Dell EMC PowerEdge R7415

Installation and Service Manual

Regulatory Model: E46S Series
Regulatory Type: E46S002

Notes, cautions, and warnings

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

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

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

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Dell EMC PowerEdge R7415 overview

The PowerEdge R7415 is a 2U, single socket rack system and support these configurations:

- One AMD EPYC™ processor
- Sixteen DIMM slots
- Two redundant power supply units (PSU) or single cabled PSU
- 8 x 3.5 inch, 12 x 3.5 inch, 12 x 3.5 inch + 2 x 3.5 inch (rear), or 24 x 2.5 inch SAS, SATA, or NVMe drives (up to 12 SAS/SATA/NVMe + 12 NVMe drives), 8 x 2.5 inch (universal drive) + 16 (NVMe drive), 24 x 2.5 inch (NVMe drive only).

NOTE: Hot swap for the NVMe drives is supported for your system. For more information on correct usage and technical specifications, see the *Dell PowerEdge Express Flash NVMe PCIe SSD 2.5 inch Small Form Factor User's Guide* at Dell.com/support/manuals > All Products > Server, Storage, & Networking > Dell Adapters page.

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

Topics:

- Supported configurations for the PowerEdge R7415 system
- Front view of the system
- Back panel features
- Locating the Service Tag of your system
- System information label

Supported configurations for the PowerEdge R7415 system

The Dell EMC PowerEdge R7415 system supports the following configurations:

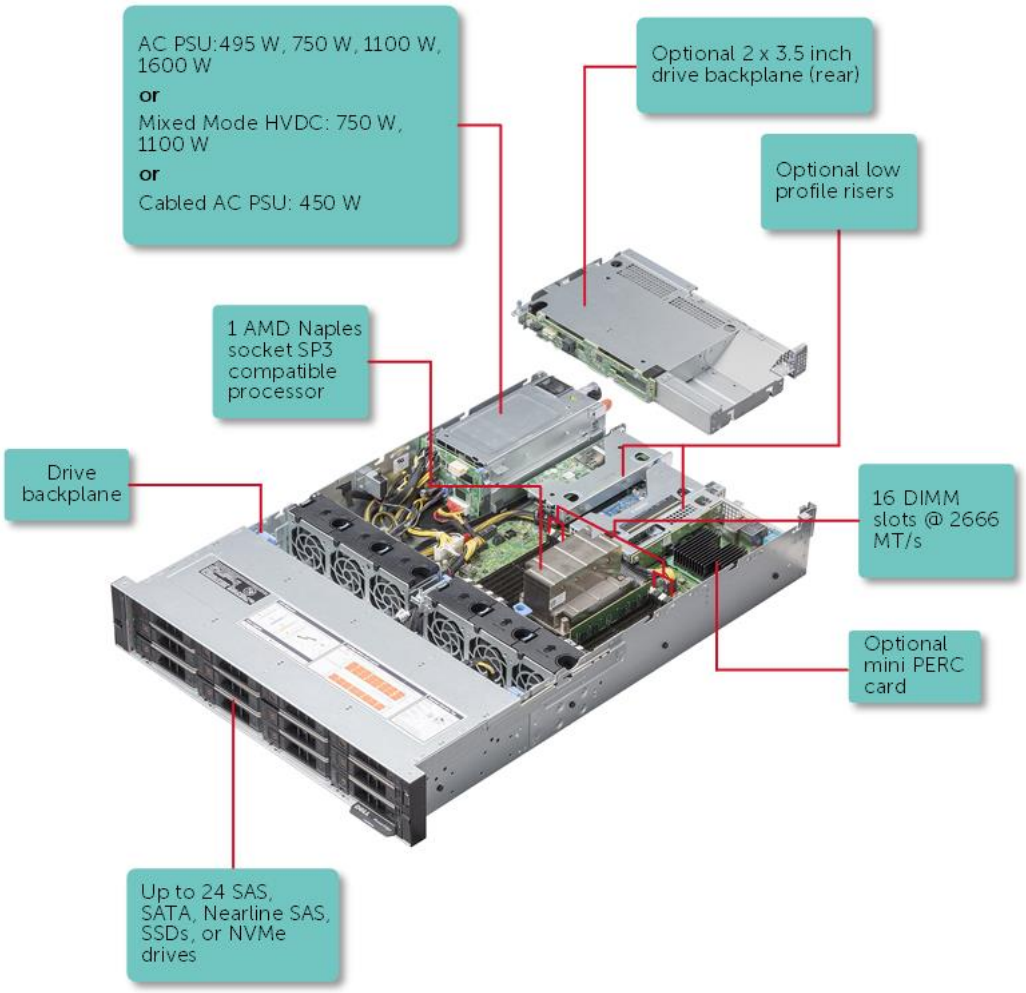


Figure 1. Supported configurations for a PowerEdge R7415 system with rear drive

Front view of the system

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



Figure 2. Front view of 12 x 3.5 inch system



Figure 3. Front view of 24 x 2.5 inch system



Figure 4. Front view of 8 x 3.5 inch 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. • 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	Drive slots [3.5 inch or 2.5 inch drives]	N/A	Enable you to install drives that are supported on your system. For more information about drives, see the Technical specifications section.
3	Right control panel	N/A	Contains the power button, USB port, iDRAC Direct port, VGA port.
4	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.
5	Optical drive (optional)	N/A	One optional slim SATA DVD-ROM drive or DVD+/-RW drive.

Item	Ports, panels, and slots	Icon	Description
			NOTE: DVD devices are data only.

Left control panel view

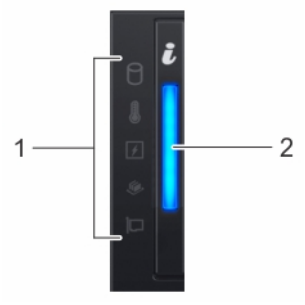


Figure 5. Left control panel without optional iDRAC Quick Sync 2.0 indicator

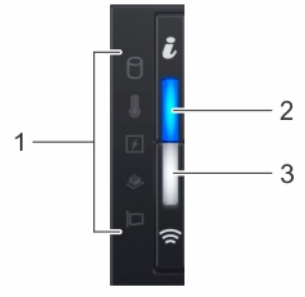


Figure 6. Left control panel with optional iDRAC Quick Sync 2.0 indicator

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 section.
2	System health and system ID indicator	🛈	Indicate the system health. For more information, see the System health and system ID indicator codes section.
3	iDRAC Quick Sync 2 wireless indicator (optional)	ᯤ	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.**

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 the Getting help section.
	Electrical indicator	The indicator turns solid amber if the system experiences an electrical error (for example, voltage out of range, or a failed power supply unit (PSU) or voltage regulator).	Check the System Event Log or system messages for the specific issue. If it is due to a problem with the PSU, check the LED on the PSU. Reseat the PSU. If the problem persists, see the Getting help section.
	Memory indicator	The indicator turns solid amber if a memory error occurs.	Check the System Event Log or system messages for the location of the failed memory. Reseat the memory module. If the problem persists, see the Getting help section.
	PCIe indicator	The indicator turns solid amber if a PCIe card experiences an error.	Restart the system. Update any required drivers for the PCIe card. Reinstall the card. If the problem persists, see the Getting help section. **NOTE: For more information about the supported PCIe cards, see the Expansion card installation guidelines section.**

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 7. 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.

System health and system ID indicator code	Condition
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 message. For information about the event and error messages generated by the system firmware and agents that monitor system components, see the Error Code Lookup page at qrl.dell.com.

iDRAC Quick Sync 2 indicator codes

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



Figure 8. 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 problem persists, see the Getting help section.
Blinks white slowly	Indicates that firmware update is in progress.	If the problem persists, 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* at www.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

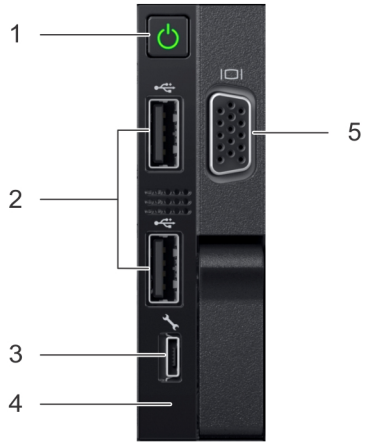


Figure 9. Right control panel view

Table 6. Right control panel

Item	Indicator, button, or connector	Icon	Description
1	Power button		Indicates if the system is powered on or off. Press the power button to manually power on or off the system. **NOTE: Press the power button to gracefully shut down an ACPI-compliant operating system.**
2	USB port (2)		The USB ports are 4-pin, 2.0-compliant. These ports enable you to connect USB devices to the system.
3	iDRAC Direct (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 www.dell.com/idracmanuals.
4	iDRAC Direct LED	N/A	The iDRAC Direct LED indicator lights up to indicate that the iDRAC Direct port is connected. For more information, see the iDRAC Direct LED indicator codes section.
5	VGA port		Enables you to connect a display device to the system. For more information, see the Technical specifications section.

iDRAC Direct LED indicator codes

The iDRAC Direct LED indicator lights up to indicate that the port is connected and is being used as a part of the iDRAC subsystem.

You can configure iDRAC Direct by using a USB to micro USB (type AB) cable, which you can connect to your laptop or tablet. The following table describes iDRAC Direct activity when the iDRAC Direct port is active:

Table 7. iDRAC Direct LED indicator codes

iDRAC Direct LED indicator code	Condition
Solid green for two seconds	Indicates that the laptop or tablet is connected.

iDRAC Direct LED indicator code	Condition
Flashing green (on for two seconds and off for two seconds)	Indicates that the laptop or tablet connected is recognized.
Turns off	Indicates that the laptop or tablet is unplugged.

Back panel features

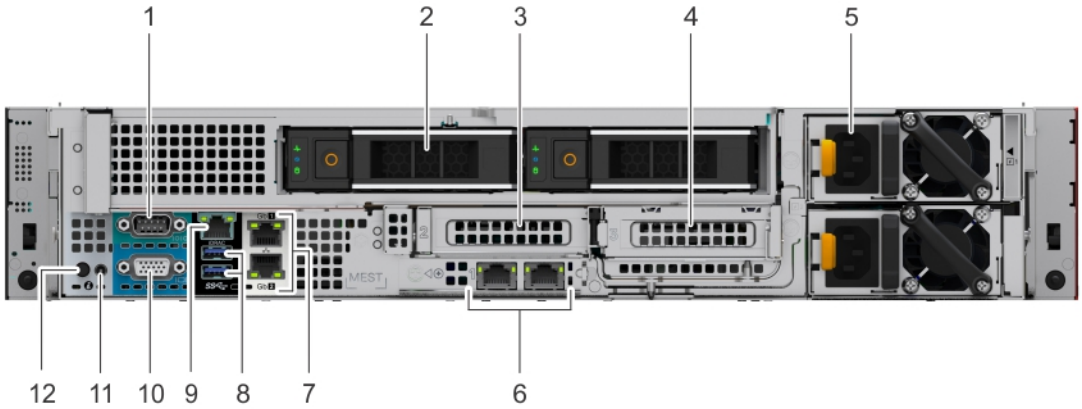


Figure 10. Back panel features of 12 x 3.5 inch + 2 x 3.5 inch (rear) drive system

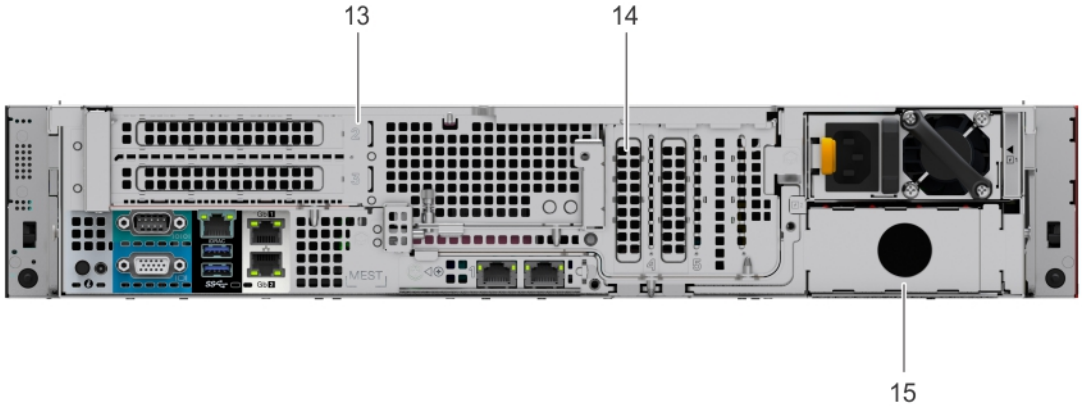


Figure 11. Back panel features of riser 1B system

Table 8. Back panel features of PowerEdge R7415

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 Serial connectors section in the Technical specifications chapter.
2	Drive	N/A	Two optional rear drives supported for 12 x 3.5 inch system.
3	Riser 1A slot	N/A	Use the card slot to connect half-height PCIe expansion card on low profile riser (slot 2).
4	Riser 3A slot	N/A	Use the card slot to connect half-height PCIe expansion card on low profile riser (slot 3).
5	Power supply unit (PSU)	N/A	For information about supported PSUs, see the PSU specification section in the Technical specifications chapter.

Item	Features	Icon	Description
6	LOM riser ports (2)		Use the Ethernet or SFP+ ports to connect Local Area Networks (LANs) to the system. For more information about the supported Ethernet or SFP+ ports, see the NIC ports section in the Technical specifications chapter (slot 1).
7	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 NIC ports section in the Technical specifications chapter.
8	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.
9	iDRAC9 dedicated network port		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.
10	VGA port		Use the VGA port to connect a display to the system. For more information about the supported VGA port, see the VGA port section in the Technical specifications chapter.
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.**
13	Riser 1B slot		Use the card slots to connect full-height PCIe expansion cards on full height riser (Upper is slot 2 and lower is slot 3).
14	PCIe slot		Use the card slots to connect up to two half-height PCIe expansion cards on the system board.
15	PSU blank		Use the PSU blank to cover the PSU 2 slot.

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.

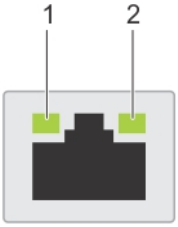


Figure 12. NIC indicator codes

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.
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 DC PSUs have an LED that serves as an indicator.

The indicator shows whether power is present or if a power fault has occurred.

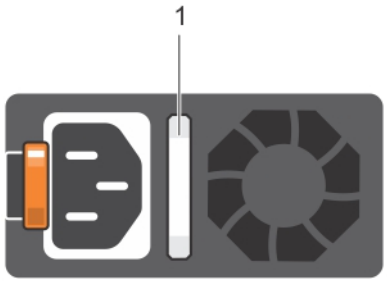


Figure 13. AC PSU status indicator

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 with respect to efficiency, feature set, health status, or supported voltage. **CAUTION: If two PSUs are installed, both the PSUs must have the same type of label; for example, Extended Power Performance (EPP) label. Mixing PSUs from previous generations of PowerEdge servers is not supported, even if the PSUs have the same power rating. This results in a PSU mismatch condition or failure to 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 vice versa, you must turn off the system.**

Power indicator codes	Condition
	CAUTION: AC PSUs support both 240 V and 120 V input voltages with the exception of Titanium PSUs, which support only 240 V. When two identical PSUs receive different input voltages, they can output different wattages, and trigger a mismatch. **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.**

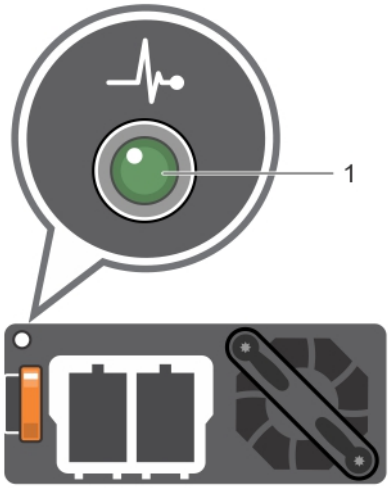


Figure 14. DC PSU status indicator

1. DC PSU status indicator

Table 11. DC 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 hot-plugging a PSU, the PSU indicator blinks green. This indicates that there is a PSU mismatch with respect to efficiency, feature set, health status, or supported voltage. **CAUTION: If two PSUs are installed, both the PSUs must have the same type of label; for example, Extended Power Performance (EPP) label. Mixing PSUs from previous generations of PowerEdge servers is not supported, even if the PSUs have the same power rating. This results in a PSU mismatch condition or failure to 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 vice versa, you must turn off the system.** **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.**

Drive indicator codes

Each drive carrier has an activity LED indicator and a status LED indicator. The indicators provide information about the current status of the drive. The activity LED indicator indicates whether the drive is currently in use or not. The status LED indicator indicates the power condition of the drive.

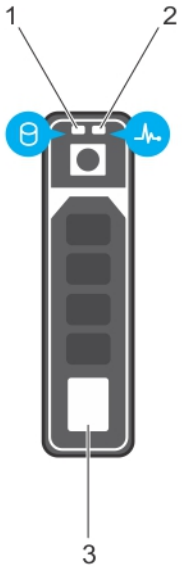


Figure 15. Drive indicators

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

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

Table 12. Drive indicator codes

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

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 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, see the Error Code Lookup page at qrl.dell.com.

The LCD panel is available only on the optional LCD bezel. The optional LCD 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 the Getting help section.
- The LCD backlight remains off if LCD messaging is turned off using the iDRAC utility, the LCD panel, or other tools.

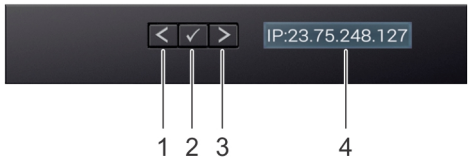


Figure 16. LCD panel features

Table 13. 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.

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.

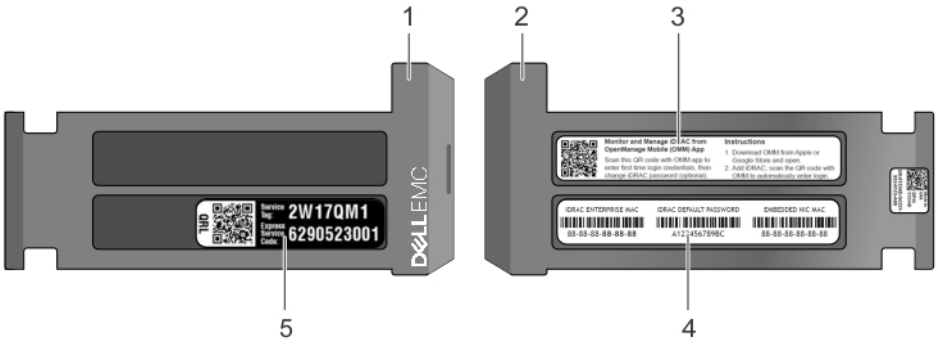


Figure 17. Locating Service Tag of your system

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

System information label

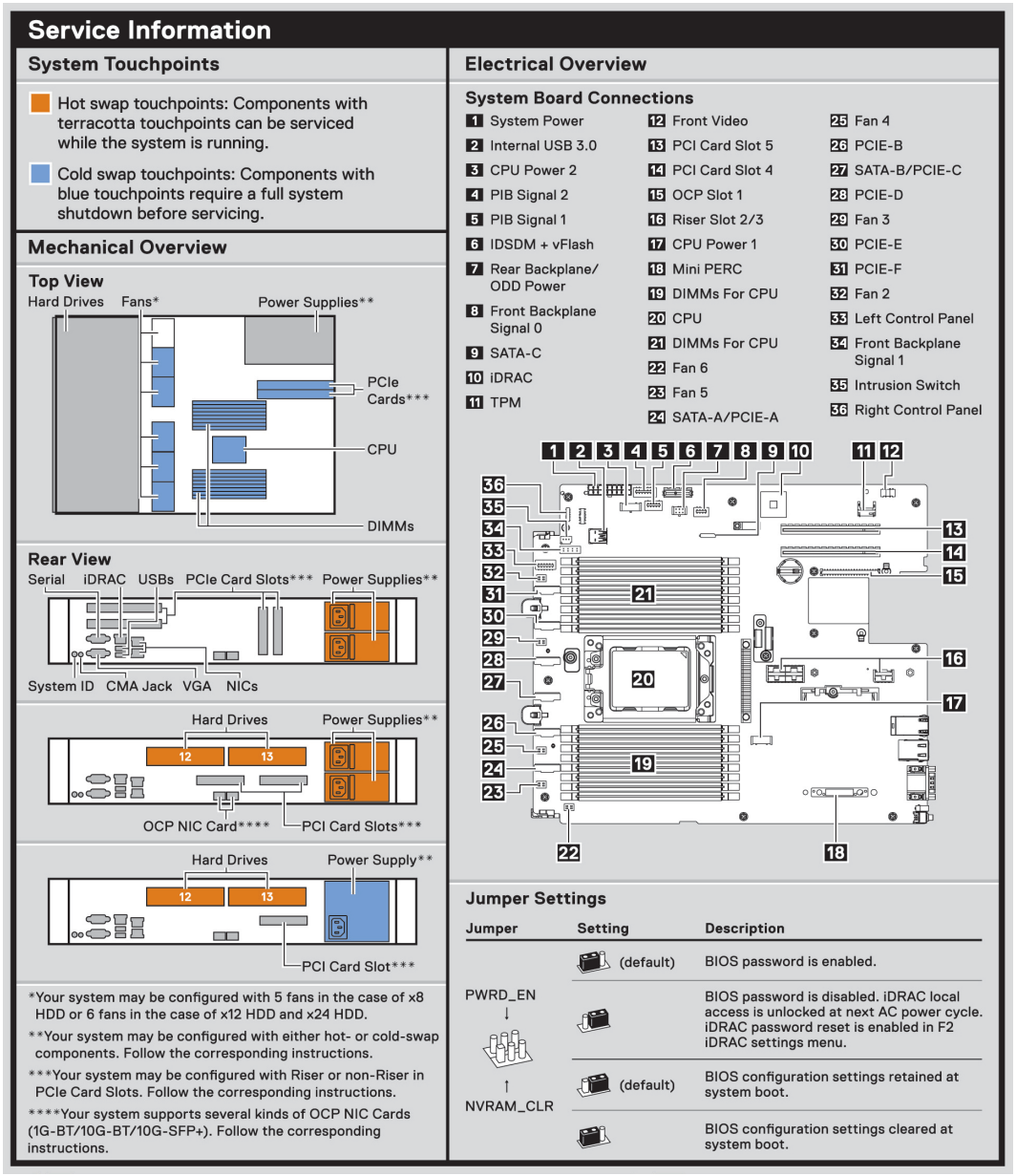


Figure 18. PowerEdge R7415 – service information

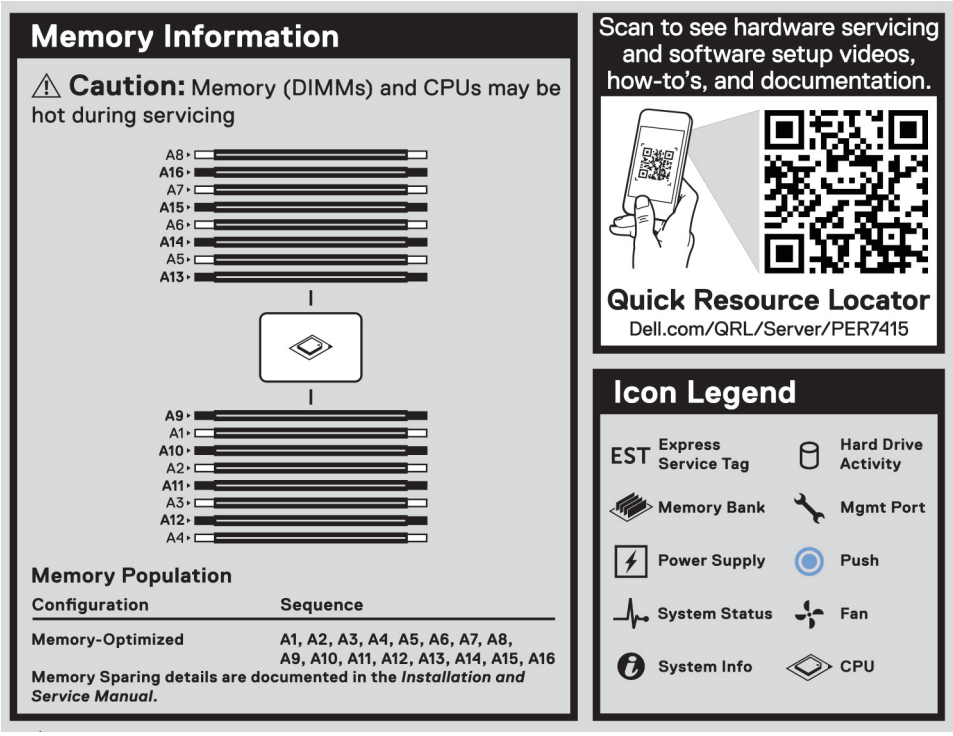


Figure 19. Memory information

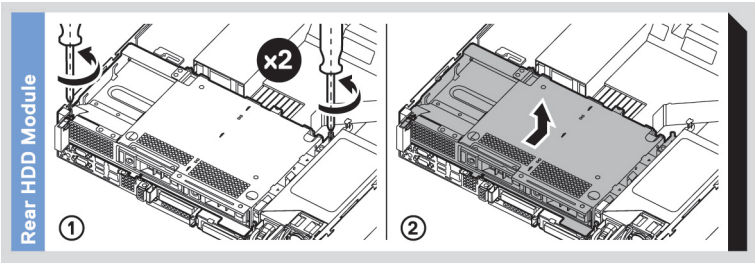


Figure 20. Rear drive installation

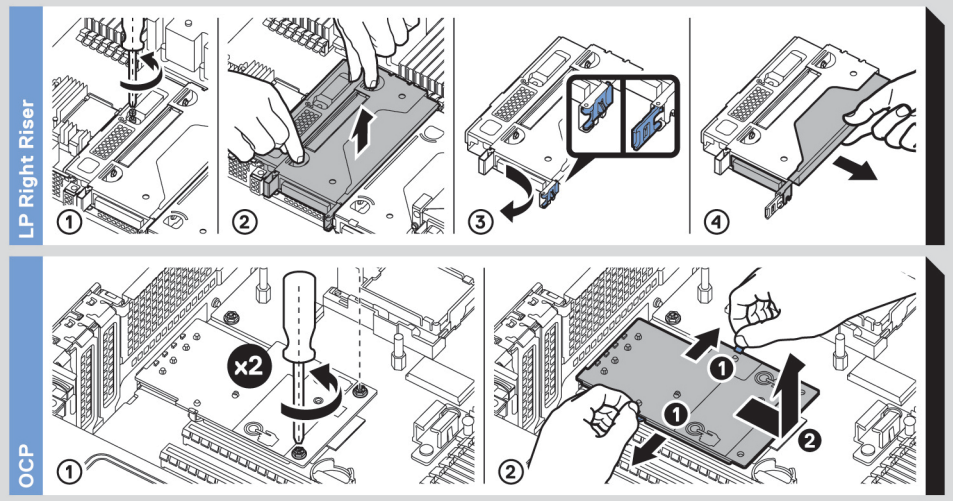


Figure 21. Riser 1A and LOM riser installation

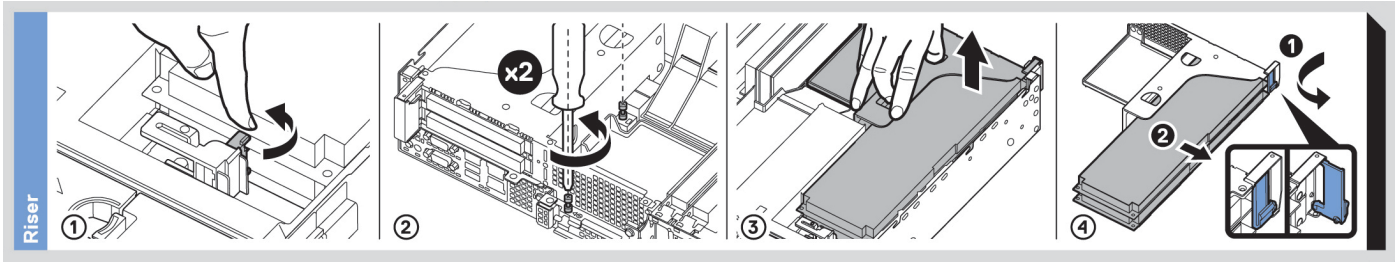


Figure 22. Riser 1B installation

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 14. 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. To identify the version of iDRAC available on your system, on the iDRAC web interface, click **?** > **About**.	www.dell.com/idracmanuals
	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	www.dell.com/poweredgemanuals

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

3

Technical specifications

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

Topics:

- System dimensions
- Chassis weight
- Processor specifications
- Supported operating systems
- PSU specifications
- System battery specifications
- Expansion bus specifications
- Memory specifications
- PERC Controller
- Drive specifications
- Ports and connectors specifications
- Video specifications
- Environmental specifications

System dimensions

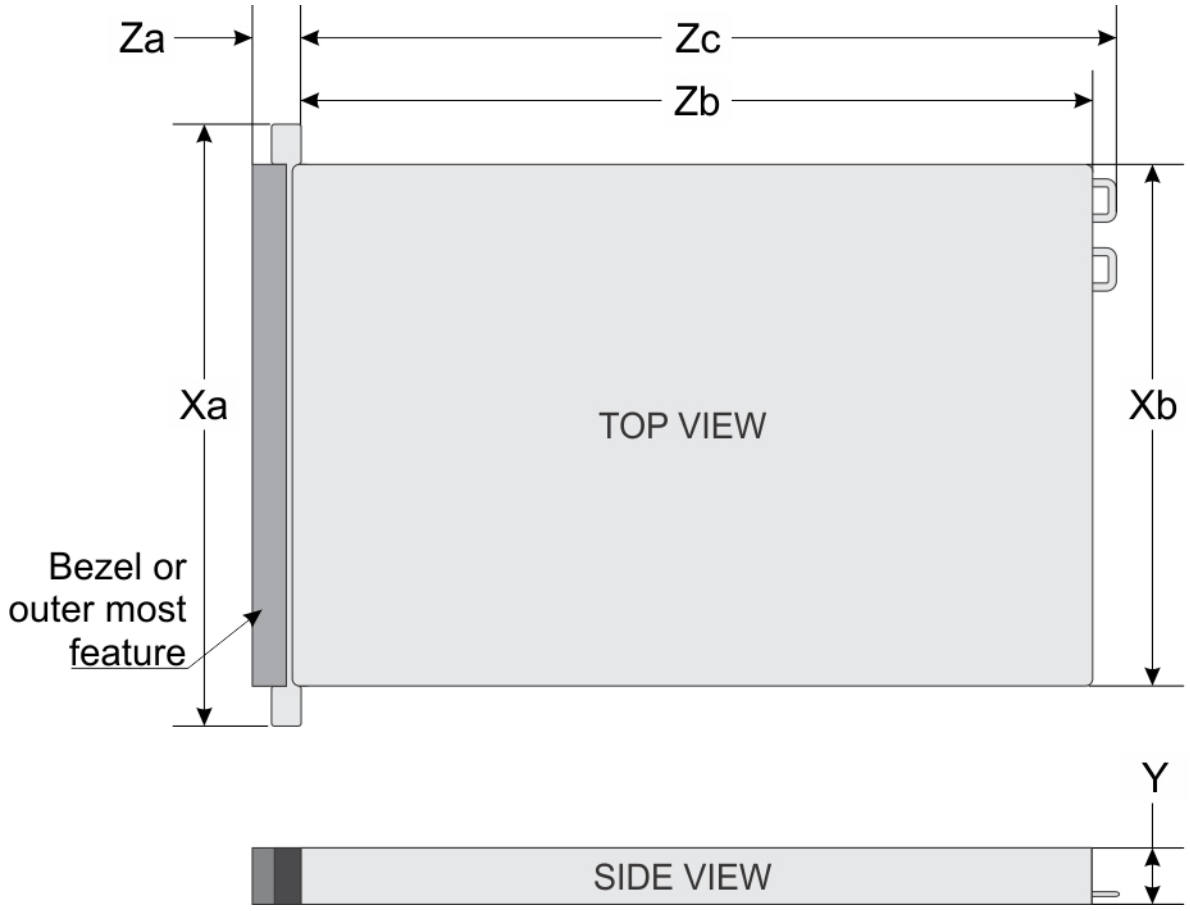


Figure 23. Dimensions of the PowerEdge R7415 system

Table 15. Dimensions of the PowerEdge R7415 system

Xa	Xb	Y	Za (with bezel)	Za (without bezel)	Zb*	Zc
482 mm (18.97 inches)	434 mm (17.08 inches)	86.8 mm (3.41 inches)	35.84 mm (1.41 inches)	22 mm (0.87 inches)	647.07 mm (25.47 inches)	681.755 mm (26.84 inches)

* - Zb goes to the nominal rear wall external surface where the system board I/O connectors are located.

Chassis weight

Table 16. Chassis weight

System	Maximum weight (with all drives/SSDs)
8 x 3.5 inch	24.4 kg (53.79 lb)
12 x 3.5 inch	26.61 kg (58.66 lb)
12 x 3.5 inch + 2 x 3.5 inch (rear)	28.21 kg (62.19 lb)
24 x 2.5 inch	23.22 kg (51.19 lb)

Processor specifications

The PowerEdge R7415 system support one AMD EPYC™ processor.

Supported operating systems

The R7415 supports the following operating systems:

- Microsoft Windows Server® with Hyper-V
- Red Hat® Enterprise Linux
- SUSE® Linux Enterprise Server

Virtualization options:

- VMware® ESXi 6.7

NOTE: For more information about the specific versions and additions, go to https://www.dell.com/support/home/Drivers/SupportedOS/poweredge-r7415.

PSU specifications

The PowerEdge R7415 system supports the following AC or DC power supply units (PSU).

Table 17. PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage
1600 W AC	Platinum	6000 BTU/hr	50/60 Hz	100–240 V AC, autoranging
1100 W AC	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC, autoranging
1100 W HVDC	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC autoranging and 200–380 V DC
1100 W DC	Platinum	4416 BTU/hr	N/A	(-(48–60)) V DC
750 W AC	Titanium	2843 BTU/hr	50/60 Hz	200–240 V AC, autoranging
750 W AC	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC, autoranging
750 W Mixed Mode HVDC(for China only)	Platinum	2891 BTU/hr	N/A	100–240 V AC autoranging and 240 V DC

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage
750 W Mixed Mode AC	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC
750 W Mixed Mode DC (for China only)	Platinum	2891 BTU/hr	N/A	240 V DC
495 W AC	Platinum	1908 BTU/hr	50/60 Hz	100–240 V AC, autoranging
450 W AC	Bronze	1871 BTU/hr	50/60 Hz	100–240 V AC, autoranging

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.

NOTE: If a system with 1600 W AC PSU operates at low line 100-120 V AC, then the power rating per PSU is derated to 800 W.

NOTE: If a system with 1100 W AC PSU or 1100 W mixed mode PSU operates at low line 100-120 V AC, then the power rating per PSU is derated to 1050 W.

System battery specifications

The PowerEdge R7415 system supports CR 2032 3.0-V lithium coin cell system battery.

Expansion bus specifications

The PowerEdge R7415 system supports PCI Express (PCIe) Gen3 expansion cards, which need to be installed on the system board using expansion card risers. This system supports low profile, full height, and 2U expansion card risers.

Table 18. Expansion card riser configurations

Expansion card riser	PCIe slots on the riser	Processor connection	Height	Length	Slot width
Riser-1B (2U riser)	Slot 2	Processor 1	Full Height	Full Length	x16
Riser-1B (2U riser)	Slot 3	Processor 1	Full Height	Full Length	x16
Riser-1A (low profile riser right)	Slot 2	Processor 1	Low Profile	Half Length	x16
Riser-3A (low profile riser left)	Slot 3	Processor 1	Low Profile	Half Length	x16

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

Memory specifications

The PowerEdge R7415 system supports 16 DDR4 DIMM (registered DIMM (RDIMM) and load reduced DIMM (LRDIMM)) slots. Supported memory bus frequencies are 2666 MT/s, 2400 MT/s, 2133 MT/s, and 1866 MT/s.

Table 19. Memory specifications

Memory module sockets	Memory capacity	Minimum RAM	Maximum RAM
Sixteen 288-pin	• 8GB, 16GB, or 32GB single rank or dual rank (RDIMMs) • 64GB quad rank(LRDIMMs)	• 8 GB with single processor	• 1 TB with a single processor

NOTE: For optimal performance, populate one DIMM per channel with DDR4-2666 memory modules on the first slot of each memory channel. The first slot of each channel can be identified as the DIMM slots with white latches. For example, 64 GB system memory capacity can be divided into 8 x 8 GB DIMM slots.

PERC Controller

The Dell PERC (PowerEdge RAID Controller) family of enterprise-class controllers is designed for enhanced performance, increased reliability and fault tolerance, and simplified management - providing a powerful, easy-to-manage way to create a robust infrastructure and help maximize system uptime.

