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College : K.L. Society's S Nijalingappa College, Rajajinagar
Bangalore
Department : Bachelor of Computer Application Department
Class : 1st Year 2nd Semester
Name of the Lab : Computer Assembly

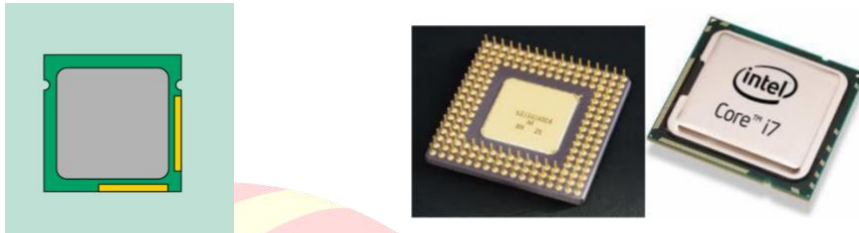


Lab -1 Demonstration of Hardware Peripherals: CPU, RAM, SMPS, Motherboard, NIC card, Processor, Processor cooling fan, PCI card, HDD

Aim: To identify the computer hardware parts.

Requirements: CPU, RAM, SMPS, Motherboard, NIC card, Processor, Processor cooling fan, PCI card, HDD

CPU/processor

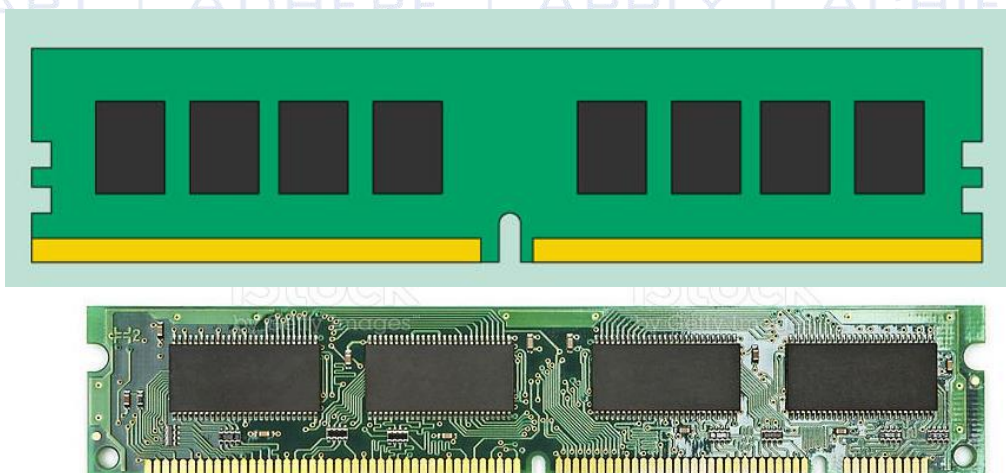


The central processing unit (CPU), also called a **processor**, is located inside the **computer case** on the motherboard. It is sometimes called the brain of the computer, and its job is to carry out commands. Whenever you press a key, click the mouse, or start an application, you're sending instructions to the CPU.

The CPU is usually a **two-inch ceramic square** with a **silicon chip** located inside. The chip is usually about the size of a thumbnail. The CPU fits into the motherboard's **CPU socket**, which is covered by the **heat sink**, an object that absorbs heat from the CPU.

A processor's **speed** is measured in **megahertz (MHz)**, or millions of instructions per second; and **gigahertz (GHz)**, or billions of instructions per second. A faster processor can execute instructions more quickly. However, the actual speed of the computer depends on the speed of many different components—not just the processor.

RAM (random access memory)

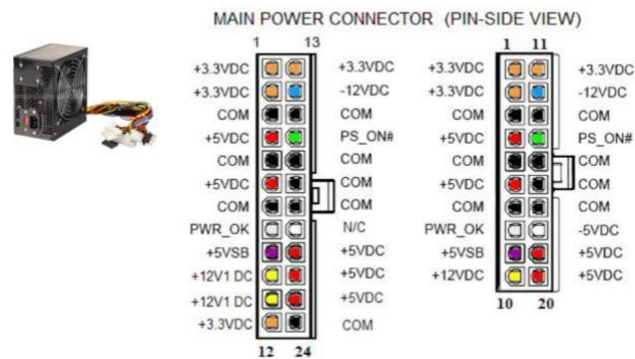
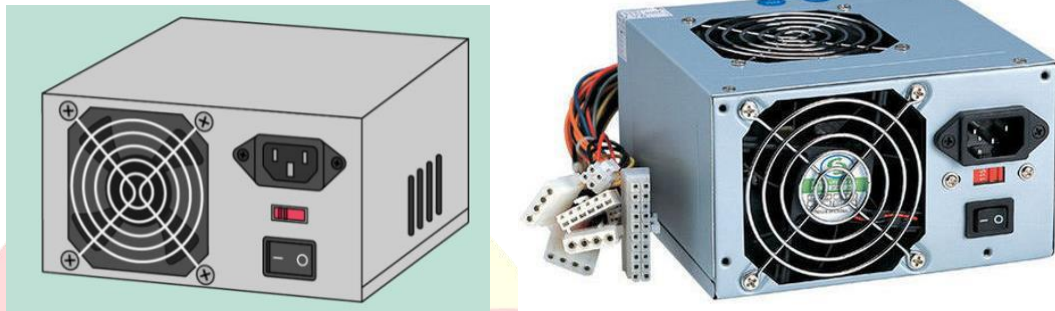


RAM is your system's **short-term memory**. Whenever your computer performs calculations, it temporarily stores the data in the RAM until it is needed.

This **short-term memory disappears** when the computer is turned off. If you're working on a document, spreadsheet, or other type of file, you'll need to **save** it to avoid losing it. When you save a file, the data is written to the **hard drive**, which acts as **long-term storage**.

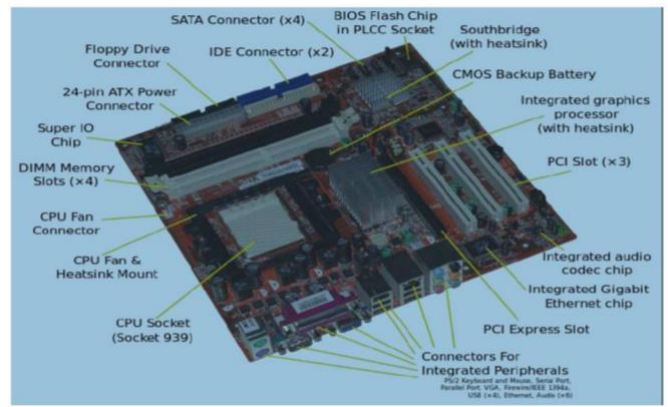
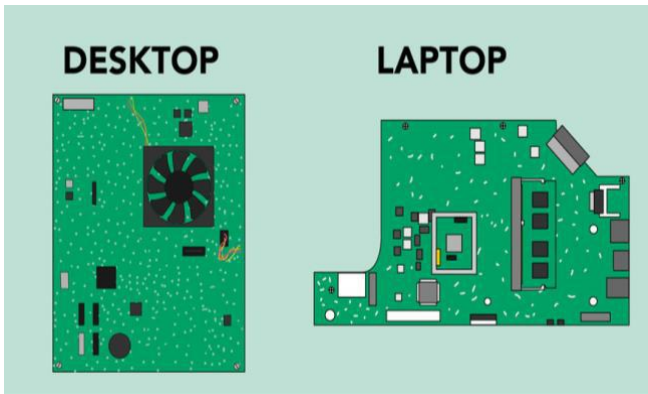
RAM is measured in **megabytes (MB) or gigabytes (GB)**. The **more RAM** you have, the more things your computer can do at the same time. If you don't have enough RAM, you may notice that your computer is sluggish when you have several programs open. Because of this, many people add **extra RAM** to their computers to improve performance.

Power supply unit



The power supply unit in a computer **converts the power** from the wall outlet to the type of power needed by the computer. It sends power through cables to the motherboard and other components.

Motherboard

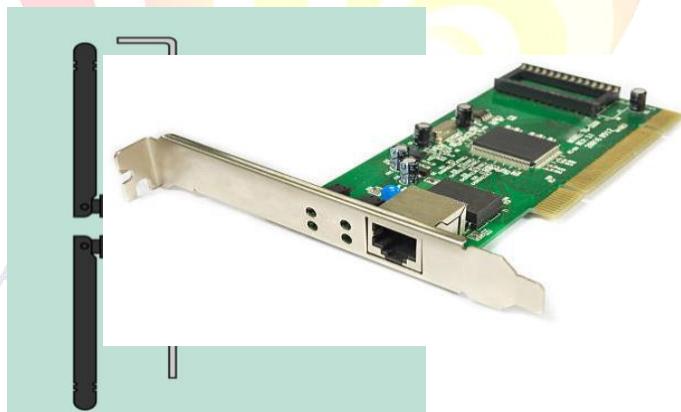


connections to your computer's ports (such as USB ports). The motherboard connects directly or indirectly to every part of the computer.

Expansion cards

Most computers have **expansion slots** on the motherboard that allow you to add various types of **expansion cards**. These are sometimes called **PCI (peripheral component interconnect) cards**. You may never need to add any PCI cards because most motherboards have built-in video, sound, network, and other capabilities.

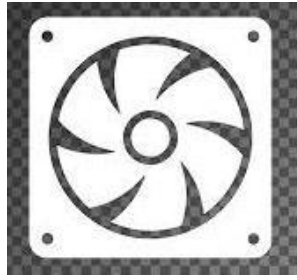
However, if you want to boost the performance of your computer or update the capabilities of an older computer, you can always add one or more cards. Below are some of the most common types of expansion cards.



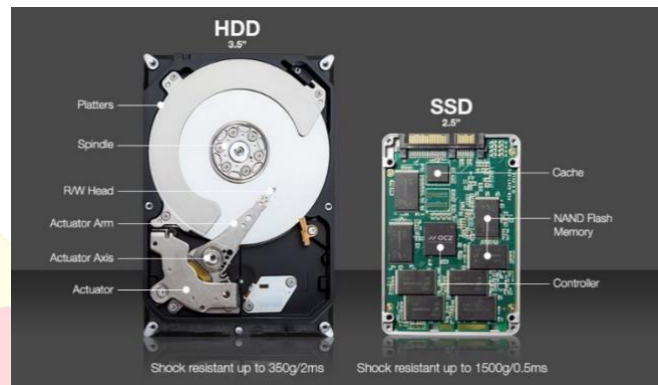
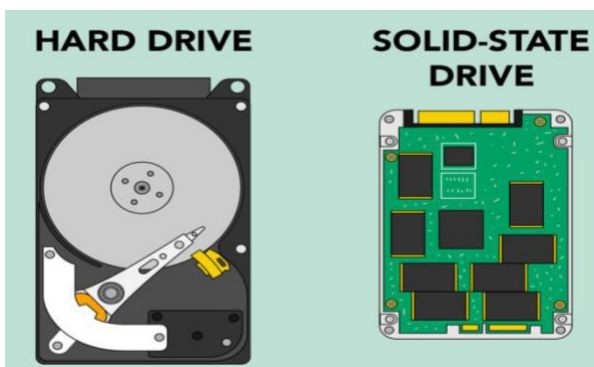
The **network card** allows your computer to communicate over a network and access the Internet. It can either connect with an **Ethernet** cable or through a **wireless** connection (often called **Wi-Fi**). Many motherboards have built-in network connections, and a network card can also be added to an expansion slot.

PROCESSOR FAN

A fan on top of a computer processor. It helps pull and blow hot air off the processor, helping keep it cooler.



Hard drive



The **hard drive** is where your software, documents, and other files are stored. The hard drive is **long-term storage**, which means the data is still saved even if you turn the computer off or unplug it.

When you run a program or open a file, the computer copies some of the data from the **hard drive** onto the **RAM**. When you **save** a file, the data is copied back to the **hard drive**. The faster the hard drive, the faster your computer can **start up** and **load programs**.

Topic	SSD	HDD
Speed	35 to 100 microsecond access speed, nearly 100 times faster than HDD.	Takes about 5000 to 10,000 microseconds to access data.
Reliability	SSD has no moving parts, so it can keep your data safe when your laptop bag drops or your system gets shaken while it's operating.	The HDD has moving parts and magnetic platters, so they are prone to get wear and tear with more usage.
Noise	Since SSD comes with no moving parts, it won't make much noise when working.	With spinning platters and moving heads, the HDD will produce noises when functioning.
Heat	No moving parts and using the flash memory, the SSD generates less heat, helping increase the lifespan and durability.	With inside moving parts, more heat will be added and damage the electronics gradually. Higher heat will cause more potential damage.
Power	SSD uses less power, so you can enjoy lower energy bill over time and an increased battery life of a laptop.	HDD costs more power than an SSD, because all the HDD parts are required to spin the platters.
Size	Available in 2.5", 1.8", and 1.0", helping save lots of precious space in computers, especially desktops.	Usually, HDD has only 3.5" and 2.5" size for desktops and laptops respectively, no smaller ones.

Lab- 2 Demonstration of various ports: CPU, VGA ports, PS/2 (Keyboard, Mouse), USB, LAN, Speaker, Audio.

Aim: To identify the computer hardware parts various ports.

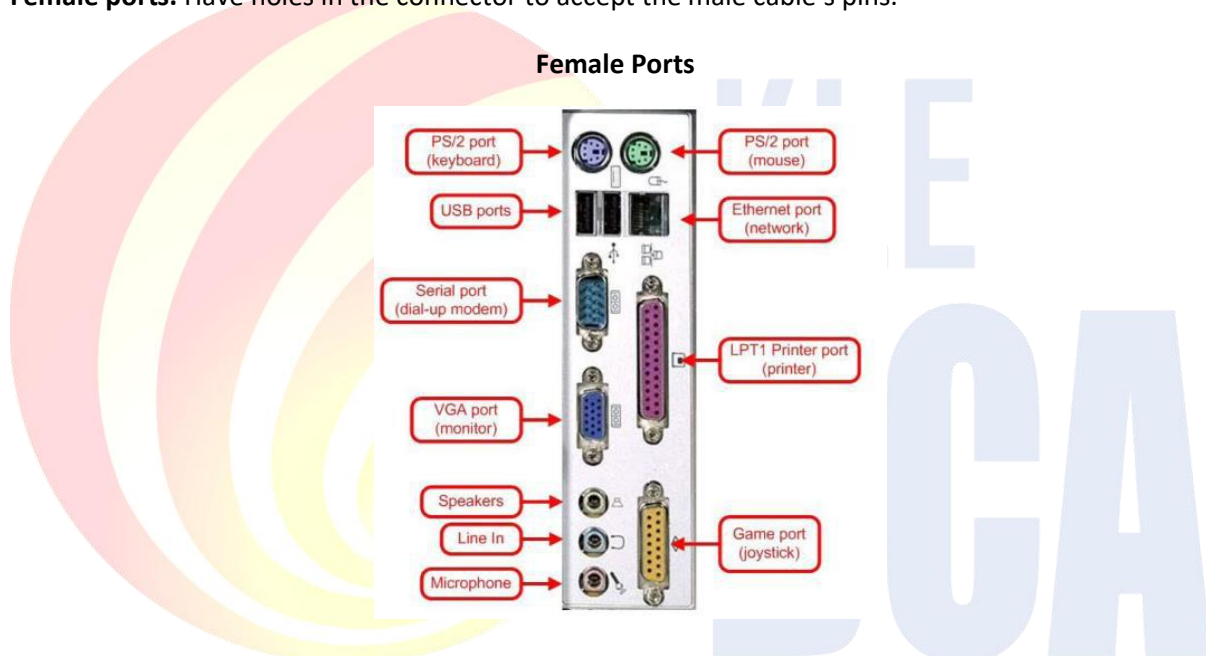
Requirements: Motherboard

CPU PORTS

Ports are **slots on the motherboard into which a cable of external device is plugged in**. Examples of external devices attached via ports are the mouse, keyboard, monitor, microphone, speakers, etc.

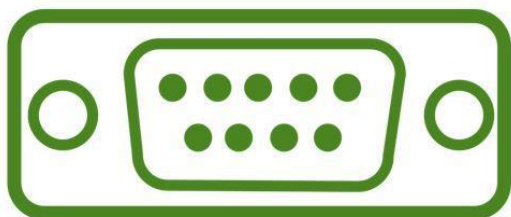
Male ports. Have pins that protrude out from the connector and require a cable with a female connector.

Female ports. Have holes in the connector to accept the male cable's pins.



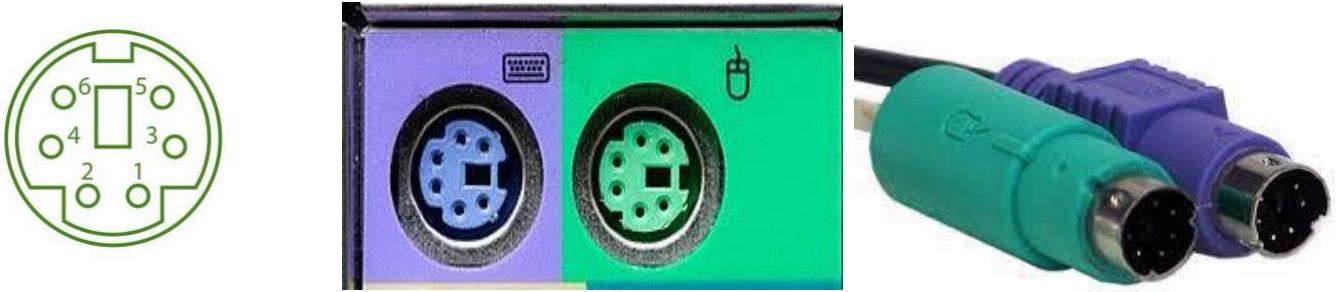
VGA PORT:

VGA ports also known as Video Graphic Array connector are those which connect the monitor to a computer's video card. VGA port has 15 holes and it is similar to the serial port connector. But VGA Ports have holes in it and the serial port connector has pins in it.



PS/2 PORT:

PS/2 ports are special ports used for connecting old computer keyboard and mouse. It was invented by IBM. In old computers, there are minimum of two PS/2 Ports, each for the keyboard and the mouse. It is a 6 pin mini Din connector.



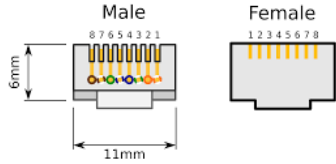
USB (Universal Serial Bus) port:

In 1997 USB was first introduced. This can connect all kinds of external USB devices, like external hard disk, printer, scanner, mouse, keyboard, etc. There are minimum of two USB Ports provided in most of the computer systems. It is a kind of new type serial connection Port that is much faster than the old serial Ports and These USB Ports are much smarter and more versatile, as it allows the “daisy chaining” of up to 127 USB peripherals connected to one port. The data transfer rate in this is Data12 megabits per second. It also provides plug & plays communication.

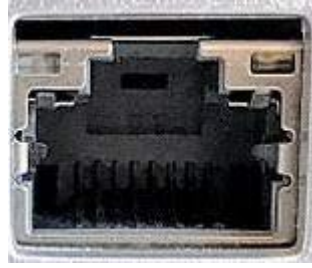


Ethernet Port:

Ethernet Port helps to connect to a network and high-speed Internet(provided by LAN or other sources). It connects the network cable to a computer and resides in a Ethernet card. It provides a data travel speed of 10 Mb to 1000 Mb(megabits) per second.

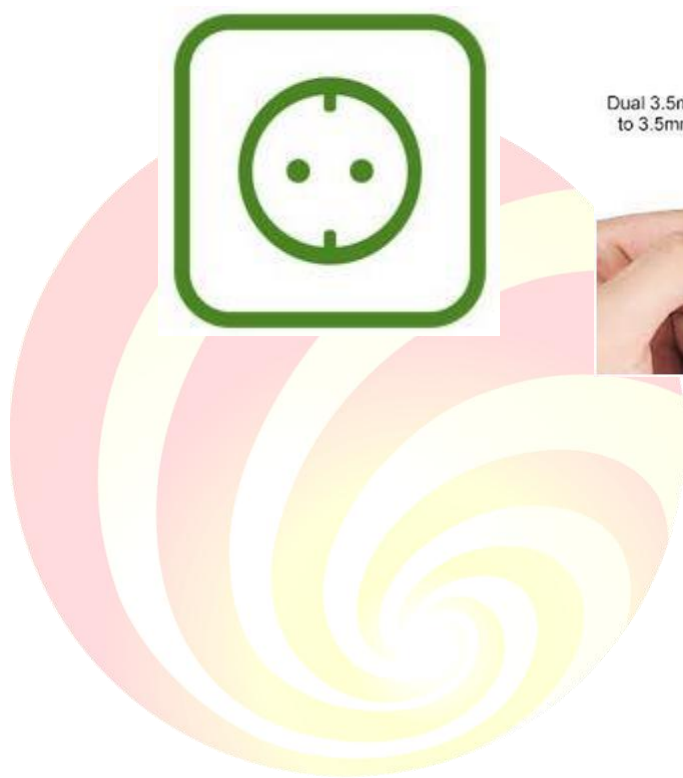


8P8C - T568B wiring
"RJ45 Ethernet cable"



Sockets: for Speaker and Audio

Microphones and speakers are connected with the help of Sockets to the sound card of the computer



BCA

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Lab -3 Identify the Computer Name and Hardware Specification (RAM capacity, Processor type, HDD 32bit/64bit)

Aim : Identify the Computer Name and Hardware Specification of RAM and HDD

Requirements: Computer

TO FIND YOUR COMPUTER NAME FROM DIFFERENT OPERATING SYSTEMS

Steps --

- Windows 7
- Windows 8/8.1
- Windows 10

WINDOWS 7

1. Click on the Start button.
2. Right-click on Computer.
3. Select Properties.
4. Under Computer name, domain, and workgroup settings you will find the computer name listed.

WINDOWS 8/8.1

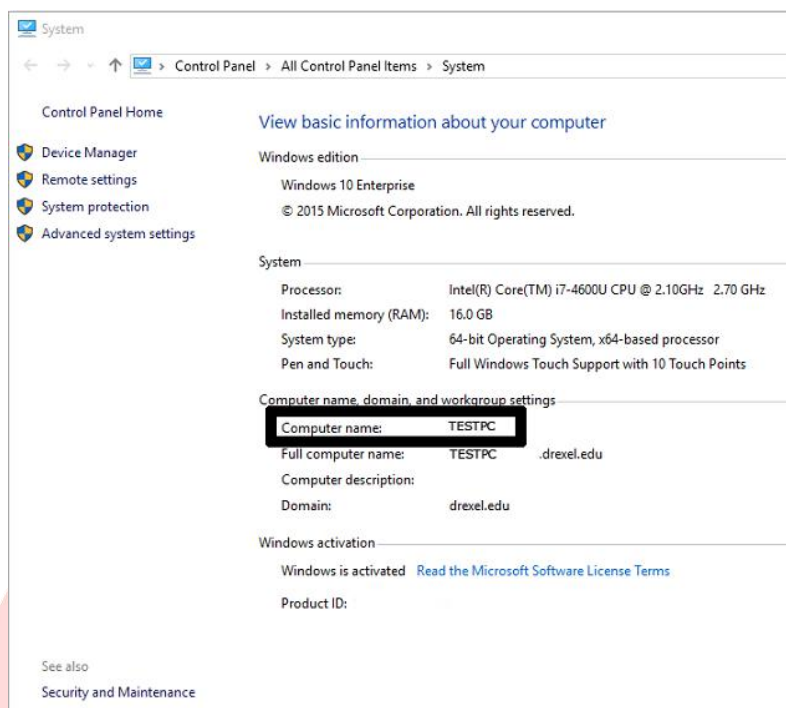
1. Click on the Start button.
2. When the launch screen appears, type Computer.
3. Right-click on Computer within the search results and select Properties.
4. Under Computer name, domain, and workgroup settings you will find the computer name listed.

WINDOWS 10

1. Click on the Start button.
2. In the search box, type Computer.
3. Right click on This PC within the search results and select Properties.
4. Under Computer name, domain, and workgroup settings you will find the computer name listed.

