

Dell Vostro 5880

Service Manual

Notes, cautions, and warnings

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

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

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

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Working on your computer

Topics:

- [Safety instructions](#)

Safety instructions

Prerequisites

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:

- You have read the safety information that shipped with your computer.
- A component can be replaced or, if purchased separately, installed by performing the removal procedure in reverse order.

About this task

 **NOTE:** Disconnect all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting to the power source.

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the [Regulatory Compliance Homepage](#)

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

 **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.

 **CAUTION:** Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

 **CAUTION:** When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

 **NOTE:** The color of your computer and certain components may appear differently than shown in this document.

Before working inside your computer

Steps

1. Save and close all open files and exit all open applications.
2. Shut down your computer. Click **Start** >  **Power** > **Shut down**.

 **NOTE:** If you are using a different operating system, see the documentation of your operating system for shut-down instructions.

3. Disconnect your computer and all attached devices from their electrical outlets.
4. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.
5. Remove any media card and optical disc from your computer, if applicable.
6. After the computer is unplugged, press and hold the power button for 5 seconds to ground the system board.

 **CAUTION:** Place the computer on a flat, soft, and clean surface to avoid scratches on the display.

7. Place the computer face down.

Electrostatic discharge—ESD protection

ESD is a major concern when you handle electronic components, especially sensitive components such as expansion cards, processors, memory DIMMs, and system boards. Very slight charges can damage circuits in ways that may not be obvious, such as intermittent problems or a shortened product life span. As the industry pushes for lower power requirements and increased density, ESD protection is an increasing concern.

Due to the increased density of semiconductors used in recent Dell products, the sensitivity to static damage is now higher than in previous Dell products. For this reason, some previously approved methods of handling parts are no longer applicable.

Two recognized types of ESD damage are catastrophic and intermittent failures.

- **Catastrophic** – Catastrophic failures represent approximately 20 percent of ESD-related failures. The damage causes an immediate and complete loss of device functionality. An example of catastrophic failure is a memory DIMM that has received a static shock and immediately generates a "No POST/No Video" symptom with a beep code emitted for missing or nonfunctional memory.
- **Intermittent** – Intermittent failures represent approximately 80 percent of ESD-related failures. The high rate of intermittent failures means that most of the time when damage occurs, it is not immediately recognizable. The DIMM receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms related to the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of memory integrity, intermittent memory errors, etc.

The more difficult type of damage to recognize and troubleshoot is the intermittent (also called latent or "walking wounded") failure.

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. The use of wireless anti-static straps is no longer allowed; they do not provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, ensure that you discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD field service kit

The unmonitored Field Service kit is the most commonly used service kit. Each Field Service kit includes three main components: anti-static mat, wrist strap, and bonding wire.

Components of an ESD field service kit

The components of an ESD field service kit are:

- **Anti-Static Mat** – The anti-static mat is dissipative and parts can be placed on it during service procedures. When using an anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to any bare metal on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the mat. ESD-sensitive items are safe in your hand, on the ESD mat, in the system, or inside a bag.
- **Wrist Strap and Bonding Wire** – The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the ESD mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Never use wireless wrist straps. Always be aware that the internal wires of a wrist strap are prone to damage from normal wear and

tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire at least once per week.

- **ESD Wrist Strap Tester** – The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is a best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.
- **Insulator Elements** – It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.
- **Working Environment** – Before deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or portable environment. Servers are typically installed in a rack within a data center; desktops or portables are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of system that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as Styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components
- **ESD Packaging** – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.
- **Transporting Sensitive Components** – When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

ESD protection summary

It is recommended that all field service technicians use the traditional wired ESD grounding wrist strap and protective anti-static mat at all times when servicing Dell products. In addition, it is critical that technicians keep sensitive parts separate from all insulator parts while performing service and that they use anti-static bags for transporting sensitive components.

Transporting sensitive components

When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

Lifting equipment

Adhere to the following guidelines when lifting heavy weight equipment:

 **CAUTION:** Do not lift greater than 50 pounds. Always obtain additional resources or use a mechanical lifting device.

1. Get a firm balanced footing. Keep your feet apart for a stable base, and point your toes out.
2. Tighten stomach muscles. Abdominal muscles support your spine when you lift, offsetting the force of the load.
3. Lift with your legs, not your back.
4. Keep the load close. The closer it is to your spine, the less force it exerts on your back.
5. Keep your back upright, whether lifting or setting down the load. Do not add the weight of your body to the load. Avoid twisting your body and back.
6. Follow the same techniques in reverse to set the load down.

After working inside your computer

About this task

 **NOTE:** Leaving stray or loose screws inside your computer may severely damage your computer.

Steps

1. Replace all screws and ensure that no stray screws remain inside your computer.
2. Connect any external devices, peripherals, or cables you removed before working on your computer.
3. Replace any media cards, discs, or any other parts that you removed before working on your computer.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

Disassembly and reassembly

NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

Topics:

- [Recommended tools](#)
- [Screw size list](#)
- [Side cover](#)
- [Front bezel](#)
- [Optical drive](#)
- [Memory modules](#)
- [WLAN card](#)
- [Graphics card](#)
- [Hard disk drive](#)
- [Coin-cell battery](#)
- [Solid-state drive](#)
- [System fan](#)
- [Power supply unit](#)
- [Heatsink assembly](#)
- [Processor](#)
- [System board](#)

Recommended tools

The procedures in this document may require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Plastic scribe-Recommended for field technician

Screw size list

Table 1. Vostro 5090

Component	Screw type	Quantity	Image	Color
Right-side cover	#6-32	2		Black
3.5-inch hard drive	#6-32	1		Silver
3.5-inch hard drive cage	#6-32	4		Silver
WLAN-card bracket	M2x3	1		Black
Solid-state drive	M2x3	1		Black

Table 1. Vostro 5090 (continued)

Component	Screw type	Quantity	Image	Color
Intel Optane memory module	M2x3	1		Black
Power-supply unit	#6-32	3		Silver
Ports bezel	#6-32	1		Silver
System board	#6-32	8		Black
System board	M2x4	1		Silver

Side cover

Removing the right-side cover

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

About this task

The following images indicate the location of the right-side cover and provide a visual representation of the removal procedure.

Steps

1. Loosen the two captive screws (6-32) that secure the right-side cover to the chassis.



2x
6-32

1



2. Using the tab on the right-side cover, slide back and lift the right-side cover off the chassis.

2



Installing the right-side cover

Prerequisites

About this task

The following images indicate the location of the right-side cover and provide a visual representation of the installation procedure.



Steps

1. Align the tabs on the right-side cover with the slots on the chassis and slide it towards the front of the computer.
2. Tighten the two captive screws (6-32) that secure the right-side cover to the chassis.



2x
6-32

2



Next steps

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

Front bezel

Removing the front cover

Prerequisites

1. Follow the procedure in [Before working inside your computer.](#)
2. Remove the [right-side cover](#).

About this task

The following images indicate the location of the front cover and provide a visual representation of the removal procedure.



Steps

1. Place the computer in an upright position.
2. Gently pry and release the front-cover tabs sequentially from the top.
3. Move the front cover outward from the chassis.
4. Disconnect the front-LED cable from the connector on the front cover.

Installing the front bezel

Prerequisites

About this task

The following images indicate the location of the base cover and provide a visual representation of the installation procedure.



Steps

1. Place the computer in an upright position.
2. Align the front-cover tabs with the slots on the chassis.
3. Move the front cover towards the chassis and snap it into place.

Next steps

1. Install the [right-side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Optical drive

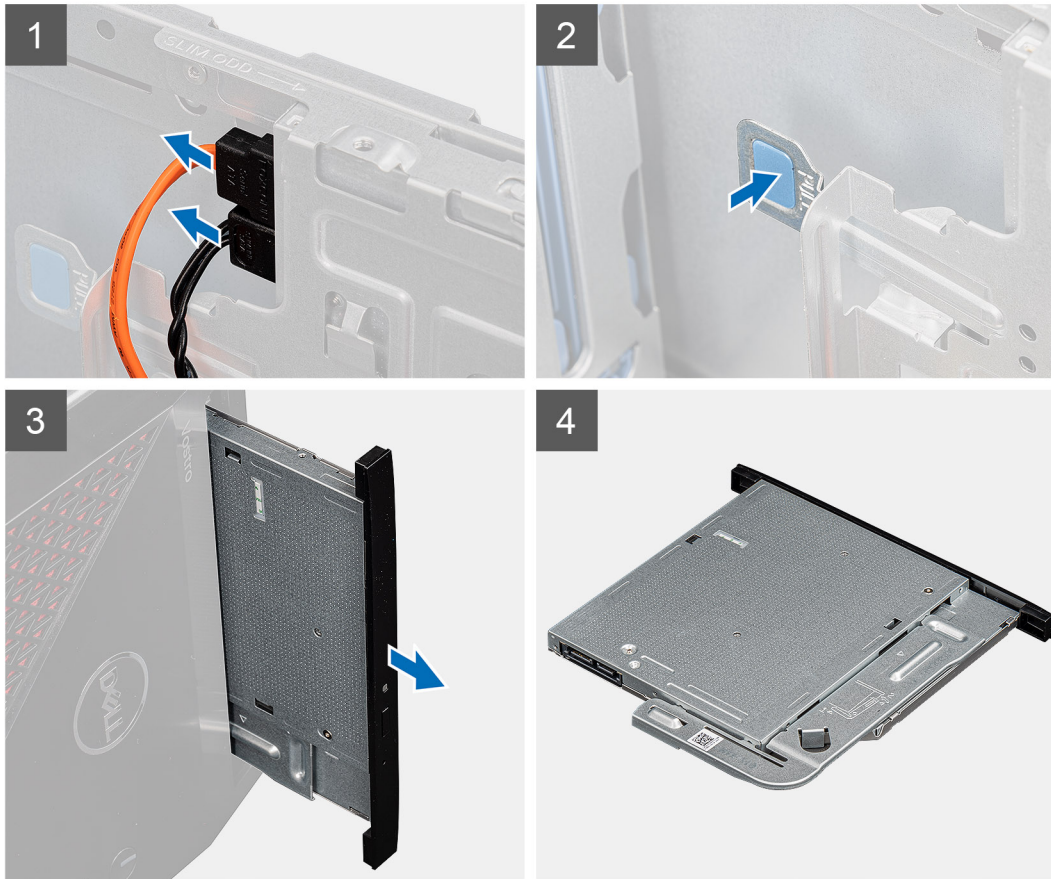
Removing the Optical drive

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).

About this task

The following images indicate the location of the optical drive and provides a visual representation of the removal procedure.



Steps

1. Lay the computer on the right side.
2. Disconnect the data and power cables from the optical drive.
3. Push the securing tab to release the optical drive from the chassis.
4. Slide and remove the optical drive from the slot.

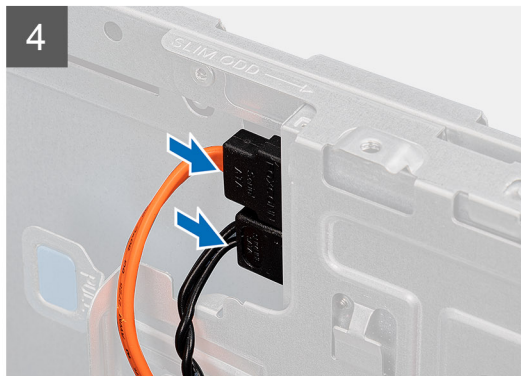
Installing the Optical drive

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following images indicate the location of the Optical drive and provide a visual representation of the installation procedure.



Steps

1. Insert the optical drive into the slot.
2. Align the optical drive assembly with the tabs on the chassis.
3. Route the power cable and data cable through the routing guides and connect the cables to the optical drive.

Next steps

1. Install the [side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Memory modules

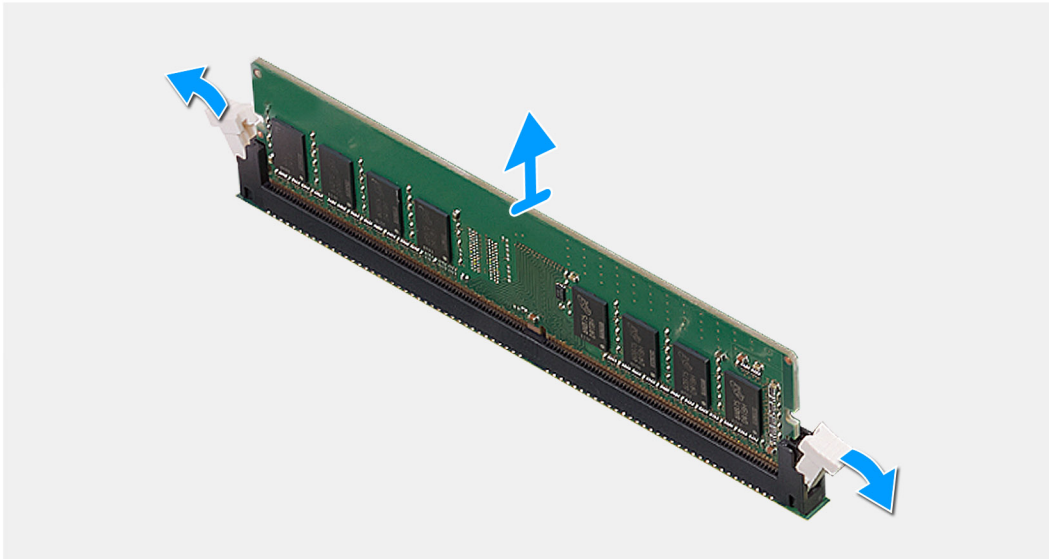
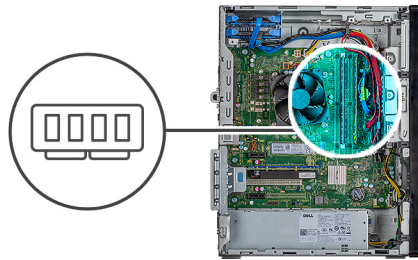
Removing the memory modules

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).

About this task

The following images indicate the location of the memory modules and provide a visual representation of the removal procedure.



Steps

1. Lay the chassis on the right side.
2. Use your fingertips to carefully spread apart the securing-clips on each end of the memory-module slot.
3. Grasp the memory module near the securing clip, and then gently ease the memory module out of the memory-module slot.

NOTE: Repeat step 2 to step 4 to remove any other memory modules installed in your computer.

NOTE: If the memory module is difficult to remove, gently ease the memory module back and forth to remove it from the slot.

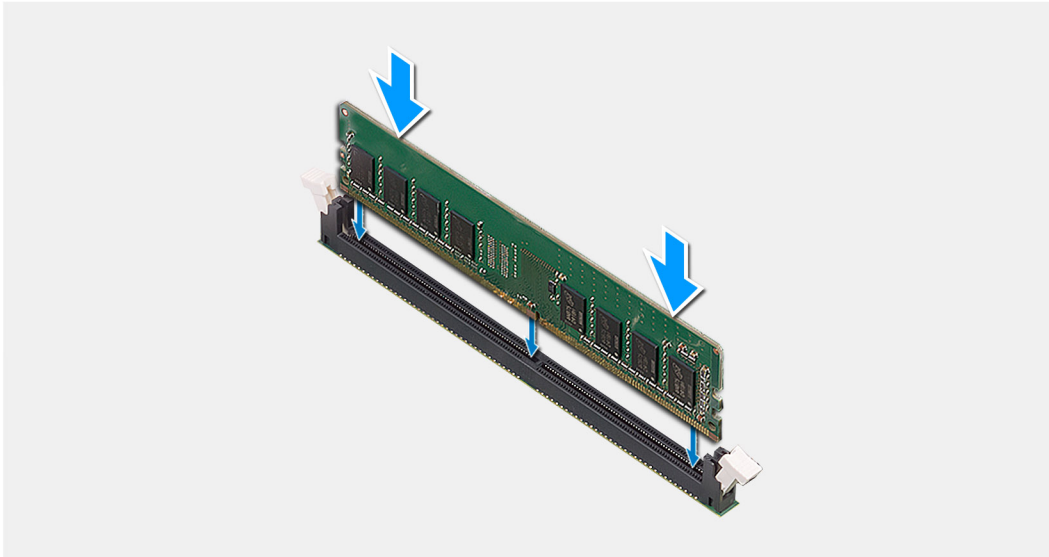
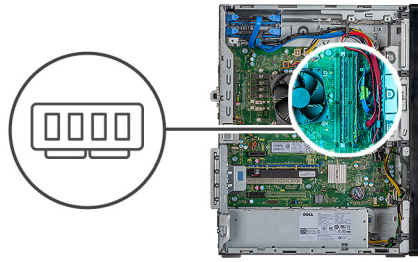
NOTE: To prevent damage to the memory module, hold the memory module by the edges. Do not touch the components on the memory module.

