

Dell EMC PowerEdge T40

Installation and Service Manual

Notes, cautions, and warnings

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

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

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

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About this document

This document provides an overview about the system, information about installing and replacing components, technical specifications, diagnostic tools, and guidelines to be followed while installing certain components.

PowerEdge T40 system overview

The PowerEdge T40 system is a tower server that supports:

- One Intel Xeon E-series processor or Intel Core i3 processor or Intel Pentium Gold processor
- Up to three 3.5-inch cabled SATA drives
- Up to four UDIMM slots
- One cabled AC power supply unit (PSU)

For more information about supported drives, see the [Drive specifications](#) section.

Topics:

- [Front view of the system](#)
- [Rear view of the system](#)
- [Inside view of the system](#)
- [Locating the information tag of your system](#)
- [System Information Label](#)

Front view of the system

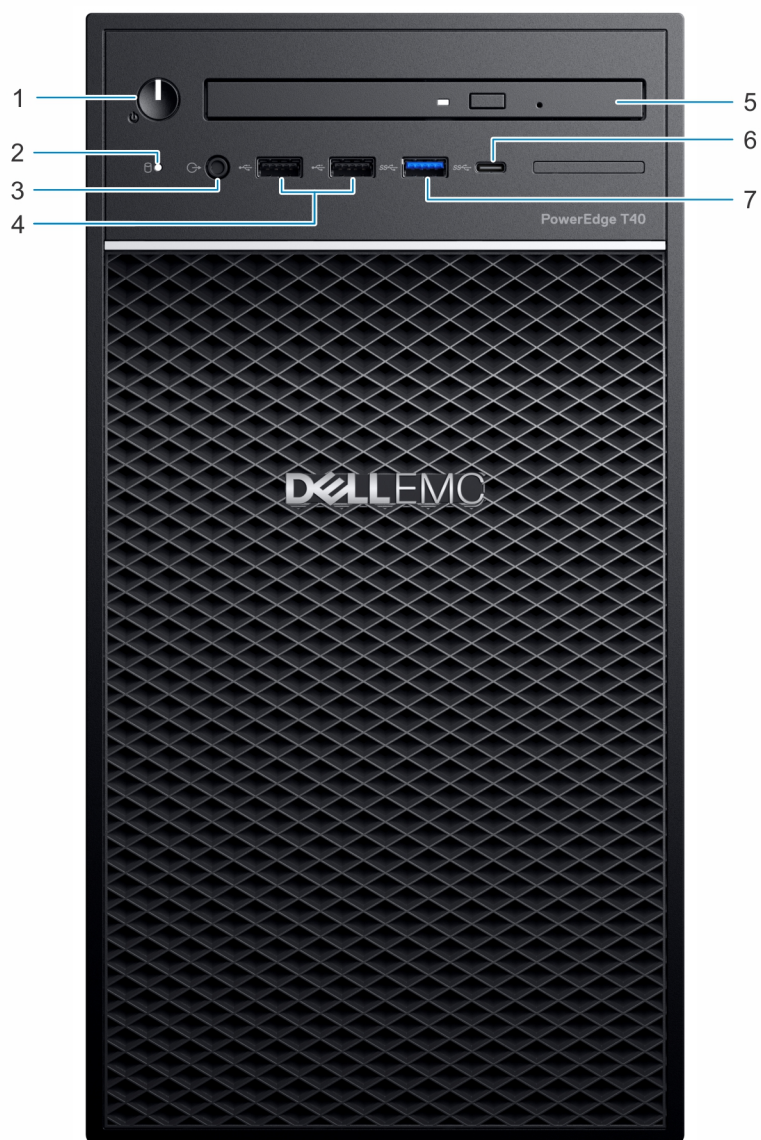


Figure 1. Front view of the system

- | | |
|---------------------------------------|---------------------------------|
| 1. Power button/Diagnostics indicator | 2. Drive activity LED indicator |
| 3. 3.5 mm Headphone port | 4. USB 2.0 Type-A port (2) |
| 5. Optical drive | 6. USB 3.1 Type-C port |
| 7. USB 3.0 Type-A port | |

For more information about the ports, see the [Ports and connectors specifications](#) section.

Rear view of the system

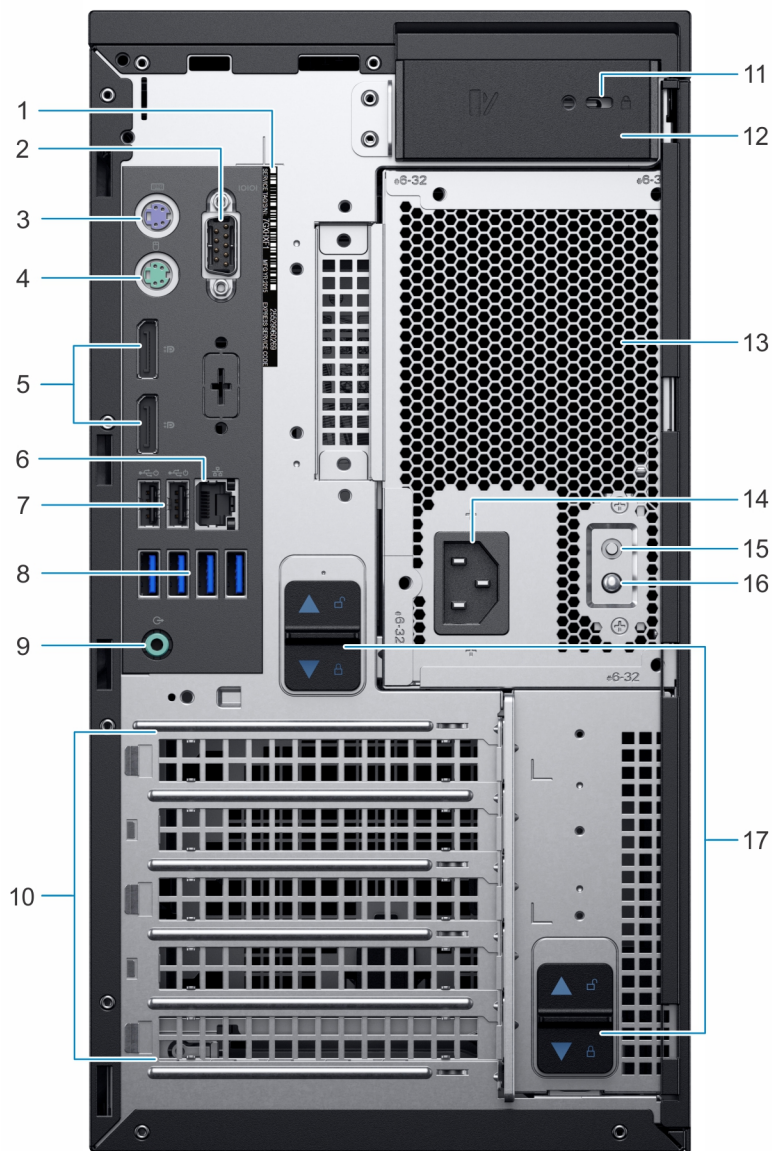


Figure 2. Rear view of the system

- | | |
|--|---|
| 1. Service tag | 2. Serial port |
| 3. PS2 port (Keyboard) | 4. PS2 port (Mouse) |
| 5. Display Port (2) | 6. NIC port |
| 7. USB 2.0 Type-A with SmartPower (2) | 8. USB 3.0 Type-A ports (4) |
| 9. Audio line-out port | 10. Expansion card slots (4) |
| 11. Kensington/padlock slot | 12. System cover release latch |
| 13. Power Supply Unit (PSU) | 14. Power connector port |
| 15. Power Supply Unit (PSU) Built-in Self Test (BIST) button | 16. Power Supply Unit (PSU) Built-in Self Test (BIST) LED |
| 17. PSU assembly release latch | |

NOTE: For more information about the ports and connectors, see the [Ports and connectors specifications](#) section.

Inside view of the system

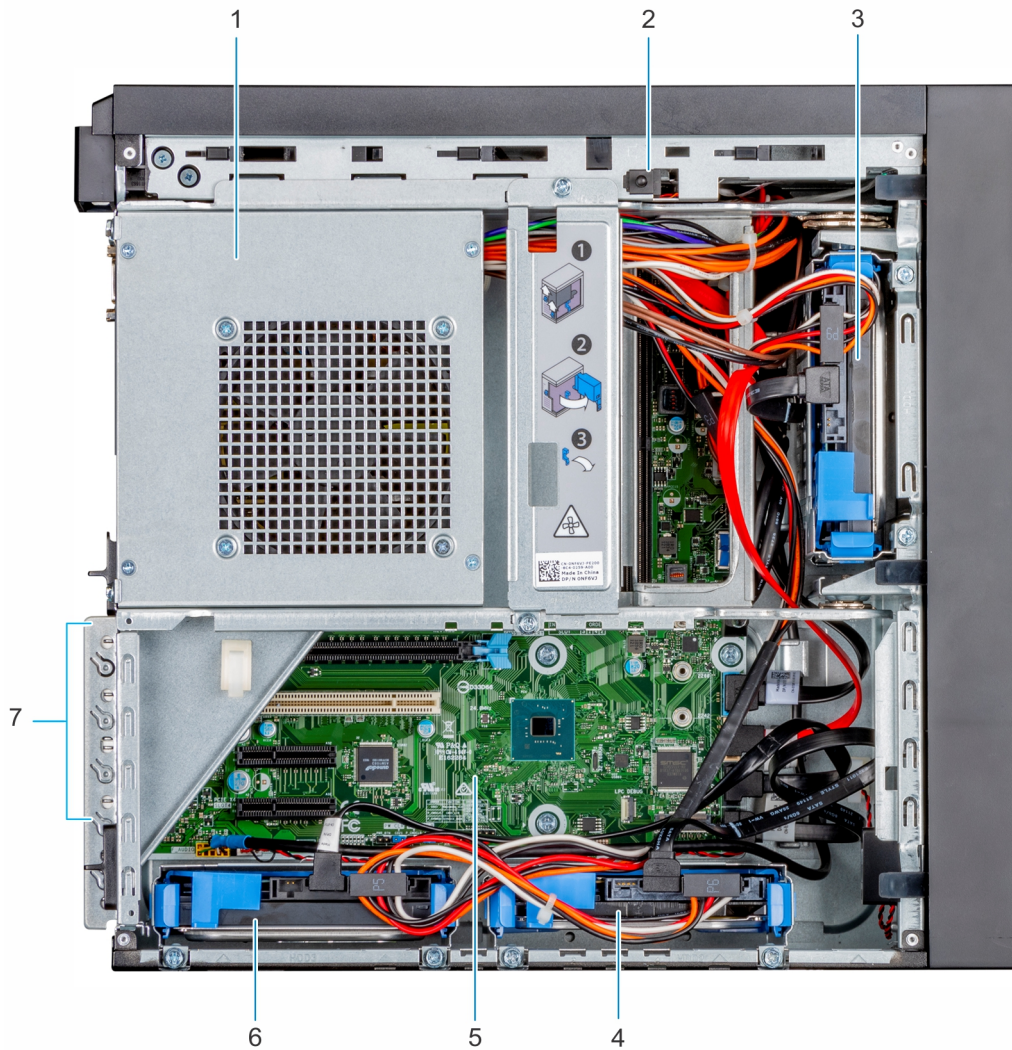


Figure 3. Inside view of the system

- 1. Power Supply Unit (PSU)
- 2. Intrusion switch
- 3. Drive 01
- 4. Drive 02
- 5. System board
- 6. Drive 03
- 7. Expansion card slots (4)

Locating the information tag of your system

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

System Information Label

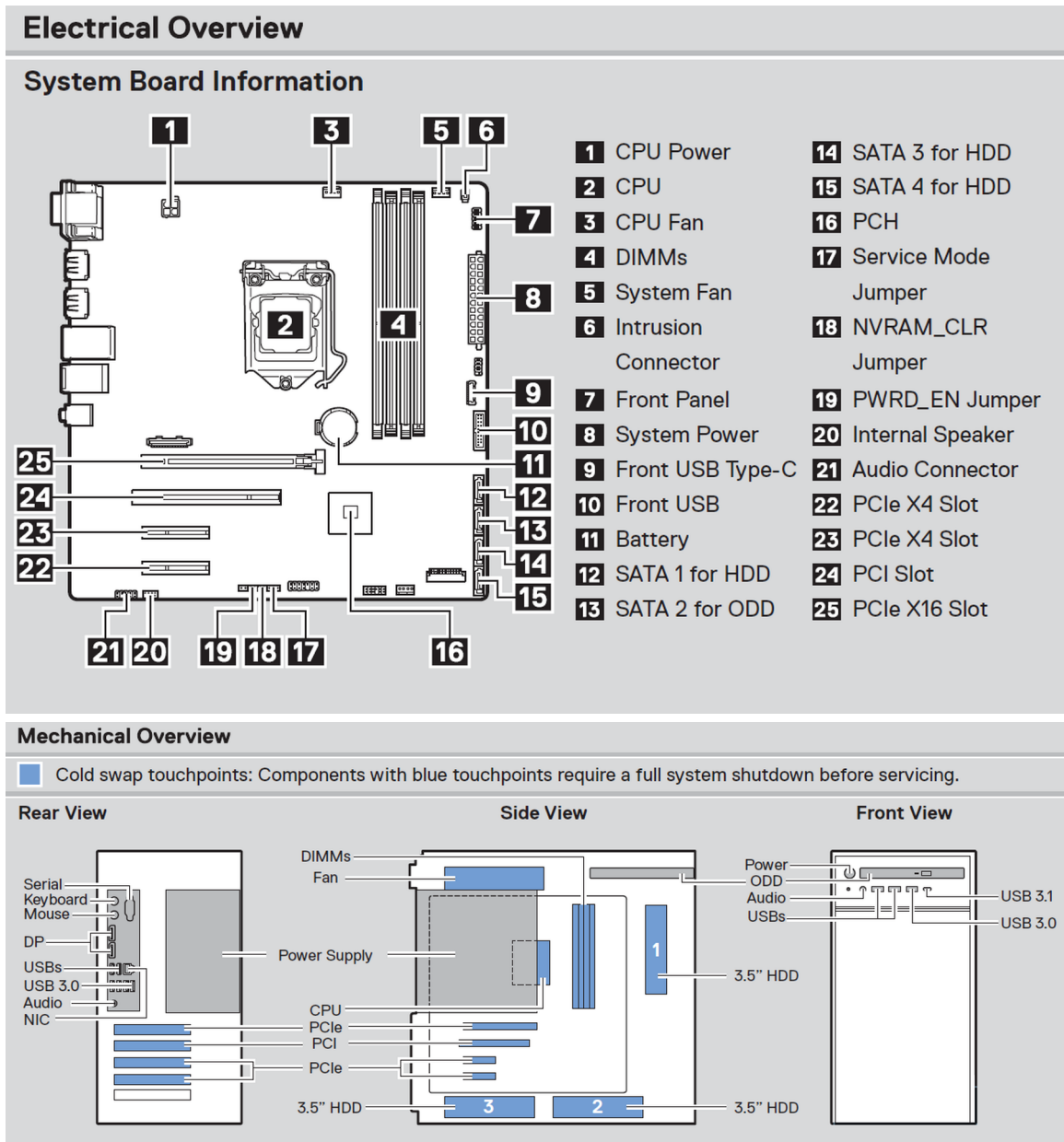


Figure 4. Service Information

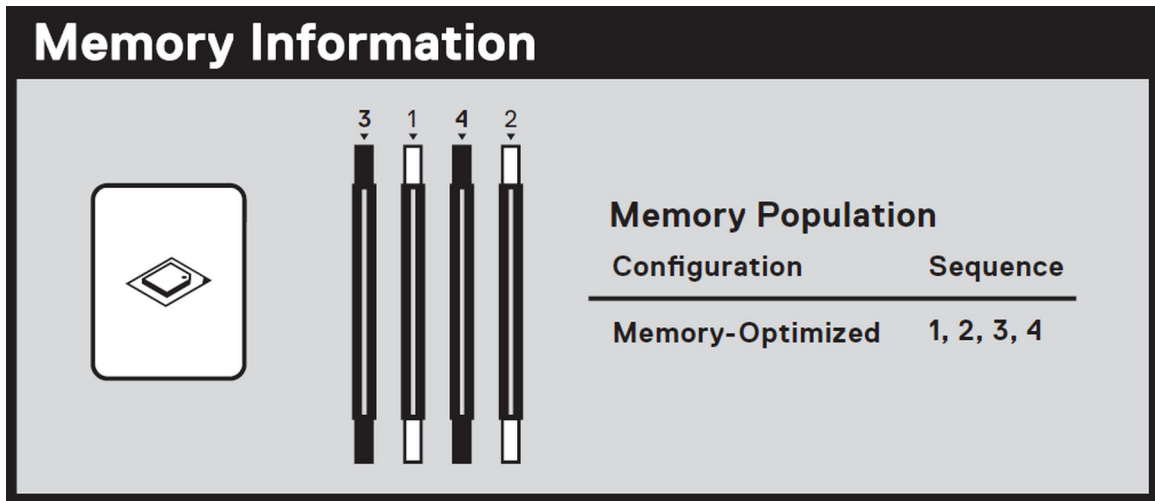


Figure 5. Memory information

Jumper Settings





Jumper	Setting	Description
PWRD_EN	 (default)	 Clear BIOS password
NVRAM_CLR	 (default)	 BIOS setting recover to Default

Figure 6. Jumper Settings

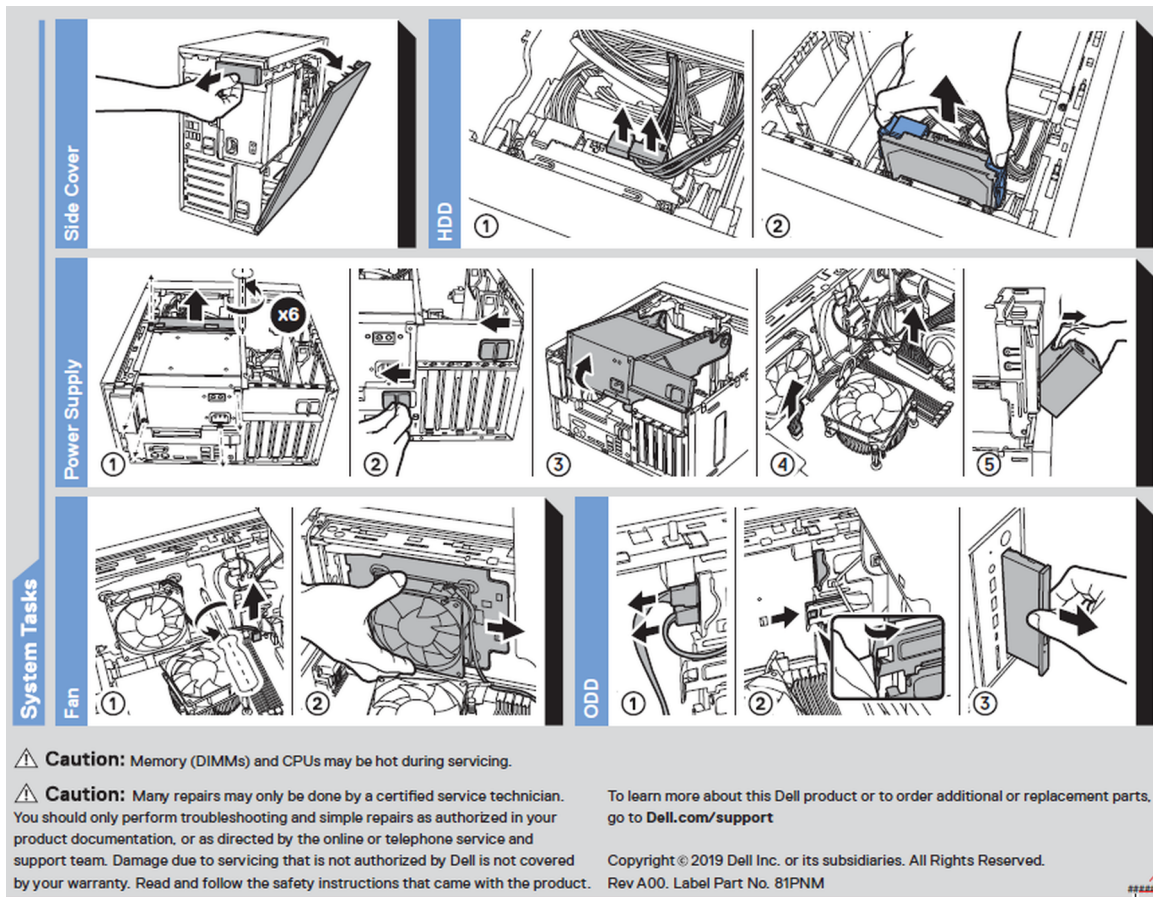
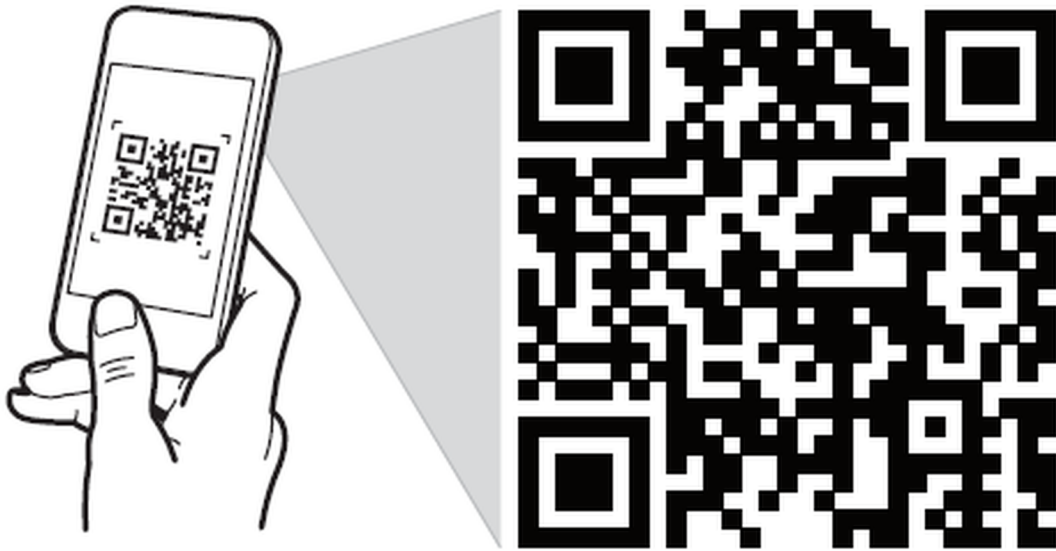


Figure 7. System task

**Scan to see hardware servicing
and software setup videos,
how-to's, and documentation.**



Quick Resource Locator
Dell.com/QRL/Server/PET40

Figure 8. Quick resource locator

Initial system setup and configuration

Setting up your system

Perform the following steps to set up your system:

Steps

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

For more information about setting up your system, see the *Getting Started Guide* that shipped with your system.

