boot Custom Policy. To enable this option, set the **Secure Boot Policy** to **Custom**.

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.
   - The password can contain the numbers 0 through 9.
   - Only the following special characters are allowed: space, (”), (+), (,), (-), (.), (/), (;), ([), (\), (]), (`).

   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 the system

About this task

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

Steps

1. Power 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, change 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.

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.

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.
```

```
Password Invalid. Number of unsuccessful password attempts: <x> Maximum number of
password attempts exceeded.System halted.
```

Even after you 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 details 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

In the **Redundant OS Control** screen you can set the redundant OS information. This enables you to set up a physical recovery disk on the system.

Viewing Redundant OS Control

To view the **Redundant OS Control** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Redundant OS Control**.

Redundant OS Control screen details

The **Redundant OS Control** screen details are explained as follows:

About this task

Option	Description
Redundant OS Location	Enables you to select a backup disk from the following devices: • **None** • **IDSDM** • **SATA Ports in AHCI mode** • **BOSS PCIe Cards (Internal M.2 Drives)** • **Internal USB** **NOTE:** RAID configurations and NVMe cards not are included as BIOS does not have the ability to distinguish between individual drives in those configurations.
Redundant OS State	**NOTE:** This option is disabled if **Redundant OS Location** is set to **None**. 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. **NOTE:** BIOS will disable the device in hardware, so it cannot be accessed by the OS.
Redundant OS Boot	**NOTE:** This option is disabled if **Redundant OS Location** is set to **None** or if **Redundant OS State** is set to **Hidden**. 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.

Miscellaneous Settings

You can use the **Miscellaneous Settings** screen to perform specific functions such as updating the asset tag and changing the system date and time.

Viewing Miscellaneous Settings

To view the **Miscellaneous Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Miscellaneous Settings**.

Miscellaneous Settings details

About this task

The **Miscellaneous Settings** screen details are explained as follows:

Option	Description
System Time	Enables you to set the time on the system.
System Date	Enables you to set the date on the system.
Asset Tag	Specifies the asset tag and enables you to modify it for security and tracking purposes.
Keyboard NumLock	Enables you to set whether the system should boot with the NumLock enabled or disabled. This option is set to **On** by default. **NOTE:** This option does not apply to 84-key keyboards.
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	Enables you to determine whether the system BIOS loads the legacy video (INT 10H) option ROM from the video controller. Selecting **Enabled** in the operating system does not support UEFI video output standards. This field is available only for UEFI boot mode. You cannot set the option to **Enabled** if **UEFI Secure Boot** mode is enabled. This option is set to **Disabled** by default.
Dell Wyse P25/P45 BIOS Access	Enables or disables the Dell Wyse P25/P45 BIOS Access. This option is set to **Enabled** by default.

iDRAC Settings utility

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

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

For more information about using iDRAC, see *Dell Integrated Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals.

Device Settings

Device Settings enables you to configure the below device parameters:

- Controller Configuration Utility
- Embedded NIC Port1-X Configuration
- NICs in slotX, Port1-X Configuration
- BOSS Card configuration

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 can be started during the boot sequence and can function 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 www.dell.com/poweredgemanuals.

Boot Manager

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

Viewing Boot Manager

About this task

To enter Boot Manager:

Steps

1. Power on, or restart your system.
2. Press F11 when you see the following message:

   ```
   F11 = Boot Manager
   ```

   If your operating system begins to load before you press F11, allow the system to complete the booting, and then restart your system and try again.

Boot Manager main menu

Menu item	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 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 System Diagnostics and UEFI shell.

One-shot UEFI boot menu

One-shot UEFI boot menu enables you to select a boot device to boot from.

System Utilities

System Utilities contains the following utilities that can be launched:

- 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.

6

PowerEdge XR2 installing and removing system components

Topics:

Safety instructions

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

WARNING: Opening or removing the system cover while the system is powered on may expose you to a risk of electric shock.

CAUTION: Do not operate the system without the cover for a duration exceeding five minutes. Operating the system without the system cover can result in component damage.

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

NOTE: It is recommended that you always use an antistatic mat and antistatic strap while working on components inside the system.

CAUTION: To ensure proper operation and cooling, all bays in the system and system fans must be always populated with a component or a blank.

Before working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Turn off the system, including 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 *Rack Installation Guide* at https://www.dell.com/poweredgemanuals.
4. Remove the system cover.

After working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Install the system cover.
2. If applicable, install the system into the rack.
   For more information, see the *Rack Installation Guide* at https://www.dell.com/poweredgemanuals.
3. Reconnect the peripherals and connect the system to the electrical outlet.
4. Turn on the attached peripherals and then turn on the system.

Recommended tools

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

- Key to the bezel lock

  The key is required only if your system includes a bezel.

- Phillips #1 screwdriver
- Phillips #2 screwdriver
- Torx #T30 screwdriver
- Torx #T8 screwdriver
- Wrist grounding strap

Optional front bezel

Removing the front bezel

The procedure to remove the front bezel with and without the LCD panel is the same.

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Loosen the thumb screws using a Phillips #2 screwdriver.
2. Pull the bezel away from the system.

Figure 18. Removing the front bezel

Installing the front bezel

The procedure to install the front bezel with and without the LCD panel is the same.

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Align the thumb screws on the bezel with the rack ears on the front of the system.
2. Using a Phillips #2 screwdriver, tighten the thumb screws to secure the bezel to the system chassis.

Figure 19. Installing the front bezel

Removing the bezel filter

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Remove the front bezel.

Steps

1. Use a Phillips #2 screwdriver, remove the screw securing the bezel guard and unhook the bezel guard from the front bezel.

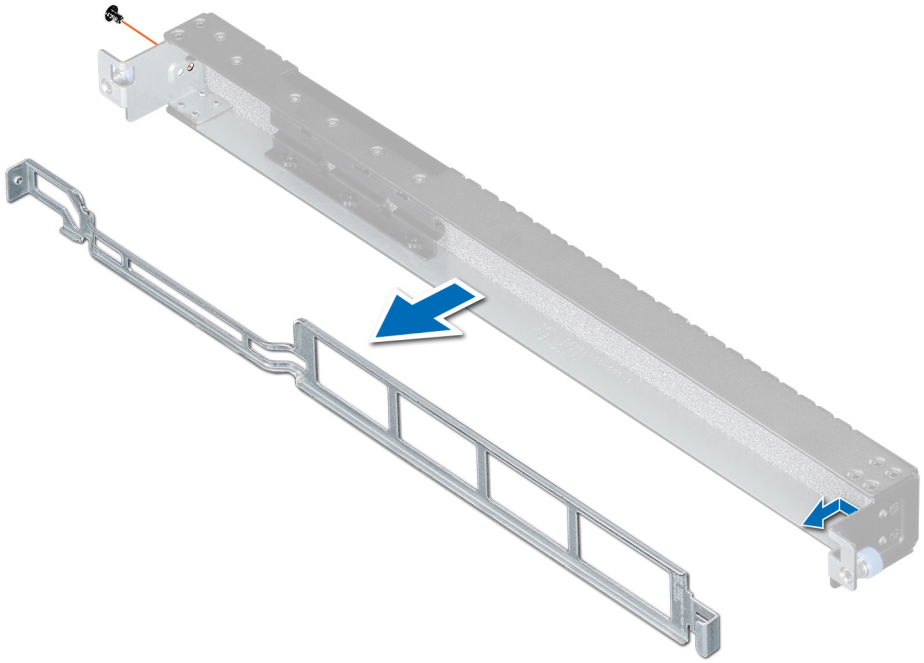

Figure 20. Removing the bezel guard

2. Use a Phillips #2 screwdriver, remove the screws securing the bezel clamp and the optional LCD panel.

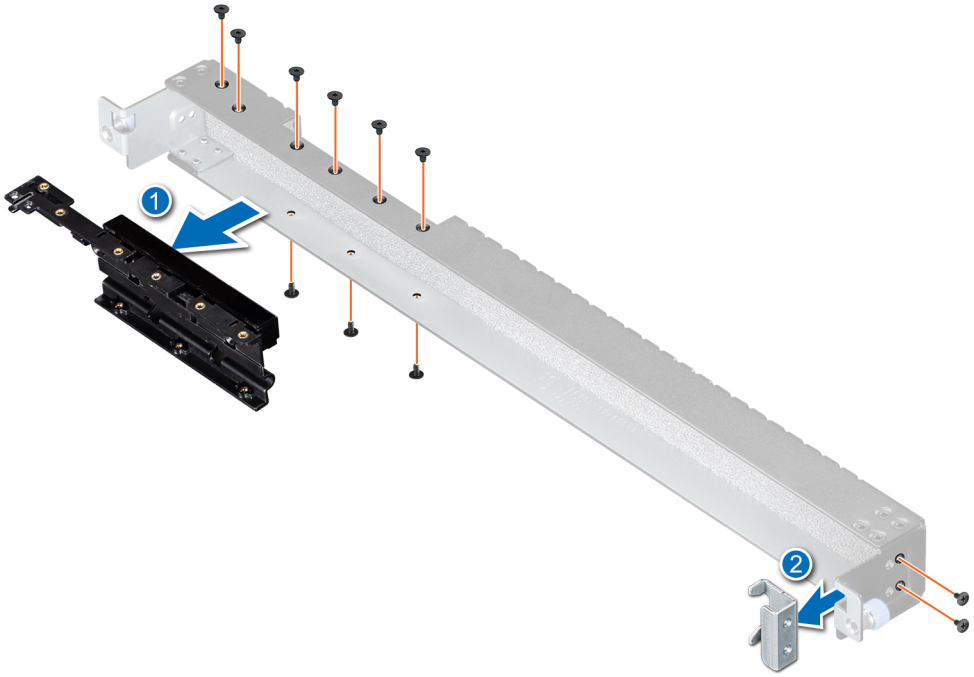

Figure 21. Removing the optional LCD bezel

3. Remove the bezel filter.

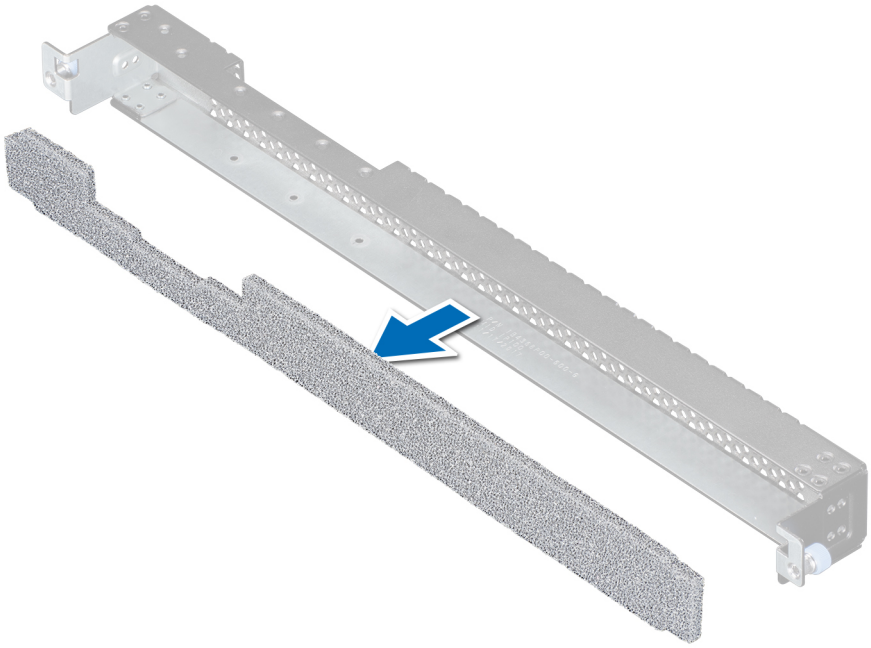

Figure 22. Removing the bezel filter

Next steps

1. Install the front bezel.
2. Follow the procedure listed in After working inside your system on page 60.

Installing the bezel filter

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Remove the front bezel.
3. Unpack the bezel filter kit.

Steps

1. Install the bezel filter.

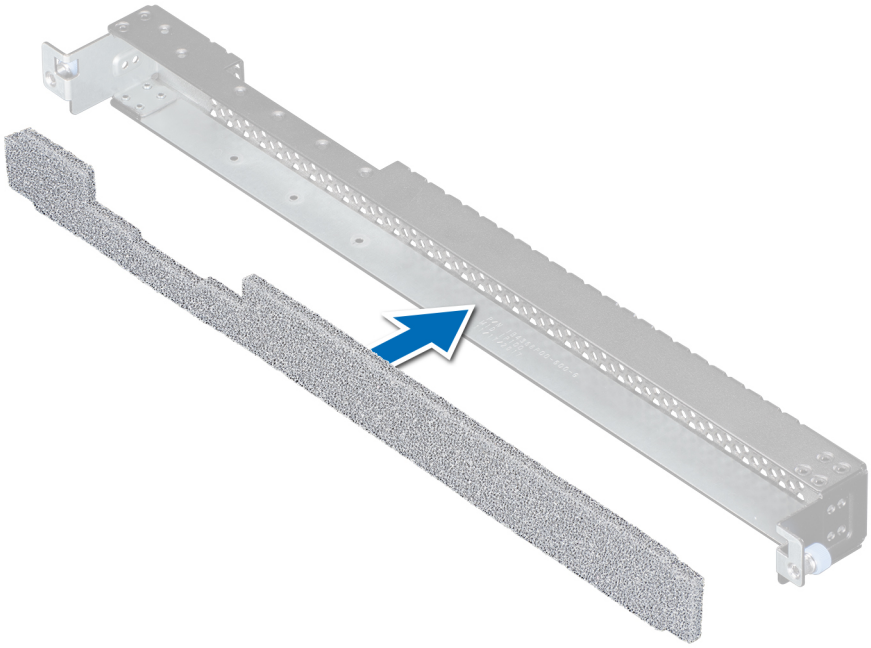

Figure 23. Installing the bezel filter

2. Use a Phillips #2 screwdriver, secure the bezel clamp and the optional LCD panel to the front bezel.

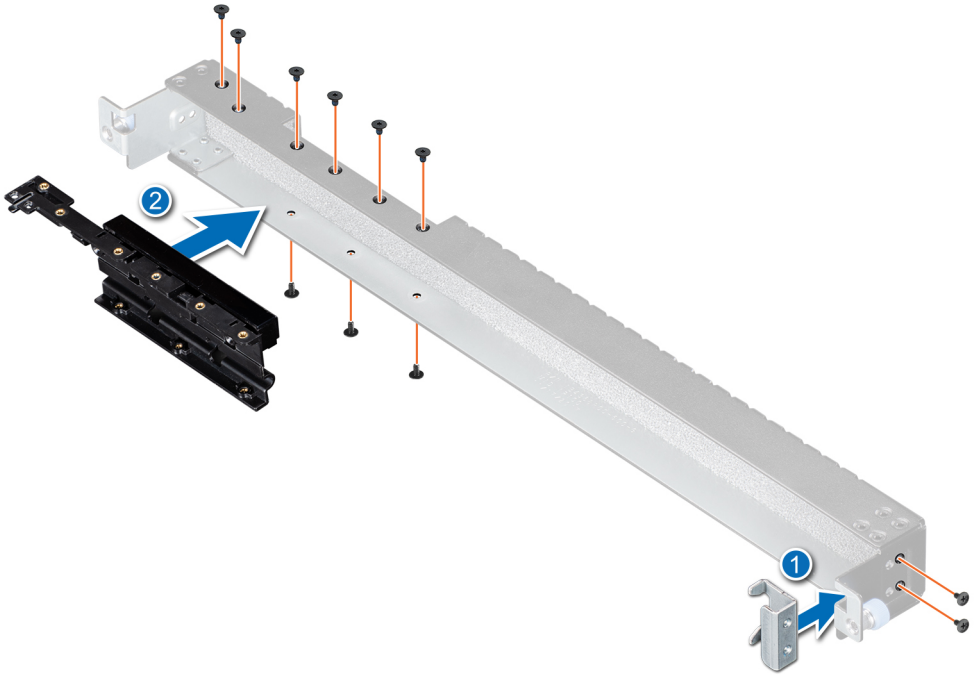

Figure 24. Installing the optional LCD bezel

3. Align the hook with the bezel guard, and use a Phillips #2 screwdriver to secure it to the front bezel.

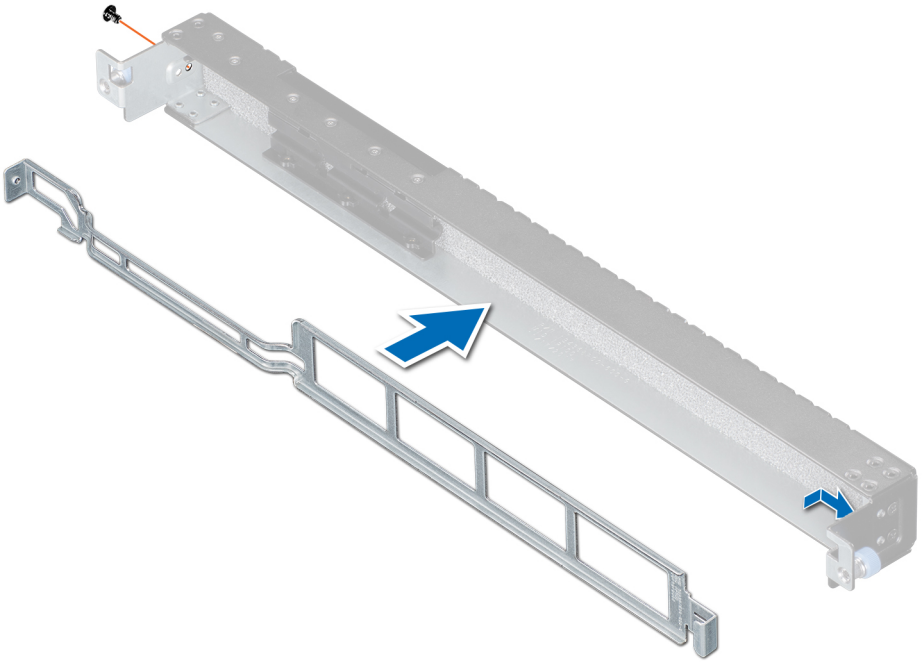

Figure 25. Installing the bezel guard

Next steps

1. install the front bezel.
2. Follow the procedure listed in After working inside your system on page 60.

System cover

Removing the system cover

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

Steps

1. Using a 1/4 inch flat head or a Phillips #2 screwdriver, rotate the latch release lock counter clockwise to the unlocked position.
2. Loosen the two captive screws on the top of the system cover.
3. Loosen the thumb screw that secures the back of the system cover to the chassis.

   NOTE: Ensure that the three screws are loosened before lifting the latch to avoid damage to the system cover.

4. Lift the latch till the system cover slides back and the tabs on the system cover disengage from the guide slots on the system.
5. Hold the cover on both sides, and lift the cover away from the system.

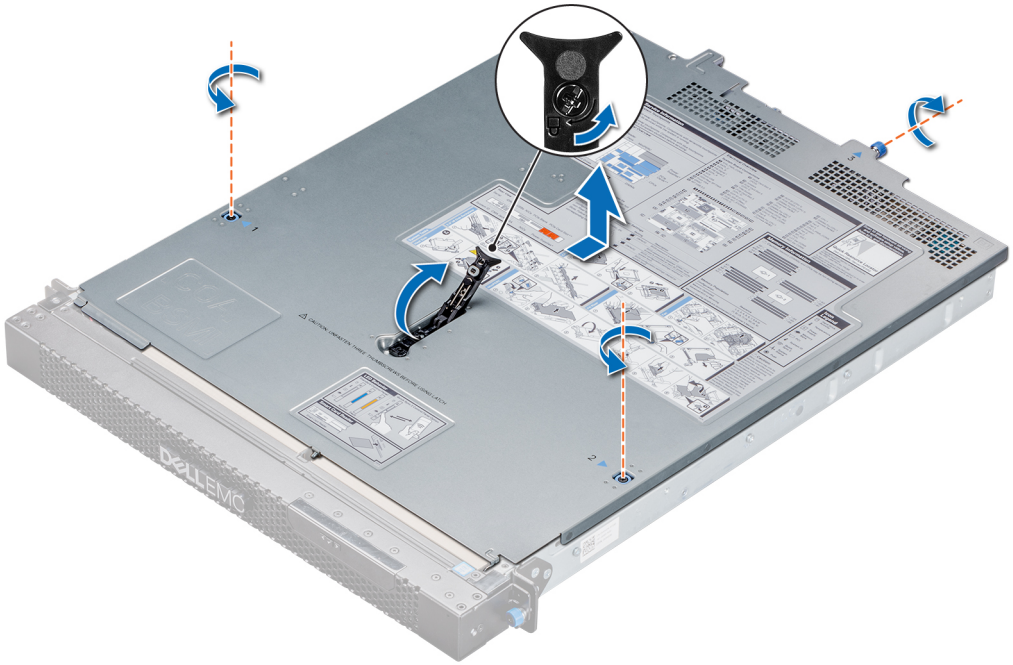

Figure 26. Removing the system cover

Next steps

Follow the procedure listed in After working inside your system on page 60.

Installing the system cover

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Ensure that all internal cables are routed correctly and connected, and no tools or extra parts are left inside the system.

Steps

1. Align the tabs on the system cover with the guide slots on the system.
2. Close the system cover latch.

   The system cover slides forward, the tabs on the system cover engage with the guide slots on the system and the system cover latch locks into place.
3. Tighten the thumb screw that secures the system cover to the back of the system.
4. Tighten the captive screws on the top of the system cover.

   NOTE: Follow the sequence provided on the system cover to tighten the screws.
5. Using a 1/4 inch flat head or a Phillips #2 screwdriver, rotate the latch release lock clockwise to the locked position.

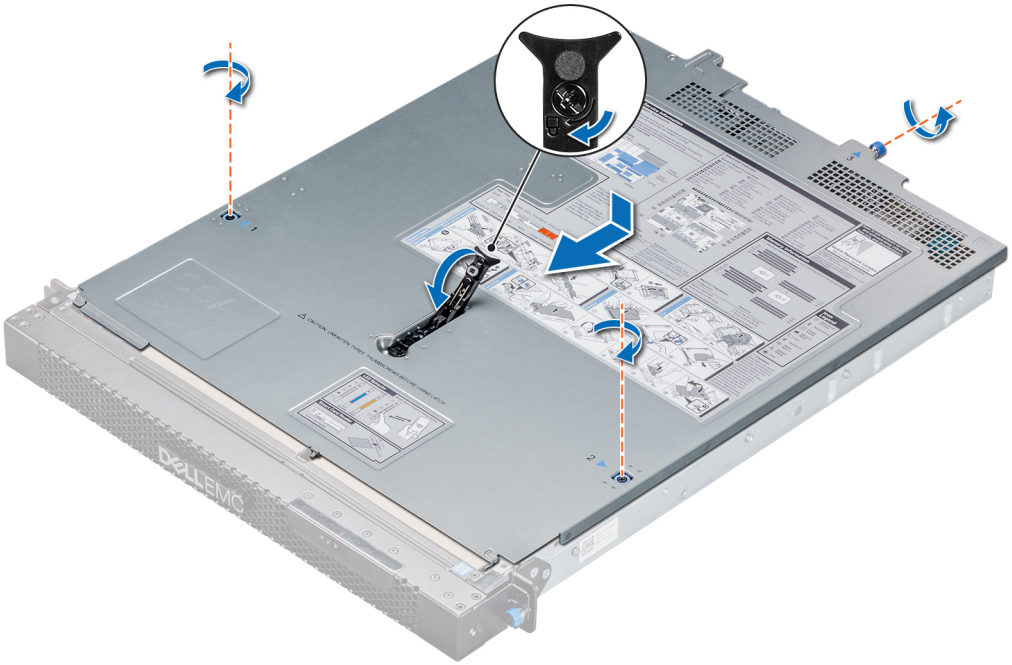

Figure 27. Installing the system cover

Next steps

Follow the procedure listed in After working inside your system on page 60.

Inside the system

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.

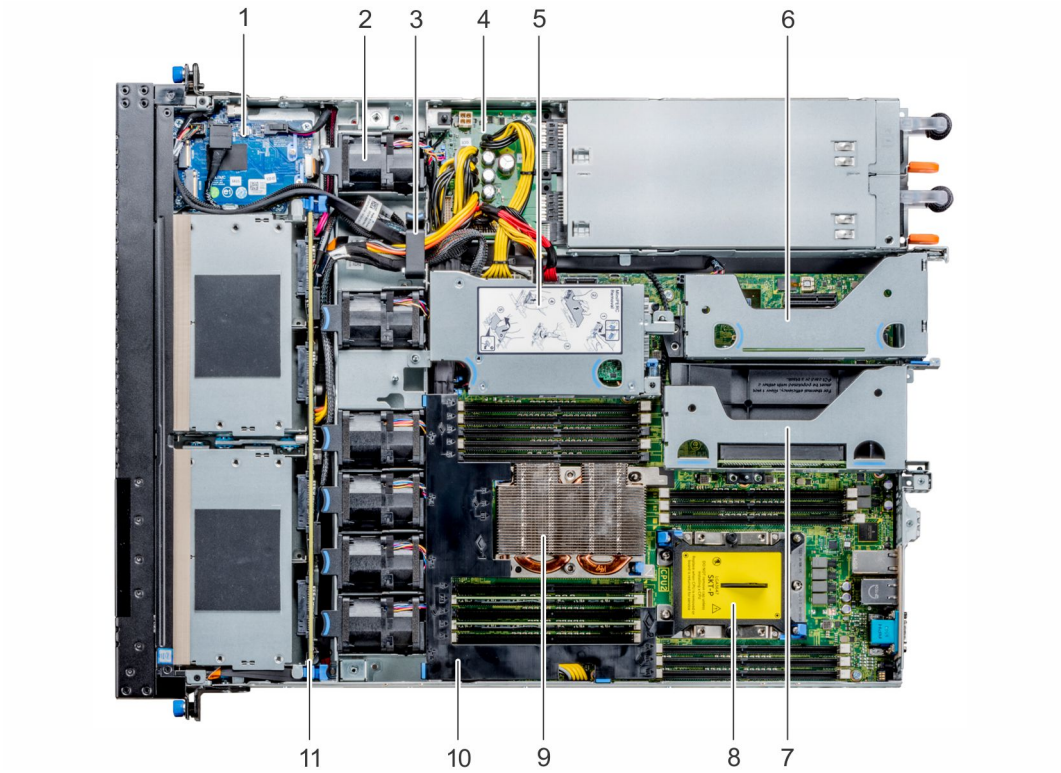

Figure 28. Inside the system

1. Front IO board (VGA, ESATA, M.2, internal USB port, and smart card controller)
2. Cooling fan (one processor configuration- 5 fans, two processor configuration - 6 fans)
3. Cabling latch
4. Power interposer board
5. MiniPERC riser or NVMe PERC riser
6. Low profile expansion riser 2
7. Low profile expansion riser 1
8. Processor 2 blank
9. Heat sink and processor 1
10. Air shroud
11. Hard drive backplane

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 on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

Steps

Holding the touch points, lift the air shroud away from the system.

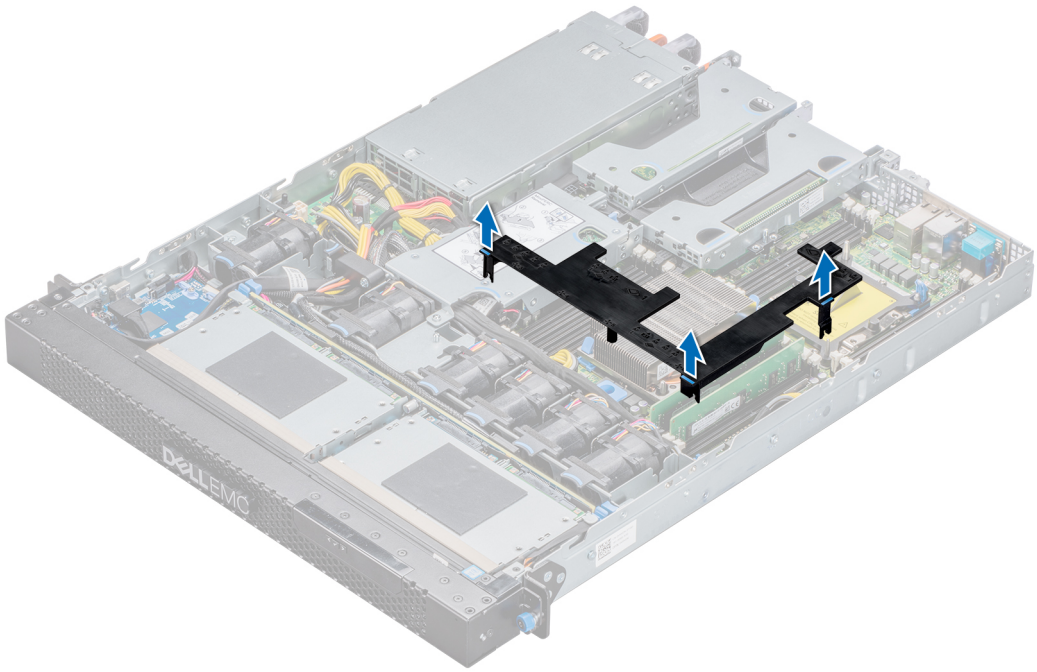

Figure 29. Removing the air shroud

Next steps

1. If applicable, install the air shroud.
2. Follow the procedure listed in After working inside your system on page 60.

Installing the air shroud

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. If applicable, route the cables inside the system along the system wall.

Steps

1. Align the tabs on the air shroud with the slots on the system.

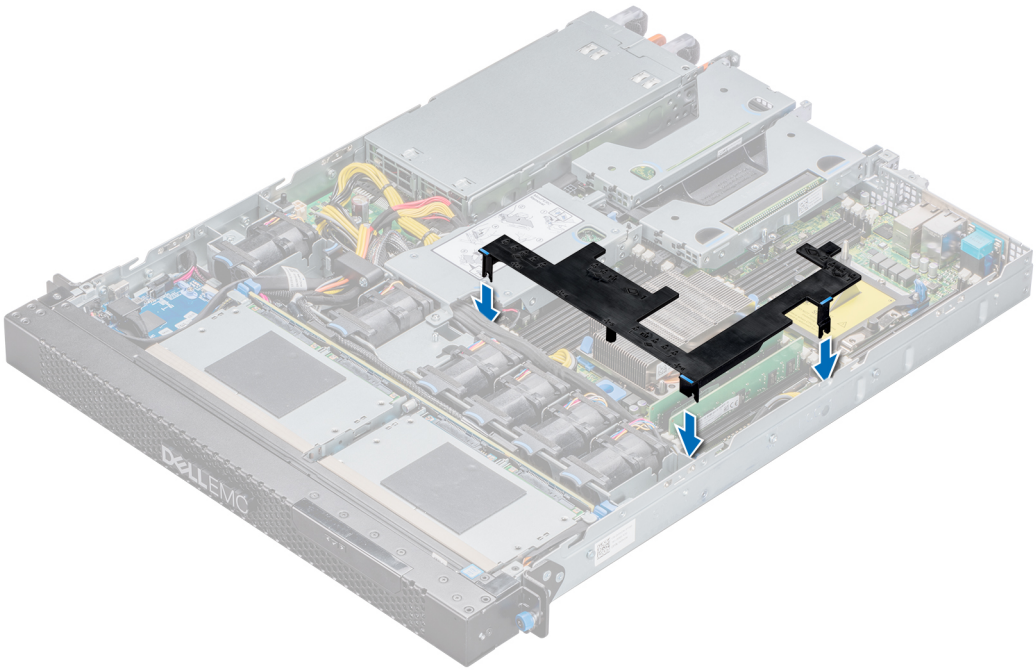

Figure 30. Installing the air shroud

2. Holding the touch points, lower the air shroud into the system until it is firmly seated.
   When firmly seated, the memory socket numbers marked on the air shroud align with the respective memory sockets.

Next steps

Follow the procedure listed in After working inside your system on page 60.

Cooling fans

Removing the cooling fan

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the air shroud

Steps

Disconnect the cooling fan cable that is connected to the system board connector and lift the fan, out holding the blue touch point.

