# Vostro 3710

## Service Manual

Regulatory Model: D17S
Regulatory Type: D17S003
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## 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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# 1

# Working inside your computer

## Before working inside your computer

**About this task**

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

**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.

   **CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.**

5. Remove any media card and optical disc from your computer, if applicable.

## Safety instructions

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 you have read the safety information that shipped with your computer.

**WARNING: Before working inside your computer, read the safety information that is shipped with your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.**

**WARNING: Disconnect your computer from 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 your computer to an electrical outlet.**

**CAUTION: To avoid damaging the computer, ensure that the work surface is flat, dry, and clean.**

**CAUTION: To avoid damaging the components and cards, handle them by their edges, and avoid touching the pins and the contacts.**

**CAUTION: You should only perform troubleshooting and repairs as authorized or directed by the Dell technical assistance team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. See the safety instructions that is shipped with the product or at www.dell.com/regulatory_compliance.**

**CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity which could harm internal components.**

**CAUTION: When you disconnect a cable, pull it by its connector or its pull tab, not the cable itself. Some cables have connectors with locking tabs or thumbscrews that you must disengage before disconnecting the cable.**

**When disconnecting cables, keep them evenly aligned to avoid bending the connector pins. When connecting cables, ensure that the ports and the connectors are correctly oriented and aligned.**

**CAUTION: Press and eject any installed card from the media-card reader.**

**CAUTION: Exercise caution when handling Lithium-ion batteries in laptops. Swollen batteries should not be used and should be replaced and disposed properly.**

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

# 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**

**CAUTION: 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.

2

# Removing and installing components

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

## Recommended tools

The procedures in this document may require the following tools:

- Philips screwdriver #1 and #2

## Screw list

**NOTE:** When removing screws from a component, it is recommended to note the screw type, the quantity of screws, and then place them in a screw storage box. This is to ensure that the correct number of screws and correct screw type is restored when the component is replaced.

**NOTE:** Some computers have magnetic surfaces. Ensure that the screws are not left attached to such surfaces when replacing a component.

**NOTE:** Screw color may vary with the configuration ordered.

**Table 1. Screw list**

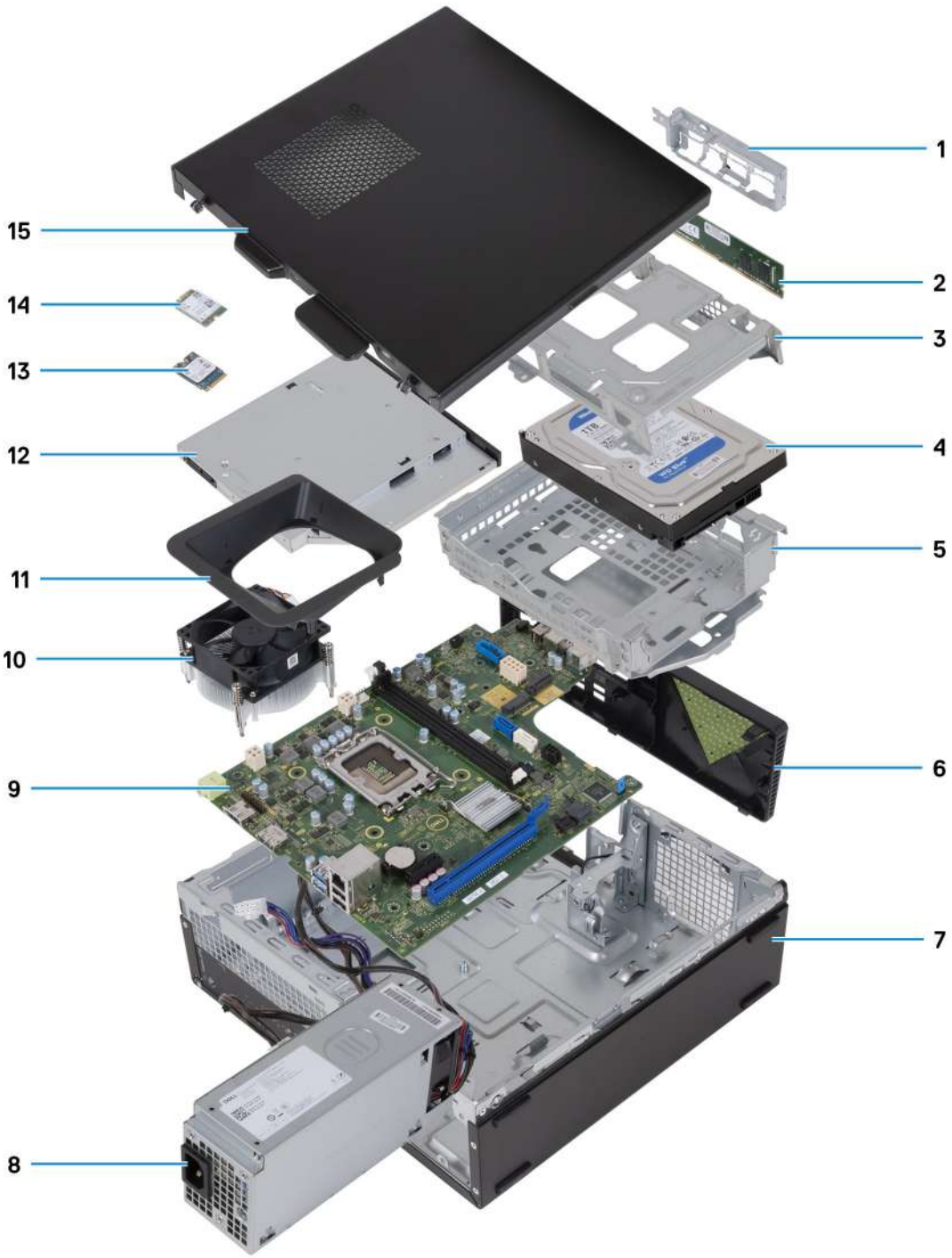
| Component | Secured to | Screw type | Quantity | Screw image |
|---|---|---|---|---|
| Left-side cover | Chassis | #6-32 | 2 | |
| 2230 solid-state drive | System board | M2x3.5 | 1 | |
| 2280 solid-state drive | System board | M2x3.5 | 1 | |
| Wireless card | System board | M2x4 | 1 | |
| 3.5-inch hard drive | Chassis | #6-32, pan head | 4 | |
| Power-supply unit | Chassis | #6-32, hex head | 3 | |
| Optical drive (optical) | Chassis | M2x2 | 2 | |
| Media-card reader (optical) | Chassis | M3x5 | 2 | |
| Front I/O-bracket | Chassis | #6-32, pan head | 2 | |

**Table 1. Screw list (continued)**

| Component | Secured to | Screw type | Quantity | Screw image |
|---|---|---|---|---|
| Processor fan and heat-sink assembly | System board | Captive (M3) | 4 | |
| System board | Chassis | #6-32, hex head | 8 | |
| System board | Chassis | #6-32x3.8 | 1 | |

# Major components of Vostro 3710

The following image shows the major components of Vostro 3710.




1. front-I/O bracket
2. memory module
3. hard-drive cage
4. hard drive
5. hard-drive and optical-drive bracket
6. front cover
7. chassis
8. power-supply unit
9. system board
10. fan and heat-sink assembly
11. fan shroud
12. optical drive (optional)

13. 2230 solid-state drive
14. wireless card
15. left-side cover

**NOTE:** Dell Technologies provides a list of components and their part numbers for the original system configuration purchased. These parts are available according to warranty coverages purchased by the customer. Contact your Dell sales representative for purchase options.

# Left-side cover

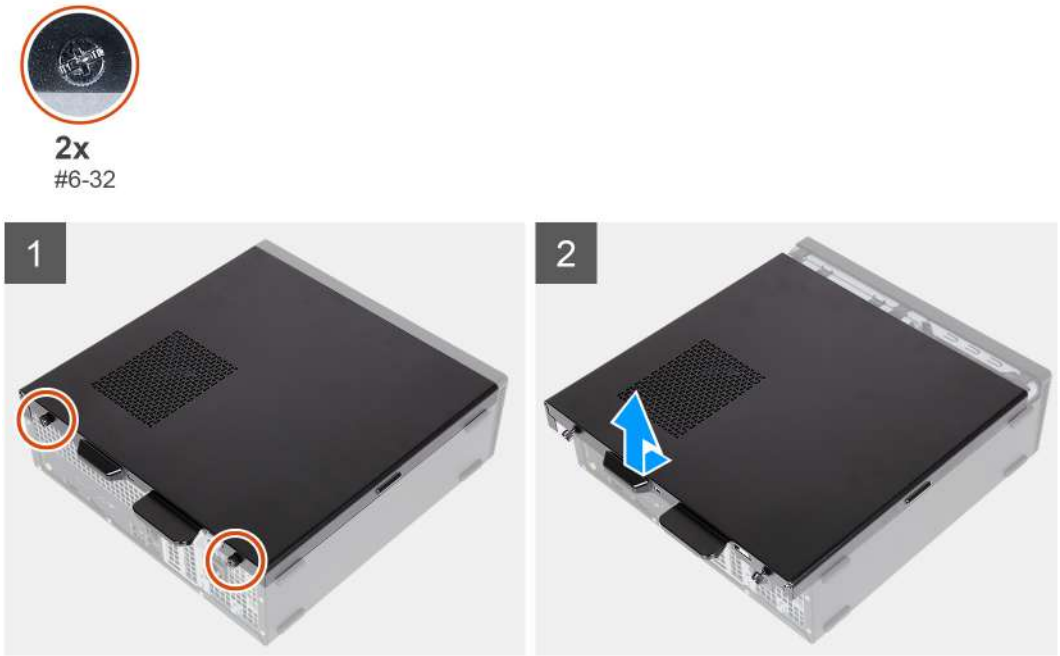
## Removing the left-side cover

### Prerequisites

1. Follow the procedure in Before working inside your computer.

### About this task

The following image(s) indicate the location of the left-side cover and provides a visual representation of the removal procedure.




### Steps

1. Remove the two screws (#6-32) that secure the left-side cover to the chassis.
2. Holding the tab on the left-side cover firmly, slide and remove the left-side cover from the chassis.

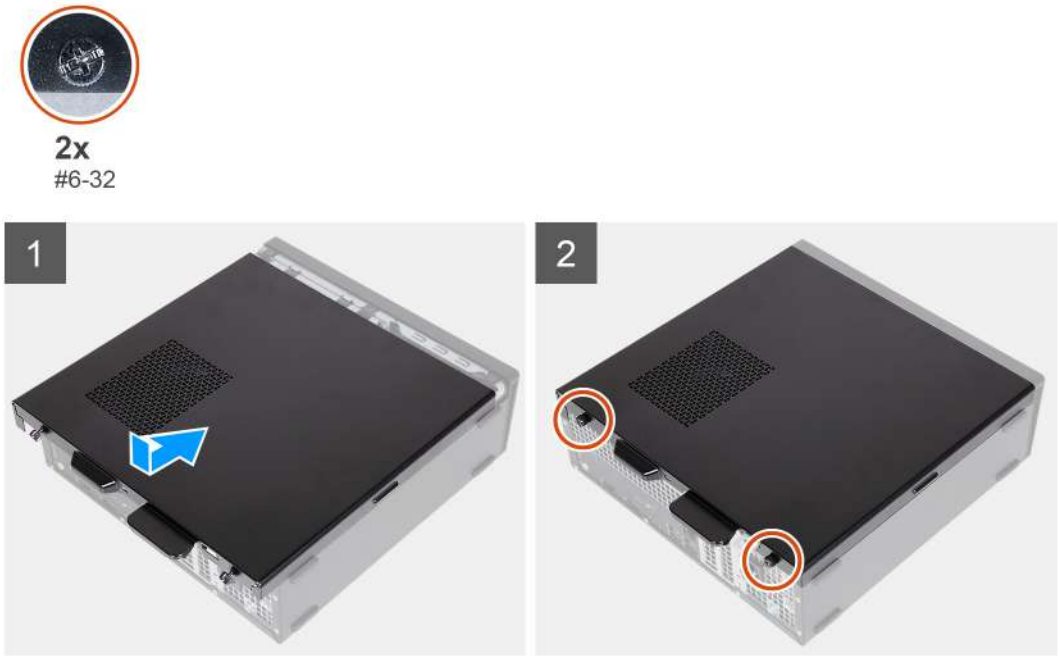
## Installing the left-side cover

### Prerequisites

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

### About this task

The following image(s) indicate the location of the left-side cover and provides a visual representation of the installation procedure.




### Steps

1. Holding the left-side cover firmly on both sides, slide it into the chassis towards the front of the computer.
2. Replace the two screws (#6-32) that secure the left-side cover to the chassis.

### Next steps

1. Follow the procedure in After working inside your computer.

# Front cover

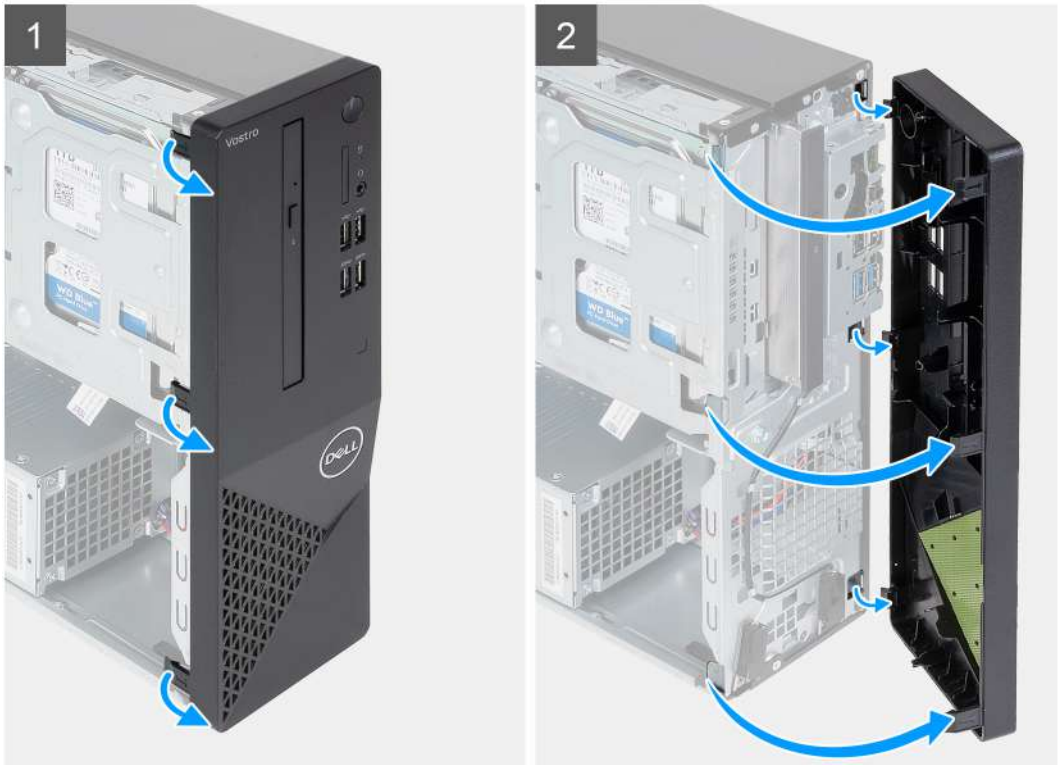
## Removing the front cover

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

### About this task

The following image(s) indicate the location of the front cover and provides a visual representation of the removal procedure.




**Steps**

1. Gently pry and release the tabs that secure the front-cover to the chassis.
2. Open the front cover and lift it away from the chassis.

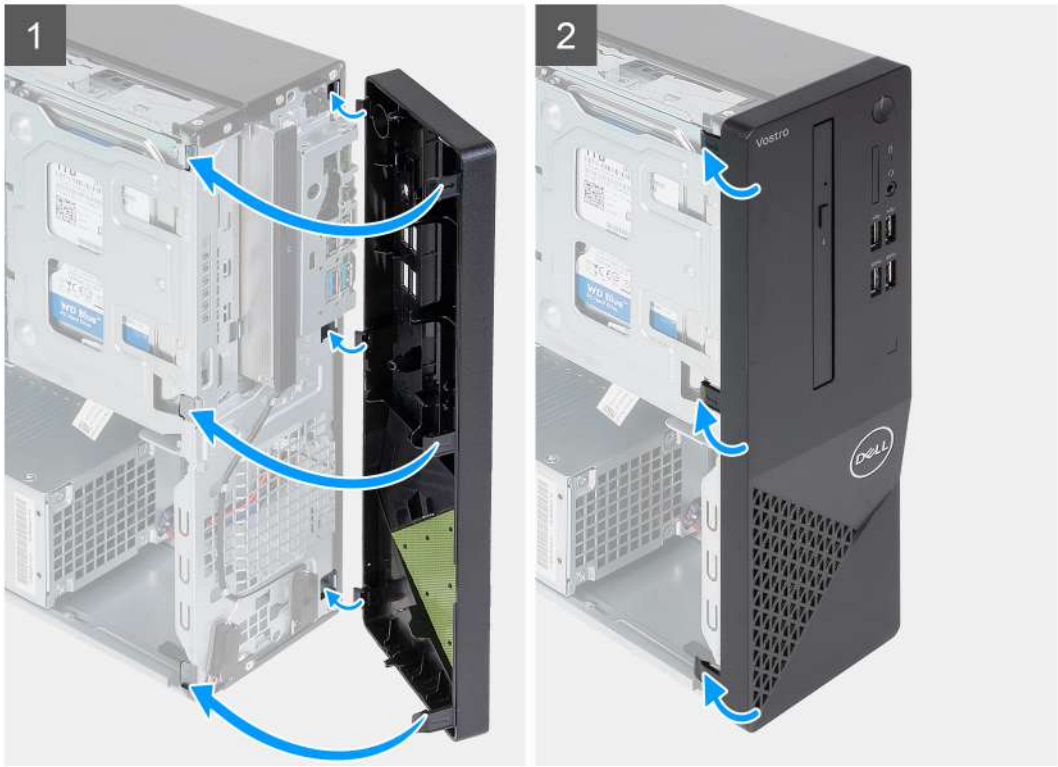
# Installing the front cover

**Prerequisites**

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

**About this task**

The following image(s) indicate the location of the front cover and provides a visual representation of the installation procedure.




