SYSTEM START-UP AND CONFIGURATION

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SYSTEM START UP

Definition:

Startup is an action commonly referred to as booting.

SYSTEM BOOTING OR START-UP

What is booting??

Booting refers to the process of attaining/getting **the normal or operative run-time environment** of a computer system.
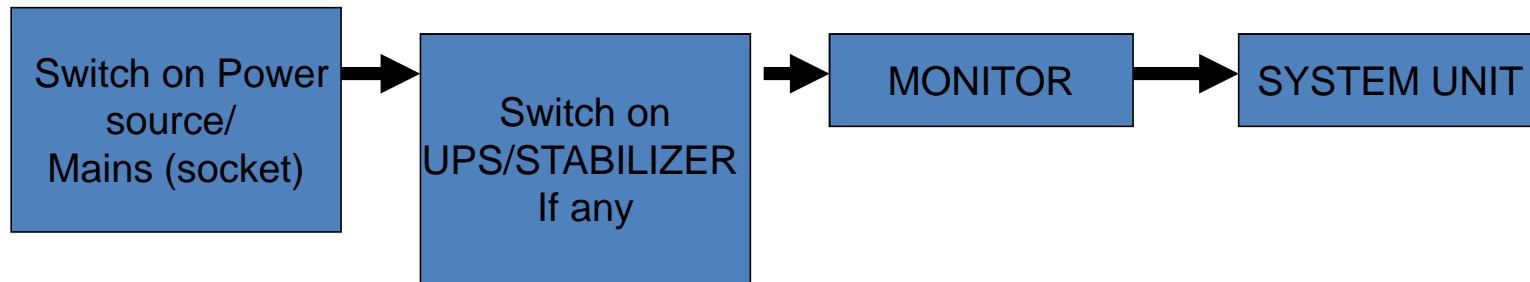
THE BOOTING PROCESS

There are **two** categories of activities involved in the booting process. i.e.;

I. Activities done by the computer user

II. Activities done by the computer itself.

GENERAL STAGES OF THE BOOTING PROCESS

1. Powering the computer or PC. Involves turning on the power socket, Uninterrupted Power Supply (UPS) if any, and pressing the monitor and system unit power buttons.

2. CPU jumping to address of BIOS (0xFFFF0)

3. BIOS and boot strap loader running POST (Power-On Self Test) and other necessary checks to check the functionality of all components connected to it.

4. Loading of the OS into memory

5. Display of log-on screen

6. Entering of user name and password.

7. Display of active desktop

THE BOOTING PROCESS – PHYSICAL PROCESSES

| Switch on Power source/ Mains (socket) | → | Switch on UPS/STABILIZER If any | → | MONITOR | → | SYSTEM UNIT |

FORMS OF BOOTING

1. ***Cold or Hard booting:*** This involves starting a computer from a powerless state. Usually cold booting involves a computer system going through all ***POST*** processes.

2. ***Warm or Soft booting:*** This refers to restarting a computer which is already on for which the operating system is already into memory.

   warm booting can also be initiated by;

   » **Pressing CTRL+ALT+DEL keys at once.**

   » **Pressing the reset button on some system cases/units**

   » **Select restart from the shutdown menu on the startup menu.**

CONDITIONS THAT CAN LEAD TO A WARM BOOT - 2

1. When the operating system has frozen or hanged

2. When an application program hangs or refuses to run

3. When changing from one operating system (like windows 7) to another (like Linux), in cases of computers with double or multiple OSs.

4. When the operating system fails to detect or interact with some peripheral devices like keyboard, mouse, or modem.

5. After installation of some software or programs.

CONDITIONS THAT CAN LEAD TO A WARM BOOT - 2

6. After installation of some device or peripheral drivers.

7. When cleaning a malware (like a virus, Worm or Trojan)

8. After configuring or setting up a network

9. Terminating a suspected data tap or hack

WHY COMPUTERS ARE WARM BOOT

•To refresh the system.   Reboots are characterized by some system refreshing effect.

•To flush RAM and remove other files that could be causing computer freezing.

•To clear memory off any malware.

•To increase the processing speed and system performance. Reboots are known to keep computers running quickly.

•To stop Memory Leaks which occur when programs don't close properly.

