Dell OptiPlex 9010/7010 Mini-Tower

Owner's Manual

Regulatory Model: D09M
Regulatory Type: D09M003

Notes, Cautions, and Warnings

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

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

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

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Contents

1

Working on Your Computer

Topics:

Before Working Inside Your Computer

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

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

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

NOTE: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance

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

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

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

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

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

To avoid damaging your computer, perform the following steps before you begin working inside the computer.

1. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
2. Turn off your computer (see Turning Off Your Computer).

   CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.
3. Disconnect all network cables from the computer.
4. Disconnect your computer and all attached devices from their electrical outlets.
5. Press and hold the power button while the computer is unplugged to ground the system board.
6. Remove the cover.

   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.

Turning Off Your Computer

CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.

1. Shut down the operating system:
   - In Windows 8:
     - Using a touch-enabled device:
       a. Swipe in from the right edge of the screen, opening the Charms menu and select **Settings**.
       b. Select the and then select **Shut down**
     - Using a mouse:
       a. Point to upper-right corner of the screen and click **Settings**.
       b. Click the and select **Shut down**.
   - In Windows 7:
     a. Click **Start** .
     b. Click **Shut Down.**

     or

     a. Click **Start** .
     b. Click the arrow in the lower-right corner of the **Start** menu as shown below, and then click **Shut Down.**.

2. Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

After Working Inside Your Computer

After you complete any replacement procedure, ensure you connect any external devices, cards, and cables before turning on your computer.

1. Replace the cover.

   CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

2. Connect any telephone or network cables to your computer.
3. Connect your computer and all attached devices to their electrical outlets.
4. Turn on your computer.
5. If required, verify that the computer works correctly by running the Dell Diagnostics.

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Removing and Installing Components

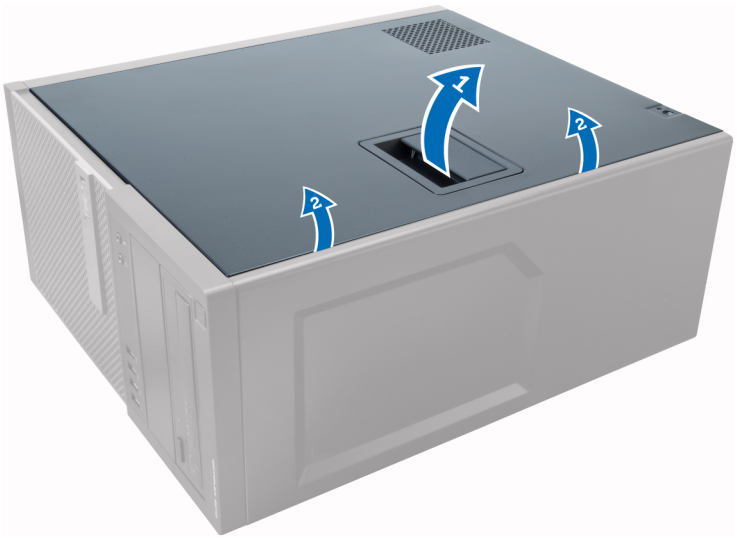
Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver
- Phillips screwdriver
- Small plastic scribe

Removing the Cover

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Pull up the cover release latch, and lift the cover upwards to remove it from the computer.

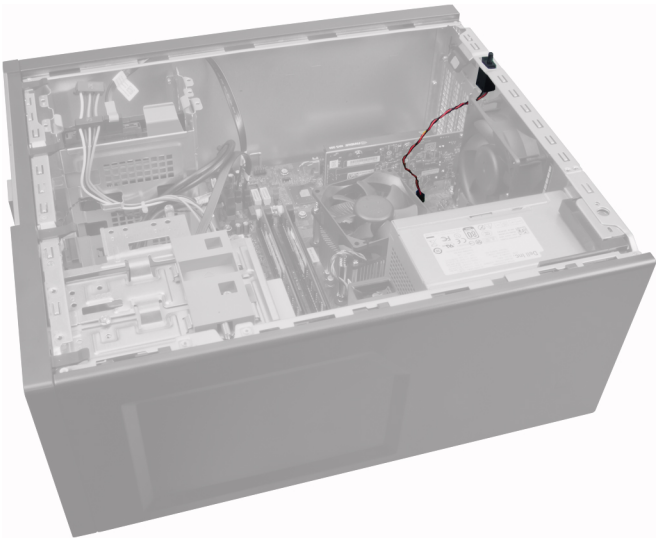


Installing the Cover

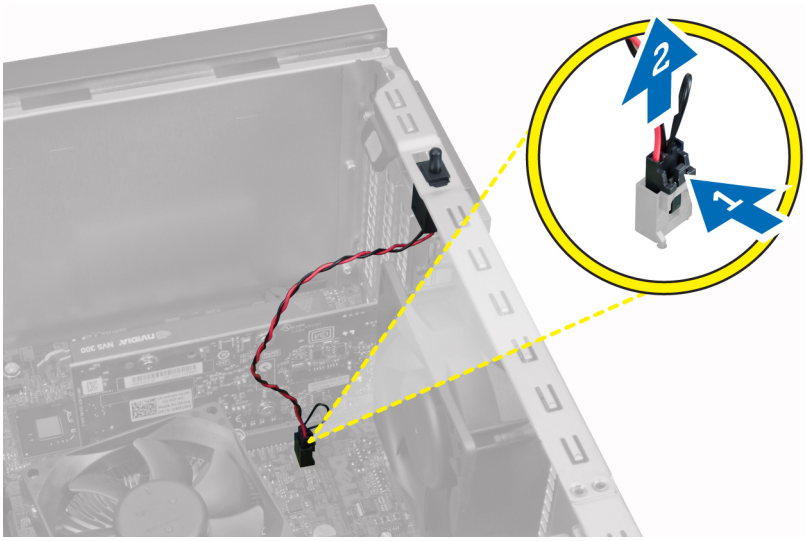
1. Align the cover along its tabs on the chassis of the computer.
2. Press down on the cover till it clicks into place.
3. Follow the procedures in *After Working Inside Your Computer*.

Removing the Intrusion Switch

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.



3. Press the clip inwards to release and gently pull the intrusion cable from system board.



4. Slide the intrusion switch toward the bottom of the chassis and remove it from the computer.

Installing the Intrusion Switch

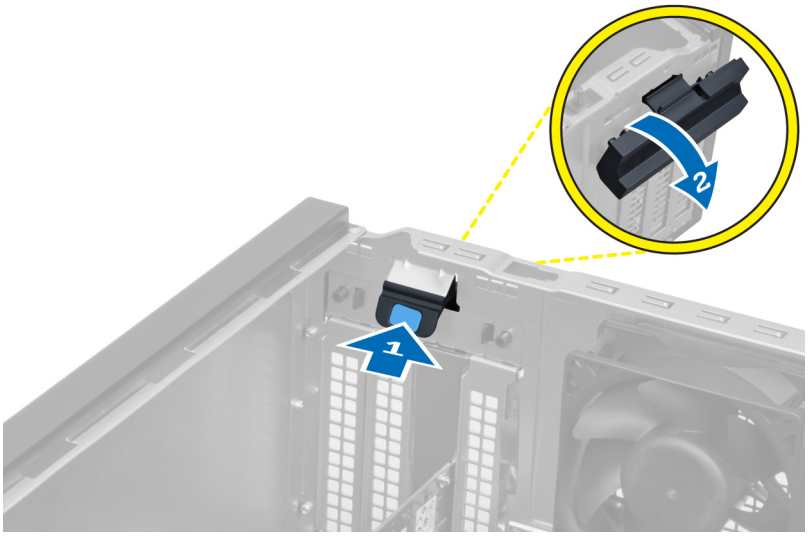
1. Insert the intrusion switch into its place in the chassis rear and slide it towards the top to secure it.

2. Connect the intrusion cable to the system board.
3. Install the cover.
4. Follow the procedures in *After Working Inside Your Computer*.

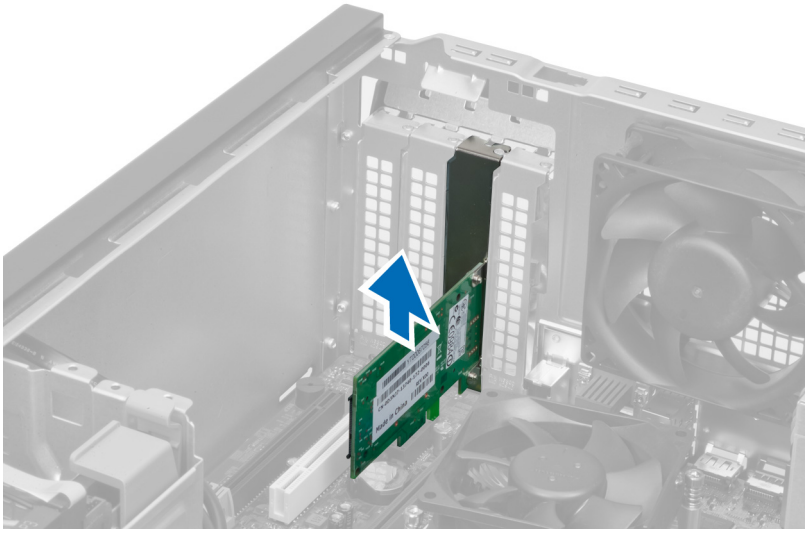
Removing the Wireless Local Area Network (WLAN) Card

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.
3. Remove the screws that secure the antenna puck to the computer. Pull the antenna puck from the computer.

4. Press the blue tab and lift the latch outwards.



5. Lift and remove the WLAN card from the connector on the system board.



Installing the WLAN Card

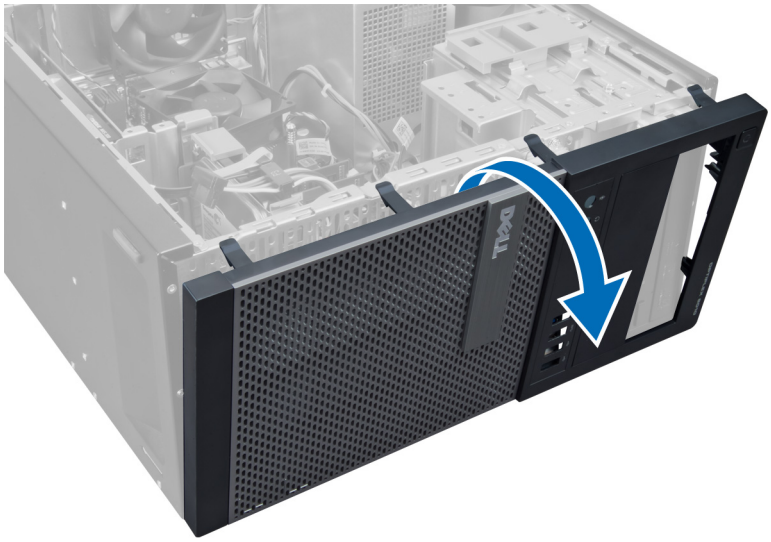
1. Insert the WLAN card into the connector on the system board and press down until it is securely in place.
2. Fix the latch.
3. Place the antenna puck on the connector and tighten the screws that secure it to the computer.
4. Install the cover.
5. Follow the procedures in *After Working Inside Your Computer*.

Removing the Front Bezel

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.

3. Gently pry the front panel retention clips away from the chassis located at the edge of front panel.

4. Rotate the front panel away from the computer to release the hooks on the opposite edge of the panel from the chassis.

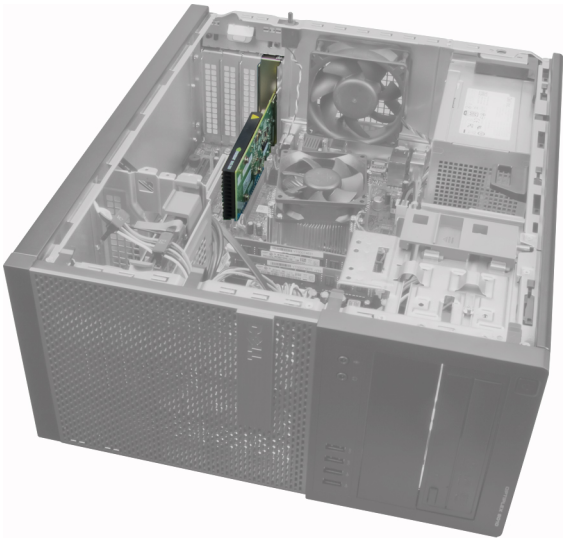


Installing the Front Bezel

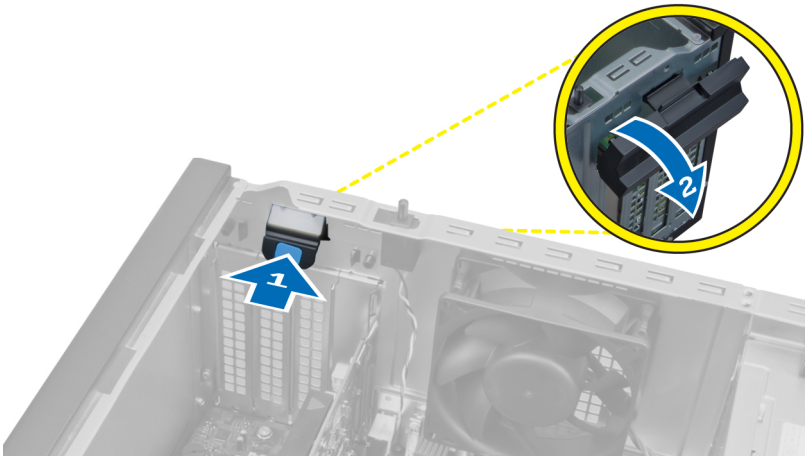
1. Insert the hooks along the bottom edge of the front bezel into the slots on the chassis front.
2. Rotate the bezel toward the computer to engage the front-bezel retention clips until they click into place.
3. Install the cover.
4. Follow the procedures in *After Working Inside Your Computer*.

Removing the Expansion Cards

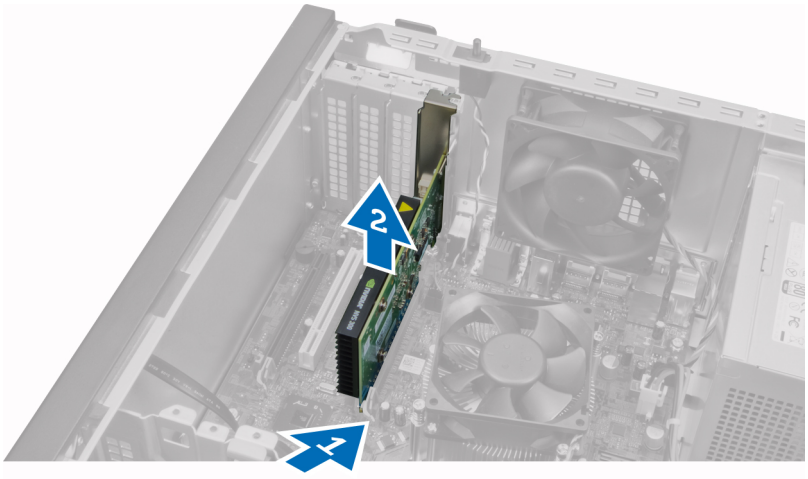
1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.



3. Press the card-retention latch on the inside and pull the latch outwards on the other side.



4. Gently pull the release lever away from the PCIe x16 card until you release the securing tab from the dent in the card. Then, ease the card up and out of its connector and remove it from the system board.



5. Repeat step 4 to remove the other expansion card(s) if available.

Installing the Expansion Card

1. Insert the expansion card into it's connector on the system board and press down until it is securely in place.
2. Repeat step 1 for other expansion cards, (if available).
3. Install the cover.

4. Follow the procedures in *After Working Inside Your Computer*.

Memory Module Guidelines

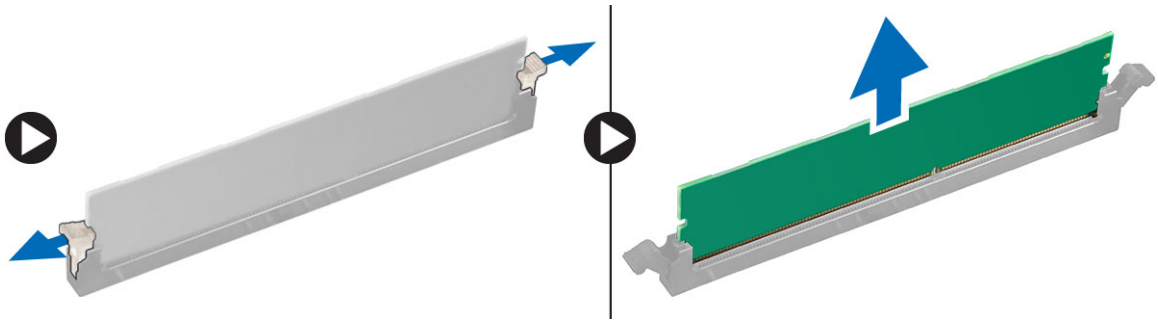
To ensure optimal performance of your computer, observe the following general guidelines when configuring your system memory:

- Memory modules of different sizes can be mixed (for example, 2 GB and 4 GB). But, all populated channels must have identical configurations.
- Memory modules must be installed beginning with the first socket.

  NOTE: The memory sockets in your computer may be labeled differently depending on the hardware configuration. For example, A1, A2 or 1,2,3.
- If the quad-rank memory modules are mixed with single or dual-rank modules, the quad-rank modules must be installed in the sockets with the white release levers.
- If memory modules with different speeds are installed, they operate at the speed of the slowest installed memory modules.

Removing the Memory

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.
3. Press down on the memory retaining tabs on each side of the memory modules, and lift the memory modules out of the connectors on the system board.

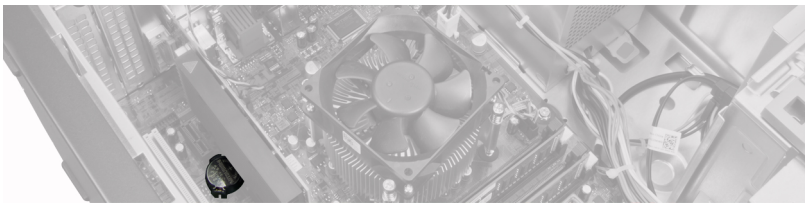


Installing the Memory

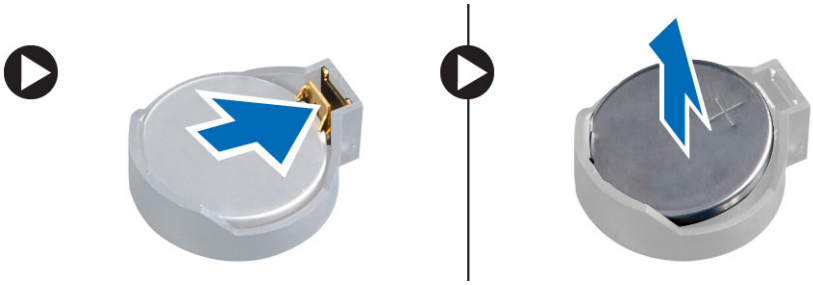
1. Align the notch on the memory-card with the tab in the system-board connector.
2. Press down on the memory module until the release tabs spring back to secure them in place.
3. Install the cover.
4. Follow the procedures in *After Working Inside Your Computer*.