The new PERC controller offerings leverage heavily on previous generation PERC family. The premium performance PERC series controller drives better IOPs and enhanced the SSD performance.

Table 20. PERC series controller offerings

Performance Level	Controller and Description
Entry	S140
Value	H330 MiniMono, H730P, MiniMono
Value Performance	H740P, MiniMono
Premium Performance	H840

Drive specifications

Drives

The PowerEdge R7415 system supports:

- Up to 8 x 3.5 inch (SAS, SATA or Nearline SAS) front accessible drives in slots 0 to 7

  or
- Up to 12 x 3.5 inch (SAS, SATA or Nearline SAS) front accessible drives in slots 0 to 11

  or
- Up to 12 x 3.5 inch (SAS, SATA or Nearline SAS) front accessible drives in slots 0 to 11 + up to 2 x 3.5 inch (SAS, SATA or Nearline SAS) rear accessible drives in slots 12 to 13

  or
- Up to 24 x 2.5 inch (SAS, SATA or Nearline SAS) front accessible drives in slots 0 to 23

  or
- Up to 12 x 2.5 inch (SAS, SATA or Nearline SAS) front accessible drives in slots 0 to 11 and up to 12 x 2.5 inch NVMe drives in 12 universal slots 12 to 23

  or
- Up to 24 x 2.5 inch NVMe drives in bay 0 (slot 0 to 11) and bay 1 (slots 0 to 11)

  or
- Up to 8 x 2.5 inch (SAS, SATA or Nearline SAS) front accessible drives in Universal slots 0 to 7 (Bay 0) and up to 16 x 2.5 inch NVMe drives in bay 0 (slots 8 to 11) and bay 1 (slots 0 to 11)

NOTE: Hot swap for the NVMe drives is supported for your system. For more information on correct usage and technical specifications, see the *Dell PowerEdge Express Flash NVMe PCIe SSD 2.5 inch Small Form Factor User's Guide* at Dell.com/support/manuals > All Products > Server, Storage, & Networking > Dell Adapters page.

NOTE: Universal slots that support SAS, SATA hard drives/SSDs, or NVMe drives in the same slot.

Ports and connectors specifications

USB ports

The PowerEdge R7415 system supports:

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

The following table provides more information about the USB specifications:

Table 21. USB specifications

Front panel	Back panel	Internal USB
• Three USB 2.0-compliant port (One iDRAC Direct (Micro-AB USB) port + two USB 2.0 port)	• Two USB 3.0-compliant port	• One internal USB 3.0 port

NOTE: The Micro-AB USB 2.0-compliant port on the front panel can be used only as an iDRAC Direct or a management port.

NIC ports

The PowerEdge R7415 system supports two Network Interface Controller (NIC) ports on the back panel, which have two 1 Gbps configuration.

NOTE: You can install up to four PCIe add-on NIC cards.

NOTE: For information about Linux network performance settings, see the *Linux® Network Tuning Guide for AMD EPYC™ Processor Based Servers* AMD tuning guide.

Serial connector

The serial connector connects a serial device to the system. The PowerEdge R7415 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 R7415 system supports two 15-pin VGA ports one each on the front and back panels.

Internal Dual SD Module

The PowerEdge R7415 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 R7415 system supports Matrox G200eR2 graphics card with 16 MB capacity.

Table 22. Supported video resolution options

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

NOTE: 1920 x 1080 and 1920 x 1200 resolutions are only supported in reduced blanking mode.

Environmental specifications

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

Table 23. Temperature specifications

Temperature	Specifications
Storage	–40°C to 65°C (–40°F to 149°F)
Continuous operation (for altitude less than 950 m or 3117 ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment.
Fresh air	For information about fresh air, see the Expanded Operating Temperature section.
Maximum temperature gradient (operating and storage)	20°C/h (68°F/h)

Table 24. Relative humidity specifications

Relative humidity	Specifications
Storage	5% to 95% RH with 33°C (91°F) maximum dew point. Atmosphere must be non-condensing at all times.
Operating	10% to 80% relative humidity with 29°C (84.2°F) maximum dew point.

Table 25. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.26 G_{rms} at 5 Hz to 350 Hz (all operation orientations).
Storage	1.88 G_{rms} at 10 Hz to 500 Hz for 15 min (all six sides tested).

Table 26. Maximum shock specifications

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

Table 27. Maximum altitude specifications

Maximum altitude	Specifications
Operating	30482000 m (10,0006560 ft)
Storage	12,000 m (39,370 ft)

Table 28. Operating temperature derating specifications

Operating temperature derating	Specifications
Up to 35°C (95°F)	Maximum temperature is reduced by 1°C/300 m (1°F/547 ft) above 950 m (3,117 ft).
35°C to 40°C (95°F to 104°F)	Maximum temperature is reduced by 1°C/175 m (1°F/319 ft) above 950 m (3,117 ft).
40°C to 45°C (104°F to 113°F)	Maximum temperature is reduced by 1°C/125 m (1°F/228 ft) above 950 m (3,117 ft).

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 29. 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 30. 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.

Standard operating temperature

Table 31. Standard operating temperature specifications

Standard operating temperature	Specifications
Continuous operation (for altitude less than 950 m or 3117 ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment.

Expanded operating temperature

Table 32. Expanded operating temperature specifications

Expanded operating temperature	Specifications
Continuous operation	5°C to 40°C at 5% to 85% RH with 29°C dew point. **NOTE: Outside the standard operating temperature (10°C to 40°C), the system can operate continuously in temperatures as low as 5°C and as high as 40°C.** For temperatures between 35°C and 40°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 45°C at 5% to 90% RH with 29°C dew point. **NOTE: Outside the standard operating temperature (10°C to 40°C), the system can operate down to –5°C or up to 45°C for a maximum of 1% of its annual operating hours.** For temperatures between 40°C and 45°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 bezel's LCD panel and in the System Event Log.

Expanded operating temperature restrictions

- Do not perform a cold startup below 5°C.
- The operating temperature specified is for a maximum altitude of 3050 m (10,000 ft).
- Redundant power supply configuration is required.
- GPGPU card is not supported.
- Rear drive configuration is not supported.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- 180 W CPU is not supported.
- Cabled PSU is not supported.

Thermal restriction matrix

Table 33. Thermal restriction matrix for R7415

Storage configuration	Front	8 x 3.5 inch drive	12 x 3.5 inch drive	12 x 3.5 inch drive	24 x 2.5 inch drive	24 x 2.5 inch drive with NVMe
Storage configuration	**Rear**	**NA**	**NA**	**2 x 3.5 inch drive**	**NA**	**NA**
Fan type		**Standard fan**	**Standard fan**	**High performanc e fan**	**Standard fan**	**High performance fan**

Storage configuration		Front	8 x 3.5 inch drive	12 x 3.5 inch drive		12 x 3.5 inch drive	24 x 2.5 inch drive	24 x 2.5 inch drive with NVMe
CPU heat sink type			1.5U heat sink	1.5U heat sink		2U heat sink	1.5U heat sink	1.5U heat sink
Processor number	TDP (W)	Core count	Ambient = 35°C	Ambient = 35°C	Ambient = 35°C	Ambient = 35°C	Ambient = 35°C	Ambient = 30°C
AMD 7601	180 W	32	Yes	Yes	Yes	Yes	Yes	Yes
AMD 7551P	180 W	32	Yes	Yes	Yes	Yes	Yes	Yes
AMD 7451	180 W	24	Yes	Yes	Yes	Yes	Yes	Yes
AMD 7401P	155 W/170 W	24	Yes	Yes	Yes	Yes	Yes	Yes
AMD 7351P	155 W/170 W	16	Yes	Yes	Yes	Yes	Yes	Yes
AMD 7251	120 W	8	Yes	Yes	Yes	Yes	Yes	Yes
AMD 7281	155 W/170 W	16	Yes	Yes	Yes	Yes	Yes	Yes
AMD 7261	155 W/170 W	8	Yes	Yes	Yes	Yes	Yes	Yes

Other thermal restrictions

The list below are other thermal restrictions:

1. Mellanox CX4 and CX5 only support up to 35°C ambient.

4

Initial system setup and configuration

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
Server LCD panel	LCD panel 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.

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 34. 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 35. 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
- System Setup
- Dell Lifecycle Controller
- Boot Manager
- PXE boot

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 using two methods:

- 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. Turn 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/idracmanuals.
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, setup password, set the SATA and PCIe NVMeRAID mode, and enable or disable USB ports.

Viewing System BIOS

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

Steps

1. Turn 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 BIOS Settings details

About this task

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

Option	Description
System Information	Specifies information about the system such as the system model name, BIOS version, and Service Tag.
Memory Settings	Specifies information and options related to the installed memory.
Processor Settings	Specifies information and options related to the processor such as speed and cache size.
SATA Settings	Specifies options to enable or disable the integrated SATA controller and ports.
NVMe Settings	Specifies 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 Menu** setting to **UEFI**. Otherwise, you should se this field to Non-RAID mode. **NOTE: For NVMe setting RAID mode, ESXi and WS2012R2 operating system is not supported. Hotplug and Ubuntu operating system will be available at a later time.**
Boot Settings	Specifies options to specify the Boot Mode (BIOS and UEFI). Enables you to modify UEFI and BIOS boot settings.
Network Settings	Specifies options to manage the UEFI network settings and boot protocols.

Option	Description
	Legacy network settings are managed from the **Device Settings** menu.
Integrated Devices	Specifies options to manage integrated device controllers and ports, specifies related features and options.
Serial Communication	Specifies options to manage the serial ports, its related features and options.
System Profile Settings	Specifies options to change the processor power management settings, memory frequency.
System Security	Specifies 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 info for redundant OS control.
Miscellaneous Settings	Specifies 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 the BIOS version.

Viewing System BIOS

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

Steps

1. Turn 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.
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.

Option	Description
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. Turn 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 **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 installed in the system.
System Memory Speed	Specifies the system memory speed.
System Memory Voltage	Specifies the system memory voltage.
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 option available is **Optimizer Mode**. This option is set to **Optimizer Mode** by default.
Current State of Memory Operating Mode	Specifies the current state of the memory operating mode.
Memory Interleaving	Specifies if Non-Uniform Memory Architecture (NUMA) is supported.

Option	Description

Table 36. Memory interleaving options

Memory	Options
Single memory module	**Disabled** by default.
Two or more memory modules	• **Disabled** • **Channel Interleaving** • **Die Interleaving** Memory Interleaving is set to **Channel Interleaving** by default.

NOTE: The AMD EPYC micro architecture utilizes four NUMA per socket. An additional performance fine tuning and/or NUMA-aware software is required for best performance.

Opportunistic Self-Refresh	Enables or disables opportunistic self-refresh feature. This option is set to **Disabled** 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 and software prefetcher.

Viewing Processor Settings

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

Steps

1. Turn 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	Each processor core supports up to two logical processors. If this option is set to **Enabled**, the BIOS displays all the logical processors. If this option is set to **Disabled**, the BIOS displays only one logical processor per core. This option is set to **Enabled** by default.
Virtualization Technology	Enables or disables the virtualization technology for the processor. This option is set to **Enabled** by default.
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.

Option	Description
NUMA Distance Enumeration	Specifies the NUMA Distance Enumeration. This option is set to **Physical** by default.
MADT Core Enumeration	Specifies the MADT Core Enumeration. This option is set to **Roud Robin** by default.
CCX as NUMA Domain	Enables or disables the CCX as NUMA Domain. This option is set to **Auto** by default.
Minimum SEV-ES ASID	Determines the numbers of Secure Encrypted Virtualization ES and non ES available Address Space IDs. This option is set to **1** by default.
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 n	**NOTE: Depending on the number of CPUs, there might be up to n processors listed.** The following settings are displayed for each processor installed in the system:

Option	Description
Family-Model-Stepping	Specifies the family, model, and stepping of the processor as defined by AMD.
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.

SATA Settings

You can use the **SATA Settings** screen to view the SATA 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. Turn 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 **Off**, **AHCI** mode, or **RAID modes**. This option is set to **AHCI Mode** by default. **NOTE:** 1. **You might also need to change the Boot Mode setting to UEFI. Otherwise, you should se the field to Non-RAID mode.** 2. **No ESXi and WS2012R2 OS support under RAID mode and Ubuntu OS will be available at a later time.**
Security Freeze Lock	Sends **Security Freeze Lock** command to the embedded SATA drives during POST. This option is applicable only for AHCI Mode. This option is set to **Enabled** by default.
Write Cache	Enables or disables the command for the embedded SATA drives during POST. This option is set to **Disabled** by default.
Port n	Sets 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 is set to **Non-RAID** mode.

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. Turn 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. If the operating system supports UEFI, you can set this option to UEFI. Setting this field to BIOS allows compatibility with non-UEFI operating systems. This option is set to **UEFI** by default. **CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.** **NOTE: Setting this field to UEFI disables the BIOS Boot Settings menu.**
Boot Sequence Retry	Enables, disable or reset 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. If set to **Reset**, the system performs a cold reset immediately. This option is set to **Enabled** by default.
Hard-disk Failover	Enables or disables the Hard-disk failover. This option is set to **Disabled** by default.
Generic USB Boot	Enables or disables the generic USB boot. This option is set to **Disabled** by default.
Hard-disk Drive Placeholder	Enables or disables the Hard-disk drive placeholder. This option is set to **Disabled** by default.
UEFI Boot Settings	Specifies the UEFI boot sequence. **NOTE: This option control the UEFI boot order. The first option in the list will be attempted first.**

Choosing system boot mode

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

- UEFI boot mode (the default), is an enhanced 64-bit boot interface.

  If you have configured your system to boot to UEFI mode, it replaces the system BIOS.

1. From the **System Setup Main Menu**, click **Boot Settings**, and select **Boot Mode**.
2. Select the UEFI boot mode you want the system to boot into.
   CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.
3. After the system boots in the specified boot mode, proceed to install your operating system from that mode.

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

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

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 Boot Settings** > **UEFI Boot Sequence**.
2. Use the arrow keys to select a boot device, and use the plus (+) and minus (-) sign keys to move the device down or up in the order.
3. 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: For information about Linux network settings, see the *Linux® Network Tuning Guide for AMD EPYC™ Processor Based Servers* AMD tuning guide.

Viewing Network Settings

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

Steps

1. Turn 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	Enables you to control the configuration of the UEFI PXE device.
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.

Table 37. PXE Device n Settings details

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

UEFI HTTP Settings	Enables you to control the configuration of the UEFI HTTP device
HTTP Device n (n = 1 to 4)	Enables or disables the device. When enabled, a UEFI HTTP boot option is created for the device.
HTTP Device n Settings (n = 1 to 4)	Enables you to control the configuration of the HTTP device.

Table 38. HTTP Device n Settings details

Option	Description
Interface	Specifies NIC interface used for the HTTP device.

Option	Description

Option	Description
Protocol	Specifies Protocol used for HTTP device. This option is set to **IPv4** or **IPv6**. This option is set to **IPv4** by default.
Vlan	Enables Vlan for HTTP device. This option is set to **Enable** or **Disable**. This option is set to **Disable** by default.
Vlan ID	Shows the Vlan ID for the HTTP device
Vlan Priority	Shows the Vlan Priority for the HTTP device.
URi	Obtain URi from the DHCP server if not specified

UEFI iSCSI Settings

Enables you to control the configuration of the iSCSI device.

Table 39. 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 **Disabled** by default.
iSCSI Device1 Settings	Enables you to control the configuration of the iSCSI device.

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. Turn 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; selecting **All Ports Off (Dynamic) All Ports On** disables all front and back USB ports during POST and front ports can be enabled or disabled dynamically by authorized users without resetting the system

Option	Description
	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.
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 (OS)**, 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.
Embedded Video Controller	Enables or disables the use of Embedded Video Controller as the primary display. When set to **Enabled**, the Embedded Video Controller will be the primary display even if add-in graphic cards are installed. When set to **Disabled**, an add-in graphics card will be 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 will then be disabled right 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 **Disabled**..
SR-IOV Global Enable	Enables or disables the BIOS configuration of Single Root I/O Virtualization (SR-IOV) devices. This option is set to **Disabled** by default.
OS Watchdog Timer	If your system stops responding, this watchdog timer aids in the recovery of your operating system. When this option is set to **Enabled**, the operating system initializes the timer. When this option is set to **Disabled** (the default), the timer does not have any effect on the system.
Memory Mapped I/O Limit	Controls where MMIO is mapped. The **1 TB** option is designed for specific OS which cannot support MMIO over 1 TB. This option is set to **8 TB** by default. The default option is the maximum address that the system supports and recommended in most cases.
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 will be available for control.

Table 40. 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.

Option	Description

Option	Description
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.

Slot Bifurcation

Auto Discovery Bifurcation Settings allows **Platform Default 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 grayed out when set to **Platform Default Bifurcation**.

Table 41. Slot Bifurcation

Option	Description
Slot 1 Bifurcation	x8 or x4 or x4x4 Bifurcation
Slot 2 Bifurcation	x16 or x8 or x4 or x4x4x8 or x8x4x4 Bifurcation
Slot 3 Bifurcation	x16 or x8 or x4 or x4x4x8 or x8x4x4 Bifurcation
Slot 4 Bifurcation	x16 or x8 or x4 or x4x4x8 or x8x4x4 Bifurcation
Slot 5 Bifurcation	x8 or x4 or x4x4 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. Turn 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	Selects 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 devices. This option is set to **Serial Device1=COM2, 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.**

Option	Description
	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.
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	Sets 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. Turn 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 (OS)** by default. Other options include **Performance** and **Custom**. **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 **OS DBPM** by default. Other option includes **Maximum Performance**.
Memory Frequency	Sets the speed of the system memory. You can select **Maximum Performance** 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.
C States	Enables or disables the processor to operate in all available power states. This option is set to **Enabled** 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.
PCI ASPM L1 Link Power Management	Enables or disables the PCI ASPM L1 Link Power Management. This option is set to **Enabled** by default.
Determinism Slider	Set the system determinism by **Power Determinism** or **Performance Determinism**. This option is set to **Performance Determinism** 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. Turn 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	Sets the system password. This option is set to **Enabled** by default and is read-only if the password jumper is not installed in the system.
Setup Password	Sets the setup password. This option is read-only if the password jumper is not installed in the system.
Password Status	Locks the system password. This option is set to **Unlocked** by default.
TPM Security	**NOTE: The TPM menu is available only when the TPM module is installed.**

Option	Description
	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, and TPM Activation 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 42. 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 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 43. 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**.

Power Button	Enables or disables the power button on the front of the system. This option is set to **Enabled** by default.
AC Power Recovery	Sets how the system behaves after AC power is restored to the system. This option is set to **Last** by default.
AC Power Recovery Delay	Sets the time delay for the system to power up after AC power is restored to the system. This option is set to **Immediate** by default.
User Defined Delay (60 s to 600 s)	Sets 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.
Secure Boot	Enables Secure Boot, where the BIOS authenticates each pre-boot image by using the certificates in the Secure Boot Policy. Secure Boot is set to **Disabled** by default.
Secure Boot Policy	When Secure Boot policy is set to **Standard**, the BIOS uses the system manufacturer's key and certificates to authenticate pre-boot images. When Secure Boot policy is set to **Custom**, the BIOS uses the user-defined key and certificates. Secure Boot policy is set to **Standard** by default.

Option	Description
Secure Boot Mode	Configures how the BIOS uses the Secure Boot Policy Objects (PK, KEK, db, dbx). If the current mode is set to **Deployed Mode**, the available options are **User Mode** and **Deployed Mode**. If the current mode is set to **User Mode**, the available options are **User Mode**, **Audit Mode**, and **Deployed Mode**.

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

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** option.

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 your system

About this task

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

Steps

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

Next steps

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

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

Deleting or changing system and setup password

Prerequisites

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

Steps

1. To enter System Setup, press F2 immediately after turning on or restarting your system.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security**.
3. On the **System Security** screen, ensure that **Password Status** is set to **Unlocked**.
4. In the **System Password** field, alter or delete the existing system password, and then press Enter or Tab.
5. In the **Setup Password** field, alter or delete the existing setup password, and then press Enter or Tab.

   If you change the system and setup password, a message prompts you to reenter the new password. If you delete the system and setup password, a message prompts you to confirm the deletion.
6. Press Esc to return to the **System BIOS** screen. Press Esc again, and a message prompts you to save the changes.
7. Select **Setup Password**, change, or delete the existing setup password and press Enter or Tab.

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

Operating with setup password enabled

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

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

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

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

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

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

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

Redundant OS Control

You can use the **Redundant OS Control** screen to set the redundant OS info for redundant OS control. It enables you to set up a physical recovery disk on your system.

Viewing Redundant OS Control

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

Steps

1. Turn 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 **Enabled** 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. Turn 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 boots 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 or disables the Load Legacy Video Option Rom option. This option is set to **Disable** 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.
Power Cycle Request	Enables or disables the Power Cycle Request. This option is set to **None** 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/idracmanuals.

Device Settings

Device Settings enables you to configure device parameters.

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 system's lifecycle. 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/idracmanuals.

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. Turn on, or restart your system.
   Enter the result of your step here (optional).
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.

One-shot BIOS boot menu

One-shot BIOS 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

Installing and removing system components

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.

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 www.dell.com/poweredgemanuals.
4. Remove the system cover.

After working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Install the system cover.
2. If applicable, install the system into the rack.
   For more information, see the *Rack Installation Guide* at 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 #T20 screwdriver
- 1/4 inch flat head screwdriver
- Wrist grounding strap

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

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

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

Optional front bezel

An optional metal bezel is mounted on the front of the system. The front bezel displays the system branding. A lock on the bezel is used to protect unauthorized access to the drives. There are two versions of bezel available:

- With LCD panel
- Without LCD panel

For bezels with LCD panel, the system status can be viewed on the LCD panel. For more information, see the LCD panel section.

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.

Steps

1. Unlock the bezel by using the bezel key.

   NOTE: The bezel key is part of the LCD bezel package.
2. Press the release button, and pull the left end of the bezel.
3. Unhook the right end, and remove the bezel.

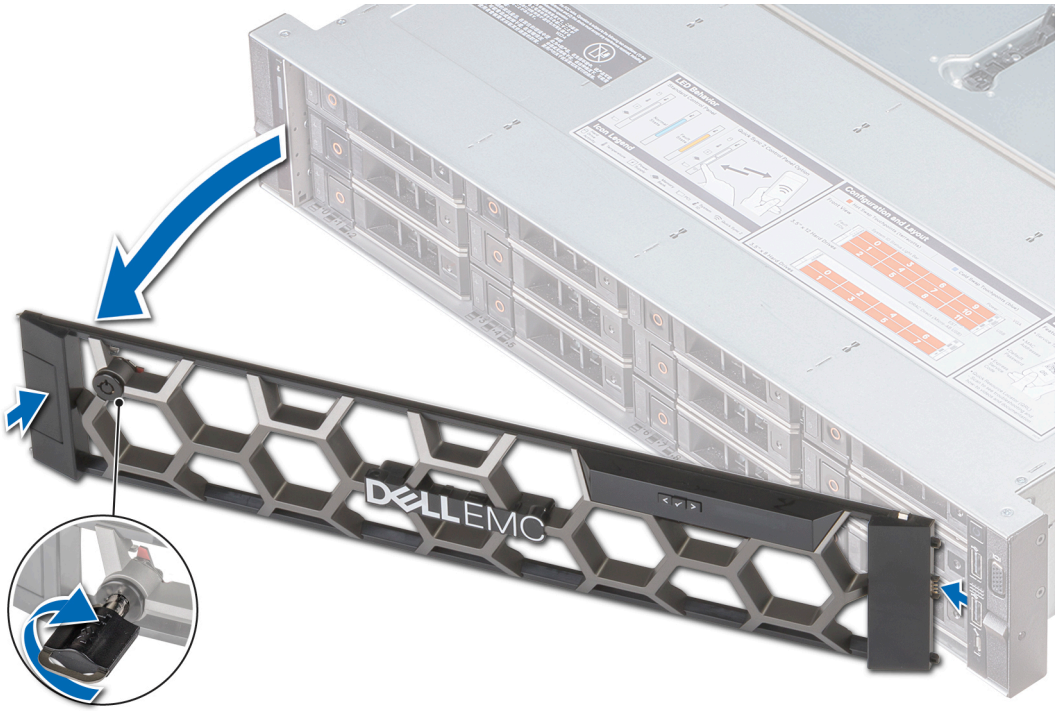


Figure 24. Removing the front bezel with the LCD panel

Next steps

Installing 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.

Steps

1. Locate and remove the bezel key.

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

2. Align and insert the right end of the bezel onto the system.
3. Push the bezel on the system until it clicks into place.
4. Lock the bezel by using the key.

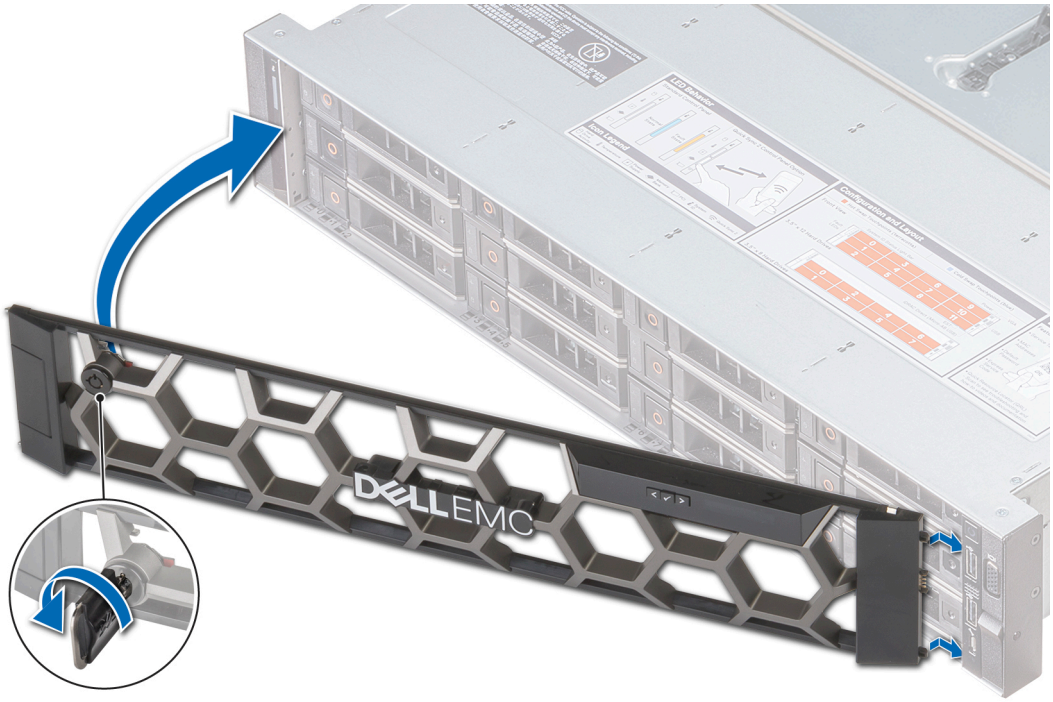


Figure 25. Installing the front bezel with the LCD panel

System cover

Removing the system cover

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Turn off the system, including any attached peripherals.
3. Disconnect the system from the electrical outlet and disconnect the peripherals.

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

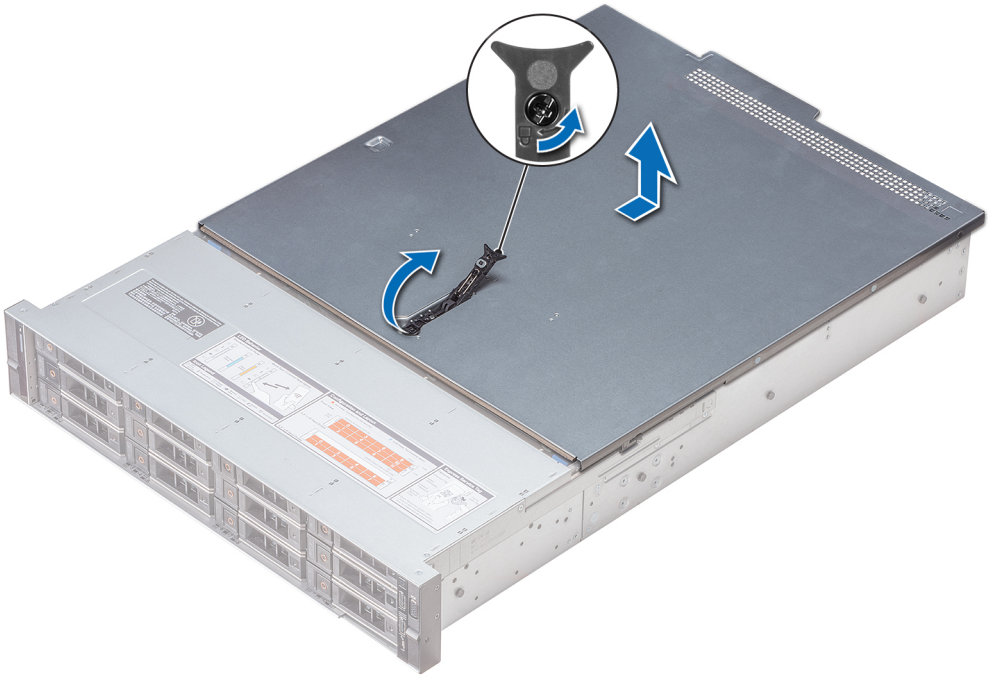


Figure 26. Removing the system cover

Next steps

Installing the system cover.

Installing the system cover

Prerequisites

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

Steps

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

   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. Using a 1/4 inch flat head or a Phillips #2 screwdriver, rotate the latch release lock clockwise to the locked position.

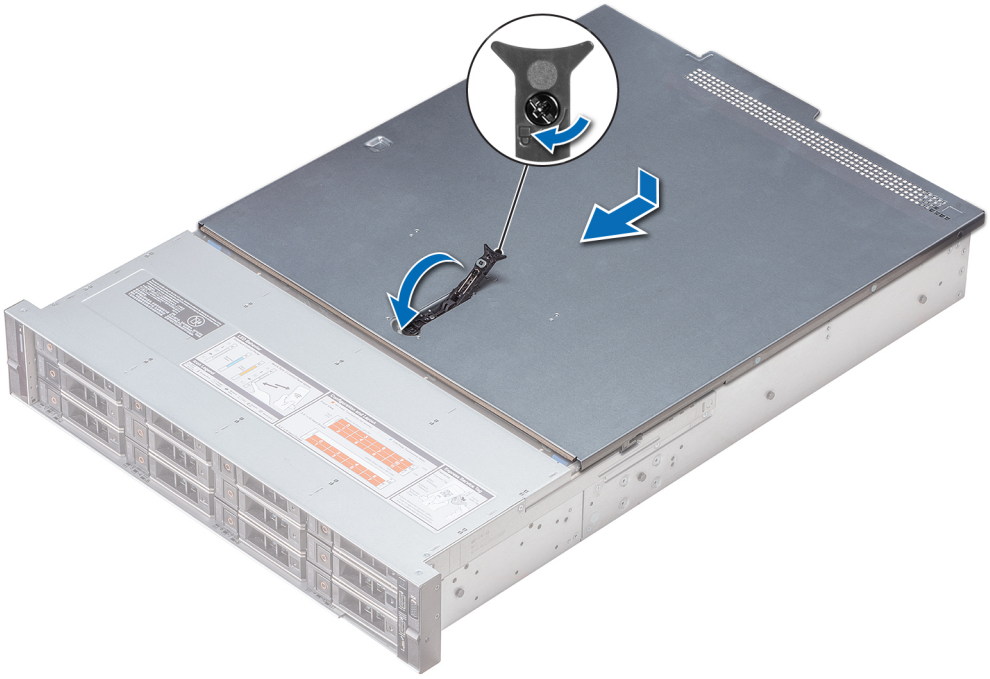


Figure 27. Installing the system cover

Next steps

1. Reconnect the peripherals and connect the system to the electrical outlet.
2. Turn on the system, including any attached peripherals.

Backplane cover

Removing the backplane cover

Prerequisites

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

Steps

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

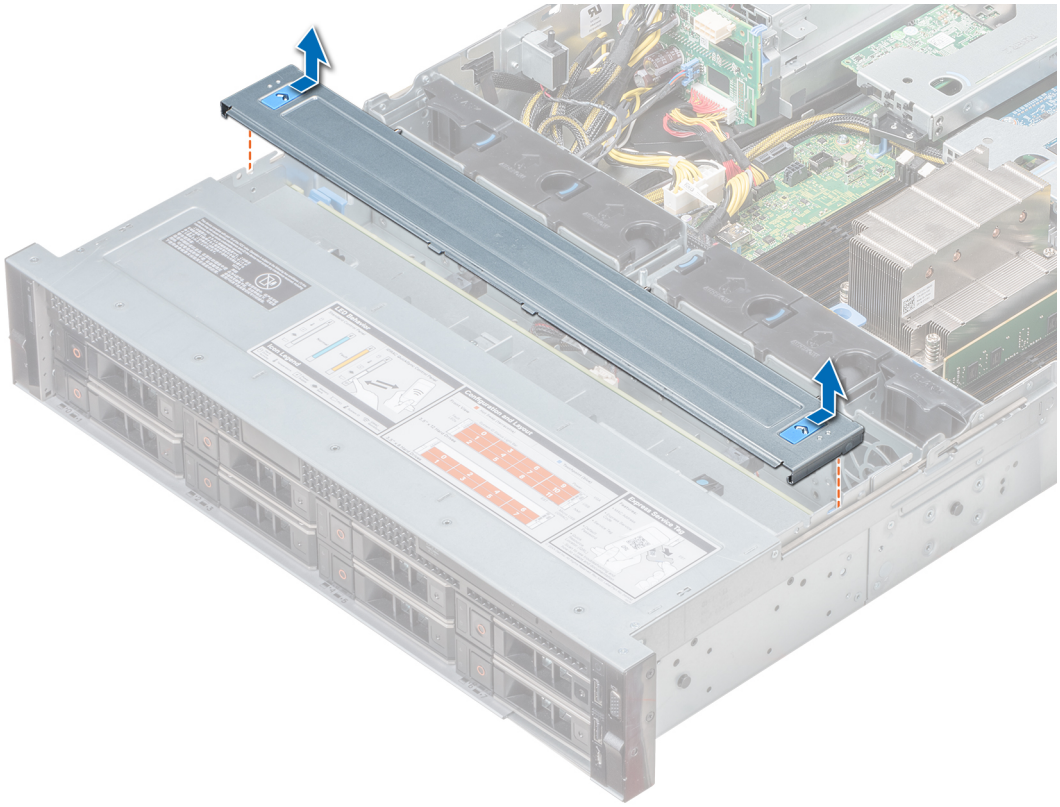


Figure 28. Removing the backplane cover

Next steps

Installing the backplane cover.

Installing the backplane cover

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Align the backplane cover with the guide slots on the system.
2. Slide the backplane cover toward the front of the system until the backplane cover locks into place.

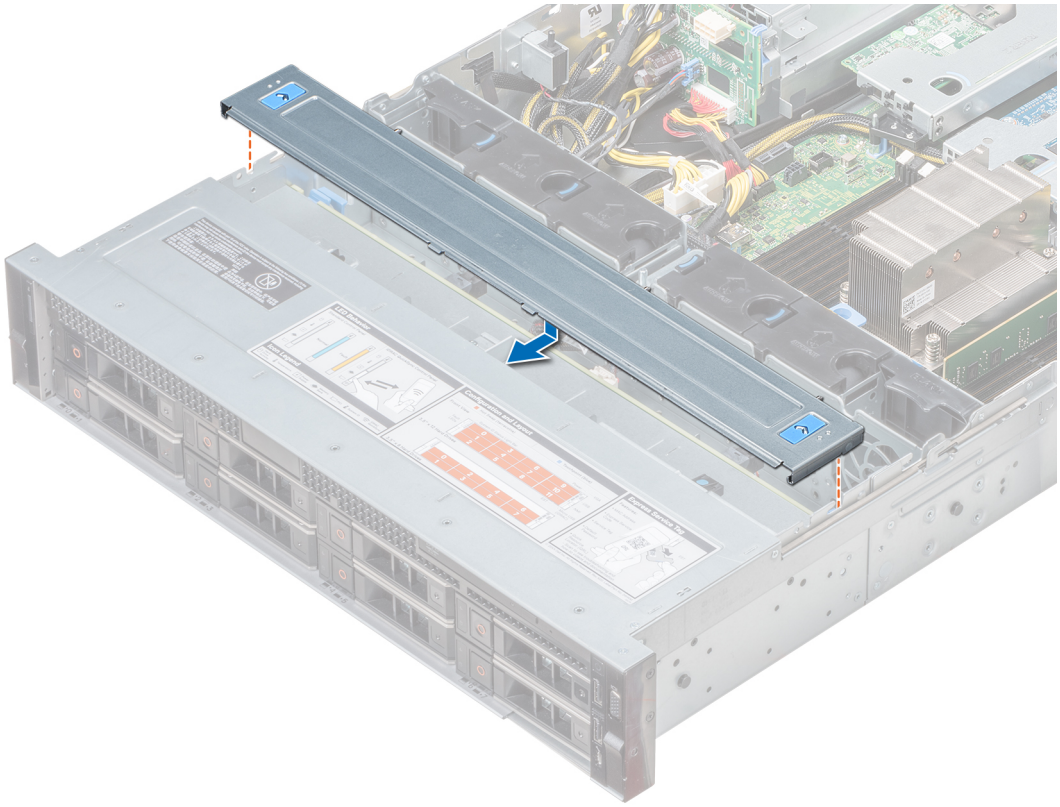


Figure 29. Installing the backplane cover

Next steps

Follow the procedure listed in After working inside your system.