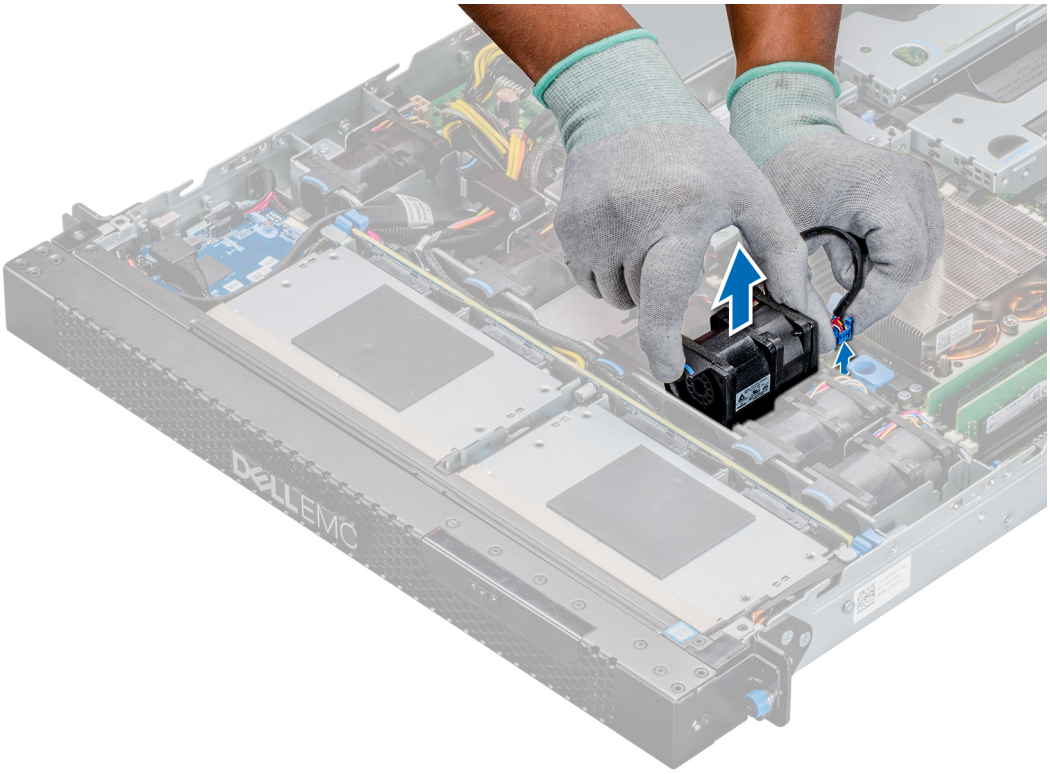

Figure 31. Removing the cooling fan

Next steps

1. Install the cooling fan
2. Install the air shroud.
3. Follow the procedure listed in After working inside your system on page 60.

Installing the cooling fan

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

Steps

1. Holding the blue touch point, place the cooling fan into the cooling fan cage.
2. Route the cooling fan cable and connect it to the connector on the system board.

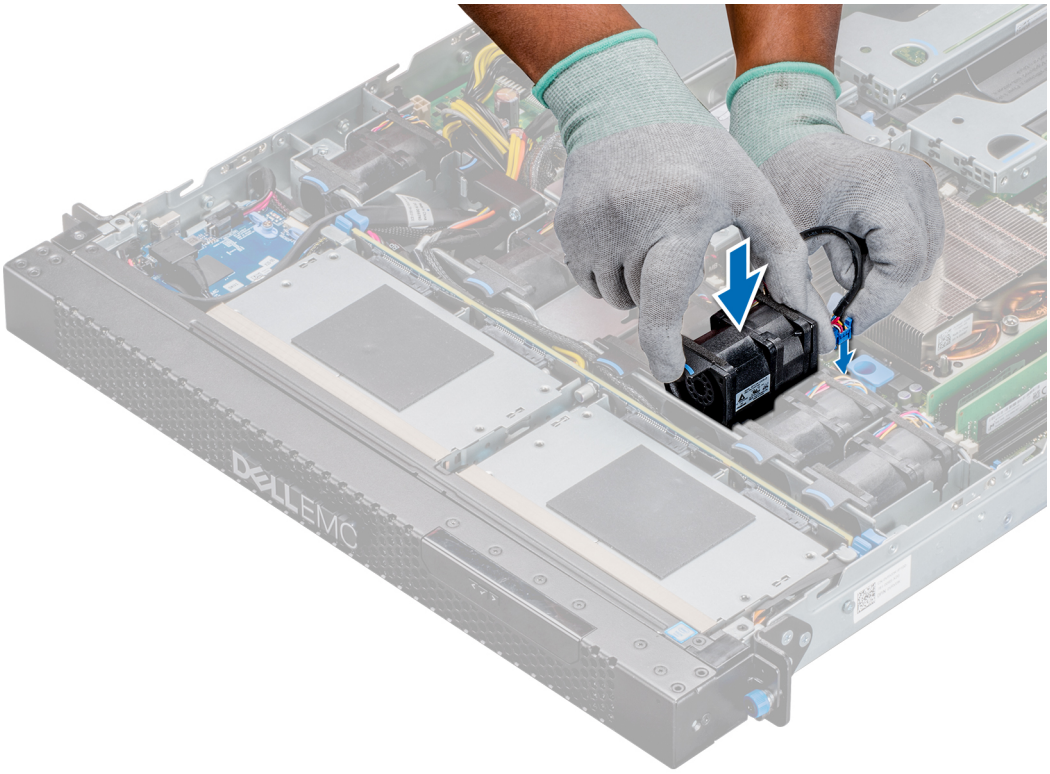

Figure 32. Installing cooling fan

Next steps

1. Install the air shroud.
2. Follow the procedure listed in After working inside your system on page 60.

Front IO board

The front IO board features multiple expansion slots and storage options:

- Two M.2 ports
- eSATA port
- Internal USB port 2.0
- VGA port
- Smart Card Reader

Removing the front IO board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the cooling fan, located next to the front IO board
4. If applicable, remove the card from the card reader.
5. If installed, remove the optional Internal USB memory key.
6. If installed, remove the Internal M.2 SSD module.

Steps

1. Disconnect the cables that are connected to the IO board.

2. Using a Phillips #2 screwdriver, remove the screws securing the I/O board to the chassis.
3. Gently lift the I/O board and then slide the board toward the rear of the system until the connectors are clear of the slots on the front of the system.

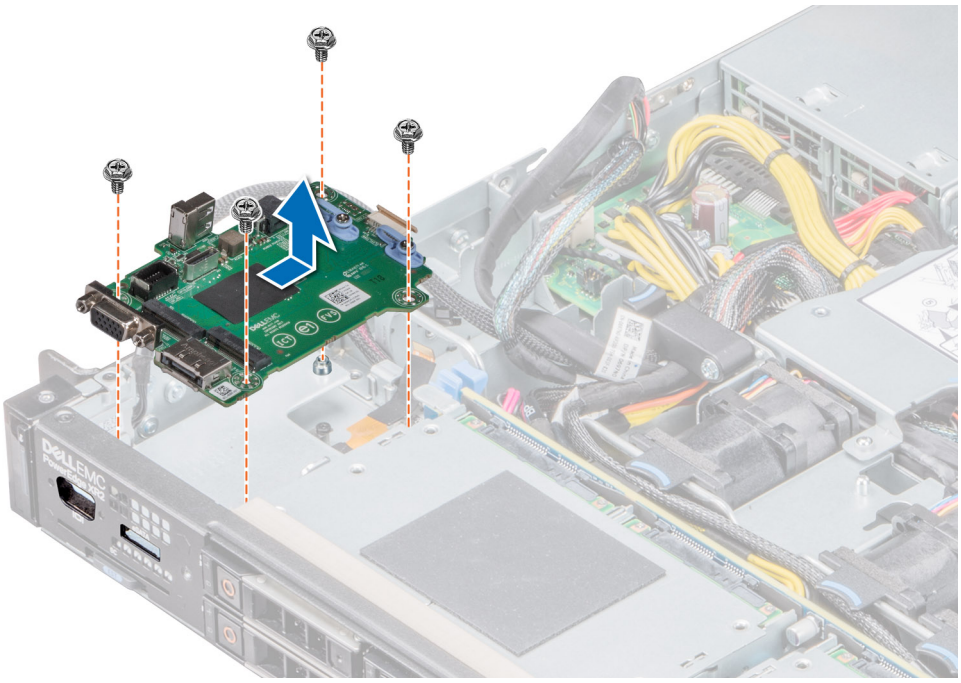

Figure 33. Removing the front IO board

Next steps

1. Install the front IO board
2. Follow the procedure listed in After working inside your system on page 60.

Installing the front IO board

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Lower the front IO board aligning the connectors on the board with the slots on the front of the system.
2. Using a Phillips #2 screwdriver, replace the screws that secure the IO board to the chassis.

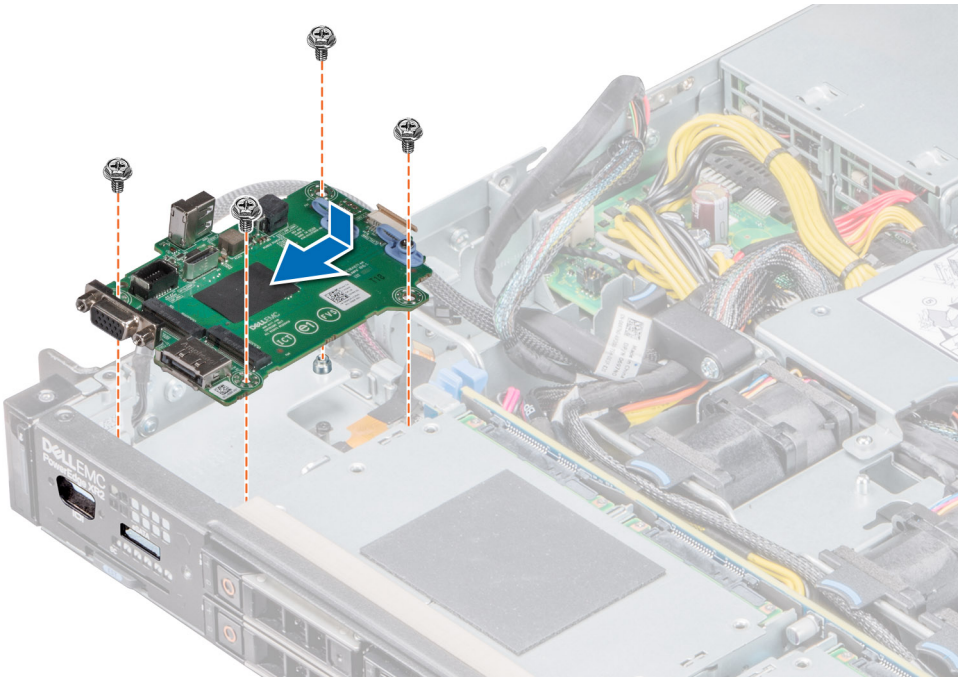

Figure 34. Installing the front IO board

Next steps

1. Reconnect all cables to the IO board.
   NOTE: Ensure that the cables inside the system are routed along the chassis wall and secured using the cable securing bracket.
2. If removed, install optional Internal USB memory key.
3. If removed, install Internal M.2 SSD module.
4. Install the cooling fan.
5. Follow the procedure listed in After working inside your system on page 60.
6. Install the smart card, if removed.

Internal M.2 SSD module

Removing the internal M.2 SSD module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

Steps

1. Loosen the screws and lift the retention straps that secure the M.2 SSD module on the front IO board.
2. Pull the M.2 SSD module away from the front IO board.

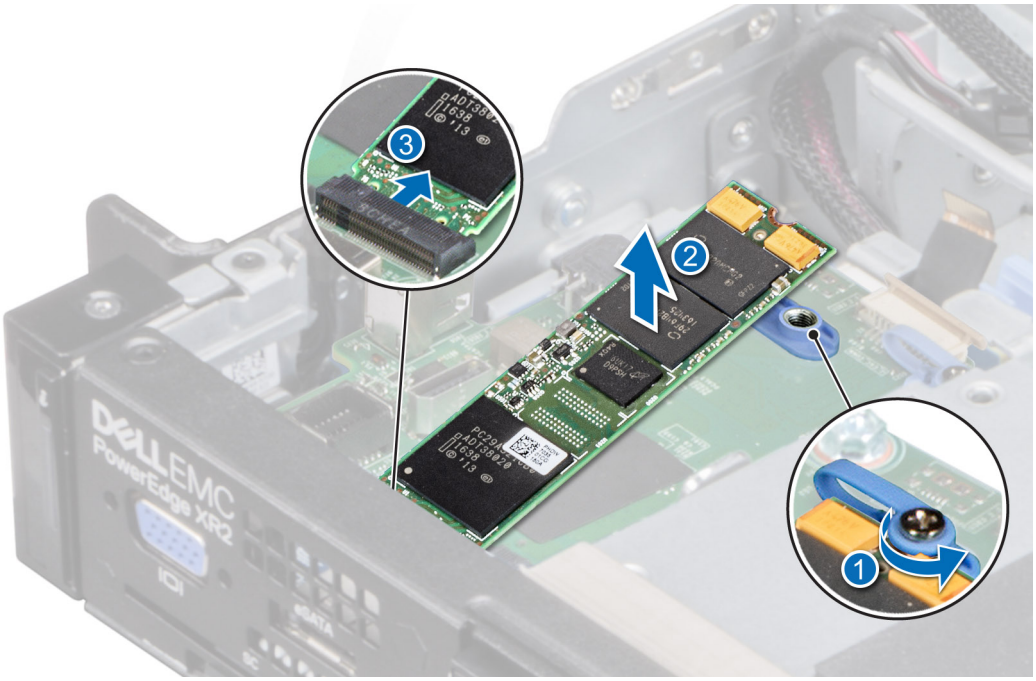

Figure 35. Removing the internal M.2 SSD module

Next steps

Install the internal M.2 SSD module.

Installing the internal M.2 SSD module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Align the M.2 SSD module connectors with the connectors on the front IO board.
2. Push the M.2 SSD module until the module is seated firmly on the front IO board.
3. Secure the M.2 SSD module on the front IO board with the retention straps and screws.

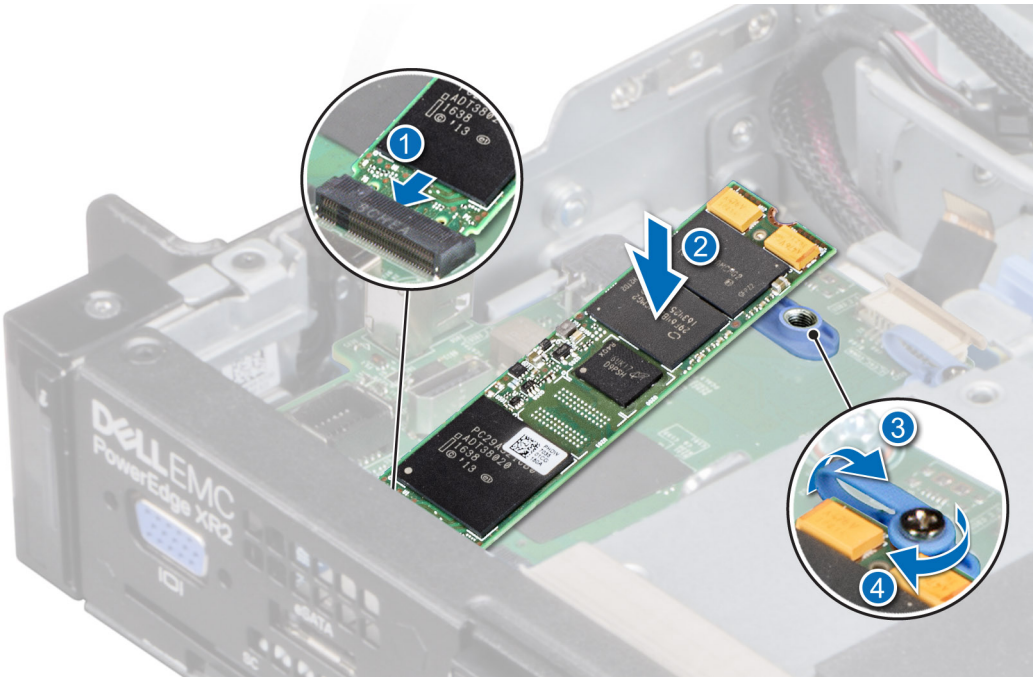

Figure 36. Installing the internal M.2 SSD module

Next steps

1. Follow the procedure listed in After working inside your system on page 60.

Common Access Card (CAC) Or Smart Card Reader

The Smart Card Reader allows for an additional form of authentication for data encryption.

Removing the Smart Card Reader

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the front IO board.

Steps

1. Using a Phillips #2 screwdriver, remove the screws securing the Smart Card Reader bracket to the chassis.

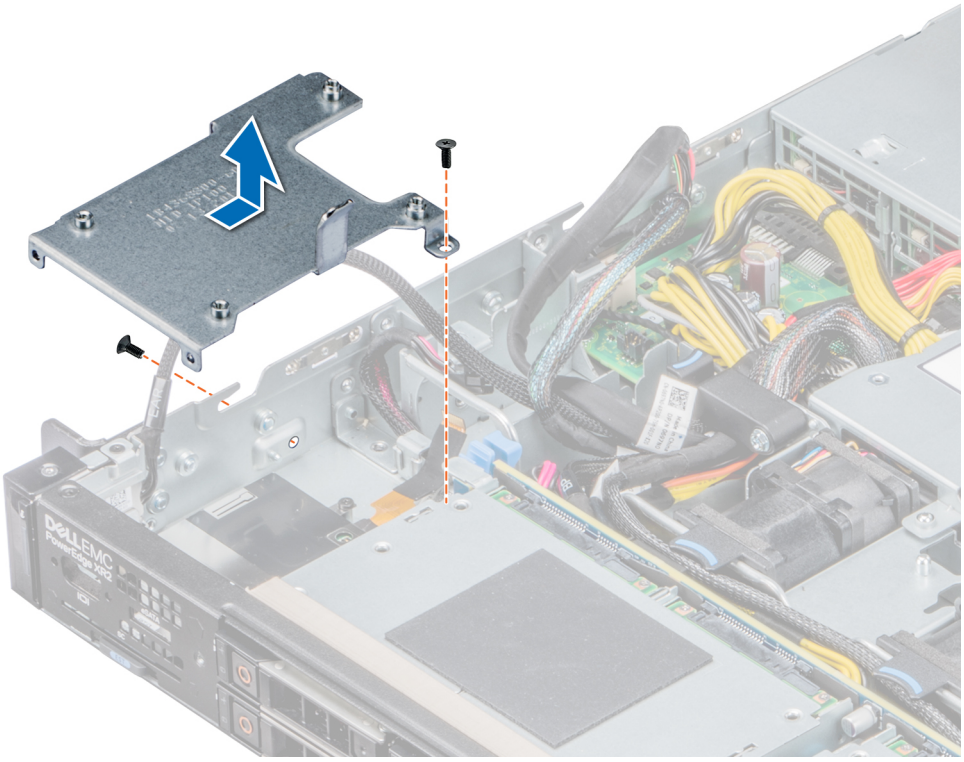

Figure 37. Removing the Smart Card Reader bracket

2. Using the screwdriver, remove the four screws securing the Smart Card Reader to the chassis.
3. Lift the Smart Card Reader out of the system.

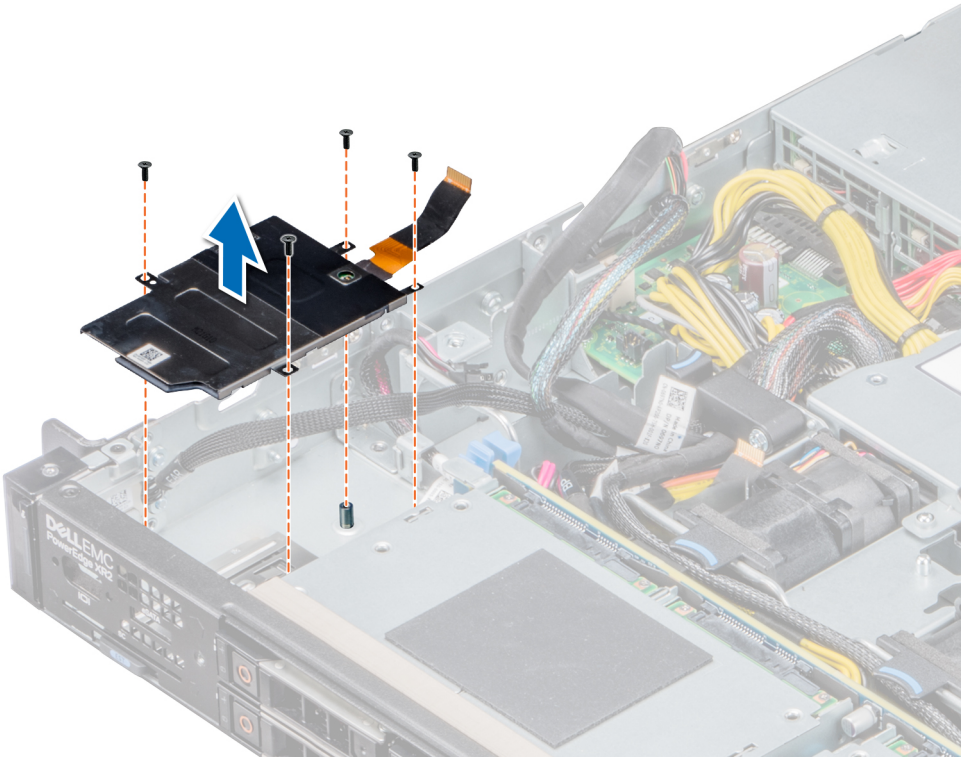

Figure 38. Removing the Smart Card Reader

Next steps

1. Install the front IO board
2. Follow the procedure listed in After working inside your system on page 60.

Installing the Smart Card Reader

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Remove the front IO board.

Steps

1. Align the Smart Card Reader with the screw holes on the chassis.
2. Using a Phillips #2 screwdriver, replace the screws that secure the Smart Card Reader to the chassis.

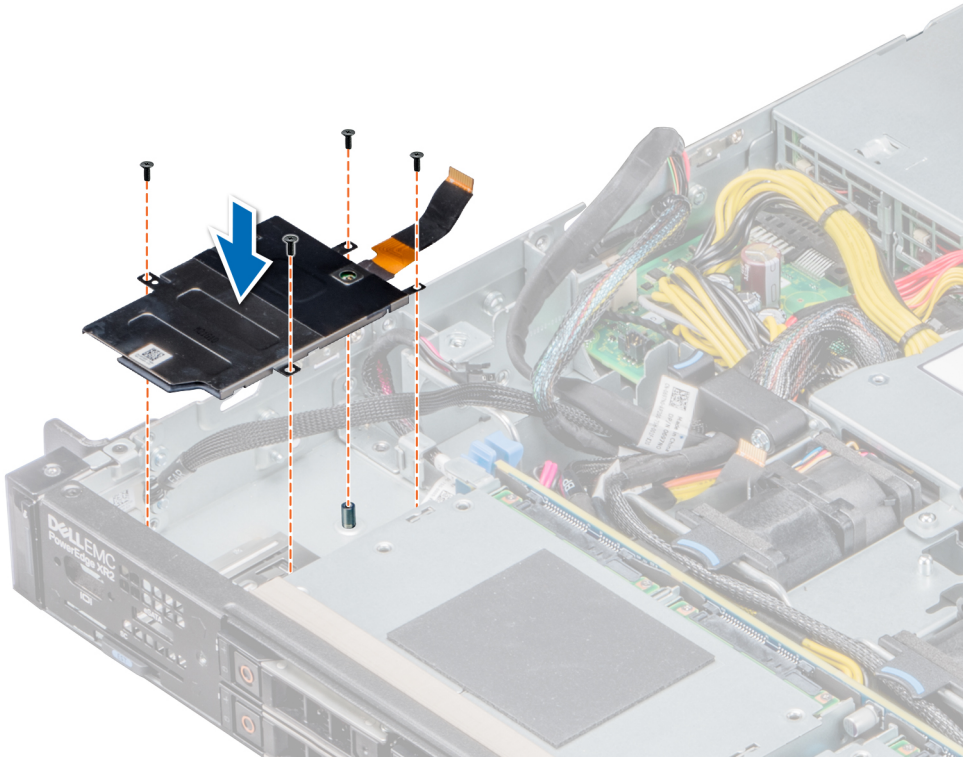

Figure 39. Installing the Smart Card Reader

3. Using a Phillips #2 screwdriver, replace the screws that secure the Smart Card Reader bracket to the chassis.

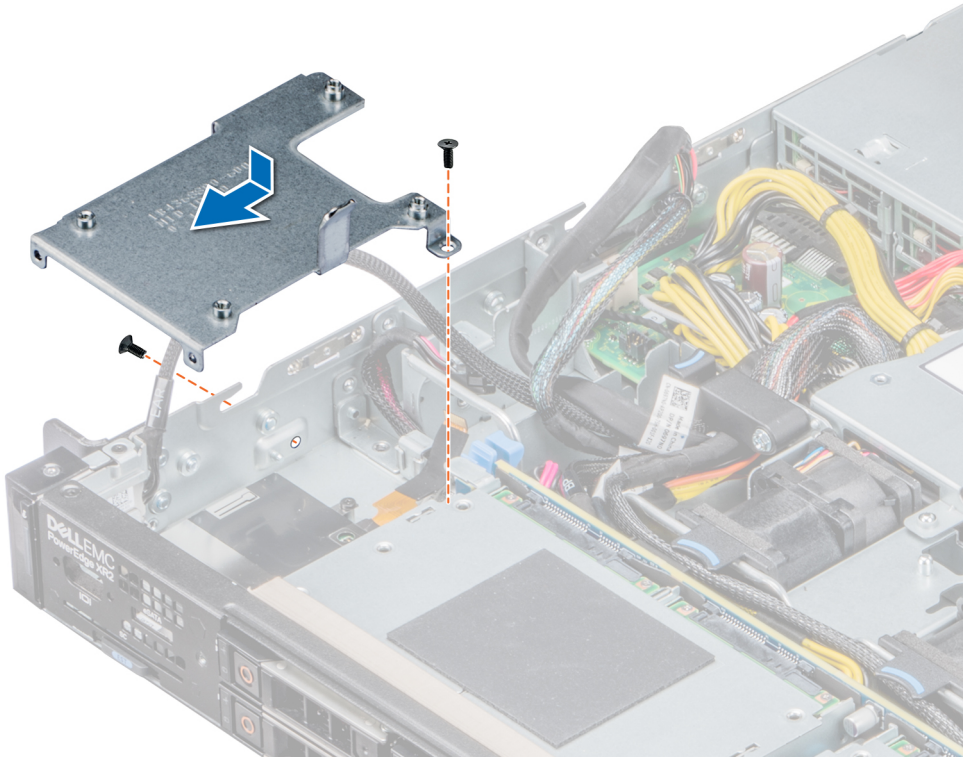

Figure 40. Installing the Smart Card Reader bracket

Next steps

1. Reconnect all cables to the Smart Card Reader.
   NOTE: Ensure that the cables inside the system are routed along the chassis wall and secured using the cable securing bracket.
2. Follow the procedure listed in After working inside your system on page 60.

Intrusion switch

Removing the intrusion switch

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
   NOTE: Ensure that you note the routing of the cables as you remove them from the system board. You must route the cables properly when you replace them to prevent the cables from being pinched or crimped.
3. Remove the air shroud
4. Remove internal MiniPERC riser or NVMe MiniPERC riser

Steps

1. Disconnect the intrusion switch cable that is connected to the system board.
2. Slide the intrusion switch out of the intrusion switch slot.

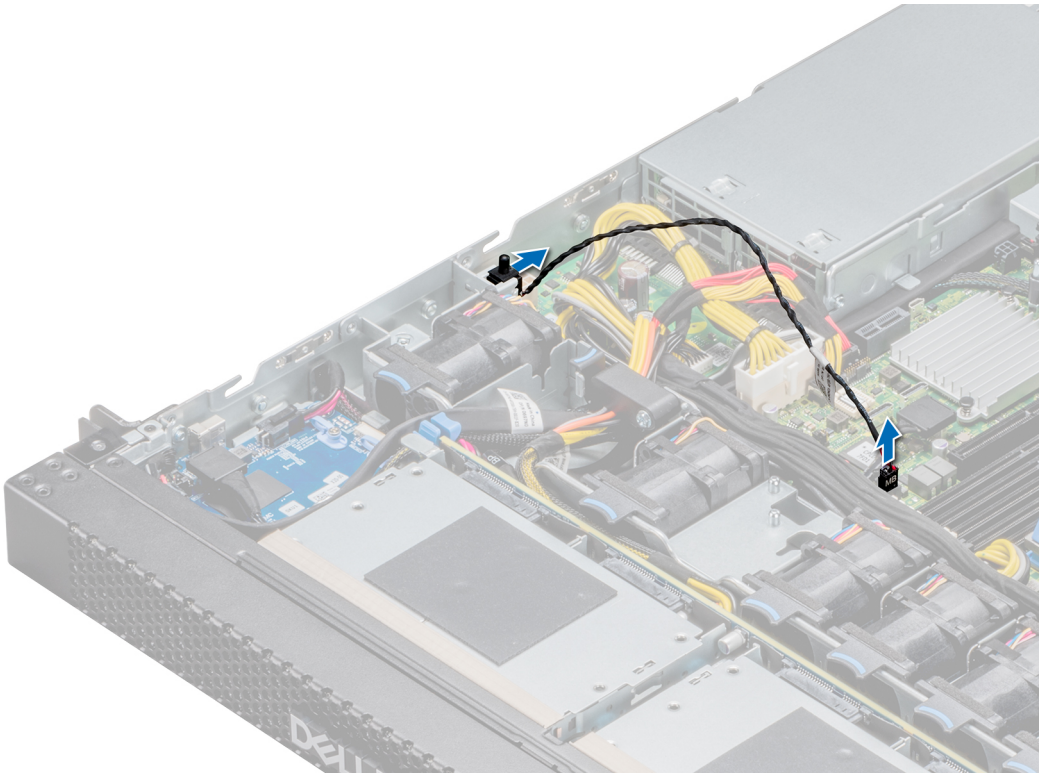

Figure 41. Removing the intrusion switch

Next steps

1. Installing intrusion switch
2. Follow the procedure listed in After working inside your system on page 60.

Installing the intrusion switch

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove air shroud
4. Remove internal MiniPERC riser or NVMe miniPERC riser

Steps

1. Align the intrusion switch with the intrusion switch slot.
2. Slide the intrusion switch until it is firmly seated in the intrusion switch slot.
3. Connect the intrusion switch cable to the connector on the system board.

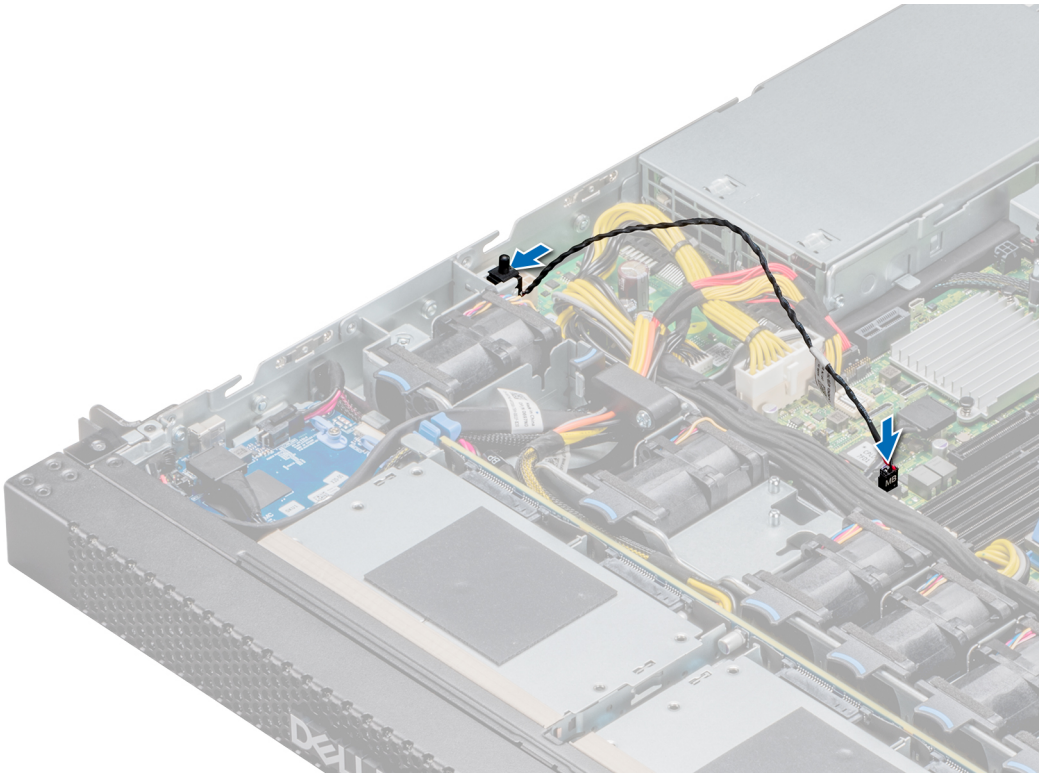

Figure 42. Installing intrusion switch

Next steps

1. Install internal MiniPERC riser or NVMe miniPERC riser
2. Install air shroud
3. Follow the procedure listed in After working inside your system on page 60.

Drives

Removing a drive blank

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. If installed, remove the front bezel

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.