Installing the memory modules

Prerequisites

About this task

The following images indicate the location of the memory modules and provide a visual representation of the installation procedure.



Steps

1. Align the notch on the memory module with the tab on the memory-module slot.
2. Insert the memory module into the memory-module connector until the memory module snaps into position and the securing clip locks in place.

NOTE: The securing clips return to the locked position. If you do not hear the click, remove the memory module and reinstall it.

NOTE: To prevent damage to the memory module, hold the memory module by the edges. Do not touch the components on the memory module.

Next steps

1. Install the [right-side cover](#).
2. Follow the procedure in [After working inside your computer](#).

WLAN card

Removing the wireless card

Prerequisites

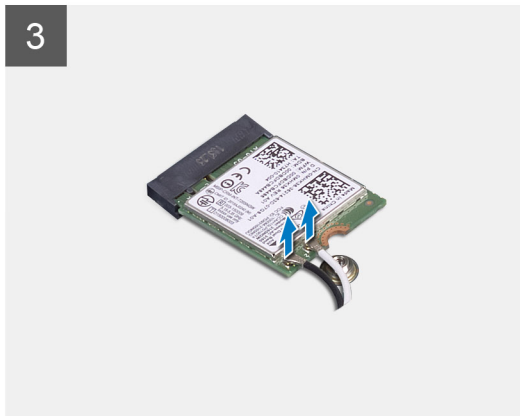
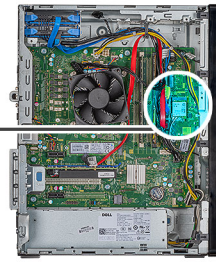
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).

About this task

The following images indicate the location of the wireless card and provide a visual representation of the removal procedure.



1x
M2x3



Steps

1. Lay the computer on the right side.
2. Remove the single (M2x3) screw that secures the wireless card to the system board.
3. Slide and lift the wireless-card bracket off the wireless card.
4. Disconnect the antenna cables from the wireless card.
5. Slide and remove the wireless card at an angle from the wireless-card slot.

Installing the wireless card

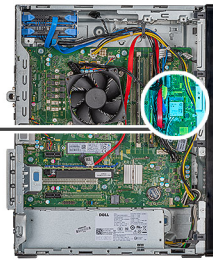
Prerequisites

About this task

The following images indicate the location of the wireless card and provide a visual representation of the installation procedure.



1x
M2x3



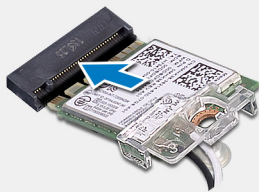
1



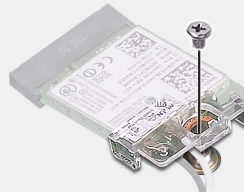
2



3



4



Steps

1. Align the notch on the wireless card with the tab on the wireless-card slot.
2. Slide the wireless card at an angle into the wireless-card slot.
3. Connect the antenna cables to the wireless card.
4. Slide and place the wireless-card bracket on the wireless card.
5. Replace the single (M2x3) screw that secures the wireless card to the system board.

Next steps

1. Install the [right-side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Graphics card

Removing the graphics card

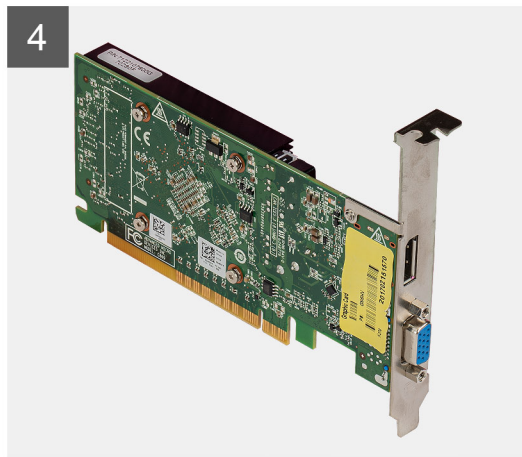
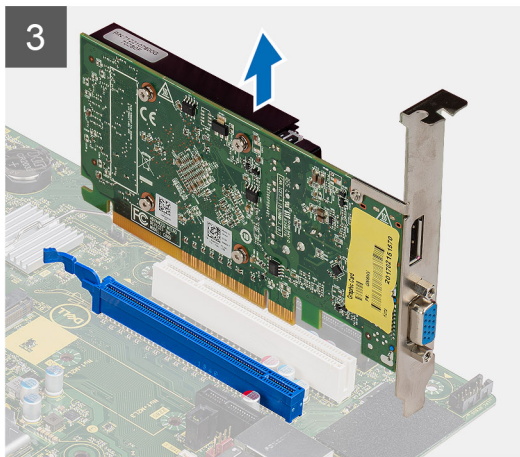
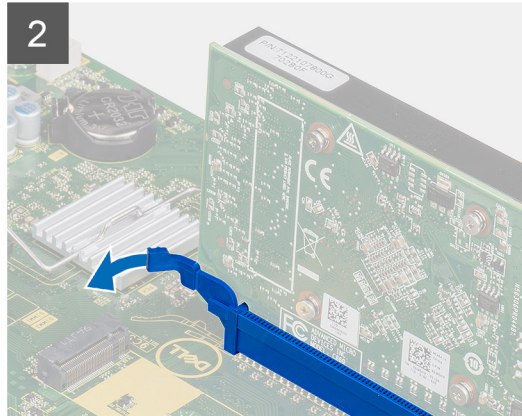
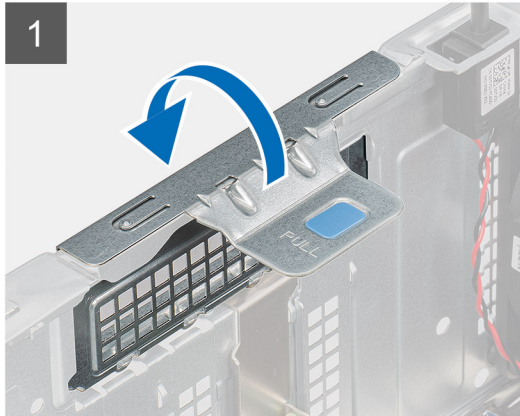
Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

2. Remove the [side cover](#).

About this task

The following images indicate the location of the graphics card and provides a visual representation of the removal procedure.



Steps

1. Lay the computer on the right side.
2. Locate the graphics card (PCI-Express).
3. Lift the pull tab to open the PCIe door.
4. Push and hold the securing tab on the graphics-card slot and lift the graphics card from the graphics-card slot.

 **NOTE:** To remove the NVIDIA GeForce RTX 2080 graphics card, lift and rotate the graphics card.

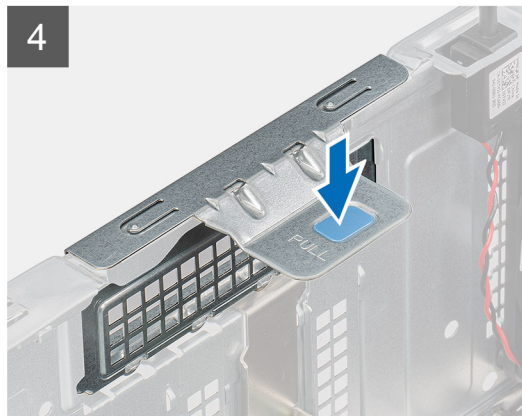
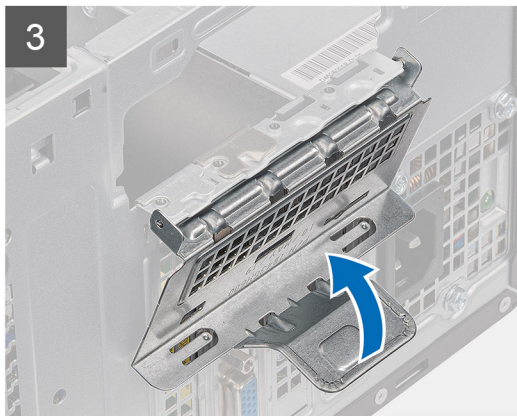
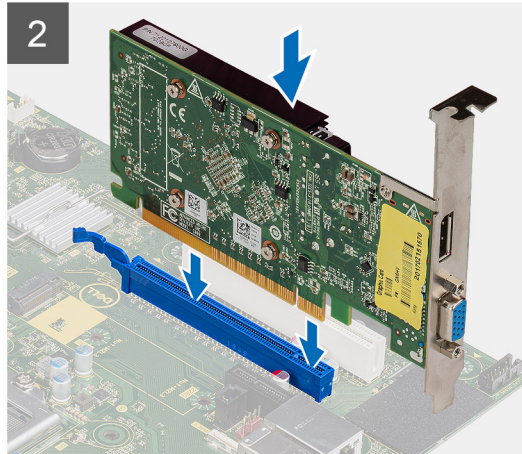
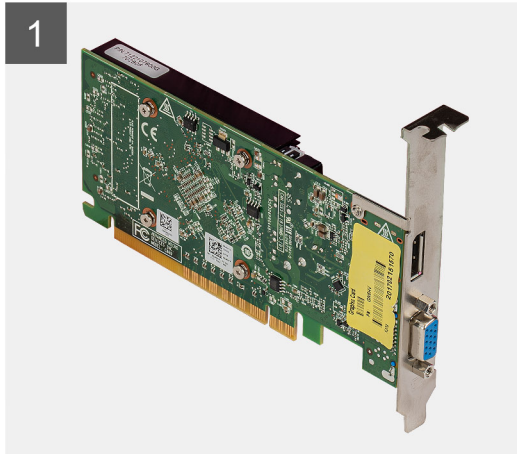
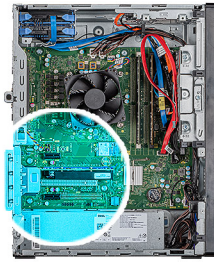
Installing the graphics card

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following images indicate the location of the graphics card and provides a visual representation of the installation procedure.



Steps

1. Align the graphics card with the PCI-Express card connector on the system board.
NOTE: To install the NVIDIA GeForce RTX 2080 graphics card, rotate and install the graphics card.
2. Using the alignment post, connect the card in the connector and press down firmly. Ensure that the card is firmly seated.
3. Lift the pull tab to close the PCIe door.

Next steps

1. Install the .
2. Follow the procedure in .

Hard disk drive

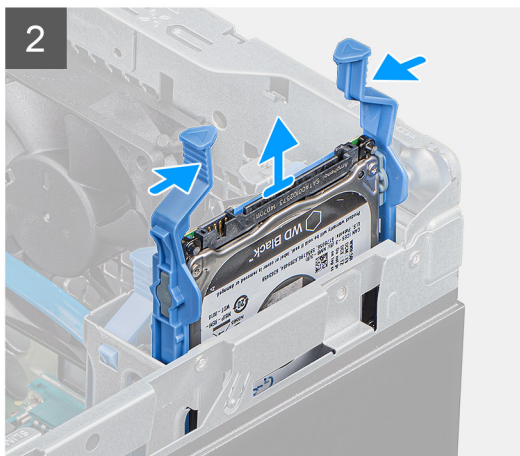
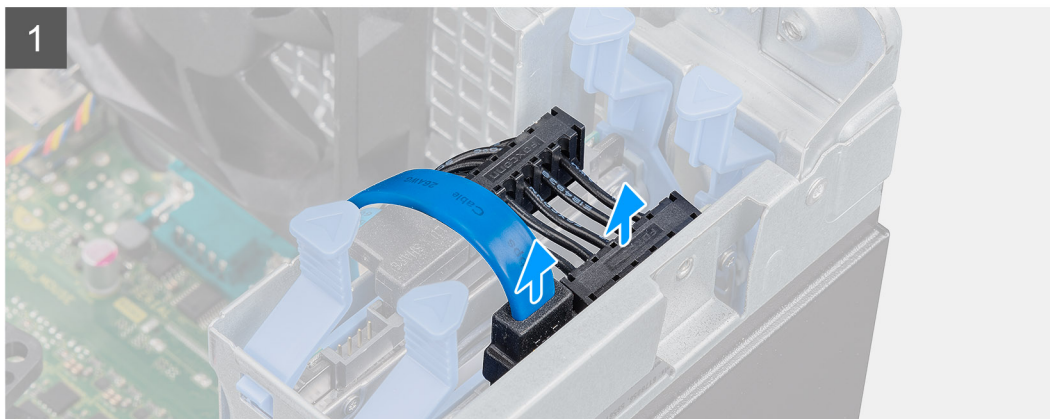
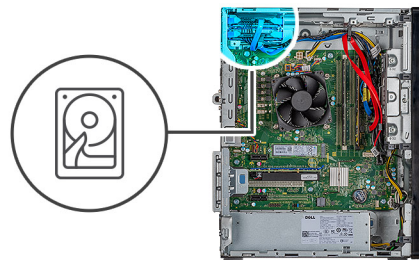
Removing the 2.5-inch hard drive assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).

About this task

The following images indicate the location of the 2.5-inch hard drive and provide a visual representation of the removal procedure.



Steps

1. Disconnect the data and power cables from the hard drive.
2. Press the release tabs on the hard-drive carrier and slide the hard-drive assembly out of the hard-drive cage.



3. Pry the hard-drive carrier to release the tabs on the assembly from the slots on the hard drive.
4. Slide and remove the hard drive off the hard-drive assembly.

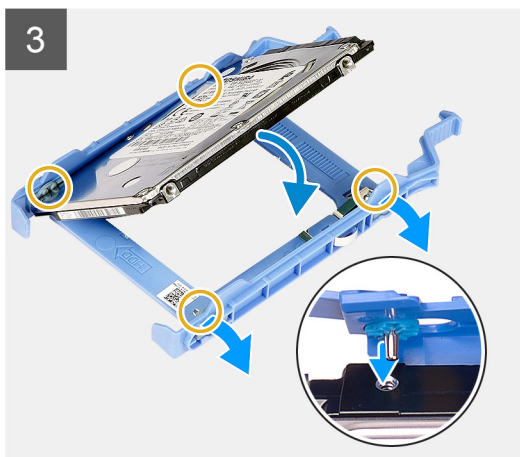
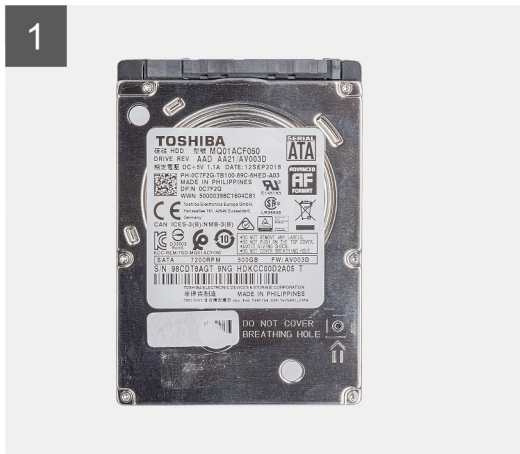
NOTE: Note the orientation of the hard drive so that you can replace it correctly.