SCREENSHOTS

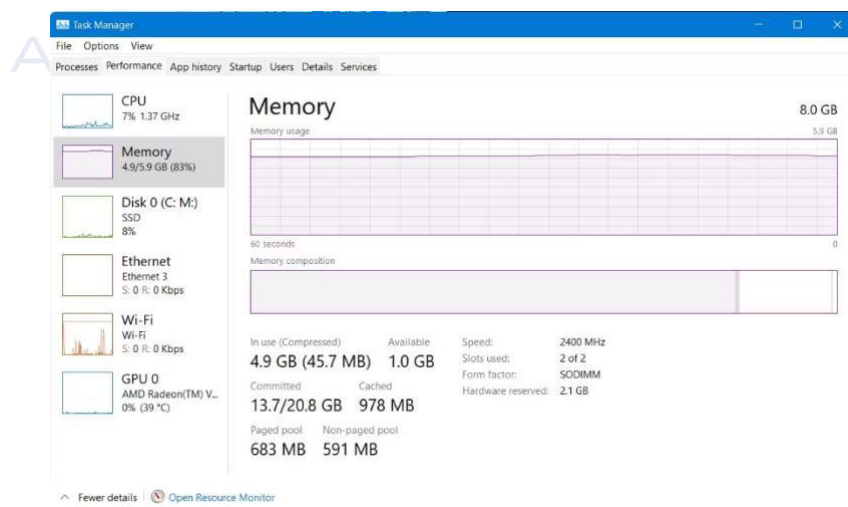
Windows 7, 8/8.1, and 10



Step -1. Use the Task Manager to Check RAM

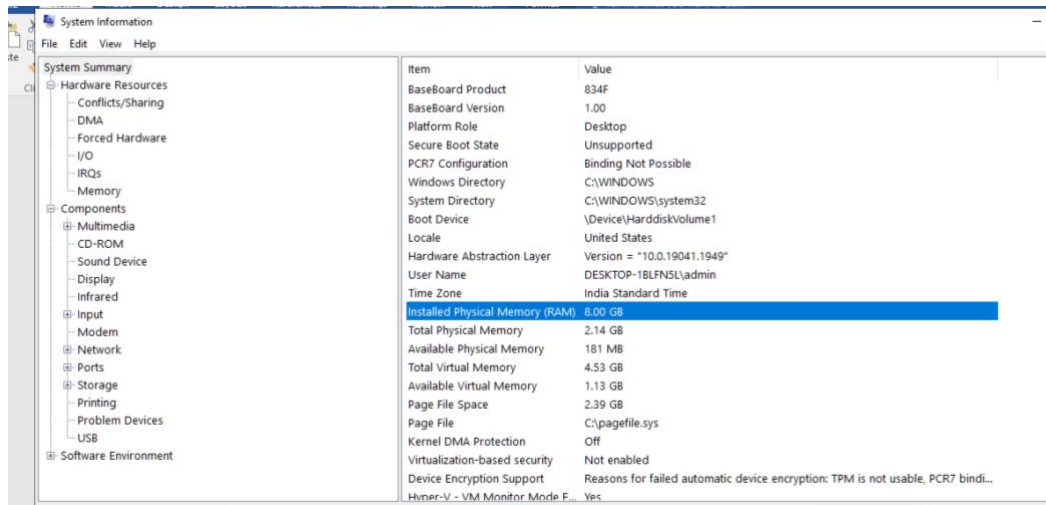
The Task Manager is an indispensable tool for telling you the intricate inner workings of your PC. Apart from tracking app performance, boot times, and memory usage, it can also tell you plenty about your RAM.

On Windows 10, launch the **Start menu**, search for **Task Manager** and click on the Best match. Within the **Task Manager**, click on **the Performance** tab and click **Memory** to **view RAM usage** and specifications.



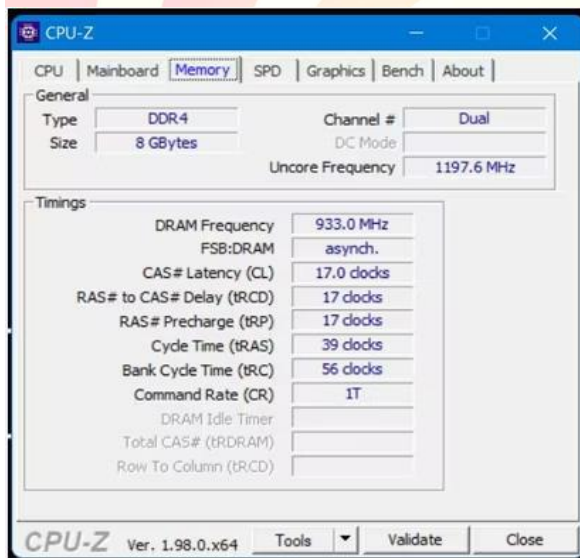
Step - 2. Use the System Information Window to Check Your RAM

Another quick method to view the RAM specs is via **System Information**. Simply launch the Start menu, search for **System Information**, click on the Best match, and then scroll to find **Installed Physical Memory (RAM)** and Total Physical Memory. This should tell you the basic information you need about your **installed RAM**.



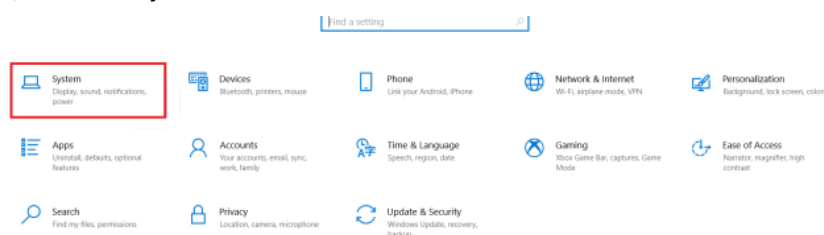
Step- 3. Use CPU-Z

Third-party system profiling software can often provide more detailed hardware performance metrics and system specs. **CPU-Z** is free-to-use software that displays detailed information about hardware components such as CPU, RAM, motherboard, etc.

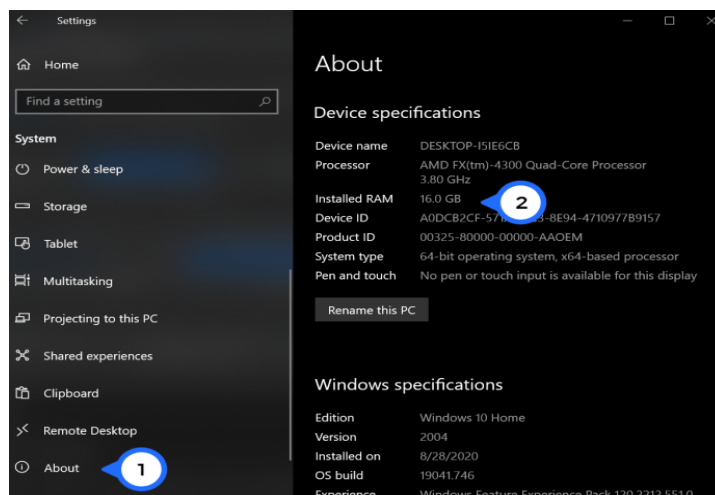


Step - 4. Use Windows Settings to Check Your RAM Specs

1. To find how much RAM your system has, press **"Win + I"** to access your PC's settings or use the **"Start Menu."**
2. Then, click on **"System."**



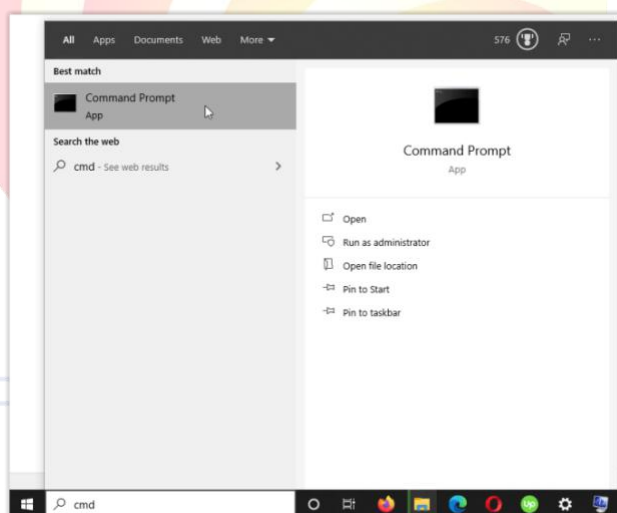
- Next, click **“About”** on the left-hand side and view your RAM on the right.



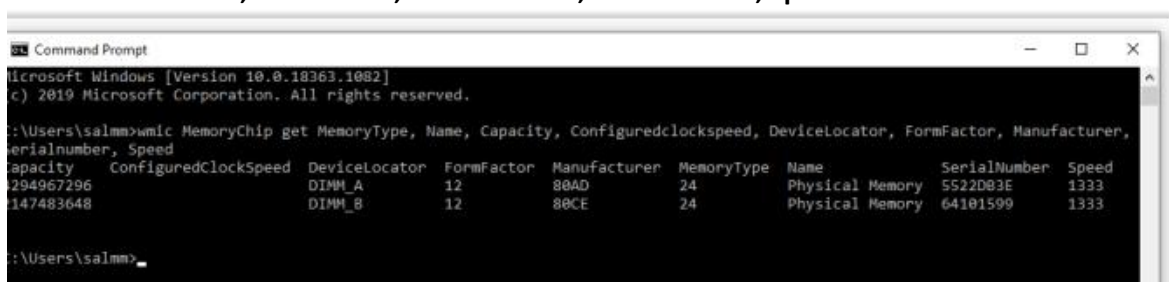
Step -5 View RAM Information via Windows 10 Command Prompt

The best method of finding out the details of your computer’s RAM is using the Windows 10 Command Prompt or PowerShell. Other built-in applications like **“System Information”** and the **“Control Panel”** only show partial details like the size, type, or both. Here’s how to view extensive RAM specs on your PC.

- Type **“cmd”** in Cortana’s search box, then click on **“Command Prompt”** in the list.



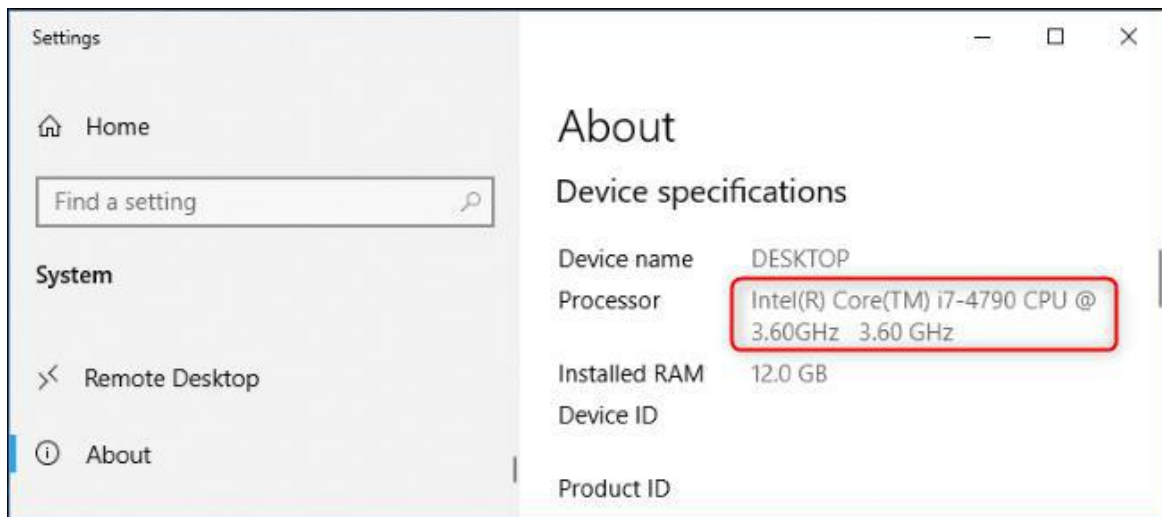
- Type the following code into the command prompt and press enter:
wmic MemoryChip get MemoryType, Name, Capacity, Configuredclockspeed, DeviceLocator, FormFactor, Manufacturer, Serialnumber, Speed



Processor Type

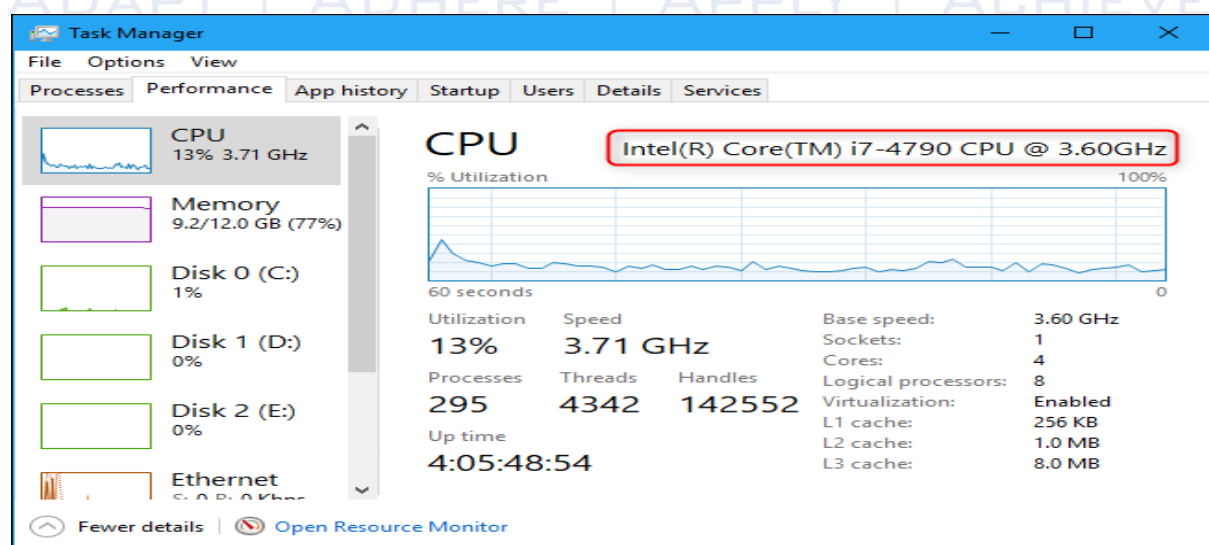
To find this information in the Windows 10 or Windows 11 Settings app, navigate to **Settings > System > About**. Look under **“Device specifications.”** The name of your computer’s processor and its speed are displayed to the right of **“Processor.”**

You can press **Windows+i** to open the Settings app quickly. You can also press the **Windows key**, type **“About”** to search your Start menu for this Settings screen, and then click the **“About This PC”** shortcut that appears.



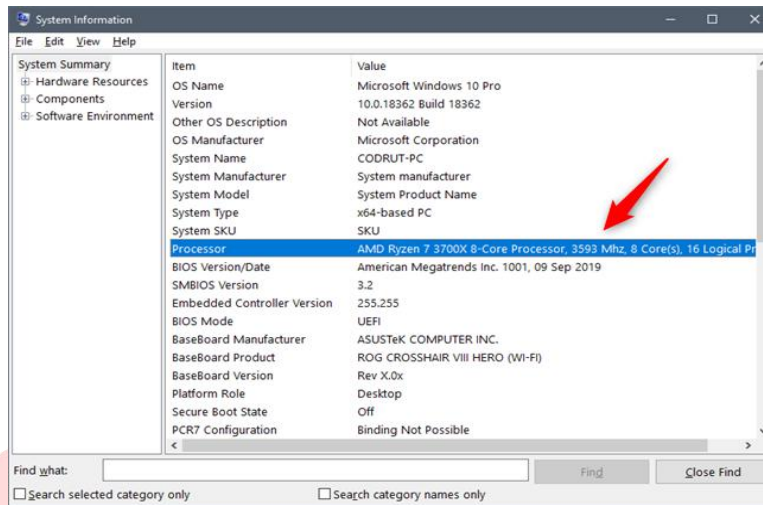
The Task Manager on Windows 10 and Windows 11 shows detailed CPU information, too. Right-click your taskbar and select **“Task Manager”** or press **Ctrl+Shift+Esc** to launch it. Click the **“Performance”** tab and select **“CPU.”** The name and speed of your computer’s CPU appear here. (If you don’t see the Performance tab, click **“More Details.”**)

You’ll also see real-time CPU usage data and other details, including the number of cores your computer’s CPU has.

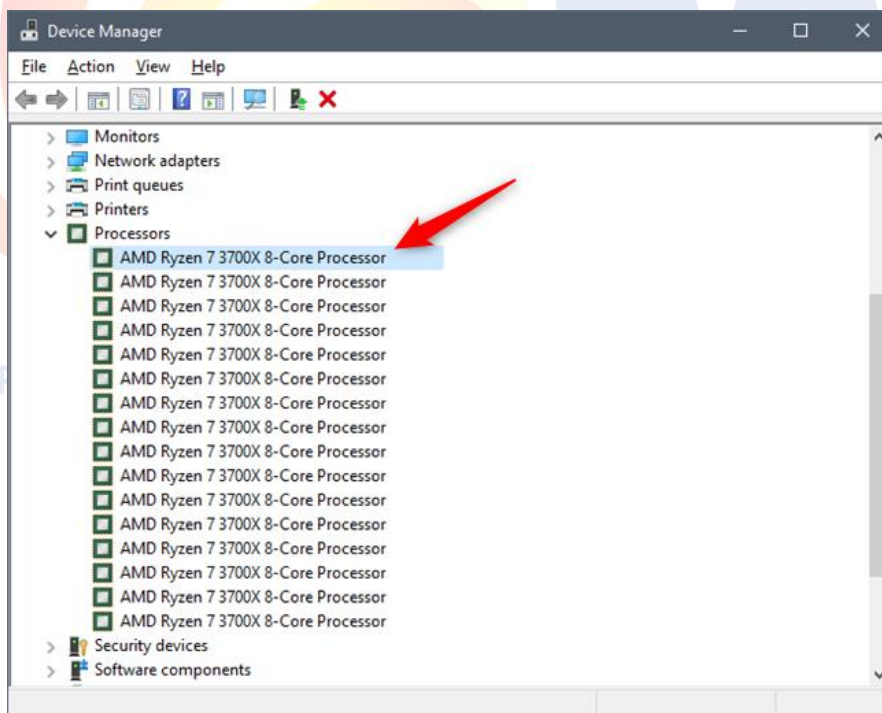


System Information app from Windows, which can also tell you details about your processor.

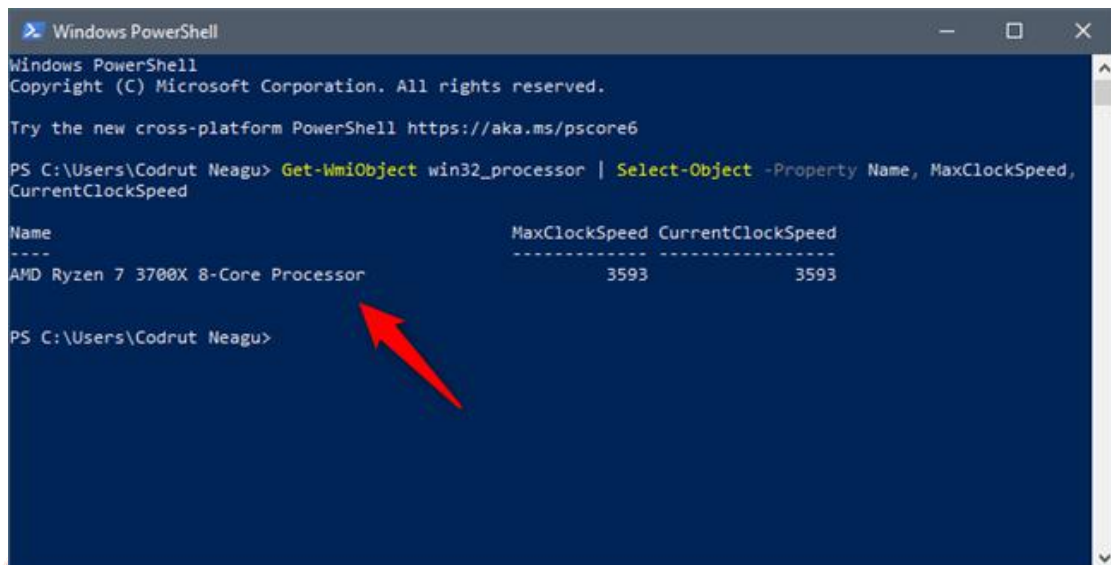
Open **System Information** and look for Processor in the System Summary. There, you should find its name and base clock.



Similarly, **open Device Manager** and expand the Processors entry. You should see your processor listed for as many times as it has threads, but all of the entries bear the same name. That's the processor's name.



You can also use PowerShell to get some information about your processor. **Open** it and run this command: `Get-WmiObject win32_processor | Select-Object -Property Name, MaxClockSpeed, CurrentClockSpeed`. The output should tell you the name of your CPU, as well as its maximum and current speeds. However, the speeds seem to be reported correctly only for Intel processors. On AMD processors, what you get is just the base speed.



```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/powershell

PS C:\Users\Codrut Neagu> Get-WmiObject win32_processor | Select-Object -Property Name, MaxClockSpeed, CurrentClockSpeed

Name                                     MaxClockSpeed CurrentClockSpeed
----                                     -
AMD Ryzen 7 3700X 8-Core Processor      3593             3593

PS C:\Users\Codrut Neagu>
```



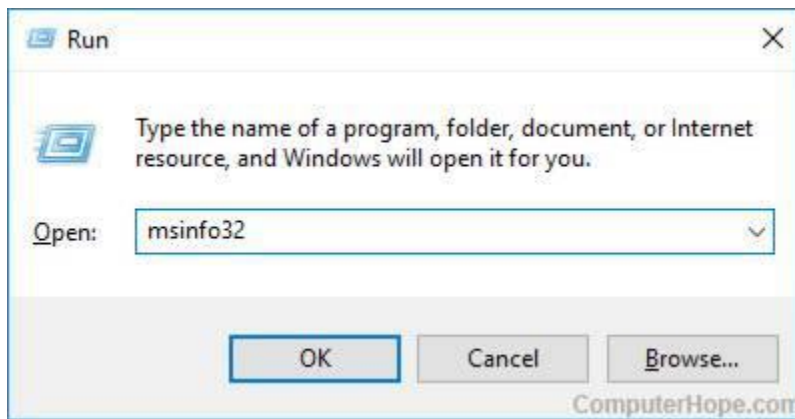
HDD Specification

Step 1. System Information utility in Windows 10 and Windows 11

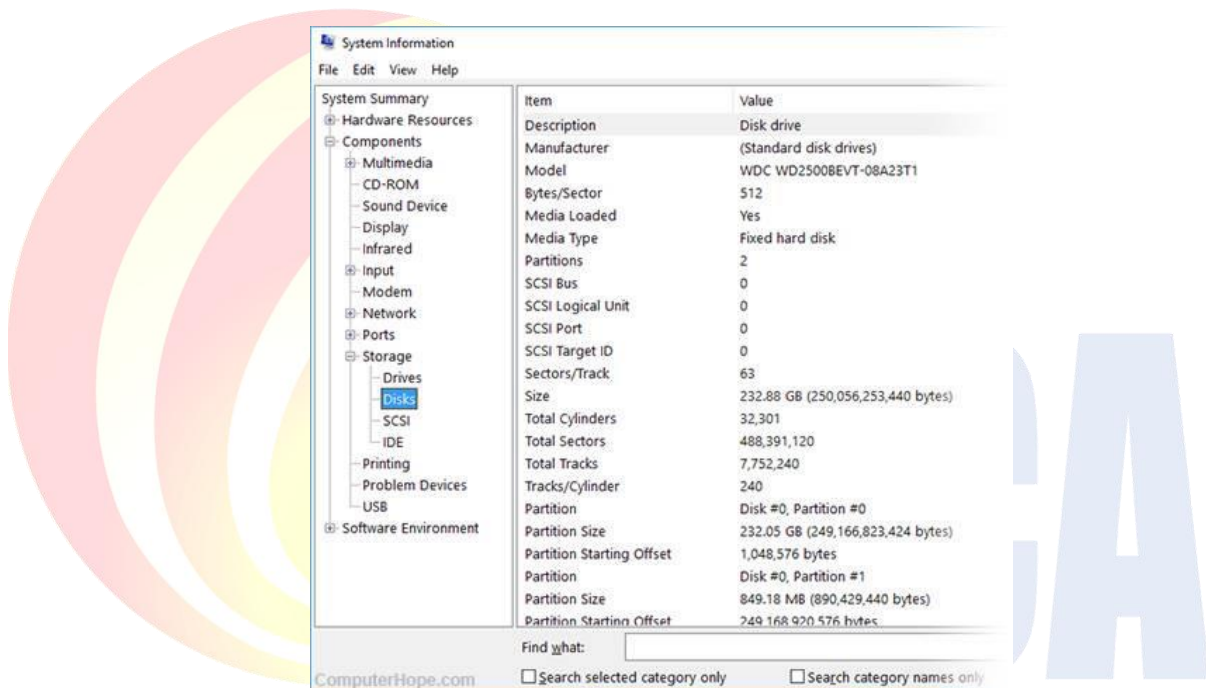
Press the **Windows key**, type System Information, and press **Enter**.

Or, you can use the **Run box** to open the System Information utility.