Options to install the operating system

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

Table 1. Resources to install the operating system

Resources	Location
Dell Systems Management Tools and Documentation media	Dell.com/operatingsystemmanuals
Supported operating systems on Dell PowerEdge systems	Dell.com/ossupport
Installation and How-to videos for supported operating systems on Dell PowerEdge systems	Supported Operating Systems for Dell PowerEdge Systems

Methods to download firmware and drivers

You can download the firmware and drivers from the Dell support site at Dell.com/support/drivers.

Downloading the drivers and firmware

Dell EMC recommends that you download and install the latest BIOS, drivers, and systems management firmware on your system.

Prerequisites

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

Steps

1. Go to Dell.com/support/drivers.
2. In the **Drivers & Downloads** section, type the Service Tag of your system in the **Service Tag or Express Service Code** box, and then click **Submit**.



NOTE: If you do not have the Service Tag, select **Detect My Product** to allow the system to automatically detect your Service Tag, or in **General support**, navigate to your product.

3. Click **Drivers & Downloads**.
The drivers that are applicable to your selection are displayed.
4. Download the drivers to a USB drive, CD, or DVD.

Pre-operating system management applications

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

Topics:

- [Options to manage the pre-operating system applications](#)
- [System Setup](#)
- [PXE boot](#)

Options to manage the pre-operating system applications

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

- System Setup
- Preboot Execution Environment (PXE)

System Setup

By using the **System Setup** screen, you can configure the BIOS settings and device settings of your system.

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


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

Viewing System Setup

To view the **System Setup** screen,

Steps

Press F2 immediately after a power-on or re-boot.

 **NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.**

Boot menu

To enter Boot Manager: Power on, or restart your system. Press F12 when the Dell logo appears to initiate a one-time boot menu with a list of the valid boot devices for the system. Diagnostics and BIOS Setup options are also included in this menu. The devices listed on the boot menu depend on the bootable devices in the system. This menu is useful when you are attempting to boot to a particular device or to bring up the diagnostics for the system. Using the boot menu does not change the boot order stored in the BIOS.

The options are:

- UEFI Boot:
 - Windows Boot Manager

- Other Options:
 - BIOS Setup
 - BIOS Flash Update
 - Diagnostics
 - Change Boot Mode Settings

Navigation keys

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

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

System Setup options

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

Table 2. General

Option	Description
System Information	Lists the primary hardware features of your system. <ul style="list-style-type: none"> • System Information • Memory Configuration • PCI Information • Processor Information • Device Information
Boot Sequence	Allows you to change the order in which the system attempts to find an operating system. <ul style="list-style-type: none"> • Windows Boot Manager • Onboard NIC • Onboard NIC
Boot List Options	Allows you to change the boot list option. <ul style="list-style-type: none"> • Legacy External Devices • UEFI (Default setting)
Advanced Boot Options	Allows you to enable Legacy Option ROMs <ul style="list-style-type: none"> • Enable Legacy Option ROMs (Default setting: enabled) • Enable Attempt Legacy Boot (Default setting: not enabled)
UEFI Boot Path Security	Allows you to control whether the system prompts the user to enter the Admin password when booting to a UEFI boot path. <ul style="list-style-type: none"> • Always, Except Internal HDD (Default setting) • Always, Except Internal HDD & PXE


Option	Description
	<ul style="list-style-type: none"> Always Never
Date/Time	<p>Allows you to set the date and time.</p> <p> NOTE: The changes to the system date and time takes effect immediately.</p>

Table 3. System configuration

Option	Description
Integrated NIC	<p>Allows you to configure the on-board LAN controller.</p> <ul style="list-style-type: none"> Enable UEFI Network Stack Disabled Enabled Enabled w/PXE (Default setting)
Serial Port	<p>Identifies and defines the serial port settings. You can set the serial port to:</p> <ul style="list-style-type: none"> Disabled COM1 (Default setting) COM2 COM3 COM4
SATA Operation	<p>Allows you to configure the internal SATA hard-drive controller.</p> <ul style="list-style-type: none"> Disabled AHCI RAID On (Default setting)
Drives	<p>Allows you to configure the SATA drives on board.</p> <ul style="list-style-type: none"> SATA-0 SATA-1 SATA-2 SATA-3 <p>Default setting: All drives are enabled.</p>
SMART Reporting	<p>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.</p> <ul style="list-style-type: none"> Enable SMART Reporting (Default setting: not enabled)
USB Configuration	<p>Allows you to enable or disable the USB configuration.</p> <ul style="list-style-type: none"> Enable USB Boot Support (Default setting) Enable Front USB Ports (Default setting) Enable rear USB Ports (Default setting)
Front USB Configuration	<p>Allows you to enable or disable the front USB configuration.</p> <ul style="list-style-type: none"> Front Port 1 (Left) Front Port 2 (Center) Front Port 3 (Right)* Front Port 4 (Type C)* <p>*Denotes a USB 3.0-capable port</p>
Rear USB Configuration	<p>Allows you to enable or disable the rear USB configuration.</p> <ul style="list-style-type: none"> Rear Port 1 (Upper Left) Rear Port 2 (Upper Right) Rear Port 3 (Left)*

Option	Description
	<ul style="list-style-type: none"> • Rear Port 4 (Center Left)* • Rear Port 5 (Center Right)* • Rear Port 6 (Right)* <p>*Denotes a USB 3.1 Gen 1–capable port</p>
Memory Map IO above 4 GB	Allows you to enable or disable memory mapping IO above 4 GB. The option is enabled by Default setting.
Audio	Allows you enable or disable the audio feature. <ul style="list-style-type: none"> • Enable Audio(Default setting) • Enable Internal Speaker (Default setting)
Miscellaneous devices	Allows you to enable or disable various on-board devices. <ul style="list-style-type: none"> • Enable PCI Slot (Default setting)

Table 4. Video

Option	Description
Multi-Display	Allows you to enable or disable multi display feature. Default setting: not enabled.
	<p>NOTE: The processor must be Intel Graphic Device (IGD) capable to view this option.</p> <p>NOTE: Ensure to install an additional GPU to utilize this option.</p>
Primary Display	Allows you to configure primary video controller when there are multiple controllers available. <ul style="list-style-type: none"> • Auto (Default setting) • Intel HD Graphics

Table 5. Security

Option	Description
Admin Password	This option allows you to enable or disable admin passwords for the system (Default setting: not enabled).
System Password	This option allows you to enable or disable system passwords for the system (Default setting: not enabled).
Strong Password	This option allows you to enable or disable strong passwords for the system (Default setting: not enabled).
Password Configuration	Allows you to control the minimum and maximum number of characters allowed for a administrative password and the system password. The range of characters is between 4 and 32.
Password Bypass	This option lets you bypass the system (Boot) password and the internal HDD password prompts during a system restart. <ul style="list-style-type: none"> • Disabled — Always prompt for the system and internal HDD password when they are set. This option is enabled by Default setting. • Reboot Bypass — Bypass the password prompts on Restarts (warm boots). <p>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.</p>
Password Change	This option allows you to determine whether changes to the System and Hard Disk passwords are permitted when an administrator password is set.

Option	Description
	Allow Non-Admin Password Changes - This option is enabled by Default setting.
TPM 2.0 Security	Allows you to control whether the Trusted Platform Module (TPM) is visible to the operating system.
NOTE: TPM function is not applied to China and Russia.	<ul style="list-style-type: none"> TPM On (Default setting) Clear PPI Bypass for Enable Commands (Default setting) PPI Bypass for Disable Commands PPI Bypass for Clear Commands Attestation Enable (Default setting) Key Storage Enable (Default setting) SHA-256 (Default setting) <p>Choose any one option:</p> <ul style="list-style-type: none"> Disabled Enabled (Default setting)
Chassis Intrusion	This field controls the chassis intrusion feature. Choose any one of the option: <ul style="list-style-type: none"> Disabled Enabled (Default setting) On-Silent
OROM Keyboard Access	<ul style="list-style-type: none"> Disabled Enabled (Default setting) One Time Enable
Admin Setup Lockout	Allows you to prevent users from entering Setup when Admin password is set (Default setting: not enabled).
Master Password Lockout	Allows you to prevent users from entering Setup when Master password is set (Default setting: not enabled).
SMM Security Mitigation	Allows you to enable or disable additional UEFI SMM Security Mitigation protections (Default setting: not enabled).

Table 6. Secure Boot

Option	Description
Secure Boot Enable	The option is not enabled by Default setting.
Secure Boot Mode	<ul style="list-style-type: none"> Deployed Mode (Default setting) Audit Mode
Expert Key Management	Allows you to enable or disable Custom Mode Key Management. <ul style="list-style-type: none"> Enable Custom Mode (This option is not enabled by Default setting) <p>If Enabled,</p> <ul style="list-style-type: none"> PK (Default setting) KEK db dbx

Table 7. Intel Software Guard Extensions

Option	Description
Intel SGX Enable	Allows you to enable or disable Intel Software Guard Extensions. <ul style="list-style-type: none"> Disabled

Option	Description
	<ul style="list-style-type: none"> Enabled Software controlled (Default setting)
Enclave Memory Size	<p>Allows you to change the Intel Software Guard Extensions Enclave Reserve Memory size.</p> <ul style="list-style-type: none"> 32 MB 64 MB 128 MB

Table 8. Performance

Option	Description
Multi Core Support	<p>This field specifies whether the processor will have one or all cores enabled. The performance of some applications will improve with the additional cores. This option is enabled by Default setting. Allows you to enable or disable multi-core support for the processor.</p> <ul style="list-style-type: none"> All (Default setting) 1 2 3 <p>NOTE:</p> <ul style="list-style-type: none"> The options displayed could be different depending on the installed processor. The options depend on the number of cores supported by the installed processor (All, 1, 2, N-1 for N-Core Processors)
Intel SpeedStep	<p>Allows you to enable or disable the Intel SpeedStep feature.</p> <p>Default setting: Enable Intel SpeedStep</p>
C-States Control	<p>Allows you to enable or disable the additional processor sleep states (depends on the processor installed).</p> <p>C states (This option is selected by Default setting)</p>
Cache Prefetch	<ul style="list-style-type: none"> Hardware Prefetcher (Default setting) Adjacent Cache Prefetch (Default setting) <p>When Hardware Prefetcher is enabled, the processor's hardware prefetcher will automatically prefetch data and code for the processor</p> <p>When Adjacent Cache is enabled, the process will retrieve the currently requested cache line, as well as subsequent cache line.</p>
Intel TurboBoost	<p>Allows you to enable or disable the Intel TurboBoost mode of the processor.</p> <p>The option Intel TurboBoost is set by Default setting.</p>
Hyper-Thread Control	<p>Allows you to enable or disable the HyperThreading in the processor.</p> <ul style="list-style-type: none"> Disabled Enabled—Default setting
Dell Reliable Memory Technology (RMT)	<p>Allows you to enable or disable the Dell RMT in the processor.</p> <ul style="list-style-type: none"> Disabled Enabled (Default setting)

Table 9. Power management

Option	Description
AC Recovery	<p>Specifies how the system will respond when AC power is applied after a AC power loss. You can set the AC Recovery to:</p> <ul style="list-style-type: none"> Power Off

Option	Description
	<ul style="list-style-type: none"> Power On Last Power State (Default setting)
Enable Intel Speed Shift Technology	Allows you to enable or disable Intel Speed Shift Technology support. The option Enable Intel Speed Shift Technology is set by Default setting.
Auto On Time	Allows you to set the time at which the system must turn on automatically. <ul style="list-style-type: none"> Disabled (Default setting) Every Day Weekdays Select Days
Fan Control Override	Allows you to control the speed of the system fan. The option Fan Control Override is not enabled by Default setting.
USB Wake Support	Allows you to enable or disable the USB Wake Support. <ul style="list-style-type: none"> Disabled (Default setting) Enabled
Wake on LAN	This option allows the system to power up from the off state when triggered by a special LAN signal. Wake-up from the Standby state is unaffected by this setting and must be enabled in the operating system. This feature only works when the system is connected to AC power supply. <ul style="list-style-type: none"> Disabled (Default setting) LAN Only LAN with PXE Boot

Table 10. POST behavior

Option	Description
Numlock LED	Allows you to specify if the NumLock function is enabled when the system boots. This option is enabled by Default setting.
Keyboard Errors	Specifies whether keyboard related errors are reported when it boots. This option is enabled by Default setting.
Extend BIOS POST Time	This option creates an additional pre-boot delay. <ul style="list-style-type: none"> 0 seconds (Default setting) 5 seconds 10 seconds
Warnings and Errors	This option causes the boot process to only pause when warning or errors are detected. Choose any one of the option: <ul style="list-style-type: none"> Prompt on Warnings and Errors (Default setting) Continue on Warnings Continue on Warnings and Errors

Table 11. Manageability

Option	Description
Intel AMT Capability	This option is selected as Enabled by Default setting.
USB provision	This option is not selected by Default setting.
MEBx Hotkey	This option is selected by Default setting.

Table 12. 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. <ul style="list-style-type: none"> · Enable Intel Virtualization Technology - This option is enabled by Default setting.
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. <ul style="list-style-type: none"> · Enable VT for Direct I/O - This option is enabled by Default setting.
Trusted Execution	Allows you to specify whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel Trusted Execution Program. <ul style="list-style-type: none"> · Trusted Execution - This option is disabled by Default setting.

Table 13. Maintenance

Option	Description
Service Tag	Displays the service tag of your system.
Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is disabled by Default setting.
SERR Messages	Allows you to control the SERR message mechanism. This option is enabled by Default setting. Some graphics cards require that the SERR message mechanism be disabled.
BIOS Downgrade	Allows you to control the flashing of the system firmware to previous revisions. This option is disabled by Default setting.
Data Wipe	Allows you to securely erase data from all internal storage devices. This option is disabled by Default setting.
BIOS Recovery	Allows you to recover from certain corrupted BIOS conditions using a recovery file. This option is enabled by Default setting.
First Power On Date	This option is not set by Default setting.

Table 14. System Logs

Option	Description
BIOS events	Displays the system event log and allows you to clear the log. <ul style="list-style-type: none"> · Clear Log

Table 15. Advanced Configurations

Option	Description
ASPM	Allows you to set the Active State Power Management level: <ul style="list-style-type: none"> · Auto (Default setting) · Disabled · L1 Only
PCIe Linkspeed	Allows you to select the max PCIe link speed attainable by devices within the system. <ul style="list-style-type: none"> · Auto (Default setting) · Gen1 · Gen2

Updating the BIOS



Prerequisites

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

About this task


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

Steps


1. Restart the system.
2. Go to **Dell.com/support**.
3. Enter the **Service Tag** or **Express Service Code** and click **Submit**.
 **NOTE:** To locate the Service Tag, click **Where is my Service Tag?**
-  **NOTE:** If you cannot find your Service Tag, click **Detect My Product**. Proceed with the instructions on screen.
4. If you are unable to locate or find the Service Tag, click the product category of your system.
5. Choose the **Product Type** from the list.
6. Select your system model and the product support page of your system appears.
7. Click **Get drivers** and click **View All Drivers**.
The Drivers and Downloads page opens.
8. On the Drivers and Downloads screen, under the **Operating System** drop-down list, select **BIOS**.
9. Identify the latest BIOS file and click **Download File**.
You can also analyze the drivers that need an update. To do this for your product, click **Analyze System for Updates** and follow the instructions on the screen.
10. Select your preferred download method in the **Please select your download method below** window, click **Download File**.
The **File Download** window appears.
11. Click **Save** to save the file on your system.
12. Click **Run** to install the updated BIOS settings on your system.
Follow the instructions on the screen.

Next steps

For more information on how to update the BIOS, please refer the article <https://www.dell.com/support/article/us/en/04/sln129956/dell-bios-updates?lang=en>

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

Updating BIOS on systems with BitLocker enabled

 **CAUTION:** If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: <https://www.dell.com/support/article/sln153694>

Updating your system BIOS using a USB flash drive

About this task

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

 **NOTE:** You will need to use a bootable USB Flash drive. Please refer to the following article for further details: <https://www.dell.com/support/article/sln143196/>

Steps

1. Download the BIOS update .EXE file to another system.
2. Copy the file e.g. O9010A12.EXE onto the bootable USB Flash drive.
3. Insert the USB Flash drive into the system that requires the BIOS update.
4. Restart the system and press F12 when the Dell Splash logo appears to display the One Time Boot Menu.

5. Using arrow keys, select **USB Storage Device** and click Return.
6. The system will boot to a Diag C:\> prompt.
7. Run the file by typing the full filename e.g. O9010A12.exe and press Return.
8. The BIOS Update Utility will load, follow the instructions on screen.



Figure 9. DOS BIOS Update Screen

Updating the Dell BIOS in Linux and Ubuntu environments

If you want to update the system BIOS in a Linux environment such as Ubuntu, see <https://www.dell.com/support/article/sln171755/>.

Flashing the BIOS from the F12 One-Time boot menu

Updating your system BIOS using a BIOS update .exe file copied to a FAT32 USB key and booting from the F12 one time boot menu.

About this task

BIOS Update

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

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

NOTE: Only systems with BIOS Flash Update option in the F12 One-Time Boot Menu can use this function.

Updating from the One-Time Boot Menu

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

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

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

CAUTION: Do not power off the system during the BIOS update process. Powering off the system could make the system fail to boot.

Steps

1. From a power off state, insert the USB key where you copied the flash into a USB port of the system .
2. Power on the system and press the F12 key to access the One-Time Boot Menu, Highlight BIOS Flash Update using the arrow keys then press **Enter**.

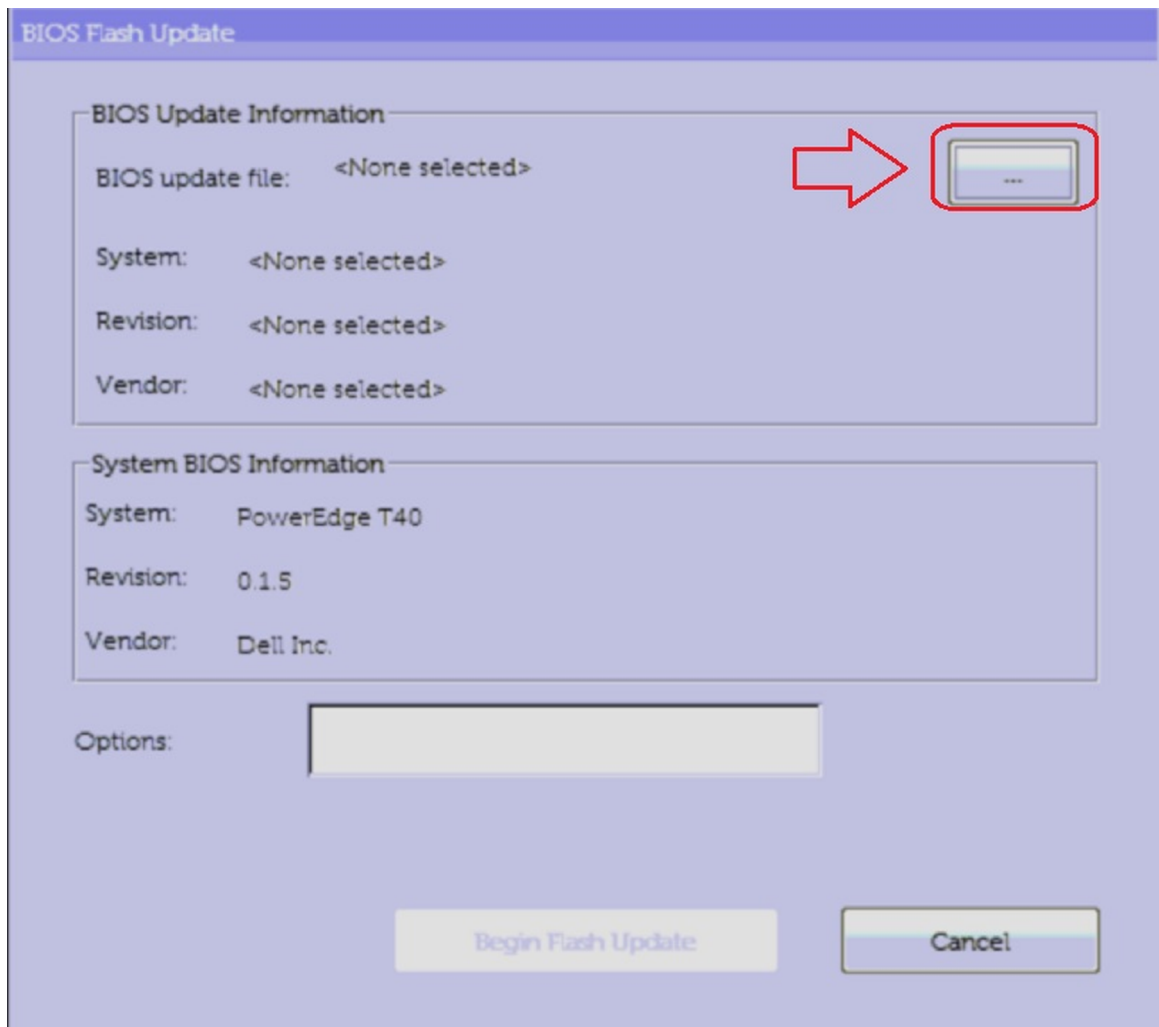
```
Use the ↑(Up) and ↓(Down) arrow keys to move the pointer to the desired boot device.
Press [Enter] to attempt the boot or ESC to Cancel. (* = Password Required)
Warning: Legacy boot mode does not support OS boot on internal storage devices
such as HDD, SSD, NVMe, or eMMC. It is intended for use with external storage devices only,
such as SD Card, USB, and Network PXE.

Boot mode is set to: UEFI; Secure Boot: OFF

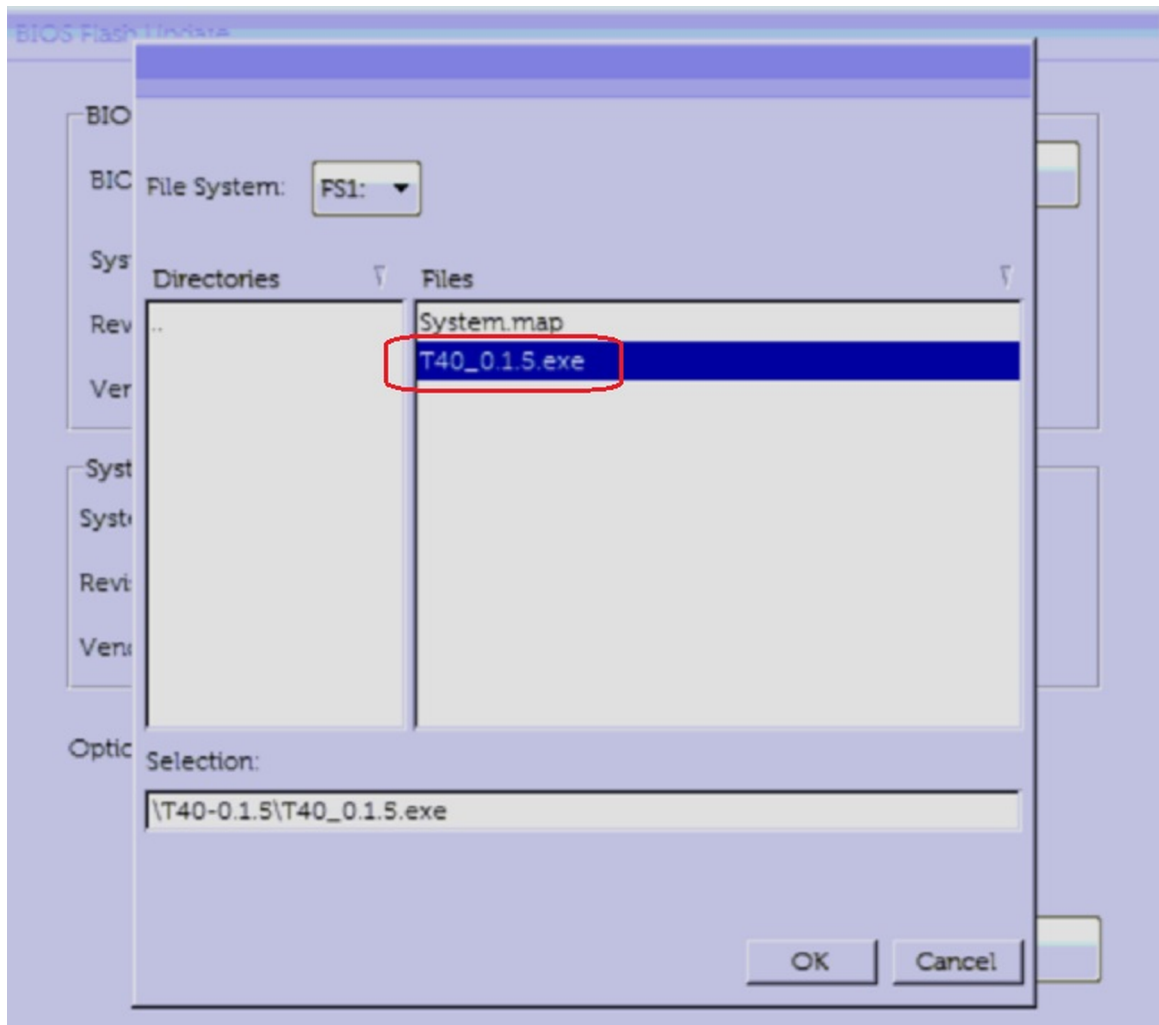
LEGACY EXTERNAL DEVICE BOOT:
  USB Storage Device
  Onboard NIC
UEFI BOOT:
  Windows Boot Manager
  UEFI: ST1000DM010-2EP102
  Onboard NIC(IPV4)
  Onboard NIC(IPV6)
OTHER OPTIONS:
  BIOS Setup
  Device Configuration
  BIOS Flash Update
  Diagnostics
  Change Boot Mode Settings

PowerEdge T40                                BIOS Revision 0.1.5                                Dell
```