### Steps

1. Align and insert the front-cover tabs into the slots on right side of the chassis.
2. Rotate the front cover towards the chassis and snap the tabs into place.

### Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

# Hard drive

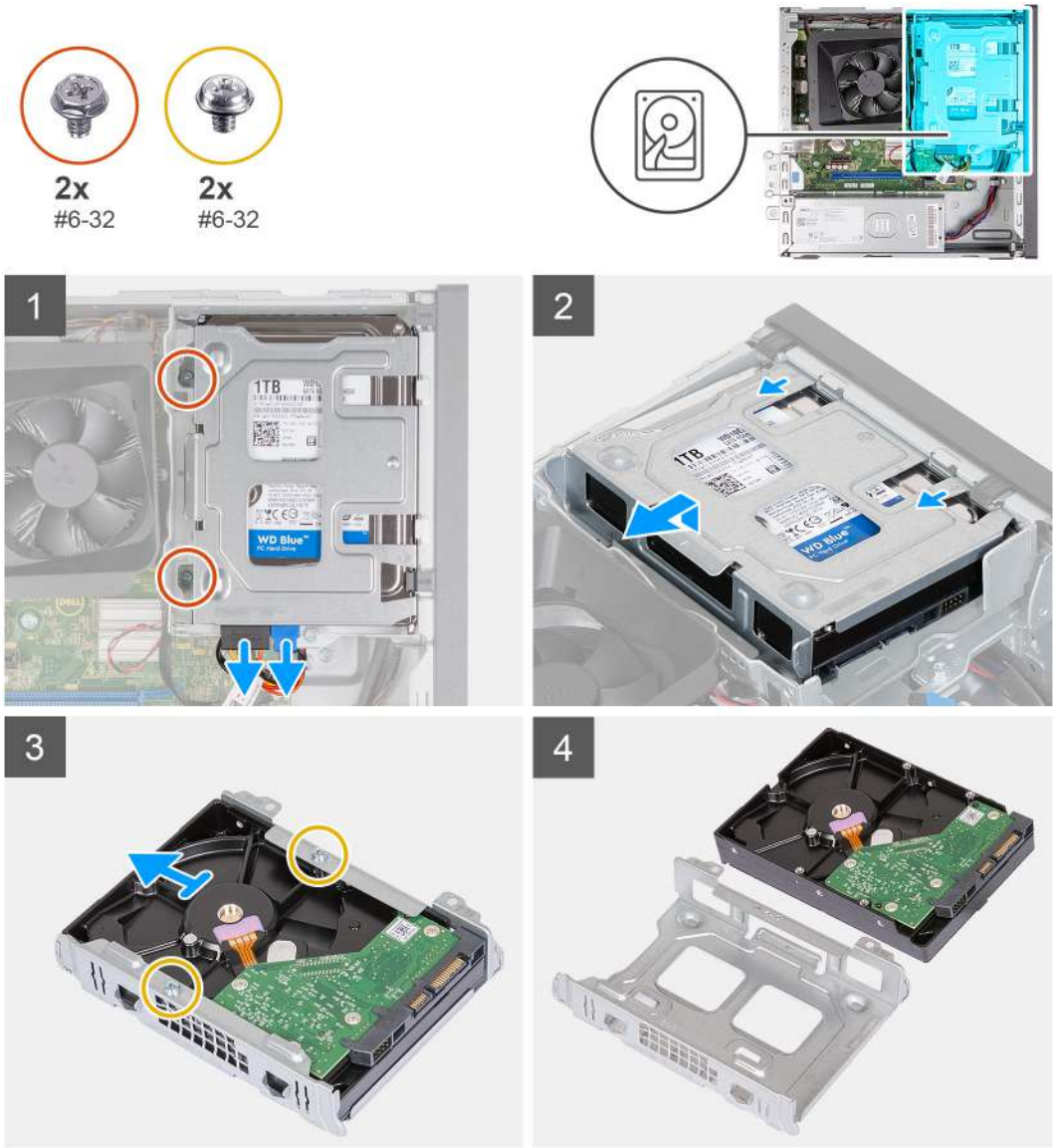
## Removing the 3.5-inch hard drive

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.

### About this task

The following image(s) indicate the location of the 3.5-inch hard drive and provides a visual representation of the removal procedure.




**Steps**

1. Place the computer on its side with the left side facing up.
2. Disconnect the data and power cables from the hard drive.
3. Remove the two (#6-32) screws that secure the 3.5-inch hard-drive assembly to the hard-drive and optical-drive bracket.
4. Lift and slide the 3.5-inch hard-drive assembly away from the hard-drive and optical-drive bracket.
5. Turn over and place the 3.5-inch hard-drive assembly on a flat surface.
6. Remove the two (#6-32) screws that secure the 3.5-inch hard drive to the hard-drive cage.
7. Slide and remove the 3.5-inch hard drive from the hard-drive cage.

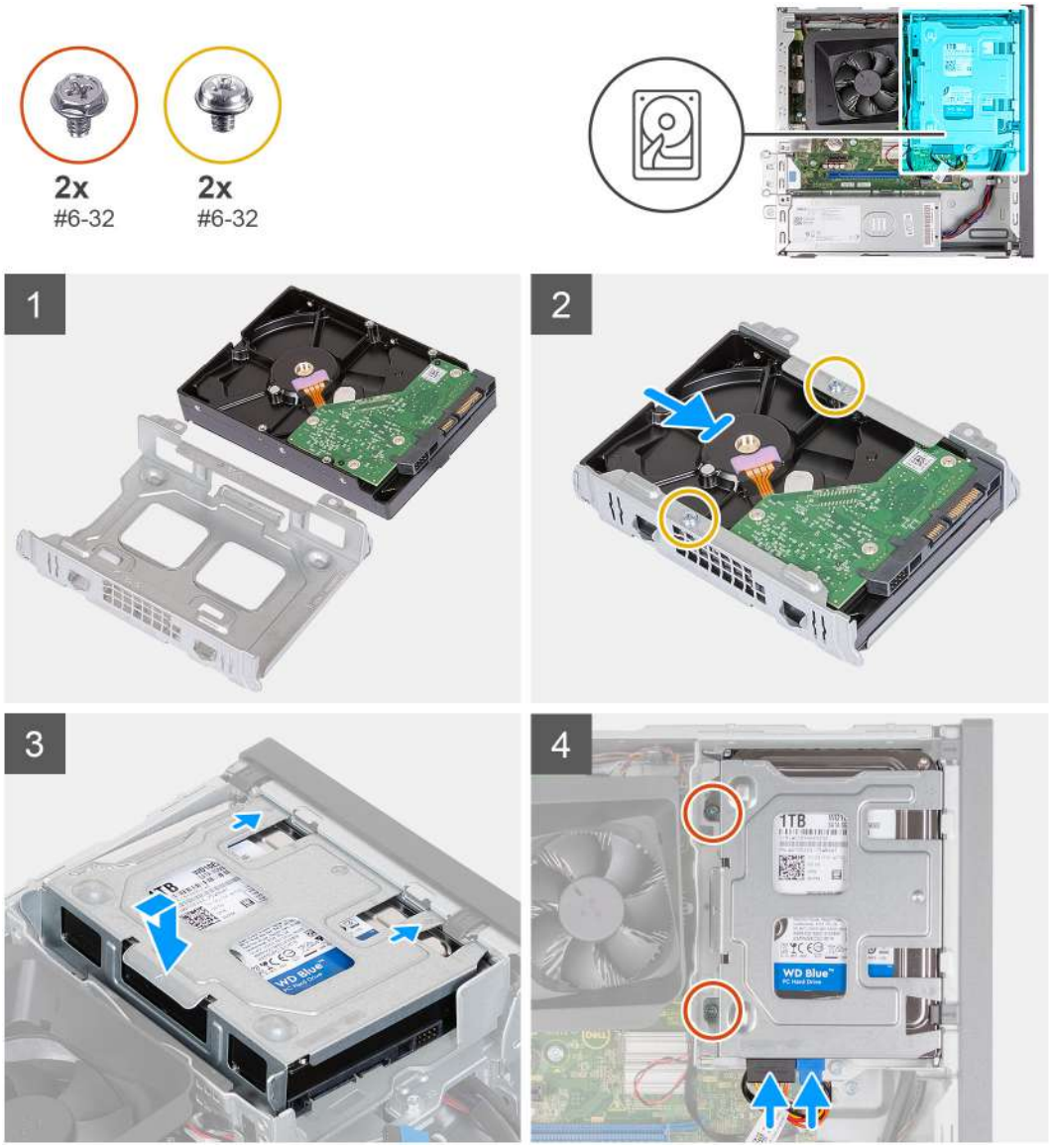
# Installing the 3.5-inch hard drive

**Prerequisites**

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

**About this task**

The following image(s) indicate the location of the 3.5-inch hard drive and provides a visual representation of the installation procedure.




### Steps

1. Align and slide the 3.5-inch hard drive into the hard-drive cage.
2. Replace the two (#6-32) screws to secure the 3.5-inch hard drive to the hard-drive cage.
3. Align and slide the hard drive assembly into the hard-drive and optical-drive bracket.
4. Replace the two (#6-32) screws to secure the 3.5-inch hard drive assembly to the hard-drive and optical-drive bracket.
5. Connect the power cable and data cables to the 3.5-inch hard drive.

### Next steps

1. Install the front cover.
2. Install the left-side cover.
3. Follow the procedure in After working inside your computer.

# Hard-drive and optical-drive cage

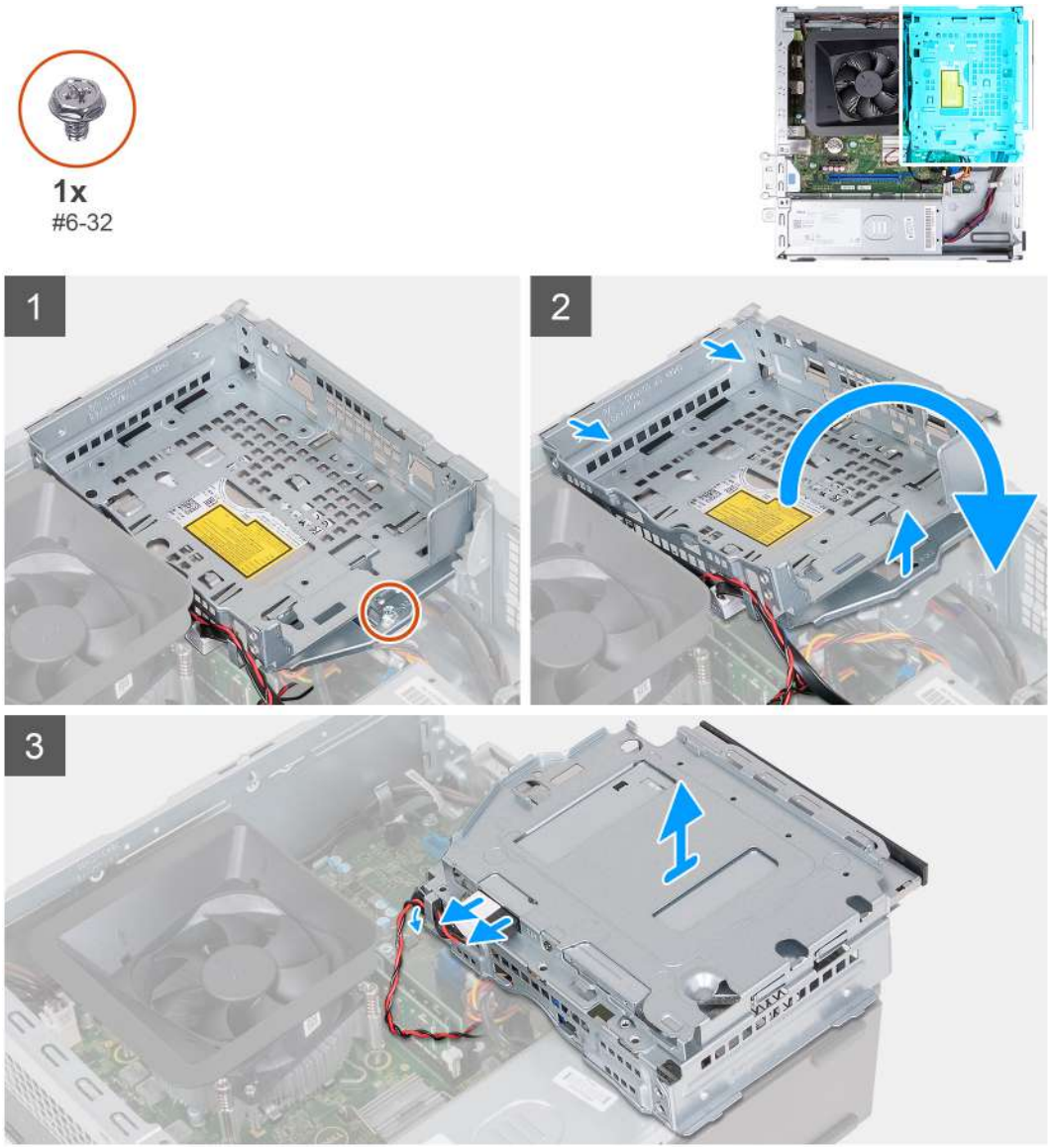
## Removing the hard-drive and optical-drive cage

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.
4. Remove the 3.5-inch hard drive.

### About this task

The following image(s) indicate the location of the hard-drive and optical-drive cage and provides a visual representation of the removal procedure.




### Steps

1. Remove the (#6-32) screw that secures the hard-drive and optical-drive bracket to the chassis.
2. Lift and slide the hard-drive and optical-drive bracket away from the chassis.

**NOTE:** Skip this step if the computer is not shipped with an optical drive. The data and power cables are still connected to the optical drive. Slide out the hard-drive and optical-drive bracket with care.

3. Hold onto the hard-drive and optical-drive bracket and turn it over.
4. Disconnect the data and power cables from the optical drive.
5. Lift the hard-drive and optical-drive bracket away from the chassis.

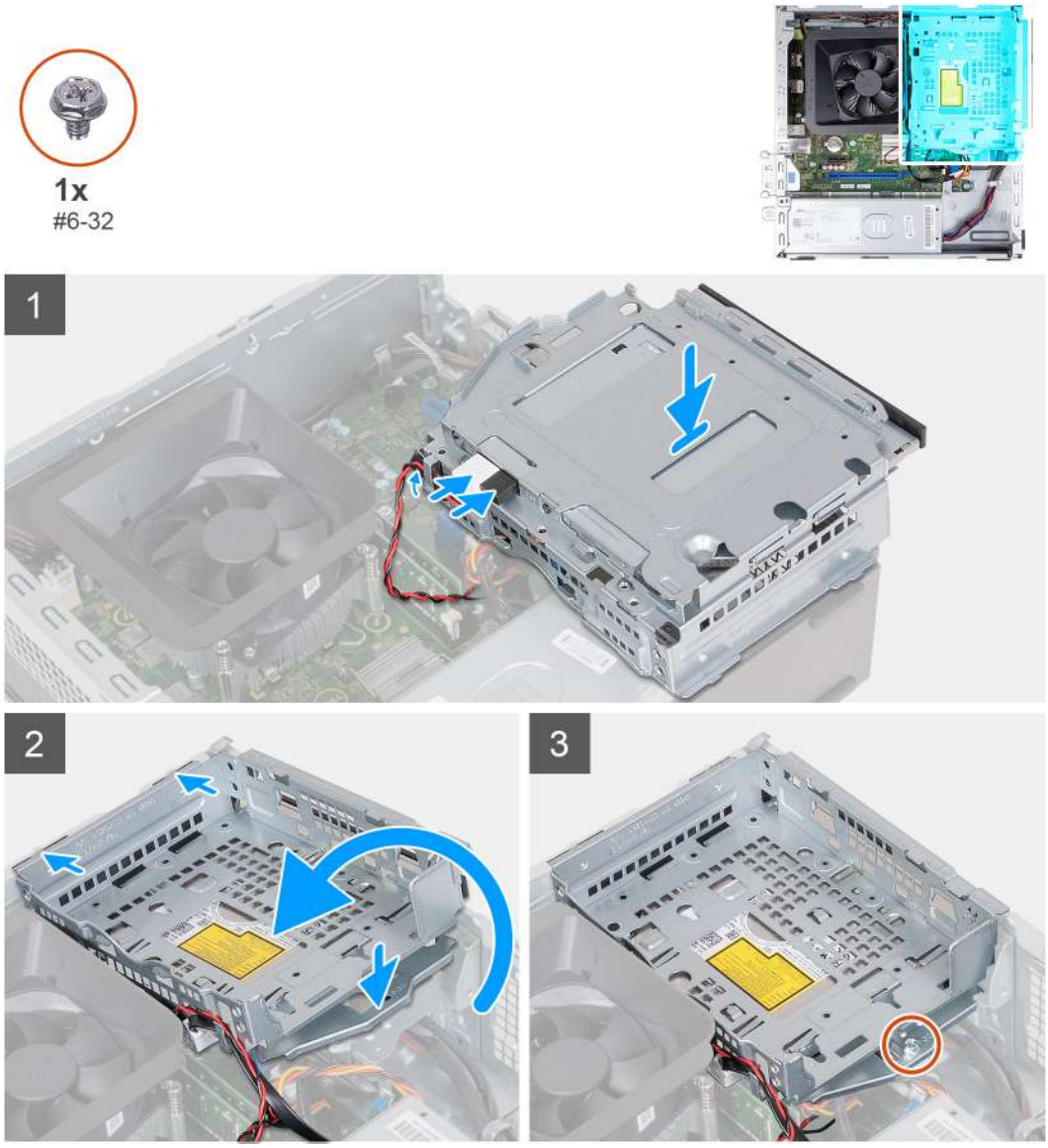
# Installing the hard-drive and optical-drive cage

### Prerequisites

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

### About this task

The following image(s) indicate the location of the hard-drive and optical-drive cage and provides a visual representation of the installation procedure.