1. Press the **Windows key+R** keyboard shortcut.
2. In the Run box, type **msinfo32**.
3. Press Enter or **click OK**.



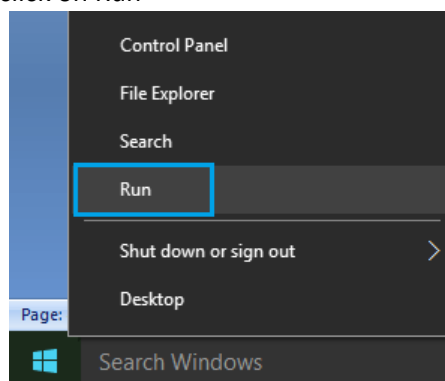
4. In the System Information window that opens, in the left window pane, you'll see a list of hardware categories. Expand Components, then Storage. Then, choose Drives, Disks, or any category you'd like to view.



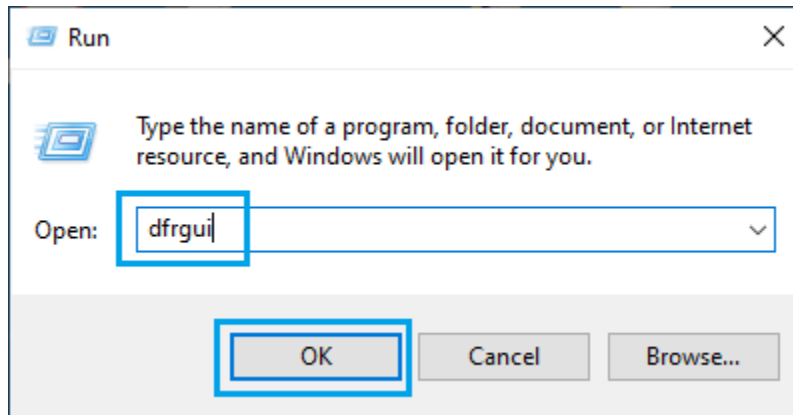
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Step -2. The easiest way to check the type of Hard Drive or storage installed on a computer is to open the Defragmenter or **Optimize Drives** utility.

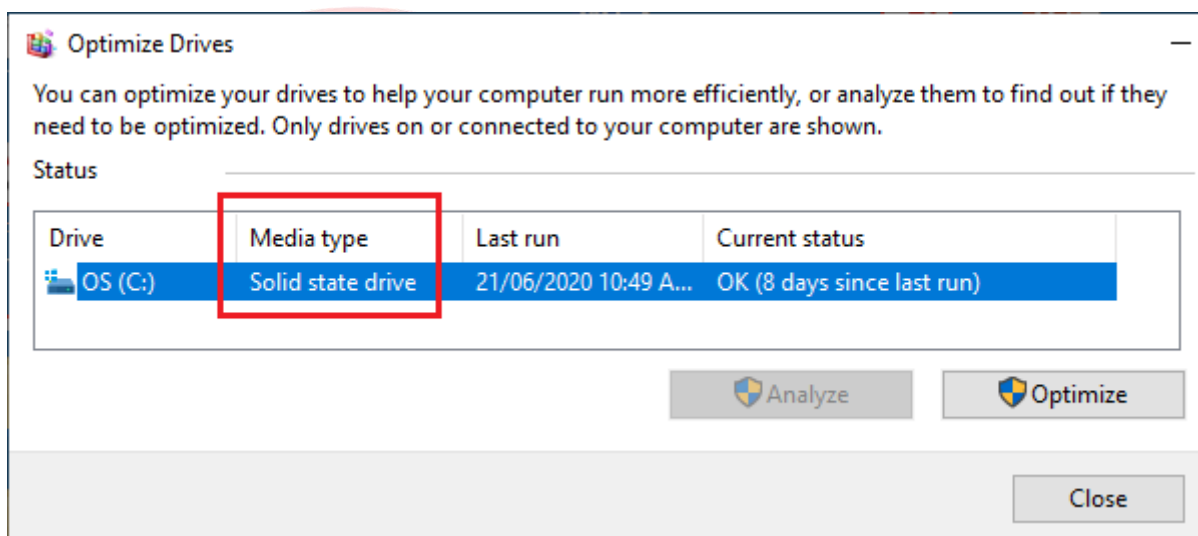
1. Right-click on Start button and click on Run



2. In Run Command window, type **dfrgui** and click on OK.

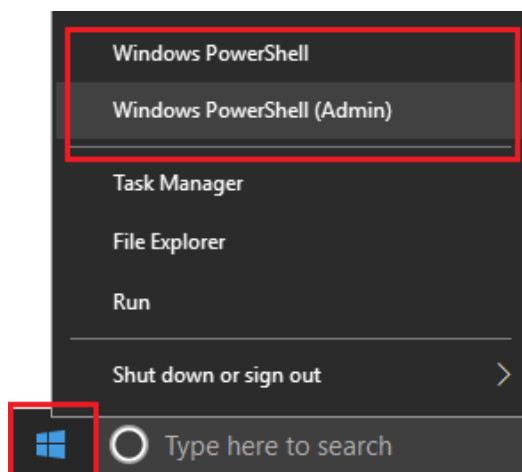


3. On the next screen, the type of Hard Drive will be listed under Media Type Column.

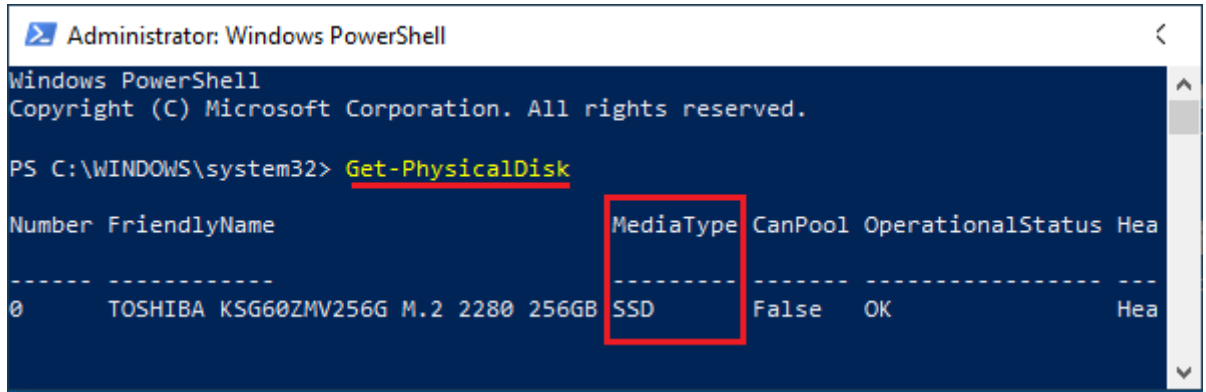


Step -3. Another quick way to check the type of Hard Disk installed on a computer is by using PowerShell utility, as available in recent versions of Windows 10.

1. Right-click on Start button and click on PowerShell (Admin).



2. On PowerShell screen, type **Get-PhysicalDisk** and press the Enter key on the keyboard of your computer.



```
Administrator: Windows PowerShell
Windows PowerShell
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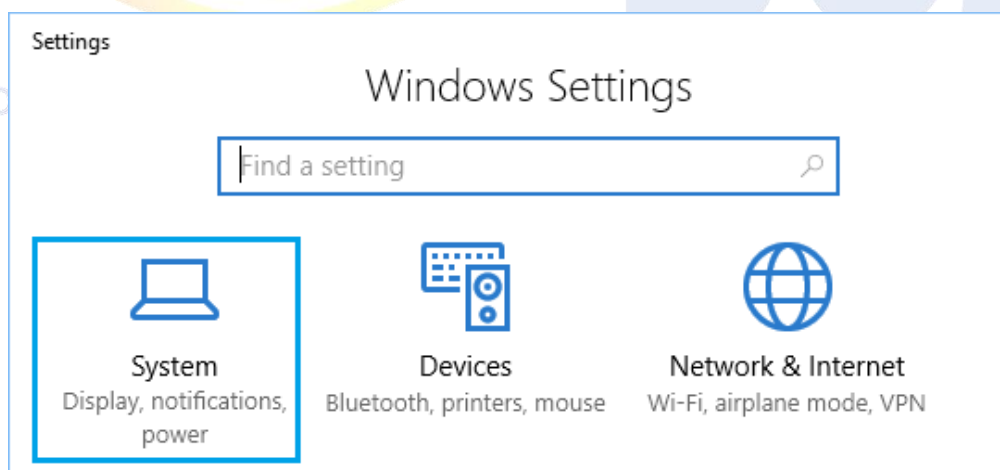
PS C:\WINDOWS\system32> Get-PhysicalDisk

Number FriendlyName MediaType CanPool OperationalStatus Health
-----
0 TOSHIBA KSG60ZMV256G M.2 2280 256GB SSD False OK Healthy
```

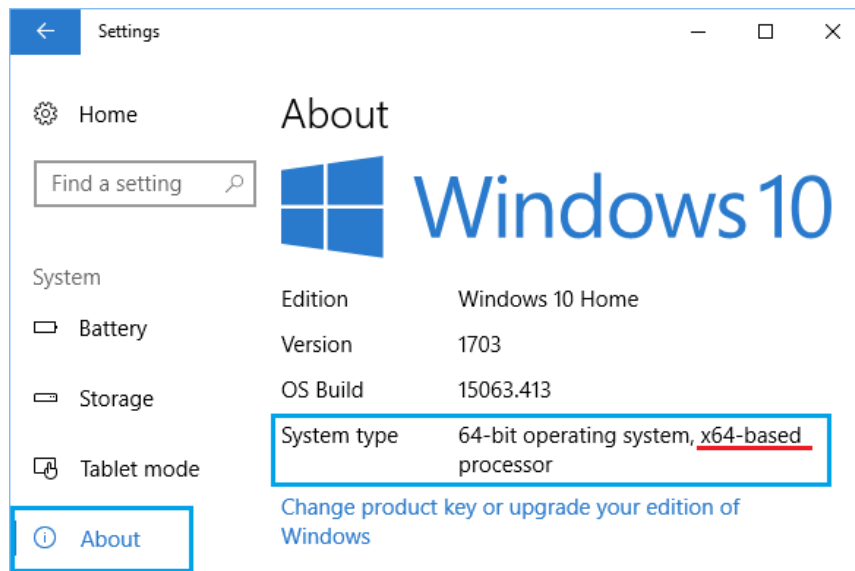
3. Once the Command is Executed, it will list the Hard Disk type on your computer under Media Type Column (see above image).

How to Check if Your Computer is 32 or 64-bit

1. Open **Settings** and click on the System tab.



2. On the next screen, click on About in the left-pane. In the right-pane, scroll down and check the entry next to System Type listing **“Device Specifications”** section.



Lab -4 Identify and Troubleshoot the problem of RAM (beep sound with blue screen), SMPS, and motherboard (CPU is not switched on)

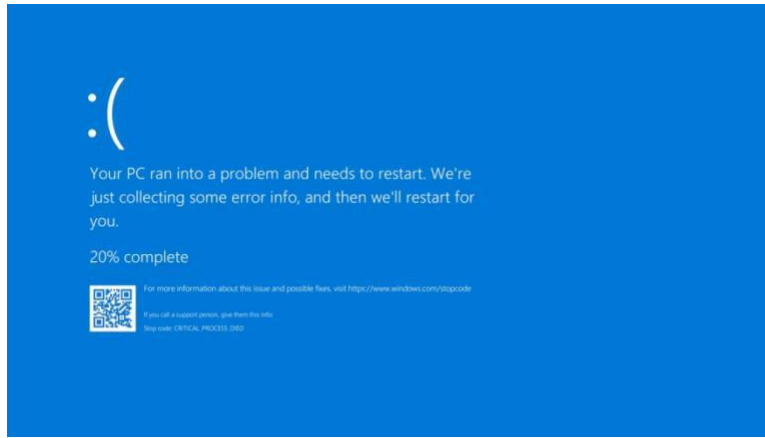
Aim: Identifying and Troubleshooting of RAM, SMPS and Motherboard

Requirements: Computer

1. Diminishing Performance

One of the most tell-tale signs of RAM failure is diminishing performance over time.

If you find that your computer is running perfectly after you first power it up, but the longer you use it, the slower it becomes—you could be in trouble. The problem will be especially noticeable on memory-intensive apps such as Photoshop, complex video games, and web browsers.



2. Random Crashes

Getting the blue screen of death on Windows every time you try and open a certain app, it's likely that the app is the culprit rather than your hardware. But if you find that the crashes occur without warning and at random times, your RAM could be responsible.

p Code	Sequence/Pattern	Meaning	Troubleshooting Steps
beeps	On-off (1.0 second each) three times, then 2.5-second pause (off). The pattern repeats until the computer is powered off.	Memory error	<ul style="list-style-type: none"> • Reseat the memory. • Make sure that the contacts on the memory and the socket are clean. • Try removing one bank of memory modules at a time. (Some systems can require a memory module in Bank 0.) • Try using memory modules from the same manufacturer with the same part number and speed. • Check for a faulty memory module by trying the memory in a known good system.

SMPS Problems and Solutions

ADAPT | ADHERE | APPLY | ACHIEVE

Power Device to efficiently provide a voltage, from different level of the input transfers power from a source like the electrical power grid to a load (Eg: Computer).

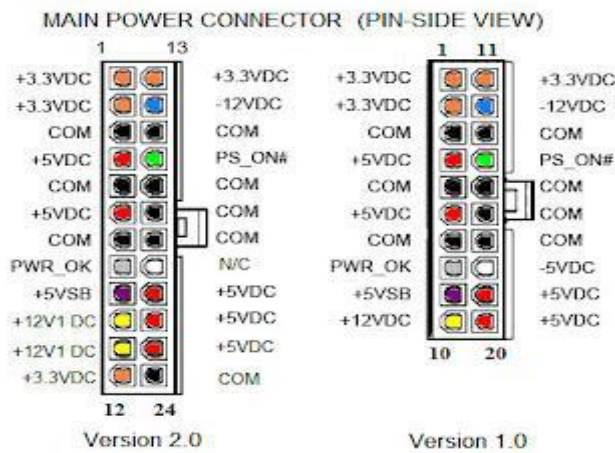


What SMPS Supply.



is SMPS ?

- **Switched Mode**
An SMPS is a regulated output voltage. SMPS



SMPS Connection Diagram

The SMPS in a conventional desktop system is designed to convert the 220V AC, 50HZ into +5V, -5V, +12V and +3.3 V DC

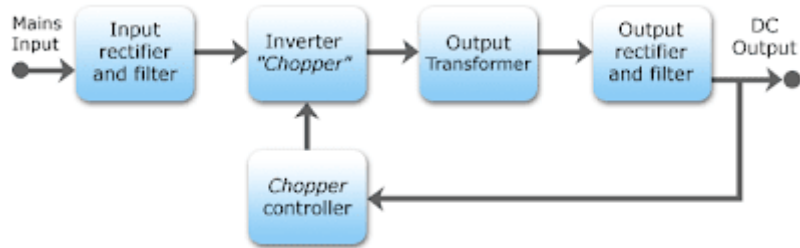


Diagram –SMPS

Tips For Power Supply Service

1. Be sure that the line- voltage switch(120/220 Vac) is set correctly for your region.
2. Do Not Use a Splitter
3. Be sure that each output is within tolerance (Voltage tolerances are usually +or-5%)
4. Verify that the power-supply connectors are attached to the motherboard drivers
5. Check the AC Input voltage with the help of a Multimeter

Troubleshooting SMPS

Problem 1: The Power doesn't come on.

Solutions

1. Check the Power from the wall socket
2. Check the Voltage Setting On the CPU
3. Check the Power switch of the Cabinet and Front Panel of Motherboard
4. Check the Power Supply Connections to the Motherboard
5. Check the SMPS without connecting it to the motherboard, you could see the two wire green and black which you have to short them (using any piece of wire/paper clip) in the 24 pin motherboard connector of the SMPS.

Problem 2: The PC Powers on after the second or third try

Solutions

1. Check the Power switch of the Cabinet
2. Replace SMPS (Get a Better Quality SMPS)

Problem 3: The PC Powers on but nothing happens after that (no beep)

Solutions

1. Remove the last hardware component installed and check again
2. Replace SMPS (Get a Better Quality SMPS)
3. Check the power cables to the Devices (Harddisk, DVD Drive etc)

Problem 4: The PC Powers on beeps and stops. NO Power On Self-Test (POST)messages

Solutions

1. Check with another SMPS
2. This may be a Motherboard Problem.

Problem 5: The PC Powers on runs POST but there is no display

Solutions

1. Check the Monitor and the VGA Cable Connections
2. Check with another SMPS
3. This may be a Display Card Problem

Problem 6: There is a squealing/whistling/whining noise from SMPS when the PC starts

Solutions

1. Check the SMPS Fan
2. Component problem with SMPS. Replace it

Problem7: The PC freezes or reboots suddenly

Solutions

1. Check the SMPS Fan (May be overheating Problem)
2. Replace the SMPS

fan error occurs during startup, you will:

- Hear an **audible beep code**, or
- See a blink pattern on the power LED

Audible beep codes

You can hear the beep codes through the on-board piezoelectric speaker. For Intel® Desktop Boards without the on-board speaker, you can hear the beeps through a speaker attached to the line out audio jack on the board.

Beep Code	Sequence/Pattern	Meaning	Troubleshooting Steps
Single beep	One 0.5 second beep	F2 Setup / F10 Boot Menu prompt	This short beep occurs when the BIOS is ready to accept keyboard input. No action needed.
2 beeps	On-off (1.0 second each) two times, then 2.5-second pause (off). The pattern repeats once.	Video error (no add-in graphics card installed)	<ul style="list-style-type: none"> • Reseat add-in graphics card. • Make sure a compatible processor is installed. Related topics No video and two beeps during boot

	Then the computer continues to boot.		Intel® Processors and Boards Compatibility Tool
3 beeps	On-off (1.0 second each) three times, then 2.5-second pause (off). The pattern repeats until the computer is powered off.	Memory error	<ul style="list-style-type: none"> • Reseat the memory. • Make sure that the contacts on the memory and the socket are clean. • Try removing one bank of memory modules at a time. (Some systems can require a memory module in Bank 0.) • Try using memory modules from the same manufacturer with the same part number and speed. • Check for a faulty memory module by trying the memory in a known good system.
High/low beeps	Alternate high and low beeps (1.0 second each) for 8 beeps. Then the computer shuts down.	CPU thermal trip warning	<ul style="list-style-type: none"> • Check that the processor heatsink/fan is properly installed. • Check that the thermal interface material is sufficient and is spread evenly.

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Visible LED blink patterns

Visible blink patterns display via the front panel power LED.

LED Blink Pattern	Sequence/Pattern	Meaning	Troubleshooting Steps
2 blinks	<p>On-off (1.0 second each) two times, then 2.5-second pause (off).</p> <p>The pattern repeats once.</p> <p>Then the computer continues to boot.</p>	Video error (no add-in graphics card installed)	<ul style="list-style-type: none"> • Reseat add-in graphics card. • Make sure a compatible processor is installed. • For more troubleshooting steps, see: <ul style="list-style-type: none"> ○ No video and two beeps during boot ○ Intel® Processors and Boards Compatibility Tool
3 blinks	<p>On-off (1.0 second each) three times, then 2.5-second pause (off).</p> <p>The pattern repeats until the computer is powered off.</p>	Memory error	<ul style="list-style-type: none"> • Reseat the memory. • Make sure that the contacts on the memory and the socket are clean. • Try removing one bank of memory modules at a time. (Some systems can require a memory module in Bank 0.) • Try using memory modules from the same manufacturer with the same part number and speed. • Check for a faulty memory module by trying the memory in a known good system.
16 on/off blinks	<p>.25 seconds on, .25 seconds off, for a total of 16 blinks.</p> <p>Then the computer shuts down.</p>	CPU thermal trip warning	<ul style="list-style-type: none"> • Check that the processor heat sink/fan is properly installed. • Check that the thermal interface material is sufficient and is spread evenly.
Continual blinks	<p>Off when the update starts, then on for 0.5 seconds, then off for 0.5 seconds.</p> <p>The pattern repeats until the BIOS update is complete.</p>	BIOS update in progress	This blink pattern is normal behavior. No action needed.

Beep codes for discontinued (legacy) desktop boards

Beep State	Meaning
1 long beep followed by 2 short beeps	Video configuration failure (a faulty video card or no card installed), or an external ROM module does not properly checksum to zero.
1	Refresh failure
2	Parity can't be reset
3	First 64K memory failure
4	Timer not operational
5	Processor failure (reserved; not used)
6	8042 GateA20 can't be toggled (memory failure or not present)
7	Exception interrupt error
8	Display memory R/W error
9	(Reserved; not used)
10	CMOS Shutdown register test error
11	Invalid BIOS (such as, POST module not found)

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Lab- 5 Configure BIOS setting – disable and enable USB and LAN

Aim : Configure BIOS Disable USB and LAN

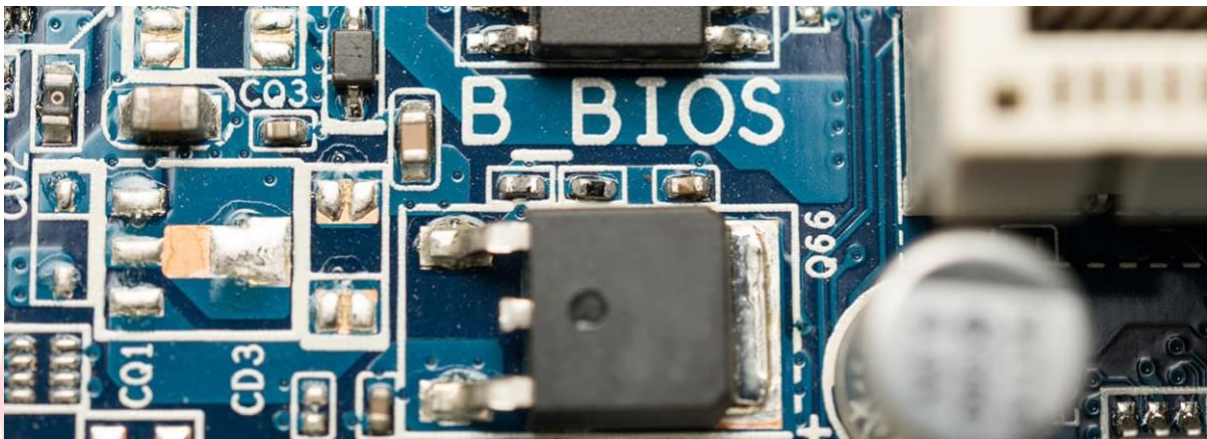
Requirements: Computer

What is BIOS?

As your PC's most important startup program, BIOS, or Basic Input / Output System, is the built-in core processor software responsible for booting up your system.

How to Enter BIOS Setup on Windows PCs

In order to access BIOS on a Windows PC, you must press your BIOS key set by your manufacturer which could be F10, F2, F12, F1, or DEL.



1. Using BIOS Setup Utility Menu Items

You can access BIOS Setup utility screens from the following interfaces:

- Use a USB keyboard, mouse, and VGA monitor connected directly to the server.
- Use a terminal (or terminal emulator connected to a computer) through the serial port on the back panel of the server.
- Connect to the server using the Sun ILOM Remote Console.

To access BIOS configuration screens and to change the system's parameters, complete the following steps:

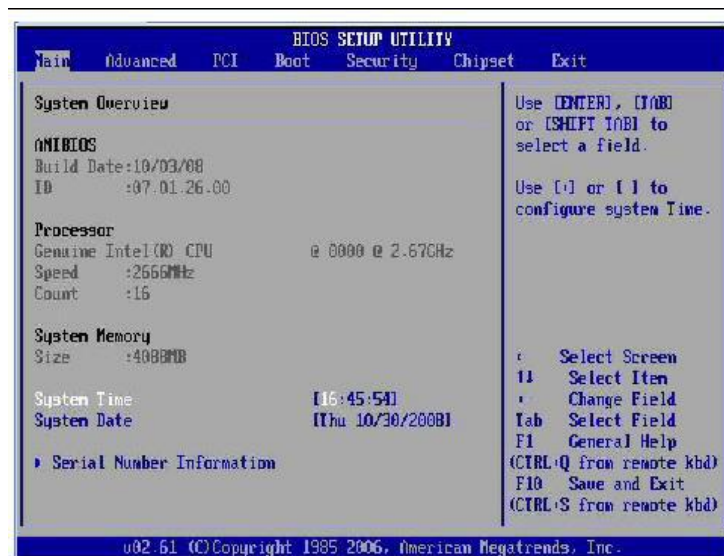
1. Power on or power cycle the server.
2. To enter the BIOS Setup utility, press the F2 key while the system is performing the power-on self-test (POST) FIGURE 1).

FIGURE 1 Press F2 to Run Setup Prompt

```
Initializing USB Controllers .. Done.  
Press F2 to run Setup (CTRL+E on Remote Keyboard)  
Press F8 for BBS POPUP (CTRL+P on Remote Keyboard)  
Press F12 to boot from the network (CTRL+N on Remote Keyboard)
```

When BIOS is started, the main BIOS Setup utility top-level screen appears (FIGURE E-2). This screen provides seven menu options across the top of the screen.