Removing the Coin-Cell Battery

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.
3. Locate the coin-cell battery on the system board.



4. Remove the expansion card(s).
5. Carefully press the release latch away from the battery to allow the battery to pop up from the socket and lift the coin-cell battery out of the computer.

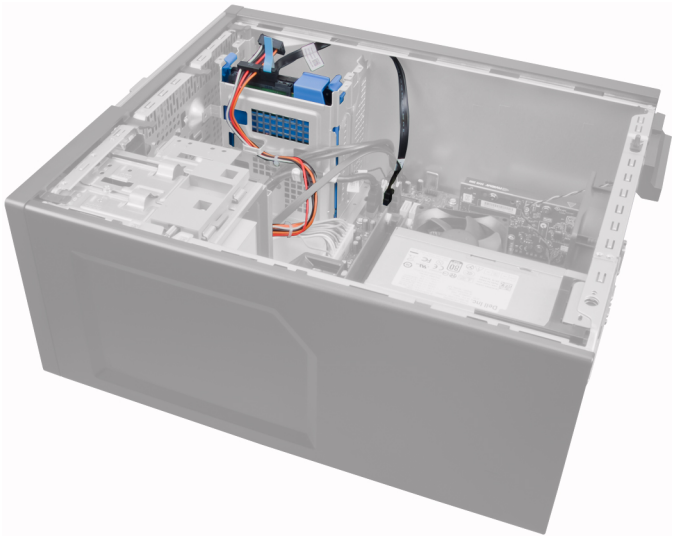


Installing the Coin-Cell Battery

1. Place the coin cell battery into its slot on the system board.
2. Press the coin cell battery downward until the release latch springs back into place and secures it.
3. Install the expansion card.
4. Install the cover.
5. Follow the procedures in *After Working Inside Your Computer*.

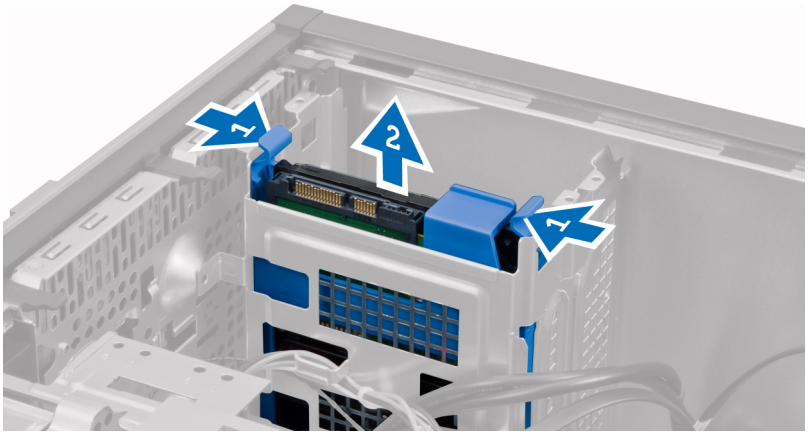
Removing the Hard Drive

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.

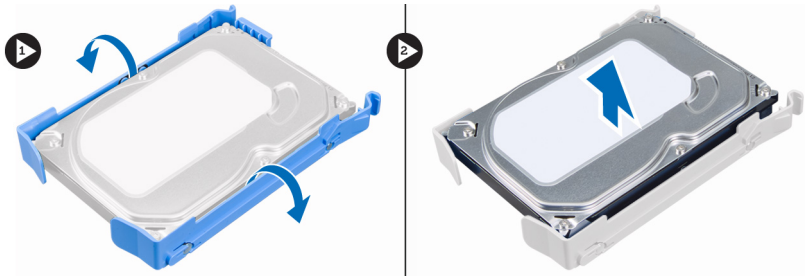


3. Remove the data cable and the power cable from the back of the hard drive.

4. Press both blue securing-bracket tabs inward and lift the hard-drive bracket out of the bay.



5. Flex the hard-drive bracket and then remove the hard drive from the bracket.



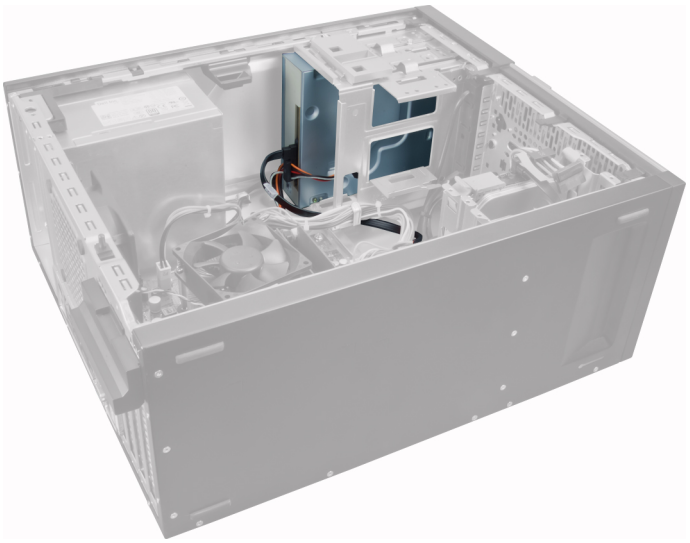
6. Repeat the steps 3 to 5 for the second hard drive, if available.

Installing the Hard Drive

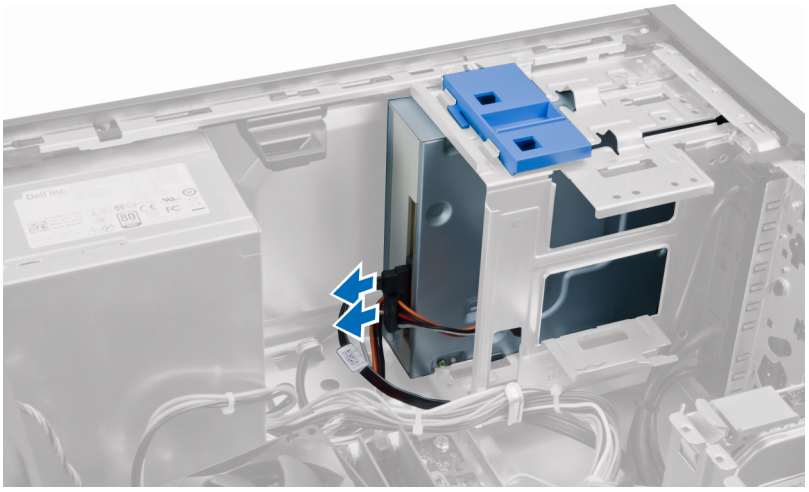
1. Insert the hard drive into the hard-drive bracket.
2. Press both blue securing-bracket tabs inward and slide the hard-drive bracket into the hard-drive bay in the chassis.
3. Connect the data cable and power cable to the back of the hard drive.
4. Install the cover.
5. Follow the procedures in *After Working Inside Your Computer*.

Removing the Optical Drive

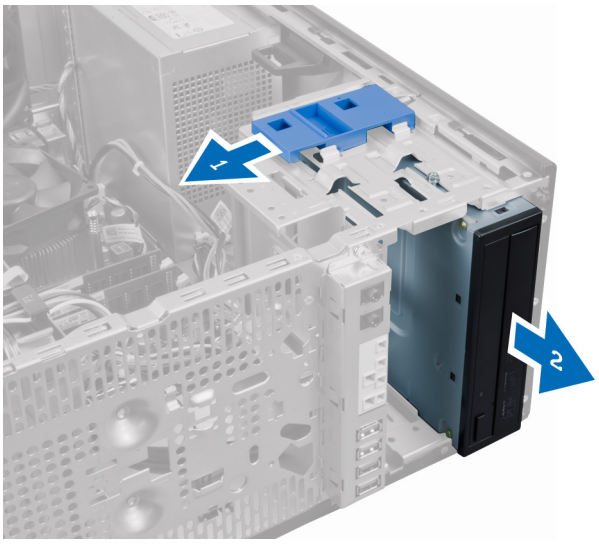
1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.
3. Remove the front panel.



4. Remove the data cable and the power cable from the back of the optical drive.



5. Slide down and hold the optical drive latch to unlock the optical drive and pull the optical drive out of the computer.



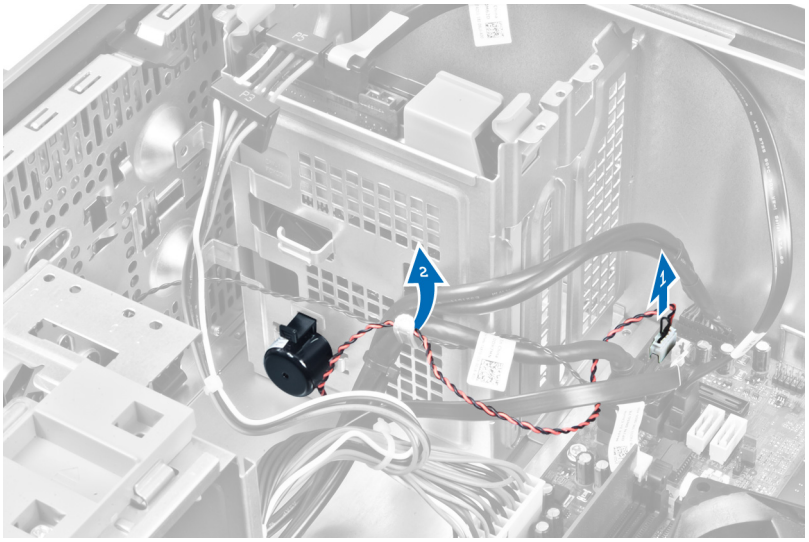
6. Repeat steps 4 to 5 to remove the second optical drive (if available).

Installing the Optical Drive

1. Push the optical drive from the front toward the back of the computer till it is secured by the optical-drive latch.
2. Connect the data cable and power cable to the back of the optical drive.
3. Install:
   a) front bezel
   b) cover
4. Follow the procedures in *After Working Inside Your Computer*.

Removing the Speaker

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.
3. Disconnect and release the speaker cable from the system board.



4. Press down the speaker-securing tab and slide the speaker upwards to remove.

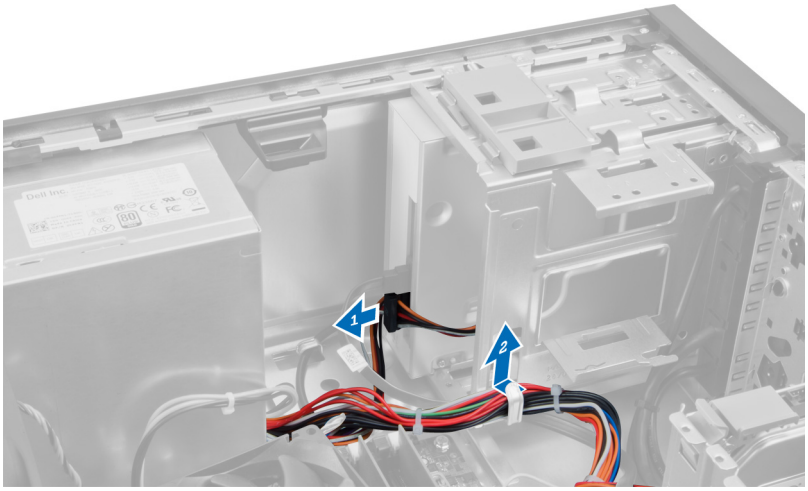
Installing the Speaker

1. Slide the speaker downwards into its slot to secure it.
2. Thread the speaker cable into the chassis clip and connect the speaker cable to the system board.
3. Install the cover.
4. Follow the procedures in *After Working Inside Your Computer*.

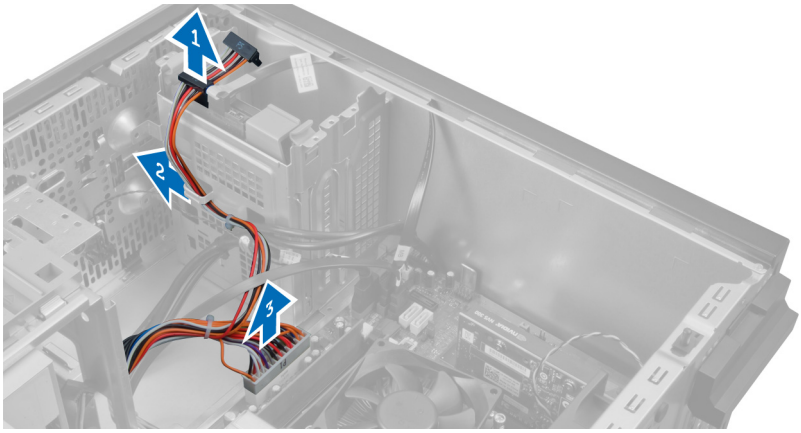
Removing the Power Supply

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.

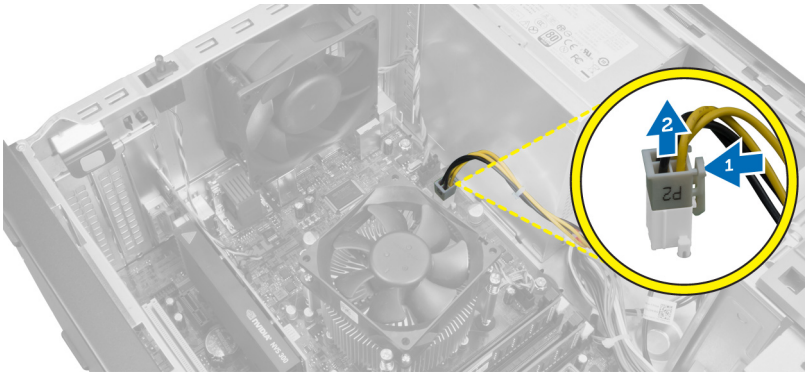
3. Release and disconnect the power cable from the optical drive(s).



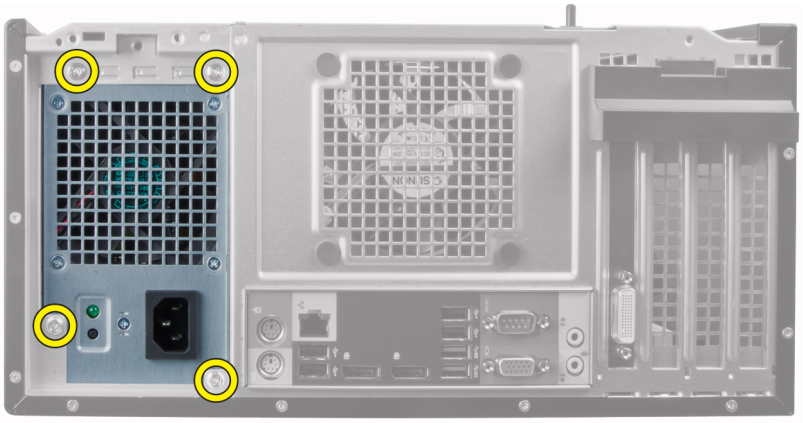
4. Disconnect the power cable from the hard drive(s) and release it from the clip. Disconnect the 24–pin cable from the system board.



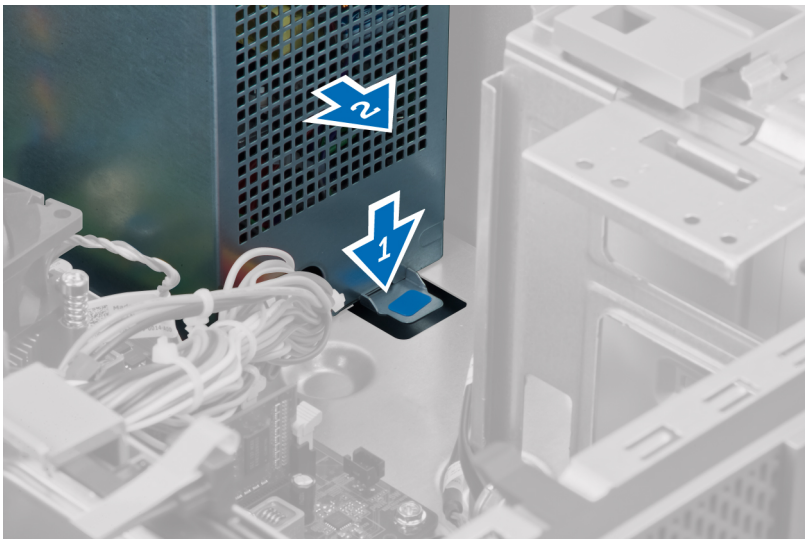
5. Disconnect the 4-pin power cable from the system board.



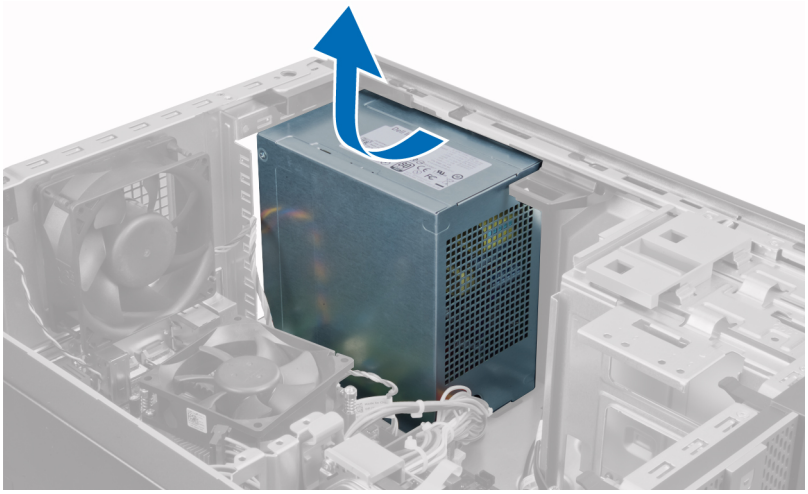
6. Remove the screws that secure the power supply to the back of the computer.



7. Push in on the blue release tab beside the power supply, and slide the power supply towards the front of the computer.



