

# Dell EMC NX430 System

## Owner's Manual



## Notes, cautions, and warnings

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

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

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

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# About your system

The Dell Storage NX430 NAS system supports one processor based on the Intel E3-1200V5 series, up to four DIMMs, and up to four hard drives or solid-state drives (SSDs).

Topics:

- [Supported configurations](#)
- [Front panel features and indicators](#)
- [Back panel features and indicators](#)
- [Hot swappable hard drive indicator codes](#)
- [iDRAC Direct LED indicator codes](#)
- [NIC indicator codes](#)
- [Indicator codes for redundant power supply unit](#)
- [Locating Service Tag of your system](#)

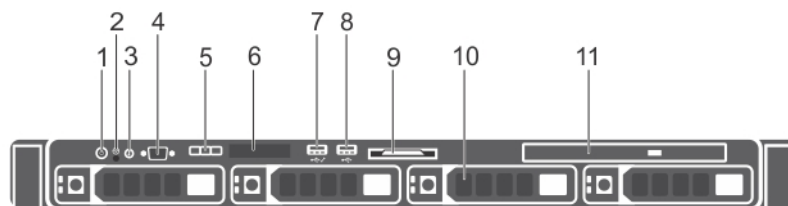
## Supported configurations

The Dell Storage NX430 NAS system supports the following configuration:

**Table 1. Supported configurations**


System	Configuration
Four hard drive system	Up to four 3.5-inch or four 2.5-inch hot-swappable hard drives in 3.5-inch hard drive adapters.






## Front panel features and indicators



**Figure 1. Front panel features and indicators — four 3.5-inch hot-swappable hard drive chassis**

**Table 2. Front panel features and indicators— four 3.5-inch hot-swappable hard drive chassis**

Item	Indicator, button, or connector	Icon	Description
1	Power-on indicator, power button		Enables you to know the power status of the system. The power-on indicator glows when the system power is on. The power button controls the power supply output to the system.

Item	Indicator, button, or connector	Icon	Description
			<p><b>NOTE:</b> On ACPI-compliant operating systems, turning off the system by pressing the power button causes the system to perform a graceful shutdown before power to the system is turned off.</p>
2	NMI button		<p>Enables you to troubleshoot software and device driver errors when running certain operating systems. This button can be pressed by using the end of a paper clip.</p> <p>Use this button only if directed to do so by qualified support personnel or by the operating system's documentation.</p>
3	System identification button		<p>Enables you to locate a particular system within a rack. The identification buttons are on the front and back panels. When one of these buttons is pressed, the LCD panel on the front and the system status indicator on the back flash until one of the buttons is pressed again.</p> <p>Press the system identification button to turn the system ID on or off.</p> <p>If the system stops responding during POST, press and hold the system ID button for more than five seconds to enter BIOS progress mode.</p> <p>To reset iDRAC (if not disabled in F2 iDRAC setup), press and hold the button for more than 15 seconds.</p>
4	Video connector		Enables you to connect a display to the system.
5	LCD menu buttons		Enables you to navigate the control panel LCD menu.
6	LCD panel		Displays system ID, status information, and system error messages. See the LCD panel features section.
7	USB management port/iDRAC managed USB port		Functions as a regular USB port or provide access to the iDRAC Direct features. For more information, see the iDRAC User's Guide at <a href="http://Dell.com/idracmanuals">Dell.com/idracmanuals</a> .
8	USB connector		Enables you to connect USB devices to the system. The port is USB 2.0-compliant.
9	Information tag		Contains system information such as service tag, NIC, MAC address for your reference. The information tag is a slide-out label panel.
10	Hard drives slots		Enables you to install up to four 3.5-inch hot-swappable hard drives or four 2.5-inch hot-swappable hard drives in 3.5-inch hard drive adapters.
11	Optical drive slot		Enables you to install an optional slim SATA DVD-ROM drive or DVD +/-RW drive.

## LCD panel

The LCD panel of your system provides system information, status, and error messages to indicate if the system is functioning correctly or if the system needs attention. For more information about error messages, see the *Dell Event and Error Messages Reference Guide* at [Dell.com/openmanagemanuals](http://Dell.com/openmanagemanuals) >OpenManage software.

- The LCD backlight turns blue during normal operating conditions.



- When the system needs attention, the LCD 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.

- The LCD backlight is turned off when the system is in standby mode and can be turned on by pressing either the Select, Left, or Right button on the LCD panel.
- The LCD backlight remains off if LCD messaging is turned off using the iDRAC utility, the LCD panel, or other tools.

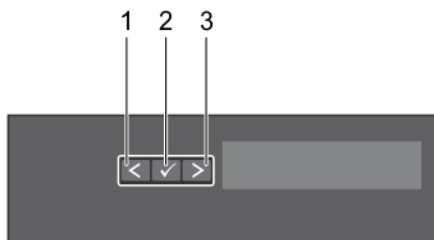


Figure 2. LCD panel features

Table 3. LCD panel features

Item	Button	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: <ul style="list-style-type: none"> <li>Press and hold the button to increase scrolling speed.</li> <li>Release the button to stop.</li> </ul>



**NOTE:** The display stops scrolling when the button is released. After 45 seconds of inactivity the display starts scrolling.

## Viewing Home screen

### About this task

The **Home** screen displays user-configurable information about the system. This screen is displayed during normal system operation when there are no status messages or errors. When the system is in standby mode, the LCD backlight turns off after a few minutes of inactivity, if there are no error messages.

### Steps

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

## Setup menu

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

Option	Description
iDRAC	Select <b>DHCP</b> or <b>Static IP</b> to configure the network mode. If <b>Static IP</b> is selected, the available fields are <b>IP</b> , <b>Subnet (Sub)</b> , and <b>Gateway (Gtw)</b> . Select <b>Setup DNS</b> to enable DNS and to view domain addresses. Two separate DNS entries are available.
Set error	Select <b>SEL</b> to view LCD error messages in a format that matches the IPMI description in the SEL. This enables you to match an LCD message with an SEL entry.  Select <b>Simple</b> to view LCD error messages in a simplified user-friendly description. For more information about error messages, see the <i>Dell Event and Error Messages Reference Guide</i> at <a href="https://Dell.com/openmanagemanuals">Dell.com/openmanagemanuals</a> > <b>OpenManage software</b> .
Set home	Select the default information to be displayed on the <b>Home</b> screen. See View menu section for the options and option items that can be set as the default on the <b>Home</b> screen.

## View menu

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

Option	Description
iDRAC IP	Displays the <b>IPv4</b> or <b>IPv6</b> addresses for iDRAC8. Addresses include <b>DNS (Primary and Secondary)</b> , <b>Gateway</b> , <b>IP</b> , and <b>Subnet</b> (IPv6 does not have Subnet).
MAC	Displays the MAC addresses for <b>iDRAC</b> , <b>iSCSI</b> , or <b>Network</b> devices.
Name	Displays the name of the <b>Host</b> , <b>Model</b> , or <b>User String</b> for the system.
Number	Displays the <b>Asset tag</b> or the <b>Service tag</b> for the system.
Power	Displays the power output of the system in BTU/hr or Watts. The display format can be configured in the <b>Set home</b> submenu of the <b>Setup</b> menu.
Temperature	Displays the temperature of the system in Celsius or Fahrenheit. The display format can be configured in the <b>Set home</b> submenu of the <b>Setup</b> menu.

## Back panel features and indicators

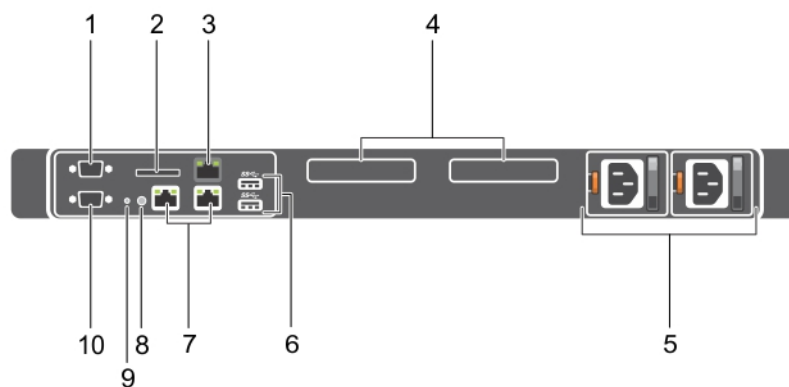





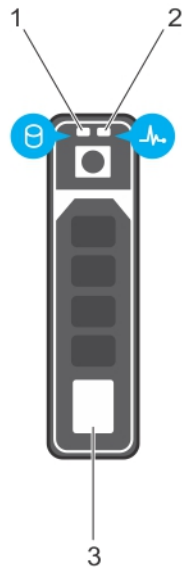


Figure 3. Back panel features and indicators

**Table 4. Back panel features and indicators**

Item	Indicator, button, or connector	Icon	Description
1	Serial connector		Enables you to connect a serial device to the system.
2	vFlash card slot (optional)		Enables you to connect the vFlash card.
3	iDRAC port (optional)		Enables you to install a dedicated management port card.
4	PCIe expansion card slots (2)		Enables you to connect PCI Express expansion cards.
5	Power supply unit (PSU1 and PSU2)		Enables you to install up to two 350 W redundant AC power supply units.
6	USB connectors		Enables you to connect USB devices to the system. These ports are USB 3.0-compliant.
7	Ethernet connectors		Enables you to connect Integrated 10/100/1000 Mbps NIC connectors.
8	System identification button		<p>Enables you to locate a particular system within a rack. The identification buttons are on the front and back panels. When one of these buttons is pressed, the LCD panel on the front and the system status indicator on the back flash until one of the buttons is pressed again.</p> <p>Press the system identification button to turn the system ID on or off.</p> <p>If the system stops responding during POST, press and hold the system ID button for more than five seconds to enter BIOS progress mode.</p> <p>To reset iDRAC (if not disabled in F2 iDRAC setup), press and hold the button for more than 15 seconds.</p>
9	System identification connector		Connects the optional system status indicator assembly through the optional cable management arm.
10	Video connector		Enables you to connect a VGA display to the system.

# Hot swappable hard drive indicator codes



**Figure 4. Hot swappable hard drive indicators**

- 1 hard drive activity indicator
- 2 hard drive status indicator
- 3 hard drive

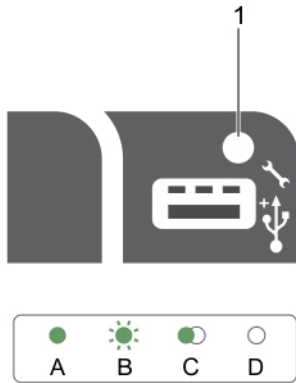
**NOTE:** If the hard drive is in Advanced Host Controller Interface (AHCI) mode, the status indicator (on the right side) does not function and remains OFF.

**Table 5. Hot swappable hard drive indicators**

Drive-status indicator pattern (RAID only)	Condition
Flashes green two times per second	Identifying drive or preparing for removal.
OFF	Drive ready for insertion or removal.
	<b>NOTE:</b> The drive status indicator remains OFF until all hard drives are initialized after the system is turned on. Drives are not ready for insertion or removal during this time.
Flashes green, amber, and turns off	Predicted drive failure
Flashes amber four times per second	Drive failed
Flashes green slowly	Drive rebuilding
Turns green	Drive online
Flashes green three seconds, amber three seconds, and turns off six seconds	Rebuild stopped

# iDRAC Direct LED indicator codes

**NOTE:** The iDRAC Direct LED indicator does not turn on when the USB port is used in the USB mode.



**Figure 5. iDRAC Direct LED indicator**

1 iDRAC Direct status indicator

The iDRAC Direct LED indicator table describes iDRAC Direct activity when configuring iDRAC Direct by using the management port (USB XML Import).

**Table 6. iDRAC Direct LED indicators**

Convention	iDRAC Direct LED indicator pattern	Condition
A	Green	Turns green for a minimum of two seconds to indicate the start and end of a file transfer.
B	Flashing green	Indicates file transfer or any operation tasks.
C	Green and turns off	Indicates that the file transfer is complete.
D	Not lit	Indicates that the USB is ready to be removed or that a task is complete.

The following table describes iDRAC Direct activity when configuring iDRAC Direct by using your laptop and cable (Laptop Connect):

**Table 7. iDRAC Direct LED indicator patterns**

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





**Figure 7. AC PSU status indicator**

1 AC PSU status indicator or handle

**Table 9. Redundant AC PSU status indicator**

Convention	Power Indicator Pattern	Condition
A	Green	A valid power source is connected to the PSU and the PSU is operational.
B	Flashing green	When the PSU firmware is being updated, the PSU handle flashes green. <p><b>CAUTION:</b> Do not disconnect the power cord or unplug the PSU when updating firmware. If firmware update is interrupted, the PSUs will not function. You must roll back the PSU firmware by using Dell Lifecycle Controller. For more information, see Dell Lifecycle Controller User's Guide at <a href="http://Dell.com/idracmanuals">Dell.com/idracmanuals</a>.</p>
C	Flashing green and turns off	When hot-adding a PSU, the PSU handle flashes green five times at 4 Hz rate and turns off. This indicates that there is a PSU mismatch with respect to efficiency, feature set, health status, and supported voltage. Ensure that both the PSUs are the same.
D	Flashing amber	Indicates a problem in the PSU. <p><b>CAUTION:</b> When correcting a PSU mismatch, replace only the PSU with the flashing indicator. Swapping the other 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.</p> <p><b>CAUTION:</b> AC PSUs support both 220 V and 110 V input voltages with the exception of Titanium PSUs, which support only 220 V. When two identical PSUs receive different input voltages, they can output different wattages, and trigger a mismatch.</p> <p><b>CAUTION:</b> If two PSUs are used, they must be of the same type and have the same maximum output power.</p> <p><b>CAUTION:</b> Combining AC and DC PSUs is not supported and triggers a mismatch.</p>
E	Not lit	Power is not connected.

# Locating Service Tag of your system

Your system is identified by a unique Express Service Code and Service Tag number. The Express Service Code and Service Tag are found on the front of the system by pulling out the information tag. Alternatively, the information may be on a sticker on the chassis of the system. This information is used by Dell to route support calls to the appropriate personnel.



## Documentation resources

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

<b>Task</b>	<b>Document</b>	<b>Location</b>
Setting up your system	For information about installing the system into a rack, see the Rack documentation included with your rack solution.	<b>Dell.com/storagemanuals</b>
	For information about turning on the system and the technical specifications of your system, see the Getting Started With Your System document that shipped with your system.	
	For information about procedures for setting up the storage system and internal storage, see <i>Setting Up Your Dell Storage NX430 Network Attached Storage System</i> .	
Configuring your system	For information about configuring, managing, updating, and restoring the system, see the <i>Dell EMC Network Attached Storage System using Windows Storage Server 2016 Administrator's Guide</i> .	<b>Dell.com/storagemanuals</b>
	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.	<b>Dell.com/idracmanuals</b>
	For information about understanding Remote Access Controller Admin (RACADM) subcommands and supported RACADM interfaces, see the RACADM Command Line Reference Guide for iDRAC.	<b>Dell.com/idracmanuals</b>
	For information about updating drivers and firmware.	<b>Dell.com/support/drivers</b>
Troubleshooting your system	For information about troubleshooting the hardware issues, see the <i>Dell EMC Network Attached Storage Systems using Windows Storage Server 2016 Troubleshooting Guide</i> .	<b>Dell.com/storagemanuals</b>
Managing your system	For information about the features of the Dell OpenManage Systems Management, see the Dell OpenManage Systems Management Overview Guide.	<b>Dell.com/openmanagemanuals</b>
	For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	<b>Dell.com/openmanagemanuals</b>

Task	Document	Location
	For information about installing, using, and troubleshooting Dell OpenManage Essentials, see the Dell OpenManage Essentials User's Guide.	<a href="https://dell.com/openmanagemanuals">Dell.com/openmanagemanuals</a>
	For information about installing and using Dell System E-Support Tool (DSET), see the Dell System E-Support Tool (DSET) User's Guide.	<a href="https://dell.com/DSET">Dell.com/DSET</a>
	For understanding the features of Dell Lifecycle Controller, see the Dell Lifecycle Controller User's Guide.	<a href="https://dell.com/idracmanuals">Dell.com/idracmanuals</a>
	For information about enterprise systems management partner programs, see the OpenManage Connections Enterprise Systems Management documents.	<a href="https://dell.com/omconnectionsenterprisesystemsmanagement">Dell.com/omconnectionsenterprisesystemsmanagement</a>
	For information about connections and client systems management, see the OpenManage Connections Client Systems Management documentation.	<a href="https://dell.com/dellclientcommandssuitemanuals">Dell.com/dellclientcommandssuitemanuals</a>
Working with the Dell EMC PowerEdge RAID controllers	For information about understanding the features of the Dell PowerEdge RAID controllers (PERC) and deploying the PERC cards, see the Storage controller documentation.	<a href="https://dell.com/storagecontrollermanuals">Dell.com/storagecontrollermanuals</a>
Understanding event and error messages	For information about checking the event and error messages generated by the system firmware and agents that monitor system components, see the <i>Event and Error Message Reference Guide for 14th Generation Dell EMC PowerEdge Servers</i> .	<a href="https://dell.com/openmanagemanuals">Dell.com/openmanagemanuals</a> > <b>OpenManage Software</b>

## Technical specifications

### Dimensions and weight

Physical	Dimensions
Height	42.8 mm (1.68 inch)
Width with rack latches	482.38 mm (18.99 inch)
Width without rack latches	434.15 mm (17.09 inch)
Depth without bezel	610 mm (24 inch)
Maximum weight for four hard drive chassis	13.8 kg (30.42 lbs)
Empty weight for four hard drive chassis	6.0 kg (13.22 lbs)

### Processor specifications

Processor	Specification
Type	One Intel E3-1200 V5 series

### Expansion bus specifications

PCI Express (PCIe) Generation 3 expansion slots (with optional expansion card risers)	Specification
LP SLOT 1	One half-height, half-length x4 link
FH SLOT 2	One full-height, half-length x8 link
PCI Express Generation 3 expansion slots (without expansion card risers)	Specification
PCI_E_G3_X4	One half-height, half-length x4 link for PERC card

PCI Express  
Generation 3  
expansion slots  
(without  
expansion card  
risers)

Specification

PCIE\_G3\_X8      One x8 link for riser

## Memory specifications

Memory      Specification

Architecture      1600 MT/s, 1866 MT/s, or 2133 MT/s DDR4 Unbuffered DIMMs  
Support for advanced ECC or memory optimized operation

Memory module  
sockets      Four 288-pin sockets

Memory module  
capacities (UDIMM)      4 GB (single-rank), 8 GB (single- and dual-rank), 16 GB (single- and dual-rank)

Minimum RAM      4 GB

Maximum RAM      64 GB

## Power specifications

Power supply  
unit      Specification

Power rating per  
power supply unit      350 W (Platinum) (100–240 V AC, 50/60 Hz, 4.8 A–2.4 A)

Heat dissipation      1357.1 BTU/hr

 **NOTE:** Heat dissipation is calculated by using the power supply wattage rating.

Voltage      100-240 V AC, autoranging, 50/60 Hz

 **NOTE:** This system is also designed to be connected to IT power systems with a phase-to-phase voltage not exceeding 230 V.

## Drive specifications

Drives      Specification

Four hard drive  
systems      Up to four 3.5-inch hot swappable SAS, SATA, or Nearline SAS hard drives

 **NOTE:** For more information about PERC, see the Dell PowerEdge RAID Controller (PERC) documentation at [Dell.com/storagecontrollermanuals](http://Dell.com/storagecontrollermanuals).

Optical drive      One optional slim SATA DVD-ROM or DVD+/-RW drive.

# Connectors specifications

## Back connectors Specification

NIC	Two 10/100/1000 Mbps
Serial	DB-9 Serial Port connector
USB	Two 9-pin, USB 3.0-compliant
Video	15-pin VGA
iDRAC8	One optional 1 GbE Ethernet
External SD vFlash	One optional SD vFlash memory card

**NOTE:** The card slot is available for use only if the iDRAC8 Enterprise license is installed on your system.

## Front connectors Specification

USB	Two 4-pin, USB 2.0-compliant
Video	15-pin VGA

## Internal connectors Specification

USB	One 9-pin, USB 3.0-compliant
Internal Dual SD Module	Two optional flash memory card slots with the internal SD module

**NOTE:** One card slot is dedicated for redundancy.

# Video specifications

## Video Specification

Video type	Integrated Matrox G200
Video memory	16 MB shared

# Expanded operating temperature

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

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

## Expanded operating temperature Specifications

≤ 10% of annual operating hours 5°C to 40°C at 5% to 85% RH with 26°C dew point.

**NOTE:** Outside the standard operating temperature (10°C to 35°C), the system can operate down to 5°C or up to 40°C for a maximum of 10% of its annual operating hours.

For temperatures between 35°C and 40°C, de-rate maximum allowable dry bulb temperature by 1°C per 175 m above 950 m (1°F per 319 ft).

## Expanded operating temperature

≤ 1% of annual operating hours

## Specifications

–5°C to 45°C at 5% to 90% RH with 26°C dew point.

**NOTE:** Outside the standard operating temperature (10°C to 35°C), the system can operate down to –5°C or up to 45°C for a maximum of 1% of its annual operating hours.

For temperatures between 40°C and 45°C, de-rate maximum allowable dry bulb temperature by 1°C per 125 m above 950 m (1°F per 228 ft).

## Expanded Operating Temperature Restrictions

- The operating temperature specified is for a maximum altitude of 3048 m (10,000 ft).
- Non-redundant power supply units are not supported.
- Non Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- Do not perform a cold startup below 5°C.
- Enable processor performance degrade.

# Environmental specifications

**NOTE:** For additional information about environmental measurements for specific system configurations, see [Dell.com/environmental\\_datasheets](https://www.dell.com/environmental_datasheets).

## 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 on fresh air, see Expanded Operating Temperature section.

#### Maximum temperature gradient (operating and storage)

20°C/h (36°F/h)

## 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.

## Maximum vibration

### Specifications

#### Operating

0.26 G<sub>rms</sub> at 5 Hz to 350 Hz (all operation orientations).

#### Storage

1.88 G<sub>rms</sub> at 10 Hz to 500 Hz for 15 min (all six sides tested).

## Maximum shock

### Specifications

#### Operating

Six consecutively executed shock pulses in the positive and negative x, y, and z axes of 40 G for up to 2.3 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.

**Maximum altitude**      **Specifications**

**Operating**      3048 m (10,000 ft).

**Storage**      12,000 m (39,370 ft).

**Operating temperature de-rating**      **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)

The following section defines the limits to help avoid IT equipment damage and/or failure from particulates and gaseous contamination. If the levels of particulates or gaseous pollution are beyond the specified limits and cause equipment damage or failure, you may need to rectify the environmental conditions. Remediation of environmental conditions is the responsibility of the customer.