Inside the system

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

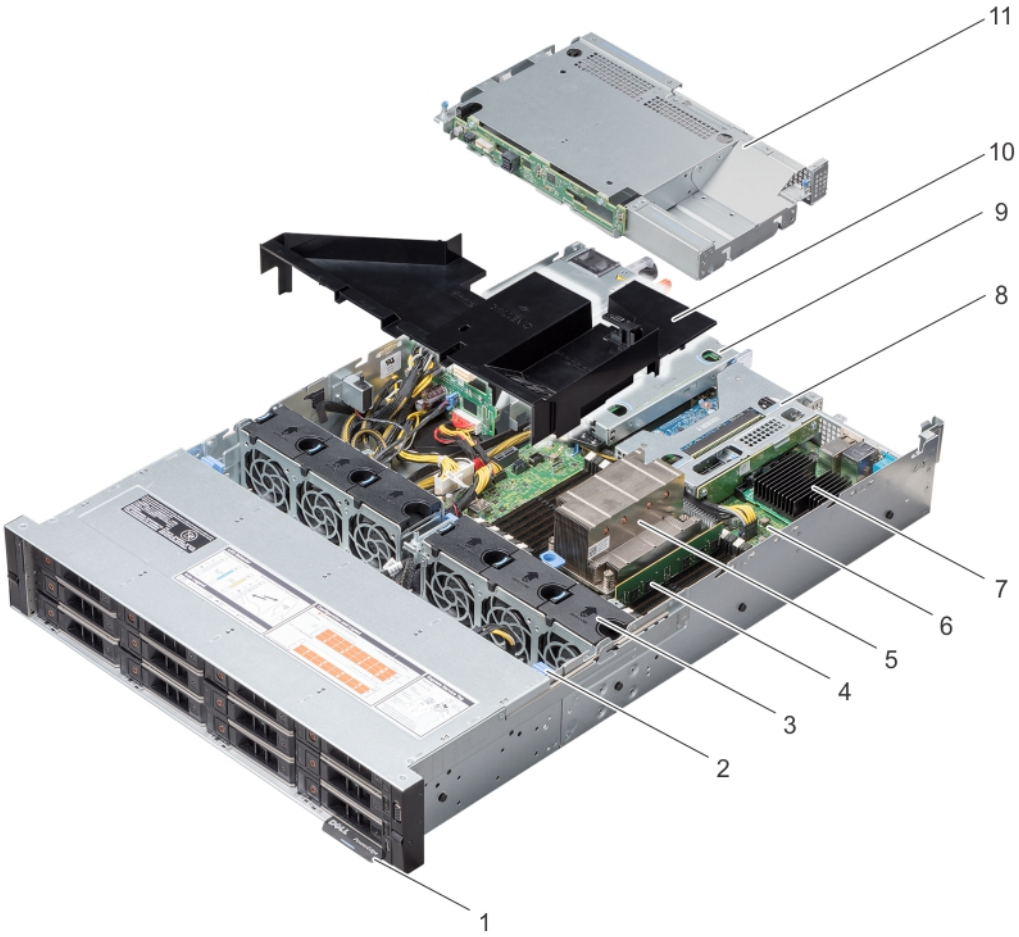


Figure 30. Inside the system with rear drive cage

1. Information tag
2. Drive backplane
3. Cooling fans
4. Memory module
5. CPU
6. System board
7. Mini PERC card
8. Riser 1A
9. Riser 3A
10. Air shroud
11. Rear drive cage

Air shroud

Removing the air shroud

Prerequisites

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

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. If installed, remove the rear drive cage.

NOTE: On a system with 2 x 3.5 inch rear drive cage, you must remove the rear drive cage before you remove the air shroud. The procedure to remove the air shroud remains the same.

Steps

Hold the air shroud at both ends, and lift it away from the system.

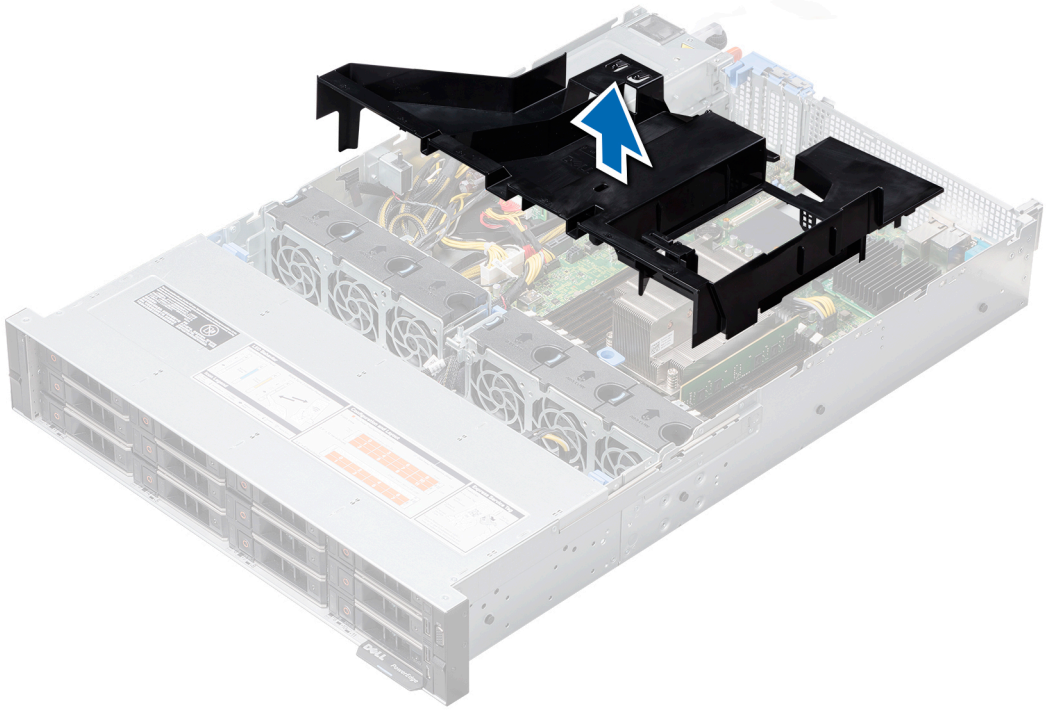


Figure 31. Removing air shroud on a system without a rear drive cage

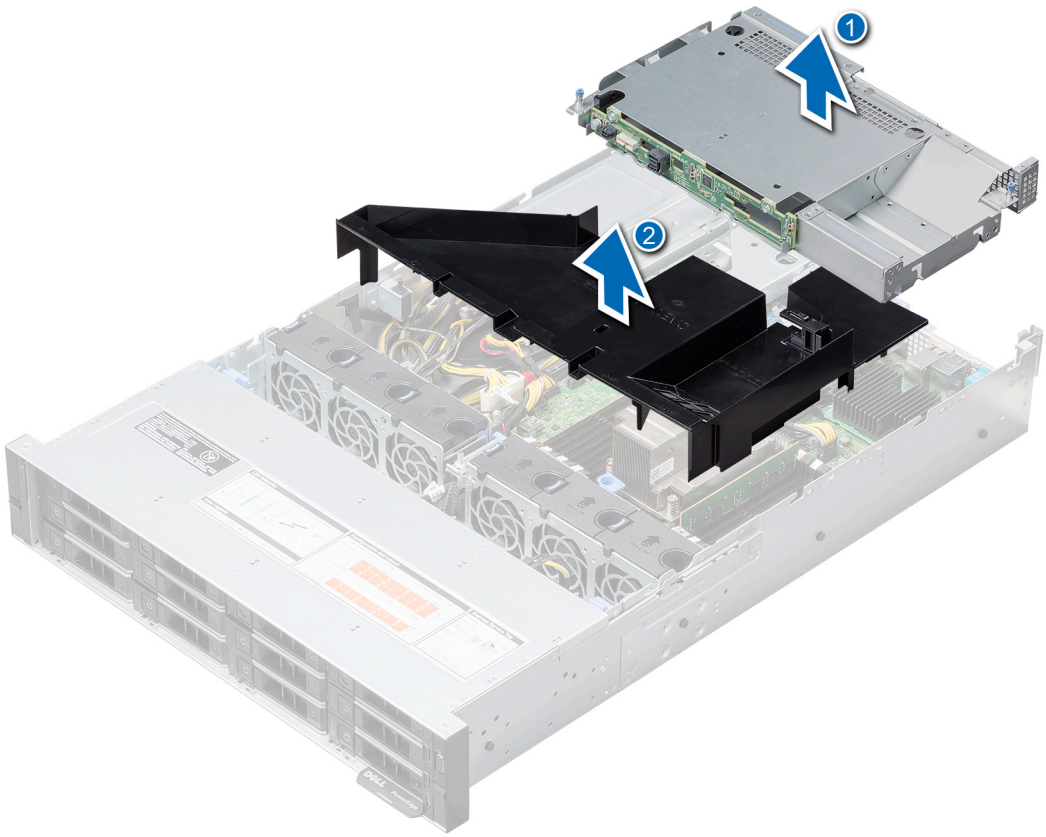


Figure 32. Removing air shroud on a system with a rear drive cage

Next steps

Install the air shroud.

Installing the air shroud

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. If applicable, route the cables inside the system along the system wall and secure the cables by using the cable latch.

Steps

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

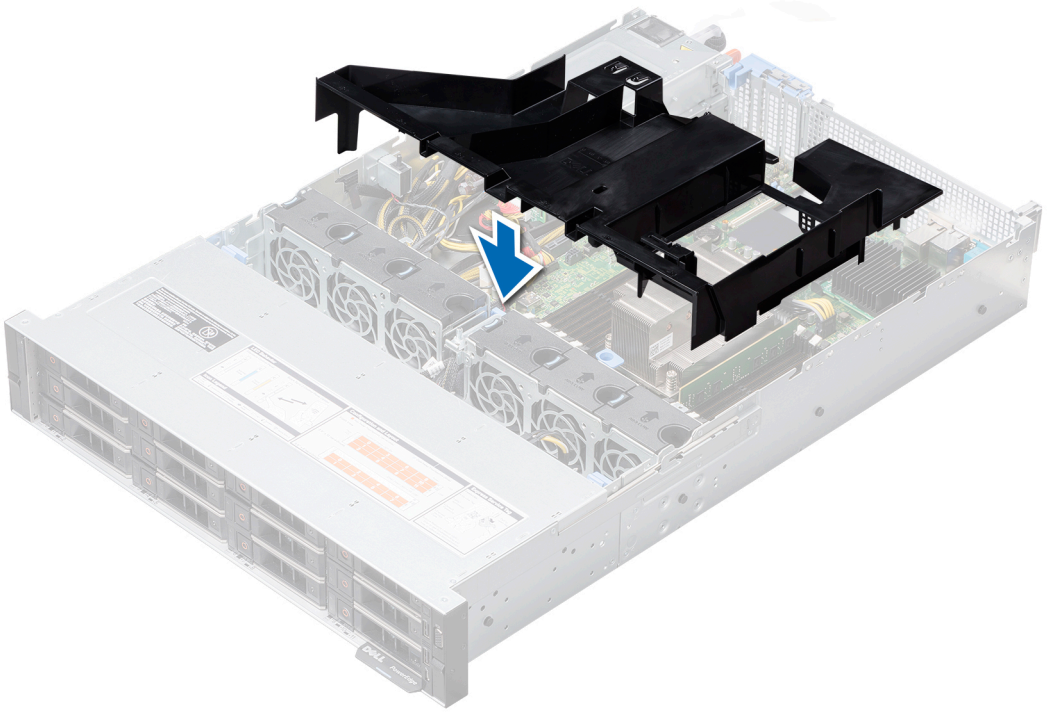
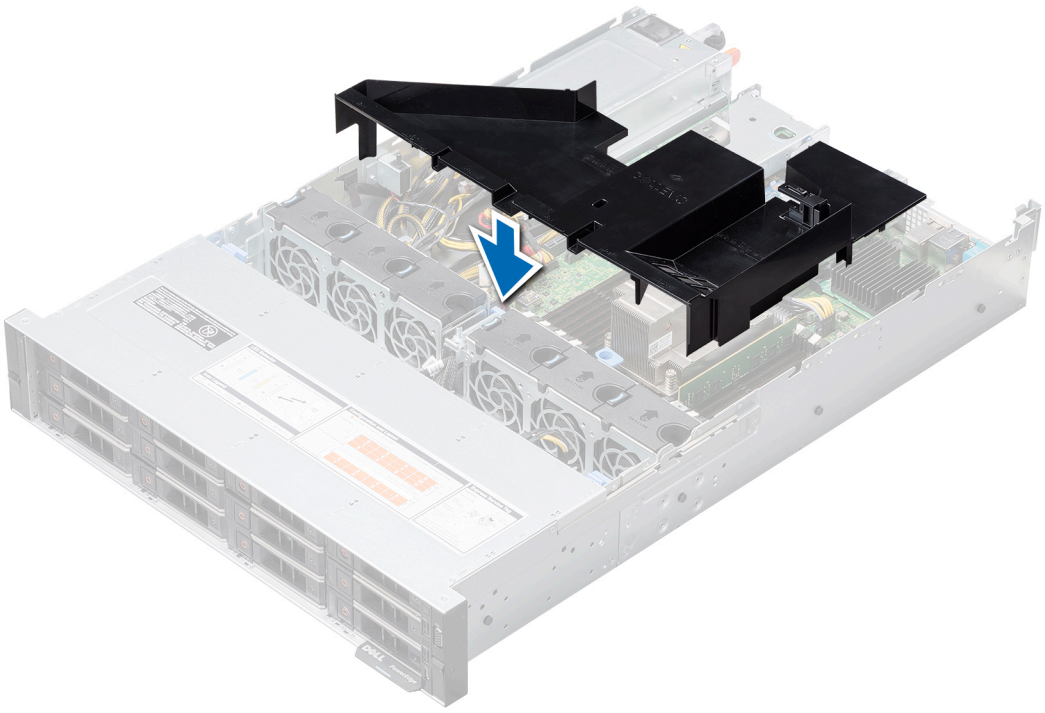


Figure 33. Installing the air shroud

NOTE: The procedure to install the air shroud for 2 x 3.5 inch rear drive system is identical.



Next steps

1. If removed, install the rear drive cage.
2. Follow the procedure listed in After working inside your system.

Cooling fans

The cooling fans are integrated into the system to dissipate the heat generated by the functioning of the system. These fans provide cooling for the processors, expansion cards, and memory modules.

Your system supports up to six standard or high performance cabled cooling fans.

Table 44. Fan support matrix for the PowerEdge R7415

Front Storage	PSU type	CPU count	Fan1	Fan2	Fan3	Fan4	Fan5	Fan6
8 x 3.5 inch	Cable PSU	1	Not required	Required	Required	Required	Required	Required
	Redundant PSU	1	Required	Required	Required	Required	Required	Required
12 x 3.5 inch	Redundant PSU	1	Required	Required	Required	Required	Required	Required
24 x 2.5 inch	Redundant PSU	1	Required	Required	Required	Required	Required	Required

NOTE: The high performance fans are required for 12 x 3.5 inch drive + 2 x 3.5 inch rear drive, or 24 x 2.5 inch drive (with NVMe) system. For more information, see the Thermal restriction matrix section.

Removing a cooling fan

The procedure for removing standard and high performance fans is identical.

Prerequisites

NOTE: Opening or removing the system cover when the system is on, may expose you to a risk of electric shock. Exercise utmost care while removing or installing cooling fans.

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.
4. Move the cables out of way to access the cooling fan cable connector on the system board. Also make a note of the cooling fan cable routed along the guides on the rear end of the fan cage.

Steps

1. Disconnect the cooling fan cable connected to the system board connector.
2. Press the release tab, and lift the cooling fan out of the cooling fan cage.



Figure 34. Removing a cooling fan

a) On the system with 8 x 3.5 inch [redundant power supply], 12 x 3.5 inch, and 24 x 2.5 inch drive, disconnect the fan 1 cable from the power interposer board (PIB) connector.

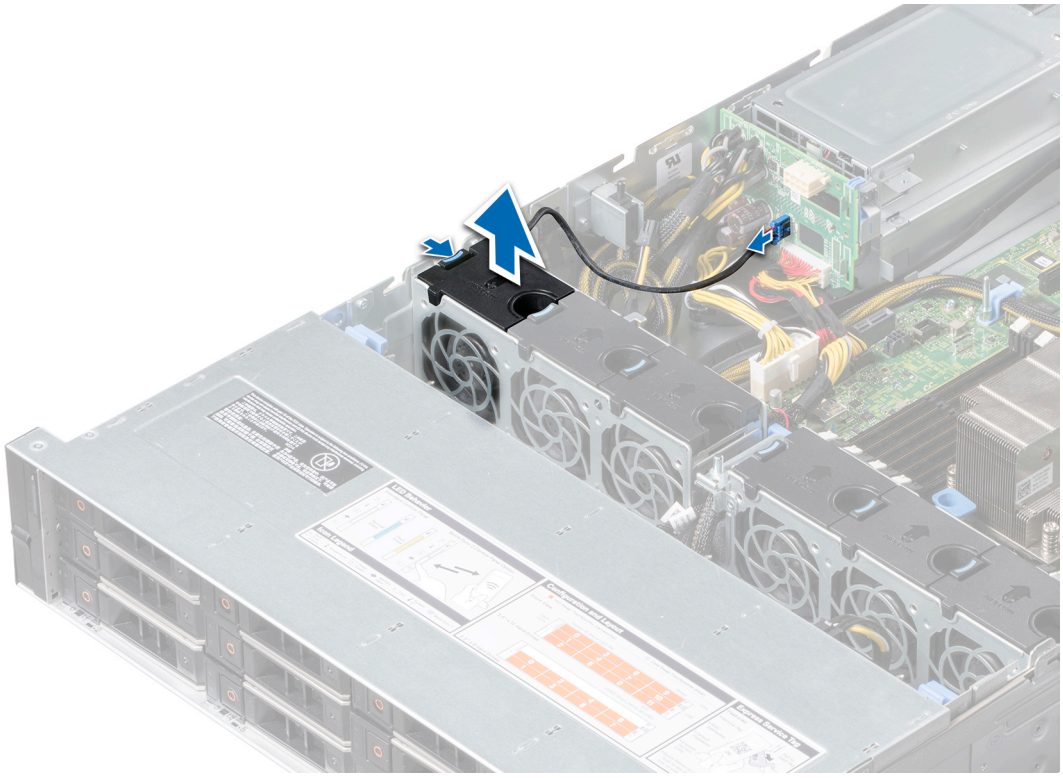


Figure 35. Disconnecting the fan cable from the PIB connector

Next steps

Installing a cooling fan.

Installing a cooling fan

The procedure for installing standard and high performance fans is identical.

Prerequisites

NOTE: Opening or removing the system cover when the system is on may expose you to a risk of electric shock. Exercise utmost care while removing or installing cooling fans.

Follow the safety guidelines listed in Safety instructions.

Steps

1. Holding the release tab, place the cooling fan into the cooling fan cage.
2. Route the cooling fan cable through the guides on the cooling fan cage.
3. Connect the cooling fan cable to the connector on the system board.



Figure 36. Installing a cooling fan

a) On the system with 8 x 3.5 inch [redundant power supply], 12 x 3.5 inch, and 24 x 2.5 inch drive, connect the fan 1 cable to the connector on the power interposer board (PIB).

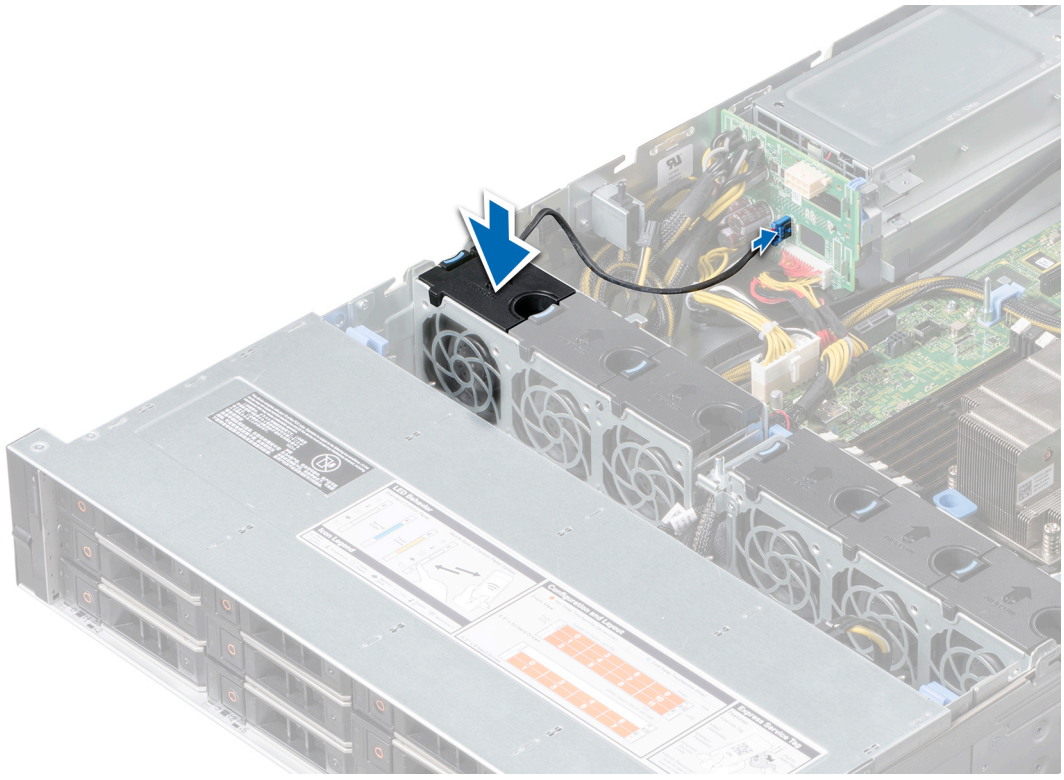


Figure 37. Connecting the fan cable to the PIB connector

Next steps

1. Installing the air shroud.
2. Follow the procedure listed in After working inside your system.

Intrusion switch

Removing the intrusion switch

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.
4. Move the cables out of way to access the intrusion switch cable. Also make a note of the intrusion switch cable routing.

Steps

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

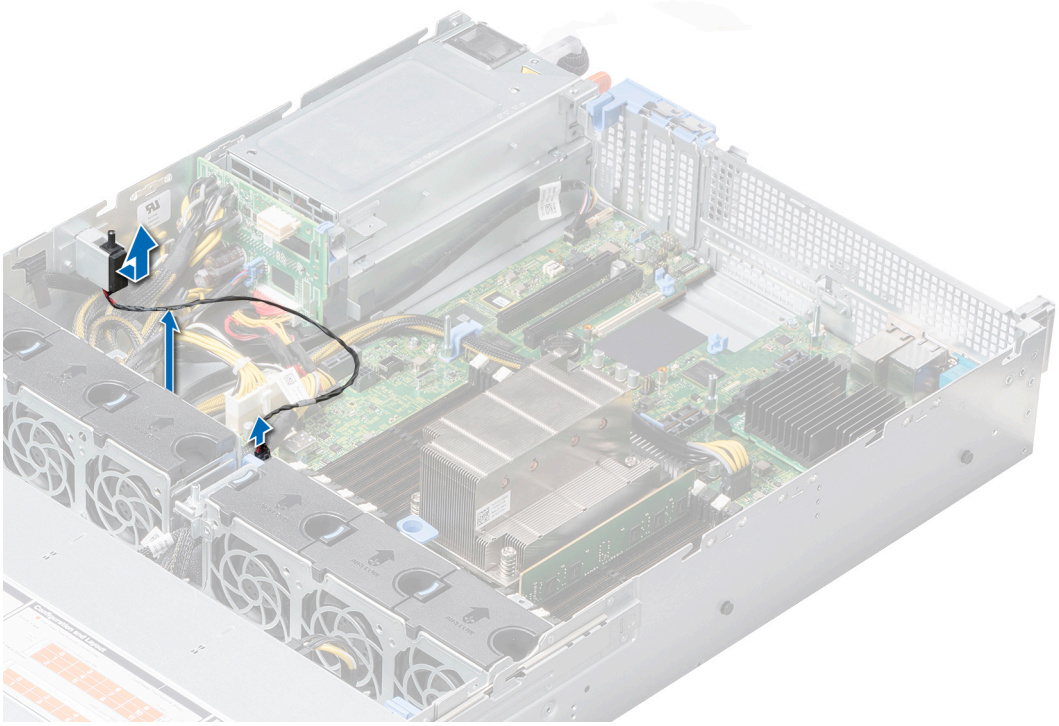


Figure 38. Removing the intrusion switch

Next steps

Installing the intrusion switch.

Installing the intrusion switch

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

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

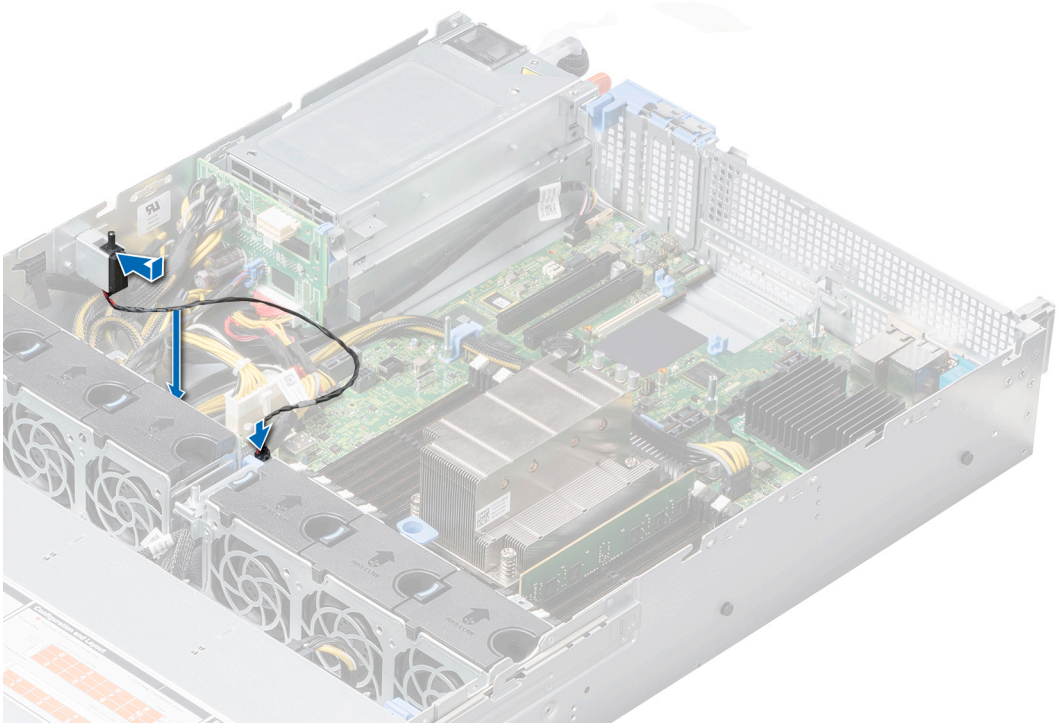


Figure 39. Installing the intrusion switch

Next steps

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

Drives

Removing a drive blank

The procedure for removing 2.5 inch and 3.5 inch drive blanks is identical.

Prerequisites

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

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

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.

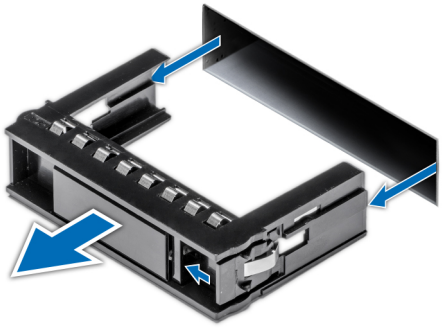


Figure 40. Removing a drive blank

Next steps

Installing a drive or installing a drive blank

Installing a drive blank

The procedure for installing 2.5 inch and 3.5 inch drive blanks is identical.

Prerequisites

Follow the safety guidelines listed in Safety instructions.

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

Steps

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

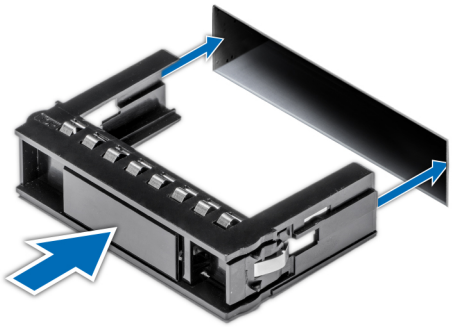


Figure 41. Installing a drive blank

Next steps

If removed, install the front bezel.

Removing a drive carrier

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. If installed, remove the front bezel.
3. Using the management software, prepare the drive for removal.

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

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

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

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

Steps

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



Figure 42. Removing a drive carrier

Next steps

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

Installing a drive carrier

Prerequisites

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

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

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

CAUTION: When installing a drive, ensure that the adjacent drives are 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.
2. If installed, remove the drive blank.

Steps

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



Figure 43. Installing a drive carrier

Next steps

If installed, install the front bezel.

Removing the drive from the drive carrier

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

   CAUTION: Mixing drives from previous generations of PowerEdge servers is not supported.
2. If installed, remove the front bezel.
3. Remove the drive carrier.

Steps

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

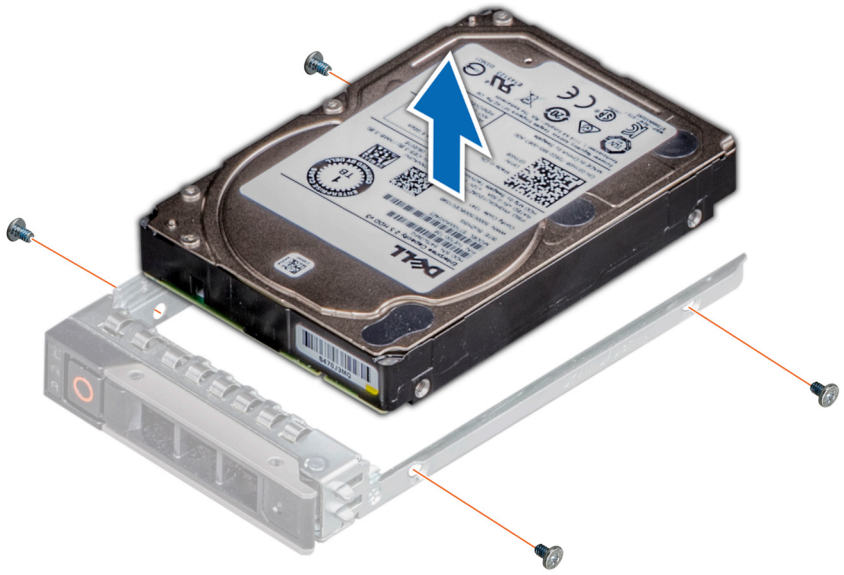


Figure 44. Removing the drive from the drive carrier

Next steps

Install the drive into the drive carrier.

Installing a drive into the drive carrier

Prerequisites

Follow the safety guidelines listed in Safety instructions.

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

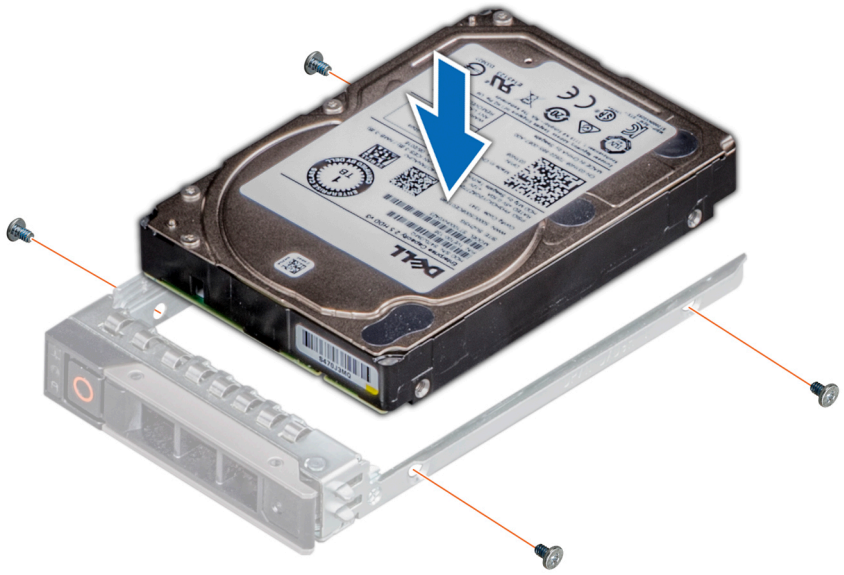


Figure 45. Installing a drive into the drive carrier

Next steps

1. If removed, install the front bezel.
2. Install the drive carrier.

System memory

The system supports DDR4 registered DIMM (RDIMMs) slots and load reduced DIMM (LRDIMMs) slots. System memory holds the instructions that are executed by the processor.

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

Memory bus operating frequency can be 2666 MT/s, 2400 MT/s, 2133 MT/s, or 1866 MT/s depending on the following factors:

- DIMM type (RDIMM or LRDIMM)
- Number of DIMM slots populated per channel
- System profile selected (for example, Performance Optimized, or Custom [can be run at high speed or lower])
- Maximum supported DIMM frequency of the processors

  NOTE: For maximum DDR frequency of the processor, refer to AMD EPYC 7000 series table below.

Table 45. AMD EPYC 7000 Series datasheet

Model number	OPN	2P/1P	Cores	Threads	Base freq (Ghz)	All cores boost freq (Ghz)	Max boost freq (Ghz)	L3 (MB)	DDR channels	Max DDR freq (1DPC)	PCIe	TDP (W)
7601	PS7601BDVIHAF	2P OR 1P	32	64	2.20	2.70	3.20	64	8	2666	X128	180
7551P	PS755PBDVIHAF	1P ONLY	32	64	2.00	2.55	3.00	64	8	2666	X128	180
7451	PS7451BDVHCAF	2P OR 1P	24	48	2.30	2.90	3.20	64	8	2666	X128	180
7401P	PS740PBEVHCAF	1P ONLY	24	48	2.00	2.80	3.00	64	8	2400/2666	X128	155/170
7351P	PS735PBEVGPAF	1P ONLY	16	32	2.40	2.90	2.90	64	8	2400/2666	X128	155/170

Model number	OPN	2P/1P	Cores	Threads	Base freq (Ghz)	All cores boost freq (Ghz)	Max boost freq (Ghz)	L3 (MB)	DDR channels	Max DDR freq (1DPC)	PCIe	TDP (W)
7281	PS7281BEVGAAF	2P OR 1P	16	32	2.10	2.70	2.70	32	8	2400/2666	X128	155/170
7251	PS7251BFV8SAF	2P OR 1P	8	16	2.10	2.90	2.90	32	8	2400	X128	120
7261	PS7261BEV8RAF	2P OR 1P	8	16	2.50	2.90	2.90	64	8	2400/2666	x128	155/170

Your system contains 16 memory sockets.

NOTE: For optimal performance, populate one DIMM per channel with DDR4-2666 memory modules on the first slot of each memory channel. The first slot of each channel can be identified as the DIMM slots with white latches. For example, 64 GB system memory capacity can be divided into 8 x 8 GB DIMM slots.