8. Lift the power supply out of the computer.

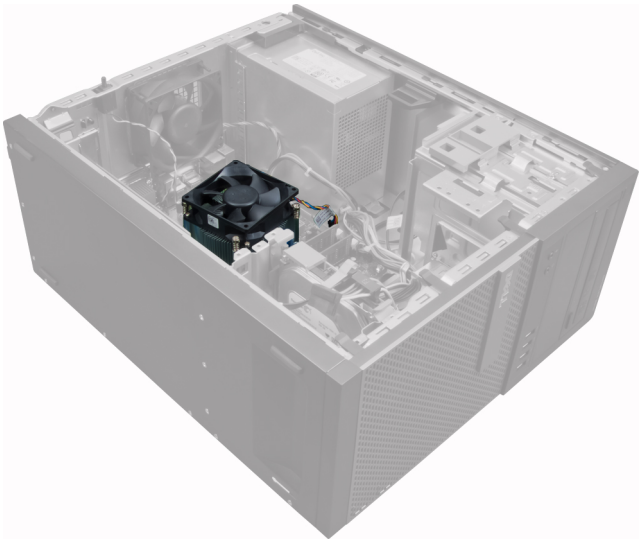


Installing the Power Supply

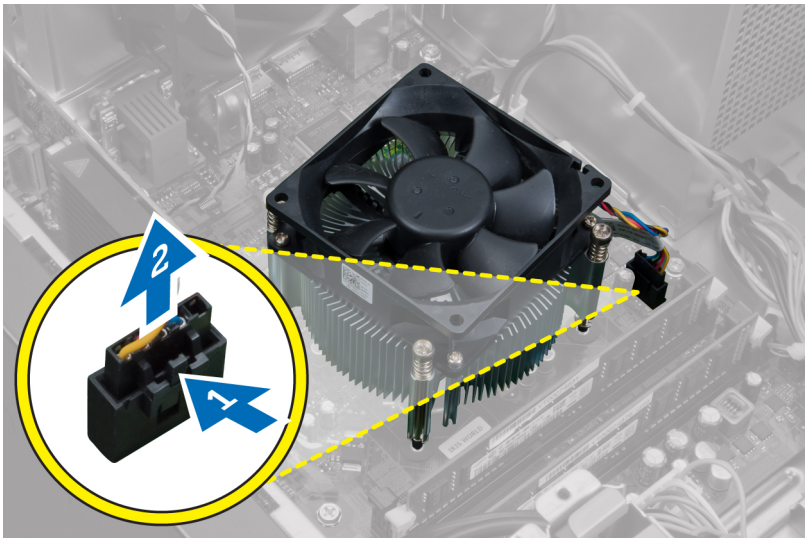
1. Place the power supply in the chassis and slide towards the back of the system to secure it.
2. Use a Phillips screwdriver to tighten the screws securing the power supply to the back of the computer.
3. Connect the 4-pin power cable to the system board.
4. Connect the 24-pin power cable to the system board.
5. Thread the power cables into the chassis clips.
6. Connect the power cables to the hard drive(s) and optical drive(s).
7. Install the cover.
8. Follow the procedures in *After Working Inside Your Computer*.

Removing the Heat Sink

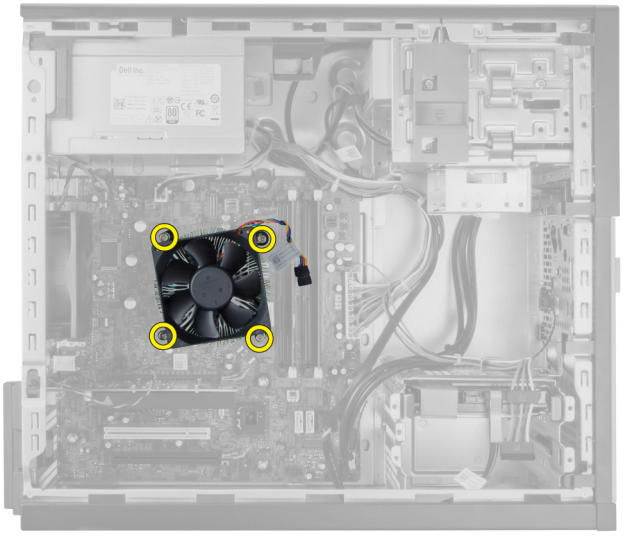
1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.



3. Press the plastic clip to release and disconnect the heat-sink cable from the system board.



4. Use a Phillips screwdriver to loosen the captive screws in diagonal order and lift the heat sink away from the computer.

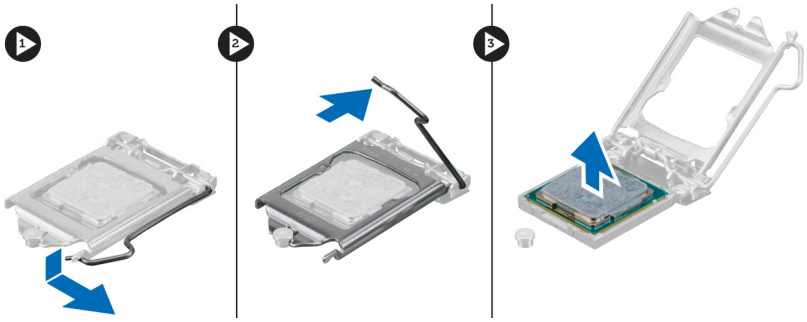


Installing the Heat-Sink Assembly

1. Place the heat-sink assembly into the chassis.
2. Use a Phillips screwdriver to tighten the captive screws in diagonal order to secure the heat-sink assembly to the system board.
3. Connect the heat-sink cable to the system board.
4. Install the cover.
5. Follow the procedures in *After Working Inside Your Computer*.

Removing the Processor

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.
3. Remove the heat sink.
4. Press the release lever down and then move it outward to release it from the retention hook. Lift the processor cover and remove the processor from the socket, and place it in antistatic bag.

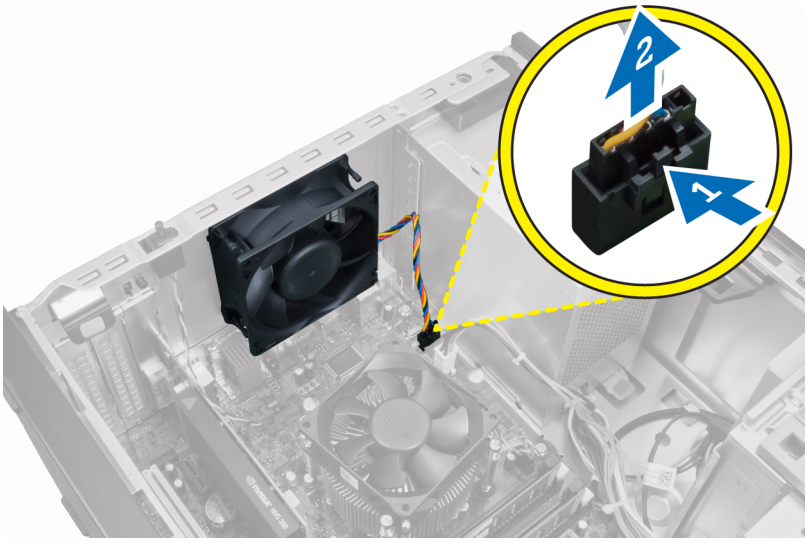


Installing the Processor

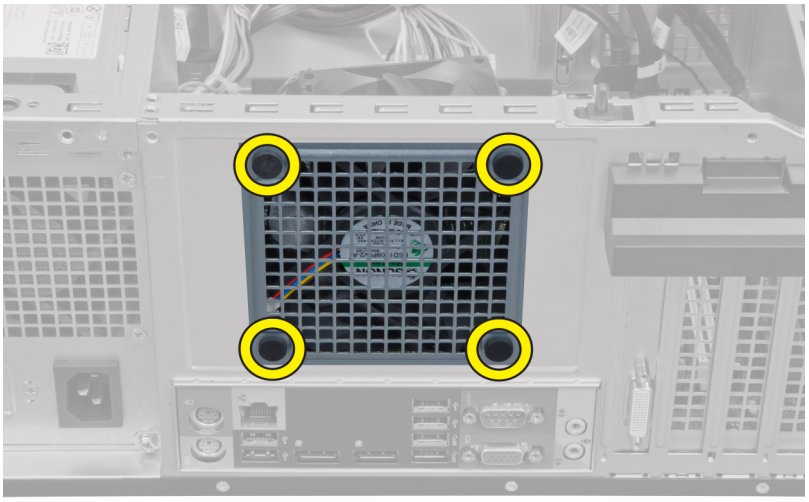
1. Insert the processor into the processor socket. Ensure the processor is properly seated.
2. Gently lower the processor cover.
3. Press the release lever down and then move it inward to secure it with the retention hook.
4. Install the heat sink.
5. Install the cover.
6. Follow the procedures in *After Working Inside Your Computer*.

Removing the System Fan

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.
3. Press the clip to release and disconnect the system fan cable from the system board.



4. Pry and remove the system fan away from the four grommets securing it to the back of the computer.

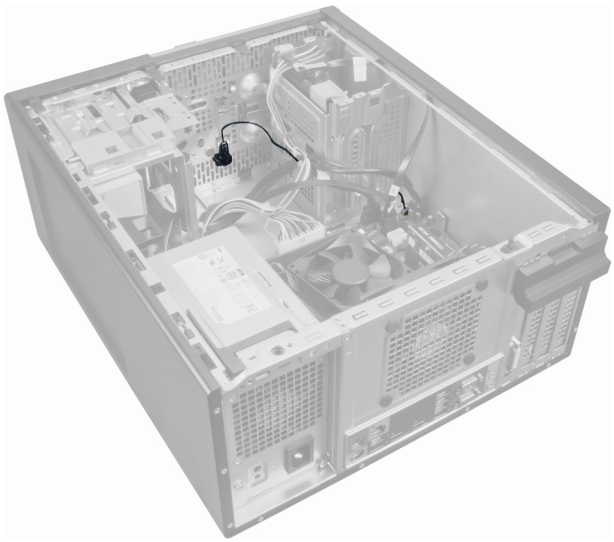


Installing the System Fan

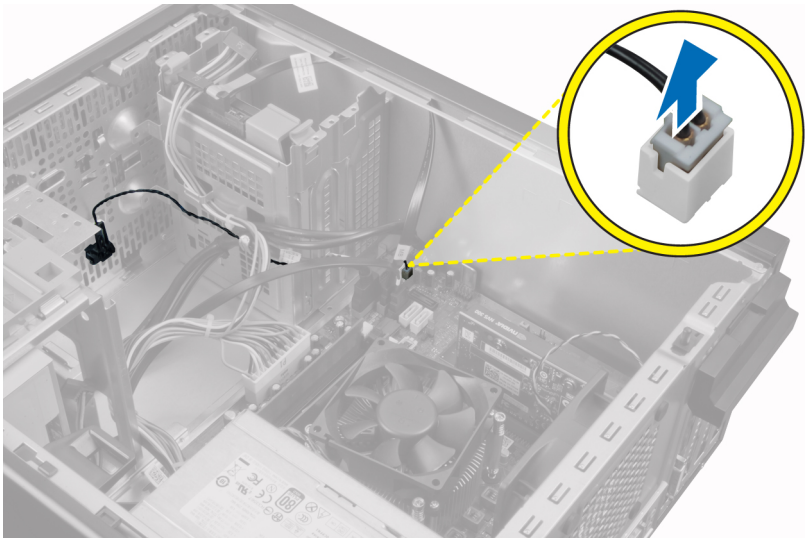
1. Place the chassis fan in the chassis.
2. Pass the four grommets through the chassis and slide outward along the groove to secure in place.
3. Connect the fan cable to the system board.
4. Install the cover.
5. Follow the procedures in *After Working Inside Your Computer*.

Removing the Thermal Sensor

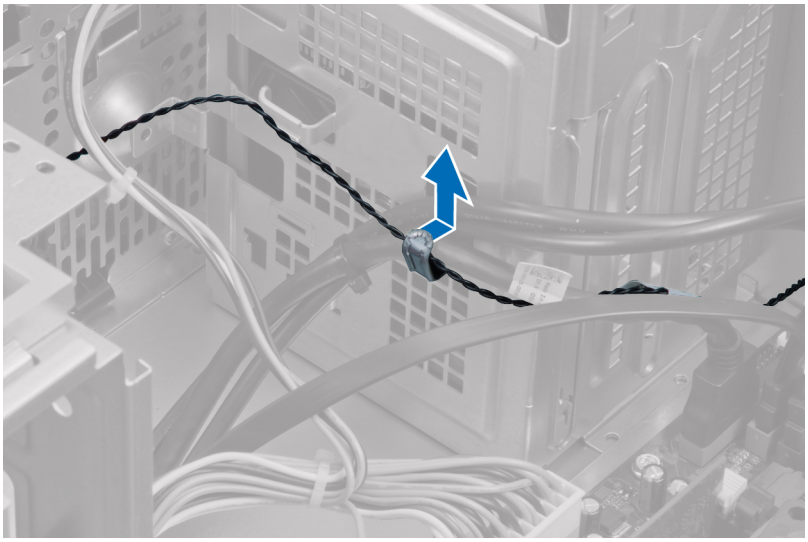
1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.



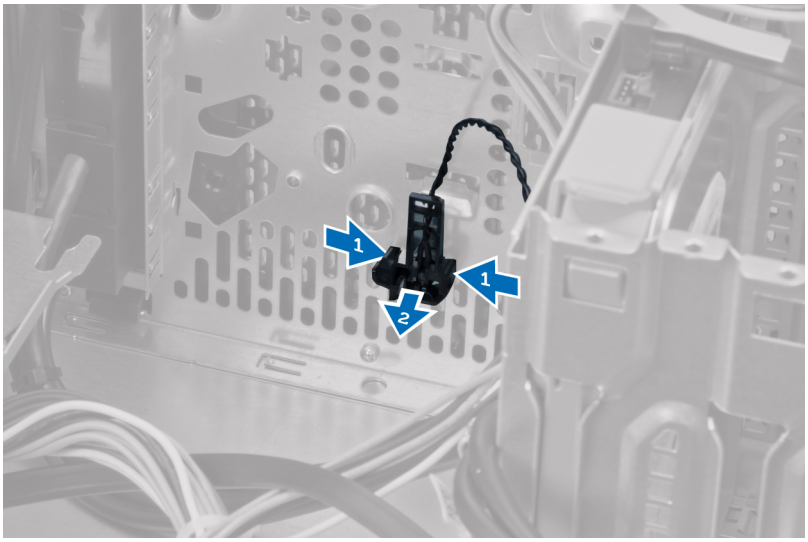
3. Disconnect the thermal sensor cable from the system board.



4. Release the thermal sensor cable from the chassis clip.



5. Gently press the tabs from both sides to release and remove the thermal sensor away from the chassis.



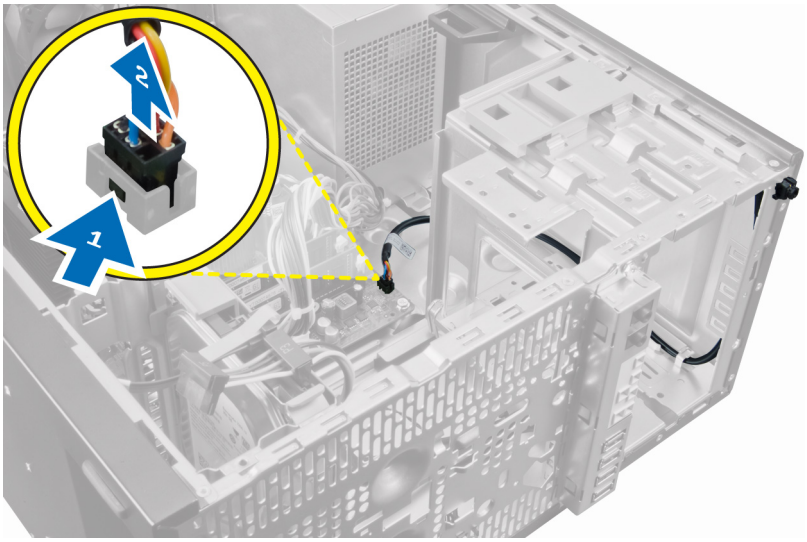
Installing the Front Thermal Sensor

1. Gently secure the thermal sensor to the chassis.

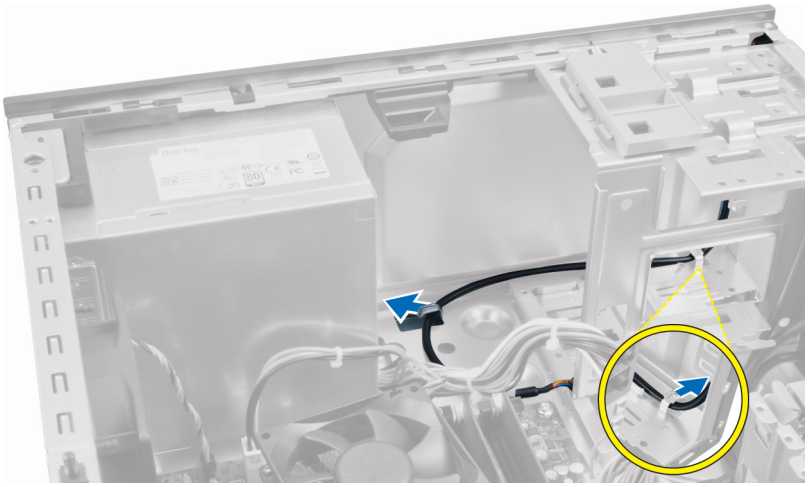
2. Thread the thermal sensor cable into the chassis clips.
3. Connect the thermal sensor cable to the system board.
4. Install the cover.
5. Follow the procedures in *After Working Inside Your Computer*.

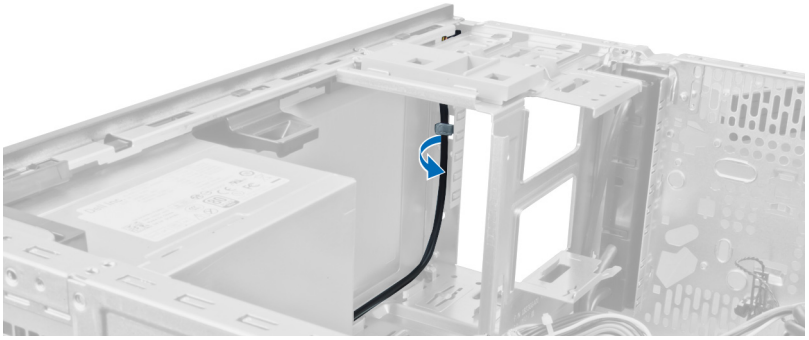
Removing the Power Switch

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the:
   a) cover
   b) front bezel
   c) optical drive
3. Press in to release and remove the power-switch cable from the system board.

