

# Dell PowerEdge T30

## Owner's Manual



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# Dell PowerEdge T30 system overview

Dell PowerEdge T30 is a tower system that supports up to:

- One Intel Xeon E3-1200 v5 processor or Intel Core i3 series processor or Intel Pentium processor
- Four 3.5-inch SATA hard drives and additional two 2.5-inch SATA hard drives (with expansion kit and controller card)
- Four DIMM slots supporting up to 64 GB of memory
- Three full-height PCIe Gen 3 slots and one full-height PCI slot
- One AC cabled power supply unit (PSU)

## Topics:

- [Supported configurations for the Dell PowerEdge T30 system](#)
- [Supported operating systems](#)
- [Front panel](#)
- [Back panel](#)
- [Diagnostic indicators](#)

## Supported configurations for the Dell PowerEdge T30 system

The Dell PowerEdge T30 system supports the following configurations.

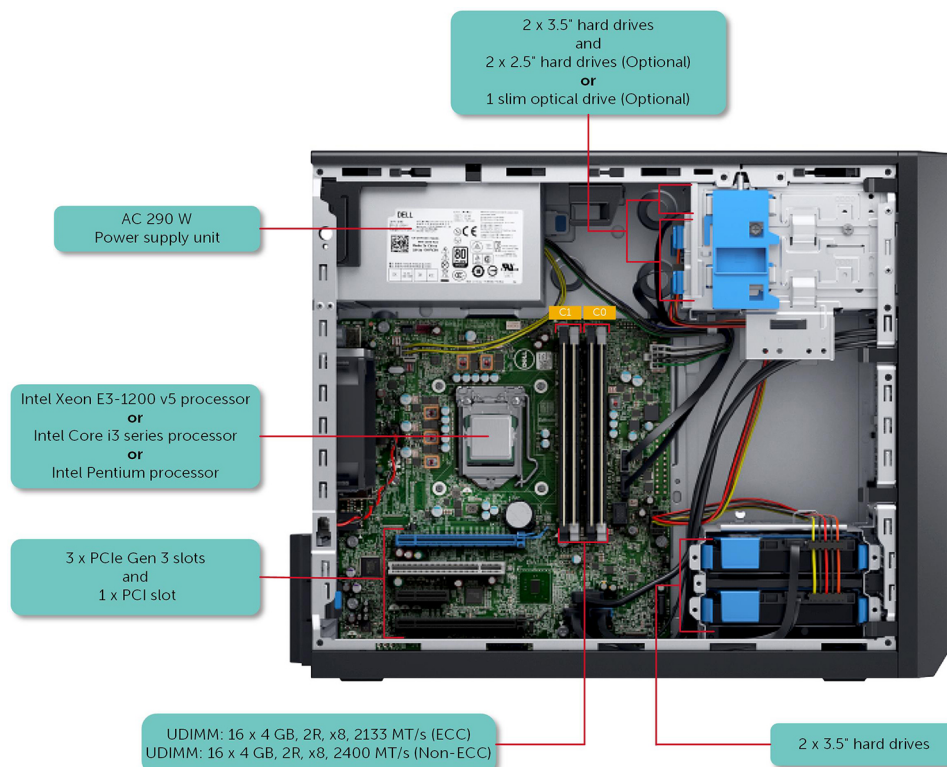


Figure 1. Supported configurations for the Dell PowerEdge T30 system

# Supported operating systems

The Dell PowerEdge T30 system supports the following operating systems based on each configuration:

**CAUTION:** Windows 2008 R2 SP1 installation media does not include native driver support for USB 3.0 controllers, all attached USB devices do not function during the OS installation. Follow the steps in the link to include the USB 3.0 drivers into the operating system image: <http://dell.to/1QGby5w>

**NOTE:**

T30 only supports fixed-configuration with no operating system preinstalled from the factory.

The configuration available in China offers Non-ECC memory with no Windows operating system supported.

**Table 1. Supported operating systems for T30 configuration**

Supported regions	Configuration	Supported Operating systems
All regions	1	1x Processor Skylake Pentium G4400
		1x 4 GB DIMM (ECC)
		1x 1 TB Client hard drive
		No Optical drive
	2	1x Processor Skylake Xeon E3-1225v5
		1x 8 GB DIMM (ECC)
		1x 1 TB Enterprise hard drive
		1x DVD RW drive
Only in China	1	1x Processor Skylake Pentium G4400
		1x 4 GB DIMM (Non-ECC)
		1x 1 TB Client hard drive
		1x DVD RW drive
	2	1x Processor Skylake Core i3 6100
		1x 4 GB DIMM (Non-ECC)
		1x 1 TB Client hard drive
		1x DVD RW drive

**NOTE:** Dell engineering team has tested Microsoft Windows Server 2008 R2 operating system (OS) on Dell PowerEdge Servers to ensure OS compatibility. While most OS features work as expected on this platform, some certification tests did not complete successfully. These findings are documented at [Dell.com/ostechsheets](http://Dell.com/ostechsheets).

For more information on the specific versions and additions, see the information on supported operating systems at [dell.com/OSsupport](http://dell.com/OSsupport).

# Front panel

The front panel provides access to the features available on the front of the server, such as the power button, status indicator, and USB ports.

## Front panel features of the PowerEdge T30 system

The following figure and the table describe the front panel features and its indicators.

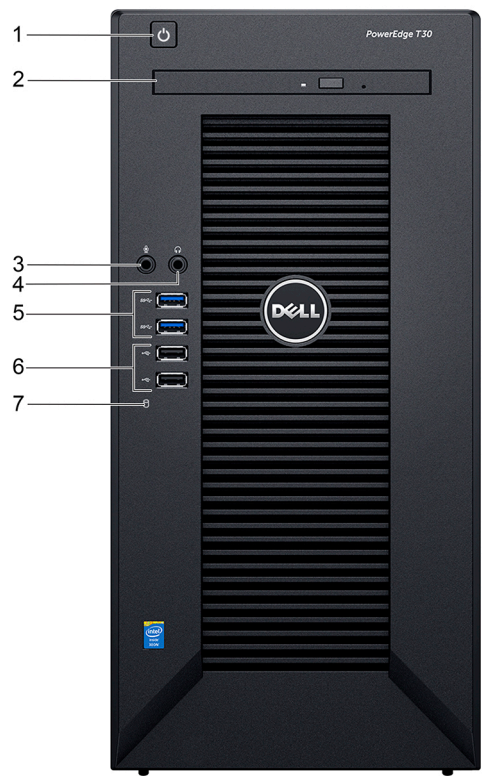







Figure 2. Front panel features and indicators

Table 2. Front panel features and indicators

Item	Indicator, Button, or Connector	Icon	Description
1	Power indicator, power button		<p>To turn the system on or off, press the power button. The indicator on the button indicates if the system is on or off.</p> <p><b>NOTE:</b> The Power-on indicator is also known as Power-on LED diagnostic indicator.</p> <p><b>NOTE:</b> To gracefully shut down an ACPI-compliant operating system, press the power button.</p>
2	Optical drive (optional)		<p>One optional slim SATA DVD-ROM drive or DVD +/- RW drive. For information about the supported optical drive, see the Technical specifications section.</p>
3	Microphone connector		<p>Use the Microphone connector to connect a microphone to the system.</p>
4	Headphone connector		<p>Use the Headphone connector to connect a headphone to the system.</p>

Item	Indicator, Button, or Connector	Icon	Description
5	USB 3.0 port (2)		Use the USB 3.0 port to connect USB devices to the system.
6	USB 2.0 port (2)		Use the USB 2.0 port to connect USB devices to the system.
7	Drive status indicator		Indicates the drive activity.

## Back panel

The back panel provides access to the features available on the back of the server, such as the power supply self-diagnostic button, Ethernet port, HDMI port, two Display port, Serial port, Line-in and Line-out connector, and USB port.

## Back panel features of the PowerEdge T30 system

The following figure and the table describe the back panel features and indicators.

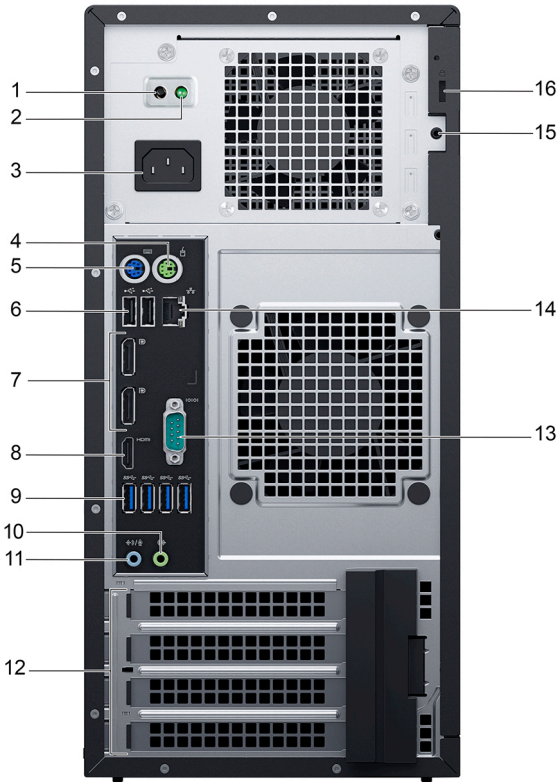














Figure 3. Back panel features and indicators

Table 3. Back panel features and indicators

Item	Indicator, Button, or Connector	Icon	Description
1	AC power status indicator		Indicates power activity.
2	Self-diagnostic button		Indicates the health status of the power supply.
3	Power connector		Use the Power connector to connect the power cable.
4	PS/2 mouse port		Use the PS/2 mouse connector to connect a PS/2 keyboard to the system.
5	PS/2 keyboard port		Use the PS/2 keyboard connector to connect a PS/2 mouse to the system.


Item	Indicator, Button, or Connector	Icon	Description
6	USB 2.0 port (2)		Use the USB 2.0 port to connect USB devices to the system.
7	Display ports (2)		Use the Display ports to connect other external display devices to the system.
8	HDMI port		Use the HDMI (High-Definition Multimedia Interface) connector to transfer video data and compressed or uncompressed digital audio data to a compatible computer monitor or video projector.
9	USB 3.0 port (4)		Use the USB 3.0 port to connect USB devices to the system.
10	Line-out connector		Use the Line-out connector to connect the input of an audio device to the system.
11	Line-in or microphone connector		Use the Line-in or Microphone connector to connect other input audio devices to the system.
12	Expansion card slots (4)		Use the Expansion card slots to connect up to three full-height PCIe expansion cards and one full-height PCI expansion card.
13	Serial port		Use the Serial connector to connect a serial device to the system.
14	Ethernet port (NIC)		One integrated 10/100/1000 Mbps Ethernet port. Use this port to connect the system to the network.
15	Security-cable slot		Allows you to connect a cable lock to the system.
16	Padlock ring		Allows you to lock the system cover.

## Diagnostic indicators



The diagnostic indicators on the system indicate operation and error status.

### Diagnostic indicators on the front panel

 **NOTE:** The diagnostic indicators are not present if the system is equipped with an LCD display.

 **NOTE:** No diagnostic indicators are lit when the system is turned off. To start the system, plug it into a working power source and press the power button.

**Table 4. Diagnostic indicators on the front panel**

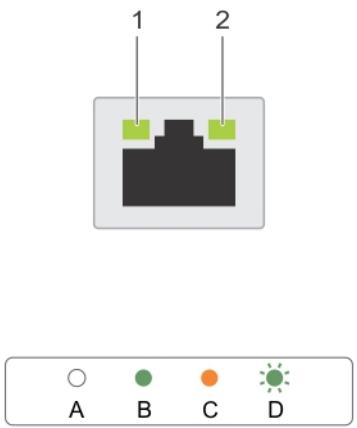
Icon	Description	Condition	Corrective action
	Hard-drive indicator	The indicator flashes amber if there is a hard-drive error.	Check the hard drive. If the problem persists, see the Troubleshooting hard drive section or the Getting help section.
	Power-on indicator	The indicator flashes amber and white if there is a component failure.	This is due to component failure in the system. For more information, see the Power on LED indicator codes section. If the problem persists, see the appropriate Troubleshooting section or the Getting help section.

Related reference

[Getting help](#)

# NIC indicator codes

Each NIC on the back panel has an indicator that provides information about the network activity and link status. The activity LED indicates whether the NIC is currently connected or not. The link LED indicates the speed of the connected network.



- 1. link indicator
- 2. activity indicator

Table 5. NIC indicators

Convention	Status	Condition
A	Link and activity indicators are off	The NIC is not connected to the network.
B	Link indicator is green	The NIC is connected to a valid network at 10 Mbps or 100 Mbps port speed. The NIC is connected to a valid network at its maximum port speed (1 Gbps or 10 Gbps).
C	Link indicator is orange	The NIC is connected to a valid network at 1000 Mbps port speed.
D	Activity indicator is flashing yellow	Network data is being sent or received.

# Power on LED indicator codes

The Power on indicator button has a dual color Light Emitting Diode (LED) that is on the front panel of the system. This indicator functions as a system diagnostic LED.

**NOTE:** The diagnostic LED is active and visible only during the POST process. Once the operating system starts to load, it is no longer visible.

Amber LED blinking scheme — The pattern is 2 or 3 blinks followed by a short pause then x number of blinks up to 7. The repeated pattern has a long pause inserted in the middle. For example 2, 4 = 2 amber blinks followed by a short pause, and then 4 amber blinks followed by long pause. Then, the pattern is repeated.

Table 6. Power on LED system state indicator codes

Amber LED state	White LED state	Description
off	off	system is OFF
off	blinking	system is in sleep state
blinking	off	power supply unit (PSU) failure



Amber LED state	White LED state	Description
steady	off	PSU is working but failed to fetch code
off	steady	system is ON

## Power on LED system diagnostics indicator codes

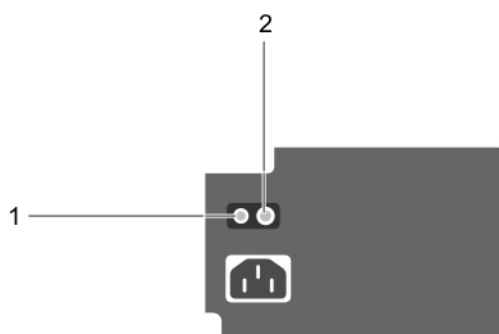
Amber LED blinking scheme — The pattern is 2 or 3 blinks followed by a short pause then x number of blinks up to 7. The same pattern is repeated after a long pause. For example 3, 5 = 3 amber blinks followed by a short pause, and then 5 amber blinks followed by long pause. Then, the pattern is repeated.

**Table 7. Power on LED system diagnostics indicator codes**

Amber LED state	Description
2, 1	system board failure
2, 2	system board, PSU or PSU cabling failure
2, 3	system board, memory or CPU failure
2, 4	coin cell battery failure
2, 5	corrupt BIOS
2, 6	CPU configuration failure or CPU failure
2, 7	memory modules are detected, but there is a memory failure
3, 1	possible peripheral card or system board failure
3, 2	possible USB failure
3, 3	no memory modules are detected
3, 4	possible system board error
3, 5	memory modules are detected, but a memory configuration or compatibility error
3, 6	possible system board resource and/or hardware failure
3, 7	some other device failure with messages on screen

## Power indicator codes for power supply unit

To perform a quick health check on the non-redundant power supply unit (PSU) of the system, press the self-diagnostic button.



**Figure 4. PSU status indicator and self-diagnostic button**

1. self-diagnostic button
2. PSU status indicator

**Table 8. PSU status indicators**

<b>Power indicator pattern</b>	<b>Condition</b>
Green	A valid power source is connected to the PSU and the PSU is operational.
Not lit	Power is not connected.

## Documentation resources

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

**Table 9. Additional documentation resources for your system**

Task	Document	Location
Setting up your system	For information about turning on the system and the technical specifications of your system, see the <i>Getting Started With Your System</i> document that is shipped with your system.  For information about installing the operating system, see the operating system documentation.	<a href="https://www.dell.com/support/manuals">Dell.com/operatingsystemmanuals</a>
Configuring your system	For information about updating drivers and firmware, see the Methods to download firmware and drivers section in this document.	<a href="https://www.dell.com/support/drivers">Dell.com/support/drivers</a>
Managing your system	For information about upgrading your system, Dell recommends that you download and install the latest BIOS, driver, and systems management firmware on your system.	<a href="https://www.dell.com/support">Dell.com/support</a>

## Technical specifications

### Chassis dimensions

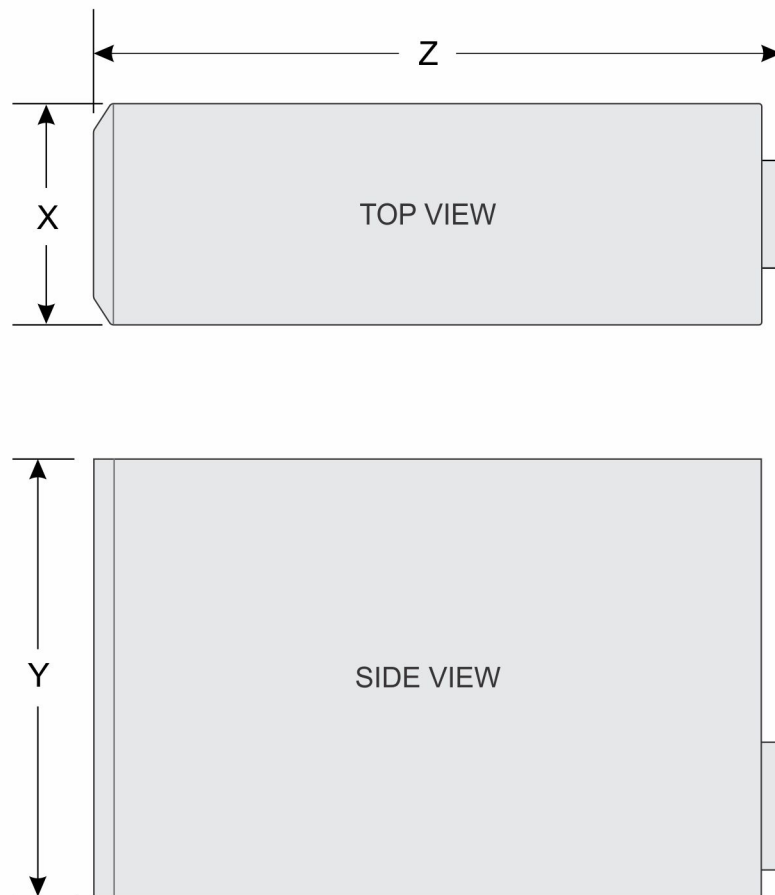


Figure 5. Chassis dimensions of the PowerEdge T30 system

Table 10. Dimensions of the PowerEdge T30 system

X	Y	Z
175.00 mm (6.88 inches)	360.00 mm (14.17 inches)	454.00 mm (17.87 inches)

### Chassis weight

Table 11. Chassis weight

System	Maximum weight (with all hard drives/SSDs)
PowerEdge T30	11.70 kg (25.70 lb)

# Processor specifications

The PowerEdge T30 system supports the following processors:

- Intel Xeon E3-1200 v5 processor
- Intel Core i3 series processor
- Intel Pentium processor

# PSU specifications

The PowerEdge T30 system supports a single 290 W AC cabled power supply unit (PSU).

**Table 12. PSU specifications**

PSU	Heat dissipation (maximum)	Frequency	Voltage
290 W AC	989.00 BTU/hr	50 – 60 Hz	100 – 240 V AC, 5.4 A, autoranging

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

**NOTE:** The PowerEdge T30 system is also designed to connect to the IT power systems with a phase-to-phase voltage not exceeding 230 V.

# System battery specification

The PowerEdge T30 system supports CR 2032 3.0-V lithium coin cell system battery.

# Expansion bus specifications

The PowerEdge T30 system supports PCI express (PCIe) generation 3 expansion cards, which must be installed on the system board. The following table provides detailed information about the expansion card specifications:

**Table 13. Expansion card specifications**

PCIe slot	Height	Length	Link
1	Full height	Half length	x16
3	Full height	Half length	x4
4	Full height	Half length	x4

**NOTE:** Slot 2 is a full-height, half-length PCI 32/33 card slot connected to PCIe and PCI Bridge.

# Memory specifications

The PowerEdge T30 system supports up to four 2133 MT/s (ECC), 2400 MT/s (Non-ECC), and 2666 MT/s (ECC) single rank or dual rank UDIMMs.

**CAUTION:** Dell recommends you to use ECC DIMMs to minimize the risk of uncorrectable system error, data loss and/or silent data corruption. Non-ECC DIMM is not used for mission-critical applications.

**NOTE:** Non-ECC DIMMs are supported only in selected countries, for more information contact your sales representative.

**Table 14. Memory specifications**

Memory module sockets	Memory capacity	Minimum RAM	Maximum RAM
Four 288-pin	4 GB, 8 GB, and 16 GB	4 GB	64 GB

# Storage Controller card specifications

The Dell EMC PowerEdge T30 supports Intel Rapid Storage Controller 12.X software RAID, and hardware RAID from optional storage controller card.

**NOTE:** The Dell EMC PowerEdge T30 supports only one P-Card (Non\_DELL- Two ports SATA 6 Gbps PCI Express SATA controller card) which supports upto four SATA devices.

**NOTE:** The software RAID modes supported on the onboard Intel Rapid Storage Controller are RAID 0 and 1 only.

## Drive specifications

### Hard drives

The PowerEdge T30 system supports one of the following hard drive configurations:

**Table 15. Hard drive configurations**

Number of hard drives	Configuration
Six hard drives	Up to four 3.5-inch hard drive, internal, cabled SATA or SATA SSD drives and two 2.5-inch hard drive (optional), internal, cabled SATA, or SATA SSD drives.
Three hard drives	Up to three 3.5-inch hard drive, internal, cabled SATA or SATA SSD drives and one optical drive (optional), internal, cabled SATA, or SATA SSD drives.
Four hard drives	Up to four 3.5-inch hard drive, internal, cabled SATA or SATA SSD drives.

**NOTE:** If you install more than four hard drives, you need to get an additional SATA controller card, SATA cables (minimum 1.6 ft) and power extension cables.