Table 46. Memory speed table

DIMM type	Rank	Capacity	DIMM rated voltage and speed	Operating Speed	
				1 DPC/ 2 DPC	
RDIMM	1R	8 GB	DDR4 (1.2 V), 2666 MT/s	2666 MT/s	2133 MT/s
RDIMM	2R	16 GB , 32 GB	DDR4 (1.2 V), 2666 MT/s	2400 MT/s	2133 MT/s
LRDIMM	4R	64 GB	DDR4 (1.2 V), 2666 MT/s	2666 MT/s	2133 MT/s

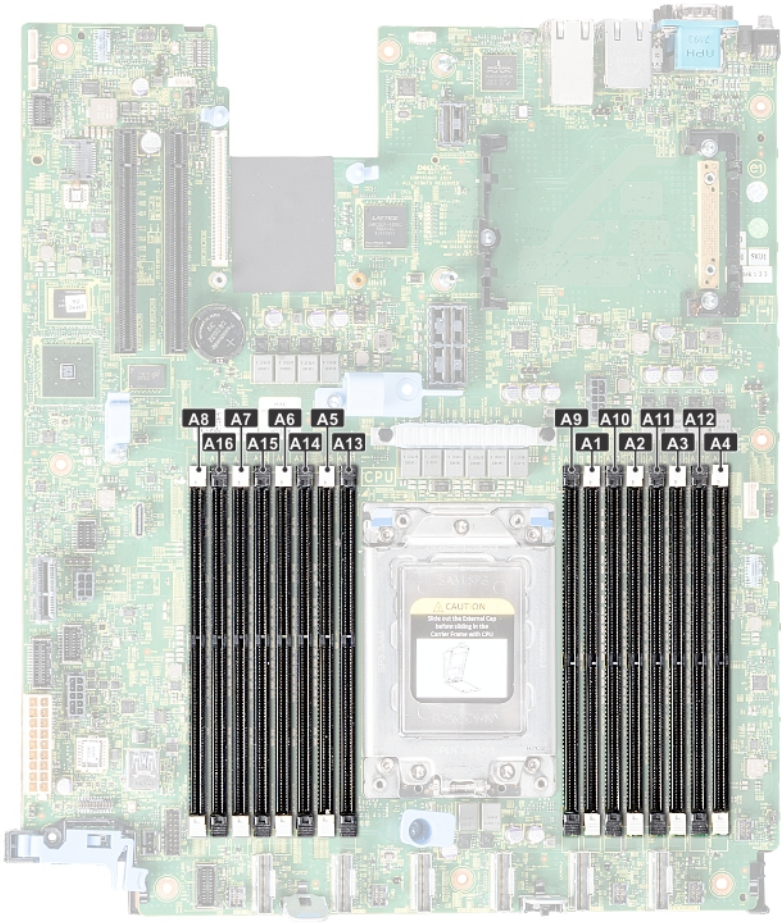


Figure 46. Memory socket location

Memory channels are organized as follows:

Table 47. Memory channels

Processor	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7
AMD Processor	A1/A9	A2/A10	A3/A11	A4/A12	A5/A13	A6/A14	A7/A15	A8/A16

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 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.
- 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 A16 are available.
  - For dual-processor systems, sockets A1 to A16 and sockets B1 to B16 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.

  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.

  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.

  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 eight identical memory modules per processor (one DIMM per channel) at a time to maximize performance.

Mode-specific guidelines

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

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.

NOTE:

- **Normal DIMM population rule:**
  - **Single processor systems: Slot 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16**
- **DIMM population changed when Performance Optimized Mode is ordered and there is a quantity of 4 or 8 DIMMs per processor.**
  - **With DIMM quantity of 4, the population with 1 processor is slot 1, 3, 5, 7**
  - **With DIMM quantity of 8, the population with 1 processor is slot 1, 2, 3, 4, 5, 6, 7, 8**

Table 48. Memory population rules

Processor	Configuration	Memory population	Memory population information
Single processor	Optimizer (Independent channel) population order	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	Populate in this order, odd amount of DIMMs per processor is allowed.

Removing a memory module

Prerequisites

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

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

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

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.

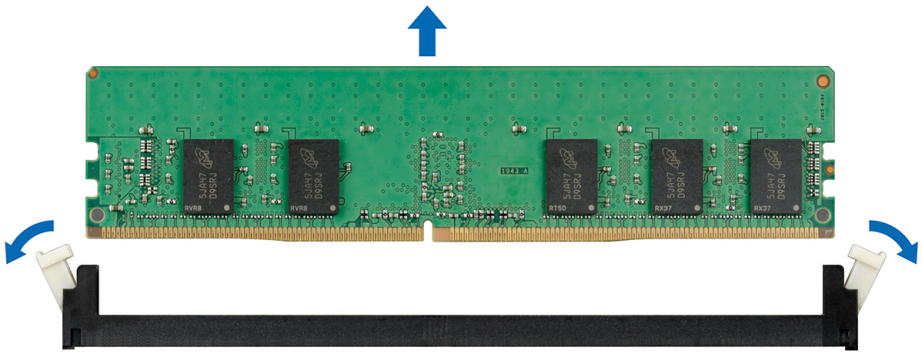


Figure 47. Removing a memory module

Next steps

1. Install a memory module.
2. If you are removing the memory module permanently, install a memory module blank. The procedure to install a memory module blank is similar to that of the memory module.

Installing a memory module

Prerequisites

Follow the safety guidelines listed in Safety instructions.

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.

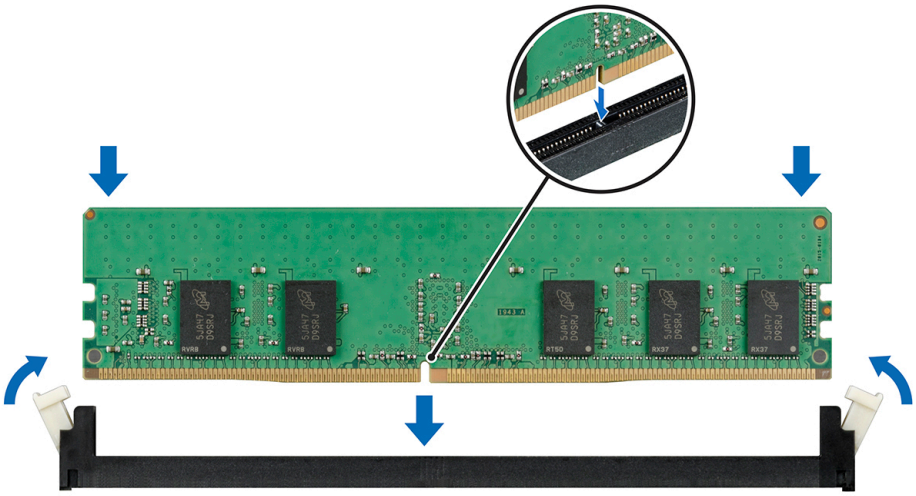


Figure 48. Installing a memory module

Next steps

1. If applicable, install the air shroud.
2. Follow the procedure listed in After working inside your system.
3. To verify if the memory module has been installed properly, press F2 and navigate to **System Setup Main Menu > System BIOS > Memory Settings**. In the **Memory Settings** screen, the System Memory Size must reflect the updated capacity of the installed memory.
4. If the 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 heat sink

Prerequisites

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

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

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

Steps

1. Using a Torx #T20 screw driver, loosen the captive screw 4 on the heat sink.

   Allow some time (approximately 30 seconds) for the heat sink to loosen from the processor.

   NOTE: The captive screw numbers are marked on the heat sink.
2. Loosen the captive screw 3 that is diagonally opposite to the screw 4.
3. Repeat the procedure for the remaining two captive screws 2 and 1.
4. Loosen all the captive screws in the sequence 4, 3, 2, 1 and lift the heat sink away from the system.

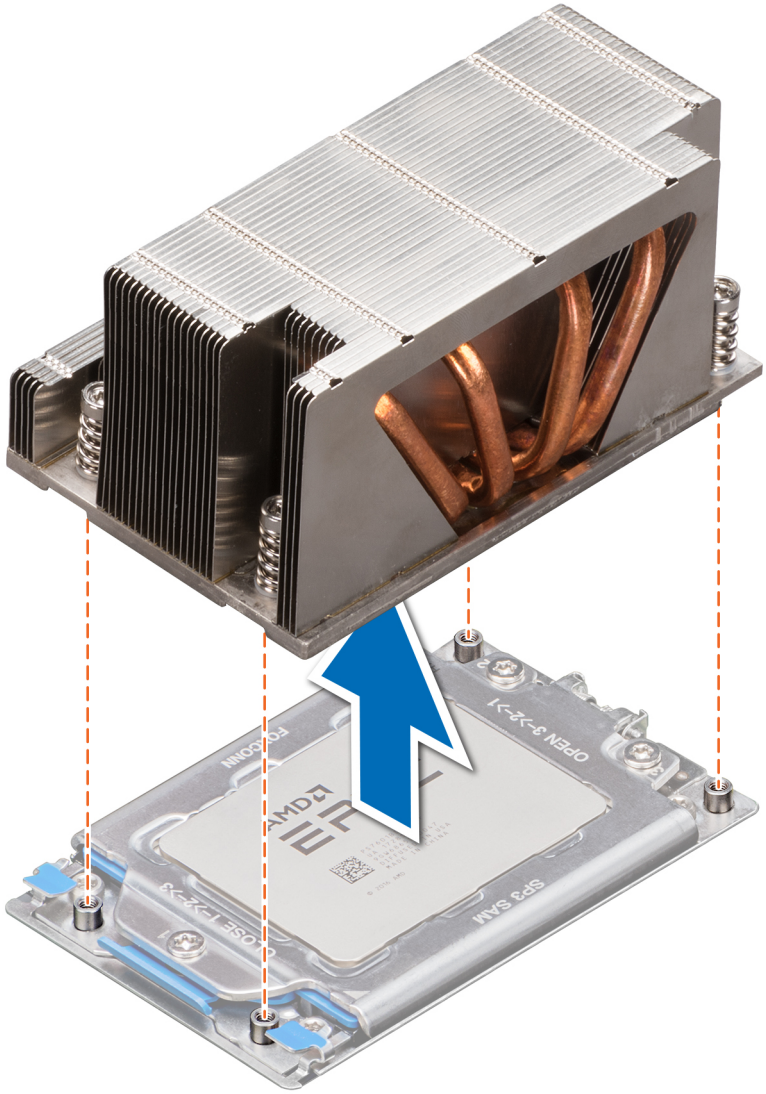


Figure 49. Removing a heat sink

Next steps

Install the heat sink.

Removing the AMD processor

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.
4. Remove the heat sink.

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

Steps

1. Using a Torx #T20 screwdriver, loosen the screws to release the force plate. The sequence to loosen the screws is 3, 2, and 1.

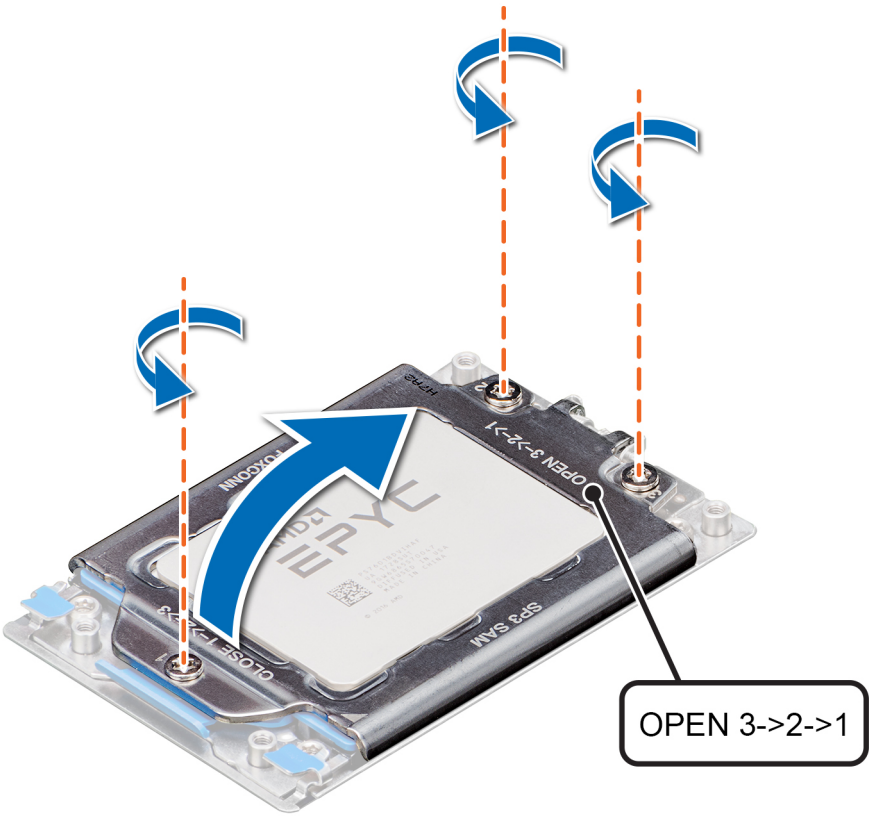


Figure 50. Removing screws on the force plate

2. Release the processor socket rail frame by lifting up the blue latches.



Figure 51. Lifting the rail frame

3. Holding the blue tab on the processor tray, slide the tray out of the rail frame.

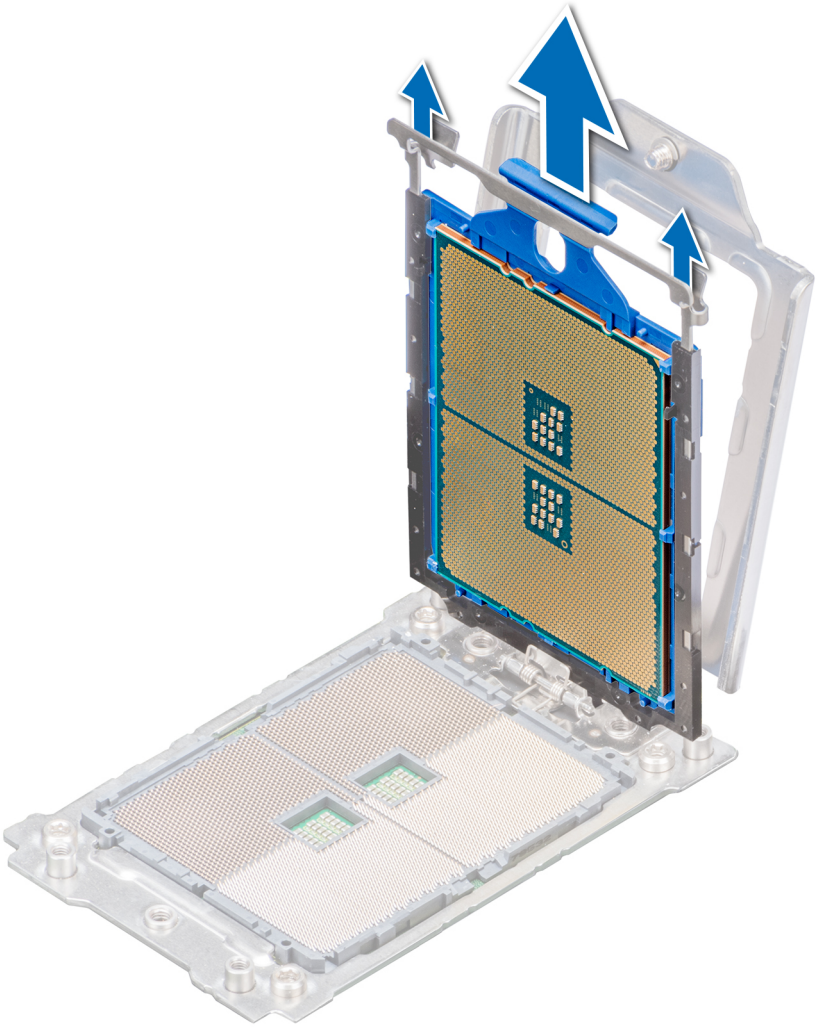


Figure 52. Removing the processor tray

Next steps

Install the AMD processor.

Installing the AMD processor

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Holding the blue tab on the processor tray, slide the tray into the processor socket rail frame until firmly seated.

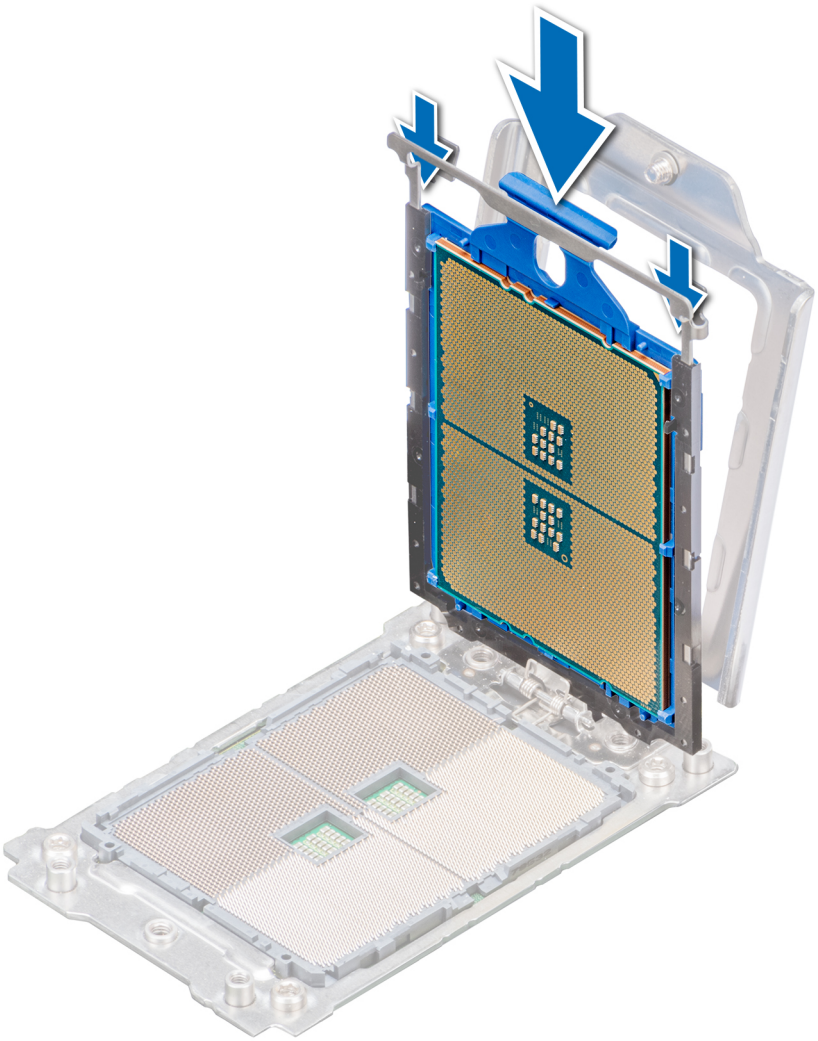


Figure 53. Placing the processor tray into the rail frame

2. Push the rail frame down until the blue latches lock into place.



Figure 54. Closing the rail frame

3. Secure the force plate to the processor socket base by tightening the screws in the sequence 1, 2, and 3. When all three screws are fully threaded, the socket is then actuated. The three screws are tightened to a torque value of 16.1 ± 1.2 kgf-cm (14.0 ± 1.0 lbf-in).

   NOTE: Press the force plate while tightening the screws to avoid tilting of the processor cover out of the processor socket.

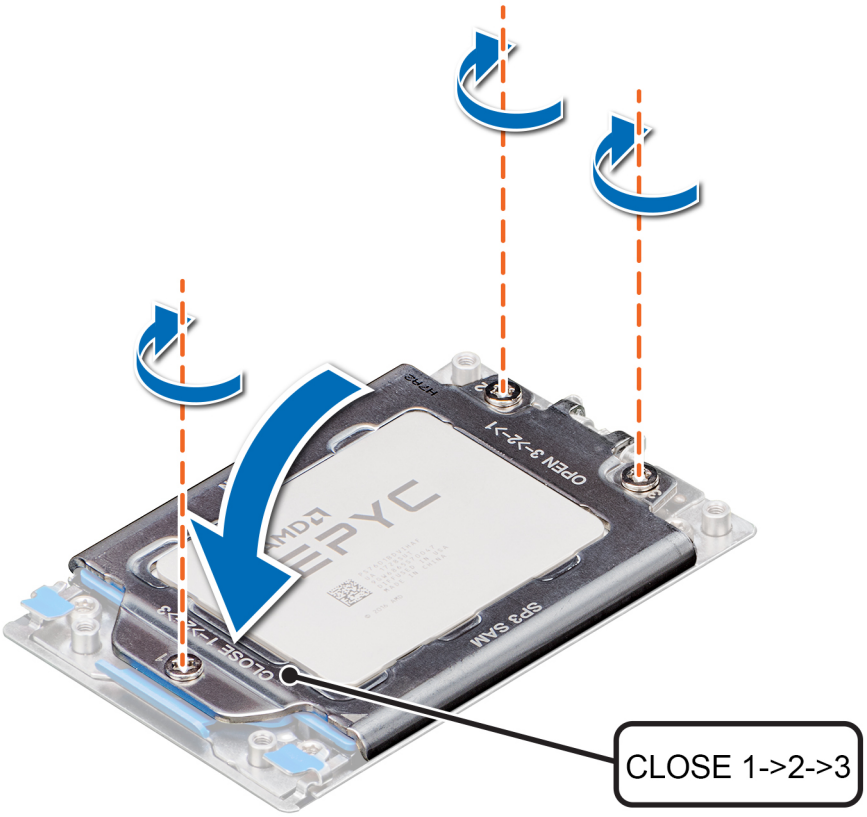


Figure 55. Securing the force plate

Next steps

1. Install the heat sink.
2. Install the air shroud.
3. Follow the procedure listed in After working inside your system.

Installing the heat sink

Prerequisites

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

1. Follow the safety guidelines listed in Safety instructions.
2. If installed, remove the processor dust cover.

Steps

1. If you are using an existing heat sink, remove the thermal grease on the heat sink by using a clean lint-free cloth.

   NOTE: For a new heat sink, the thermal paste is pre-applied to the heat sink. Remove the protective cover and install the heat sink.

2. 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 of the syringe after you use it.

3. Orient the heat sink with the screw holes on the processor plate. The captive screws on the heat sink should align with the screw holes on the processor plate.
4. Using a Torx #T20 screwdriver, tighten the captive screw 1 to secure the heat sink to the system board.

   NOTE: The captive screw numbers are marked on the heat sink.
5. Tighten the captive screw 2 that is diagonally opposite to the screw 1.
6. Repeat the procedure for the remaining captive screws 3 and 4.
7. Tighten all the captive screws in the sequence 1, 2, 3, 4.

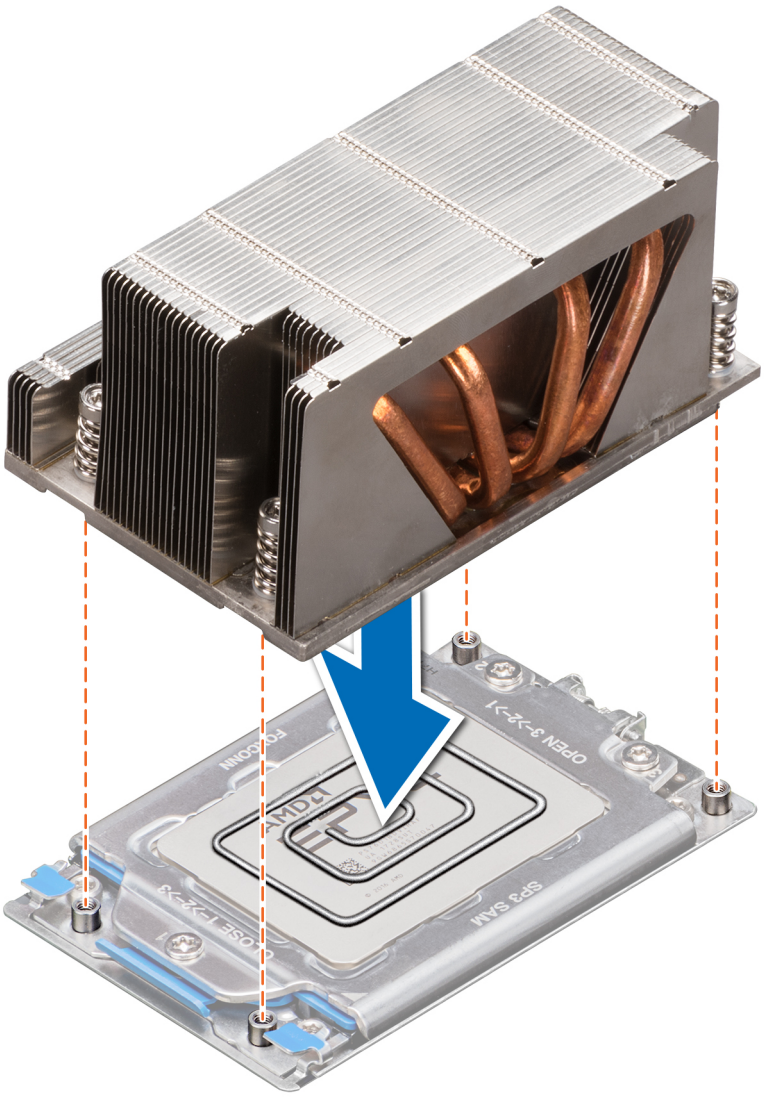


Figure 56. Installing the heat sink

Next steps

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

Rear drive cage

The rear drive cage supports up to two 3.5 inch drives.

Removing the rear drive cage

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove all the drives.
4. Disconnect all the cables from the rear drive backplane.

Steps

1. Using a Phillips #2 screwdriver, loosen the captive screws that secure the rear drive cage to the system.
2. Slide the rear drive cage towards the front of the system to an unlocked position marked on the drive cage.
3. Lift the rear drive cage away from the system.

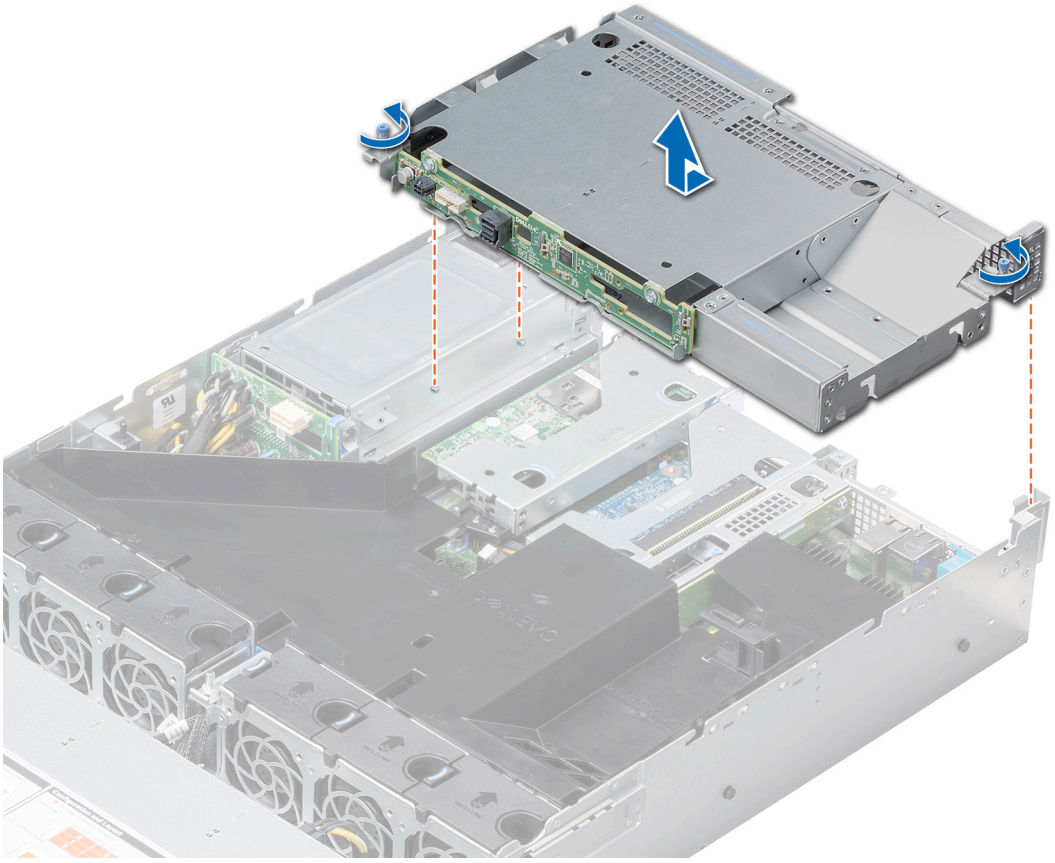


Figure 57. Removing the rear drive cage

Next steps

Install the rear drive cage.

Installing the rear drive cage

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Align the captive screws on the drive cage with the screw holes on the system.
2. Lower the drive cage into the system and slide it to the back of the system to align with the locked position marked on the drive cage.

3. Using a Phillips #2 screwdriver, tighten the captive screws.

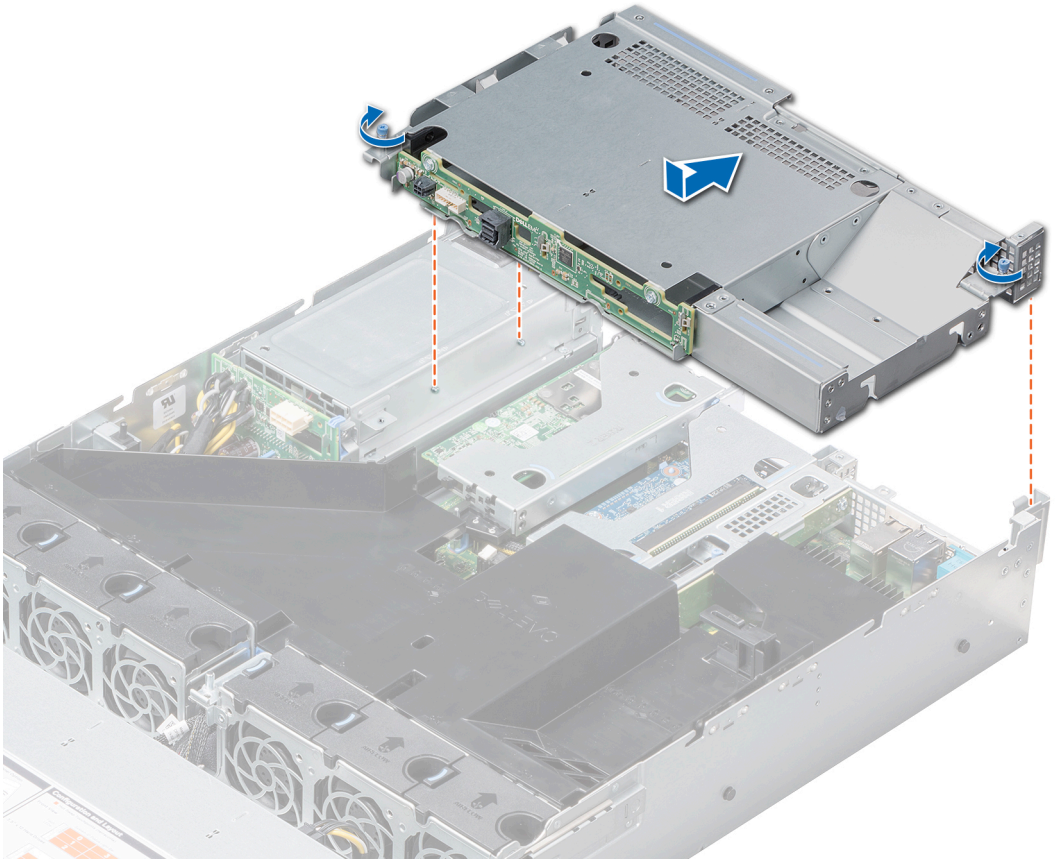


Figure 58. Installing the rear drive cage

Next steps

1. Reconnect all the disconnected cables to the rear drive backplane.
2. Install all the drives.
3. Follow the procedure listed in After working inside your system.

Drive backplane

Depending on your system configuration, the drive backplanes supported in PowerEdge R7415 are listed here:

- 3.5 inch (x8) SAS, SATA backplane
- 3.5 inch (x12) SAS or SATA backplane and 3.5 inch (x2) SAS or SATA backplane (rear)
- 2.5 inch (x24) SAS or SATA backplane
- 2.5 inch (x12) SAS or SATA + 2.5 inch (x12) NVMe backplane
- 2.5 inch (x24) NVMe backplane
- 2.5 inch (x8) SAS or SATA + 2.5 inch (x16) NVMe backplane

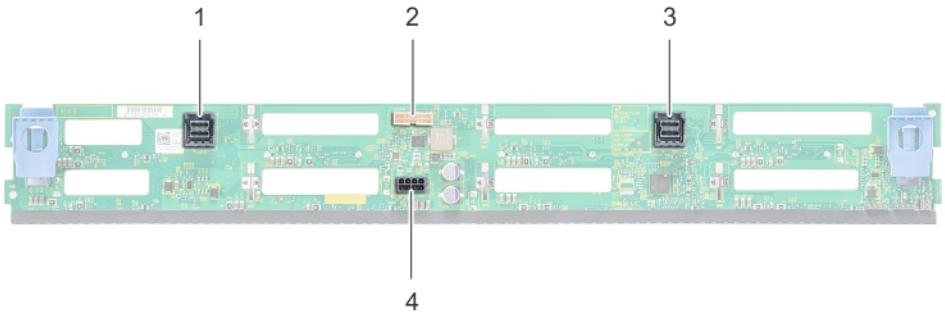


Figure 59. 8 X 3.5 inch drive backplane

1. SAS/SATA B cable connector
2. Signal connector
3. SAS/SATA A cable connector
4. Power connector

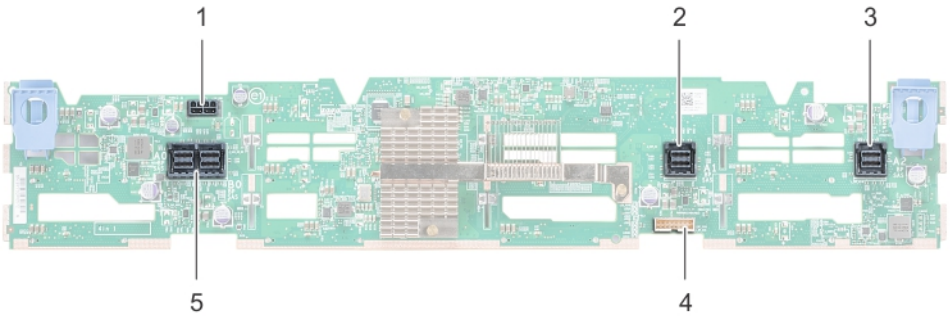


Figure 60. 12 X 3.5 inch drive backplane

1. Power cable connector
2. SAS/SATA cable connector
3. SAS/SATA cable connector
4. Backplane signal connector
5. SAS cable connector

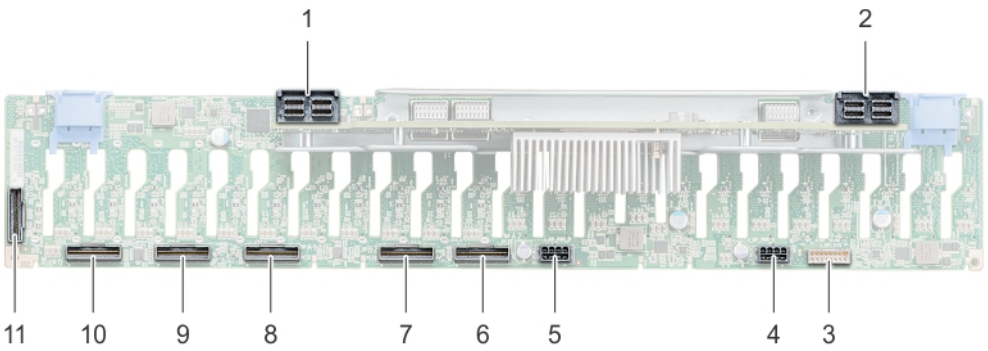


Figure 61. 24 X 2.5 inch drive backplane

1. SAS cable connector
2. SAS cable connector
3. Signal cable connector
4. Power cable connector
5. Power cable connector
6. Signal cable (A2) connector
7. Signal cable (B2) connector
8. Signal cable (A1) connector

9. Signal cable (B1) connector
10. Signal cable (A0) connector
11. Signal cable (B0) connector

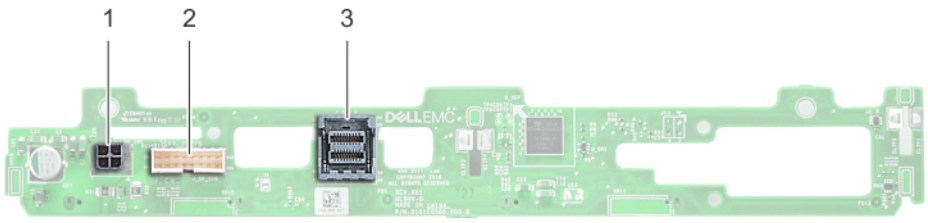


Figure 62. 2 x 3.5 inch drive backplane (rear)

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

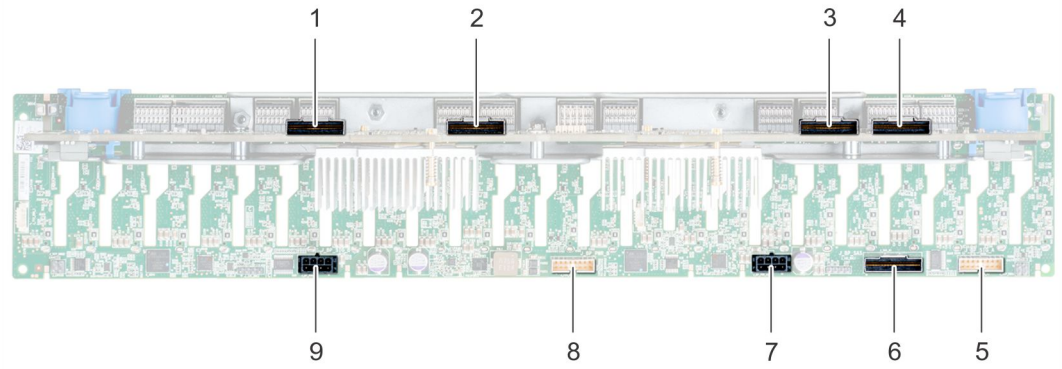


Figure 63. 24 x 2.5 inch drive backplane

1. expander board connector B1 (PE1_B)
2. expander board connector A1 (PE1_A)
3. expander board connector B2 (PE2_B)
4. expander board connector A2 (PE2_A)
5. signal connector (J_SIG_A1)
6. SAS connector (J_BP_SAS)
7. power connector (J_BP_PWR_A1)
8. signal connector (J_SIG_A2)
9. power connector (J_BP_PWR_A2)

Removing the drive backplane

Prerequisites

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

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

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

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.
4. Remove the backplane cover.
5. Remove all drives from the front bay.