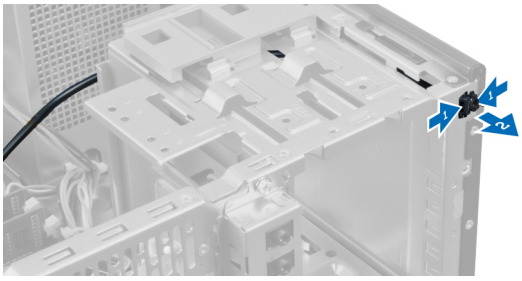


4. Release the power-switch cable from the chassis clips.

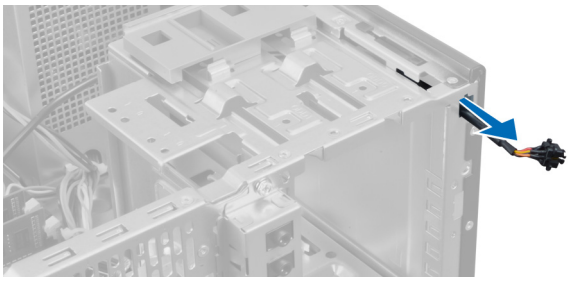




5. Press the clips on both side of the power switch to release it from the chassis and pull the power switch out of the computer.



6. Slide the power switch along with its cable out through the front of the computer.



Installing the Power Switch

1. Slide the power switch in through the front of the computer.
2. Secure the power-switch cable to the chassis.
3. Thread the power-switch cable into the chassis clips.
4. Connect the power-switch cable to the system board.
5. Install the:
   a) optical drive
   b) front bezel

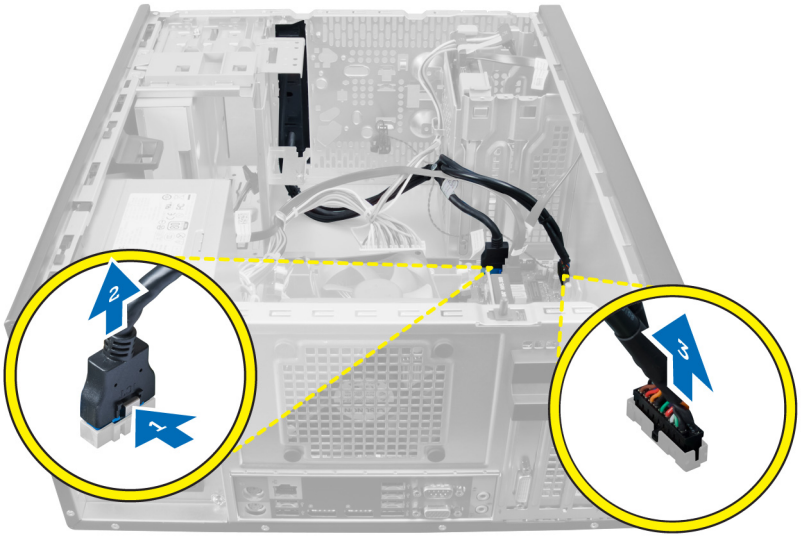
c) cover

6. Follow the procedures in *After Working Inside Your Computer*.

Removing the Input/Output (I/O) Panel

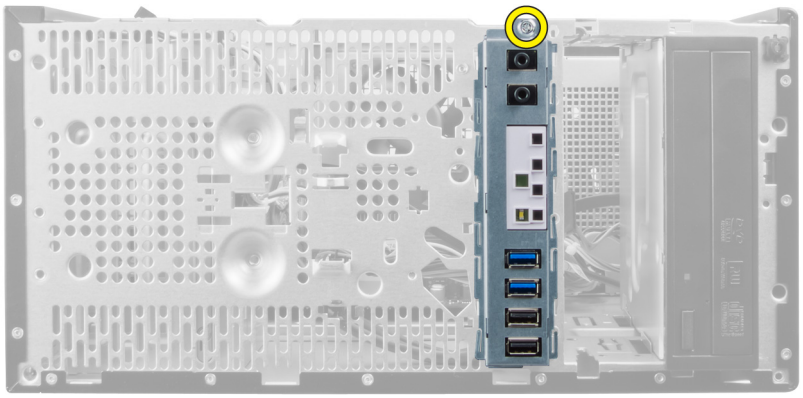
1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the cover.
3. Remove the front panel.

4. Disconnect the I/O panel and FlyWire cable from the system board.

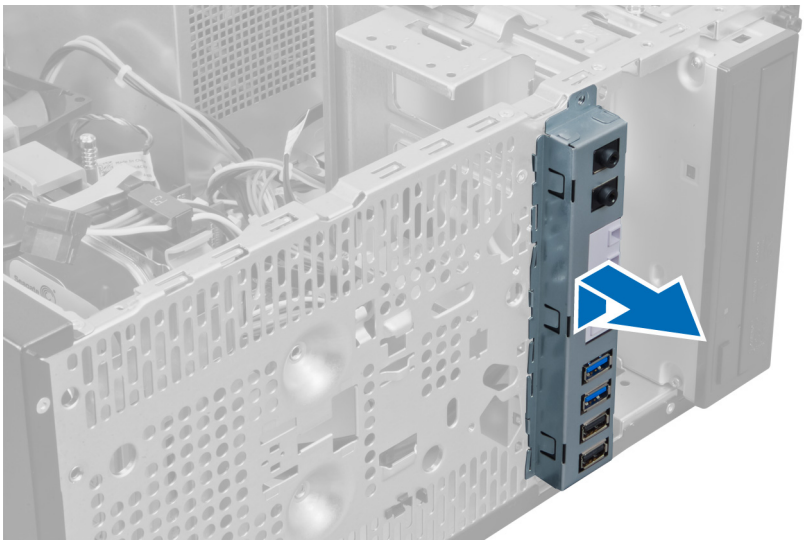


5. Unthread and release the I/O Panel and FlyWire cable from the clip on the computer.

6. Remove the screw that secures the I/O panel to the computer.



7. Slide the I/O panel towards the left of the computer to release it and pull the I/O panel along with its cable out of the computer.

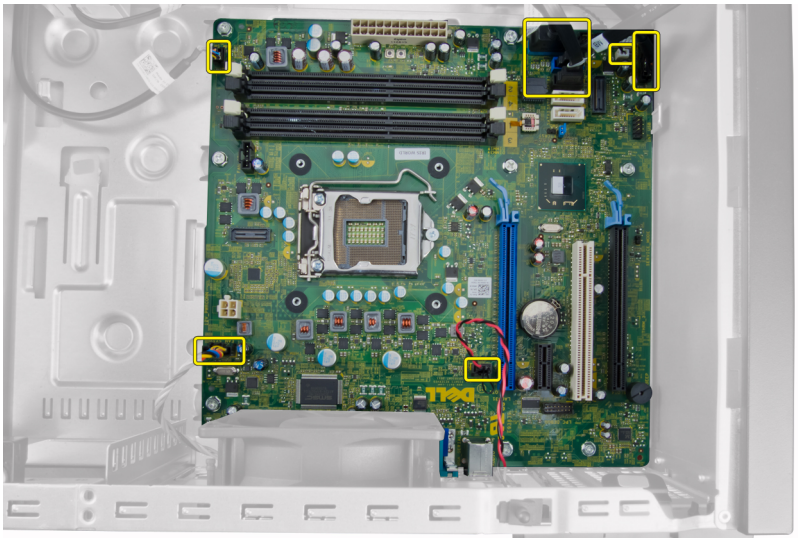


Installing the Input/Output Panel

1. Insert the I/O panel into the slot on the chassis front.
2. Slide the I/O panel towards the right of the computer to secure to the chassis.
3. Use a Phillips screwdriver to tighten the single screw securing the I/O panel to the chassis.
4. Thread the I/O panel and FlyWire cables into the chassis clip.
5. Connect the I/O panel and FlyWire cables to the system board.
6. Install the front panel.
7. Install the cover.
8. Follow the procedures in *After Working Inside Your Computer*.

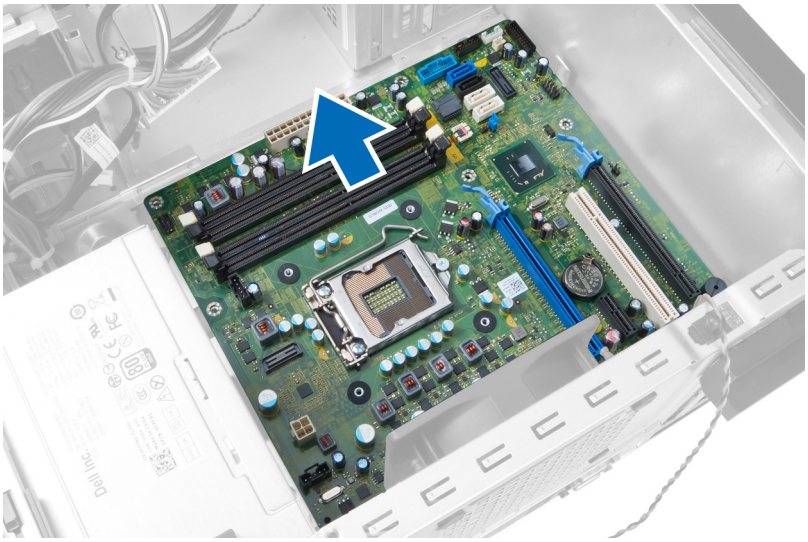
Removing the System Board

1. Follow the procedures in *Before Working Inside Your Computer*.
2. Remove the:
   a) cover
   b) memory
   c) expansion card(s)
   d) heat sink
   e) processor
3. Disconnect all the cables connected to the system board.

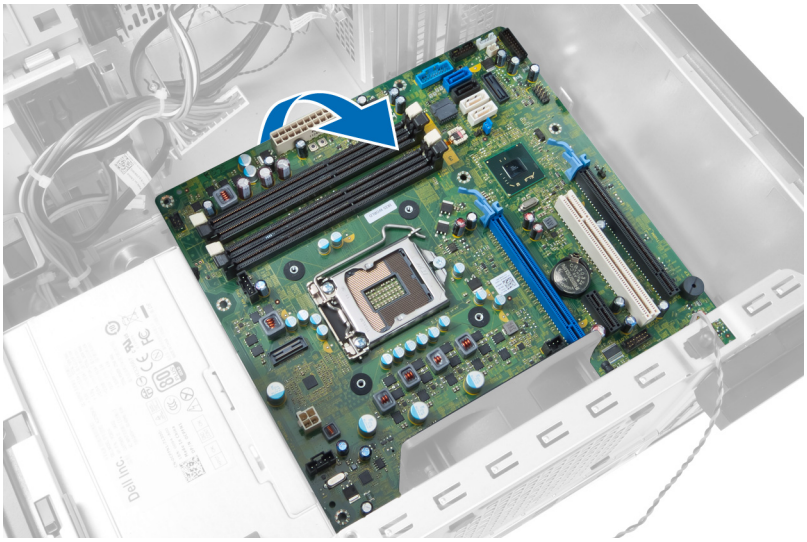


4. Remove the screws that secure the system board to the computer.

5. Slide the system board towards the front of the computer.



6. Carefully tilt the system board to 45–degrees, and then lift the system board out of the computer.



System Board Components

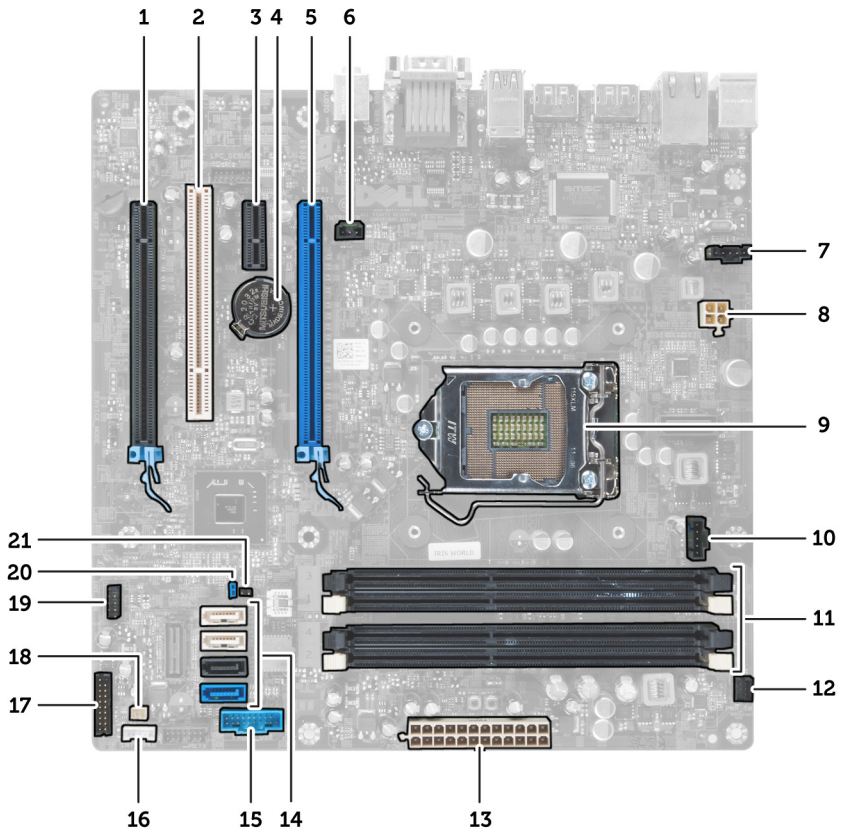


Figure 1. Components Of The System Board

1. PCI Express x16 slot (wired as x4)
2. PCI slot
3. PCIe x1 slot
4. Coin-cell battery
5. PCI Express x16 slot
6. Intrusion switch connector
7. System fan connector
8. 4–pin CPU power connecter
9. CPU Socket
10. Heat-sink fan connector
11. DDR DIMM memory slots (4)
12. Front power-button connector
13. ATX 24–pin power connector
14. SATA connectors
15. Front panel USB connector
16. Speaker connector

17. Front panel audio connector
18. Thermal sensor connector
19. Internal USB 2.0 connector
20. Password reset jumper
21. RTCRST jumper connector

Installing the System Board

1. Align the system board to the port connectors on the rear of the chassis and place the system board in the chassis.
2. Tighten the screws securing the system board to the chassis.
3. Connect the cables to the system board.
4. Install the:
   a) processor
   b) heat sink
   c) expansion card(s)
   d) memory
   e) cover
5. Follow the procedures in *After Working Inside Your Computer*.

3

System Setup

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

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

Topics:

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

  NOTE: XXX denotes the SATA drive number.
- Optical Drive
- Diagnostics

  NOTE: Choosing Diagnostics, will display the ePSA diagnostics screen.

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

Navigation Keys

The following table displays the system setup navigation keys.

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

Table 1. Navigation Keys

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

Keys	Navigation
	NOTE: For the standard graphics browser only.
<Esc>	Moves to the previous page till you view the main screen. Pressing <Esc> in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.
<F1>	Displays the System Setup help file.

System Setup Options

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

Table 2. General

Option	Description
System Information	Displays the following information: • **System Information** - Displays **BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date,** and the **Express Service Code**. • **Memory Information** - Displays **Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology, DIMM 1 Size, DIMM 2 Size**, **DIMM 3 Size** and **DIMM 4 Size**. • **PCI Information** - Displays **SLOT1, SLOT2, SLOT3,**and **SLOT4.** • **Processor Information** - Displays **Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable,** and **64-Bit Technology**. • **Device Information** - Displays **SATA-0, SATA-1, SATA-2 , SATA-3**, **LOM MAC Address**, **Audio Controller** and **Video Controller**.
Boot Sequence	Allows you to specify the order in which the computer attempts to find an operating system. The options are: • Diskette drive • ST320LT007-9ZV142 / ST3250312AS • USB Storage Device • CD/DVD/CD-RW Drive • Onboard NIC
Boot List Option	• Legacy • UEFI
Date/Time	Allows you to set the date and time. The changes to the system date and time takes effect immediately.

Table 3. System Configuration

Option	Description
Integrated NIC	Allows you to enable or disable the integrated network card. You can set the integrated NIC to: • Disabled • Enabled • Enabled w/PXE • Enabled w/ImageServer **NOTE: Depending on the computer and its installed devices, the items listed in this section may or may not appear.**
Serial Port	Allows you to define the serial port settings. You can set the serial port to: • Disabled • COM1 • COM2

Option	Description
	• COM3 • COM4 **NOTE: The operating system may allocate resources even though the setting is disabled.**
SATA Operation	Allows you to configure the operating mode of the integrated hard drive controller. • **Disabled** - The SATA controllers are hidden. • **ATA** - SATA is configured for ATA mode. • **AHCI** - SATA is configured for AHCI mode. • **RAID ON** - SATA is configured to support RAID mode.
Drives	Allows you to enable or disable the various on-board drives: • SATA-0 • SATA-1 • SATA-2 • SATA-3
SMART Reporting	This field controls if the hard drive errors for the integrated drives are reported during system startup. This technology is part of the SMART (Self Monitoring Analysis and Reporting Technology) specification. • **Enable SMART Reporting** - This option is disabled by default.
USB Configuration	This field configures the integrated USB controller. If *Boot Support* is enabled, the system is allowed to boot any type of USB mass storage devices (HDD, memory key, floppy). If USB port is enabled, device attached to this port is enabled and available for operation system. If USB port is disabled, the operation system cannot see any device attached to this port. The options for USB configuration differ based on the form factors: For Mini-Tower, Desktop, Small Form Factor the options are: • Enable Boot Support • Enable Rear Dual USB Ports • Enable Rear Quad USB Ports • Enable Front USB Ports For Ultra Small Form Factor, the options are: • Enable Boot Support • Enable Rear Dual USB 2.0 Ports • Enable Rear Dual USB 3.0 Ports • Enable Front USB Ports **NOTE: USB keyboard and mouse always work in the BIOS setup irrespective of these settings.**
Miscellaneous Devices	Allows you to enable or disable various on-board devices. • **Enable PCI Slot** - This option is enabled by default.