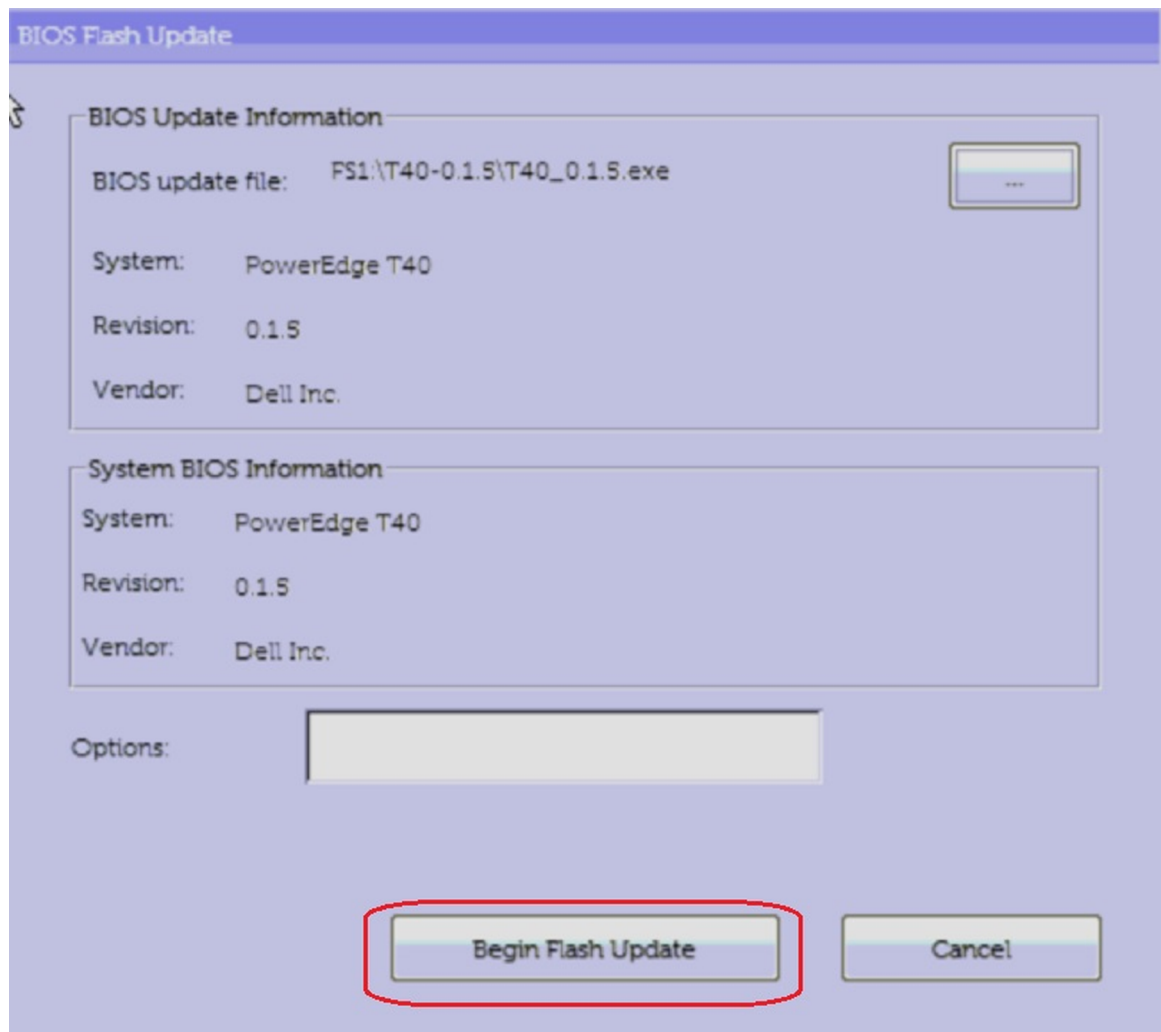
3. The Bios flash menu will open then click the browse button.



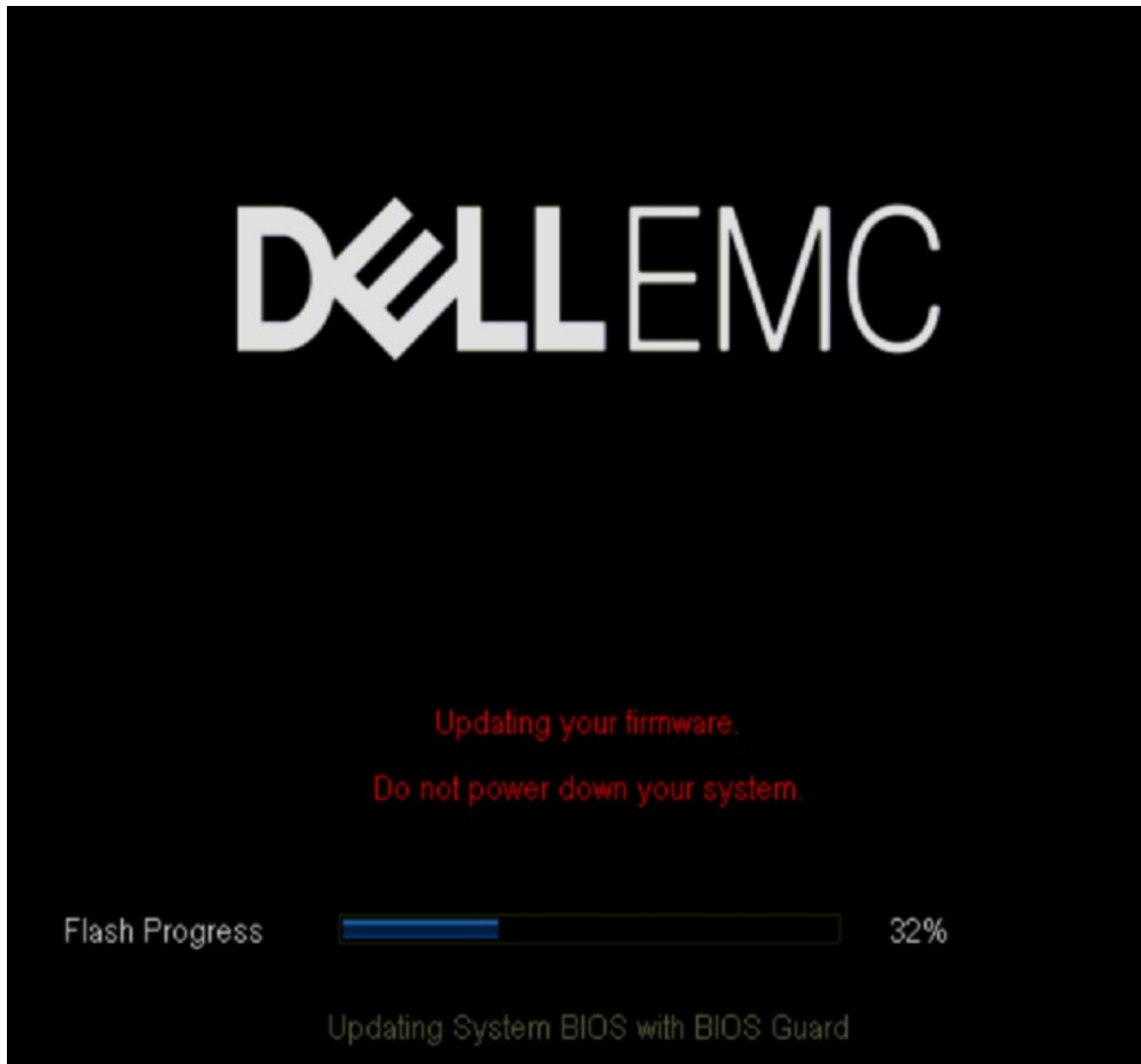
4. The T40_0.1.5.exe file is shown as an example in the following screenshot. The actual file name may vary.
5. Once the file is selected, it will show in the file selection box and you can click the OK button to continue.



6. Click the **Begin Flash Update** button.



7. A warning box is displayed asking you if you want to proceed. Click the Yes button to begin the flash.
8. At this point the BIOS flash will execute, the system will reboot and then the BIOS flash will start and a progress bar will show the progress of the flash. Depending on the changes included in the update, the progress bar may go from zero to 100 multiple times and the flash process could take as long as 10 minutes. Generally this process takes two to three minutes.



9. Once complete, the system will reboot and the BIOS update process is completed.

System and setup password

Table 16. System and setup password

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

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

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

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

NOTE: System and setup password feature is disabled.

Assigning a system setup password

Prerequisites

To assign a **System or Admin Password**, the status must be **Not Set**.

About this task

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

Steps

1. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
Use the following guidelines to assign the system password:
 - A password can have up to 32 characters.
 - The password can contain the numbers 0 through 9.
 - Only lower case letters are valid, upper case letters are not allowed.
 - Only the following special characters are allowed: space, ("), (+), (,), (-), (.), (/), (:), ([), (\), (]), (').
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and a message prompts you to save the changes.
5. Press Y to save the changes.
The system reboots.

Deleting or changing an existing system setup password


Prerequisites

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

About this task

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

Steps

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

PXE boot

You can use the Preboot Execution Environment (PXE) option to boot and configure the networked systems, remotely.

To access the **PXE boot** option, boot the system and then press F12 during POST instead of using standard Boot Sequence from BIOS Setup. It does not pull any menu or allows managing of network devices.

Installing and removing system components


Safety instructions

About this task

 **NOTE:** To avoid injury, do not attempt to lift the system by yourself.

 **WARNING:** Opening or removing the system cover while the system is powered on may expose you to a risk of electric shock.

 **CAUTION:** Do not operate the system without the cover for a duration exceeding five minutes. Operating the system without the system cover can result in component damage.

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

 **NOTE:** It is recommended that you always use an antistatic mat to place the system components and antistatic strap that is connected to a grounded work bench while working on the components inside the system

Before working inside your system

Prerequisites

Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Power off the system and attached peripherals.
2. Disconnect the system from the electrical outlet, and disconnect the peripherals.
3. [Remove the system cover](#)
4. Lay the system on its side.

After working inside your system

Prerequisites

Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. [Install the system cover](#).
2. Place the system upright on a flat, stable surface.
3. Reconnect the peripherals and connect the system to the electrical outlet.
4. Power on the attached peripherals and then power on the system.

Recommended tools

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

- Phillips #1 screwdriver
- Phillips #2 screwdriver
- Torx #T15 screwdriver
- 5mm hex nut screwdriver
- Plastic scribe
- Wrist grounding strap connected to the ground
- ESD mat

System cover

Removing the system cover

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).

Steps

1. Pull the system cover release latch.
2. Remove the system cover.



Figure 10. Removing system cover

Next steps

1. [Replace the system cover.](#)

Installing the system cover

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)

Steps

1. Align the tabs on the system cover with the slots on the chassis.
2. Press the system cover until it clicks into place.



Figure 11. Installing the system cover

Next steps

1. Reconnect the peripherals and connect the system to an electrical outlet.
2. Power on the system, including attached peripherals.

Front bezel

Removing the front bezel

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).

Steps

1. Lift the retention clips at the edge of the bezel to release the bezel from the system.
2. Unhook the bezel tabs and pull the bezel away from the system.



Figure 12. Removing the front bezel

Next steps

1. [Replace the front bezel.](#)

Installing the front bezel

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).

Steps

1. Place the bezel tabs into the bezel slots in the system.
2. Press the bezel into the system until the retention clips lock into place.



Figure 13. Installing the front bezel

Next steps

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

Hard drives

Removing a drive carrier from the drive bay

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).
3. Using the management software, prepare the drive for removal. Power off the system and unplug the cables before removing the drive. For more information, see the www.dell.com/storagecontrollermanuals.
4. Disconnect the power and data cables from the drive.

NOTE: To prevent data loss, ensure that your operating system supports drive installation. See the documentation supplied with your operating system.

CAUTION: Mixing drive carriers from previous generations of PowerEdge servers is not supported.

Steps

Press the retention clips and lift the drive carrier out from the drive bay.

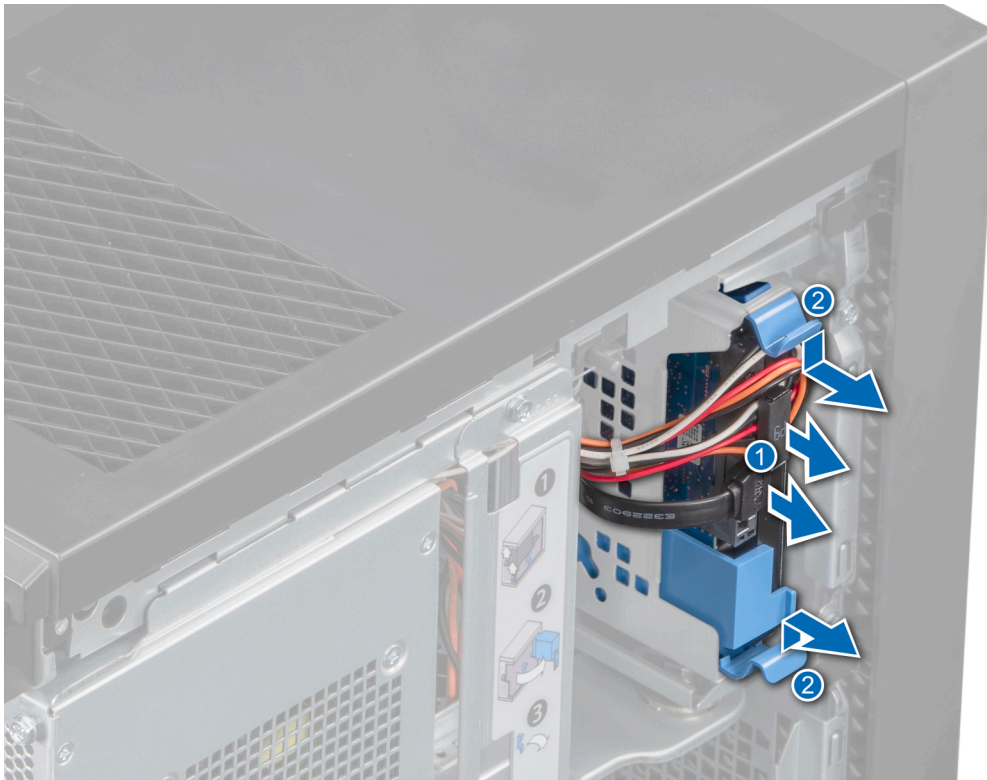


Figure 14. Removing the hard drive carrier

Next steps

1. [Replace the drive carrier into the drive bay.](#)

Installing a drive carrier into the drive bay

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).

Steps

Align and slide the drive carrier into the drive bay until it clicks into place.



Figure 15. Installing the hard drive carrier

Next steps

1. Connect the power and data cables to the drive.
2. Follow the procedure that is listed in [After working inside your system](#).

NOTE: SATA ports on the system board are corresponding to SATA devices. Please refer to System Information Label.

NOTE: "SATA 1" is for the first drive. "SATA 2" is for the ODD. "SATA 3" is for the 2nd drive. "SATA 4" is for the 3rd drive.

Removing a drive from the drive carrier

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).
3. [Remove the drive carrier from the drive bay](#).

Steps

1. Flex the drive bracket outwards to release the metal studs on the drive bracket from the holes on the drive.
2. Remove the drive from the carrier.

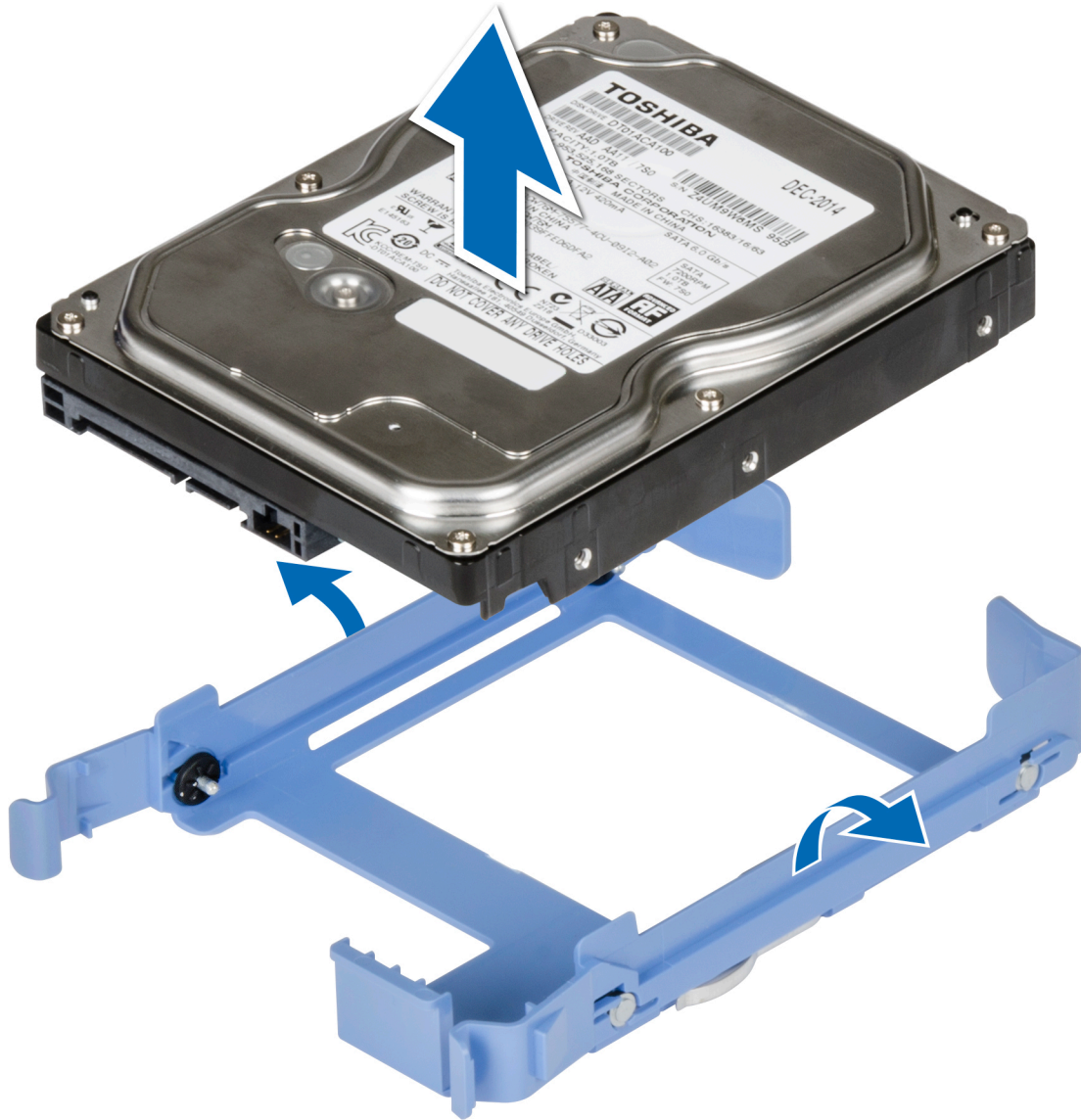


Figure 16. Removing the drive from the drive carrier

Next steps

1. Install the drive into the drive carrier.

Installing a drive into the drive carrier

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).

Steps

1. Align the screw holes on one side of the drive with the pins on the drive carrier.
2. Flex the drive bracket outward, and align the metal studs on the drive bracket to the holes on the drive and place the drive into the drive carrier.