**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:** 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:** 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:** Applies to data center and non-data center environments.

**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.

# Initial system setup and configuration

## Setting up your system

Complete the following steps to set up your system:

- 1 Unpack the system.
- 2 Install the system into the rack. For more information about installing the system into the rack, see your system *Rack Installation Placemat* at **Dell.com/poweredgemanuals**.
- 3 Connect the peripherals to the system.
- 4 Connect the system to its electrical outlet.
- 5 Turn the system on by pressing the power button or by using iDRAC.
- 6 Turn on the attached peripherals.

## 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 to system issues, helps them perform remote system management, and reduces the need for physical access to the system.

## Options to set up iDRAC IP address

You must configure the initial network settings based on your network infrastructure to enable the communication to and from iDRAC. You can set up the IP address by using one of the following interfaces:

Interfaces	Document/Section
iDRAC Settings utility	See <i>Dell Integrated Dell Remote Access Controller User's Guide</i> at <b>Dell.com/idracmanuals</b>
Dell Deployment Toolkit	See <i>Dell Deployment Toolkit User's Guide</i> at <b>Dell.com/openmanagemanuals</b>
Dell Lifecycle Controller	See <i>Dell Lifecycle Controller User's Guide</i> at <b>Dell.com/idracmanuals</b>
Chassis or Server LCD panel	See the LCD panel section

You must use the default iDRAC IP address 192.168.0.120 to configure the initial network settings, including setting up DHCP or a static IP for iDRAC.

- NOTE:** To access iDRAC, ensure that you install the iDRAC port card or connect the network cable to the Ethernet connector 1 on the system board.
- NOTE:** Ensure that you change the default user name and password after setting up the iDRAC IP address.



# Log in to iDRAC

You can log in to iDRAC as:

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

The default user name and password are `root` and `calvin`. You can also log in by using Single Sign-On or Smart Card.

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

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

# Reinstalling the NAS operating system by using DVD

## About this task

**CAUTION:** Back up the internal disk drives on your system before reinstalling or upgrading the NAS Operating System. The DVD reinstall process formats or deletes the OS disks (virtual disk 0) resulting in loss of any data or installed applications. The DVD reinstall process does not install RASR USB Recovery application.

## Steps

- 1 Back up data that is stored on any internal disk drives or external storage arrays.
- 2 If required, connect the external USB DVD drive to your NAS system.
- 3 Insert your Dell Storage NAS Operating System resource media into your NAS system.
- 4 Restart your NAS system and ensure that your NAS system boots from the resource media.

The OS reinstallation begins and proceeds without any user intervention, if no errors are encountered. This process takes around 60 to 90 minutes to complete. Errors encountered are also flagged on the front panel LCD of your device. To resolve issues, see the *Dell Storage Network Attached Storage (NAS) Systems Troubleshooting Guide* available at [Dell.com/storagemanuals](http://Dell.com/storagemanuals).

- 5 After reinstalling the OS, complete the initial configuration tasks.

**NOTE:** For information about the initial configuration tasks, see the Initial configuration of your NAS system section in *Dell Storage Network Attached Storage (NAS) Systems Running Windows Storage Server 2016 or 2012 R2 Administrator's Guide*.

# Pre-operating system management applications

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

## Options to manage the pre-operating system applications

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

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

**NOTE:** The NX430 system does not support UEFI mode.

## 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:

- 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 provides the following options.

**NOTE:** The NX Series systems support only BIOS mode. Do not change the boot mode to UEFI because the system will not load the appliance OS when in UEFI mode.

Option	Description
<b>System BIOS</b>	Enables you to configure BIOS settings.
<b>iDRAC Settings</b>	Enables you to configure the iDRAC settings. The iDRAC settings utility is used to set up and configure the iDRAC parameters. You can enable or disable various iDRAC parameters using the iDRAC settings utility. For more information about this utility, see <i>Integrated Dell Remote Access Controller User's Guide</i> at <a href="http://Dell.com/idracmanuals">Dell.com/idracmanuals</a> .
<b>Device Settings</b>	Enables you to configure device settings.

## System BIOS

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

### Viewing System BIOS

To view the **System BIOS** screen, perform the following 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**.

### System BIOS Settings details

The **System BIOS Settings** screen provides the following options.

**NOTE:** The NX Series systems support only BIOS mode. Do not change the boot mode to UEFI because the system will not load the appliance OS when in UEFI mode.

Option	Description
<b>System Information</b>	Specifies information about the system such as the system model name, BIOS version, and Service Tag.
<b>Memory Settings</b>	Specifies information and options related to the installed memory.
<b>Processor Settings</b>	Specifies information and options related to the processor such as speed and cache size.
<b>SATA Settings</b>	Specifies options to enable or disable the integrated SATA controller and ports.
<b>Boot Settings</b>	Specifies options to choose the Boot mode and allows you to modify the boot settings.
<b>Network Settings</b>	Specifies options to manage the network settings and boot protocols. Legacy network settings are managed from the <b>Device Settings</b> menu.
<b>Integrated Devices</b>	Specifies options to manage integrated device controllers and ports, specifies related features and options.
<b>Serial Communication</b>	Specifies options to manage the serial ports, its related features and options.
<b>System Profile Settings</b>	Specifies options to change the processor power management settings, memory frequency.

Option	Description
<b>System Security</b>	Specifies options to configure the system security settings, such as system password, setup password, and Trusted Platform Module (TPM) security. This option also manages the power button on the system.
<b>Miscellaneous Settings</b>	Specifies options to change the system date and time.

## Boot Settings

You can use the Boot Settings screen to set the boot mode to either BIOS. It also enables you to specify the boot order.

### Viewing Boot Settings

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

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

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

## Choosing the system boot mode

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

### About this task

- BIOS boot mode (the default) is the standard BIOS-level boot interface.
- Unified Extensible Firmware Interface (UEFI) boot mode is an enhanced 64-bit boot interface. If you have configured your system to boot to UEFI mode, it overlays the system BIOS.

**NOTE:** The NX Series systems support only BIOS mode. Do not change the boot mode to UEFI because the system will not load the appliance OS when in UEFI mode.

### Steps

- 1 From the **System Setup Main Menu**, click **Boot Settings**, and select **Boot Mode**.
- 2 Select the 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 [Dell.com/ossupport](http://Dell.com/ossupport).

## Changing the boot order

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**.

- 1 On the **System Setup Main Menu** screen, click **System BIOS > Boot Settings**.
- 2 Click **Boot Option Settings > Boot Sequence**.
- 3 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.
- 4 Click **Exit**, and then click **Yes** to save the settings on exit.

## 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:

- 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

The **System Security Settings** screen provides the following options:

Option	Description
<b>Intel AES-NI</b>	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 <b>Enabled</b> by default.
<b>System Password</b>	Sets the system password. This option is set to <b>Enabled</b> by default and is read-only if the password jumper is not installed in the system.
<b>Setup Password</b>	Sets the setup password. This option is read-only if the password jumper is not installed in the system.
<b>Password Status</b>	Locks the system password. This option is set to <b>Unlocked</b> by default.

Option	Description
<b>TPM Security</b>	<p> <b>NOTE:</b> The TPM menu is available only when the TPM module is installed.</p> <p>Enables you to control the reporting mode of the TPM. The <b>TPM Security</b> option is set to <b>Off</b> by default. You can only modify the TPM Status, TPM Activation, and Intel TXT fields if the <b>TPM Status</b> field is set to either <b>On with Pre-boot Measurements</b> or <b>On without Pre-boot Measurements</b>.</p>
<b>TPM Information</b>	Changes the operational state of the TPM. This option is set to <b>No Change</b> by default.
<b>TPM Status</b>	Specifies the TPM status.
<b>TPM Command</b>	<p> <b>CAUTION:</b> Clearing the TPM results in the loss of all keys in the TPM. The loss of TPM keys may affect booting to the operating system.</p> <p>Clears all the contents of the TPM. The <b>TPM Clear</b> option is set to <b>No</b> by default.</p>
<b>Intel TXT</b>	Enables or disables the Intel Trusted Execution Technology (TXT) option. To enable the <b>Intel TXT</b> option, virtualization technology and TPM Security must be enabled with Pre-boot measurements. This option is set to <b>Off</b> by default.
<b>Power Button</b>	Enables or disables the power button on the front of the system. This option is set to <b>Enabled</b> by default.
<b>NMI Button</b>	Enables or disables the NMI button on the front of the system. This option is set to <b>Disabled</b> by default.
<b>AC Power Recovery</b>	Sets how the system behaves after AC power is restored to the system. This option is set to <b>Last</b> by default.
<b>AC Power Recovery Delay</b>	Sets the time delay for the system to power up after AC power is restored to the system. This option is set to <b>Immediate</b> by default.
<b>User Defined Delay (60s to 240s)</b>	Sets the <b>User Defined Delay</b> option when the <b>User Defined</b> option for <b>AC Power Recovery Delay</b> is selected.
<b>UEFI Variable Access</b>	<p> <b>NOTE:</b> The NX430 system does not support UEFI mode. This option cannot be used.</p> <p>Provides varying degrees of securing UEFI variables. When set to <b>Standard</b> (the default), UEFI variables are accessible in the operating system per the UEFI specification. When set to <b>Controlled</b>, 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.</p>
<b>Secure Boot</b>	Enables Secure Boot, where the BIOS authenticates each pre-boot image by using the certificates in the Secure Boot Policy. Secure Boot is disabled by default.
<b>Secure Boot Policy</b>	When Secure Boot policy is set to <b>Standard</b> , the BIOS uses the system manufacturer's key and certificates to authenticate pre-boot images. When Secure Boot policy is set to <b>Custom</b> , the BIOS uses the user-defined key and certificates. Secure Boot policy is set to <b>Standard</b> by default.
<b>Secure Boot Policy Summary</b>	Specifies the list of certificates and hashes that secure boot uses to authenticate images.


## Secure Boot Custom Policy Settings

Secure Boot Custom Policy Settings is displayed only when **Secure Boot Policy** is set to **Custom**.

### Viewing Secure Boot Custom Policy Settings

To view the **Secure Boot Custom Policy Settings** screen, perform the following 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**.
- 5 On the **System Security** screen, click **Secure Boot Custom Policy Settings**.

## Secure Boot Custom Policy Settings details

The **Secure Boot Custom Policy Settings** screen details are explained as follows:

Option	Description
<b>Platform Key</b>	Imports, exports, deletes, or restores the platform key (PK).
<b>Key Exchange Key Database</b>	Enables you to import, export, delete, or restore entries in the Key Exchange Key (KEK) Database.
<b>Authorized Signature Database</b>	Imports, exports, deletes, or restores entries in the Authorized Signature Database (db).
<b>Forbidden Signature Database</b>	Imports, exports, deletes, or restores entries in the Forbidden Signature Database (dbx).

## Creating a system and setup password

### Prerequisite

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

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 step

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

- ① **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

### Prerequisite

- ① **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.

## Operating with a setup password enabled

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

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

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

Even after you 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.

- ① **NOTE:** You can use the password status option with the setup password option to protect the system password from unauthorized changes.

## 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 Information

To view the **System Information** screen:

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

```
F2 = System Setup
```

- ① **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

The **System Information** screen provides the following options.

**NOTE:** The NX Series systems support only BIOS mode. Do not change the boot mode to UEFI because the system will not load the appliance OS when in UEFI mode.

Option	Description
<b>System Model Name</b>	Specifies the system model name.
<b>System BIOS Version</b>	Specifies the BIOS version installed on the system.
<b>System Management Engine Version</b>	Specifies the current version of the Management Engine firmware.
<b>System Service Tag</b>	Specifies the system Service Tag.
<b>System Manufacturer</b>	Specifies the name of the system manufacturer.
<b>System Manufacturer Contact Information</b>	Specifies the contact information of the system manufacturer.
<b>System CPLD Version</b>	Specifies the current version of the system complex programmable logic device (CPLD) 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:

- 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

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

Option	Description
<b>System Memory Size</b>	Specifies the memory size in the system.

Option	Description
<b>System Memory Type</b>	Specifies the type of memory installed in the system.
<b>System Memory Speed</b>	Specifies the system memory speed.
<b>System Memory Voltage</b>	Specifies the system memory voltage.
<b>Video Memory</b>	Specifies the amount of video memory.
<b>System Memory Testing</b>	Specifies whether the system memory tests are run during system boot. Options are <b>Enabled</b> and <b>Disabled</b> . This option is set to <b>Disabled</b> by default.
<b>Memory Operating Mode</b>	Specifies the memory operating mode. The available option is <b>Optimizer Mode</b> .

## 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 logical processor idling.

### Viewing Processor Settings

To view the **Processor Settings** screen:

- 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

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

Option	Description
<b>Logical Processor</b>	Enables or disables the logical processors and displays the number of logical processors. If this option is set to <b>Enabled</b> , the BIOS displays all the logical processors. If this option is set to <b>Disabled</b> , the BIOS displays only one logical processor per core. This option is set to <b>Enabled</b> by default.
<b>QPI Speed</b>	Enables you to control QuickPath Interconnect data rate settings.
<b>Virtualization Technology</b>	Enables or disables the additional hardware capabilities provided for virtualization. This option is set to <b>Enabled</b> by default.
<b>Adjacent Cache Line Prefetch</b>	Optimizes the system for applications that need high utilization of sequential memory access. This option is set to <b>Enabled</b> by default. You can disable this option for applications that need high utilization of random memory access.
<b>Hardware Prefetcher</b>	Enables or disables the hardware prefetcher. This option is set to <b>Enabled</b> by default.
<b>DCU Streamer Prefetcher</b>	Enables or disables the Data Cache Unit (DCU) streamer prefetcher. This option is set to <b>Enabled</b> by default.
<b>DCU IP Prefetcher</b>	Enables or disables the Data Cache Unit (DCU) IP prefetcher. This option is set to <b>Enabled</b> by default.

Option	Description												
<b>Configurable TDP</b>	Enables you to reconfigure the processor Thermal Design Power (TDP) levels during POST based on the power and thermal delivery capabilities of the system. TDP verifies the maximum heat the cooling system is needed to dissipate. This option is set to <b>Nominal</b> by default.   <b>NOTE:</b> This option is only available on certain stock keeping units (SKUs) of the processors.												
<b>X2Apic Mode</b>	Enables or disables the X2Apic mode.												
<b>Dell Controlled Turbo</b>	Controls the turbo engagement. Enable this option only when <b>System Profile</b> is set to <b>Performance</b> .   <b>NOTE:</b> Depending on the number of installed CPUs, there may be up to four processor listings.												
<b>Number of Cores per Processor</b>	Controls the number of enabled cores in each processor. This option is set to <b>All</b> by default.												
<b>Processor 64-bit Support</b>	Specifies if the processor(s) support 64-bit extensions.												
<b>Processor Core Speed</b>	Specifies the maximum core frequency of the processor.												
<b>Processor 1</b>	The following settings are displayed for each processor installed in the system: <table border="1" data-bbox="338 772 1348 1060"> <thead> <tr> <th>Option</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><b>Family-Model-Stepping</b></td> <td>Specifies the family, model, and stepping of the processor as defined by Intel.</td> </tr> <tr> <td><b>Brand</b></td> <td>Specifies the brand name.</td> </tr> <tr> <td><b>Level 2 Cache</b></td> <td>Specifies the total L2 cache.</td> </tr> <tr> <td><b>Level 3 Cache</b></td> <td>Specifies the total L3 cache.</td> </tr> <tr> <td><b>Number of Cores</b></td> <td>Specifies the number of cores per processor.</td> </tr> </tbody> </table>	Option	Description	<b>Family-Model-Stepping</b>	Specifies the family, model, and stepping of the processor as defined by Intel.	<b>Brand</b>	Specifies the brand name.	<b>Level 2 Cache</b>	Specifies the total L2 cache.	<b>Level 3 Cache</b>	Specifies the total L3 cache.	<b>Number of Cores</b>	Specifies the number of cores per processor.
Option	Description												
<b>Family-Model-Stepping</b>	Specifies the family, model, and stepping of the processor as defined by Intel.												
<b>Brand</b>	Specifies the brand name.												
<b>Level 2 Cache</b>	Specifies the total L2 cache.												
<b>Level 3 Cache</b>	Specifies the total L3 cache.												
<b>Number of Cores</b>	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 RAID on your system.


 **NOTE:** Dell Storage NX system does not support HDDs connected to SATA ports and does not enable SATA RAID Mode. It supports only PERC RAID Controller.

### Viewing SATA Settings

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

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

Option	Description
<b>Embedded SATA</b>	Enables the embedded SATA option to be set to <b>Off</b> , <b>AHCI</b> , or <b>RAID</b> modes. This option is set to <b>AHCI</b> by default.
<b>Security Freeze Lock</b>	Sends Security Freeze Lock command to the Embedded SATA drives during POST. This option is applicable only for AHCI mode.
<b>Write Cache</b>	Enables or disables the command for Embedded SATA drives during POST.
<b>Port A</b>	For <b>AHCI</b> or <b>RAID</b> mode, BIOS support is always enabled.

Option	Description
<b>Model</b>	Specifies the drive model of the selected device.
<b>Drive Type</b>	Specifies the type of drive attached to the SATA port.
<b>Capacity</b>	Specifies the total capacity of the hard drive. This field is undefined for removable media devices such as optical drives.

**Port B** For **AHCI** or **RAID** mode, BIOS support is always enabled.

Option	Description
<b>Model</b>	Specifies the drive model of the selected device.
<b>Drive Type</b>	Specifies the type of drive attached to the SATA port.
<b>Capacity</b>	Specifies the total capacity of the hard drive. This field is undefined for removable media devices such as optical drives.

**Port C** For **AHCI** or **RAID** mode, BIOS support is always enabled.

Option	Description
<b>Model</b>	Specifies the drive model of the selected device.
<b>Drive Type</b>	Specifies the type of drive attached to the SATA port.
<b>Capacity</b>	Specifies the total capacity of the hard drive. This field is undefined for removable media devices such as optical drives.

**Port D** For **AHCI** or **RAID** mode, BIOS support is always enabled.

Option	Description
<b>Model</b>	Specifies the drive model of the selected device.
<b>Drive Type</b>	Specifies the type of drive attached to the SATA port.
<b>Capacity</b>	Specifies the total capacity of the hard drive. This field is undefined for removable media devices such as optical drives.

**Port E** For **AHCI** or **RAID** mode, BIOS support is always enabled.

Option	Description
<b>Model</b>	Specifies the drive model of the selected device.
<b>Drive Type</b>	Specifies the type of drive attached to the SATA port.
<b>Capacity</b>	Specifies the total capacity of the hard drive. This field is undefined for removable media devices such as optical drives.

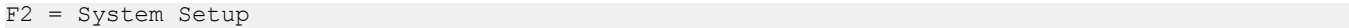
Option	Description
<b>Port F</b>	For <b>AHCI</b> or <b>RAID</b> mode, BIOS support is always enabled.
<b>Option</b>	<b>Description</b>
<b>Model</b>	Specifies the drive model of the selected device.
<b>Drive Type</b>	Specifies the type of drive attached to the SATA port.
<b>Capacity</b>	Specifies the total capacity of the hard drive. This field is undefined for removable media devices such as optical drives.

## 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:

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


**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

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

Option	Description
<b>User Accessible USB Ports</b>	Enables or disables the USB ports. Selecting <b>Only Back Ports On</b> disables the front USB ports, selecting <b>All Ports Off</b> disables all USB ports. The USB keyboard and mouse operate during boot process in certain operating systems. After the boot process is complete, the USB keyboard and mouse do not work if the ports are disabled.  <b>NOTE:</b> Selecting <b>Only Back Ports On</b> and <b>All Ports Off</b> disables the USB management port and also restricts access to iDRAC features.
<b>Internal USB Port</b>	Enables or disables the internal USB port. This option is set to <b>Enabled</b> by default.
<b>Integrated Network Card 1</b>	Enables or disables the integrated network card.
<b>Embedded NIC1 and NIC2</b>	<b>NOTE:</b> The <b>Embedded NIC1</b> and <b>NIC2</b> options are only available on systems that do not have <b>Integrated Network Card 1</b> .  Enables or disables the Embedded NIC1 and NIC2 options. If set to <b>Disabled</b> , 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.
<b>Embedded Video Controller</b>	Enables or disables the <b>Embedded Video Controller</b> option. This option is set to <b>Enabled</b> by default.

Option	Description
<b>Current State of Embedded Video Controller</b>	Displays the current state of the embedded video controller. The <b>Current State of Embedded Video Controller</b> 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 <b>Embedded Video Controller</b> setting is set to <b>Disabled</b> .
<b>OS Watchdog Timer</b>	If your system stops responding, this watchdog timer aids in the recovery of your operating system. When this option is set to <b>Enabled</b> , the operating system initializes the timer. When this option is set to <b>Disabled</b> (the default), the timer does not have any effect on the system.
<b>Memory Mapped I/O above 4 GB</b>	Enables or disables the support for PCIe devices that need large amounts of memory. This option is set to <b>Enabled</b> by default.
<b>Slot Disablement</b>	Enables or disables the available PCIe slots on your system. The slot disablement feature controls the configuration of 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.

## 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:

- 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

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

Option	Description
<b>Serial Communication</b>	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 <b>Auto</b> by default.
<b>Serial Port Address</b>	Enables you to set the port address for serial devices. This option is set to <b>Serial Device 1=COM2, Serial Device 2=COM1</b> by default. <ul style="list-style-type: none"> <li><b>NOTE:</b> 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.</li> <li><b>NOTE:</b> 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.</li> </ul>
<b>External Serial Connector</b>	Enables you to associate the External Serial Connector to Serial Device 1, Serial Device 2, or the Remote Access Device by using this option. <ul style="list-style-type: none"> <li><b>NOTE:</b> 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.</li> </ul>

Option	Description
	<p><b>NOTE:</b> Every time the system boots, the BIOS syncs the serial MUX setting saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS setup utility may not always revert this setting to the default setting of Serial Device 1.</p>
<b>Failsafe Baud Rate</b>	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.
<b>Remote Terminal Type</b>	Sets the remote console terminal type. This option is set to VT 100/VT 220 by default.
<b>Redirection After Boot</b>	Enables or disables the BIOS console redirection when the operating system is loaded. This option is set to <b>Enabled</b> 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:

- 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

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

Option	Description
<b>System Profile</b>	<p>Sets the system profile. If you set the <b>System Profile</b> option to a mode other than <b>Custom</b>, the BIOS automatically sets the rest of the options. You can only change the rest of the options if the mode is set to <b>Custom</b>. This option is set to <b>Performance Per Watt (OS)</b>.</p> <p><b>NOTE:</b> All the parameters on the system profile setting screen are available only when the <b>System Profile</b> option is set to <b>Custom</b>.</p>
<b>CPU Power Management</b>	Sets the CPU power management. This option is set to <b>OS DBPM</b> by default. DBPM is Demand-Based Power Management.
<b>Memory Frequency</b>	Sets the speed of the system memory. You can select <b>Maximum Performance</b> , <b>Maximum Reliability</b> , or a specific speed.
<b>Turbo Boost</b>	Enables or disables the processor to operate in the turbo boost mode. This option is set to <b>Enabled</b> by default.
<b>C1E</b>	Enables or disables the processor to switch to a minimum performance state when it is idle. This option is set to <b>Enabled</b> by default.
<b>C States</b>	Enables or disables the processor to operate in all available power states. This option is set to <b>Enabled</b> by default.
<b>Memory Refresh Rate</b>	Sets the memory refresh rate to either 1x or 2x. This option is set to <b>1x</b> by default.
<b>Uncore Frequency</b>	Enables you to select the <b>Processor Uncore Frequency</b> option.