FIGURE 2 BIOS Setup Utility - Main Screen



3. Use the left and right arrow keys to select the different menu options.

As you select each menu option, the top-level screen for that menu option appears.

4. To select an option on a top-level screen, use the up and down arrow keys to scroll up and down the options presented.

Only options that can be modified are highlighted when you press the up and down arrow keys.

If a field can be modified, as you select the option, user instructions for modifying the option appear in the right column of the screen.

If a field is a link to a sub-screen, instructions to press the Enter key to access the sub screen appear in the right column.

5. Modify the setup field and press the Esc key to save the changes and exit the screen.

Some screens present a confirmation dialog box that enables unwanted changes to be retracted.

6. On sub-screens that only provide configuration information and cannot be modified, press the Esc key to exit the screen.

7. To continue modifying other setup parameters, repeat Step 3 through Step 6. Otherwise, go to Step 8.

8. Press and release the right arrow key until the Exit menu screen appears.

9. Follow the instructions on the Exit menu screen to save or discard your changes and exit the BIOS Setup utility.

2 BIOS Setup Screens Overview

contains summary descriptions of the top-level BIOS setup screens.

TABLE E-1 BIOS Setup Screens Summary		
Screen	Description	See This Section
Main	General product information, including BIOS type, processor, memory, and time/date.	BIOS Main Menu Screens
Advanced	Configuration information for the CPU, memory, IDE, Super IO, trusted computing, USB, PCI, MPS and other information.	BIOS Advanced Menu Screens
PCI	Configure the server to clear NVRAM during system boot.	BIOS PCI Menu Screens
Boot	Configure the boot device priority (storage drives and the DVD-ROM drive).	BIOS Setup Utility: Boot - Boot Settings
Security	Set or change the user and supervisor passwords.	BIOS Security Menu Screens
Chipset	View the configuration of server chipsets.	BIOS Chipset Menu Screens
Exit	Save changes and exit, discard changes and exit, discard changes, or load optimal or fail-safe defaults.	BIOS Exit Menu Screens

Enabling or Disabling the Front or Rear USB Ports in BIOS

You can manage which USB ports on the computer are allowed to connect to USB devices, such as keyboards, headsets, or USB storage devices through BIOS.

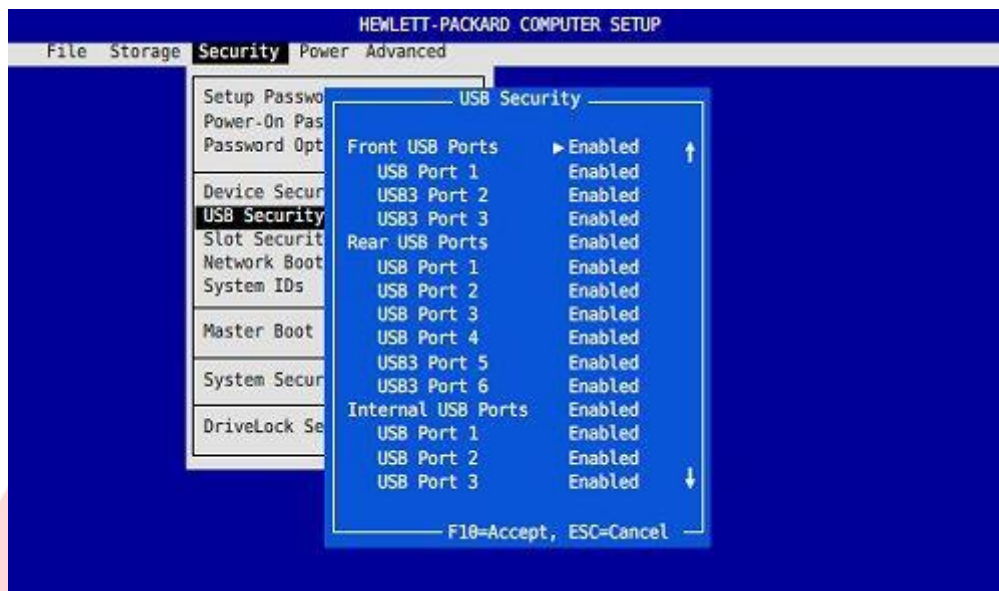
1. Turn on the computers, and then immediately click F10 to enter the BIOS.
2. Under the **Security** tab, use the up and down arrows to select **USB Security**, and then press Enter.

Figure : Select USB Security



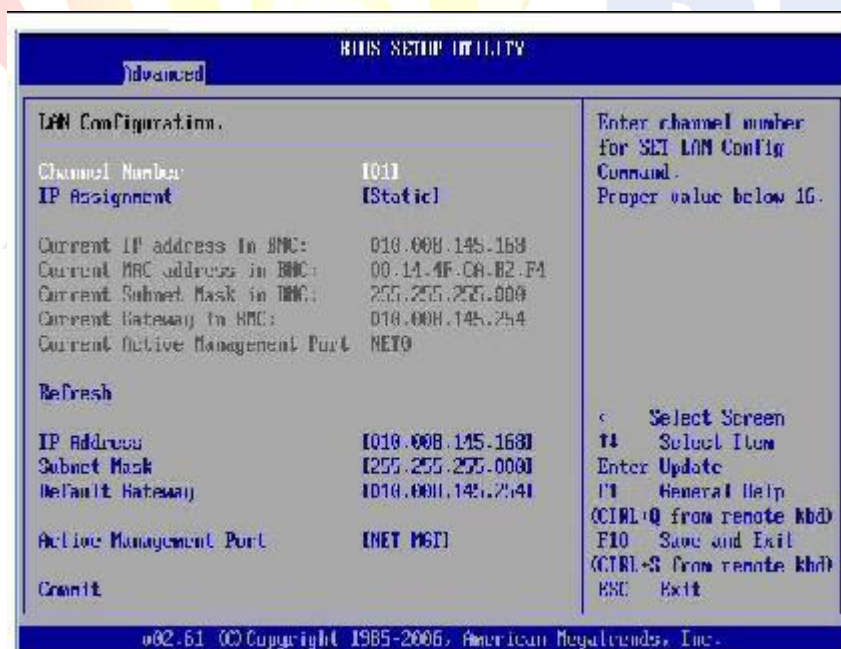
3. A list of USB ports and their locations displays.
4. Use the up and down arrows to select a port, then use the left and right arrows to select either **Enabled** or **Disabled** as desired.

Figure : Enable or Disable the USB port



5. When you are finished, press F10 to save your changes and exit BIOS.

FIGURE 14 BIOS Setup Utility: Advanced - LAN Configuration



Lab -6 Identify, how to recover the hidden files from corrupted pen drive using command

Aim : Recover the hidden files from corrupted pen drive using command

Requirements: Computer

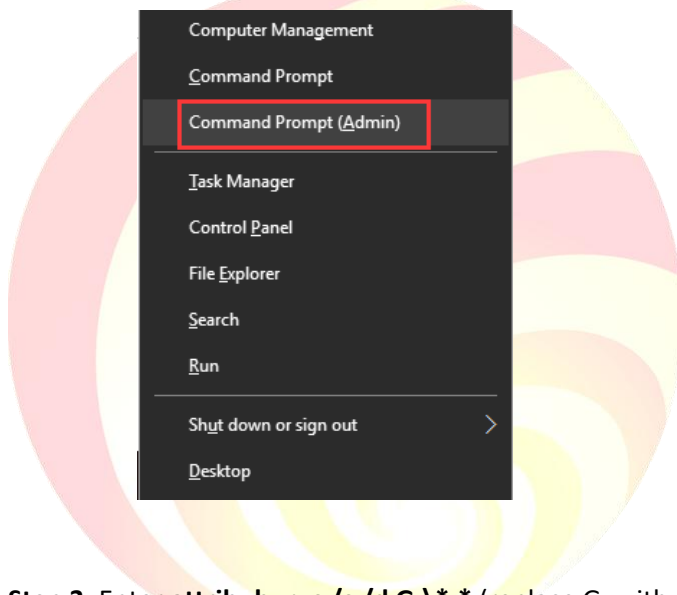
Show Hidden Files on a USB Using CMD

Command Prompt (CMD) is the second choice when you want to show hidden files on external hard disks, USB drives, memory cards, or other storage devices. Here, you will learn the full attrib command for hidden files.

To unhide files using CMD, follow these three steps:

Step 1. Properly connect the USB drive to your computer.

Step 2. Press Windows + X keys to bring up a menu and click Command Prompt (Admin) in this menu.



Step 3. Enter **attrib -h -r -s /s /d G:*.*** (replace G: with the drive letter for your device) in the Command Prompt window and press Enter.

When you finish these steps, access your USB flash drive, hard drive, or memory card to check if you can see all of the hidden files.

Attrib syntax explanation

- -h clears the Hidden file attribute.
- -r clears the Read-only file attribute
- -s clears the System file attribute.
- /s applies attrib and any command-line options to matching files in the current directory and all of its subdirectories.
- /d applies attrib and any command-line options to directories.

Lab -7 Recover the contents from Crashed Hard disk using Disk Drill software

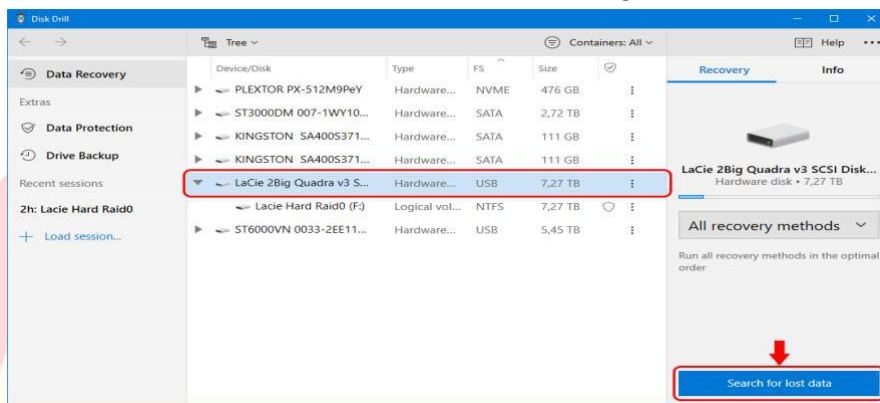
Aim : Recover the contents from Crashed Hard disk

Requirements: Computer

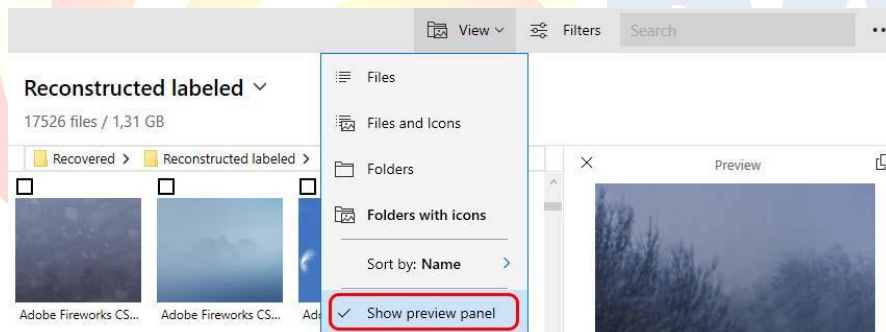
To Recover Deleted Data from a Damaged Hard Drive:

Disk Drill for Windows offers a flexible and effective method to recover data from an external hard disk. Follow these steps to recover your lost and deleted files from an external hard drive.

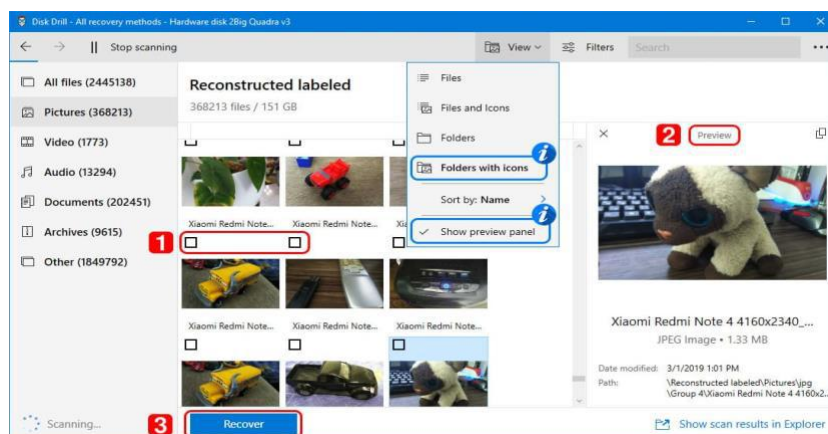
1. Download and **install the program** on your Windows machine. Since you are recovering data from an external hard drive you can install the program on your computer's main hard drive.
2. Connect the external hard drive to your machine and launch Disk Drill.
3. Select the external drive from the app's list of available disks.
4. Click the **Search for lost data** button to start scanning the device



5. Preview the files that can be recovered and select those you want to restore.



6. Click the **Recover** button to retrieve the files you selected to a storage location of your choice. Don't save the data to the external drive during recovery as it may lead to file corruption.



Lab- 8 Install Operating System – Windows 7/ Windows 10) and also make partitions

Aim : Installing Windows 7

Requirements: Computer, windows 7 OS CD, CD Drive

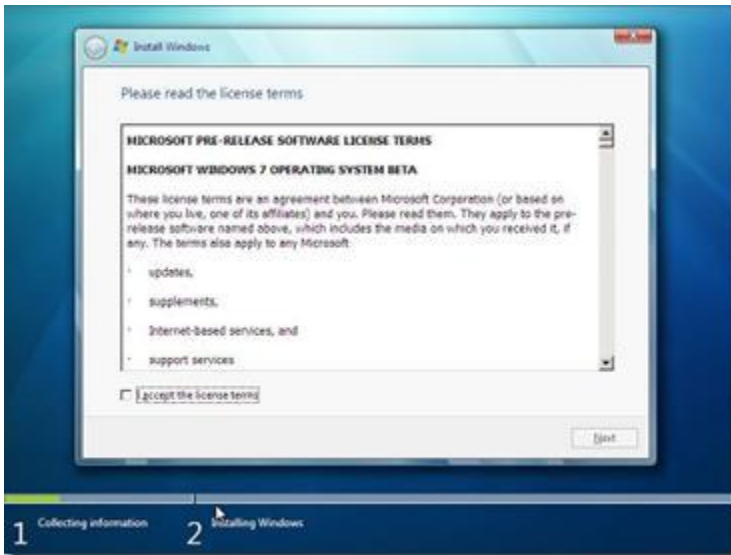
1. Boot your PC using Windows 7 DVD/USB drive and press any key if you see **Press any key to continue** message.
2. Next select your language, keyboard type (Generally the US) and time format.



3. Click the **Install** button.



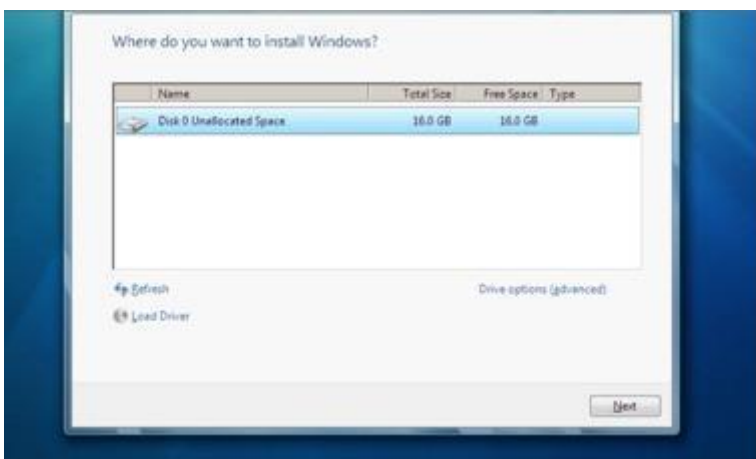
4. Click the box labelled **I agree with the license terms** and click **Next** to proceed further.



5. In the next screen, click on the **Custom (advanced)** option. I hope you are not upgrading here. If you are doing an upgrade then just click on the Upgrade option.



6. This is an important step as you need to select the drive where you would like to install Windows 7. Note that selecting a wrong partition will wipe out the data. Also, note that Windows 7 creates another small partition of about 200 MB if you are installing Windows 7 on an empty hard drive. The hidden 200MB partition will not be shown in the Windows Explorer!



7. You can also format the selected partition by opening drive option and then choosing the **Format** option.

8. Click on the **Next** button to start the Windows 7 installation. Windows may restart many times during the installation and you need not worry about that.



9. After completing the installation, Windows will give you the below screen to enter your username and password.



10. In the next step you will be asked to enter the Product Key. Enter the key that you have got and click the **Next** button.



11. Here you need to select the Windows 7 update option. Click **Use recommended settings** option.

9. Select Time Zone, date and time and click **Next**.

10. In the next screen, you need to select the type of network. That is, choose between Home network, Work network and Public network.



11. Finally, the setup will ask you to create a group depending on the type of Network you have chosen. If you are not sure, just skip as you can do it later as well.

12. You will see the Windows 7 desktop. That is, you have successfully installed Windows 7 on your PC

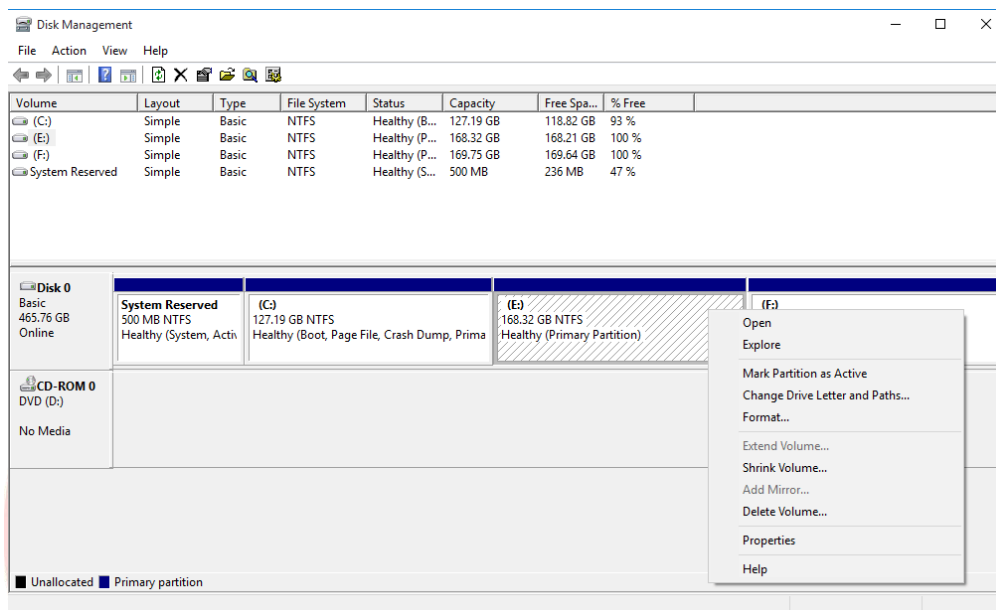
Make partitions in Windows 7 after installation

Method 1: Make partitions with Disk Management

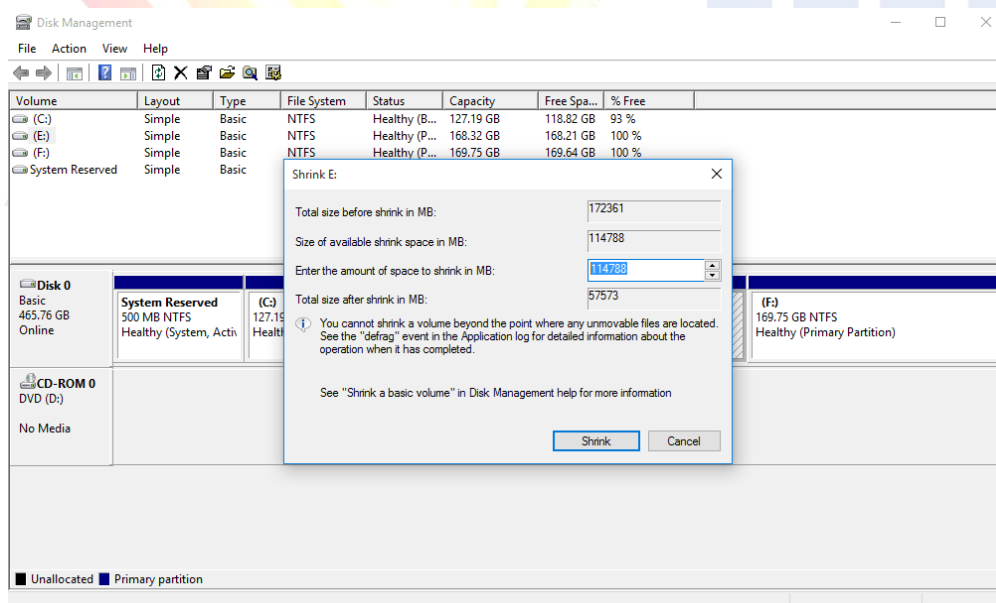
For example, you have C/D/E three primary partitions in Windows 7 after installation, and you want to make more partitions on this disk. Let's see how to make disk partition in Windows 7 after installation with **Disk Management**.

Step 1: Use Windows+R to open Run, type **"diskmgmt.msc"** and click OK.

Step 2: Right-click on the partition you wish to resize and select the Shrink Volume option.

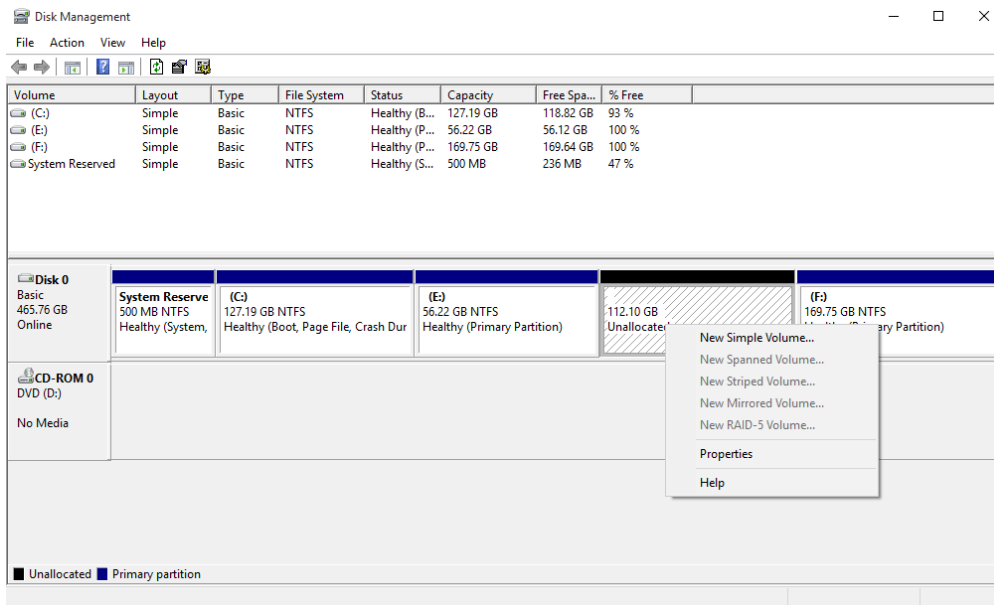


Step 3: Enter the size you wish to shrink your drive to in megabytes (1000 MB = 1GB). Then click on the Shrink button.



Note: You cannot shrink your volume more than the amount indicated in the Size of available shrink space in MB section.

Step 4: You should now see a new unallocated space in your Disk Management window. Right-click on the unallocated space and select the New Simple Volume option. The New Simple Volume Wizard should pop up. Click on the Next button to continue.



Step 5: Enter the amount of memory you wish to allocate for your new partition and click on the Next button. To store data on this partition, you must format it first. Click on the Format this volume with the following settings:

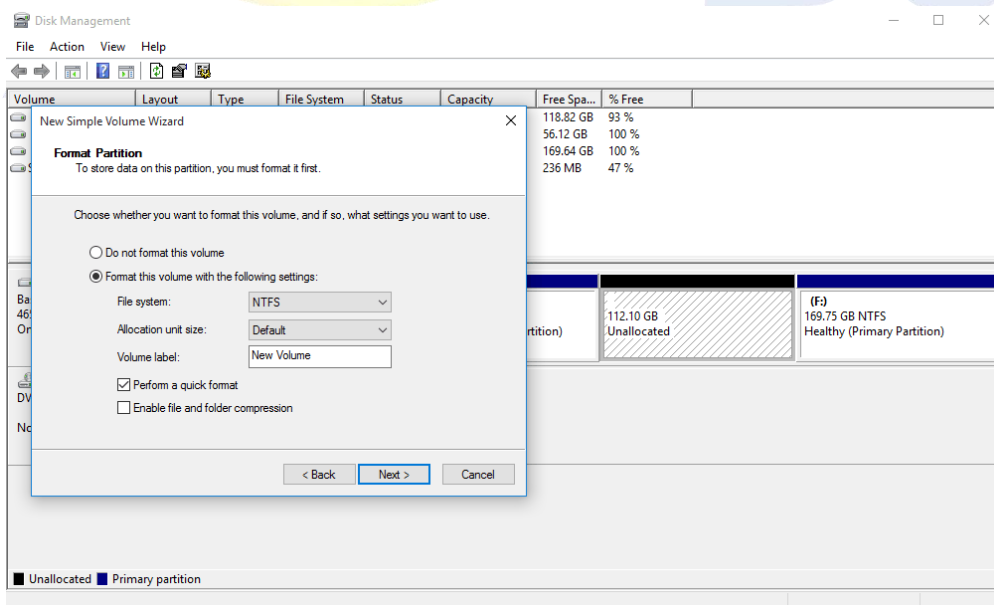
For File System, select NTFS

For Allocation unit size, select Default

For Volume Label, type the name you wish to give your new drive.