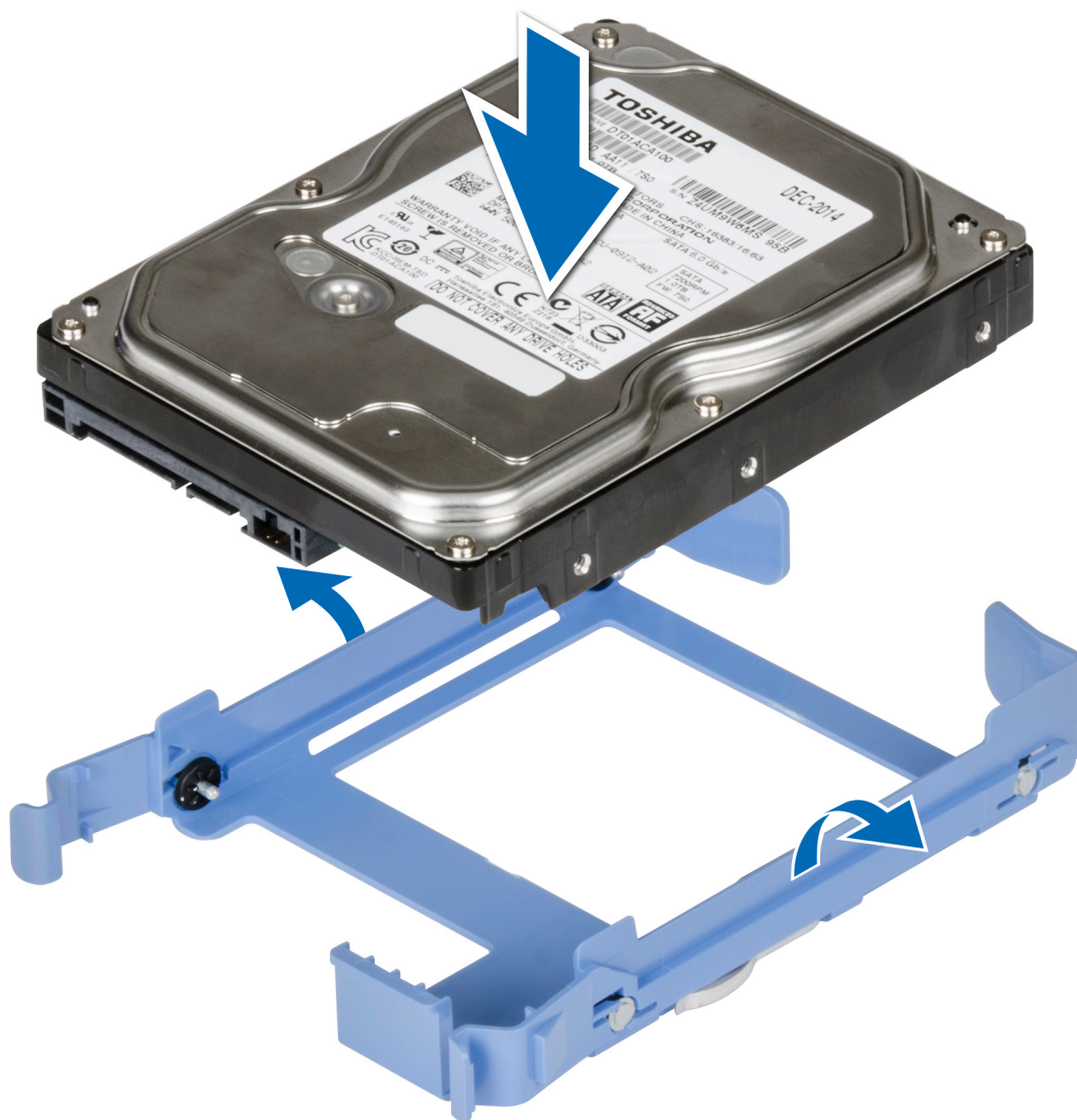


Figure 17. Installing a drive into the drive carrier

Next steps

1. Install a 3.5-drive carrier into the drive bay.
2. Follow the procedure that is listed in [After working inside your system](#).

PSU assembly

Opening the PSU assembly

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).

Steps

1. Slide the PSU assembly release latches to the unlock position.
2. Lift the PSU assembly.



Figure 18. Opening the PSU assembly

Next steps

Close the PSU assembly.

Closing the PSU assembly

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).

Steps

1. Lower the PSU assembly until the PSU assembly is firmly seated.
2. Slide the PSU assembly release latches to the lock position.

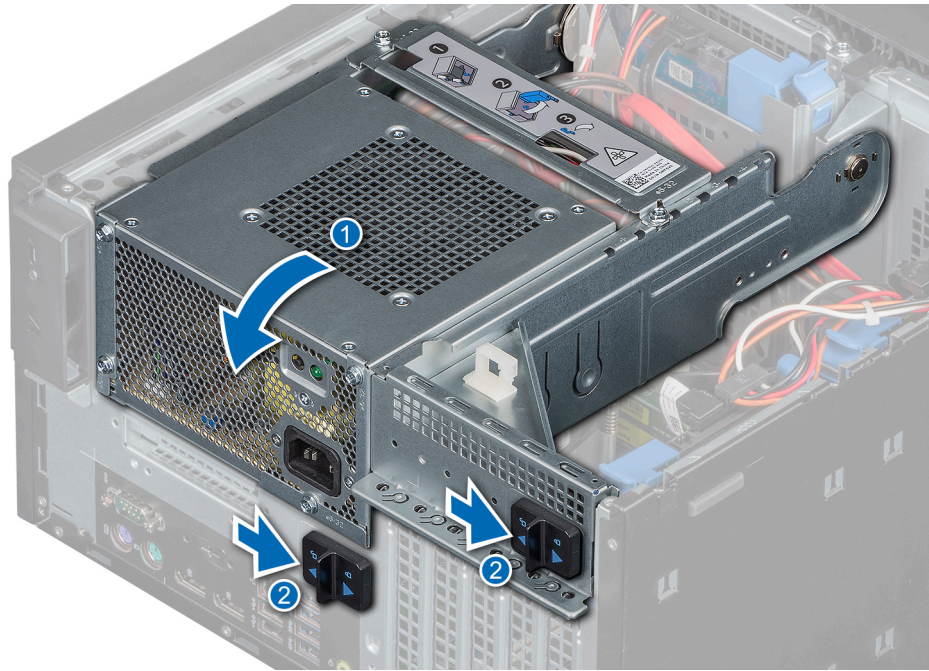


Figure 19. Closing the PSU assembly

Next steps

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

Power supply unit

Removing the power supply unit

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).
3. Disconnect the PSU cable from the drive.
4. [Open the PSU assembly](#).
5. Disconnect the PSU cables from the optical drive and the system board.
NOTE: Observe the routing of the cable as you remove it from the system.
6. [Close the PSU assembly](#).

Steps

1. Remove the screws securing the PSU support bracket to the PSU assembly and remove the PSU support bracket from the chassis.
2. Remove the screws securing the PSU to the PSU assembly.
 - a. Slide and remove the PSU from of the chassis.

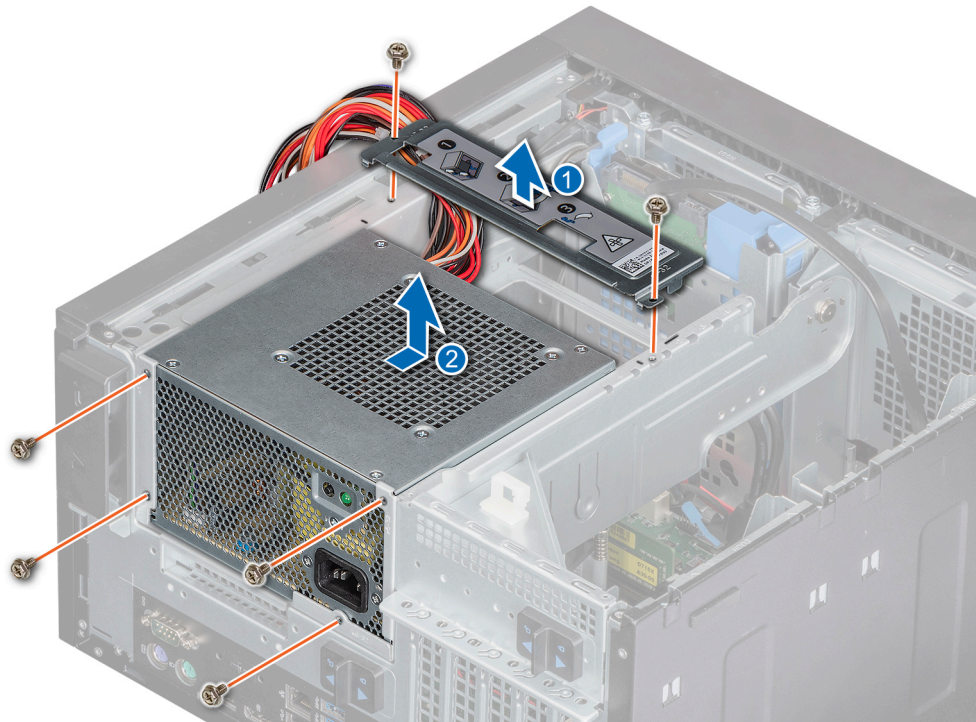


Figure 20. Removing power supply unit

Next steps

1. [Replace the PSU.](#)

Installing the power supply unit

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).

Steps

1. Insert the PSU into the PSU assembly and slide it towards the rear of the chassis until it is firmly seated.
 - a. Tighten the screws to secure the PSU to the chassis.
2. Align and tighten the PSU support bracket to secure in place.

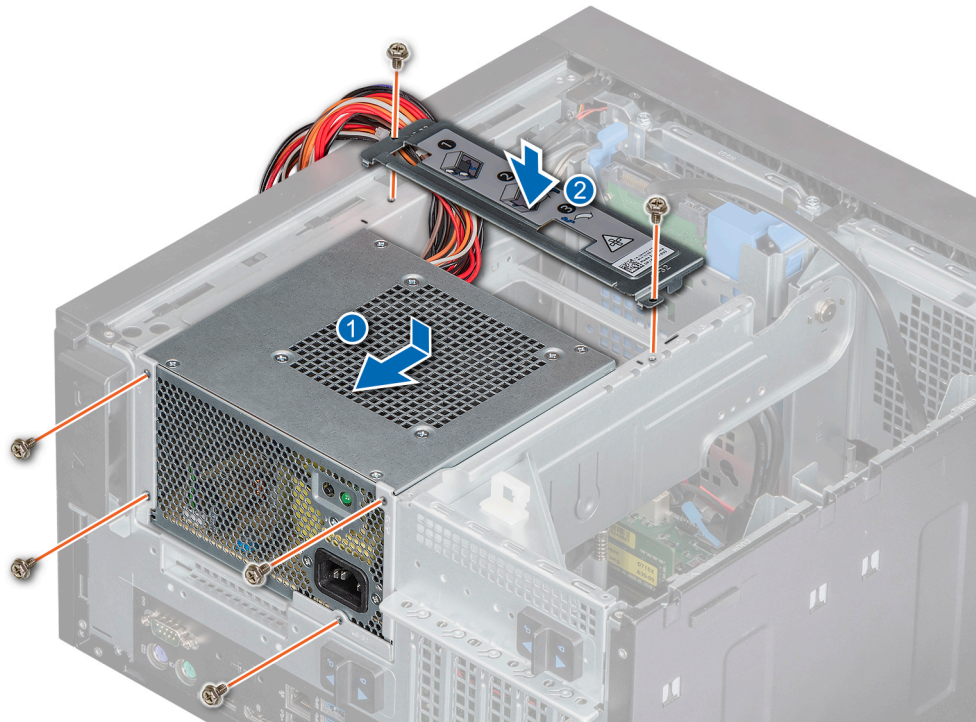


Figure 21. Installing power supply unit

Next steps

1. Connect the PSU cable to the drive.
2. [Open the PSU assembly.](#)
3. Connect the PSU cables to the optical drive and the system board.

NOTE: Route the cable properly when you replace it to prevent the cable from being pinched or crimped.

4. [Close the PSU assembly.](#)
5. Follow the procedure listed in [After working inside your system.](#)

Expansion cards

Removing the Expansion card

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your system.](#)
3. [Open the PSU assembly.](#)
4. If applicable, disconnect the cables connected to the expansion card.

Steps

1. Push the ejector on the expansion card slot to release the expansion card.
2. Holding the card by its edge, pull the card to disengage it from the connector on the system board.
3. Remove the expansion card from the system.

Figure 22. Removing the expansion card



4. If you are removing the expansion card permanently, install a filler bracket.

NOTE:

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

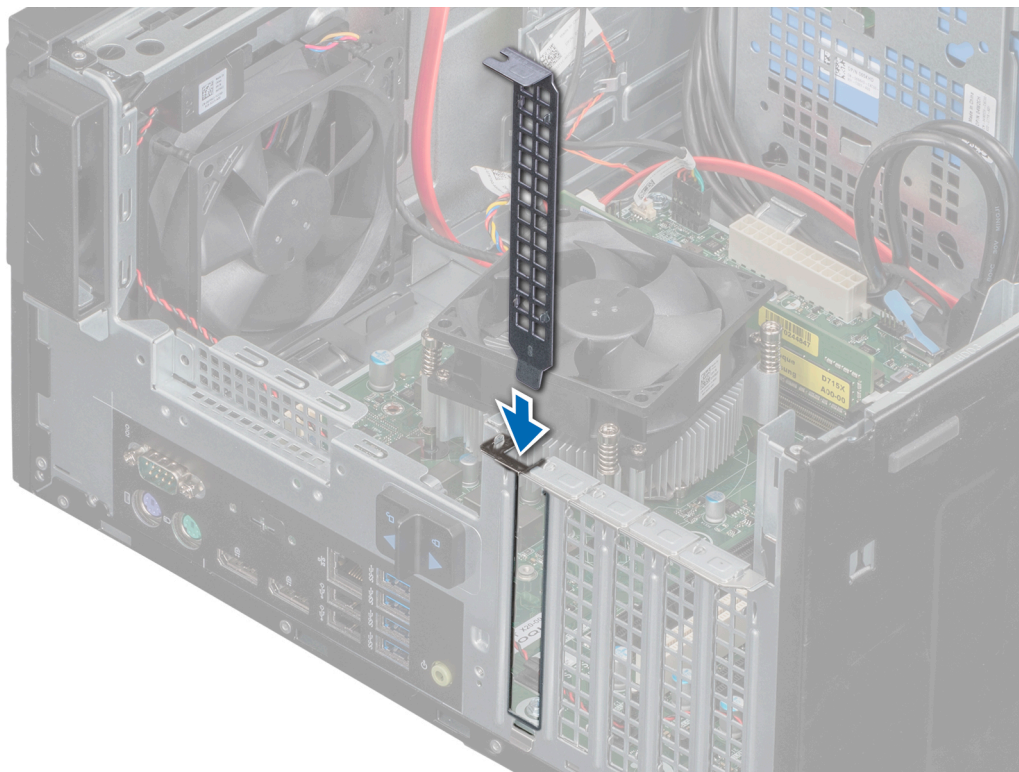


Figure 23. Installing the filler bracket

Next steps

1. [Replace the expansion card.](#)

Installing the expansion card

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).

Steps

1. Unpack the expansion card and prepare it for installation.

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

2. Remove the expansion card or filler bracket from the expansion card holder.

i **NOTE:** Store this bracket for future use. Filler brackets must be installed in empty expansion-card slots to maintain FCC certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

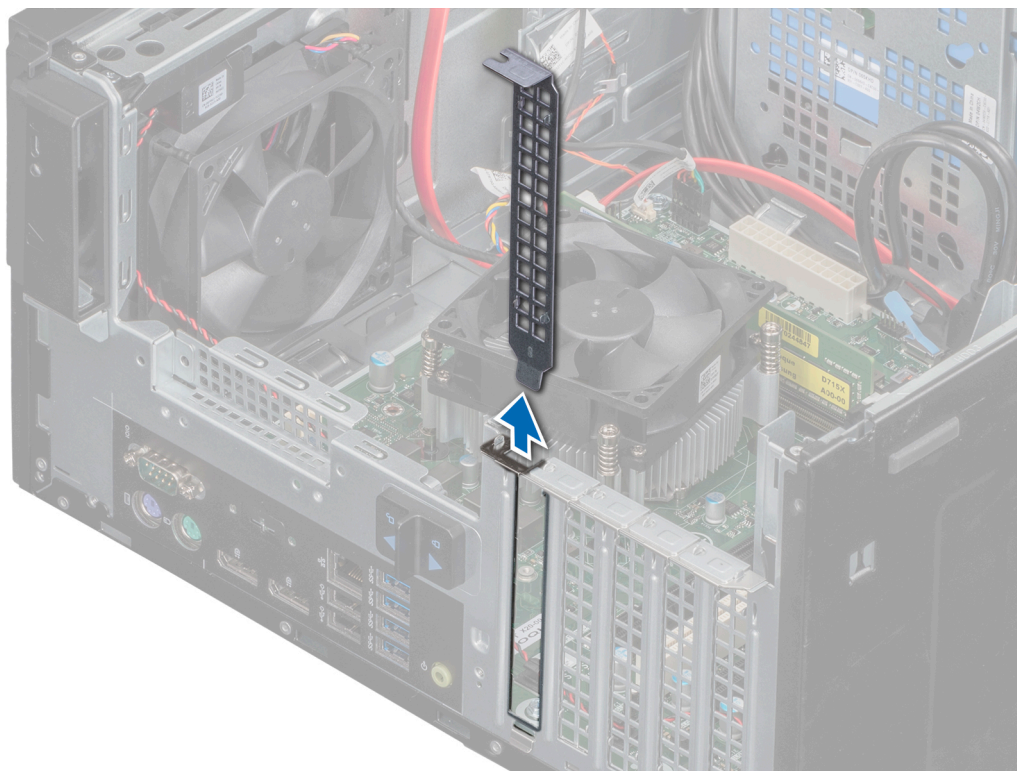


Figure 24. Removing the filler bracket

3. Push the ejector on the expansion card slot to allow the expansion card to be inserted into the socket.
4. Holding the card by its edges, position the card so that the card aligns with the expansion card connector.
5. Insert the card firmly into the expansion card connector until the card is fully seated.

Figure 25. Installing the expansion card



Next steps

1. If applicable, connect the cables to the expansion card.
2. [Close the PSU assembly.](#)
3. Install any device drivers required for the card as described in the documentation for the card.
4. Follow the procedure listed in [After working inside your system.](#)

Memory module

System memory guidelines

Your system contains four memory sockets that are organized into two channels. In each channel, the first socket is marked white and the second socket is marked black.

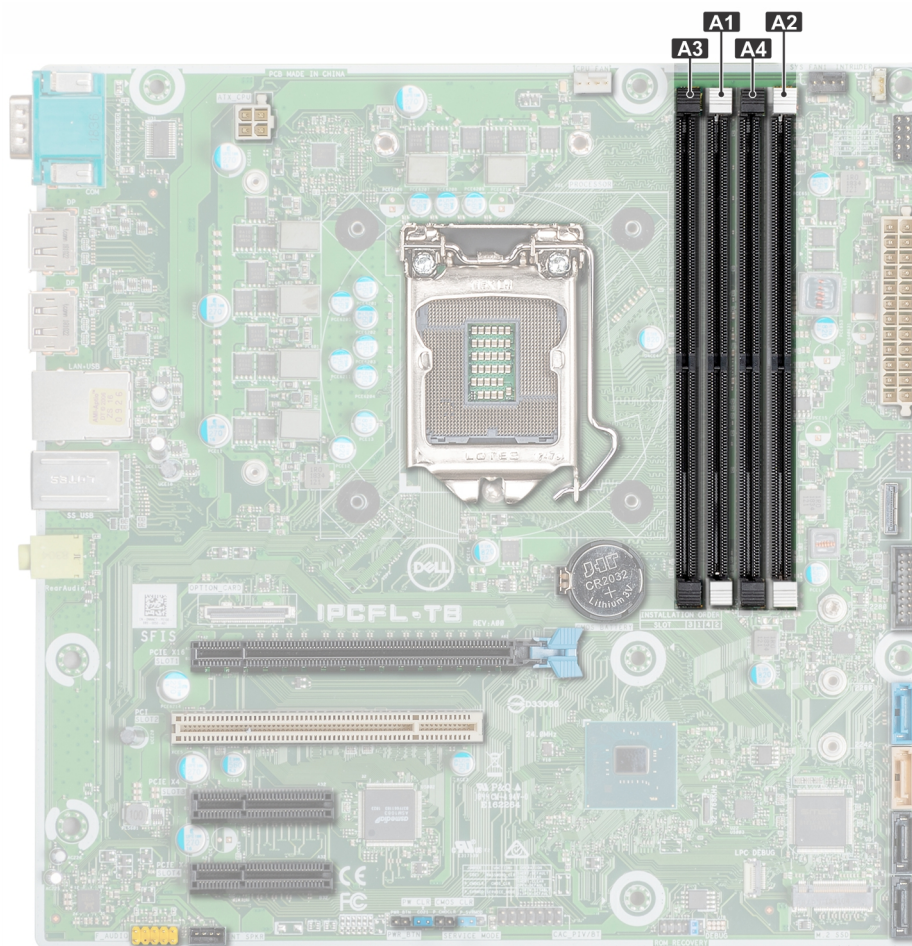


Figure 26. Memory socket locations on the system board

Memory channels are organized as follows:

Table 17. Memory channels

Channel 0	Channel 1
Slot A1 and A3	Slot A2 and A4

General memory module installation guidelines

To ensure optimal performance of your system, observe the following general guidelines when configuring your system memory. If your system's memory configurations fail to observe these guidelines, your system might not boot, stop responding during memory configuration, or operate with reduced memory.

The memory bus may operate at frequency 2400 MT/s, or 2133 MT/s depending on the following factors:

- System profile selected (for example, Performance Optimized, or Custom [can be run at high speed or lower])
- Maximum supported DIMM speed of the processors
- Maximum supported speed of the DIMMs

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

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

- All DIMMs must be DDR4.
- RDIMMs and LRDIMMs must not be mixed.

- 64 GB LRDIMMs that are DDP (Dual Die Package) LRDIMMs must not be mixed with 128 GB LRDIMMs that are TSV (Through Silicon Via/3DS) LRDIMMs.
- x4 and x8 DRAM based memory modules can be mixed.
- Up to two RDIMMs can be populated per channel regardless of rank count.
- Up to two LRDIMMs can be populated per channel regardless of rank count.
- A maximum of two different ranked DIMMs can be populated in a channel regardless of rank count.
- If memory modules with different speeds are installed, they operate at the speed of the slowest installed memory modules.
- Populate memory module sockets only if a processor is installed.
- Populate all the sockets with white release tabs first, followed by the black release tabs.
- When mixing memory modules with different capacities, populate the sockets with memory modules with the highest capacity first.

For example, if you want to mix 8 GB and 16 GB memory modules, populate 16 GB memory modules in the sockets with white release tabs and 8 GB memory modules in the sockets with black release tabs.

- Memory modules of different capacities can be mixed provided other memory population rules are followed.

For example, 8 GB and 16 GB memory modules can be mixed.

- In a dual-processor configuration, the memory configuration for each processor must be identical.

For example, if you populate socket A1 for processor 1, then populate socket B1 for processor 2, and so on.

- Mixing of more than two memory module capacities in a system is not supported.
- Unbalanced memory configurations result in a performance loss so always populate memory channels identically with identical DIMMs for best performance.
- Populate six identical memory modules per processor (one DIMM per channel) at a time to maximize performance.
- To ensure proper system cooling, memory module blanks must be installed in memory sockets that are not occupied.

Removing a memory module

Prerequisites

⚠ WARNING: Allow the memory modules to cool after you power off the system. Handle the memory modules by the card edges and avoid touching the components or metallic contacts on the memory module.

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

1. Follow the safety guidelines listed in [Safety guidelines](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Open the PSU assembly](#).