### Optical drive

The PowerEdge T30 system supports an optional slim 9.5 mm SATA DVD-ROM drive or DVD+/-RW drive.

**NOTE:** External optical drives can be connected through the USB ports.

## Ports and connectors specifications

### USB ports

The PowerEdge T30 system supports up to:

- Six USB 2.0-compliant ports
- Six USB 3.0-complaint ports

**Table 16. USB specifications**

Front panel	Back panel	Internal
Two 4-pin USB 2.0-compliant	Two 4-pin USB 2.0-compliant	Two 4-pin USB 2.0-compliant
Two 4-pin USB 3.0-compliant	Four 4-pin USB 3.0-compliant	-

## NIC port

The PowerEdge T30 system supports a Network Interface Controller (NIC) port on the back panel, which is available in 10/100/1000 Mbps NIC configurations.

## Video specification

The PowerEdge T30 system supports:

- Intel® HD Graphics P530 for Intel Xeon E3-1200 v5 processor
- Intel® HD Graphics 510 for Intel Pentium processor
- Intel® HD Graphics 530 for Intel Core i3 series processor

## Environmental specifications

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

**Table 17. Environmental specifications**

Type	Condition	Temperature or Specification
<b>Temperature</b>		
	Maximum Temperature Gradient (Operating and Storage)	20 °C/h (36 °F/h)
	Storage Temperature Limits	–40 °C to 65 °C (–40 °F to 149 °F)
	Continuous operation (for altitude less than 950 m or 3117 ft)	5 °C to 35 °C (41 °F to 95 °F) with no direct sunlight on the equipment.
<b>Relative Humidity</b>		
	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.
<b>Maximum Vibration</b>		
	Operating	0.26 G <sub>rms</sub> at 5 Hz to 350 Hz (operating orientation).
	Storage	1.37 G <sub>rms</sub> at 5 Hz to 200 Hz for 15 minutes (all six sides tested).
<b>Maximum Shock</b>		
	Operating	Six consecutively executed shock pulses in the positive and negative x, y, and z axes of 6 G for up to 11 ms.
	Storage	Six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the system) of 105 G for up to 2 ms.
<b>Maximum Altitude</b>		
	Operating	3,048 m (10,000 ft)
	Storage	35,000 m (10,688 ft)
<b>Operating Altitude De-rating</b>		
	Up to 35 °C (95 °F)	Maximum temperature is reduced by 1 °C/300 m (1 °F/547 ft) above 950 m (3,117 ft).
	35 °C to 40 °C (95 °F to 104 °F)	Maximum temperature is reduced by 1 °C/175 m (1 °F/319 ft) above 950 m (3,117 ft).

Type	Condition	Temperature or Specification
	40 °C to 45 °C (104 °F to 113 °F)	Maximum temperature is reduced by 1 °C/125 m (1 °F/228 ft) above 950 m (3,117 ft).

## Particulate and gaseous contamination specifications

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

**NOTE:** This section defines the limits to help avoid IT equipment damage and/or failure from particulates and gaseous contamination. If it is determined that levels of particulates or gaseous pollution are beyond the limits specified in the following table and are the reason for the damage and/or failures to your equipment, it may be necessary for you to re-mediate the environmental conditions that are causing the damage and/or failures. Re-mediation of environmental conditions will be the responsibility of the customer.

**Table 18. Particulate contamination specifications**

Particulate contamination	Specifications
Air Filtration <b>NOTE:</b> 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.	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit. <b>NOTE:</b> Air entering the data center must have MERV11 or MERV13 filtration.
Conductive Dust <b>NOTE:</b> Applies to data center and non-data center environments.	Air must be free of conductive dust, zinc whiskers, or other conductive particles.
Corrosive Dust <b>NOTE:</b> Applies to data center and non-data center environments.	<ul style="list-style-type: none"> <li>Air must be free of corrosive dust.</li> <li>Residual dust present in the air must have a deliquescent point less than 60% relative humidity.</li> </ul>

**Table 19. Gaseous contamination specifications**

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



# Initial system setup and configuration

## Setting up your system

Complete the following steps to set up your system:

### Steps

1. Unpack the system.
2. Connect the peripherals to the system.
3. Connect the system to its electrical outlet.
4. Turn the system on by pressing the power button.
5. Turn on the attached peripherals.

## Options to install the operating system

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

**Table 20. Resources to install the operating system**

Resources	Location
Dell Systems Management Tools and Documentation media	<a href="https://dell.com/operatingsystemmanuals">Dell.com/operatingsystemmanuals</a>
Supported operating systems on Dell PowerEdge systems	<a href="https://dell.com/ossupport">Dell.com/ossupport</a>
Installation and How-to videos for supported operating systems on Dell PowerEdge systems	<a href="#">Supported Operating Systems for Dell PowerEdge Systems</a>

## Methods to download firmware and drivers

You can download the firmware and drivers from the Dell support site at [Dell.com/support/drivers](https://dell.com/support/drivers).


### Downloading the drivers and firmware

Dell recommends that you download and install the latest BIOS and drivers on your system.

#### Prerequisites

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

#### Steps

1. Go to [Dell.com/support/drivers](https://dell.com/support/drivers).
2. In the **Drivers & Downloads** section, type the Service Tag of your system in the **Service Tag or Express Service Code** box, and then click **Submit**.  
 **NOTE:** If you do not have the Service Tag, select **Detect My Product** to allow the system to automatically detect your Service Tag, or in General support, navigate to your product.
3. Click **Drivers & Downloads**.  
The drivers that are applicable to your selection are displayed.
4. Download the drivers to a USB drive, CD, or DVD.

# System Setup

System Setup enables you to manage your system hardware and specify BIOS level options. From the System Setup, you can:

- Change the NVRAM settings after you add or remove hardware
- View the system hardware configuration
- Enable or disable integrated devices
- Set system performance and power management
- Manage your system security

## Topics:

- [Boot Sequence](#)
- [Navigation keys](#)
- [System Setup options](#)
- [Updating the BIOS](#)
- [BIOS recovery](#)
- [Trusted Platform Module specification](#)
- [System and setup password](#)

## Boot Sequence

Boot Sequence allows you to bypass the system setup-defined boot device order and boot directly to a specific device—for example, optical drive or hard drive. During the Power-on Self Test (POST), you can:

- Access System Setup by pressing F2
- Bring up the one-time boot menu by pressing F12

The one-time boot menu displays the devices that you can boot from, including the diagnostic option. The boot-menu options are explained as follows:

**Table 21. Boot Sequence**

Option	Description
<b>Legacy Boot</b>	<p>Enables you to install an operating system from the available options:</p> <ul style="list-style-type: none"> <li>• Internal hard drive</li> <li>• CD/DVD/CD-RW Drive</li> <li>• Onboard NIC</li> </ul> <p><b>NOTE:</b> The Internal hard drive option displays the hard drive model number. For example, if the internal hard drive model number is ST2000DM001-1ER164, then this is displayed.</p>
<b>UEFI Boot</b>	Windows Boot Manager
<b>Other options</b>	<p>The other options displayed in the boot sequence are:</p> <ul style="list-style-type: none"> <li>• BIOS Setup</li> <li>• BIOS Flash Update</li> <li>• Diagnostics</li> <li>• Intel (R) Management Engine BIOS Extension (MEBx)</li> <li>• <b>NOTE:</b> The Intel (R) Management Engine BIOS Extension (MEBx) option is not available when the</li> </ul>

Option	Description
	<ul style="list-style-type: none"> <li>• <b>system is configured Management Engine lockout mode or Management Engine disabled mode.</b></li> <li>• Change Boot Mode Settings</li> </ul>

The boot sequence screen also displays the option to access the **System Setup** screen.

## Navigation keys

**NOTE:** For most of the System Setup options, changes that you make are recorded but do not take effect until you restart the system.

Keys	Navigation
<b>Up arrow</b>	Moves to the previous field.
<b>Down arrow</b>	Moves to the next field.
<b>Enter</b>	Selects a value in the selected field (if applicable) or follow the link in the field.
<b>Spacebar</b>	Expands or collapses a drop-down list, if applicable.
<b>Tab</b>	Moves to the next focus area.
	<b>NOTE:</b> For the standard graphics browser only.
<b>Esc</b>	Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.
<b>F1</b>	Displays the System Setup help file.

## System Setup options



**NOTE:** Depending on your system and the devices installed on the system, the items listed in this section may or may not appear.

Table 22. General

Option	Description
<b>System Information</b>	<p>Specifies information about the system and the primary hardware features of your system. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>System Information</b></li> <li>• <b>Memory Configuration</b></li> <li>• <b>PCI Information</b></li> <li>• <b>Processor Information</b></li> <li>• <b>Device Information</b></li> </ul>
<b>Boot Sequence</b>	<p>Specifies the list of devices, in which the system checks for an operating system to install in the sequence of the listed devices. You can modify the sequence, if necessary. The available devices are:</p> <ul style="list-style-type: none"> <li>• <b>Diskette Drive</b></li> <li>• <b>USB Storage Device</b></li> <li>• <b>CD/DVD/CD-RW Drive</b></li> <li>• <b>Onboard NIC</b></li> <li>• <b>Internal hard drive(s)</b></li> </ul> <p><b>NOTE:</b> The Diskette Drive option refers to the USB floppy drive.</p>
<b>Boot List Options</b>	<p>Specifies the boot options. The available options are:</p>

Option	Description
	<ul style="list-style-type: none"> <li>• <b>Legacy</b></li> <li>• <b>UEFI</b></li> </ul>
<b>Advanced Boot Options</b>	<p>Allows you to Enable Legacy Option ROMs. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Enable Legacy Option ROMs</b></li> <li>• <b>Enable Attempt Legacy Boot</b></li> </ul> <p>By default, the <b>Enable Legacy Option ROMs</b> option is enabled.</p>
<b>Date/Time</b>	<p>Allows you to set the date and time on the system. The changes to the system date and time takes effect immediately.</p>

**Table 23. System configuration**

Option	Description
<b>Integrated NIC</b>	<p>Allows you to configure the integrated network controller. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Enable UEFI Network Stack</b></li> <li>• <b>Disabled</b></li> </ul> <p> <b>NOTE:</b> You can use the Disabled option, only if Active Management Technology (AMT) option is disabled.</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b></li> <li>• <b>Enabled w/PXE</b></li> </ul> <p>By default, the <b>Enabled w/PXE</b> option is selected.</p>
<b>Serial Port</b>	<p>Identifies and defines the serial port settings. You can set the serial port to:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b></li> <li>• <b>COM1</b></li> <li>• <b>COM2</b></li> <li>• <b>COM3</b></li> <li>• <b>COM4</b></li> </ul> <p> <b>NOTE:</b> The operating system may allocate resources even if the Serial port setting is disabled.</p> <p>By default, the <b>COM1</b> option is selected.</p>
<b>SATA Operation</b>	<p>Allows you to configure the internal SATA hard-drive controller. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b></li> <li>• <b>AHCI</b></li> <li>• <b>RAID On</b></li> </ul> <p>By default, the <b>RAID On</b> option is selected.</p>
<b>Drives</b>	<p>Allows you to configure the SATA drives on the system board. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>SATA-0</b></li> <li>• <b>SATA-1</b></li> <li>• <b>SATA-2</b></li> <li>• <b>SATA-3</b></li> </ul> <p>By default, all SATA drives are selected.</p>
<b>SMART Reporting</b>	<p>Specifies the hard-drive errors for the integrated drives that are reported during system startup. This technology is part of the SMART (Self Monitoring Analysis and Reporting Technology) specification.</p> <p>SMART Reporting is set to <b>Enable SMART Reporting</b>. By default, this option is disabled.</p>
<b>USB Configuration</b>	<p>Allows you to enable or disable the USB port configuration. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Enable Boot Support</b></li> <li>• <b>Enable Front USB Ports</b></li> </ul>




Option	Description
	<ul style="list-style-type: none"> <li>• <b>Enable rear USB Ports</b></li> </ul>
<b>Front USB Configuration</b>	<p>Allows you to enable or disable the front USB ports. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Front Port 1</b></li> <li>• <b>Front Port 2</b></li> <li>• <b>Front Port 3</b></li> <li>• <b>Front Port 4</b></li> </ul>
<b>Rear USB Configuration</b>	<p>Allows you to enable or disable the rear USB ports. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Rear Port 1</b></li> <li>• <b>Rear Port 2</b></li> <li>• <b>Rear Port 3</b></li> <li>• <b>Rear Port 4</b></li> <li>• <b>Rear Port 5</b></li> <li>• <b>Rear Port 6</b></li> </ul>
<b>USB PowerShare</b>	<p>Allows you to enable or disable USB PowerShare.</p> <p>USB PowerShare is set to <b>Enable USB PowerShare</b>. By default, this option is disabled.</p>
<b>Miscellaneous devices</b>	<p>Allows you to enable or disable various devices on the system board.</p> <p>Miscellaneous devices is set to <b>Enable PCI Slot</b>. By default, this option is enabled.</p>

**Table 24. Video**

Option	Description
<b>Primary Display</b>	<p>Allows you to configure primary video controller when there are multiple controllers available. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b></li> <li>• <b>Intel HD Graphics</b></li> </ul> <p>By default, the <b>Auto</b> option is selected.</p>

**Table 25. Security**

Option	Description
<b>Admin password</b>	<p>Allows you set, change, or delete the administrator (Admin) password (sometimes called the setup password). The Admin Password enables several security features. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Enter the old password</b></li> <li>• <b>Enter the new password</b></li> <li>• <b>Confirm the new password</b></li> </ul> <p>By default, the password is not set.</p>
<b>System password</b>	<p>Allows you set, change, or delete the system password (previously called the primary password). The system password enables several security features. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Enter the old password</b></li> <li>• <b>Enter the new password</b></li> <li>• <b>Confirm the new password</b></li> </ul> <p>By default, the password is not set.</p>
<b>Internal HDD_0 Password</b>	<p>Allows you set, change, or delete the password for the internal hard drive available in the system. The internal HDD_0 password enables several security features. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Enter the old password</b></li> <li>• <b>Enter the new password</b></li> <li>• <b>Confirm the new password</b></li> </ul> <p>By default, the password is not set.</p>

Option	Description
<b>Strong Password</b>	<p>Allows you to enable the option to always set strong passwords.</p> <p>Strong Password is to <b>Enable Strong Password</b>. By default, this option is disabled.</p>
<b>Password Configuration</b>	<p>Allows you to define the length of the <b>Admin password</b> and <b>System password</b>. The minimum characters used in the password must be 4 and the maximum characters used must be 32. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Admin Password Min</b></li> <li>• <b>Admin Password Max</b></li> <li>• <b>System Password Min</b></li> <li>• <b>System Password Max</b></li> </ul> <p> <b>NOTE:</b> Before you configure the password, ensure that you have provided the Service Tag information of your system.</p>
<b>Password Bypass</b>	<p>Allows you to disable the permission to bypass the System password, when the administrator password is set. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b></li> <li>• <b>Reboot bypass</b></li> </ul> <p>By default, the <b>Disabled</b> option is selected.</p>
<b>Password Change</b>	<p>Allows you to enable the disable permission to the System passwords when the administrator password is set.</p> <p>Password Change is set to <b>Allow Non-Admin Password Changes</b>.</p>
<b>TPM 1.2 Security</b>	<p>Allows you to control whether the Trusted Platform Module (TPM) is visible to the operating system. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>TPM On</b></li> </ul> <p> <b>NOTE:</b> The following options are available only if the TPM On option is enabled.</p> <ul style="list-style-type: none"> <li>• <b>PPI Bypass for Enable Commands</b></li> <li>• <b>PPI Bypass for Disable Commands</b></li> <li>• <b>Disabled</b></li> <li>• <b>Enabled</b></li> <li>• <b>Clear</b></li> </ul> <p>By default, the <b>TPM On</b> option is selected.</p> <p> <b>NOTE:</b> If you have upgraded the TPM 1.2 version to TPM 2.0 version, then the available option is TPM 2.0 Security.</p>
<b>Computrace (R)</b>	<p>Allows you to activate or disable the optional Computrace software. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Deactivate</b></li> <li>• <b>Disable</b></li> <li>• <b>Activate</b></li> </ul> <p>By default, the <b>Deactivate</b> option is selected.</p>
<b>CPU XD Support</b>	<p>Allows you to enable the Execute Disable mode of the processor.</p> <p>By default, CPU XD Support is set to <b>Enable CPU XD Support</b>.</p>
<b>OROM Keyboard Access</b>	<p>Allows you to determine whether users are able to enter Option ROM Configuration screens using shortcut keys during boot. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Enable</b></li> <li>• <b>One Time Enable</b></li> <li>• <b>Disable</b></li> </ul> <p>By default, the <b>Enabled</b> option is selected.</p>
<b>Admin Setup Lockout</b>	<p>Allows you to prevent users from entering Setup when an administrator password is set.</p> <p>Admin Setup Lockout is set to <b>Enable Admin Setup Lockout</b>. By default, this option is disabled.</p>

**Table 26. Secure Boot**

Option	Description
<b>Secure Boot Enable</b>	<p>Allows you to enable or disable the Secure Boot Feature. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b></li> <li>• <b>Enabled</b></li> </ul> <p>By default, the <b>Disabled</b> option is selected.</p>
<b>Expert Key Management</b>	<p>Allows you to enable or disable Custom Mode Key Management.</p> <p>Expert Key Management is set to <b>Enable Custom Mode</b>. By default, this option is disabled.</p> <p>If the <b>Enable Custom Mode</b> option is enabled, the available options are:</p> <ul style="list-style-type: none"> <li>• <b>PK</b></li> <li>• <b>KEK</b></li> <li>• <b>db</b></li> <li>• <b>dbx</b></li> </ul>

**Table 27. Performance**

Option	Description
<b>Multi Core Support</b>	<p>This field specifies whether the processor has one or all cores enabled. The performance of some applications improve with the additional cores. Allows you to enable or disable multi-core support for the processor. The available options are:</p> <ul style="list-style-type: none"> <li>• <b>All</b> (Default)</li> <li>• <b>1</b></li> <li>• <b>2</b></li> <li>• <b>3</b></li> </ul> <p>By default, the <b>All</b> option is selected.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• The options displayed could be different depending on the installed processor.</li> <li>• The options depend on the number of cores supported by the installed processor (All, 1, 2, N-1 for N-Core Processors)</li> </ul>
<b>Intel SpeedStep</b>	<p>Allows you to enable or disable the Intel SpeedStep feature.</p> <p>Intel SpeedStep is set to <b>Enable Intel SpeedStep</b>.</p>
<b>C-States Control</b>	<p>Allows you to enable or disable the additional processor sleep states.</p> <p>By default, C-States Control is set to <b>C states</b>.</p>
<b>Limit CPUID Value</b>	<p>This field limits the maximum value the processor Standard CPUID Function supports.</p>
<b>Intel® TurboBoost</b>	<p>Allows you to enable or disable <b>Intel® TurboBoost</b> mode of the processor. If the system supports Intel Xeon E3-1225 processor, then by default <b>Intel® TurboBoost</b> is enabled.</p>
<b>Table 28. Processors supporting the Intel® TurboBoost configuration</b>	
Processor type	Supports Intel® TurboBoost
Intel Core i3-6100	No
Intel Xeon E3-1225	Yes
Intel Pentium G4400	No
<b>Hyper-Thread Control</b>	<p>Allows you to enable or disable the Hyper-Threading technology. If the system supports Intel Core i3-6100 or Intel Xeon E3-1225 processor, then by default <b>Hyper-Thread Control</b> is enabled.</p>

Option	Description
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Table 29. Processors supporting the Hyper-Thread Control configuration	
Processor type	Supports Hyper-Thread Control
Intel Core I3-6100	Yes
Intel Xeon E3-1225	No
Intel Pentium G4400	No

**Table 30. Power management**

Option	Description
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<b>Auto On Time</b>	<p>Allows you to set the time at which the system must turn on automatically. The available options are:</p> <ul style="list-style-type: none"> <li>· <b>Disabled</b></li> <li>· <b>Every Day</b></li> <li>· <b>Weekdays</b></li> <li>· <b>Select Days</b></li> </ul> <p>By default, the <b>Disabled</b> option is selected.</p>
<b>Fan Control Override</b>	<p>Allows you to control the speed of the system fan. By default, this option is disabled.</p>
<b>Wake on LAN</b>	<p>This option allows the system to power up from the off state when triggered by a special LAN signal. Wake-up from the Standby state is unaffected by this setting and must be enabled in the operating system. This feature only works when the system is connected to AC power supply. The available options are:</p> <ul style="list-style-type: none"> <li>· <b>Disabled</b></li> <li>· <b>LAN Only</b></li> <li>· <b>LAN with PXE</b></li> </ul> <p>By default, the <b>Disabled</b> option is selected.</p>

**Table 31. POST behavior**

Option	Description
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<b>Numlock LED</b>	<p>Allows you to specify if the NumLock function is enabled when the system boots. By default, this option is enabled.</p>
<b>MEBx Hotkey</b>	<p>Allows you to specify the MEBx shortcut key function must be enabled when the system boots. By default, this option is enabled.</p>
<b>Keyboard Errors</b>	<p>Specifies the keyboard-related errors are reported when it boots. By default, this option is enabled.</p>

**Table 32. Virtualization support**

Option	Description
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<b>Virtualization</b>	<p>This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization technology.</p> <p>Virtualization is set to <b>Enable Intel Virtualization Technology</b>. By default, this option is enabled.</p>
<b>VT for Direct I/O</b>	<p>Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel Virtualization technology for direct I/O.</p> <p>VT for Direct I/O is set to <b>Enable VT for Direct I/O</b>. By default, this option is enabled.</p>

**Table 33. Maintenance**

Option	Description
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<b>Service Tag</b>	<p>Displays the service tag of your system.</p>
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Option	Description
<b>Asset Tag</b>	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.
<b>SERR Messages</b>	Allows you to control the SERR message mechanism. This option is not set by default. Some graphics cards require that the SERR message mechanism be disabled.
<b>BIOS Downgrade</b>	Allows you to control the flashing of the system firmware to previous revisions. By default, this option is enabled.
<b>Data Wipe</b>	Allows you to securely erase data from all internal storage devices. By default, this option is enabled.