Table 4. Security

Option	Description
Admin Password	This field lets you set, change, or delete the administrator (admin) password (sometimes called the setup password). The admin password enables several security features. The drive does not have a password set by default. • Enter the old password • Enter the new password • Confirm the new password

Option	Description
System Password	Allows you to set, change, or delete the computer password (previously called the primary password). The drive does not have a password set by default. • Enter the old password • Enter the new password • Confirm the new password
Internal HDD-0 Password	Allows you to set, change, or delete the password on the computer's internal hard disk drive (HDD). Successful changes to this password take effect immediately. The drive does not have a password set by default. • Enter the old password • Enter the new password • Confirm the new password
Strong Password	**Enable strong password** - This option is disabled by default.
Password Configuration	This field controls the minimum and maximum number of characters allowed for the admin and system passwords. • Admin Password Min • Admin Password Max • System Password Min • System Password Max
Password Bypass	Allows you to bypass the *System Password* and the internal HDD password prompts during a system restart. • Disabled - Always prompt for the system and internal HDD password when they are set. This option is disabled by default. • Reboot Bypass - Bypass the password prompts on restarts (warm boots). **NOTE: The system will always prompt for the system and internal HDD passwords when powered on from the off state (a cold boot). Also, the system will always prompt for passwords on any module bay HDDs that may be present.**
Password Change	Allows you to determine whether changes to the system and hard disk passwords are permitted when an administrator password is set. • **Allow Non-Admin Password Changes** - This option is enabled by default.
TPM Security	This option lets you control whether the Trusted Platform Module (TPM) in the system is enabled and visible to the operating system. **TPM Security** - This option is disabled by default. **NOTE: Activation, deactivation, and clear options are not affected if you load the setup program's default values. Changes to this option take effect immediately.**
Computrace	This field lets you activate or disable the BIOS module interface of the optional *Computrace Service* from *Absolute Software*. • **Deactivate** - This option is disabled by default. • Disable • Activate
CPU XD Support	Allows you to enable or disable the execute disable mode of the processor. • **Enable CPU XD Support** - This option is enabled by default.
OROM Keyboard Access	Allows you to determine if you access the Option Read Only Memory (OROM) configuration screens via hotkeys during boot. These settings prevent access to the Intel RAID (CTRL+I) or Intel Management Engine BIOS Extension (CTRL+P/F12). • **Enable** - User may enter OROM configuration screens via the hotkey.

Option	Description
	• **One-Time Enable** - User can enter the OROM configuration screens via the hotkeys during the next boot. After the boot, the setting will revert to disabled. • **Disable** - User can not enter the OROM configuration screens via the hotkey. This option is set to **Enable** by default.
Admin Setup Lockout	Allows you to enable or disable the option to enter setup when an admin password is set. • **Enable Admin Setup Lockout** - This option is not set by default.

Table 5. Secure Boot

Option	Description
Secure Boot Enable	Allows you to enable or disable Secure Boot feature • Disable • Enable
Expert key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The **Enable Custom Mode** option is disabled by default. The options are: • PK • KEK • db • dbx If you enable the **Custom Mode**, the relevant options for **PK, KEK, db, and dbx** appear. The options are: • **Save to File**- Saves the key to a user-selected file • **Replace from File**- Replaces the current key with a key from a user-selected file • **Append from File**- Adds a key to the current database from a user-selected file • **Delete**- Deletes the selected key • **Reset All Keys**- Resets to default setting • **Delete All Key**s- Deletes all the keys **NOTE: If you disable the Custom Mode, all the changes made will be erased and the keys will restore to default settings.**

Table 6. Performance

Option	Description
Multi Core Support	Specifies whether the process will have one or all cores enabled. The performance of some applications will improve with the additional cores. • All - Enabled by default • 1 • 2
Intel® SpeedStep™	Allows you to enable or disable the Intel SpeedStep mode of the processor. This option is enabled by default.
C States Control	Allows you to enable or disable the additional processor sleep states. This option is enabled by default.
Intel® TurboBoost™	Allows you to enable or disable Intel TurboBoost mode of the processor. • **Disabled** - Does not allow the TurboBoost driver to increase the performance state of the processor above the standard performance. • **Enabled** - Allows the Intel TurboBoost driver to increase the performance of the CPU or graphics processor.
Hyper-Thread Control	Allows you to enable or disable the Hyper-Threading technology. This option is disabled by default.

Table 7. Power Management

Option	Description
AC Recovery	Specifies how the computer will respond when AC power is applied after an AC power loss. You can set the AC Recovery to: • Power Off (default) • Power On • Last Power State
Auto On Time	This option sets the time of the day when you would like the system to turn on automatically. Time is kept in standard 12-hour format (hour:minutes:seconds). The startup time can be changed by typing the values in the time and A.M./P.M. fields. • **Disabled** - The system will not automatically power up. • **Every Day** - The system will power up every day at the time you specified above . • **Weekdays** - The system will power up Monday through Friday at the time you specified above. • **Select Days** - The system will power up on days selected above at the time you specified above. **NOTE: This feature does not work if you turn off your computer using the switch on a power strip or surge protector or if Auto Power is set to disabled.**
Deep Sleep Control	Allows you to define the controls when Deep Sleep is enabled. • Disabled • Enabled in S5 only • Enabled in S4 and S5 This option is disabled by default.
Fan Control Override	Controls the speed of the system fan. This option is disabled by default. **NOTE: When enabled, the fan runs at full speed.**
USB Wake Support	This option allows you to enable USB devices to wake the computer from standby. • **Enable USB Wake Support** - This option is disabled by default.
Wake on LAN	This option allows the computer to power up from the off state when triggered by a special LAN signal. Wake-up from the Standby state is unaffected by this setting and must be enabled in the operating system. This feature only works when the computer is connected to AC power supply. The options differ based on the form factor. • **Disabled** - Does not allow the system to power on by special LAN signals when it receives a wake-up signal from the LAN or wireless LAN. • **LAN Only** - Allows the system to be powered on by special LAN signals. • **WLAN Only** - Allows the system to be powered on by special WLAN signals. (For Ultra Small Form Factor only) • **LAN or WLAN** - Allows the system to be powered on by special LAN or WLAN signals. (For Ultra Small Form Factor only) This option is Disabled by default.
Block Sleep	This option lets you block entering to sleep (S3 state) in operating system environment. • **Block Sleep (S3 state)** - This option is disabled by default.

Table 8. POST Behavior

Option	Description
Numlock LED	Specifies if the NumLock function can be enabled when the system boots. This option is enabled by default.
Keyboard Errors	Specifies whether keyboard related errors are reported when it boots. This option is enabled by default.
POST Hotkeys	Specifies whether the sign-on screen displays a message, that displays the keystroke sequence required to enter the BIOS Boot Option Menu.

Option	Description
	• **Enable F12 Boot Option menu** - This option is enabled by default.

Table 9. Virtualization Support

Option	Description
Virtualization	This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization technology. • **Enable Intel Virtualization Technology** - This option is enabled by default.
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel® Virtualization technology for direct I/O. • **Enable Intel Virtualization Technology for Direct I/O** - This option is enabled by default.
Trusted Execution	This option specifies whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel Trusted Execution technology. The TPM virtualization technology, and Virtualization technology for direct I/O must be enabled to use this feature. • **Trusted Execution** - This option is disabled by default.

Table 10. Maintenance

Option	Description
Service Tag	Displays the Service Tag of your computer.
Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.
SERR Messages	Controls the SERR message mechanism. This option is not set by default. Some graphics cards require that the SERR message mechanism be disabled.

Table 11. Image Server

Option	Description
Lookup Method	Specifies how the ImageServer looks up the server address. • Static IP • DNS (enabled by default) **NOTE: This field is only relevant when the *Integrated NIC* control in the *System Configuration* group is set to *Enabled with ImageServer*.**
ImageServer IP	Specifies the primary static IP address of the ImageServer with which the client software communicates. The default IP address is **255.255.255.255**. **NOTE: This field is only relevant when the *Integrated NIC* control in the *System Configuration* group is set to *Enabled with ImageServer* and when *Lookup Method* is set to *Static IP*.**
ImageServer Port	Specifies the primary IP port of the ImageServer, which can be used by the client to communicate. The default IP port is **06910**. **NOTE: This field is only relevant when the *Integrated NIC* control in the *System Configuration* group is set to *Enabled with ImageServer*.**
Client DHCP	Specifies how the client obtains the IP address. • Static IP • DHCP (enabled by default) **NOTE: This field is only relevant when the *Integrated NIC* control in the *System Configuration* group is set to *Enabled with ImageServer*.**
Client IP	Specifies the static IP address of the client. The default IP address is **255.255.255.255**.

Option	Description
	NOTE: This field is only relevant when the *Integrated NIC* control in the *System Configuration* group is set to *Enabled with ImageServer* and when *Client DHCP* is set to *Static IP*.
Client SubnetMask	Specifies the subnet mask of the client. The default setting is **255.255.255.255**. **NOTE: This field is only relevant when the *Integrated NIC* control in the *System Configuration* group is set to *Enabled with ImageServer* and when *Client DHCP* is set to *Static IP*.**
Client Gateway	Specifies the gateway IP address for the client. The default setting is **255.255.255.255**. **NOTE: This field is only relevant when the *Integrated NIC* control in the *System Configuration* group is set to *Enabled with ImageServer* and when *Client DHCP* is set to *Static IP*.**
License Status	Displays the current license status.

Table 12. System Logs

Option	Description
BIOS events	Displays the system event log and allows you to clear the log. • Clear Log

Updating the BIOS

It is recommended to update your BIOS (system setup), on replacing the system board or if an update is available. For laptops, ensure that your computer battery is fully charged and connected to a power outlet

1. Re-start the computer.
2. Go to **dell.com/support**.
3. Enter the **Service Tag** or **Express Service Code** and click **Submit**.

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

   NOTE: If you cannot find your Service Tag, click Detect My Product. Proceed with the instructions on screen.
4. If you are unable to locate or find the Service Tag, click the Product Category of your computer.
5. Choose the **Product Type** from the list.
6. Select your computer model and the **Product Support** page of your computer appears.
7. Click **Get drivers** and click **View All Drivers**.
   The Drivers and Downloads page opens.
8. On the Drivers and Downloads screen, under the **Operating System** drop-down list, select **BIOS**.
9. Identify the latest BIOS file and click **Download File**.

   You can also analyze which drivers need an update. To do this for your product, click **Analyze System for Updates** and follow the instructions on the screen.
10. Select your preferred download method in the **Please select your download method below** window, click **Download File**.
    The **File Download** window appears.
11. Click **Save** to save the file on your computer.
12. Click **Run** to install the updated BIOS settings on your computer.

    Follow the instructions on the screen.

Jumper Settings

To change a jumper setting, pull the plug off its pin(s) and carefully fit it down onto the pin(s) indicated on the system board. The following table displays the system board jumper settings.

Table 13. Jumper Settings

Jumper	Setting	Description
PSWD	Default	Password features are enabled
RTCRST	pin 1 and 2	Real-time clock reset. Can be used for troubleshooting.

System and Setup Password

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

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.

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

Assigning a System Password and Setup Password

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

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

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

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press <Enter>.
   The **System Security** screen appears.
2. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
3. Select **System Password** , enter your system password, and press <Enter> or <Tab>.
   Use the following guidelines to assign the system password:
   - A password can have up to 32 characters.
   - The password can contain the numbers 0 through 9.
   - Only lower case letters are valid, upper case letters are not allowed.
   - Only the following special characters are allowed: space, (”), (+), (,), (-), (.), (/), (;), ([), (\), (]), (`).

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

Deleting or Changing an Existing System and/or Setup Password

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.

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

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press <Enter>.
   The **System Security** screen is displayed.
2. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
3. Select **System Password**, alter or delete the existing system password and press <Enter> or <Tab>.
4. Select **Setup Password**, alter or delete the existing setup password and press <Enter> or <Tab>.

   NOTE: If you change the System and/or Setup password, re-enter the new password when promoted. If you delete the System and/or Setup password, confirm the deletion when promoted.
5. Press <Esc> and a message prompts you to save the changes.
6. Press <Y> to save the changes and exit from the System Setup.
   The computer reboots.

Disabling a System Password

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

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

1. Follow the procedures in *Before Working on Your Computer*.
2. Remove the cover.
3. Identify the PSWD jumper on the system board.
4. Remove the PSWD jumper from the system board.

   NOTE: The existing passwords are not disabled (erased) until the computer boots without the jumper.
5. Install the cover.

   NOTE: If you assign a new system and/or setup password with the PSWD jumper installed, the system disables the new password(s) the next time it boots.
6. Connect the computer to the electrical outlet and power-on the computer.
7. Power-off the computer and disconnect the power cable from the electrical outlet.
8. Remove the cover.
9. Replace the PSWD jumper on the system board.
10. Install the cover.
11. Follow the procedures in *After Working on Your Computer*.
12. Power-on the computer.
13. Go to the system setup, and assign a new system or setup password. See *Setting up a System Password*.

4

Technology and Components

Topics:

- RAID Technology

RAID Technology

RAID Configurations

At the time of purchase, a customer can choose one of two optional RAID configurations for their OptiPlex 9010 system or may choose to have two independent drives.

Factory RAID Configurations

- RAID 0- (Default) Striped Disk Array with no Fault Tolerance. Provides data striping (spreading out blocks of each file across multiple disks) but no redundancy. This improves performance but puts all data at risk in the event of a disk failure. If one drive fails, then all data in the array (both disks) is lost.
- RAID 1- Mirrored Disk Array. Provides redundancy in case one of the two drives fails. This allows for all data to be duplicated on the fly but is not as fast as a RAID 0. If a disk fails, the data can be recovered from the second disk.

Table 14. OptiPlex 9010 RAID Data Protection: (includes two matching capacity/speed hard drives)

HDD Configuration	MT	DT	SFF	USFF
RAID 1 Data Protection: (includes two matching capacity/speed hard drives)				
1 TB SATA 7200 RPM HDD (3.5")	Yes	No	No	No
500 GB SATA 7200 RPM HDD (3.5")	Yes	No	No	No
250 GB SATA 7200 RPM HDD (3.5")	Yes	No	No	No
500 GB SATA 7200 RPM HDD (2.5")	Yes	Yes	Yes	No
320 GB SATA 7200 RPM HDD (2.5")	Yes	Yes	Yes	No
500 GB SATA 7200 RPM Hybrid HDD (2.5")	Yes	Yes	Yes	No
RAID 0 Performance: (includes two matching capacity/speed hard drives)				
1 TB* SATA 7200 RPM HDD (3.5")	Yes	No	No	No
500 GB* SATA 7200 RPM HDD (3.5")	Yes	No	No	No
250 GB* SATA 7200 RPM HDD (3.5")	Yes	No	No	No
500 GB* SATA 7200 RPM HDD (2.5")	Yes	Yes	Yes	Yes
320 GB* SATA 7200 RPM HDD (2.5")	Yes	Yes	Yes	Yes
500 GB* SATA 7200 RPM Hybrid HDD (2.5")	Yes	Yes	Yes	Yes

What is RAID 0 / RAID 1?

Learn more about RAID and its different types.

RAID 0 / RAID 1

Table 15. Comparing RAID 0 / RAID 1

	RAID 0 (Striping)	RAID 1 (Data Mirror)
Description	Offers performance benefits over a single hard drive configuration. This is ideal for users who work with large files or require fast data access.	Offers backup integrity by having the same data on two drives. If one drive fails, the data is still intact on the other hard drive. This is ideal for applications where data integrity is of utmost importance. Since the identical data is housed on both drives, the storage capacity for the entire array is equivalent to the size of the smallest drive in the array.
Computer Sees	2 x 160 GB = 320 GB	160 GB
Characteristics	RAID controller breaks the data into blocks and distributes the pieces to both drives simultaneously.	RAID controller writes the same data to both drives.
Customer Benefit	RAID 0 offers performance benefits over a single hard drive configuration. This bundle is ideal for early adopters and power users that manipulate large files or require fast data access.	RAID 1 offers data integrity by having the same data on two drives. If one drive fails, the data is still intact on the other hard drive. This bundle is ideal for applications where data integrity is of utmost importance. This should not be considered a data backup however.

Benefits	• High performance and capacity for storage-intensive applications:
	  • Digital Video and Audio
	  • Photoshop® and photo-editing applications
	  • Publishing and graphics
	  • Gaming applications
	  • Multitasking
	• Gets the most out of the computer's performance.
		• Create fail-safe storage for important data:
		• • Secure data
		  • Easiest system recovery
		  • Any application where data is important and the storage system is at risk for failure
		  • Data protection
		  • Protect the data that is important such as financial records, small business records, or medical files
		• Provides the easiest means of data redundancy.

Configuring RAID

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At some point a customer may want to configure his or her computer for RAID if a RAID configuration was not selected when purchased. Two hard drives must be installed in the computer to set up a RAID configuration.

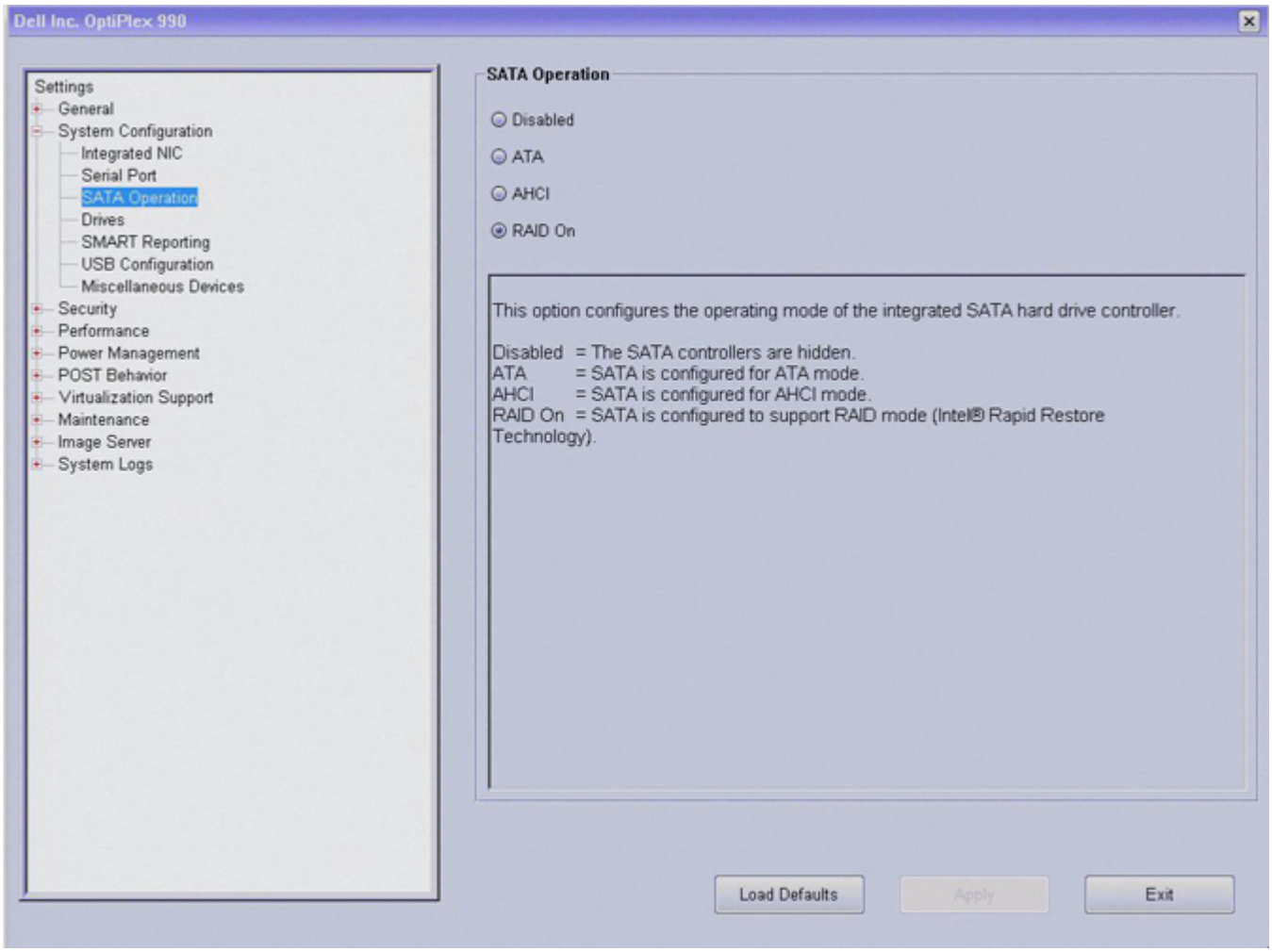
Consumer can use two methods to configure RAID hard drive volumes.