Steps

1. Locate the appropriate memory module socket.

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

2. Push the ejectors outward on both ends of the memory module socket to release the memory module from the socket.
3. Lift and remove the memory module from the system.

i NOTE: If you are removing the memory module permanently, install a memory module blank. The procedure to install a memory module blank is similar to that of the memory module.

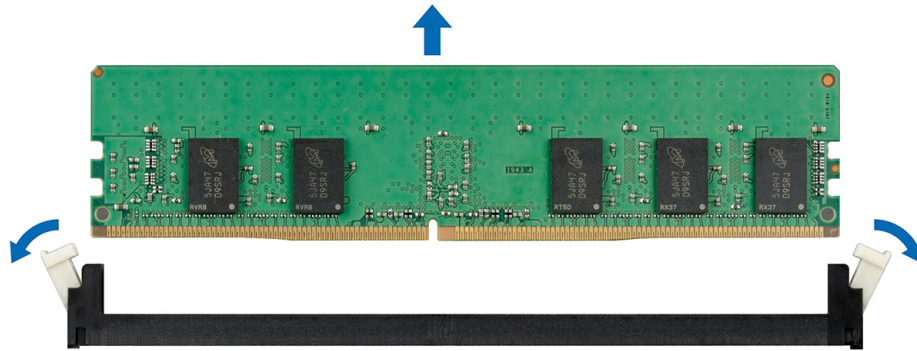


Figure 27. Removing a memory module

Next steps

1. [Replace a memory module.](#)

Installing a memory module

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).

Steps

1. Locate the appropriate memory module socket.

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

CAUTION: To prevent damage to the memory module or the memory module socket during installation, do not bend or flex the memory module; insert both ends of the memory module simultaneously.

2. Open the ejectors on the memory module socket outward to allow the memory module to be inserted into the socket.
3. Align the edge connector of the memory module with the alignment key of the memory module socket, and insert the memory module in the socket.

CAUTION: Do not apply pressure at the center of the memory module; apply pressure at both ends of the memory module evenly.

NOTE: The memory module socket has an alignment key that enables you to install the memory module in the socket in only one orientation.

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

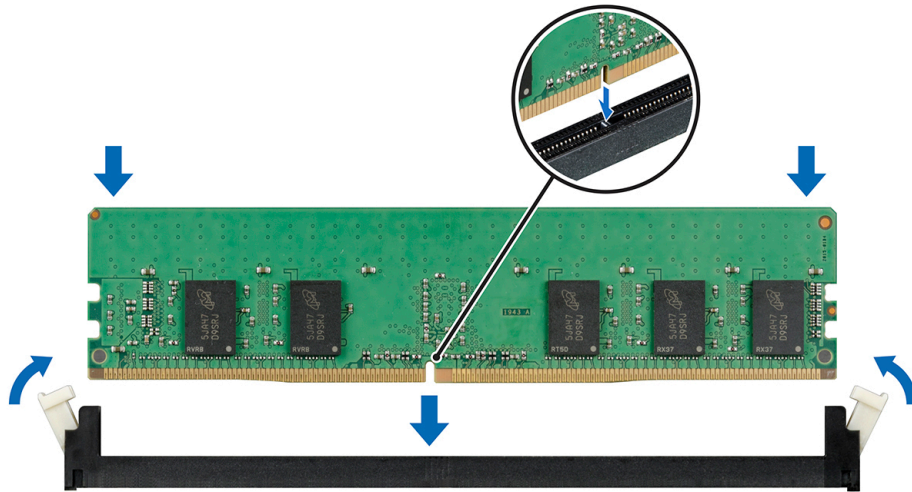


Figure 28. Installing a memory module

Next steps

1. Close the PSU assembly.
2. Follow the procedure listed in [After working inside your system](#).
3. To verify if the memory module has been installed properly, press F2 and navigate to System Setup Main Menu > System BIOS > Memory Settings . In the Memory Settings screen, the System Memory Size must reflect the updated capacity of the installed memory. If the value is incorrect, one or more of the memory modules may not be installed properly. Ensure that the memory modules are firmly seated in the sockets. Run the system memory test in system diagnostics. See [Dell Embedded System Diagnostics](#).

System battery

Replacing the system battery

Prerequisites

⚠ WARNING: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. For more information, see the safety information that shipped with your system.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. If applicable, disconnect the power or data cables from expansion card(s).

Steps

1. Locate the battery socket. For more information, see the [System board jumpers and connectors](#) section.

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

2. Use a plastic scribe to pry out the system battery.

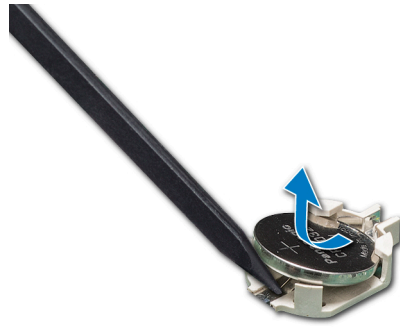


Figure 29. Removing the system battery

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

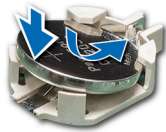


Figure 30. Installing the system battery

Next steps

1. If applicable, connect the cables to the expansion card(s).
2. Follow the procedure listed in [After working inside your system](#).
3. While booting, press F2 to enter the System Setup and ensure that the battery is operating properly.
4. Enter the correct time and date in the System Setup **Time** and **Date** fields.
5. Exit the System Setup.

Optical drive

Removing the optical drive

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Open the PSU assembly](#).

Steps

1. Disconnect the power and data cables from the back of the optical drive.

NOTE: Observe the routing of the power and data cable inside the chassis as you remove them from the system board and the drive. You must route these cables properly when you replace them to prevent them from being pinched or crimped.

2. Pull the optical drive release tab to unlock the optical drive.
3. Slide the optical drive out of the system.

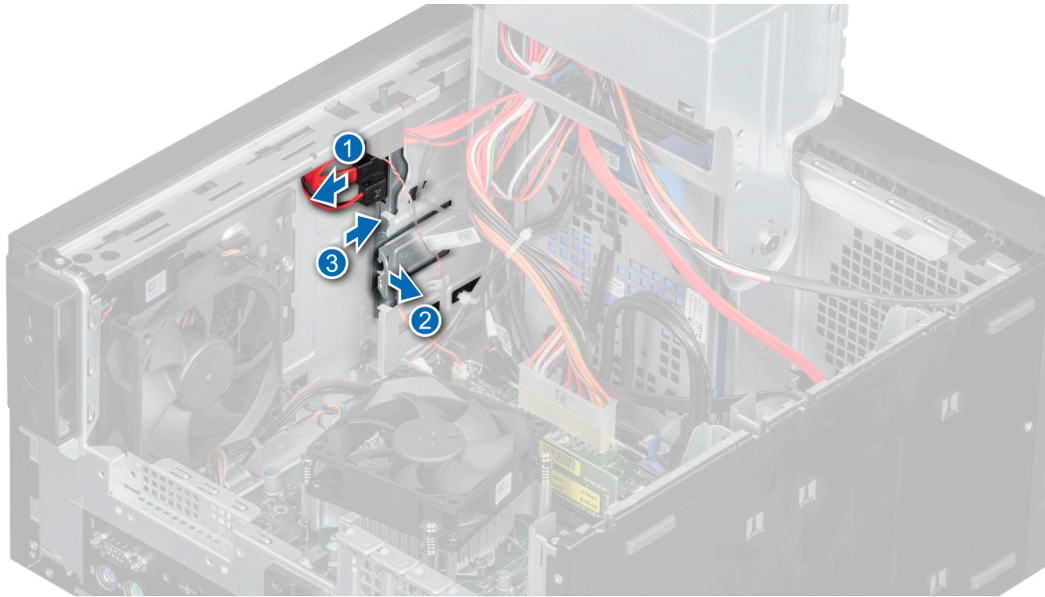


Figure 31. Removing the optical drive

Next steps

1. [Replace the optical drive.](#)

Installing the optical drive

Prerequisites

NOTE: Only slim 9.5-mm SATA DVD-ROM drive or DVD+/-RW drive can be installed in your system. External optical drives can be connected through USB ports.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).
3. [Open the PSU assembly](#).

Steps

1. Align and push the optical drive into the slot until the release tab snaps into place.
2. Connect the power cable and the data cable to the optical drive.

NOTE: Route the cables properly to prevent them from being pinched or crimped.

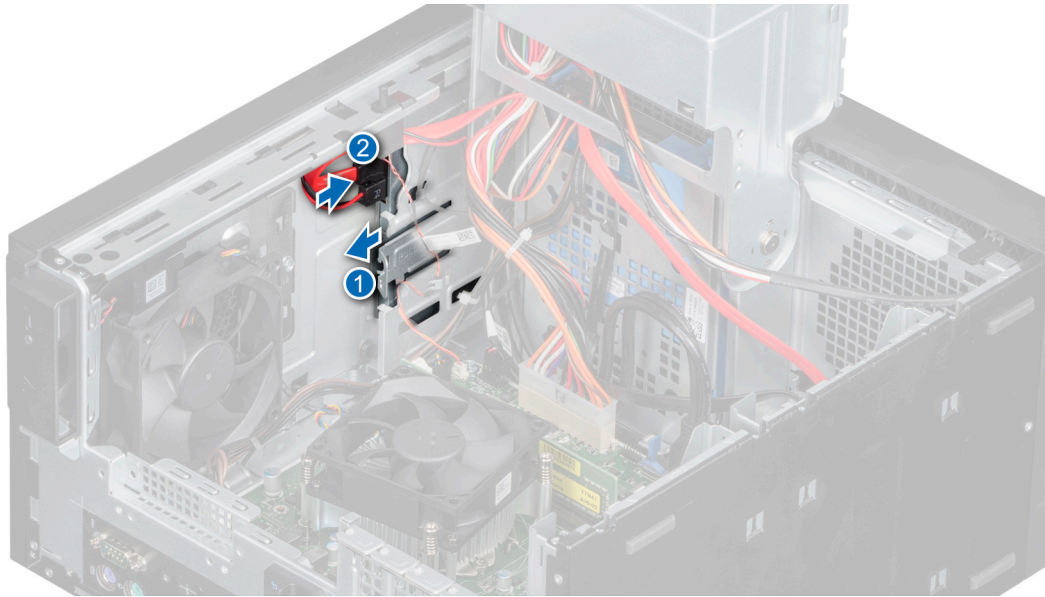


Figure 32. Installing the optical drive

Next steps

1. [Close the PSU assembly.](#)
2. Follow the procedure that is listed in [After working inside your system.](#)

NOTE: SATA ports on the system board are corresponding to SATA devices. Please refer to System Information Label.

NOTE: "SATA 1" is for the first drive. "SATA 2" is for the ODD. "SATA 3" is for the 2nd drive. "SATA 4" is for the 3rd drive.

Speaker

Removing speaker

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your system.](#)
3. [Open the PSU hinge.](#)
4. Disconnect the speaker cable from the connector on the system board.

NOTE: Un-route the cable through the retention clips on the system fan base plate and system board.

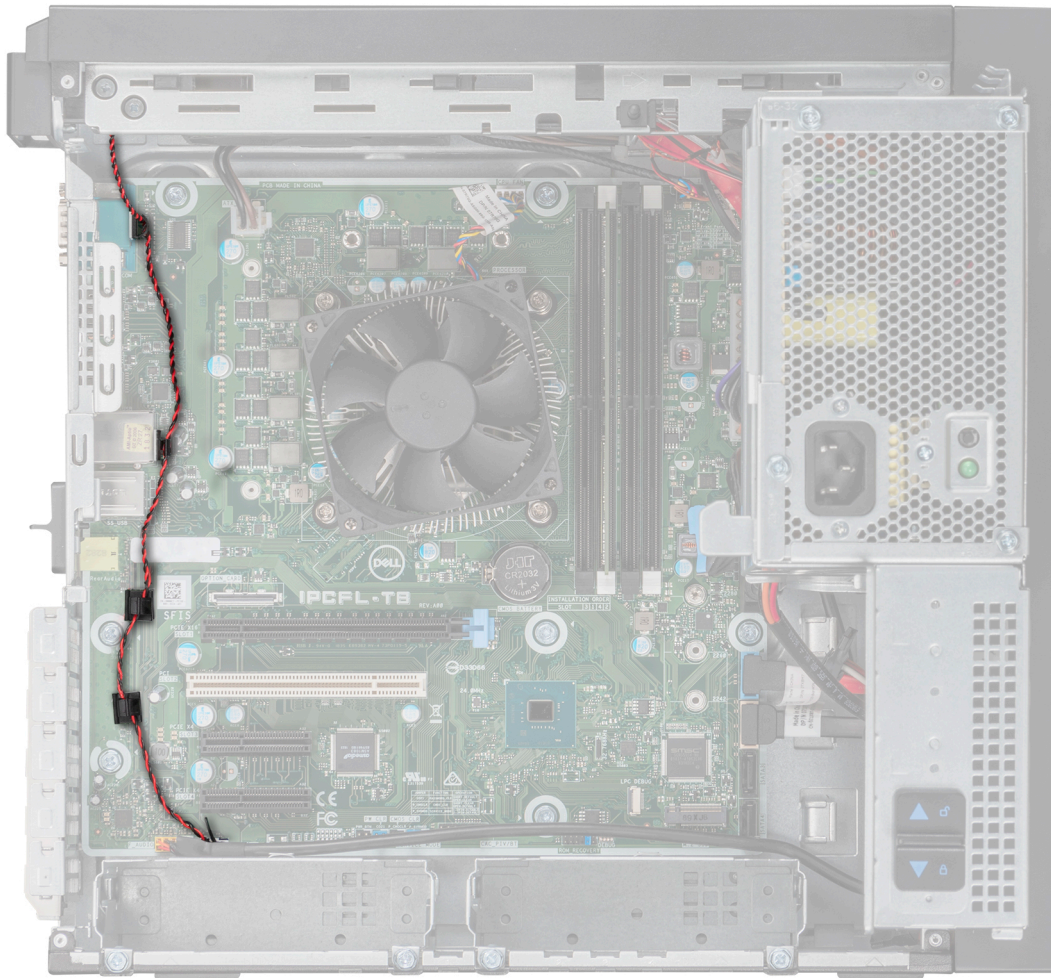


Figure 33. Speaker cable routing

Steps

1. Press the release tab to disengage the speaker.
2. Push the speaker to the front of the chassis and remove the speaker from the system.

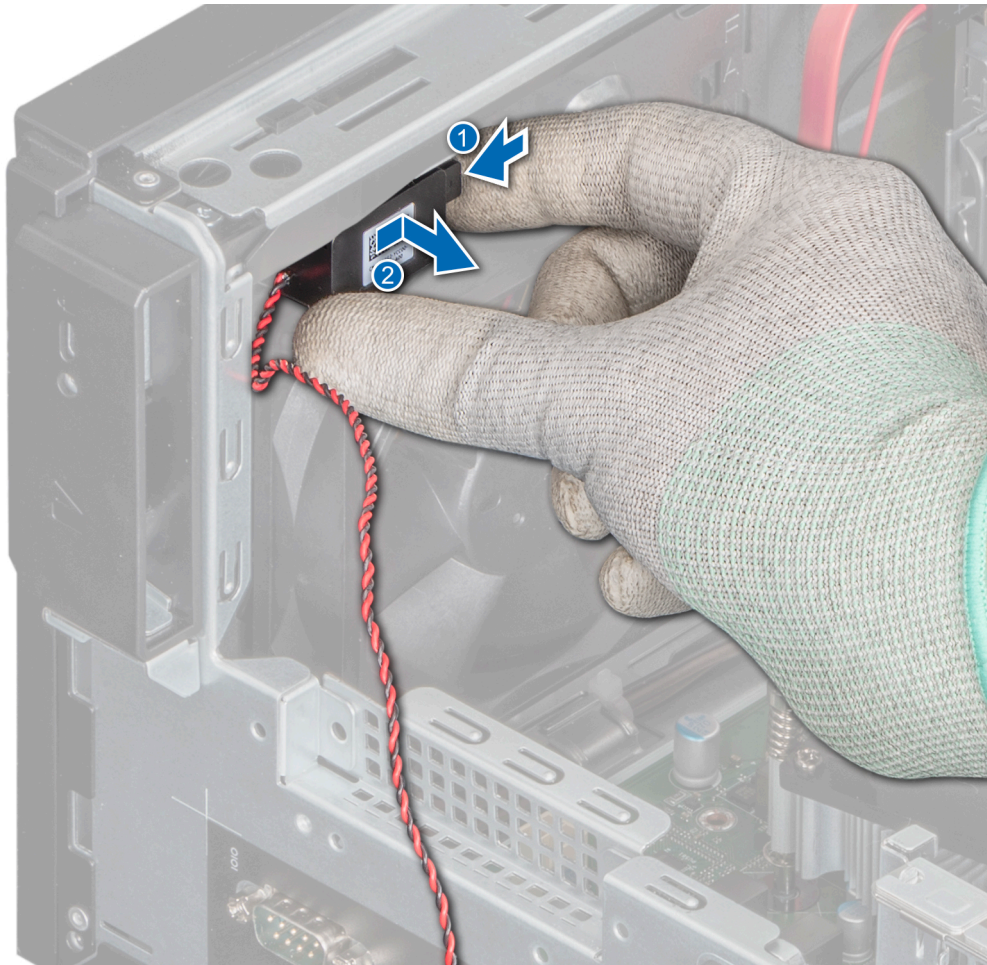


Figure 34. Removing speaker

Next steps

1. [Replace the speaker.](#)

Installing the speaker

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).

Steps

1. Align and insert the speaker in the slot on the fan base plate until it is firmly seated.
2. Connect the speaker cable to the connector on the system board.

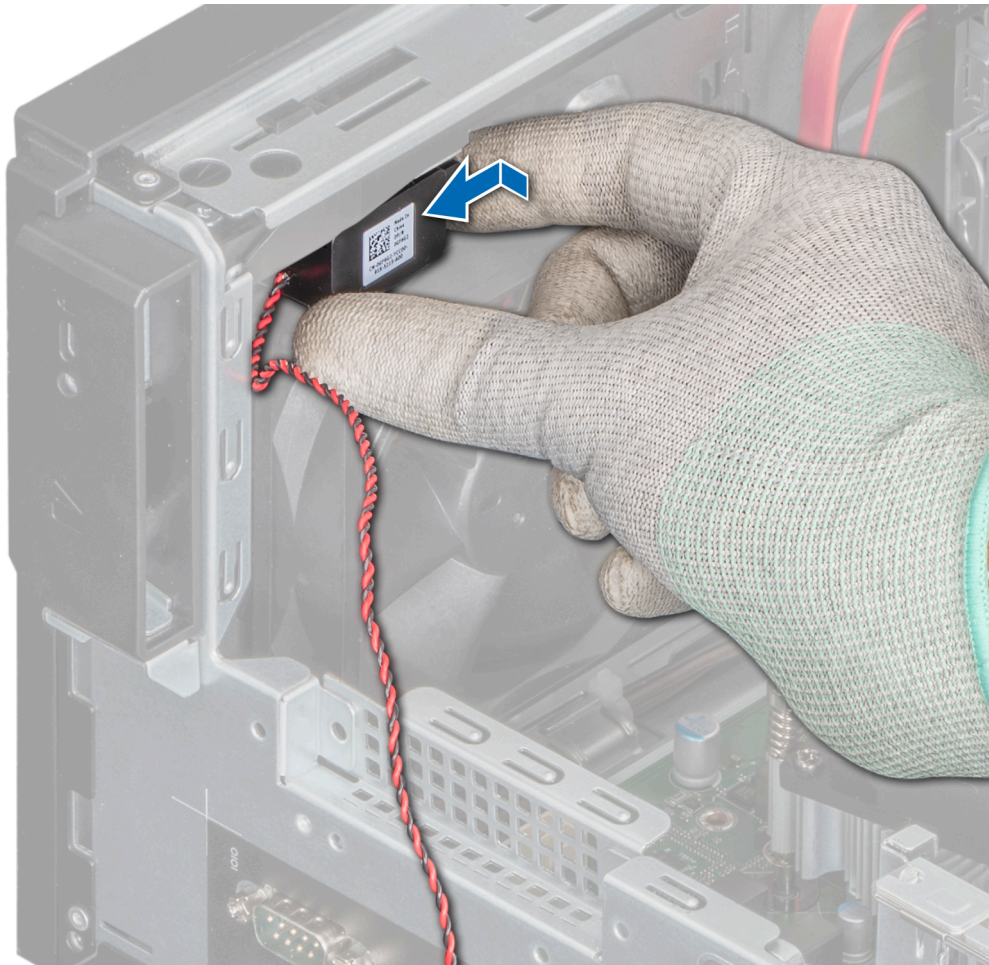


Figure 35. Installing the speaker

NOTE: Route the cable through the retention clips on the system fan base plate and system board.

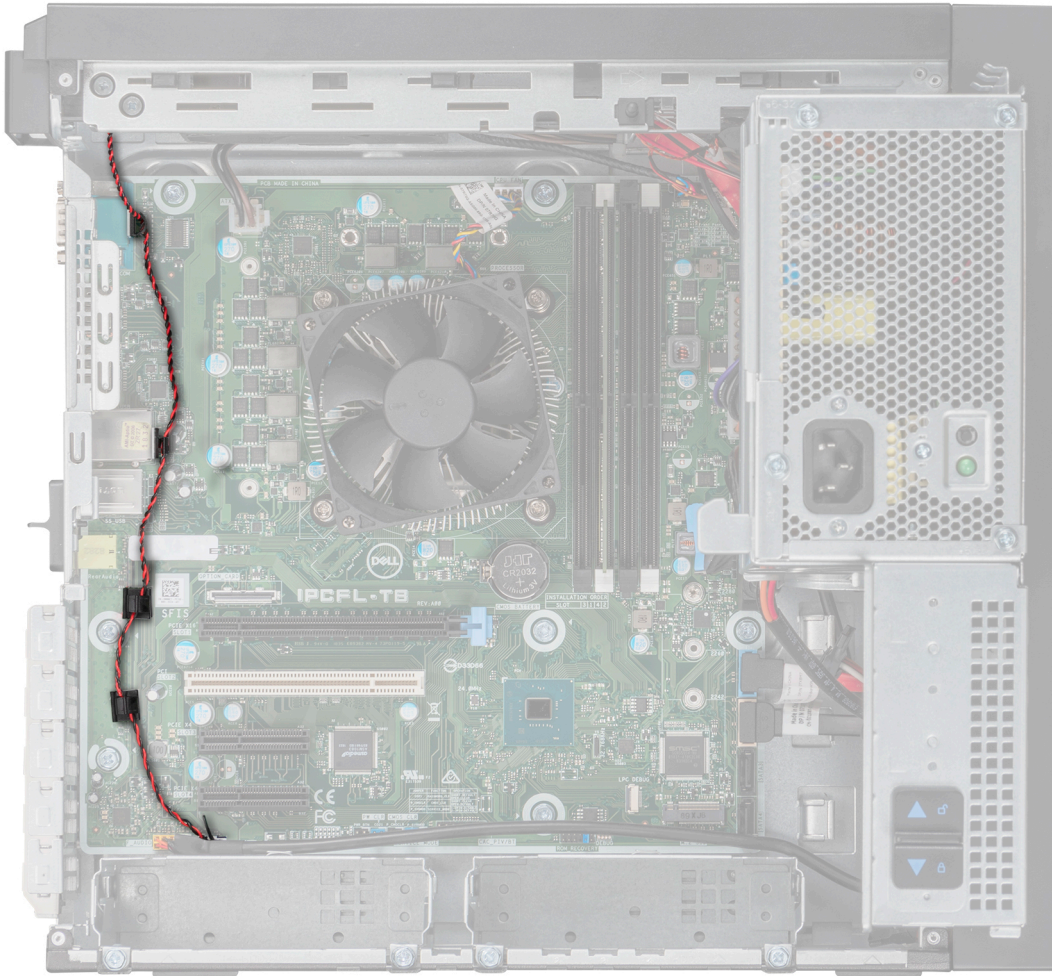


Figure 36. Speaker cable routing

Next steps

1. [Close the PSU hinge.](#)
2. Follow the procedure listed in [After working inside your system.](#)

System fan

Removing system fan

Prerequisites

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

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

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your system.](#)
3. [Open the PSU assembly.](#)
4. [Remove the speaker.](#)
5. Disconnect the fan power cable from the system board connector.