Option	Description
	Dynamic mode enables the processor to optimize power resources across the cores and uncore during runtime. The optimization of the uncore frequency to either save power or optimize performance is influenced by the setting of the <b>Energy Efficiency Policy</b> option.
<b>Energy Efficient Policy</b>	Enables you to select the <b>Energy Efficient Policy</b> option. The CPU uses the setting to manipulate the internal behavior of the processor and determines whether to target higher performance or better power savings.
<b>Number of Turbo Boot Enabled Cores for Processor 1</b>	Controls the number of turbo boost enabled cores for processor 1. The maximum number of cores is enabled by default.
<b>Monitor/Mwait</b>	Enables the Monitor/Mwait instructions in the processor. This option is set to <b>Enabled</b> for all system profiles, except <b>Custom</b> by default. <p> <b>NOTE:</b> This option can be disabled only if the <b>C States</b> option in the <b>Custom</b> mode is set to <b>disabled</b>.</p> <p> <b>NOTE:</b> When <b>C States</b> is set to <b>Enabled</b> in the <b>Custom</b> mode, changing the <b>Monitor/Mwait</b> setting does not impact the system power or performance.</p>

## 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:

- 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

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

 **NOTE:** The NX430 system does not support UEFI mode.

Option	Description
<b>System Time</b>	Enables you to set the time on the system.
<b>System Date</b>	Enables you to set the date on the system.
<b>Asset Tag</b>	Specifies the asset tag and enables you to modify it for security and tracking purposes.
<b>Keyboard NumLock</b>	Enables you to set whether the system boots with the NumLock enabled or disabled. This option is set to <b>On</b> by default. <p> <b>NOTE:</b> This option does not apply to 84-key keyboards.</p>



Option	Description
<b>F1/F2 Prompt on Error</b>	Enables or disables the F1/F2 prompt on error. This option is set to <b>Enabled</b> by default. The F1/F2 prompt also includes keyboard errors.
<b>Load Legacy Video Option ROM</b>	N/A
<b>Dell Wyse P25/P45 BIOS Access</b>	Enables or disables the Dell Wyse P25/P45 BIOS Access. This option is set to <b>Enabled</b> by default.
<b>Power Cycle Request</b>	Enables or disables the Power Cycle Request. This option is set to <b>None</b> by default.

## iDRAC Settings utility

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

**NOTE:** The NX Series systems support only BIOS mode. Do not change the boot mode to UEFI because the system will not load the appliance OS when in UEFI mode.

For more information about using iDRAC, see *Integrated Dell Remote Access Controller User's Guide* at [Dell.com/idracmanuals](http://Dell.com/idracmanuals).

## Entering the iDRAC Settings utility

- 1 Turn on or restart the managed system.
- 2 Press F2 during Power-on Self-test (POST).
- 3 On the **System Setup Main Menu** page, click **iDRAC Settings**.  
The **iDRAC Settings** screen is displayed.

## Changing the thermal settings

The iDRAC settings utility enables you to select and customize the thermal control settings for your system.

- 1 Click **iDRAC Settings > Thermal**.
- 2 Under **SYSTEM THERMAL PROFILE > Thermal Profile**, select one of the following options:
  - Default Thermal Profile Settings
  - Maximum Performance (Performance Optimized)
  - Minimum Power (Performance per Watt Optimized)
- 3 Under **USER COOLING OPTIONS**, set the **Fan Speed Offset**, **Minimum Fan Speed**, and **Custom Minimum Fan Speed**.
- 4 Click **Back > Finish > Yes**.

## 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.

## Embedded systems management

The Dell Lifecycle Controller provides advanced embedded systems management throughout the lifecycle of the system. The Dell Lifecycle Controller can be started during the boot sequence and can function independently of the operating system.

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

For more information about setting up the Dell Lifecycle Controller, configuring hardware and firmware, and deploying the operating system, see the Dell Lifecycle Controller documentation at [Dell.com/idracmanuals](https://Dell.com/idracmanuals).

## Boot Manager

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

## Viewing Boot Manager

To enter **Boot Manager**:

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

```
F11 = Boot Manager
```

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

## Boot Manager main menu

Menu item	Description
<b>Continue Normal Boot</b>	The system attempts to boot to devices starting with the first item in the boot order. If the boot attempt fails, the system continues with the next item in the boot order until the boot is successful or no more boot options are found.
<b>One-shot Boot Menu</b>	Enables you to access boot menu, where you can select a one-time boot device to boot from.
<b>Launch System Setup</b>	Enables you to access System Setup.
<b>Launch Lifecycle Controller</b>	Exits the Boot Manager and invokes the Dell Lifecycle Controller program.
<b>System Utilities</b>	Enables you to launch System Utilities menu such as System Diagnostics and UEFI shell.

**NOTE:** The NX430 system does not support UEFI mode.


## 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/UEFI Update File Explorer
- Reboot System

 **NOTE:** Depending on the boot mode selected, you might have BIOS or UEFI Update File Explorer.

# Installing and removing system components

This section provides information about installing and removing the system components.

Topics:

- Safety instructions
- Before working inside your system
- After working inside your system
- Recommended tools
- Front bezel (optional)
- System cover
- Inside the system
- Intrusion switch
- Cooling shroud
- System memory
- Hard drives
- Optical drive (optional)
- Cooling fans
- Expansion cards and expansion card riser
- iDRAC port card (optional)
- Processor and heat sink
- Power supply units
- System battery
- Hard drive backplane
- Control panel assembly
- Power interposer board
- Trusted Platform Module
- System board

## Safety instructions

- ⚠ WARNING:** 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.
- ⚠ 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.
- ⚠ CAUTION:** Operating the system without the system cover can result in component damage.
- ℹ NOTE:** Dell recommends that you always use a static mat and static strap while working on components inside the system.

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

## Before working inside your system

### Prerequisite

Follow the safety guidelines listed in the Safety instructions section.

### Steps

- 1 Turn off the system, including any attached peripherals.
- 2 Disconnect the system from the electrical outlet and disconnect the peripherals.
- 3 If installed, remove the front bezel.
- 4 If applicable, remove the system from the rack.  
For more information, see the *Rack Installation* placemat at [Dell.com/poweredge manuals](https://Dell.com/poweredge manuals).
- 5 Remove the system cover.

## After working inside your system

### Prerequisite

Follow the safety guidelines listed in the Safety instructions section.

### Steps

- 1 Install the system cover.
- 2 If applicable, install the system into the rack.  
For more information, see the *Rack Installation* placemat at [Dell.com/poweredge manuals](https://Dell.com/poweredge manuals).
- 3 If removed, install the front bezel.
- 4 Reconnect the peripherals and connect the system to the electrical outlet.
- 5 Turn on the system, including any attached peripherals.

## Recommended tools

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

- Key to the bezel lock. This is needed only if your system includes a bezel.
- Phillips #2 screwdriver
- Plastic scribe
- Wrist grounding strap

## Front bezel (optional)

The front bezel is attached to the front side of the server and prevents accidents while removing the hard drive or when pressing the reset or power button. The front bezel can also be locked for additional security.

## Installing the optional front bezel

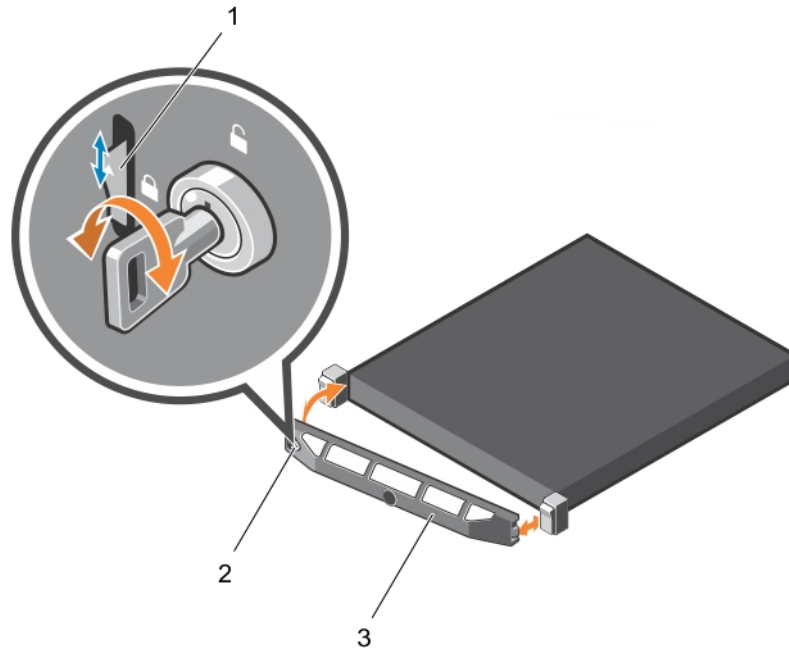
### Prerequisite

- 1 Follow the safety guidelines listed in the Safety instructions section.

### Steps

- 1 Locate and remove the bezel key.  
**NOTE:** The bezel key is attached to the back of the bezel.
- 2 Hook the right end of the bezel onto the chassis.

- 3 Fit the free end of the bezel onto the system.
- 4 Lock the bezel by using the key.



**Figure 8. Installing the optional front bezel**

- |   |               |   |      |
|---|---------------|---|------|
| 1 | release latch | 2 | lock |
| 3 | front bezel   |   |      |

## Removing the optional front bezel

### Prerequisite

- 1 Follow the safety guidelines listed in the Safety instructions section.

### Steps

- 1 Locate and remove the bezel key.

**NOTE:** The bezel key is attached to the back of the bezel.

- 2 Unlock the bezel at the left end of the bezel.
- 3 Slide the release latch up and pull the left end of the bezel.
- 4 Unhook the right end, and remove the bezel.

## System cover

The system cover protects the components inside the system and helps in maintaining air flow inside the system. Removing the system cover actuates the intrusion switch which aids in maintaining system security.

## Removing the system cover

### Prerequisites

- 1 Follow the safety guidelines listed in the Safety instructions section.

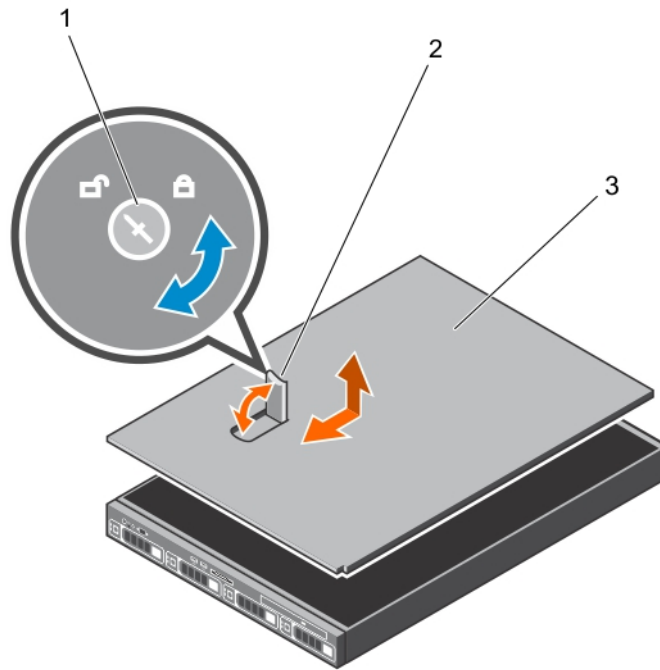
- 2 Turn off the system, including any attached peripherals.
- 3 Disconnect the system from the electrical outlet and disconnect the peripherals.
- 4 If installed, remove the optional bezel. For more information, see the Removing the optional front bezel section.
- 5 If installed, remove the front bezel.

### Steps

- 1 Rotate the latch release lock counter clockwise to the unlocked position.
- 2 Lift the latch toward the back of the system.  
The system cover slides back and the tabs on the system cover disengage from the slots on the chassis.

**NOTE:** The position of the latch may vary depending on the configuration of your system.

- 3 Hold the cover on both sides, and lift the cover away from the system.



**Figure 9. Removing and installing the system cover**

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1 latch release lock</li> <li>3 system cover</li> </ol> | <ol style="list-style-type: none"> <li>2 latch</li> </ol> |
|--|---|

### Next step

- 1 Install the system cover.

## Installing the system cover

### Prerequisites

- 1 Follow the safety guidelines listed in the safety instructions section.
- 2 Ensure that all internal cables are connected and placed out of the way and no tools or extra parts are left inside the system.

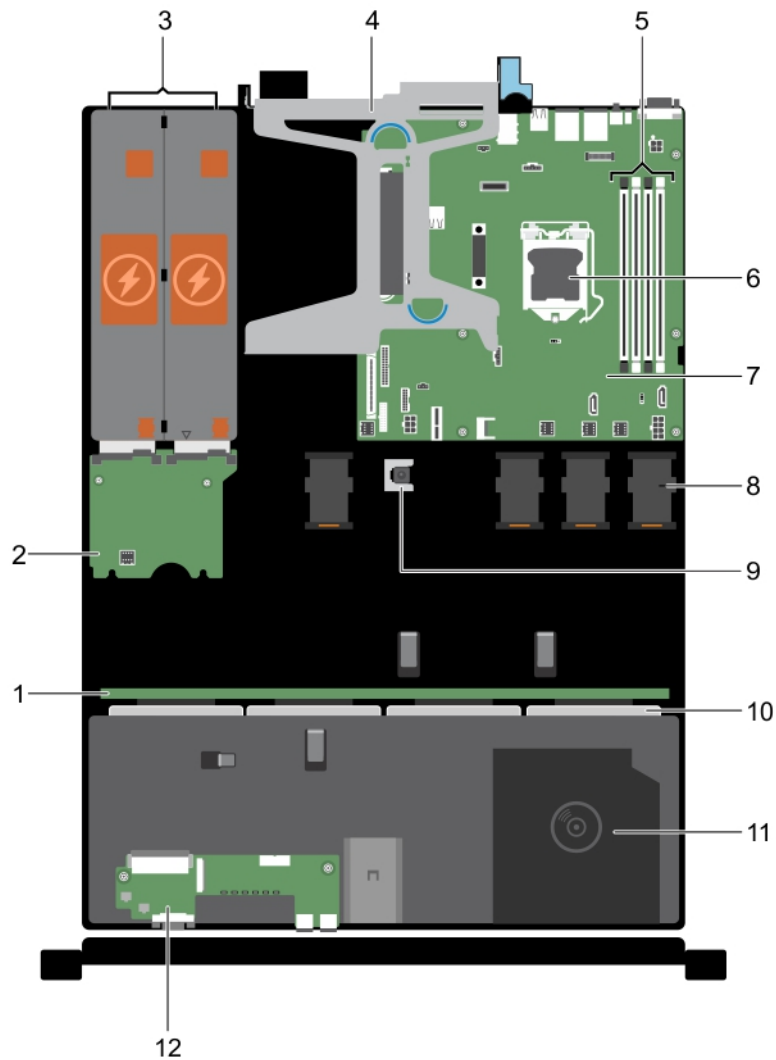
## Steps

- 1 Align the slots on the system cover with the tabs on the chassis.
- 2 Push the system cover latch down to move the system cover into the closed position.  
The system cover slides forward and the tabs on the system cover engage with the slots on the chassis. The system cover latch locks into place when the system cover engages with the slots on the chassis.
- 3 Rotate the latch release lock clockwise to the locked position.

## Next steps

- 1 If removed, install the bezel.
- 2 Reconnect the peripherals and connect the system to the electrical outlet.
- 3 Turn on the system, including any attached peripherals.

# Inside the system



**Figure 10. Inside the system—with four 3.5-inch hot swappable hard drives**

- |   |                       |   |                        |
|---|-----------------------|---|------------------------|
| 1 | hard drive backplane  | 2 | power interposer board |
| 3 | power supply unit (2) | 4 | expansion card riser   |



- 5 memory module sockets
- 7 system board
- 9 intrusion switch
- 11 optical drive (optional)

- 6 processor
- 8 cooling fan (4)
- 10 hard drives
- 12 control panel assembly

## Intrusion switch

This section provides information about removing or installing the intrusion switch.

### Removing the intrusion switch

#### 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.

- 1 Follow the safety guidelines listed in safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Keep the plastic scribe ready.

#### Steps

- 1 Disconnect the intrusion switch cable from the connector on the system board.
- 2 Remove the cable from the cable routing latch.
- 3 Using a plastic scribe, slide the intrusion switch and remove it from under the intrusion switch slot.

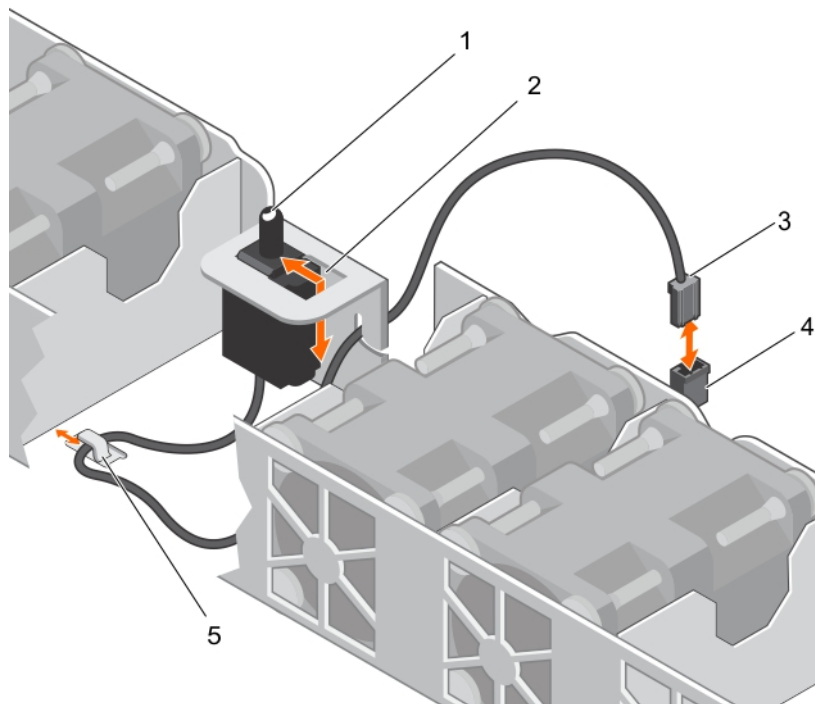


Figure 11. Removing the intrusion switch

1 intrusion switch

2 intrusion switch slot

- 3 intrusion switch cable
- 5 cable routing clip

- 4 intrusion switch connector on the system board

### Next steps

- 1 Install the intrusion switch.
- 2 Follow the procedure listed in the After working inside your system section.

## Installing the intrusion switch

### 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.

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

### Steps

- 1 Insert the intrusion switch into the intrusion switch slot.
- 2 Slide the intrusion switch until it locks into position.
- 3 Route the intrusion switch cable through the cable routing tab.
- 4 Connect the intrusion switch cable to the connector on the system board.

### Next step

- 1 Follow the procedure listed in After working inside your system section.

## Cooling shroud

The cooling shroud has aerodynamically placed openings that direct the airflow across the entire system. The airflow passes through all the critical parts of the system, where the vacuum pulls air across the entire surface area of the heat sink allowing increased cooling.

## Removing the cooling shroud

### 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.

- 1 Follow the safety guidelines listed in the Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 If connected, disconnect the cables from expansion card (s).

**NOTE:** If required, close the expansion card latch on the cooling shroud to release the full length card.

- 4 If installed, remove the expansion card riser.

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

### Step

By holding the sides of the cooling shroud, lift the cooling shroud away from the system.

## Next steps

- 1 Reinstall the cooling shroud.
- 2 If removed, reinstall the optional PCIe expansion card riser.
- 3 If disconnected, connect the cables to the expansion card(s).
- 4 If required, open the expansion-card latch on the cooling shroud to support the full length expansion card.
- 5 Follow the procedure listed in the After working inside your system section.

# Installing the cooling shroud

## 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.

- 1 Follow the safety guidelines listed in the Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 If applicable, route the cables inside the system along the chassis wall and secure the cables by using the cable-securing bracket.

## Steps

- 1 Align the tabs on the cooling shroud with the securing slots on the chassis.
- 2 Lower the cooling shroud into the chassis until it is firmly seated.

When firmly seated, the memory socket numbers marked on the cooling shroud align with the respective memory sockets.

## Next step

- 1 Follow the procedure listed in the After working inside your system section.

# System memory

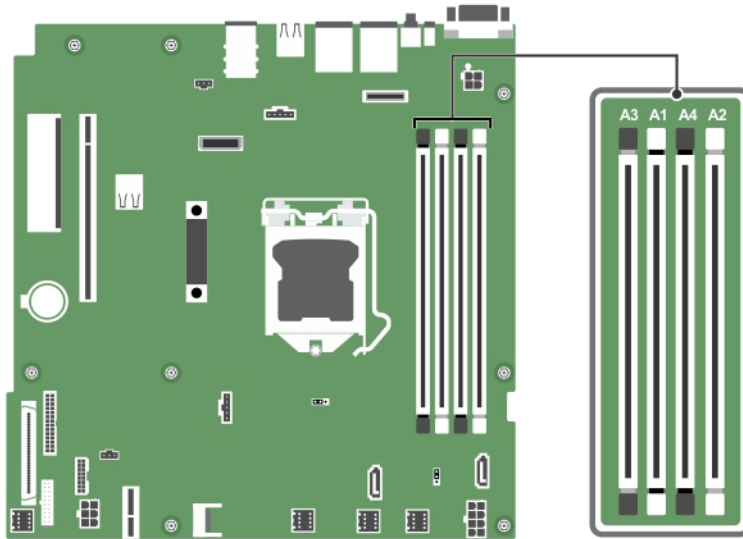
Your system supports DDR4 ECC unbuffered DIMMs (RDIMMs).