### Steps

1. Hold the hard-drive and optical-drive bracket near the chassis, and connect the data and power cables for the optical drive.

**NOTE:** Skip this step if the computer is not shipped with an optical drive.

2. Turn over and align the hard-drive and optical-drive bracket to the chassis.
3. Slide the bracket at an angle into position and place it down on the chassis.
4. Replace the (#6-32) screws that secures the hard-drive and optical-drive bracket to the chassis.

### Next steps

1. Install the 3.5-inch hard drive.
2. Install the front cover.
3. Install the left-side cover.
4. Follow the procedure in After working inside your computer.

# Optical drive (optional)

## Removing the optical drive

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.
4. Remove the 3.5-inch hard drive.
5. Remove the HDD and ODD cage.

### About this task

**NOTE:** Depending on the configuration ordered, your computer may not have an optical drive installed.

The following image(s) indicate the location of the optical drive and provides a visual representation of the removal procedure.

**Steps**

1. Place the hard-drive and optical-drive bracket on a flat surface to locate the (M2x3) screw.
2. Remove the (M2x3) screw that secures the optical drive to the hard-drive and optical-drive bracket.
3. Slide the optical drive out from the hard-drive and optical-drive bracket.
4. Turn over and place the optical drive on a flat surface.
5. Use a pin or any similar tool with a pointed end, and insert the pointed end into the optical-drive emergency eject pinhole to eject the optical drive tray.
6. Use the end of a plastic scribe to push out and unlock the first securing tab of the optical drive bezel.
7. Pull the optical drive bezel gently to release the two remaining securing tabs of the optical bezel.

# Installing the optical drive

**Prerequisites**

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

**About this task**

The following image(s) indicate the location of the optical drive and provides a visual representation of the installation procedure.

### Steps

1. Align the optical drive bezel to the optical drive and snap the bezel onto the optical drive.

   **NOTE:** Start from the edge of the bezel with the smaller securing tabs and snap them into place.

2. Slide the optical drive into the hard-drive and optical-drive bracket.
3. Replace the (M2x3) screw that secures the optical drive to the hard-drive and optical-drive bracket.

### Next steps

1. Install the HDD and ODD cage.
2. Install the 3.5-inch hard drive.
3. Install the front cover.
4. Install the left-side cover.
5. Follow the procedure in After working inside your computer.

# Power button

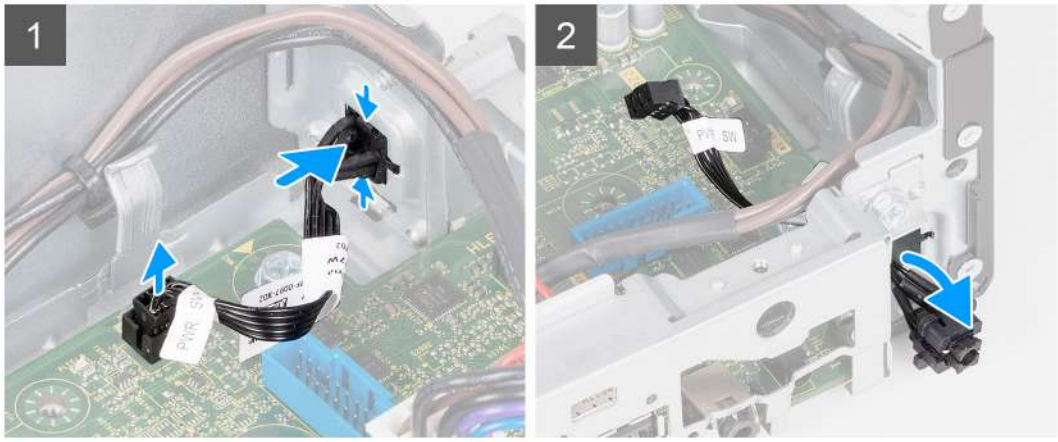
## Removing the power button

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.
4. Remove the 3.5-inch hard drive.
5. Remove the HDD and ODD cage.

### About this task

The following image(s) indicate the location of the power button and provides a visual representation of the removal procedure.




### Steps

1. Place the computer on its side with the left side facing up.
2. Disconnect the power-button cable from the system board.
3. Press the release tabs on the power button to release it from the slot on the chassis.
4. Route the power button along with its cable through the slot on the chassis.
5. Remove the power button and its cable from the front of the chassis.

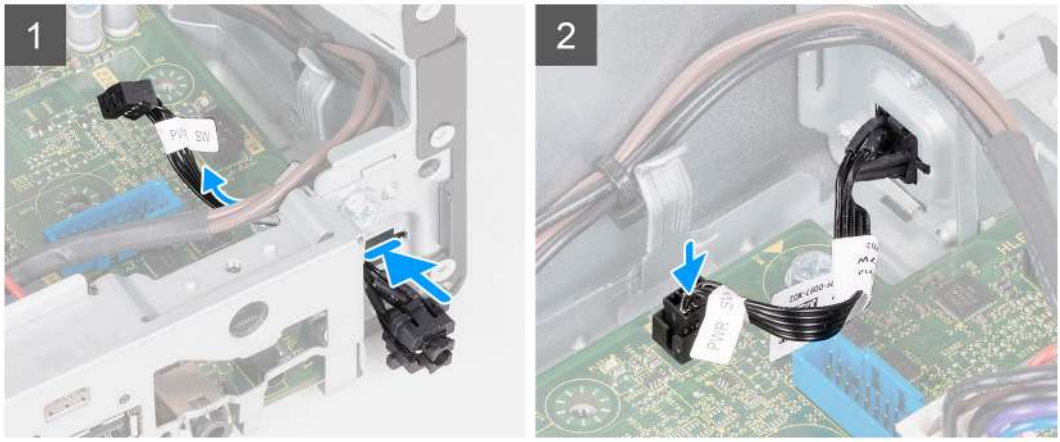
## Installing the power button

### Prerequisites

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

### About this task

The following image(s) indicate the location of the power button and provides a visual representation of the installation procedure.




### Steps

1. Place the computer on its side with the left side facing up.
2. Slide the power-button cable through the slot on the front of the chassis.
3. Press the tabs on the power button, insert it through the slot on the chassis, and secure it into place on the chassis.
4. Connect the power-button cable to the system board.
5. Place the computer in an upright position.

### Next steps

1. Install the HDD and ODD cage.
2. Install the 3.5-inch hard drive.
3. Install the front cover.
4. Install the left-side cover.
5. Follow the procedure in After working inside your computer.

# Memory

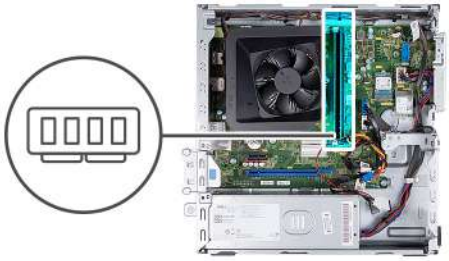
## Removing the memory

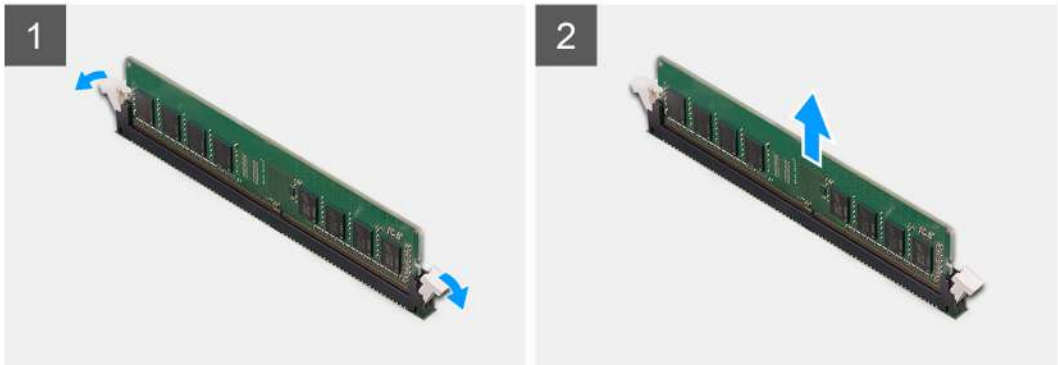
### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.
4. Remove the 3.5-inch hard drive.
5. Remove the HDD and ODD cage.

### About this task

The following image(s) indicate the location of the memory and provides a visual representation of the removal procedure.






**Steps**

1. Pull the securing-clips on each end of the memory-module slot down to release the memory module.
2. Grasp the memory module in the middle, and then gently ease the memory module out of the memory-module slot.
3. Repeat Steps 1 and 2 for the next memory module, if applicable.

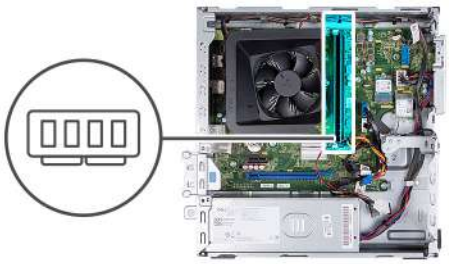
## Installing the memory

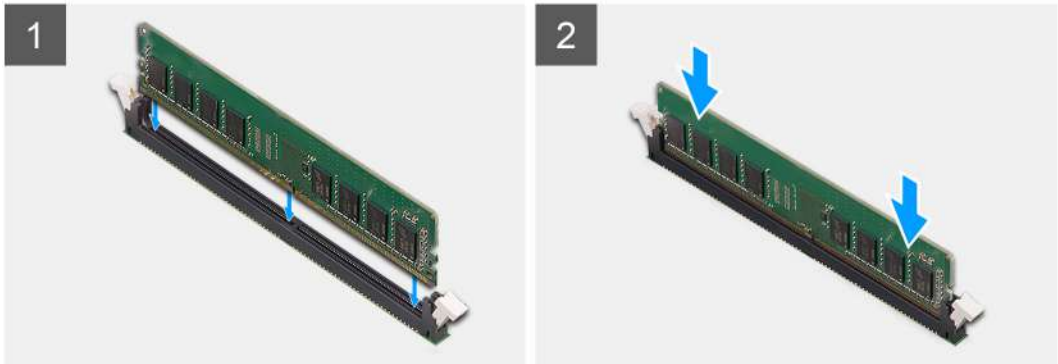
**Prerequisites**

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

**About this task**

The following image(s) indicate the location of the memory and provides 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 slot.
3. Press down on the memory module until the memory module snaps into position. Ensure that both securing clips are locked in place to secure the memory module.
4. Repeat Steps 1 to 3 for the next memory module, if applicable.

### Next steps

1. Install the HDD and ODD cage.
2. Install the 3.5-inch hard drive.
3. Install the front cover.
4. Install the left-side cover.
5. Follow the procedure in After working inside your computer.

# Solid-state drive

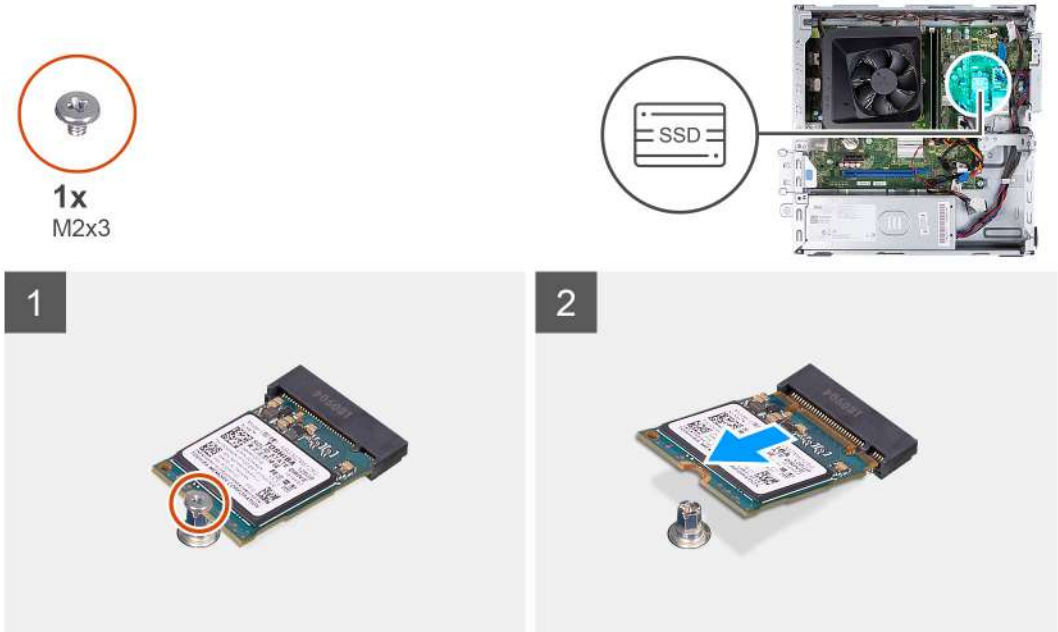
## Removing the M.2 2230 solid-state drive

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.
4. Remove the 3.5-inch hard drive.
5. Remove the HDD and ODD cage.

### About this task

The following image(s) indicate the location of the M.2 2230 solid-state drive and provides a visual representation of the removal procedure.




### Steps

1. Remove the screw (M2x3) that secures the solid-state drive to the system board.
2. Slide and lift the solid-state drive from the M.2 card slot on the system board.

# Installing the M.2 2230 solid-state drive

### Prerequisites

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

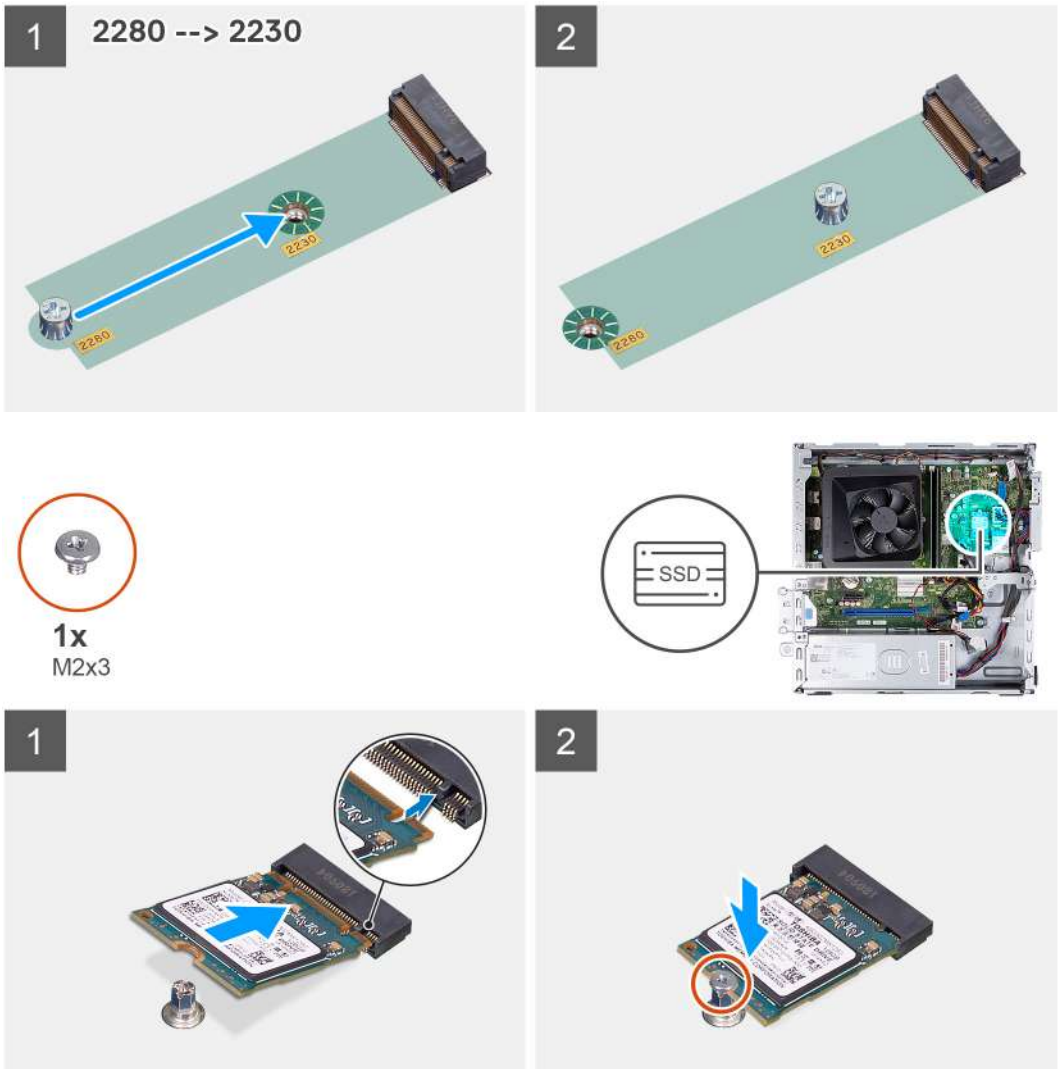
### About this task

**NOTE:** If you are replacing a M.2 2280 solid-state drive with a M.2 2330 solid-state drive, ensure the M.2 2280 solid-state drive is removed first.