**Table 34. System Logs**

Option	Description
<b>BIOS events</b>	Displays the system event log and allows you to clear the log by enabling the <b>Clear Log</b> option.

## Updating the BIOS

### Prerequisites

Dell recommends you to update your BIOS (System Setup), when replacing the system board.

### Steps


1. Restart the system.
2. Go to **Dell.com/support**.
3. Enter the **Service Tag** or **Express Service Code** and click **Submit**.

 **NOTE:** To locate the Service Tag, click **Where is my Service Tag?**

 **NOTE:** If you cannot find your Service Tag, click **Detect My Product**. Proceed with the instructions on screen.

4. If you are unable to locate or find the Service Tag, click the product category of your system.
5. Choose the **Product Type** from the list.
6. Select your system model and the product support page of your system appears.
7. Click **Get drivers** and click **View All Drivers**.  
The Drivers and Downloads page opens.
8. On the Drivers and Downloads screen, under the **Operating System** drop-down list, select **BIOS**.
9. Identify the latest BIOS file and click **Download File**.  
You can also analyze the drivers that need an update. To do this for your product, click **Analyze System for Updates** and follow the instructions on the screen.
10. Select your preferred download method in the **Please select your download method below** window, click **Download File**.  
The **File Download** window appears.
11. Click **Save** to save the file on your system.
12. Click **Run** to install the updated BIOS settings on your system.  
Follow the instructions on the screen.

### Next steps

 **NOTE:** Dell recommends not to update the BIOS version for more than 3 revisions. For example, if you want to update the BIOS from 1.0 to 7.0, then install version 4.0 first and then install version 7.0.

### Related reference

[Locating service tag of your system](#)

# BIOS recovery

The BIOS recovery is designed to fix the main BIOS, and cannot work if the boot is damaged. The BIOS recovery will not work in the event of EC corruption, ME corruption, or a hardware related issue. The BIOS recovery image should be available on the unencrypted partition on the drive for BIOS recovery feature.

## Rollback BIOS feature

Two versions of the BIOS recovery image are saved on the hard drive:

- Current running BIOS (old)
- To-be-updated BIOS (new)

The old version is already stored on the hard drive. The BIOS adds new version to the hard drive, maintains the old version, and deletes other existing versions. For example, A00 and A02 versions are already on the hard drive, A02 is the running BIOS. The BIOS adds A04, maintains A02, and deletes A00. Having two BIOS version enables the Rollback BIOS feature.

If the recovery file cannot be stored (hard drive is out of space), the BIOS sets a flag to indicate this condition. The flag is reset in the event it later becomes possible to store the recovery file. The BIOS notifies the user during POST and in BIOS Setup, the BIOS recovery is degraded. BIOS recovery through hard drive may not be possible, however BIOS recovery through USB flash drive is still possible.

For USB key: root directory or "\"

BIOS\_IMG.rcv: the recovery image stored on the USB key.

## BIOS recovery using USB key

### About this task

 **NOTE:** Ensure that you have the file type extensions visible in the operating system.

 **NOTE:** Ensure that you have downloaded the latest BIOS from the Dell support site and save it on your system.

### Steps

1. Browse to the location of the downloaded BIOS update executable (.exe) file.
2. Rename the file to BIOS\_IMG.rcv.  
For example, if the file name is PowerEdge\_T30\_0.0.5.exe, rename it to BIOS\_IMG.rcv
3. Copy the BIOS\_IMG.rcv file to the root directory of the USB key.
4. If not plugged in, plug in the USB key, restart the system, press F2 to enter the System Setup, and then press power button to shut down the system.
5. Start the system.
6. While the system is starting up, press the Ctrl+Esc keys while holding the power button until the **BIOS Recovery Menu** dialog box is displayed.
7. Click **Continue** to start the BIOS recovery process.

 **NOTE:** Ensure that the Recovery BIOS option is selected in the BIOS Recovery Menu dialog box.

8. Select the path on the USB drive where BIOS recovery file is stored( root directory or "\" ) and follow the on-screen instructions.

## Trusted Platform Module specification

The Dell PowerEdge T30 supports upgrading the Trusted Platform Module (TPM) from version 1.2 to version 2.0 or downgrading from version 2.0 to version 1.2.

 **NOTE:** The option to upgrade the TPM is supported only in the Microsoft Windows operating system environment.

 **NOTE:** For more information about initializing the TPM using Bitlocker, see <http://technet.microsoft.com/en-us/library/cc753140.aspx>.

# Upgrading Trusted Platform Module to version 2.0

## Prerequisites


1. Ensure that the **Dell TPM 2.0 Update Utility** is downloaded and is available to upgrade the TPM version from 1.2 to 2.0.

 **NOTE:** The TPM update file is available in the **Security** section of the driver and downloads of section for the system.

## About this task

To upgrade the Trusted Platform Module (TPM) from version 1.2 to version 2.0, follow the steps:


## Steps

1. Boot to the operating system (OS), in an elevated PowerShell window, execute the following command: `Disable-TPMAutoProvisioning` and, press Enter.  
Ensure that **AutoProvisioning** is disabled.
2. Reboot the system, and press F2 to enter System Setup.
3. In the left pane, select **TPM 1.2 security**.
4. In the **TPM 1.2 security** window, select the **Clear** checkbox, and click **Yes** in the warning dialog box.
5. Press **Escape** to exit from the **TPM 1.2 security** window.
6. Reboot the system, press F2 to enter the System Setup.
7. In the left pane, select **TPM 1.2 security**.  
 **NOTE:** Ensure that the **Clear** checkbox is grayed out and that the **TPM 1.2 security** is set to **Disabled**.
8. Set the **TPM 1.2 security** to **Enabled**.
9. Click **OK** to apply the setting.  
By clicking **OK**, the system reboots to the OS.
10. In the folder that has the TPM Update Program, double-click on the **Dell TPM 2.0 Update Utility**. At the TPM Update Program windows prompt, click **OK**.
11. In the **Confirm TPM Replacement** window, click **OK** to start the TPM update.  
The system will automatically restart.
12. The POST screen displays the update progress.
13. After the update process is complete the following message appears: **Firmware Update successfully. Rebooting your system**.  
The system reboots after the update has completed successfully.
14. Boot to the OS, in an elevated PowerShell window, execute the following command: `Enable-TPMAutoProvisioning` and press Enter.  
Ensure that **AutoProvisioning** is enabled.
15. To access the **Trusted Platform Module Management on Local Computer**, in the **Run** window, type `tpm.msc` and click **OK**.
16. In the **Trusted Platform Module Management on Local Computer** window, ensure that the **Specification Version: 2.0** is displayed in the **TPM Manufacturer Information** section.
17. In the **Actions** pane, click **Prepare the TPM**.  
The **Manage the TPM security hardware** window opens. Wait until the **TPM is ready** message appears.
18. Close the **Manage the TPM security hardware** window.  
The status section now indicates that the TPM is ready for use.

# Downgrading the Trusted Platform Module to version 1.2

## Prerequisites


1. Ensure that the **Dell TPM 1.2 Update Utility** is downloaded and is available to downgrade the TPM version from 2.0 to 1.2.

 **NOTE:** The TPM update utility is available in the **Security** section of the driver and downloads of page for the server

## About this task

Follow these steps to downgrade the Trusted Platform Module (TPM) from version 2.0 to version 1.2:

## Steps

1. Boot to the operating system (OS), in an elevated PowerShell window, execute the following command: `Disable-TPMAutoProvisioning` and, press Enter.  
Ensure that **AutoProvisioning** is disabled.
2. Reboot the system, and press F2 to enter System Setup.
3. In the left pane, select **TPM 1.2 security**.
4. In the **TPM 1.2 security** window, select the **Clear** checkbox, and click **Yes** in the warning dialog box.
5. Press `Escape` to exit from the **TPM 1.2 security** window.
6. Reboot the system, press F2 to enter the System Setup.
7. In the left pane, select **TPM 1.2 security**.  
 **NOTE:** Ensure that the **Clear** checkbox is grayed out and that the **TPM 1.2 security** is **Disabled**.
8. Set the **TPM 1.2 security** to **Enabled**.
9. Click **OK** to apply the setting.
10. In the folder that has the TPM Update Program, double-click on the **Dell TPM 1.2 Update Utility**. At the TPM Update Program windows prompt click **OK**.
11. In the **Confirm TPM Replacement** window, click **OK** to start the TPM update.  
The system will automatically restart.
12. The POST screen displays the update progress.
13. After the update process is complete the following message appears: **Firmware Update successfully. Rebooting your system**.  
The system reboots after the update has completed successfully.
14. Boot to the OS, in an elevated PowerShell window, execute the following command: `Enable-TPMAutoProvisioning` and press Enter.  
Ensure that **AutoProvisioning** is enabled.
15. To access the **Trusted Platform Module Management on Local Computer**, in the **Run** window, type `tpm.msc` and click **OK**.
16. In the **Trusted Platform Module Management on Local Computer** window, ensure that the **Specification Version: 1.2** is displayed in the **TPM Manufacturer Information** section.
17. In the **Actions** pane, click **Prepare the TPM**.  
The **Manage the TPM security hardware** window opens. Wait till the **TPM is ready** message appears.
18. Close the **Manage the TPM security hardware** window.  
The status section now indicates that the TPM is ready for use.

# Configuring TPM Bitlocker key


## Prerequisites

1. Ensure that you have a supported Microsoft Windows Server Operating System installed on your system.
2. Ensure that you have TPM version 2.0 installed on your system.
3. Log in as an Administrator.

## Steps

1. To access the **Trusted Platform Module Management on Local Computer**, in the **Run** window, type `tpm.msc` and click **OK**.
2. In the **Trusted Platform Module Management on Local Computer** window, ensure that the **Specification Version: 2.0** in the **TPM Manufacturer Information** section.
3. In the **Actions** pane, click **Prepare the TPM**.  
The **Manage the TPM security hardware** opens. Wait till the **TPM is ready** message appears.
4. From the Windows Control Panel open **Bitlocker Drive Encryption**.
5. In the **Bitlocker Drive Encryption** window, select **Save to a file** or **Print the recovery key** and click **next**.
6. After the process is complete, shut down the system.
7. Install the new system board that has TPM1.2 (FW\_5.81.0.0).
8. Boot to the operating system.
9. From the Windows Control Panel open the **Bitlocker Drive Encryption**.

10. To start the encryption on the **BitLocker Drive Encryption** page, click **Turn On BitLocker** on the volume that the operating system is installed on.

 **NOTE:** If the TPM is not initialized, you see the Initialize TPM Security Hardware wizard. Follow the instruction on the screen to initialize the TPM and restart your system.

 **NOTE:** After the encryption is completed, you will need to provide the Bitlocker key every time the system starts up.

11. To check the TPM status, access the **Trusted Platform Module Management on Local Computer**, in the **Run** window, type **tpm.msc** and click **OK**.
12. In the **Bitlocker Drive Encryption** window ensure that Bitlocker is active.
13. In the **Actions** pane, click on **Prepare the TPM**.  
The **Manage the TPM security hardware** opens. Wait till the **TPM is ready** message appears.
14. Close the **Manage the TPM security hardware** window.  
The status section now indicates that the TPM is ready for use.

### Next steps

Follow the instructions in the Upgrading the Trusted Platform Module to version 2.0 section to upgrade the TPM.

### Related tasks

[Upgrading Trusted Platform Module to version 2.0](#)

## System and setup password

You can create a system password and a setup password to secure your system.


Password type	Description
---------------	-------------

<b>System password</b>	Password that you must enter to log on to your system.
------------------------	--

<b>Setup password</b>	Password that you must enter to access and make changes to the BIOS settings of your system.
-----------------------	--

 **CAUTION:** The password features provide a basic level of security for the data on your system.


 **CAUTION:** Anyone can access the data stored on your system if it is not locked and left unattended.

 **NOTE:** Your system is shipped with the system and setup password feature disabled.

## Assigning a system password and setup password

### Prerequisites

You can assign a new **System Password** and/or **Setup Password** or change an existing **System Password** and/or **Setup Password** only when **Password Status** is **Unlocked**. If the Password Status is **Locked**, you cannot change the System Password.

 **NOTE:** If the password jumper is disabled, the existing System Password and Setup Password are deleted and you need not provide the system password to log on to the system.

### About this task

To enter the system setup, press F2 immediately after a power-on or re-boot.

### Steps

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.  
The **System Security** screen appears.
2. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
3. Select **System Password**, enter 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 lower case letters are valid, upper case letters are not allowed.
- Only the following special characters are allowed: space, ("), (+), (.), (-), (.), (/), (;), ([), (\), (]), (').

Re-enter the system password when prompted.

4. Type the system password that you entered earlier and click **OK**.
5. Select **Setup Password**, type your system password and press Enter or Tab.  
A message prompts you to re-type the setup password.
6. Type the setup password that you entered earlier and click **OK**.
7. Press Esc and a message prompts you to save the changes.
8. Press Y to save the changes.  
The system reboots.

## Deleting or changing an existing system and/or setup password


### Prerequisites

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked.

### About this task


To enter the System Setup, press F2 immediately after a power-on or reboot.

### Steps

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.  
The **System Security** screen is displayed.
  2. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
  3. Select **System Password**, alter or delete the existing system password and press Enter or Tab.
  4. Select **Setup Password**, alter or delete the existing setup password and press Enter or Tab.
-  **NOTE:** If you change the System and/or Setup password, re-enter the new password when prompted. If you delete the System and/or Setup password, confirm the deletion when prompted.
5. Press Esc and a message prompts you to save the changes.
  6. Press Y to save the changes and exit from System Setup.  
The system reboots.

## Disabling a system password

### Prerequisites

-  **NOTE:** The system's software security features include a system password and a setup password. The password jumper disables any password(s) currently in use.

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

### About this task

-  **NOTE:** You can also use the following steps to disable a forgotten password.

### Steps

1. Identify the PSWD jumper on the system board.
2. Remove the PSWD jumper from the system board.

 **NOTE:** The existing passwords are not disabled (erased) until the system boots without the jumper.

 **NOTE:** If you assign a new system and/or setup password with the PSWD jumper installed, the system disables the new password(s) the next time it boots.

3. Replace the PSWD jumper on the system board.

#### Next steps

1. Follow the procedure listed in the After working inside your system section.
2. Reboot the system and press F2 to enter the System Setup and see Setting up a System Password.

#### Related tasks

[Before working inside your system](#)

[After working inside your system](#)


[System Setup](#)

#### Related reference

[Safety instructions](#)

## Intel Active Management Technology

Intel Active Management Technology (AMT) enables you to remotely manage, diagnose, and repair the managed server.

 **NOTE:** Intel AMT is supported only on Intel Xeon processor-based systems.







It provides the following features:

- Allows you to discover devices even while the system is powered off.
- With out-of-band management capabilities, you can remotely remediate and recover systems after OS failures.
- Blocks incoming threats and infected clients before they affect the network.
- Provides remote hardware and software asset tracking.

For more information on Intel AMT, see [www.intel.com/amt](http://www.intel.com/amt).

# Installing and removing system components

## Safety instructions

-  **NOTE:** Whenever you need to lift the system, get others to assist you. To avoid injury, do not attempt to lift the system by yourself.
-  **WARNING:** Opening or removing the system cover while the system is powered on may expose you to a risk of electric shock.
-  **CAUTION:** Do not operate the system without the cover for a duration exceeding five minutes.
-  **CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.
-  **NOTE:** It is recommended that you always use an antistatic mat and antistatic strap while working on components inside the system.
-  **NOTE:** To ensure proper operation and cooling, all bays in the system and system fans must be populated always with either a component or with a blank.

## Before working inside your system

### Prerequisites

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. Remove the system cover.

### Related tasks

[Removing the system cover](#)

### Related reference

[Safety instructions](#)

## After working inside your system

### Prerequisites

Follow the safety guidelines listed in the Safety instructions section.

### Steps

1. Install the system cover.
2. Place the system upright on a flat, stable surface.



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

#### Related tasks

[Installing the system cover](#)

#### Related reference

[Safety instructions](#)

## Recommended tools

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

- Phillips #1 screwdriver
- Phillips #2 screwdriver
- Wrist grounding strap

## System cover

The system cover protects the components inside the system and helps in maintaining air flow inside the system. Removing the system cover activates the intrusion switch.

## Removing the system cover

#### Prerequisites

1. Follow the safety guidelines listed in the Safety instructions section.
2. Turn off the system and any attached peripherals.
3. Disconnect the system from the electrical outlet and peripherals.
4. Place the system on a flat, stable surface.

#### Steps

Pull the system cover release latch and lift the system cover away from the system



**Figure 6. Removing the system cover**

#### Next steps

1. Install the system cover.
2. Place the system upright on its feet on a flat and stable surface.
3. Reconnect the peripherals and connect the system to the electrical outlet.
4. Turn the system on, including any attached peripherals.

#### Related tasks

[Installing the system cover](#)

#### Related reference

[Safety instructions](#)

## 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 tabs at the bottom of the system cover on the slots on the chassis.
2. Push the system cover until it locks into place.



**Figure 7. Installing the system cover**

#### Next steps

1. Place the system upright on its feet on a flat and stable surface.
2. Reconnect the peripherals and connect the system to the electrical outlet.
3. Turn on the system, including any attached peripherals.

#### Related reference

[Safety instructions](#)

## Bezel

The 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.

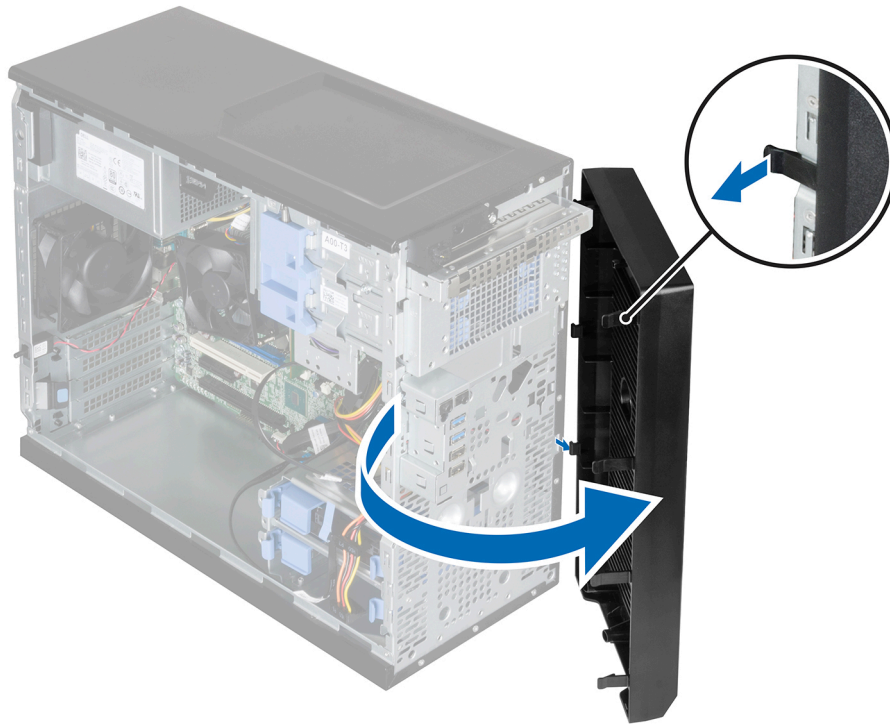
## Removing the bezel

#### Prerequisites

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. Release the four retention clips that secure the bezel to the chassis. The clips are located at the edge of the bezel.
2. Pull the bezel away from the system.



**Figure 8. Removing the bezel**

#### Next steps

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

#### Related tasks

[Before working inside your system](#)

[Installing the bezel](#)

[After working inside your system](#)

#### Related reference

[Safety instructions](#)

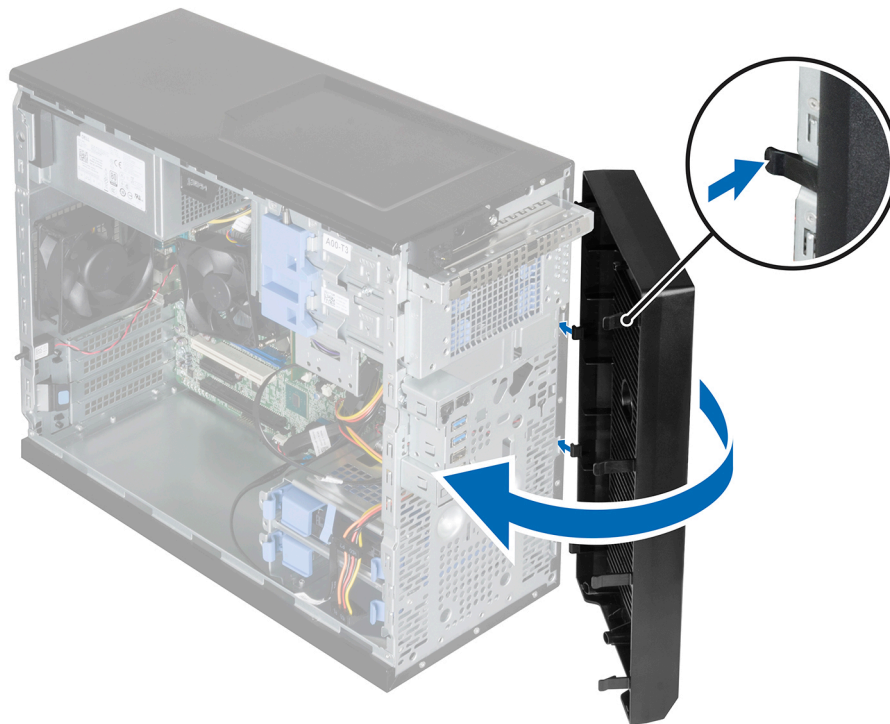
## Installing the bezel

#### Prerequisites

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 bezel tabs into the bezel tab slots on the chassis.
2. Press the bezel into the chassis until the retention clips lock into place.