**ⓘ NOTE:** MT/s indicates memory module speed in Mega Transfers per second.

Memory bus operating frequency can be 2133 MT/s, 1866 MT/s, or 1600 MT/s depending on the following factors:

- System profile selected (for example, Performance Optimized, Custom, or Dense Configuration Optimized)
- Maximum supported memory module frequency of the processors

The system contains four memory sockets — two sets of 2-sockets each. Each 2-socket set is organized into one channel. In each 2-socket set, the first socket release lever is marked white and the second socket release lever is marked black.



**Figure 12. Memory socket locations on the system board**

Memory channels are organized as follows:

- Processor 1
  - channel 0: memory sockets A1 and A3
  - channel 1: memory sockets A2 and A4

The following table shows the memory populations and operating frequencies for the supported configurations:

**Table 10. Memory populations and operating frequencies for the supported configurations**

Memory module type	Memory modules populated per channel	Operating frequency (in MT/s)		Maximum memory module ranks per channel
		1.2 V		
ECC (RDIMM)	1	2133, 1866, 1600		Dual rank or single rank
	2	2133, 1866, 1600		Dual rank or single rank

## General memory module installation guidelines

Your 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:

- x4 and x8 DRAM-based DIMMs can be mixed.
- Up to two dual- or single-rank ECC UDIMMs can be populated per channel.
- Populate DIMM sockets only if a processor is installed. For single-processor systems, sockets A1 to A4 are available.
- Populate all sockets with white release levers first, and then all the sockets with black release levers.
- 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 4 GB and 8 GB DIMMs, populate 8 GB DIMMs in the sockets with white release levers and 4 GB DIMMs in the sockets with black release levers.
- Memory modules of different capacities can be mixed provided other memory population rules are followed (for example, 4 GB and 8 GB memory modules can be mixed).

- Mixing of more than two DIMM capacities in a system is not supported.
- Populate two DIMMs per processor (one DIMM per channel) at a time to maximize performance.

## Mode-specific guidelines

Four memory channels are allocated to each processor. The allowable configurations depend on the memory mode selected.

### Advanced Error Correction Code (lockstep)

Advanced Error Correction Code (ECC) mode extends SDDC from x4 DRAM based DIMMs to both x4 and x8 DRAMs. This protects against single DRAM chip failures during normal operation.

The installation guidelines for memory modules are as follows:

- Memory modules must be identical in size, speed, and technology.
- DIMMs installed in memory sockets with white release levers must be identical and the same rule applies for sockets with black release levers. This ensures that identical DIMMs are installed in matched pair—for example, A1 with A2, A3 with A4, A5 with A6, and so on.

### Memory optimized (independent channel) 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.

### Memory sparing

**NOTE:** To use memory sparing, this feature must be enabled in System Setup.

In this mode, one rank per channel is reserved as a spare. If persistent correctable errors are detected on a rank, the data from this rank is copied to the spare rank, and the failed rank is disabled.

With memory sparing enabled, the system memory available to the operating system is reduced by one rank per channel. For example, in a dual-processor configuration with sixteen 4 GB quad-rank memory modules, the available system memory is:  $3/4$  (ranks/channel)  $\times$  16 (memory modules)  $\times$  4 GB = 48 GB, and not  $16$  (memory modules)  $\times$  4 GB = 64 GB.

**NOTE:** Memory sparing does not offer protection against a multi-bit uncorrectable error.

**NOTE:** Both Advanced ECC/Lockstep and Optimizer modes support memory sparing.

### Memory mirroring

Memory mirroring offers the strongest memory module reliability mode compared to all other modes, providing improved uncorrectable multi-bit failure protection. In a mirrored configuration, the total available system memory is one half of the total installed physical memory. Half of the installed memory is used to mirror the active memory modules. In the event of an uncorrectable error, the system switches over to the mirrored copy. This ensures SDDC and multi-bit protection.

The installation guidelines for memory modules are as follows:

- Memory modules must be identical in size, speed, and technology.
- Memory modules installed in memory module sockets with white release levers must be identical and the same rule applies for sockets with black and green release tabs. This ensures that identical memory modules are installed in matched pairs—for example, A1 with A2, A3 with A4, A5 with A6, and so on.

**Table 11. Processor configuration**

Processor	Configuration	Memory population rules	Memory population information
Single CPU	Memory population order	{1,2}, {3,4}	See Memory mirroring note

## Sample memory configurations

The following tables show sample memory configurations for one and two processor configurations that follow the appropriate memory guidelines.

**NOTE:** 1R, 2R, and 4R in the following tables indicate single, dual, and quad-rank DIMMs respectively.

**Table 12. Memory configurations—single processor**

System capacity (in GB)	DIMM size (in GB)	Number of DIMMs	DIMM rank, organization, and frequency	DIMM slot population
4	4	1	1R, x8, 2133 MT/s	A1
			1R, x8, 1866 MT/s	
8	4	2	1R, x8, 2133 MT/s	A1, A2
			1R, x8, 1866 MT/s	
16	4	4	1R, x8, 2133 MT/s	A1, A2, A3, A4
			1R, x8, 1866 MT/s	
	8	2	2R, x8, 2133 MT/s	A1, A2
			2R, x8, 1866 MT/s	

## Removing memory modules

### 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.

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

**WARNING:** The memory modules are hot to touch for some time after the system has been powered down. Allow the memory modules to cool before handling them. Handle the memory modules by the card edges and avoid touching the components or metallic contacts on the memory module.

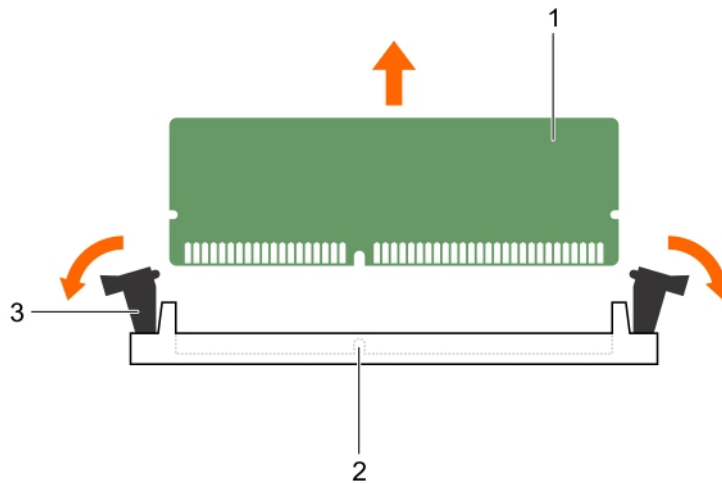
**CAUTION:** To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. Remove memory module blanks only if you intend to install memory modules in those sockets.

### 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 To release the memory module from the socket, simultaneously press the ejectors on both ends of the memory module socket.
- 3 Lift and remove the memory module from the system.



**Figure 13. Removing the memory module**

- |   |                                  |   |                      |
|---|----------------------------------|---|----------------------|
| 1 | memory module                    | 2 | memory module socket |
| 3 | memory module socket ejector (2) |   |                      |

#### Next steps

- 1 If you are removing the memory module permanently, install a memory-module blank.
- 2 Install the memory module.
- 3 Install the cooling shroud.
- 4 Follow the procedure listed in the After working inside your system section.

## Installing memory modules

#### 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.

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

**WARNING:** The memory modules are hot to touch for some time after the system has been powered down. Allow the memory modules to cool before handling them. Handle the memory modules by the card edges and avoid touching the components or metallic contacts on the memory module.

#### Steps

- 1 Locate the appropriate memory module socket.

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

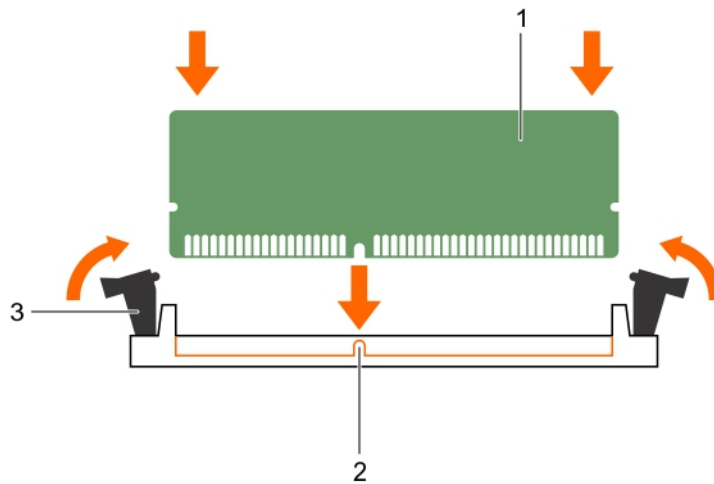
- Align the edge connector of the memory module with the alignment key of the memory module socket, and insert the memory module in the socket.

**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.

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

When the memory module is properly seated in the socket, the levers on the memory module socket align with the levers on the other sockets that have memory modules installed.



**Figure 14. Installing the memory module**

- |   |                                  |   |               |
|---|----------------------------------|---|---------------|
| 1 | memory module                    | 2 | alignment key |
| 3 | memory module socket ejector (2) |   |               |

### Next steps

- Follow the procedure listed in the After working inside your system section.
- Press F2 to enter System Setup, and check the **System Memory** setting.  
The system should have already changed the value to reflect the installed memory.
- 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.
- Run the system memory test in system diagnostics.

## Hard drives

Your system supports enterprise class hard drives. Enterprise class drives are designed for 24x7 operating environment. Selecting the correct drive class enables the critical areas of quality, functionality, performance, and reliability to be optimized for the target implementation.



Choosing the right drive type depends on the usage pattern. Due to industry advances, in some cases, the larger capacity drives have been changed to a larger sector size. The larger sector size can have impacts on operating systems and applications. For more information about these hard drives, see the *512e and 4Kn Disk Formats* whitepaper and *4K Sector HDD FAQ* document at [Dell.com/poweredgemanuals](https://Dell.com/poweredgemanuals).

**CAUTION:** Before attempting to remove or install a hard 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 hot swappable hard drive removal and insertion.

**CAUTION:** Do not turn off or restart your system while the hard drive is being formatted. Doing so can cause a hard drive failure.

Use only hard drives that have been tested and approved for use with the hard drive backplane.

When you format a hard drive, allow enough time for the formatting to be completed. Be aware that high-capacity hard drives can take a long time to format.

## Supported hard drive configuration

**Four hard drive systems** Up to four 3.5-inch hot-swappable SATA hard drives, or SATA solid state drives (SSDs)

**NOTE:** SAS/SATA hard drives cannot be mixed in a system.

The hot-swappable hard drives connect to the system board through the hard drive backplane. Hot-swappable hard drives are supplied in hot-swappable hard drive carriers that fit in the hard drive slots.

## Removing a 3.5-inch hot swappable hard drive carrier blank

### Prerequisites

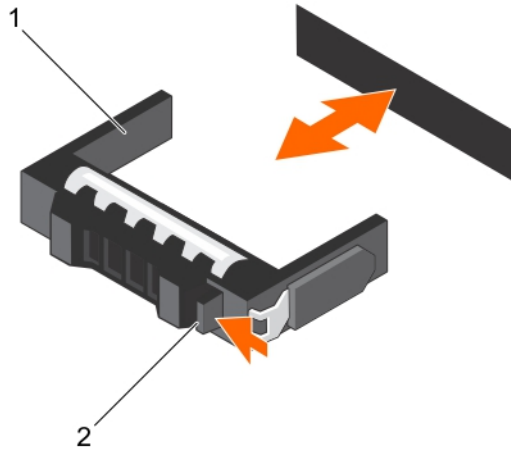
**CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell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

**CAUTION:** To maintain proper system cooling, all empty hard drive slots must have drive carrier blanks installed.

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

### Step

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



**Figure 15. Removing and installing a 3.5-inch hot swappable hard drive carrier blank**

1 hard drive carrier blank

2 release button

### Next step

If removed, install the front bezel.

## Installing a 3.5-inch hot swappable hard drive carrier blank

### 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 came with the product.

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

### Step

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

### Next step

If removed, install the front bezel.

## Removing a hot swappable hard drive carrier

### 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 came with the product.

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 If installed, remove the front bezel.
- 3 Using the management software, prepare the hard drive for removal. For more information, see the documentation for the storage controller.  
If the hard drive is online, the green activity or fault indicator flashes when the hard drive is turned off. You can remove the hard drive when the hard drive indicators turn off.

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

**NOTE:** Hot swappable hard drives are supplied in hot swappable hard drive carriers that fit in the hard drive slots.

### Steps

- 1 Press the release button to open the hard drive carrier release handle.
- 2 Slide the hard drive carrier out of the hard drive slot.

**CAUTION:** To maintain proper system cooling, all empty hard drive slots must have hard drive carrier blanks installed.

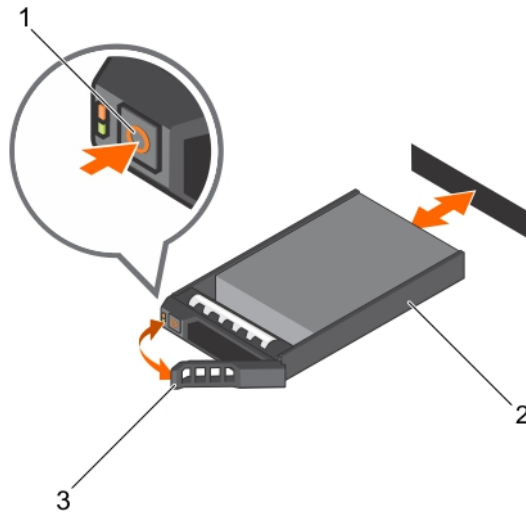


Figure 16. Removing and installing a hot swappable hard drive carrier

- |   |                           |   |                    |
|---|---------------------------|---|--------------------|
| 1 | release button            | 2 | hard drive carrier |
| 3 | hard drive carrier handle |   |                    |

### Next step

If you are not replacing the hard drive immediately, insert a hard drive carrier blank in the empty hard drive slot, or install a hard drive carrier.

## Installing a hot swappable hard drive carrier

### 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.
- CAUTION:** Use only hard drives that have been tested and approved for use with the hard drive backplane.
- CAUTION:** Combining SAS and SATA hard drives in the same RAID volume is not supported.
- CAUTION:** When installing a hard drive, ensure that the adjacent drives are fully installed. Inserting a hard 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 hard drive is installed and the system is powered on, the hard drive automatically begins to rebuild. Make absolutely sure that the replacement hard drive is blank or contains data that you wish to have overwritten. Any data on the replacement hard drive is immediately lost after the hard drive is installed.

**NOTE:** Hot swappable hard drives are supplied in hot swappable hard drive carriers that fit in the hard drive slots.

- 1 If installed, remove the hard drive carrier blank.
- 2 Install a hot swappable hard drive into the hot swappable hard drive carrier.

### Steps

- 1 Press the release button on the front of the hot swappable hard drive carrier and open the hot swappable hard drive carrier handle.
- 2 Insert the hot swappable hard drive carrier into the hard drive slot, and push the hot swappable hard drive carrier until it comes in contact with the backplane.
- 3 Close the hot swappable hard drive carrier handle to lock the hot swappable hard drive carrier in place.

### Next step

If removed, install the front bezel.

## Installing a 2.5-inch hot swappable hard drive into a 3.5-inch hard drive adapter

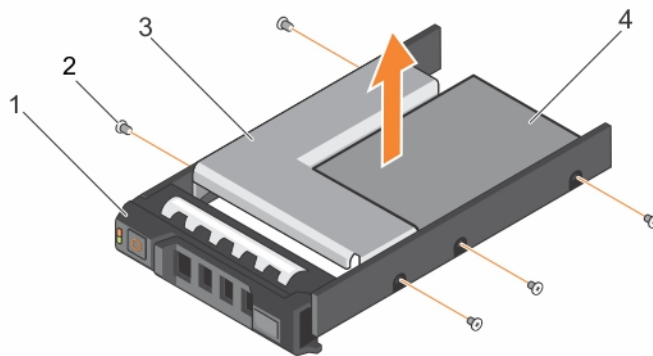
### Prerequisites

**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.

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Keep the Phillips #2 screwdriver ready.

### Steps

- 1 Align the screw holes on the 2.5-inch hot swappable hard drive with the screw holes on the 3.5-inch hard drive adapter.
- 2 Install the screws to secure the 2.5-inch hot swappable hard drive to the 3.5-inch hard drive adapter.



**Figure 17. Installing a 2.5-inch hot swappable hard drive into a 3.5-inch hard drive adapter**

- |   |   |   |                                   |
|---|---|---|-----------------------------------|
| 1 | 3.5-inch hot swappable hard drive carrier | 2 | screw (5)                         |
| 3 | 3.5-inch hard drive adapter               | 4 | 2.5-inch hot swappable hard drive |

### Next step

Install the 3.5-inch adapter into the 3.5-inch hot swappable hard drive carrier.

# Removing a 2.5-inch hot swappable hard drive from a 3.5-inch hard drive adapter

## 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 came with the product.

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Keep the Phillips #2 screwdriver ready.
- 3 Remove the 3.5-inch hard drive adapter from the 3.5-inch hot swappable hard drive carrier.

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

## Steps

- 1 Remove the screws from the side of the 3.5-inch hard drive adapter.
- 2 Remove the 2.5-inch hot swappable hard drive from the 3.5-inch hard drive adapter.

# Installing a 3.5-inch hard drive into the 3.5-inch hot swappable hard drive carrier

## 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.

- 1 Follow the safety guidelines listed in the Safety instructions section.
- 2 Keep the Phillips #2 screwdriver ready.
- 3 Install the 2.5-inch hot swappable hard drive into the 3.5-inch hard drive .

## Steps

- 1 Insert the 3.5-inch hard drive into the 3.5-inch hot swappable hard drive carrier with the connector end of the hard drive toward the back of the 3.5-inch hot swappable hard drive carrier.
- 2 Align the screw holes on the 3.5-inch hard drive and the 3.5-inch hard drive with the holes on the 3.5-inch hot swappable hard drive carrier.
- 3 Install the screws to secure the 3.5-inch hard drive to the 3.5-inch hot swappable hard drive carrier.

## Next step

Install the 3.5-inch hot swappable hard drive carrier into the system.

# Removing a 3.5-inch hard drive from a 3.5-inch hot swappable hard drive carrier

## Prerequisites

- 1 Follow the safety guidelines listed in the Safety instructions section.

- 2 Keep the Phillips #2 screwdriver ready.
- 3 Remove the 3.5-inch hot swappable hard drive carrier from the system.

### Steps

- 1 Remove the screws from the rails on the 3.5-inch hot swappable hard drive carrier.
- 2 Lift the 3.5-inch hard drive out of the 3.5-inch hot swappable hard drive carrier.

### Next step

Remove the 2.5-inch hot swappable hard drive from a 3.5-inch hard drive .

## Optical drive (optional)

Optical drives retrieve and store data on optical discs such as compact disks(CD), digital versatile disks (DVD), and Blu-ray discs (BD). Optical drives can be categorized into two basic types: optical disk readers and optical disk writers.

## Removing the optional optical drive

The procedure for removing an optical drive and optical drive blank is the same.

### Prerequisites

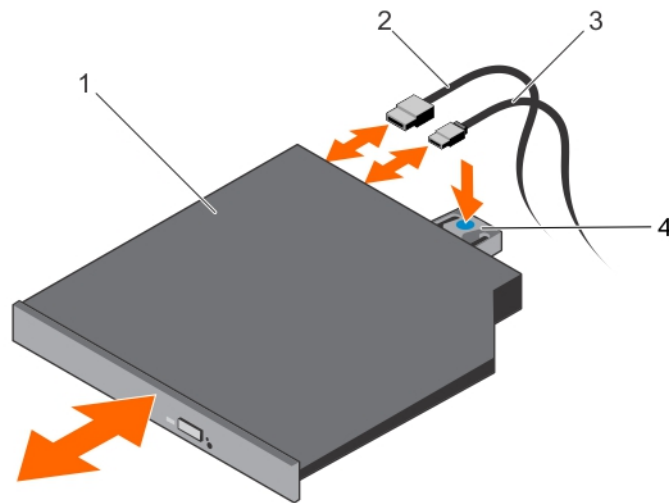
**⚠ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell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

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

**ⓘ NOTE: Observe the routing of the power and data cables inside the chassis as you remove them from the system board and the optical drive. Route these cables in the same way when you replace them to prevent them from being pinched or crimped.**

### Steps

- 1 Disconnect the power and data cables from the back of the optical drive.
- 2 If required, disconnect the power and data cables from the system board.
- 3 To release the optical drive, press and push the release tab toward the front of the system.
- 4 Slide the optical drive out of the system.



**Figure 18. Removing and installing the optical drive**

- |   |               |   |             |
|---|---------------|---|-------------|
| 1 | optical drive | 2 | data cable  |
| 3 | power cable   | 4 | release tab |

### Next steps

- 1 Depending on your system configuration, install an optical drive.
- 2 If you are not immediately installing an optical drive, install an optical drive blank.

**NOTE:** Blanks must be installed on empty optical drive 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 Follow the procedure listed in the After working inside your system section.

## Installing the optional optical drive

The procedure for installing an optical drive and optical drive blank is the same.

### 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.

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 If installed, remove the optical drive blank by pressing the blue release tab at the back of the blank and pushing the blank out of the system.

### Steps

- 1 Align the optical drive with the optical drive slot on the front of the chassis.
- 2 Slide the optical drive into the slot until the latch snaps into place.
- 3 Connect the power and data cables to the back of the optical drive.
- 4 Route the power and data cables through the cable routing latch of the system.
- 5 Connect the power and data cables to the connectors on the system board.

## Next step

Follow the procedure listed in the After working inside your system section.

# Cooling fans

Depending on your system configuration, your system can support up to four cooling fans.

**NOTE:** Hot swappable removal or installation of the fans is not supported.

**NOTE:** Each fan is listed in the management software of the system, referenced by the respective fan number. If there is a problem with a particular fan, you can easily identify and replace the proper fan by noting down the fan numbers provided on the cooling fans.