Click on the Perform a quick format

Then click on the Next button



If you want another new partition, follow the same step. If your disk is MBR, sometimes, you may receive an error message: you cannot create a new volume in this allocated space because the disk already contains the maximum number of partitions.

MBR disk only supports 4 primary partitions or 3 primary partitions and 1 extended partition at most. In this case, you have to [convert MBR to GPT](#)

Method 2: Make partitions with AOMEI Partition Assistant

Disk Management has some limitations, the size of available shrink space is very small, or even zero; Sometimes, the disk already contains the maximum number of partitions, and you do not want to delete an old one to create a new one with Disk Management, what should you do?

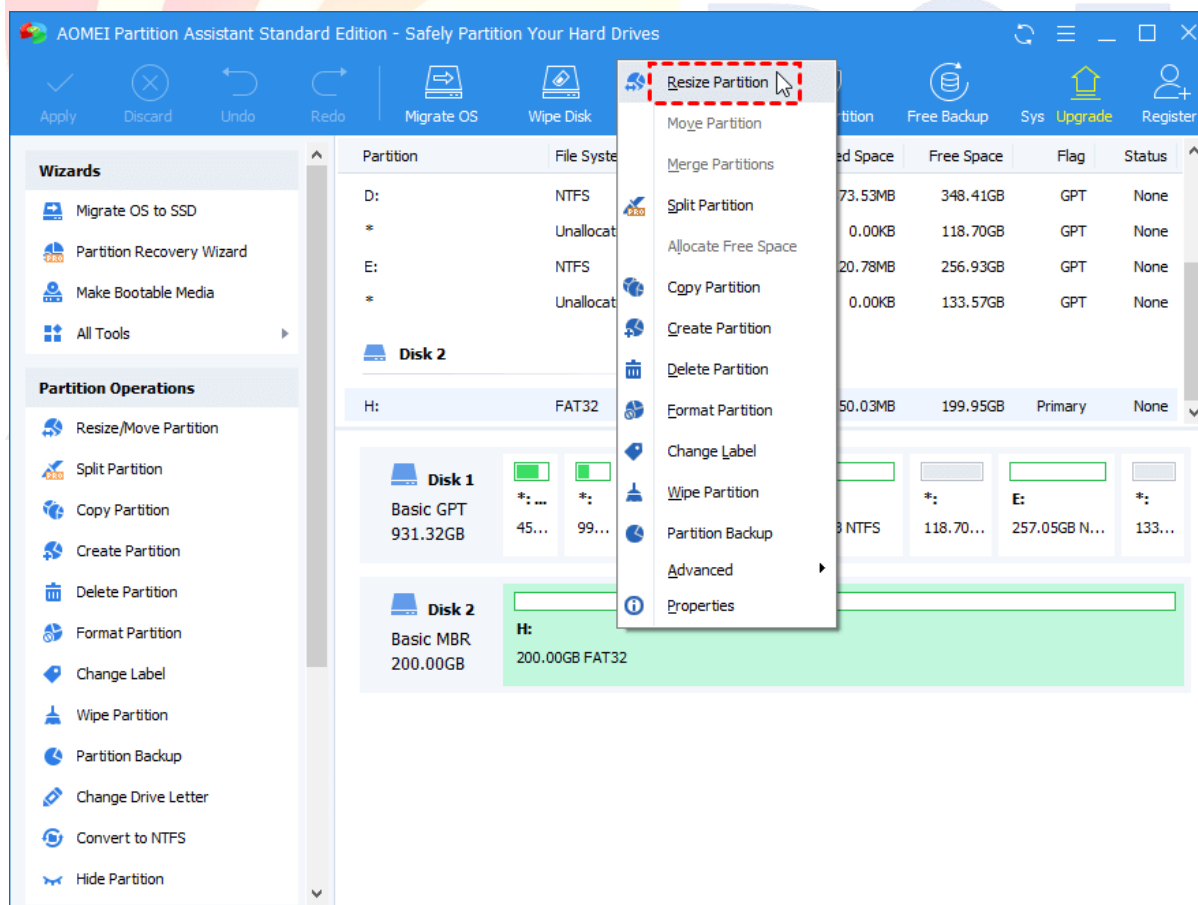
In this case, you can use a third-party software. [AOMEI Partition Assistant Standard](#) is a professional disk management tool. It is fast and free to use. It allows you to make partitions in Windows 7/8/10 without formatting. Let's see how to create partitions in Windows 7/8/10 with AOMEI Partition Assistant.

[Download FreewareWin 10/8.1/8/7/XP](#)

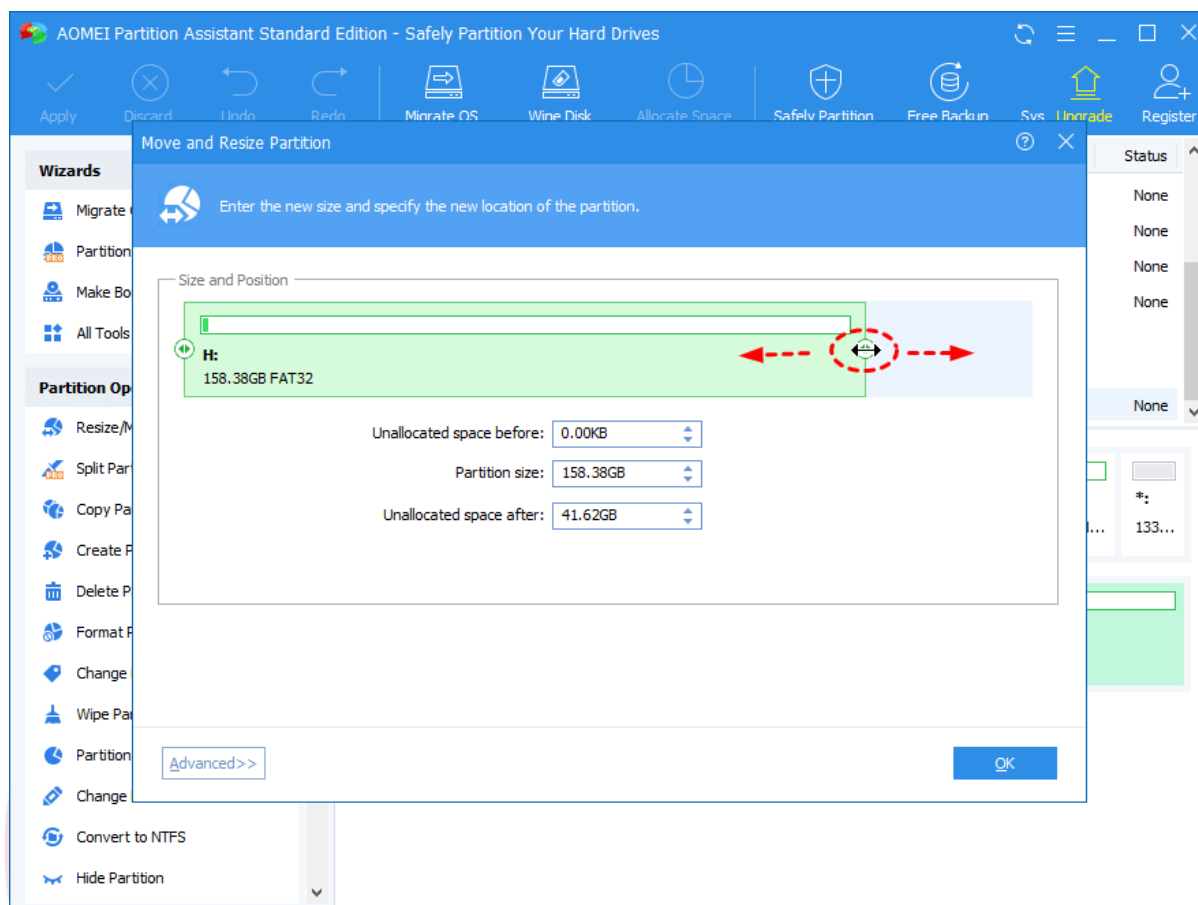
Secure Download

Step 1: Download AOMEI Partition Assistant and launch the software.

Step 2: Right-click the partition you want to shrink and choose Resize Partition.

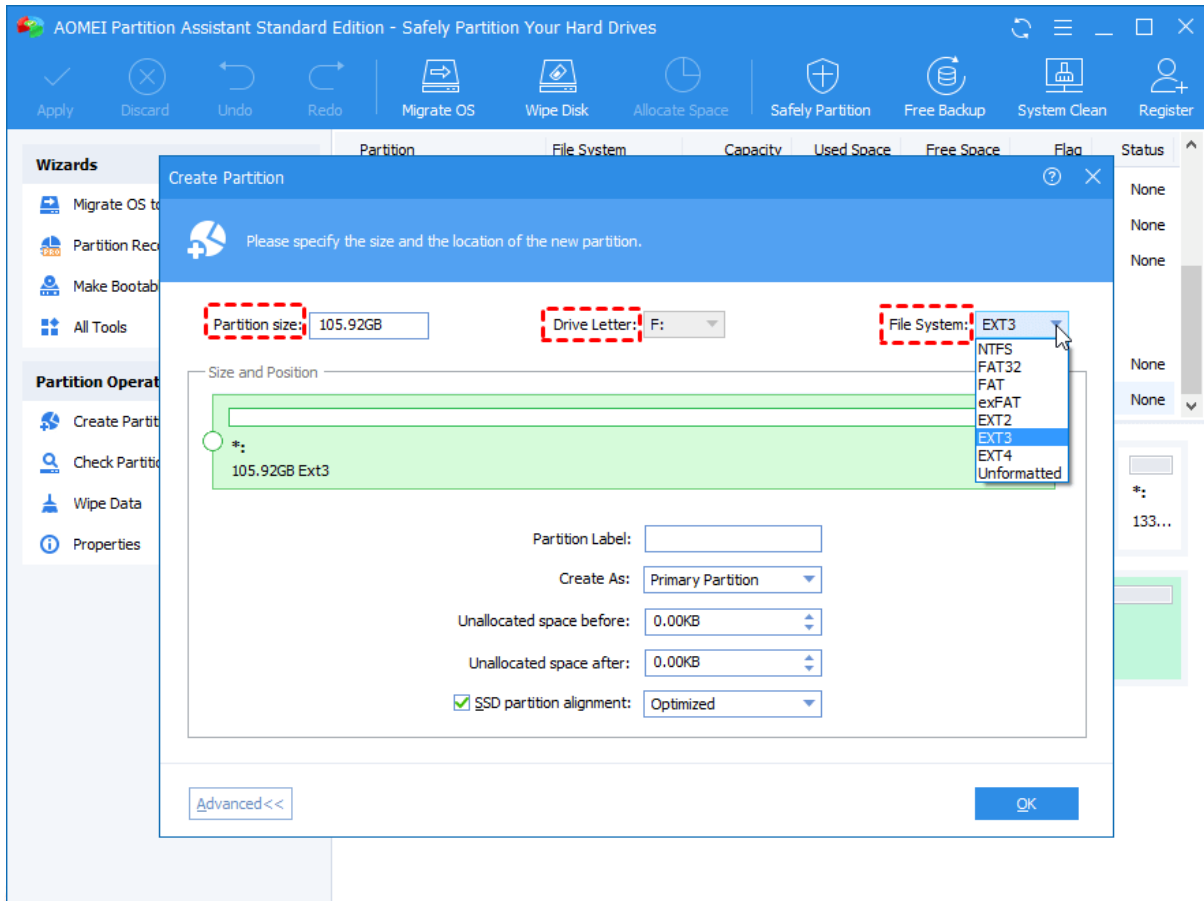


Step 3: Position the mouse pointer on the right border of the partition and drag the border rightwards to extend partition. Or type the size of unallocated space after. Then click OK.



Step 4: You will see there is an unallocated space of 55.96GB right after E partition. Right click the unallocated space and choose Create Partition. Type the Partition Size, choose Drive Letter and File System, then click OK.

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Step 5: Click Apply at upper left corner to save the change



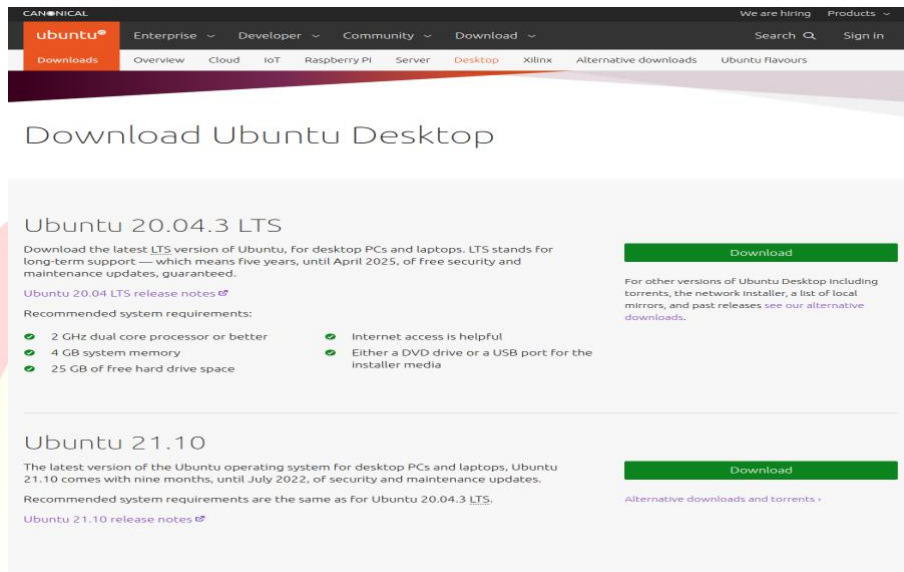
Lab- 9 Install operating System - Unix family (Linux/ Ubuntu)

Aim : Installing Ubuntu

Requirements: Computer, Ubuntu OS CD, CD Drive or pen drive

2. Download an Ubuntu Image

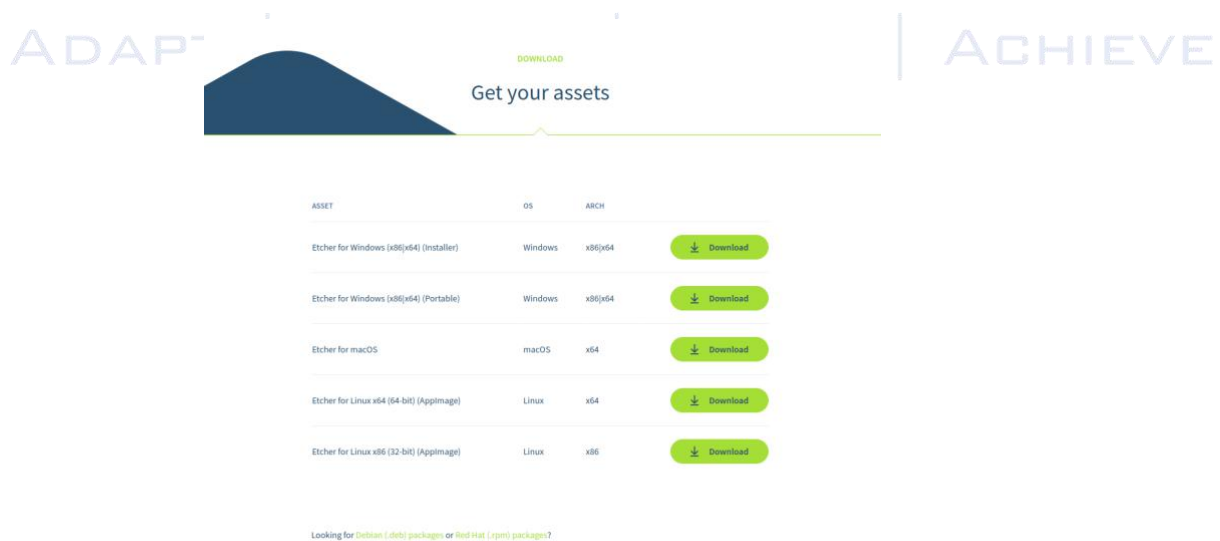
You can download an Ubuntu image here. Make sure to save it to a memorable location on your PC! For this tutorial, we will use the Ubuntu 20.04 LTS release.



3. Create a Bootable USB stick

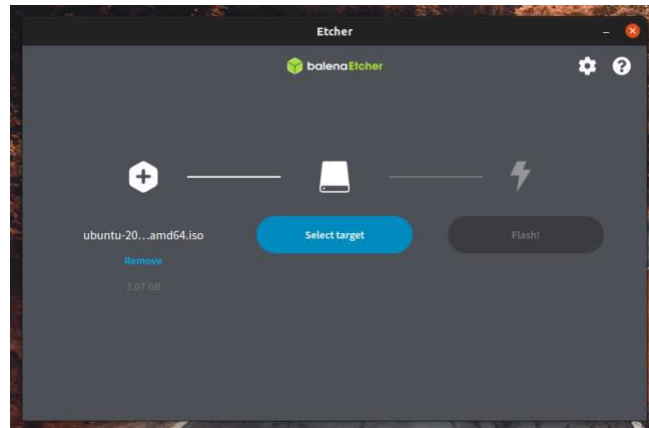
To install Ubuntu Desktop, you need to write your downloaded ISO to a USB stick to create the installation media. This is not the same as copying the ISO, and requires some bespoke software.

Choose the version that corresponds to your current operating system, download and install the tool.



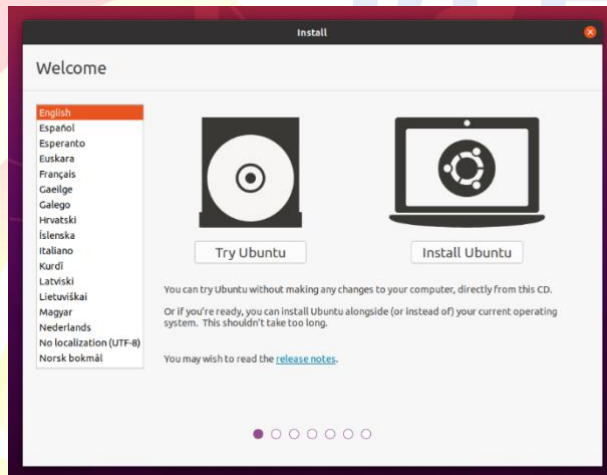
Rufus on Windows, Etcher on Mac OS and Startup Disk Creator on Ubuntu.

Select your downloaded ISO, choose your USB flash drive, and then click Flash! to install your image



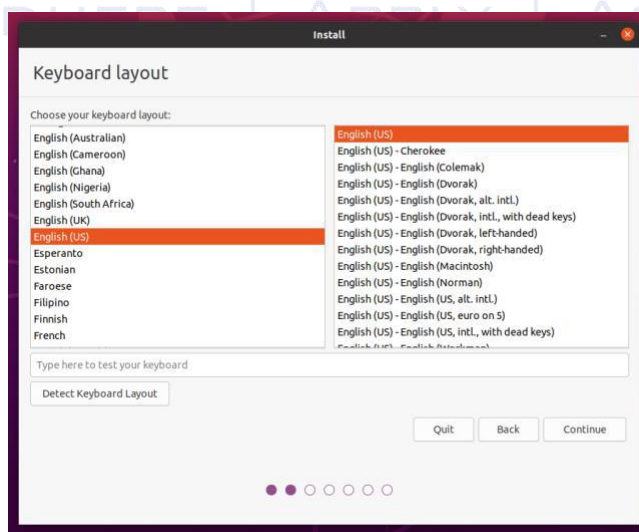
4. Boot from USB flash drive

Insert the USB flash drive into the laptop or PC you want to use to install Ubuntu and boot or restart the device. It should recognise the installation media automatically. If not, try holding F12 during startup and selecting the USB device from the system-specific boot menu.



To proceed, click Install Ubuntu.

You will be asked to select your keyboard layout. Once you've chosen one, click Continue.

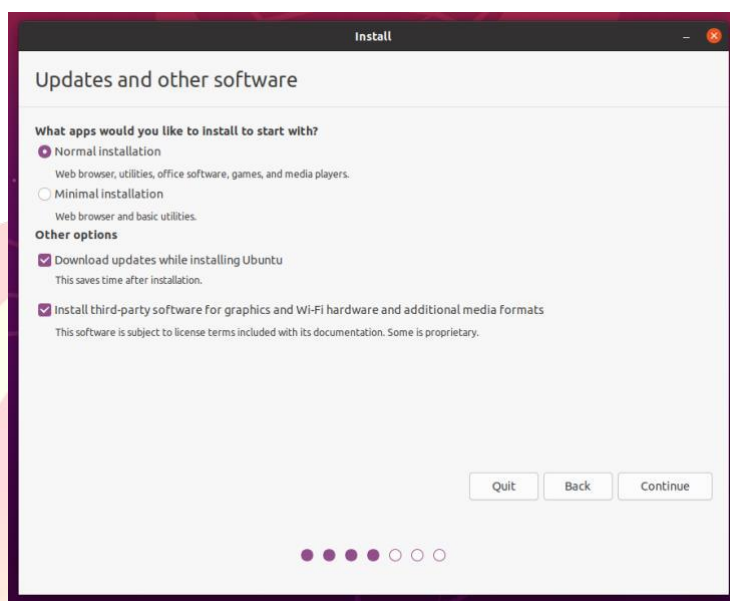


5. Installation Setup

Next, you will be prompted to choose between the Normal installation and Minimal installation options. The minimal installation is useful for those with smaller hard drives or who don't require as many pre-installed applications.

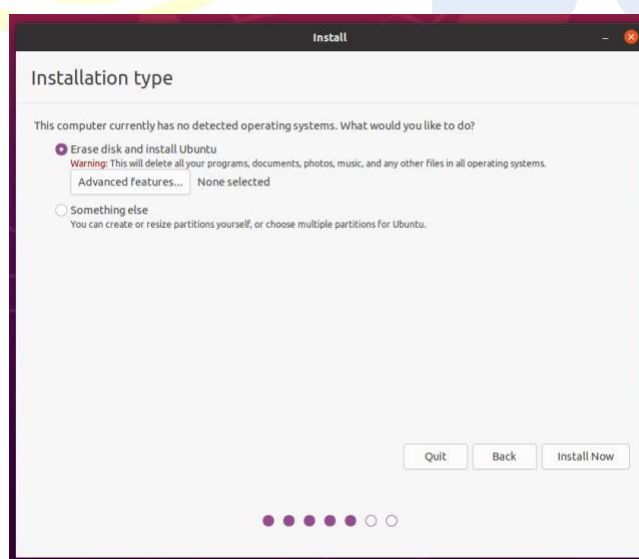
In Other options, you will be prompted to download updates as well as third-party software that may improve device support and performance (for example, Nvidia graphics drivers) during the installation. It is recommended to check both of these boxes.

If you are not currently connected to the internet, you will be prompted to do so at this point. Ensure you are able to remain connected throughout the installation.

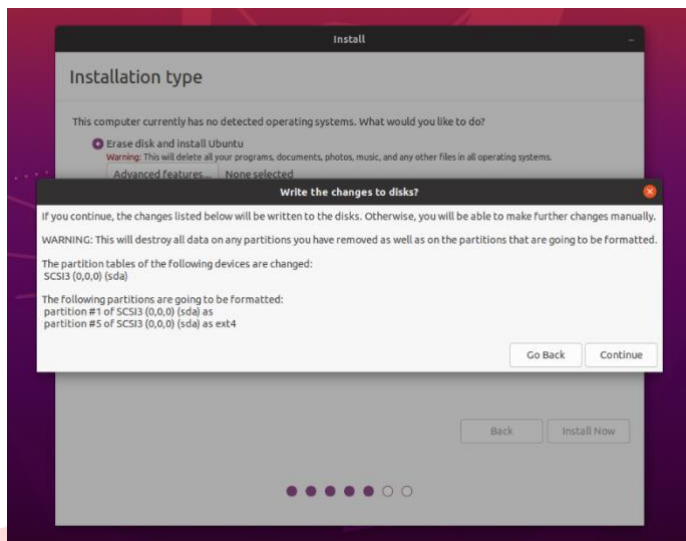


6. Drive Management

This screen allows you to configure your installation. If you would like Ubuntu to be the only operating system on your device, select Erase disk and install Ubuntu.