•To complete software installation by allowing the system to configure or initiate a new software or hardware to other system elements.

•To fix Internet/network Connection. *Sometimes computers lose their connection to the Internet or network and a restart can easily re-establish the connection.*

Circumstances that may cause computer system boot failure

✓When there is no working operating system (OS).

✓Absence of a working **hard disk** or bootable device. Or when the hard disk crashes. The hard disk is the home of the OS.

✓When the system is not powered.

✓When key OS files are corrupted by a malware

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STARTING OR FIRING SYSTEM PROGRAMS

A program – is an organized list of statements (instructions) that when properly installed and executed, can cause a computer to behave in a pre-determined manner or carry out a defined task. All computer programs are designed to do specific tasks.

Examples of computer system programs are;

- **Ms word**
- **Ms excel**
- **Avast anti-virus**
- **WhatsApp**
- **etc.**

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REVISION EXERCISE - 3

1. What is *booting*?

2. Distinguish a *Hard Boot* from a *Soft Boot*

3. State three factors that can lead to *Hard disk Crash.*

4. Explain any *three* key stages of a booting process.

5. Briefly explain how you would warm or soft boot a computer system.

6. State **four** reasons to explain why computers are warm boot.

REVISION EXERCISE - 3

7. State four conditions that can lead to a worm boot

8. What is **Bios**?

9. Briefly explain the roles of the following in the booting process;

   a) BIOS

   b) Operating System

SYSTEM CONFIGURATION

Definition:

Is the arrangement in which hardware and software components of a given computer are laid out, set up or interconnected in order to have a working computer to perform intended tasks. In this section, two areas are important:

1. System specification of a computer,
2. How to find system specifications of a computer.

SYSTEM SPECIFICATIONS

This is structured set of information manufacturers provide to indicate a given standards in the design of a system or sub-system. System specifications are either minimum or recommended.

Minimum system specifications include the list of requirement design component(s) that can be used at a level of the lowest guidelines for software or hardware to perform a task.

SYSTEM SPECIFICATIONS

Recommended system specifications are requirements that are almost always of a significantly higher level and represent the ideal situation in which to run the software or hardware component.

A sample of system requirements include:

HARDWARE REQUIREMENTS

The most common set of requirements defined by any operating system or software application is the physical computer resources, also known as hardware, A hardware requirements list is often accompanied by a Hardware Compatibility List (HCL), especially in case of operating systems. An HCL lists tested, compatible, and sometimes incompatible hardware devices for a particular operating system or application.

HARDWARE REQUIREMENTS

1. Architecture.
2. Processing power.
3. Memory.
4. Secondary storage.
5. CD ROM drives.
6. Display adapter.
7. Peripherals.
8. Network interface card (NIC)

SOFTWARE REQUIREMENTS

Deal with defining software resource requirements and basics that need to be installed on a computer to provide optimal functioning of an application. They include:

1. Platform.

2. APIs and drivers.

3. DirectX.

4. .framework.

5. Web browser.

6. Internet connection.

SYSTEM SPECIFICATIONS

How to find specifications of a computer:

Using the internet:

1. Open a browser of your choice,

2. Use a URL of any search engine of your choice.

3. Type in the computer name and model.

4. A list of system requirements shall be displayed for you.

SYSTEM SPECIFICATIONS

On the computer itself:

1. Right click my computer.

2. Select properties.

Note: 1) This approach shall give you a detailed list of standard information clusters that provides a better way of understanding how the system shall work.

2) Alternatively, you can run the following commands/utilities for returning system specifications for General, services, startup and tools;

- Dxdiag
- System Config.

INSTALLING COMPUTER PARTS:

The term computer parts refer to all items that can be put / added in / on the computer to provide a best environment to a user to perform tasks. In this section; software, hardware are well known as parts to configure.