Steps

1. Remove the screw that secures the system fan base plate to the chassis.
2. Slide the system fan base plate towards the front of the chassis to release it from the system.

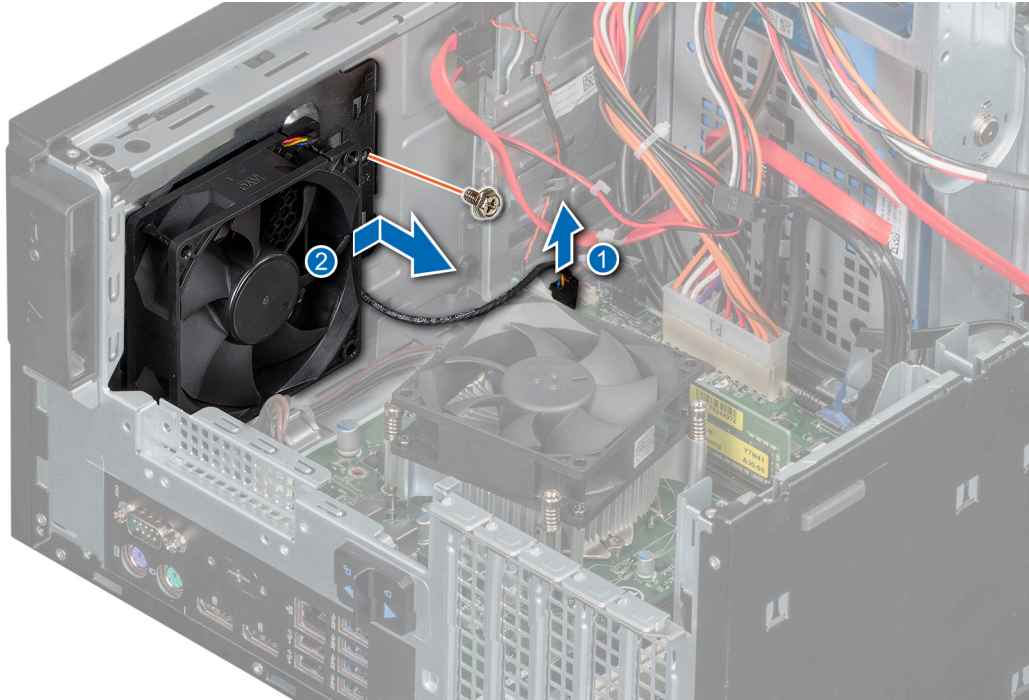


Figure 37. Removing the system fan chassis

3. Unroute the system fan cable from the routing channel on the system fan base plate.
4. Stretch the grommets securing the fan.
5. Pull the fan away from the grommets.
6. Repeat steps 4 and 5 to release the fan from the remaining grommets.



Figure 38. Removing the System fan

Next steps

1. [Replace the system fan.](#)

Installing system fan

Prerequisites

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

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).

Steps

1. Align the grommets on the system fan base plate with the holes on the system fan frame.
2. Stretch the grommets and push the system fan toward the system fan base plate to secure the system fan in place.
3. Route the system fan cable through the routing channel on the system fan base plate.



Figure 39. Installing system fan

4. Align the system fan base plate with the slots on the chassis.
5. Slide the fan base plate into the slot until it is firmly seated.
6. Tighten the screw to secure the system fan base plate to the chassis.
7. Connect the system fan power cable to the connector on the system board.

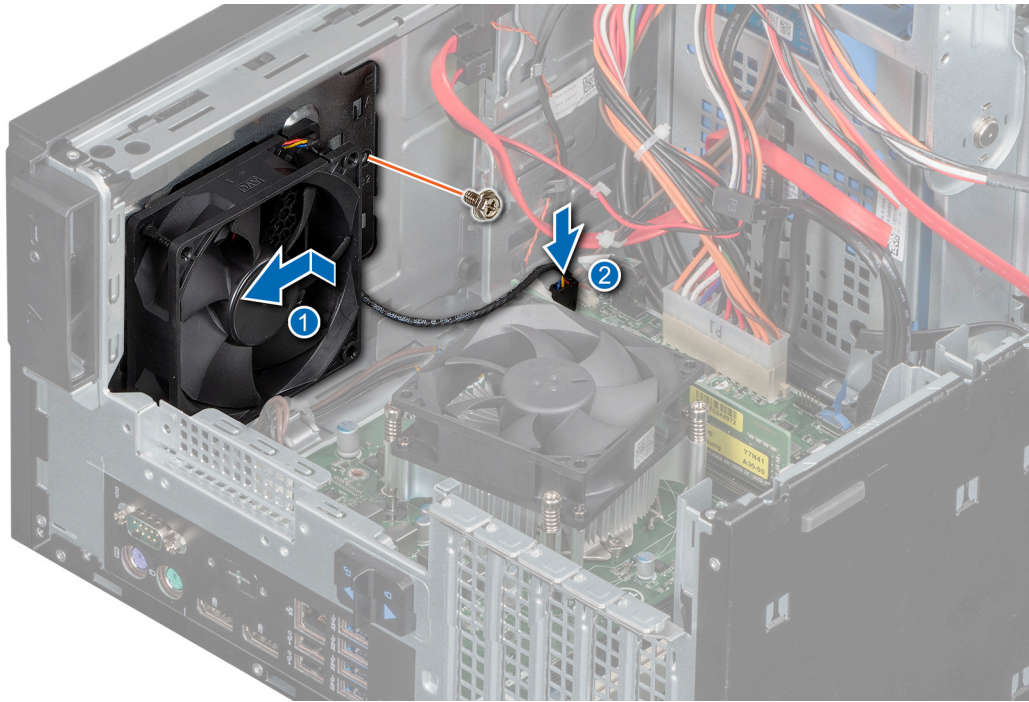


Figure 40. System fan bracket installation

Next steps

1. Install the speaker.
2. Close the PSU assembly.
3. Follow the procedure listed in [After working inside your system](#).

Intrusion switch

Removing intrusion switch

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Open the PSU assembly](#).

Steps

1. Disconnect the intrusion switch cable from the connector on the system board.
2. Slide and push the intrusion switch out of the intrusion switch slot on the system.

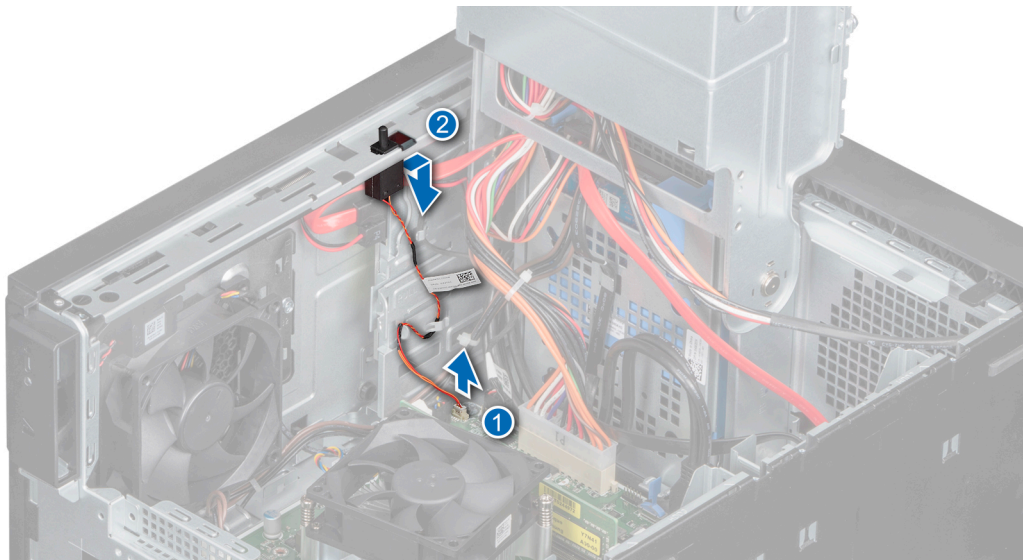


Figure 41. Removing intrusion switch

Next steps

Replace the intrusion switch.

Installing intrusion switch

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).

Steps

1. Align and slide the intrusion switch into the slot in the system.
2. Connect the intrusion switch cable to the connector on the system board.
3. Route the intrusion switch cable through the cable routing clips.

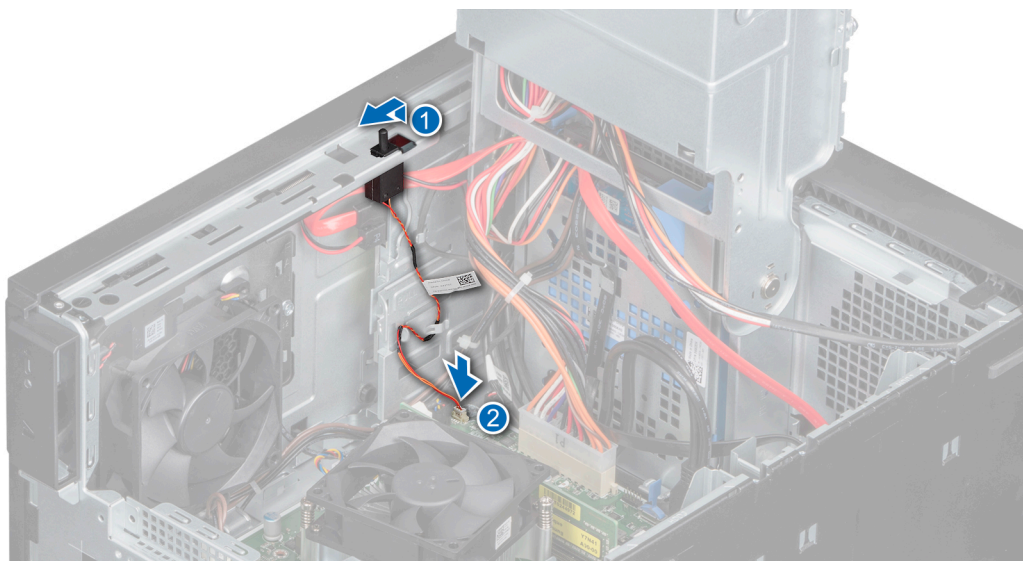


Figure 42. Installing the intrusion switch

Next steps

1. [Close the PSU assembly.](#)
2. Follow the procedure listed in [After working inside your system.](#)

Processor and heatsink

Removing heat sink module

Prerequisites

⚠ WARNING: The heat sink may be hot to touch for some time after the system has been powered off. Allow the heat sink to cool before removing it.

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the safety guidelines listed in [Before working inside your system.](#)
3. [Open the PSU assembly.](#)

Steps

1. Disconnect the heat sink fan power cable connector from the connector on the system board.
2. Using a Phillips #2 screwdriver, loosen the screws on the heat sink in the order mentioned below:
 - a) Loosen the first screw three turns.
 - b) Loosen the screw diagonally opposite to the screw you loosened first.
 - c) Return to the first screw and loosen it completely.
 - d) Repeat the procedure for the remaining two screws.
3. Lift the heat sink from the system.

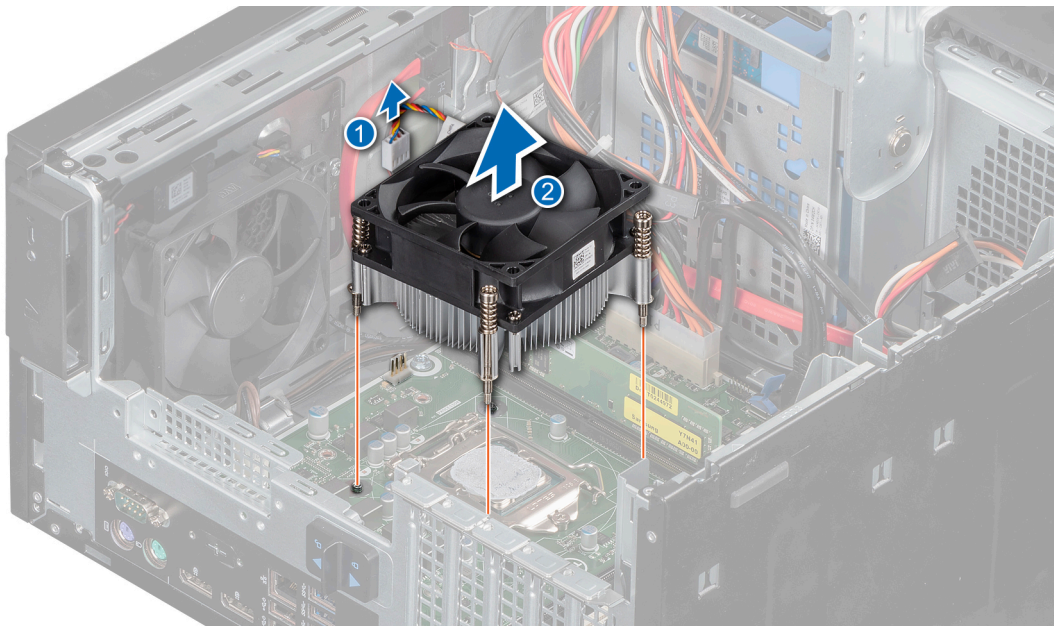


Figure 43. Removing heat sink

Next steps

1. If you are removing a faulty heat sink, [replace the heat sink module](#), if not, [remove the processor](#).

Removing the processor

Prerequisites

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

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

ⓘ NOTE: Only remove the processor if you are replacing the processor or system board. This procedure is not required when replacing a heat sink module.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the safety guidelines listed in [Before working inside your system](#).
3. [Open the PSU assembly](#).
4. [Remove the heat sink module](#).

Steps

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

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

3. Lift the processor out of the socket.

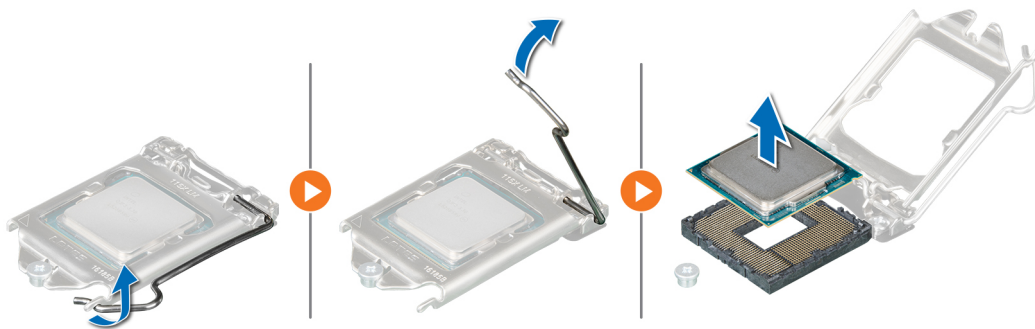


Figure 44. Removing the processor

Next steps

1. [Replace the processor](#).

Installing the processor

Prerequisites

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

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the safety guidelines listed in [Before working inside your system](#).
3. [Remove the heat sink module](#).

Steps

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

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

2. Place the processor in the socket.
3. Close the processor shield by sliding it under the retention screw on the system board.
4. Lower the processor shield lever and push it under the tab to lock the processor shield.

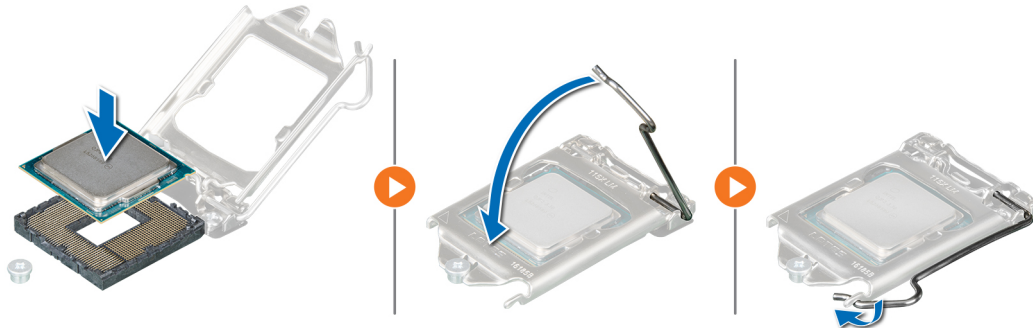


Figure 45. Installing the processor

Next steps

1. [Install the Heat sink module.](#)
2. [Close the PSU assembly.](#)
3. Follow the procedure that is listed in [After working inside your system.](#)

Installing heat sink module

Prerequisites

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

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the safety guidelines listed in [Before working inside your system.](#)
3. If removed, [install the processor.](#)

Steps

1. If you are using an existing heat sink, remove the thermal grease from the heat sink by using a clean lint-free cloth.
2. Use the thermal grease syringe included with your processor kit to apply the grease in a quadrilateral design on the top of the processor.

CAUTION: Applying too much thermal grease can result in excess grease coming in contact with and contaminating the processor socket.

NOTE: The thermal grease syringe is intended for single use only. Dispose the syringe after you use it.

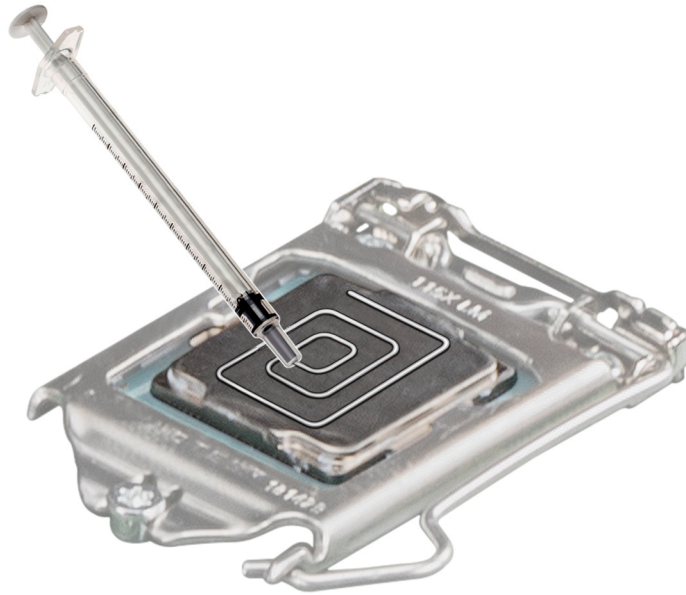


Figure 46. Applying thermal grease on top of the processor

3. Align the screws on the heat sink with the standoffs on the system board.

i **NOTE:** Orient the heat sink fan appropriately so that the heat sink fan cable position is closer to the memory modules.

4. Using the Phillips #2 screwdriver, tighten the screws on the heat sink in the order mentioned below:
 - a) Tighten the first screw three turns.
 - b) Tighten the screw diagonally opposite to the screw you loosened first.
 - c) Return to the first screw and tighten it completely.
 - d) Repeat the procedure for the remaining two screws.
5. Connect the heat sink assembly cable to the connector on the system board.

i **NOTE:** Ensure to loop the heat sink fan cable around the heat sink fan screw head

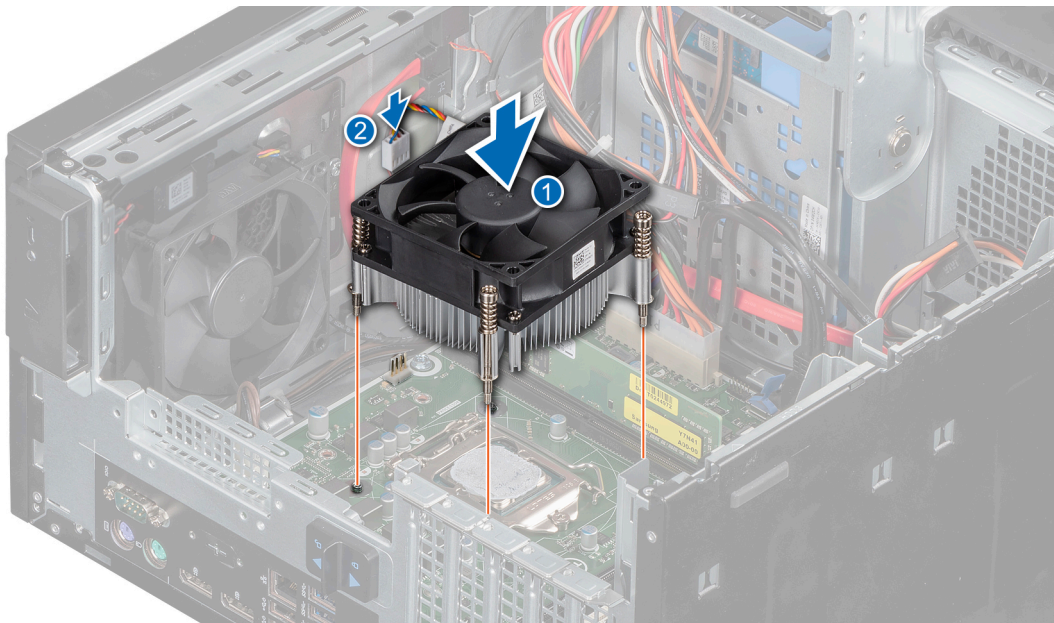


Figure 47. Installing Heat sink

Next steps


1. Close the PSU assembly.


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

System board

Removing the system board

Prerequisites

 **CAUTION:** If you are using the Trusted Program Module (TPM) with an encryption key, you may be prompted to create a recovery key during program or System Setup. Be sure to create and safely store this recovery key. If you replace this system board, you must supply the recovery key when you restart your system or program before you can access the encrypted data on your hard drives.

 **CAUTION:** Do not attempt to remove the TPM plug-in module from the system board. After the TPM plug-in module is installed, it is cryptographically bound to that specific system board. Any attempt to remove an installed TPM plug-in module breaks the cryptographic binding, and it cannot be reinstalled or installed on another system board.

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. [Open the PSU assembly](#).
4. [Remove the memory modules](#).
5. [Remove the expansion card](#) if installed.
6. [Remove the heat sink module](#).
7. [Remove the processor](#).
8. Disconnect all cables from the system board.