**NOTE:** Refer to the procedure for removing the M.2 2280 solid-state drive.

**NOTE:** The following image indicate where to install the solid-state drive screw mount based on form factor.

The following image(s) indicate the location of the M.2 2230 solid-state drive and provides a visual representation of the installation procedure.




### Steps

1. Align the notch on the solid-state drive with the tab on the M.2 card slot.
2. Slide the solid-state drive into the M.2 card slot on the system board.
3. Replace the screw (M2x3) that secures the solid-state drive to the system board.

### Next steps

1. Install the HDD and ODD cage.
2. Install the 3.5-inch hard drive.
3. Install the front cover.
4. Install the left-side cover.
5. Follow the procedure in After working inside your computer.

## Removing the M.2 2280 solid-state drive

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.
4. Remove the 3.5-inch hard drive.
5. Remove the HDD and ODD cage.

### About this task

The following image(s) indicate the location of the M.2 2280 solid-state drive and provides a visual representation of the removal procedure.

### Steps

1. Remove the screw (M2x3) that secures the solid-state drive to the system board.
2. Slide and lift the solid-state drive from the M.2 card slot on the system board.

## Installing the M.2 2280 solid-state drive

### Prerequisites

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

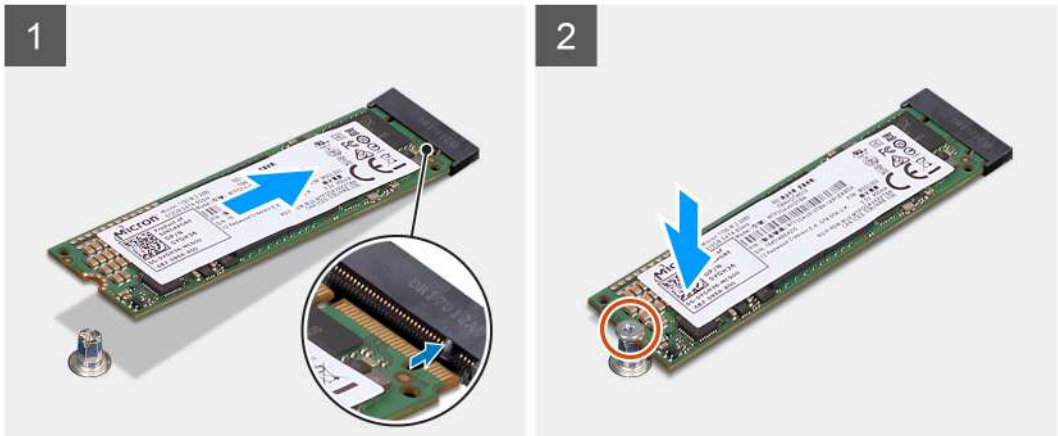
### About this task

**NOTE:** If you are replacing a M.2 2230 solid-state drive with a M.2 2280 solid-state drive, ensure the M.2 2230 solid-state drive is removed first.

**NOTE:** See the procedure for removing the M.2 2230 solid-state drive.

**NOTE:** The following image indicate where to install the solid-state drive screw mount based on form factor.

The following image(s) indicate the location of the M.2 2280 solid-state drive and provides a visual representation of the installation procedure.




### Steps

1. Align the notch on the solid-state drive with the tab on the M.2 card slot.
2. Slide the solid-state drive into the M.2 card slot on the system board.
3. Replace the screw (M2x3) that secures the solid-state drive to the system board.

### Next steps

1. Install the HDD and ODD cage.
2. Install the 3.5-inch hard drive.
3. Install the front cover.

4. Install the left-side cover.
5. Follow the procedure in After working inside your computer.

# Wireless card

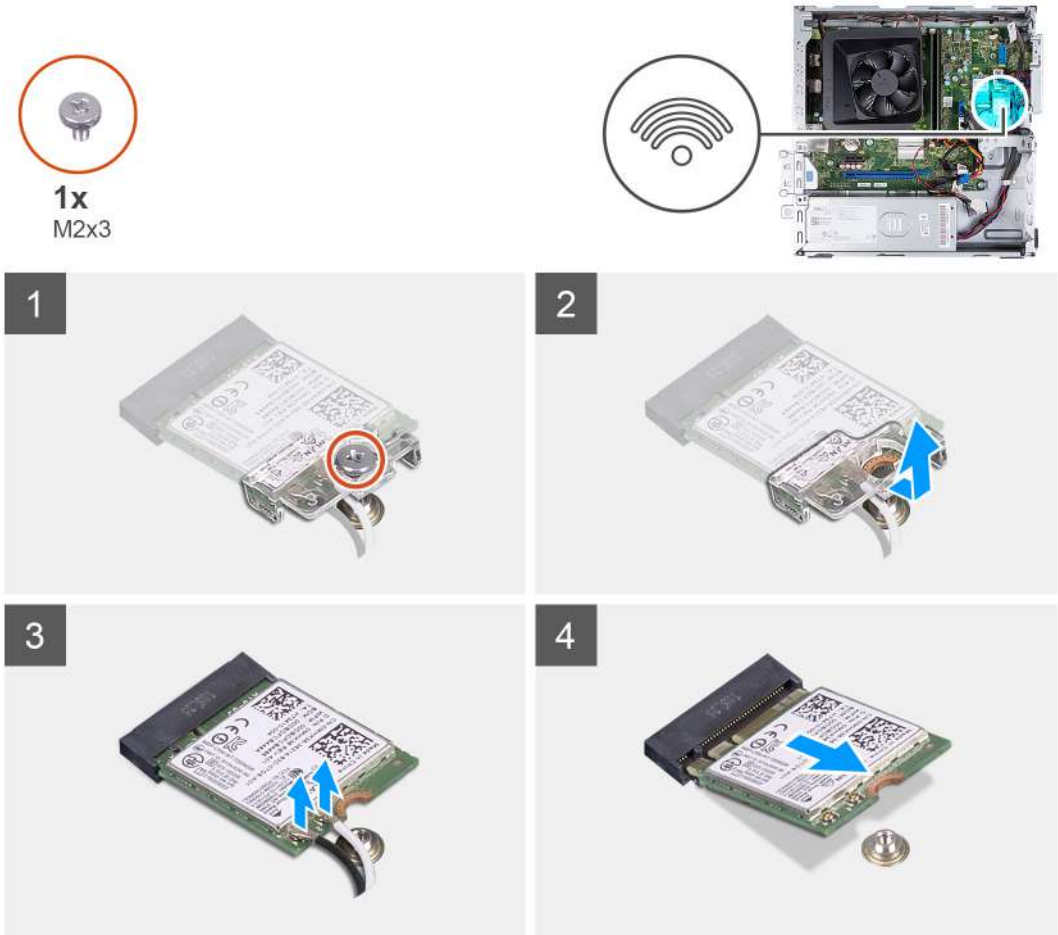
## Removing the wireless card

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.
4. Remove the 3.5-inch hard drive.
5. Remove the HDD and ODD cage.

### About this task

The following image(s) indicate the location of the wireless card and provides a visual representation of the removal procedure.




### Steps

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

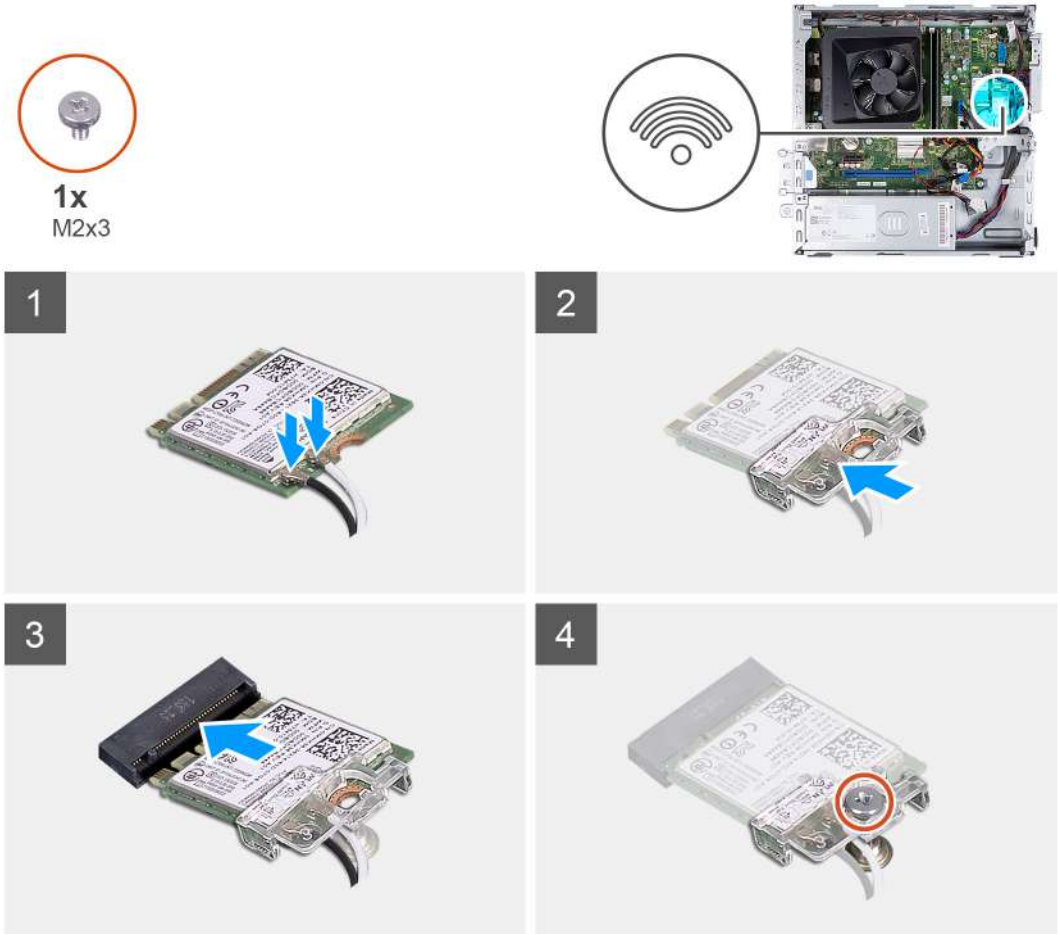
# Installing the wireless card

### Prerequisites

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

### About this task

The following image(s) indicate the location of the wireless card and provides a visual representation of the installation procedure.




### Steps

1. Connect the antenna cables to the wireless card.

   **NOTE:** Start from the edge of the bezel with the smaller securing tabs and snap them into place.

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

### Next steps

1. Install the HDD and ODD cage.
2. Install the 3.5-inch hard drive.
3. Install the front cover.
4. Install the left-side cover.
5. Follow the procedure in After working inside your computer.

# Coin-cell battery

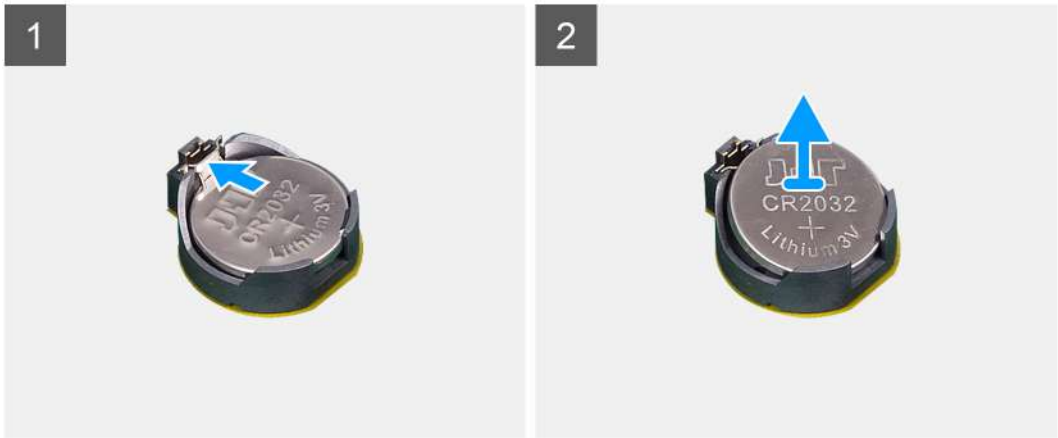
## Removing the coin-cell battery

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

### About this task

The following image(s) indicate the location of the coin-cell battery and provides a visual representation of the removal procedure.




### Steps

1. Place the computer on its side with the left side facing up.
2. Push the coin-cell battery securing-clip on the coin-cell battery socket to release the coin-cell battery.
3. Push the coin-cell battery securing-clip on the coin-cell battery socket to release the coin-cell battery.

## Installing the coin-cell battery

### Prerequisites

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

### About this task

The following image(s) indicate the location of the coin-cell battery and provides a visual representation of the installation procedure.

### Steps

1. Insert the coin-cell battery into the socket with the positive side (+) label facing up and snap the battery in the socket.
2. Place the computer in an upright position.

### Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

# Antenna modules

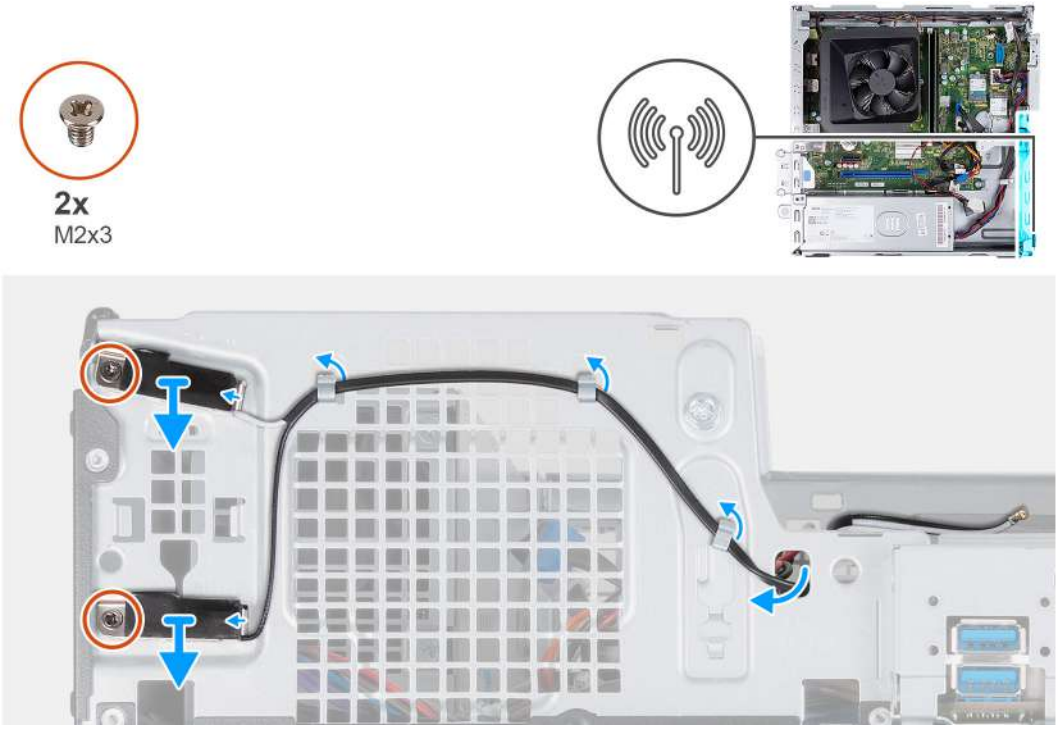
## Removing the antenna modules

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.
4. Remove the 3.5-inch hard drive.
5. Remove the HDD and ODD cage.
6. Remove the wireless card.

### About this task

The following image(s) indicate the location of the antenna modules and provides a visual representation of the removal procedure.




### Steps

1. Remove the two screws (M2x3) that secure the antenna modules to the chassis.
2. Remove the antenna cables through the routing guide on the chassis and route the antenna cables through the slot on the chassis.
3. Lift the antenna modules along with its cables off the chassis.