INSTALLING COMPUTER PARTS:

Connecting and setting up computer hardware parts:

1. Connecting hardware components or peripheral devices by plugging them into ports e.g. PS/2, HDMI, USB, e.t.c.

2. Setting up hardware components involves the processing of configuring a tangible part such as a printer.

INSTALLING A SYSTEMS' UNIT

A systems' unit contains the most critical hardware components of a computer. Some of these parts can be added or removed to increase performance of a computer system. These include:
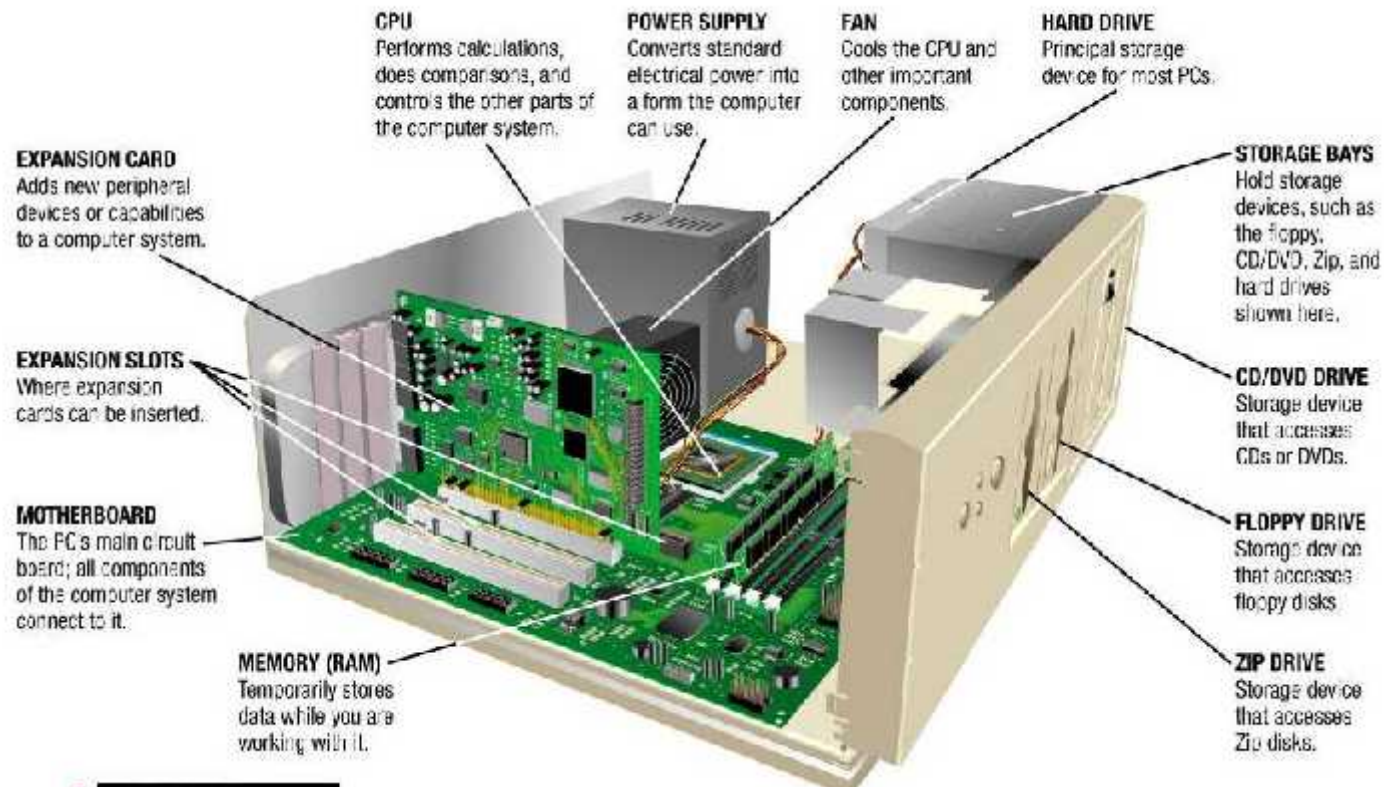
a) RAM chips,

b) CPU,

c) RAM BIOS,

INSTALLING A SYSTEMS' UNIT

d) Hard disk,

e) CD-ROM / DVD drives,

f) Sound card,

g) Network card.

h) Video Cards .