Steps

1. Using the Phillips #2 screwdriver remove the screws that secure the system board to the chassis.

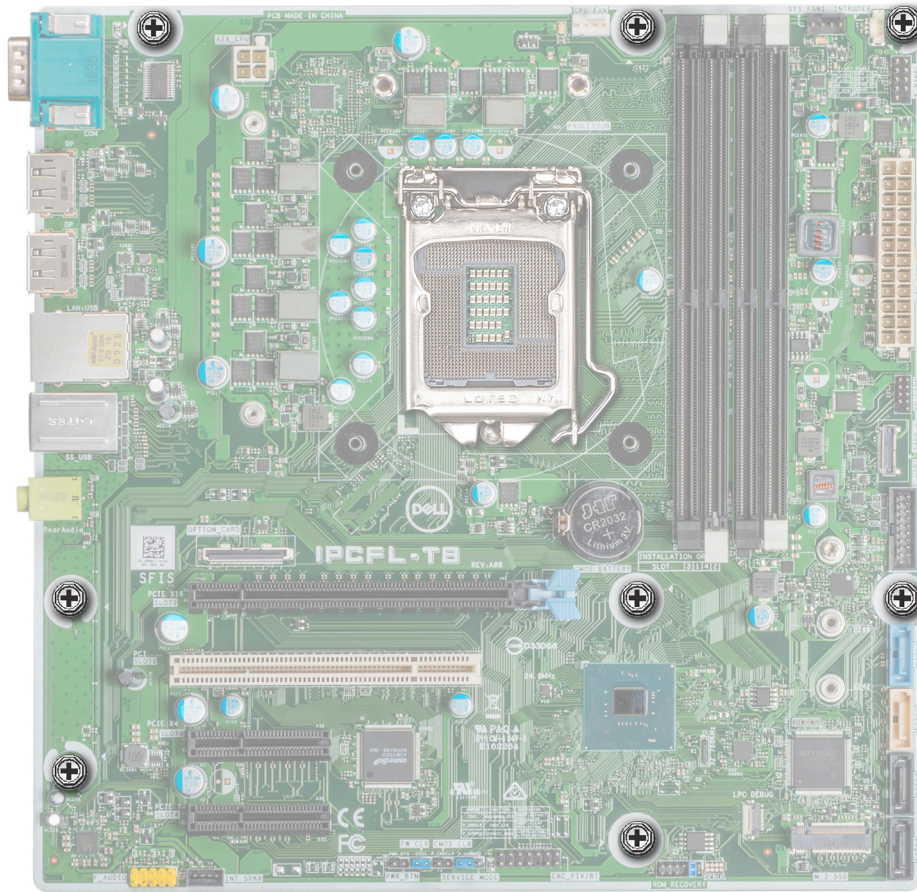


Figure 48. Syetm board screw location

2. Remove the screws securing the serial port.
3. Holding the edges of the system board, incline the system board at an angle and lift the system board out of the chassis.

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

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

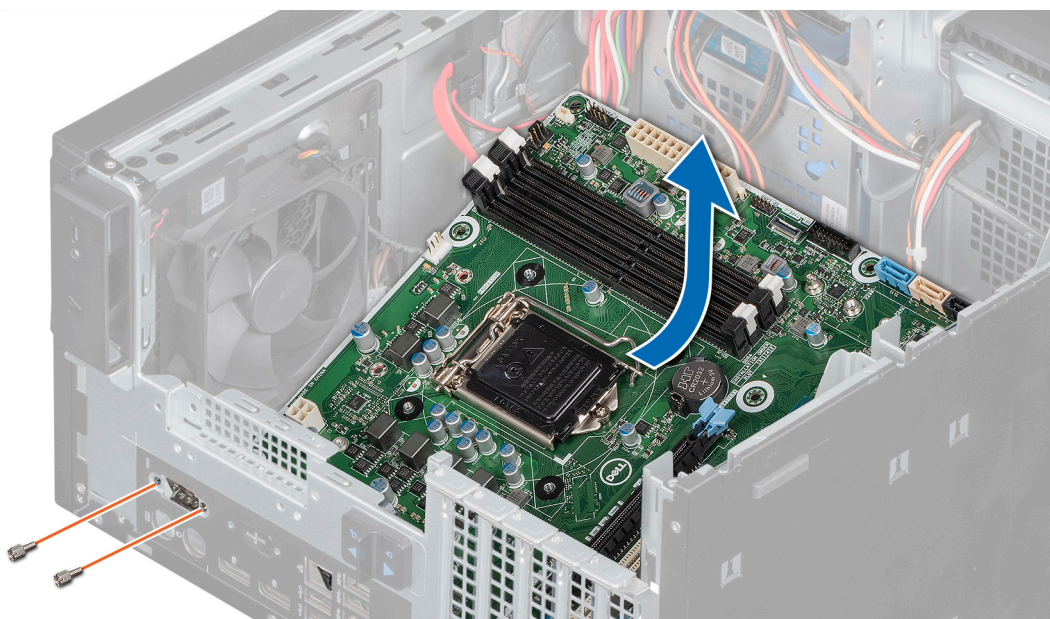


Figure 49. Removing the system board

Next steps

1. [Replace or install the system board.](#)

Installing the system board

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).

Steps

1. Unpack the new system board assembly.

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

i | **NOTE:** Ensure to remove the serial port screws from the replacement system board.

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

2. Holding the system board by its edges, incline the system board at an angle and align the ports on the system board with the slots on the system, and lower the system board into the system.
3. Tighten the screws to secure the serial port.

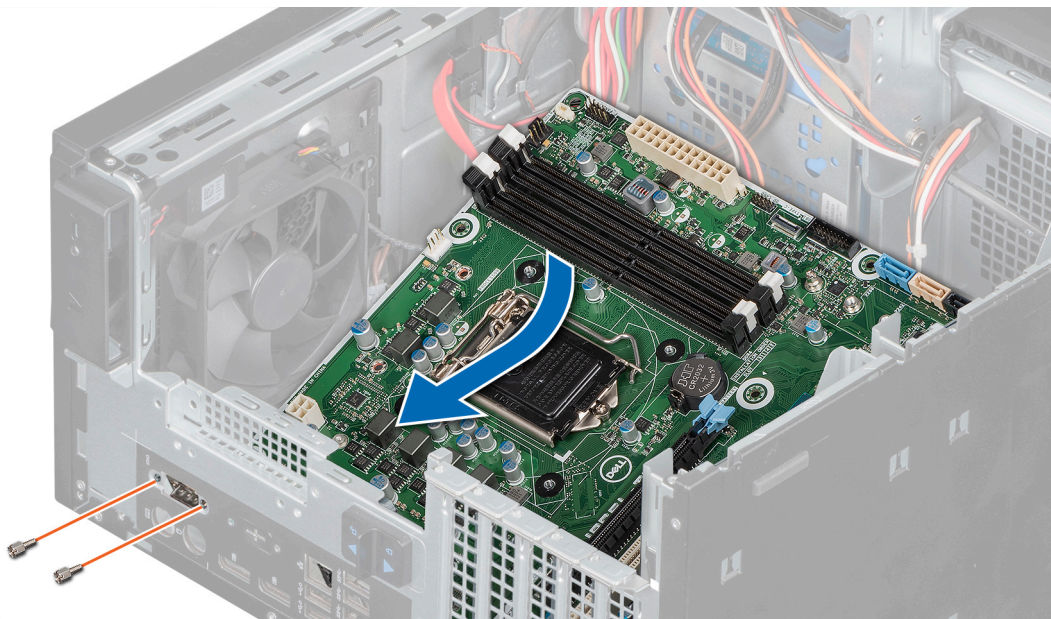


Figure 50. Installing the system board

4. Using the Phillips #2 screwdriver secure the system board to the chassis with screws.

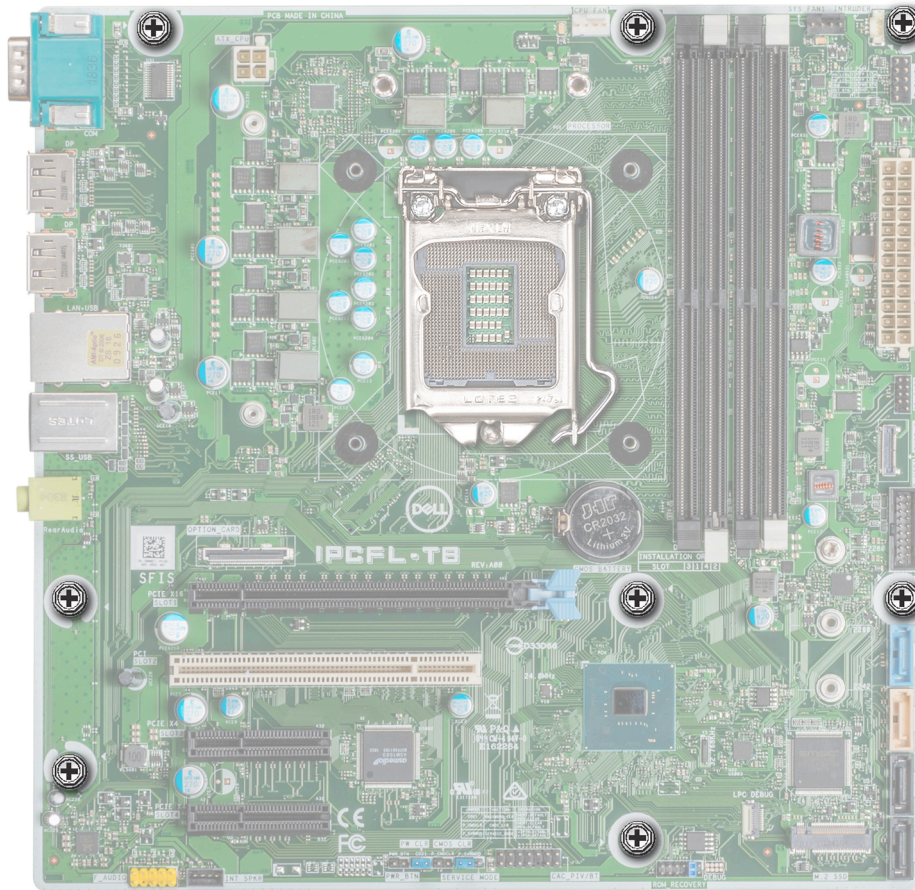


Figure 51. System board screw location

Next steps

1. Replace the following:
 - a. Memory modules.
 - b. Processor.
 - c. Heat sink module.
 - d. Expansion card, if installed
2. Reconnect all cables to the system board.

NOTE: Ensure that the cables inside the system are routed along the chassis wall and secured by using the cable securing bracket.
3. Close the PSU assembly.
4. Follow the procedure listed in [After working inside your system](#).
5. Let the system boot.
6. Ensure that you:
 - a. Update the BIOS firmware.
 - b. Enter the system service tag after you install the system board. For more information see [Entering the service Tag](#).

Entering the System Service Tag by using the Service Menu

Prerequisites

WARNING: Service Menu only appears once after a new system board is replaced. The setting in Service Menu cannot be undone once you apply the changes.

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

NOTE: Intel Pentium/Core processor-based systems support Intel Standard Manageability.

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

Steps

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

NOTE: If the system is powered on, shut the system down and start it up (cold boot).
4. After the system has started up, the **Service Menu** screen is displayed.
5. Select the number in AMT Options box corresponding to the AMT/VPRO number noted earlier from the system cover.

NOTE: MANAGEABILITY ENGINE (ME) DISABLED and MANAGEABILITY ENGINE (ME) LOCKOUT are not supported on the PowerEdge T40.
6. Type the service tag information in the **Enter Service Tag** section.
7. Type the optional asset tag information in the **Enter Asset Tag** section.
8. Click **OK** to save the changes and exit.

Entering the system Service Tag by using System Setup

Steps

1. Turn on the system.
2. Press F2 to enter System Setup.
3. Click **Service Tag Settings**.
4. Enter the Service Tag.

NOTE: You can enter the Service Tag only when the Service Tag field is empty. Ensure that you enter the correct Service Tag. After the Service Tag is entered, it cannot be updated or changed.
5. Click **Ok**.

Control panel

Removing the control panel

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure listed in [Before working inside your system](#).
3. Disconnect all peripherals that are connected to the control panel.
4. [Open the PSU assembly](#).
5. [Remove the front bezel](#).
6. [Remove the optical drive](#).

Steps

1. Disconnect the cables mentioned below from the system board and unroute the cables from routing guides next to the system board on the chassis.
 - a) Control panel audio cable.
 - b) System board power cable.
 - c) USB Type-C cable.

- d) USB Type-A cables.
2. Remove the screw that secures the control panel to the chassis.
3. Tilt the control panel and release the tabs from the slots on the chassis.
4. Gently remove the control panel and cables away from the chassis.



Figure 52. Removal of the control panel

Next steps

1. [Replace the control panel.](#)

Installing the control panel

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).

Steps

1. Insert the cables through the control panel slot on the chassis.
2. Tilt the control panel at an angle and insert it into the control panel slot in the chassis.
3. Using the Phillips #2 screwdriver, tighten the screw to secure the control panel to the chassis.



Figure 53. Installing the control panel

4. Route the cables through the system clip.
5. Connect the cables mentioned below to the system board.
 - a) Control panel audio cable.
 - b) System board power cable.
 - c) USB Type-C cable.
 - d) USB Type_A cables.

Next steps

1. [Install the optical Drive.](#)
2. [Install the front bezel.](#)
3. [Close the PSU assembly.](#)
4. Reconnect the disconnected peripherals from the control panel assembly if any.
5. Follow the procedure listed in [After working inside your system.](#)

Power button module

Removing power button module

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions.](#)
2. Follow the procedure listed in [Before working inside your system.](#)
3. [Open the PSU assembly.](#)
4. [Remove the front bezel.](#)
5. [Remove the optical drive.](#)
6. [Remove the control panel.](#)

Steps

1. Disconnect the power button module cable from the connector on the system board.
2. Remove the power button module cable from the routing guides on the chassis.
3. Remove the adhesive tape that secures the power button module to the chassis.
4. Press the latches on the sides of the power button module and remove it from the chassis.



Figure 54. Removing the power button module

Next steps

1. [Replace the power button module.](#)

Installing power button module

Prerequisites

1. Follow the safety guidelines listed in [Safety instructions](#).
2. Follow the procedure that is listed in [Before working inside your system](#).

Steps

1. Insert the power button module into the power button slot on the chassis.
2. Affix the adhesive tape to secure the power button module to the chassis.



Figure 55. assembly

3. Route the power button module cable through the routing clips on the chassis.
4. Connect the power button module cable to the connector on the system board.

Next steps

1. [Install the control panel.](#)
2. [Install the optical Drive.](#)
3. [Install the front bezel.](#)
4. [Close the PSU hinge.](#)
5. Follow the procedure listed in [After working inside your system.](#)

Jumpers and connectors

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

Topics:

- System board jumpers and connectors
- System board jumper settings
- Disabling forgotten password

System board jumpers and connectors

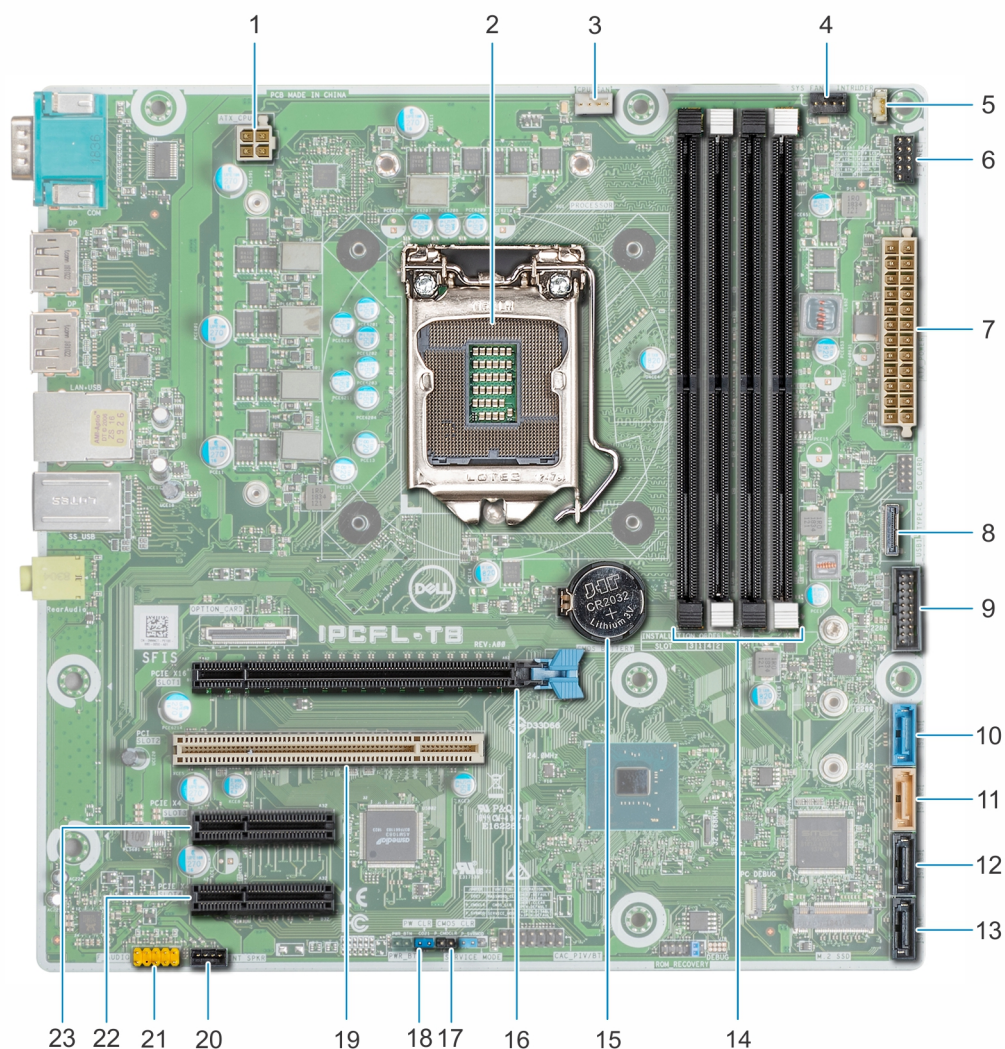


Figure 56. System board jumpers and connectors

Table 18. System board jumpers and connectors

Item	Connector	Description
1	ATX_CPU	Processor power connector
2	PROCESSOR	Processor socket
3	CPU_FAN	Processor fan connector
4	SYS FAN 1	System fan connector
5	INTRUDER	Intrusion switch connector
6	F_PANEL	Power button module connector
7	ATX_POWER	System power connector
8	TYPE-C	Front panel USB Type-C connector
9	F_USB 1	Front panel USB connector
10	SATA 1	SATA connector 1
11	SATA 2	SATA connector 2
12	SATA 3	SATA connector 3
13	SATA 4	SATA connector 4
14	A3, A1, A4, A2	Memory module sockets
15	CMOS BATTERY	CMOS Battery connector
16	PCIe x16 Slot 1	PCIe card connector 1
17	NVRAM_CLR (CMOS_CLR)	BIOS setting recover to default jumper
18	PWRD_EN (PW_CLR)	Reset BIOS password
19	PCI Slot 2	PCI card connector 2
20	INT SPKR	Speaker connector
21	F_AUDIO	Audio connector
22	PCIe x4 Slot 4	PCIe card connector 4
23	PCIe x4 Slot 3	PCIe card connector 3

System board jumper settings

The service system board jumper must be set to `Password` to function normally. As long as the jumper stays at Service Mode, all values set in BIOS will not be saved and the system will not exit the manufacturing mode with an error prompt indicating that jumpers are incorrect.

Table 19. System Board Jumper Settings





Jumper	Setting	Description
PWRD_EN (PW_CLR)		The password feature is enabled.
		Clears BIOS password.
NVRAM_CLR (CMOS_CLR)		Real-time clock reset. Can be used for troubleshooting (pins 1 and 2).
		Recovers BIOS setting to default.


Table 20. System board jumper details

Jumper	Function	Operation
CO21	PASSWORD_CLR	Short: Default Open: Clear
P_CMOCLR	CMOS_CLR	Short: Clear Open: Default
P_SVRMOD	SERVICE_MODE	1-2 Short: Disable 2-3 Short: Default

Disabling forgotten password

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


Prerequisites

 **CAUTION:** Many repairs may only be done by a certified service technician. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

Steps

1. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover.
3. Move the jumper (CO21) on the system board jumper to "CLEAR" position.
4. Install the system cover.

The existing passwords are not disabled (erased) until the system boots with the jumper on "CLEAR" position. However, before you assign a new system and/or setup password, you must move the jumper back to "DEFAULT" position.

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

5. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
6. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
7. Remove the system cover.
8. Move the jumper on the system board jumper back to "DEFAULT" position.
9. Install the system cover.
10. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
11. Assign a new system and/or setup password.

Technical specifications

The technical and environmental specifications of your system are outlined in this section.

Topics:

- [Chassis dimensions](#)
- [System weight](#)
- [Processor specifications](#)
- [Supported operating systems](#)
- [PSU specifications](#)
- [System fan specifications](#)
- [System battery specifications](#)
- [Expansion card specifications](#)
- [Memory specifications](#)
- [Storage controller specifications](#)
- [Drive specifications](#)
- [Ports and connectors specifications](#)
- [Video specifications](#)
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Chassis dimensions

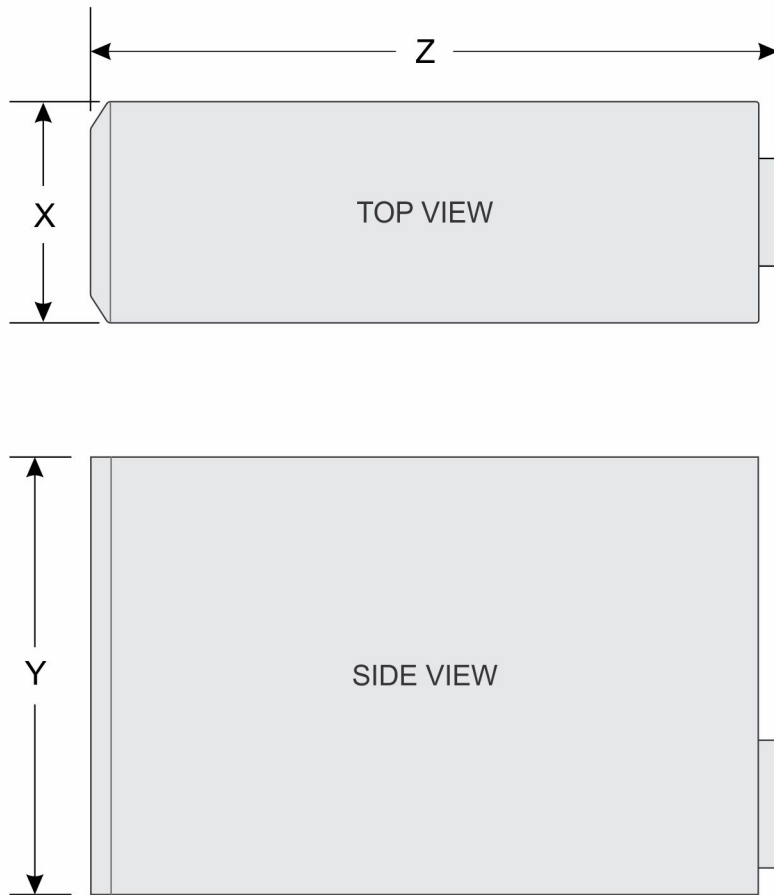


Figure 57. Chassis dimensions

Table 21. PowerEdge T40 chassis dimensions

X	Y	Z
176.6 mm (6.95 inches)	335 mm (13.18 inches)	359.5 mm (14.15 inches)

System weight

Table 22. PowerEdge T40 system weight

System configuration	Maximum weight (with all drives/SSDs)
1x 3.5-inch drive	8.4 Kg (18.52 lb)

Processor specifications

The PowerEdge T40 system supports the following processors:

Table 23. Processor Specifications

Supported processor	Model	UMA Graphics
Intel Xeon E	E series	Intel UHD Graphics P630
Intel Core i3	i3-9100	Intel UHD Graphics 630
Intel Pentium Gold	G5400	Intel UHD Graphics 610

NOTE: Processor availability is subject to change and may vary by region/country.