**Figure 9. Installing the bezel**

#### **Next steps**

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

#### **Related tasks**

[Before working inside your system](#)

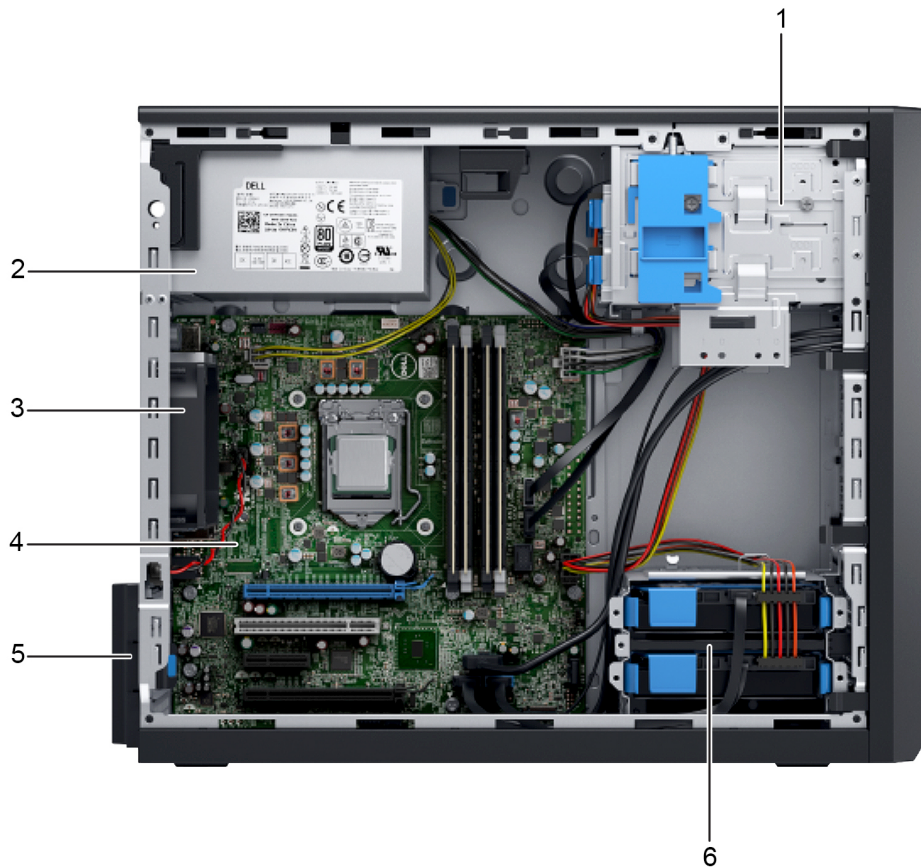
[After working inside your system](#)

#### **Related reference**

[Safety instructions](#)

## **Inside the system**

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



**Figure 10. Inside the system**

- |                                 |   |
|---------------------------------|---|
| 1. hard drive in the cage (4)   | 2. power supply unit                    |
| 3. chassis fan                  | 4. system board                         |
| 5. expansion card release latch | 6. hard drive in the hard-drive bay (2) |

## Power switch

The power switch allows you to turn the system on or off.

## Removing the power 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.

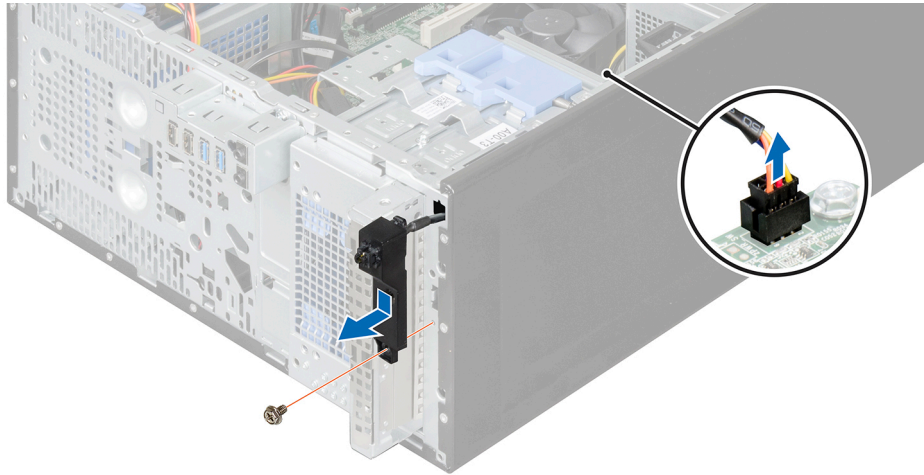
1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Remove the bezel.
4. Disconnect the power-switch cable from the system board.
5. Keep the Phillips #2 screwdriver ready.

### Steps

1. Remove the power-switch cable from the chassis clip.
2. Remove the screw securing the power switch to the chassis.



3. Slide the power switch down to disengage it from the slot and pull out the power switch from the system.



**Figure 11. Removing the power switch**

#### Next steps

1. Connect the power-switch cable to the system board.
2. Install the bezel
3. Install the power switch.
4. Follow the procedure listed in the After working inside your system section.

#### Related tasks

[Before working inside your system](#)

[Removing the bezel](#)

[Installing the bezel](#)

[Installing the power switch](#)

[After working inside your system](#)

#### Related reference

[Safety instructions](#)

## Installing the power switch

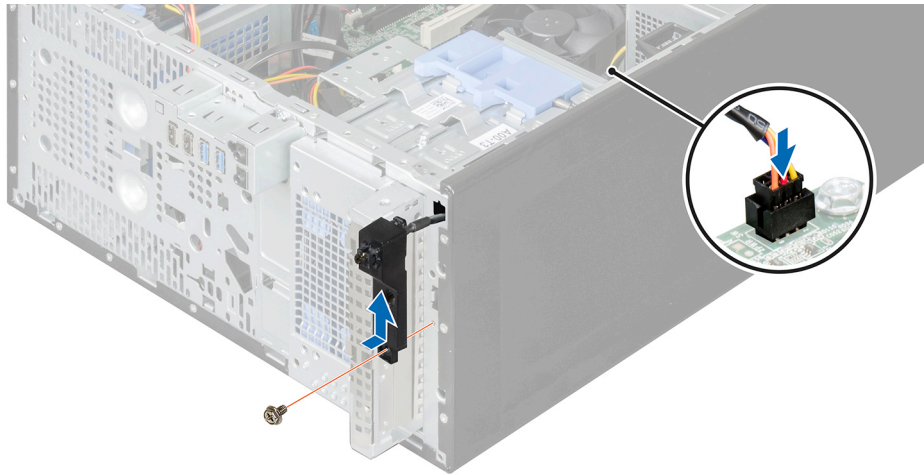
#### Prerequisites

**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.
3. Keep the Phillips #2 screwdriver ready.

#### Steps

1. Insert and route the power-switch cable through the chassis clip.
2. Slide the power switch through the slot on the front of the system and secure it to the system.
3. Connect the power-switch cable to the power-switch connector on the system board.



**Figure 12. Installing the power switch**

#### Next steps

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

#### Related tasks

[Before working inside your system](#)

[Installing the bezel](#)

[After working inside your system](#)

#### Related reference

[Safety instructions](#)

## Chassis intrusion switch

The chassis intrusion switch detects and logs when the system cover is removed. This switch is activated as soon as the system cover is removed.

## Removing the chassis intrusion switch

#### Prerequisites

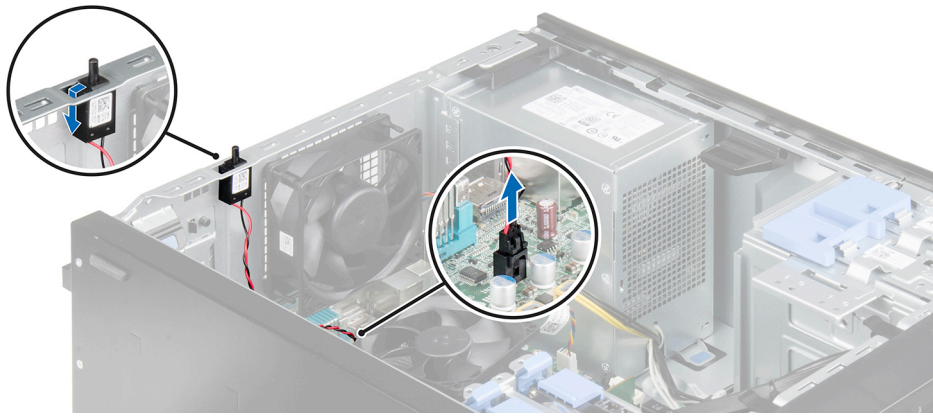
**CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell 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.
3. Disconnect the chassis intrusion switch cable from the system board.

#### Steps

1. Hold the chassis intrusion switch and slide the switch into the free space next to it.
2. Push the chassis intrusion switch down and out of the slot.





**Figure 13. Removing the chassis intrusion switch**

#### Next steps

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

#### Related tasks

[Before working inside your system](#)

[Installing the chassis intrusion switch](#)

[After working inside your system](#)

#### Related reference

[Safety instructions](#)

## Installing the chassis intrusion switch

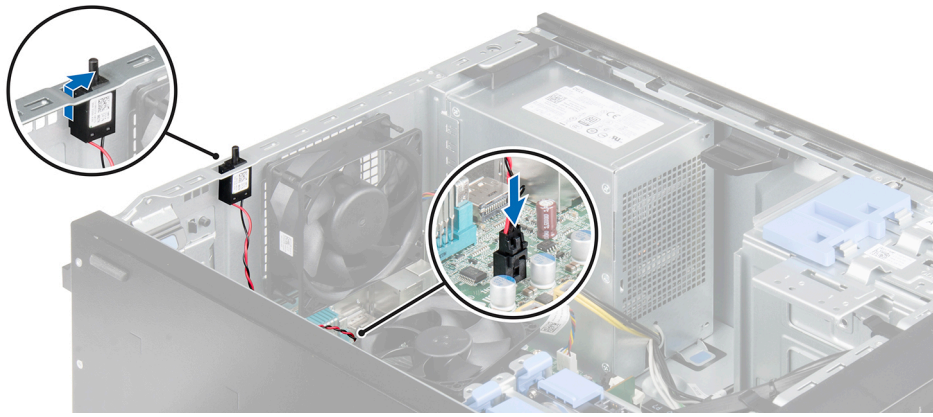
#### Prerequisites

**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 chassis intrusion switch into the chassis intrusion switch slot and slide it to secure it.
2. Connect the chassis intrusion switch cable to the system board.



**Figure 14. Installing the chassis intrusion switch**

#### Next steps

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

#### Related tasks

[Before working inside your system](#)

[After working inside your system](#)

#### Related reference

[Safety instructions](#)

## Input/Output (I/O) panel

The input/output panel has the USB ports, microphone and headphone connectors.

## Removing the I/O panel

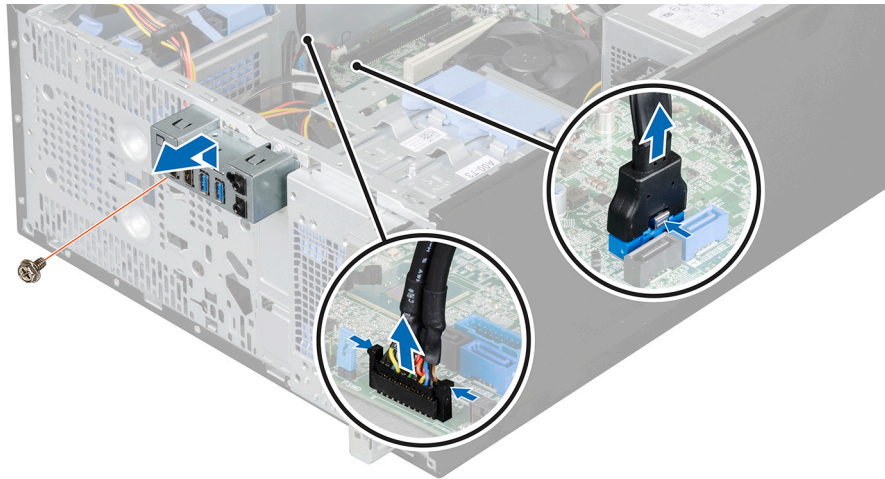
#### Prerequisites

**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 bezel.
4. Keep the Phillips #2 screwdriver ready.

#### Steps

1. Disconnect the input/output (I/O) panel data and USB data cables from the system board.
2. Remove the screw securing the I/O panel to the chassis.
3. Slide the I/O panel towards the front of the chassis to release it and pull the I/O panel along with its cables out of the system.



**Figure 15. Removing the I/O panel**

#### Next steps

1. Install the I/O panel.
2. Install the bezel
3. Follow the procedure listed in the After working inside your system section.

#### Related tasks

[Before working inside your system](#)

[Removing the bezel](#)

[Installing the I/O panel](#)

[Installing the bezel](#)

[After working inside your system](#)

#### Related reference

[Safety instructions](#)

## Installing the I/O panel

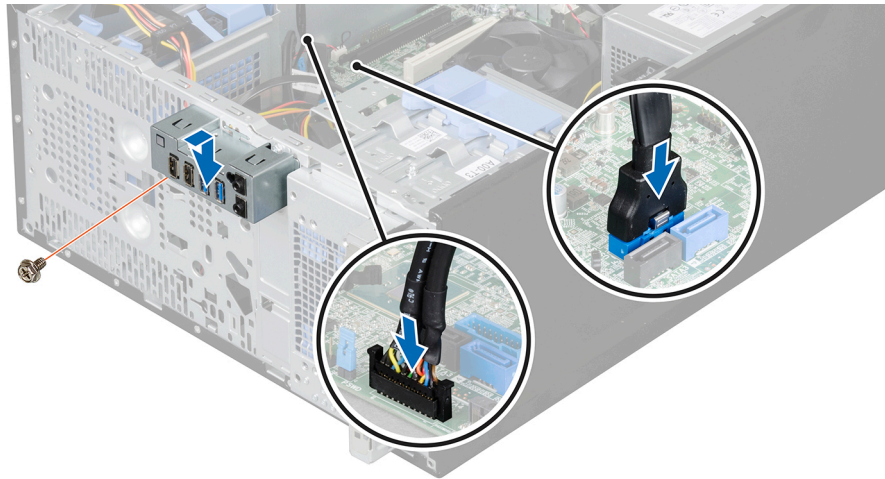
#### Prerequisites

**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 bezel.
4. Keep the Phillips #2 screwdriver ready.

#### Steps

1. Insert the input/output (I/O) panel data and USB cables.
2. Push the I/O panel into the guide slot and push it downward to lock the assembly into place.
3. Tighten the screw to secure the I/O panel to the chassis.
4. Connect the I/O panel data and USB cables to the system board.



**Figure 16. Installing the I/O panel**

#### Next steps

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

#### Related tasks

[Before working inside your system](#)

[Removing the bezel](#)

[Installing the bezel](#)

[After working inside your system](#)

#### Related reference

[Safety instructions](#)

## Hard drives

Your system supports 2.5-inch and 3.5-inch hard drives. Choosing the right drive type depends on the usage pattern. Improper use of hard drives will lead to significant risk and increase the drives failure rate.

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

- NOTE:** Use only hard drives that have been tested and approved for use with your system.
- NOTE:** To install more than four drive devices (including optical drive and hard drives), you need an additional power extension cable, controller card, and SATA cables (minimum 1.6 ft).
- NOTE:** The screws that secure the 2.5-inch hard drive to the hard drive cage are available on the front of the hard drive cage.
- NOTE:** Use the vertical type SATA cables to connect hard drives in the hard drive cage to avoid damaging the connector pins. This is applicable for the 2.5-inch hard drives and optical drive.
- NOTE:** Use right angle connectors to connect to the hard drives in the hard drive bay. You may not be able to close the system cover if incorrect connector cables are used.
- NOTE:** Do not mix enterprise class hard drives with entry-level hard drives.

Your system supports four 3.5-inch entry-level hard drives and enterprise class hard drives. Entry-level hard drives are designed for 8x5 operating environment and enterprise class hard drives are designed for 24x7 operating environment. Two hard drives are located in the removable hard drive cage and two hard drives are located in the fixed hard drive bay.

Choosing the right hard drive type depends on the usage pattern. Improper use of entry-level hard drives (including workloads exceeding 550 TB/year) leads to significant risk and increases the failure rate of the drives. 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 white paper and 4K Sector HDD FAQ document at [Dell.com/poweredge manuals](https://Dell.com/poweredge manuals).

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

## Removing the hard drive cage

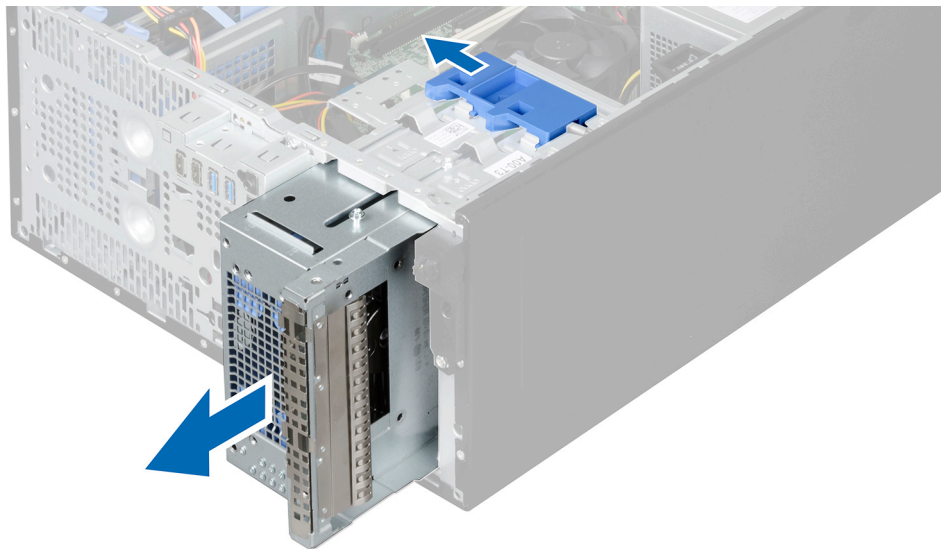
### Prerequisites

**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, remove the power and data cables from the hard drives in the hard drive cage.
4. Remove the bezel.

### Steps

Slide and hold the hard drive cage latch and pull the hard drive cage out of the system.



**Figure 17. Removing the hard drive cage**

### Next steps

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

### Related tasks

[Before working inside your system](#)

[Removing the bezel](#)

[Installing the hard drive cage](#)

[After working inside your system](#)

### Related reference

[Safety instructions](#)



# Installing the hard drive cage

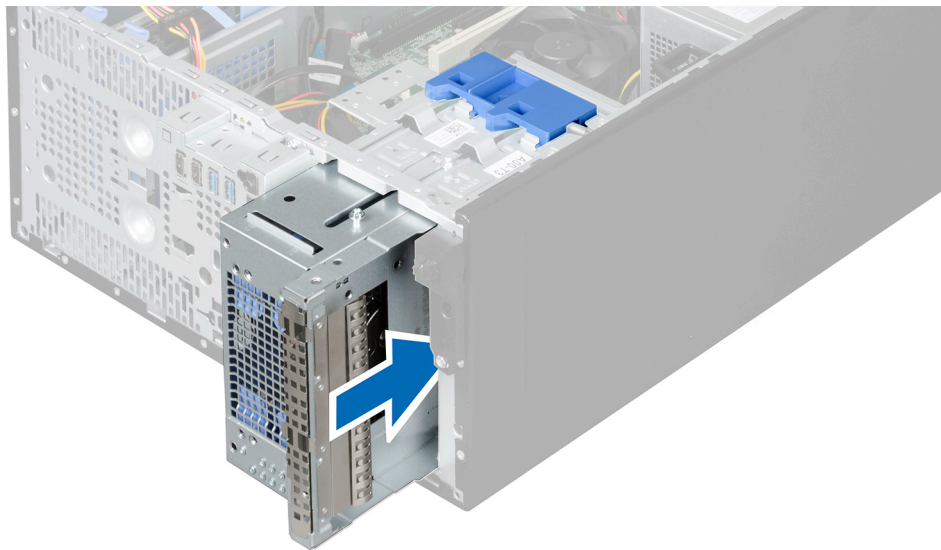
## Prerequisites

**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

Insert the hard drive cage and push it into the system until it clicks into place.



**Figure 18. Installing the hard drive cage**

## Next steps

1. Install the bezel.
2. If applicable, connect the power and data cables to the hard drives and optical drive in the hard drive cage.
3. Follow the procedure listed in the After working inside your system section.

## Related tasks

[Before working inside your system](#)

[Installing the bezel](#)

[After working inside your system](#)

## Related reference

[Safety instructions](#)

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

## Prerequisites

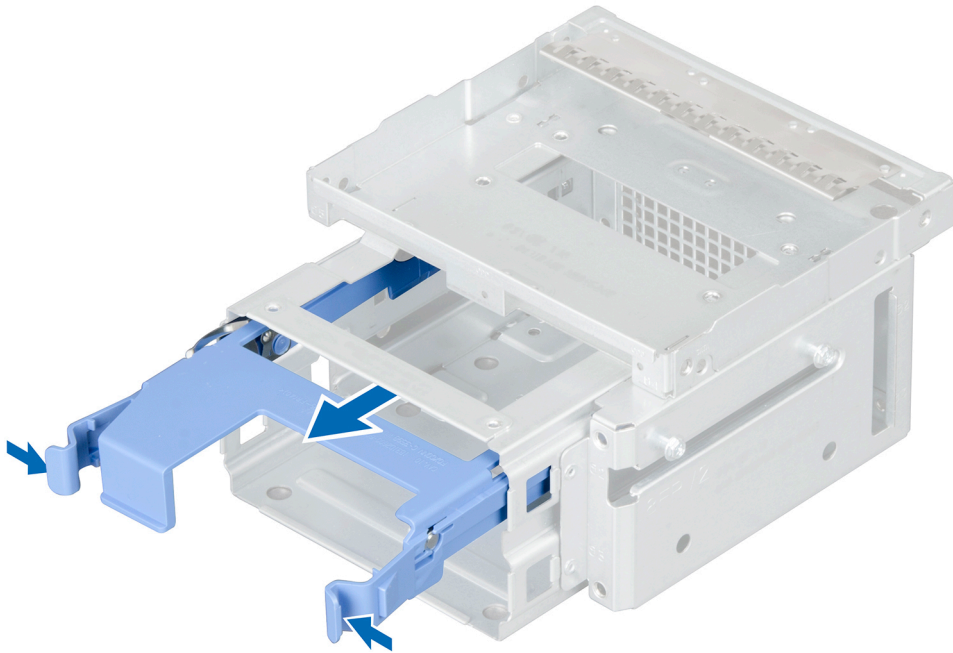
**CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell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

**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, disconnect the power and data cables from the hard drive in the hard drive cage.
4. Remove the hard drive cage.