6. Disconnect all the cables from the backplane.

Steps

Press and hold the blue release tabs, and lift the backplane up to disengage the slots on the backplane from the hooks on the system.

NOTE: If your backplane has an expander board, the procedure to remove remains the same.



Figure 64. Removing the drive backplane

Next steps

Install the drive backplane.

Installing the drive backplane

Prerequisites

Follow the safety guidelines listed in Safety instructions.

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

Steps

1. Align the slots on the backplane with the hooks on the system by holding the blue release tabs.
2. Lower the drive backplane until the blue release tabs snap into place.



Figure 65. Installing the drive backplane

Next steps

1. Connect all the cables to the backplane.
2. Install all the drives.
3. Install the backplane cover.
4. Install the air shroud.
5. Follow the procedure listed in After working inside your system.

Removing the rear drive backplane

Prerequisites

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

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

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove all the drives from the rear drive cage.
4. Disconnect all the cables from the backplane.
5. Remove the rear drive cage.

Steps

1. Using a Phillips #2 screwdriver, remove the screws that secure the drive backplane to the rear drive cage.
2. Disengage the backplane from the hooks on the rear drive cage, and remove it from the rear drive cage.

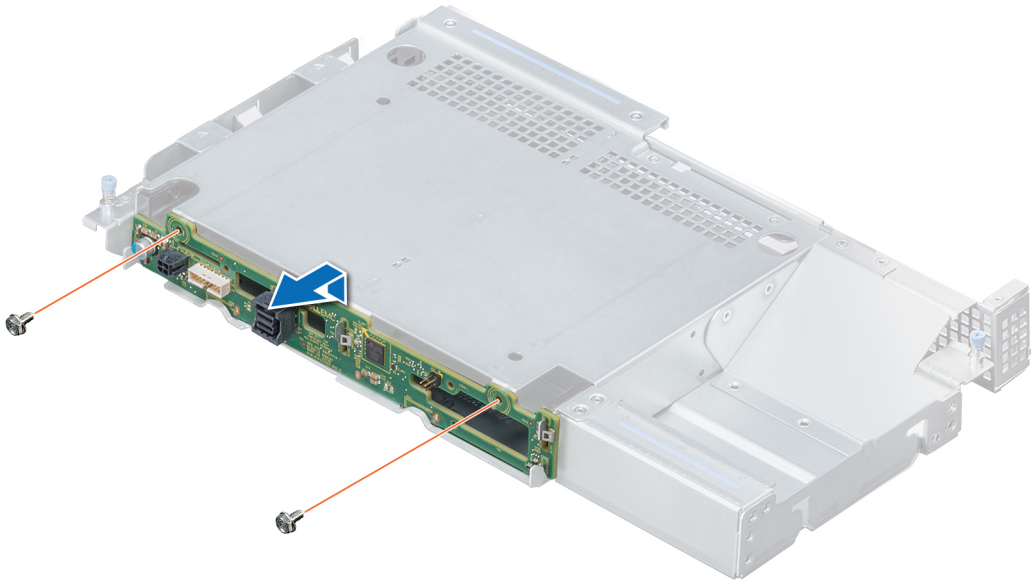


Figure 66. Removing the rear drive backplane

Next steps

Install the rear drive backplane.

Installing the rear drive backplane

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Use the hooks on the rear drive cage as guides to align the drive backplane.
2. Lower the backplane into the rear drive cage until it is firmly seated.
3. Using a Phillips #2 screwdriver, secure the backplane to the rear drive cage with the screws.

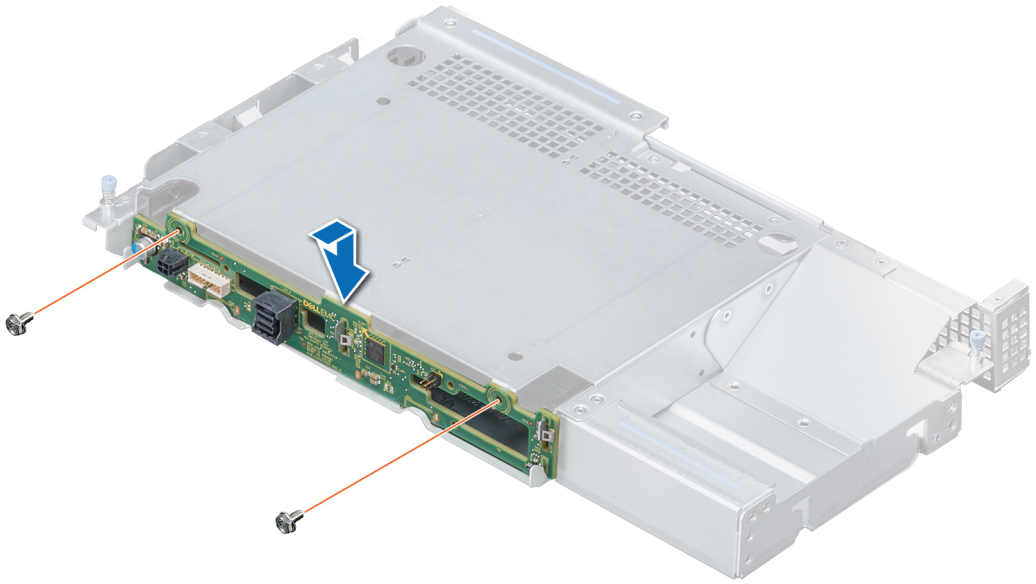


Figure 67. Installing the rear drive backplane

Next steps

1. Install the rear drive cage.
2. Install all the drives.
3. Connect all the cables to the backplane.
4. Follow the procedure listed in After working inside your system.

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.

Expansion card installation guidelines

The following table describes the supported expansion cards:

Table 49. Expansion card riser configurations

Expansion card riser	PCIe slots on the riser	Processor connection	Height	Length	Slot width
Riser-1B (2U riser)	Slot 2	Processor 1	Full Height	Full Length	x16
Riser-1B (2U riser)	Slot 3	Processor 1	Full Height	Full Length	x16
Riser-1A (low profile riser right)	Slot 2	Processor 1	Low Profile	Half Length	x16
Riser-3A (low profile riser left)	Slot 3	Processor 1	Low Profile	Half Length	x16

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

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

Table 50. Riser configurations: No riser - CPU

Card Type	Slot Priority	Maximum number of cards
LOM riser ; 2x1G BCM5720L (FXN)	1	1
LOM riser ; 2x10G BCM57416 (BASeT/SFP +) (FXN)	1	1
HCA: EDR (Mellanox)	4	2
PCIe SSD PCIe Card (SAMSUNG)	4,5	2
HBA: FC32 (Emulex)	4,5	2
NIC: 25Gb (Broadcom/Mellanox)	4,5	2
HBA: FC16 (Emulex)	4,5	2
NIC: 10Gb (Intel/Broadcom/Mellanox)	4,5	2
HBA: FC8 (Emulex)	4,5	2
NIC: 1Gb (Broadcom/Intel)	4,5	2
PERC 10: External Adapter (Dell)	4,5	1
HBA: External Adapter (Dell)	4,5	1
Internal Storage (Dell)	4,5	1
PERC 10: Mini mono/PERC 9: Mini mono/ HBA: Mini mono (Dell)	Integrated Slot	1

Table 51. Riser configurations: Riser 1A + Riser 3A - CPU

Card type	Slot priority	Maximum number of cards
LOM riser ; 2x1G BCM5720L	1	1
LOM riser ; 2x10G BCM57416 (BASeT/SFP +)	1	1
PCIe SSD PCIe Card (Samsung)	2, 3	2
HCA: EDR (Mellanox)	2, 3	2
HBA: FC32 (Emulex)	2, 3	2
NIC: 25Gb (Broadcom/Mellanox)	2, 3	2
HBA: FC16 (Emulex)	2, 3	2
NIC: 10Gb (Intel/Broadcom/Mellanox)	2, 3	2
HBA: FC8 (Emulex)	2, 3	2
NIC: 1Gb (Broadcom/Intel)	2, 3	2
PERC 10: External Adapter (Dell)	2, 3	1
HBA: External Adapter (Dell)	2, 3	1
Internal Storage (Dell)	2, 3	1
PERC 10: Mini mono/PERC 9: Mini mono/ HBA: Mini mono (Dell)	Integrated Slot	1

Table 52. Riser configurations: Riser 1B - CPU

Card type	Slot priority	Maximum number of cards
LOM riser ; 2x1G BCM5720L	1	1

Card type	Slot priority	Maximum number of cards
LOM riser ; 2x10G BCM57416 (BASeT/SFP +)	1	1
HCA: EDR (Mellanox)	4	1
Internal Storage (Dell)	5	1
HCA: EDR (Mellanox)	2, 3	2
NIC: 100Gb (Mellanox)	2, 3	2
HBA: FC32 (Emulex)	2, 3	2
NIC: 25Gb (Broadcom/Mellanox)	2, 3	2
HBA: FC16 (Emulex)	2, 3	2
NIC: 10Gb (Intel/Broadcom/Mellanox)	2, 3	2
HBA: FC8 (Emulex)	2, 3	2
NIC: 1Gb (Broadcom/Intel)	2, 3	2
PERC 10: External Adapter (Dell)	2, 3	2
HBA: External Adapter (Dell)	2, 3	1
Internal Storage (Dell)	2, 3	1
PCIe SSD PCIe Card (SAMSUNG)	2, 3, 4, 5	4
HBA: FC32 (Emulex)	4, 5	2
NIC: 25Gb (Broadcom/Mellanox)	4, 5	2
HBA: FC16 (Emulex)	4, 5	2
NIC: 10Gb (Intel/Broadcom/Mellanox)	4, 5	2
HBA: FC8 (Emulex)	4, 5	2
NIC: 1Gb (Broadcom/Intel)	4, 5	2
PERC 10: External Adapter (Dell)	4, 5	1
HBA: External Adapter (Dell)	4, 5	1
PERC 10: Mini mono/PERC 9: Mini mono/ HBA: Mini mono (Dell)	Integrated Slot	1

Removing expansion card from the 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 air shroud.
4. If applicable, disconnect the cables from the expansion card.
5. When removing a card from the risers, ensure that the PCIe card holder latch is closed.

NOTE: The procedure to remove expansion card from riser 1A, riser 3A, or riser 1B is identical.

Steps

1. Pull and lift up the expansion card retention latch lock to open.
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.

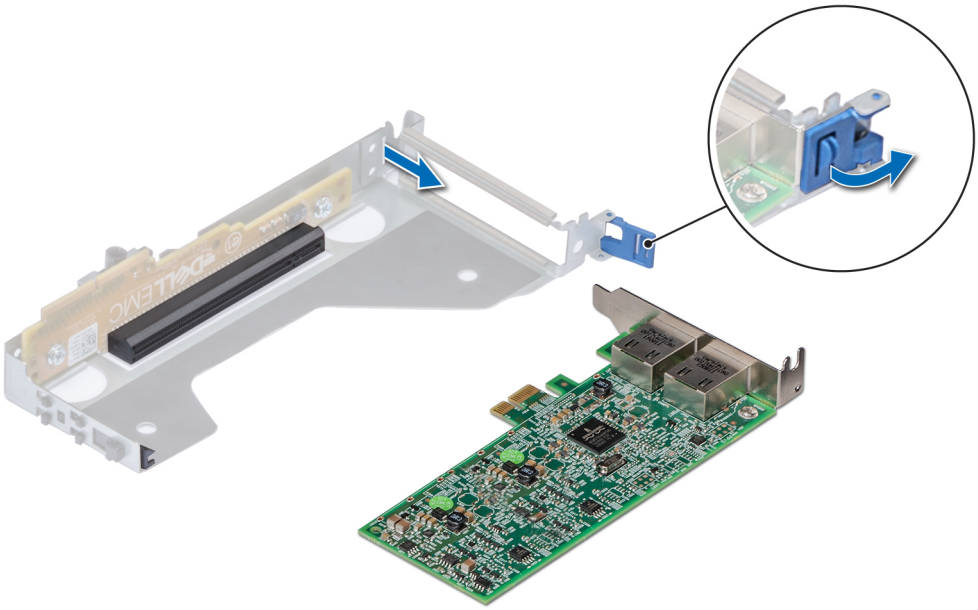


Figure 68. Removing the expansion card from the riser 3A

3. Install a filler bracket if you are not going to replace the expansion card.

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

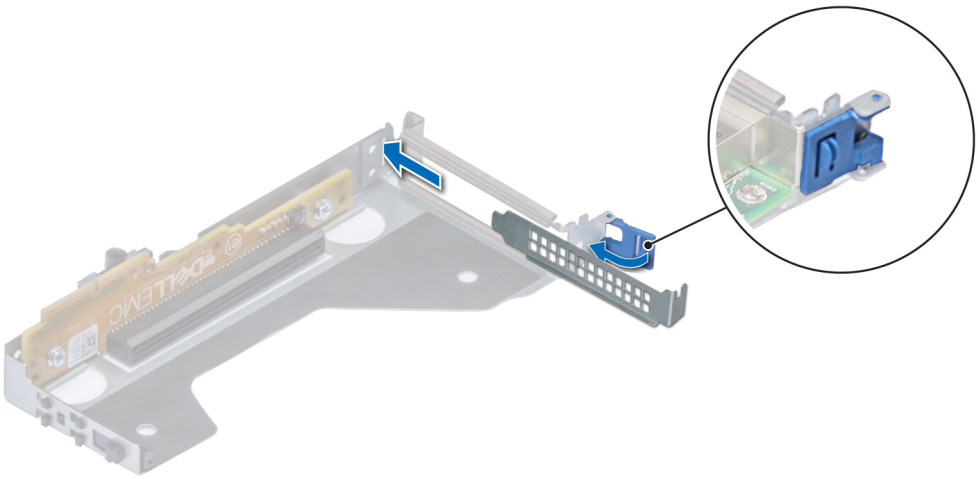


Figure 69. Installing a filler bracket for a riser 3A

Next steps

Install expansion card into the expansion card riser.

Installing expansion card into the expansion card riser

Prerequisites

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

   NOTE: For instructions, see the documentation accompanying the card.
3. When installing a card into low profile or full height riser, open the PCIe card holder latch.

NOTE: The procedure to install expansion card into the riser 1A, riser 3A, or riser 1B is identical.

Steps

1. Pull and lift up the expansion card retention latch lock to open.
2. 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.

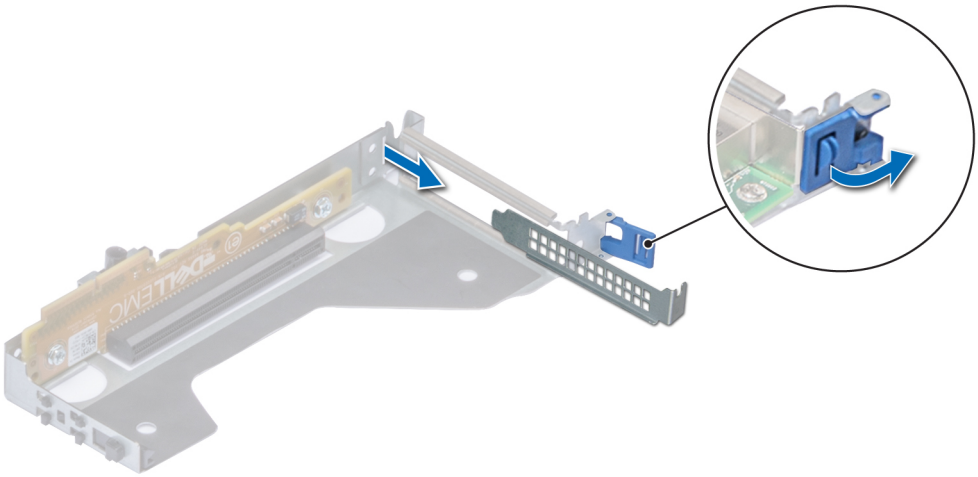


Figure 70. Removing a filler bracket for a riser 3A

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

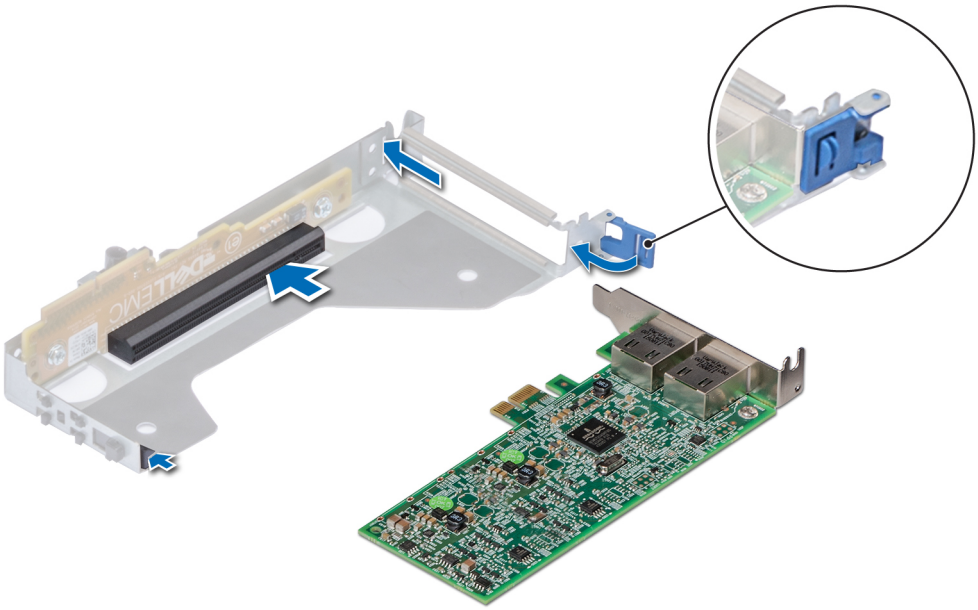


Figure 71. Installing the expansion card into a riser 3A

Next steps

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

Removing an expansion card

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Disconnect any cables connected to the expansion card.
4. Remove the air shroud.
5. If installed, remove the rear drive cage.

Steps

1. Pull and lift up the expansion card retention latch lock to open.
2. Hold the expansion card by the edge and pull the card to disconnect from the system board connector.

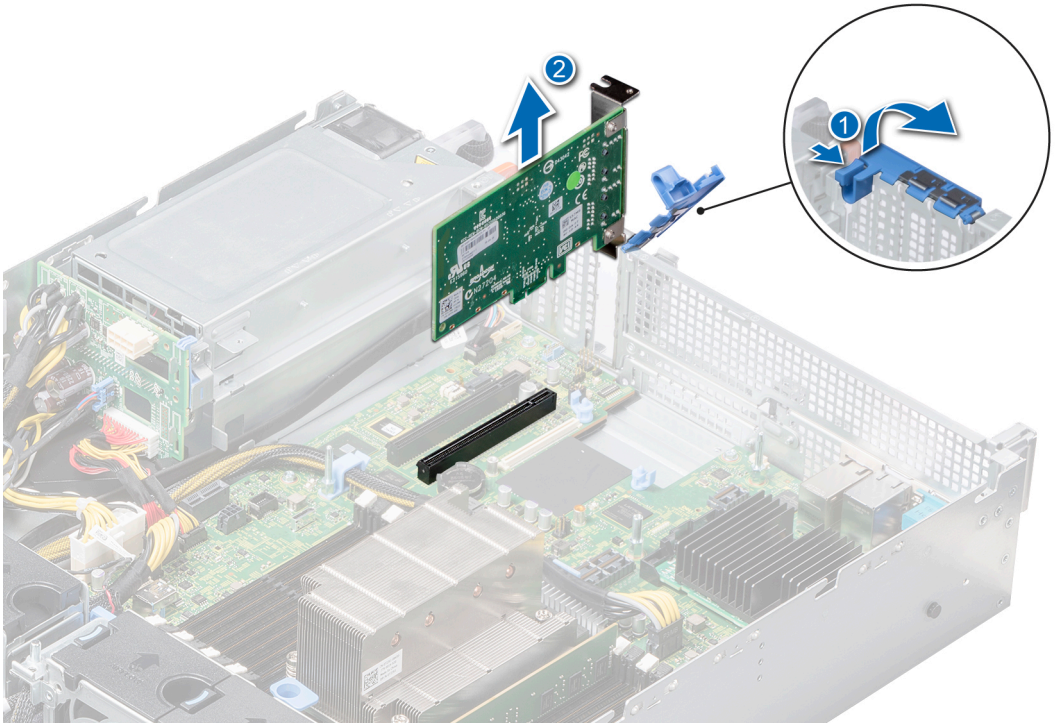


Figure 72. Removing an expansion card from the system board

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

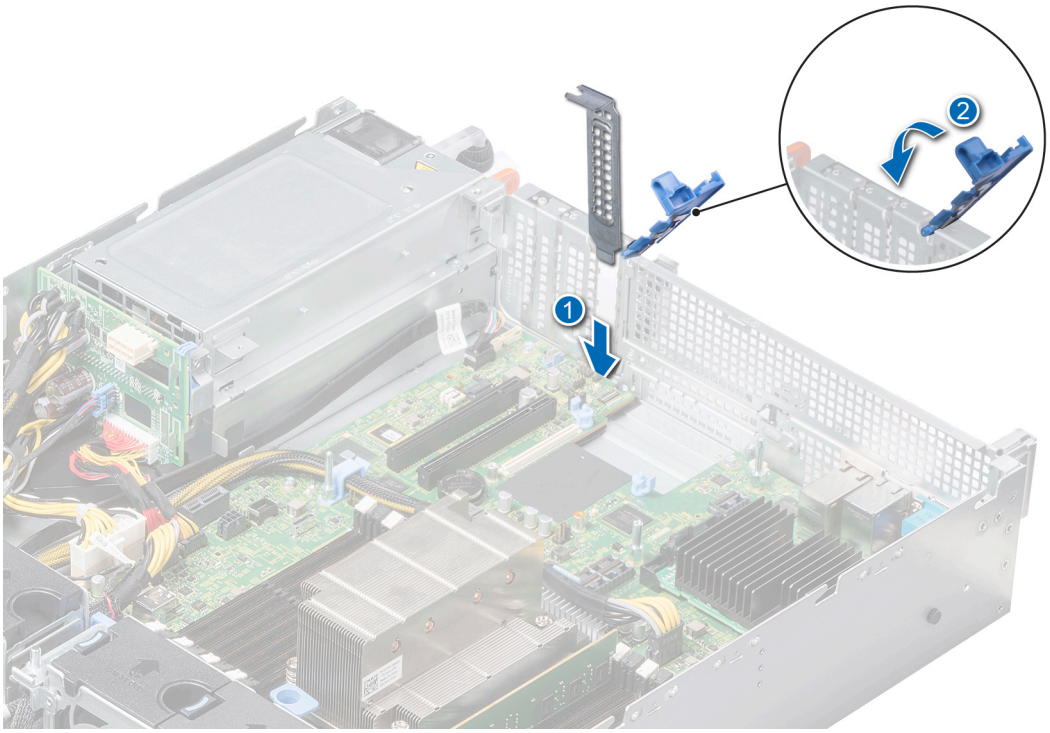


Figure 73. Installing the filler bracket

   e) Press the expansion card latch till the filler bracket locks into place.

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

Next steps

Install an expansion card.

Installing an expansion card

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

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

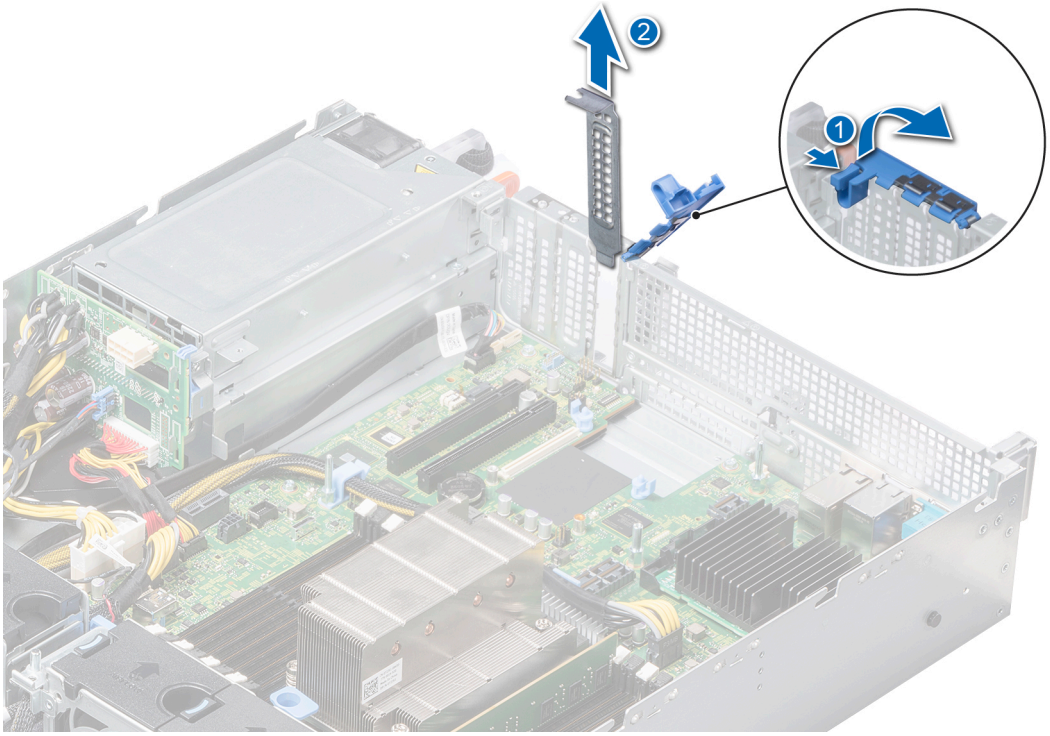


Figure 74. Removing the filler bracket

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

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

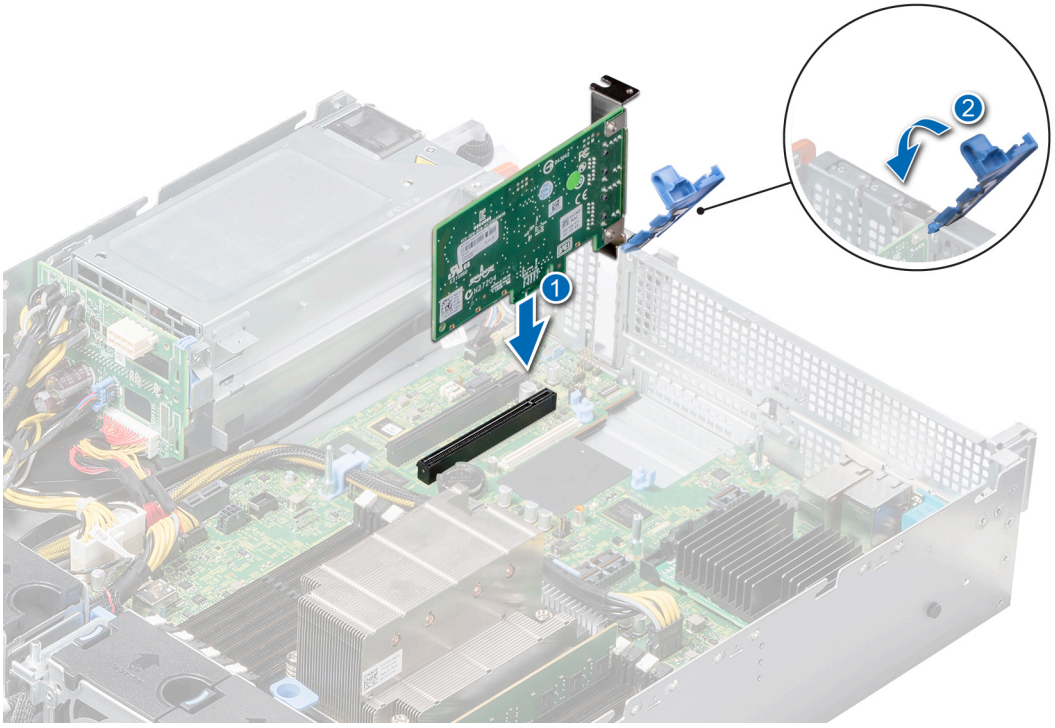


Figure 75. Installing an expansion card on the system board

Next steps

1. Connect the required cables to the expansion card.
2. Install the air shroud.
3. If removed, install the rear drive cage.
4. Follow the procedure listed in After working inside your system.

Removing expansion card risers

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Disconnect any cables connected to the expansion card.
4. Remove the air shroud.
5. If installed, remove the rear drive cage.

Steps

Hold the touch points, and lift the expansion card riser, from the riser connector, on the system board.

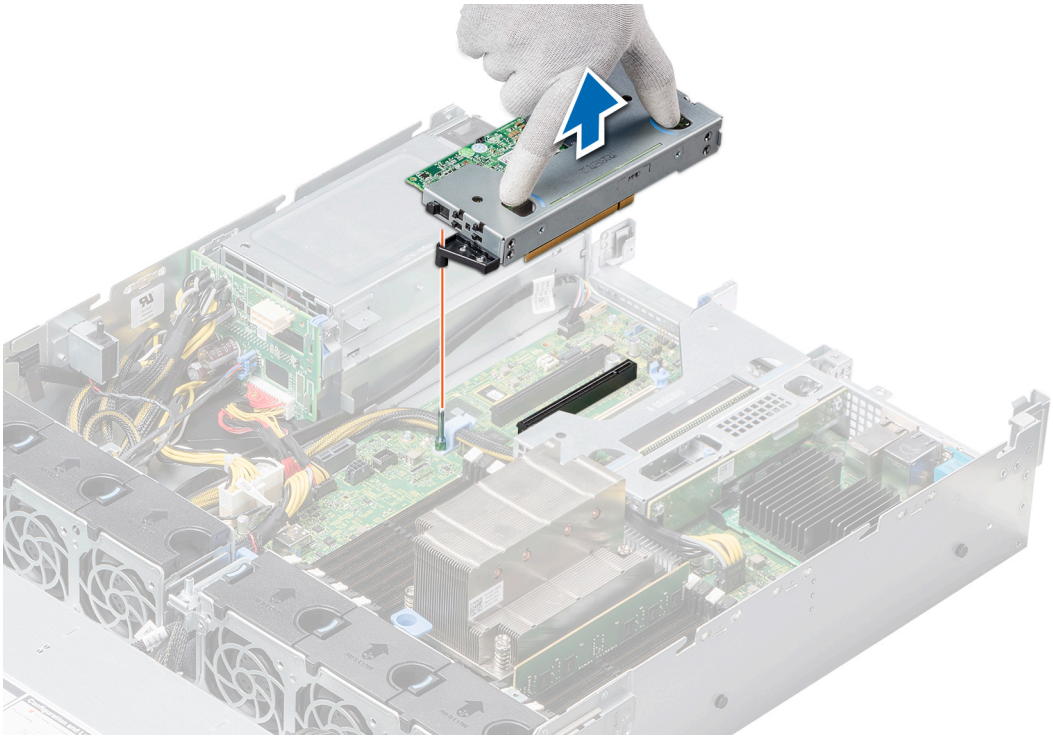


Figure 76. Removing the riser 3A

a) For the riser 1A, first loosen the captive screw and then holding the touch points lift the riser away from the system.

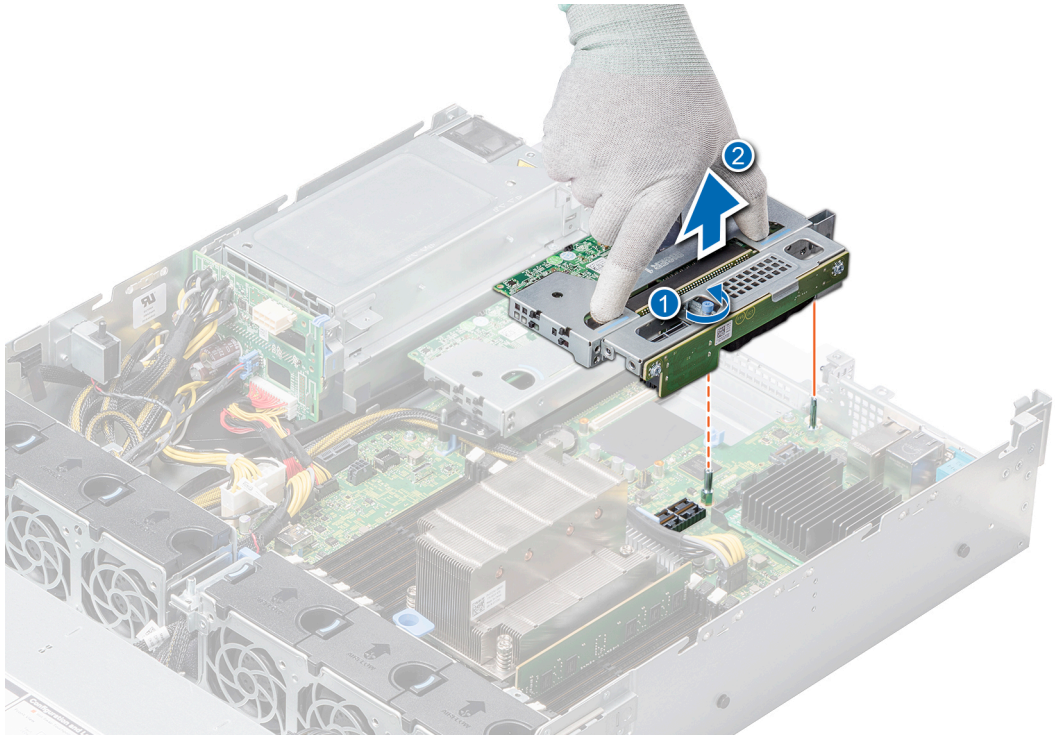


Figure 77. Removing the riser 1A

b) For the riser 1B, follow the steps below:

1. Using a Phillips #2 screwdriver, loosen the captive screws.
2. Remove the screw at the back of the riser 1B.
3. Holding the touch points, lift the riser away from the system.

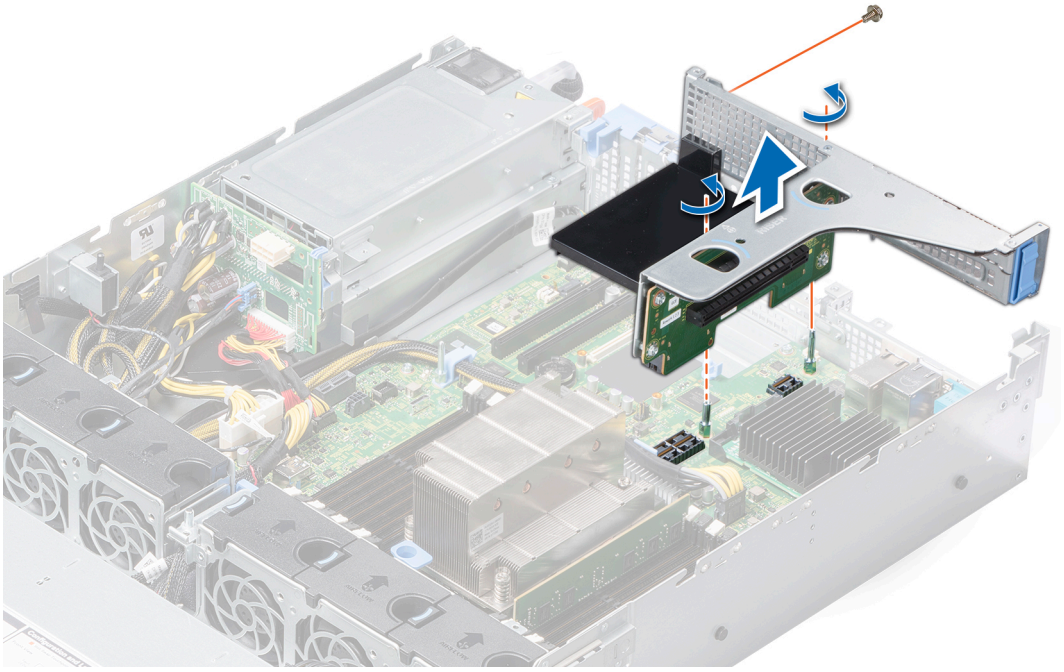


Figure 78. Removing the riser 1B

Next steps

Install the expansion card risers.