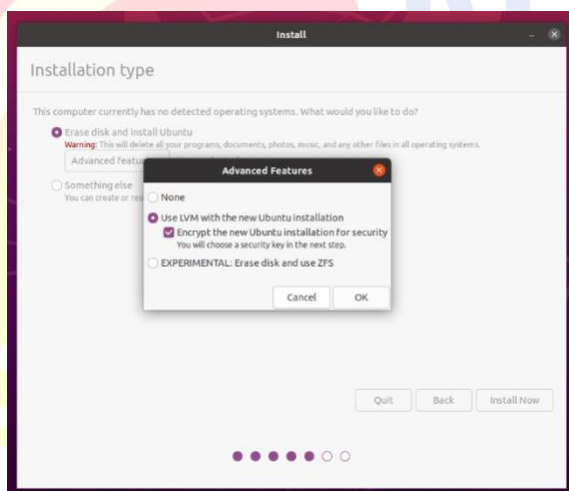


If you continue the installation without enabling encryption, click Install Now and confirm the changes with Continue. Otherwise keep reading.

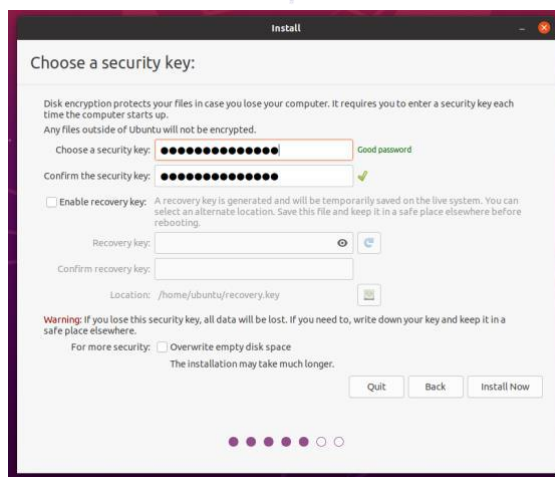


7. (Optional) Enable Encryption

If you would like to encrypt your device, select Advanced features... > Use LVM with the new Ubuntu installation > Encrypt the new Ubuntu installation for security.



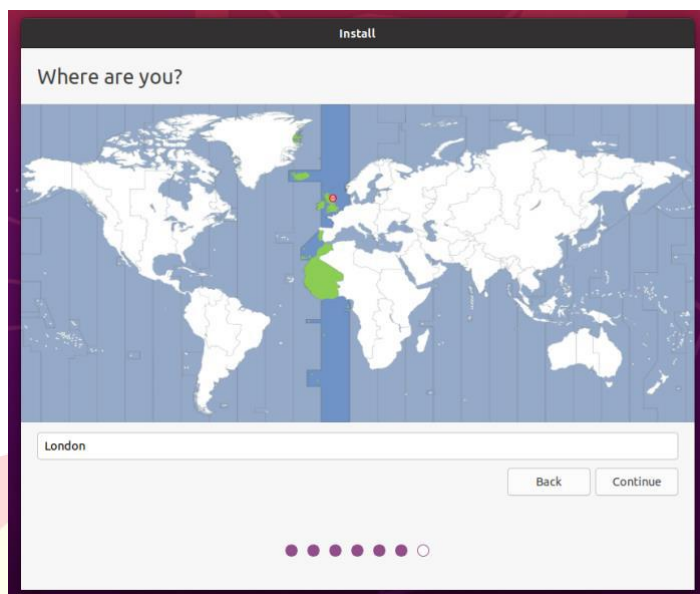
You will be prompted to create a security key once you click Install Now.



Click Install Now and confirm the changes with Continue.

8. Choose your Location

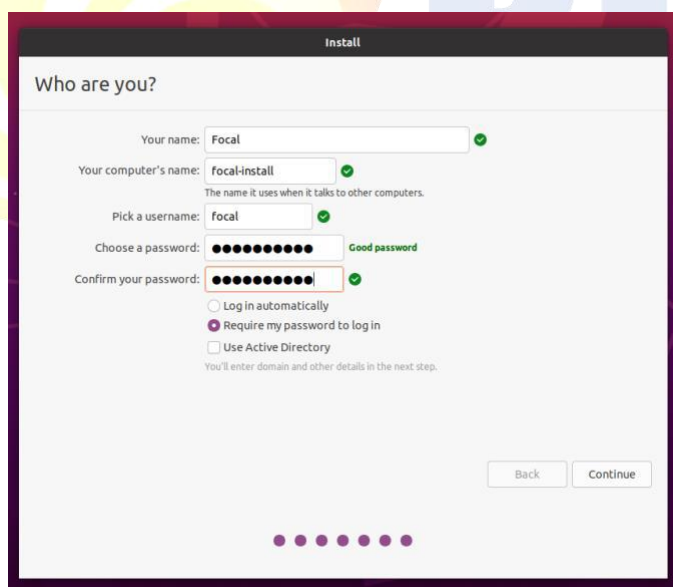
Select your location and timezone from the map screen and click Continue. This information will be detected automatically if you are connected to the internet.



9. Create Your Login Details

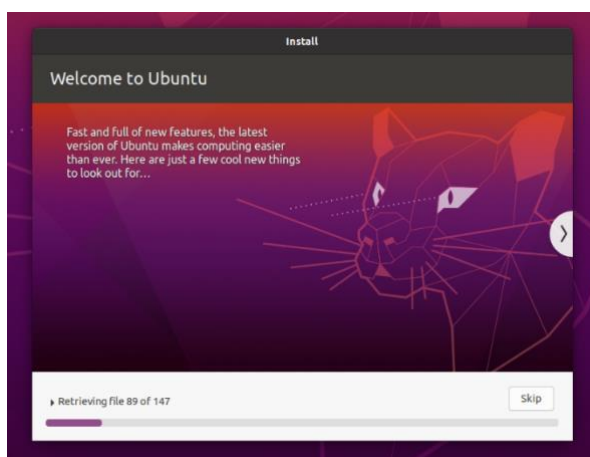
On this screen, you will be prompted to enter your name and the name of your computer as it will appear on the network. Finally, you will create a username and a strong password.

You can choose to log in automatically or require a password. If you are using your device whilst travelling, it's recommended to keep automatic login disabled.



10. Complete the Installation

Now sit back and enjoy the slideshow as Ubuntu installs in the background!



Once the installation has completed, you will be prompted to restart your machine.

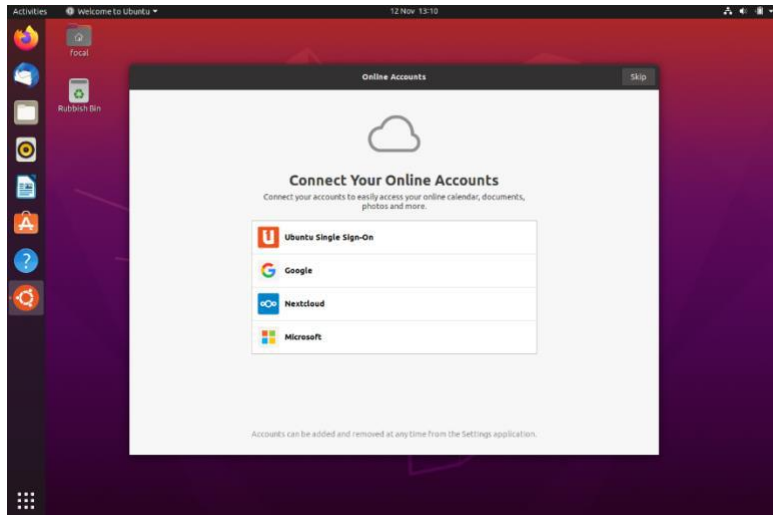
Click Restart Now.

When you restart, you will be prompted to remove your USB flash drive from the device. Once you've done this, press ENTER.



Enter your password on the login screen (assuming you selected that option when creating your login details).





The welcome widget will help you with some additional setup options, including:

welcome widget you with some

- Connecting your profile to various online accounts.
- Configure Livepatch to automatically apply updates to your device (this option is only available when using a long term support [LTS] version of Ubuntu).
- Opting into sending device information to Canonical to help improve Ubuntu (by default, Canonical doesn't collect device information).
- Activating location services.
- Downloading additional apps from Ubuntu Software.

It's always good practice to ensure your system is up to date, especially after a fresh install.

The easiest way to do this is via the Software Updater app. Search for Software Updater via the app menu (the icon with 9 squares in the bottom corner of your window) and it will check for updates and apply them.

You can also update Ubuntu using the terminal.

Press CTRL+ALT+T to bring up a Terminal window (or click the terminal icon in the sidebar).

Type in:

sudo apt update

You will be prompted to enter your login password.

This will check for updates and tell you if there are any that need applying. To apply any updates, type:

sudo apt upgrade

Type Y, then press ENTER to confirm to finish the update process.

Lab- 10 Install Application Software – Python3.8, Office2010/2013, Ms SQL, TOAD , Openoffice etc,

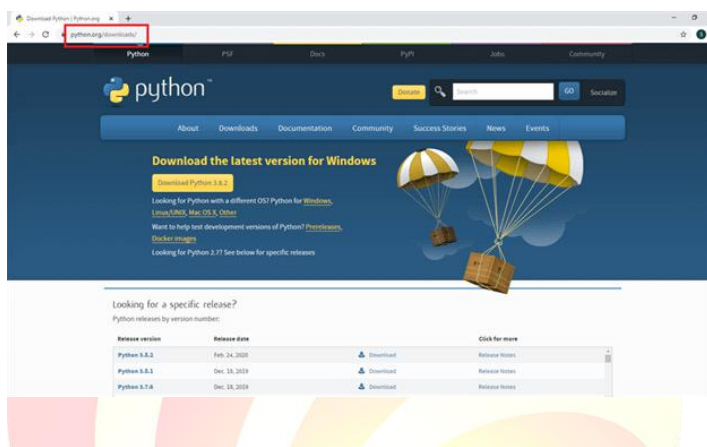
Aim : Installing Python3.8, Openoffice etc

Requirements: Application software - Python3.8, Office2010/2013, Ms SQL, TOAD , Openoffice etc

Installing Python.3.8

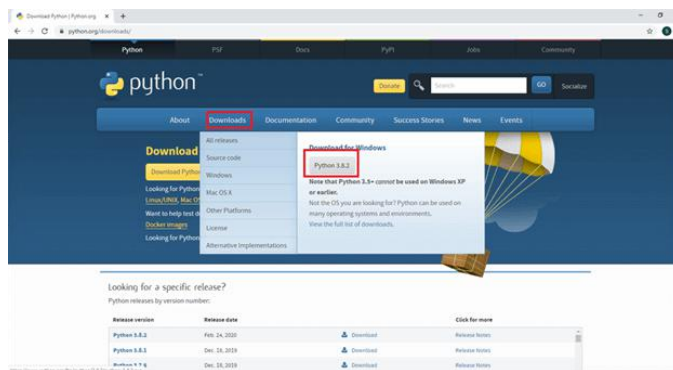
Step 1

Click this link, it will take you to the Python official download website.



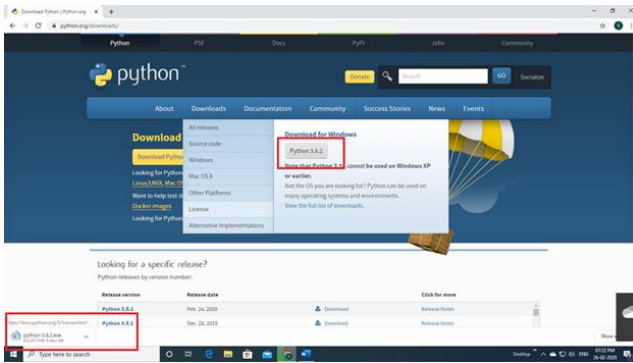
Step 2

Click the download button and you will see Python 3.8.2.



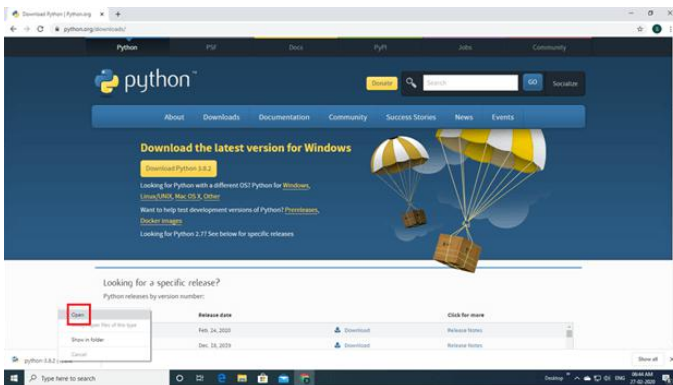
Step 3

Click Python 3.8.2 and Python will start to download.



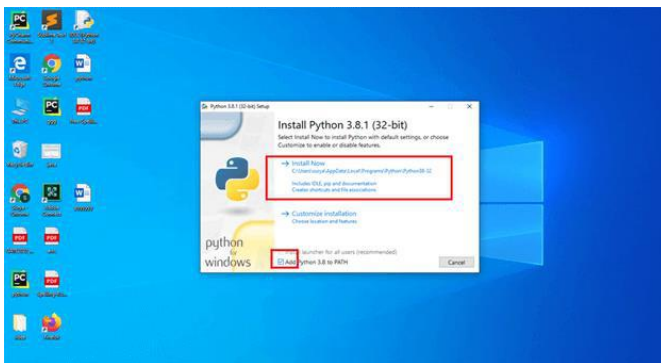
Step 4

Next, right click the mouse button you will see open button click to open.



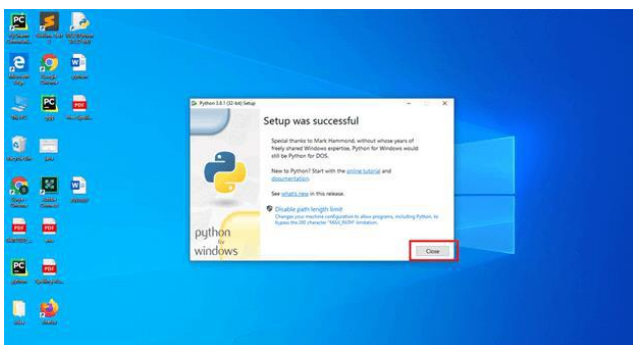
Step 5

Enable to add Python 3.8 to path and click install now.



Step 6

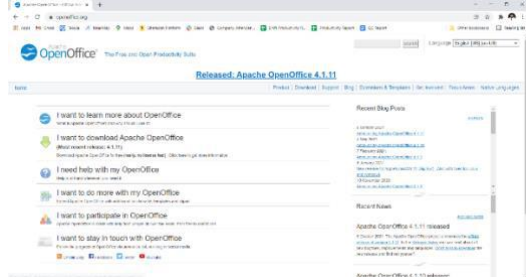
Wait a few minutes and display setup was successful. Next you will click the close button.



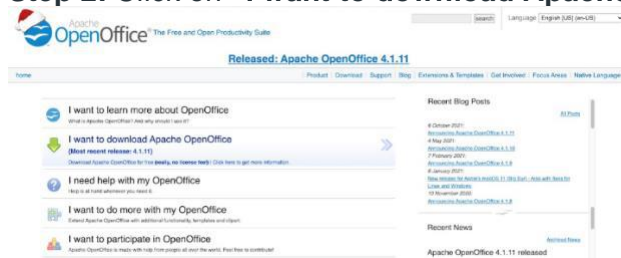
Installing Openoffice

Follow the below steps to install Apache OpenOffice on Windows:

Step 1: Visit the official website using URL <https://www.openoffice.org/> in any web browser.



Step 2: Click on “I want to download Apache OpenOffice” link.



Step 3: The link directs us to the download page on which we choose your operating system, language, and version of the Apache OpenOffice, and then click on the **Download full installation** button.

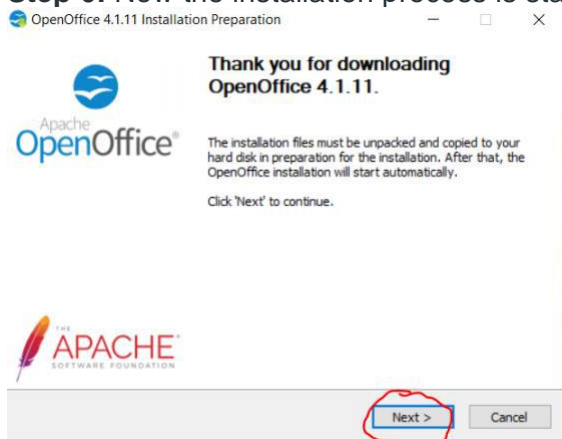


Step 4: Now find the executable file in the download folder of your system and run it.

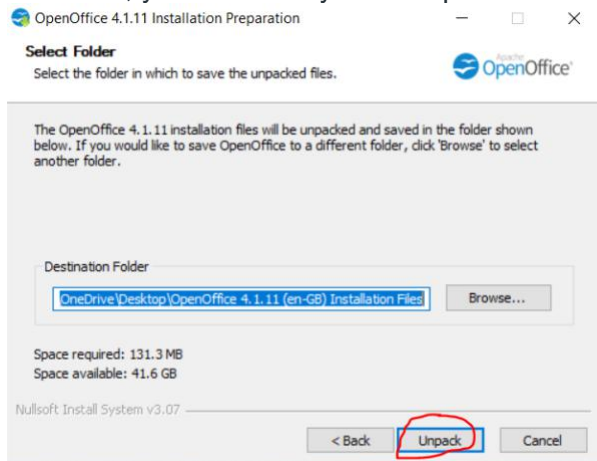


Step 5: It will confirm that the software makes changes to your system, so click on the **Yes** button.

Step 6: Now the installation process is started so click on the **Next** button.



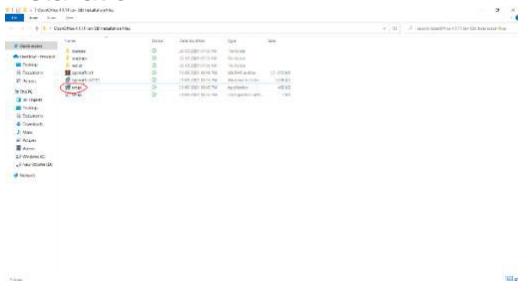
Step 7: Next screen will be of Unpack the Apache OpenOffice in which you want to choose your location where you want your extract folder, in this folder, the setup will take place, and after that, you continue your setup in that folder. Now click on the Unpack button.



Step 8: After Unpack the setup will automatically start if not started then find your place where you unpack your Setup and open that folder.

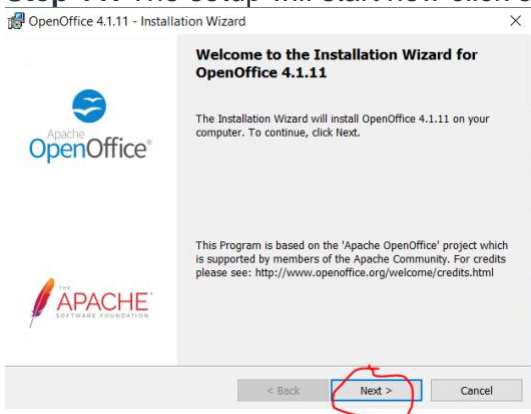


Step 9: Now in the folder you find many files but click only on the setup to continue your installation.

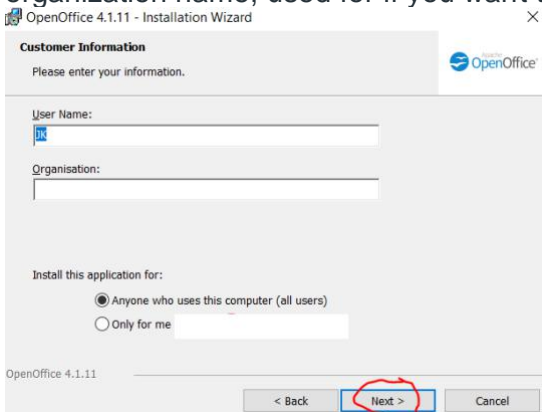


Step 10: After double click again you see the prompt confirmation of the setup to make changes to your system. Click on **Yes**.

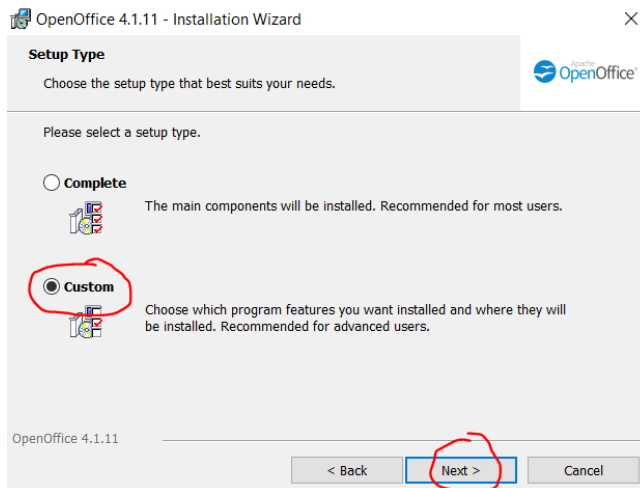
Step 11: The setup will start now click on the **Next** button.



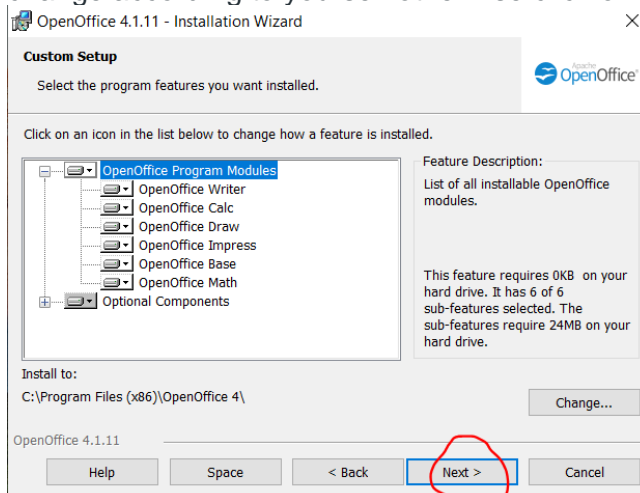
Step 12: Next screen will be of customer information where you write your name and organization name, used for if you want to otherwise click on the **Next** button.



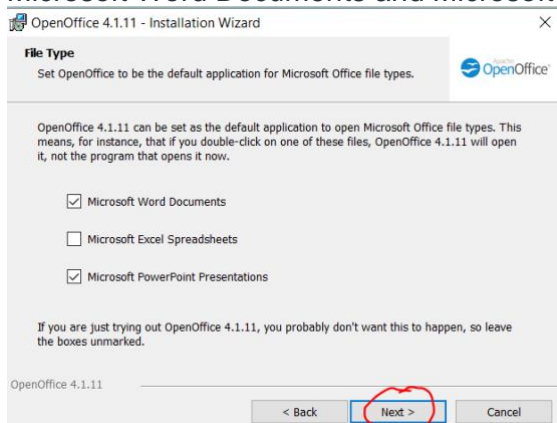
Step 13: Next screen will be of setup type if you want direct installing your software then click on complete and Next it is for basic users and if you Customize your setup then click on custom and then Next it is recommended for Advanced User.



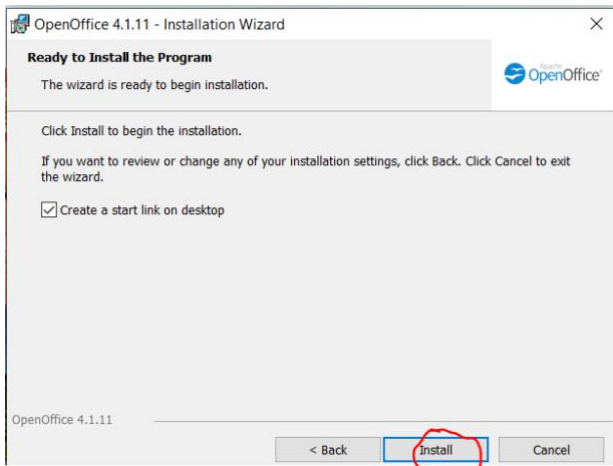
Step 14: Next screen will be of the program modules and components choose the drive change according to yourself otherwise click on the Next button.