Note:

All these components can be connected using channels or expansion slots.
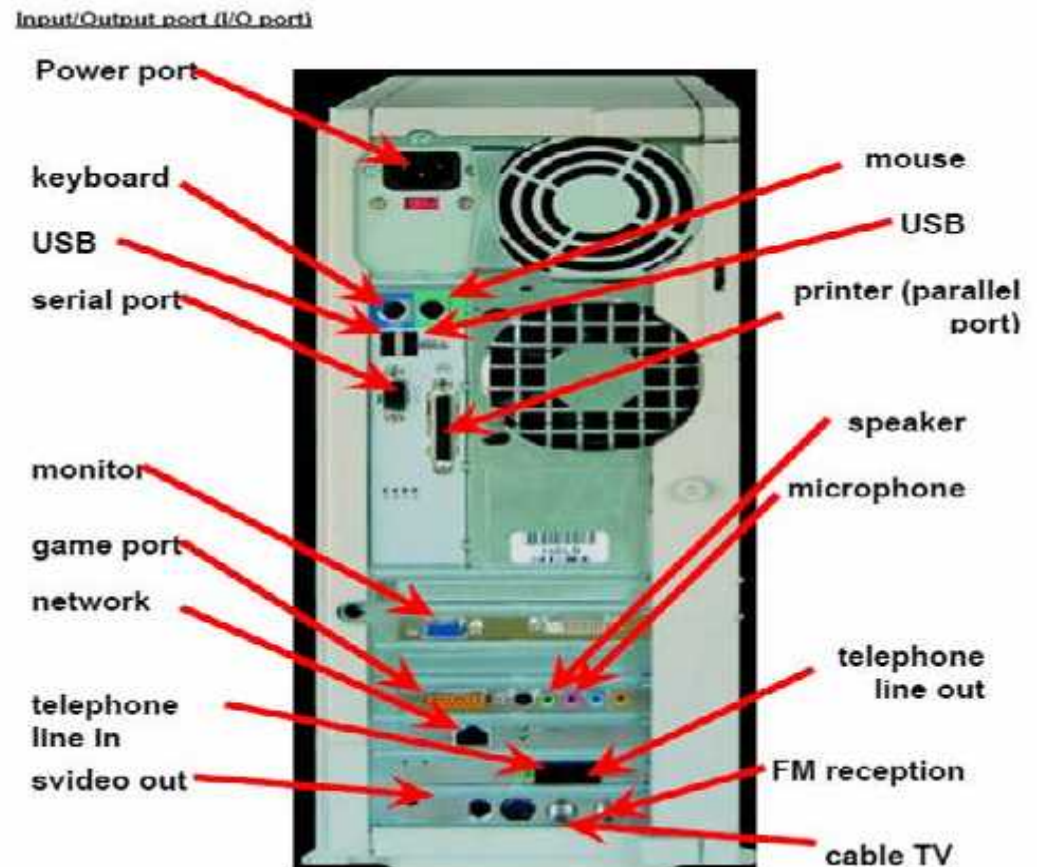
OTHER PARTS FOUND IN A SYSTEM UNIT.

CPU
Performs calculations, does comparisons, and controls the other parts of the computer system.

POWER SUPPLY
Converts standard electrical power into a form the computer can use.

FAN
Cools the CPU and other important components.

HARD DRIVE
Principal storage device for most PCs.

EXPANSION CARD
Adds new peripheral devices or capabilities to a computer system.

STORAGE BAYS
Hold storage devices, such as the floppy, CD/DVD, Zip, and hard drives shown here.

EXPANSION SLOTS
Where expansion cards can be inserted.

CD/DVD DRIVE
Storage device that accesses CDs or DVDs.

MOTHERBOARD
The PC's main circuit board; all components of the computer system connect to it.

FLOPPY DRIVE
Storage device that accesses floppy disks

MEMORY (RAM)
Temporarily stores data while you are working with it.