Installing the expansion card risers

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

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

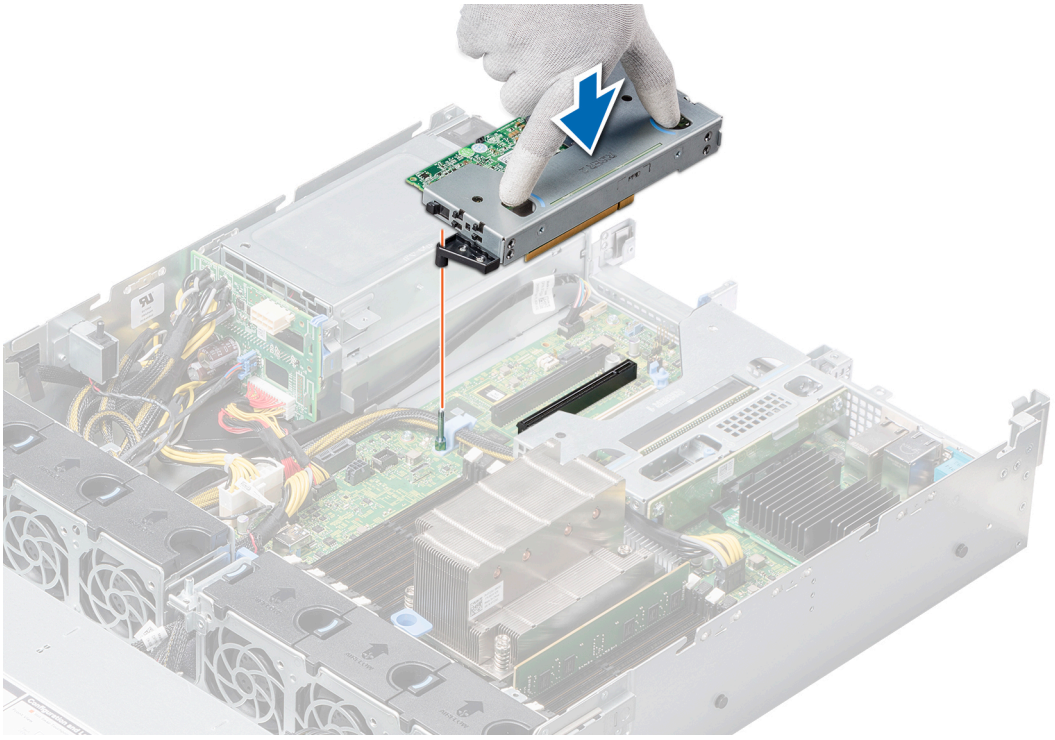


Figure 79. Installing the riser 3A

a) For the riser 1A, tighten the captive screw to secure the riser to the system board.

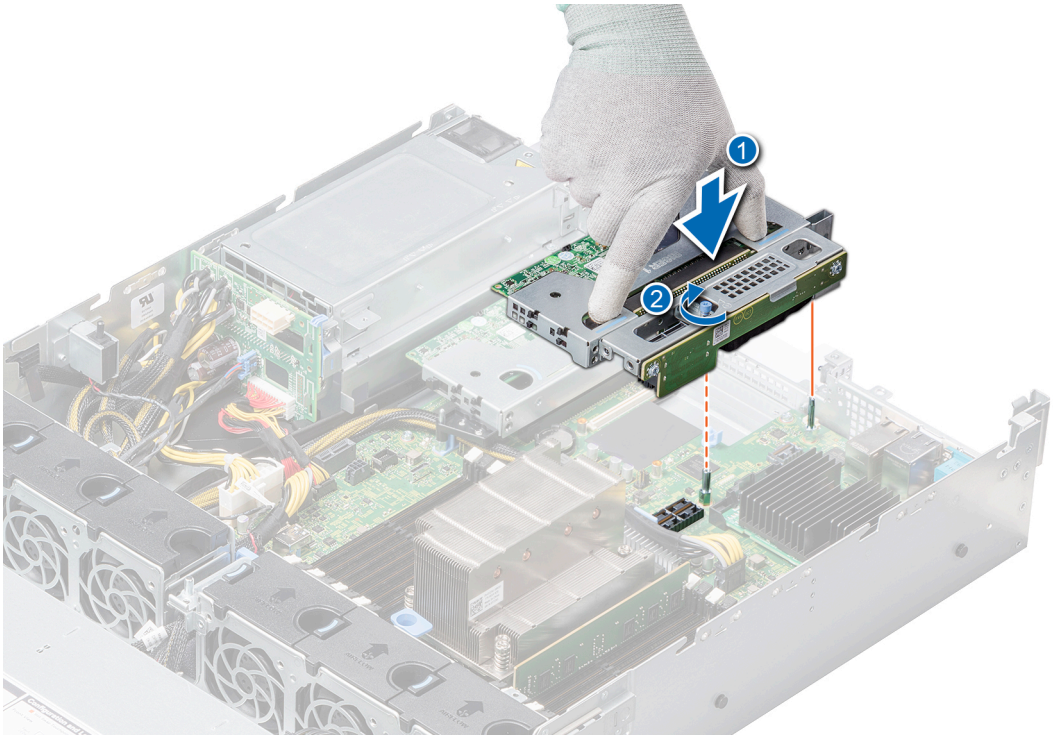


Figure 80. Installing the riser 1A

b) For the riser 1B, tighten the captive screws and replace the screw at the back of the riser to firmly hold the riser to the system board.

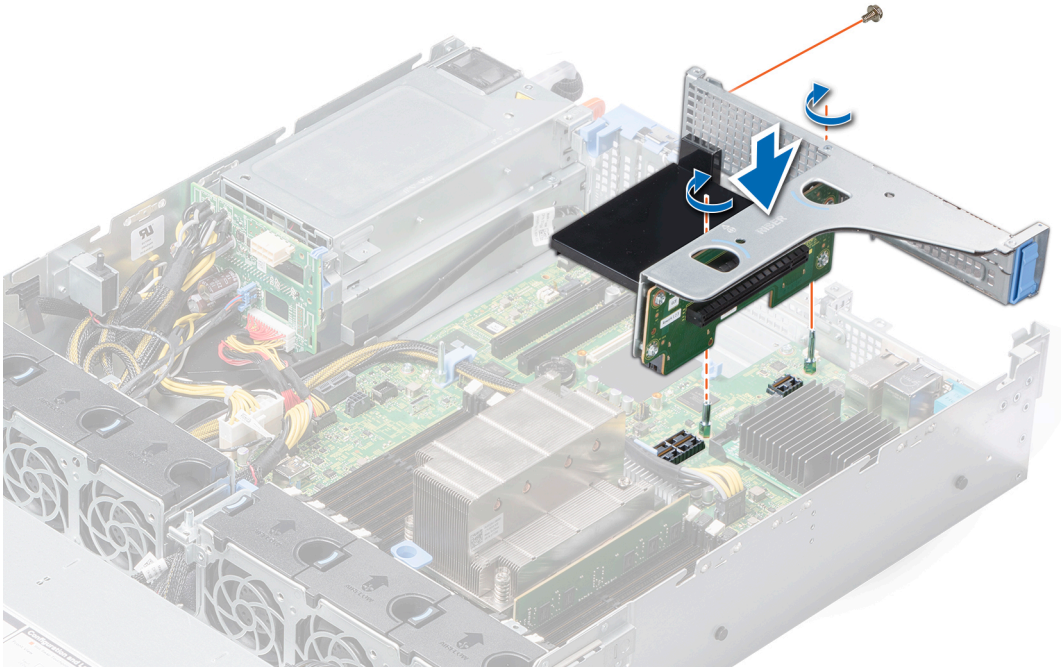


Figure 81. Installing the riser 1B

Next steps

1. Install the air shroud.
2. If removed, install the rear drive cage.
3. Install any device drivers required for the card as described in the documentation for the card.
4. Follow the procedure listed in After working inside your system.

Optional MicroSD or vFlash card

Removing the MicroSD card

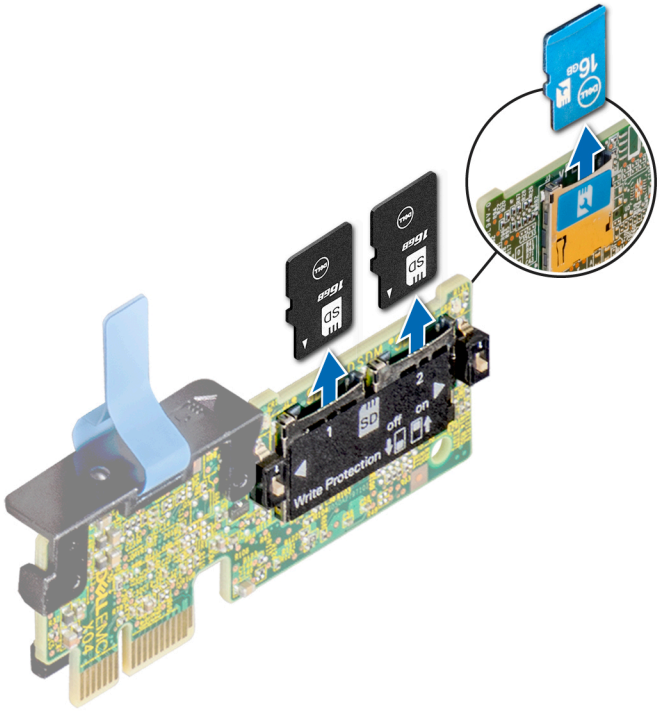
Prerequisites

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

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

Installing the MicroSD card.

Installing the MicroSD card

Prerequisites

Follow the safety guidelines listed in Safety instructions.

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

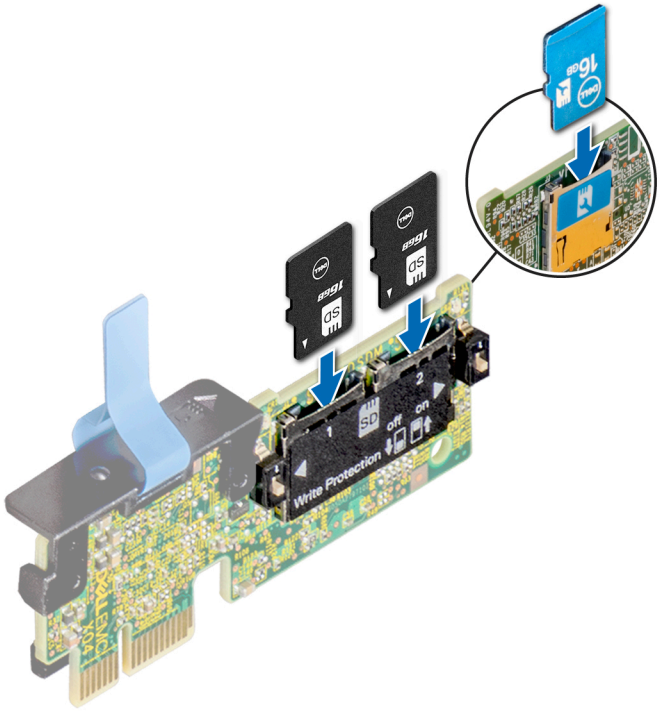
NOTE: If reinstalling, ensure that you install the MicroSD cards into the same slots based on the labels you had marked on the cards during removal.

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. Install the air shroud.
2. Follow the procedure listed in After working inside your system.

Optional IDSDM or vFlash module

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

Removing the IDSDM or vFlash module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.
4. If you are replacing the IDSDM or vFlash module, remove the MicroSD cards.

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

Steps

1. Locate the IDSDM or vFlash connector on the system board.

   To locate IDSDM or vFlash connector, see the System board jumpers and connectors section.
2. Holding the pull tab, lift the IDSDM or vFlash module out of the system.

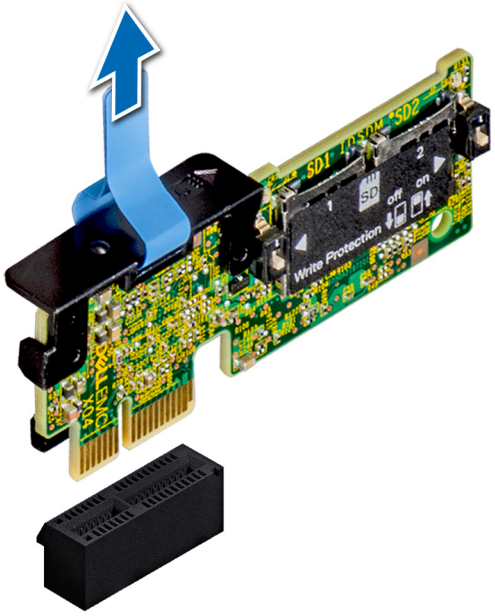


Figure 82. Removing the optional IDSDM/vFlash module

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

Next steps

Install the IDSDM or vFlash module.

Installing the IDSDM or vFlash module

Prerequisites

Follow the safety guidelines listed in Safety instructions.

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.

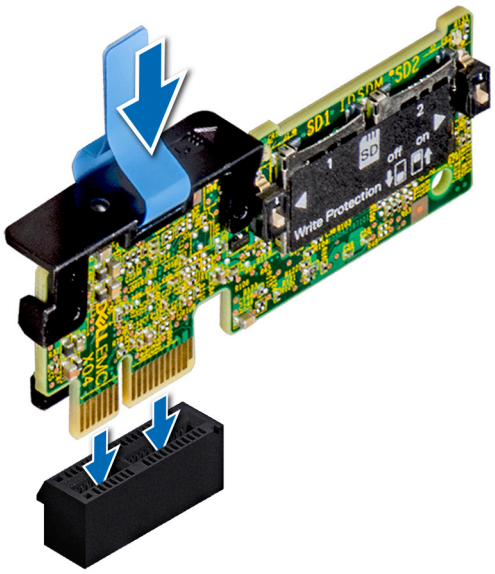


Figure 83. Installing optional IDSDM/vFlash card

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. Install the air shroud.
3. Follow the procedure listed in After working inside your system.

LOM riser card

Removing the LOM riser card

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.
4. If installed, remove the rear drive cage.
5. If installed, remove the risers.

Steps

1. Using a Phillips #2 screwdriver, remove 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 disconnect the card 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.

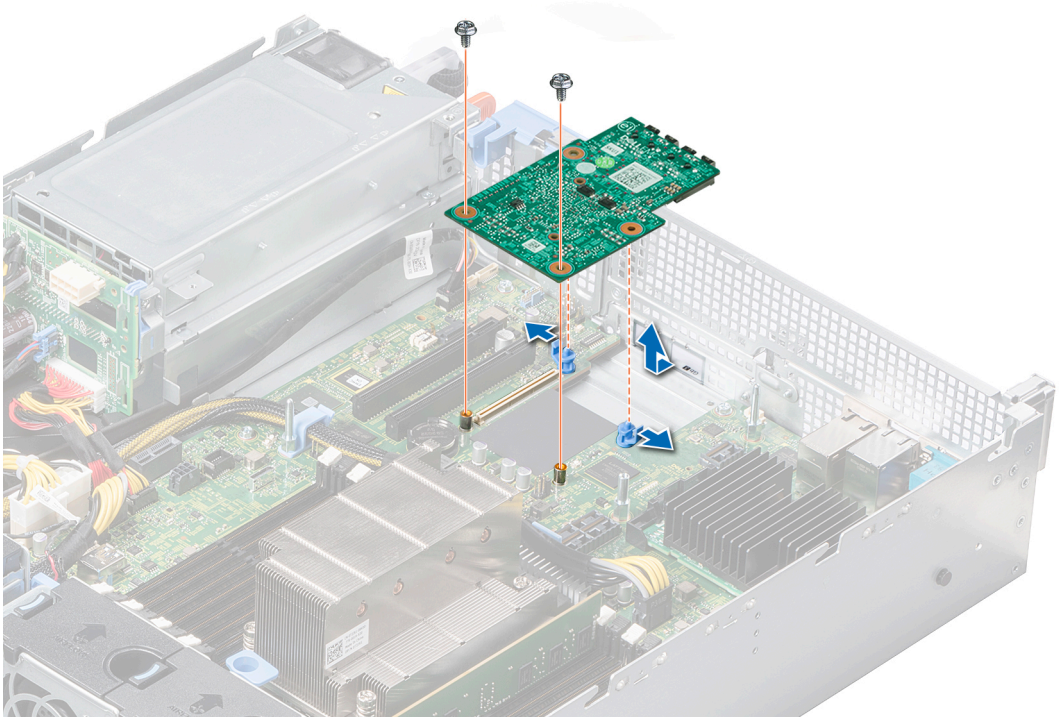


Figure 84. Removing the LOM riser card

5. Lift the LOM riser card out of the system.
6. Remove the LOM riser bracket.
   a) Using a Phillips #2 screwdriver, remove the screw that secures the bracket to the chassis.
   b) Slide the bracket out of the slot on the chassis.

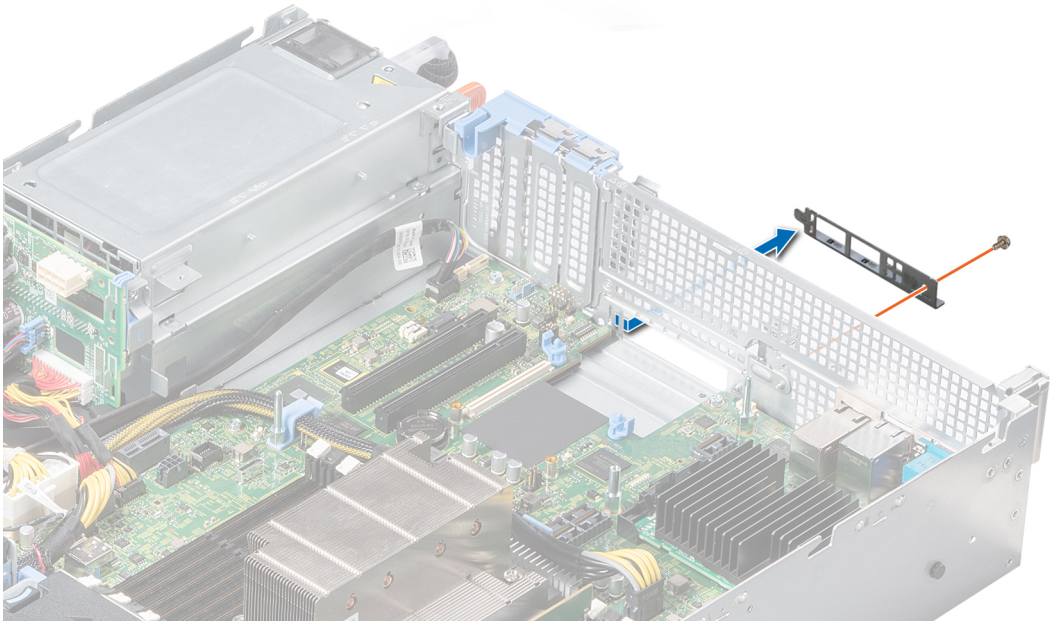


Figure 85. Removing the LOM riser bracket

7. If the LOM riser card is not being replaced immediately, install the LOM filler bracket.
   a) Insert and slide the LOM filler bracket into the slot on the chassis.
   b) Using a Phillips #2 screwdriver, secure the LOM filler bracket to the chassis with a screw

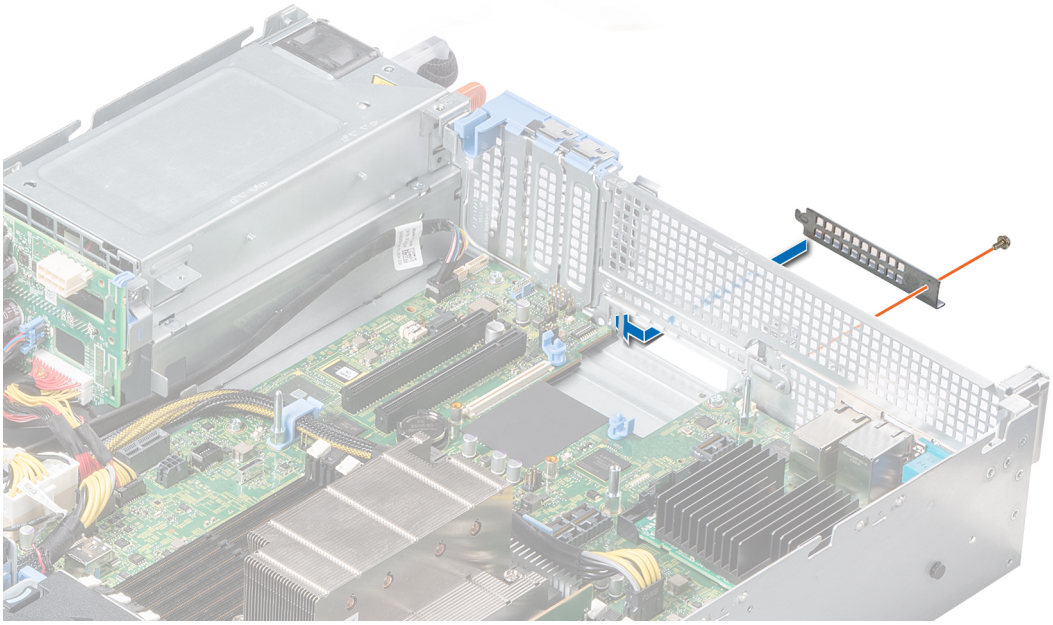


Figure 86. Installing the LOM filler bracket

Next steps

Install the LOM riser card.

Installing the LOM riser card

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Remove the LOM filler bracket.
   a) Using a Phillips #2 screwdriver, remove the screw that secures the bracket to the chassis.
   b) Slide the LOM filler bracket out of the slot on the chassis.

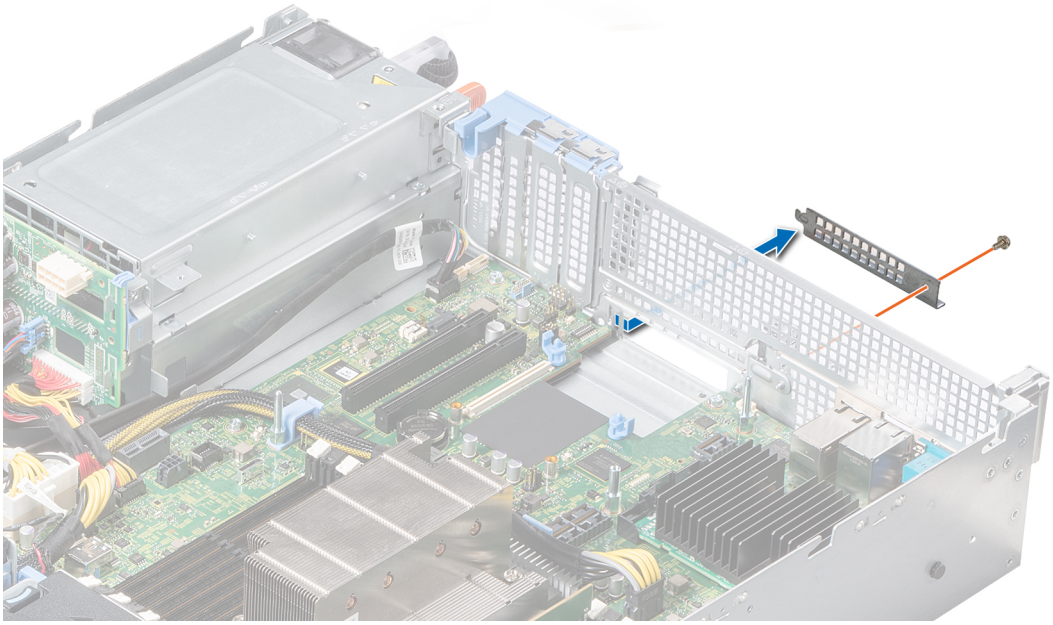


Figure 87. Removing the LOM filler bracket

2. Install the LOM riser bracket.
   a) Insert and slide the LOM riser bracket into the slot on the chassis.
   b) Using a Phillips #2 screwdriver, secure the bracket to the chassis with a screw.

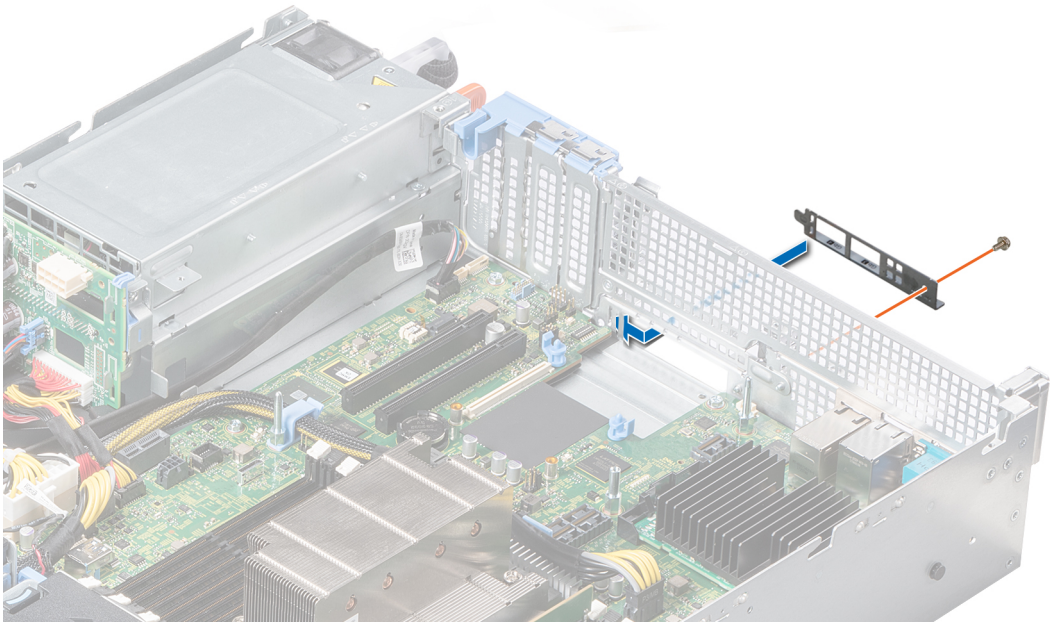


Figure 88. Installing the LOM riser bracket

3. Align and slide the LOM riser card to fit into the slot on the back panel of the system.
4. Press the LOM riser card until the card is firmly seated on the system board connector and the two blue plastic snap holds the LOM riser card in place.
5. Using a Phillips #2 screwdriver, secure the LOM riser card to the system board with the two screws.

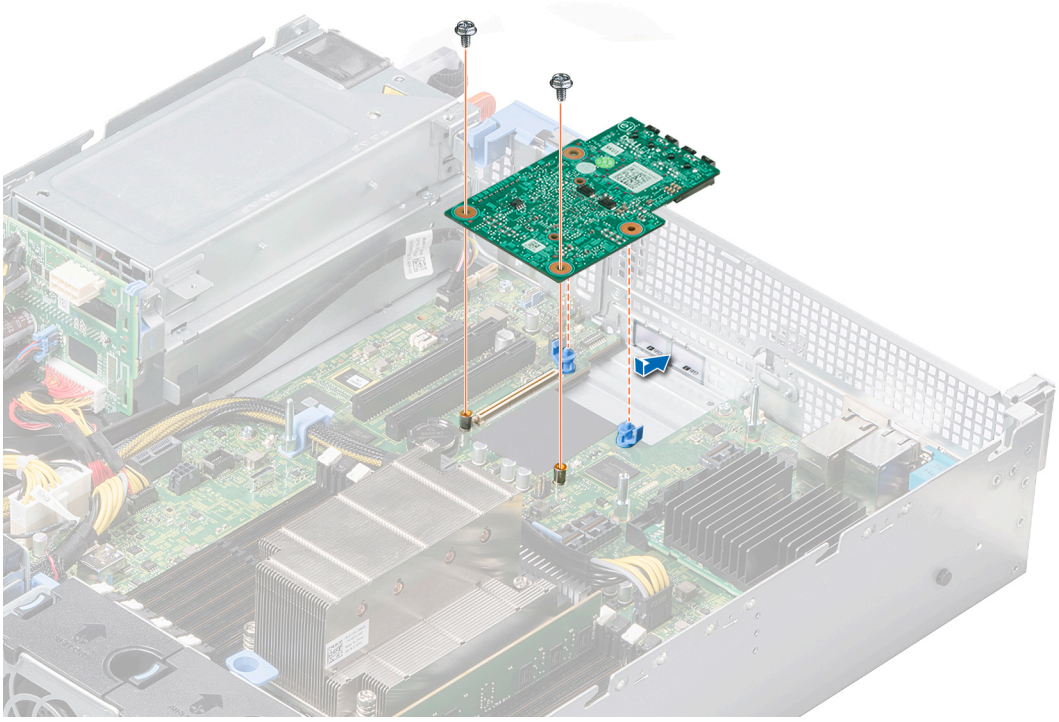


Figure 89. Installing the LOM riser card

Next steps

1. If removed, install the risers.
2. If removed, install the rear drive cage.
3. Install the air shroud.
4. Follow the procedure listed in After working inside your system.

Mini PERC card

Your system includes a dedicated expansion card slot on the system board for the primary storage controller card. The mini PERC card provides the storage subsystem for internal drives of your system. The mini PERC card supports SAS and SATA drives and also enables you to set up the drives in RAID configurations as supported by the version of the mini PERC card.

Removing the mini PERC card

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.
4. If installed, remove the rear drive cage.
5. If installed, remove the riser 1B.

Steps

1. Using a Phillips #2 screwdriver, loosen the screws that secure the cable to the mini PERC card.
2. Holding the tab, lift the cable to disconnect from the mini PERC card.
3. Slide out the mini PERC card to disengage it from the card holder on the system board.
4. Lift the mini PERC card out of the system.

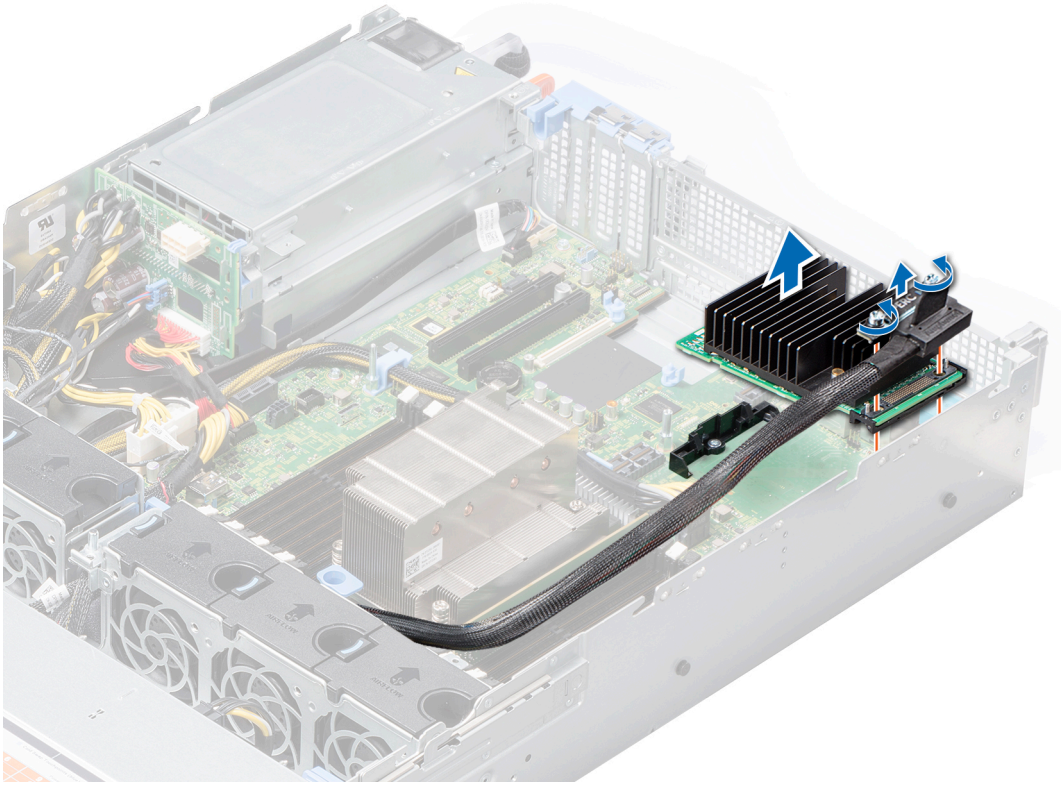


Figure 90. Removing the mini PERC card

Next steps

Install the mini PERC card.

Installing the mini PERC card

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Slide the mini PERC card at an angle into the card holder on the system board.
2. Lower the mini PERC card into place until the mini PERC card is firmly seated on the card holder.
3. Route the cable along the side walls of the chassis.
4. Align the screws on the cable with the screw holes on the mini PERC card.
5. Using a Phillips #2 screwdriver, secure the cable to the mini PERC card with the screws.

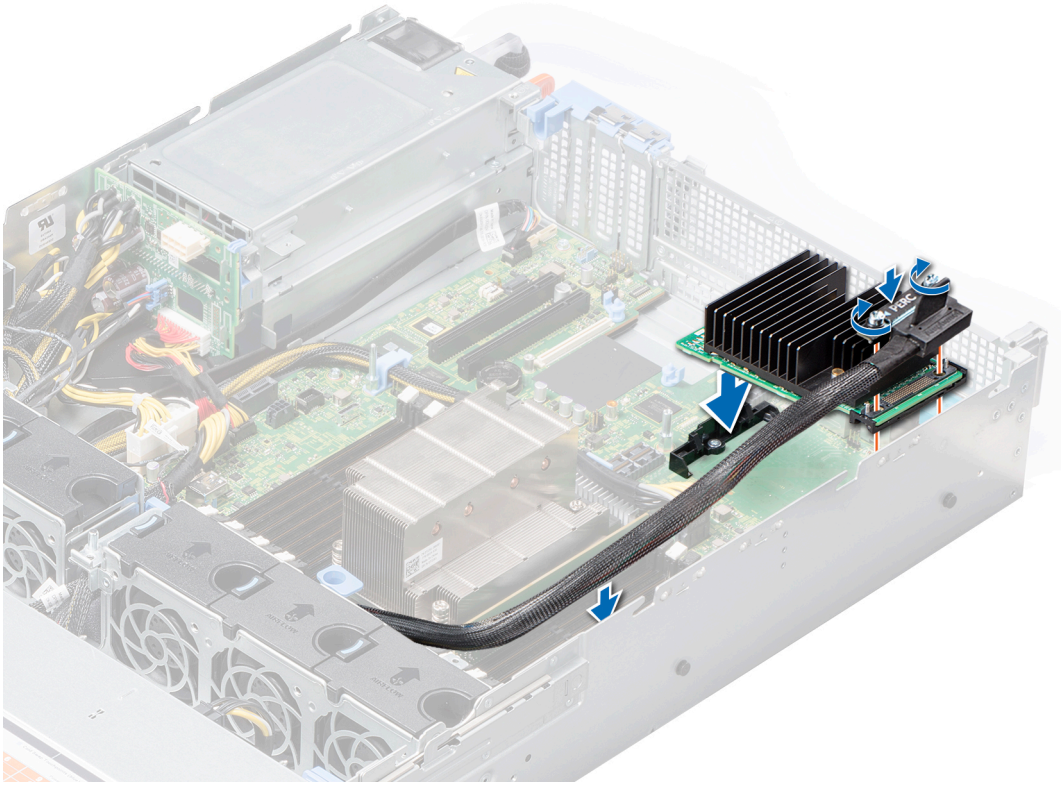


Figure 91. Installing the mini PERC card

Next steps

1. If removed, install the riser 1B.
2. Install the air shroud.
3. If removed, install the rear drive cage.
4. Follow the procedure listed in After working inside your system.