Installing the 2.5-inch hard drive assembly

Prerequisites

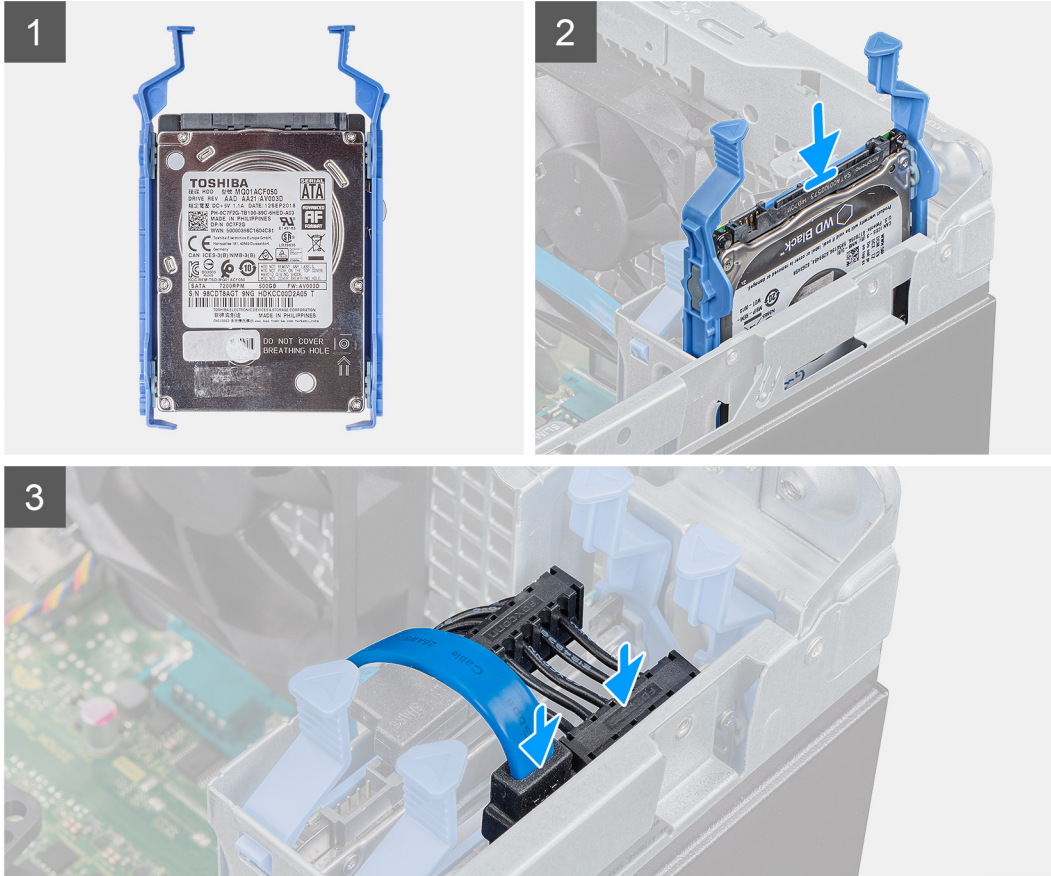
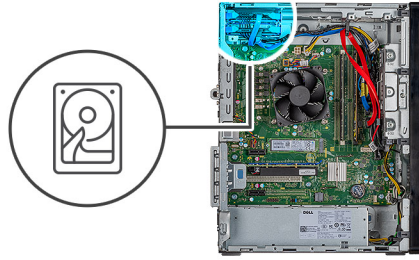
About this task

The following images indicate the location of the 2.5-inch hard drive and provide a visual representation of the installation procedure.



Steps

1. Place the hard drive into the hard-drive carrier and align the tabs on the carrier with the slots on the hard drive.
2. Snap the hard drive into the hard-drive carrier.



3. Slide the hard-drive assembly into the hard-drive cage until it snaps into place.
4. Connect the data cable and power cable to the hard drive.

Next steps

1. Install the [right-side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Removing the 3.5-inch hard drive

Prerequisites

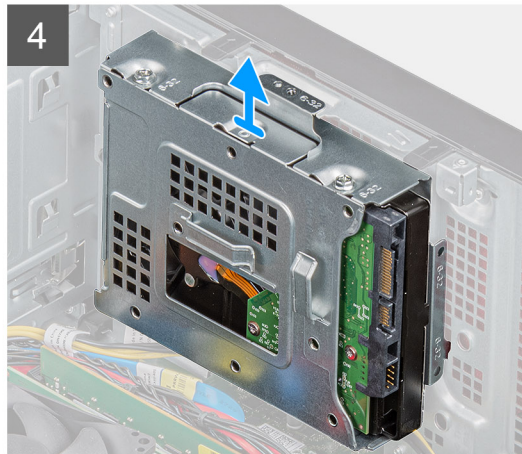
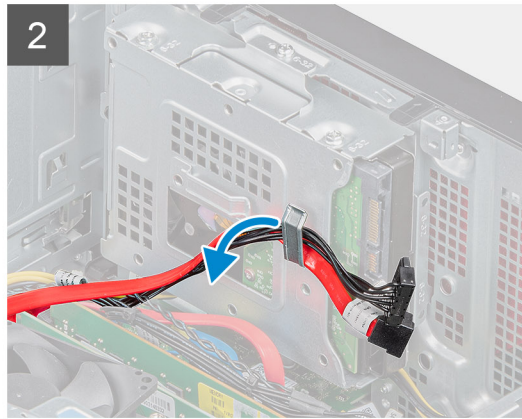
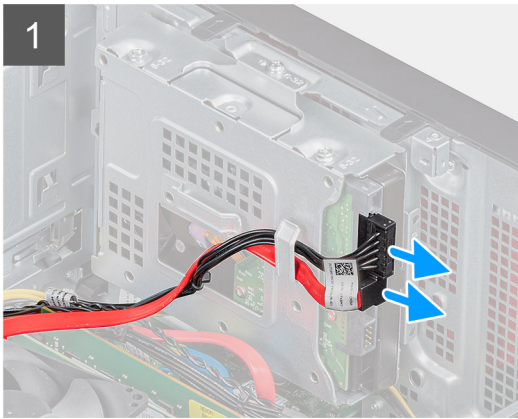
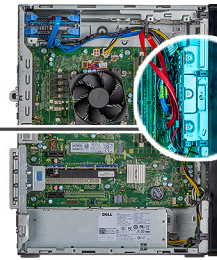
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).

About this task

The following images indicate the location of the 3.5-inch hard drive and provide a visual representation of the removal procedure.



1x
6-32



Steps

1. Lay the computer on the right side.
2. Disconnect the data and power cables from the hard drive.
3. Remove the cables from the routing guides on the hard-drive assembly.
4. Remove the single (6-32) screw that secures the 3.5-inch hard-drive assembly to the chassis.
5. Lift the hard-drive assembly away from the chassis.
6. Remove the four (6-32) screws that secure the the hard drive to the hard-drive cage.
7. Remove the hard drive from the hard-drive cage.

NOTE: To remove 2nd 3.5-inch hard drive, disconnect and un-route the hard-drive power extension cable, 3.5-inch SATA cable, 2.5-inch hard drive and ODD SATA cable and CPU power cable from the cable holder clip. Remove the two (6-32) screws that secure the hard drive assembly to the chassis. Remove the hard drive from the hard-drive cage.

Installing the 3.5-inch hard drive

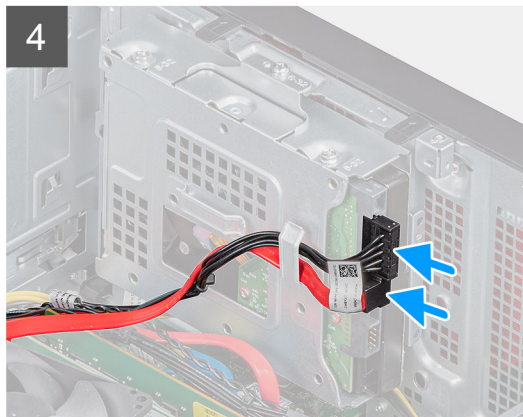
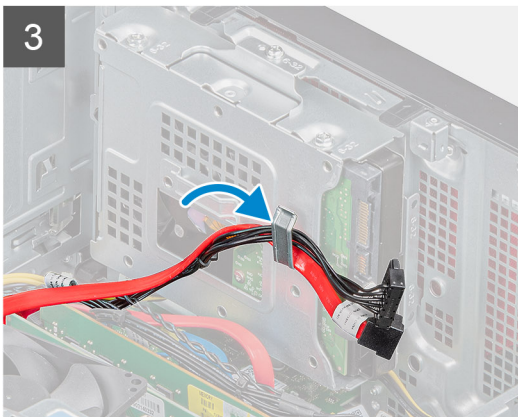
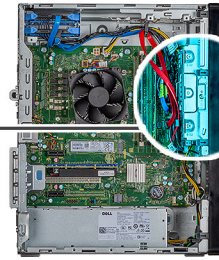
Prerequisites

About this task

The following images indicate the location of the 3.5-inch hard drive and provide a visual representation of the installation procedure.



1x
6-32



Steps

1. Insert the hard drive into the hard-drive cage.
2. Replace the four (6-32) screws that secure the hard drive to the hard-drive cage.
3. Align the hard-drive assembly with the tabs on the chassis.
4. Using the alignment post, align the screw hole on the hard-drive assembly with the screw hole on the chassis.
5. Replace the single (6-32) screw that secures the hard-drive assembly to the chassis.
6. Route the power cable and data cable through the routing guides on the hard-drive assembly and connect the cables to the hard drive.

i NOTE: For systems with 2nd 3.5-inch hard drive, ensure to un-route the cable from the clip holder and then remove the clip from the chassis. After installing the hard drive into the hard-drive cage, align the 4 holes on the 3.5-inch hard-drive cage with the 4 hooks on the ODD bracket and place it into its slot on the chassis. Secure the hard-drive assembly to the chassis with two (6-32) screws. Connect and route the hard-drive power extension cable, 3.5-inch SATA cable, 2.5-inch hard drive and ODD SATA cable and CPU power cable through the cable holder clip.

Next steps

1. Install the [right-side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Coin-cell battery

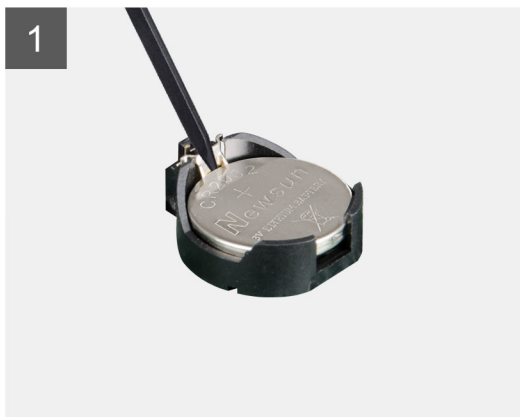
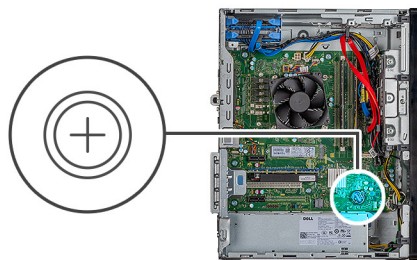
Removing the coin-cell battery

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).

About this task

The following images indicate the location of the coin-cell battery and provide a visual representation of the removal procedure.



Steps

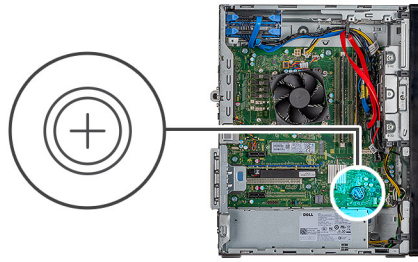
1. Lay the computer on the right side.
2. Using a plastic scribe, push the coin-cell battery-release lever on the coin-cell battery socket to release the coin-cell battery out of the socket.
3. Remove the coin-cell battery.

Installing the coin-cell battery

Prerequisites

About this task

The following images indicate the location of the coin-cell battery and provide a visual representation of the installation procedure.



Insert the coin-cell battery into the socket with the positive side (+) labeled facing up and snap the battery in the socket.

Next steps

1. Install the [right-side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Solid-state drive

Removing the 2230 solid-state drive/Intel Optane memory module

Prerequisites

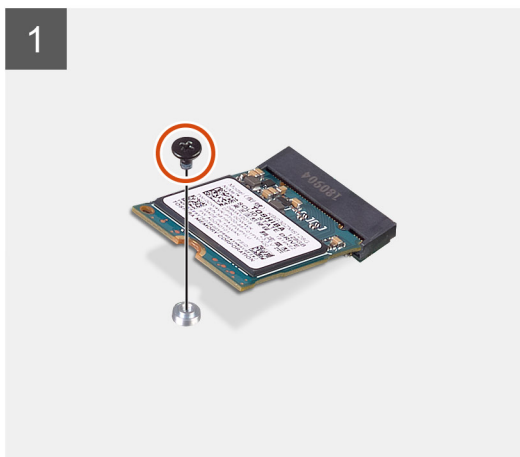
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).

About this task

The following images indicate the location of the solid-state drive and provide a visual representation of the removal procedure.



1x
M2x3



Steps

1. Remove the single (M2x3) screw that secures the 2230 solid-state drive/Intel Optane memory module to the system board.
2. Slide and lift the 2230 solid-state drive/Intel Optane memory module from the M.2 card slot on the system board.

Installing the 2230 solid-state drive/Intel Optane memory module

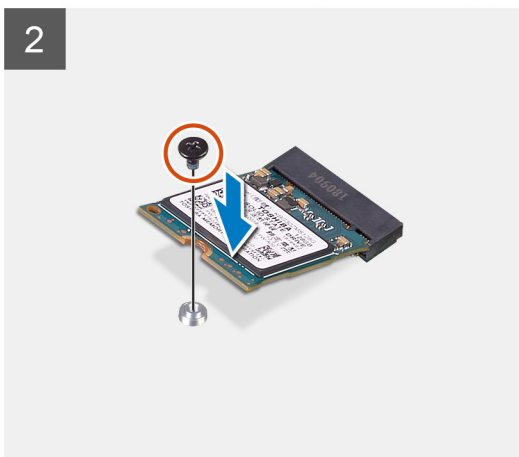
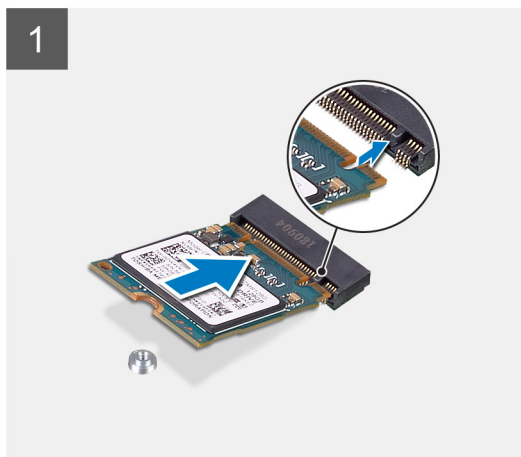
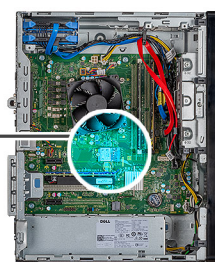
Prerequisites

About this task

The following images indicate the location of the solid-state drive and provide a visual representation of the installation procedure.



1x
M2x3



Steps

1. Locate the notch on the 2230 solid-state drive/Intel Optane memory module.
2. Align the notch on the 2230 solid-state drive/Intel Optane memory module with the tab on the M.2 card slot.
3. Slide the 2230 solid-state drive/Intel Optane memory module into the M.2 card slot on the system board.
4. Replace the single (M2xL3) screw that secures the 2230 solid-state drive/Intel Optane memory module to the system board.

Next steps

1. Install the [right-side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Removing the M.2 2280 solid-state drive/Intel Optane memory module

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).

About this task

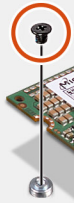
The following images indicate the location of the solid-state drive and provide a visual representation of the removal procedure.



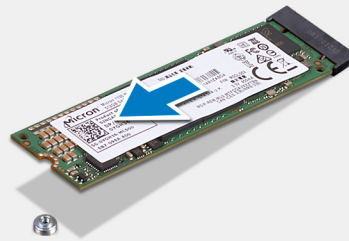
1x
M2x3



1



2



Steps

1. Remove the single (M2xL3) screw that secures the solid-state drive/Intel Optane memory to the system board.
2. Slide and lift the M.2 2280 solid-state drive/Intel Optane memory from the M.2 card slot on the system board.