### Steps

Press the retention clips inwards and pull the hard drive out of the hard drive cage.



**Figure 19. Removing a 3.5-inch hard drive carrier from the hard drive cage**

### Next steps

1. Install the 3.5-inch hard drive carrier in the hard drive cage.
2. Follow the procedure listed in the After working inside your system section.

### Related tasks

[Before working inside your system](#)

[Removing the hard drive cage](#)

[Installing a 3.5-inch hard drive carrier in the hard drive cage](#)

[After working inside your system](#)

### Related reference

[Safety instructions](#)

# Installing a 3.5-inch hard drive carrier in the hard drive cage

## 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 hard drive cage from the system.

**NOTE:** If you have a 2.5-inch hard drive installed in the hard drive cage, disconnect the power and data cables from the hard drive.

## Steps

1. Align the ridges of the hard drive carrier with the grooves on the hard drive cage.
2. Insert and push the hard drive into the hard drive cage until it clicks into place.
3. Install the hard drive cage into the system.

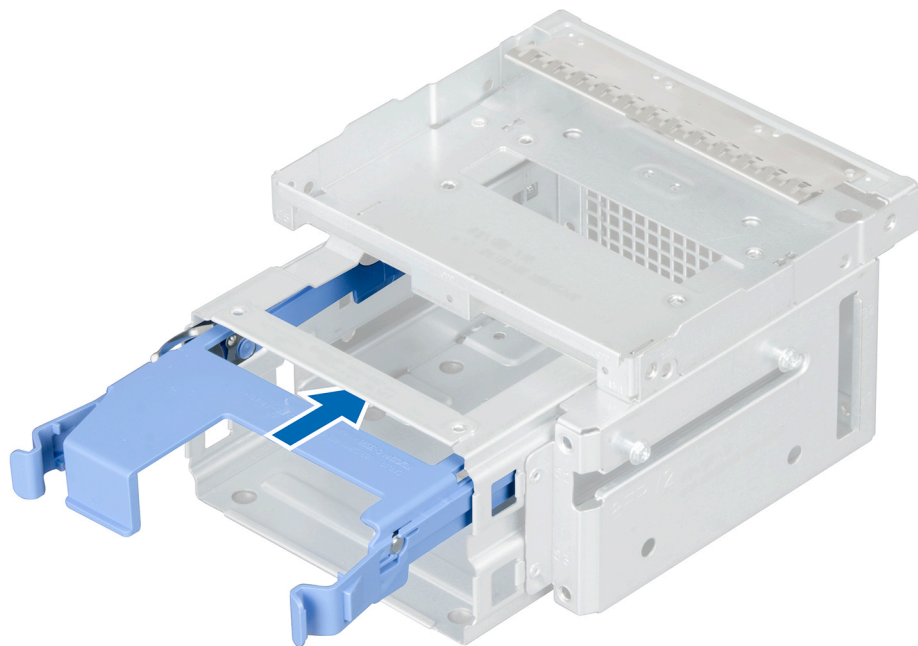


Figure 20. Installing a 3.5-inch hard drive carrier in the hard drive cage

## Next steps

1. Connect the power and data cables to the hard drive.

**NOTE:** For information about cabling the hard drives, see the System Information Label on the system cover.

**NOTE:** Ensure that SATA cables with a right angle connector are used to connect the hard drives in the hard drive bay.

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



## Related tasks

[Before working inside your system](#)

[Removing the hard drive cage](#)


[After working inside your system](#)

## Related reference

[Safety instructions](#)

# Removing a 2.5-inch hard drive(s) from the optical drive bay

## Prerequisites

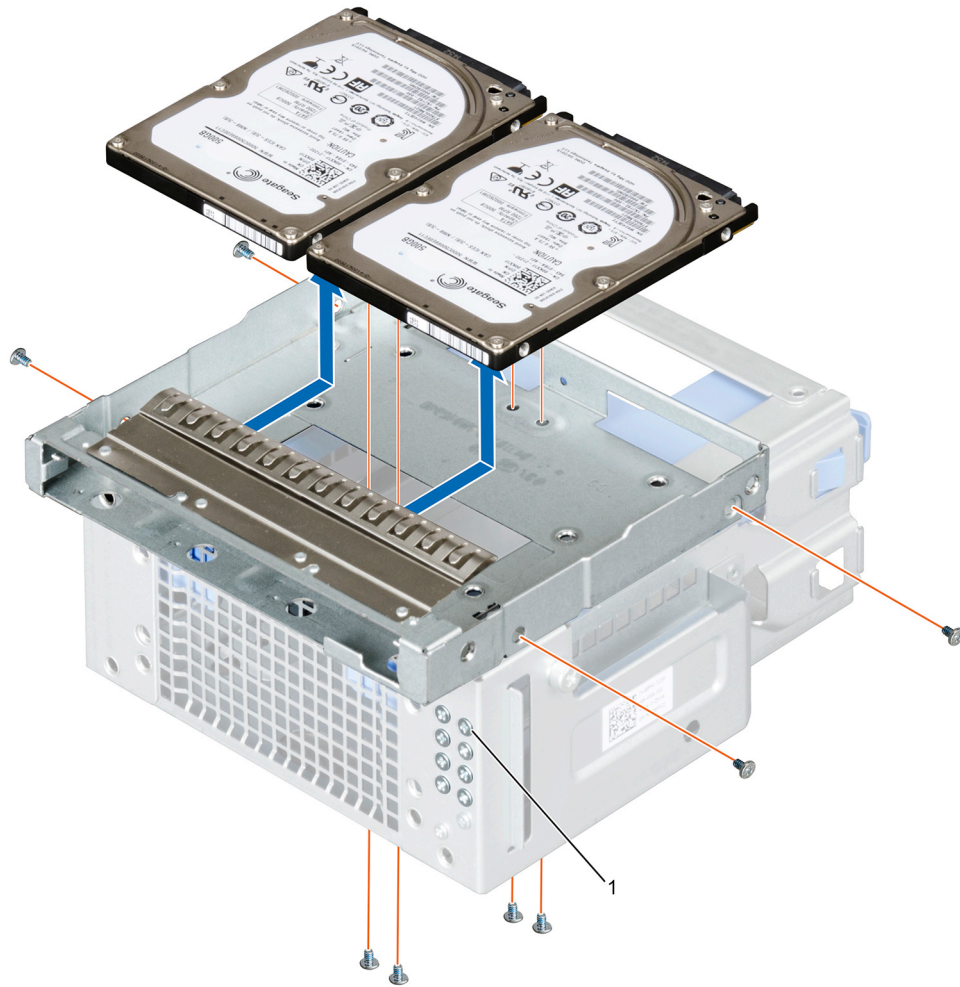
 **CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell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

 **NOTE:** If you have an optical drive installed you cannot install the 2.5-inch hard drives until you remove the optical drive.

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 installed, disconnect the cables connected to the 3.5-inch hard drives installed in the hard drive cage
4. Remove the hard drive cage from the system.
5. Keep the Phillips #2 screwdriver ready.

## Steps

1. Place the hard drive cage upside down.
2. Remove the screws securing the hard drive to the hard drive cage.
3. Lift and slide the hard drive out of the optical drive bay.



**Figure 21. Removing a 2.5-inch hard drive from the optical drive bay**

- a. 2.5-inch hard drive screws (8)

**NOTE:** The screws used to secure the hard drive to the hard drive cage are available on the front of the hard drive cage.

#### Next steps

1. Connect the power and data cables to the hard drive in the optical drive bay.
2. Install a 2.5-inch hard drive in the optical drive bay.
3. Follow the procedure listed in the After working inside your system section.

#### Related tasks

[Before working inside your system](#)

[Removing the hard drive cage](#)

[Installing a 2.5-inch hard drive\(s\) in the optical drive bay](#)


[After working inside your system](#)

#### Related reference

[Safety instructions](#)

# Installing a 2.5-inch hard drive(s) in the optical drive bay

## 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 power and data cables from the hard drive in the hard drive cage.

## Steps

1. Remove the hard drive cage from the system.



**NOTE:** If you have a 3.5-inch hard drive seated in the hard drive cage:

- a. Remove the power and data cables from the hard drive.
- b. Remove the hard drive from the hard drive cage.

2. Slide the hard drive into the optical drive bay.
3. Tighten the screws on the sides of the hard drive cage to secure the hard drive.

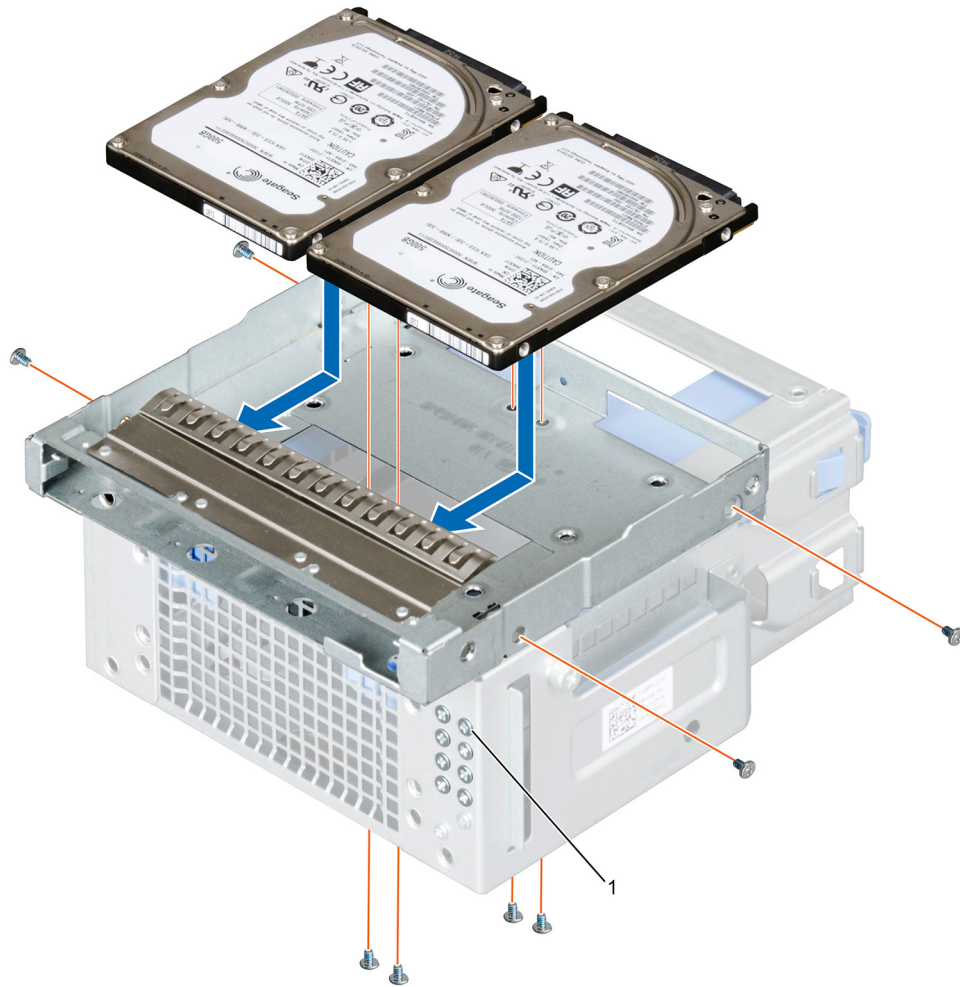


**NOTE:** The screws that secure the 2.5-inch hard drive to the hard drive cage are available on the front of the hard drive cage.

4. Place the hard drive cage upside down and tighten the screws on the bottom of the hard drive cage to secure the hard drive.



**NOTE:** For information about cabling the hard drives, see the System Information Label on the system cover.



**Figure 22. Installing a 2.5-inch hard drive in the optical drive bay**

a. 2.5-inch hard drive screws (8)

**NOTE:** Use the SATA cables to connect hard drives in the hard drive cage to avoid damaging the connector pins. This is applicable for the 2.5-inch hard drives and optical drive.

#### Next steps

1. Insert the hard drive cage into the system.
2. Connect the power and data cables to the hard drive.
3. Follow the procedure listed in the After working inside your system section.
4. Reboot the system and press F2 to enter the System Setup and ensure that the hard drive controller is enabled.

#### Related tasks

[Before working inside your system](#)

[Removing the hard drive cage](#)

[Installing the hard drive cage](#)

[After working inside your system](#)

#### Related reference

[Safety instructions](#)

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

## 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. Disconnect the power and data cables from the hard drive in the hard drive bay.

## Steps

Press the retention clips inwards and lift the hard drive carrier from the hard drive bay.

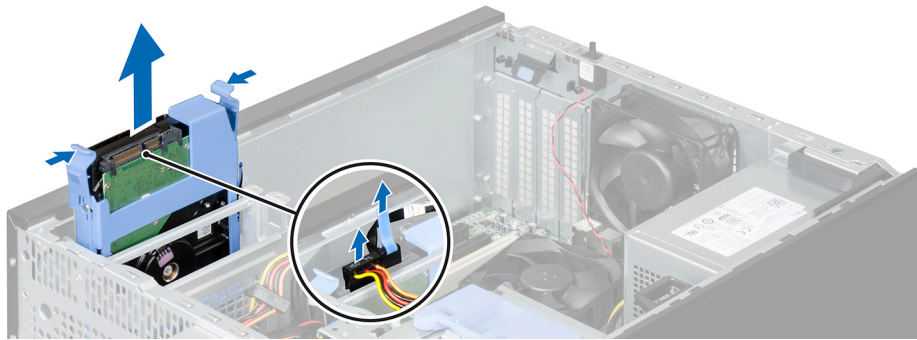


Figure 23. Removing a 3.5-inch hard drive from the hard drive bay

## Next steps

1. Install a 3.5-inch hard drive carrier from the hard drive bay.
2. Follow the procedure listed in the After working inside your system section.

## Related tasks

[Before working inside your system](#)

[Installing a 3.5-inch hard drive carrier in the hard drive bay](#)

[After working inside your system](#)

# Installing a 3.5-inch hard drive carrier in the hard drive bay

## Prerequisites

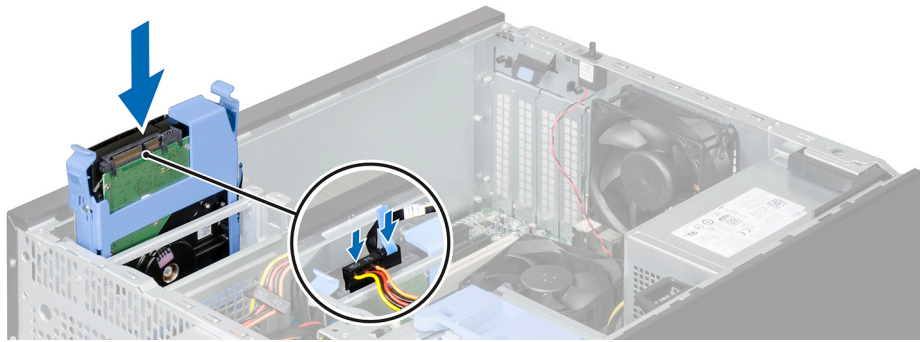
**CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell 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, disconnect the SATA cables.

## Steps

1. Align the guide ridges of the hard drive carrier with the grooves on the hard drive bay.

2. Insert and push the hard drive into the hard drive bay until it clicks into place.



**Figure 24. Installing a 3.5-inch hard drive carrier in the hard drive bay**

**NOTE:** For information on cabling the hard drives, see the System Information Label on the system cover.

**NOTE:** Ensure that SATA cables with a right angle connector are used to connect the hard drives in the hard drive bay.

#### Next steps

1. If applicable, connect the power and data cables to the hard drive(s).
2. Follow the procedure listed in the After working inside your system section.

#### Related tasks

[Before working inside your system](#)

[After working inside your system](#)

## Removing a hard drive from a 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. Follow the procedure listed in the Before working inside your system section.
3. Disconnect the power and data cables from the hard drive(s).
4. Remove the hard drive from the hard drive cage or hard drive bay.

#### Steps

To release the hard drive, flex the sides of the hard drive carrier and push the hard drive out of the carrier.





**Figure 25. Removing a hard drive from a hard drive carrier**

#### Next steps

1. Install the hard drive in the hard drive cage or hard drive bay.
2. Connect the power and data cables to the hard drive
3. Follow the procedure listed in the After working inside your system section.

#### Related tasks

[Before working inside your system](#)

[Removing a 3.5-inch hard drive carrier from the hard drive bay](#)

[Installing a hard drive into a hard drive carrier](#)

[After working inside your system](#)

## Installing a hard drive into a hard drive carrier

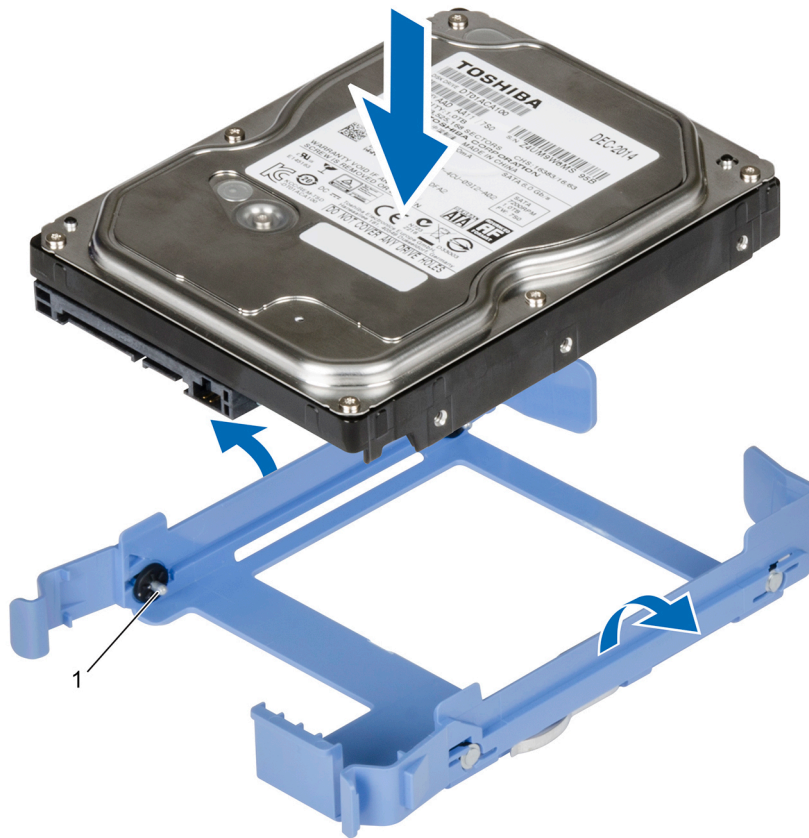
#### Prerequisites

**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. Follow the procedure listed in the Before working inside your system section.

#### Steps

1. Align the screw holes on the hard drive with the guide pins on the hard drive carrier.
2. Press the hard drive into the hard drive carrier to secure it.



**Figure 26. Installing a hard drive into a hard drive carrier**

a. pins (4)

#### Next steps

1. Install the hard drive in the hard drive cage or hard drive bay.
2. Connect the power and data cables to the hard drive.
3. Follow the procedure listed in the After working inside your system section.

#### Related tasks

[Before working inside your system](#)

[Installing a 3.5-inch hard drive carrier in the hard drive bay](#)

[After working inside your system](#)

## Optical drive

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

## Removing the optical drive

#### 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.

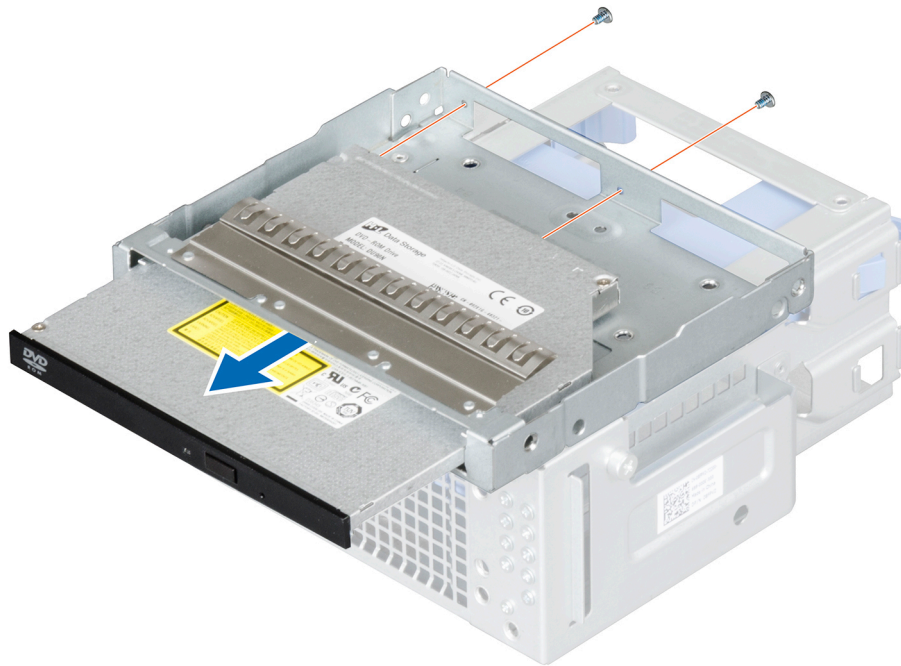
1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.



3. If applicable, remove the power and data cables from the optical drive and hard drives in the hard drive cage.
4. Remove the bezel.
5. Remove the hard drive cage.
6. Remove the screws securing the optical drive.

### Steps

1. Hold the tabs on the optical drive filler and remove the optical drive filler from the hard drive cage.
2. Slide the optical drive out of the optical drive bay.



**Figure 27. Removing the optical drive**

### Next steps

1. Install the optical drive filler in the bezel.
2. Install the hard drive cage.
3. If applicable, connect the power and data cables from the optical drive and hard drives.
4. Install the bezel.
5. Follow the procedure listed in the After working inside your system section.