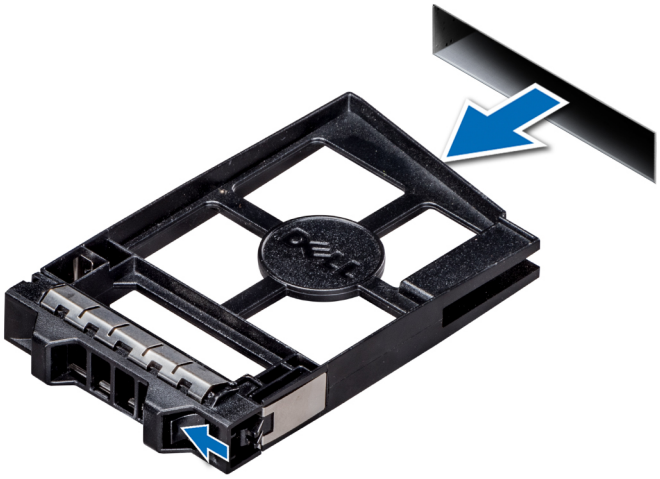

Figure 43. Removing a drive blank

Next steps

1. Install a drive or a drive blank
2. If applicable, install the front bezel

Installing a drive blank

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

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.

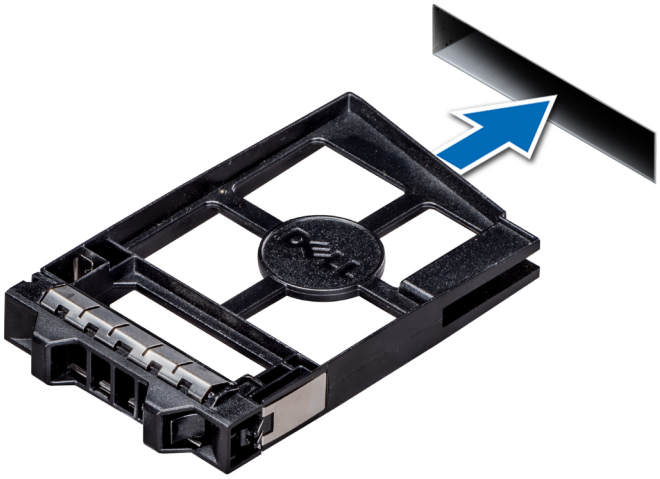

Figure 44. Installing a drive blank

Next steps

If removed, install the front bezel.

Removing a drive

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Using the management software, prepare the drive for removal.

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

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

   CAUTION: Mixing 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 release handle.
2. Holding the handle, slide the drive out of the drive slot.

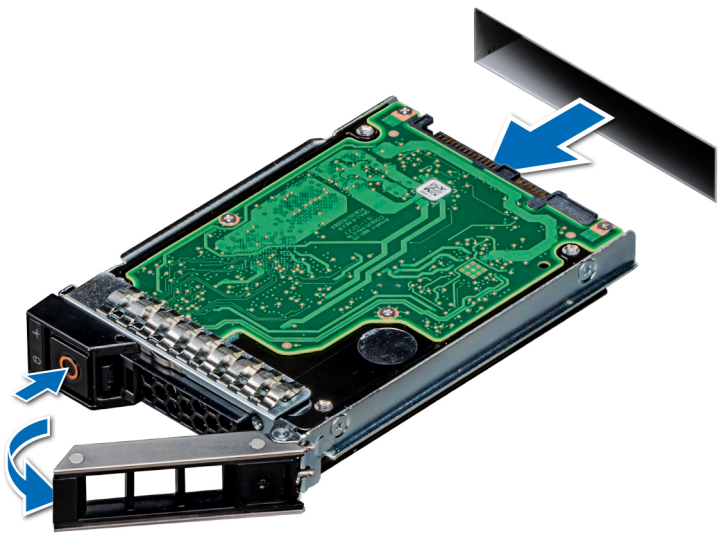

Figure 45. Removing a drive

Next steps

1. Install a drive.
2. If you are not replacing the drive immediately, insert a drive blank in the empty rive slot to maintain proper system cooling.

Installing a 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 fully installed. Inserting a drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.

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

CAUTION: When a replacement hot swappable drive is installed and the system is powered on, the drive automatically begins to rebuild. Ensure that the replacement drive is blank or contains data that you wish to overwrite. Any data on the replacement drive is immediately lost after the drive is installed.

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. If applicable, remove the drive blank.

Steps

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

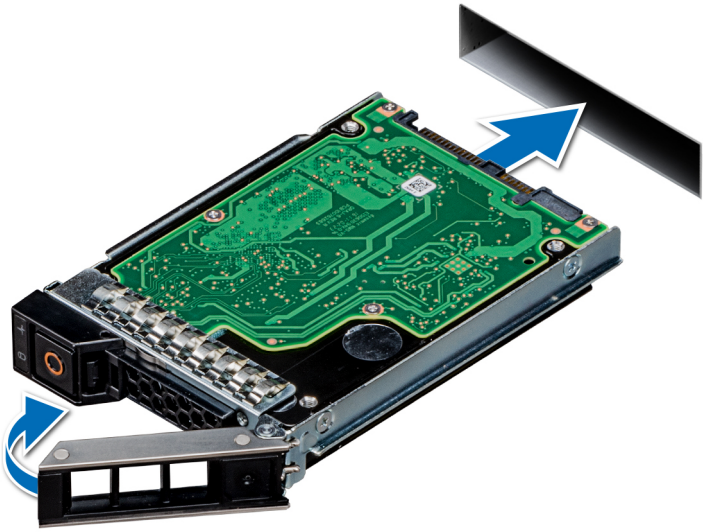

Figure 46. Installing a drive

Next steps

If applicable, install the front bezel.

Removing the drive from the drive carrier

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

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.

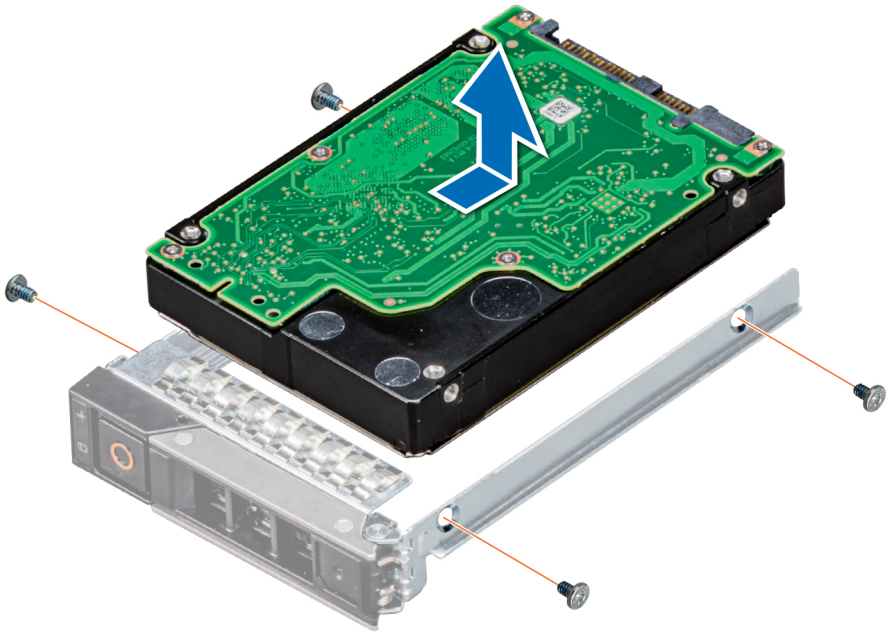

Figure 47. Removing the drive from the drive carrier

2. Lift the drive out of the drive carrier.

Next steps

If applicable, install the drive into the drive carrier.

Installing a drive into the drive carrier

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

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

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

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.
   When aligned correctly, the back of the drive is flush with the back of the drive carrier.

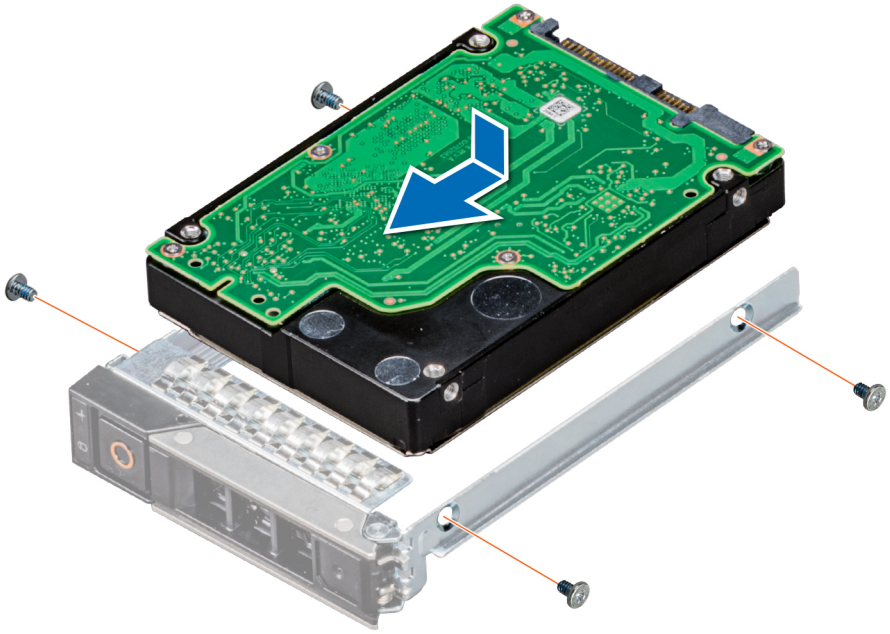

Figure 48. Installing a drive into the drive carrier

3. Using a Phillips #1 screwdriver, secure the drive to the drive carrier with screws.

   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.

System memory

System memory guidelines

The PowerEdge systems support DDR4 Registered DIMMs (RDIMMs), and Load Reduced DIMMs (LRDIMMs). System memory holds the instructions that are executed by the processor.

Your system contains 16 memory sockets. Processor 1 supports up to 10 memory sockets and Processor 2 supports up to 6 memory sockets. Six memory channels are allocated to each processor. Processor 1 has four 2 DIMM slots per channel and two 1 DIMM slot per channel, Processor 2 has six 1 DIMM per channel.

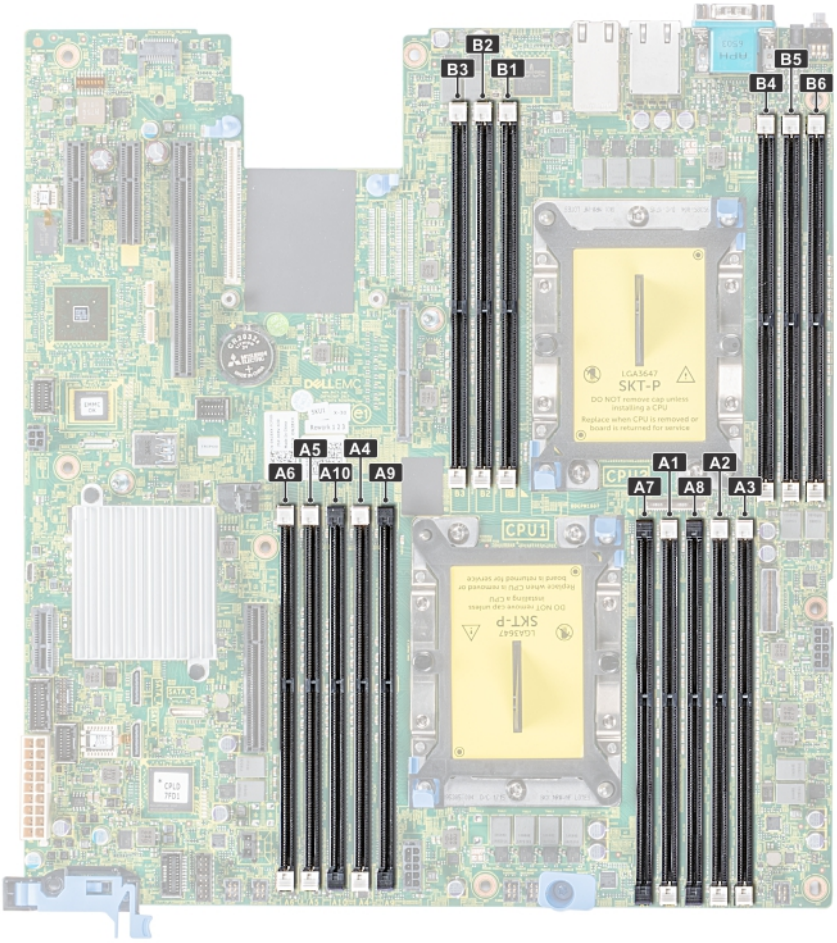

Figure 49. Memory socket locations

Memory channels are organized as follows:

Table 36. Memory channels

Processor	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
Processor 1	Slots A1 and A7	Slots A2 and A8	Slots A3	Slots A4 and A9	Slots A5 and A10	Slots A6
Processor 2	Slots B1	Slots B2	Slots B3	Slots B4	Slots B5	Slots B6

Table 37. Memory population

DIMM Type	DIMMs Populated/ Channel	Voltage	Operating Frequency (in MT/s)	Maximum DIMM Rank/ Channel
RDIMM	1	1.2 V	2666, 2400, 2133, 1866	Dual rank or single rank
	2		2666, 2400, 2133, 1866	Dual rank or single rank
LRDIMM	1	1.2 V	2666, 2400, 2133, 1866	Quad rank
	2		2666, 2400, 2133, 1866	Quad rank

General memory module installation guidelines

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

The memory bus may operate at frequency can be 2666 MT/s, 2400 MT/s, or 2133 MT/s depending on the following factors:

- System profile selected (for example, Performance Optimized, or Custom [can be run at high speed or lower])
- Maximum supported DIMM speed of the processors.
- Maximum supported DIMM speed of the processors.
- Maximum supported speed of the DIMMs

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

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

- All DIMMs must be DDR4.
- RDIMMs and LRDIMMs must not be mixed.
- 64 GB LRDIMMs that are DDP (Dual Die Package) LRDIMMs must not be mixed with 128 GB LRDIMMs that are TSV (Through Silicon Via/3DS) LRDIMMs.
- x4 and x8 DRAM based memory modules can be mixed.
- Up to two RDIMMs can be populated per channel regardless of rank count.
- Up to two LRDIMMs can be populated per channel regardless of rank count.
- A maximum of two different ranked DIMMs can be populated in a channel regardless of rank count.
- If memory modules with different speeds are installed, they will operate at the speed of the slowest installed memory module(s).
- Populate memory module sockets only if a processor is installed.
  - For single-processor systems, sockets A1 to A10 are available.
  - For dual-processor systems, sockets A1 to A10 and sockets B1 to B6 are available.
- Populate all the sockets with white release tabs first, followed by the black release tabs.
- When mixing memory modules with different capacities, populate the sockets with memory modules with the highest capacity first.

  NOTE: For example, if you want to mix 8 GB and 16 GB memory modules, populate 16 GB memory modules in the sockets with white release tabs and 8 GB memory modules in the sockets with black release tabs.
- Memory modules of different capacities can be mixed provided other memory population rules are followed.

NOTE: For example, 8 GB and 16 GB memory modules can be mixed.

- In a dual-processor configuration, the memory configuration for each processor must be identical.

  NOTE: For example, if you populate socket A1 for processor 1, then populate socket B1 for processor 2, and so on.
- Mixing of more than two memory module capacities in a system is not supported.
- Unbalanced memory configurations will result in a performance loss so always populate memory channels identically with identical DIMMs for best performance.
- Populate six identical memory modules per processor (one DIMM per channel) at a time to maximize performance.

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

- When the DIMM quantity is 4 per processor, the population is slot 1, 2, 4, 5.
- When the DIMM quantity is 8 per processor, the population is slot 1, 2, 4, 5, 7, 8, 9, 10.

Mode-specific guidelines

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

Table 38. Memory operating modes

Memory Operating Mode	Description
Optimizer Mode	The **Optimizer Mode** if enabled, the DRAM controllers operate independently in the 64-bit mode and provide optimized memory performance.
Mirror Mode	The **Mirror Mode** if enabled, the system maintains two identical copies of data in memory, and the total available system memory is one half of the total installed physical memory. Half of the installed memory is used to mirror the active memory modules. This feature provides maximum reliability and enables the system to continue running even during a catastrophic memory failure by switching over to the mirrored copy. The installation guidelines to enable Mirror Mode require that the memory modules be identical in size, speed, and technology, and they must be populated in sets of 6 per processor.
Single Rank Spare Mode	**Single Rank Spare Mode** allocates one rank per channel as a spare. If excessive correctable errors occur in a rank or channel, while the operating system is running, they are moved to the spare area to prevent errors from causing an uncorrectable failure. Requires two or more ranks to be populated in each channel.
Multi Rank Spare Mode	**Multi Rank Spare Mode** allocates two ranks per channel as a spare. If excessive correctable errors occur in a rank or channel, while the operating system is running, they are moved to the spare area to prevent errors from causing an uncorrectable failure. Requires three or more ranks to be populated in each channel. With single rank memory sparing enabled, the system memory available to the operating system is reduced by one rank per channel. For example, in a dual-processor configuration with sixteen 16 GB dual-rank memory modules, the available system memory: 16 GB x 16(memory modules) - 8GB(1 rank sparing/channel) x 12(channel) = 256 GB - 96 GB = 160 GB. For multi rank sparing, in a dual-processor configuration with sixteen 64 GB quad-rank memory modules, the available system memory: 64 GB x 16(memory modules) - 32 GB(2 rank sparing/ channel) x 12 (channel) = 1024 GB - 384 GB = 640 GB. **NOTE:** To use memory sparing, this feature must be enabled in the BIOS menu of System Setup. **NOTE:** Memory sparing does not offer protection against a multi-bit uncorrectable error.
Dell Fault Resilient Mode	The **Dell Fault Resilient Mode** if enabled, the BIOS creates an area of memory that is fault resilient. This mode can be used by an OS that supports the feature to load critical applications or enables the OS kernel to maximize system availability. **NOTE:** This feature is only supported in Gold and Platinum Intel processors. **NOTE:** Memory configuration has to be of same size DIMM, speed, and rank.

Optimizer Mode

This mode supports Single Device Data Correction (SDDC) only for memory modules that use x4 device width. It does not impose any specific slot population requirements.

- Dual processor: Populate the slots in round robin sequence starting with processor 1.

  NOTE: Processor 1 and processor 2 population should match.

Table 39. Memory population rules

Processor	Configuration	Memory population	Memory population information
Single processor	Optimizer (Independent channel) population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	• Populate in this order, odd amount allowed. • Odd number of DIMM population is allowed. **NOTE:** Odd number of DIMMs will result in unbalanced memory configurations, which in turn will result in performance loss. It is recommended to populate all memory channels identically with identical DIMMs for best performance. • Optimizer population order is not traditional for 4 and 8 DIMM installations of single processor. ○ For 4 DIMMs: A1, A2, A4, A5 ○ For 8 DIMMs: A1, A2, A4, A5, A7, A8, A9, A10
	Mirror population order	{1, 2, 3, 4, 5, 6}	Mirroring is supported with 6 DIMM slots per processor.
	Single rank sparing population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Populate in this order, odd amount allowed. Requires two ranks or more per channel.
	Multi rank sparing population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Populate in this order, odd amount allowed. Requires three ranks or more per channel.
Dual processor (Populate round robin starting with processor1)	Optimized (Independent channel) population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}...	• Odd amount of DIMM slots per processor allowed. • Odd number of DIMM population is allowed. **NOTE:** Odd number of DIMMs will result in unbalanced memory configurations, which in turn will result in performance loss. It is recommended to populate all memory channels identically with identical DIMMs for best performance.

Table 39. Memory population rules (continued)

Processor	Configuration	Memory population	Memory population information
			• Optimizer population order is not traditional for 8 and 14 DIMM installations of dual processor. ○ For 8 DIMMs: A1, A2, A4, A5, B1, B2, B4, B5 ○ For 14 DIMMs: A1, A2, A4, A5, A7, A8, A9, A10, B1, B2, B3, B4, B5, B6
	Mirroring population order	A{1, 2, 3, 4, 5, 6}, B{1, 2, 3, 4, 5, 6}	Mirroring is supported with 6 DIMM slots per processor.
	Single rank sparing population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}...	Populate in this order, odd amount per processor allowed. Requires two ranks or more per channel.
	Multi rank sparing population order	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}...	Populate in this order, odd amount per processor allowed. Requires three ranks or more per channel.

Removing a memory module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the air shroud, if removing memory associated with processor 1

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

Steps

1. Locate the appropriate memory module socket.

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

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

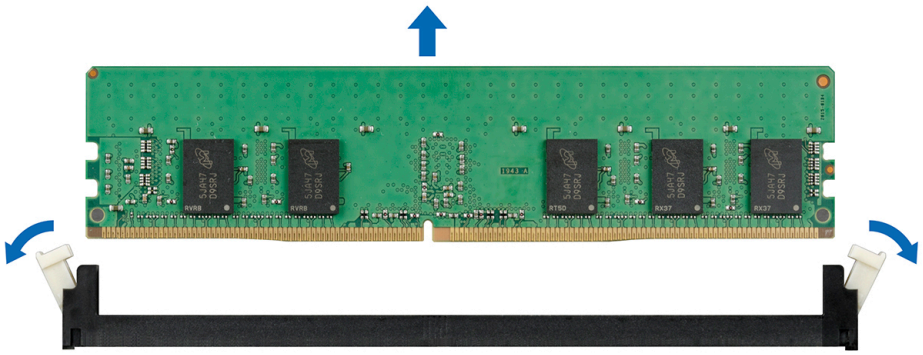

Figure 50. Removing a memory module

Next steps

1. Install the memory module

Installing a memory module

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

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

CAUTION: Ensure that you install the NVDIMM-N battery if you are using NVDIMM-N.

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

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

Steps

1. Locate the appropriate memory module socket.

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

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

2. Open the ejectors on the memory module socket outward to allow the memory module to be inserted into the socket.
3. Align the edge connector of the memory module with the alignment key of the memory module socket, and insert the memory module in the socket.

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

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

4. Press the memory module with your thumbs until the socket levers firmly click into place.

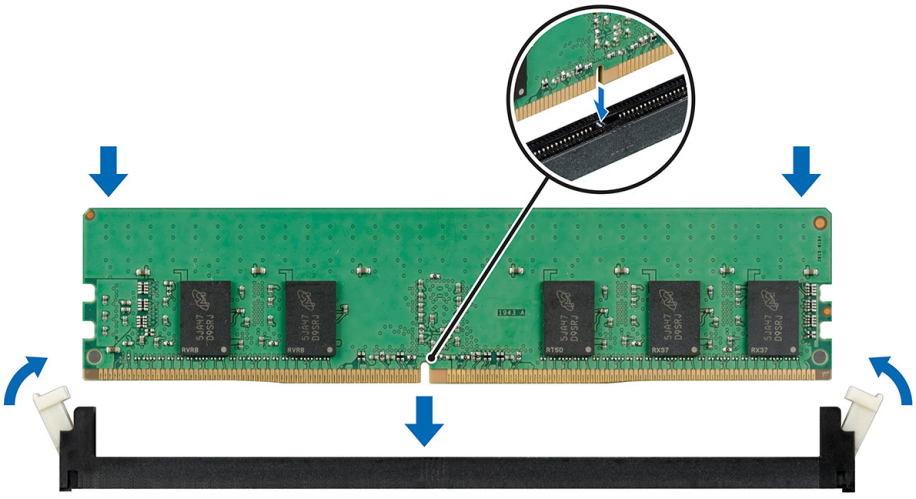

Figure 51. Installing a memory module

Next steps

1. Install the air shroud, if installing memory associated with processor 1
2. Follow the procedure listed in After Working inside your system.
3. To verify if the memory module has been installed properly, press F2 and go to to **System Setup Main Menu > System BIOS > Memory Settings**. In the **Memory Settings** screen, the System Memory Size must reflect the updated capacity of the installed memory.
4. If the value is incorrect, one or more of the memory modules may not be installed properly. Ensure that the memory module is firmly seated in the memory module socket.
5. Run the system memory test in system diagnostics.

Processors and heat sinks

Removing a processor and heat sink module

Prerequisites

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

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the air shroud, if removing processor 1

Steps

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

   NOTE: It is normal for the heat sink to slip off the blue retention clips when the screws are partially loosened, continue to loosen one or more screws.
2. Pushing both blue retention clips simultaneously, lift the processor and heat sink module (PHM) out of the system.
3. Set the PHM aside with the processor side facing up.

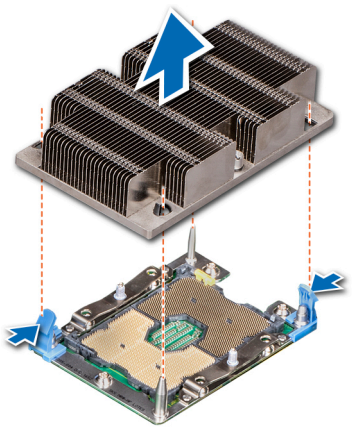

Figure 52. Removing a processor and heat sink module (1U)

Next steps

Install the Processor and Heat sink module.

Removing the processor from the processor and heat sink module

Prerequisites

NOTE: Only remove the processor from the processor and heat sink module if you are replacing the processor or heat sink. This procedure is not required when replacing a system board.

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the air shroud, if removing processor 1
4. Remove the processor and heat sink module

Steps

1. Place the heat sink with the processor side facing up.
2. Insert a flat blade screwdriver into the release slot marked with a yellow label. Twist (do not pry) the screwdriver to break the thermal paste seal.
3. Push the retaining clips on the processor bracket to unlock the bracket from the heat sink.

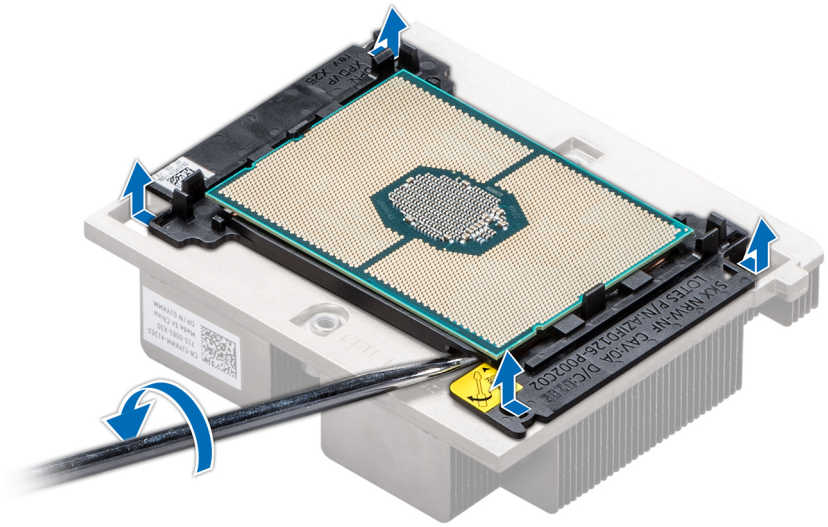

Figure 53. Loosening the processor bracket

4. Lift the bracket and the processor away from the heat sink, and place the processor connector side down on the processor tray.
5. Flex the outer edges of the bracket to release the bracket from the processor.

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

Figure 54. Removing the processor bracket

Next steps

Install the processor into the processor and heat sink module.

Installing the processor into a processor and heat sink module

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Place the processor in the processor tray.

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

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

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

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

Figure 55. Installing the processor bracket

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

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

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

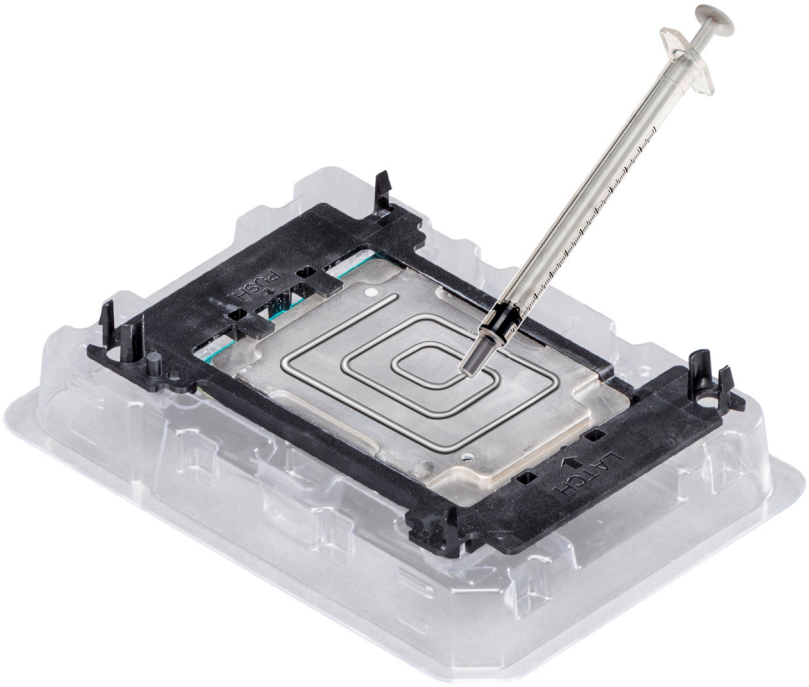

Figure 56. Applying thermal grease on top of the processor

5. Place the heat sink on the processor and push down on the base of the heat sink until the bracket locks onto the heat sink.

   NOTE:

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

- Do not press on the heat sink fins.
- Ensure that the pin 1 indicator on the heat sink is aligned with the pin 1 indicator on the bracket before placing the heat sink onto the processor and bracket.

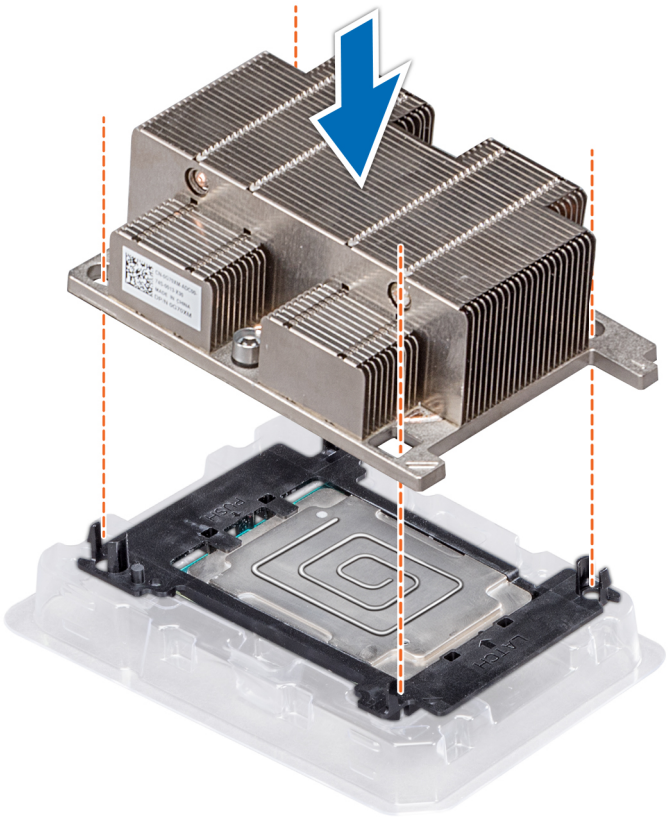

Figure 57. Installing the heat sink onto the processor

Next steps

1. Install the processor and heat sink module
2. Install the air shroud, if installing processor 1
3. Follow the procedure listed in After working inside your system on page 60.

Installing a processor and heat sink module

Prerequisites

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

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. If installed, remove the processor blank.