The following table shows the number of fans required for different system configurations:

**Table 13. Number of fans based on system configuration**

System configuration	Number of fans
Systems with four 3.5-inch hard drives with adapter	3
Systems with four 3.5-inch hard drives with adapter with PCIe riser card	4

**NOTE:** Ensure that you install a cooling fan blank in an empty cooling fan bracket.

## Removing the cooling fan blank

### 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.

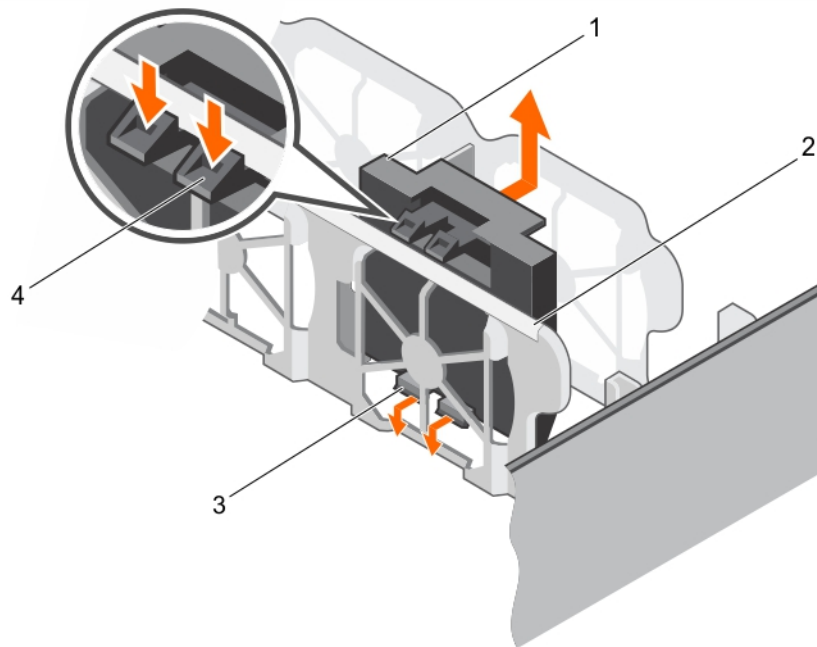
**NOTE:** The procedure for removing each cooling fan blank is identical.

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

### Steps

- 1 Press the release tabs and push the cooling fan blank to disengage it from the cooling fan bracket.
- 2 Lift the cooling fan blank out of the cooling fan bracket.





**Figure 19. Removing and installing a cooling fan blank**

- |   |                       |   |                 |
|---|-----------------------|---|-----------------|
| 1 | cooling fan blank (2) | 2 | release tab (2) |
| 3 | cooling fan bracket   | 4 | tab             |

#### Next steps

- 1 Install the cooling fan.
- 2 Follow the procedure listed in the After working inside your system section.

## Installing the cooling fan blank

#### 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.

**NOTE:** The procedure for removing each cooling fan blank is identical.

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

#### Steps

- 1 Lower the cooling fan blank into the cooling fan bracket.
- 2 Insert the tabs on the cooling fan blanks into the slots on the cooling fan bracket.
- 3 Press the cooling fan blank until it clicks into place.

#### Next step

Follow the procedure listed in the After working inside your system section.

# Removing a cooling fan

## Prerequisites

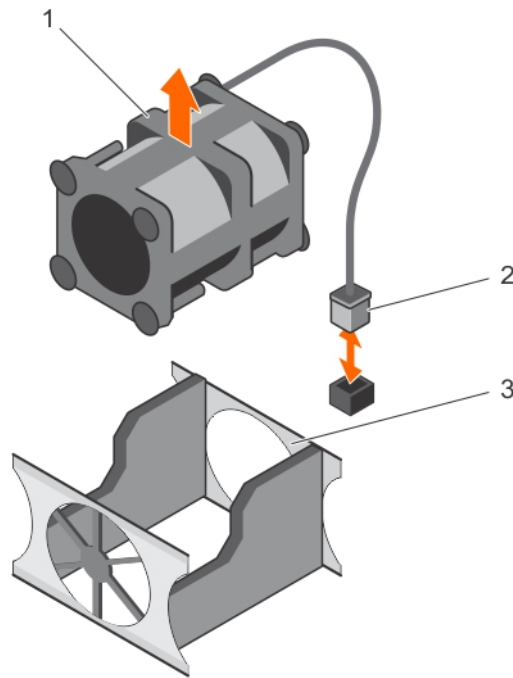
**⚠ CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by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

**📘 NOTE:** The procedure for removing each fan is identical.

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 If required, remove the cooling shroud.

## Steps

- 1 Disconnect the power cable from the power connector on the system board by pressing the sides of the power cable.
- 2 Lift the fan out of the cooling fan bracket.



**Figure 20. Removing and installing a cooling fan**

- |   |                     |   |                       |
|---|---------------------|---|-----------------------|
| 1 | cooling fan         | 2 | power cable connector |
| 3 | cooling fan bracket |   |                       |

## Next steps

- 1 Install the cooling fan.
- 2 Follow the procedure listed in the After working inside your system section.

# Installing a cooling fan

## 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.

**NOTE:** The procedure for installing each fan is identical.

- 1 Follow the safety guidelines listed in safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 If installed, remove the cooling fan blank.
- 4 If required, remove the cooling shroud.

## Steps

- 1 Lower the fan into the cooling fan bracket.
- 2 Connect the power cable to the power cable connector on the system board.

## Next steps

- 1 Install the cooling shroud.
- 2 Follow the procedure listed in the After working inside your system section.

# Expansion cards and expansion card riser

An expansion card in the computer is a add-on card that can be inserted into an expansion slot on the computer system board or riser card to add enhanced functionality to the system through the expansion bus.

**NOTE:** A System Event Log (SEL) event is logged if an expansion card riser is unsupported or missing. It does not prevent your system from turning on and no BIOS POST message or F1/F2 pause is displayed.

**NOTE:** The expansion card riser is optional for systems with four hard drives.

# Expansion card installation guidelines

Your system supports PCIe Express Generation 3 cards. The following table provides riser configurations for NX430 systems:

**Table 14. Expansion card slots available on the expansion card riser**

PCIe slot on the expansion card riser	Height	Length	Link width	Slot width
LP SLOT 1	Half Height	Half Length	x4	x8
FH SLOT 2	Full Height	Half Length	x8	x16

**Table 15. Expansion card slots available on the system board**

PCIe slot on the system board	Height	Length	Link width	Slot width
PCIE_G3_X4	Half Height	Half Length	x4	x8

**NOTE:** The expansion cards are not hot-swappable.

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

**Table 16. Expansion card installation order**

Card priority	Card type		Slot priority	Maximum allowed
1	RAID	PowerEdge RAID Controller (PERC) H730 and H330	Internal PERC slot	1
		PERC H830 Full Height	2	1
		PERC H830 Low Profile	1	1
2	10 Gb NICs	Intel and Broadcom Dual Port	2	1
		Intel and Broadcom Dual Port Low Profile	1	1
3	FC8 HBA	Qlogic QLE2562, Qlogic QLE2560, Emulex LPE12002, Emulex LPE12000, Emulex LPE15000, and Emulex LPE15002	2	1
		Qlogic QLE2562, Qlogic QLE2560, Emulex LPE12002, Emulex LPE12000, Emulex LPE15000, and Emulex LPE15002 Low Profile	1	1
4	1 Gb NICs	Intel and Broadcom Dual and Quad Port	2	1
		Intel and Broadcom Dual and Quad Port Low Profile	1	1
5	Non-RAID	12GB SAS HBA Full Height	2	1
		12GB SAS HBA Low Profile	1	1

# Removing the expansion card riser

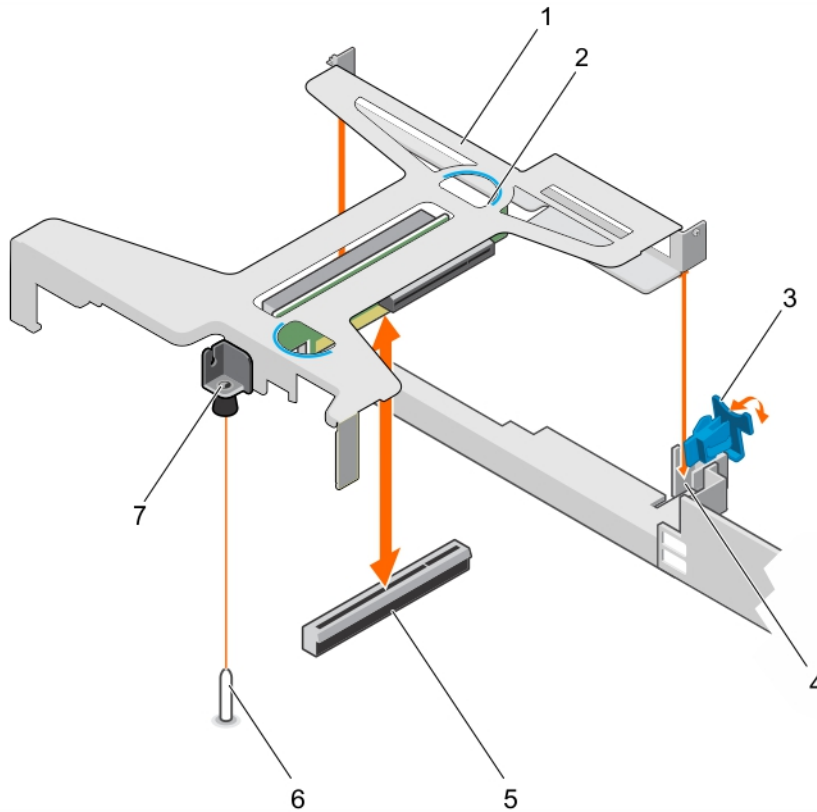
## Prerequisites

**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.

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

## Steps

- 1 Lift and rotate the expansion card riser latch to open it.
- 2 Holding the touch points, lift the expansion card riser from the riser connector on the system board.



**Figure 21. Removing and installing the expansion card riser**

- |   |  |   |                               |
|---|--|---|-------------------------------|
| 1 | expansion card riser                   | 2 | touch point (2)               |
| 3 | expansion card latch                   | 4 | guide slot on the chassis     |
| 5 | riser connector on the system board    | 6 | guide pin on the system board |
| 7 | guide slot on the expansion card riser |   |                               |

## Next step

Install the expansion card riser.

# Installing the expansion card riser

## 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.

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Install the expansion card into the expansion card riser.

## Steps

- 1 Open the expansion card riser latch.
- 2 Align the following:
  - a Guide on the expansion card riser with the guide pin on the system board.
  - b Expansion card riser connector with the connector on the system board.
- 3 Lower the expansion card riser until the expansion card riser is firmly seated in the connector on the system board.
- 4 Close the expansion card riser latch.

## Next step

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

# Removing an expansion card

## Prerequisites

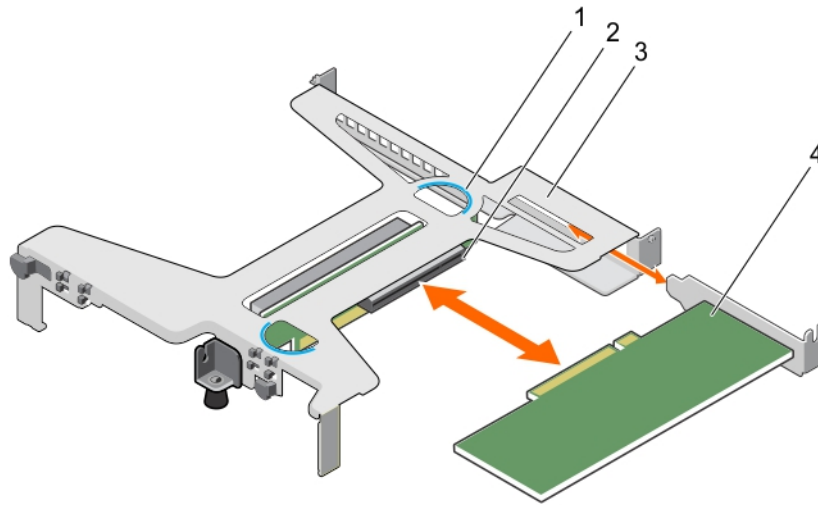
**CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell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

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Disconnect any cables connected to the expansion card or expansion card riser.
- 4 If installed, remove the expansion card riser.

## Steps

- 1 Hold the expansion card by its edges and remove it from the expansion card riser connector.
- 2 If you are removing the card permanently, install a filler bracket in the empty expansion card slot and close the expansion card latch.

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



**Figure 22. Removing and installing the expansion card from the expansion card riser**

- |   |                      |   |                                |
|---|----------------------|---|--------------------------------|
| 1 | touch point (2)      | 2 | expansion card riser connector |
| 3 | expansion card riser | 4 | expansion card                 |

#### Next steps

- 1 Install the filler bracket or expansion card, if applicable.
- 2 Install the expansion card riser
- 3 Follow the procedure listed in the After working inside your system section.

## Installing an expansion card

#### 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.

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Remove the expansion card riser.
- 4 If installed, remove the filler bracket.

#### Steps

- 1 Locate the expansion card connector on the riser.
- 2 Holding the expansion card by its edges, position the card so that the card connector aligns with the connector on the expansion card riser.
- 3 Insert the card connector into the expansion card riser connector until the card is firmly seated.
- 4 If required, connect the cables to the expansion card.

#### Next steps

- 1 Install the expansion card riser.
- 2 Follow the procedure listed in the After working inside your system section.

# Removing the internal PERC card

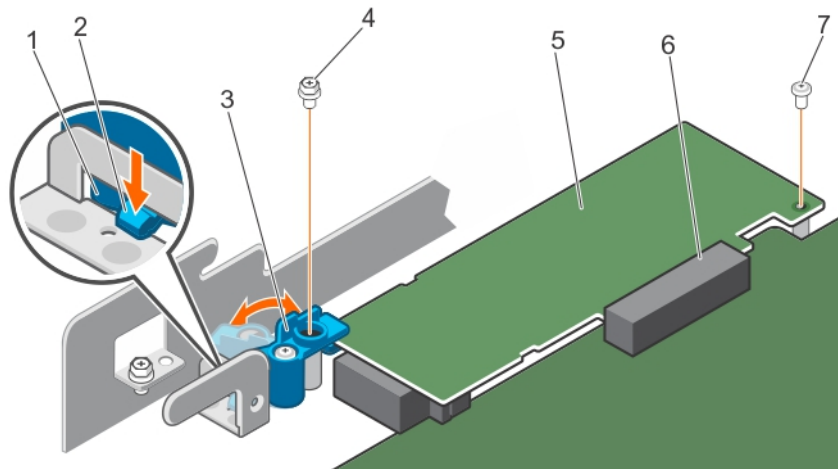
## Prerequisites

**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.

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Remove the expansion card riser.
- 4 Keep the Phillips #2 screwdriver ready.

## Steps

- 1 Remove the screw from the PERC card lock.
- 2 Turn the PERC card lock to disengage the lock from the PERC card.
- 3 Push the PERC card lock until the tab on the PERC card lock clicks into the slot on the chassis.

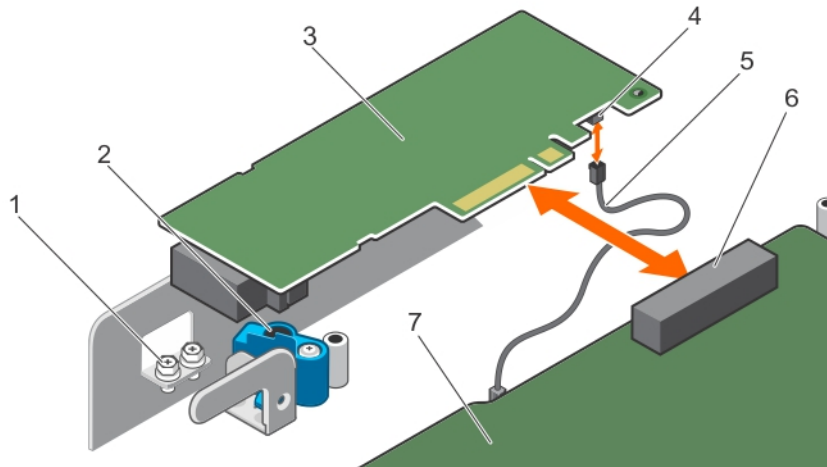


**Figure 23. Opening and closing the PERC card lock**

- |   |                               |
|---|-------------------------------|
| 1 slot on the chassis                         | 2 tab on the PERC card lock   |
| 3 PERC card lock                              | 4 screw on the PERC card lock |
| 5 PERC card                                   | 6 PERC card slot              |
| 7 screw securing the PERC card to the chassis |                               |

- 4 Remove the screw that secures the PERC card to the chassis.
- 5 Disconnect the PERC card LED cable from the system board.
- 6 Hold the PERC card by the edges and pull the PERC card to disengage it from the PERC card slot.
- 7 Lift the PERC card away from the chassis.





**Figure 24. Removing and installing the internal PERC card**

- |   |   |   |                                      |
|---|---|---|--------------------------------------|
| 1 | screw (2)                               | 2 | PERC card lock                       |
| 3 | PERC card                               | 4 | LED cable connector on the PERC card |
| 5 | PERC card LED cable                     | 6 | PERC card connector                  |
| 7 | LED cable connector on the system board |   |                                      |

#### Next steps

- 1 Install the internal PERC card.
- 2 Install the expansion card riser.
- 3 Follow the procedure listed in the After working inside your system section.

## Installing the internal PERC card

#### Prerequisites

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Remove the expansion card riser.
- 4 Keep the Phillips #2 screwdriver ready.

#### Steps

- 1 Connect the PERC LED cable to the LED cable connector on the PERC card.
- 2 Insert the PERC card in the PERC card slot.
- 3 Press and slide the tab on the PERC card lock to disengage it from the slot on the chassis.
- 4 Turn the internal PERC card lock to engage it with the PERC card.
- 5 Install the first screw to secure the PERC card lock to the PERC card.
- 6 Install the second screw to secure the PERC card to the chassis.

**NOTE:** Use the two screws supplied with the system to secure the PERC card to the PERC card lock and the chassis

- 7 Connect the PERC LED cable to the LED cable connector on the system board.

#### Next steps

- 1 Install the expansion card riser.
- 2 Follow the procedure listed in the After working inside your system section.

# iDRAC port card (optional)

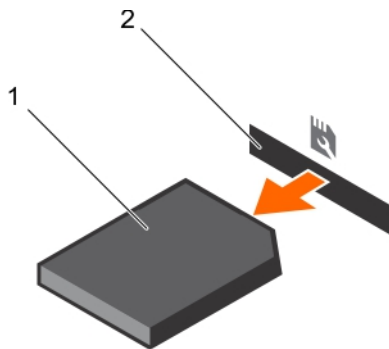
The iDRAC port card consists of a SD vFlash card slot and an iDRAC port. The iDRAC port card is used for advanced management of the system. An SD vFlash card is a Secure Digital (SD) card that plugs into the SD vFlash card slot in the system. It provides persistent on-demand local storage and a custom deployment environment that allows automation of server configuration, scripts, and imaging. It emulates USB device(s). For more information, see the Integrated Dell Remote Access Controller User's Guide at [Dell.com/esmanuals](http://Dell.com/esmanuals).

The iDRAC port card consists of the SD vFlash card slot and an iDRAC port. The iDRAC port card features a dedicated NIC port and is used for remote, advanced management of the system through the network.

An SD vFlash card is a Secure Digital (SD) card that plugs into the SD vFlash card slot in the iDRAC port card. It provides persistent on-demand local storage and a custom deployment environment that enables automation of server configuration, scripts, and imaging. It emulates a USB device. For more information, see the Integrated Dell Remote Access Controller User's Guide at [Dell.com/idracmanuals](http://Dell.com/idracmanuals).

## Replacing an optional SD vFlash card

- 1 Locate the SD vFlash card slot at the back of the chassis.
- 2 To remove the SD vFlash card, push the SD vFlash card inward to release it, and pull the SD vFlash card from the SD vFlash card slot.



**Figure 25. Removing and installing the SD vFlash card**

- 1 SD vFlash card
- 2 SD vFlash card slot
- 3 Install a replacement SD vFlash card by inserting the contact-pin end of the SD vFlash card into the SD vFlash card slot on the module.  
**NOTE:** The slot is keyed to ensure correct insertion of the SD vFlash card.
- 4 Press the SD vFlash card inward to lock it into the SD vFlash card slot.

## Removing the optional iDRAC port card

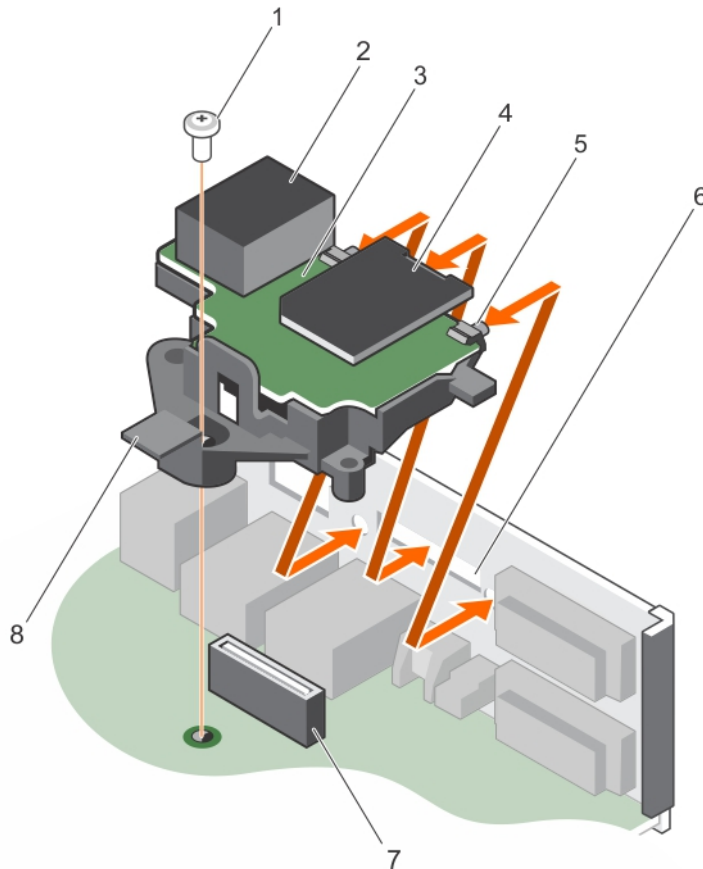
### Prerequisites

**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.

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Keep the Phillips #2 screwdriver ready.
- 4 If connected, disconnect the network cable from the iDRAC port card.
- 5 Remove the cooling shroud.

## Steps

- 1 Loosen the screw securing the iDRAC port card holder to the system board.
- 2 Pull the iDRAC port card to disengage it from the iDRAC port card connector on the system board, and remove the card from the chassis.