Installing the M.2 2280 solid-state drive/Intel Optane memory module

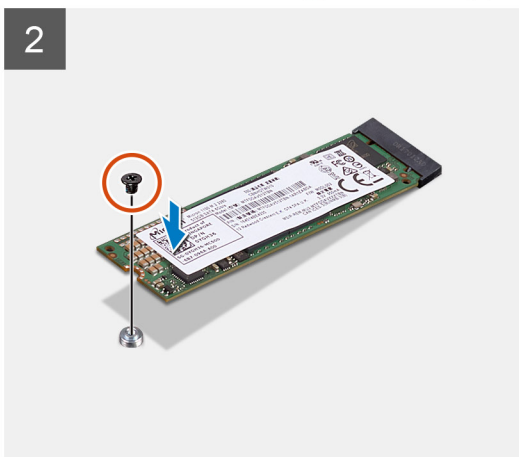
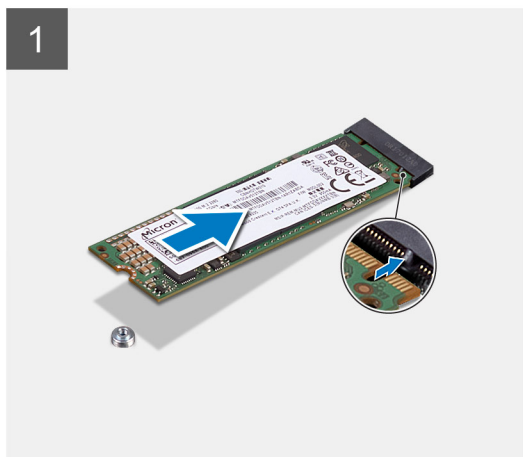
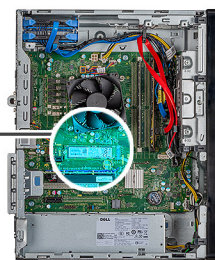
Prerequisites

About this task

The following images indicate the location of the M.2 2280 solid-state drive and provide a visual representation of the installation procedure.



1x
M2x3



Steps

1. Locate the notch on the M.2 2280 solid-state drive/Intel Optane memory.
2. Align the notch on the M.2 2280 solid-state drive/Intel Optane memory with the tab on the M.2 card slot.
3. Slide the M.2 2280 solid-state drive/Intel Optane memory into the M.2 card slot on the system board.
4. Replace the single (M2x3) screw that secures the M.2 2280 solid-state drive/Intel Optane memory to the system board.

Next steps

1. Install the [right-side cover](#).
2. Follow the procedure in [After working inside your computer](#).

System fan

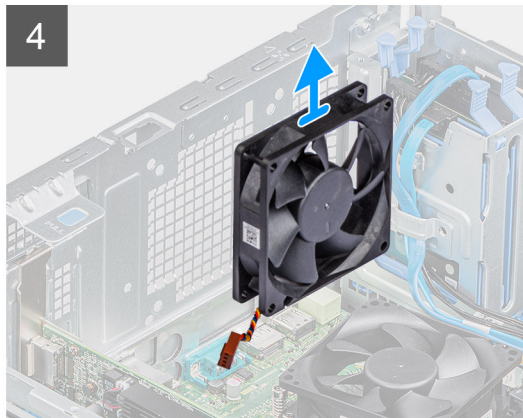
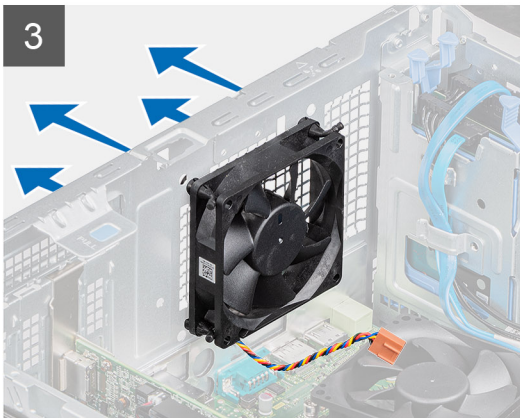
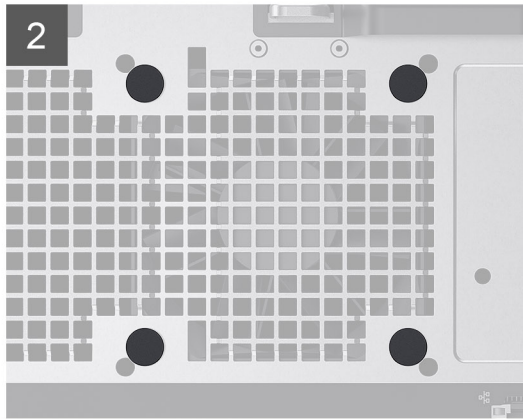
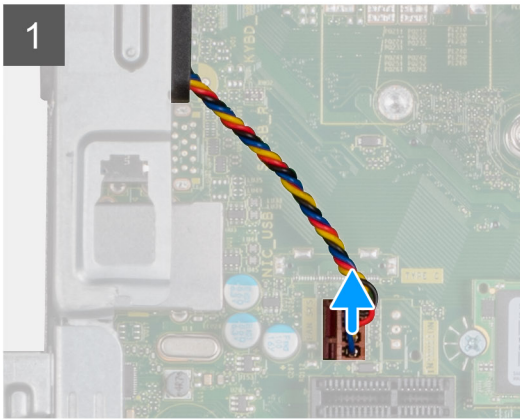
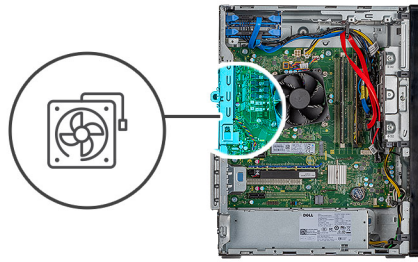
Removing the chassis fan

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).

About this task

The following images indicate the location of the chassis fan and provide a visual representation of the removal procedure.



Steps

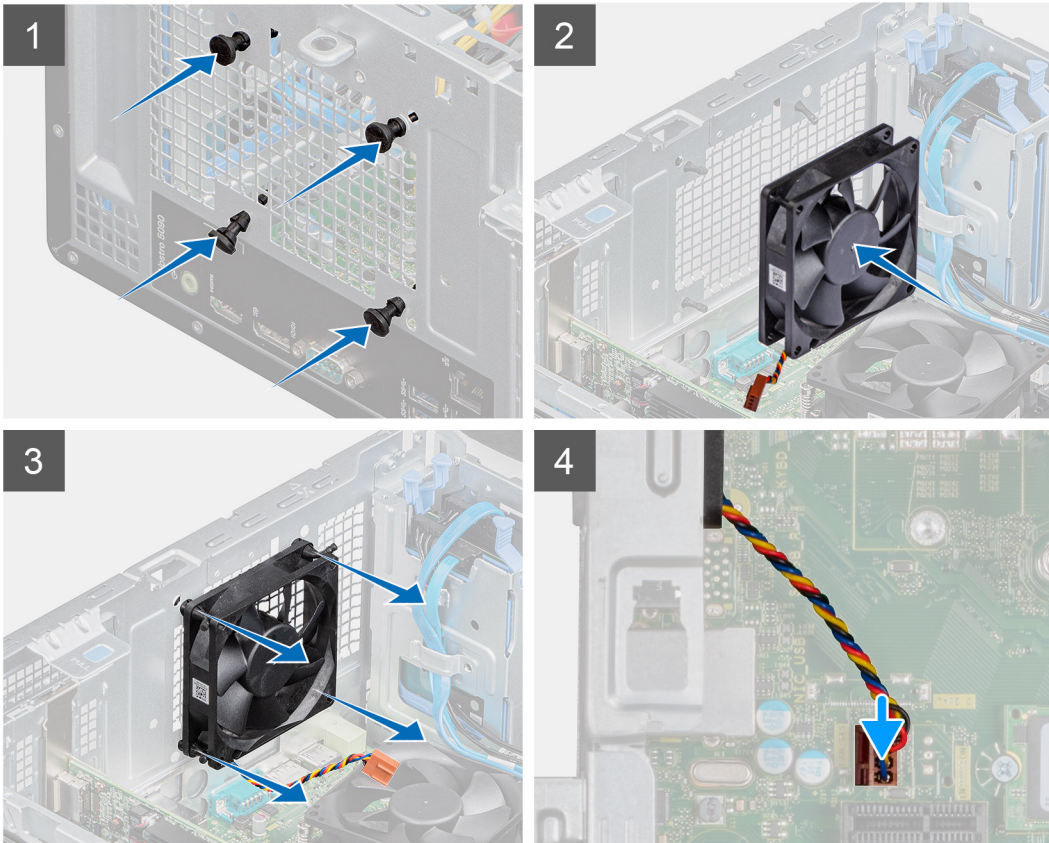
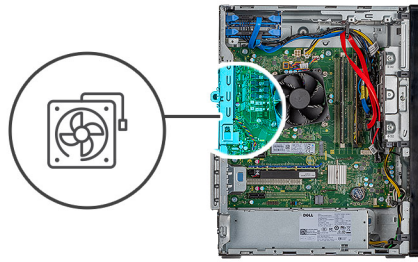
1. Lay the computer on the right side.
2. Disconnect the fan cable from the system board.
3. Gently pull the fan to release it from the rubber grommets.
4. Remove the fan off the chassis.

Installing the chassis fan

Prerequisites

About this task

The following images indicate the location of the chassis fan and provide a visual representation of the installation procedure.



Steps

1. Align the slots on the fan with the rubber grommets on chassis.
2. Route the rubber grommets through the slots on fan and pull the rubber grommets until the fan snaps into position.
3. Connect the fan cable to the system board.

Next steps

1. Install the [right-side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Power supply unit

Removing the power-supply unit

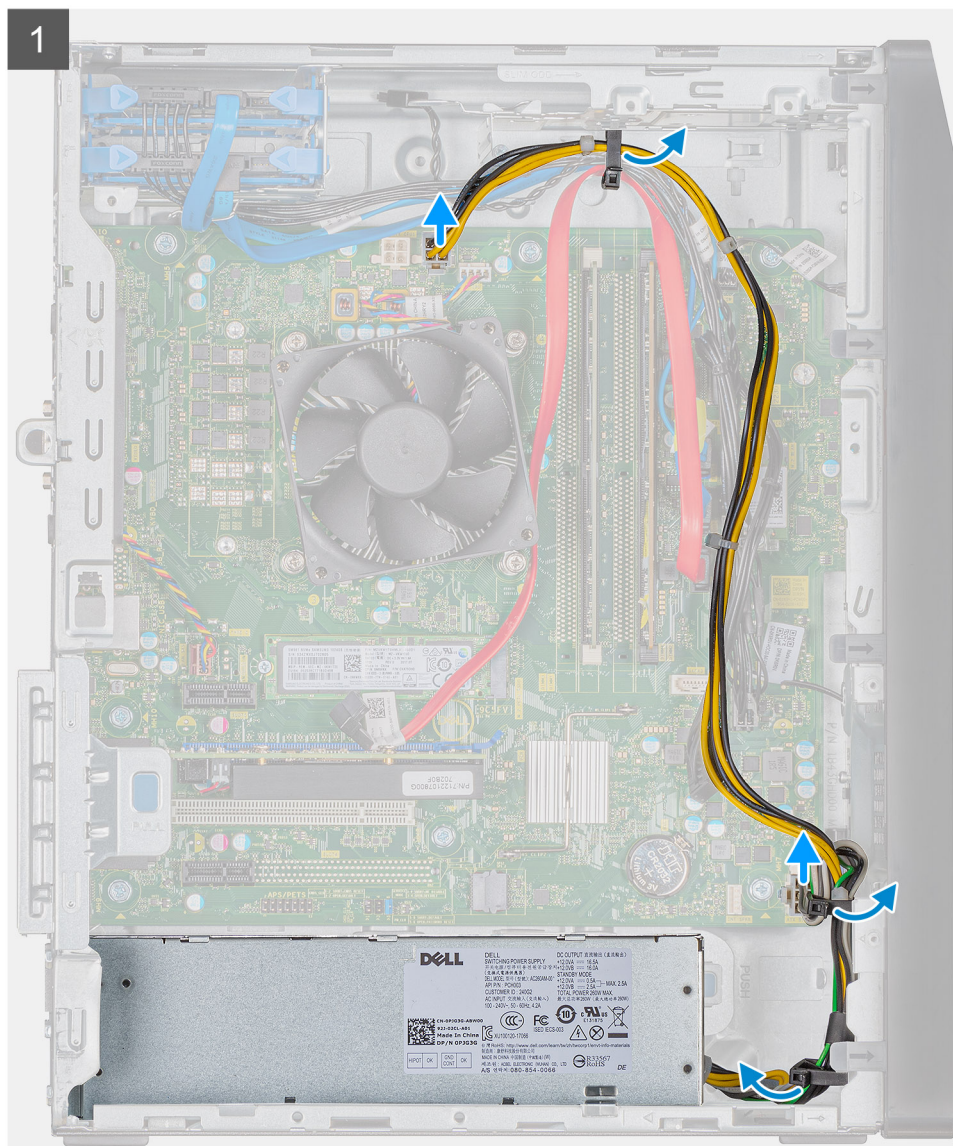
Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).

About this task

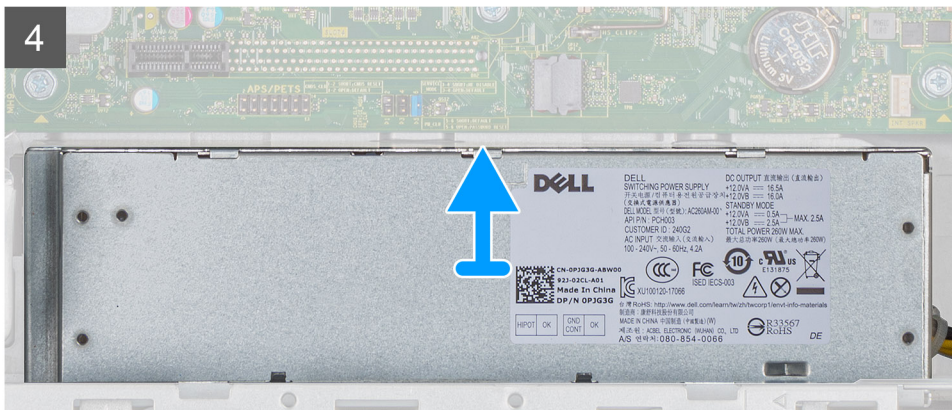
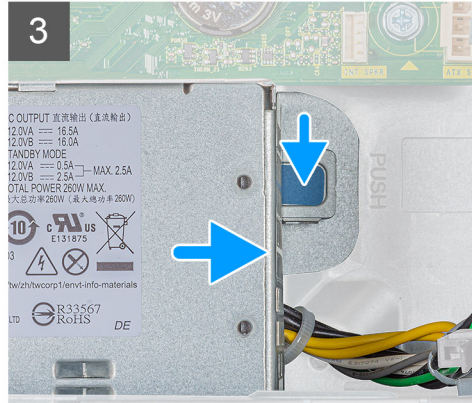
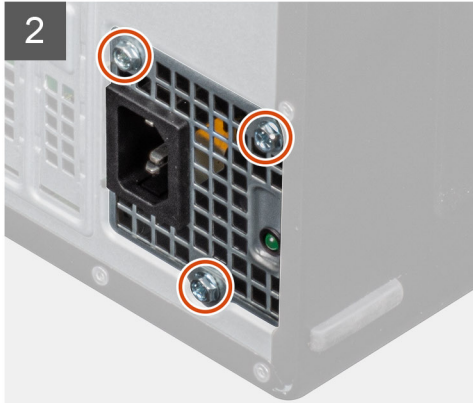
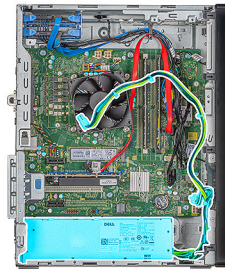
The following images indicate the location of the power-supply unit and provide a visual representation of the removal procedure.

Power-supply unit with single connector.