- One method: uses the Intel RAID Option ROM utility and is performed before installing the operating system.
- The second method: uses the new Intel Matrix Storage Console which called Intel Rapid Storage Technology, and is performed under operating system.

Both methods require the computer be set to RAID-enabled mode before starting any of the RAID configuration procedures.

Setting the Computer to RAID-Enabled Mode

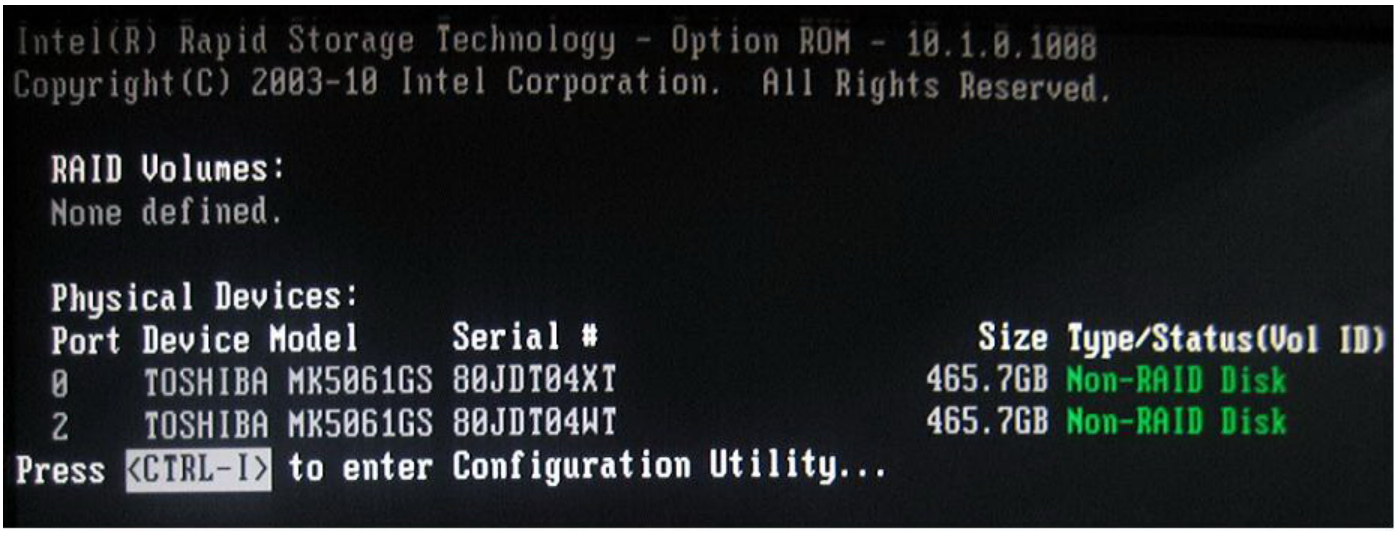
1. Enter System Setup by F2 when you see DELL logo after starting the computer.
2. Use the up and down-arrow keys or the mouse select System Configuration, and press <Enter>.
3. Use the up and down-arrow keys or the mouse select SATA Operation
4. Press <Tab> key and then move up and down-arrow keys, or use the mouse to select the RAID Onbutton. Click Apply.
5. If the setting was changed from RAID AHCI / RAID On, a pop-up window displays. If the pop-up window displays, use the mouse to select 'Yes'. If the setting didn't change, the pop-up window will not display. Go to step 6.
6. Press <Esc> or select Exit. If prompted 'Are you sure you want to exit?' Select 'Yes'.



RAID BIOS Messages

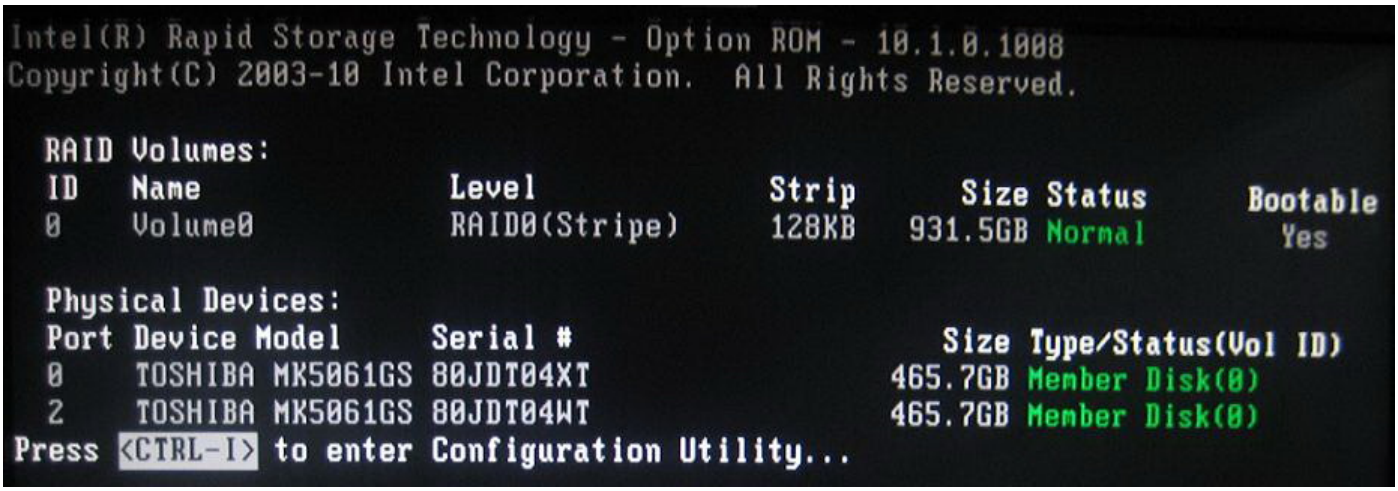
This chapter provides more information on RAID BIOS Messages.

Non RAID Message



When the SATA Operation field in System Setup has been set to**RAID On** the system displays a RAID BIOS message after the Dell logo during POST. The message above is what is displayed if no RAID volume is created. As illustrated above any recognized hard drives will be displayed. Pressing <**CTRL-I**> consumer can enter RAID Configuration Utility control panel to execute some operations such as ´Create RAID Volume´

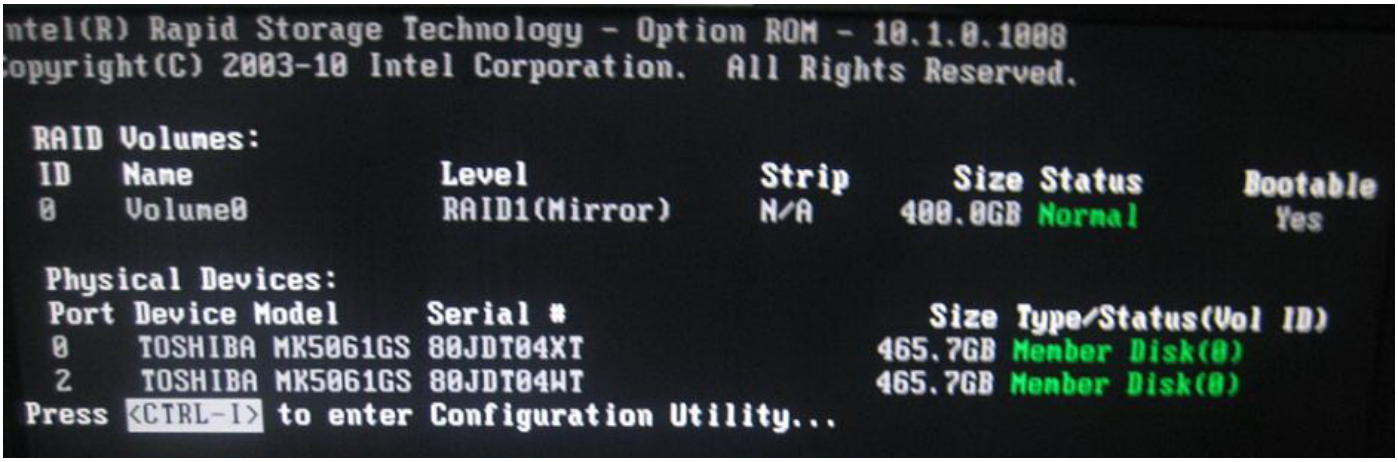
RAID 0 Message



A RAID 0 Stripe configuration displays a message as illustrated above just after the Dell logo screen during POST. Use the Port field to help identify a failed hard drive.

Array Capacity of RAID 0 : (Size of Smallest Drive * Number of Drives)

RAID 1 Message



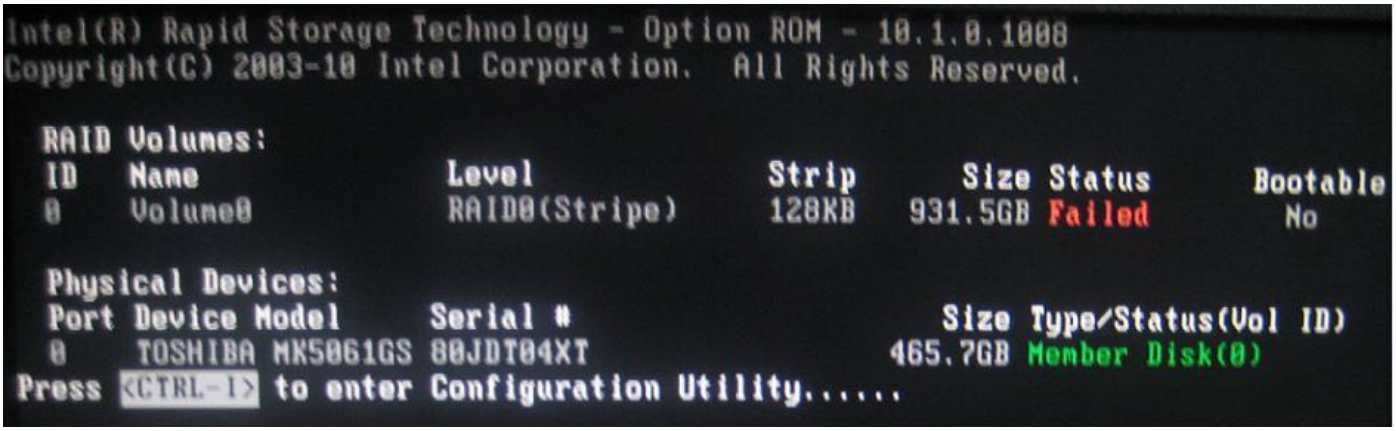
A RAID 1 Mirror configuration displays a message as illustrated above just after the Dell logo screen during POST. Use the Port field to help identify a failed hard drive.

Array Capacity of RAID 1: Size of Smaller Drive

RAID BIOS Error Messages

This chapter provides more information on RAID BIOS Error Messages.

RAID 0 Failed

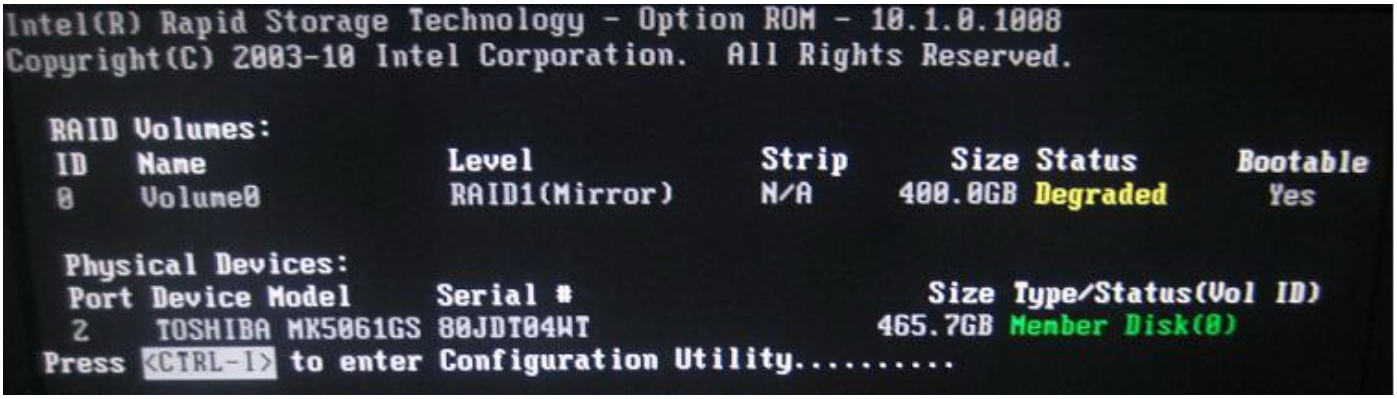


If a RAID 0 Stripe volume fails, the error message illustrated above is displayed. The message gives the status of the volume and identifies any hard drive the system can see. In the illustration above the only hard drive seen is on Port 0. Use this knowledge to troubleshoot the hard drive located on Port 2.

NOTE: Data cannot be recovered from a RAID 0 failure.

If the hard drive has indeed failed, be sure to identify in the comments to the field technician on which port the bad hard drive is located.

RAID 1 Degraded



If a RAID 1 Mirror volume has a degraded status it displays the error message illustrated above. One of the two hard drives cannot be seen by the system and may have failed. After a short period of time this message disappears and the system boots normally on the remaining drive.

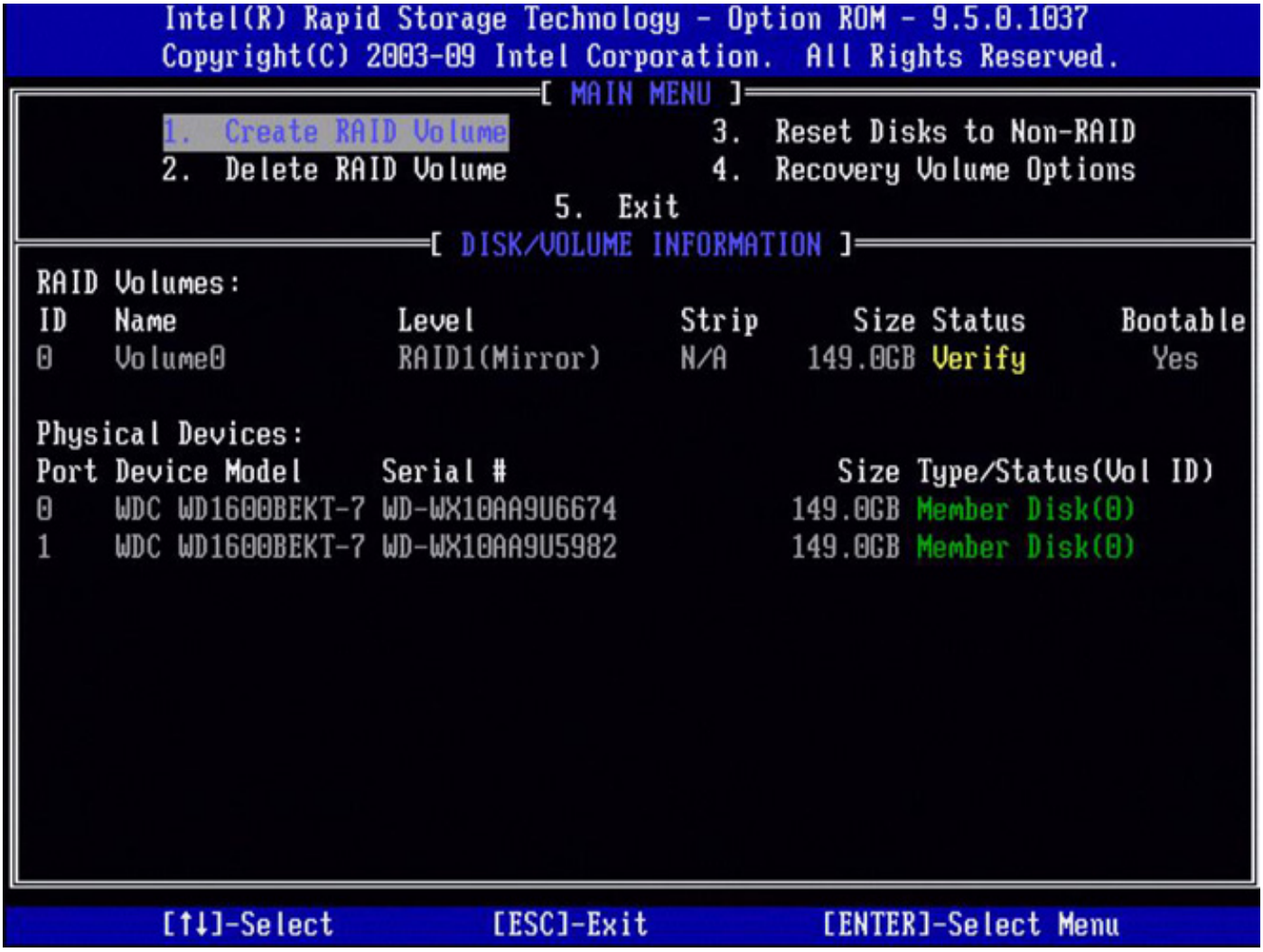
NOTE: In a RAID 1 configuration, the system can continue to operate normally on the remaining drive. However, no redundancy is in place and any further data loss cannot be recovered until the array is rebuilt.

In the illustration above the only hard drive seen is on Port 2. Use this knowledge to troubleshoot the hard drive located on Port 0. Once the problem has been corrected, boot into Windows and use the Intel Rapid Storage Technology software to rebuild the mirror.

If the hard drive has indeed failed, be sure to identify in the comments to the field technician on which port the bad hard drive is located.

Intel Option ROM Utility

This chapter provides more information on RAID BIOS Error Messages.



NOTE: Although any size drives may be used to create a RAID configuration using the Intel RAID Option ROM utility, ideally the drives should be of equal size. In a RAID 0 configuration, the size of the configuration is the size of the smallest drive multiplied by the number of drives (two) in the configuration. In a RAID 1 configuration, the size of the configuration is the smaller of the two drives used.