   The procedure to remove the processor blank is similar to that of the processor.

Steps

1. Align the pin-1 indicator of the heat sink to the system board and then place the processor and heat sink module (PHM) on the processor socket.

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

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

2. Push the blue retention clips inward to allow the heat sink to drop into place.
3. Supporting the heat sink with one hand.
4. Using the Torx #T30 screwdriver, tighten the screws on the heat sink in the order below:
   a. Partially tighten the first screw (approximately three turns).
   b. Tighten the second screw completely.
   c. Return to the first screw and tighten it completely.

   If the PHM slips off the blue retention clips when the screws are partially tightened, follow these steps to secure the PHM:

   a. Loosen both the heat sink screws completely.
   b. Lower the PHM on to the blue retention clips, follow the procedure that is described in step 2.
   c. Secure the PHM to the system board, follow the procedure that is described in step 4.

NOTE: The processor and heat sink module retention screws should not be tightened to more than 0.13 kgf-m (1.35 N.m or 12 in-lbf).

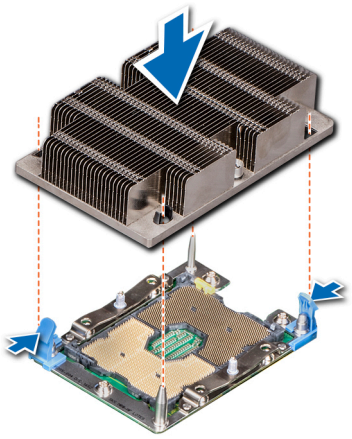

Figure 58. Installing a processor and heat sink module (1U)

Next steps

1. Install the air shroud., if installing processor 1
2. Follow the procedure listed in After working inside your system.

Internal MiniPERC riser

Removing the internal MiniPERC riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Open the cable guiding latch for easy access.

Steps

1. Open the plunger.
2. Hold the blue touch points and lift the internal MiniPERC riser.

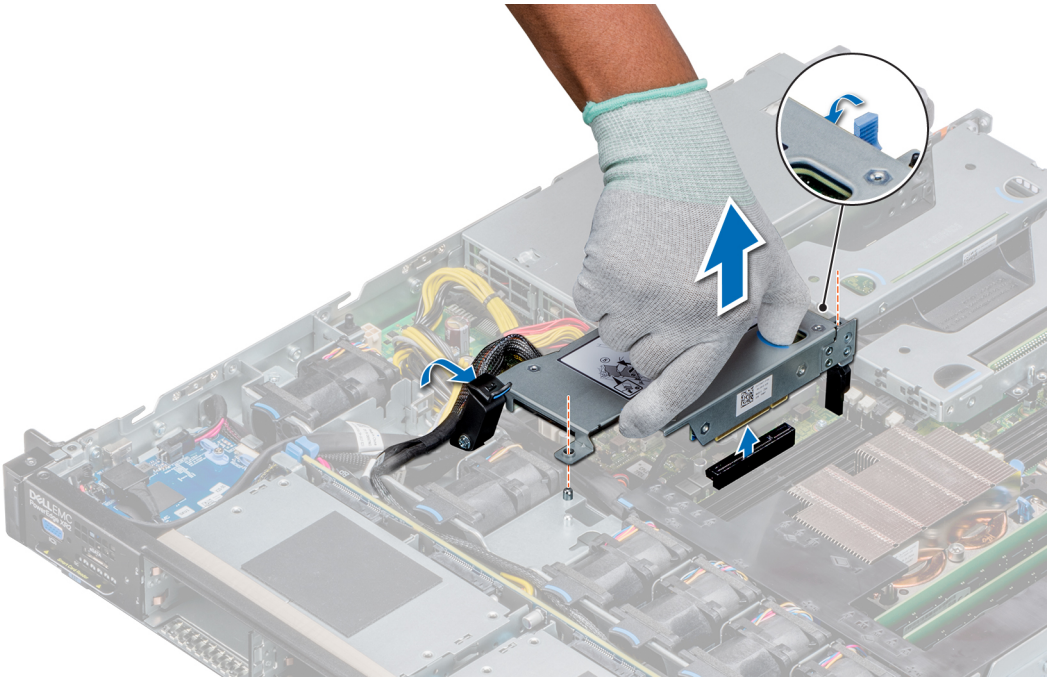

Figure 59. Removing the internal MiniPERC riser

3. Turn the riser to access the PERC cable.
4. Using a Phillips #2 screwdriver, loosen the screws that connect the PERC cable to the MiniPERC riser.

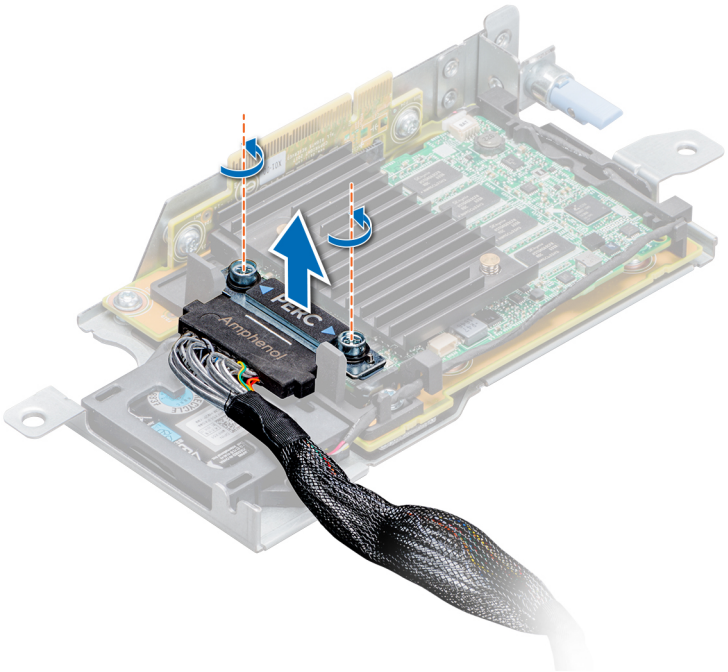

Figure 60. Removing the PERC cable from the riser

Next steps

1. Follow the procedure listed in After working inside your system on page 60.
2. Install the internal MiniPERC riser.

Installing the internal MiniPERC riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

Steps

1. Using a Phillips #2 screwdriver, tighten the screws that connect the PERC cable to the MiniPERC riser.

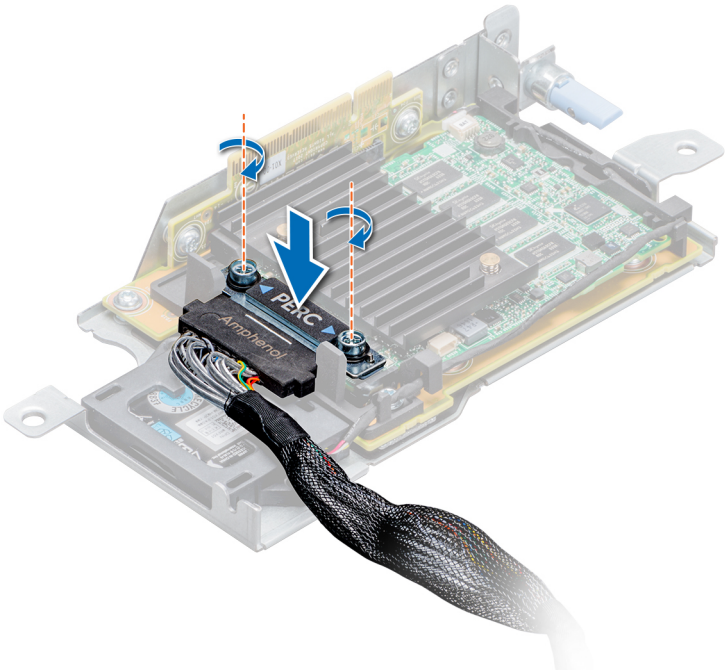

Figure 61. Installing the PERC cable

2. Holding the blue touch points, align the slots on the internal MiniPERC riser to the guides on the system.

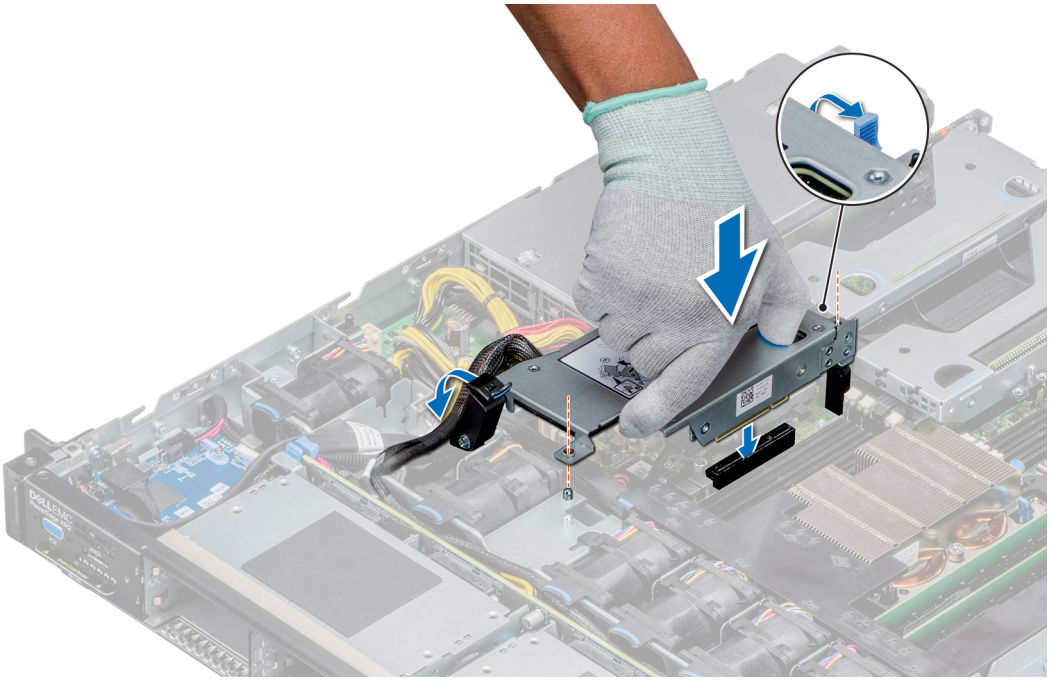

Figure 62. Installing the internal MiniPERC riser

3. Lift the plunger to lock the riser in place.

Next steps

1. Close the cable guiding latch.
2. Follow the procedure listed in After working inside your system on page 60.

Expansion cards and expansion card risers

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.

Removing an expansion card riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the internal MiniPERC riser (applicable to expansion card riser 2)

Steps

Hold the touch points, and lift the expansion card riser.

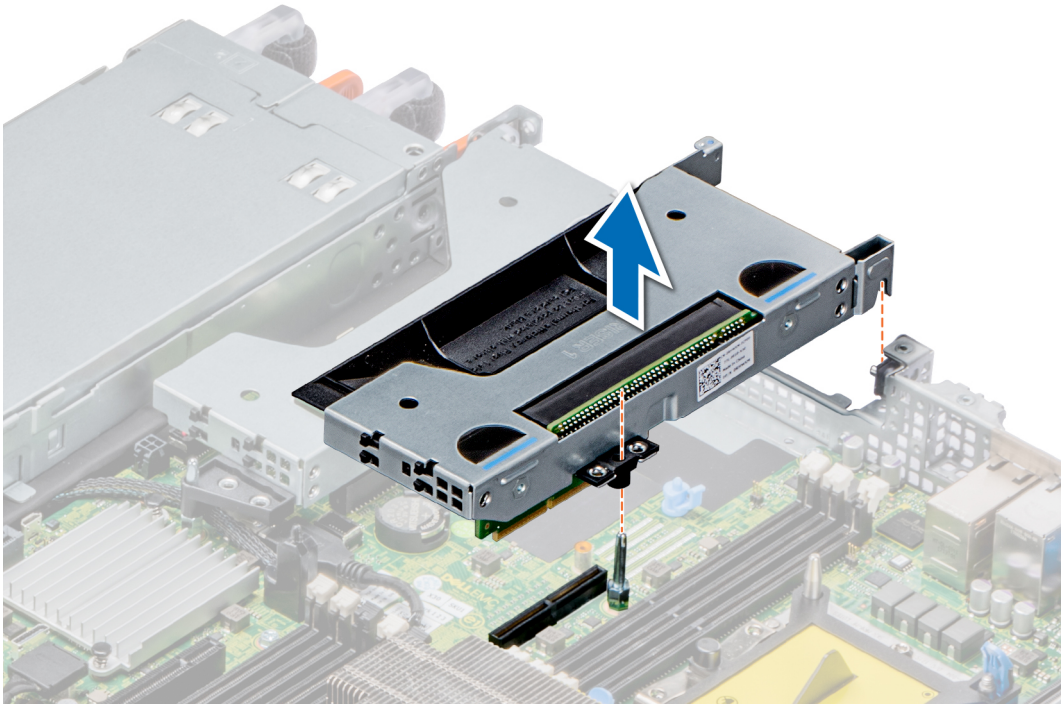

Figure 63. Removing low profile riser right(Riser 1)

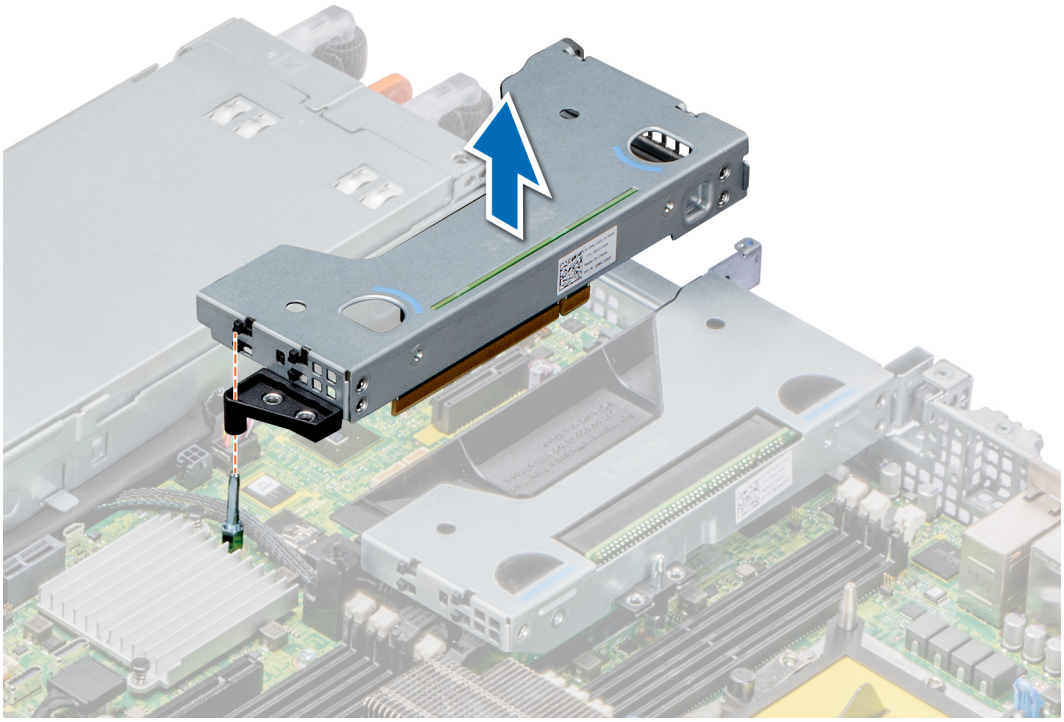

Figure 64. Removing low profile riser left(Riser 2)

Next steps

Install the expansion card riser.

Installing an expansion card riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. If removed, install the expansion cards into the expansion card riser.

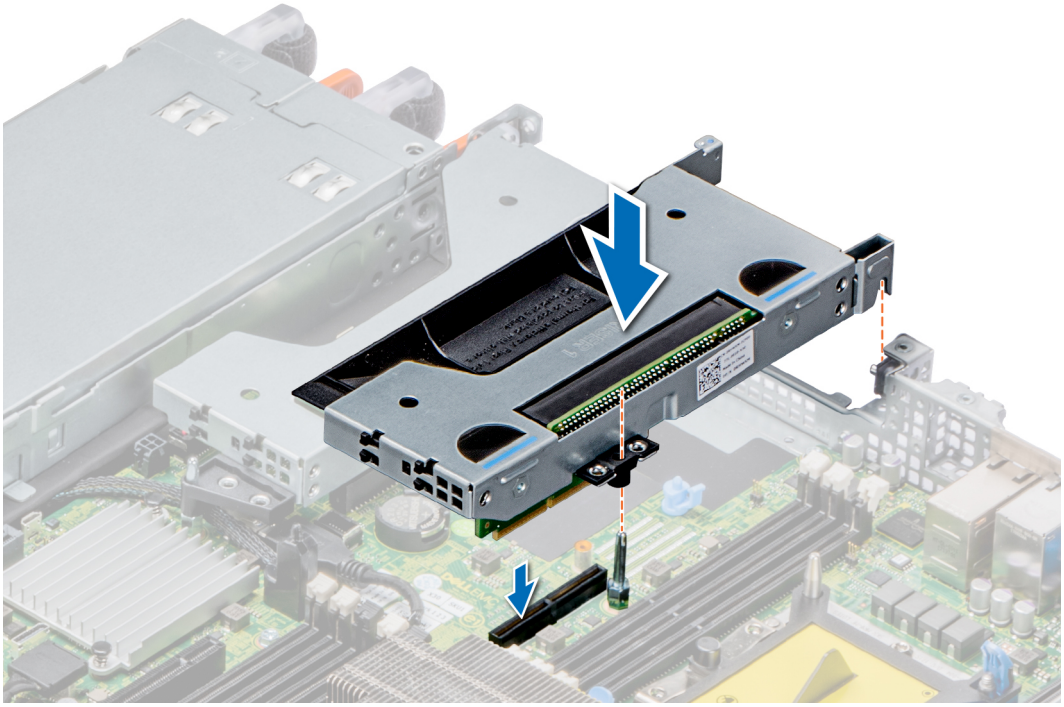

Figure 65. Installing low profile riser right(Riser 1)

2. Holding the touch points, align the expansion card riser with the connector and the riser guide pin on the system board.
3. Lower the expansion card riser into place until the expansion card riser connector is fully seated in the connector.

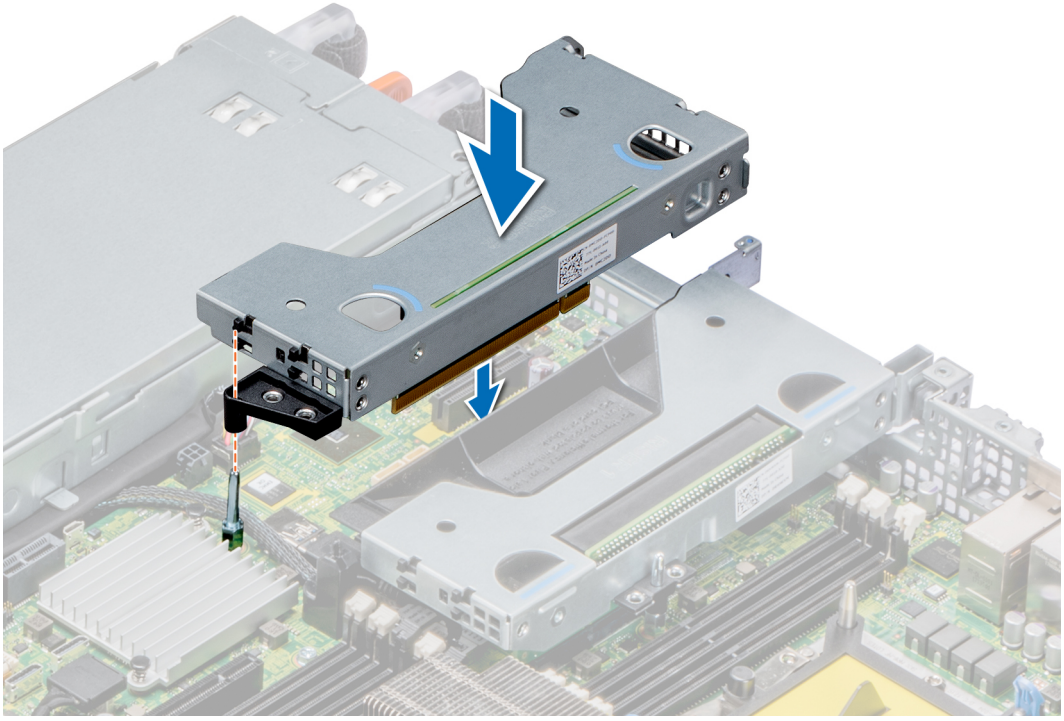

Figure 66. Installing low profile riser left(Riser 2)

Next steps

1. Replace the internal MiniPERC riser (applicable to expansion card riser 2)
2. Follow the procedure listed in After working inside your system on page 60.
3. Install any device drivers required for the card as described in the documentation for the card.

Removing the expansion card from the expansion card riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. If applicable, remove the air shroud
4. Remove the expansion card riser
5. If applicable, disconnect the cables from the expansion card.

Steps

1. Lift the expansion card latch out of the slot on the riser (Low profile expansion riser 1) .
2. Hold the expansion card by its edges, and pull the card until the card edge connector disengages from the expansion card connector on the riser.

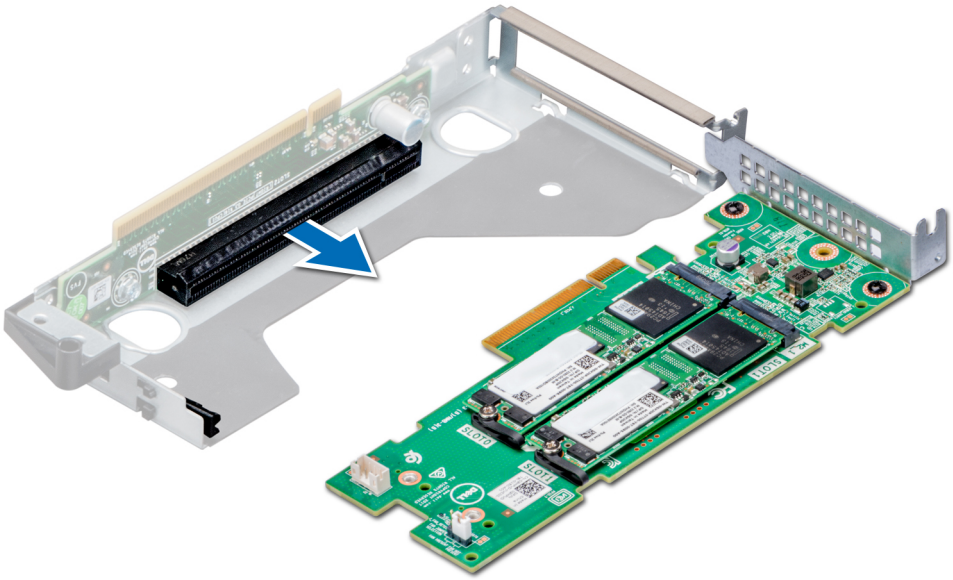

Figure 67. Removing expansion card from low profile riser

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

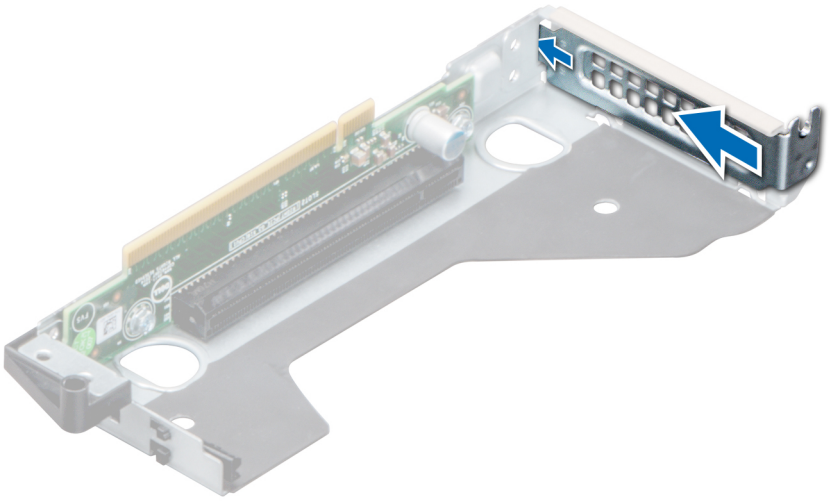

Figure 68. Installing filler bracket for low profile riser

Next steps

1. Install expansion card into 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.

   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.

3. If you are removing the card permanently from low profile riser 1, install a card blank to ensure proper airflow in the system.

Installing an expansion card into the expansion card riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. If installing a new expansion card, unpack it and prepare the card for installation.

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

Steps

1. Lift the expansion card latch on the riser (Low profile expansion riser 1).
2. Remove the card blank if installing a new card in low profile expansion riser 1.
3. 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.

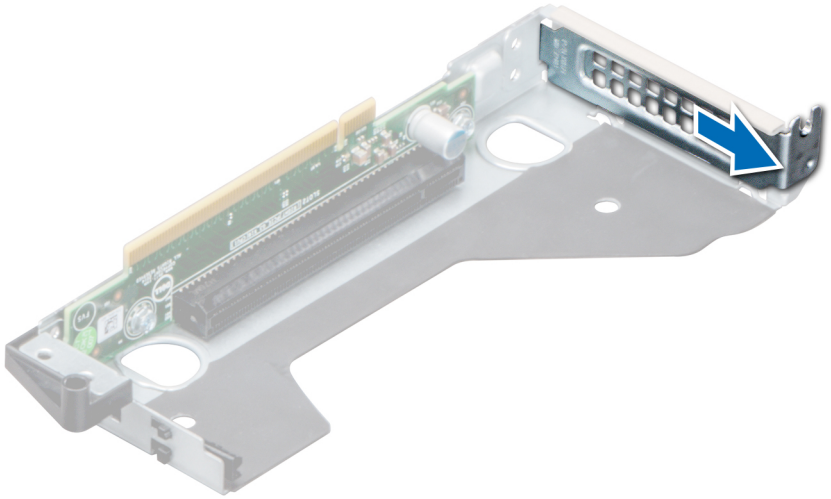

Figure 69. Removing filler bracket for low profile riser

4. Hold the card by its edges, and align the card edge connector with the expansion card connector on the riser.
5. Insert the card edge connector firmly into the expansion card connector until the card is fully seated.
6. Close the expansion card retention latch.

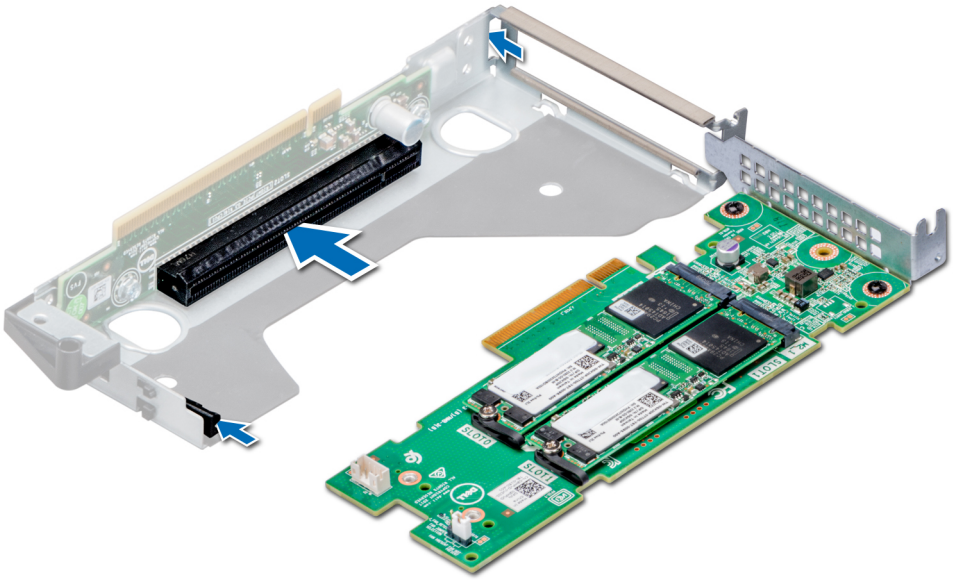

Figure 70. Installing expansion card into low profile riser

Next steps

1. If applicable, connect the cables to the expansion card.
2. Install the expansion card riser.
3. If applicable, install air shroud.
4. Follow the procedure listed in After working inside your system on page 60.
5. Install any device drivers required for the card as described in the documentation for the card.

GPU

Removing the GPU card from the expansion card riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the expansion card riser(Riser 2)

   NOTE: GPU should only be installed in Low Profile Expansion Left Riser 2.
4. If applicable, remove the expansion card
5. If applicable, disconnect the cables from the expansion card.

Steps

1. Move the card guide latch away from the GPU.
2. Hold the GPU card by its edges, and pull the card until the card edge connector disengages from the expansion card connector on the riser.

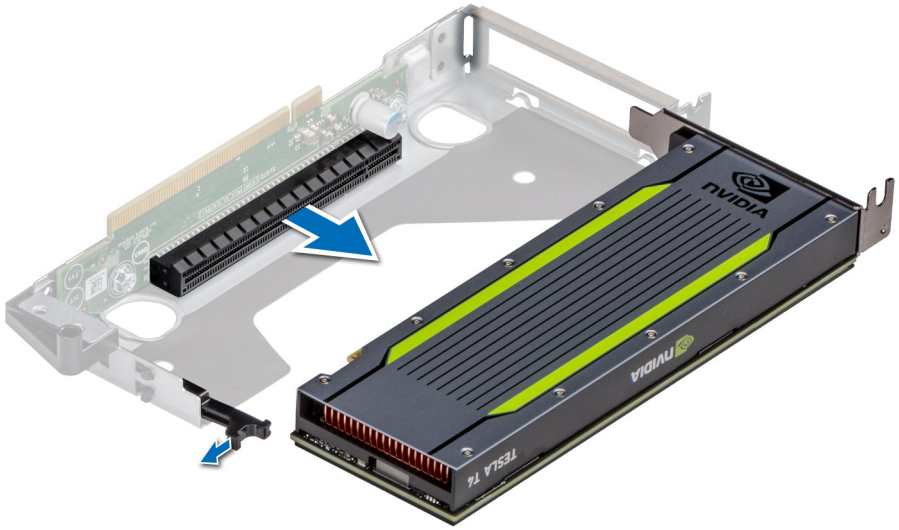

Figure 71. Removing GPU card from low profile riser

3. If the GPU card is not going to be replaced, install a filler bracket.

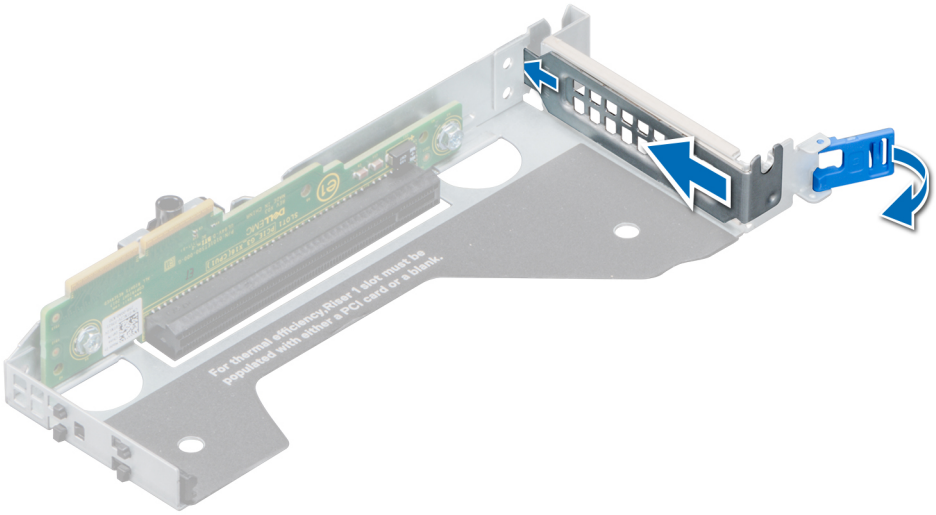

Figure 72. Installing filler bracket

Next steps

1. Install GPU card into 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.

Installing a GPU card into the expansion card riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. If installing a new GPU card, unpack it and prepare the card for installation.