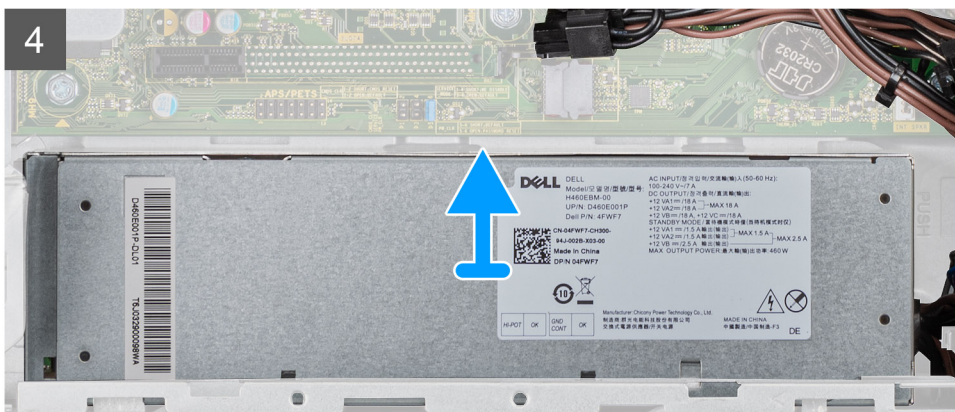
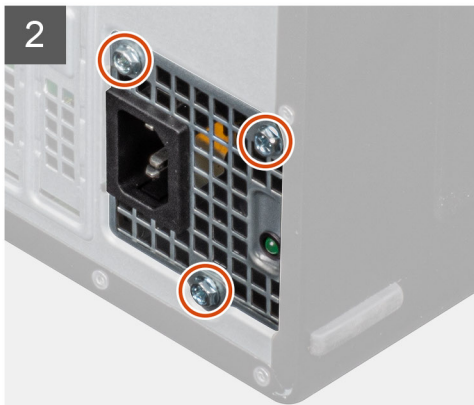
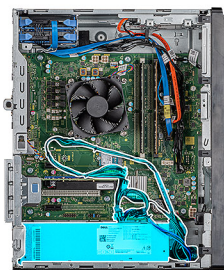
3x
6-32



Power-supply unit with dual connector.



3x
6-32



Steps

1. Lay the computer on the right side.
2. Disconnect the power cables from the system board and remove them from the routing guides on the chassis.
3. Remove the three (6-32) screws that secure the power-supply unit to the chassis.
4. Press the securing tab on the chassis to release the power-supply from its slot.
5. Slide and lift the power-supply unit off the chassis.

Installing the power-supply unit

Prerequisites

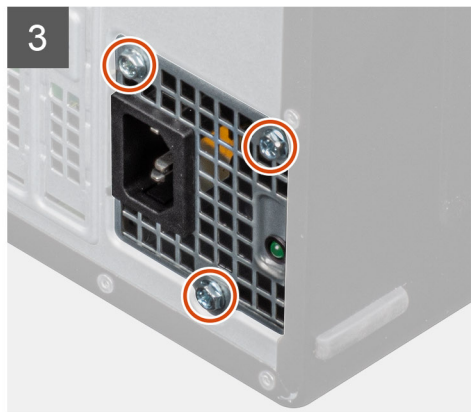
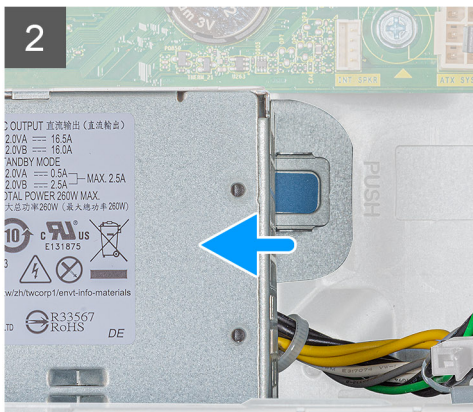
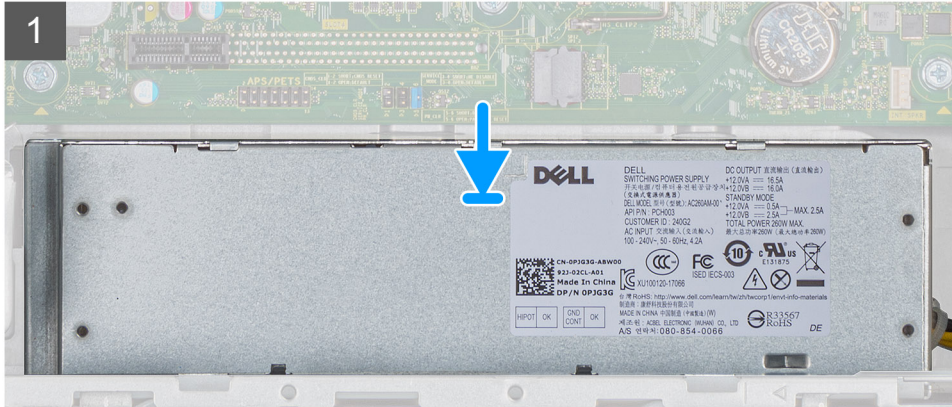
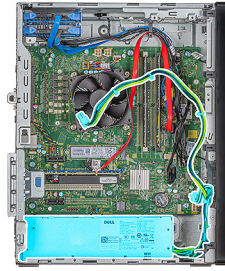
About this task

The following images indicate the location of the power-supply unit and provide a visual representation of the installation procedure.

Installing power-supply unit with single connector.



3x
6-32



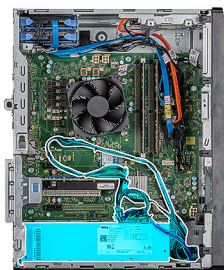
4



Installing power-supply unit with dual connector.



3x
6-32





Steps

1. Press and hold the securing tab on the chassis and slide the power-supply unit into the chassis until it snaps into position.
2. Replace the three (6-32) screws that secure the power-supply unit to the chassis.
3. Route the power cable through the routing guides on the chassis and connect the power cables to their respective connectors on the system board.
4. Connect the power cable to the power-supply unit.

Next steps

1. Install the [right-side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Heatsink assembly

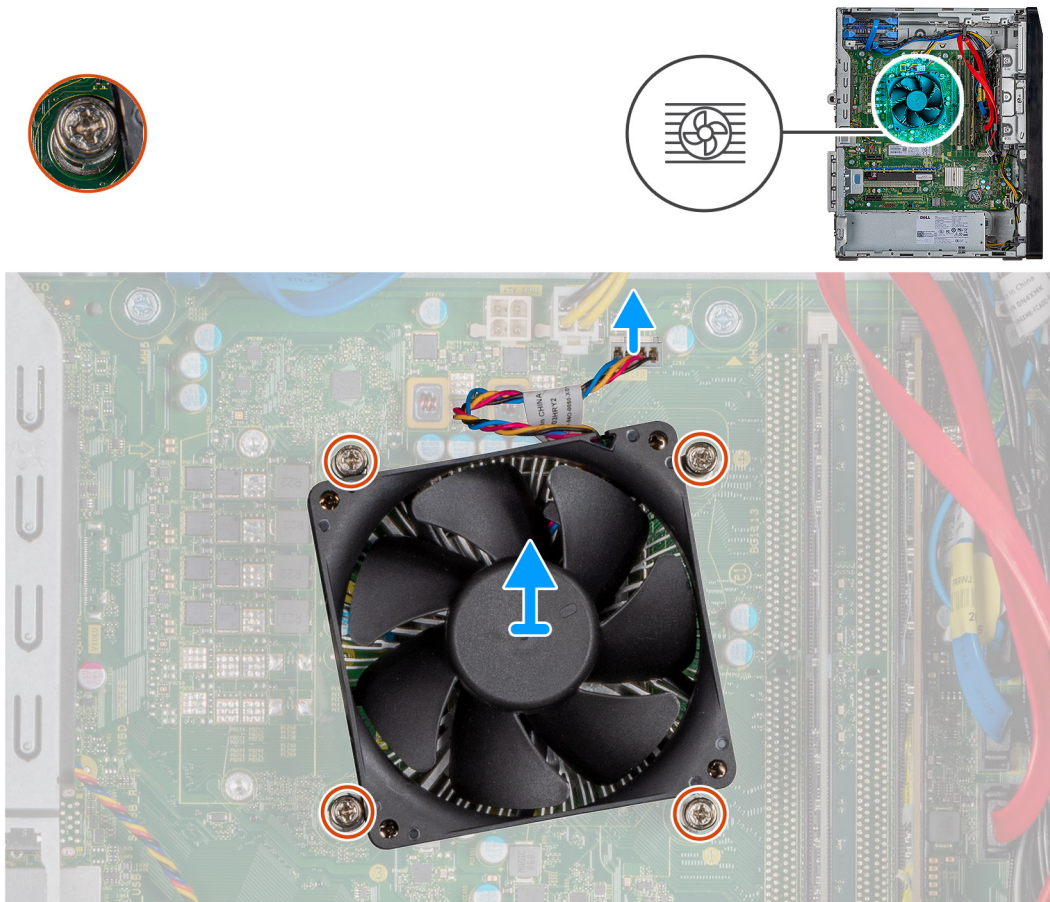
Removing the processor fan and heat-sink assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).

About this task

The following images indicate the location of the base cover and provide a visual representation of the removal procedure.



Steps

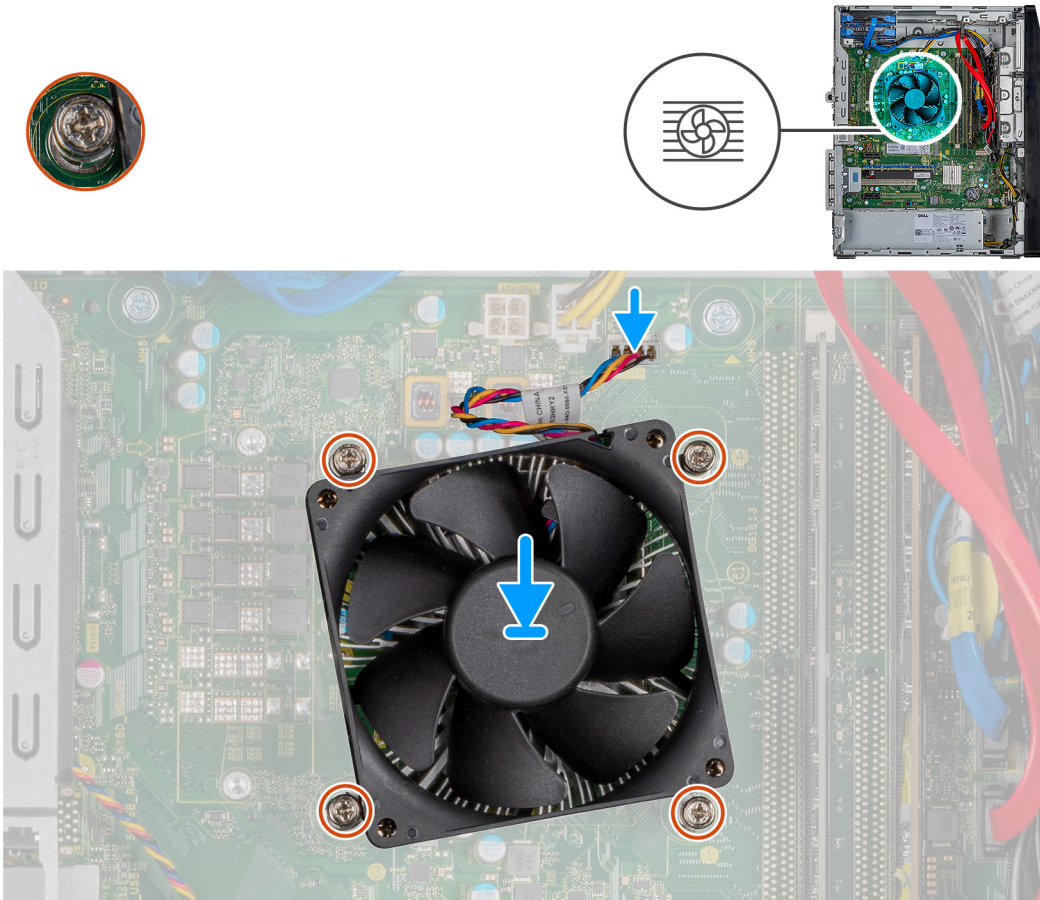
1. Locate the processor fan and heat-sink assembly on your computer.
2. Disconnect the processor-fan cable from the system board.
3. Loosen the captive screws that secure the processor fan and heat-sink assembly to the system board, as per the callout on the system board.
4. Lift the processor fan and heat-sink assembly off the system board.

Installing the processor fan and heat-sink assembly

Prerequisites

About this task

The following images indicate the location of the base cover and provide a visual representation of the installation procedure.



Steps

1. Align the screw holes on the processor fan and heat-sink assembly with the screw holes on the system board.
2. As per the callout on the system board, tighten the captive screws that secure the processor fan and heat-sink assembly to the system board.
3. Connect the processor-fan cable from the system board.

Next steps

1. Install the [right-side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Processor

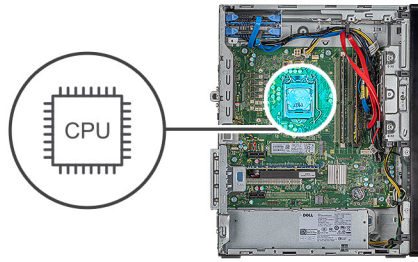
Removing the processor

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).
3. Remove the [processor fan and heat-sink assembly](#).

About this task

The following images indicate the location of the processor and provide a visual representation of the removal procedure.



Steps

1. Press the release lever down and then push it away from the processor to release it from the securing tab.
2. Extend the release lever completely and open the processor cover.

CAUTION: When removing the processor, do not touch any of the pins inside the socket or allow any objects to fall on the pins in the socket.

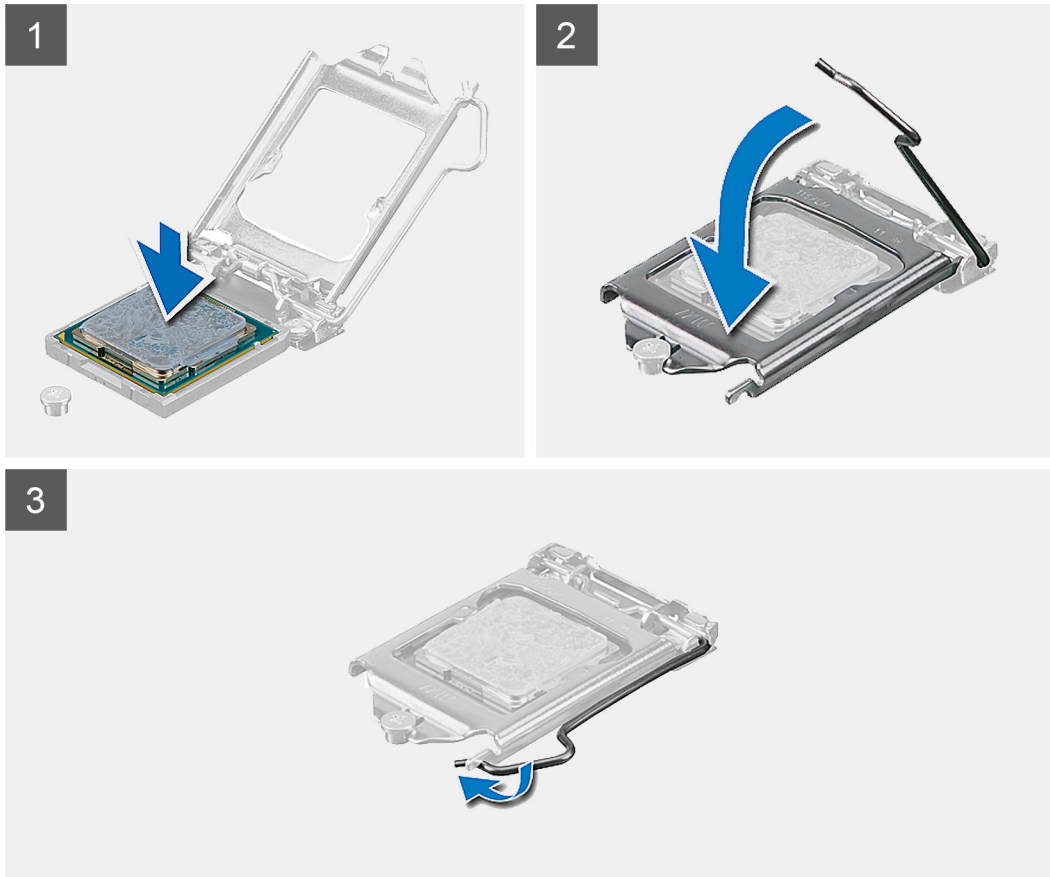
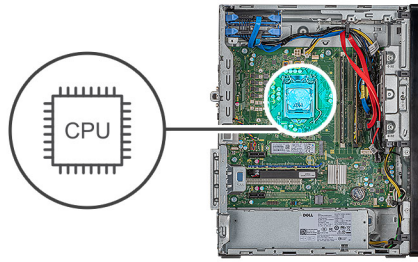
3. Gently lift the processor from the processor socket.