### Related tasks

[Before working inside your system](#)

[Removing the bezel](#)

[Removing the hard drive cage](#)

[Installing the optical drive filler](#)

[Installing the optical drive](#)

[Installing the bezel](#)

[Installing the hard drive cage](#)

[After working inside your system](#)

## Installing the optical drive

### 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.

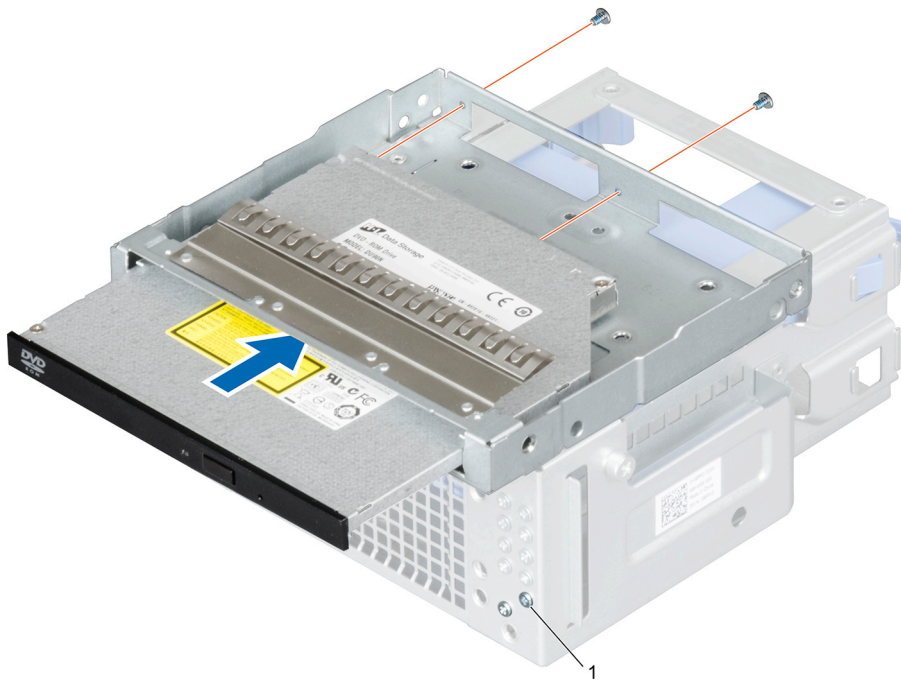
- NOTE:** Only slim 9.5 mm SATA DVD-ROM drive or DVD+/-RW drive can be installed in your system. External optical drives can be connected through USB ports.
- NOTE:** If you install an optical drive, you cannot install 2.5-inch hard drives.
- NOTE:** To install more than four drive devices (including optical drive and hard drives), you need an additional power extension cable, controller card, and SATA cables (minimum 1.6 ft).

1. Remove the bezel.
2. If installed, remove the optical drive filler from the bezel and the hard drive cage
3. Remove the hard drive cage.
4. Keep the Phillips #1 screwdriver ready.

### Steps

1. Slide the optical drive into the optical drive bay.
2. Tighten the screws on the back of the optical drive bay to secure the optical drive.

- NOTE:** The screws used to secure the optical drive to the optical drive or hard drive slot are available on the front of the hard drive cage.



**Figure 28. Installing the optical drive**

- a. optical drive screws (2)

### Next steps

1. Insert the hard drive cage into the system.
2. If applicable, connect the power and data cables to the optical drive and hard drives.
3. Install the bezel
4. Follow the procedure listed in the After working inside your system section.

### Related tasks

[Before working inside your system](#)

[Removing the bezel](#)

[Removing the optical drive filler](#)

Removing the hard drive cage  
Installing the hard drive cage  
Installing the bezel  
After working inside your system

## Removing the optical drive filler

### 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 bezel.
4. Disconnect the power and data cable from the optical drive and hard drives.

### Steps

1. On the bezel, press down on the retention clip of the optical drive filler and pull the filler out of the bezel.
2. Remove the hard drive cage.
3. Hold the tabs on the optical drive filler and remove the optical drive filler from the optical drive bay.

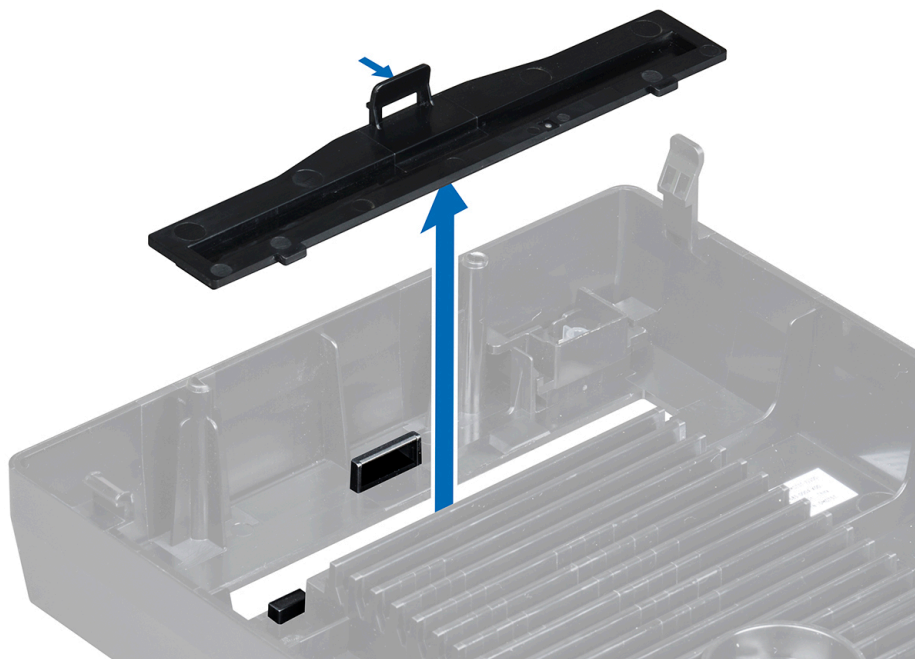
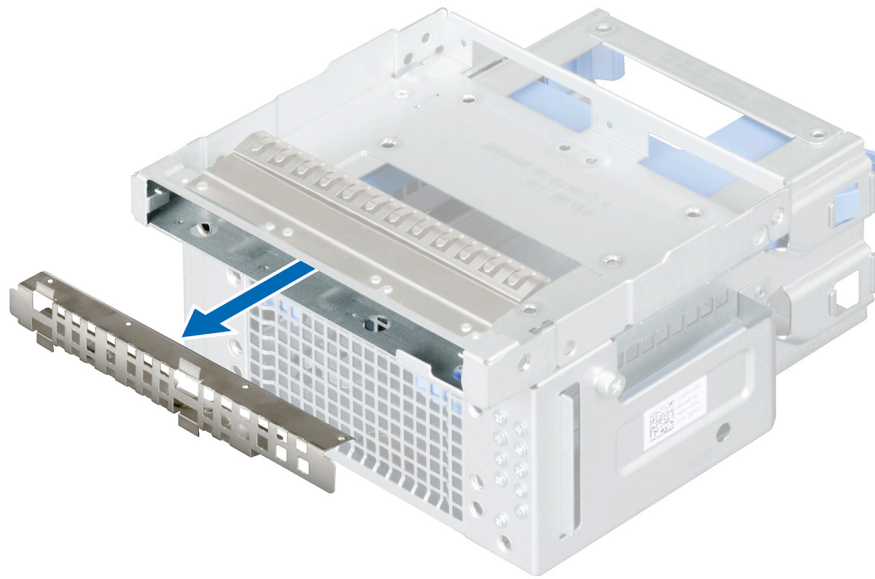


Figure 29. Removing the optical drive filler from the bezel



**Figure 30. Removing the optical drive filler from the optical drive bay**

#### Next steps

1. Install the hard drive cage.
2. Install the bezel.
3. Follow the procedure listed in the After working inside your system section.

#### Related tasks

[Before working inside your system](#)

[Removing the bezel](#)

[Removing the hard drive cage](#)

[Installing the optical drive filler](#)

[Installing the hard drive cage](#)

[Installing the bezel](#)

[After working inside your system](#)

## Installing the optical drive filler

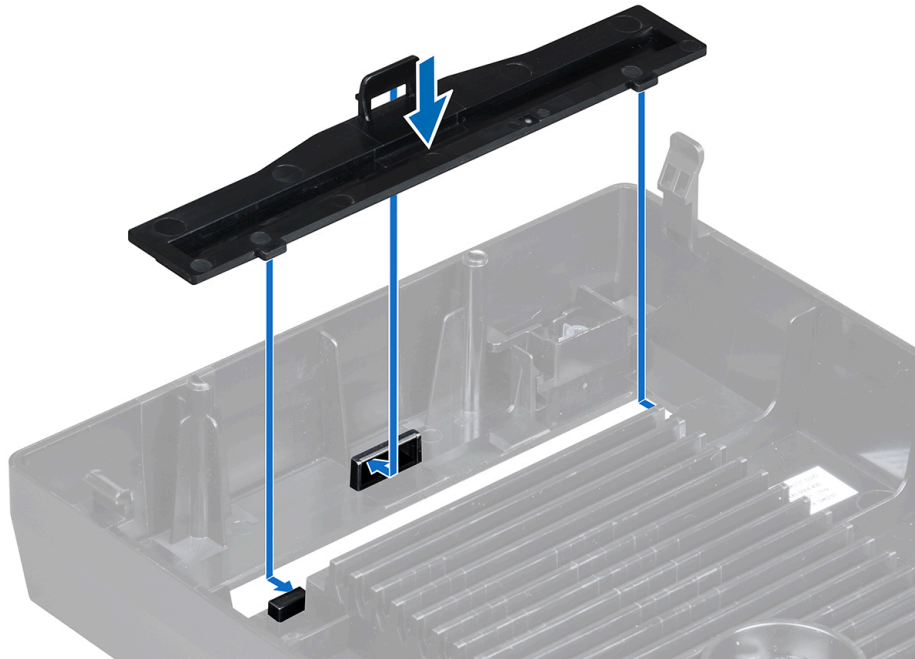
#### Prerequisites

**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.

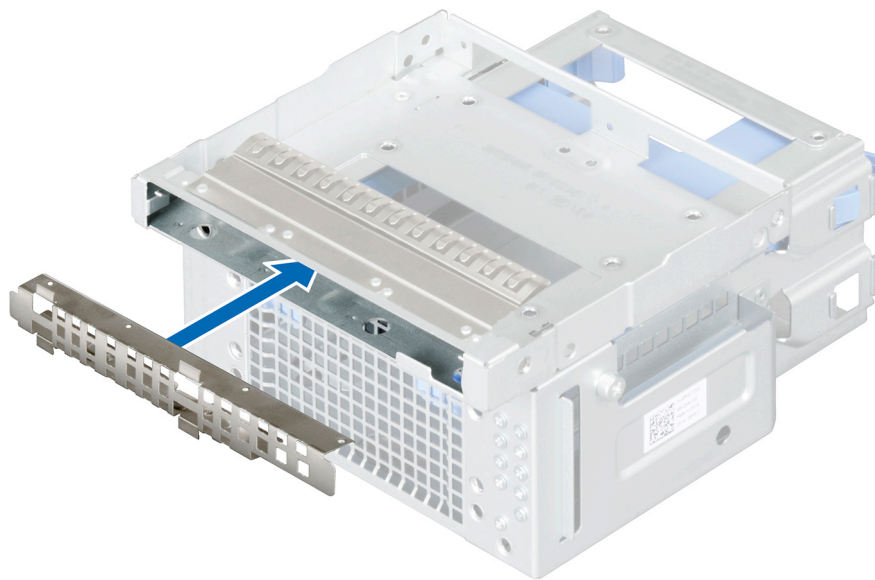
1. Follow the safety guidelines listed in the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Remove the bezel.
4. Remove the hard drive cage.

#### Steps

1. On the bezel, press down on the retention clip of the optical drive filler and push the filler until it clicks into place.
2. On the hard drive cage, hold the tabs on the optical drive filler and push the optical drive filler into the optical drive bay.



**Figure 31. Installing the optical drive filler in the bezel**



**Figure 32. Installing the optical drive filler in the optical drive bay**

#### **Next steps**

1. Installing the hard drive cage.
2. Install the bezel.
3. Follow the procedure listed in the After working inside your system section.

#### **Related tasks**

[Before working inside your system](#)

[Removing the bezel](#)

[Removing the hard drive cage](#)

[Installing the hard drive cage](#)

[Installing the bezel](#)

[After working inside your system](#)



# System memory

Your system supports DDR4 unbuffered ECC DIMMs and Non-ECC DIMMs.

**CAUTION:** Dell recommends you to use ECC DIMMs to minimize the risk of uncorrectable system error, data loss and/or silent data corruption. Non-ECC DIMM is not used for mission-critical applications.

**NOTE:** Non-ECC DIMMs are supported only in selected countries, for more information contact your sales representative.

System performance varies depending on:

- Maximum frequency of the DIMMs
- Number of DIMMs populated per channel
- System profile selected (for example, Performance Optimized, Custom, or Dense Configuration Optimized).

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

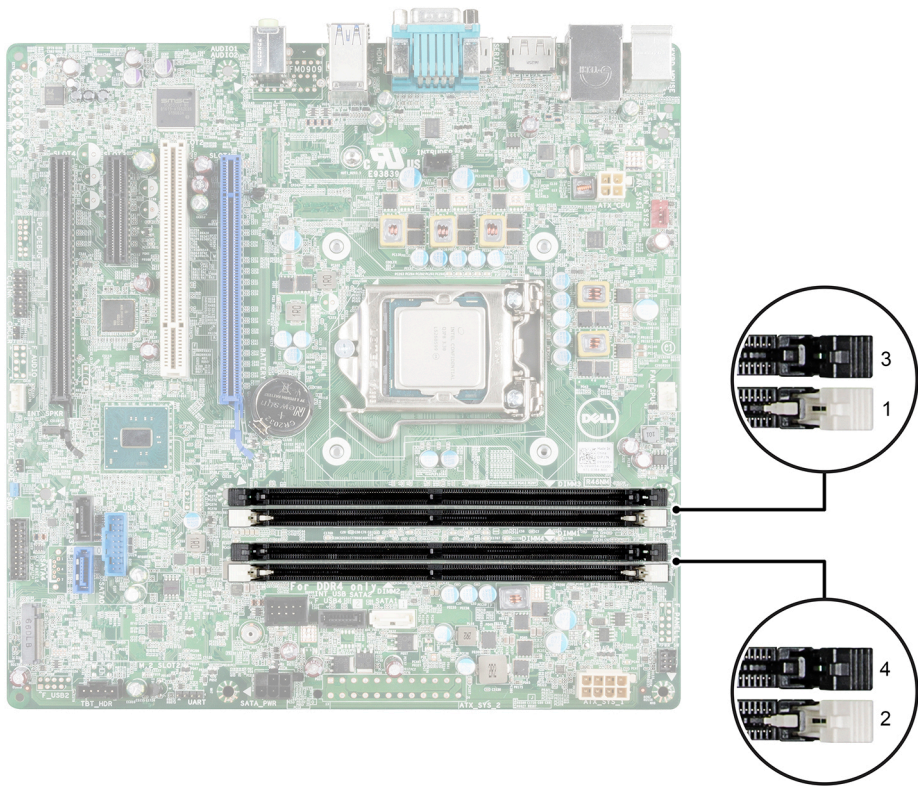


Figure 33. Memory socket locations on the system board

Memory channels are organized as follows:

- Channel 0: memory sockets 1 and 3
- Channel 1: memory sockets 2 and 4

The following table shows the memory population and operating frequencies for the supported configurations.

Table 35. Supported memory

Memory module type	Memory modules populated per channel	Operating frequency (in MT/s)	Maximum memory module rank per channel	Operating voltage
UDIMM	Two	2133, 2400, 2666	Four	1.2 V

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

# General memory module installation guidelines

Memory configurations that fail to observe these guidelines can prevent your system from booting, stop responding during memory configuration, or operating with reduced memory.

**NOTE:** This system supports only UDIMMs.

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

- Up to two UDIMMs can be populated in a channel.
- Populate all sockets with white release tabs first, and then all the sockets with black release tabs.
- Populate the sockets by the highest rank count, in the following order—first in sockets with white release tabs and then with the black release tabs. For example, if you want to mix single-rank and dual-rank memory modules, populate dual-rank memory modules in the sockets with white release tabs and single-rank memory modules in the sockets with black release tabs.
- Memory modules of different capacities can be mixed provided other memory population rules are followed (for example, 2 GB and 4 GB memory modules can be mixed).
- When mixing memory modules with different capacities, populate the sockets with memory modules with highest capacity first. For example, if you want to mix 2 GB and 4 GB memory modules, populate 4 GB memory modules in the sockets with white release tabs and 2 GB memory modules in the sockets with black release tabs.
- If memory modules with different speeds are installed, they will operate at the speed of the slowest installed memory module(s) or slower depending on system DIMM configuration.

## Sample memory configurations

The following table shows sample memory configurations for a single processor configuration that follow the appropriate memory guidelines stated in this section.

**CAUTION:** Dell recommends you to use ECC DIMMs to minimize the risk of uncorrectable system error, data loss and/or silent data corruption. Non-ECC DIMM is not used for mission-critical applications.

**NOTE:** 16 GB quad-rank RDIMMs are not supported.

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

**NOTE:** Non-ECC DIMMs are supported only in selected countries, for more information contact your sales representative.

**NOTE:** When the 2666 MHz ECC, and 2400 MHz non-ECC modules are used in the system, the system memory speed drops to 2133 MHz. This is a BIOS restriction.

Table 36. Memory configurations

Populated system capacity (in GB)	Memory module size (in GB)	Number of memory modules	Memory module rank, organization, and frequency	Memory type	Memory module slot population
4	4	1	1R, x8, 2133 MT/s	ECC	1
			1R, x8, 2400 MT/s	Non-ECC	
			1R, x8, 2400 MT/s	ECC	
8	4	2	1R, x8, 2133 MT/s	ECC	1, 2
			1R, x8, 2400 MT/s	Non-ECC	
			1R, x8, 2400 MT/s	ECC	
16	4	4	1R, x8, 2400 MT/s	ECC	1
			1R, x8, 2400 MT/s	ECC	
			1R, x8, 2400 MT/s	ECC	

Populated system capacity (in GB)	Memory module size (in GB)	Number of memory modules	Memory module rank, organization, and frequency	Memory type	Memory module slot population
32	8	2	2R, x8, 2133 MT/s	ECC	1, 2
			1R, x8, 2400 MT/s	ECC	
			2R, x8, 2400 MT/s	Non-ECC	
	8	4	2R, x8, 2133 MT/s	ECC	1, 2, 3, 4
			1R, x8, 2400 MT/s	ECC	
			2R, x8, 2400 MT/s	Non-ECC	
	16	2	2R, x8, 2133 MT/s	ECC	1, 2
			2R, x8, 2400 MT/s	Non-ECC	
			2R, x8, 2400 MT/s	ECC	
64	16	4	2R, x8, 2133 MT/s	ECC	1, 2, 3, 4
			2R, x8, 2400 MT/s	Non-ECC	
			2R, x8, 2400 MT/s	ECC	

## Removing a memory module

### Prerequisites

**NOTE:** 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:** 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. Locate the appropriate memory module sockets

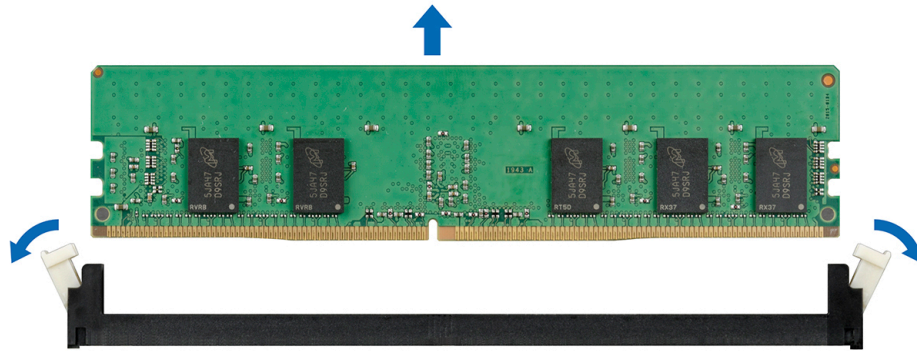
### Steps

1. To release the memory module from the socket, simultaneously press the ejectors on both ends of the 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. Lift the memory module away from the chassis.





**Figure 34. Removing a memory module**

#### Next steps

1. Install a memory module.
2. Follow the procedure listed in the After working inside your system section.

#### Related tasks

[Before working inside your system](#)

[Installing a memory module](#)

[After working inside your system](#)

## Installing a memory 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 are shipped with your product.

**NOTE:** 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.

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. Locate the memory module sockets on the system board.

#### Steps

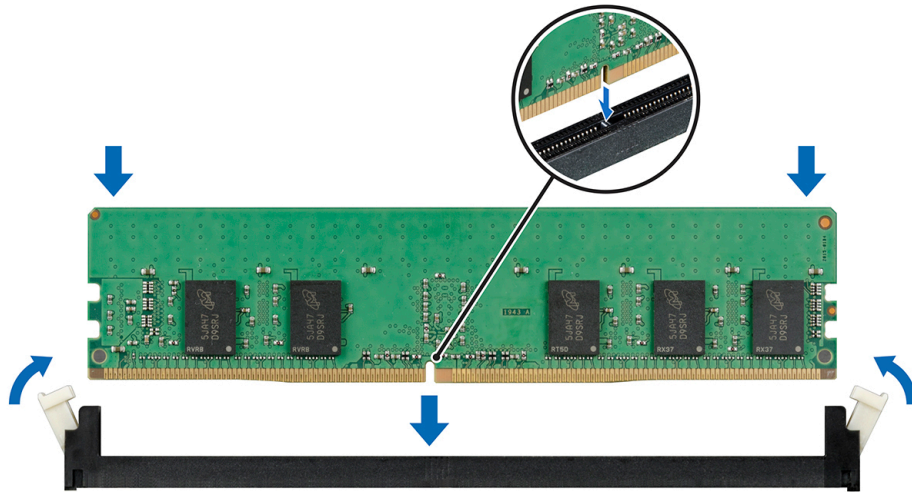
1. Push the ejectors on the memory module socket down and out to allow the memory module to be inserted into the socket.