ZIP DRIVE
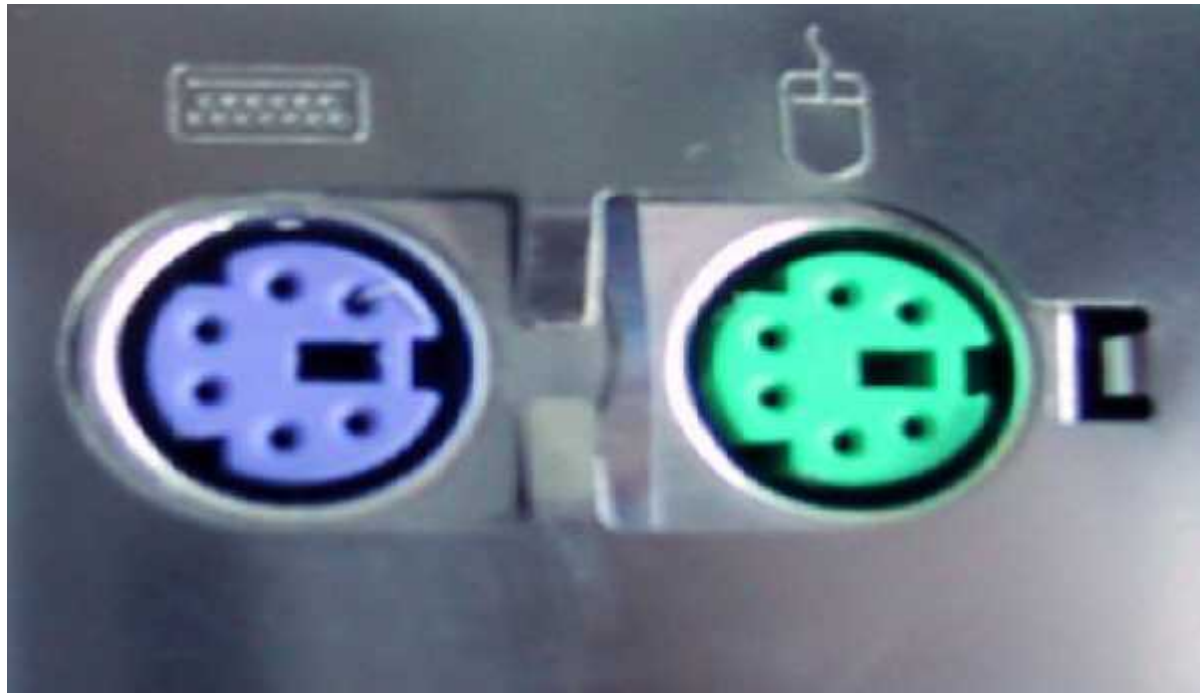Storage device that accesses Zip disks.

CONNECTING A PERIPHERAL DEVICE

A peripheral device in a hardware component that can be connected externally on a computer's system unit. Examples include: keyboard, mouse, monitor, printer, e.t.c.