Installing the processor

Prerequisites

About this task

The following images indicate the location of the processor and provide a visual representation of the installation procedure.



Steps

1. Ensure that the release lever on the processor socket is fully extended in the open position.
2. Align the notches on the processor with the tabs on the processor socket and place the processor in the processor socket.

 **CAUTION:** Ensure that the processor-cover notch is positioned underneath the alignment post.

3. When the processor is fully seated in the socket, pivot the release-lever down and place it under the tab on the processor cover.

Next steps

1. Install the [processor fan and heat-sink assembly](#).
2. Install the [right-side cover](#).
3. Follow the procedure in [After working inside your computer](#).

System board

Removing the system board

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [right-side cover](#).
3. Remove the [wireless card](#).
4. Remove the [memory modules](#).
5. Remove the [solid-state drive/Intel Optane memory module](#).
6. Remove the [processor fan and heat-sink assembly](#).
7. Remove the [processor](#).

About this task

The following images indicate the location of the system board and provide a visual representation of the removal procedure.



1x
6-32

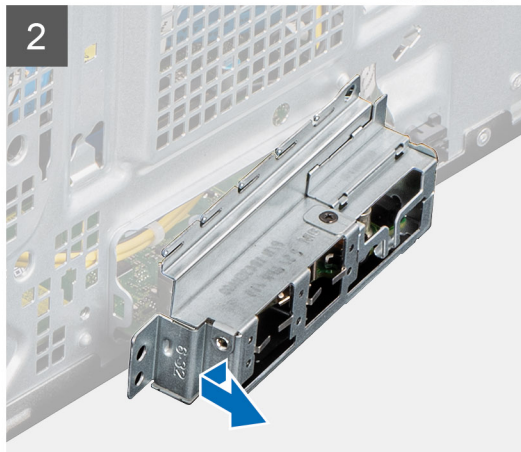
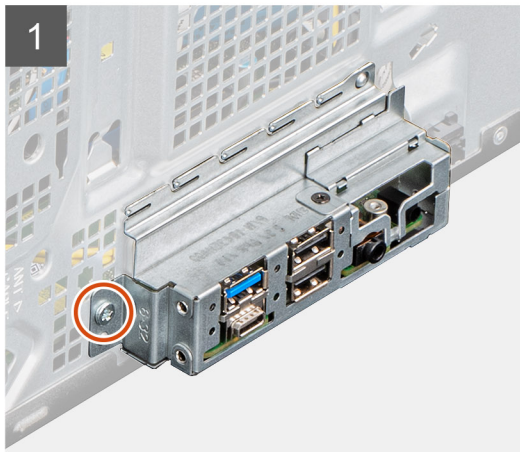
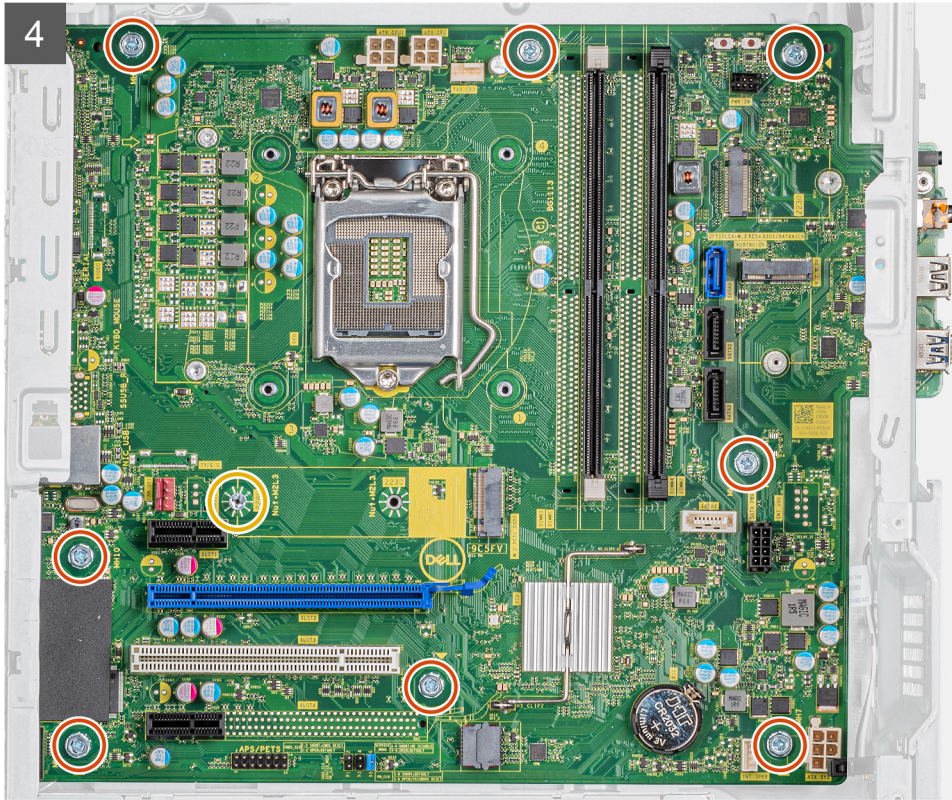
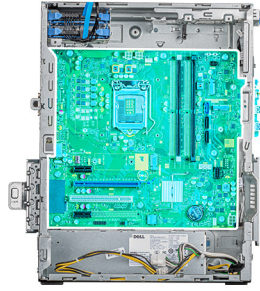
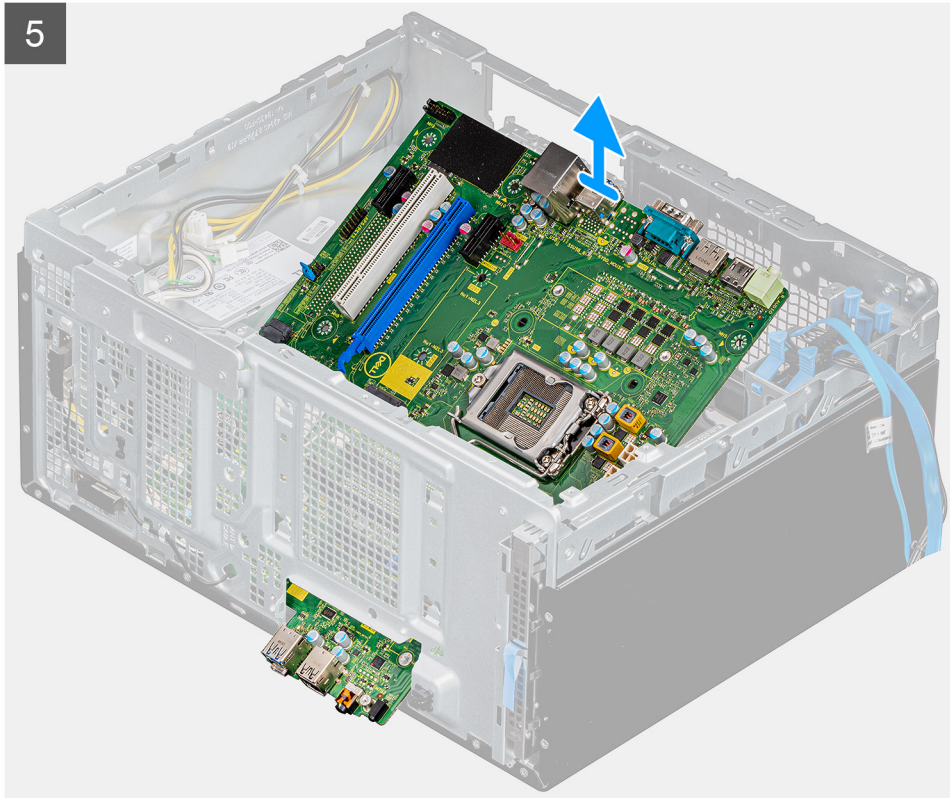
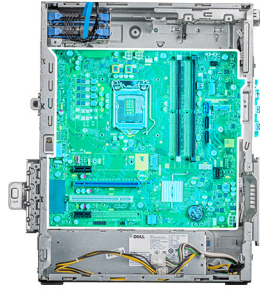


Figure 3 shows the internal view of the Dell Latitude 5420 laptop. The battery cover is being removed, as indicated by the blue arrows. The cover is lifted away from the mainboard, revealing the internal components. The battery cover is shown at the bottom of the image, with the word "PUSH" visible on its side. The mainboard is green and features various components, including the CPU, RAM, and storage. The battery is a large, black, rectangular unit located at the bottom of the laptop. The Dell logo is visible on the bottom of the laptop chassis.





Steps

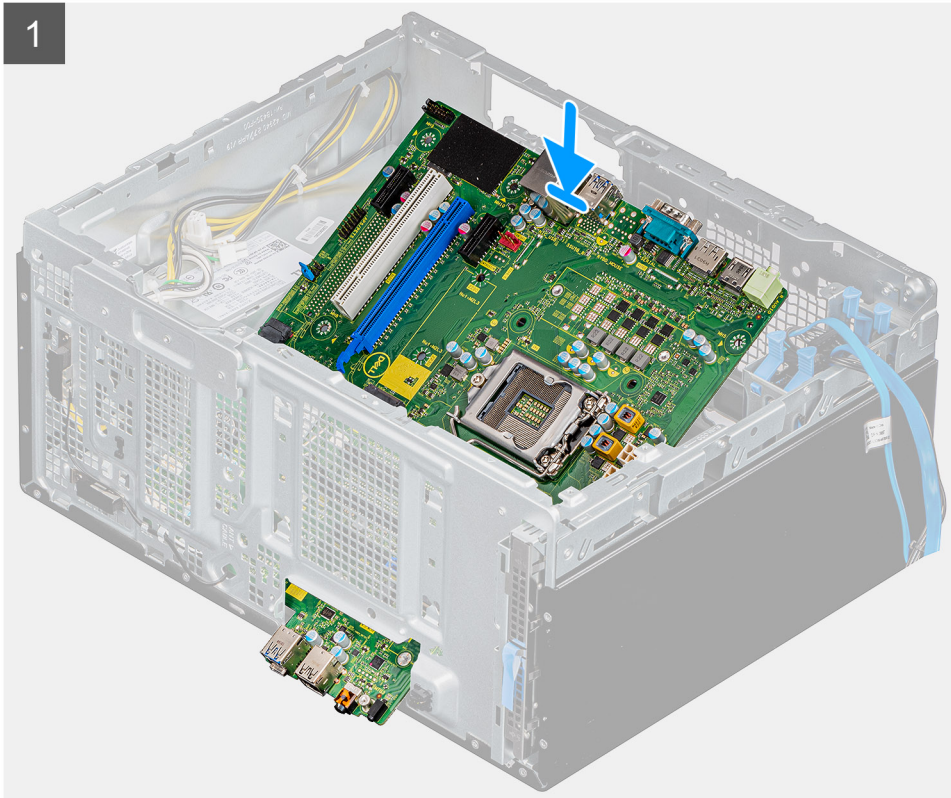
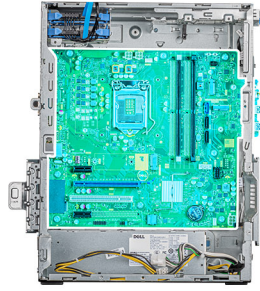
1. Lay the computer on the right side.
2. Remove the single (6-32) screw that secures the ports bezel to the chassis.
3. Disconnect all the cables connected to the system board.
4. Remove the eight screws (6-32) and that secure the system board to the chassis.
5. Remove the single (M2x4) screw and that secures the system board to the chassis.
6. Lift the system board at an angle to release the ports and remove the system board off the chassis.

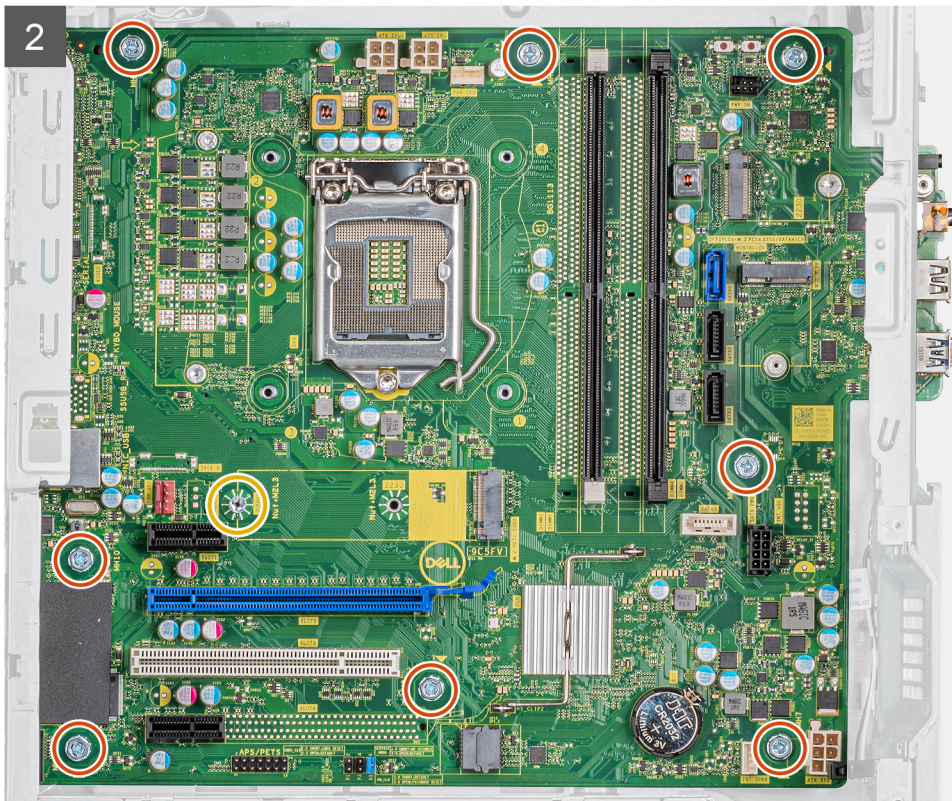
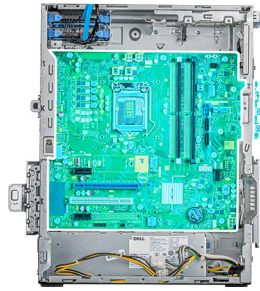
Installing the system board

Prerequisites

About this task

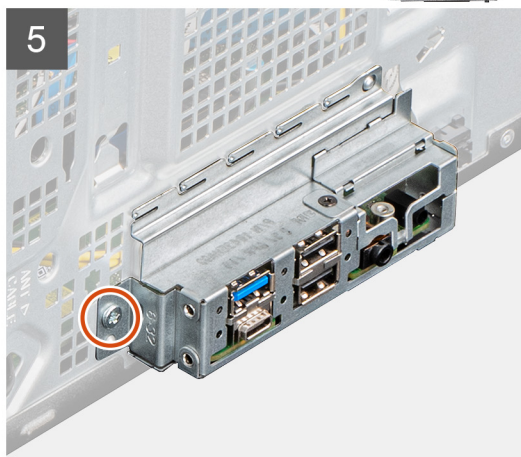
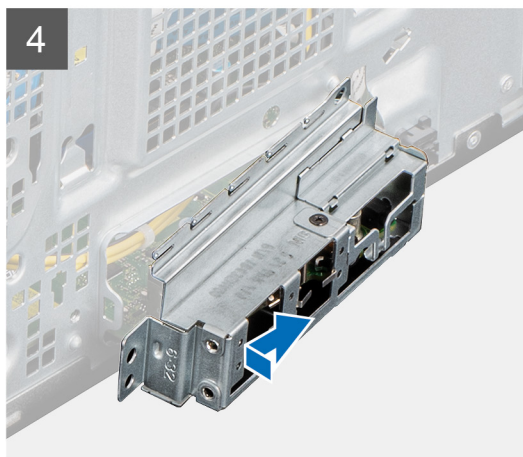
The following images indicate the location of the system board and provide a visual representation of the installation procedure.







1x
6-32



Steps

1. Align the ports on the system board with the slots on the chassis and align the system board in place.
2. Replace the single (M2x4) screw that secures the system board to the chassis.
3. Replace the eight (6-32) screws that secure the system board to the chassis.
4. Route and connect all the cables that you disconnected from the system board .
5. Align the screw holes on the ports bezel with the screw holes on the chassis.
6. Replace the single (6-32) screw that secures the ports bezel to the chassis.