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

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

**NOTE:** The memory module socket has an alignment key that allows you to install the memory module in the socket in only one way.

3. Press down on the memory module with your thumbs until the socket levers latch into a locked position. 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.
4. Repeat step 1 through step 3 of this procedure to install the remaining memory modules.



**Figure 35. Installing a memory module**

#### Next steps

1. Follow the procedure listed in the After working inside your system section.
2. Press F2 to enter the System Setup, and check the memory settings.

The system should have already changed the value to reflect the newly installed memory.

3. If the value is incorrect, one or more of the memory modules may not be installed properly. Repeat step 1 through step 3 of this procedure, checking to ensure that the memory modules are firmly seated in their sockets.
4. Run the appropriate diagnostic test.

#### Related tasks

[Before working inside your system](#)

[After working inside your system](#)

## System fan

Your system supports one system fan. The system fan is an essential part of a server's cooling system. It ensures that the key components of the server such as the processors, hard drives, and memory get adequate air circulation to keep them cool. A failure in the server's cooling system can result in the server overheating and may lead to damage.

## Removing the system 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.

**CAUTION:** Never operate your system with the system fan removed. System can overheat and result in shutdown of the system and loss of data.

**CAUTION:** Do not operate the system with the cover removed for a duration exceeding 5 minutes.

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. Disconnect the system fan power cable from the system board.

### Steps

1. Stretch the grommets that secure the fan to the chassis to ease the removal of the fan.

**CAUTION:** Do not remove or install the system fan by holding the fan blades.

2. Hold the system fan by the side and push it out of the grommet.
3. Repeat steps 1 and 2 to release all four sides of the system fan.

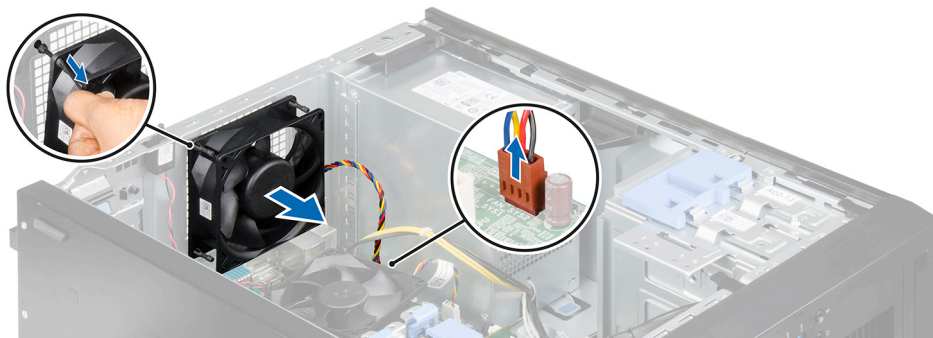


Figure 36. Removing the system fan

### Next steps

1. Install the system fan.
2. Connect the system fan power cable to the system board.
3. Follow the procedure listed in the After working inside your system section.

### Related tasks

[Before working inside your system](#)

[Installing the system fan](#)

[After working inside your system](#)

## Installing the system 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.

**CAUTION:** Do not operate the system with the cover removed for a duration exceeding 5 minutes.

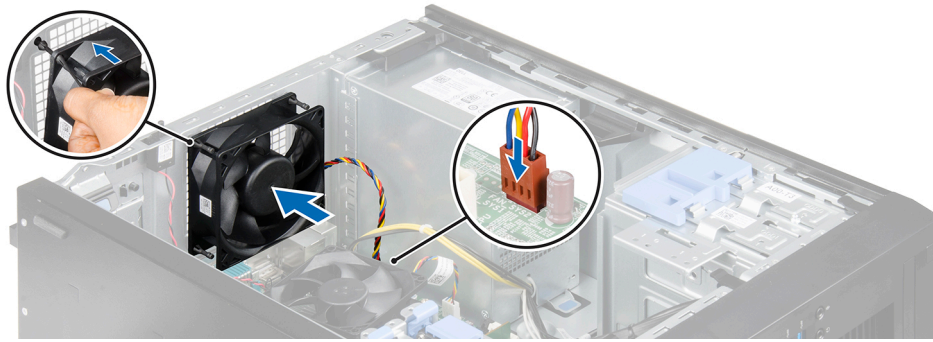
**CAUTION:** Do not remove or install the system fan by holding the fan blades.

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. Hold the system fan by the sides with the cable end facing the bottom of the chassis.
2. Align the four grommets of the system fan with the four grooves on the sides of the system fan.
3. Pass the grommets through the corresponding grooves on the system fan.
4. Stretch the grommets and push the system fan towards the chassis till it locks into place.

**NOTE:** Install the two lower grommets first.



**Figure 37. Installing the system fan**

#### Next steps

1. Connect the system fan power cable to the system fan connector on the system board.
2. Follow the procedure listed in the After working inside your system section.

#### Related tasks

[Before working inside your system](#)

[After working inside your system](#)

## Expansion cards

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

## Expansion card installation guidelines

**Table 37. PCI Express Generation 3 expansion cards supported**

Expansion card type	PCIe Slot	Processor Connection	Height	Length	Link Width	Slot Width
PCIe	1	Processor	Full height	Half length	x16	x16
PCI	2	PCIe and PCI Bridge	Full height	Half length	-	32/33
PCIe	3	Platform Controller Hub (PCH)	Full height	Half length	x4	x4
PCIe	4	Platform Controller Hub (PCH)	Full height	Half length	x4	x16

**NOTE:** All the PCIe slots support Generation 2 and 3 PCIe expansion cards.

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

**NOTE:** The power consumption of the PCIe expansion cards is less than 25 W.

## 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 the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Disconnect all the cables from the expansion card.

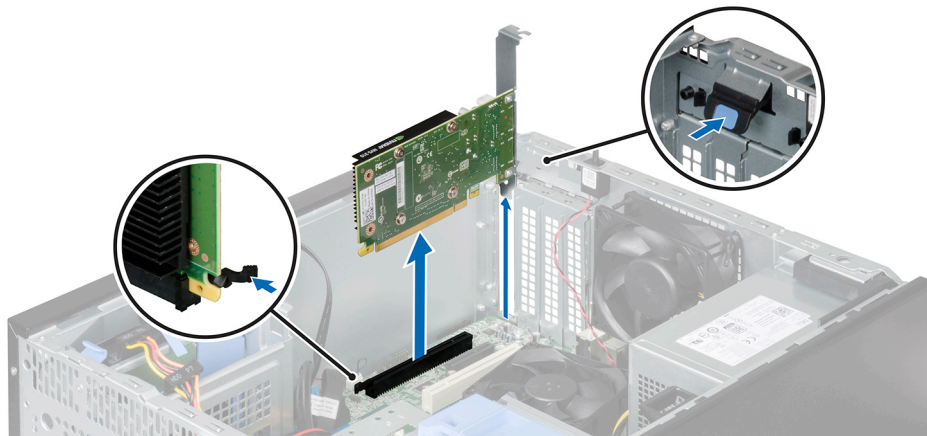
#### Steps

1. Press and push out the expansion card release latch.
2. Holding the card by its edge, pull the card to disengage it from the connector and lift the card out of the chassis.
3. If you are removing the card permanently, install an expansion card filler in the empty card slot.

The steps for installing or removing an expansion card filler are similar to installing or removing an expansion card.

**NOTE:** You must install an expansion card filler bracket over an empty expansion 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.

4. Push the expansion card latch toward the system until it clicks into place.



**Figure 38. Removing an expansion card**

#### Next steps

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

#### Related tasks

[Before working inside your system](#)

[Installing an expansion card](#)

[After working inside your system](#)

## 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 the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.
3. Unpack the expansion card and prepare it for installation.



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

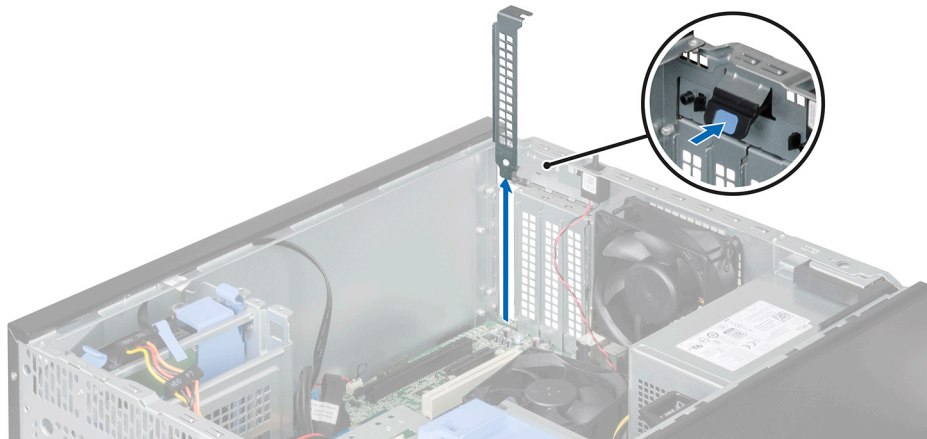
### Steps

1. Push out the expansion card release latch to open it.
2. If installed, remove the expansion-card filler.

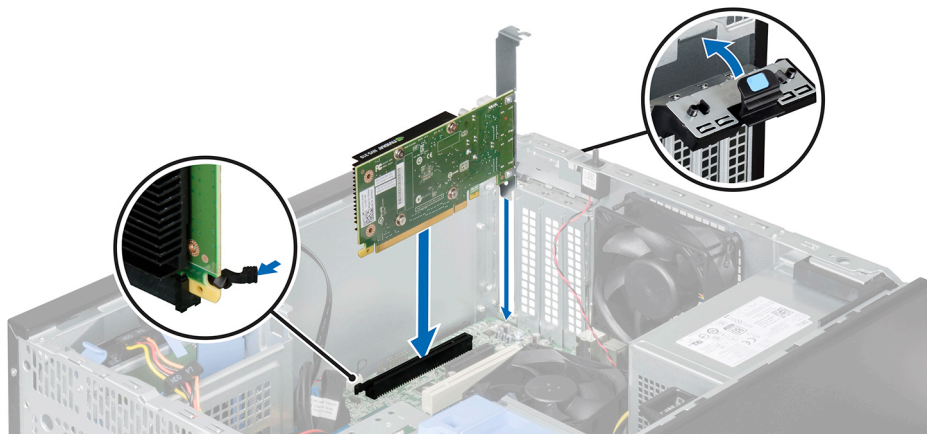
The steps for installing or removing an expansion-card filler are similar to installing or removing an expansion card.

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

3. Holding the expansion card by its edges, position the card so that the card-edge connector aligns with the expansion card connector.
4. Push the expansion card into the expansion card slot until the expansion card is fully seated.
5. Push the expansion card latch toward the system until it clicks into place.



**Figure 39. Removing the expansion-card filler**



**Figure 40. Installing an expansion card**

### Next steps

1. If applicable, connect the cables to the expansion card.
2. Follow the procedure listed in the After working inside your system section.

### Related tasks

[Before working inside your system](#)

[After working inside your system](#)

# Processors and heat sinks

Use the following procedures when:

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

## Removing a heat sink

### Prerequisites

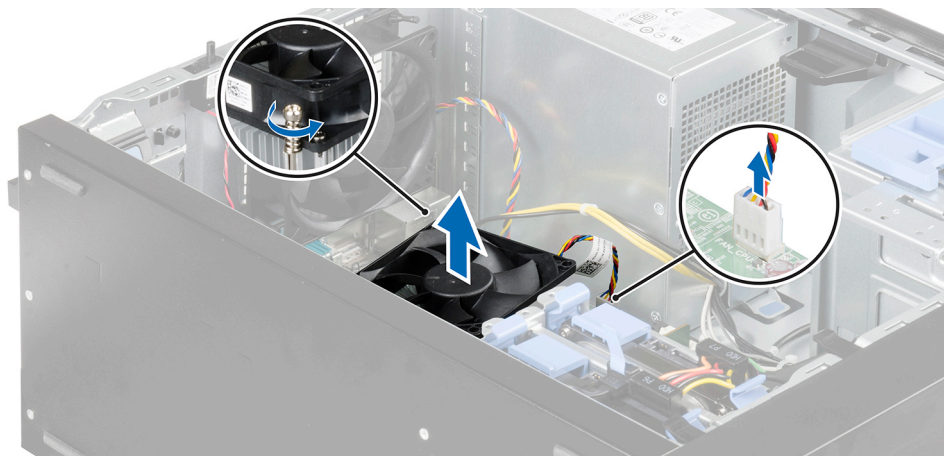
**CAUTION:** Never remove the heat sink from a processor unless you intend to remove the processor. The heat sink is necessary to maintain proper thermal conditions.

**WARNING:** The heat sink is hot to touch. Allow the heat sink to cool for some time after powering down the system.

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. Disconnect the CPU fan cable connected to the system board.
4. Keep the Phillips #2 screwdriver ready.

### Steps

1. Loosen one of the screws that secure the heat sink to the system board.  
Allow some time (approximately 30 seconds) for the heat sink to loosen from the processor.
2. Remove the screw diagonally opposite to the screw that you first removed.
3. Repeat step 1 and 2 for removing the remaining two screws.
4. Lift the heat sink out of the system.



**Figure 41. Removing a heat sink**

### Next steps

1. Replace the processor and heat sink.
2. Follow the procedure listed in the After working inside your system section.

### Related tasks

[Before working inside your system](#)

[Removing the processor](#)

[Installing a processor](#)

[Installing a heat sink](#)

[After working inside your system](#)

# Removing the 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. Remove the heat sink.
4. Keep the Phillips #2 screwdriver ready.

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

**CAUTION:** The processor is held in its socket under strong pressure. Be aware that the release lever can spring up suddenly if not firmly held.

## Steps

1. Release the socket lever by pushing the lever down and out from under the tab on the processor shield.
2. Lift the lever upward until the processor shield lifts.

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

3. Lift the processor out of the socket.

**NOTE:** After removing the processor, place it in an antistatic container for reuse, return, or temporary storage. Do not touch the bottom of the processor to avoid damage to the processor contacts. Touch only the side edges of the processor.

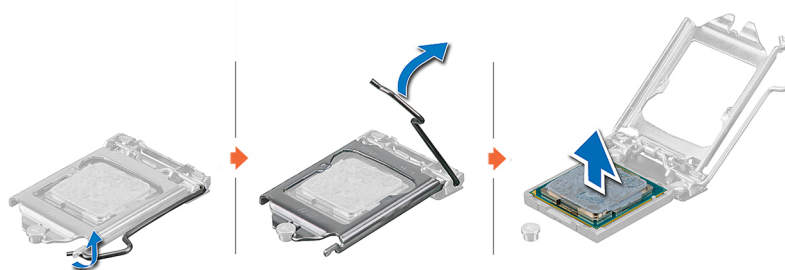


Figure 42. Removing a processor

## Next steps

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

## Related tasks

[Before working inside your system](#)

[Removing a heat sink](#)

[Installing a processor](#)

[Installing a heat sink](#)

[After working inside your system](#)



# 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://www.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. 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.

6. Locate the processor socket.
7. If applicable, remove the socket protective cap.

**NOTE:** The heat sink and processor are too hot to 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. 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.

2. Release the socket-release lever by pushing the lever down and out from under the tab.

**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.

3. Align the pin-1 indicator of the processor with the triangle on the system board.
4. Place the processor on the socket such that the slots on the processor align with the socket.
5. Close the processor shield.

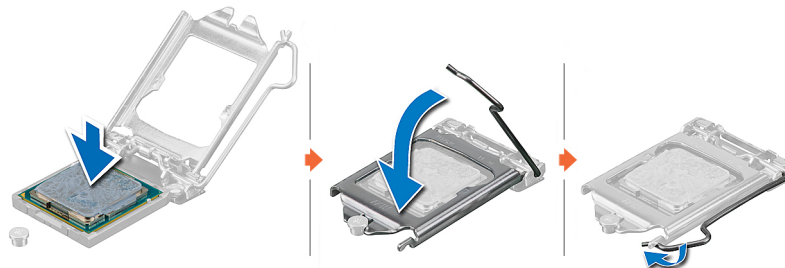


Figure 43. Installing a processor

## 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. Follow the procedure listed in the After working inside your system.
3. While booting, press F2 to enter System Setup and verify that the processor information matches the new system configuration.
4. Run the system diagnostics to verify that the new processor operates correctly.

#### Related tasks

[Before working inside your system](#)

[Installing a heat sink](#)

[After working inside your system](#)

## Installing a heat sink

#### 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. Install the processor.
4. If you are using an existing heat sink, remove the thermal grease from the heat sink by using a clean lint-free cloth.
5. Keep the Phillips #2 screwdriver ready.

#### Steps

1. Place the heat sink onto the processor.



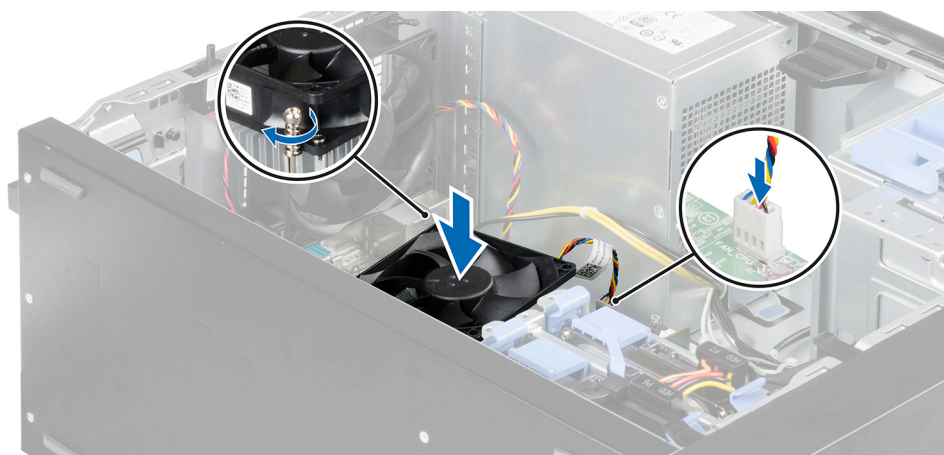
**NOTE:** Ensure that the CPU fan cable is close to its connector on the system board

2. Tighten one of the four screws to secure the heat sink to the system board.
3. Tighten the screw diagonally opposite to the first screw that you tightened.



**NOTE:** Do not over-tighten the heat sink retention screws when installing the heat sink. To prevent over-tightening, tighten the retention screw until resistance is felt, and stop after the screw is seated. The screw tension should not be more than 6 in-lb (6.9 kg-cm).

4. Repeat the procedure for the remaining two screws.



**Figure 44. Installing the heat sink**

#### Next steps

1. Connect the CPU fan cable to the system board.
2. Follow the procedure listed in the After working inside your system section.

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

#### Related tasks

[Before working inside your system](#)

[Installing a processor](#)

[After working inside your system](#)

## Power supply unit

Your system supports one AC cabled 290 W power supply unit (PSU).

## Removing the power supply unit

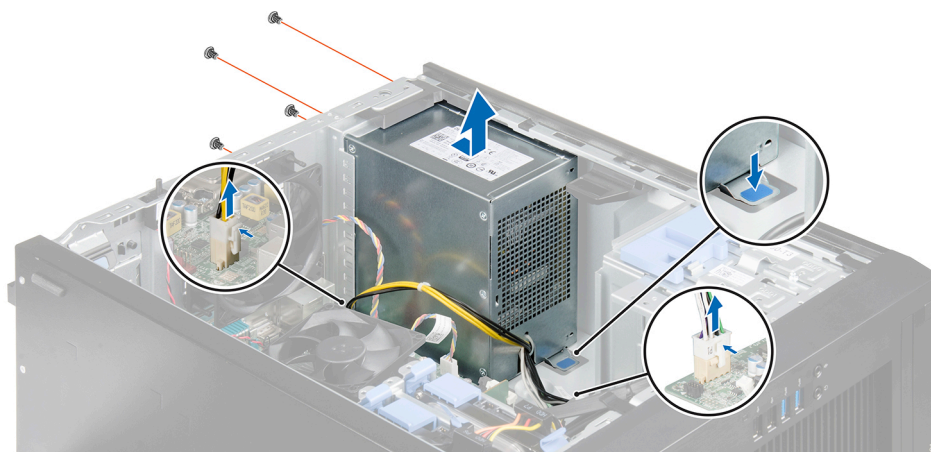
#### Prerequisites

**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. Follow the procedure listed in the Before working inside your system section.

#### Steps

1. Disconnect the P1 and P2 power cables from the power supply unit (PSU) to the system board connectors.
2. Remove the screws securing the PSU to the chassis.
3. Press the release tab beside the power supply unit, and slide the PSU towards the front of the system.
4. Lift the PSU out of the system.



**Figure 45. Removing the power supply unit**

#### Next steps

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

#### Related tasks

[Before working inside your system](#)

[Installing the power supply unit](#)

[After working inside your system](#)

# Installing the 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. Follow the procedure listed in the Before working inside your system section.

## Steps

1. Place the power supply unit (PSU) in the chassis and slide it towards the back of the chassis.
2. Tighten the screws on the back of the chassis to secure the PSU to the chassis.
3. Connect the P1 and P2 power cables to the system board connectors.

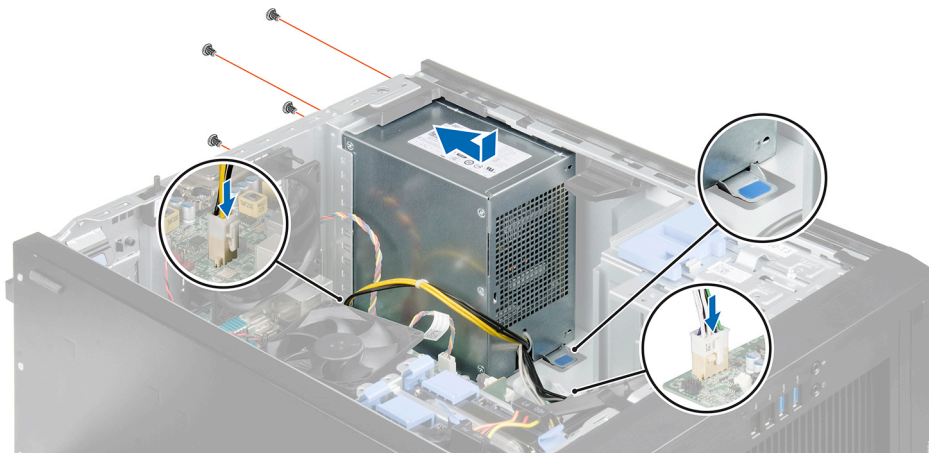


Figure 46. Installing the power supply unit

## Next steps

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

## Related tasks

[Before working inside your system](#)

[After working inside your system](#)

# System battery

The system battery is used to power the real-time clock and storing the BIOS settings of the system.