Peripheral devices are connected to a system's unit using an interface / connection point called a port. Examples of ports include:
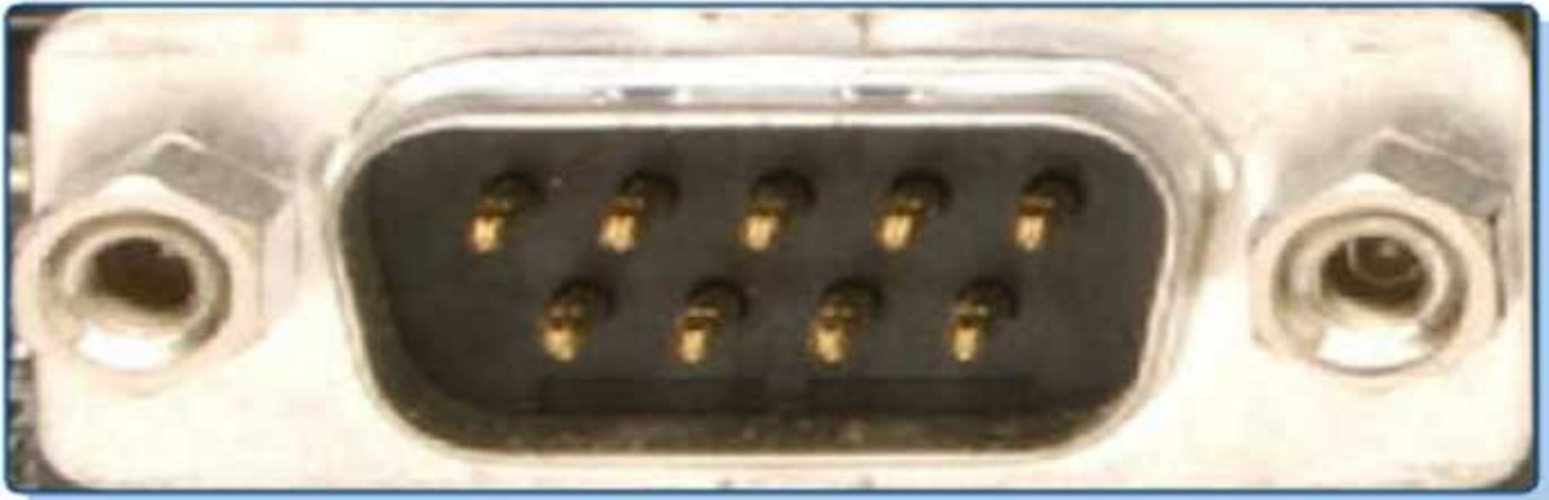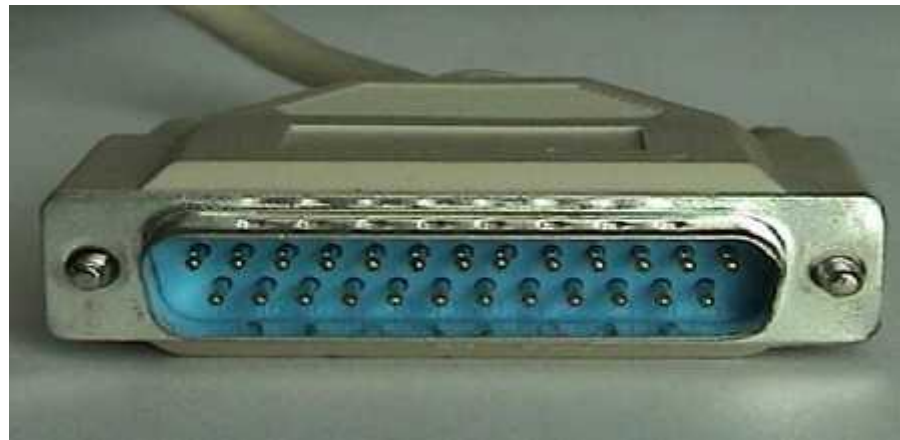

Input/Output port (I/O port)

Power port

keyboard

USB

serial port

monitor

game port

network

telephone line In

svideo out

mouse

USB

printer (parallel port)

speaker

microphone

telephone line out

FM reception

cable TV

24PS/2 KEYBOARD AND MOUSE PORTS

MALE SERIAL CONNECTOR

25 –PIN MALE SERIAL CONNECTOR

DB – 25 FEMALE PARALLEL PORT

CENTRONICS 36-PIN FEMALE PORT

USB PORT/CONNECTOR
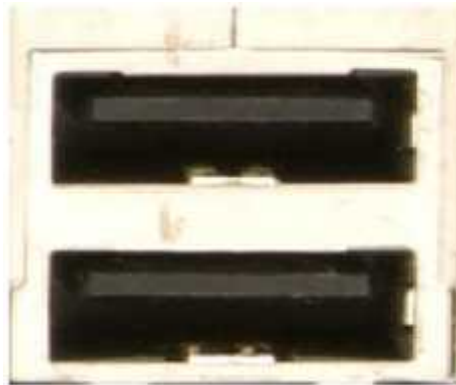
FIRE WIRE 6-PIN CABLE AND CONNECTOR

EXAMPLES OF PORTS

1. Serial Port
2. Parallel Port
3. PS/2 Port
4. Universal Serial Bus (or USB) Port
5. VGA Port
6. Power Connector
7. Firewire Port
8. HDMI Port
9. Ethernet Port, e.t.c.

INSTALLING COMPUTER PARTS:

System installation:

System installation refers to the process of putting a software program into a computer as needed by the user. This can be the installation of operating system or application programs.

METHODS OF INSTALLING (OS)

1. **Clean install**. It is done on a brand new computer system or in case one wants to have a new operating system. It involves formatting the hard disk fully during the process.

2. **Upgrade**. It is done when a user wants to improve functionality of the software that involves installing a new operating system on the existing operating system.

METHODS OF INSTALLING (OS)

3. **Multi-boot install**. It is done when a user runs more than one operating systems on the same system. E.g. one can install Windows 8 and Linux to run on the same computer.