Cable routing

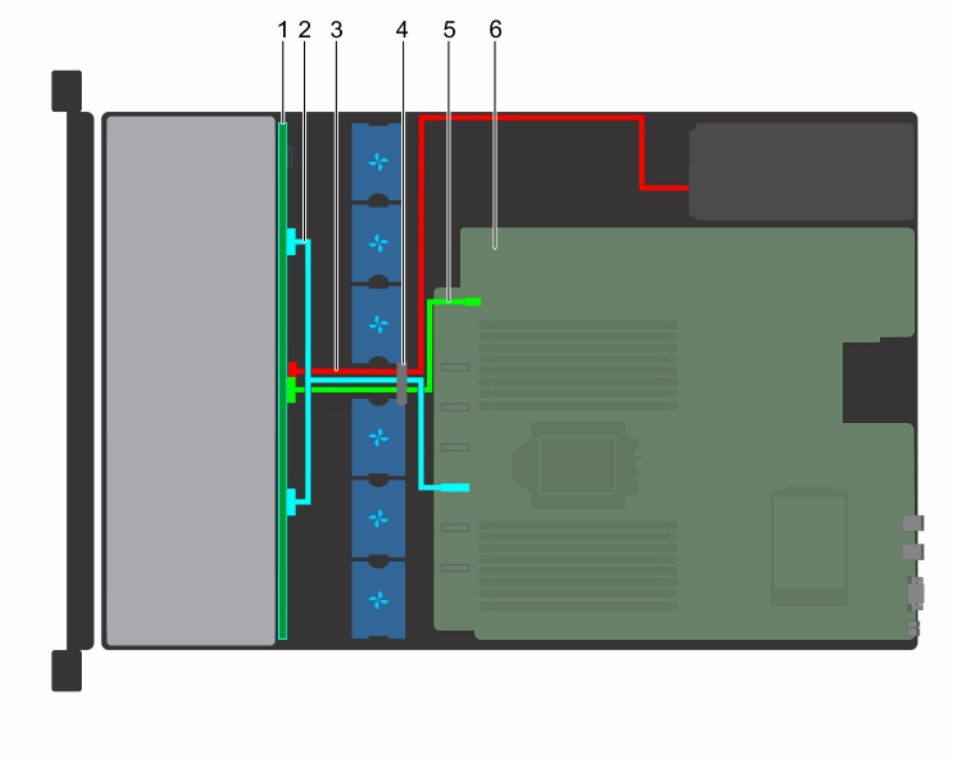


Figure 92. Cable routing - 8 x 3.5 inch drive backplane

1. Drive backplane
2. SATA cable
3. Power cable
4. Cable guiding latch
5. Signal cable
6. System board

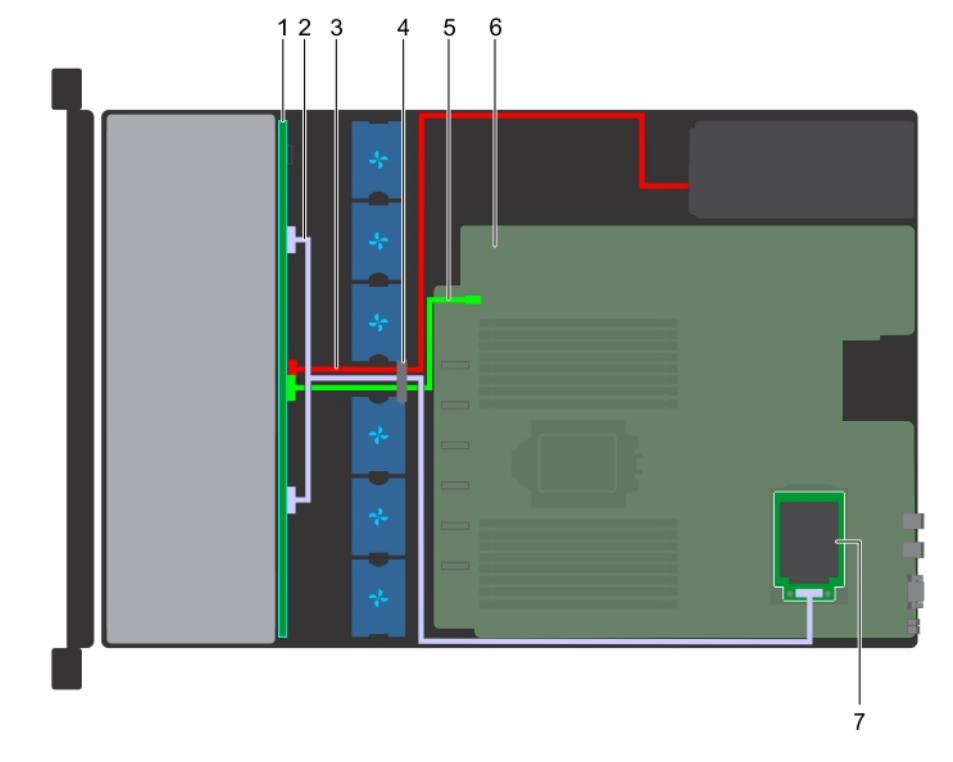


Figure 93. Cable routing - 8 x 3.5 inch drive backplane with mini PERC card

1. Drive backplane
2. SAS cable
3. Power cable
4. Cable guiding latch
5. Signal cable
6. System board
7. Mini PERC card

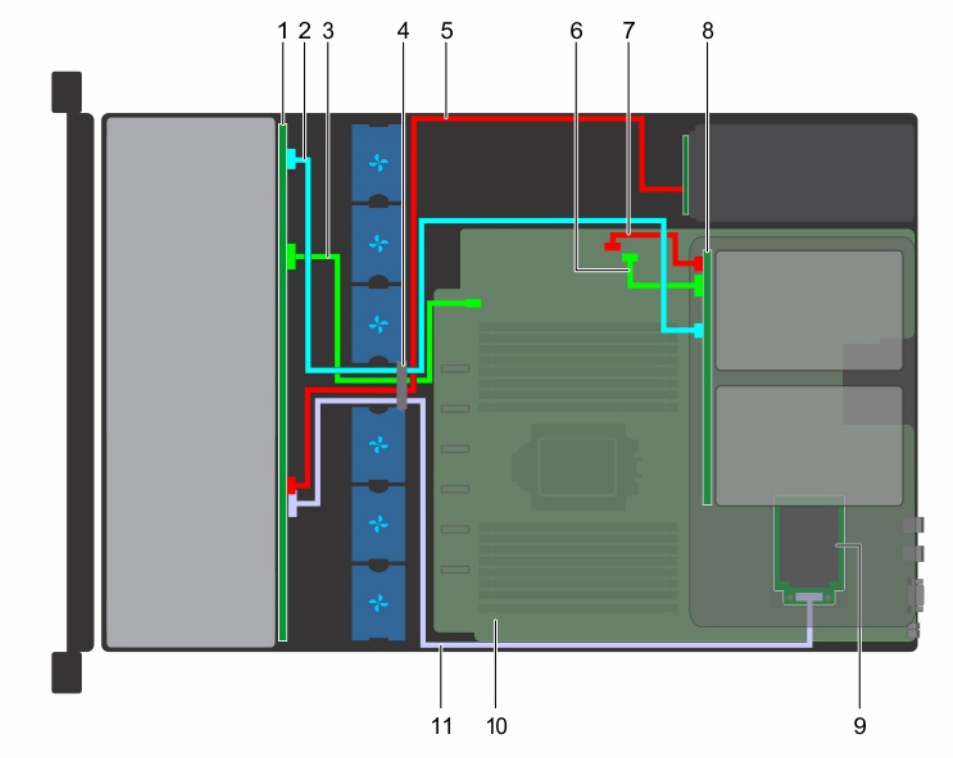


Figure 94. Cable routing - 12 x 3.5 inch drive backplane with 2 x 3.5 inch rear drive backplane

1. Drive backplane
2. SAS cable

3. Signal cable
4. Cable guiding latch
5. Power cable
6. Rear drive signal cable
7. Rear drive power signal
8. Rear drive backplane
9. Mini PERC card
10. System board
11. SAS cable

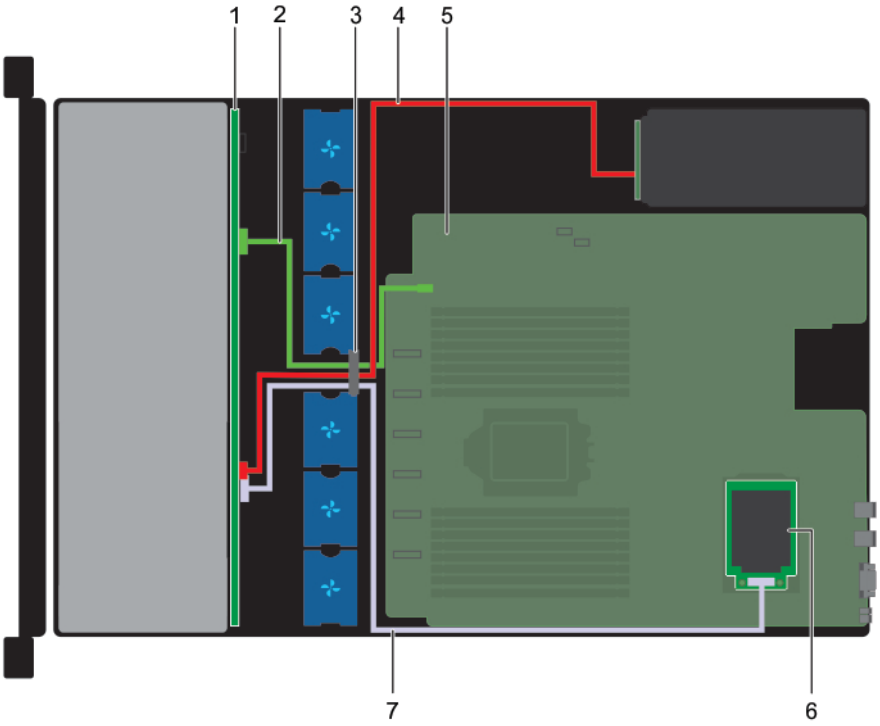


Figure 95. Cable routing - 12 x 3.5 inch drive backplane

1. Drive backplane
2. Signal cable
3. Cable guiding latch
4. Power cable
5. System board
6. Mini PERC card
7. SAS cable

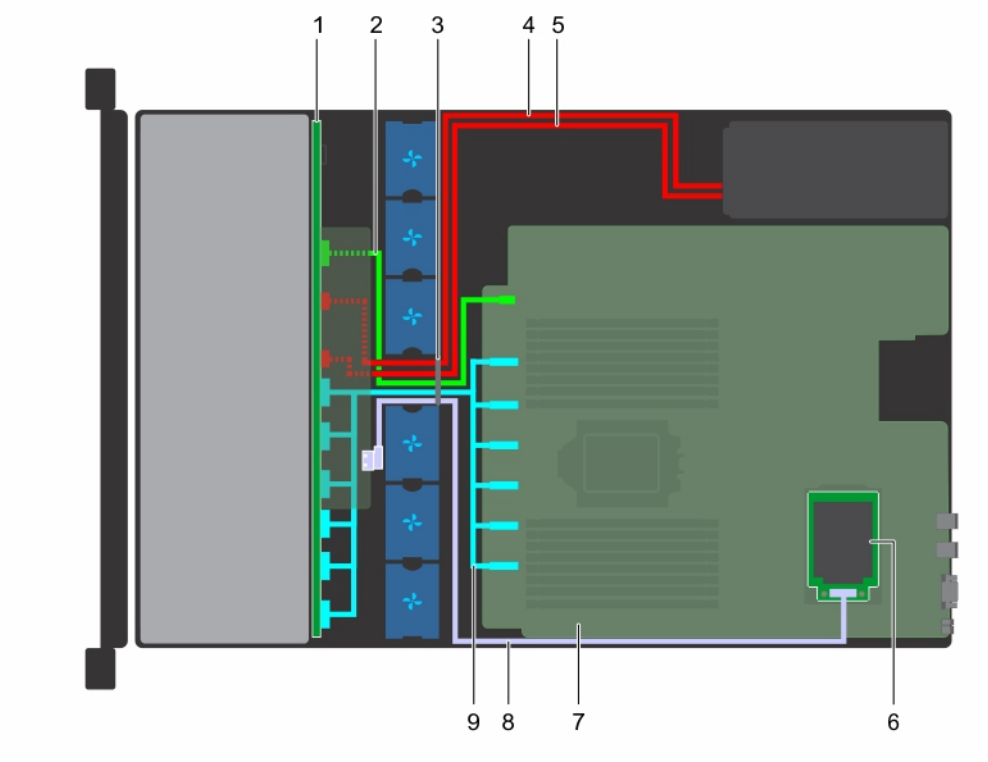


Figure 96. Cable routing - 12 x 2.5 inch SAS drive + 12 x 2.5 inch NVMe drive backplane

1. Drive backplane
2. Signal cable
3. Cable guiding latch
4. Power cable
5. Power cable
6. Mini PERC card
7. System board
8. SAS cable
9. PCIe cable

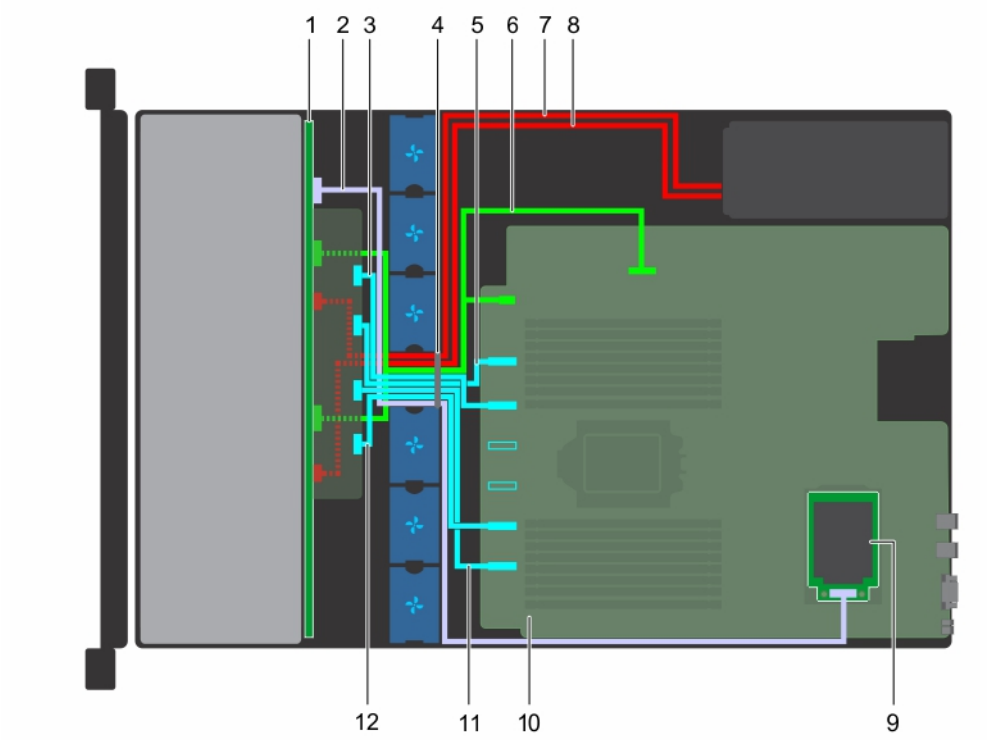


Figure 97. Cable routing - 24 x 2.5 inch NVMe drive backplane

1. Drive backplane
2. SAS cable
3. PCIe cable
4. Cable guiding latch
5. PCIe cable
6. Signal cable
7. Power cable
8. Power cable
9. Mini PERC card
10. System board
11. PCIe cable
12. PCIe 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.
2. Follow the procedure listed in Before working inside your system.
3. If applicable, disconnect the power or data cables from the expansion card(s).
4. If installed, remove the riser 3A.
5. Remove the LOM riser card.

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.

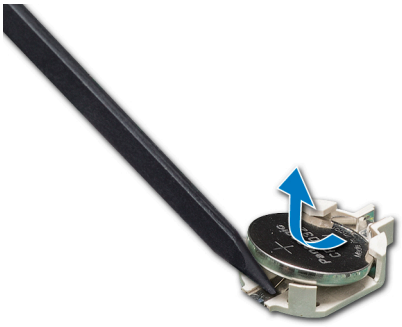


Figure 98. Removing the system battery

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.

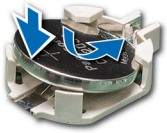


Figure 99. Installing the system battery

Next steps

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

Optional internal USB memory key

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

An optional USB memory key can be installed in the internal USB 3.0 port.

NOTE: To locate the internal USB port on the system board, see the System board jumpers and connectors section.

Replacing 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.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.

Steps

1. Locate the USB port or USB memory key on the system board.
   To locate the internal USB port on the system board, see the System board jumpers and connectors section.
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. Install the air shroud.
2. Follow the procedure listed in After working inside your system.
3. While booting, press F2 to enter **System Setup** and verify that the system detects the USB memory key.

Optional optical drive

Optical drives retrieve and store data on optical discs such as CD and DVD. Optical drives can be categorized into two basic types: optical disc readers and optical disc writers.

Removing the optical drive

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. If installed, remove the front bezel.
4. Disconnect the power and data cables from the connectors on the optical drive.

NOTE: Ensure that you note the routing of the power and data cable on the side of the system as you remove them from the system board and drive. Route these cables properly when you replace them to prevent them from being pinched or crimped.

Steps

1. Press the release tab to release the optical drive.
2. Slide the optical drive out of the system until it is free of the optical drive slot.

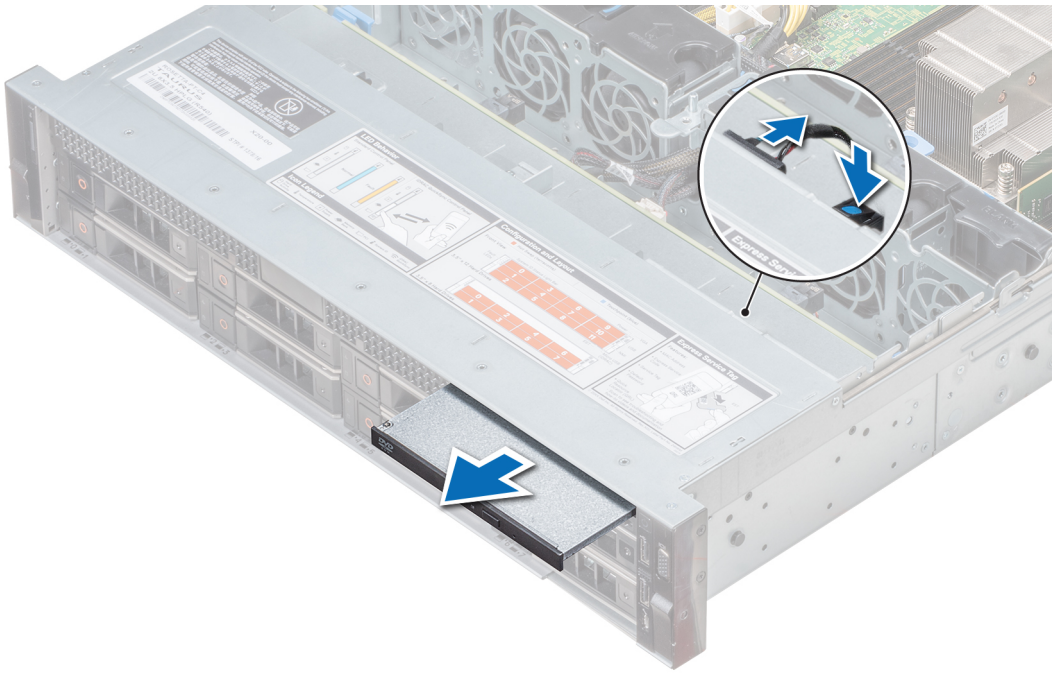


Figure 100. Removing optical drive

3. If you are not installing a new optical drive, install the optical drive blank. The procedure to install the optical drive blank is the same as the optical drive.

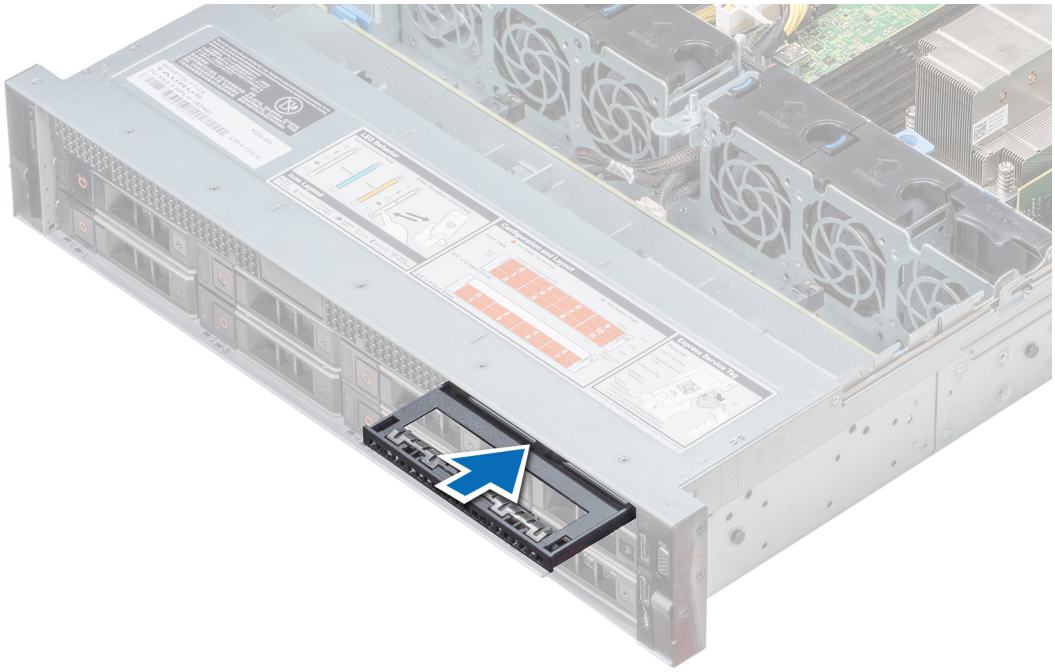


Figure 101. Installing optical drive blank

Next steps

Install an optical drive.

Installing the optical drive

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. If installed, remove the optical drive blank. The procedure to remove an optical blank is similar to the optical drive.

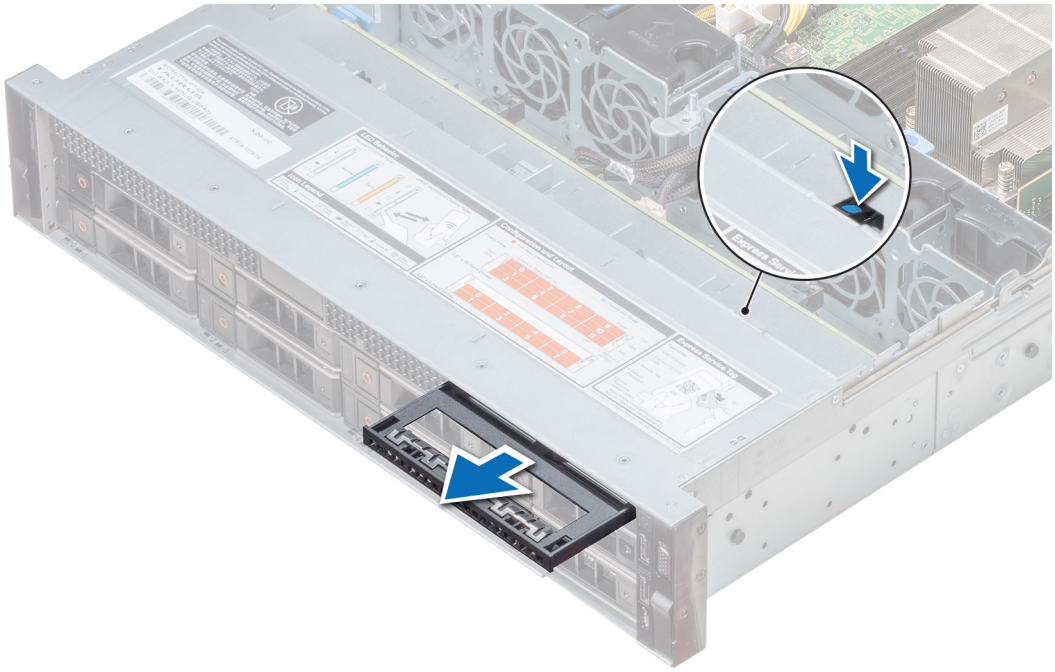


Figure 102. Removing optical blank

2. Align the optical drive with the optical drive slot on the front of the system.
3. Slide in the optical drive until the release tab snaps into place.

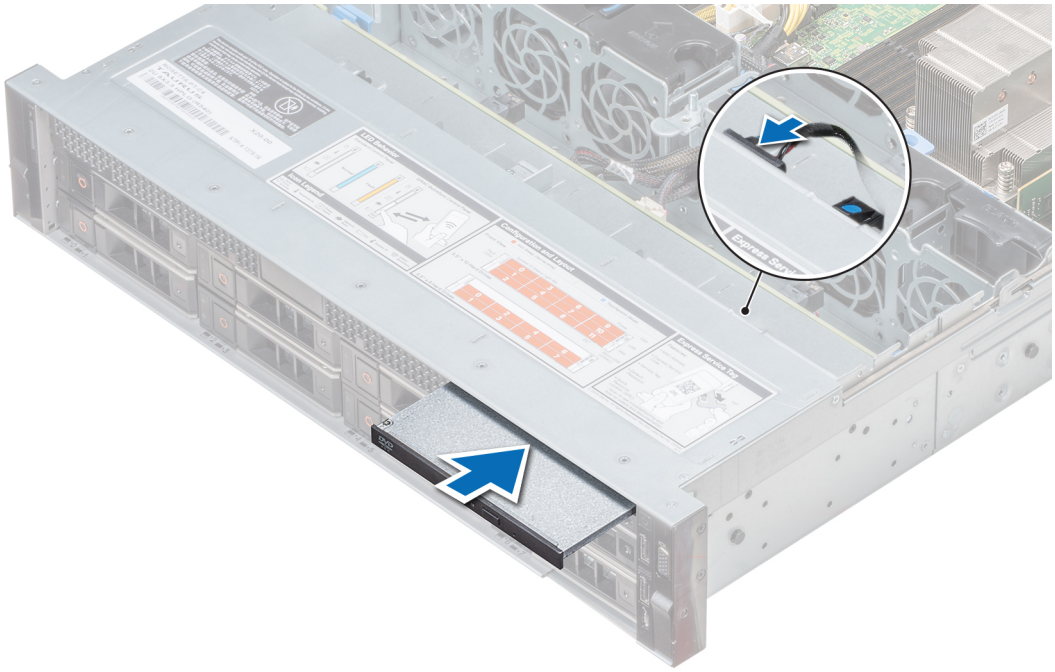


Figure 103. Installing optical drive

Next steps

1. Connect the power and data cables to the connector on the optical drive and the connector on the system board.

   NOTE: Route the cable properly on the side of the system to prevent it from being pinched or crimped.
2. If removed, install the front bezel.
3. Follow the procedure listed in After working inside your system.

Power supply units

The power supply unit (PSU) is an internal hardware component which supplies power to the components in the system.

Your system supports one of the following:

- Two 1600 W, 1100 W, 750 W, or 495 W AC PSUs
- Two 1100 W, 750 W Mixed Mode HVDC (for China only) PSUs
- Two 750 W Mixed Mode AC, DC (DC for China only) PSUs
- One 450 W cabled AC PSU

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

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 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 to maximize efficiency.

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

Hot spare feature

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

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

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

The default PSU settings are as follows:

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

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

Removing a power supply unit blank

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

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

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

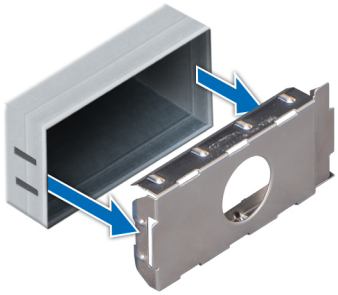


Figure 104. Removing a power supply unit blank

Next steps

Install the PSU or PSU blank.

Installing a power supply unit blank

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Install the power supply unit (PSU) blank only in the second PSU bay.

Steps

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

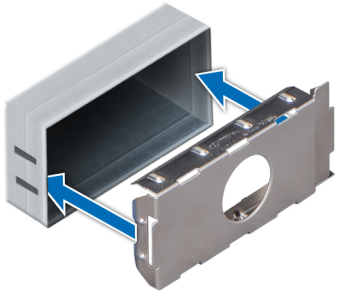


Figure 105. Installing a power supply unit blank

Removing a power supply unit

The procedure for removing AC and DC PSUs is identical.

Prerequisites

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

1. Follow the safety guidelines listed in Safety instructions.
2. Disconnect the power cable from the power source and from the PSU you intend to remove, and then remove the cable from the strap on the PSU handle.
3. 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 www.dell.com/poweredgemanuals.

Steps

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

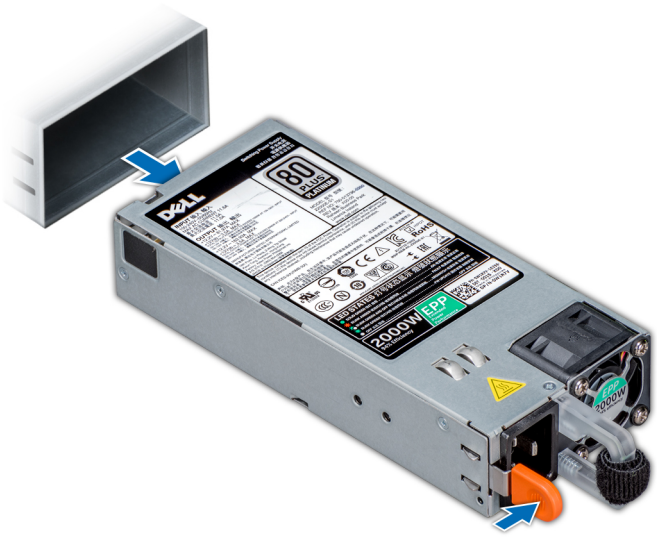


Figure 106. Removing a power supply unit

Next steps

Install the PSU or the PSU blank.

Installing a power supply unit

The procedure for installing AC and DC PSUs is identical.

Prerequisites

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

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

Steps

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

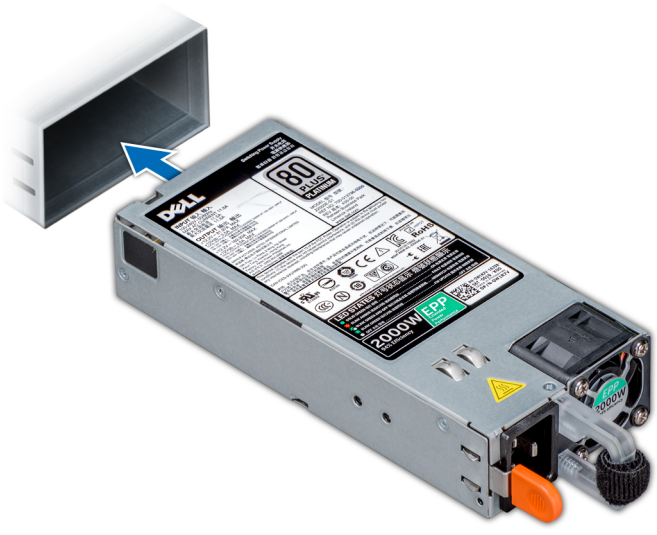


Figure 107. Installing a power supply unit

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 www.dell.com/poweredgemanuals.
2. Connect the power cable to the PSU, and plug the cable into a power outlet.

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

NOTE: When installing, hot swapping, or hot adding a new PSU, wait for 15 seconds for the system to recognize the PSU and determine its status. The PSU redundancy may not occur until discovery is complete. 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.

Removing a non-redundant cabled AC power supply unit

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.
4. Disconnect all the cables from the connectors on the system board.
5. If installed, remove the expansion card riser.

Steps

1. Using a Phillips #2 screwdriver, remove the screw securing the PSU to the system.
2. Slide the PSU out of the PSU cage.

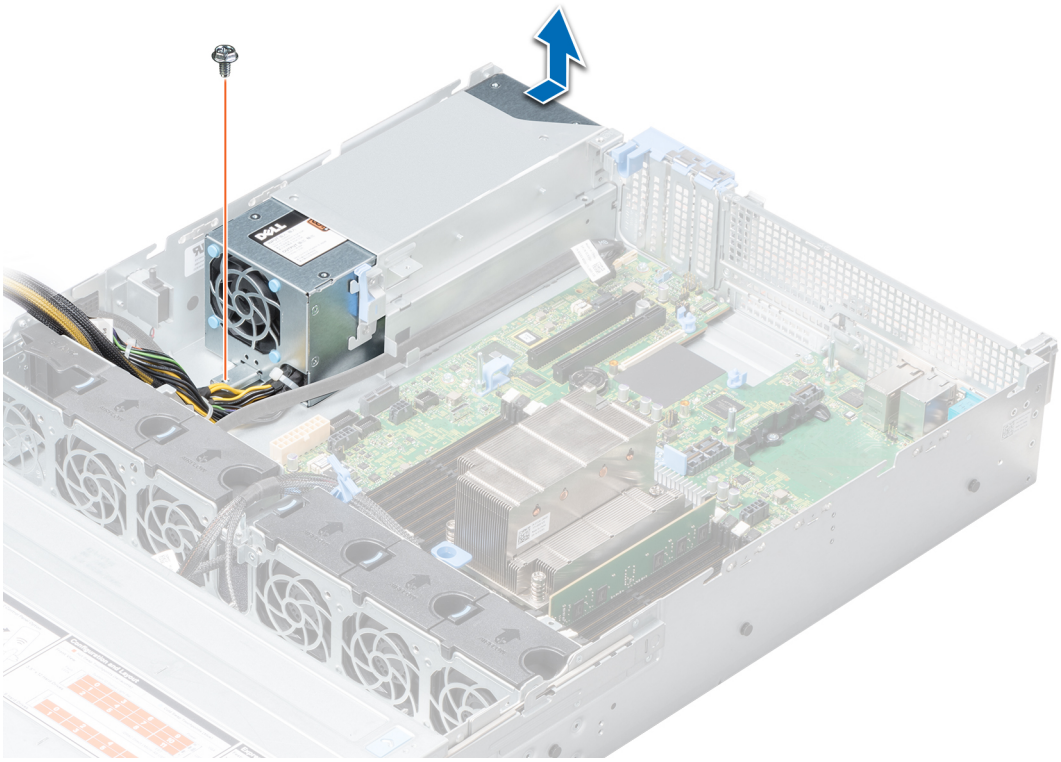


Figure 108. Removing a non-redundant cabled AC PSU

Next steps

1. Installing a non-redundant cabled AC PSU.

Installing a non-redundant cabled AC power supply unit

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Unpack the new power supply unit (PSU).
2. Slide the new PSU into the PSU cage until the PSU is fully seated.
3. Using a Phillips #2 screwdriver, secure the PSU to the system with the screw.

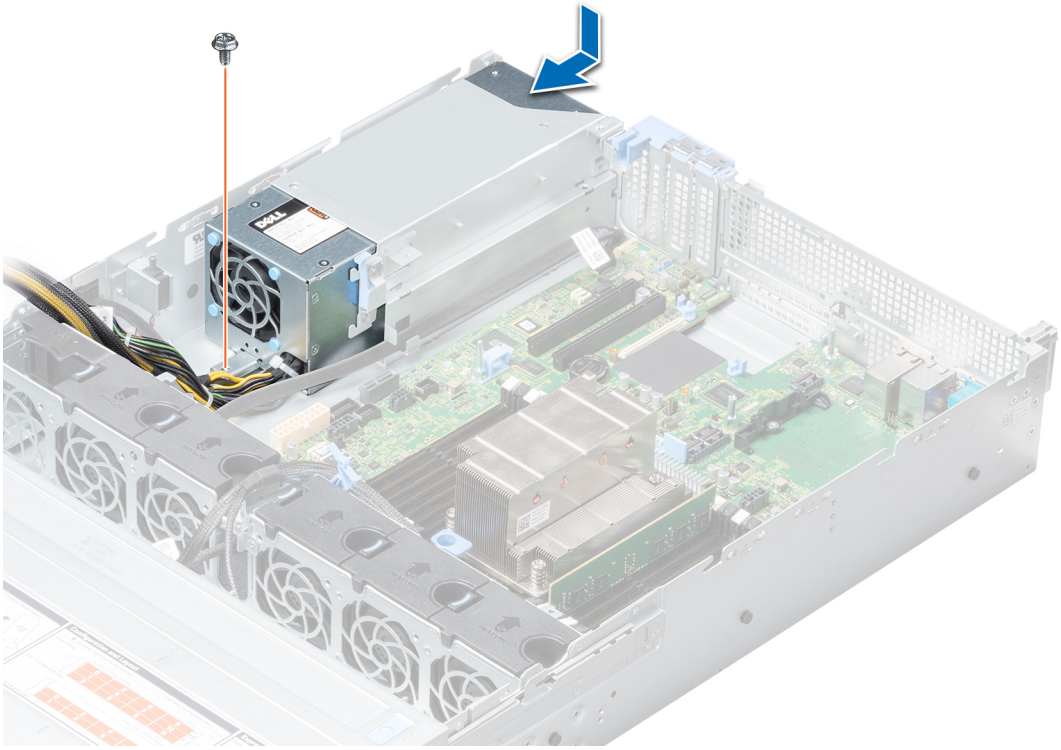


Figure 109. Installing a non-redundant cabled AC PSU

Next steps

1. Connect all the cables to the connectors on the system board.
2. If removed, install the expansion card riser.
3. Install the air shroud.
4. Follow the procedure listed in After working inside your system.

Wiring instructions for a DC power supply unit

Your system supports up to two –(48–60) V DC power supply units (PSUs).

NOTE: For equipment using –(48–60) V DC power supply units (PSUs), a qualified electrician must perform all connections to DC power and to safety grounds. Do not attempt connecting to DC power or installing grounds yourself. All electrical wiring must comply with applicable local or national codes and practices. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow all safety instructions that came with the product.

CAUTION: Wire the unit with copper only, unless otherwise specified, use only 10 American Wire Gauge (AWG) wire rated minimum 90ºC for source and return. Protect the –(48–60) V DC (1 wire) with a branch circuit over-current protection rated 50 A for DC with a high interrupt current rating.

CAUTION: Connect the equipment to a –(48–60) V DC supply source that is electrically isolated from the AC source (reliably grounded –(48–60) V DC SELV source). Ensure that the –(48–60) V DC source is efficiently secured to earth (ground).

NOTE: A readily accessible disconnect device that is suitably approved and rated shall be incorporated in the field wiring.