**Figure 26. Removing and installing the iDRAC port card**

- |   |                           |   |                           |
|---|---------------------------|---|---------------------------|
| 1 | screw                     | 2 | iDRAC port                |
| 3 | iDRAC port card board     | 4 | SD vFlash media card slot |
| 5 | tabs on the iDRAC port    | 6 | slots on the chassis      |
| 7 | iDRAC port card connector | 8 | iDRAC port card holder    |

## Next steps

- 1 Install the iDRAC port card.
- 2 Install the cooling shroud.
- 3 If disconnected, reconnect the network cable.
- 4 Follow the procedure listed in the After working inside your system section.

# Installing the optional iDRAC port card

## 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.

- 1 Ensure that you follow the [Safety instructions](#).
- 2 Follow the procedure listed in [Before working inside your system](#).
- 3 Keep the Phillips #2 screwdriver ready.
- 4 Remove the cooling shroud.

### Steps

- 1 Align and insert the tabs on the iDRAC port card into the slots on the chassis.
- 2 Insert the iDRAC port card into the connector on the system board.
- 3 Tighten the screw that secures the iDRAC port card holder to the system board.

### Next steps

- 1 Install the cooling shroud.
- 2 If disconnected, reconnect the network cable.
- 3 Follow the procedure listed in [After working inside your system](#).

## Processor and heat sink

Use the following procedure when:

- Removing and installing a heat sink
- Installing an additional processor
- Replacing a processor

## Removing a processor

### 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.

**ℹ NOTE:** This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.



- 1 Follow the safety guidelines listed in the Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Keep the Phillips #2 screwdriver ready.
- 4 Remove the cooling shroud.
- 5 Remove the heat sink.
- 6 If you are upgrading your system, download the latest system BIOS version from [Dell.com/support](https://Dell.com/support) and follow the instructions included in the compressed download file to install the update on your system.

**ℹ NOTE:** You can update the system BIOS by using the Dell Lifecycle Controller.

**⚠ CAUTION:** The processor is held in its socket under strong pressure. The release lever can spring up suddenly if not firmly grasped.

**⚠ WARNING:** The processor is hot to touch for some time after the system has been powered down. Allow the processor to cool before removing it.

### Steps

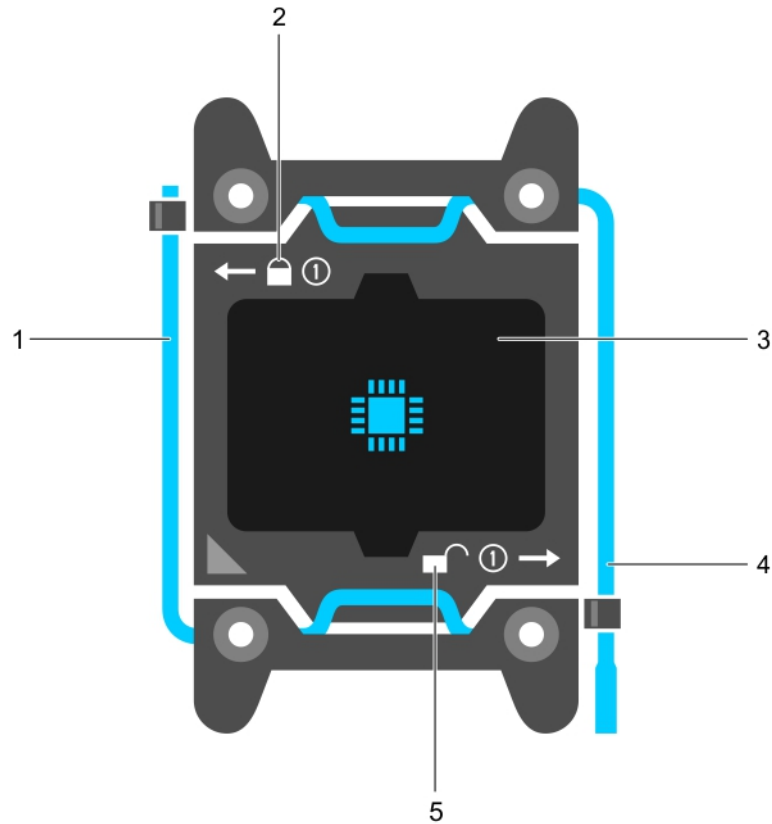
- 1 Release the *open first* socket lever near the unlock icon  by pushing the lever down and out from under the tab.
- 2 Release the *close first* socket release lever near the lock icon  by pushing the lever down and out from under the tab. Lift the lever 90 degrees upward.

- 3 Lower the *open first* socket-release lever to lift the processor shield.
- 4 Hold the tab on the processor shield and lift the processor shield until the *open first* socket-release lever lifts up.

**⚠ CAUTION:** The socket pins are fragile and can be permanently damaged. Be careful not to bend the pins in the socket when removing the processor out of the socket.

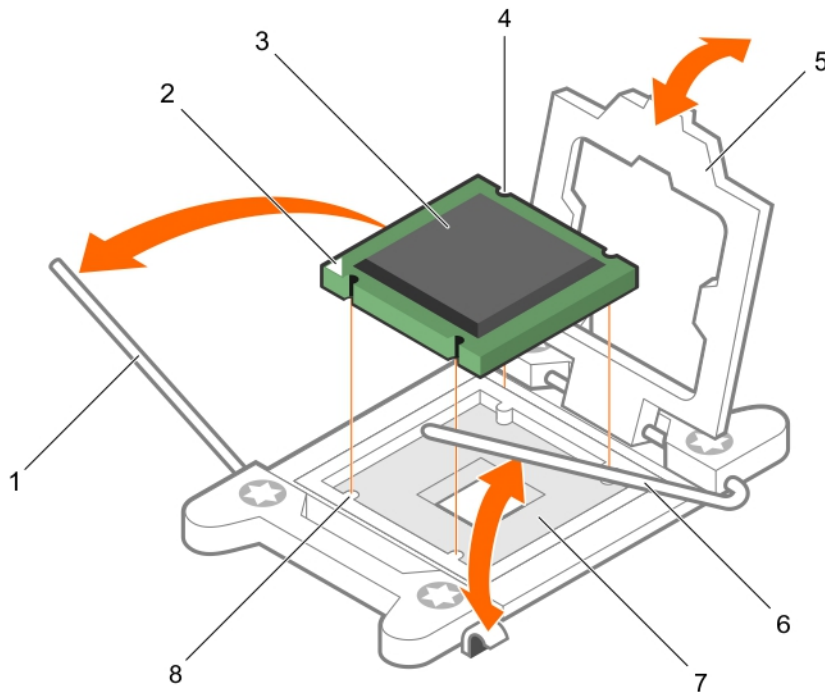
- 5 Lift the processor out of the socket and leave the *open first* socket-release lever up.

**📌 NOTE:** After removing the processor, place it in an anti-static container for reuse, return, or temporary storage. Do not touch the bottom of the processor. Touch only the side edges of the processor.



**Figure 27. Processor shield**

- |   |                                  |   |                                 |
|---|----------------------------------|---|---------------------------------|
| 1 | close first socket release lever | 2 | lock icon                       |
| 3 | processor                        | 4 | open first socket release lever |
| 5 | unlock icon                      |   |                                 |



**Figure 28. Removing and installing a processor**

- |   |                                  |   |                                 |
|---|----------------------------------|---|---------------------------------|
| 1 | close first socket-release lever | 2 | pin-1 indicator of processor    |
| 3 | processor                        | 4 | slot (4)                        |
| 5 | processor shield                 | 6 | open first socket-release lever |
| 7 | socket                           | 8 | socket keys (4)                 |

### Next steps

- 1 Replace the processor.
- 2 Install the heat sink.
- 3 Reinstall the cooling shroud.
- 4 Follow the procedure listed in the After working inside your system section.

## Installing a processor

### 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.

- 1 Follow the safety guidelines listed in the Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Keep the Phillips #2 screwdriver ready.
- 4 If you are upgrading your system, download the latest system BIOS version from [Dell.com/support](https://Dell.com/support) and follow the instructions included in the compressed download file to install the update on your system.

 **NOTE:** You can also update the system BIOS by using the Dell Lifecycle Controller.

5 Remove the cooling shroud.

 **NOTE:** If applicable, close the expansion card latch on the cooling shroud to release the full length card.

6 If connected, disconnect the cables from expansion card (s).

7 If installed, remove the expansion card riser.

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

 **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.


### Steps


1 Unpack the new processor.

 **NOTE:** If the processor has previously been used in a system, remove any remaining thermal grease from the processor by using a lint-free cloth.

2 Locate the processor socket.


3 If applicable, remove the socket protective cap.

4 Release the *open first* socket-release lever near the unlock icon  by pushing the lever down and out from under the tab.

5 Similarly, release the *close first* socket-release lever near the lock icon  by pushing the lever down and out from under the tab. Lift the lever 90 degrees upward.

6 Hold the tab near the lock symbol on the processor shield and lift it up and out of the way.

 **CAUTION:** Positioning the processor incorrectly can permanently damage the system board or the processor. Be careful not to bend the pins in the socket.

 **CAUTION:** While removing or reinstalling the processor, wipe your hands of any contaminants. Contaminants on the processor pins such as thermal grease or oil can damage the processor.

7 Align the processor with the socket keys.


 **CAUTION:** Do not use force to seat the processor. When the processor is positioned correctly, it engages easily into the socket.

8 Align the pin-1 indicator of the processor with the triangle on the .

 **CAUTION:** Do not use force to seat the processor. When the processor is positioned correctly, it engages easily into the socket.

9 Place the processor on the socket such that the slots on the processor align with the socket keys.

10 Close the processor shield.

11 Lower the *close first* socket-release lever near the lock icon  and push it under the tab to lock it.

12 Similarly, lower the *open first* socket-release lever near the unlock icon  and push it under the tab to lock it.

### Next steps

 **NOTE:** Ensure that you install the heat sink after you install the processor. The heat sink is necessary to maintain proper thermal conditions.

1 Install the heat sink.

2 If removed, reinstall the PCIe expansion card riser.

3 If disconnected, reconnect the cables to the expansion cards.

4 While booting, press F2 to enter System Setup and verify that the processor information matches the new system configuration.

5 Run the system diagnostics to verify that the new processor operates correctly.

# Power supply units

Your system supports 350 W AC redundant power supply units (PSUs).

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

When two identical PSUs are installed, the PSU configuration is redundant (1 + 1). In redundant mode, power is supplied to the system equally from both PSUs to maximize efficiency.

When only one PSU is installed, the PSU configuration is non-redundant (1 + 0). Power is supplied to the system only by the single PSU.

In a non-redundant configuration, install a PSU blank in the empty PSU slot.

## Hot spare feature

Your system supports the hot spare feature that significantly reduces the power overhead associated with power supply 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 [Dell.com/idracmanuals](http://Dell.com/idracmanuals).

## Removing a redundant power supply unit

### 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.

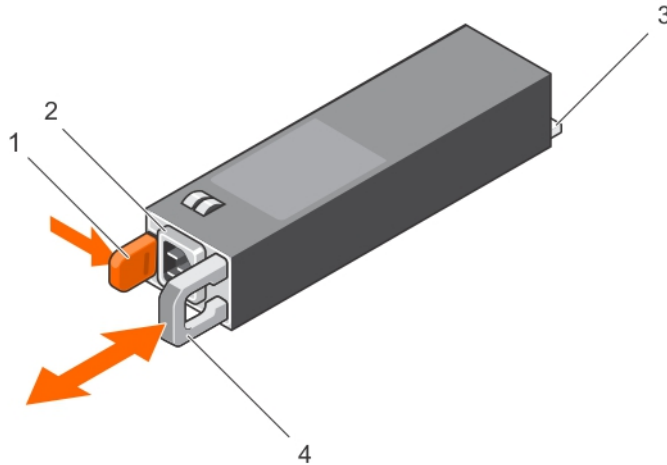
**CAUTION:** The system requires one power supply unit (PSU) for normal operation. On power-redundant systems, remove and replace only one PSU at a time in a system that is powered on.

- 1 Follow the safety guidelines listed in the Safety instructions section.
- 2 Disconnect the power cable from the power source.
- 3 Disconnect the power cable from the PSU and remove the straps that bundle and secure the system cables.
- 4 Unlatch and lift the optional cable management arm if it interferes with PSU removal. For information about the cable management arm, see the system's rack documentation.

### Step

Press the release latch and pull the PSU out of the chassis.





**Figure 29. Removing and installing a redundant PSU**

- |   |                 |   |               |
|---|-----------------|---|---------------|
| 1 | release latch   | 2 | PSU connector |
| 3 | power connector | 4 | PSU handle    |

#### Next steps

- 1 Install the PSU.
- 2 If you are not immediately installing a PSU, install the PSU blank.

## Installing a redundant power supply unit

#### 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.

- 1 Follow the safety guidelines listed in the Safety instructions section.
- 2 Verify that both power supply units (PSUs) are of the same type and have the same maximum output power.

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

- 3 If installed, remove the PSU blank.

#### Step

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

#### Next steps

- 1 If you have unlatched the cable management arm, relatch it. For information about the cable management arm, see the rack documentation of the system.
- 2 Connect the power cable to the PSU and plug the cable into a power outlet.

**⚠ CAUTION:** When connecting the power cable, secure the cable with the strap.

**NOTE:** When installing, hot-swapping, or hot-adding a new PSU in a system with two PSUs, allow several seconds for the system to recognize the PSU and determine its status. The PSU status indicator turns green to signify that the PSU is functioning properly.

## Removing the power supply unit blank

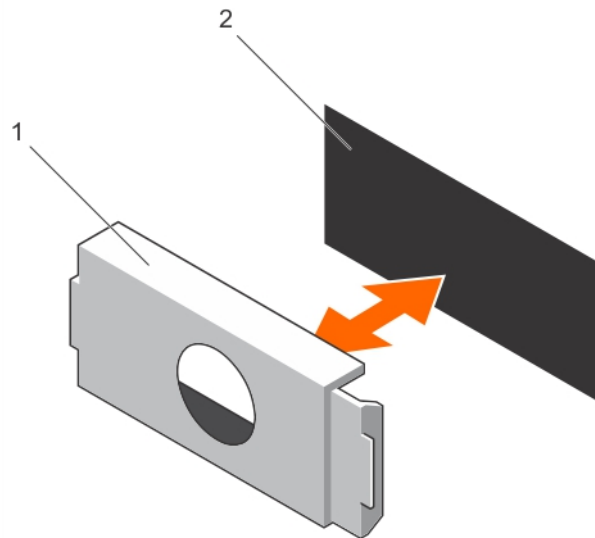
### Prerequisite

Ensure that you follow the [Safety instructions](#).

### Step

If you are installing a second power supply unit (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 30. Removing and installing the PSU blank**

1 PSU blank

2 PSU bay

## Installing the power supply unit blank

Install the power supply unit (PSU) blank only in the second PSU bay.

### Prerequisite

**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.

## Step

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

# System battery

The system board battery is used for low-level system functions like powering the real-time clock and storing the computer's BIOS settings.

## Replacing the system battery

### Prerequisites

- 1 Follow the safety guidelines listed in safety instructions section.
- 2 Follow the procedure listed in the Before working in your system section. .
- 3 Remove the expansion card riser.
- 4 Keep the plastic scribe ready.

**⚠ 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.

**⚠ 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.

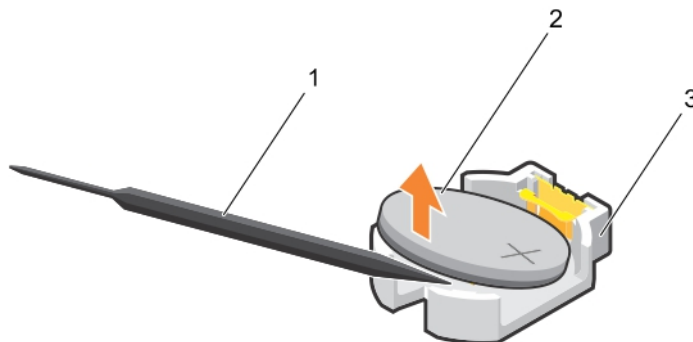
**ⓘ NOTE:** This is a Field Replaceable Unit (FRU). Removal and installation procedures must be performed only by Dell certified service technicians.

### Steps

- 1 Locate the battery socket. For more information, see the System board 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 as shown in the following illustration:

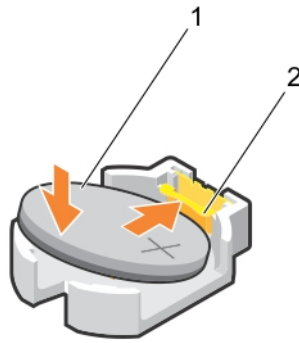


**Figure 31. Removing the system battery**

- 1 plastic scribe
- 3 securing tabs

- 2 positive side of the battery connector

- 3 Install a new system battery by holding the battery with the "+" sign facing up and slide it under the securing tabs.
- 4 Press the battery into the connector until it snaps into place.



**Figure 32. Installing the system battery**

1 positive side of the battery connector

2 battery connector

#### Next steps

- 1 Install the expansion card riser.
- 2 Follow the procedure listed in the After working in your system section. .
- 3 While booting, press F2 to enter System Setup and ensure that the battery is operating properly.
- 4 Enter the correct time and date in the System Setup **Time** and **Date** fields.
- 5 Exit System Setup.

## Hard drive backplane

Dell Storage NX430 NAS supports four 3.5-inch SAS/SATA backplane.

## Removing the hard drive backplane

#### 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.

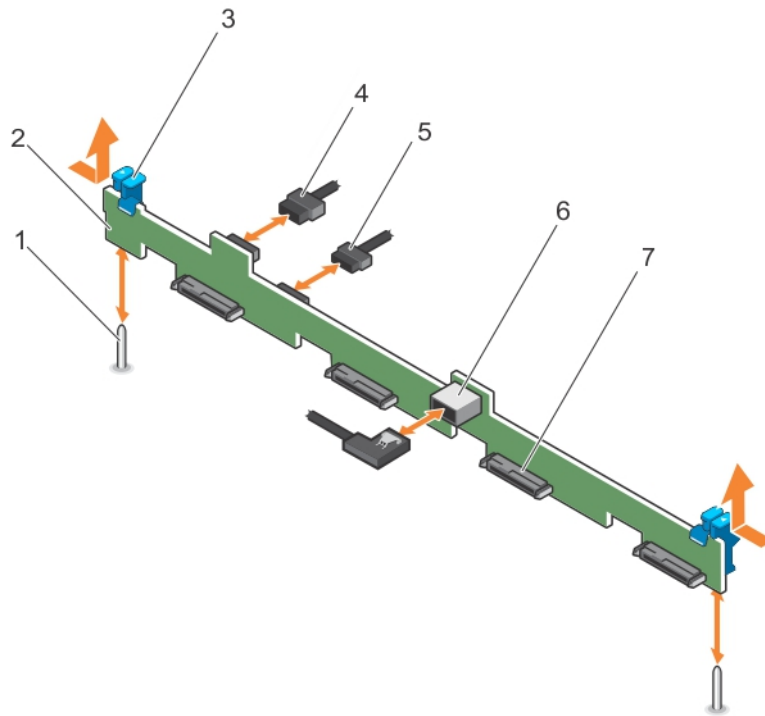
**CAUTION:** To prevent damage to the drives and backplane, you must remove the hard drives from the system before removing the backplane.

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

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Remove all hard drives.
- 4 Disconnect the SAS/SATA data, signal, and power cables from the backplane.

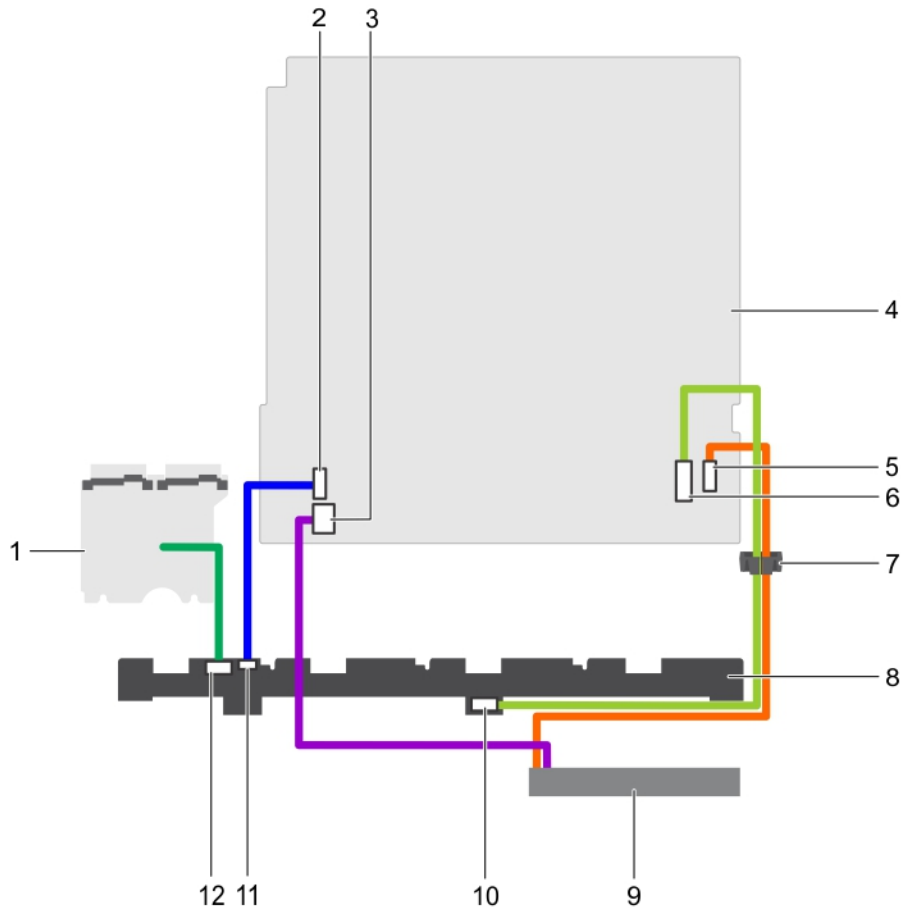
#### Step

Press the release tabs and lift the backplane upward and slide it toward the back of the chassis.



**Figure 33. Removing and installing the four 3.5-inch hard drive SAS/SATA backplane**

- |   |                                 |   |                                  |
|---|---------------------------------|---|----------------------------------|
| 1 | guide pin (2)                   | 2 | hard drive or SSD backplane      |
| 3 | release tab (2)                 | 4 | backplane power cable            |
| 5 | backplane signal cable          | 6 | SAS A connector on the backplane |
| 7 | hard drive or SSD connector (4) |   |                                  |



**Figure 34. Cabling diagram—Four 3.5-inch hard drive SAS/SATA backplane**

- |    |   |    |  |
|----|---|----|--|
| 1  | power interposer board (PIB)                            | 2  | signal cable connector on the system board |
| 3  | optical drive power cable connector on the system board | 4  | system board                               |
| 5  | optical drive SATA connector on the system board        | 6  | SAS connector on the system board          |
| 7  | cable routing clip                                      | 8  | backplane                                  |
| 9  | optical drive   | 10 | SAS connector on the backplane             |
| 11 | signal cable connector on the backplane                 | 12 | power cable connector on the backplane     |

#### Next steps

- 1 Install the hard drive backplane.
- 2 Follow the procedure listed in the After working inside your system section.