## Related tasks

[Before working inside your system](#)

[After working inside your system](#)

[System Setup](#)

# Replacing the system battery

## Prerequisites

**NOTE:** 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.

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 battery socket.

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

2. Press the release latch to release the battery from the socket and lift the battery out of the system.



**Figure 47. Removing the system battery**

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



**Figure 48. Installing the system battery**

### Next steps


1. Follow the procedure listed in the After working inside your system section.
2. Press F2 to enter the System Setup to confirm that the battery is operating properly.
3. Enter the correct time and date in the System Setup **Time** and **Date** fields.
4. Exit System Setup.


## 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.


## 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.

 **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.

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 following:
  - a. system fan
  - b. all expansion cards

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

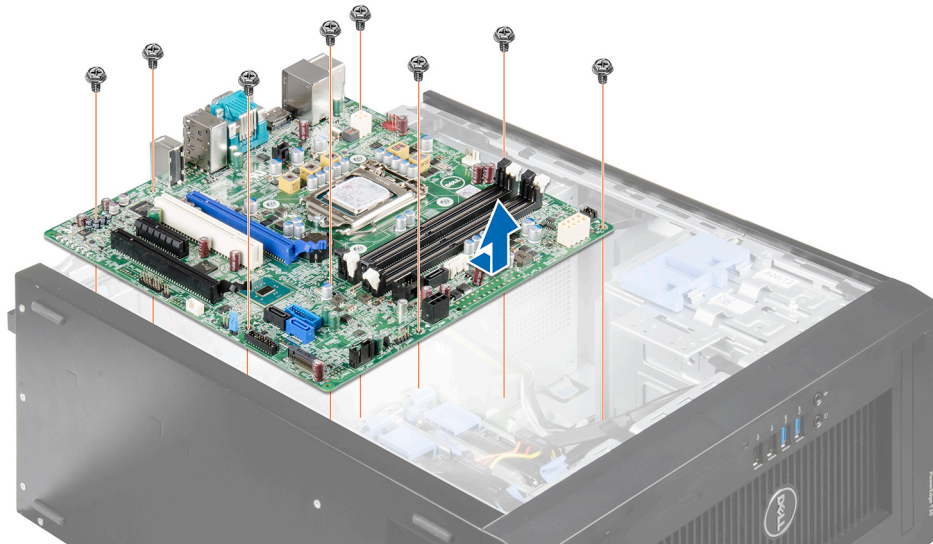
  - c. heat sink and processor
  - d. memory modules
4. Disconnect all the cables from the system board.
5. Keep the Phillips #2 screwdriver ready.

### Steps

1. Remove the eight screws that secure the system board to the chassis.
2. Hold the system board by the sides, slide the system board towards the front of the system and lift the system board out.

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





**Figure 49. Removing the system board**

### Next steps

1. Install the system board.
2. Connect all the cables to the system board.
3. Follow the procedure listed in the After working inside your system section.

### Related tasks

[Before working inside your system](#)

[Removing an expansion card](#)

[Removing the system fan](#)

[Removing a memory module](#)

[Removing a heat sink](#)

[Removing the processor](#)

[Installing the system board](#)

[After working inside your system](#)

## 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.

**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.

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. Unpack the new system board assembly.

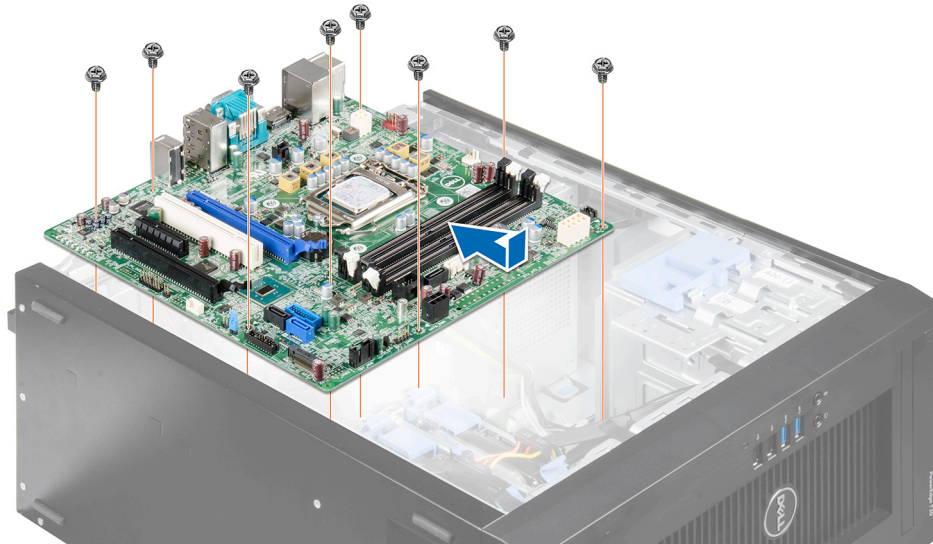
**CAUTION:** Do not lift the system board assembly by grasping any components.

4. Keep the Phillips #2 screwdriver ready.

### Steps

1. Lower the system board into the chassis.
2. Push the system board towards the back of the chassis until the system board's screw holes align with the screw holes on the chassis.
3. Secure the system board to the chassis using the eight screws.

**NOTE:** Dell recommends that you install screws from diagonally opposite corners.



**Figure 50. Installing the system board**

### Next steps

1. Install the following:
  - a. heat sink and processor
  - b. memory modules
  - c. expansion cards
  - d. system fan
2. Connect all cables to the system board.
3. Follow the procedure listed in the After working inside your system section.
4. Enter the system service tag after you install the system board. For more information about entering the service tag, see the Entering The Service Tag After Replacing The System Board section.

### Related tasks

[Before working inside your system](#)

[Installing a heat sink](#)

[Installing a processor](#)

[Installing a memory module](#)

[Installing an expansion card](#)

[Installing the system fan](#)

[After working inside your system](#)

## Entering the system service tag using Intel Active Management Technology

### Prerequisites

**NOTE:** Intel Active Management Technology (AMT) is supported only on Intel Xeon processor-based systems.

This procedure is used to update the service tag after a system board replacement.



### Steps

1. Remove the system cover.
  - a) On the inside of the system cover near the System Information Label, note down the number on the AMT/VPRO QR code label.
2. Install the system cover.
3. Start the system.

 **NOTE:** If the system is powered on, shut the system down and start it up (cold boot).


4. After the system has started up, the **Service Menu** screen is displayed.
5. Select the number corresponding to the AMT/VPRO number noted earlier from the system cover.
6. Type the service tag information in the **Enter Service Tag** section.
7. Type the optional asset tag information in the **Enter Asset Tag** section.
8. Click **OK** to save the changes and exit.

 **NOTE:** MANAGEABILITY ENGINE (ME) LOCKOUT is not supported for the PowerEdge T30.

## Entering the system Service Tag by using System Setup

### Steps

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**.

# 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 using additional equipment or risking data loss. If you are unable to fix the problem yourself, service and support personnel can use the diagnostics results to help you solve the problem.

**NOTE:** For more information about OEM diagnostic event messages, see the [Event and Error Message Reference Guide for 13th Generation Dell PowerEdge Servers Version 1.2](#)

## Topics:

- [Dell Embedded System Diagnostics](#)

## Dell Embedded System Diagnostics

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

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

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

## Running the Embedded System Diagnostics from Boot Manager

### Prerequisites

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

### Steps

1. When the system is booting, press F10.
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.

## System diagnostics controls

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

# Jumpers and connectors

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

## Topics:

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

## System board connectors

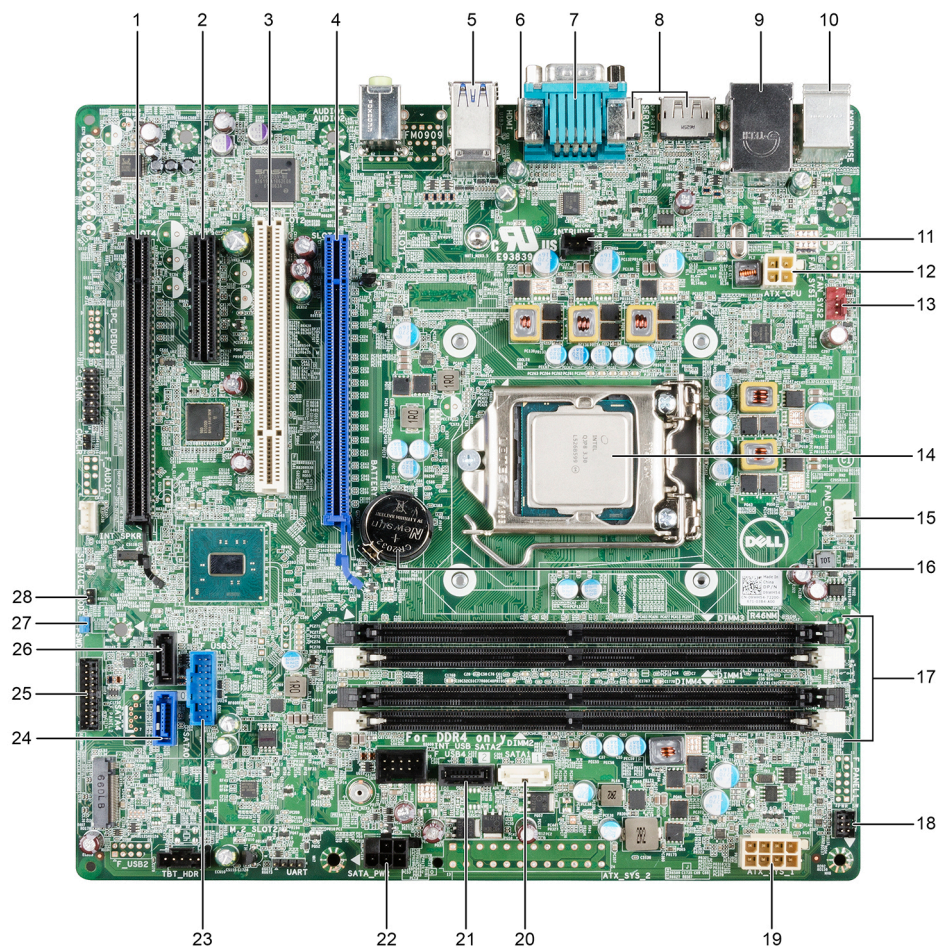


Figure 51. System board connectors




Table 38. System board connectors

Item	Connector	Description
1	SLOT4	PCI Express x16 slot (wired as x4)
2	SLOT3	PCI Express x4 slot
3	SLOT2	PCI slot

Item	Connector	Description
4	SLOT1	PCI Express x16 Gen 3 slot
5	R_USB3	USB 3.0 connector
6	HDMI	HDMI connector
7	SERIAL	serial port connector
8	DP_PORT1DP_PORT2	2 x Display port
9	NIC_USB	USB 2.0 with Network connector
10	KYBD_MOUSE	keyboard/mouse connector
11	INTRUDER	intrusion switch connector
12	ATX_CPU	P2 power connector
13	FAN_SYS	System fan connector
14	CPU	CPU socket
15	FAN_CPU	CPU fan connector
16	BATTERY	coin cell battery
17	DIMM slots	Memory slot
18	F_PANEL1	front power switch connector
19	ATX_SYS_1	8-pin power connector
20	SATA1	SATA 1 connector (Optical drive)
21	SATA2	SATA 2 connector (Hard drive)
22	SATA_PWR	HDD_ODD_Power cable connector
23	F_USB4	USB 3.0 connector
24	SATA0	SATA 0 connector
25	F_USB3	Front I/O panel connector
26	SATA3	SATA 3 connector
27	PSWD	password reset jumper
28	SERVICE_MODE	Service_Mode Jumper connector

## System board jumper settings

**Table 39. System Board Jumper Settings**

Jumper	Setting	Description
PSWD	 (jumper engaged_ default)	The password feature is enabled.
	 (jumper removed)	Clears BIOS password.
CMCLR	 (jumper removed_default)	Real-time clock reset. Can be used for troubleshooting (pins 1 and 2).

Jumper	Setting	Description
	 (jumper engaged)	Recovers BIOS setting to default.

## Disabling forgotten password

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

### Prerequisites

#### Steps

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

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, you must move the jumper back to pins 4 and 6.

**NOTE:** If you assign a new system and/or setup password with the jumper on pins 2 and 4, the system disables the new password(s) the next time it boots.

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

### Related tasks

[Before working inside your system](#)


[Removing the system cover](#)

[Installing the system cover](#)

[After working inside your system](#)

# 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:

- [Minimum to POST](#)
- [Troubleshooting system startup failure](#)
- [Troubleshooting external connections](#)
- [Troubleshooting the video subsystem](#)
- [Troubleshooting a USB device](#)
- [Troubleshooting a serial input and output device](#)
- [Troubleshooting a NIC](#)
- [Troubleshooting a wet system](#)
- [Troubleshooting a damaged system](#)
- [Troubleshooting the system battery](#)
- [Troubleshooting power supply units](#)
- [Troubleshooting cooling fans](#)
- [Troubleshooting system memory](#)
- [Troubleshooting an optical drive](#)
- [Troubleshooting a drive](#)
- [Troubleshooting expansion cards](#)
- [Troubleshooting processors](#)

## Minimum to POST

### Minimum components

The minimum components to allow the Dell PowerEdge T30 to complete POST are as follows:

- System board
- Power supply unit
- Processor (CPU)
- One Memory Module (DIMM) installed in socket A1

## Troubleshooting system startup failure

If you boot the system to the BIOS boot mode after installing an operating system from the UEFI 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.

# Troubleshooting external connections

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

- Compare the technical specification of the system with the external device to check the compatibility.
- Check the external device functionality with some other similar system so that we are sure that the device is working fine.
- Check any other similar external device with this system so that we are sure that the system port is working fine.

For any further queries contact, [Global Technical Support](#).

## Troubleshooting the video subsystem

### Prerequisites

#### 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 LCD Built-in Self Test (BIST).

#### Results

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

#### Next steps

If the tests fail, see the Getting help section.

## Troubleshooting a USB device

### Prerequisites

 **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.

 **NOTE:** Older operating systems may not support USB 3.0.

4. 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 troubleshoot other USB devices attached to the system.
5. Turn off all attached USB devices, and disconnect them from the system.
6. Restart the system.
7. 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.
8. Check if USB 3.0 is enabled in System Setup. If it is enabled, disable it and restart your system.
9. 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
10. Reconnect and turn on each USB device one at a time.
11. 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 steps

If all troubleshooting fails, see the Getting help section.

#### Related reference

[Getting help](#)

## Troubleshooting a serial input and output device

#### Prerequisites

#### 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 I/O serial device.  
If the problem is resolved, replace the interface cable with a known working cable.
3. Turn off the system and the I/O serial device, and swap the serial device with a compatible device.
4. Turn on the system and the I/O serial device.

#### Next steps

If the problem persists, see the Getting help section.

#### Related reference

[Getting help](#)

## 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.
  - Try another known good network cable.
  - 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, hubs, 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 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.
8. Ensure that all network cables are of the proper type and do not exceed the maximum length.

#### Next steps

If the problem persists, see the Getting help section.


#### Related reference

[Getting help](#)



# Troubleshooting a wet system

## Prerequisites

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

## Steps

1. Turn off the system 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
  - Expansion cards
  - Cooling fan(s)
  - 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, turn off 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 steps

If the tests fail, see the Getting help section.

## Related tasks

[Removing the system cover](#)

[Installing the system cover](#)


## Related reference

[Using system diagnostics](#)

[Getting help](#)

# Troubleshooting a damaged system

## Prerequisites

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

## Steps

1. Turn off the system 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:
  - expansion cards
  - power supply unit(s)
  - cooling fan(s)
  - processor(s) and heat sink(s)
  - memory modules
  - drive carriers or cage
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 steps

If the problem persists, see the Getting help section.

### Related tasks

[Removing the system cover](#)

[Installing the system cover](#)


### Related reference


[Using system diagnostics](#)


[Getting help](#)

## 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 the 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 steps

If the problem persists, see the Getting help section.


### Related reference

[System Setup](#)

[Getting help](#)

# Troubleshooting power supply units

## 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.

The following sections provide information on troubleshooting power source and power supply units problems.

## Troubleshooting power source problems

### Steps

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.

### Results

 **NOTE:** Some power supply units require 200-240V AC to deliver their rated capacity. For more information, see the system Technical Specifications section in the Installation and Service Manual available at [Dell.com/poweredgemanuals](https://dell.com/poweredgemanuals).

## Power supply unit problems

### Steps

1. Ensure that no loose connections exist.  
For example, loose power cables.
2. Ensure that the power supply unit (PSU) handle or LED indicates that the PSU is working properly.  
For more information about PSU indicators, see the Power indicator codes section.
3. If you have recently upgraded your system, ensure that the PSU has enough power to support the new system.
4. 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.

### Related reference

[Getting help](#)

## Power supply unit Built-in Self Test button

### Prerequisites

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. Verify that the power outlet is functioning normally.

## Steps

Press the Built-in Self Test (BIST) button on the power supply unit (PSU).

a) If the LED turns green, this indicates that the PSU is functioning properly.

b) If the LED does not turn on, further troubleshooting is required to determine the point of failure.

Open the system and disconnect the power cables from all devices including the system board and press the PSU BIST button.

Option	Description
If the LED turns green, this indicates that the PSU is functioning properly.	Further troubleshooting is required to determine the point of failure.
	<p>Attach the power cable(s) to the system board and press the PSU BIST button.</p> <ul style="list-style-type: none"><li>• If the LED turns green, this indicates that the system board is functioning properly.</li><li>• Further troubleshooting is required to determine the point of failure.</li><li>• Continue to reattach power to additional devices (hard drive, optical drive, etc.) and repeat the test after each addition to isolate the failed component.</li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>a. Ensure that the PSU meets the power requirements to support all the installed hardware</li><li>b. If the addition of a particular device causes a failure remove power from one of the other devices and retest. This will help determine if the device is failed or if the accumulation of devices exceeds the capacity of the PSU.</li></ul>
If the LED does not turn on.	See the Getting help section.

## Next steps

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

# 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 management software of the system. 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 the Safety instructions section.
2. Follow the procedure listed in the Before working inside your system section.

## Steps

1. Reseat the fan's power cable.
2. Restart the system.

## Next steps

1. Follow the procedure listed in the After working inside your system section.
2. If the problem persists, see the Getting help section.

## Related tasks


[Before working inside your system](#)

## Related reference

[Getting help](#)

# Troubleshooting system memory

## Prerequisites

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

## Steps

1. If the system is operational, run the appropriate 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.

 **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 steps

If the problem persists, see the Getting help section.

## Related tasks

[Removing the system cover](#)

[Installing the system cover](#)


## Related reference

[Using system diagnostics](#)

[Getting help](#)

# Troubleshooting an optical drive

## Prerequisites

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

## Steps

1. 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 steps

If the problem persists, see the Getting help section.

## Related tasks

[Removing the system cover](#)

[Installing the system cover](#)


## Related reference

[Getting help](#)

# Troubleshooting a drive

## Prerequisites

 **CAUTION:** This troubleshooting procedure can erase data stored on the drive. Before you proceed, back up all files on the 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 required through the following steps.
2. Ensure that the needed device drivers for your controller card are installed and are configured correctly. For more information, see the operating system documentation.

3. Restart the system and enter the System Setup.
4. Verify that the controller is enabled and the drives are displayed in the System Setup.

### Next steps

If the problem persists, see the Getting help section.


### Related reference

[Using system diagnostics](#)

[Getting help](#)

## 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.

 **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 steps

If the problem persists, see the Getting help section.

### Related tasks

[Removing the system cover](#)


[Installing the system cover](#)

### Related reference

[Getting help](#)

# Troubleshooting processors

## Prerequisites

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

## Steps

1. 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.

## Related tasks

[Removing the system cover](#)

[Installing the system cover](#)

## Related reference

[Using system diagnostics](#)

[Getting help](#)



## Getting help

### Topics:

- [Contacting Dell EMC](#)
- [Documentation feedback](#)
- [Accessing system information by using QRL](#)
- [Locating service tag of your system](#)

## Contacting Dell EMC

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

### Steps

1. Go to [Dell.com/support/home](http://Dell.com/support/home).
2. Select your country from the drop-down menu on the lower right corner of the page.
3. For customized support:
  - a) Enter your system Service Tag in the **Enter your Service Tag** field.
  - b) Click **Submit**.  
The support page that lists the various support categories is displayed.
4. For general support:
  - a) Select your product category.
  - b) Select your product segment.
  - c) Select your product.  
The support page that lists the various support categories is displayed.
5. For contact details of Dell EMC Global Technical Support:
  - a) Click [Global Technical Support](#).
  - b) The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell EMC Global Technical Support team.

## Documentation feedback

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

## Accessing system information by using QRL

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

### Prerequisites

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

The QRL includes the following information about your system:

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

## Quick Resource Locator

Use the Quick Resource Locator (QRL) to get immediate access to system information and how-to videos. This can be done by visiting **dell.com/QRL** or by using your smartphone or tablet and a model specific Quick Resource (QR) code located on your Dell PowerEdge system. To try out the QR code, scan the following image.



Figure 52. Quick resource locator

## Locating service tag of your system

Your system is identified by a unique Express Service Code and Service Tag number. The Express Service Tag is found on top of the system and Express Service Code is found on back of the system. This information is used by Dell to route support calls to the appropriate personnel.



Figure 53. Locating service tag of your system