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

3. Remove the riser 2 expansion card.

NOTE: GPU should be installed in Low Profile Expansion Left Riser 2 only.

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.

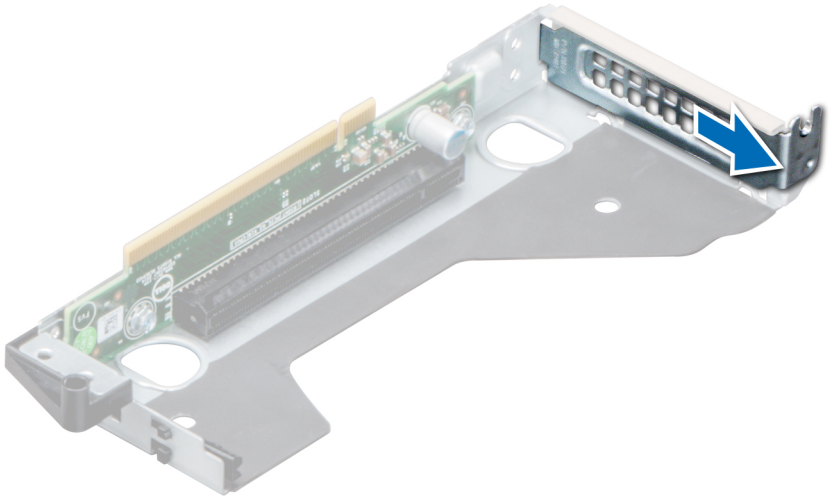

Figure 73. Removing filler bracket for low profile riser

2. Hold the GPU card by its edges, and align the card edge connector with the expansion card connector on the riser.
3. Insert the GPU card edge connector firmly into the expansion card connector until the card is fully seated.
4. Close the expansion card retention latch.

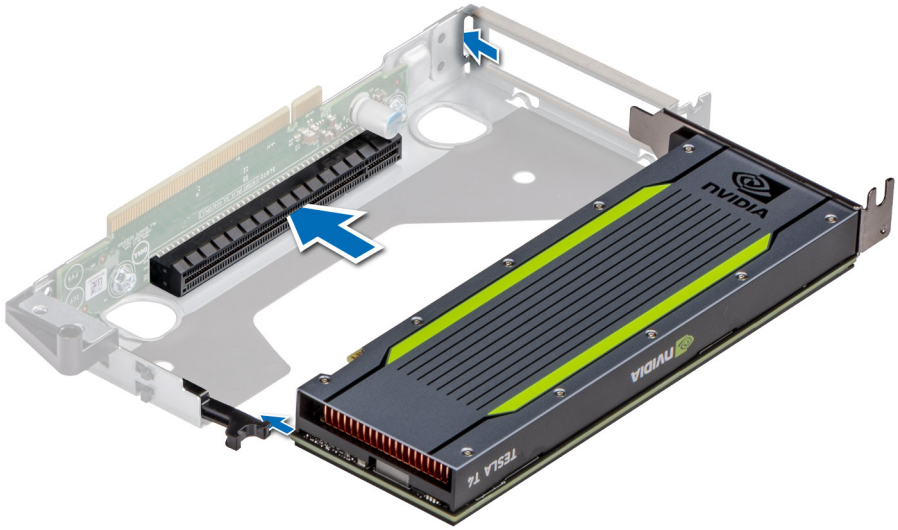

Figure 74. Installing GPU card into low profile riser

Next steps

1. Install the expansion card riser
2. If applicable, install air shroud
3. Follow the procedure listed in After working inside your system on page 60.
4. Install any device drivers required for the card as described in the documentation for the card.

NVME MiniPERC riser

Removing the NVMe PERC riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the Low Profile Right Riser(Riser 1) to have access to the Mezzanine B connector on the system board.

Steps

1. Open the cable guiding latch.
2. Disconnect the Mezzanine B cable from the system board and remove the cable from the cable guide clip.
3. Disconnect PERC cable and the NVMe Bridge cable from the NVMe backplane.
4. Hold the blue touch points, and lift the NVMe PERC riser.

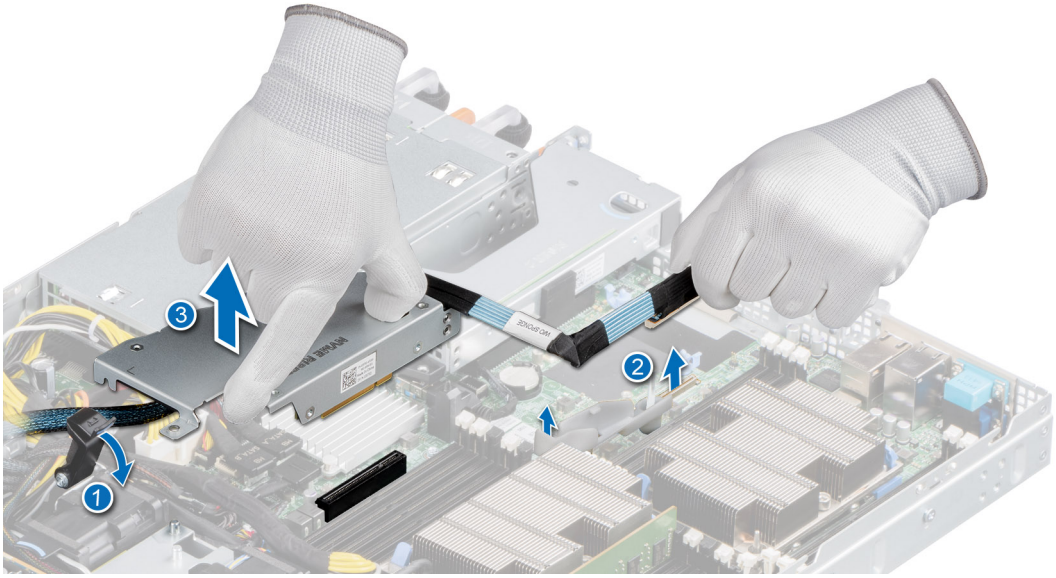

Figure 75. Removing the NVMe PERC riser

Next steps

1. Follow the procedure listed in After working inside your system on page 60.
2. Install the NVMe PERC riser

Installing the NVMe PERC riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

Steps

1. Connect the PERC cable to the miniPERC card and NVMe Bridge cable to the NVMe Bridge connector.
2. Holding the blue touch points, lower the riser into the place until the NVMe bridge card edge connector is fully seated in the connector on the system board.

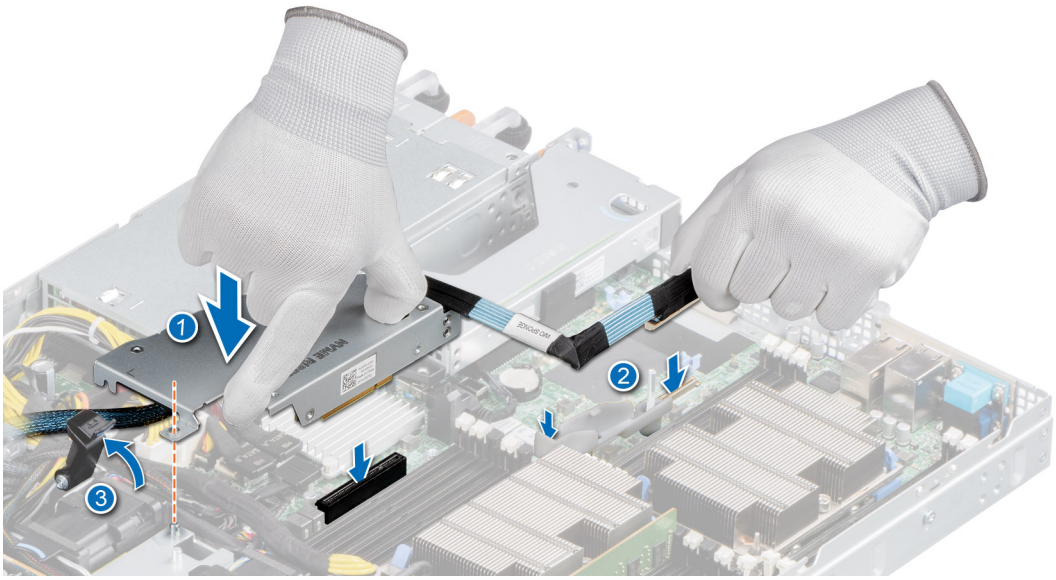

Figure 76. Installing the NVMe PERC riser

3. Guide the Mezzanine B cable through the Cable Guide Clip and connect the Mezzanine B cable to the Mezzanine B connector on the system board.
4. Open the cable guiding latch, and route the PERC cable and the NVMe bridge cable towards the NVMe backplane.
5. Connect the PERC and the NVMe bridge cable to the NVMe backplane.

Next steps

1. Close the cable guiding latch.
2. Install the Low Profile Right Riser(Riser 1).
3. Follow the procedure listed in After working inside your system on page 60.

Mini PERC

Removing the MiniPERC card from NVMe PERC riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the NVMe PERC riser

Steps

1. Disconnect the NVME Bridge cable from the NVMe bridge connector board.
2. To remove the NVME Bridge connector board, loosen and remove the two screws securing the NVMe Bridge connector board using a Phillips #2 screw driver.

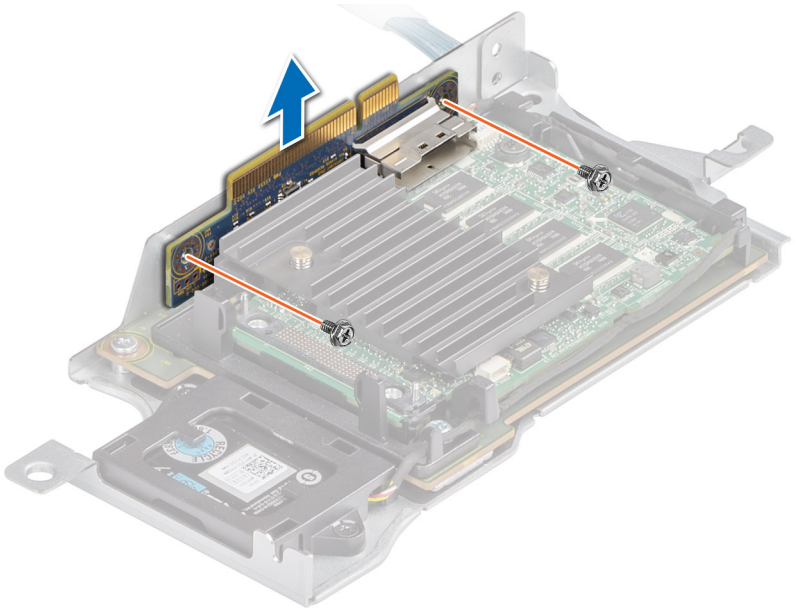

Figure 77. Removing NVMe Bridge connector board

3. To remove the PERC cable, loosen the screws that connect the PERC cable to the MiniPERC riser using a Phillips #2 screw driver.

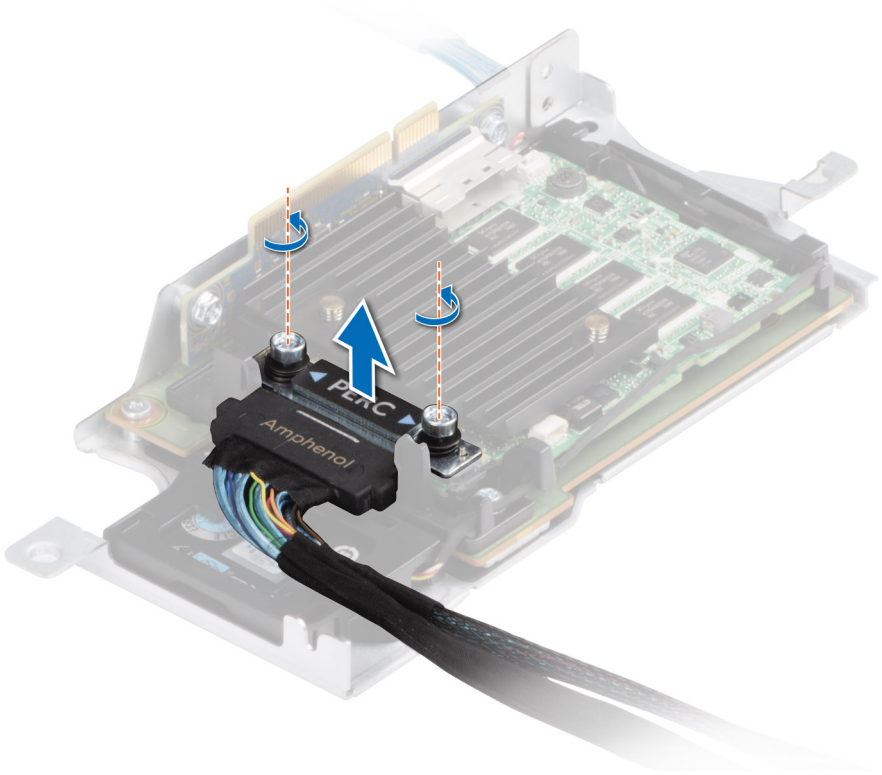

Figure 78. Removing the miniPERC cable from the riser

4. If applicable, to remove the PERC battery, disconnect the battery cable from the miniPERC card, then loosen and remove the screws securing the battery cage using a Phillips #1 screw driver.

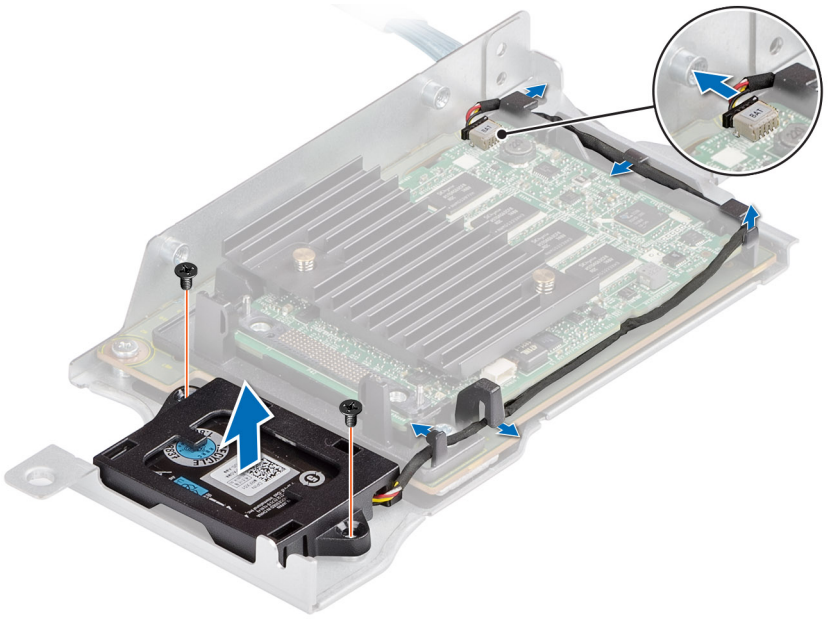

Figure 79. Removing the miniPERC battery

5. Lift the mini PERC card and the battery(if applicable) out of the NVMe riser.

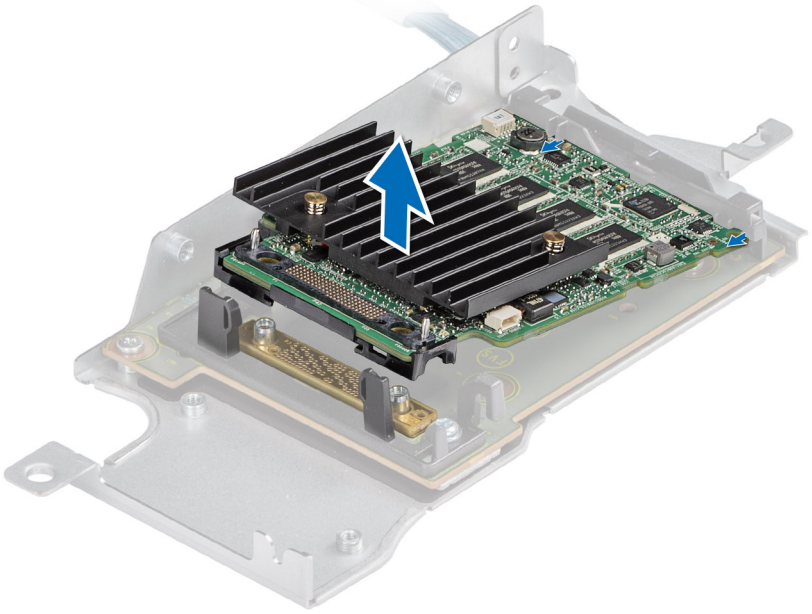

Figure 80. Removing the miniPERC card

Next steps

1. Follow the procedure listed in After working inside your system on page 60.
2. Install the MiniPERC card

Installing the Mini PERC card in NVMe PERC Riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

Steps

1. Place the mini PERC card in the NVMe PERC riser.

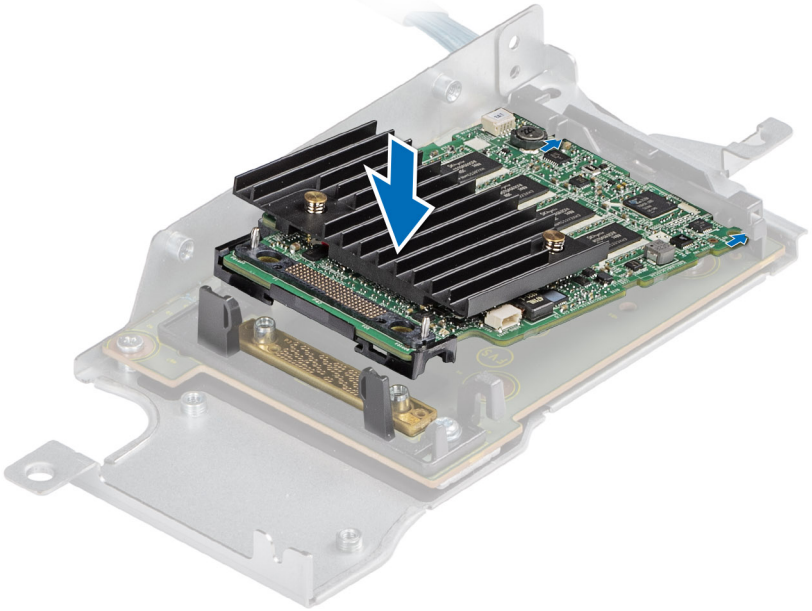

Figure 81. Installation of miniPERC card

2. If applicable, to place the battery at its position, connect the battery cable to the miniPERC card, then route the PERC battery cable along the riser.

NOTE: Placing the PERC battery at its position is not possible without routing the cable properly.

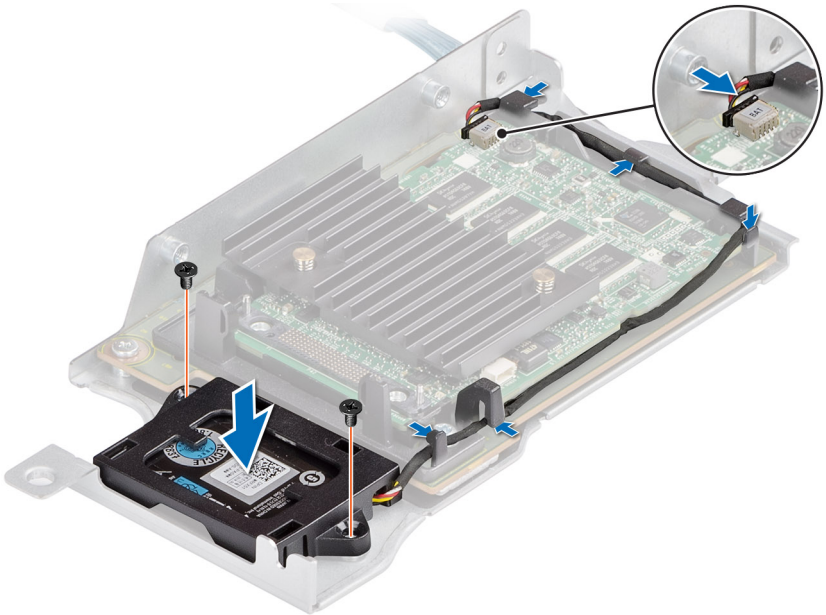

Figure 82. Installation of miniPERC battery

3. Place the PERC battery inside the battery cage and secure the cage by tightening the screws using Phillips #1 screw driver.
4. Place the NVMe Bridge connector board in its position and secure the board by tightening the screws using Phillips #2 screw driver.

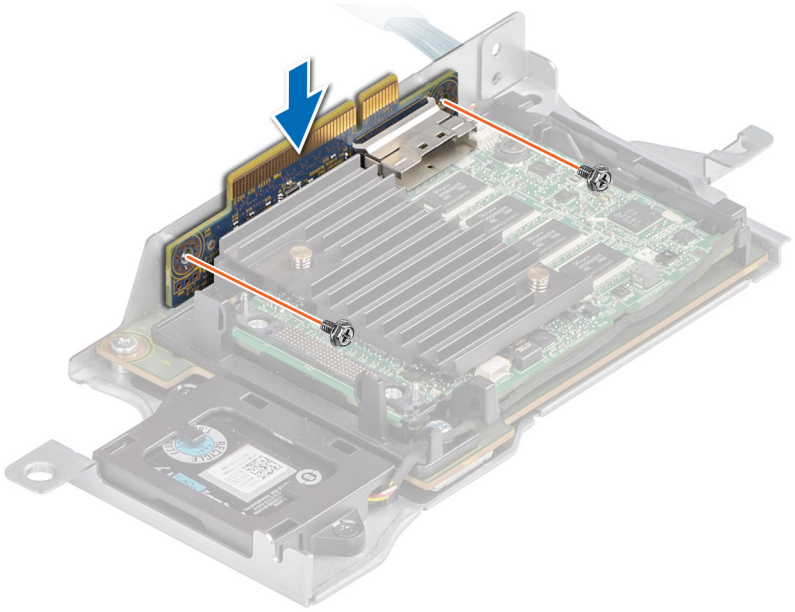

Figure 83. Installing NVMe bridge connector board

5. To secure the PERC cable and mini PERC on the MNVE riser, place the cable at its position and tighten the screws using a Phillips #2 screwdriver.

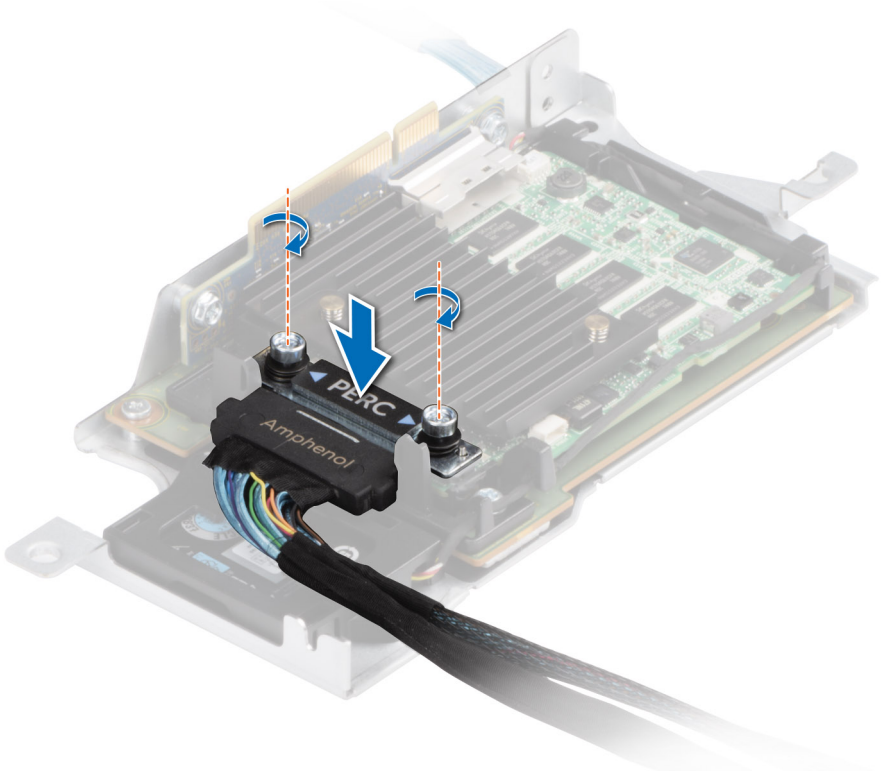

Figure 84. Installing the miniPERC cable

Next steps

1. Install the NVMe PERC riser
2. Follow the procedure listed in After working inside your system on page 60.

M.2 SSD module

Removing the M.2 SSD module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the BOSS card.

NOTE: Removing the BOSS card is similar to the procedure for removing an expansion card riser.

Steps

1. Loosen the screws and lift the retention straps that secure the M.2 SSD module on the BOSS card.
2. Pull the M.2 SSD module away from the BOSS card.

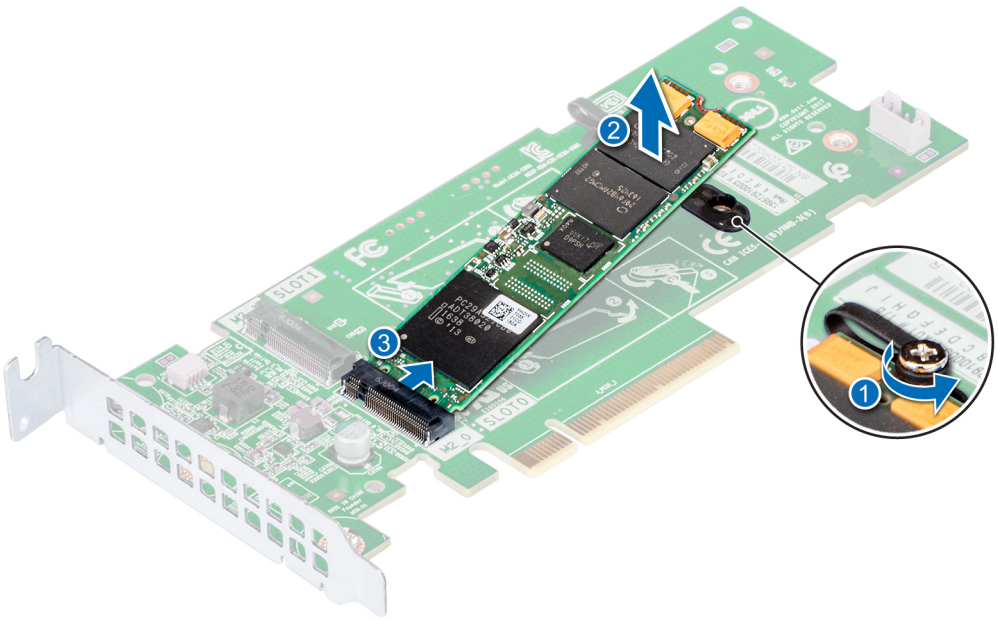

Figure 85. Removing the M.2 SSD module

a. module connector (2)
b. screws (2)
c. module (2)

Next steps

Install the M.2 SSD module.

Installing the M.2 SSD module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Align the M.2 SSD module connectors with the connectors on the BOSS card.
2. Push the M.2 SSD module until the module is seated firmly on the BOSS card.

3. Secure the M.2 SSD module on the BOSS card with the retention straps and screws.

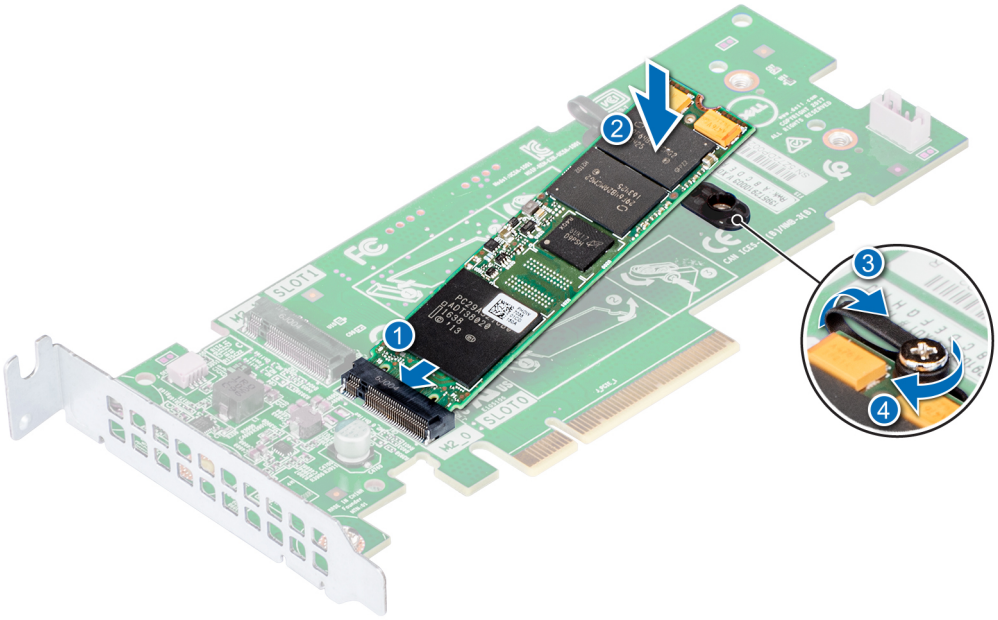

Figure 86. Installing the M.2 SSD module

a. module connector (2)
b. screws (2)
c. modules (2)

Next steps

1. Install the BOSS card.
   NOTE: Installing the BOSS card is similar to installing the expansion card riser.
2. Follow the procedure listed in After working inside your system on page 60.

Optional IDSDM or vFlash module

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

Removing the optional IDSDM or vFlash card

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

Steps

1. Locate the IDSDM/vFlash connector on the system board.
   To locate IDSDM/vFlash, see the System board jumpers and connectors section.
2. Holding the pull tab, lift the IDSDM/vFlash card out of the system.

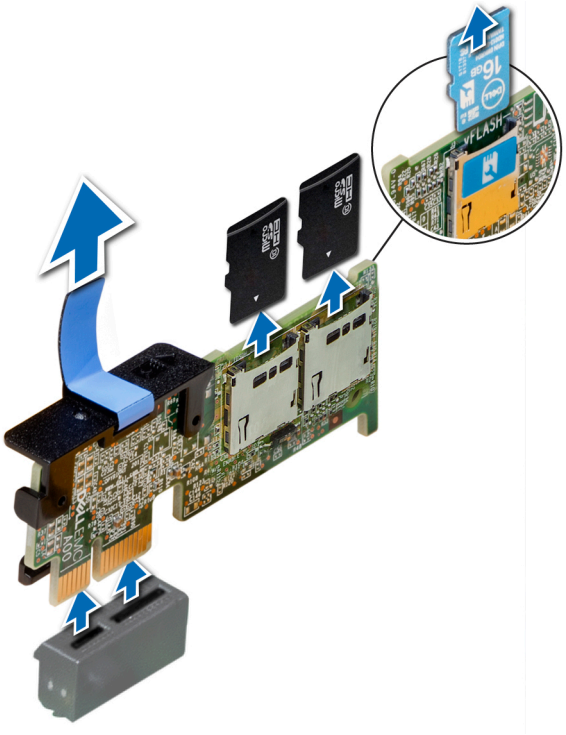

Figure 87. Removing the optional IDSDM/vFlash card

NOTE: There are two dip switches on the IDSDM/vFlash card for write-protection.

Next steps

Install the optional IDSDM/vFlash card.

Installing the IDSDM or vFlash module

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Locate the IDSDM or vFlash connector on the system board.
   To locate IDSDM or vFlash, see the System board jumpers and connectors section.