## Installing the hard drive backplane

#### 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.

**CAUTION:** To prevent damage to the control panel flex cable, do not bend the control panel flex cable after it is inserted into the connector.

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

### Steps

- 1 Align the slots on the hard drive backplane with the hooks on the chassis.
- 2 Press down the hard drive backplane until the release tabs snap into place.
- 3 Connect the SAS/SATA/SSD data, signal, and power cables to the backplane.

### Next steps


- 1 Install the hard drives in their original locations.
- 2 Follow the procedure listed in the After working inside your system section.

## Control panel assembly

This section provides information about removing or installing the LCD control panel assembly.

## Removing the LCD control panel assembly

### 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.

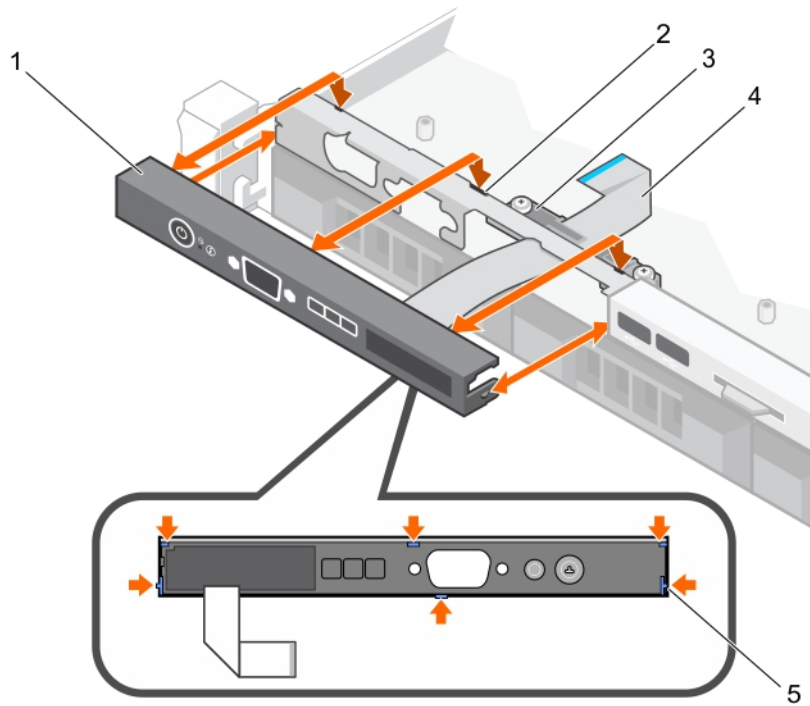
- 1 Follow the safety guidelines listed in safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Keep the Phillips #2 screwdriver ready.

### Steps

- 1 Disconnect the cables from the control panel board.

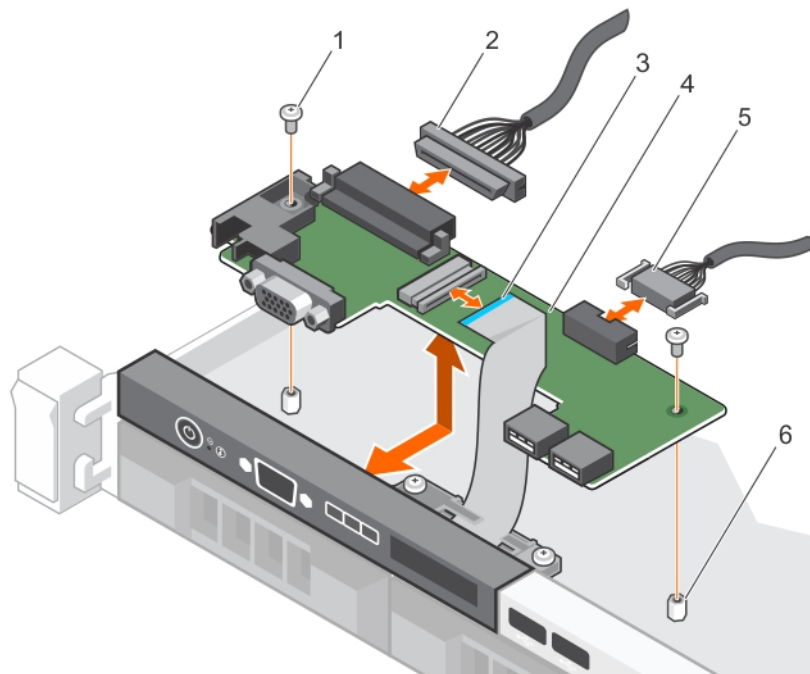
 **CAUTION:** Do not use excessive force when removing the control panel as it can damage the connectors.

- 2 Hold the top edge of the LCD control panel at the corners and pull upward until the LCD control panel tabs are released.
- 3 Pull the control panel away from the chassis.
- 4 Remove the screws securing the LCD control panel board.
- 5 Lift the LCD control panel board away from the chassis.



**Figure 35. Removing and installing the LCD control panel—four 3.5-inch hot swappable hard drive chassis**

- |   |                                     |   |                      |
|---|-------------------------------------|---|----------------------|
| 1 | LCD control panel                   | 2 | notches (6)          |
| 3 | display module cable retention clip | 4 | display module cable |
| 5 | tabs on the LCD control panel (6)   |   |                      |



**Figure 36. Removing and installing the LCD control panel board—four hard drive chassis**

- |   |                      |   |                               |
|---|----------------------|---|-------------------------------|
| 1 | screw (2)            | 2 | control panel connector cable |
| 3 | display module cable | 4 | LCD control panel board       |



**Next steps**

- 1 Install the LCD control panel assembly.
- 2 Follow the procedure listed in the After working inside your system section.

## Installing the LCD control panel assembly

**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.

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Keep the Phillips #2 screwdriver ready.

**Steps**

- 1 Align the tabs on the control panel with the notches on the chassis.
- 2 Route the LCD cable through the cable retention clip.
- 3 Push the control panel toward the chassis until it snaps into place.

**Next step**

Follow the procedure listed in the After working inside your system section.

## Power interposer board

The power interposer board is a board that connects the redundant power supplies to the system board. The power interposer board (PIB) is only supported in systems with redundant power supplies.

## Removing the power interposer board

**Prerequisites**

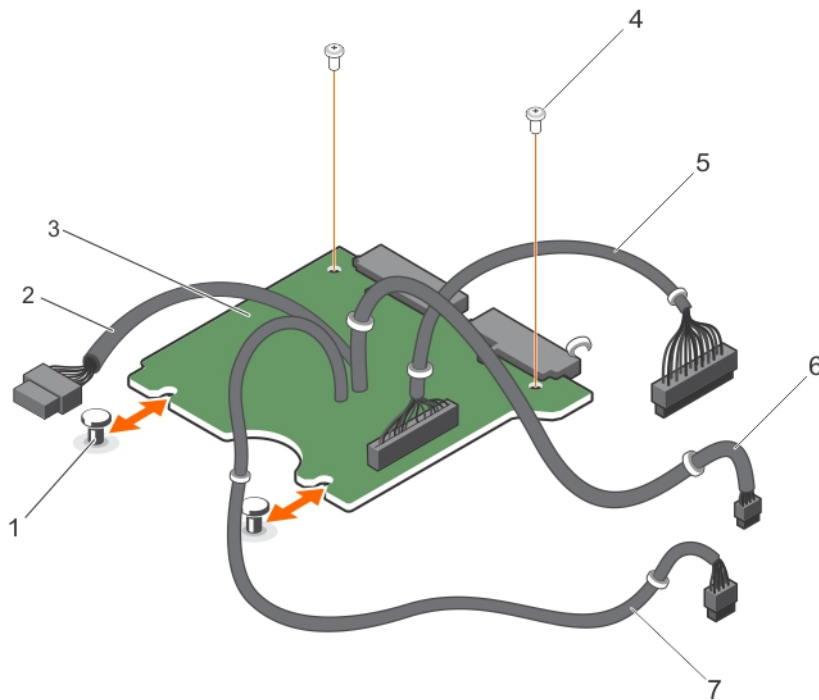
**⚠ CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by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

**ℹ NOTE:** The power interposer board is present only in systems that support redundant power supplies.

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Remove the power supply units from the system.

**Steps**

- 1 Disconnect the power distribution cables from the system board.
- 2 Remove the two screws securing the power interposer board (PIB) to the chassis.
- 3 Holding the PIB, lift it slightly to disengage it from the screw holes.
- 4 Slide the PIB toward the back of the chassis and lift it out of the chassis.



**Figure 37. Removing and installing the power interposer board**

- |   |                              |   |                                      |
|---|------------------------------|---|--------------------------------------|
| 1 | standoffs (2)                | 2 | 10 pin cable to hard drive backplane |
| 3 | power interposer board       | 4 | screw (2)                            |
| 5 | 28 pin cable to system board | 6 | 4 pin cable to system board          |
| 7 | 8 pin cable to system board  |   |                                      |

### Next steps

- 1 Install the power interposer board.
- 2 Follow the procedure listed in the After working inside your system section.

## Installing the power interposer board

### 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.

- 1 Follow the safety guidelines listed in the Safety instructions section.
- 2 Follow the procedure listed in Before working inside your system section.
- 3 Keep the Phillips #2 screwdriver ready.

### Steps

- 1 Align the power interposer board (PIB) with the standoffs on the chassis.
- 2 Install the two screws that secure the PIB to the chassis.
- 3 Connect the power distribution cables to the system board and fan cable connector to PIB.

## Next steps

- 1 Install the power supply units.
- 2 Follow the procedure listed in After working inside your system section.

# Trusted Platform Module

Trusted Platform Module (TPM) is a dedicated microprocessor designed to secure hardware by integrating cryptographic keys into devices. A software can use a Trusted Platform Module to authenticate hardware devices. As each TPM chip has a unique and secret RSA key burned in as it is produced, it can perform the platform authentication.

**⚠ CAUTION:** Do not attempt to remove the Trusted Platform Module (TPM) from the system board. After the TPM is installed, it is cryptographically bound to that specific system board. Any attempt to remove an installed TPM breaks the cryptographic binding, and it cannot be re-installed or installed on another system board.

**ⓘ NOTE:** This is a Field Replaceable Unit (FRU). Removal and installation procedures must be performed only by Dell certified service technicians.

## Installing the Trusted Platform Module

### 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 came with the product.

**ⓘ NOTE:** This is a Field Replaceable Unit (FRU). Removal and installation procedures should be performed only by Dell certified service technicians.

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

### Steps

- 1 Locate the Trusted Platform Module (TPM) connector on the system board.

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

- 2 Align the edge connectors on the TPM with the slot on the TPM connector.
- 3 Insert the TPM into the TPM connector such that the plastic bolt aligns with the slot on the system board.
- 4 Press the plastic bolt until the bolt snaps into place.

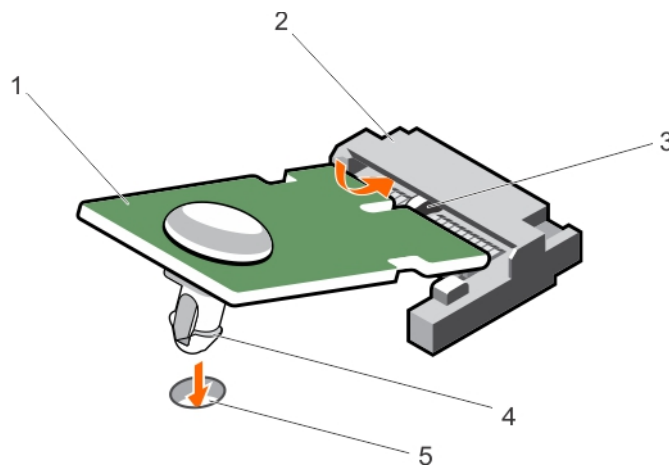


Figure 38. Installing the TPM

1 TPM

2 TPM connector

- 3 slot on the TPM connector
- 4 plastic bolt
- 5 slot on the system board

### Next steps

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

## Reenabling the TPM for TXT users

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

## System board

A system board (also known as the motherboard) is the main printed circuit board found in systems. The system board allows communication between many of the crucial electronic components of the system, such as the central processing unit (CPU) and memory, and also provides connectors for other peripherals. Unlike a backplane, a system board contains significant number of sub-systems such as the processor expansion cards, and other components.

## Removing the system board

### 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.
- ℹ **NOTE:** This is a Field Replaceable Unit (FRU). Removal and installation procedures must be performed only by Dell certified service technicians.
- ⚠ **CAUTION:** If you are using the Trusted Program Module (TPM) with an encryption key, you may be prompted to create a recovery key during program or System Setup. Be sure to create and safely store this recovery key. If you replace this system board, you must supply the recovery key when you restart your system or program before you can access the encrypted data on your hard drives.
- ⚠ **CAUTION:** Do not attempt to remove the TPM plug-in module from the system board. After 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 section.
- 2 Keep the Phillips #2 screwdriver ready.
- 3 Follow the procedure listed in the Before working inside your system section.
- 4 Remove the following components:
  - a cooling shroud
  - b memory modules

- c cooling fan cables
- d expansion cards
- e expansion card riser
- f heat sink and processor
- g iDRAC port card, if installed
- h internal dual SD module, if installed

**Steps**

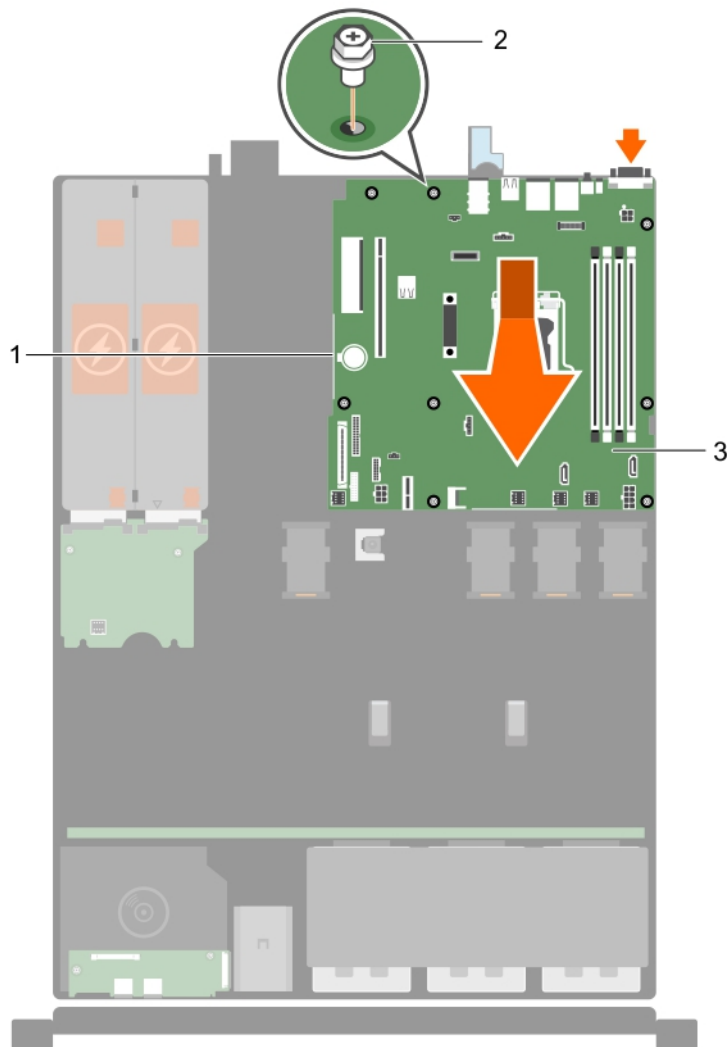
1 Disconnect all cables from the system board.

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

2 Remove the screws on the system board, and slide the system board toward the front of the chassis.

3 Hold the system board by the touch points and lift it out of the chassis.

**⚠ CAUTION: To prevent damage to the system board, do not lift the system board by holding a memory module, processor, or other components; hold the system board by its edges only.**



**Figure 39. Removing and installing the system board**

1 touch point (2)

2 screw (8)

### Next steps

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

## Installing the system board

### 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.

**ⓘ NOTE:** This is a Field Replaceable Unit (FRU). Removal and installation procedures must be performed only by Dell certified service technicians.

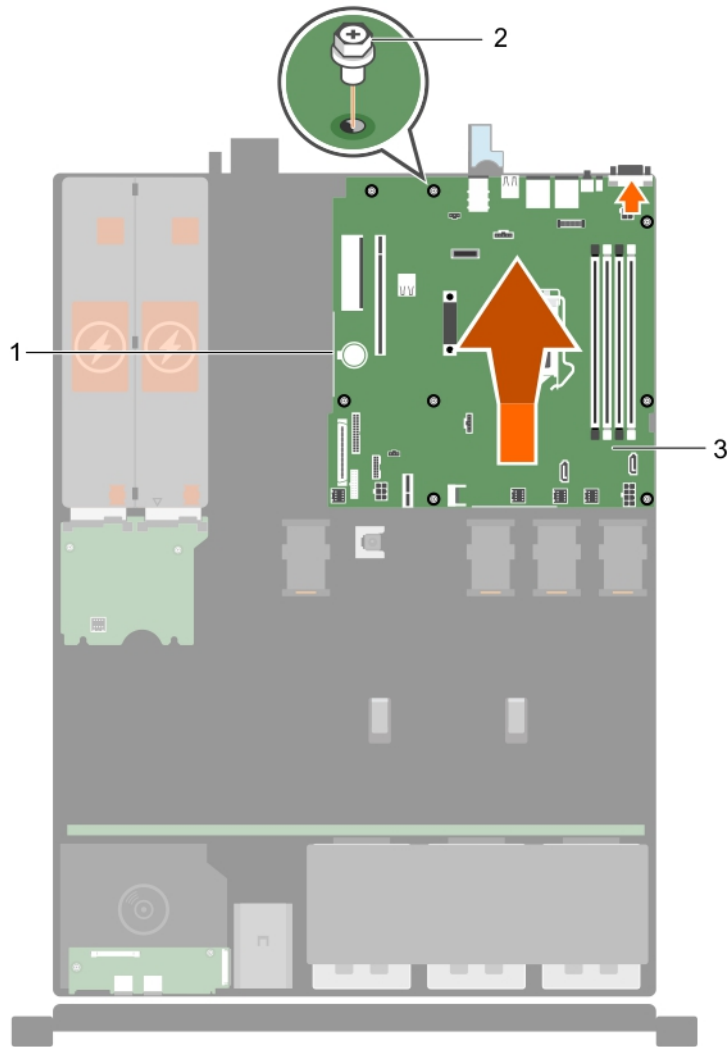
**⚠ CAUTION:** Do not lift the system board by holding a memory module, processor, or other components.

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

- 1 Follow the safety guidelines listed in Safety instructions section.
- 2 Follow the procedure listed in the Before working inside your system section.
- 3 Keep the Phillips #2 screwdriver ready.

### Steps

- 1 Hold the system board by its edges, and orient it toward the back of the chassis.
- 2 Lower the system board into the chassis until the connectors at the back of the system board align with the slots on the back of the chassis.
- 3 Tighten the screws that secure the system board to the chassis.



**Figure 40. Install the system board**

- |   |                 |   |           |
|---|-----------------|---|-----------|
| 1 | touch point (2) | 2 | screw (8) |
| 3 | system board    |   |           |

**Next steps**

- 1 If required, install the Trusted Platform Module (TPM). See, the Installing the Trusted Platform Module section.
- 2 Reinstall the following components:
  - a expansion card riser
  - b memory modules
  - c heat sink and processor
  - d cooling shroud
  - e iDRAC port card, if removed
- 3 Reconnect all cables to the system board.

**NOTE:** Ensure that the cables inside the system are routed through the cable routing latch.

- 4 Follow the procedure listed in the After working inside your system section.
- 5 Import your new or existing iDRAC Enterprise license. For more information, see the Integrated Dell Remote Access Controller User's Guide, at [Dell.com/idracmanuals](http://Dell.com/idracmanuals).

 **NOTE: If you are using Easy Restore, you do not have to import an existing iDRAC Enterprise license.**

- 6 Ensure that you perform the following steps:
  - a Use the Easy Restore feature to restore the service tag. See the Restoring the Service Tag by using the Easy Restore feature section.
  - b If the service tag is not backed up in the backup flash device, enter the system service tag manually. See the Entering the system service tag by using System Setup section.
  - c Update the BIOS and iDRAC versions.
  - d Re-enable the Trusted Platform Module (TPM).

## Restoring the Service Tag using Easy Restore

The easy restore feature allows you to restore your Service Tag, license, Personality module, and the system configuration data after replacing the system board. All data is backed up in a backup flash device automatically. If BIOS detects a new system board, and the service tag in the backup flash device, BIOS prompts the user to restore the backup information.

 **NOTE: The NX Series systems support only BIOS mode. Do not change the boot mode to UEFI because the system will not load the appliance OS when in UEFI mode.**

Below is a list of options available:

- Restore the service tag, license, and diagnostics information, press **Y**

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

- To restore the system configuration data, press **Y**

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

## Manually update the Service Tag

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

### About this task

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

### Steps

- 1 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. Once the service tag is entered, it cannot be updated or changed.**

- 5 Click **OK**.

## Entering the system Service Tag by using System Setup

If Easy Restore fails to restore the Service Tag, use System Setup to enter the Service Tag.

- 1 Turn on the system.
- 2 Press F2 to enter System Setup.
- 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**.
- 6 Import your new or existing iDRAC Enterprise license.



For more information, see the *Integrated Dell Remote Access Controller User's Guide* at [Dell.com/idracmanuals](http://Dell.com/idracmanuals).

# Using 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 requiring 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.

## 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

## When to use the Embedded System Diagnostics

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

## Running the Embedded System Diagnostics from Boot Manager

### Prerequisite

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**.

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.

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

- 1 As the system boots, press F11.
- 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
<b>Configuration</b>	Displays the configuration and status information of all detected devices.
<b>Results</b>	Displays the results of all tests that are run.
<b>System health</b>	Provides the current overview of the system performance.
<b>Event log</b>	Displays a time-stamped log of the results of all tests run on the system. This is displayed if at least one event description is recorded.

For information about embedded system diagnostics, see the *ePSA Diagnostics Guide (Notebooks, Desktops and Servers)* available at [Dell.com/support/home](http://Dell.com/support/home).