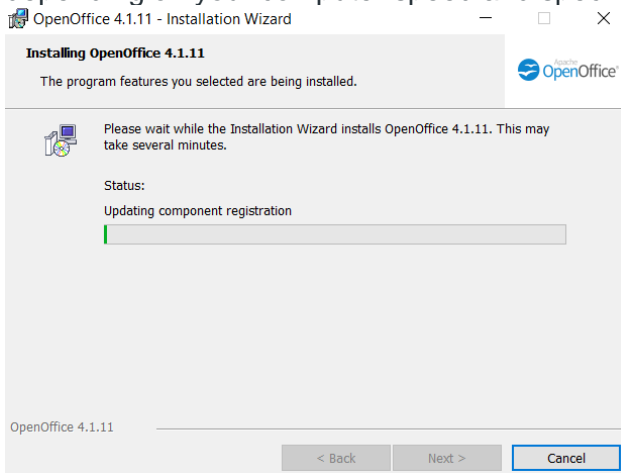
Step 15: Next screen will be of Choose file type and click on Next button. Here we select Microsoft Word Documents and Microsoft PowerPoint Presentation.



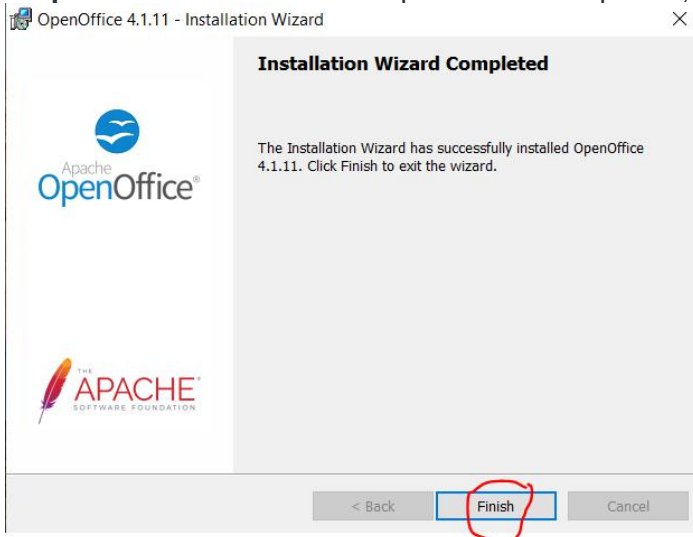
Step 16: Now the program is ready to install Click on the **Install** button.



Step 17: After this, the installation process will start and it might take 2 – 4 minutes depending on your computer speed and specification to complete the installation.



Step 18: After the installation process is completed, click on the **Finish** button.



At this point, Apache OpenOffice is successfully installed on the system and an icon is created on the desktop.



Lab 11- Install anyone of the antivirus software (Avast, Kaspersky etc) and observe the variations before and after installation.

Aim : Installing antivirus software

Requirements: Antivirus software - Avast, Kaspersky

Install Avast Free Antivirus

1. Click the button below to download the **Avast Free Antivirus** setup file, and save it in a familiar location on your PC (by default, downloaded files are saved to your **Downloads** folder).

[DOWNLOAD AVAST FREE ANTIVIRUS FOR WINDOWS](#)

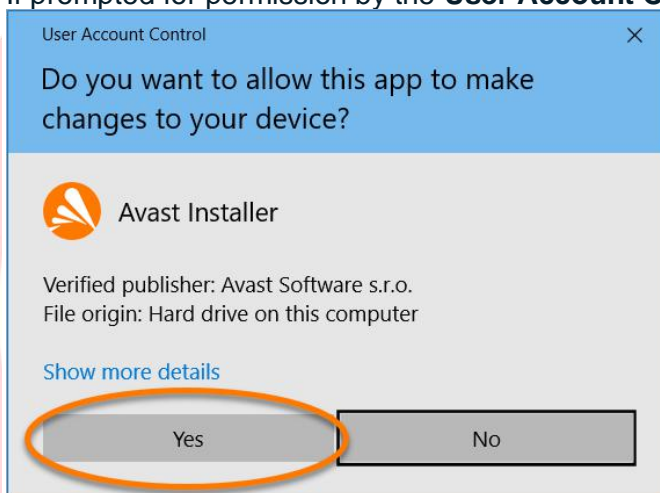
2. Right-click the downloaded setup file `avast_free_antivirus_setup_online.exe` and select **Run as administrator** from the context menu.



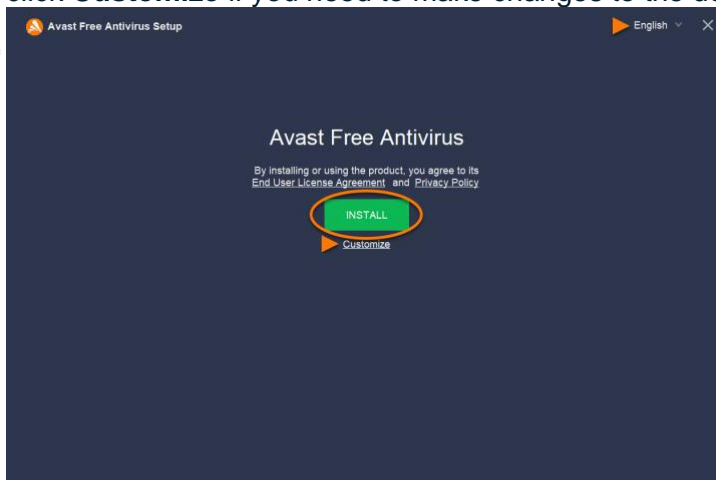
NOTE: If you do not see the **Run as administrator** option, refer to the following article for instructions to manage administrative accounts on your PC:

Managing administrative accounts on your Windows PC

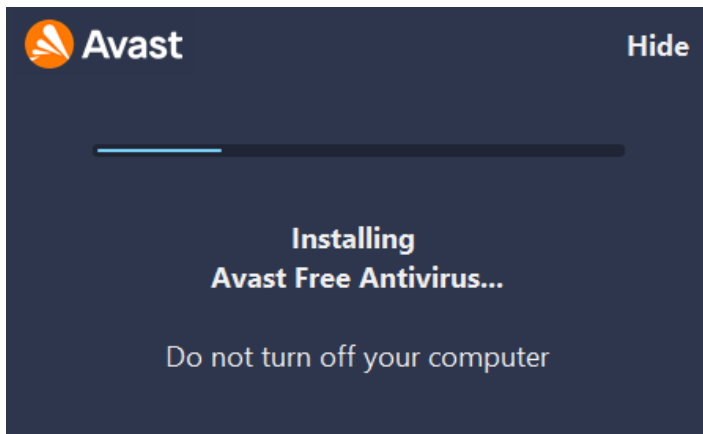
4. If prompted for permission by the **User Account Control** dialog, click **Yes**.



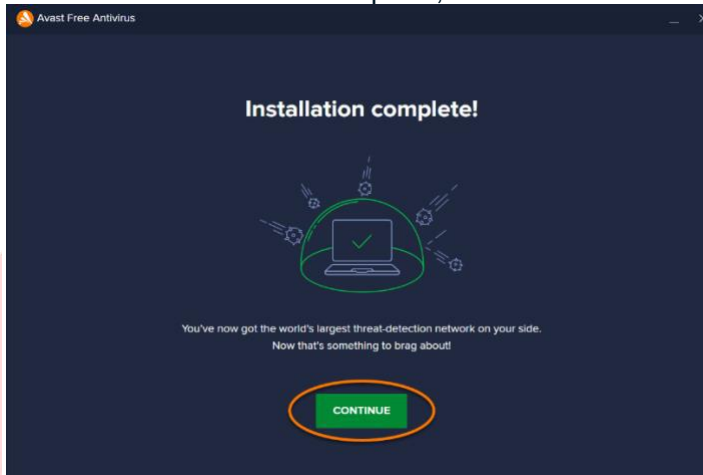
5. To change the default setup language, click the current language in the top-right corner of the screen. Then, click **Install** to proceed with default installation, or click **Customize** if you need to make changes to the default setup.



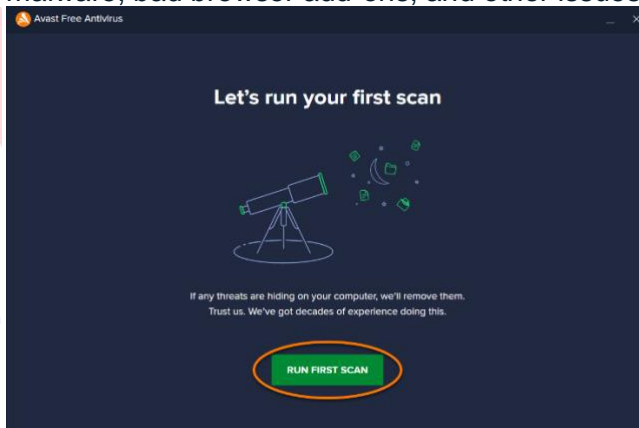
6. Wait while setup installs Avast Free Antivirus on your PC.



7. When the installation is complete, click **Continue**.



8. Click **Run first scan** to start a comprehensive **Smart Scan**, which detects viruses, malware, bad browser add-ons, and other issues on your PC.



Avast Free Antivirus is now installed on your PC and ready to use, but some components may not fully function until you restart your PC.

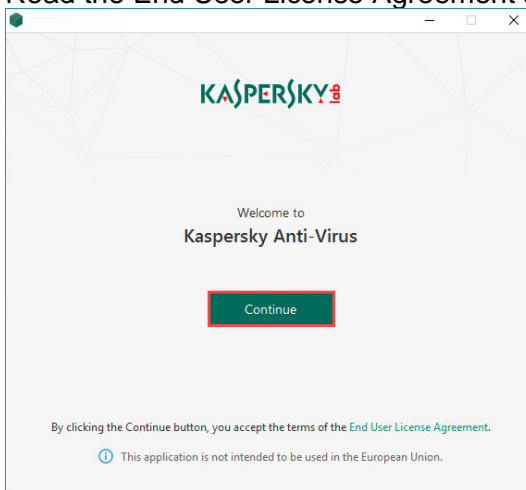
It is no longer necessary to register Avast Free Antivirus, as your initial free subscription automatically activates after installation.

Install Kaspersky Antivirus

1. Download the Kaspersky Anti-Virus installation package from the Kaspersky website, or via the link in the email you received from us.
2. Run the installer.
3. Wait until the searching for a newer version of the application has been completed, or click **Skip**.



4. Read the End User License Agreement and click **Continue** if you agree to the terms.

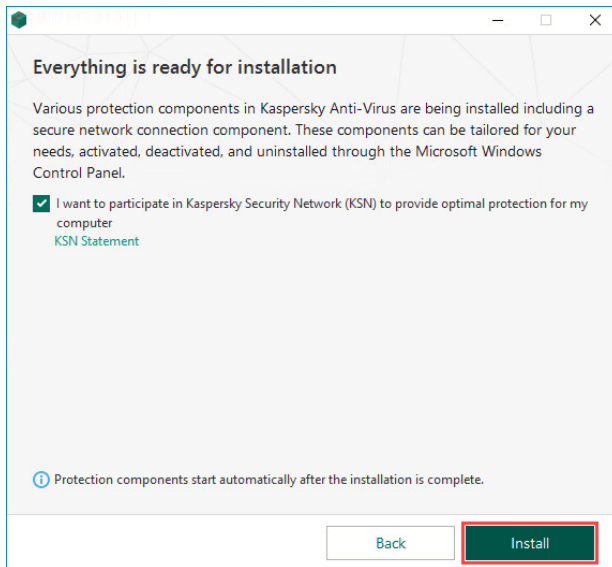


5. Read the Kaspersky Security Network Statement carefully. Select the checkbox if you agree to the terms.

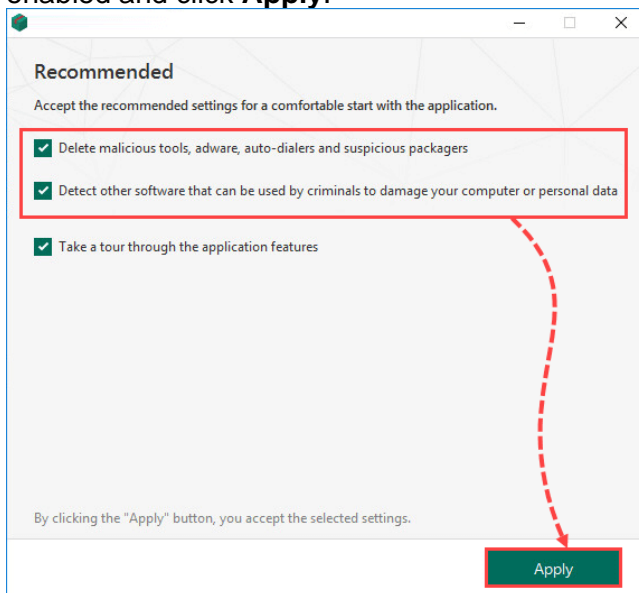
If you don't want to participate in the Kaspersky Security Network, clear the checkbox.

6. Together with Kaspersky Internet Security, Kaspersky Secure Connection will be installed to ensure protected connection to the Internet. Click **Install**.

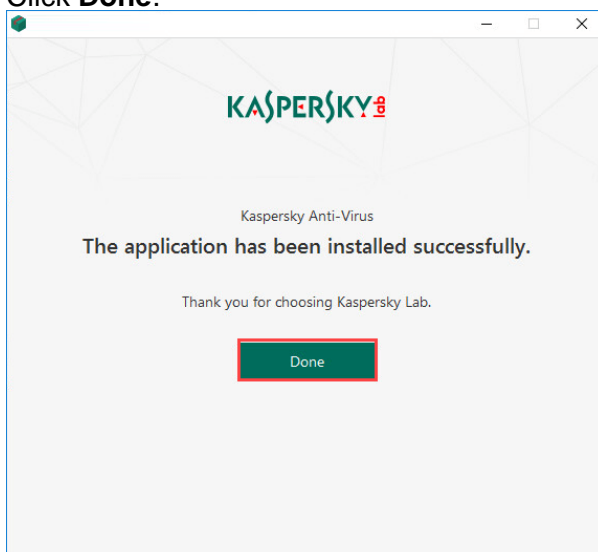
7.



8. Wait for the installation to complete. Make sure the recommended settings are enabled and click **Apply**.



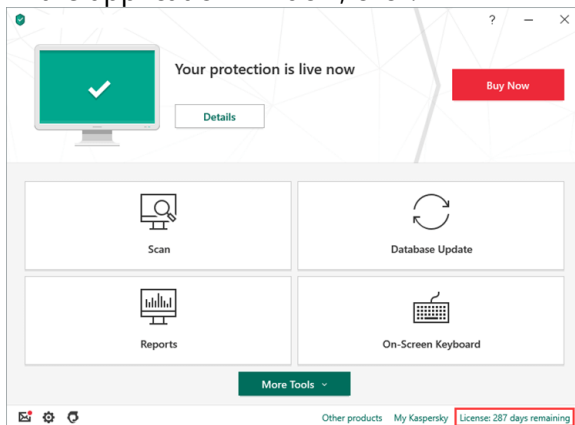
9. Click **Done**.



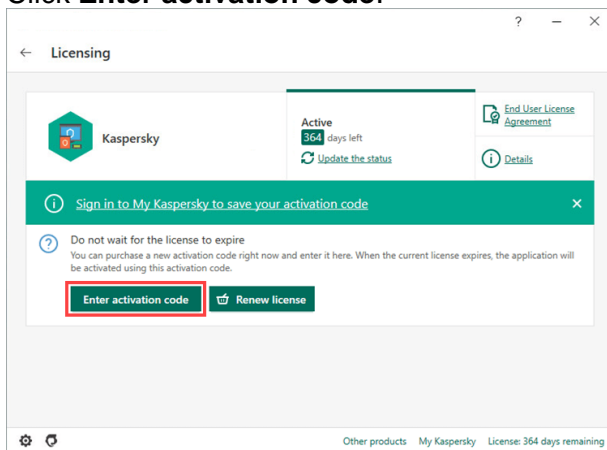
Kaspersky Anti-Virus will now be installed

To activate the application:

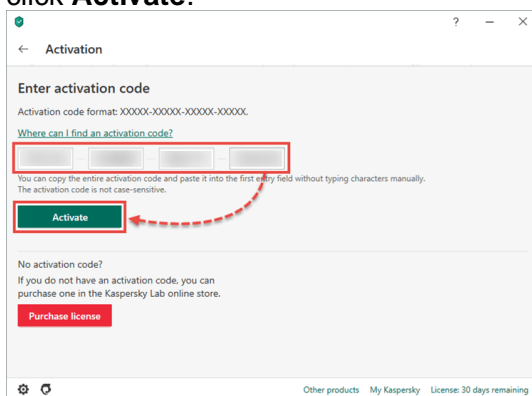
1. In the application window, click.



2. Click **Enter activation code**.



3. Enter the code from the message you have received after buying the license and click **Activate**.



4. Click **Done**.

Kaspersky Anti-Virus is now activated.

Lab- 12 Add new Hardware device (keyboard, mouse, speaker, Microphone)

Aim : Adding keyboard, mouse, speaker, Microphone

Requirements: Computer, keyboard, mouse, speaker, Microphone

Same setting for all device. (keyboard, mouse, speaker, Microphone)

In Windows XP and Windows 7 need to add device

Installing Hardware Automatically

Windows XP Professional supports Plug and Play hardware. For most devices that are Plug and Play-compliant, as long as the appropriate driver is available and the basic input/output system (BIOS) on the computer is a Plug and Play BIOS or an Advanced Configuration and Power Interface (ACPI) BIOS, Windows XP Professional automatically detects, installs, and configures the device. When there is a new piece of hardware detected that cannot be installed automatically, Windows XP Professional displays the Found New Hardware Wizard (see Figure 11.1).



Figure 11.1?? *The Found New Hardware Wizard*

However, you might occasionally need to initiate automatic installation for some Plug and Play hardware. You do this with the Add Hardware Wizard. For non-Plug and Play hardware, Windows XP Professional often identifies the hardware and automatically installs and configures it. For non-Plug and Play hardware that Windows XP Professional does not identify, install, and configure, you initiate the automatic installation of the hardware with the Add Hardware Wizard.

To automatically install hardware, complete the following steps:

1. Click Start, click Control Panel, and then click Printers And Other Hardware.
2. In the Printers And Other Hardware window, under See Also, click Add Hardware to start the Add Hardware Wizard.

Windows XP Professional queries the hardware about the hardware resources that it requires and the settings for those resources. A hardware resource allows a hardware device to communicate directly with the operating system. Windows XP Professional can resolve conflicts between Plug and Play hardware for hardware resources.

3. Confirm the automatic hardware installation.

After Windows XP Professional finishes the installation, you should verify correct installation and configure the hardware.

Using the Add Hardware Wizard

You can also use the Add Hardware Wizard to initiate automatic hardware installation for undetected hardware devices, both Plug and Play and non-Plug and Play, and to troubleshoot devices.

To start the Add Hardware Wizard, do the following:

1. In Control Panel, click Printers And Other Hardware.
2. Click Add Hardware.

Windows XP Professional starts the Add Hardware Wizard, which is used to install software to support the hardware you add to your computer and to troubleshoot problems that you might be having with your hardware.

You can also click System in the Performance And Maintenance window accessed from Control Panel and start the Add Hardware Wizard from the Hardware tab of the System Properties dialog box.

3. Click Next to close the Welcome To The Add Hardware Wizard page.

Windows XP Professional searches for new devices and one of the following three events occurs:

- If Windows XP Professional detects any new Plug and Play hardware, it installs the new hardware.
- If Windows XP Professional detects new hardware, it starts the Found New Hardware Wizard.
- If the wizard cannot find a new device, it displays the Is The Hardware Connected page. If you have already connected the new device, click Yes, I Have Already Connected The Hardware and then click Next. The wizard displays the The Following Hardware Is Already Installed On Your Computer page, shown in Figure 11.2. To add hardware that is not in the list, click Add A New Hardware Device.



Figure 11.2??? Adding hardware or troubleshooting with the Add Hardware Wizard

To use the Add Hardware Wizard to troubleshoot a hardware device, click the device in the list of installed hardware devices and click Next. The Completing The Add Hardware Wizard page appears. Click Finish to launch a troubleshooter to help resolve any problems you might be having with that hardware device.

Confirming Hardware Installation

After installing hardware, you should confirm the installation using the Device Manager.

You can do the following to start Device Manager:

1. In Control Panel, click Performance And Maintenance.
2. Click System.
3. Click the Hardware tab, and then click Device Manager.

Device Manager can also be launched from the Computer Management console. It is a snap-in located under System Tools.

This allows you to view the installed hardware, as shown in Figure 11.3.

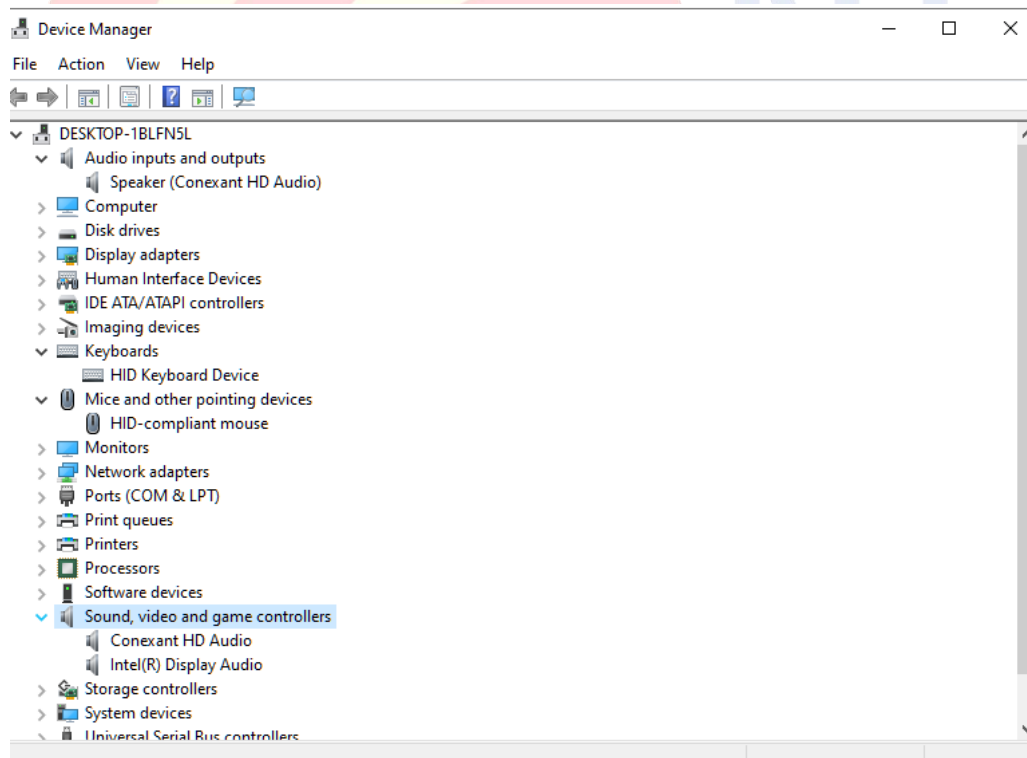


Figure 11.3 Device Manager showing devices listed by type

Windows XP Professional uses icons in the Device Manager window to identify each installed hardware device. If Windows XP Professional does not have an icon for the device type, it displays a question mark.

Expand the device tree to locate the newly installed hardware device. The device icon indicates whether the hardware device is operating properly. You can use the information in Table 11.1 to determine the hardware status.

Installing Hardware Manually

To manually install hardware, first determine which hardware resource is required by the hardware device. Next, you must determine the available hardware resources. In some cases, you will have to change hardware resources. Finally, you might have to troubleshoot any problems you encounter.

Determining Which Hardware Resources Are Required

When installing new hardware, you need to know what resources the hardware can use. You can reference the product documentation to determine the resources that a hardware device requires. Table 11.2 describes the resources that hardware devices use to communicate with an operating system.

Table 11.2 *Hardware Device Resources*

Determining Available Hardware Resources

After you determine which resources a hardware device requires, you can look for an available resource. Device Manager provides a list of all hardware resources and their availability, as shown in Figure 11.4.