2. Align IDSDM or vFlash module with the connector on the system board.
3. Push IDSDM or vFlash module until it is firmly seated in the connector on the system board.

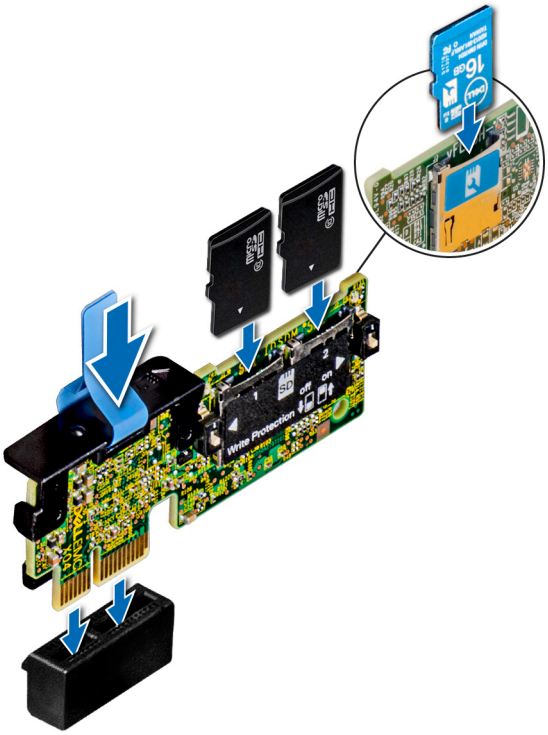

Figure 88. Installing the IDSDM or vFlash module

Next steps

1. Install the MicroSD cards

   NOTE: Reinstall the MicroSD cards into the same slots based on the labels you had marked on the cards during removal.
2. Follow the procedure listed in After working inside your system on page 60.

Removing the MicroSD card

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

Steps

1. Locate the MicroSD card slot on the IDSDM or vFlash module, and press the card to partially release it from the slot.
2. Hold the MicroSD card, and remove it from the slot.

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

Next steps

Install the MicroSD cards.

Installing the MicroSD card

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

NOTE: To use an MicroSD card with your system, ensure that the **Internal SD Card Port** is enabled in System Setup.

NOTE: If reinstalling, ensure that you install the MicroSD cards into the same slots based on the labels you had marked on the cards during removal.

Steps

1. Locate the MicroSD card connector on the IDSDM or vFlash module. Orient the MicroSD card appropriately and insert the contact-pin end of the card into the slot.

   NOTE: The slot is keyed to ensure correct insertion of the card.

2. Press the card into the card slot to lock it into place.

Next steps

1. Follow the procedure listed in After working inside your system on page 60.

LOM riser card

Removing the LOM riser card

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. If installed, remove the expansion card riser 1

Steps

1. Using a Phillips #2 screwdriver, loosen the screws that secure the LOM riser card to the system board.
2. Release the two blue side plastic snaps holding the LOM riser card.
3. Hold the LOM riser card by the edges on either side, and lift to remove it from the connector on the system board.
4. Slide the LOM riser card towards the front of the system until the Ethernet connectors or the SFP are clear of the slot in the back panel.

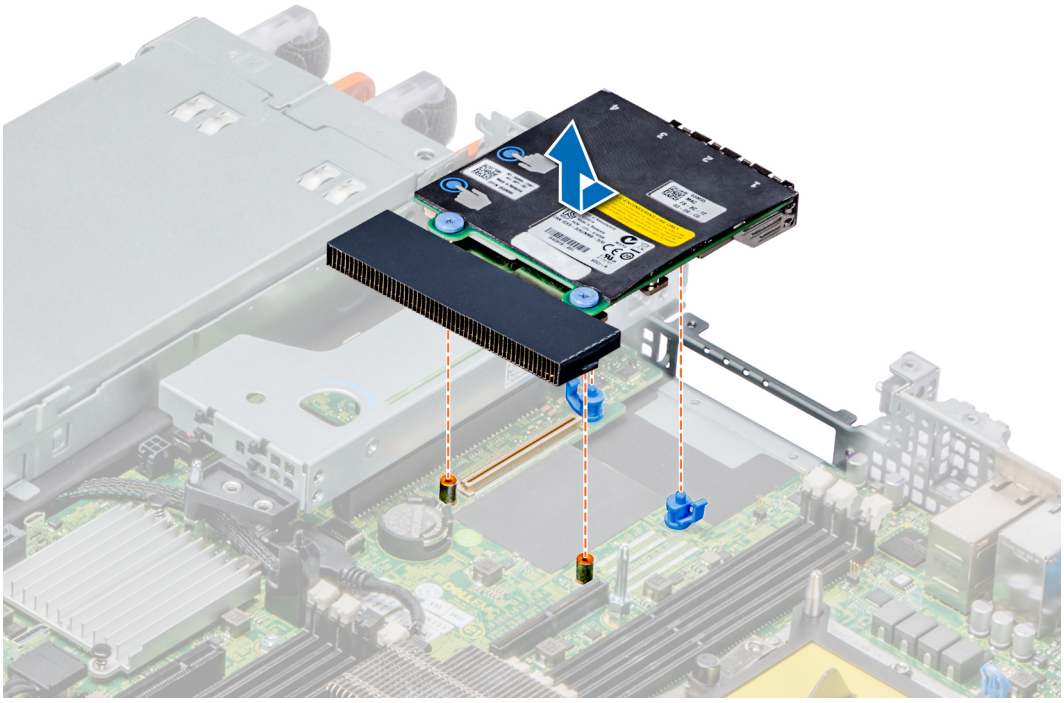

Figure 89. Removing the LOM riser card

Next steps

Install the LOM riser card.

Installing the LOM riser card

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Orient the LOM riser card to fit through the Ethernet connectors or the SFP slot on the system.
2. Press the LOM riser card until the card is firmly seated on the system board connector and the two blue plastic snaps hold the LOM riser card in place.
3. Using a Phillips #2 screwdriver, tighten the screws to secure the LOM riser card to the system board.

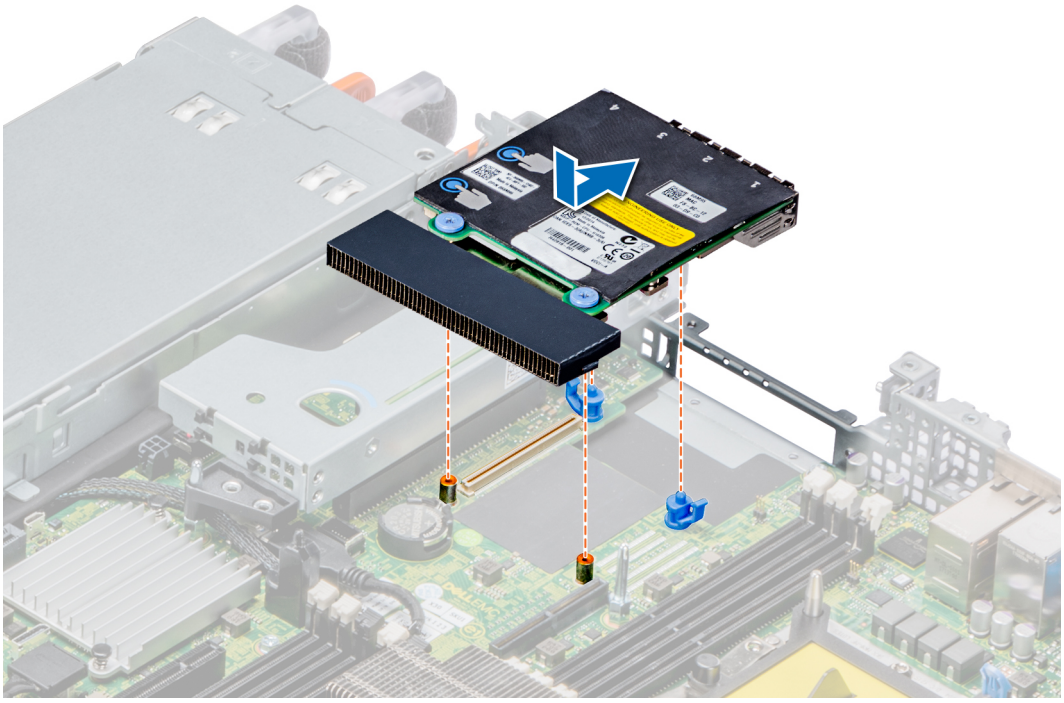

Figure 90. Installing the LOM riser card

Next steps

1. If removed, replace the expansion card riser 1
2. Follow the procedure listed in After working inside your system on page 60.

Hard drive backplane

Hard drive backplane details

Depending on your system configuration, the hard drive backplanes that are supported in PowerEdge XR2 are listed here:

Table 40. Supported backplane options for PowerEdge XR2 systems

System	Supported drives options
PowerEdge XR2	2.5-inch (x8) SAS, SATA backplane

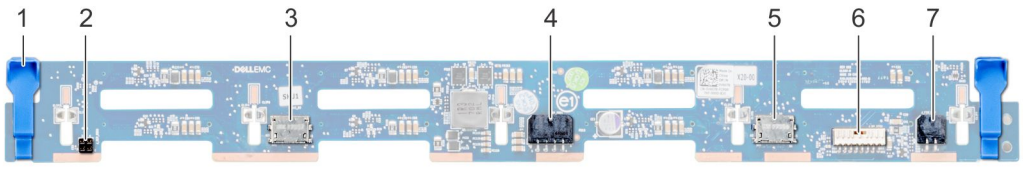

Figure 91. 8 X 2.5-inch drive backplane

1. Latch
2. Jumpers
3. SAS/SATA B cable connector
4. Power connector
5. SAS/SATA A cable connector
6. Signal connector
7. Front IO power cable connector

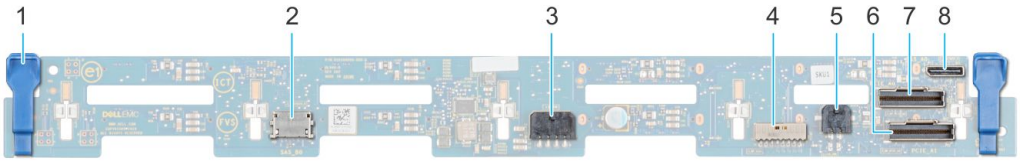

Figure 92. 2.5-inch drive NVME backplane

1. Latch
2. SAS/SATA B cable connector
3. Power connector
4. Signal connector
5. Front IO power cable connector
6. PCIe A0 cable connector
7. PCIe A1 cable connector
8. SAS/SATA A cable connector

Removing the hard drive backplane

Prerequisites

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

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

NOTE: The procedure to remove the backplane is similar for all backplane configurations.

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the air shroud.
4. Remove all hard drives from the front bay.
5. Disconnect all the cables from the backplane.
6. Remove all the fans.

Steps

Press the blue release tabs and lift the backplane to disengage the backplane from the hooks on the system.

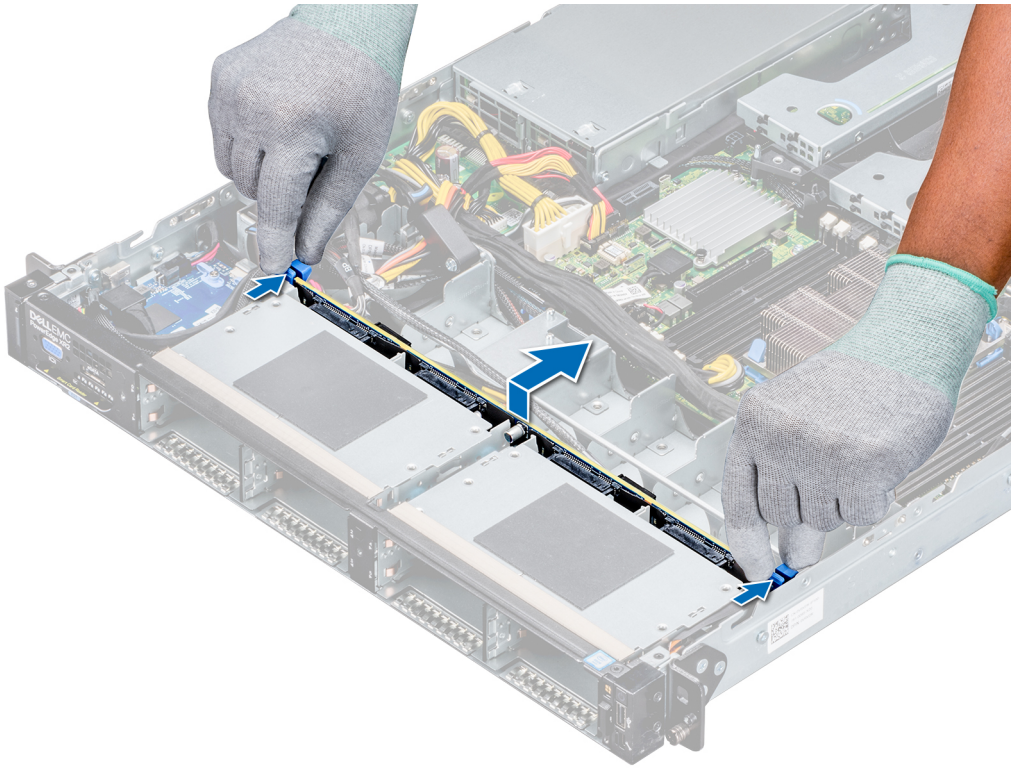

Figure 93. Removing the hard drive backplane

Next steps

Install the hard drive backplane.

Installing the hard drive backplane

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Use the hooks on the system as guides to align the slots on the backplane.
2. Lower the hard drive backplane until the blue release tabs snap into place.

Figure 94. Installing the hard drive backplane

Next steps

1. Connect all the cables to the backplane.
2. Install all the hard drives.
3. Install the cooling fans.
4. Install the air shroud.
5. Follow the procedure listed in After working inside your system on page 60.

Cable routing

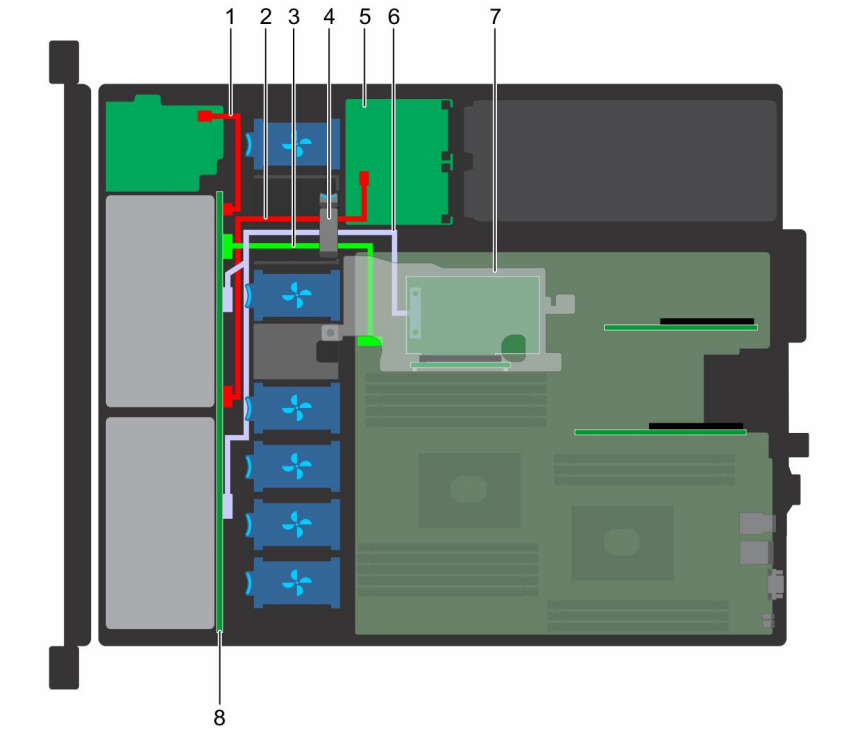

Figure 95. Cable routing - 8 x 2.5-inch hard drive backplane with miniPERC

1. FIO power cable
2. backplane power cable
3. backplane signal cable
4. cable routing clip
5. power interposer board
6. SAS cable
7. internal MiniPERC riser
8. hard drive backplane

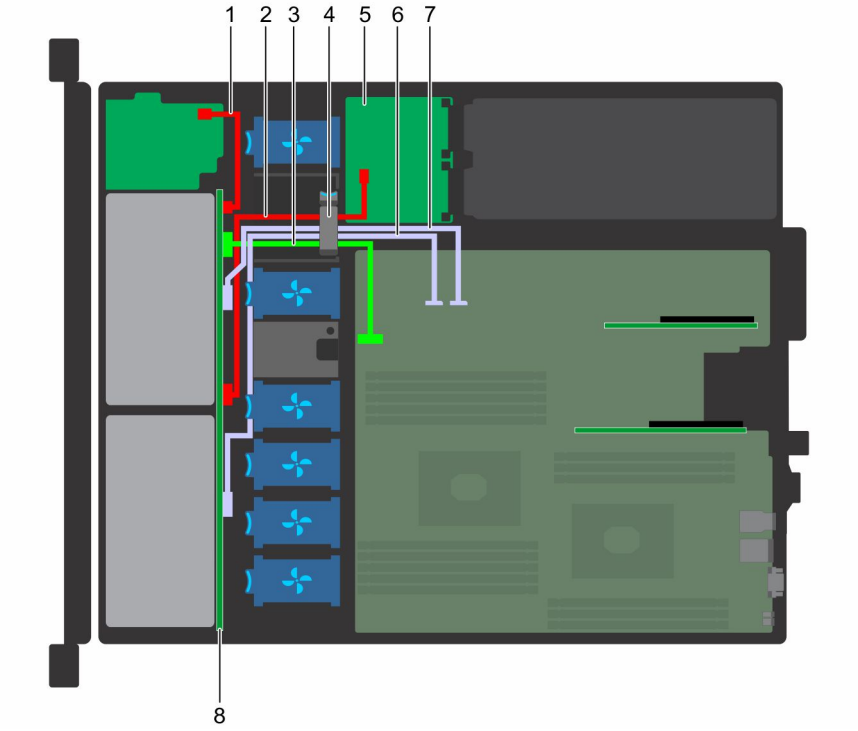

Figure 96. Cable routing - 8 x 2.5-inch hard drive backplane with onboard SATA

1. FIO power cable
2. backplane power cable
3. backplane signal cable
4. cable routing clip
5. power interposer board
6. SATA cable B
7. SATA cable A
8. hard drive backplane

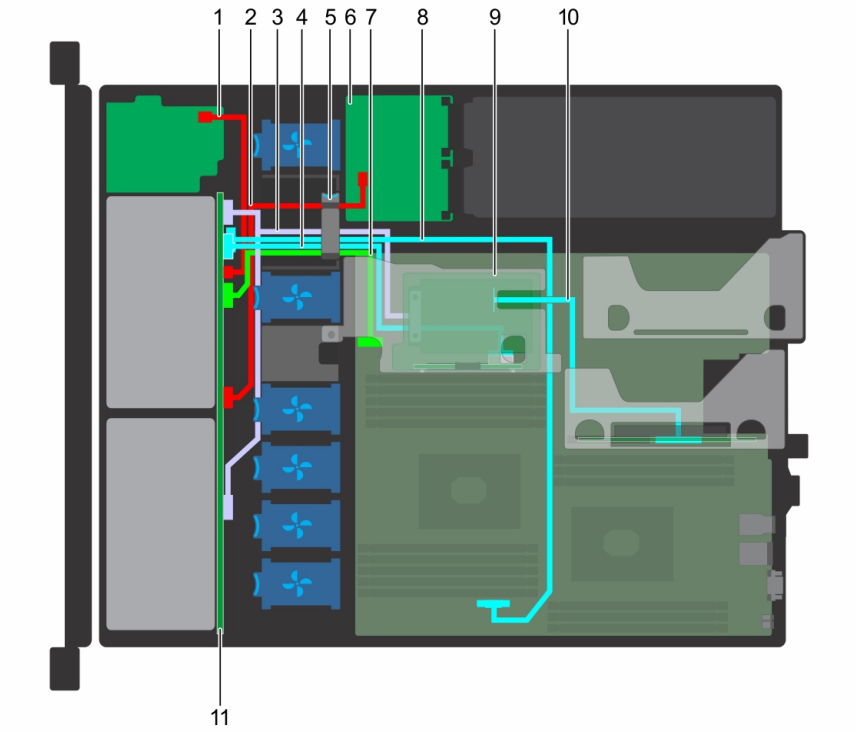

Figure 97. Cable routing - with 8 x 2.5-inch NVMe backplane with NVMe miniPERC riser and two processors

1. FIO power cable
2. Backplane power cable
3. SAS cable
4. NVMe PCIe A0 cable
5. Cable routing clip
6. Power interposer board

7. Backplane signal cable
8. NVMe PCIe A1 cable
9. NVMe MiniPERC riser
10. Mezzanine B cable

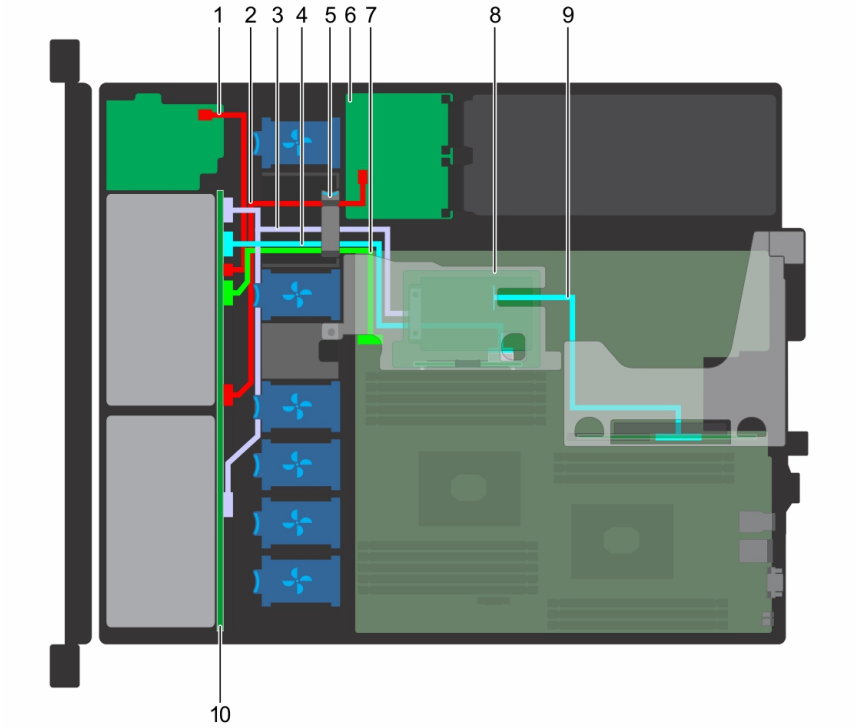

Figure 98. Cable routing - with 8 x 2.5-inch hard drive NVMe backplane with NVMe MiniPERC riser and one processor

1. FIO power cable
2. Backplane power cable
3. SAS cable
4. NVMe PCIe A0 cable
5. Cable routing clip
6. Power interposer board
7. Backplane signal cable
8. NVMe MiniPERC riser
9. Mezzanine B cable

System battery

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 on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the expansion card riser.

Steps

1. Locate the battery socket. For more information, see the System board jumpers and connectors section.

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.

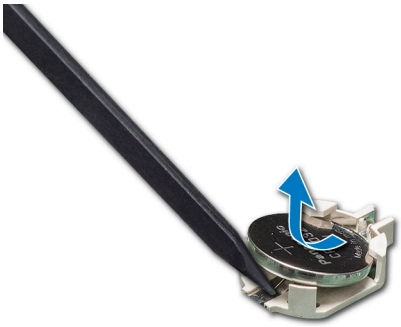

Figure 99. Removing the system battery

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.

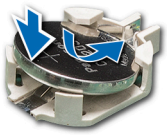

Figure 100. Installing the system battery

Next steps

1. Install the expansion card riser 1.
2. If applicable, connect the cables to the expansion card(s).
3. Follow the procedure listed in After working inside your system on page 60.
4. While booting, press F2 to enter the System Setup and ensure that the battery is operating properly.
5. Enter the correct time and date in the System Setup **Time** and **Date** fields.
6. Exit the System Setup.

Optional internal USB memory key

NOTE: The internal USB port is on the front IO board, see the Inside the system section.

Replacing the optional internal USB memory key

Prerequisites

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

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

Steps

1. Locate the USB port or USB memory key on the front IO board.
2. If installed, remove the USB memory key from the USB port.

3. Insert the replacement USB memory key into the USB port.

Next steps

1. Follow the procedure listed in After working inside your system on page 60.
2. While booting, press F2 to enter **System Setup** and verify that the system detects the USB memory key.

Power supply units

NOTE: For more information, see the Technical specifications section.

NOTE: DC Power Supplies utilize non-standard power cords, and are non-compatible with AC Power Supplies power cords. The DC Power Supply for the XR2 uses the Anderson Power Products Saf-D-Grid power connector. The compatible power cords from Anderson Power Products are model 2035KZx and 2058KZx, where 'x' is the length in meters.

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. Mixing PSUs will result in mismatch condition or failure to turn the system on.

NOTE: When two identical PSUs are installed, power supply redundancy (1+1 – with redundancy or 2+0 – without redundancy) is configured in system BIOS. In redundant mode, power is supplied to the system equally from both PSUs when Hot Spare is disabled. When Hot Spare is enabled, one of the PSUs is put into the sleep mode when system utilization is low in order to maximize efficiency.

NOTE: If two PSUs are used, they must be of the same maximum output power.

Removing a power supply unit

Prerequisites

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

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Disconnect the power cable from the power source and PSU, and then remove the cable from the strap on the PSU handle.
4. Unlatch and lift the optional cable management arm if it interferes with the PSU removal.

   For information about the cable management arm, see the system's rack documentation at For additional information about environmental certifications, please refer to the Product Environmental Datasheet located with the Manuals & Documents on www.dell.com/poweredgemanuals.

Steps

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

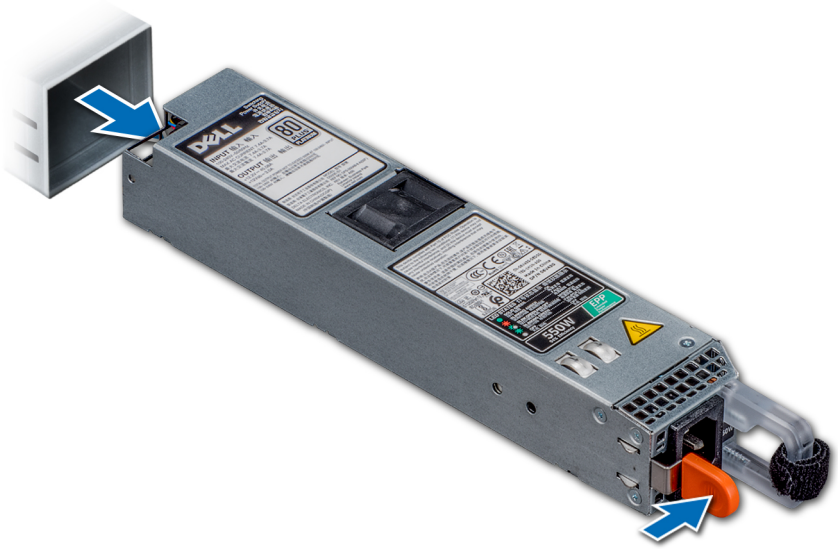

Figure 101. Removing a power supply unit

Next steps

Install the PSU.

Installing a power supply unit

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. For systems that support redundant PSU, ensure that both the PSUs are of the same type and have the same maximum output power.

   NOTE: The maximum output power (shown in watts) is listed on the PSU label.

Steps

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

Figure 102. Installing a power supply unit

Next steps

1. If you have unlatched the cable management arm, relatch it. For information about the cable management arm, see the system's rack documentation at For additional information about environmental certifications, please refer to the Product Environmental Datasheet located with the Manuals & Documents on www.dell.com/poweredgemanuals.
2. Plug the cable into a power outlet and PSU.

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

   NOTE: When installing, hot swapping, or hot adding a new PSU, wait for 15 seconds for the system to recognize the PSU and determine its status. The PSU redundancy may not occur until discovery is complete. 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.
3. Follow the procedure listed in After working inside your system on page 60.

Power interposer board

Removing power interposer board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the cooling fans
4. Remove the MiniPERC riser or NVMe PERC riser
5. Disconnect the cables that are connected to the Power Interposer board.
6. Disconnect the cables that are connected from the power interposer board to the system board and hard drive backplane.
7. Remove the PSU

CAUTION: To prevent damage to the power interposer board, you must remove the power supply module (s) or power supply blank from the system before removing the power interposer board or power distribution board.

Steps

1. Using a Phillips #2 screwdriver, remove the two screws securing the power interposer board (PIB) to the system.
2. Slide the board towards the front of the system and then lift it out.

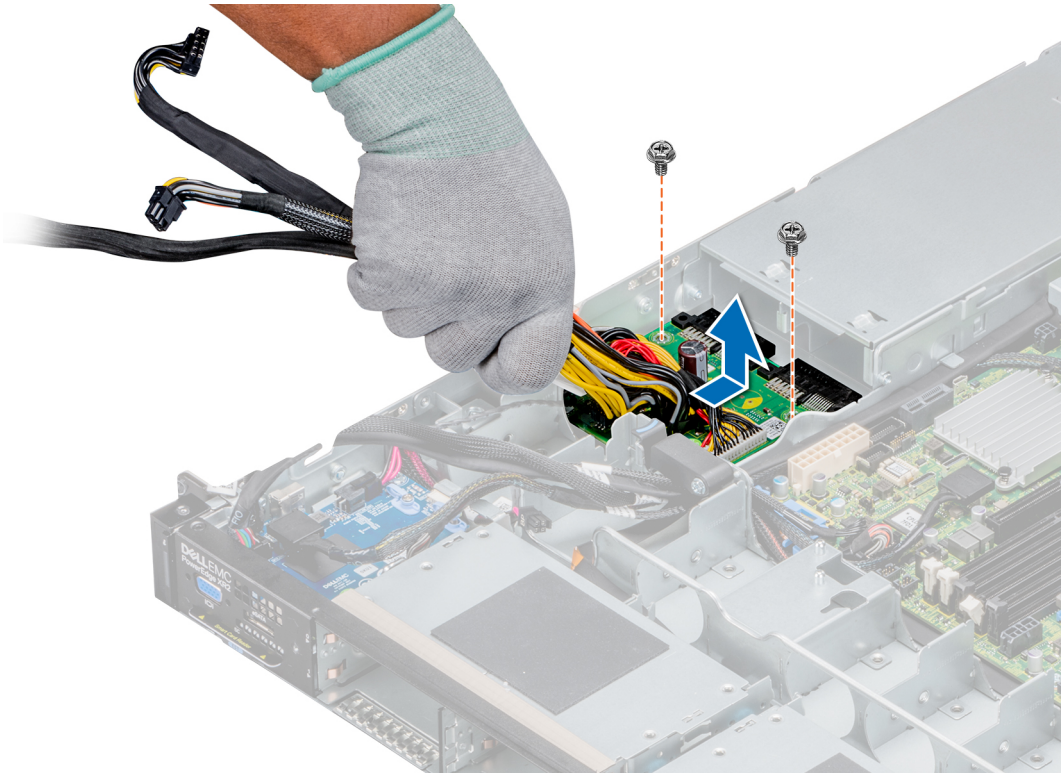

Figure 103. Removing a PIB

Next steps

1. Install the power interposer board

Installing power interposer board

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Slide the PIB into place.
2. Using a Phillips #2 screwdriver, tighten the two screws to secure the PIB to the system.
3. Route the cables, and connect it to the appropriate connectors on the power interposer board, system board, and hard drive backplane.