Supported operating systems

The PowerEdge T40 supports the following operating systems:

- Microsoft Windows Server 2016
- Microsoft Windows Server 2019
- Ubuntu 18.04 LTS

NOTE: For more information, go to www.dell.com/ossupport.

NOTE: For more information about the specific versions and additions, go to <https://www.dell.com/support/home/Drivers/SupportedOS/poweredge-T40>.

PSU specifications

The PowerEdge T40 system supports one cabled AC power supply unit (PSU).

Table 24. PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage	Current
300 W AC	Bronze	1024 BTU/hr	50 – 60 Hz	100 – 240 V AC, autoranging	6A

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

NOTE: The PowerEdge T40 system is also designed to connect to the IT power systems with a phase-to-phase voltage not exceeding 240 V.

System fan specifications

The PowerEdge T40 system supports the following:

- One system cooling fan located at the top of the system.
- One processor cooling fan located on the heat sink.

NOTE: When selecting or upgrading the system configuration, to ensure optimum power utilization, verify the system power consumption with the Dell Energy Smart Solution Advisor available at Dell.com/ESSA.

System battery specifications

The PowerEdge T40 system supports CR 2032 3.0-V lithium coin cell system battery.

Expansion card specifications

The PowerEdge T40 system supports up to three PCI express (PCIe) Generation 3 and once PCI card.

Table 25. Expansion card slots supported on the system board

PCIe slot	Slot Type	Processor Connection	PCIe slot height	Maximum Add-in Card Length
Slot 1	PCIe x16 Gen3	Processor	Full Height	Half length
Slot 2	PCI	Platform Controller Hub	Full Height	Half length
Slot 3	PCIe x4 Gen 3 (open ended)	Platform Controller Hub	Full Height	Half length
Slot 4	PCIe x4 Gen 3 (open ended)	Platform Controller Hub	Full Height	Half length

NOTE: The expansion cards are not hot swappable.

Memory specifications

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

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

Table 26. Memory specifications

DIMM Type	DIMM capacity	Minimum RAM	Maximum RAM
UDIMM, DDR4, ECC/Non-ECC	8 GB	8 GB	32 GB
	16 GB	16 GB	64 GB

Storage controller specifications

The PowerEdge T40 system supports Intel Virtual RAID on CPU (Intel VROC) software RAID.

NOTE: Intel VROC supports RAID modes 0, 1, 5, and 10.

NOTE: The PowerEdge T40 system does not support RAID 10 as RAID 10 is supported only on systems with 4 drives.

Drive specifications

Drives

The PowerEdge T40 system supports the following drive configurations:

Table 27. Drive configurations

Configuration	Capacity
Up to 3 x 3.5-inch drive cabled SATA drives.	1 / 2 / 4 TB

NOTE: The PowerEdge T40 system only supports entry drives.

Entry Drives : Least expensive drives used in applications where low usage and limited total number of drives are applicable. Due to restrictions on use, these drives are available in a small number of systems and configurations.

Optical drives

The PowerEdge T40 system supports the following optical drives.

Table 28. Supported optical drive type

Supported drive type	Supported number of drives
Slim 9.5 mm SATA DVD+/-RW drive	One

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

Ports and connectors specifications

USB ports specifications

The PowerEdge T40 system supports the USB ports mentioned below:

Table 29. PowerEdge T40 system USB specifications

Front Panel	Rear Panel
<ul style="list-style-type: none">Two USB 2.0-compliant Type-A portsOne USB 3.0 Type-A compliant portOne USB 3.1-compliant Type-C port	<ul style="list-style-type: none">Four USB 3.0 Type-A compliant portsTwo USB 2.0 Type-A compliant ports

NIC port specifications

The PowerEdge T40 system supports a Network Interface Controller (NIC) port on the back panel, which is available in 10/100/1000 Mbps NIC configurations.

Serial connector specifications

The PowerEdge T40 system supports one serial connector on the back panel, which is a 9-pin connector, Data Terminal Equipment (DTE), 16550-compliant.

DisplayPort specifications

The PowerEdge T40 system supports two DisplayPorts located on the back panel of the system.

Video specifications

The PowerEdge T40 system supports:

- Intel UHD Graphics P630 for Intel Xeon E processor
- Intel UHD Graphics 630 for Intel Core i3 processor
- Intel UHD Graphics 610 for Intel Pentium Gold processor

Environmental specifications

NOTE: For additional information about environmental certifications, refer to the *Product Environmental Datasheet* located with the Manuals & Documents on www.dell.com/support/home.

Table 30. Temperature specifications

Temperature	Specifications
Storage	-40–65°C (-40–149°F)
Continuous operation (for altitude less than 900 m or 2953 ft)	10–35°C (50–95°F) with no direct sunlight on the equipment
Fresh air	T40 do not support Fresh air (Expanded operating temperature)
Maximum temperature gradient (operating and storage)	20°C/h (36°F/h)

Table 31. Relative humidity specifications

Relative humidity	Specifications
Storage	5% to 95% RH with 27°C (80.6°F) maximum dew point. Atmosphere must be noncondensing at all times.
Operating	20% to 80% RH with 21°C (69.8 °F) maximum dew point.

Table 32. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.26 G _{rms} at 5 Hz to 350 Hz (all operation orientations)
Storage	1.88 G _{rms} at 10 Hz to 500 Hz for 15 minutes (all six sides tested)

Table 33. Maximum shock pulse specifications

Maximum shock pulse	Specifications
Operating	Six consecutively executed shock pulses in the positive and negative x, y, and z axis of 6G for up to 11 ms.
Storage	Six consecutively executed shock pulses in the positive and negative x, y, and z axis (one pulse on each side of the system) of 71 G for up to 2 ms.

Table 34. Maximum altitude specifications

Maximum altitude	Specifications
Operating	3048 m (10,000 ft)
Storage	12,000 m (39,370 ft)


Table 35. Operating temperature derating specifications

Operating temperature derating	Specifications
Up to 35°C (95°F)	Maximum temperature is reduced by 1°C/300 m (1°F/547 ft), above 900 m (2,953 ft).

Thermal restriction matrix

Table 36. Thermal restrictions matrix

Ambient	25°C	30°C	35°C
Processor	No restriction	No restriction	No restriction
DIMM	No restriction	No restriction	No restriction
Drive	Limited to entry drives with power less than 6.8W Or No restriction to 1 / 2 TB 7200 rpm and 4 TB 5400 rpm		

Ambient	25°C	30°C	35°C
	 NOTE: The PowerEdge T40 does not support enterprise-class drives.		
Card	Limited to Tier 2 PCIe cards Or PCIe cards do not require system level cooling assistance up to a local ambient temperature of 55°C		

Particulate and gaseous contamination specifications

Table 37. Particulate contamination specifications






Particulate contamination	Specifications
Air filtration	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit.
	 NOTE: This condition applies only to data center environments. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor.
	 NOTE: Air entering the data center must have MERV11 or MERV13 filtration.
Conductive dust	Air must be free of conductive dust, zinc whiskers, or other conductive particles.
	 NOTE: This condition applies to data center and non-data center environments.
Corrosive dust	Air must be free of corrosive dust.
Residual dust present in the air	must have a deliquescent point less than 60% relative humidity.
	 NOTE: This condition applies to data center and non-data center environments.

Table 38. Gaseous contamination specifications

Gaseous contamination	Specifications
Copper coupon corrosion rate	<300 Å/month per Class G1 as defined by ANSI/ISA71.04-2013
Silver coupon corrosion rate	<200 Å/month per Class G1 as defined by ANSI/ISA71.04-2013
	 NOTE: Maximum corrosive contaminant levels measured at ≤50% relative humidity.

System diagnostics and indicator codes

The diagnostic indicators on the system front panel display system status during system startup.



Topics:

- [Front panel indicator codes](#)
- [NIC indicator codes](#)
- [Power supply unit Built-in Self Test](#)
- [Enhanced Pre-Boot System Assessment — ePSA diagnostics](#)
- [Diagnostics](#)
- [Diagnostic error messages](#)
- [System error messages](#)

Front panel indicator codes

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

Table 39. Front panel indicator codes

Icon	Description	Condition	Corrective action
	Drive indicator	The indicator flashes white if drives are being accessed.	Not applicable.
	Power-on indicator	The indicator displays solid and flashing amber if there is a component failure.	This is due to component failure in the system. For more information, see the Diagnostics section. If the problem persists, see the appropriate Troubleshooting section or the Getting help section.

NIC indicator codes

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

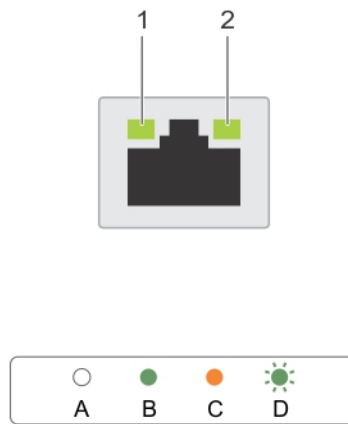


Figure 58. NIC indicators

- 1. link indicator
- 2. activity indicator

Table 40. NIC indicators

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

Power supply unit Built-in Self Test

PowerEdge T40 supports a power supply unit Built-in Self Test (BIST).

Steps

1. Turn off your server.
2. Disconnect the power cord from the power supply unit, and wait for 15 seconds.
3. After 15 seconds, connect the power cord back to the PSU
4. Press the PSU BIST button.
 - If the LED turns on and remains on while the BIST button is pressed, it indicates that the power supply unit is functional. Continue with troubleshooting steps for other devices.
 - If the LED does not turn on, it indicates PSU failure.

Steps to confirm that power supply unit is defective

Perform the steps to identify a faulty power supply unit

Steps

1. Disconnect the power cord from the power supply unit.

 **CAUTION:** Ensure that you take adequate safety precautions before accessing the components on your server.

2. Disconnect the internal PSU cables from the motherboard and each internal device.
3. Connect the power cord to the PSU
4. Press the PSU BIST button.
 - If the LED turns on and remains on while the BIST button is pressed, it indicates that the power-supply unit is functional. Continue with troubleshooting steps for other devices.
 - If the LED does not turn on, it indicates a power-supply unit failure. Replace the power supply unit.

Enhanced Pre-Boot System Assessment — ePSA diagnostics

About this task

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:

The ePSA diagnostics can be initiated on one-time boot menu by pressing F12 while powering on the computer.

- 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.

 **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.

Running the ePSA Diagnostics

About this task

Invoke diagnostics boot by either of the methods that are suggested below:

Steps

1. Power on the system.
2. As the system boots, press the F12 key when the Dell logo is displayed.
3. In the boot menu screen, use Up/Down arrow key to select the **Diagnostics** option and then press **Enter**.

 **NOTE:** The Enhanced Pre-boot System Assessment window displays, listing all devices detected in the system. The diagnostics starts running the tests on all the detected devices.

4. Press the arrow in the lower-right corner to go to the page listing. The detected items are listed and tested.
5. To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
6. Select the device from the left pane and click **Run Tests**.
7. If there are any issues, error codes are displayed. Note the error code and contact Dell.

Diagnostics

Power status light: Indicates the power status.

Solid Amber – The system is unable to boot to the operating system. This indicates that the power supply or another device in the system is failing.

Blinking Amber – The system is unable to boot to the operating system. This indicates that the power supply is normal but another device in the system is failing or not installed properly.

i | **NOTE: To determine the device that is failing, see the light patterns .**

Off – System is in hibernation or turned off.

The power status light blinks amber along with beep codes indicating failures.

For example, the power status light blinks amber two times followed by a pause, and then blinks five times followed by a pause. This 2,5 pattern continues until the computer is turned off indicating the Recovery image is not found.

The following table shows different light patterns and what they indicate:

Table 41. Diagnostic LED codes and Beep Codes

LED # of Flashes / Beep codes	Problem description	Faults
2,1	Faulty system board	Faulty system board
2,2	Faulty system board, power supply unit (PSU), or cabling	Faulty system board, power supply unit (PSU), or cabling
2,3	Faulty system board, CPU, or DIMMS	Faulty system board, power supply unit (PSU), or DIMMS
2,4	Faulty coin cell battery	Faulty coin cell battery
2,5	BIOS Recovery	AutoRecovery trigger, recovery image is not found or is invalid
2,6	CPU	CPU Error
2,7	Memory	Memory SPD failure
3,3	Memory	No memory detected
3,5	Memory	Modules incompatible or invalid configuration
3,6	BIOS Recovery	On-demand trigger, recovery image is not found
3,7	BIOS Recovery	On-demand trigger, recovery image is invalid

The system may emit a series of beeps during start-up if the errors or problems cannot be displayed. The repetitive beep codes help the user troubleshoot problems with the system.

Diagnostic error messages

Table 42. Diagnostic error messages

Error messages	Description
AUXILIARY DEVICE FAILURE	The touchpad or external mouse may be faulty. For an external mouse, check the cable connection. Enable the Pointing Device option in the System Setup program.
BAD COMMAND OR FILE NAME	Ensure that you have spelled the command correctly, put spaces in the proper place, and used the correct path name.
CACHE DISABLED DUE TO FAILURE	The primary cache internal to the microprocessor has failed. Contact Dell
CD DRIVE CONTROLLER FAILURE	The optical drive does not respond to commands from the computer.
DATA ERROR	The hard drive cannot read the data.
DECREASING AVAILABLE MEMORY	One or more memory modules may be faulty or improperly seated. Reinstall the memory modules or, if necessary, replace them.
DISK C: FAILED INITIALIZATION	The hard drive failed initialization. Run the hard drive tests in Dell Diagnostics .

Error messages	Description
DRIVE NOT READY	The operation requires a hard drive in the bay before it can continue. Install a hard drive in the hard drive bay.
ERROR READING PCMCIA CARD	The computer cannot identify the ExpressCard. Reinsert the card or try another card.
EXTENDED MEMORY SIZE HAS CHANGED	The amount of memory recorded in non-volatile memory (NVRAM) does not match the memory module installed in the computer. Restart the computer. If the error appears again, Contact Dell
THE FILE BEING COPIED IS TOO LARGE FOR THE DESTINATION DRIVE	The file that you are trying to copy is too large to fit on the disk, or the disk is full. Try copying the file to a different disk or use a larger capacity disk.
A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ / : * ? " < > -	Do not use these characters in filenames.
GATE A20 FAILURE	A memory module may be loose. Reinstall the memory module or, if necessary, replace it.
GENERAL FAILURE	The operating system is unable to carry out the command. The message is usually followed by specific information. For example, Printer out of paper. Take the appropriate action.
HARD-DISK DRIVE CONFIGURATION ERROR	The computer cannot identify the drive type. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE CONTROLLER FAILURE 0	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE FAILURE	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE READ FAILURE	The hard drive may be defective. Shut down the computer, remove the hard drive, and boot the computer from an optical. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
INSERT BOOTABLE MEDIA	The operating system is trying to boot to non-bootable media, such as an optical drive. Insert bootable media.
INVALID CONFIGURATION INFORMATION-PLEASE RUN SYSTEM SETUP PROGRAM	The system configuration information does not match the hardware configuration. The message is most likely to occur after a memory module is installed. Correct the appropriate options in the system setup program.
KEYBOARD CLOCK LINE FAILURE	For external keyboards, check the cable connection. Run the Keyboard Controller test in Dell Diagnostics .
KEYBOARD CONTROLLER FAILURE	For external keyboards, check the cable connection. Restart the computer, and avoid touching the keyboard or the mouse during the boot routine. Run the Keyboard Controller test in Dell Diagnostics .

Error messages	Description
KEYBOARD DATA LINE FAILURE	For external keyboards, check the cable connection. Run the Keyboard Controller test in Dell Diagnostics .
KEYBOARD STUCK KEY FAILURE	For external keyboards or keypads, check the cable connection. Restart the computer, and avoid touching the keyboard or keys during the boot routine. Run the Stuck Key test in Dell Diagnostics .
LICENSED CONTENT IS NOT ACCESSIBLE IN MEDIADIRECT	Dell MediaDirect cannot verify the Digital Rights Management (DRM) restrictions on the file, so the file cannot be played.
MEMORY ADDRESS LINE FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY ALLOCATION ERROR	The software you are attempting to run is conflicting with the operating system, another program, or a utility. Shut down the computer, wait for 30 seconds, and then restart it. Run the program again. If the error message still appears, see the software documentation.
MEMORY DOUBLE WORD LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY ODD/EVEN LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY WRITE/READ FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
NO BOOT DEVICE AVAILABLE	The computer cannot find the hard drive. If the hard drive is your boot device, ensure that the drive is installed, properly seated, and partitioned as a boot device.
NO BOOT SECTOR ON HARD DRIVE	The operating system may be corrupted, Contact Dell .
NO TIMER TICK INTERRUPT	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics .
NOT ENOUGH MEMORY OR RESOURCES. EXIT SOME PROGRAMS AND TRY AGAIN	You have too many programs open. Close all windows and open the program that you want to use.
OPERATING SYSTEM NOT FOUND	Reinstall the operating system. If the problem persists, Contact Dell .
OPTIONAL ROM BAD CHECKSUM	The optional ROM has failed. Contact Dell .
SECTOR NOT FOUND	The operating system cannot locate a sector on the hard drive. You may have a defective sector or corrupted File Allocation Table (FAT) on the hard drive. Run the Windows error-checking utility to check the file structure on the hard drive. See Windows Help and Support for instructions (click Start > Help and Support). If a large number of sectors are defective, back up the data (if possible), and then format the hard drive.
SEEK ERROR	The operating system cannot find a specific track on the hard drive.
SHUTDOWN FAILURE	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics . If the message reappears, Contact Dell .
TIME-OF-DAY CLOCK LOST POWER	System configuration settings are corrupted. Connect your computer to an electrical outlet to charge the battery. If the problem persists, try to restore the data by entering the System Setup program, then immediately exit the program. If the message reappears, Contact Dell .
TIME-OF-DAY CLOCK STOPPED	The reserve battery that supports the system configuration settings may require recharging. Connect your computer to an

Error messages	Description
	electrical outlet to charge the battery. If the problem persists, Contact Dell.
TIME-OF-DAY NOT SET-PLEASE RUN THE SYSTEM SETUP PROGRAM	The time or date stored in the system setup program does not match the system clock. Correct the settings for the Date and Time options.
TIMER CHIP COUNTER 2 FAILED	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics.
UNEXPECTED INTERRUPT IN PROTECTED MODE	The keyboard controller may be malfunctioning, or a memory module may be loose. Run the System Memory tests and the Keyboard Controller test in Dell Diagnostics or Contact Dell.
X:\ IS NOT ACCESSIBLE. THE DEVICE IS NOT READY	Insert a disk into the drive and try again.

System error messages

Table 43. System error messages

System message	Description
Alert! Previous attempts at booting this system have failed at checkpoint [nnnn]. For help in resolving this problem, please note this checkpoint and contact Dell Technical Support	The computer failed to complete the boot routine three consecutive times for the same error.
CMOS checksum error	RTC is reset, BIOS Setup default has been loaded.
CPU fan failure	CPU fan has failed.
System fan failure	System fan has failed.
Hard-disk drive failure	Possible hard disk drive failure during POST.
Keyboard failure	Keyboard failure or loose cable. If reseating the cable does not solve the problem, replace the keyboard.
No boot device available	No bootable partition on hard disk drive, the hard disk drive cable is loose, or no bootable device exists. <ul style="list-style-type: none"> If the hard drive is your boot device, ensure that the cables are connected and that the drive is installed properly and partitioned as a boot device. Enter system setup and ensure that the boot sequence information is correct.
No timer tick interrupt	A chip on the system board might be malfunctioning or motherboard failure.
NOTICE - Hard Drive SELF MONITORING SYSTEM has reported that a parameter has exceeded its normal operating range. Dell recommends that you back up your data regularly. A parameter out of range may or may not indicate a potential hard drive problem	S.M.A.R.T error, possible hard disk drive failure.

Getting help

Topics:

- [Recycling or End-of-Life service information](#)
- [Uploading files to Dell Technical Support](#)
- [Contacting Dell](#)
- [Accessing system information by using QRL](#)

Recycling or End-of-Life service information

Take back and recycling services are offered for this product in certain countries. If you want to dispose of system components, visit www.dell.com/recyclingworldwide and select the relevant country.

Uploading files to Dell Technical Support

If you want to send system reports or other files to **Dell Technical Support**, you can use the [file upload](#) page available on **Dell TechDirect**.

The uploaded files are bound to the Service Tag you provide during the process. There is no prior registration needed for usage.

NOTE: Uploading a file will not automatically open a Service Request!

NOTE: As a registered Dell TechDirect user you have the ability to attach documents as part of Technical Support or Self-Dispatch service requests created in the portal.

For more information on how to manually upload files to Dell Technical Support, see [manual upload help page](#).

Contacting Dell

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

Steps

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

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) located on the information tag in the front of the T40, to access the information about the PowerEdge T40.

Prerequisites

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

The QRL includes the following information about your system:

- How-to videos
- Reference materials, including the Installation and Service Manual, and mechanical overview
- Your system service tag to quickly access your specific hardware configuration and warranty information
- A direct link to Dell to contact technical assistance and sales teams

Steps

1. Go to www.dell.com/qrl and navigate to your specific product or
2. Use your smartphone or tablet to scan the model-specific Quick Resource (QR) code on your system or in the Quick Resource Locator section.

Quick Resource Locator for PowerEdge T40 system



Figure 59. Quick Resource Locator for PowerEdge T40 system

Documentation resources

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

To view the document that is listed in the documentation resources table:

- From the Dell EMC support site:
 1. Click the documentation link that is provided in the Location column in the table.
 2. Click the required product or product version.
 3. On the Product Support page, click **Manuals & documents**.
- Using search engines:
 - Type the name and version of the document in the search box.

NOTE: To locate the product name and model, see the front of your system.

Table 44. Additional documentation resources for your system

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