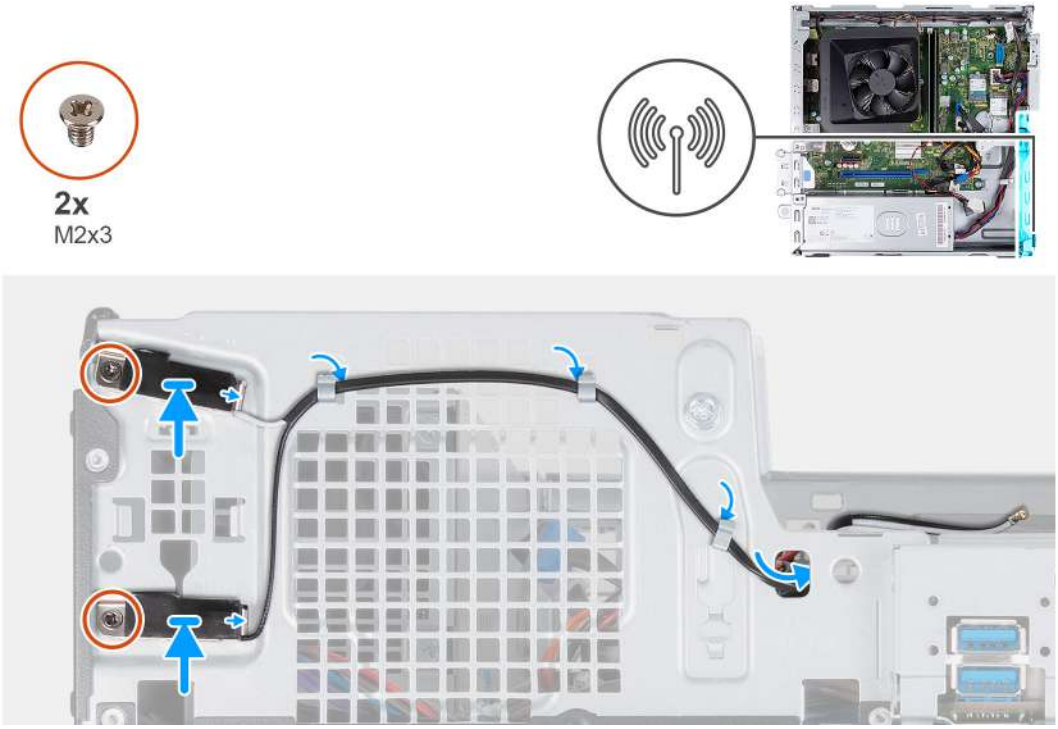
## Installing the antenna modules

### Prerequisites

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

### About this task

The following image(s) indicate the location of the antenna modules and provides a visual representation of the installation procedure.




### Steps

1. Place the antenna modules on the chassis.
2. Align the captive screws on the antenna modules with the screw holes on the chassis.
3. Replace the two screws (M2x3) that secure the antenna modules to the chassis.
4. Route the antenna cables through the slot on the chassis and route the antenna cables through the routing guides on the chassis.

### Next steps

1. Install the wireless card.
2. Install the HDD and ODD cage.
3. Install the 3.5-inch hard drive.
4. Install the front cover.
5. Install the left-side cover.
6. Follow the procedure in After working inside your computer.

# Media-card reader (optional)

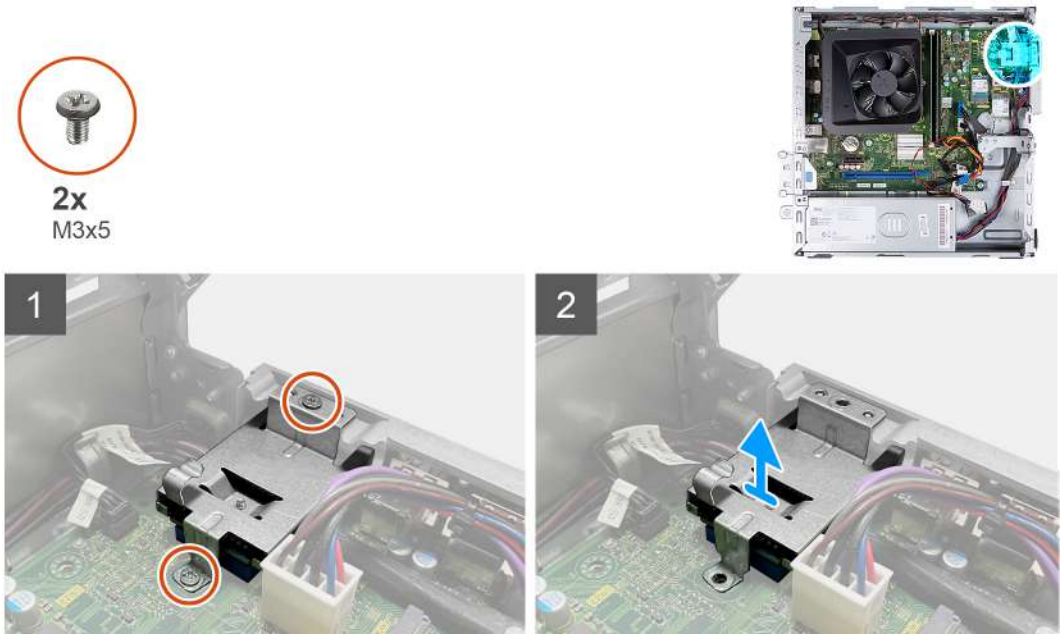
## Removing the media-card reader

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.
4. Remove the 3.5-inch drive.
5. Remove the HDD and ODD cage.

### About this task

The following image(s) indicate the location of the media-card reader and provides a visual representation of the removal procedure.




### Steps

1. Remove the two screws (M3x5) that secure the media-card reader bracket to the system board and the chassis.
2. Slide and lift the media-card reader and its bracket off the system board.

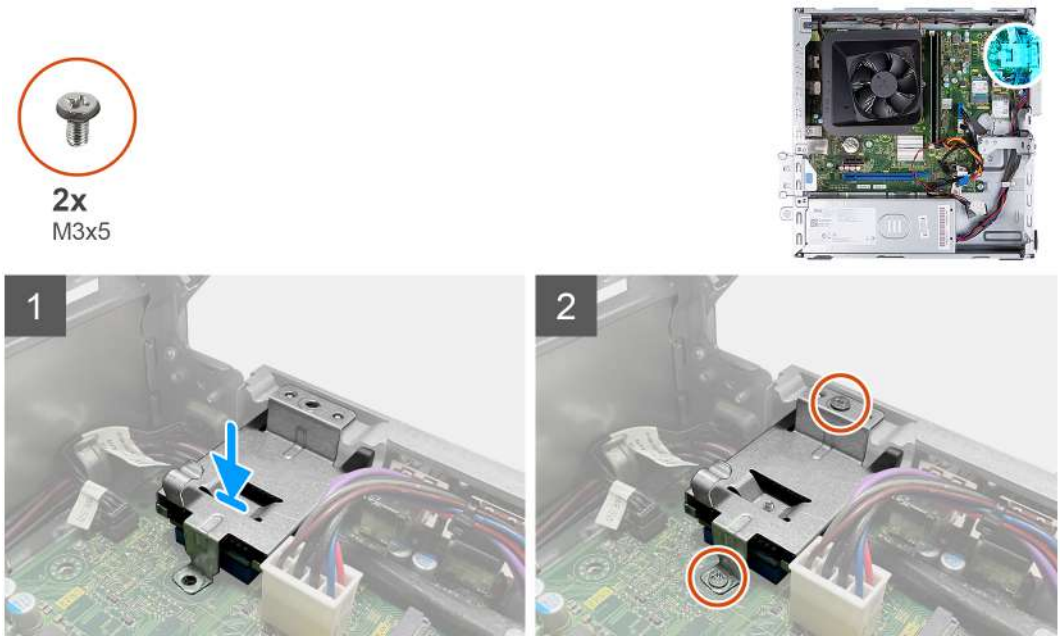
## Installing the media-card reader

### Prerequisites

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

### About this task

The following image(s) indicate the location of the media-card reader and provides a visual representation of the installation procedure.



### Steps

1. Place and slide the media-card reader onto its slot on the system board.
2. Align the screw hole on the media-card reader bracket with the screw holes on the system board and the chassis.
3. Replace the two screws (M3x5) that secure the media-card reader bracket to the system board and the chassis.

### Next steps

1. Install the 3.5-inch drive.
2. Install the HDD and ODD cage.
3. Install the front cover.
4. Install the left-side cover.
5. Follow the procedure in After working inside your computer.

# Power-supply unit

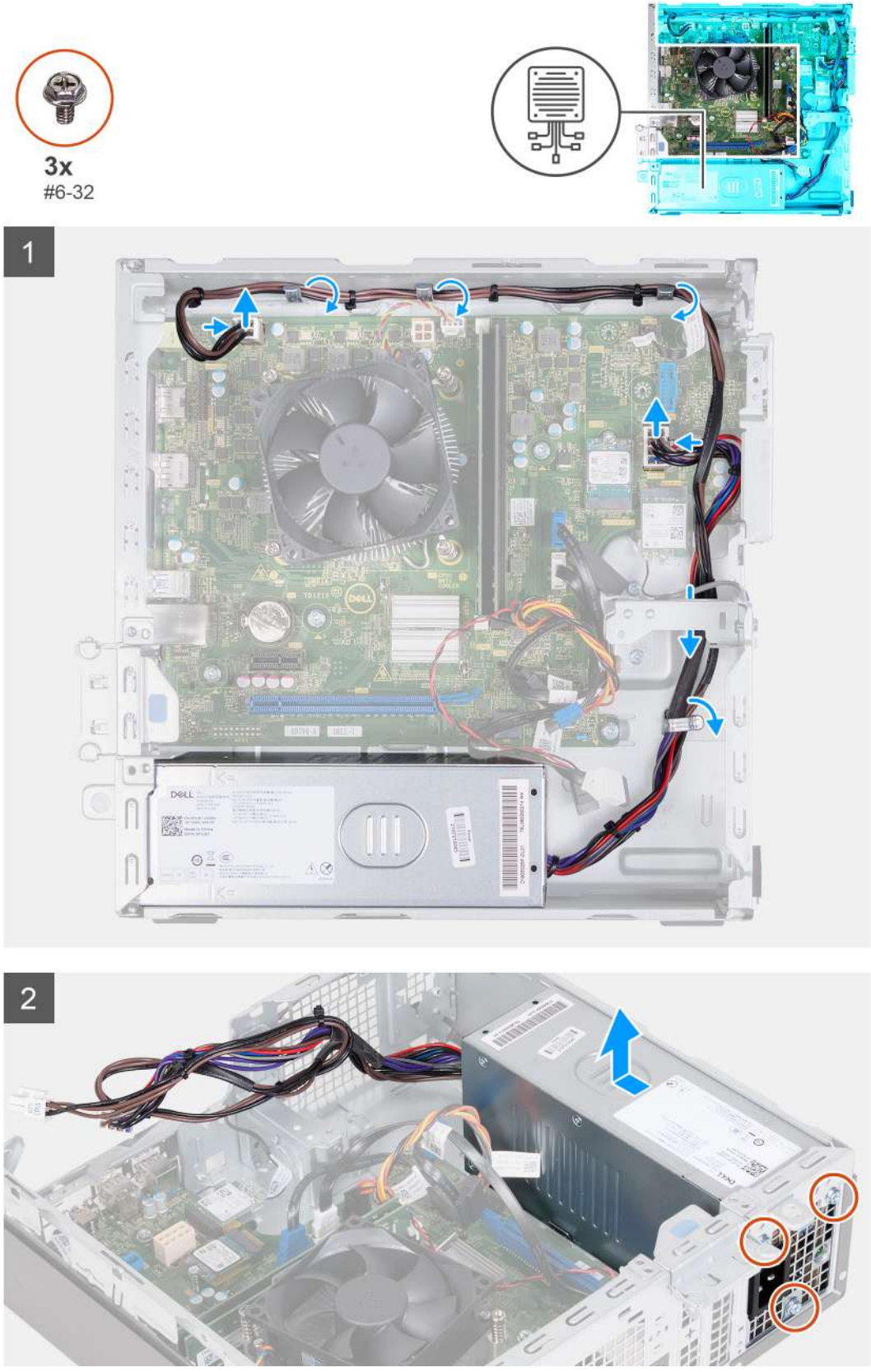
## Removing the power supply

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.
4. Remove the 3.5-inch hard drive.
5. Remove the HDD and ODD cage.

### About this task

The following image(s) indicate the location of the power supply and provides a visual representation of the removal procedure.




**Steps**

1. Press the securing clip and disconnect the processor-power cable from the system board.
2. Press the securing clip and disconnect the system-board power cable from the system board.
3. Remove the power-supply unit cables from the routing guides on the chassis.

4. Remove the three screws (#6-32) that secure the power-supply unit to the chassis.
5. Slide and lift the power-supply unit off the chassis.

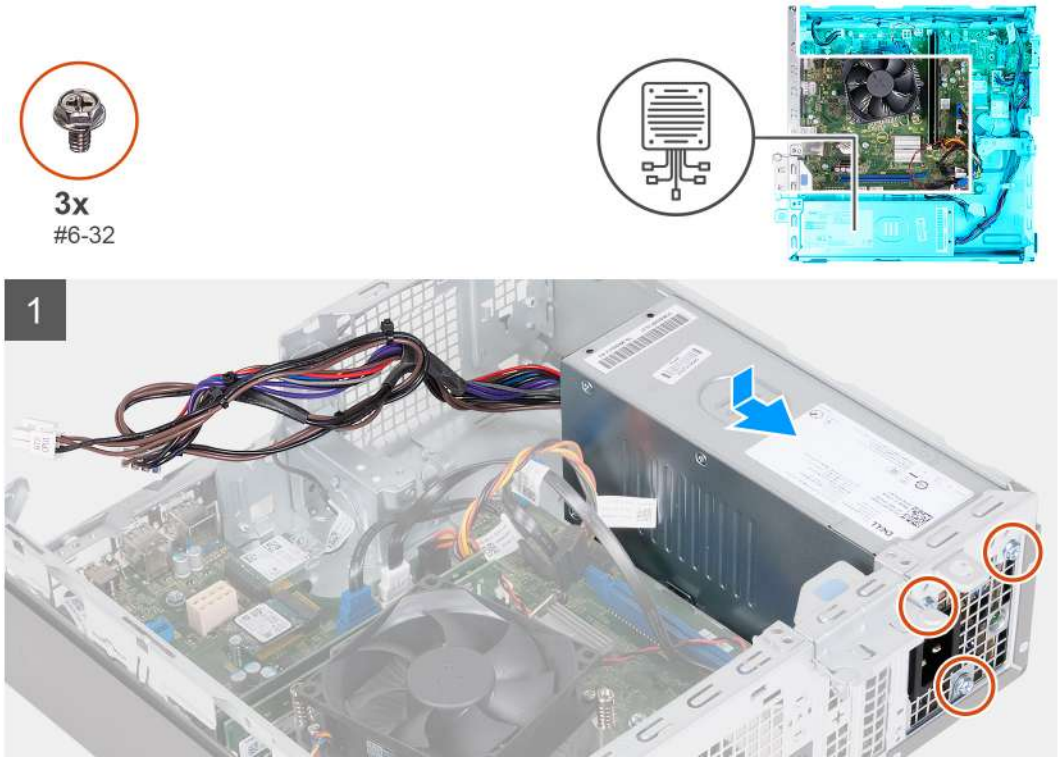
# Installing the power supply

### Prerequisites

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

### About this task

The following image(s) indicate the location of the power supply and provides a visual representation of the installation procedure.



### Steps

1. Place and slide the tabs on the power-supply unit into the latches on the chassis.
2. Align the screw holes on the power-supply unit to the screw holes on the chassis.
3. Replace the three screws (#6-32) that secure the power-supply unit to the chassis.
4. Route the power-supply unit cables through the routing guides on the chassis.
5. Connect the system-board power cable to the system board.
6. Connect the processor-power cable to the system board.

### Next steps

1. Install the HDD and ODD cage.
2. Install the 3.5-inch hard drive.
3. Install the front cover.
4. Install the left-side cover.
5. Follow the procedure in After working inside your computer.

# Fan shroud

## Removing the fan shroud

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

### About this task

The following image(s) indicate the location of the fan shroud and provides a visual representation of the removal procedure.

### Steps

1. Place the computer on its side with the left side facing up.
2. Locate the securing tabs of the fan and pull them to release the shroud from the processor fan.
3. Lift the fan off the processor fan.

## Installing the fan shroud

### Prerequisites

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

### About this task

The following image(s) indicate the location of the fan shroud and provides a visual representation of the installation procedure.

### Steps

1. Align the fan shroud over the processor fan such that one side of the fan is facing the rear of the chassis. This side of the fan shroud has the word "REAR" etched into it.
2. Position the fan shroud over the processor fan such that all the stubs on the shroud are aligned to the corresponding stub holes on the processor fan.
3. Press down on the fan shroud until all the securing tabs have snapped into their positions.
4. Place the computer in an upright position.

### Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

# Processor fan and heat-sink assembly

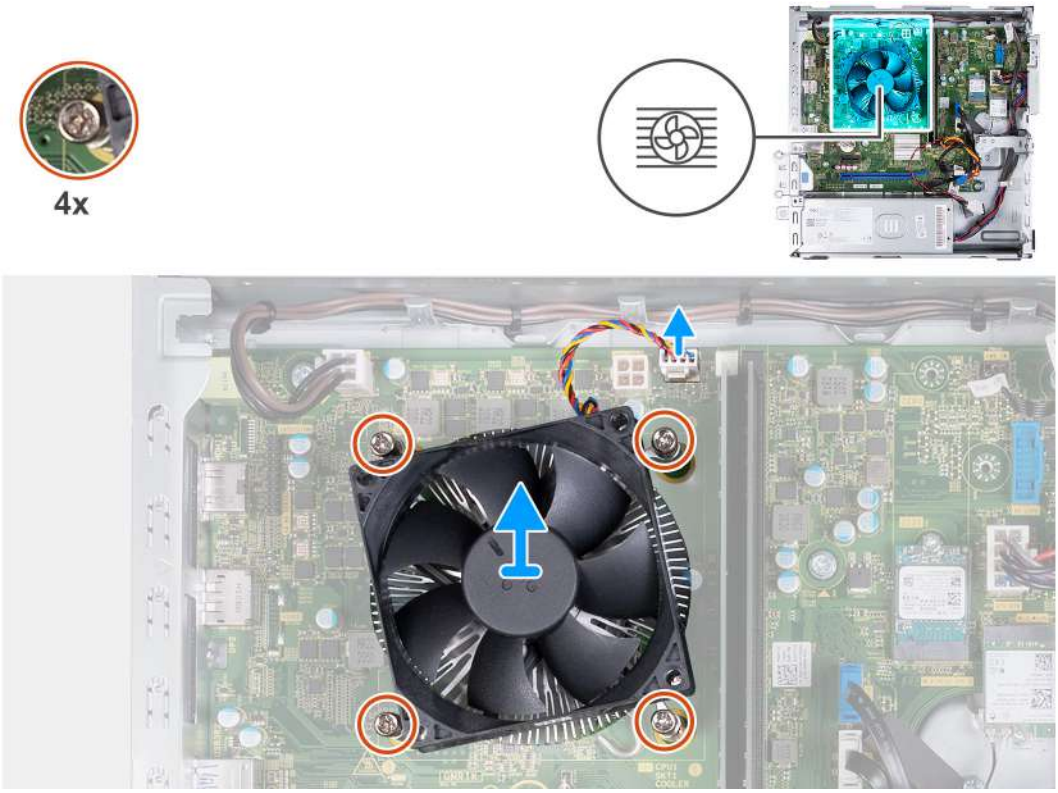
## Removing the fan and heat-sink assembly

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the fan shroud.

### About this task

The following image(s) indicate the location of the fan and heat-sink assembly and provides a visual representation of the removal procedure.




### Steps

1. Disconnect the fan and heat-sink assembly cable from the system board.
2. In a reverse sequential order (4>3>2>1) loosen the four captive screws that secure the processor fan and heat-sink assembly to the system board.
3. Lift the processor fan and heat-sink assembly from the system board.

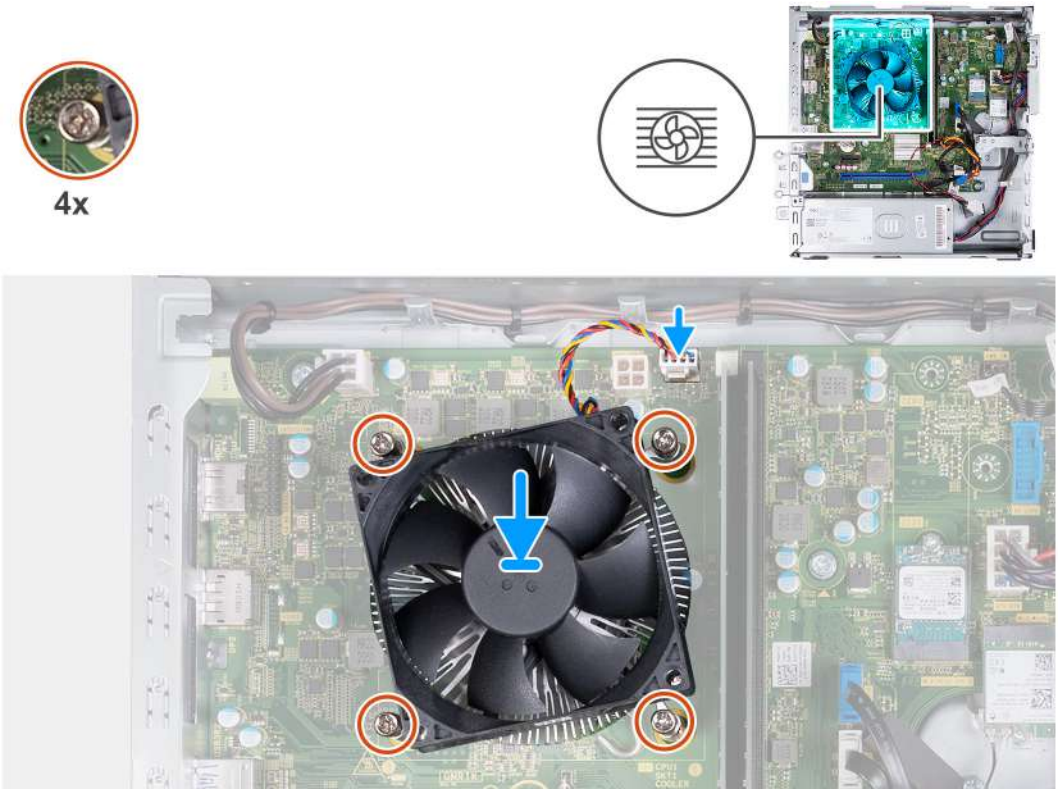
## Installing the fan and heat-sink assembly

### Prerequisites

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

### About this task

The following image(s) indicate the location of the fan and heat-sink assembly and provides a visual representation of the installation procedure.




### Steps

1. Gently place the processor fan and heat-sink assembly on the processor.
2. Align the screw holes on the processor fan and heat-sink assembly with the screw holes on the system board.
3. In sequential order (1>2>3>4) tighten the four captive screws that secure the processor fan and heat-sink assembly to the system board.
4. Connect the fan cable to the system board.

### Next steps

1. Install the fan shroud.
2. Install the left-side cover.
3. Follow the procedure in After working inside your computer.

# Processor

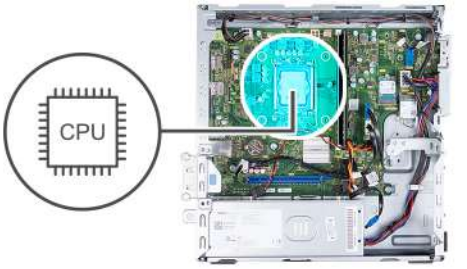
## Removing the processor

### Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the fan shroud.
4. Remove the fan and heat-sink assembly.

### About this task

The following image(s) indicate the location of the processor and provides 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.
3. Gently lift the processor from the processor socket.

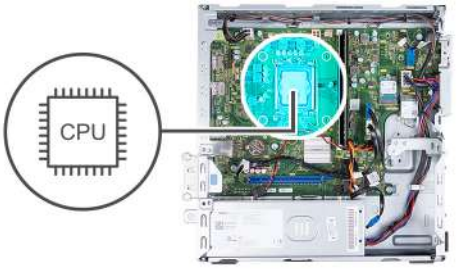
## Installing the processor

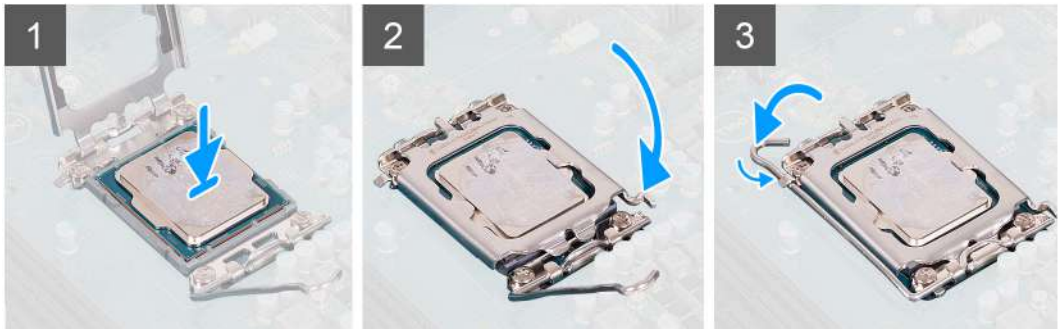
**Prerequisites**

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

**About this task**

The following image(s) indicate the location of the processor and provides a visual representation of the installation procedure.




**Steps**

1. Ensure that the release lever and the processor cover are 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.
3. Close the processor cover, pivot the release lever down, and place it under the tab on the processor socket.

### Next steps

1. Install the fan and heat-sink assembly.
2. Install the fan shroud.
3. Install the left-side cover.
4. 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 left-side cover.
3. Remove the front cover.
4. Remove the 3.5-inch hard drive.
5. Remove the HDD and ODD cage.
6. Remove the memory.
7. Remove the M.2 2230 solid-state drive or M.2 2280 solid-state drive, which is applicable.
8. Remove the wireless card.
9. Remove the coin-cell battery.
10. Remove the media-card reader.
11. Remove the fan shroud.
12. Remove the fan and heat-sink assembly.
13. Remove the processor.

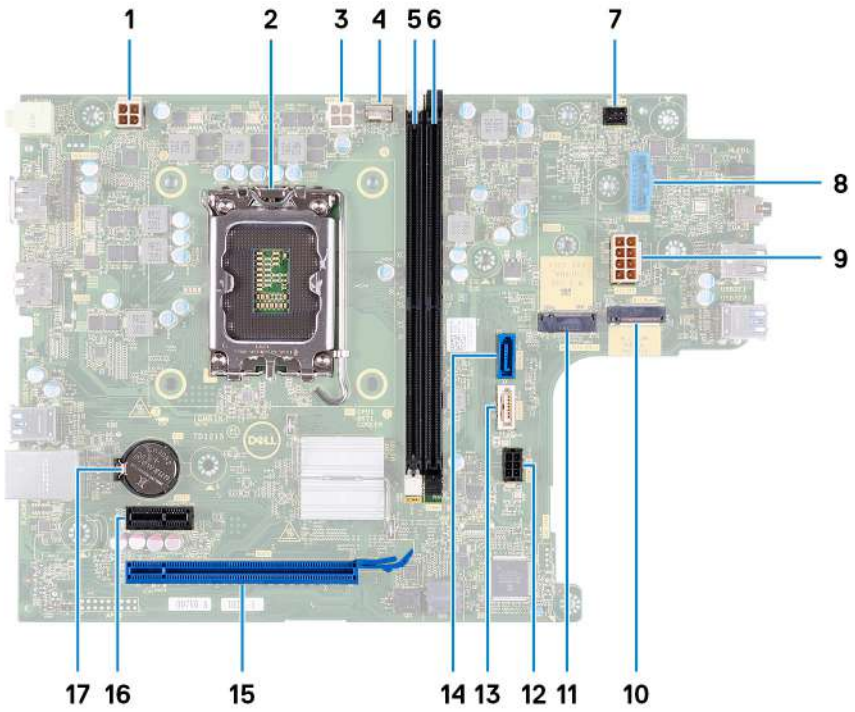
### About this task

**NOTE:** The Service Tag information of your computer is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

**NOTE:** Replacing the system board removes any changes that you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

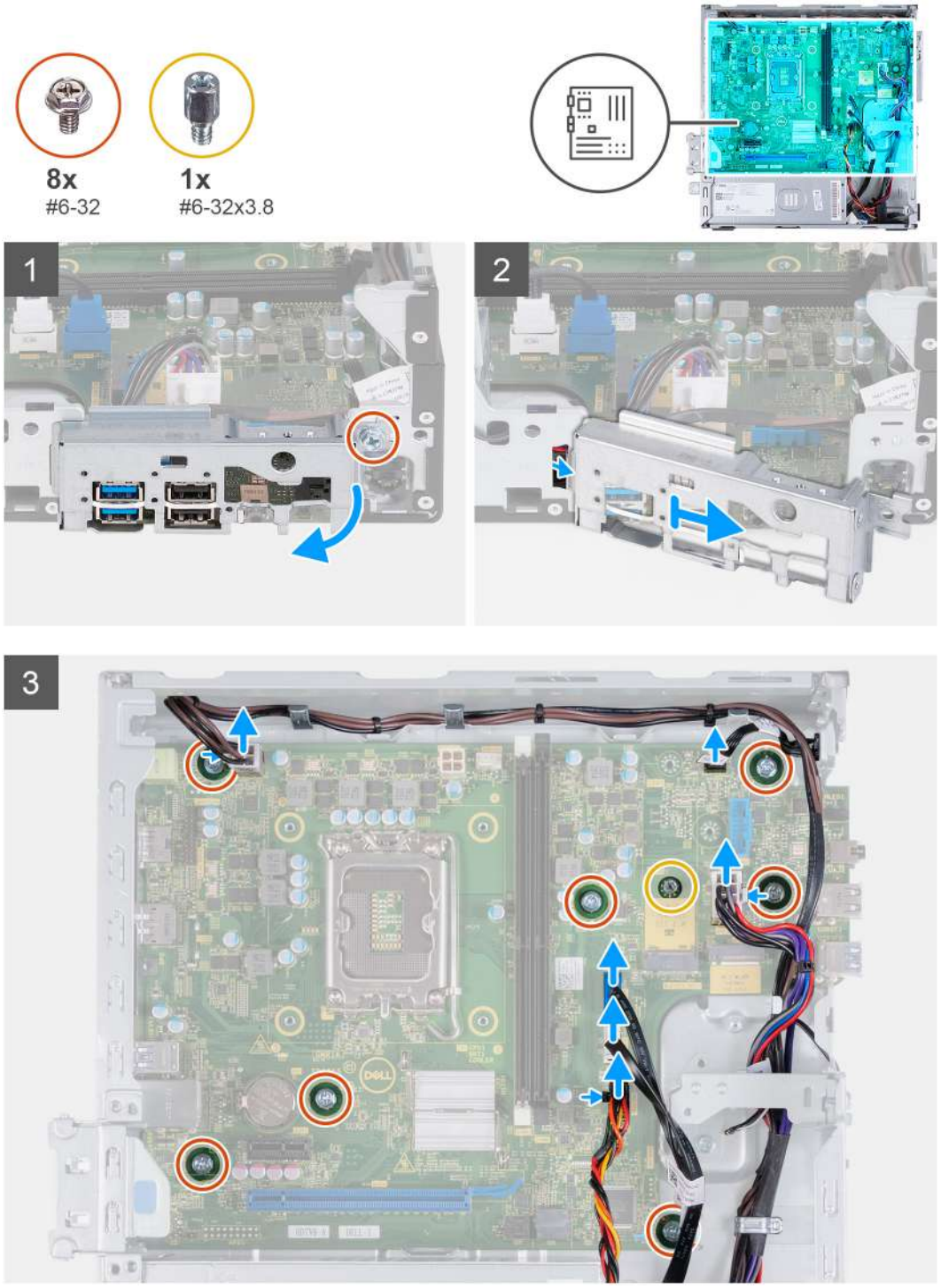
**NOTE:** Before disconnecting the cables from the system board, note the location of the connectors so that you can reconnect the cables correctly after you replace the system board.

The following image(s) indicate the location of the connectors and slots of the system board.




1. processor-power cable connector (ATX CPU1)
2. processor socket
3. processor-power cable connector (ATX CPU2)
4. processor-fan cable connector
5. memory module slot (DIMM1)
6. memory module slot (DIMM2)
7. power-button cable connector
8. media-card reader cable connector
9. system-board power cable connector (ATX SYS)
10. M.2 wireless-card slot
11. M.2 2230/2280 solid-state drive slot
12. hard-drive and optical-drive power cable connector (SATA PWR)
13. optical-drive data cable connector (SATA-3)
14. hard-drive data cable connector (SATA-0, boot drive)
15. PCIe x16 slot (SLOT2)
16. PCIe x1 slot (SLOT1)
17. coin-cell battery socket

The following image(s) indicate the location of the system board and provides a visual representation of the removal procedure.


8x
#6-32
1x
#6-32x3.8
1
2
3

### Steps

1. Remove the screw (#6-32) that secures the front I/O-bracket to the chassis.
2. Remove and lift the front I/O-bracket from the chassis.
3. Disconnect the following cables from the system board. See the system-board components for more information about the respective connectors of the following cables:
   - hard-drive and optical-drive power cable
   - optical-drive data cable
   - hard-drive data cable
   - system-board power cable
   - power-button cable
   - processor-power cable
4. Remove the seven screws (#6-32) and the screw (#6-32x3.8) that secure the system board to the chassis.
5. Lift the system board at an angle and remove it from the chassis.