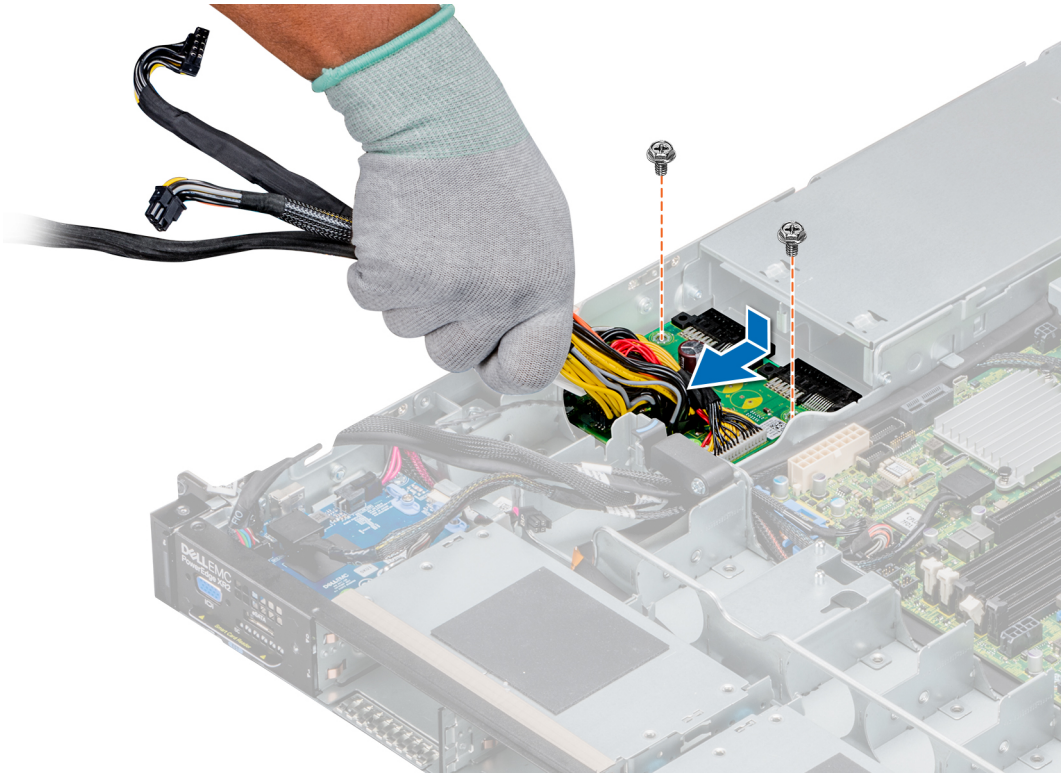

Figure 104. Installing a PIB

Next steps

1. Install PSUs
2. Install the MiniPERC riser or NVMe PERC riser
3. Install the cooling fans
4. Install the air shroud
5. Follow the procedure listed in After working inside your system on page 60.

Control panel

Removing the left control panel

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

   NOTE: Ensure that you note the routing of the cables as you remove them from the system board. You must route the cables properly when you replace them to prevent the cables from being pinched or crimped.
3. Remove the MiniPERC riser or NVMe PERC riser

Steps

1. Disconnect the control panel cable from the system board connector.
2. Using a Phillips #1 screwdriver, remove the screw that secures the control panel to the system.
3. Holding the sides, remove the left control panel assembly away from the system.

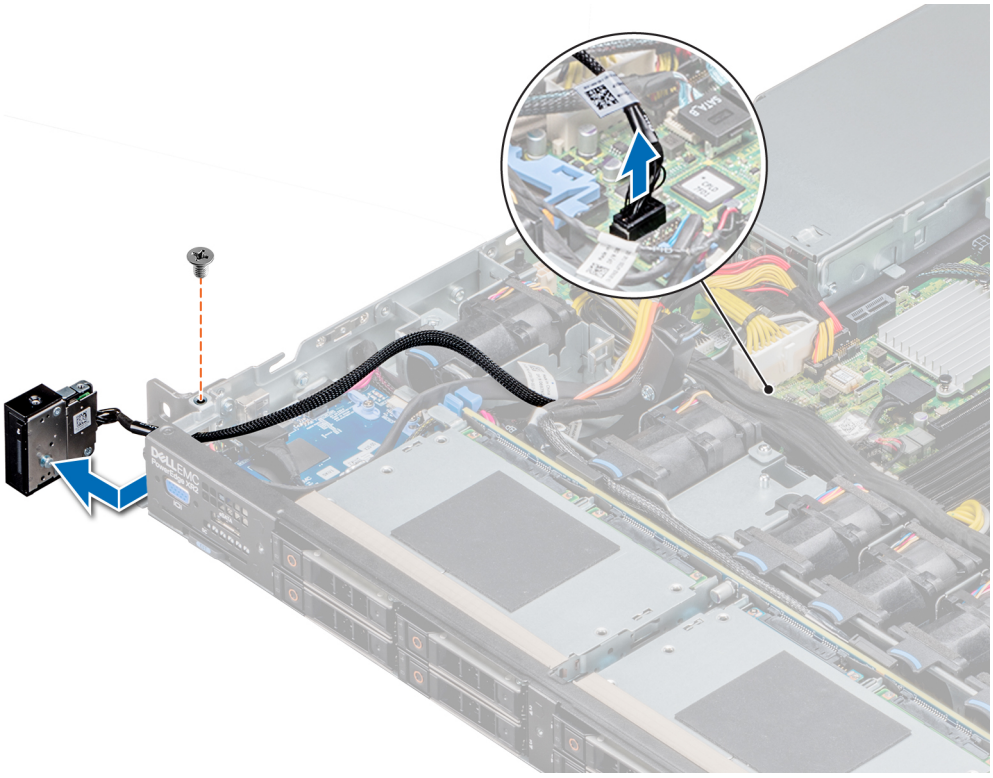

Figure 105. Removing the left control panel

Next steps

Install the left control panel.

Installing the left control panel

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Route the control panel cable through the side wall of the system.
2. Align the left control panel assembly with the system.
3. Connect the control panel cable to the system board connector.
4. Using Phillips #1 screwdriver, replace the screw that secures the left control panel to the system.

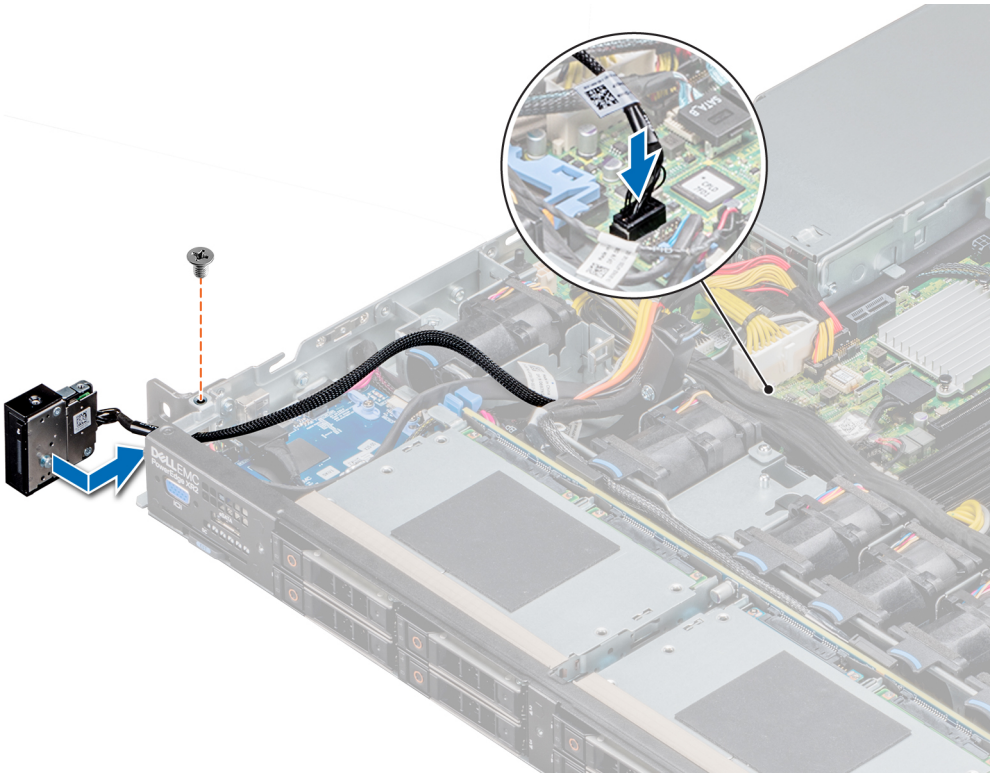

Figure 106. Installing the left control panel

Next steps

1. Install the air shroud
2. Install the internal PERC riser or NVMe PERC riser
3. Follow the procedure listed in After working inside your system on page 60.

Removing the right control panel

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.

   NOTE: Ensure that you note the routing of the cables as you remove them from the system board. You must route the cables properly when you replace them to prevent the cables from being pinched or crimped.
3. Remove the cooling fan
4. Remove the MiniPERC riser or NVMe PERC riser
5. Remove the hard drive backplane or NVMe backplane

Steps

1. Lift the cable latch, and disconnect the control panel cable from the system board connector.

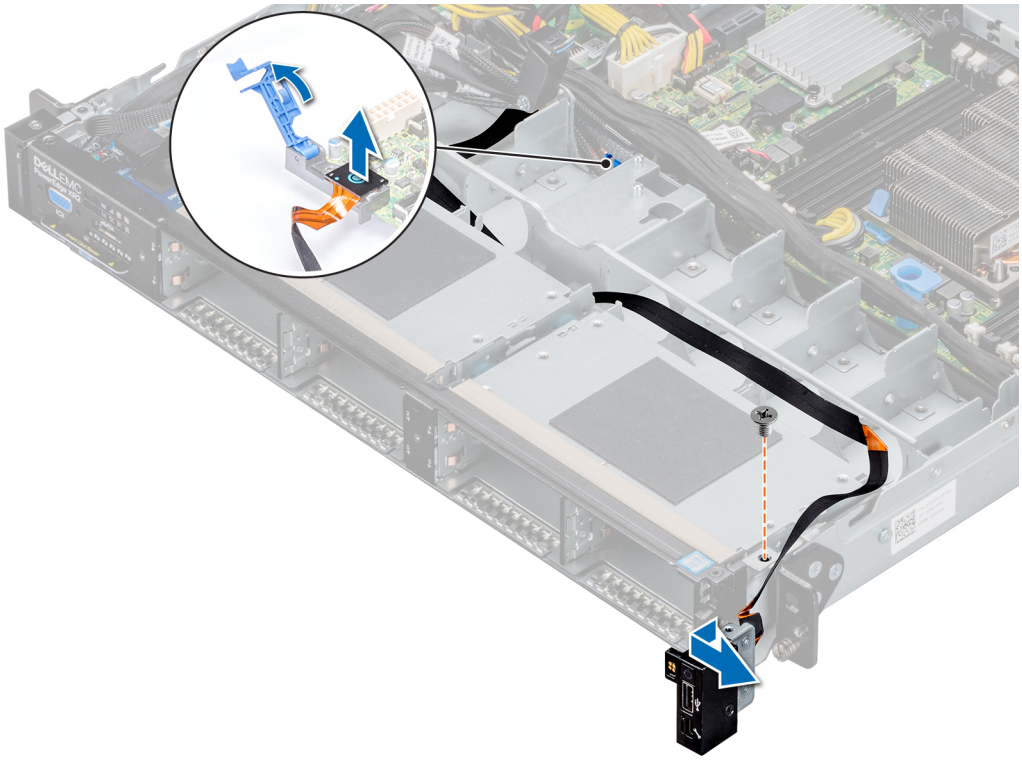

Figure 107. Removing the right control panel

2. Using a Phillips #1 screwdriver, remove the screw that secures the right control panel to the system.

Next steps

1. Install the right control panel

Installing the right control panel

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Route the control panel cable through the slot on the system.
2. Align the right control panel with the control panel slot on the system and attach the control panel to the system.
3. Connect the control panel cable to the system board connector and secure it using cable latch.
4. Using Phillips #1 screwdriver, replace the screw that secures the right control panel to the system.

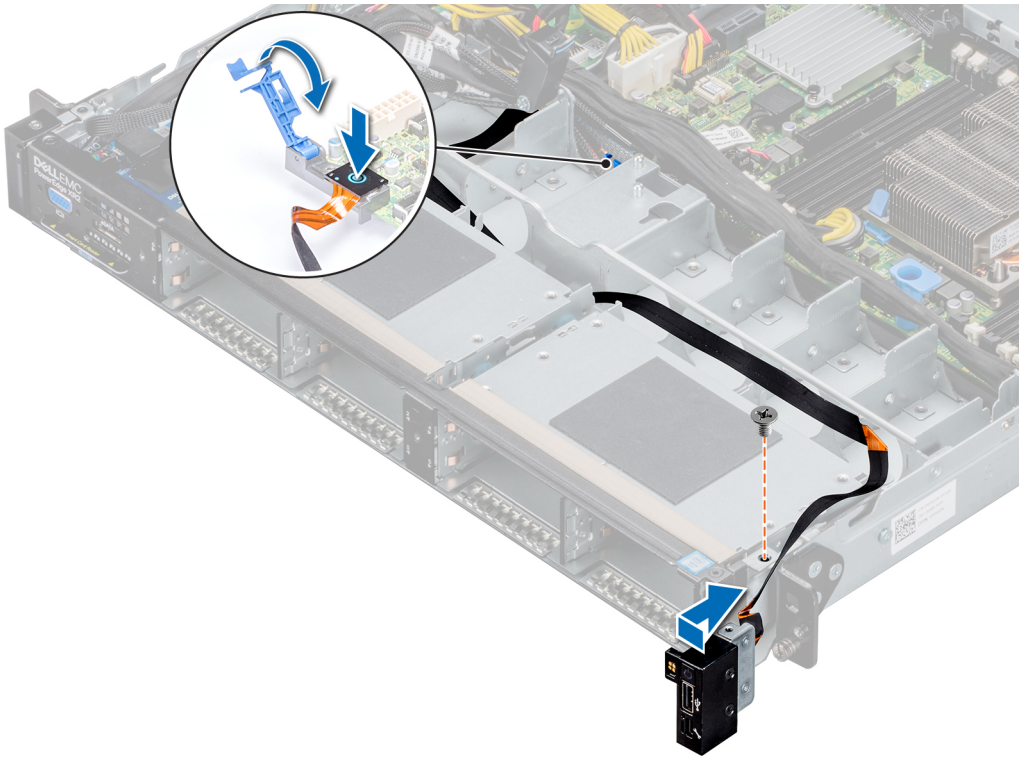

Figure 108. Installing the right control panel

Next steps

1. Install the MiniPERC riser. or NVMe PERC riser
2. Install the hard drive backplane or NVMe backplane
3. Install the cooling fan
4. Follow the procedure listed in After working inside your system on page 60.

System board

Removing the system board

Prerequisites

CAUTION: If you are using the Trusted Platform Module (TPM) with an encryption key, you may be prompted to create a recovery key during program or System Setup. Be sure to create and safely store this recovery key. If you replace this system board, you must supply the recovery key when you restart your system or program before you can access the encrypted data on your hard drives.

CAUTION: Do not attempt to remove the TPM plug-in module from the system board. Once the TPM plug-in module is installed, it is cryptographically bound to that specific system board. Any attempt to remove an installed TPM plug-in module breaks the cryptographic binding, and it cannot be reinstalled or installed on another system board.

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Follow the procedure listed in Before working inside your system on page 60.
3. Remove the following:
   a. Air shroud
   b. Expansion cards and risers

c. Internal MiniPERC riser or NVMe MiniPERC riser
d. IDSDM/vFlash module(if installed)
e. Processors and heat sink modules
f. Processor blanks (if applicable)

CAUTION: To prevent damage to the processor socket when replacing a faulty system board, ensure that you cover the processor socket with the processor dust cover.

g. Memory modules
h. LOM riser card

Steps

1. Remove the riser 2 support clip.

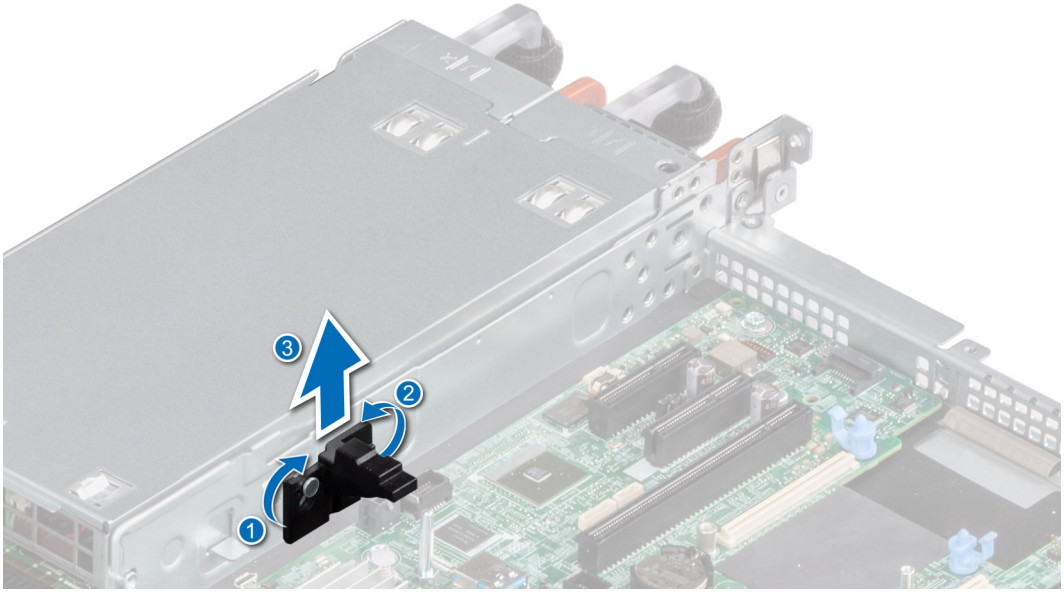

Figure 109. Riser 2 support clip removal

2. Disconnect all cables from the system board.

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

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

NOTE: Ensure that you disconnect the cable from the internal USB port on the system board to the front IO board.

3. Using a Phillips #2 screwdriver, remove the screws that secure the system board to the chassis.
4. Hold the system board holder, slightly lift the system board to disengage from the step standoff and connectors from the slots on the chassis.

   Sliding the board towards the front disengages the connectors on the system board from the slots on the chassis.
5. Lift the system board out of the system.

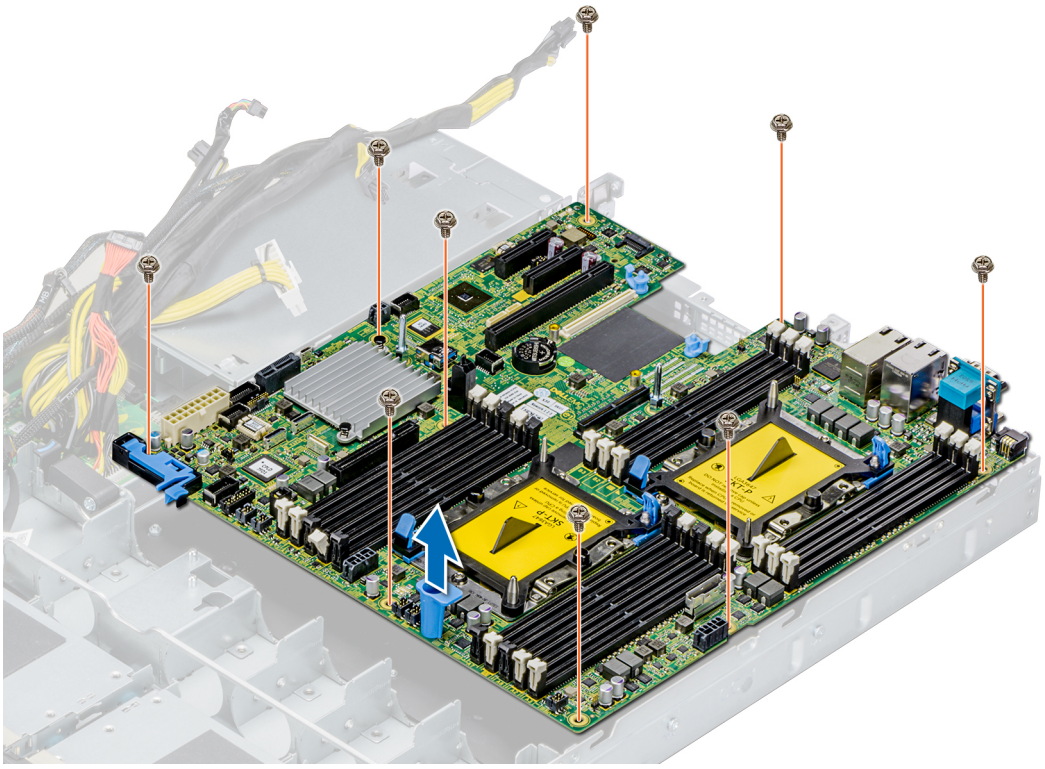

Figure 110. Removing the system board

Next steps

Install the system board.

Installing the system board

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

Steps

1. Unpack the new system board assembly.

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

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

2. Holding the system board holder, align the connectors on the system board with the slots on the back of the chassis and insert the system board at an angle to avoid the fan shroud post.
3. Routing the VGA cable as close as possible to the internal chassis wall, connect the cable to the system board connector.
4. Align the slot on the riser 2 support clip with the standoff on the internal chassis wall.
5. Push the Riser 2 support clip at an angle so that the standoff locks into the side of the support clip.

   NOTE: Ensure that the cable is not pinched.

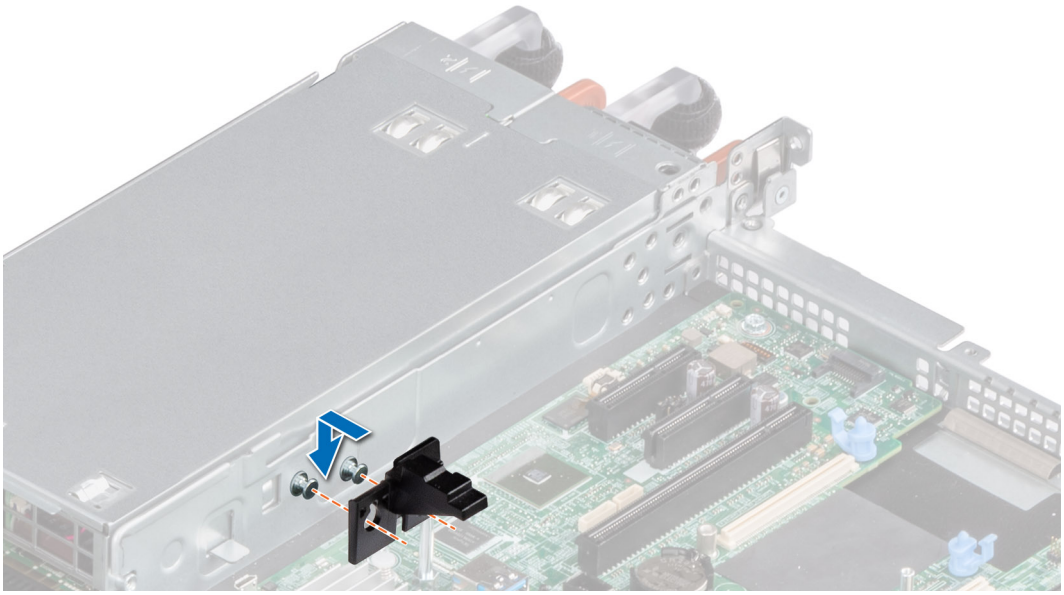

Figure 111. Riser 2 support clip installation

6. Using a Phillips #2 screwdriver, tighten the screws to secure the system board to the chassis.

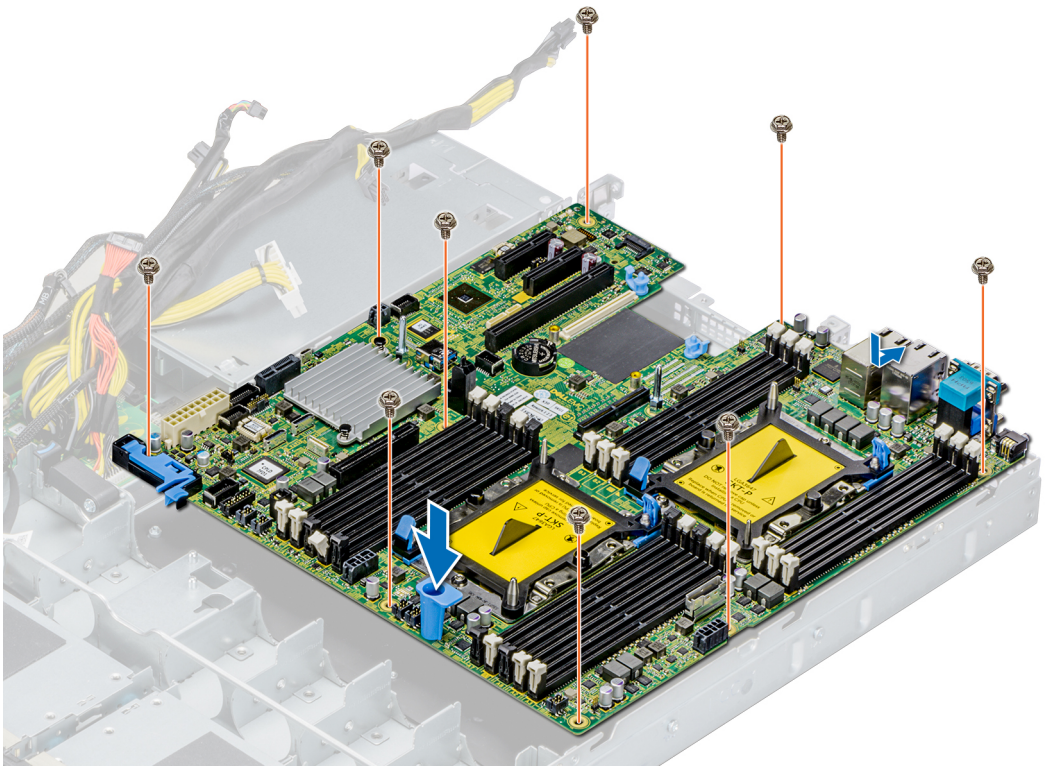

Figure 112. Installing the system board

Next steps

1. Replace the following:
   a. Install the Trusted Platform Module (TPM)
      NOTE: The TPM plug-in module is attached to the system board and cannot be removed. A replacement TPM plug-in module is provided for all system board replacements, where a TPM plug-in module was installed.
   b. Internal PERC riser or NVMe PERC riser

c. IDSDM/vFlash module card(if removed)
d. All expansion cards and risers
e. Processors and heat sink modules
f. Processor blanks (if applicable)
g. Memory modules
h. LOM riser card
i. Air shroud

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. Follow the procedure listed in After working inside your system on page 60.
4. Ensure that you:
   a. Use the Easy Restore feature to restore the Service Tag. For more information, see the Restoring the Service Tag by using the Easy Restore feature section.
   b. If the Service Tag is not backed up in the backup flash device, enter the Service Tag manually. For more information, see the Manually update the Service Tag section.
   c. Update the BIOS and iDRAC versions.
   d. Re-enable the Trusted Platform Module (TPM). For more information, see the Upgrading the Trusted Platform Module section.
5. Import your new or existing iDRAC Enterprise license.

   For more information, see *Integrated Dell Remote Access Controller User's Guide*, at www.dell.com/poweredgemanuals.

Trusted Platform Module

Upgrading the Trusted Platform Module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.

NOTE:

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

About this task

CAUTION: If you are using the Trusted Platform Module (TPM) with an encryption key, you may be prompted to create a recovery key during program or System Setup. Work with the customer to create and safely store this recovery key. When replacing this system board, you must supply the recovery key when you restart your system or program before you can access the encrypted data on your hard drives.

CAUTION: Once the TPM plug-in module is installed, it is cryptographically bound to that specific system board. Any attempt to remove an installed TPM plug-in module breaks the cryptographic binding, the removed TPM cannot be reinstalled or installed on another system board.

Removing the TPM

Steps

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

5. Pull the plastic rivet out of its slot on the system board.

Installing the TPM

Steps

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

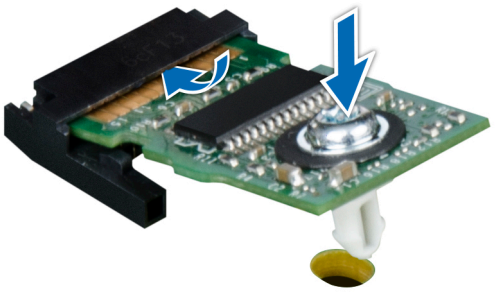

Figure 113. Installing the TPM

Next steps

1. Install the system board.

Initializing TPM for BitLocker users

Steps

Initialize the TPM.

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

The **TPM Status** changes to **Enabled, Activated**.

Initializing the TPM 1.2 for TXT users

Steps

1. While booting your system, press F2 to enter System Setup.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
3. From the **TPM Security** option, select **On with Pre-boot Measurements**.
4. From the **TPM Command** option, select **Activate**.
5. Save the settings.
6. Restart your system.
7. Enter **System Setup** again.
8. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
9. From the **Intel TXT** option, select **On**.

Initializing the TPM 2.0 for TXT users

Steps

1. While booting your system, press F2 to enter System Setup.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
3. From the **TPM Security** option, select **On**.
4. Save the settings.
5. Restart your system.
6. Enter **System Setup** again.
7. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
8. Select the **TPM Advanced Settings** option.
9. From the **TPM2 Algorithm Selection** option, select **SHA256**, then go back to **System Security Settings** screen.
10. On the **System Security Settings** screen, from the **Intel TXT** option, select **On**.
11. Save the settings.
12. Restart your system.

901D rugged kit

The 901D kit provides rugged protection for the PowerEdge XR2 server. The 901D kit consists of the components mentioned below:

- Standoff hex spacer screws
- Screws
- Mylar foam
- 901D riser 1
- PCI rugged bracket
- Power supply rugged bracket
- Drive lock bracket

Installing the 901D kit

Prerequisites

Follow the safety guidelines listed in Safety instructions on page 59.

1. Remove the expansion risers.
2. Remove the PCI card from the expansion riser 1.
3. Remove the system board.

   CAUTION: You must remove the system board, to install or remove the standoff hex spacer screw.

   NOTE: Do not discard the standoff hex nut removed from the system board. It must be reused to secure the 901D standoff hex spacer.
4. Unpack the 901D kit.

Steps

1. Remove the standoff hex spacer and the hex nut.

   NOTE: Do not discard the standoff hex nut.

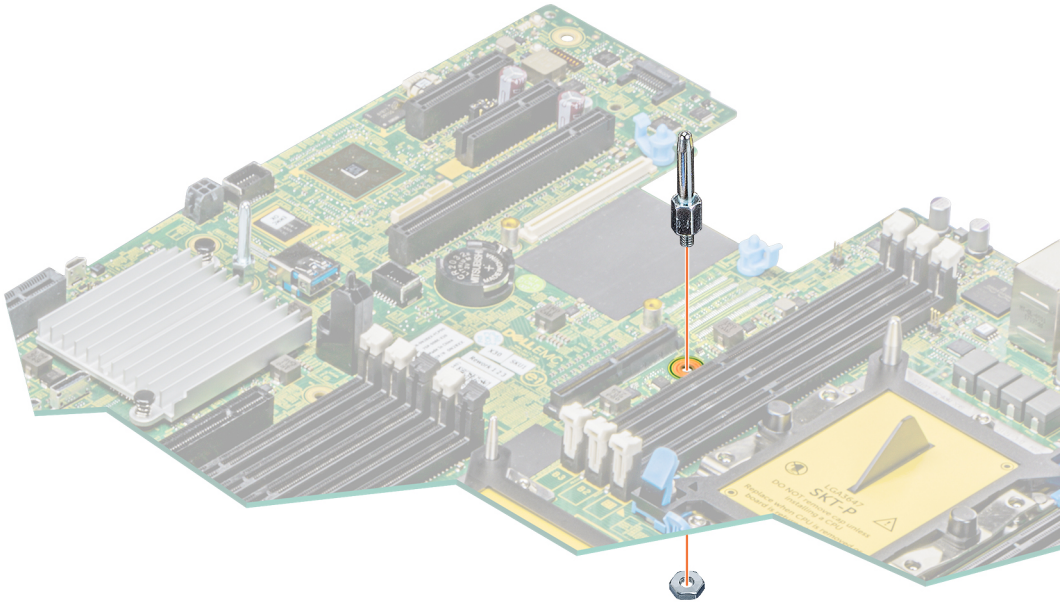

Figure 114. Removing the standoff hex spacer from the system board

2. Fasten the standoff hex spacer shipped with the 901D kit on the system board.

   NOTE: Reuse the hex nut that was removed from the system board, to secure the standoff hex spacer.