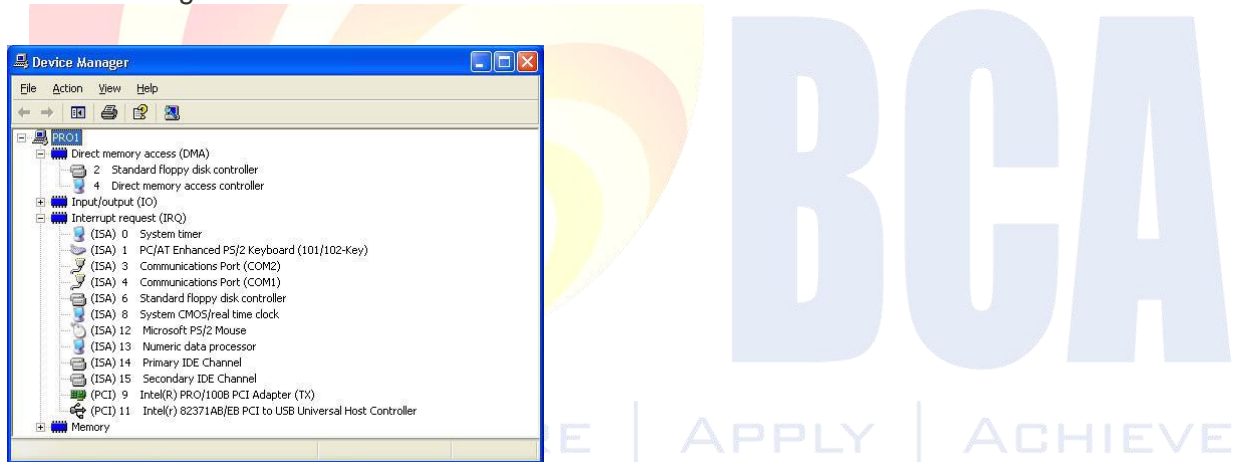


Figure 11.4 *Device Manager showing resources listed by connection*

You can do the following to view the hardware resource lists:

1. In the System Properties dialog box, click the Hardware tab, and then click Device Manager.
2. On the View menu, click Resources By Connection.

The Device Manager displays the resources that are currently in use (for example, IRQs).

3. To view a list of resources for another type of hardware resource, click the type of hardware resource you want to see on the View menu.

When you know which hardware resources are available, you can install the hardware manually with the Add Hardware Wizard.

If you select a hardware resource during manual installation, you might need to configure the hardware device so that it can use the resource. For example, for a network adapter to use IRQ 5, you might have to set a jumper on the adapter and configure Windows XP Professional so that it recognizes that the adapter now uses IRQ 5.

Changing Hardware Resource Assignments

You might need to change hardware resource assignments. For example, a hardware device might require a specific resource presently in use by another device. You might also encounter two hardware devices requesting the same hardware resource, resulting in a conflict.

To change a resource setting, use the Resources tab in the device's Properties dialog box. You can use the following procedure to access the Resources tab:

1. In the Hardware tab of the System Properties dialog box, click Device Manager.
2. Expand the device list, right-click the specific device, and then click Properties.
3. In the Properties dialog box for the device, click the Resources tab.

When you change a hardware resource, print the content of Device Manager. This provides you with a record of the hardware configuration. If you encounter problems, you can use the printout to verify the hardware resource assignments.

From this point, follow the same procedures that you used to choose a hardware resource during a manual installation.

Changing the resource assignments for non-Plug and Play devices in Device Manager does not change the resources used by that device. You only use Device Manager to instruct the operating system on device configuration. To change the resources used by a non-Plug and Play device, consult the device documentation to see whether switches or jumpers must be configured on the device



Lab -13 Connect the LCD Projector with Laptop/CPU

Aim : Connecting LCD Projector to Laptop /CPU

Requirements: Computer, LCD Projector

Computer, LCD Projector Windows 11 Windows 10 with Dongle.

When you're in a conference room and need to project, connect your PC using one of the cable connectors in the room, press the **Windows logo key + P**, and then choose one of the four options:

- **PC screen only.** You'll see everything on your PC. (When you're connected to a wireless projector, this option changes to Disconnect.)
- **Duplicate.** You'll see the same things on both screens.
- **Extend.** You'll see everything across both screens, and you can drag and move items between the two.
- **Second screen only.** You'll see everything on the connected screen. The other screen will be blank.

Then again, you might not even need a cable. If your PC and the projector both support Miracast, press the **Windows logo key + K**, choose a projector, and you're set.

Not sure if your PC supports Miracast? Windows will let you know. Just press the **Windows logo key + K** to check.

Connect a laptop to a projector using an HDMI, DVI, VGA cable, or Bluetooth (if it's supported by both devices).

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Lab -14 Adding additional RAM to the system (expanding RAM size)

Aim : Expanding RAM size

Requirements: Computer, RAM

Upgrade Desktop Memory (RAM) - 10 easy steps to install memory in a desktop computer

Installing memory can be done in a matter of minutes, but there's no need to feel rushed. Work at your own pace and consult this guide or the video as often as you need to!

Step 1 - Gathering Supplies

Clear off your installation space and make sure you're working in a static-safe environment. Remove any plastic bags or papers from your workspace. Then, you'll need the following items:

- Your desktop computer
- Crucial® desktop memory
- Screwdriver
- Owner's manual



Memory installation supplies

Step 2 - Shut Down Your Desktop Computer

Because your files, documents, and data are on your storage drive, not your Random Access Memory (RAM), they remain unaffected during this process.

Step 3 - Unplug the Power Cable

This includes any cables and accessories plugged into the computer

Step 4 - Hold the Power Button for Five Seconds

This discharges any residual electricity still in the system.

Step 5 - Open the Case

For instructions about opening your specific system, consult its owner's manual. You can also take pictures as you work through the process to see where cables or screws are attached to make it easier to put back together.



Open computer case

Step 6 - Ground Yourself!

Touch an unpainted metal surface – this is an extra safeguard that protects your computer memory and components from static damage during the installation process.



Ground yourself

Step 7 - Remove Existing Memory Modules

Press down on the clips on the sides of each module, the clip mechanism will push the memory module up. You can then pull the module completely out.



Computer memory removal

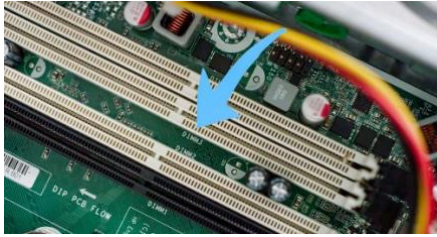
Step 8 - Install Memory

Holding the modules along the edges, align the notches on the module with the ridge in the slot, then apply even pressure and firmly press the module in. It usually takes about 30 pounds of pressure to fully install the module.



Note

Some desktops require you to install modules in matched pairs (memory banks). If this is the case, the slots will likely be labelled for how the memory should be installed. If you only have two memory slots, don't worry about this – proceed with the simple install.



Memory banks

Step 9 - Close the Computer Case

Step 10 - Plug the Power Cable in

Your Memory is now Installed!

Boot up and enjoy a more responsive computer that's now better equipped to run memory-intensive apps.



KLE
BCA

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Lab - 15 Graphic card insertions

Aim : Adding graphic card

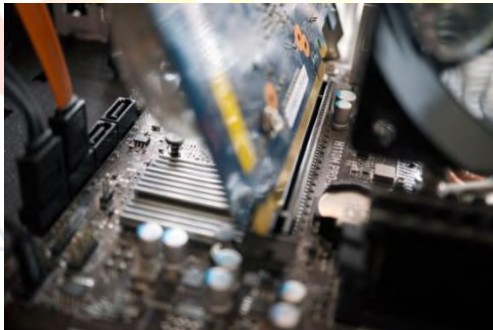
Requirements: Computer, Graphic card

Installing the new graphics card

1. Power down the PC.



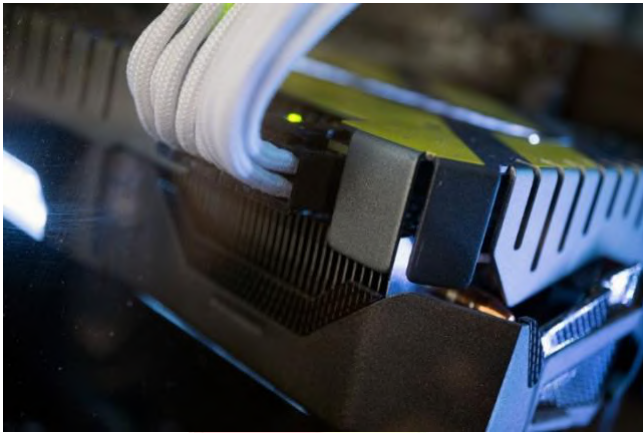
2. Hit the switch on the back of the PC to turn off supply to the PSU.
3. Extract the side panel (usually held on by two screws on the rear).
 - If you do not already have a GPU installed, skip to Step 7.
4. Remove the screws holding the GPU in on the rear bracket.



5. Unlock the PCI-e slot clip.
6. Remove the GPU by lightly pulling on the card.
7. Hover the new GPU over PCI-e slot.



8. Push down on the **GPU** to slide the connector into the slot.
9. Ensure the **secure lock** clicks into place.
10. Screw the rear **bracket** down to secure the card to the chassis.
11. Connect any required **PSU** cables.



12. Reattach the **side panel**.

Now, all you need to do is to plug in the display connectors on the rear of the case, whether they're DisplayPort, HDMI, DVI, or VGA. After that, hit the PSU power switch and boot up Windows. If the PC does not turn on or no signals get sent to the monitor, we'll need to double-check that all cables are connected correctly (both inside and on the rear of the PC), and the GPU is seated properly in the PCIe slot.

Installing required drivers

Before the GPU can be used for intensive workloads like gaming, you need to get new drivers installed so Windows and software can effectively communicate with the card. Hit the links below to download and install drivers for a new NVIDIA or AMD card.

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Lab - 16 Assemble and Disassemble Desktop system

Aim : Assembling and Disassembling system

Requirements: Computer, Keyboard, Mouse, Monitor, Tool Kit Screwdriver

Part1: How to assemble a CPU

This part is all about CPU assembling. Specifically, you have to be very careful with this process.

Following are the steps to assemble CPU:

1. Take Inventory
2. Make space and time
3. Prepare your CPU case
4. Install motherboard
5. Install the processor
6. Install the processor heat sink
7. Install the RAM
8. Install SMPS
9. Install the HDD
10. Install CD/DVD drive
11. Connect Expansion cards
12. Install SYS/Rear cooling fan
13. Bus cable connection
14. Power Cable connection
15. Front Panel connector connection

1. Take Inventory:

Before you start, take inventory of your parts. Make sure you have the following components and tools with you.

1. Case/ Tower/Cabinet
2. Motherboard
3. Processor
4. HeatSink and CPU Fan
5. SMPS

6. Hard disk drive
7. CD/ DVD drive
8. RAM
9. CMOS Battery
10. A good screwdriver sets

2. Make Space, Make Time:

Building a PC takes space. You can use your dining room table to build your PC. So, make sure you have plenty of working space and a few hours to proceed with minimal interruption. You must work on a flat, stable table top surface or bare floor, where you have room to lay out all of the items, to begin with, assemble.

3. Prepare your CPU cabinet:

Now it is time to prepare the case. Remove the case cover from the CPU cabinet.

You need to check Screw brass standoffs are perfectly placed or not. If it is not in a proper position, in that case, you need to position them accurately. (always check the manual and follow their instructions)

4. INSTALL THE MOTHERBOARD:

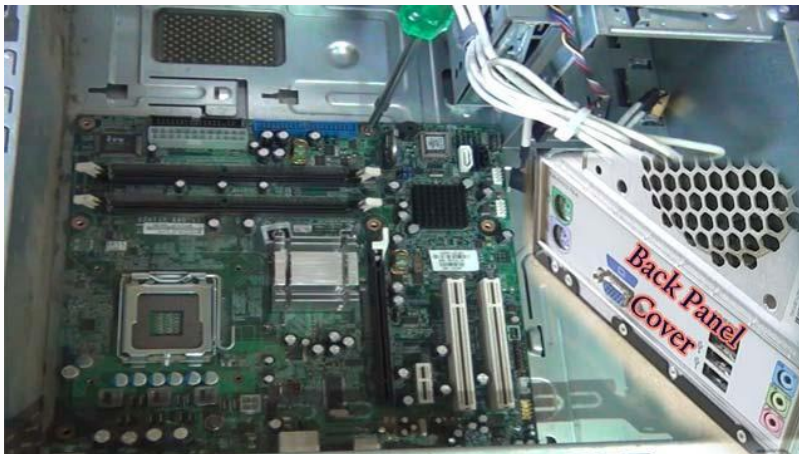


Fig: motherboard and Back panel cover

You must take great care, especially when installing the motherboard. First, remove the motherboard of its packaging and put it on top of the antistatic bag it came in. Remember, you always want to safeguard your components from potentially hazardous static electricity.

1. You need to secure the motherboard onto the PC case/chassis and inspect carefully for any visible defects.

2. Next, review the motherboard handbook, to make sure you are familiar with the motherboard layout and understand which socket is which. Manuals are immensely helpful, usually easy to read, and include illustrations instructions.
3. Check the layout of the sockets on the motherboard. And confirm that the ports on your motherboard's back panel match the holes on the case's Input/output (I/O) shield installed in your case. If it is necessary, then remove the old I/O shield by tapping it firmly a few times with the thicker end of a screwdriver. And then replace it with the shield that came with the new motherboard.
4. You need carefully position the motherboard on top of the brass standoffs. After that line up all the holes, use the screws that accompanied the case to fasten down the motherboard.
5. Don't forget to place the CMOS in the proper position.

5. INSTALL THE PROCESSOR (CPU):



Fig: CPU placement

1. Use the unlocking mechanism to open the CPU socket which is, usually a lever.
2. Carefully line up the pins and place the chip in its socket; it will fit only when oriented correctly. An arrow or a missing pin on one corner of the chip will show you how to line things up.
3. Align with the triangular symbol with the processor and socket key marks, as shown in the Figure.
4. Lower the lever to lock the CPU into place.

6. INSTALL THE CPU HEAT SINK:

You should follow the manufacturer instructions to install the heat sink and the cooling fan. If you bought an OEM CPU and a separate heat sink, then you need to spread a thin layer of the thermal grease over the chip. The thermal grease ensures proper transfer of heat.

There are some heat sinks that come with this grease already applied. In that case, you don't need to use thermal grease over the chip.

1. Attach the clip that holds the heat sink in place, keeping in mind that it may require a fair amount of force. Again, follow the instructions that came with the heat sink. They will show

you how to fit it correctly. If you are in doubt, you can visit the manufacturer's website for more information.

2. Plug the CPU fan's power connector into the proper connector on the motherboard.

7. INSTALL RAM MEMORY:



Fig: Install RAM

1. Unlock the two tabs from both ends of the RAM slot.
2. To install the RAM, insert them into the proper sockets and push down firmly but evenly until the clips on both sides of the socket pop into place. If your motherboard supports dual-channel memory, consult the user manual to determine which pairs of RAM sockets you should use.

8. Install the Power Supply Unit (SMPS):



Fig: Install Power supply unit (SMPS)

1. Place the SMPS inside the CPU cabinet in the proper position. If you are not able to find the correct location, then check the manual.
2. Final steps, to install SMPS, you need to tighten the screw to secure the SMPS to the case.

9. To install HDD:

You can see a 3.5 inch bay inside the CPU cabinet. If you are unable to find it, then check the manual of the case to identify the bay location.

Place the HDD inside the bay properly and tighten the screw.

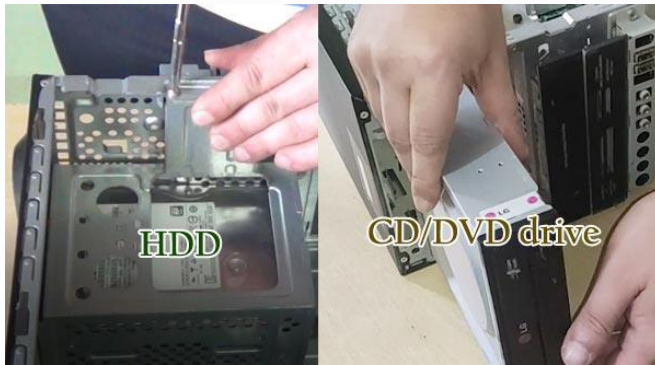


Fig: Install drives

10. To install CD/DVD:

You can see a 5.25 inch bay inside the CPU cabinet. If you are unable to find it, check the manual of the case to identify the bay location.

Place the CD/DVD inside the CPU cabinet to align with the 5.25-inch bay. And, finally, you need to tighten all the screws to hold firmly.

11. Install Expansion cards:

Expansion cards help to increase the functionality of your computer. You can place Expansion cards on the motherboard.

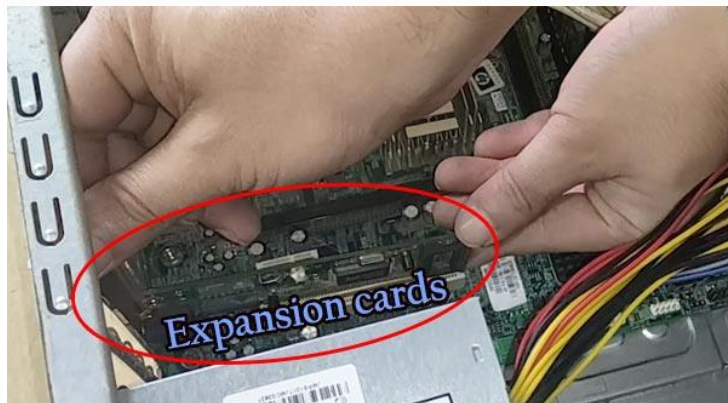


Fig: Install Expansion Cards

PCI compatible expansion cards can place on the **PCI slots** of the motherboard.

PCI-e compatible expansion cards can place on the **PCI-e slots** of the motherboard.

Video cards or graphics cards can place on the **AGP slot** of the motherboard.

You must know about various parts of a motherboard such that, you can effortlessly identify the different connectors.

12. Install Sys/Rear cooling fan:



Find the location where you can place the Sys/Rear cooling Fan. Generally, SYS/Rear cooling can place below the SMPS.

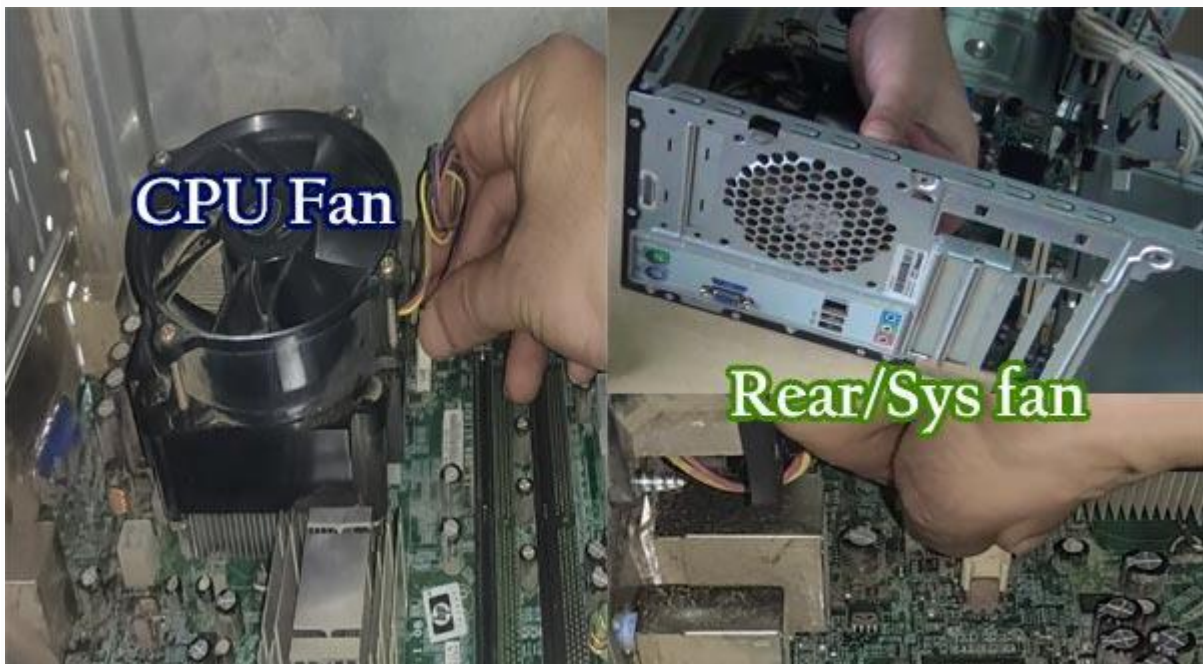


Fig: Cooling fans

13. Bus cable connection:

Amazingly, bus cable or data cable connections are prime connections. Bus cable helps to share information or data between the storage device and motherboard.



sata-pata bus and connector

If your motherboard has a SATA Bus connector, then you need to use **SATA cables**. AND if your motherboard has a PATA Bus connector, then you can use **PATA cable** or **IDE cable**.

In general, two bus cables need to connect inside the CPU. First, Bus cable connects the HDD and motherboard. And the second Bus cable connects the CD/DVD drive and motherboard.

14. Power Cable connection:



Fig: Cable connection

This one is the final step of assembling a CPU. You need to provide power to the different parts of the CPU. Plug the **ATX power connector** from your power supply into the matching port on your motherboard.

1. You can find a **20/24 pins ATX power connector port** on the motherboard. The 20/24 pins ATX power connector cable coming from SMPS needs to connect here. Check the lock system in both ends of the connector and the port, and place it properly. As always, refer to your motherboard's manual for the exact locations.
2. There is another **4-pins ATX power connector port**, you can find on the motherboard. You can locate this port near the processor socket. You must connect the 4-pins power connector in this port properly.

15. Front Panel connector connection:

Use your motherboard user manual and find the description of front-panel connectors.

First, Attach each of the tiny leads from the power and reset switches. After that, the hard-disk activity lights, the PC speaker, and any front-panel USB to the corresponding pin on your motherboard.

Part2: How to assemble PC

This one is the final part of assembling a computer system.

1. Check your keyboard connector port. If it is a USB connector, then connect your keyboard into the proper USB port. And if it is a PS/2 connector, then connect to the correct, PS/2 port.
2. Same steps you need to follow to connect your mouse into the proper port.

3. You require a VGA (Video Graphic Array) cable to connect the monitor and CPU. Find the 15 pins male connector on the backside of the CPU cabinet and your monitor. Use the VGA cable to connect the CPU cabinet and the monitor. Finally, you need to tighten the lock screws.
 4. If you have a speaker, you can connect the speaker on the backside of your CPU cabinet. To get sound from the speaker, you need to plug the speaker's cable with the Aux port.
 5. And if you have a printer, you can connect the printer on the backside of your CPU cabinet. These days, you can connect your speaker BUS cable on the USB port.
- Finally, connects power to the various parts of your computer. You have to connect the power cable with the CPU case, monitor, speaker, and printer.

Check your PC Set-Up:

It is time to turn on your system and check your PC set up. Make sure the keyboard, mouse, and monitor are all plugged into the appropriate ports on the back of the PC. Plug the power cord back in, and turn the machine on.

To boot a computer you need hardware and software. Till now you have understood to assemble a computer. If you want to work on that computer you need to install an Operating System.

What is disassembling a PC?

Disassembling a PC means disconnecting the different components of a PC.

Steps for disassembling a PC

Generally, people want to know both assemble and disassemble steps of a computer. Therefore I am sharing my ideas to help you to assemble and disassemble a computer system.

1. Unplugged the AC power supply to the PC from the wall socket
2. Remove the Cover or chassis or case.
3. Unplugged bus cables and ATX power cables
4. Remove Adapter Cards if any
5. Now Remove the processor and the heatsink and fan
6. Remove hard disk and CD/ DVD drives
7. Next, remove the Memory Modules
8. Remove the Power Supply (SMPS)
9. Finally, Remove the Motherboard

1. Unplugged the AC power supply to the PC from the wall socket

This one is the first step to begin a PC disassemble process. Always remember first disconnect all the power supply connected to your computer system before starting to remove parts.

2. Remove the case covering

Loose the screws and remove the case covering to access the inside parts of the CPU cabinet case.

3. Unplugged bus cables and ATX power cables

Disconnect all the cables one by one inside the CPU case. First, disconnect ATX power cables from the motherboard. After that, disconnect power supply cables, bus cables from the HDD/SSD, and motherboard.

4. Remove adapter cards if any

If any adapter is connected then, disconnect the card from the motherboard.

5. Remove the processor and the heatsink and fan

Now its time to remove the heatsink from the motherboard. Generally, the CPU fan and the heatsink attach together. If it is separated in that case, you need to remove the fan first after that, you can remove the CPU heatsink.

In the final step, unlock the processor socket and remove the processor from the motherboard carefully.

6. Remove hard disk and CD/ DVD drives

Its time to remove the other parts of the computer system. Remove the Hard disk drive or SSD from the motherboard. You can also remove the CD/DVD drive from the CPU case.

Sometimes, to remove CD/DVD drive from the CPU case, you need to remove the front cover of the CPU cabinet case first. After that, you can remove the ROM drives.

7. Remove memory modules

In this process, you do remove the RAM from the motherboard. First, unlock the RAM from both ends and pull the RAM carefully.

8. Remove the Power Supply Unit (PSU)

Already you know, SMPS supplies power to the various parts of the computer system. Here you need to remove the SMPS from the CPU cabinet case.

9. Remove the motherboard

The final step of the PC disassemble process is this one. Carefully remove the motherboard from the CPU cabinet case.

Note: Remember, bolts or screws are the very essential things. They help to make rigid, all the parts used inside the computer. To remove any part from the computer system mostly, you need to take out bolts first. Here in PC disassemble steps, I have ignored that portion.