Next steps

1. Install the [processor](#).
2. Install the [processor fan and heat-sink assembly](#).
3. Install the [memory module](#).
4. Install the [wireless card](#).
5. Install the [solid-state drive/Intel Optane memory module](#).
6. Install the [right-side cover](#).
7. Follow the procedure in [After working inside your computer](#).

System setup

System setup enables you to manage your desktop 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 performance and power management thresholds
- Manage your computer security

Topics:

- [Accessing System Setup](#)
- [Navigation Keys](#)
- [System setup options](#)
- [Updating the BIOS in Windows](#)
- [Updating your system BIOS using a USB flash drive](#)
- [System and setup password](#)

Accessing System Setup

Steps

1. Turn on (or restart) your computer.
2. After the white Dell logo appears, press F2 immediately.

The System Setup page is displayed.

 **NOTE:** If you wait too long and the operating system logo appears, wait until you see the desktop. Then, shut down or restart your computer and try again.

 **NOTE:** After the Dell logo appears, you can also press F12 and then select **BIOS setup**.

Navigation Keys

The following table displays the system setup navigation keys.

 **NOTE:** For most of the system setup options, changes that you make are recorded but do not take effect until you re-start the system.

Table 2. Navigation Keys

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
<Enter>	Allows you to select a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
<Tab>	Moves to the next focus area.  NOTE: For the standard graphics browser only.
<Esc>	Moves to the previous page till 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.

Table 2. Navigation Keys (continued)

Keys	Navigation
<F1>	Displays the System Setup help file.

System setup options

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

General screen options

This section lists the primary hardware features of your computer.

Option	Description
System Information	• System Information: Displays BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date, and the Express Service Code. • Memory Information: Displays Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology, DIMM A1 Size, DIMM B 2Size. • Processor Information: Displays Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable, and 64-Bit technology. • Device Information: Displays Primary Hard Drive, SATA-0SATA-0, SATA-1, SATA-2, SATA-3, LOM MAC Address, Video Controller, Audio Controller, WiFi Device, M.2PCIe SSD-0, Bluetooth Device.
Boot Sequence	Boot Sequence Allows you to change the order in which the computer attempts to find an operating system. The options are: • Windows Boot Manager • Onboard NIC(IPV4) • Oboard NIC(IPV6) By default, all the options are checked. You can also deselect any option or change the boot order.
UEFI Boot Path Security	This options control whether or not the system will prompt the user to enter the Admin password (if set) when booting a UEFI boot path from the F12 Boot Menu • Always Except Internal HDD (default) • Always • Never
Date/Time	Allows you to change the date and time.

System Configuration screen options

Option	Description
Integrated NIC	Allows you to configure the integrated network controller. The options are: • Disabled • Enabled • Enabled w/PXE: This option is enabled by default.
SATA Operation	Allows you to configure the internal SATA hard-drive controller. The options are: • Disabled • AHCI • RAID On(default)

Option	Description
Drives	Allows you to configure the SATA drives on board. All drives are enabled by default. The options are: • SATA-0 • SATA-1 • SATA-2 • SATA-3 • M.2 PCIe SSD-2
SMART Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. This technology is part of the SMART (Self-Monitoring Analysis and Reporting Technology) specification. This option is disabled by default. • Enable SMART Reporting
USB Configuration	This field configures the integrated USB controller. If Boot Support is enabled, the system is allowed to boot any type of USB Mass Storage Devices (HDD, memory key, floppy). If USB port is enabled, device attached to this port is enabled and available for OS. If USB port is disabled, the OS cannot see any device attached to this port. • Enable USB Boot Support (default) • Enable Front USB Ports(default) • Enable Rear USB Ports (default)  NOTE: USB keyboard and mouse always work in the BIOS setup irrespective of these settings.
Front USB Configuration	This field enables or disables the front USB configuration • Front Port 1 (Bottom Right)*: This option is enabled by default. • Front Port 2 (Bottom Left)*: This option is enabled by default. • Front Port 1 with Power Share (Top Right) • Front Port 2 (Top Left) * denotes a USB 3.0-capable port
Rear USB Configuration	This field enables or disables the rear USB configuration • Rear Port 1 (Bottom Right) • Rear Port 2 (Bottom Left) • Rear Port 3 (Top Left) • Rear Port 4 (Top Right) * denotes a USB 3.0-capable port
Audio	This field enables or disables the integrated audio controller. By default, the Enable Audio option is selected. The options are: • Enable Microphone: This option is enabled by default.
Miscellaneous Devices	Allows you to enable or disable the following devices: • Enable PCI Slot • Enabled Secure Digital (SD) Card (default)  NOTE: All devices are enabled by default.

Security screen options

Option	Description
Admin Password	Allows you to set, change, or delete the administrator (admin) password.  NOTE: You must set the admin password before you set the system or hard drive password. Deleting the admin password automatically deletes the system password and the hard drive password.

Option	Description
	 NOTE: Successful password changes take effect immediately. Default setting: Not set
System Password	Allows you to set, change, or delete the system password.  NOTE: Successful password changes take effect immediately. Default setting: Not set
Internal HDD-0 Password	Allows you to set, change, or delete the password on the system's internal hard-disk drive.  NOTE: Successful password changes take effect immediately. Default Setting: Not set
Internal HDD-1 Password	Allows you to set, change, or delete the password on the system's internal hard-disk drive.  NOTE: Successful password changes take effect immediately. Default Setting: Not set
Internal HDD-3 Password	Allows you to set, change, or delete the password on the system's internal hard-disk drive.  NOTE: Successful password changes take effect immediately. Default Setting: Not set
Password Change	Allows you to enable the disable permission to the System and Hard Drive passwords when the admin password is set. Default setting: Allow Non-Admin Password Changes is selected.
UEFI Capsule Firmware Update	This option controls whether the system allows the BIOS updates through UEFI capsule update packages. This option is enabled by default.
TPM 2.0 Security	Allows you to enable the Trusted Platform Module (TPM) during POST. The options are: • TPM On (enabled by default) • Clear • PPI Bypass for Enabled Commands • PPI Bypass for Disabled Commands • PPI Bypass for Clear Command • Attestation Enable (enabled by default) • Key Storage Enable (enabled by default) • SHA-256 (enabled by default) • Disabled • Enabled (enabled by default)
PTT Security	Allows you to enable the Platform Trust Technology feature (PTT). The option is: • PTT On (not enabled)
Absolute(R)	Allows you to activate or disable the optional Computrace software. The options are: • Deactivate • Disable • Permanently Disabled  NOTE: The Activate and Disable options will permanently activate or disable the feature and no further changes are allowed Default setting: Deactivate
Master Password Lockout	The option Enable Master Password Lockout is not selected by default.
SMM Security Mitigation	Allows you to enable or disable the additional UEFI SMM Security Mitigation protections.

Option	Description
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Default Setting: SMM Security Mitigation is not selected.

Video screen options

Option	Description
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Multi-Display	This option enables or disables Multi-Display. It should be enabled for Windows 7 or later. This feature is not applicable to other operating systems.
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- **Enable Multi-Display:** This option is enabled by default.

Primary Display	This option determines which video controller becomes the primary display when multiple controllers are available in the system
------------------------	---

- **Auto:** This option is enabled by default.
- Intel HD Graphics
- NVIDIA HD Graphics

Secure Boot screen options

Option	Description
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Secure Boot Enable	This option enables or disables the Secure Boot feature.
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Default setting: Not selected

Secure Boot Mode	• Deployed Mode (default) • Audit Mode
-------------------------	---

Expert Key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The Enable Custom Mode option is disabled by default. The options are:
------------------------------	---

- **PK** (default)
- KEK
- db
- dbx

If you enable the **Custom Mode**, the relevant options for **PK, KEK, db, and dbx** appear. The options are:

- **Save to File**—Saves the key to a user-selected file.
- **Replace from File**—Replaces the current key with a key from a user-selected file.
- **Append from File**—Adds a key to the current database from a user-selected file
- **Delete**—Deletes the selected key
- **Reset All Keys**—Resets to default setting
- **Delete All Keys**—Deletes all the keys

 **NOTE:** If you disable the **Custom Mode**, all the changes made are erased and the keys restore to default settings.

Intel Software Guard Extensions screen options

Option	Description
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Intel SGX Enable	This field specifies you to provide a secured environment for running code/storing sensitive information in the context of the main OS. The options are:
-------------------------	--

- Disabled
- Enabled

Option	Description
	• Software Controlled (default)
Enclave Memory Size	This option sets SGX Enclave Reserve Memory Size. The options are: • 32 MB • 64 MB • 128 MB

Performance screen options

Option	Description
Multi Core Support	This field specifies whether the process has one or all cores enabled. The performance of some applications improve with the additional cores. This option is enabled by default. Allows you to enable or disable multi-core support for the processor. The installed processor supports two cores. If you enable Multi Core Support, two cores are enabled. If you disable Multi Core Support, one core is enabled. • All (enabled by default) • 1 • 2 • 3
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep feature. Enable Intel SpeedStep Default setting: The option is enabled.
C-States Control	Allows you to enable or disable the additional processor sleep states. C states Default setting: The option is enabled.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. Enable Intel TurboBoost (default)

Power Management screen options

Option	Description
AC Recovery	Allows you to enable or disable the computer from turning on automatically when an AC adapter is restored. • Power Off (default) • Power On • Last Power State
Enable Intel Speed Shift Technology	This option is used to enable or disable the Intel speed shift technology support. The option is enabled by default.
Auto On Time	Allows you to set the time at which the computer must turn on automatically. The options are: • Disabled • Every Day • Weekdays • Select Days Default setting: Disabled
Deep Sleep Control	Allows you to aggressive the system is at conserving power while Shut down (S5) or in Hibernate (S4) mode.

Option	Description
	• Disabled • Enabled in S5 only • Enabled in S4 and S5 (default)
USB Wake Support	Allows you to enable USB devices to wake the system from Standby. • Enable USB Wake Support Default setting: The option is enabled..
Wake on LAN/WLAN	Allows you to enable or disable the feature that powers on the computer from the Off state when triggered by a LAN signal. • Disabled: This option is enabled by default. • LAN Only • WLAN Only • LAN or WLAN • LAN with PXE Boot
Block Sleep	This option lets you block entering to sleep (S3 state) in operating system environment. Block Sleep (S3 state) Default setting: This option is disabled

POST Behavior screen options

Option	Description
Numlock LED	This option specifies whether the NumLock LED should be on when the system boots. • Enable Numlock LED: The option is enabled.
Keyboard Errors	This option option specifies whether the keyboard related errors are reported when it boots. • Enables Keyboard Error Detection: The option is enabled by default.
Fastboot	Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are: • Minimal • Thorough (default) • Auto
Extend BIOS POST Time	This option created an additional pre-boot delay. • 0 seconds (default) • 5 seconds • 10 seconds
Full Screen Logo	. This option displays full screen logo if your image match screen resolution. The option Enable Full Screen Logo is not selected by default.
Warnings and Errors	• Prompt on Warnings and Errors (default) • Continue on Warnings • Continue on Warnings and Errors

Virtualization support screen options

Option	Description
Virtualization	Allows you to enable or disable the Intel Virtualization Technology. Enable Intel Virtualization Technology (default).

Option	Description
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel® Virtualization technology for direct I/O. Enable VT for Direct I/O - enabled by default.

Wireless screen options

Option	Description
Wireless Device Enable	Allows you to enable or disable internal wireless devices. • WLAN/WiGig (default) • Bluetooth (default)

Advanced configuration options

Option	Description
ASPM	Allows you to set the ASPM level. • Auto (default) • Disabled • L1 Only

Maintenance screen options

Option	Description
Service Tag	Displays the Service Tag of your computer.
Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.
SERR Messages	This field controls the SERR message mechanism. Some graphic card required the SERR message. • Enable SERR Messages (default)
BIOS Downgrade	This field controls flashing of the system firmware to pervious revisions. Allows BIOS Downgrade (Enabled by default)
Data Wipe	This field enables user to erase data from all internal storage device.
BIOS Recovery	Allows you to recover from certain corrupted BIOS conditions from a recover file on the user primary hard drive. Enabled by default.

System Log screen options

Option	Description
BIOS Events	Allows you to view and clear the System Setup (BIOS) POST events.

SupportAssist System Resolution

Option	Description
Auto OS Recovery Threshold	Allows you to control the automatic boot flow for SupportAssist System. Options are: • Off • 1 • 2 (Enabled by default) • 3
SupportAssist OS Recovery	Allows you to recover the SupportAssist OS Recovery (Disabled by default)

Updating the BIOS in Windows

Prerequisites

It is recommended to update your BIOS (System Setup) when you replace the system board or if an update is available.

About this task

 **NOTE:** If BitLocker is enabled, it must be suspended prior to updating the system BIOS, and then re enabled after the BIOS update is completed.

Steps

1. Restart the computer.
2. Go to **Dell.com/support**.
 - Enter the **Service Tag** or **Express Service Code** and click **Submit**.
 - Click **Detect Product** and follow the instructions on screen.
3. If you are unable to detect or find the Service Tag, click **Choose from all products**.
4. Choose the **Products** category from the list.

 **NOTE:** Choose the appropriate category to reach the product page.
5. Select your computer model and the **Product Support** page of your computer appears.
6. Click **Get drivers** and click **Drivers and Downloads**.
The Drivers and Downloads section opens.
7. Click **Find it myself**.
8. Click **BIOS** to view the BIOS versions.
9. Identify the latest BIOS file and click **Download**.
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 computer.
12. Click **Run** to install the updated BIOS settings on your computer.
Follow the instructions on the screen.

Updating your system BIOS using a USB flash drive

About this task

If the system cannot load into Windows, but there is still a need to update the BIOS, download the BIOS file using another system and save it to a bootable USB Flash Drive.

 **NOTE:** You will need to use a bootable USB flash drive. Please refer to the following article for further details [How to Create a Bootable USB Flash Drive using Dell Diagnostic Deployment Package \(DDDP\)](#)

Steps

1. Download the BIOS update .EXE file to another system.
2. Copy the file e.g. O9010A12.EXE onto the bootable USB flash drive.
3. Insert the USB flash drive into the system that requires the BIOS update.
4. Restart the system and press F12 when the Dell splash logo appears to display the One Time Boot Menu.
5. Using arrow keys, select **USB Storage Device** and click **Enter**.
6. The system will boot to a Diag C:\> prompt.
7. Run the file by typing the full filename, for example, O9010A12.exe and press **Enter**.
8. The BIOS Update Utility will load. Follow the instructions on screen.

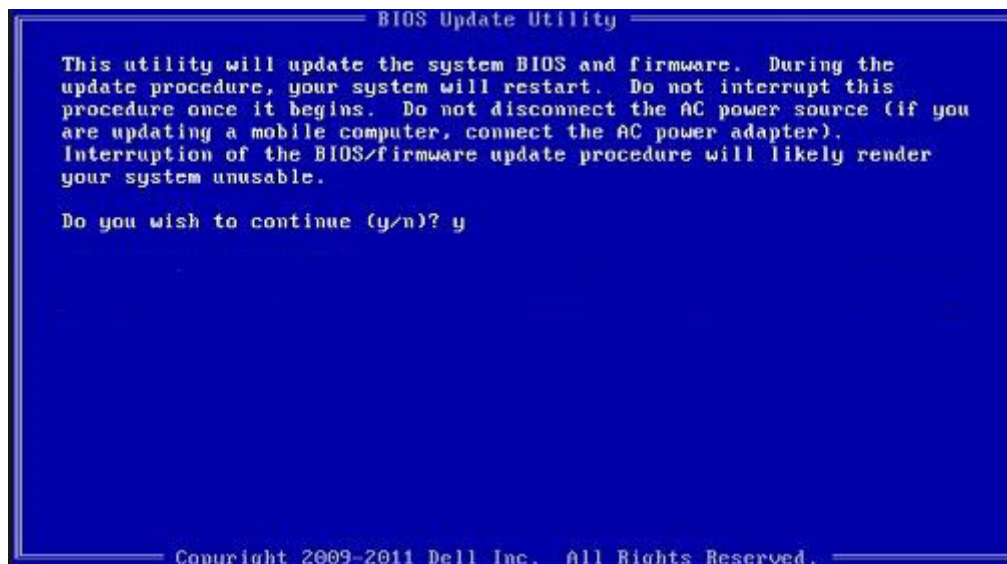


Figure 1. DOS BIOS Update Screen

System and setup password

Table 3. System and setup password

Password type	Description
System password	Password that you must enter to log on to your system.
Setup password	Password that you must enter to access and make changes to the BIOS settings of your computer.