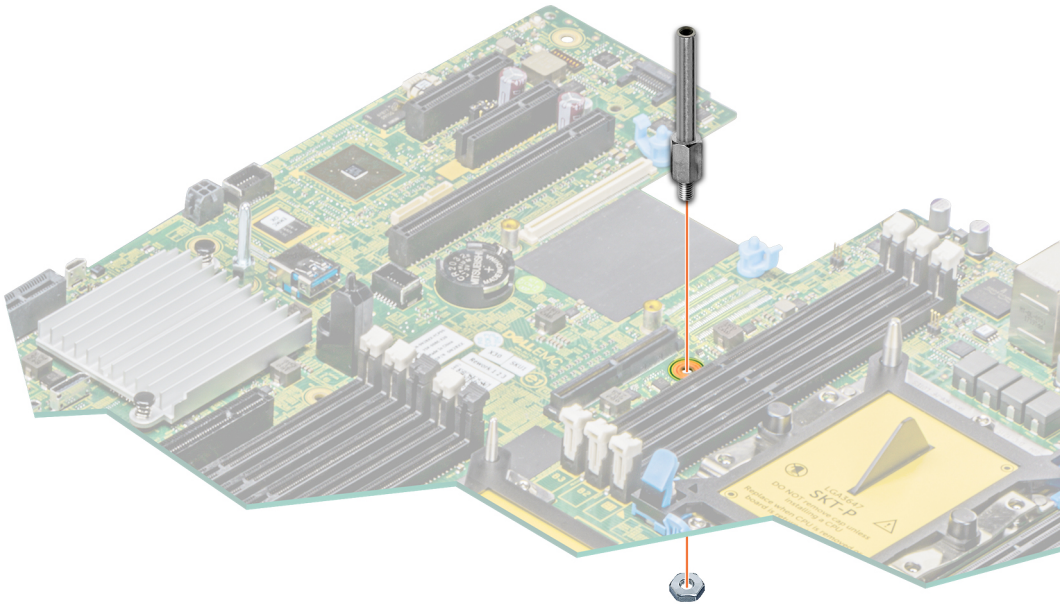

Figure 115. Installing the 901D standoff hex spacer on the system board

3. Replace the system board.
4. Fasten the 901D standoff hex spacer.

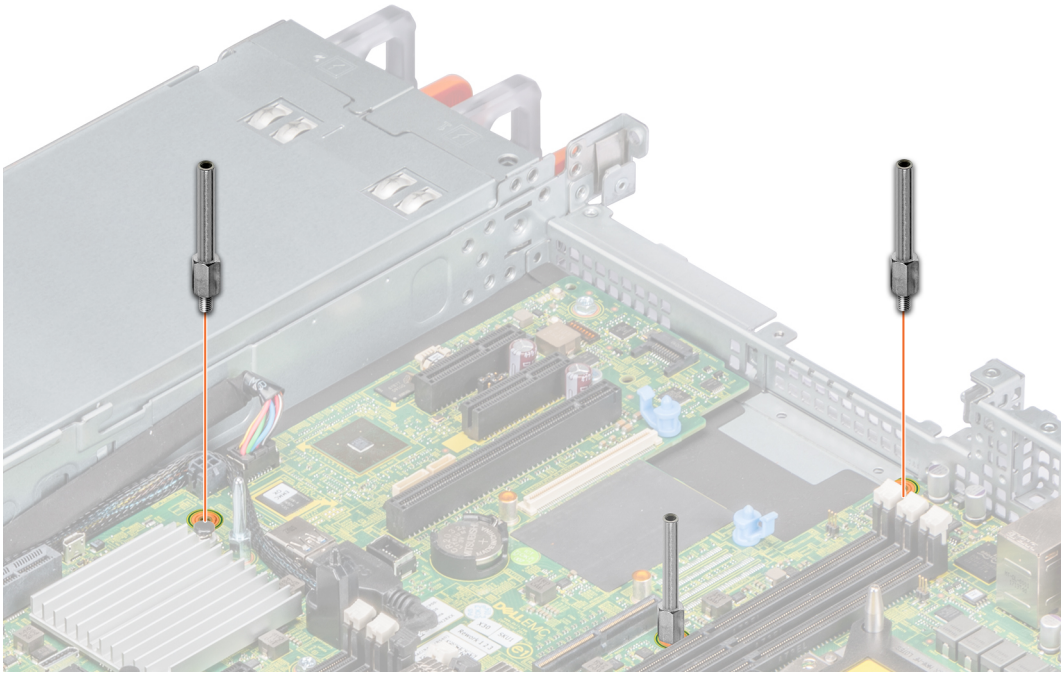

Figure 116. Installing the 901D standoffs

5. Remove the adhesive cover from the mylar foam, and install it on the chassis wall.

   NOTE: Ensure to clean the chassis wall surface before installing the mylar foam.

   NOTE: Press the mylar foam to ensure that it is firmly affixed on the chassis wall.

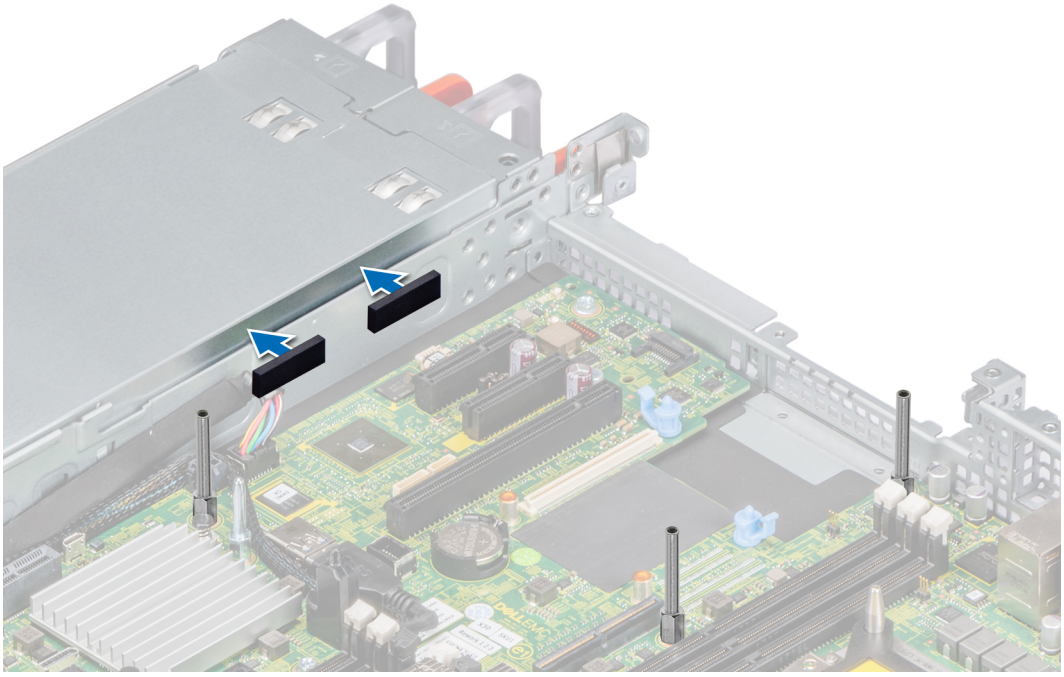

Figure 117. Installing the mylar foam

6. Install the PCI card on the 901D riser 1 bracket shipped with the 901D kit, and push the blue expansion card retention latch to lock it in place.

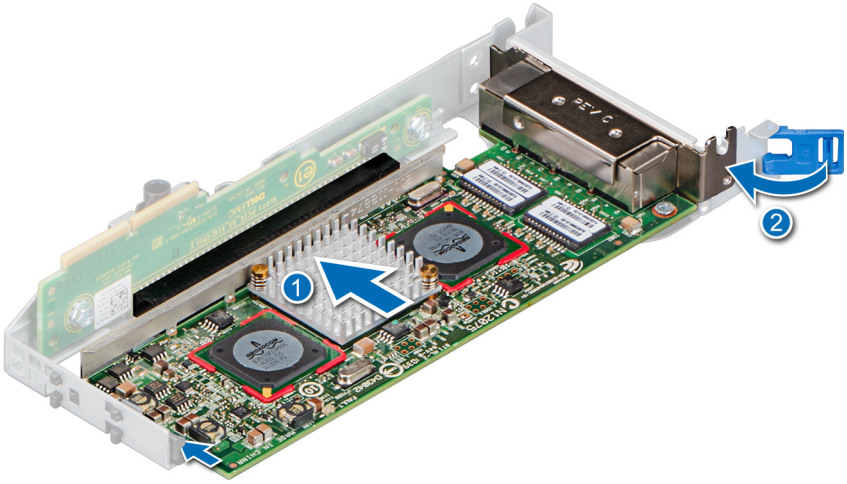

Figure 118. Installing the PCI card on the 901D riser

7. Install the mylar foam on the blue expansion card retention latch of the 901D riser.

   NOTE: Before installing the mylar foam, ensure to clean the blue retention latch with alcohol.

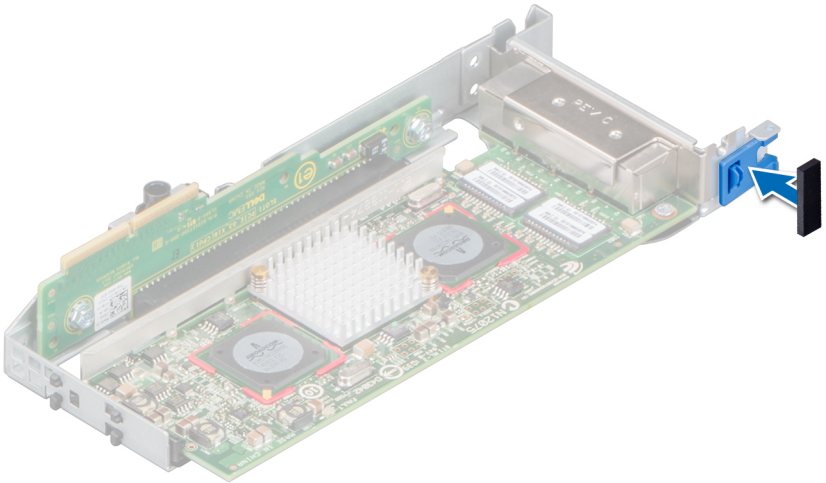

Figure 119. Installing the mylar foam

8. Align the 901D riser with the standoff hex spacers and lower it until it is firmly seated in the PCIe slot on the system board.

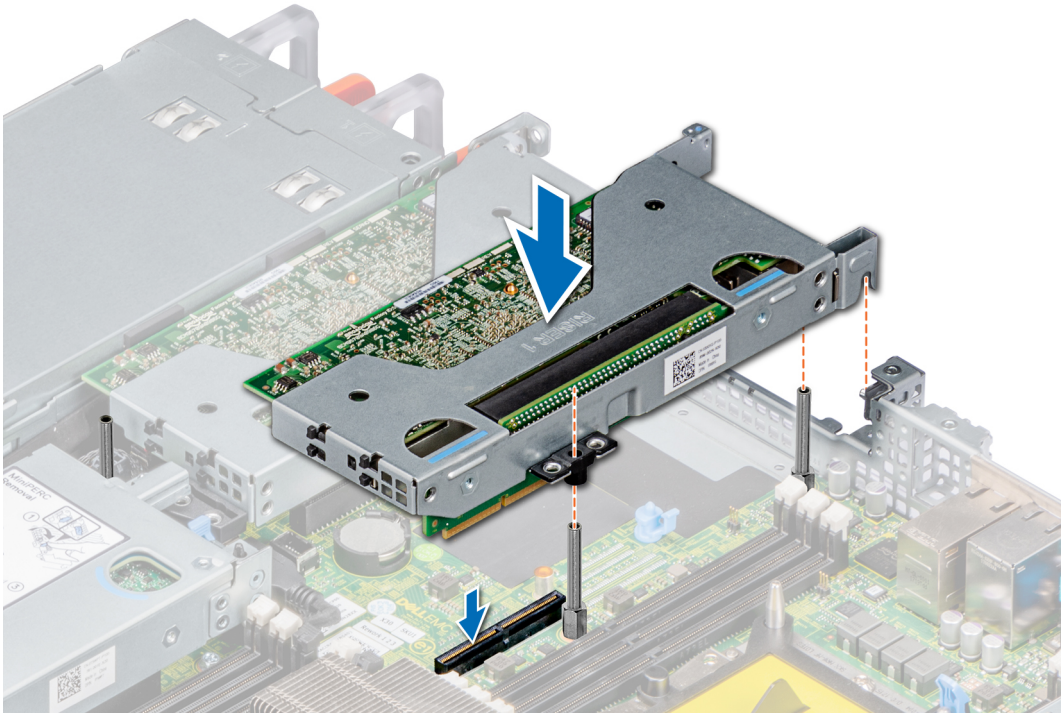

Figure 120. Installing the 901D riser on the system board

NOTE: The 901D kit includes additional mylar foam. Place the mylar foam between the risers and the chassis as required, to provide maximum support.

9. Turn over the system cover and locate the screw hole. The screw hole is covered by a label. Use a plastic scribe to puncture the label and SIL, to expose the screw hole. This screw hole secures the system cover, and the 901D riser.

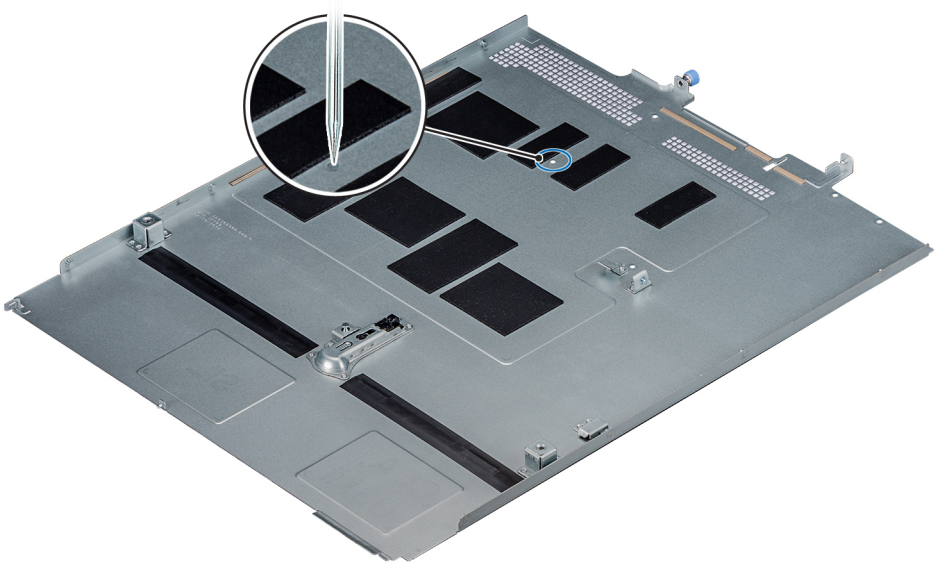

Figure 121. Exposing the standoff hex spacer screw hole

10. Install the system cover.

NOTE: Ensure to align the system cover with the 901D kit standoff hex spacers.

11. Fasten the system cover with the screws shipped in the 901D kit.

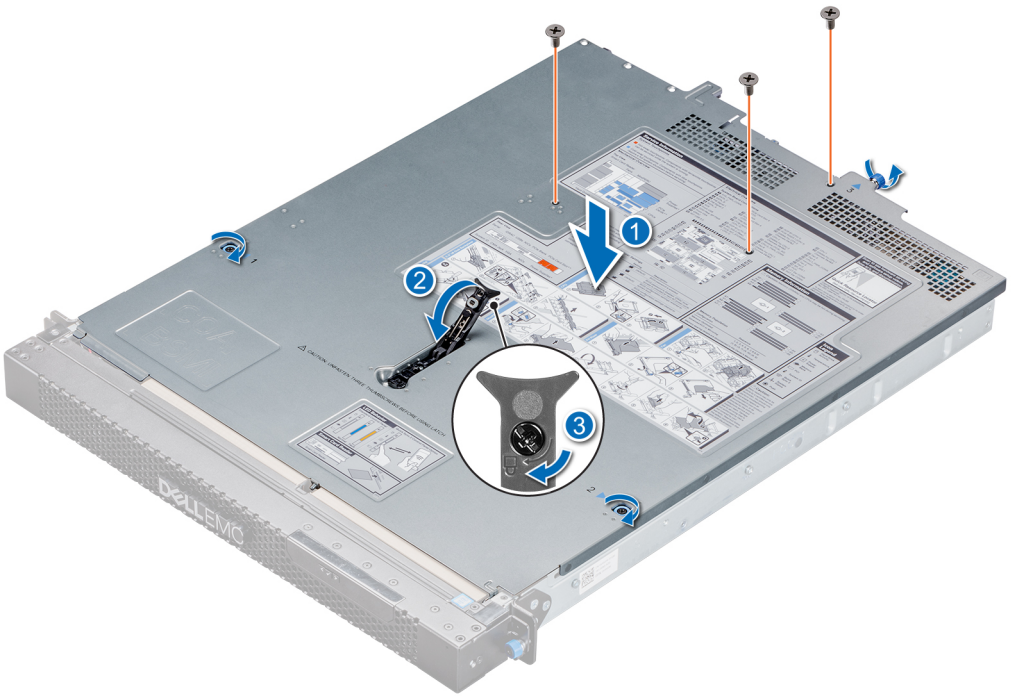

Figure 122. Installing the system cover

Installing the 901D rugged brackets

Prerequisites

1. Follow the safety guidelines listed in Safety instructions on page 59.
2. Unpack the 901D rugged brackets.
3. Remove the front bezel.

Steps

1. Using a Phillips #2 screwdriver, secure the power supply rugged bracket.

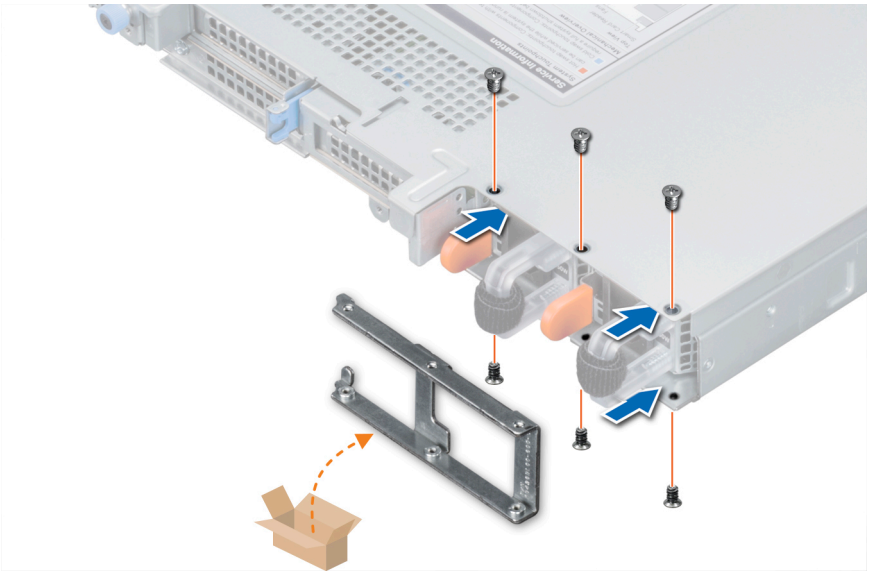

Figure 123. Installing the 901D power supply rugged bracket

2. Align the hook with the slot on the system chassis, and tighten the two thumb screws to secure the drive lock bracket.

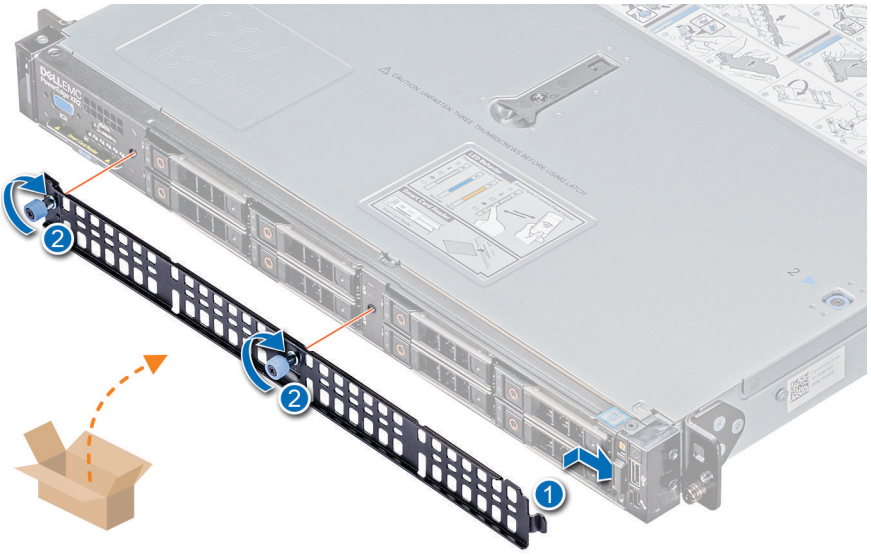

Figure 124. Installing the drive lock

3. Using a Phillips #2 screwdriver, secure the 901D PCI rugged bracket.

NOTE: To secure the 901D PCI rugged bracket, ensure to use the black screws shipped with the 901D kit.

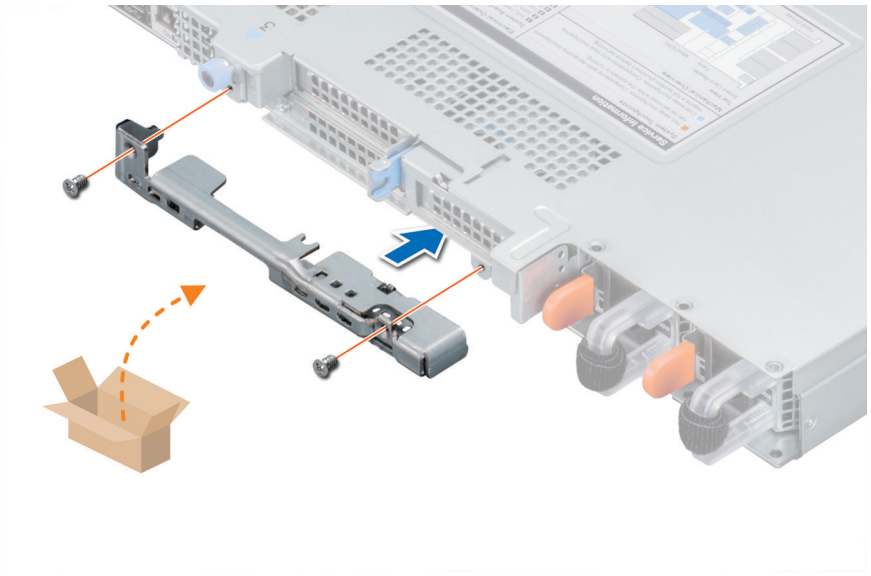

Figure 125. Installing the 901D PCI rugged bracket

Next steps

1. Install the front bezel.
2. Follow the procedure listed in After working inside your system on page 60.

7

System diagnostics

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

Topics:

Dell Embedded System Diagnostics

NOTE: The Dell Embedded System Diagnostics is also known as Enhanced Pre-boot System Assessment (ePSA) diagnostics.

The Embedded System Diagnostics provides a set of options for particular device groups or devices allowing you to:

- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing

Running the Embedded System Diagnostics from Boot Manager

Run the Embedded System Diagnostics (ePSA) if your system does not boot.

Steps

1. When the system is booting, press F11.
2. Use the up arrow and down arrow keys to select **System Utilities** > **Launch Diagnostics**.
3. Alternatively, when the system is booting, press F10, select **Hardware Diagnostics** > **Run Hardware Diagnostics**.
   The **ePSA Pre-boot System Assessment** window is displayed, listing all devices detected in the system. The diagnostics starts executing the tests on all the detected devices.

Results

Running the Embedded System Diagnostics from the Dell Lifecycle Controller

Steps

1. As the system boots, press F10.
2. Select **Hardware Diagnostics** → **Run Hardware Diagnostics**.
   The **ePSA Pre-boot System Assessment** window is displayed, listing all devices detected in the system. The diagnostics starts executing the tests on all the detected devices.

System diagnostic controls

Menu	Description
Configuration	Displays the configuration and status information of all detected devices.
Results	Displays the results of all tests that are run.
System health	Provides the current overview of the system performance.
Event log	Displays a time-stamped log of the results of all tests run on the system. This is displayed if at least one event description is recorded.

8

Jumpers and connectors

This topic provides specific information about the jumpers. It also provides some basic information about jumpers and switches and describes the connectors on the various boards in the system. Jumpers on the system board help to disable the system and setup passwords. You must know the connectors on the system board to install components and cables correctly.

Topics:

System board jumpers and connectors

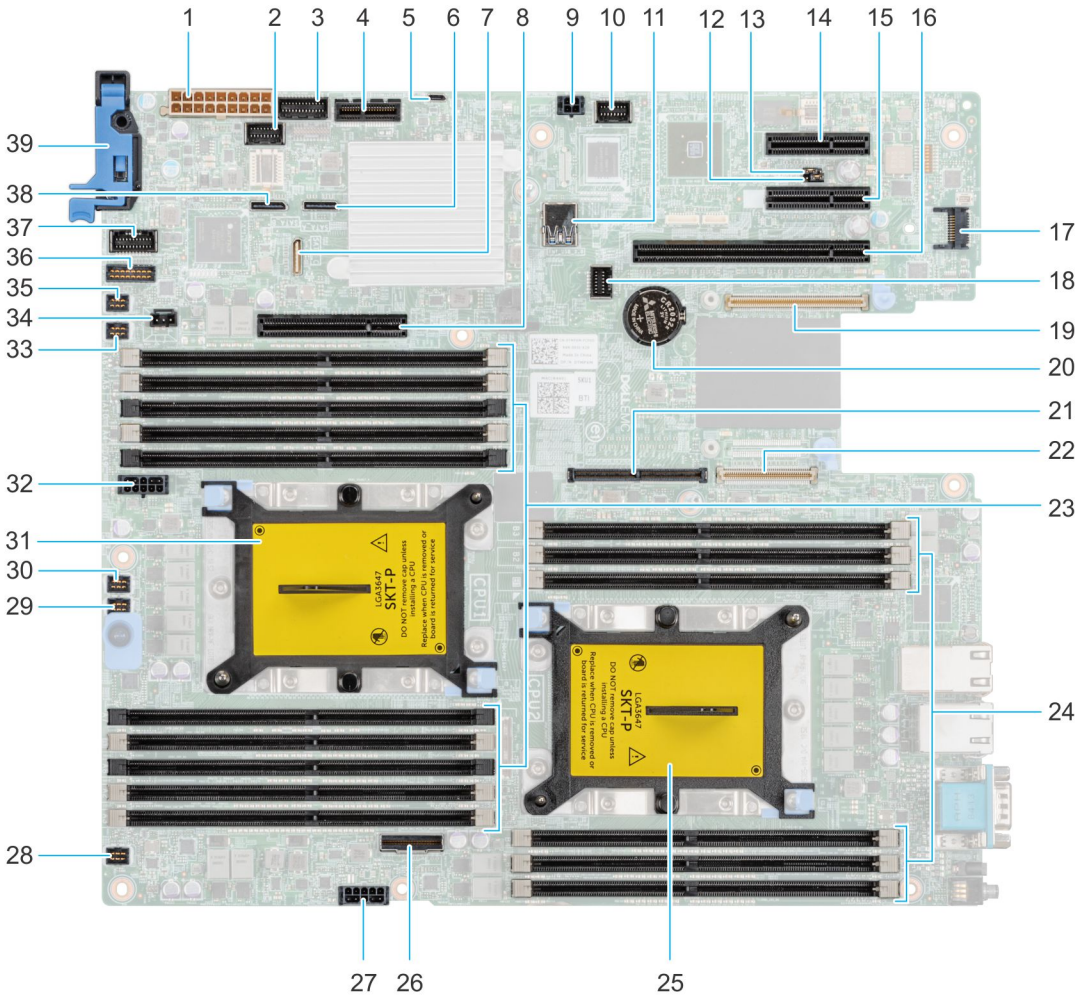

Figure 126. System board jumpers and connectors

Table 41. System board jumpers and connectors

Item	Connector	Description
1	SYS_PWR_CONN(P1)	System power connector
2	J_PIB_SIG1	Power interposer board signal connector 1
3	J_PIB_SIG2	Power interposer board signal connector 2
4	J_ACE	Internal Dual SD Module
5	J_CP_USB2	Front USB connector
6	J_SATA_A1	Internal SATA A connector
7	J_SATA_C1	Internal SATA C connector
8	PCIE_G3_X8(CPU1)	Internal PERC controller connector
9	J_REAR_BP_PWR1	Rear backplane power connector
10	J_FRONT_VIDEO	VGA connector
11	INT_USB_3.0	USB connector
12	NVRAM_CLR	Clear NVRAM
13	PWRD_EN	Reset BIOS password
14	(SLOT6)PCIE_G3_x4(PCH)	PCIE slot x4
15	(SLOT5)PCIE_G3_x4(PCH)	PCIE slot x4
16	SLOT3	PCIe slot (Riser 2)
17	J_TPM_MODULE	TPM module connector
18	J_BP_SIG0	Backplane signal connector
19	J_MEZZ_A1	LOM riser card connector
20	BATTERY	Battery connector
21	PCIE_G3_X16(CPU1)	Riser 1 connector
22	(B)(Riser2)PCIE_G3_x16(CPU1)	Mezzanine B connector
23	A6, A5, A10, A4, A9, A7, A1, A8, A2, A3	Memory module sockets
24	B3, B2, B1, B4, B5, B6	Memory module sockets
25	CPU2	Processor socket 2
26	PCIE_A0	NVMe connector
27	CPU2_PWR_CONN(P3)	CPU2 power connector
28	FAN6	Cooling fan 6 connector
29	FAN5	NA FAN5
30	FAN4	FAN4
31	CPU1	Processor socket 1
32	CPU1_PWR_CONN(P2)	CPU1 power connector
33	FAN3	FAN3
34	J_INTRU	Intrusion switch connector
35	FAN2	FAN2
36	J_BP_SIG1	Backplane signal connector 1
37	LFT_CP_CONN	Left control panel connector

Table 41. System board jumpers and connectors (continued)

Item	Connector	Description
38	J_SATA_B1	Internal SATA B connector
39	RGT_CP_CONN	Right control panel connector

System board jumper settings

For information on resetting the password jumper to disable a password, see the Disabling a forgotten password section.

Disabling forgotten password

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

Prerequisites

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

Steps

1. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover.
3. Move the jumper on the system board jumper from pins 2 and 4 to pins 4 and 6.
4. Install the system cover.

   The existing passwords are not disabled (erased) until the system boots with the jumper on pins 4 and 6. However, before you assign a new system and/or setup password, you must move the jumper back to pins 2 and 4.

   NOTE: If you assign a new system and/or setup password with the jumper on pins 4 and 6, the system disables the new password(s) the next time it boots.

5. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
6. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
7. Remove the system cover.
8. Move the jumper on the system board jumper from pins 4 and 6 to pins 2 and 4.
9. Install the system cover.
10. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
11. Assign a new system and/or setup password.

9

Getting help

Topics:

Contacting Dell

Dell provides several online and telephone based support and service options. If you do not have an active internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical assistance, or customer service issues:

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 your system Service Tag in the **Enter your Service Tag** field.
   b. Click **Submit**.
   The support page that lists the various support categories is displayed.
4. For general support:
   a. Select your product category.
   b. Select your product segment.
   c. Select your product.
   The support page that lists the various support categories is displayed.
5. For contact details of Dell Global Technical Support:
   a. Click Global 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 information tag in the front of the system, to access the information about the PowerEdge system.

Prerequisites

Ensure that your smartphone or tablet has the QR code scanner installed.

The QRL includes the following information about your system:

- How-to videos
- Reference materials, including the Installtion and Service Manual, LCD diagnostics, and mechanical overview
- Your system service tag to quickly access your specific hardware configuration and warranty information
- A direct link to Dell to contact technical assistance and sales teams

Steps

1. Go to www.dell.com/qrl and navigate to your specific product or
2. Use your smartphone or tablet to scan the model-specific Quick Resource (QR) code on your system or in the Quick Resource Locator section.

Quick Resource Locator for PowerEdge XR2

Figure 127. Quick Resource Locator

Receiving automated support with SupportAssist

Dell EMC SupportAssist is an optional Dell EMC Services offering that automates technical support for your Dell EMC server, storage, and networking devices. By installing and setting up a SupportAssist application in your IT environment, you can receive the following benefits:

- **Automated issue detection** — SupportAssist monitors your Dell EMC devices and automatically detects hardware issues, both proactively and predictively.
- **Automated case creation** — When an issue is detected, SupportAssist automatically opens a support case with Dell EMC Technical Support.
- **Automated diagnostic collection** — SupportAssist automatically collects system state information from your devices and uploads it securely to Dell EMC. This information is used by Dell EMC Technical Support to troubleshoot the issue.
- **Proactive contact** — A Dell EMC Technical Support agent contacts you about the support case and helps you resolve the issue.

The available benefits vary depending on the Dell EMC Service entitlement purchased for your device. For more information about SupportAssist, go to www.dell.com/supportassist.

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.