## Installing the system board

### Prerequisites

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

### About this task

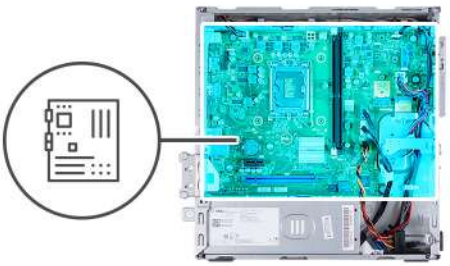
**NOTE:** The Service Tag information of your computer is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

**NOTE:** Replacing the system board removes any changes that you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

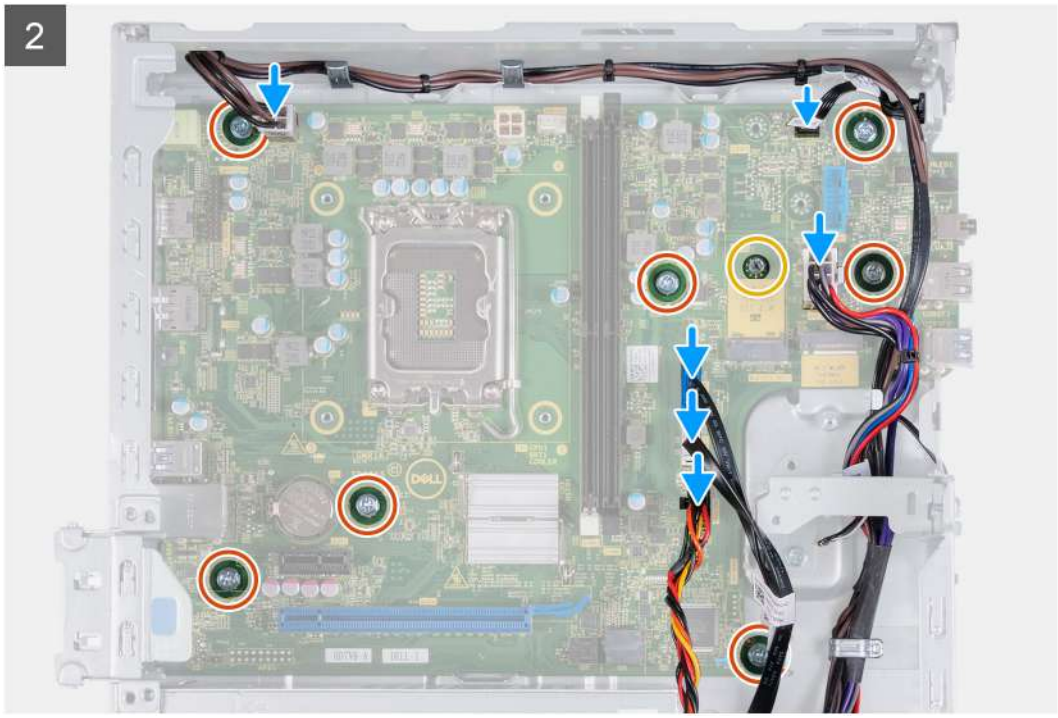
**NOTE:** Before disconnecting the cables from the system board, note the location of the connectors so that you can reconnect the cables correctly after you replace the system board.

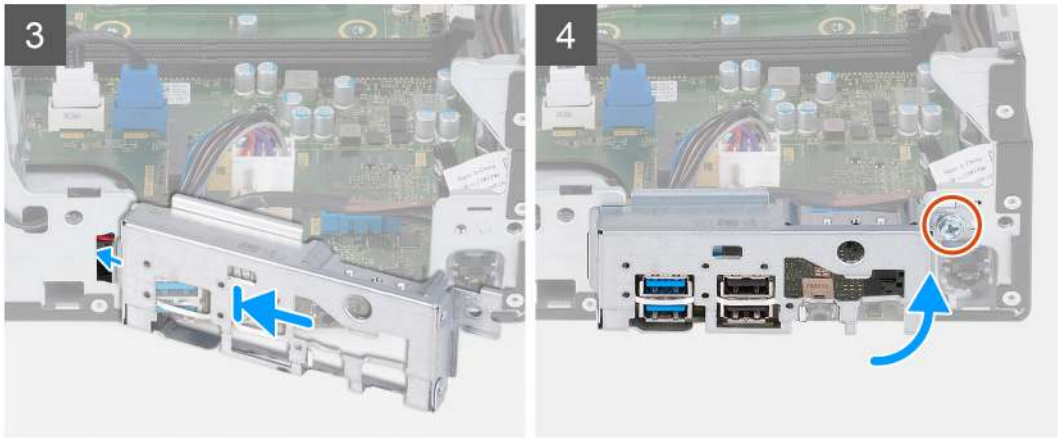
The following image(s) indicate the location of the system board and provides a visual representation of the installation procedure.

8x
#6-32
1x
#6-32x3.8



1


2




### Steps

1. Slide the system board at an angle with the rear external ports aligned to their respective openings of back panel at the rear of the chassis.
2. Place the system board onto the chassis and ensure the front I/O-ports are placed into the front I/O-slots on the chassis.
3. Replace the seven screws (#6-32) and the screw (#6-32x3.8) that secure the system board to the chassis.
4. Route and connect the following cables to the system board. See the system-board components for more information about the respective connectors of the following cables:
   - hard-drive and optical-drive power cable
   - optical-drive data cable
   - hard-drive data cable
   - system-board power cable
   - power-button cable
   - processor-power cable
5. Place and align the front I/O-bracket with I/O slot on the chassis.
6. Replace the screw (#6-32) that secures the front I/O-bracket to the chassis.

### Next steps

1. Install the processor.
2. Install the fan and heat-sink assembly.
3. Install the fan shroud.
4. Install the media-card reader.
5. Install the coin-cell battery.
6. Install the wireless card.
7. Install the M.2 2230 solid-state drive or M.2 2280 solid-state drive, which is applicable.
8. Install the memory.
9. Install the HDD and ODD cage.
10. Install the 3.5-inch hard drive.
11. Install the front cover.
12. Install the left-side cover.
13. Follow the procedure in After working inside your computer.

# 3

# Drivers and downloads

When troubleshooting, downloading or installing drivers it is recommended that you read the Dell Knowledge Based article, Drivers and Downloads FAQ 000123347.

# 4

# System setup

**CAUTION: Unless you are an expert computer user, do not change the settings in the BIOS Setup program. Certain changes can make your computer work incorrectly.**

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

**NOTE:** Before you change BIOS Setup program, it is recommended that you write down the BIOS Setup program screen information for future reference.

Use the BIOS Setup program for the following purposes:

- Get information about the hardware installed in your computer, such as the amount of RAM and the size of the hard drive.
- Change the system configuration information.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, and enabling or disabling base devices.

## BIOS overview

The BIOS manages data flow between the computer's operating system and attached devices such as hard disk, video adapter, keyboard, mouse, and printer.

## Entering BIOS setup program

**About this task**

Turn on (or restart) your computer and press F2 immediately.

## Navigation keys

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

**Table 2. Navigation keys**

| Keys | Navigation |
|---|---|
| Up arrow | Moves to the previous field. |
| Down arrow | Moves to the next field. |
| Enter | Selects 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.<br>**NOTE:** For the standard graphics browser only. |
| Esc | Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system. |

# Boot Sequence

Boot Sequence allows you to bypass the System Setup–defined boot device order and boot directly to a specific device (for example: optical drive or hard drive). During the Power-on Self Test (POST), when the Dell logo appears, you can:

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

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

- Removable Drive (if available)
- STXXXX Drive (if available)

  **NOTE:** XXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

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

# One time boot menu

To enter **one time boot menu**, turn on your computer, and then press F12 immediately.

**NOTE:** It is recommended to shutdown the computer if it is on.

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

- Removable Drive (if available)
- STXXXX Drive (if available)

  **NOTE:** XXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

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

# System setup options

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

### Table 3. System setup options—System information menu

| Overview | |
|---|---|
| **System Information** | |
| BIOS Version | Displays the BIOS version number. |
| Service Tag | Displays the Service Tag of the computer. |
| Asset Tag | Displays the Asset Tag of the computer. |
| Manufacture Date | Displays the manufacture date of the computer. |
| Ownership Date | Displays the ownership date of the computer. |
| Express Service Code | Displays the express service code of the computer. |
| Ownership Tag | Displays the ownership tag of the computer. |
| Signed Firmware Update | Displays whether the signed firmware update is enabled. |
| **PROCESSOR** | |

### Table 3. System setup options—System information menu (continued)

| Overview | |
|---|---|
| Processor Type | Displays the processor type. |
| Maximum Clock Speed | Displays the maximum processor clock speed. |
| Minimum Clock Speed | Displays the minimum processor clock speed. |
| Current Clock Speed | Displays the current processor clock speed. |
| Core Count | Displays the number of cores on the processor. |
| Processor ID | Displays the processor identification code. |
| Processor L2 Cache | Displays the Processor L2 Cache size. |
| Processor L3 Cache | Displays the Processor L2 Cache size. |
| Microcode Version | Displays the microcode version of the processor. |
| Intel® Hyper-Threading Capable | Displays whether the processor is Hyper-Threading (HT) capable. |
| 64-Bit Technology | Displays whether 64-bit technology is used. |
| **MEMORY** | |
| Memory Installed | Displays the total computer memory installed. |
| Memory Available | Displays the total computer memory available. |
| Memory Speed | Displays the memory speed. |
| Memory Channel Mode | Displays single or dual channel mode. |
| Memory Technology | Displays the technology that is used for the memory. |
| DIMM 1 Size | Displays the DIMM 1 memory size. |
| DIMM 2 Size | Displays the DIMM 2 memory size. |
| **DEVICES** | |
| Video Controller | Displays the video controller type of the computer. |
| Video Memory | Displays the video memory information of the computer. |
| Wi-Fi Device | Displays the wireless device information of the computer. |
| Native Resolution | Displays the native resolution of the computer. |
| Video BIOS Version | Displays the video BIOS version of the computer. |
| Audio Controller | Displays the audio controller information of the computer. |
| Bluetooth Device | Displays the Bluetooth device information of the computer. |
| LOM MAC Address | Displays the LOM MAC address of the computer. |
| Slot 2 | Displays the status of the expansion slot (Slot 2) of the computer. |
| Slot 3 | Displays the status of the expansion slot (Slot 3) of the computer. |

### Table 4. System setup options—Boot Configuration menu

| Boot Configuration | |
|---|---|
| **Boot Sequence** | |
| Boot Mode: UEFI only | Displays the boot mode of this computer. |
| Boot Sequence | Specifies the order that the BIOS searches the list of devices to find an operating system to boot.<br>By default, UEFI Hard Drive 2 is selected<br>By default, Windows Boot Manager is selected<br>By default, UEFI Hard Drive is selected |

### Table 4. System setup options—Boot Configuration menu (continued)

| Boot Configuration | |
|---|---|
| | By default, ONBOARD NIC (IPV4) is selected<br>By default, ONBOARD NIC (IPV6) is selected<br>By default, UEFI HTTPS Boost is selected |
| **Secure Boot** | |
| Enable Secure Boot | Enables secure boot using only validated boot software.<br>Default: OFF |
| Secure Boot Mode | Modifies the behavior of Secure Boot to allow evaluation or enforcement of UEFI driver signatures. Deployed Mode should be selected for normal operation of Secure Boot.<br>By default, Deployed Mode is selected. |
| **Expert Key Management** | |
| Enable Custom Mode | Allows the PK, KEK, db, and dbx security key databases to be modified.<br>Default: OFF<br>**NOTE:** If Custom Mode is not enabled, any changes that are made with respect to the keys will not be saved. |
| Custom Mode Key Management | Allows for selection of key database.<br>• Save to File will save the key to a user-selected file.<br>• Replace from File will replace the current key with a key from a user-selected file.<br>• Append from File will add a key to the current database from a user-selected file.<br>• Delete will delete the selected key.<br>• Reset All Keys will reset all four keys to their default settings.<br>By default, PK security key database is selected.<br>By default, Save to File is selected. |

### Table 5. System setup options—Integrated Devices menu

| Integrated Devices | |
|---|---|
| **Date/Time** | |
| Date | Sets the computer date in MM/DD/YYYY format. Changes to the date take effect immediately. |
| Time | Sets the computer time in HH/MM/SS 24-hour format. You can switch between 12-hour and 24-hour clock. Changes to the time take effect immediately. |
| **Audio** | Enables or disables all integrated audio controller.<br>Default: ON |
| Enable Microphone | Enables or disables microphone.<br>By default, Enable Microphone is selected. |
| Enable Internal Speaker | Enables or disables internal speaker.<br>By default, Enable Internal Speaker is selected. |
| **USB Configuration** | Enables or disables booting from USB mass storage devices such as external hard drive, optical drive, and USB drive.<br>By default, Enable Front USB Ports is selected. |

### Table 5. System setup options—Integrated Devices menu (continued)

| Integrated Devices | |
|---|---|
| | By default, Enable Rear USB Ports is selected.<br>By default, Enable USB Boot Support is selected. |
| **Front USB Configuration** | Enables or disables individual USB ports.<br>By default, Front Port 1 (Bottom Left)* is selected.<br>By default, Front Port 2 (Bottom Right)* is selected.<br>By default, Front Port 3 (Top Left) is selected.<br>By default, Front Port 5 (Top Right) is selected.<br>* Denotes a USB 3.0-capable port<br>**NOTE:** USB keyboard and mouse always work in the BIOS setup irrespective of this setting. |
| **Rear USB Configuration** | Enables or disables individual USB ports.<br>By default, Rear Port 1 (Top Left)* is selected.<br>By default, Rear Port 2 (Top Right)* is selected.<br>By default, Rear Port 3 (Bottom Left) is selected.<br>By default, Rear Port 5 (Bottom Right) is selected.<br>* Denotes a USB 3.0-capable port<br>**NOTE:** USB keyboard and mouse always work in the BIOS setup irrespective of this setting. |

### Table 6. System setup options—Storage menu

| Storage | |
|---|---|
| **SATA Operation** | |
| SATA/NVMe Operation | Configures operating mode of the integrated storage device controller.<br>Default: RAID On. Storage device is configured to support RAID. (Intel® Rapid Restore Technology) |
| **Storage Interface** | |
| Port Enablement | Enables or disables the onboard drives.<br>Default: SATA-0 is ON<br>Default: SATA-1 is ON<br>Default: SATA-3 is ON<br>Default: M.2 PCIe SDD-0 is ON |
| **SMART Reporting** | Enable or disable SMART Reporting during system startup.<br>Default: OFF |
| **Drive Information** | Displays the information of various onboard drives. |
| **Enable MediaCard** | Turn on or off all media cards, or enable or disable the media card in read-only state.<br>By default, Secure Digital (SD) Card is selected. |

### Table 7. System setup options—Display menu

| Display |
|---|
| **Primary Display** |

### Table 7. System setup options—Display menu (continued)

| Display | |
|---|---|
| Video Primary Display | Set or change the primary video controller when multiple controllers are available in the system.<br>By default, Auto is selected. |
| **Full Screen Logo** | |
| Full Screen Logo | Displays the full screen logo if the screen resolution matches the image of the logo.<br>Default: OFF |

### Table 8. System setup options—Connection menu

| Connection | |
|---|---|
| **Network Controller Configuration** | |
| Integrated NIC | Controls the onboard LAN controller.<br>By default, Enable with PXE is selected. |
| **Wireless Device Enable** | |
| WLAN | Enables or disables the internal WLAN device.<br>Default: ON |
| Bluetooth® | Enables or disables the internal Bluetooth® device.<br>Default: ON |
| **Enable UEFI Network Stack** | |
| Enable UEFI Network Stack | Enable or disable UEFI Network Stack.<br>Default: ON |
| **HTTP(s) Boot Feature** | Enables or disables internal speaker.<br>By default, Enable Internal Speaker is selected. |
| HTTP(s) Boot | Enables or disables HTTP(s) Boot Feature.<br>Default: ON |
| HTTP(s) Boot Modes | Configure the HTTP(s) Boot Mode. Auto Mode will extract Boot URL from the Dynamic Host Configuration Protocol (DHCP). Manual mode reads user-provided Boot URL.<br>By default, Auto Mode is selected. |

### Table 9. System setup options—Power menu

| Power | |
|---|---|
| **USB Wake Support** | |
| Enable USB Wake Support | Enables USB devices like a mouse or keyboard to wake the system from Standby, Hibernation, or Power Off state.<br>Default: ON |
| **AC Behavior** | |
| AC Recovery | Configures the system response when power is restored after an unexpected loss of power.<br>Default: Power OFF is selected. System stays off after AC power is restored. |
| **Active State Power Management** | |

### Table 9. System setup options—Power menu (continued)

| Power | |
|---|---|
| ASPM | Configures the Active State Power Management (ASPM) level.<br>Default: Auto. There is handshaking between the device and PCI Express hub to determine the best ASPM mode supported by the device. |
| **Block Sleep** | |
| Block Sleep | Blocks the computer from entering Sleep (S3) mode in the operating system.<br>Default: OFF |
| **Deep Sleep Control** | |
| Deep Sleep Control | Configures how aggressive the system is at conserving power while in Shutdown (S5) or Hibernate (S4) mode.<br>Default: Enabled in S4 and S5 |
| **Intel® Speed Shift Technology** | |
| Intel® Speed Shift Technology | Enables or disables the Intel Speed Shift Technology support. Turning on this option allows the operating system to select the appropriate processor performance automatically.<br>Default: ON |