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

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

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

NOTE: System and setup password feature is disabled.

Assigning a system setup password

Prerequisites

You can assign a new **System or Admin Password** only when the status is in **Not Set**.

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 **Security** and press **Enter**.
The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
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, ("), (+), (.), (-), (/), (:), ([), (\), (]), (`).
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press **Esc** and a message prompts you to save the changes.
5. Press **Y** to save the changes.
The computer reboots.

Deleting or changing an existing system setup password

Prerequisites

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and 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 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 computer restarts.

Troubleshooting

Topics:

- [System diagnostic lights](#)
- [Diagnostic error messages](#)
- [Diagnostic error messages](#)
- [System error messages](#)
- [WiFi power cycle](#)

System diagnostic lights

Power-supply diagnostics light

Indicates the power-supply state.

Hard-drive activity light

Turns on when the computer reads from or writes to the hard drive.

Table 4. LED codes

Diagnostic light codes	Problem description
1,2	Unrecoverable SPI flash failure
2,1	CPU failure
2,2	System board failure, corrupt BIOS, ROM error
2,3	No memory/RAM detected
2,4	Memory/RAM failure
2,5	Invalid Memory installed
2,6	System board error, chipset error, clock failure, gate A20 failure, super I/O failure, keyboard controller failure
3,1	CMOS battery failure
3,2	PCIe or video card/chip failure
3,3	Recovery Image not found
3,4	Recovery Image found but invalid
3,5	Power Rail Failure
3,6	Bad SPI volume error
3,7	Intel ME (Management Engine) error
4,2	CPU power cable connection issue

Diagnostic error messages

Table 5. Diagnostic error messages

Error messages	Description
AUXILIARY DEVICE FAILURE	The touchpad or external mouse may be faulty. For an external mouse, check the cable connection. Enable the Pointing Device option in the System Setup program.
BAD COMMAND OR FILE NAME	Ensure that you have spelled the command correctly, put spaces in the proper place, and used the correct path name.
CACHE DISABLED DUE TO FAILURE	The primary cache internal to the microprocessor has failed. Contact Dell
CD DRIVE CONTROLLER FAILURE	The optical drive does not respond to commands from the computer.
DATA ERROR	The hard drive cannot read the data.
DECREASING AVAILABLE MEMORY	One or more memory modules may be faulty or improperly seated. Reinstall the memory modules or, if necessary, replace them.
DISK C: FAILED INITIALIZATION	The hard drive failed initialization. Run the hard drive tests in Dell Diagnostics .
DRIVE NOT READY	The operation requires a hard drive in the bay before it can continue. Install a hard drive in the hard drive bay.
ERROR READING PCMCIA CARD	The computer cannot identify the ExpressCard. Reinsert the card or try another card.
EXTENDED MEMORY SIZE HAS CHANGED	The amount of memory recorded in non-volatile memory (NVRAM) does not match the memory module installed in the computer. Restart the computer. If the error appears again, Contact Dell
THE FILE BEING COPIED IS TOO LARGE FOR THE DESTINATION DRIVE	The file that you are trying to copy is too large to fit on the disk, or the disk is full. Try copying the file to a different disk or use a larger capacity disk.
A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ / : * ? " < > -	Do not use these characters in filenames.
GATE A20 FAILURE	A memory module may be loose. Reinstall the memory module or, if necessary, replace it.
GENERAL FAILURE	The operating system is unable to carry out the command. The message is usually followed by specific information. For example, Printer out of paper. Take the appropriate action.
HARD-DISK DRIVE CONFIGURATION ERROR	The computer cannot identify the drive type. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE CONTROLLER FAILURE 0	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE FAILURE	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive,

Table 5. Diagnostic error messages (continued)

Error messages	Description
	and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE READ FAILURE	The hard drive may be defective. Shut down the computer, remove the hard drive, and boot the computer from an optical. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
INSERT BOOTABLE MEDIA	The operating system is trying to boot to non-bootable media, such as an optical drive. Insert bootable media.
INVALID CONFIGURATION INFORMATION-PLEASE RUN SYSTEM SETUP PROGRAM	The system configuration information does not match the hardware configuration. The message is most likely to occur after a memory module is installed. Correct the appropriate options in the system setup program.
KEYBOARD CLOCK LINE FAILURE	For external keyboards, check the cable connection. Run the Keyboard Controller test in Dell Diagnostics .
KEYBOARD CONTROLLER FAILURE	For external keyboards, check the cable connection. Restart the computer, and avoid touching the keyboard or the mouse during the boot routine. Run the Keyboard Controller test in Dell Diagnostics .
KEYBOARD DATA LINE FAILURE	For external keyboards, check the cable connection. Run the Keyboard Controller test in Dell Diagnostics .
KEYBOARD STUCK KEY FAILURE	For external keyboards or keypads, check the cable connection. Restart the computer, and avoid touching the keyboard or keys during the boot routine. Run the Stuck Key test in Dell Diagnostics .
LICENSED CONTENT IS NOT ACCESSIBLE IN MEDIADIRECT	Dell MediaDirect cannot verify the Digital Rights Management (DRM) restrictions on the file, so the file cannot be played.
MEMORY ADDRESS LINE FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY ALLOCATION ERROR	The software you are attempting to run is conflicting with the operating system, another program, or a utility. Shut down the computer, wait for 30 seconds, and then restart it. Run the program again. If the error message still appears, see the software documentation.
MEMORY DOUBLE WORD LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY ODD/EVEN LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY WRITE/READ FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
NO BOOT DEVICE AVAILABLE	The computer cannot find the hard drive. If the hard drive is your boot device, ensure that the drive is installed, properly seated, and partitioned as a boot device.
NO BOOT SECTOR ON HARD DRIVE	The operating system may be corrupted, Contact Dell .
NO TIMER TICK INTERRUPT	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics .

Table 5. Diagnostic error messages (continued)

Error messages	Description
NOT ENOUGH MEMORY OR RESOURCES. EXIT SOME PROGRAMS AND TRY AGAIN	You have too many programs open. Close all windows and open the program that you want to use.
OPERATING SYSTEM NOT FOUND	Reinstall the operating system. If the problem persists, Contact Dell .
OPTIONAL ROM BAD CHECKSUM	The optional ROM has failed. Contact Dell .
SECTOR NOT FOUND	The operating system cannot locate a sector on the hard drive. You may have a defective sector or corrupted File Allocation Table (FAT) on the hard drive. Run the Windows error-checking utility to check the file structure on the hard drive. See Windows Help and Support for instructions (click Start > Help and Support). If a large number of sectors are defective, back up the data (if possible), and then format the hard drive.
SEEK ERROR	The operating system cannot find a specific track on the hard drive.
SHUTDOWN FAILURE	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics . If the message reappears, Contact Dell .
TIME-OF-DAY CLOCK LOST POWER	System configuration settings are corrupted. Connect your computer to an electrical outlet to charge the battery. If the problem persists, try to restore the data by entering the System Setup program, then immediately exit the program. If the message reappears, Contact Dell .
TIME-OF-DAY CLOCK STOPPED	The reserve battery that supports the system configuration settings may require recharging. Connect your computer to an electrical outlet to charge the battery. If the problem persists, Contact Dell .
TIME-OF-DAY NOT SET-PLEASE RUN THE SYSTEM SETUP PROGRAM	The time or date stored in the system setup program does not match the system clock. Correct the settings for the Date and Time options.
TIMER CHIP COUNTER 2 FAILED	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics .
UNEXPECTED INTERRUPT IN PROTECTED MODE	The keyboard controller may be malfunctioning, or a memory module may be loose. Run the System Memory tests and the Keyboard Controller test in Dell Diagnostics or Contact Dell .
X:\ IS NOT ACCESSIBLE. THE DEVICE IS NOT READY	Insert a disk into the drive and try again.

Diagnostic error messages

Table 6. Diagnostic error messages

Error messages	Description
AUXILIARY DEVICE FAILURE	The touchpad or external mouse may be faulty. For an external mouse, check the cable connection. Enable the Pointing Device option in the System Setup program.
BAD COMMAND OR FILE NAME	Ensure that you have spelled the command correctly, put spaces in the proper place, and used the correct path name.

Table 6. Diagnostic error messages (continued)

Error messages	Description
CACHE DISABLED DUE TO FAILURE	The primary cache internal to the microprocessor has failed. Contact Dell
CD DRIVE CONTROLLER FAILURE	The optical drive does not respond to commands from the computer.
DATA ERROR	The hard drive cannot read the data.
DECREASING AVAILABLE MEMORY	One or more memory modules may be faulty or improperly seated. Reinstall the memory modules or, if necessary, replace them.
DISK C: FAILED INITIALIZATION	The hard drive failed initialization. Run the hard drive tests in Dell Diagnostics .
DRIVE NOT READY	The operation requires a hard drive in the bay before it can continue. Install a hard drive in the hard drive bay.
ERROR READING PCMCIA CARD	The computer cannot identify the ExpressCard. Reinsert the card or try another card.
EXTENDED MEMORY SIZE HAS CHANGED	The amount of memory recorded in non-volatile memory (NVRAM) does not match the memory module installed in the computer. Restart the computer. If the error appears again, Contact Dell
THE FILE BEING COPIED IS TOO LARGE FOR THE DESTINATION DRIVE	The file that you are trying to copy is too large to fit on the disk, or the disk is full. Try copying the file to a different disk or use a larger capacity disk.
A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ / : * ? " < > -	Do not use these characters in filenames.
GATE A20 FAILURE	A memory module may be loose. Reinstall the memory module or, if necessary, replace it.
GENERAL FAILURE	The operating system is unable to carry out the command. The message is usually followed by specific information. For example, <i>Printer out of paper</i> . Take the appropriate action.
HARD-DISK DRIVE CONFIGURATION ERROR	The computer cannot identify the drive type. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE CONTROLLER FAILURE 0	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE FAILURE	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE READ FAILURE	The hard drive may be defective. Shut down the computer, remove the hard drive, and boot the computer from an optical. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try

Table 6. Diagnostic error messages (continued)

Error messages	Description
	another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
INSERT BOOTABLE MEDIA	The operating system is trying to boot to non-bootable media, such as an optical drive. Insert bootable media.
INVALID CONFIGURATION INFORMATION-PLEASE RUN SYSTEM SETUP PROGRAM	The system configuration information does not match the hardware configuration. The message is most likely to occur after a memory module is installed. Correct the appropriate options in the system setup program.
KEYBOARD CLOCK LINE FAILURE	For external keyboards, check the cable connection. Run the Keyboard Controller test in Dell Diagnostics .
KEYBOARD CONTROLLER FAILURE	For external keyboards, check the cable connection. Restart the computer, and avoid touching the keyboard or the mouse during the boot routine. Run the Keyboard Controller test in Dell Diagnostics .
KEYBOARD DATA LINE FAILURE	For external keyboards, check the cable connection. Run the Keyboard Controller test in Dell Diagnostics .
KEYBOARD STUCK KEY FAILURE	For external keyboards or keypads, check the cable connection. Restart the computer, and avoid touching the keyboard or keys during the boot routine. Run the Stuck Key test in Dell Diagnostics .
LICENSED CONTENT IS NOT ACCESSIBLE IN MEDIADIRECT	Dell MediaDirect cannot verify the Digital Rights Management (DRM) restrictions on the file, so the file cannot be played.
MEMORY ADDRESS LINE FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY ALLOCATION ERROR	The software you are attempting to run is conflicting with the operating system, another program, or a utility. Shut down the computer, wait for 30 seconds, and then restart it. Run the program again. If the error message still appears, see the software documentation.
MEMORY DOUBLE WORD LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY ODD/EVEN LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY WRITE/READ FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
NO BOOT DEVICE AVAILABLE	The computer cannot find the hard drive. If the hard drive is your boot device, ensure that the drive is installed, properly seated, and partitioned as a boot device.
NO BOOT SECTOR ON HARD DRIVE	The operating system may be corrupted, Contact Dell.
NO TIMER TICK INTERRUPT	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics .
NOT ENOUGH MEMORY OR RESOURCES. EXIT SOME PROGRAMS AND TRY AGAIN	You have too many programs open. Close all windows and open the program that you want to use.
OPERATING SYSTEM NOT FOUND	Reinstall the operating system. If the problem persists, Contact Dell.
OPTIONAL ROM BAD CHECKSUM	The optional ROM has failed. Contact Dell.
SECTOR NOT FOUND	The operating system cannot locate a sector on the hard drive. You may have a defective sector or corrupted File Allocation Table (FAT) on the hard drive. Run the Windows

Table 6. Diagnostic error messages (continued)

Error messages	Description
	error-checking utility to check the file structure on the hard drive. See Windows Help and Support for instructions (click Start > Help and Support). If a large number of sectors are defective, back up the data (if possible), and then format the hard drive.
SEEK ERROR	The operating system cannot find a specific track on the hard drive.
SHUTDOWN FAILURE	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics . If the message reappears, Contact Dell.
TIME-OF-DAY CLOCK LOST POWER	System configuration settings are corrupted. Connect your computer to an electrical outlet to charge the battery. If the problem persists, try to restore the data by entering the System Setup program, then immediately exit the program. If the message reappears, Contact Dell.
TIME-OF-DAY CLOCK STOPPED	The reserve battery that supports the system configuration settings may require recharging. Connect your computer to an electrical outlet to charge the battery. If the problem persists, Contact Dell.
TIME-OF-DAY NOT SET-PLEASE RUN THE SYSTEM SETUP PROGRAM	The time or date stored in the system setup program does not match the system clock. Correct the settings for the Date and Time options.
TIMER CHIP COUNTER 2 FAILED	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics .
UNEXPECTED INTERRUPT IN PROTECTED MODE	The keyboard controller may be malfunctioning, or a memory module may be loose. Run the System Memory tests and the Keyboard Controller test in Dell Diagnostics or Contact Dell.
X:\ IS NOT ACCESSIBLE. THE DEVICE IS NOT READY	Insert a disk into the drive and try again.

System error messages

Table 7. System error messages

System message	Description
Alert! Previous attempts at booting this system have failed at checkpoint [nnnn]. For help in resolving this problem, please note this checkpoint and contact Dell Technical Support	The computer failed to complete the boot routine three consecutive times for the same error.
CMOS checksum error	RTC is reset, BIOS Setup default has been loaded.
CPU fan failure	CPU fan has failed.
System fan failure	System fan has failed.
Hard-disk drive failure	Possible hard disk drive failure during POST.
Keyboard failure	Keyboard failure or loose cable. If reseating the cable does not solve the problem, replace the keyboard.
No boot device available	No bootable partition on hard disk drive, the hard disk drive cable is loose, or no bootable device exists.

Table 7. System error messages (continued)

System message	Description
	• If the hard drive is your boot device, ensure that the cables are connected and that the drive is installed properly and partitioned as a boot device. • Enter system setup and ensure that the boot sequence information is correct.
No timer tick interrupt	A chip on the system board might be malfunctioning or motherboard failure.
NOTICE - Hard Drive SELF MONITORING SYSTEM has reported that a parameter has exceeded its normal operating range. Dell recommends that you back up your data regularly. A parameter out of range may or may not indicate a potential hard drive problem	S.M.A.R.T error, possible hard disk drive failure.

WiFi power cycle

About this task

If your computer is unable to access the internet due to WiFi connectivity issues a WiFi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a WiFi power cycle:

 **NOTE:** Some ISPs (Internet Service Providers) provide a modem/router combo device.

Steps

1. Turn off your computer.
2. Turn off the modem.
3. Turn off the wireless router.
4. Wait for 30 seconds.
5. Turn on the wireless router.
6. Turn on the modem.
7. Turn on your computer.

Getting help

Topics:

- [Contacting Dell](#)

Contacting Dell

Prerequisites

 **NOTE:** If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

About this task

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

Steps

1. Go to **Dell.com/support**.
2. Select your support category.
3. Verify your country or region in the **Choose a Country/Region** drop-down list at the bottom of the page.
4. Select the appropriate service or support link based on your need.