# Jumpers and connectors

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





Topics:

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

## System board jumper settings

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

**Table 17. System board jumper settings**

Jumper	Setting	Description
PWRD_EN	 (default) (default)	The password feature is enabled (pins 4–6).
	 (default)	The password feature is disabled (pins 2–4). iDRAC local access is unlocked at the next AC power cycle.
NVRAM_CLR	 (default) (default)	The configuration settings are retained at system boot (pins 1–3).
	 (default)	The configuration settings are cleared at the next system boot (pins 3–5).

# System board connectors

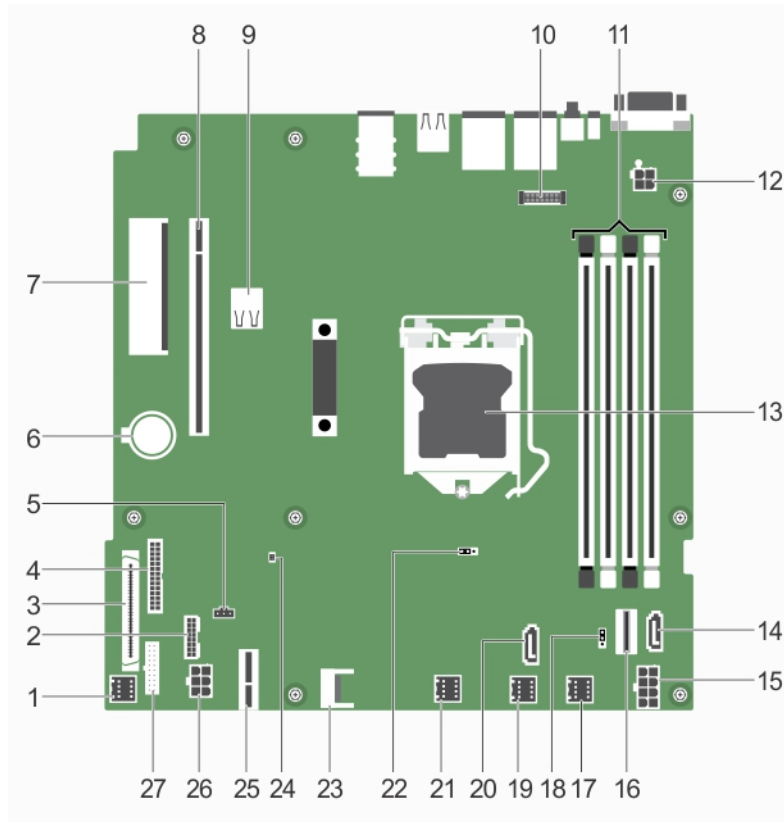


Figure 41. System board connectors

Table 18. System board connectors

Item	Connector	Description
1	FAN1	Cooling fan connector
2	BP_SIG	Backplane signal connector
3	CTRL_PNL	Control panel interface connector
4	PIB_CONN	Power connector
5	R_INTRUSION	Intrusion switch connector
6	BATTERY	Battery connector
7	PCIE_G3_X4	Internal PERC connector
8	PCIE_G3_X8	Riser card connector
9	INT_USB_3.0	Internal USB connector 3.0
10	AMEA	iDRAC port card connector
11	DIMMs	Memory module sockets
12	CPU_PWR	4-pin power connector
13	CPU	Processor socket
14	SATA_ODD/SSD	Optical drive/SSD SATA connector

Item	Connector	Description
15	SYS_PWR	8-pin power connector
16	SATA0-3	SATA connector
17	FAN4	Cooling fan connector
18	PWRD_EN	Password jumpers
19	FAN3	Cooling fan connector
20	J_SATA_2	SATA SSD connector
21	FAN2	Cooling fan connector
22	NVRAM_CLR	NVRAM password jumper
23	TPM	Trusted Platform Module connector
24	SAS_LED	PERC card LED connector
25	IDSDM	Internal dual SD module connector
26	HDD/ODD_PWR	6-pin power connector
27	FP_USB	Front panel USB connector

## Disabling a forgotten password

The system's software security features include a system password and a setup password. The password jumper enables the password features or disables them and clears any passwords currently in use.

### Prerequisite

**⚠ 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 Open the system.
- 3 Move the jumper on the system board jumper from pins 4 and 6 to pins 2 and 4.
- 4 Close the system.

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

**① NOTE: If you assign a new system and/or setup password with the jumper on pins 2 and 4, the system disables the new passwords 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 Open the system.
- 8 Move the jumper on the system board jumper from pins 2 and 4 to pins 4 and 6.
- 9 Close the system.
- 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.

# Troubleshooting your system

## Safety first — for you and your system

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

**NOTE:** Solution validation was performed by using the factory shipped hardware configuration.

Topics:

- [Troubleshooting system startup failure](#)
- [Troubleshooting external connections](#)
- [Troubleshooting the video subsystem](#)
- [Troubleshooting a USB device](#)
- [Troubleshooting a serial I/O device](#)
- [Troubleshooting a NIC](#)
- [Troubleshooting a wet system](#)
- [Troubleshooting a damaged system](#)
- [Troubleshooting the system battery](#)
- [Troubleshooting power supply units](#)
- [Troubleshooting cooling problems](#)
- [Troubleshooting cooling fans](#)
- [Troubleshooting system memory](#)
- [Troubleshooting an internal USB key](#)
- [Troubleshooting an SD card](#)
- [Troubleshooting an optical drive](#)
- [Troubleshooting a tape backup unit](#)
- [Troubleshooting a hard drive](#)
- [Troubleshooting expansion cards](#)
- [Troubleshooting processors](#)

## Troubleshooting system startup failure

If you boot the system to the UEFI boot mode after installing an operating system from the BIOS Boot Manager, the system stops responding. To avoid this issue, you must boot to the same boot mode in which you installed the operating system.

For all other startup issues, note the system messages that appear on the screen.

**NOTE:** Dell Storage NX430 NAS system supports BIOS boot mode only

# Troubleshooting external connections

Before troubleshooting any external devices, ensure that all external cables are securely attached to the external connectors on your system before troubleshooting any external devices.

## Troubleshooting the video subsystem

### Prerequisite

**NOTE:** Ensure the **Local Server Video Enabled** option is selected in the iDRAC Graphical User Interface (GUI), under **Virtual Console**. If this option is not selected, local video is disabled.

### Steps

- 1 Check the cable connections (power and display) to the monitor.
- 2 Check the video interface cabling from the system to the monitor.
- 3 Run the appropriate diagnostic test.

If the tests run successfully, the problem is not related to video hardware.

### Next step

If the tests fail, see the Getting help section.

## Troubleshooting a USB device

### Prerequisite

**NOTE:** Follow steps 1 to 6 to troubleshoot a USB keyboard or mouse. For other USB devices, go to step 7.

### Steps

- 1 Disconnect the keyboard and/or mouse cables from the system and reconnect them.
- 2 If the problem persists, connect the keyboard and/or mouse to another USB port on the system.
- 3 If the problem is resolved, restart the system, enter System Setup, and check if the non-functioning USB ports are enabled.
- 4 Check if USB 3.0 is enabled in System Setup. If enabled, disable it and see if the issue is resolved.
- 5 In **iDRAC Settings Utility**, ensure that **USB Management Port Mode** is configured as **Automatic** or **Standard OS Use**.
- 6 If the problem is not resolved, replace the keyboard and/or mouse with a known working keyboard or mouse.  
If the problem is not resolved, proceed to step 7 to troubleshoot other USB devices attached to the system.
- 7 Turn off all attached USB devices, and disconnect them from the system.
- 8 Restart the system.
- 9 If your keyboard is functioning, enter System Setup, verify that all USB ports are enabled on the **Integrated Devices** screen. If your keyboard is not functioning, use remote access to enable or disable the USB options.
- 10 Check if USB 3.0 is enabled in System Setup. If it is enabled, disable it and restart your system.
- 11 If the system is not accessible, reset the NVRAM\_CLR jumper inside your system and restore the BIOS to the default settings. See the System board jumper setting section
- 12 In the **iDRAC Settings Utility**, ensure that **USB Management Port Mode** is configured as **Automatic** or **Standard OS Use**.
- 13 Reconnect and turn on each USB device one at a time.
- 14 If a USB device causes the same problem, turn off the device, replace the USB cable with a known good cable, and turn on the device.

### Next step

If all troubleshooting fails, see the Getting help section.



# Troubleshooting a serial I/O device

## Steps

- 1 Turn off the system and any peripheral devices connected to the serial port.
- 2 Swap the serial interface cable with a known working cable, and turn on the system and the serial device.  
If the problem is resolved, replace the interface cable with a known working cable.
- 3 Turn off the system and the serial device, and swap the serial device with a compatible device.
- 4 Turn on the system and the serial device.

## Next step

If the problem persists, see the Getting help section.

# Troubleshooting a NIC

## Steps

- 1 Run the appropriate diagnostic test. For more information, see the Using system diagnostics section for the available diagnostic tests.
- 2 Restart the system and check for any system messages pertaining to the NIC controller.
- 3 Check the appropriate indicator on the NIC connector:
  - If the link indicator does not glow, the cable connected might be disengaged.
  - If the activity indicator does not glow, the network driver files might be damaged or missing.  
Install or replace the drivers as necessary. For more information, see the NIC documentation.
  - If the problem persists, use another connector on the switch or hub.
- 4 Ensure that the appropriate drivers are installed and the protocols are bound. For more information, see the NIC documentation.
- 5 Enter System Setup and confirm that the NIC ports are enabled on the **Integrated Devices** screen.
- 6 Ensure that all the NICs and switches on the network are set to the same data transmission speed and duplex. For more information, see the documentation for each network device.
- 7 Ensure that all network cables are of the proper type and do not exceed the maximum length.

## Next step

If the problem persists, see the Getting help section.

# Troubleshooting a wet system

## Prerequisite

**⚠ 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 and attached peripherals, and disconnect the system from the electrical outlet.
- 2 Remove the system cover.
- 3 Remove the following components (if installed) from the system:
  - power supply unit(s)
  - optical drive
  - hard drives
  - hard drive backplane
  - USB memory key
  - hard drive tray
  - cooling shroud

- expansion card risers (if installed)
  - expansion cards
  - cooling fan assembly (if installed)
  - cooling fans
  - memory modules
  - processor(s) and heat sink(s)
  - system board
- 4 Let the system dry thoroughly for at least 24 hours.
  - 5 Reinstall the components you removed in step 3 except the expansion cards.
  - 6 Install the system cover.
  - 7 Turn on the system and attached peripherals.  
If the problem persists, see the Getting help section.
  - 8 If the system starts properly, shut down the system, and reinstall all the expansion cards that you removed.
  - 9 Run the appropriate diagnostic test. For more information, see the Using system diagnostics section.

### Next step

If the tests fail, see the Getting help section.

## Troubleshooting a damaged system

### Prerequisite

**⚠ 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 and attached peripherals, and disconnect the system from the electrical outlet.
- 2 Remove the system cover.
- 3 Ensure that the following components are properly installed:
  - cooling shroud
  - expansion card risers (if installed)
  - expansion cards
  - power supply unit(s)
  - cooling fan assembly (if installed)
  - cooling fans
  - processor(s) and heat sink(s)
  - memory modules
  - hard drive carriers/cage
  - hard drive backplane
- 4 Ensure that all cables are properly connected.
- 5 Install the system cover.
- 6 Run the appropriate diagnostic test. For more information, see the Using system diagnostics section.

### Next step

If the problem persists, see the Getting help section.

# Troubleshooting the system battery

## 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.
- ⓘ NOTE:** If the system is turned off for long periods of time (for weeks or months), the NVRAM may lose its system configuration information. This situation is caused by a defective battery.
- ⓘ NOTE:** Some software may cause the system time to speed up or slow down. If the system seems to operate normally except for the time set in System Setup, the problem may be caused by a software, rather than by a defective battery.

## Steps

- 1 Re-enter the time and date in System Setup.
- 2 Turn off the system, and disconnect it from the electrical outlet for at least an hour.
- 3 Reconnect the system to the electrical outlet, and turn on the system.
- 4 Enter System Setup.  
If the date and time displayed in System Setup are not correct, check the System Error Log (SEL) for system battery messages.

## Next step

If the problem persists, see the Getting help section.

# Troubleshooting power supply units

- ⚠ 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.

# Troubleshooting power source problems

- 1 Press the power button to ensure that your system is turned on. If the power indicator does not glow when the power button is pressed, press the power button firmly.
- 2 Plug in another working power supply unit to ensure that the system board is not faulty.
- 3 Ensure that no loose connections exist.  
For example, loose power cables.
- 4 Ensure that the power source meets applicable standards.
- 5 Ensure that there are no short circuits.
- 6 Have a qualified electrician check the line voltage to ensure that it meets the needed specifications.

# Power supply unit problems

- 1 Ensure that no loose connections exist.  
For example, loose power cables.
- 2 Ensure that the power supply handle or LED indicates that the power supply is working properly.  
For more information about power supply indicators, see the Power indicator codes section.
- 3 If you have recently upgraded your system, ensure that the power supply unit (PSU) has enough power to support the new system.
- 4 If you have a redundant power supply configuration, ensure that both the PSUs are of the same type and wattage.  
You may have to upgrade to a higher wattage PSU.

- 5 Ensure that you use only PSUs with the Extended Power Performance (EPP) label on the back.
- 6 Reseat the PSU.

**NOTE:** After installing a PSU, allow several seconds for the system to recognize the PSU and determine if it is working properly.

If the problem persists, see the Getting help section.

## Troubleshooting cooling problems

**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.

Ensure that the following conditions exist:

- System cover, cooling shroud, EMI filler panel, memory module blank, or back filler bracket is not removed.
- Ambient temperature is not higher than the system specific ambient temperature.
- External airflow is not obstructed.
- A cooling fan is not removed or has not failed.
- The expansion card installation guidelines have been followed.

Additional cooling can be added by one of the following methods:

From the iDRAC web GUI:

- 1 Click **Hardware > Fans > Setup**.
- 2 From the **Fan Speed Offset** drop-down list, select the cooling level required or set the minimum fan speed to a custom value.

From F2 System Setup:

- 1 Select **iDRAC Settings > Thermal**, and set a higher fan speed from the fan speed offset or minimum fan speed.

From RACADM commands:

- 1 Run the command `racadm help system.thermalsettings`

For more information, see the Integrated Dell Remote Access User's Guide at [Dell.com/idracmanuals](http://Dell.com/idracmanuals).

## Troubleshooting cooling fans

### 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.

**NOTE:** The fan number is referenced by the systems management software. In the event of a problem with a particular fan, you can easily identify and replace it by noting down the fan numbers on the cooling fan assembly.

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

### Steps

- 1 Remove the system cover.
- 2 Reseat the fan or the fan's power cable.
- 3 Install the system cover.
- 4 Restart the system.

## Next step

If the problem persists, see the Getting help section.

# Troubleshooting system memory

## Prerequisite

**⚠ 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 If the system is operational, run the appropriate system diagnostic test. See the Using system diagnostics section for the available diagnostic tests.  
If the diagnostic tests indicate a fault, follow the corrective actions provided by the diagnostic tests.
- 2 If the system is not operational, turn off the system and attached peripherals, and unplug the system from the power source. Wait at least for 10 seconds, and then reconnect the system to the power source.
- 3 Turn on the system and attached peripherals, and note the messages on the screen.  
If an error message is displayed indicating a fault with a specific memory module, go to step 12.
- 4 Enter System Setup, and check the system memory setting. Make any changes to the memory settings, if needed.  
If the memory settings match the installed memory but the problem still persists, go to step 12.
- 5 Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
- 6 Remove the system cover.
- 7 Check the memory channels and ensure that they are populated correctly.

**① NOTE:** See the system event log or system messages for the location of the failed memory module. Reinstall the memory device.

- 8 Reseat the memory modules in their sockets.
- 9 Install the system cover.
- 10 Enter System Setup and check the system memory setting.  
If the problem is not resolved, proceed with step 11.
- 11 Remove the system cover.
- 12 If a diagnostic test or error message indicates a specific memory module as faulty, swap or replace the module with a known working memory module.
- 13 To troubleshoot an unspecified faulty memory module, replace the memory module in the first DIMM socket with a module of the same type and capacity.  
If an error message is displayed on the screen, this may indicate a problem with the installed DIMM type(s), incorrect DIMM installation, or defective DIMM(s). Follow the on-screen instructions to resolve the problem.
- 14 Install the system cover.
- 15 As the system boots, observe any error message that is displayed and the diagnostic indicators on the front of the system.
- 16 If the memory problem persists, repeat step 12 through step 15 for each memory module installed.

## Next step

If the problem persists, see the Getting help section.

# Troubleshooting an internal USB key

## Prerequisite

**⚠ 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 Enter System Setup and ensure that the **USB key port** is enabled on the **Integrated Devices** screen.
- 2 Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
- 3 Remove the system cover.
- 4 Locate the USB key and reseat it.
- 5 Install the system cover.
- 6 Turn on the system and attached peripherals, and check if the USB key is functioning.
- 7 If the problem is not resolved, repeat step 2 and step 3.
- 8 Insert a known working USB key.
- 9 Install the system cover.

## Next step

If the problem persists, see the Getting help section.

# Troubleshooting an SD card

## 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.

**ℹ NOTE:** Certain SD cards have a physical write-protect switch on the card. If the write-protect switch is turned on, the SD card is not writable.

## Steps

- 1 Enter System Setup, and ensure that the **Internal SD Card Port** is enabled.
- 2 Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
- 3 Remove the system cover.
  - ℹ NOTE:** When an SD card failure occurs, the internal dual SD module controller notifies the system. On the next restart, the system displays a message indicating the failure. If redundancy is enabled at the time of SD card failure, a critical alert will be logged and chassis health will degrade.
- 4 Replace the failed SD card with a new SD card.
- 5 Install the system cover.
- 6 Reconnect the system to its electrical outlet and turn on the system, including any attached peripherals.
- 7 Enter System Setup, and ensure that the **Internal SD Card Port** and **Internal SD Card Redundancy** modes are set to the needed modes.

Verify that the correct SD slot is set as **Primary SD Card**.
- 8 Check if the SD card is functioning properly.
- 9 If the **Internal SD Card Redundancy** option is set to **Enabled** at the time of the SD card failure, the system prompts you to perform a rebuild.

**ℹ NOTE:** The rebuild is always sourced from the primary SD card to the secondary SD card.

# Troubleshooting an optical drive

## Prerequisite

**⚠ 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 Try using a different CD or DVD.
- 2 If the problem is not resolved, enter System Setup and ensure that the integrated SATA controller and the drive's SATA port are enabled.
- 3 Run the appropriate diagnostic test.
- 4 Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
- 5 If installed, remove the bezel.
- 6 Remove the system cover.
- 7 Ensure that the interface cable is securely connected to the optical drive and to the controller.
- 8 Ensure that a power cable is properly connected to the drive.
- 9 Install the system cover.

## Next step

If the problem persists, see the Getting help section.

# Troubleshooting a tape backup unit

## Prerequisite

**⚠ 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 Use a different tape cartridge.
- 2 Ensure that the device drivers for the tape backup unit are installed and are configured correctly. See your tape drive documentation for more information about device drivers.
- 3 Reinstall the tape-backup software as instructed in the tape-backup software documentation.
- 4 Ensure that the interface cable of the tape drive is connected to the external port on the controller card.
- 5 Perform the following steps to ensure that the controller card is properly installed:
  - a Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
  - b Remove the system cover.
  - c Reseat the controller card in the expansion card slot.
  - d Install the system cover.
  - e Turn on the system and attached peripherals.
- 6 Run the appropriate diagnostic test. For more information, see the Using system diagnostics.

## Next step

If you cannot resolve the problem, see the Getting help section.

# Troubleshooting a hard drive

## Prerequisites

**⚠ CAUTION:** This troubleshooting procedure can erase data stored on the hard drive. Before you proceed, back up all files on the hard drive.

**⚠ 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 Run the appropriate diagnostic test. See the Using system diagnostics section.

Depending on the results of the diagnostics test, proceed as needed through the following steps.

- 2 If your system has a RAID controller and your hard drives are configured in a RAID array, perform the following steps:
  - a Restart the system and press F10 during system startup to run the Dell Lifecycle Controller, and then run the Hardware Configuration wizard to check the RAID configuration.  
See the Dell Lifecycle Controller documentation or online help for information about RAID configuration.
  - b Ensure that the hard drives are configured correctly for the RAID array.
  - c Take the hard drive offline and reseal the drive.
  - d Exit the configuration utility and allow the system to boot to the operating system.
- 3 Ensure that the needed device drivers for your controller card are installed and are configured correctly. See the operating system documentation for more information.
- 4 Restart the system and enter the System Setup.
- 5 Verify that the controller is enabled and the drives are displayed in the System Setup.

### Next step

If the problem persists, see the Getting help section.

## Troubleshooting expansion cards

### 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.

**ℹ NOTE:** When troubleshooting an expansion card, you also have to see the documentation for your operating system and the expansion card.

### Steps

- 1 Run the appropriate diagnostic test. See the Using system diagnostics section.
- 2 Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
- 3 Remove the system cover.
- 4 Ensure that each expansion card is firmly seated in its connector.
- 5 Install the system cover.
- 6 Turn on the system and attached peripherals.
- 7 If the problem is not resolved, turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
- 8 Remove the system cover.
- 9 Remove all expansion cards installed in the system.
- 10 Install the system cover.
- 11 Run the appropriate diagnostic test. See the Using system diagnostics section.  
If the tests fail, see the Getting help section.
- 12 For each expansion card you removed in step 8, perform the following steps:
  - a Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
  - b Remove the system cover.
  - c Reinstall one of the expansion cards.
  - d Install the system cover.
  - e Run the appropriate diagnostic test. See the Using system diagnostics section.

### Next step

If the problem persists, see the Getting help section.



# Troubleshooting processors

## Prerequisite

**⚠ 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 Run the appropriate diagnostics test. See the Using system diagnostics section.
- 2 Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
- 3 Remove the system cover.
- 4 Ensure that the processor and heat sink are properly installed.
- 5 Install the system cover.
- 6 Run the appropriate diagnostic test. See the Using system diagnostics section.
- 7 If the problem persists, see the Getting help section.

# Getting help

Topics:

- [Contacting Dell](#)
- [Documentation feedback](#)
- [Accessing system information by using QRL](#)

## 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 on 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:

- 1 Go to **Dell.com/support**.
- 2 Select your country from the drop-down menu on the bottom 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 **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 documentation pages and click **Send Feedback** to send your feedback.

## Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) to get immediate access to the information about your system.

### Prerequisite

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

The QRL includes the following information about your system:

### About this task

- How-to videos
- Reference materials, including the Owner's 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 **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 Dell system or in the Quick Resource Locator section.

## Quick resource locator