Input requirements

- Supply voltage: –(48–60) V DC
- Current consumption: 32 A (maximum)

Kit contents

- Dell part number 6RYJ9 terminal block or equivalent (1)
- #6-32 nut equipped with lock washer (1)

Required tools

Wire-stripper pliers capable of removing insulation from size 10 AWG solid or stranded, insulated copper wire.

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

Required wires

- One UL 10 AWG, 2 m maximum (stranded) black wire [–(48–60) V DC].
- One UL 10 AWG, 2 m maximum (stranded) red wire (V DC return).
- One UL 10 AWG, 2 m maximum, green with a yellow stripe, stranded wire (safety ground).

Assembling and connecting safety ground wire

Prerequisites

NOTE: For equipment using –(48–60) V DC power supply units (PSUs), a qualified electrician must perform all connections to DC power and to safety grounds. Do not attempt connecting to DC power or installing grounds yourself. All electrical wiring must comply with applicable local or national codes and practices. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow all safety instructions that came with the product.

Steps

1. Strip the insulation from the end of the green or yellow wire, exposing approximately 4.5 mm (0.175 inch) of copper wire.
2. Using a hand-crimping tool (Tyco Electronics, 58433-3 or equivalent), crimp the ring-tongue terminal (Jeeson Terminals Inc., R5-4SA or equivalent) to the green and yellow wire (safety ground wire).
3. Connect the safety ground wire to the grounding post on the back of the system by using a #6-32 nut equipped with a locking washer.

Assembling DC input power wires

Prerequisites

NOTE: For equipment using –(48–60) V DC power supply units (PSUs), a qualified electrician must perform all connections to DC power and to safety grounds. Do not attempt connecting to DC power or installing grounds yourself. All electrical wiring must comply with applicable local or national codes and practices. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow all safety instructions that came with the product.

Steps

1. Strip the insulation from the ends of the DC power wires, exposing approximately 13 mm (0.5 inch) of copper wire.

   NOTE: Reversing polarity when connecting DC power wires can permanently damage the power supply or the system.

2. Insert the copper ends into the mating connectors and tighten the captive screws at the top of the mating connector using a Phillips #2 screwdriver.

   NOTE: To protect the power supply from electrostatic discharge, the captive screws must be covered with the rubber cap before inserting the mating connector into the power supply.

3. Rotate the rubber cap clockwise to fix it over the captive screws.
4. Insert the mating connector into the power supply.

Power interposer board

Removing the power interposer board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud.
4. Disconnect all the cables connected to the system board.
5. 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 screw securing the power interposer board (PIB) to the system.
2. Press the blue release latch on the PIB to release it from the hook on the PSU cage.
3. Lift the PIB away from the system.

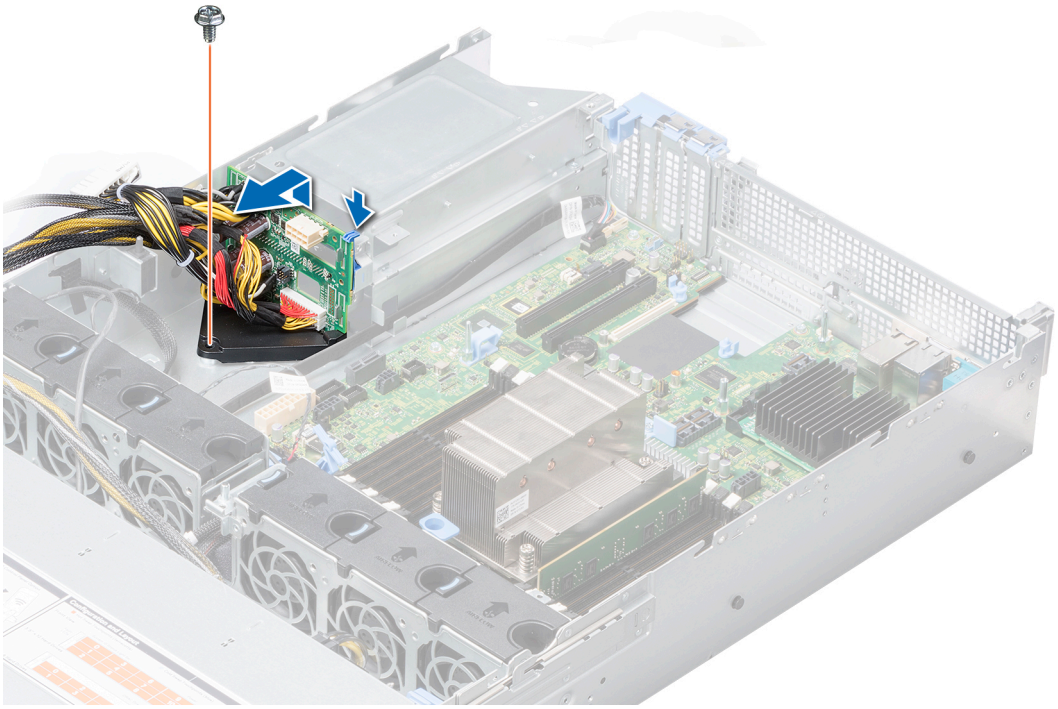


Figure 110. Removing power interposer board

Next steps

1. Installing the power interposer board.

Installing the power interposer board

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Align the slots on the PIB with the hook on the PSU cage and slide it into place.
2. Using Phillips #2 screwdriver, tighten the screw to secure the PIB to the system.
3. Route the cables and connect it to the system board.

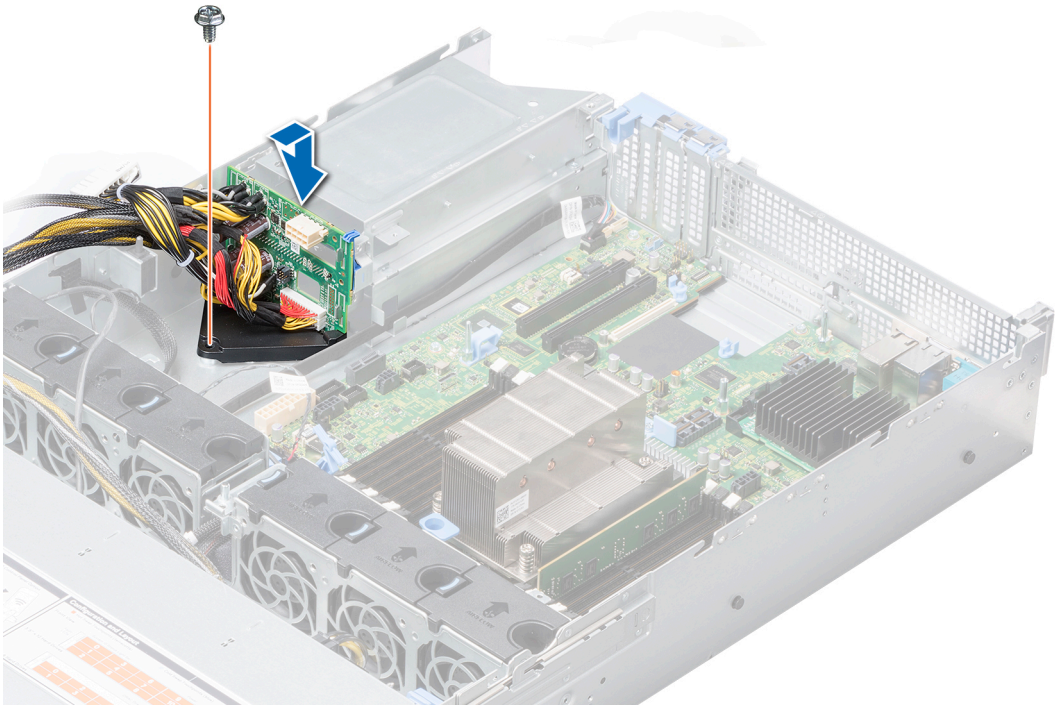


Figure 111. Installing power interposer board

Next steps

1. Install PSU.
2. Install the air shroud.
3. Follow the procedure listed in After working inside your system.

Control panel

Removing the left control panel

Prerequisites

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

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.

Steps

1. Disconnect the left control panel cable from the connector on the system board.
2. Using a Phillips #1 screwdriver, remove the screws that secure the left control panel assembly to the system.

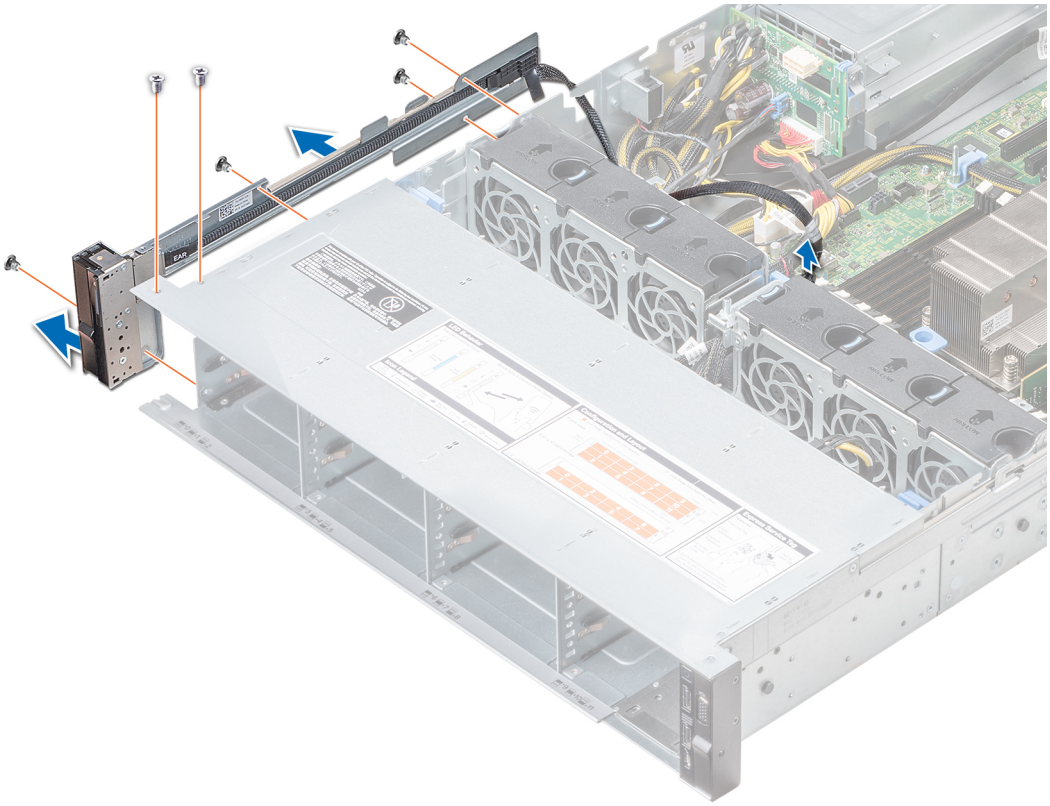


Figure 112. Removing the left control panel

3. Holding by the sides, remove the left control panel assembly away from the system.

Next steps

Installing the left control panel.

Installing the left control panel

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Route the control panel cable through the side wall of the system.
2. Align the left control panel assembly with the control panel slot on the system and attach the control panel assembly to the system.
3. Connect the control panel cable to the system board connector.
4. Using a Phillips #1 screwdriver, tighten the screws to secure the left control panel assembly to the system.

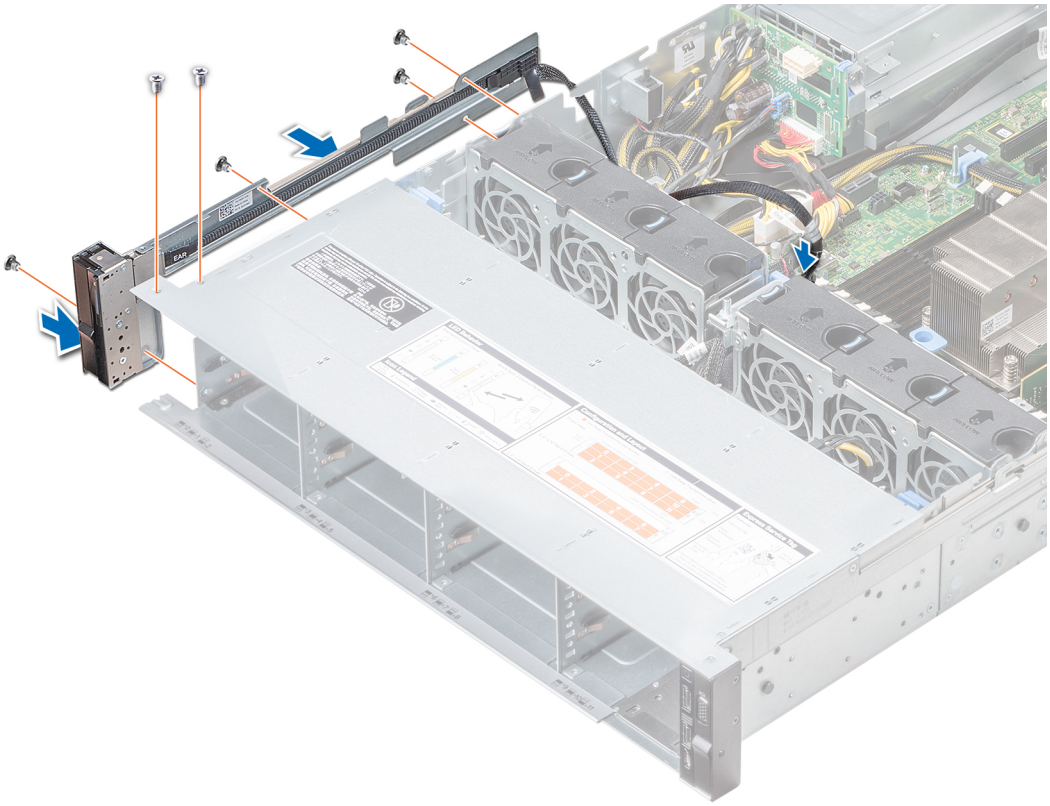


Figure 113. Installing the left control panel

Next steps

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

Removing the right control panel

Prerequisites

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

   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.

Steps

1. Disconnect the VGA cable from the connector on the system board
2. Lift open the cable latch and disconnect the control panel cable from the connector on the system board.
3. Using a Phillips #1 screwdriver, remove the screws that secure the right control panel assembly to the system.

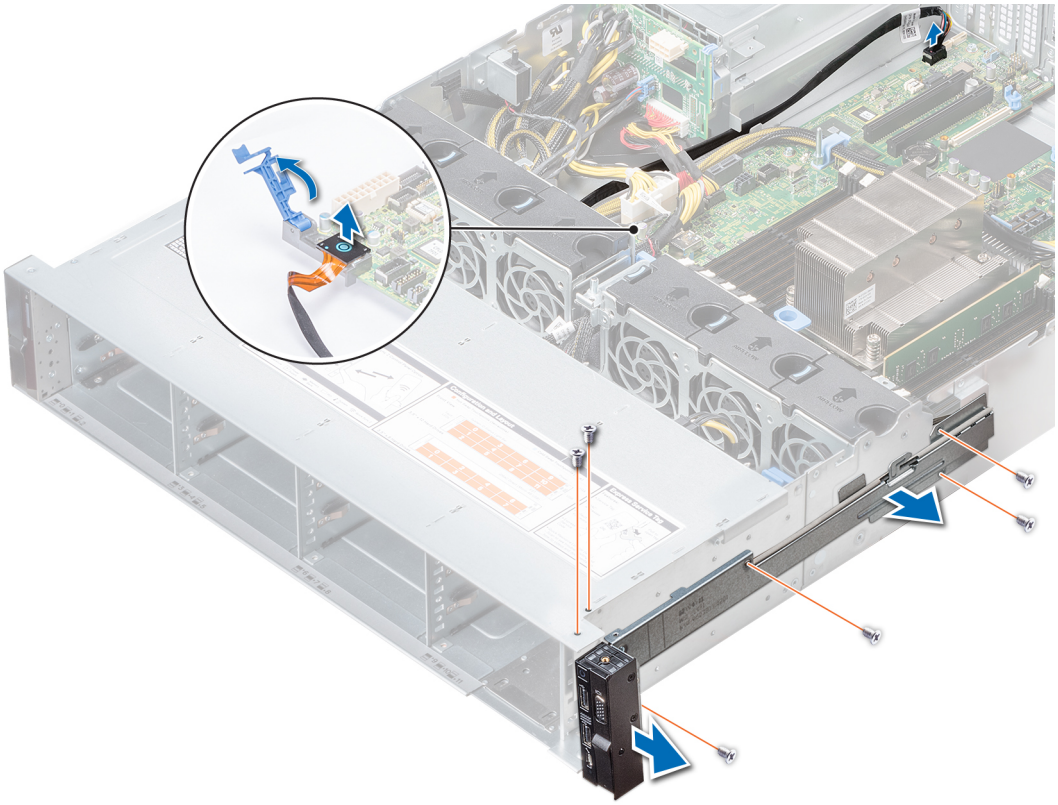


Figure 114. Removing the right control panel

4. Holding by the sides, remove the right control panel assembly away from the system.

Next steps

Install the right control panel.

Installing the right control panel

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Route the control panel cable and VGA cable through the side wall of the system.
2. Align the right control panel assembly with the control panel slot on the system and attach the right control panel assembly to the system.
3. Connect the VGA cable to the connector on the system board.
4. Connect the control panel cable to the connector system board and secure it using cable latch.
5. Using a Phillips #1 screwdriver, secure the right control panel assembly to the system with screws.

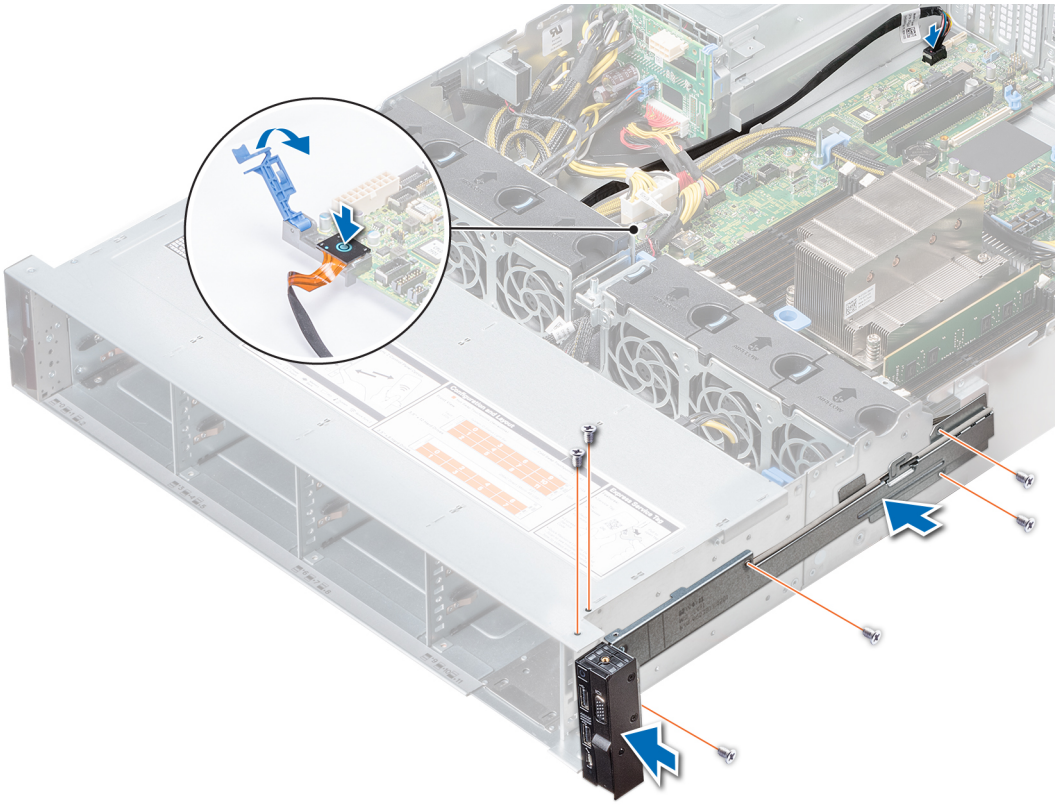


Figure 115. Installing the right control panel

Next steps

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

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 drives.

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

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 re-installed or installed on another system board.

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

c. Expansion card risers
d. Mini PERC card
e. vFlash/IDSDM module
f. Internal USB key (if installed)
g. Processor
h. Heat sink
i. Memory modules and memory module blanks
j. LOM riser card
k. Rear drive cage (if applicable)

Steps

1. 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.

2. Using a Phillips #2 screwdriver, remove the 10 screws that secures the system board to the chassis.

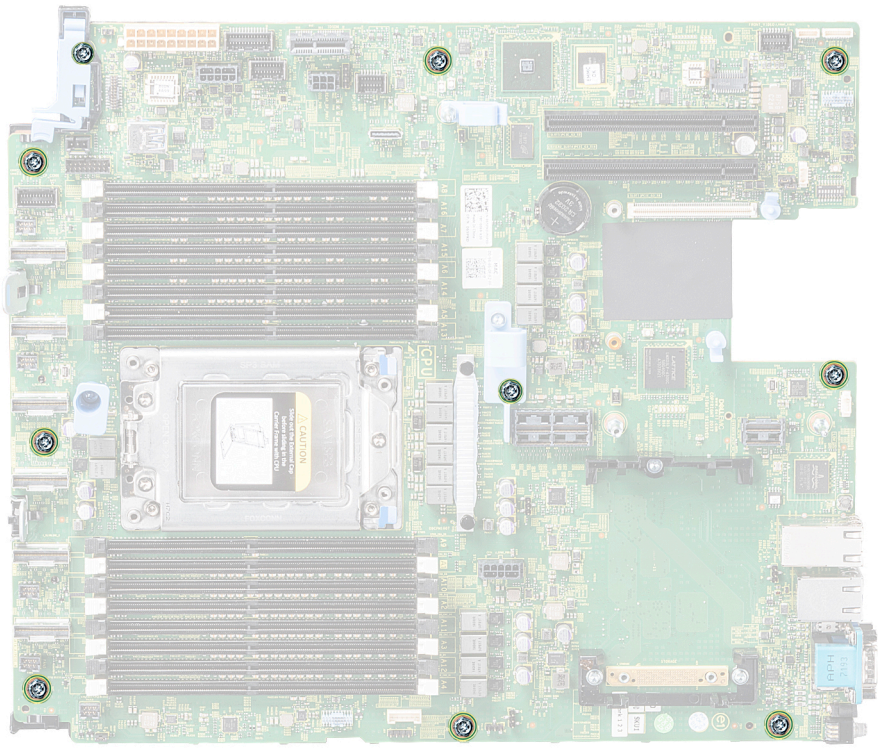


Figure 116. System board screws

3. Hold the system board holder, slightly lift the system board to disengage from the step stand-off and connectors from the slots on the chassis.
4. Lift the system board out of the chassis.

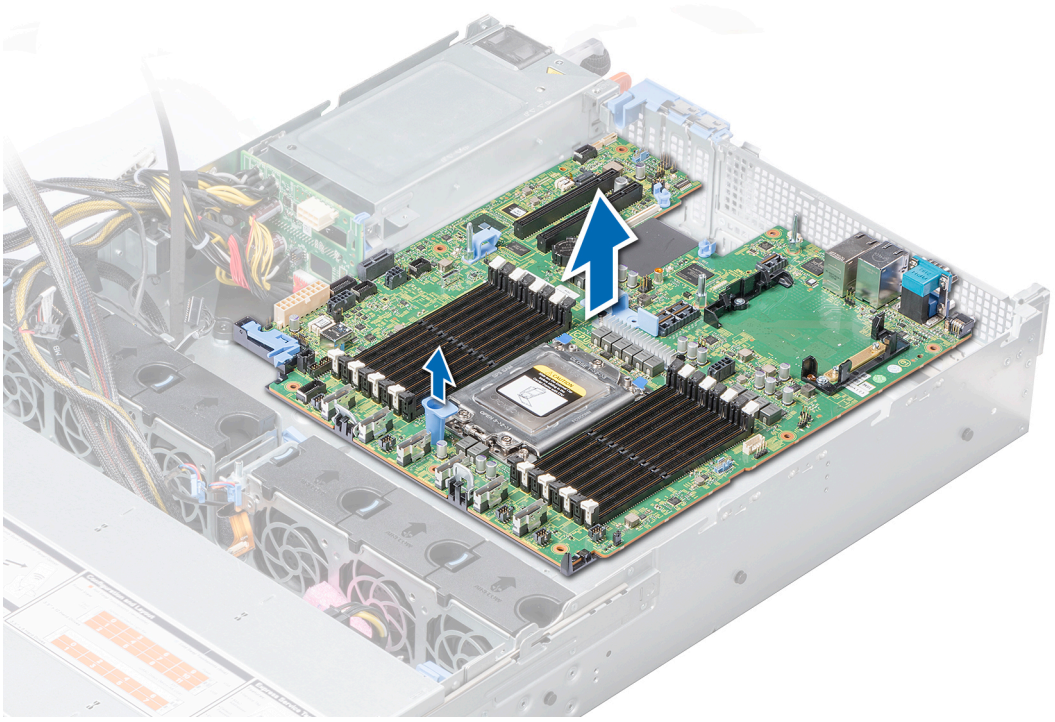


Figure 117. Removing the system board

Next steps

Installing the system board.

Installing the system board

Prerequisites

Follow the safety guidelines listed in Safety instructions.

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, incline the system board with the step stand-off , and lower the system board on the chassis.
3.
4. Using a Phillips #2 screwdriver, secure the system board to the chassis with the 10 screws.

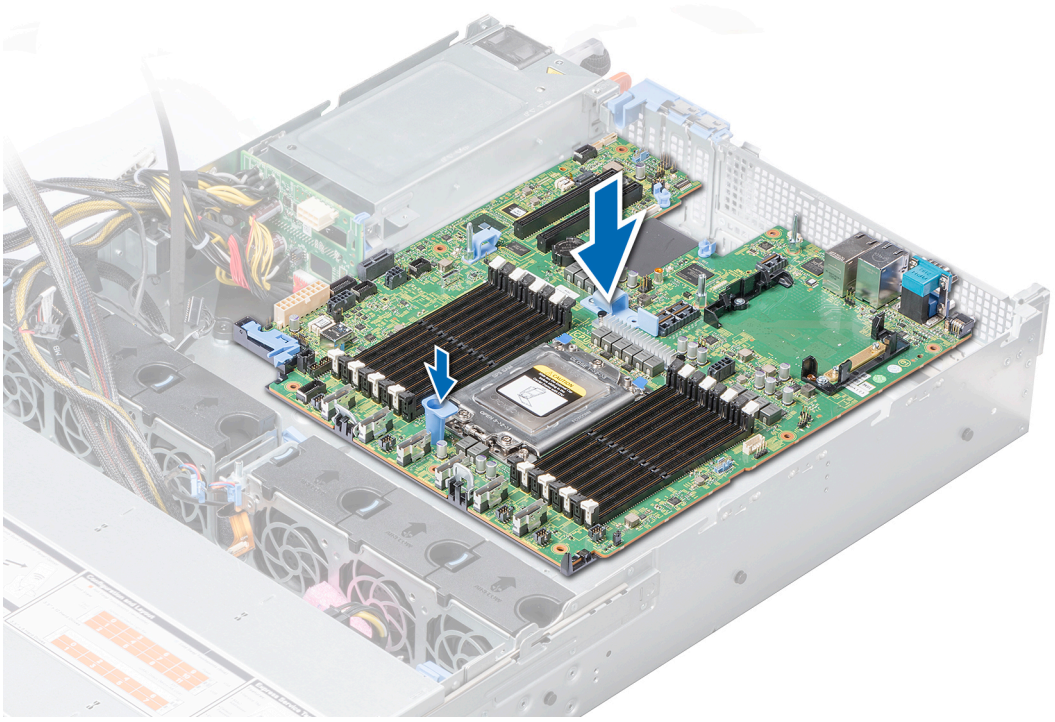


Figure 118. Installing the system board

Next steps

1. Replace the following:
   a. Trusted Platform Module (TPM)
   b. Mini PERC card
   c. IDSDM/vFlash module
   d. Expansion cards
   e. Expansion card risers
   f. Processor
   g. Heat sink
   h. Memory modules and memory module blanks
   i. LOM riser card
   j. Air shroud
   k. Rear drive cage (if applicable)
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.
4. Ensure that you:
   a. Use the Easy Restore feature to restore the Service Tag. For more information, see the Easy restore 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 Restoring the Service Tag by using Easy Restore 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 iDRAC User's Guide, at **Dell.com/idracmanuals**.

Restore the service tag using Easy Restore

The Easy Restore feature allows you to restore your Service Tag, iDRAC license, UEFI configuration, and the system configuration data after replacing the system board. All data is backed up automatically in a backup flash drive device. If BIOS detects a new system board, and the Service Tag in the backup Flash device is different, BIOS prompts the user to restore the backup information.

About this task

Following is a list of options available:

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

   NOTE: When the restore process is complete, BIOS prompts to restore the system configuration data.
4. To restore the system configuration data, press **Y**
5. To use the default configuration settings, press **N**

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

NOTE: If restoring the Service Tag is successful, you can check the Service Tag information in the System Information screen and compare it with the Service Tag on the system.

Manually updating Service Tag

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

About this task

If you know the system Service Tag, use the **System Setup** menu to enter the Service Tag.

Steps

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

   NOTE: You can enter the Service Tag only when the Service Tag field is empty. Ensure that you enter the correct Service Tag. After the Service Tag is entered, it cannot be updated or changed.
5. Click **OK**.

Trusted Platform Module

Upgrading the Trusted Platform Module

Prerequisites

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

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.

   NOTE: To locate the TPM connector on the system board, see the System board jumpers and connectors section.
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.

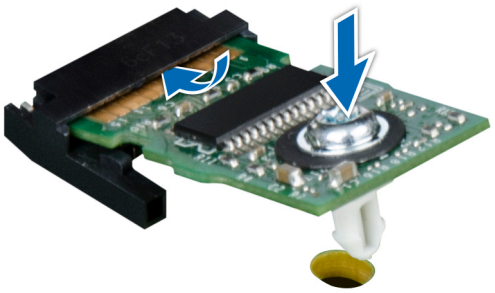


Figure 119. Installing the TPM

Next steps

1. Install the system board.
2. Follow the procedure listed in After working inside your system.

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**.

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

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 system board. 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
- System board jumper settings
- Disabling forgotten password

System board jumpers and connectors

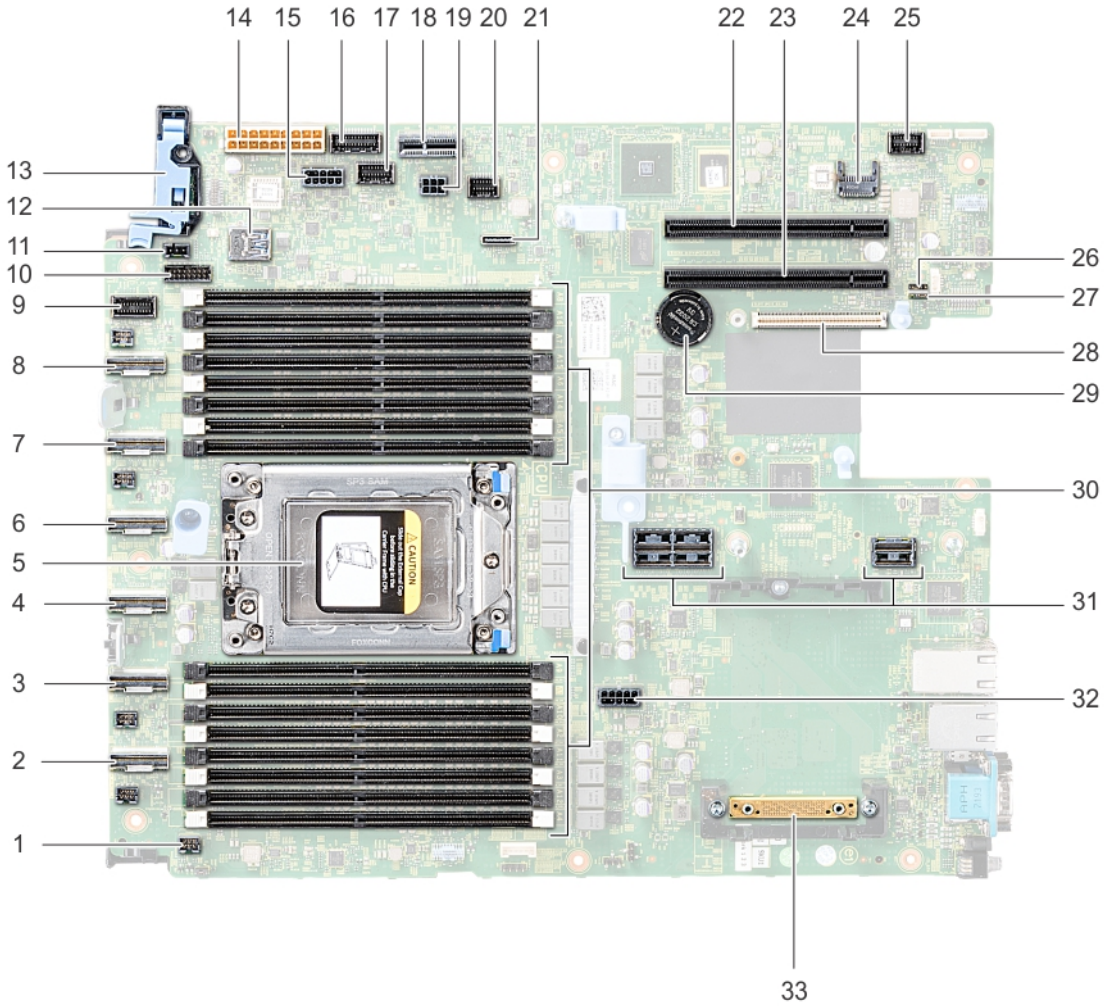


Figure 120. System board jumpers and connectors

Table 53. System board jumpers and connectors

Item	Connector	Description
1.	FAN6	Cooling fan 6 connector

Item	Connector	Description
2.	SATA_A/PCIE_A	Internal SATA A or PCIe A connector
3.	PCIE_B	PCIe B connector
4.	SATA_B/PCIE_C	Internal SATA B or PCIe C connector
5.	CPU	Processor socket
6.	PCIE_D	PCIe D connector
7.	PCIE_E	PCIe E connector
8.	PCIE_F	PCIe F connector
9.	LFT_CP_CONN	Left control panel connector
10.	BP_SIG1	Backplane signal connector 1
11.	INTRUSION	Intrusion switch connector
12.	J_USB3_INT1	USB connector
13.	RGT_CP_CONN	Right control panel connector
14.	SYS_PWR1	System power connector 1
15.	SYS_PWR2	System power connector 2
16.	PIB_SIG2	Power interposer board signal connector 2
17.	PIB_SIG1	Power interposer board signal connector 1
18.	IDSDM	Internal Dual SD Module connector
19.	J_BP_PWR0	Backplane power connector
20.	J_BP_SIG0	Backplane signal connector
21.	J_SATA_A1	SATA A connector
22.	SLOT5	PCIe slot 5
23.	SLOT4	PCIe slot 4
24.	J_TPM_MODULE	TPM module connector
25.	J_FRONT_VIDEO1	VGA connector
26.	PWRD_EN	Reset BIOS password
27.	NVRAM_CLR	Clear NVRAM
28.	SLOT1	LOM riser card connector
29.	BATTERY	Battery connector
30.	A8, A16, A7, A15, A6, A14, A5, A13, A9, A1, A10, A2, A11, A3, A12, A4	Memory module sockets
31.	RISER1A/RISER1B	Expansion card riser connector [2U riser]
32.	SYS_PWR3	System power connector 3
33.	J_STORAGE	Mini PERC card connector

System board jumper settings

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

Table 54. System board jumper settings

Jumper	Setting	Description
PWRD_EN		The BIOS password feature is enabled.

Jumper	Setting	Description
		The BIOS password feature is disabled. iDRAC local access is unlocked at next AC power cycle. iDRAC password reset is enabled in F2 iDRAC settings menu.
NVRAM_CLR		The BIOS configuration settings are retained at system boot.
		The BIOS configuration settings are cleared at system boot.

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

1. Turn 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 3 and 5 to pins 1 and 3, and wait approximately 10 seconds.
4. Replace the jumper plug on the pins 3 and 5.
5. Install the system cover.
6. Reconnect the system to the electrical outlet, including any attached peripherals, and turn on the system.

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. Turn 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 turn on the system, including any attached peripherals.
6. Turn 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 turn on the system, including any attached peripherals.
11. Assign a new system and/or setup password.

9

Getting help

Topics:

- Contacting Dell
- Documentation feedback
- Accessing system information by using QRL
- Receiving automated support with SupportAssist
- Recycling or End-of-Life service information

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.

Documentation feedback

You can rate the documentation or write your feedback on any of our Dell EMC documentation pages and click **Send Feedback** to send your feedback.

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) located on the information tag in the front of the R7415, to access the information about the Dell EMC PowerEdge R7415.

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 R7415



Figure 121. Quick Resource Locator for PowerEdge R7415

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.