Creating a RAID 0 or a RAID 1 Configuration

NOTE: Any data on either hard drive is lost when creating a RAID configuration using the following procedure. Back up all data to another storage device before continuing.

NOTE: Use the following procedure only if reinstalling the operating system. Do not use the following procedure to migrate an existing storage configuration to a RAID 0 configuration.

1. Set the computer to RAID-enabled mode.
2. Press <Ctrl><i> when prompted to enter the Intel RAID Option ROM utility.
3. Press the up- and down-arrow keys to highlight Create RAID Volume and press <Enter>.
4. Enter a RAID volume name or accept the default. Press <Enter>.
5. For RAID 0, press the up- and down-arrow keys to select RAID0(Stripe)and press <Enter>.For RAID 1, press the up- and down-arrow keys to select RAID1(Mirror)and press <Enter>.
6. Press the up- and down-arrow keys and spacebar to select the two drives that will constitute RAID configuration and press <Enter>.
7. For RAID 0, press the up- and down-arrow keys to change the stripe size and press <Enter>.For RAID 1, skip to step 8.
8. Select the desired capacity for the volume and press <Enter>. The default value is the maximum available size.

9. Press <Enter> to create the volume.
10. Press <y> to confirm creating the RAID volume.
11. Verify that the correct volume configuration is displayed on the main Intel RAID Option ROM utility screen.
12. Press the up- and down-arrow keys to select Exit and press <Enter>.
13. Install the operating system.

NOTE: For RAID 0, select the stripe size closest to the size of the average file to be stored on the RAID volume. If this is not known, choose 128 KB as the stripe size.

Creating a Recovery Volume

NOTE: Any data on either hard drive is lost when creating a RAID configuration using the following procedure. Back up all data to another storage device before continuing.

NOTE: Use the following procedure only if reinstalling the operating system. Do not use the following procedure to migrate an existing storage configuration to a RAID 0 configuration.

1. Set the computer to RAID-enabled mode.
2. Press <Ctrl><i> when prompted to enter the Intel RAID Option ROM utility.
3. Press the up- and down-arrow keys to highlight Create RAID Volume and press <Enter>.
4. Enter a RAID volume name or accept the default. Press <Enter>.
5. For Recovery, press the up- and down-arrow keys to select Recovery and press <Enter>.
6. Press the up- and down-arrow keys and spacebar to select the disk. Press the <Tab> to select Master. Press <space bar> to select the recovery disk. Press <Enter> to continue.
7. Press <Enter> to select a sync option.
8. Press the up- and down-arrow keys to choose the sync option:
   - Continuous
   - On Request
9. Press <Enter> to continue.
10. Press <Enter> to create the volume.
11. Press <y> to confirm creating the RAID volume.
12. Verify that the correct volume configuration is displayed on the main Intel RAID Option ROM utility screen.
13. Press the up- and down-arrow keys to select Exit and press <Enter>.
14. Install the operating system.

Deleting a RAID Volume

NOTE: When performing this operation, all data on the RAID drives is lost.

NOTE: For RAID 0 only: If the computer currently boots to RAID and the RAID volume is deleted in the Intel RAID Option ROM utility, the computer becomes unbootable.

1. Press <Ctrl><i> when prompted to enter the Intel RAID Option ROM utility.
2. Use the up- and down-arrow keys to highlight Delete RAID Volume and press <Enter>.
3. Use the up- and down-arrow keys to highlight the RAID volume to be deleted and press <Delete>.
4. Press <y> to confirm the deletion of the RAID volume.
5. Press <Esc> to exit the Intel RAID Option ROM utility.

Reset Disks to Non-RAID

NOTE: When performing this operation, all data on the RAID drives is lost.

1. Press <Ctrl><i> when prompted to enter the Intel RAID Option ROM utility.
2. Use the up- and down-arrow keys to highlight Reset Disks to Non-RAIDand press <Enter>.
3. Use the up- and down-arrow keys to highlight the RAID volume to be reset and press <Space> to select the disk(s).
4. Press <Enter> to complete the selection.
5. Press <y> to confirm the reset.

Intel Rapid Storage Technology

This chapter provides more information on RAID BIOS Error Messages.

Creating a Volume

You can combine SATA disks to create a volume in order to enhance your storage system. Based on the available hardware and your computer's configuration, you may be able to create a volume by selecting an enhancement goal, such as 'Protect data' under 'Status', or by selecting a volume type under 'Create'. We recommend that you get familiar with the minimum requirements in this section before starting the volume creation process.

NOTE: Performing this action will permanently delete any existing data on the disks used to create a volume, unless you choose to keep the data when selecting array disks. Back up all valuable data before starting the process.

Creating Additional Volumes

Creating multiple volumes on a single array

You can add a volume to an existing RAID array by creating another volume that uses the available space on the array. This feature allows you to combine different volume types and their respective benefits. For example, a configuration with RAID 0 and RAID 1 on two SATA disks provides better data protection than a single RAID 0 and higher performance than a single RAID 1.

The first RAID volume occupies part of the array, leaving space for the other volume to be created. After creating the first volume with an array allocation set to less than 100% in the Configure Volume step, you will be able to add a second volume to that array.

NOTE: This configuration is only available if the array allocation for the first volume created is less than 100% and space is available on that array. The application currently supports an array to include a maximum of two RAID volumes on a single array.

1. Click 'Create' or 'Create a custom volume' under 'Status'.
2. Select the volume type. Selecting a volume type in the list updates the graphical representation to provide a detailed description of that type.
3. Click 'Next'.
4. Select 'Yes' to add the volume to an existing array.
5. Make any necessary changes in the Advanced section.
6. Click 'Next'.
7. Review the selected configuration. Click 'Back' or an option in the left pane if you want to make changes.
8. Click 'Finish' to start the creation process.

Creating additional volumes on a new array

You can choose to create two or more volumes on two different arrays, as long as the volume requirements are met.

1. Click 'Create' or 'Create a custom volume' under 'Status'.
2. Select the volume type. Selecting a volume type in the list updates the graphical representation to provide a detailed description of that type.
3. Click 'Next'.
4. Select 'Yes' to add the volume to an existing array.
5. Make any necessary changes in the Advanced section.
6. Click 'Next'.
7. Review the selected configuration. Click 'Back' or an option in the left pane if you want to make changes.
8. Click 'Finish' to start the creation process.

Rebuilding a Volume

When a volume is reported as degraded because of a failed or missing disk, the disk must be replaced or reconnected and the volume be rebuilt in order to maintain fault-tolerance. The option to rebuild is only available when a compatible disk is connected, available and normal. If a spare disk is available, the rebuild process will start automatically when a disk fails or is missing. For RAID 0 volumes, the rebuild process will start automatically only when one of its members is reported as at risk.

NOTE: Completing this action will permanently delete existing data on the new disk and make any other volume on the array inaccessible. We recommend that you back up valuable data before continuing.

Rebuilding from 'Status' (manually)

1. Verify that the volume is reported as degraded in the Manage subsection. If you have more than one volume listed in this section, you will need to fix the issues reported one at a time.
2. Click 'Rebuild to another disk' next to the volume you want to rebuild.
3. In the Rebuild Volume dialog, select the disk that will replace the failed disk. Only compatible disks in a normal state will be displayed. Refer to Volume Requirements for more information.
4. Click 'OK' to confirm.
5. The volume starts rebuilding and the page refreshes displaying the progress of the operation. You can use other applications during this time and you will be notified when the process has successfully completed.

Rebuilding from 'Manage' (manually)

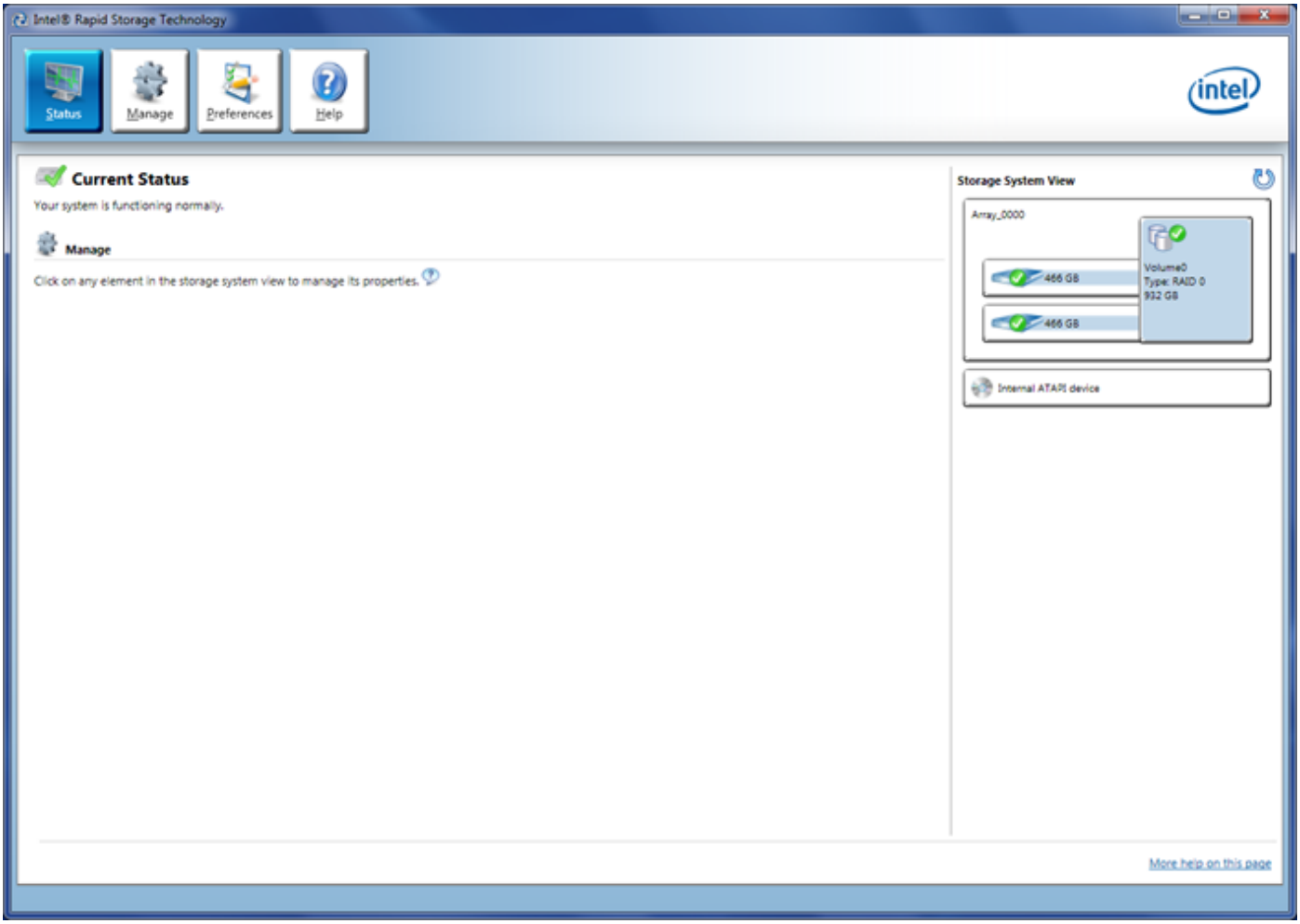
1. Verify that the volume is reported as degraded in the Manage subsection. If you have more than one volume listed in this section, you will need to fix the issues reported one at a time.
2. Click 'Rebuild to another disk' next to the volume you want to rebuild.

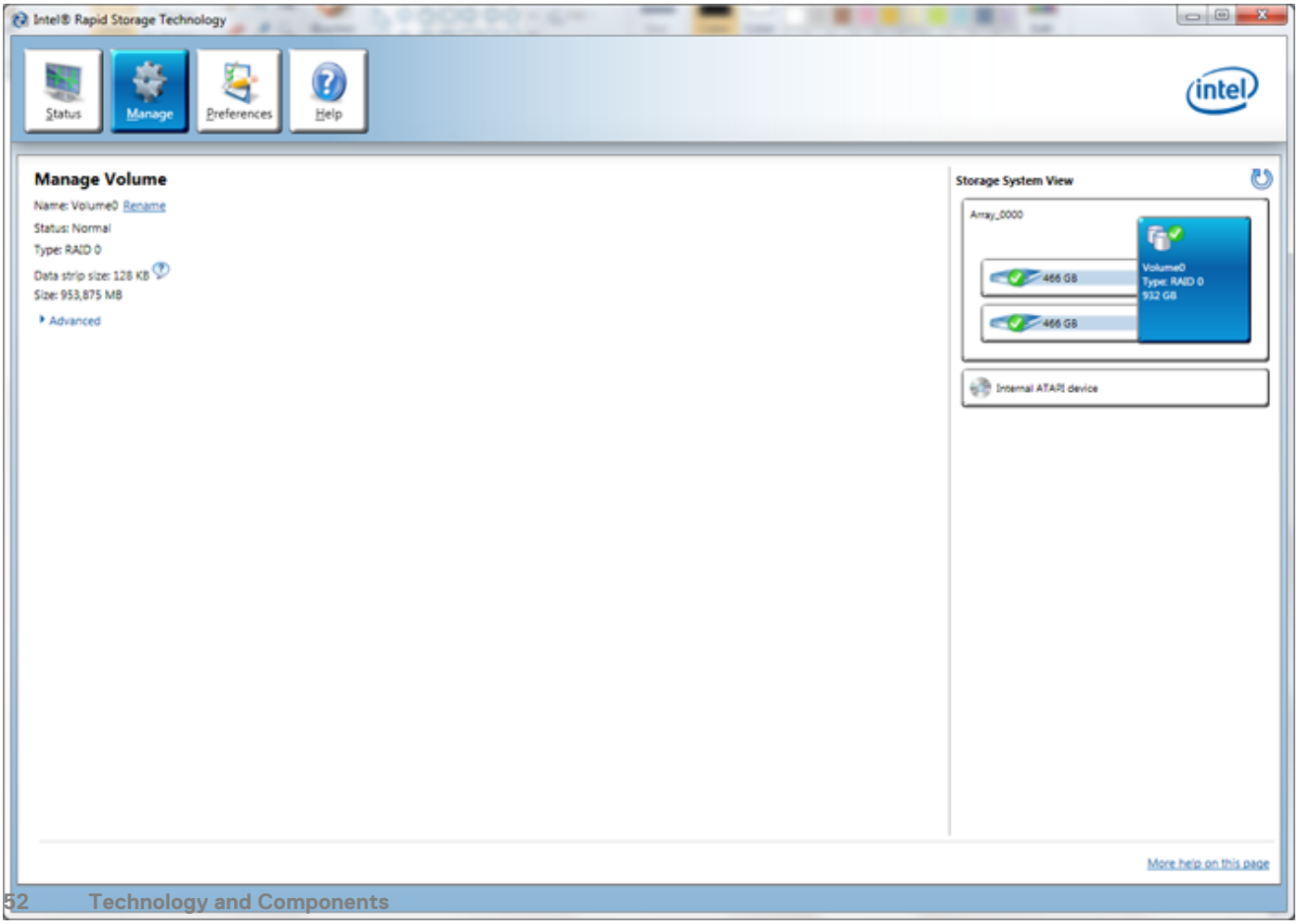
Deleting a Volume

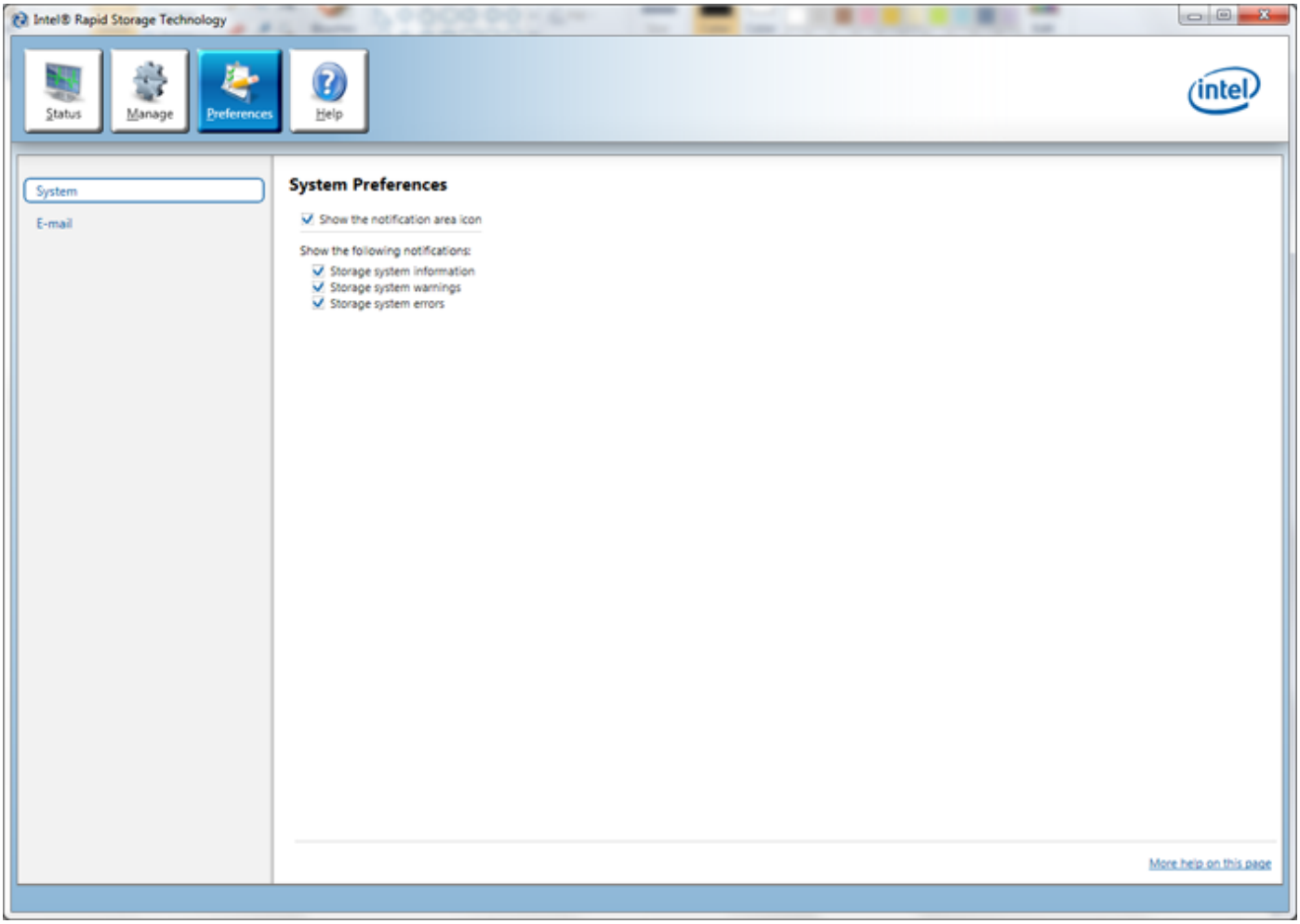
NOTE: Cannot recover data once a volume is deleted.