### Table 10. System setup options—Security menu

| Security | |
|---|---|
| TPM 2.0 Security | Enable or disable TPM 2.0 Security.<br>Default: ON |
| Attestation Enable | Enable or disable Attestation.<br>Default: OFF |
| SHA-256 | Enable or disable SHA-256.<br>Default: OFF |
| Clear | Enable or disable the Intel Platform Trust Technology (PPT) owner information. When enabled, this setting will reset the PPT to its default state. Changes to this setting take effect after exiting the BIOS setup menu.<br>Default: OFF |
| PPI ByPass for Clear Commands | Enable or disable the TPM Physical Presence Interface (PPI). When enabled, this setting will allow the OS to skip BIOS PPI user prompts when issuing the Clear command. Changes to this setting take effect immediately.<br>Default: OFF |
| **SMM Security Mitigation** | |
| SMM Security Mitigation | Enable or disable additional SMM Security Mitigation protection. The operating system makes use of this feature to protect the secure environment crated by virtualization-based security.<br>Default: OFF |
| **Data Wipe on Next Boot** | |
| Start Data Wipe | Enable or disable data wipe cycle. If enabled, the BIOS will schedule a data wipe cycle for storage device(s) connected to the motherboard on the next reboot. Any data on the storage device(s) cannot be recovered after this Secure Wipe Operation.<br>Default: OFF |

### Table 10. System setup options—Security menu (continued)

| Security | |
|---|---|
| Absolute® | Enable or disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute® Software.<br>Default: Enable Absolute |
| **UEFI Boot Path Security** | |
| UEFI Boot Path Security | Configures whether the computer will prompt the user for the admin password (if set) when booting to a UEFI boot path device from the F12 boot menu.<br>Default: Always Except Internal HDD is selected |
| Admin Password | Set, change, or delete the administrator password. |
| System Password | Set, change, or delete the system password. |
| Internal HDD-0 Password | Set, change, or delete the internal hard-disk drive password. |
| Password Configuration | Control the minimum and maximum number of characters allowed for Admin and System passwords. |
| Password Change | Enable or disable changes to the System and Hard Disk passwords when an administrator password is set. |
| UEFI Capsule Firmware Updates | Enable or disable BIOS updates through UEFI capsule update packages. |
| **PTT Security** | |
| PTT On | Enable or disable Platform Trust Technology (PTT) visibility to the operating system. |
| Clear | Default: Disabled |
| PPI ByPass for Clear Commands | Enable or disable the TPM Physical Presence Interface (PPI). When enabled, this setting will allow the OS to skip BIOS PPI user prompts when issuing the Clear command. Changes to this setting take effect immediately.<br>Default: Disabled |
| Absolute® | Enable or disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute® Software.<br>Default: Enable Absolute |
| Admin Setup Lockout | Enable to prevent users from entering Setup when an Admin Password is set. |
| Master Password Lockout | Disables the master password support. Hard Disk passwords need to be cleared before changing the setting. |
| SMM Security Mitigation | Enable or disable SMM Security Mitigation |

### Table 11. System setup options—Passwords menu

| Passwords | |
|---|---|
| **Admin Password** | Enables the user to set, change, or delete the administrator (admin) password. The admin password enables several security features |
| **System Password** | Enables the user to set, change, or delete the system password. |
| **Password Configuration** | |
| Upper Case Letter | Enforces password restriction that the password must contain at least one upper case letter.<br>Default: OFF |
| Lower Case Letter | Enforces password restriction that the password must contain at least one lower case letter.<br>Default: OFF |

### Table 11. System setup options—Passwords menu (continued)

| Passwords | |
|---|---|
| Digit | Enforces password restriction that the password must contain at least one digit.<br>Default: OFF |
| Special Character | Enforces password restriction that the password must contain at least one special character.<br>Default: OFF |
| Minimum Characters | Controls the minimum number of characters allowed for password.<br>Default: 04 |
| **Password Changes** | |
| Enable Non-Admin Password Changes | Enables or disables the user to change the system and hard drive password without the need for admin password.<br>Default: ON |
| **Master Password Lockout** | |
| Enable Master Password Lockout | Enables or disables master password support. |
| **Allow Non-Admin PSID Revert** | |
| Enable Allow Non-Admin PSID Revert | Enables or disables Physical Security ID (PSID) revert of NVMe storage drives from the Dell Security Manager prompt.<br>Default: Disabled<br>**NOTE:** When disabled, the PSID revert is protected by the BIOS Admin password (if set), and the user will be prompted for the password before the revert is performed |

### Table 12. System setup options—Update,Recovery menu

| Update,Recovery | |
|---|---|
| **UEFI Capsule Firmware Updates** | |
| Enable UEFI Capsule Firmware Updates | Enables or disables BIOS updates through UEFI capsule update packages.<br>Default: ON |
| **BIOS Recovery from Hard Drive** | |
| BIOS Recovery from Hard Drive | Enables the computer to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key.<br>Default: ON<br>**NOTE:** BIOS Recovery from Hard Drive is not available for Self-encrypting drives (SED). |
| **BIOS Downgrade** | |
| Allow BIOS Downgrade | Controls flashing of the system firmware to previous revisions.<br>Default: ON |
| **SupportAssist OS Recovery** | |
| SupportAssist OS Recovery | Enables or disables the boot flow for SupportAssist OS Recovery tool, in the event of certain system errors.<br>Default: ON |
| **BIOSConnect** | |

### Table 12. System setup options—Update,Recovery menu (continued)

| Update,Recovery | |
|---|---|
| BIOSConnect | Enables or disables cloud Service OS recovery if the main OS fails to boot within the number of failures equal or greater than the value specified by Dell Auto OS Recovery Threshold, and local Service does not boot, or is not installed.<br>Default: ON |
| **Dell Auto OS Recovery Threshold** | |
| Dell Auto OS Recovery Threshold | Controls the automatic boot flow for SupportAssist System Resolution Console and for Dell operating system Recovery tool.<br>Default: 2. |

### Table 13. System setup options—System Management menu

| System Management | |
|---|---|
| **Service Tag** | Displays the Service Tag of the computer. |
| **Asset Tag** | Creates a system Asset Tag that can be used by an IT administrator to uniquely identify a particular system. Once set in BIOS, the Asset Tag cannot be changed. |
| **Wake on LAN/WLAN** | |
| Wake on LAN/WLAN | Enables the computer to be powered on by special LAN signals.<br>Default: Disabled |
| **Auto On Time** | |
| Auto On Time | Controls automatic powering up of system for defined days and times.<br>Default: Disabled |

### Table 14. System setup options—Keyboard menu

| Keyboard | |
|---|---|
| **Keyboard Errors** | |
| Enable Keyboard Error Detection | Enables or disables report of keyboard-related errors when the computer boots.<br>Default: ON |
| **Numlock LED** | |
| Enable Numlock LED | Enables or disables Numlock when the computer boots.<br>Default: ON |

### Table 15. System setup options—Pre-boot Behavior menu

| Pre-boot Behavior | |
|---|---|
| **Warnings and Errors** | |
| Warnings and Errors | Selects an action on encountering a warning or error during boot.<br>Default: Prompt on Warnings and Errors. Stop, prompt, and wait for user input when warnings or errors are detected.<br>**NOTE:** Errors deemed critical to the operation of the computer hardware will always halt the computer. |
| **Fastboot** | |
| Fastboot | Configures the speed of the UEFI boot process. |

### Table 15. System setup options—Pre-boot Behavior menu (continued)

| Pre-boot Behavior | |
|---|---|
| | Default: Thorough. Performs complete hardware and configuration initialization during boot. |
| **Extend BIOS POST Time** | |
| Extend BIOS POST Time | Configures the BIOS POST (Power-On Self-Test) load time.<br>Default: 0 seconds |

### Table 16. System setup options—Virtualization menu

| Virtualization | |
|---|---|
| **Intel® Virtualization Technology** | |
| Enable Intel® Virtualization Technology (VT) | Enables the computer to run a virtual machine monitor (VMM).<br>Default: ON |
| **VT for Direct I/O** | |
| Enable Intel® VT for Direct I/O | Enables the computer to perform Virtualization Technology for Direct I/O (VT-d). VT-d is an Intel method that provides virtualization for memory map I/O.<br>Default: ON |

### Table 17. System setup options—Performance menu

| Performance | |
|---|---|
| **Multi-Core Support** | |
| Active Cores | CPU core disabling is not supported with current BIOS version. Changes the number of CPU cores available to the operating system. The default value is set to the maximum number of cores.<br>Default: All Cores |
| **Intel® SpeedStep** | |
| Enable Intel SpeedStep Technology | Enables or disables the Intel SpeedStep Technology to dynamically adjust processor voltage and core frequency, decreasing average power consumption and heat production.<br>Default: ON |
| **C-States Control** | |
| Enable C-State Control | Enables or disables the CPU's ability to enter and exit low-power states.<br>Default: ON |

### Table 18. System setup options—System Logs menu

| System Logs | |
|---|---|
| **BIOS Event Log** | |
| Clear BIOS Event Log | Select keep or clear BIOS events.<br>Default: Keep |
| Power Events | |

# System and setup password

**Table 19. 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 F12 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.
   - At least one special character: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [ \ ] ^ _ ` { | }
   - Numbers 0 through 9.
   - Upper case letters from A to Z.
   - Lower case letters from a to z.
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and save the changes as prompted by the pop-up message.
5. Press Y to save the changes.
   The computer restarts.

## 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/or Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked.

### About this task

To enter the System Setup, press F12 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**, update, or delete the existing system password, and press Enter or Tab.
4. Select **Setup Password**, update, or delete the existing setup password, and press Enter or Tab.

   **NOTE:** If you change the System and/or Setup password, reenter the new password when prompted. If you delete the System and/or Setup password, confirm the deletion when prompted.

5. Press Esc and a message prompts you to save the changes.
6. Press Y to save the changes and exit from System Setup.
   The computer restarts.

# Real Time Clock (RTC) reset

The Real Time Clock (RTC) reset function allows you or the service technician to recover the recently launched model Dell computers from **No POST/No Boot/No Power** situations. You can initiate the RTC reset on the computer from a power-off state only if it is connected to AC power. Press and hold the power button for 30 seconds. The computer RTC reset occurs after you release the power button.

**NOTE:** The RTC reset is aborted if the power button is held for less than 25 seconds or more than 40 seconds.

The RTC reset restores the BIOS to defaults and resets the computer's date and time. The computer restarts several times during the reset process. Depending on how the computer is configured, you may see LED indications during the period the power button is held and after it is released. Once the reset is complete, the computer restarts and the Dell logo appears indicates reset success.

**CAUTION: Once RTC reset is complete, the computer may remain in a no-boot status until the time, date, and other BIOS settings are correctly set to boot in Windows. Failing to boot immediately after a reset does not mean that the reset has failed. You must restore the previous BIOS settings, such as the SATA Operation mode (ex. RAID On AHCI) for the computer to reboot normally.**

The following items are unaffected by the RTC reset:

- TPM (remains on and enabled if it was in that state prior to RTC reset)
- Service Tag
- Asset Tag
- Ownership Tag
- Admin Password
- System Password
- Hard drive Password
- Key Databases
- System Logs

The following items may or may not reset based on your custom BIOS setting selections:

- Boot List
- Secure Boot Enable
- Allow BIOS Downgrade
- Password clear

The Master System Password is used to clear the admin and computer password.

To clear the system or BIOS passwords, contact Dell technical support as described at www.dell.com/contactdell.

**NOTE:** For information on how to reset Windows or application passwords, refer to the documentation accompanying Windows or your application.

## Clearing BIOS (System Setup) and System passwords

**About this task**

To clear the system or BIOS passwords, contact Dell technical support as described at www.dell.com/contactdell.

**NOTE:** For information on how to reset Windows or application passwords, refer to the documentation accompanying Windows or your application.

# Updating the BIOS

## Updating the BIOS in Windows

**Steps**

1. Go to www.dell.com/support.
2. Click **Product support**. In the **Search support** box, enter the Service Tag of your computer, and then click **Search**.

   **NOTE:** If you do not have the Service Tag, use the SupportAssist feature to automatically identify your computer. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.
   For more information, see knowledge base article 000124211 at www.dell.com/support.

## Updating the BIOS using the USB drive in Windows

**Steps**

1. Follow the procedure from step 1 to step 6 in Updating the BIOS in Windows to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information, see the knowledge base article 000145519 at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12** .
6. Select the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
   The **BIOS Update Utility** appears.
8. Follow the on-screen instructions to complete the BIOS update.

## Updating the BIOS from the F12 One-Time boot menu

Update your computer BIOS using the BIOS update.exe file that is copied to a FAT32 USB drive and booting from the F12 One-Time boot menu.

**About this task**

**BIOS Update**

You can run the BIOS update file from Windows using a bootable USB drive or you can also update the BIOS from the F12 One-Time boot menu on the computer.

Most of the Dell computers built after 2012 have this capability, and you can confirm by booting your computer to the F12 One-Time Boot Menu to see if BIOS FLASH UPDATE is listed as a boot option for your computer. If the option is listed, then the BIOS supports this BIOS update option.

**NOTE:** Only computers with BIOS Flash Update option in the F12 One-Time boot menu can use this function.

### Updating from the One-Time boot menu

To update your BIOS from the F12 One-Time boot menu, you need the following:

- USB drive formatted to the FAT32 file system (key does not have to be bootable)
- BIOS executable file that you downloaded from the Dell Support website and copied to the root of the USB drive
- AC power adapter that is connected to the computer
- Functional computer battery to flash the BIOS

Perform the following steps to perform the BIOS update flash process from the F12 menu:

**CAUTION: Do not turn off the computer during the BIOS update process. The computer may not boot if you turn off your computer.**

### Steps

1. From a turn off state, insert the USB drive where you copied the flash into a USB port of the computer.
2. Turn on the computer and press F12 to access the One-Time Boot Menu, select BIOS Update using the mouse or arrow keys then press Enter.
   The flash BIOS menu is displayed.
3. Click **Flash from file**.
4. Select external USB device.
5. Select the file and double-click the flash target file, and then click **Submit**.
6. Click **Update BIOS**. The computer restarts to flash the BIOS.
7. The computer will restart after the BIOS update is completed.

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# Troubleshooting

## Locate the Service Tag or Express Service Code of your Dell computer

Your Dell computer is uniquely identified by a Service Tag or Express Service Code. To view relevant support resources for your Dell computer, enter its Service Tag or Express Service Code at www.dell.com/support.

For more information on how to find the Service Tag for your computer, see Locate the Service Tag for your Dell Laptop.

## SupportAssist diagnostics

**About this task**

The SupportAssist diagnostics (previously known as ePSA diagnostics) performs a complete check of your hardware. The SupportAssist diagnostics is embedded in the BIOS and is launched by it internally. The SupportAssist diagnostics provides a set of options for particular devices or device groups. It allows you to:

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

**NOTE:** Some tests are meant for specific devices and require user interaction. Ensure that you are present in front of the computer when the diagnostic tests are performed.

For more information, see SupportAssist Pre-Boot System Performance Check.

## 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.

## Recovering the operating system

When your computer is unable to boot to the operating system even after repeated attempts, it automatically starts Dell SupportAssist OS Recovery.

Dell SupportAssist OS Recovery is a standalone tool that is preinstalled in all Dell computers installed with Windows operating system. It consists of tools to diagnose and troubleshoot issues that may occur before your computer boots to the operating system. It enables you to diagnose hardware issues, repair your computer, back up your files, or restore your computer to its factory state.

You can also download it from the Dell Support website to troubleshoot and fix your computer when it fails to boot into their primary operating system due to software or hardware failures.

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at www.dell.com/serviceabilitytools. Click **SupportAssist** and then, click **SupportAssist OS Recovery**.

# 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.

# Drain residual flea power (perform hard reset)

### About this task

Flea power is the residual static electricity that remains in the computer even after it has been powered off and the battery is removed.

For your safety, and to protect the sensitive electronic components in your computer, you are requested to drain residual flea power before removing or replacing any components in your computer.

Draining residual flea power, also known as a performing a "hard reset", is also a common troubleshooting step if your computer does not power on or boot into the operating system.

**To drain residual flea power (perform a hard reset)**

### Steps

1. Turn off your computer.
2. Disconnect the power adapter from your computer.
3. Press and hold the power button for 20 seconds to drain the flea power.
4. Connect the power adapter to your computer.
5. Turn on your computer.

   **NOTE:** For more information about performing a hard reset, see the knowledge base article 000130881 at www.dell.com/support.

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# Getting help and contacting Dell

## Self-help resources

You can get information and help on Dell products and services using these self-help resources:

**Table 20. Self-help resources**

| Self-help resources | Resource location |
|---|---|
| Information about Dell products and services | www.dell.com |
| My Dell app | |
| Tips | |
| Contact Support | In Windows search, type `Contact Support`, and press Enter. |
| Online help for operating system | www.dell.com/support/windows<br>www.dell.com/support/linux |
| Access top solutions, diagnostics, drivers and downloads, and learn more about your computer through videos, manuals and documents. | Your Dell computer is uniquely identified by a Service Tag or Express Service Code. To view relevant support resources for your Dell computer, enter the Service Tag or Express Service Code at www.dell.com/support.<br>For more information on how to find the Service Tag for your computer, see Locate the Service Tag on your computer. |
| Dell knowledge base articles for a variety of computer concerns | 1. Go to www.dell.com/support.<br>2. On the menu bar at the top of the Support page, select **Support** > **Knowledge Base**.<br>3. In the Search field on the Knowledge Base page, type the keyword, topic, or model number, and then click or tap the search icon to view the related articles. |

## Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see www.dell.com/contactdell.

**NOTE:** Availability varies by country/region and product, and some services may not be available in your country/region.

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