When a volume is deleted, you create available space that can be used to create new volumes. Note that you cannot delete a system volume using this application because the operating system needs the system files to run correctly. Also, if the volume is a recovery volume and the master or recovery disk files are accessed, you will need to hide these files before the volume can be deleted.

1. Under 'Status' or 'Manage', in the storage system view, click the volume you want to delete. The volume properties are now displayed on the left.
2. Click 'Delete volume'.
3. Review the warning message, and click 'Yes' to delete the volume.
4. The 'Status' page refreshes and displays the resulting available space in the storage system view. You can now use it to create a new volume.


Intel® Rapid Storage Technology
Status
Manage
Preferences
Help
intel
Current Status
Your system is functioning normally.
Manage
Click on any element in the storage system view to manage its properties.
Storage System View
Array_0000
466 GB
466 GB
Volume0
Type: RAID 0
932 GB
Internal ATAPI device
More help on this page


Intel® Rapid Storage Technology
Status
Manage
Preferences
Help
intel
Manage Volume
Name: Volume0 Rename
Status: Normal
Type: RAID 0
Data strip size: 128 KB
Size: 953,875 MB
Advanced
Storage System View
Array_0000
466 GB
466 GB
Volume0
Type: RAID 0
932 GB
Internal ATAPI device
More help on this page


Intel® Rapid Storage Technology
Status
Manage
Preferences
Help
intel
System
E-mail
System Preferences
Show the notification area icon
Show the following notifications:
Storage system information
Storage system warnings
Storage system errors
More help on this page

5

Diagnostics

If you experience a problem with your computer, run the ePSA diagnostics before contacting Dell for technical assistance. The purpose of running diagnostics is to test your computer's hardware without requiring additional equipment or risking data loss. If you are unable to fix the problem yourself, service and support personnel can use the diagnostics results to help you solve the problem.

Topics:

Enhanced Pre-Boot System Assessment (ePSA) Diagnostics

The ePSA diagnostics (also known as system diagnostics) performs a complete check of your hardware. The ePSA is embedded with the BIOS and is launched by the BIOS internally. The embedded system diagnostics provides a set of options for particular devices or device groups allowing you to:

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

CAUTION: Use the system diagnostics to test only your computer. Using this program with other computers may cause invalid results or error messages.

NOTE: Some tests for specific devices require user interaction. Always ensure that you are present at the computer terminal when the diagnostic tests are performed.

1. Power-on the computer.
2. As the computer boots, press the <F12> key as the Dell logo appears.
3. On the boot menu screen, select the **Diagnostics** option.
   The **Enhanced Pre-boot System Assessment** window is displayed, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.
4. If you wish to run a diagnostic test on a specific device, press <Esc> and click **Yes** to stop the diagnostic test.
5. Select the device from the left pane and click **Run Tests**.
6. If there are any issues, error codes are displayed.
   Note the error code and contact Dell.

6

Troubleshooting Your Computer

Power LED Diagnostics

The power button LED located on the front of the chassis also functions as a bicolored diagnostic LED. The diagnostic LED is only active and visible during the POST process. Once the operating system starts to load, it is no longer visible.

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

Table 16. Power LED Diagnostics

Amber LED State	White LED State	Description
off	off	system is OFF
off	blinking	system is in sleep state
blinking	off	power supply unit (PSU) failure
steady	off	PSU is working but failed to fetch code
off	steady	system is ON

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

Beep Code

The computer can emit a series of beeps during start-up if the display does not show errors or problems. These series of beeps, called beep codes, identify various problems. The delay between each beep is 300 ms, the delay between each set of beeps is 3 sec, and the beep sound lasts 300 ms. After each beep and each set of beeps, the BIOS should detect if the user presses the power button. If so, BIOS will jump out from looping and execute the normal shutdown process and power system.

Code	1-3-2

Cause	Memory failure

Error Messages

Error Message	Description
Address mark not found	The BIOS found a faulty disk sector or could not find a particular disk sector.
Alert! Previous attempts at booting this system have failed at checkpoint [nnnn]. For help in resolving this problem, please note this checkpoint and contact Dell Technical Support.	The computer failed to complete the boot routine three consecutive times for the same error. Contact Dell and report the checkpoint code (nnnn) to the support technician
Alert! Security override Jumper is installed.	The MFG_MODE jumper has been set and AMT Management features are disabled until it is removed.
Attachment failed to respond	The floppy or hard drive controller cannot send data to the associated drive.
Bad command or file name	Ensure that you have spelled the command correctly, put spaces in the proper place, and used the correct pathname.
Bad error-correction code (ECC) on disk read	The floppy or hard drive controller detected an uncorrectable read error.
Controller has failed	The hard drive or the associated controller is defective.
Data error	The floppy or hard drive cannot read the data. For the Windows operating system, run the chkdsk utility to check the file structure of the floppy or hard drive. For any other operating system, run the appropriate corresponding utility.
Decreasing available memory	One or more memory modules may be faulty or improperly seated. Re-install the memory modules and, if necessary, replace them.
Diskette drive 0 seek failure	A cable may be loose or the computer configuration information may not match the hardware configuration.
Diskette read failure	The floppy disk may be defective or a cable may be loose. If the drive access light turns on, try a different disk.
Diskette subsystem reset failed	The floppy drive controller may be faulty.
Gate A20 failure	One or more memory modules may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them.
General failure	The operating system is unable to carry out the command. This message is usually followed by specific information—for example, **Printer out of paper**. Take the appropriate action to resolve the problem.
Hard-disk drive configuration error	The hard drive failed initialization.

Error Message	Description
Hard-disk drive controller failure	The hard drive failed initialization.
Hard-disk drive failure	The hard drive failed initialization.
Hard-disk drive read failure	The hard drive failed initialization.
Invalid configuration information-please run SETUP program	The computer configuration information does not match the hardware configuration.
Invalid Memory configuration, please populate DIMM1	DIMM1 slot does not recognize a memory module. The module should be re-seated or installed.
Keyboard failure	A cable or connector may be loose, or the keyboard or keyboard/mouse controller may be faulty.
Memory address line failure at address, read value expecting value	A memory module may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them.
Memory allocation error	The software you are attempting to run is conflicting with the operating system, another program, or a utility.
Memory data line failure at address, read value expecting value	A memory module may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them.
Memory double word logic failure at address, read value expecting value	A memory module may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them.
Memory odd/even logic failure at address, read value expecting value	A memory module may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them
Memory write/ read failure at address, read value expecting value	A memory module may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them.
Memory size in CMOS invalid	The amount of memory recorded in the computer configuration information does not match the memory installed in the computer.
Memory tests terminated by keystroke	A keystroke interrupted the memory test.
No boot device available	The computer cannot find the floppy disk or hard drive.
No boot sector on hard-disk drive	The computer configuration information in System Setup may be incorrect.
No timer tick interrupt	A chip on the system board might be malfunctioning.

Error Message	Description
Non-system disk or disk error	The floppy disk in drive A does not have a bootable operating system installed on it. Either replace the floppy disk with one that has a bootable operating system, or remove the floppy disk from drive A and restart the computer.
Not a boot diskette	The operating system is trying to boot to a floppy disk that does not have a bootable operating system installed on it. Insert a bootable floppy disk.
Plug and play configuration error	The computer encountered a problem while trying to configure one or more cards.
Read fault	The operating system cannot read from the floppy or hard drive, the computer could not find a particular sector on the disk, or the requested sector is defective.
Requested sector not found	The operating system cannot read from the floppy or hard drive, the computer could not find a particular sector on the disk, or the requested sector is defective.
Reset failed	The disk re-set operation failed.
Sector not found	The operating system cannot locate a sector on the floppy or hard drive.
Seek error	The operating system cannot find a specific track on the floppy disk or hard drive.
Shutdown failure	A chip on the system board might be malfunctioning.
Time-of-day clock stopped	The battery might be dead.
Time-of-day not set-please run the System Setup program	The time or date stored in System Setup does not match the computer clock.
Timer chip counter 2 failed	A chip on the system board may be malfunctioning.
Unexpected interrupt in protected mode	The keyboard controller may be malfunctioning or a memory module may be loose.
WARNING: Dell's Disk Monitoring System has detected that drive [0/1] on the [primary/ secondary] EIDE controller is operating outside of normal specifications. It is advisable to immediately back up your data and replace your hard drive by calling your support desk or Dell.	During initial startup, the drive detected possible error conditions. When your computer finishes booting, immediately back up your data and replace your hard drive (for installation procedures, see "Adding and Removing Parts" for your computer type). If no replacement drive is immediately available and the drive is not the only bootable drive, enter System Setup and change the appropriate drive setting to **None**. Then remove the drive from the computer.
Write fault	The operating system cannot write to the floppy or hard drive.
Write fault on selected drive	The operating system cannot write to the floppy or hard drive.

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Specifications

NOTE: Offerings may vary by region. For more information regarding the configuration of your computer, click Start (Start icon) > Help and Support, and then select the option to view information about your computer.

Table 17. Processor

Feature	Specification
Processor type	• Intel Core i3 series • Intel Core i5 series • Intel Core i7 series • Intel Pentium Dual Core series • Intel Celeron series **NOTE: Intel Celeron series is only available for the Dell OptiPlex 7010.**
Total Cache	Up to 8 MB cache depending on processor type

Table 18. Memory

Feature	Specification
Type	DDR3
Speed	1600 MHz
Connectors:	
Desktop, Mini-Tower, Small Form Factor	four DIMM slots
Ultra Small Form Factor	two DIMM slots
Capacity	
Optiplex 7010	2 GB, 4 GB, 6 GB, 8 GB, and 16 GB
Optiplex 9010	2 GB, 4 GB, 6 GB, 8 GB, 16 GB, and 32 GB
Minimum Memory	2 GB
Maximum memory:	
Optiplex 7010	16 GB
Optiplex 9010	32 GB

Table 19. Video

Feature	Specification
Integrated	• Intel HD Graphics (Celero/Pentium CPU-GPU) • Intel HD Graphics 2000 (iCore DC/QC Intel 7 Series Express Chipset CPU-GPU combo) • Intel HD Graphics 2500/4000 (i3/i5/i7 DC/QC Intel 7 Series Express Chipset CPU-GPU Combo)
Discrete	PCI Express x16 graphics adapter

Table 20. Audio

Feature	Specification
Integrated	two Channel High Definition Audio

Table 21. Network

Feature	Specification
Integrated	Intel 82579LM Ethernet capable of 10/100/1000 Mb/s communication

Table 22. System Information

Feature	Specification
System Chipset	Intel 7 Series Express Chipset
DMA Channels	two 82C37 DMA controllers with seven independently programmable channels
Interrupt Levels	Integrated I/O APIC capability with 24 interrupts
BIOS Chip (NVRAM)	12 MB

Table 23. Expansion Bus

Feature	Specification
Bus Type	PCIe gen2, gen3 (x16), USB 2.0, and USB 3.0
Bus Speed	PCI Express: • x1-slot bidirectional speed – 500 MB/s • x16-slot bidirectional speed – 16 GB/s SATA: 1.5 Gbps, 3.0 Gbps, and 6 Gbps

Table 24. Cards

Feature	Specification
PCI:	
Mini-Tower	up to one full-height card
Desktop	up to one low-profile card
Small Form Factor	none
Ultra Small Form Factor	none
PCI Express x1:	
Mini-Tower	up to three full-height cards
Desktop	up to three low-profile cards
Small Form Factor	up to two low-profile cards
Ultra Small Form Factor	none
PCI-Express x16:	
Mini-Tower	up to two full-height cards
Desktop	up to two low-profile cards
Small Form Factor	up to two low-profile cards
Ultra Small Form Factor	none
Mini PCI Express:	
Mini-Tower	none
Desktop	none

Feature	Specification
Small Form Factor	none
Ultra Small Form Factor	up to one half-height card

Table 25. Drives

Feature	Specification	
Externally Accessible (5.25-inch drive bays)		
Mini-Tower	two	
Desktop	one	
Small Form Factor	one slim optical drive bay	
Ultra Small Form Factor	one slim optical drive bay	
Internally Accessible	3.5-inch SATA drive bays	2.5-inch SATA drive bays
Mini-Tower	two	two
Desktop	one	two
Small Form Factor	one	two
Ultra Small Form Factor	none	one

Table 26. External Connectors

Feature	Specification
Audio:	
Front Panel	one microphone connector and one headphone connector
Back Panel	one line-out connector and one line-in/microphone connector
Network Adapter	one RJ45 connector
Serial	one 9-pin connector; 16550 C compatible
Parallel	one 25-pin connector (optional for mini-tower, desktop and small form factor)
USB 2.0:	
Mini-Tower, Desktop, Small Form Factor	Front Panel: two Back Panel: four
Ultra Small Form Factor	Front Panel: none Back Panel: two
USB 3.0:	Front Panel: two Back Panel: two
Video	• 15-pin VGA connector • two 20-pin DisplayPort connectors **NOTE: Video connectors may vary based on the graphics card selected.**

Table 27. Internal Connectors

Feature	Specification
PCI 2.3 data width (maximum) – 32 bits:	
Mini-Tower and Desktop	one 120-pin connector
Small Form Factor and Ultra Small Form Factor	none
PCI Express x1 data width (maximum) – one PCI Express lane:	

Feature	Specification
Mini-Tower and Desktop	one 36-pin connector
Small Form Factor and Ultra Small Form Factor	none
PCI Express x16 (wired as x4) data width (maximum) – four PCI Express lanes:	
Mini-Tower, Desktop, Small Form Factor	one 164-pin connector
Ultra Small Form Factor	none
PCI Express x16 data width (maximum) – 16 PCI Express lanes:	
Mini-Tower, Desktop, Small Form Factor	one 164-pin connector
Ultra Small Form Factor	none
Mini PCI Express data width (maximum) – one PCI Express lane and one USB interface:	
Mini-Tower, Desktop, Small Form Factor	none
Ultra Small Form Factor	one 52-pin connector
Serial ATA:	
Mini-Tower	four 7-pin connectors
Desktop	three 7-pin connectors
Small Form Factor	three 7-pin connectors
Ultra Small Form Factor	two 7-pin connectors
Memory:	
Mini-Tower, Desktop, Small Form Factor	four 240-pin connectors
Ultra Small Form Factor	two 240-pin connectors
Internal USB:	
Mini-Tower and Desktop	one 10-pin connector
Small Form Factor and Ultra Small Form Factor	none
System Fan	one 5-pin connector
Front panel control:	
Mini-Tower, Desktop, Small Form Factor	one 6–pin and two 20–pin connector
Ultra Small Form Factor	one 14–pin, one 20–pin and one 10–pin connector
Thermal Sensor	one 2-pin connector
Processor	one 1155-pin connector
Processor Fan	one 5-pin connector
Service mode jumper	one 2-pin connector
Password clear jumper	one 2-pin connector
RTC reset jumper	one 2-pin connector
Internal speaker	one 5-pin connector
Intruder connector	one 3-pin connector
Power connector:	
Mini-Tower, Desktop, Small Form Factor	one 24-pin and one 4-pin connector
Ultra Small Form Factor	one 8-pin, one 6-pin, and one 4-pin connector

Table 28. Controls and Lights

Feature	Specification
Front of the computer:	
Power button light	White light — Solid white light indicates power-on state; blinking white light indicates sleep state of the computer.
Drive activity light	White light — Blinking white light indicates that the computer is reading data from or writing data to the hard drive.
Back of the computer:	
Link integrity light on integrated network adapter	Green — a good 10 Mbps connection exists between the network and the computer. Orange — a good 100 Mbps connection exists between the network and the computer. Yellow — a good 1000 Mbps connection exists between the network and the computer. Off (no light) — the computer is not detecting a physical connection to the network.
Network activity light on integrated network adapter	Yellow light — A blinking yellow light indicates that network activity is present.
Power supply diagnostic light	Green light — The power supply is turned on and is functional. The power cable must be connected to the power connector (at the back of the computer) and the electrical outlet.

Table 29. Power

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

Power	Wattage	Maximum Heat Dissipation	Voltage
Mini-Tower	275 W	1390 BTU/hr	100 VAC to 240 VAC, 50 Hz to 60 Hz, 5.0 A
Desktop	250 W	1312 BTU/hr	100 VAC to 240 VAC, 50 Hz to 60 Hz, 4.4 A
Small Form Factor	240 W	1259 BTU/hr	100 VAC to 240 VAC, 50 Hz to 60 Hz, 3.6 A
Ultra Small Form Factor	200 W	758 BTU/hr	100 VAC to 240 VAC, 50 Hz to 60 Hz, 2.9 A
Coin-cell battery	3 V CR2032 lithium coin cell		

Table 30. Physical Dimension

Physical	Height	Width	Depth	Weight
Mini-Tower	36.00 cm (14.17 inches)	17.50 cm (6.89 inches)	41.70 cm (16.42 inches)	9.40 kg (20.72 lb)
Desktop	36.00 cm (14.17 inches)	10.20 cm (4.01 inches)	41.00 cm (16.14 inches)	7.90 kg (17.42 lb)
Small Form Factor	29.00 cm (11.42 inches)	9.30 cm (3.66 inches)	31.20 cm (12.28 inches)	6.00 kg (13.22 lb)
Ultra Small Form Factor	23.70 cm (9.33 inches)	6.50 cm (2.56 inches)	24.00 cm (9.45 inches)	3.30 kg (7.28 lb)

Table 31. Environmental

Feature	Specification
Temperature range:	

Feature	Specification
Operating	10 °C to 35 °C (50 °F to 95 °F)
Storage	–40 °C to 65 °C (–40 °F to 149 °F)
Relative humidity (maximum):	
Operating	20% to 80% (non-condensing)
Storage	5% to 95% (non-condensing)
Maximum vibration:	
Operating	0.26 GRMS
Storage	2.20 GRMS
Maximum shock:	
Operating	40 G
Storage	105 G
Altitude:	
Operating	–15.20 m to 3048 m (–50 ft to 10,000 ft)
Storage	–15.20 m to 10,668 m (–50 ft to 35,000 ft)
Airborne contaminant level	G1 or lower as defined by ANSI/ISA-S71.04-1985

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Contacting Dell

To contact Dell for sales, technical support, or customer service issues:

1. Visit support.dell.com.
2. Verify your country or region in the **Choose a Country/Region** drop-down menu at the bottom of the page.
3. Click **Contact Us** on the left side of the page.
4. Select the appropriate service or support link based on your need.
5. Choose the method of contacting Dell that is convenient for you.