4. **Virtualisation install**. It is used when one wants to configure a server. It enables multiple copies of the operating system to run on a single hardware thus creating several virtual machines like in the case of nComputing.

WHAT TO DO BEFORE INSTALLING

1. Document your login IDs, passwords, and settings.

2. Export your e-mail and address book, bookmarks / favourites, and cookies.

3. Download the latest applications and drivers.

4. House cleaning and backing up your data.

5. Assess whether you need service packs

WHAT TO DO BEFORE INSTALLING

6. Load genuine operating system from known developers.

7. Reconfigure personal settings.

8. Enable previous versions and create a "clean install" restore point.

9. Configure network, install service packs, patches, and security updates.

10. Ask your self "Do you really need this software"?

WHAT TO DO BEFORE INSTALLING

11. Is there any conflicting software on your computer?

12. Always read online reviews about the software.

13. Investigate the software developer or company and their reputation.

14. Check out removal options before installing.

15. Always create System Restore Point.

WHAT TO DO BEFORE INSTALLING

16. Always select Custom installation.

17. Always uncheck installation of extras.

18. Install to the default directory.

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STEPS FOLLOWED WHEN INSTALLING THE OS

1. Insert the installation disk or flash drive.

2. Restart your computer.

3. Wait for the computer's first start-up screen to appear.

4. Press and hold Del or F2 to enter the BIOS page.

5. Locate the "Boot Order" section.

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STEPS FOLLOWED WHEN INSTALLING THE OS

6. Select the location from which you want to start your computer.

7. Move your selected location to the top of the list.

8. Save your settings and exit the BIOS.

9. Restart your computer.

10. Follow the on-screen prompts.

INSTALLING AN APPLICATION PROGRAM

1. How to install from a CD or DVD (*with or without the auto-run feature*).

2. How to install from a download.

3. How to install from a USB flash drive.

TO INSTALL PROGRAMS FROM A CD OR DVD:

i. Insert the program disc into your computer's disc drive or tray, label side up.

ii. Click the option to run Install or Setup.

iii. If the installer offers a language selection, choose yours; likewise, agree to the end-user license agreement, if requested.

iv. If the installer offers **Express** or **Custom** installation options, choose the Express option to let the installer set up the program without further input from you.

INSTALLING SOFTWARE FROM THE WEB

i.   Today, the most common way to get new software is to **download it** from the Internet.

ii. Locate and download an **.exe** file.

iii. Locate and **double-click** the .exe file. (It will usually be in your **Downloads** folder.).

iv. A dialog box will appear. Follow the instructions to install the software.

v.   The software will be installed. You can now open the application from the **Start menu.**

HOW TO INSTALL FROM A USB FLASH DRIVE

i.   Open Windows Explorer or My Computer and find the USB drive that is typically the last drive letter.

ii.   Once the drive is opened find the setup or executable file, double-click the file icon to start the setup process.

HOW TO UNINSTALL SOFTWARE

i. Open the Control Panel or press the Windows key, type **Control Panel**, and then press **Enter**.

ii. Double-click **Add or Remove Programs**, **Uninstall a program**, or **Programs and Features** depending on your version of Windows.

iii. Within the new window, select the program you want to uninstall and click the **Change**, **Remove**, or **Uninstall** button.

CONTROL PANEL

Definition: The **Control Panel** is a component of Microsoft Windows that provides the ability to view and change system settings. Tools / applets in the control panel include:

1. **Accessibility options.** Allows users to configure the accessibility of their PC.

2. **Add New Hardware.** Launches a wizard which allows users to add new hardware devices to the system. This can be done by selecting from a list of devices or by specifying the location of the driver installation files.

CONTROL PANEL

3. **Add or Remove Programs.** The Add/Remove Programs dialog allows the user to manipulate software installed on the system in a number of ways.

4. **Administrative Tools.** Contains tools for system administration, including security, performance and service configuration.

5. **Automatic Updates.** This is used to specify how the Automatic Updates client should download updates from the Microsoft Update Website.

CONTROL PANEL

6. **Date and Time.** Allows user to change the date and time stored in the machine's BIOS, change the time zone and specify whether to synchronize the date and time with an Internet Time Server and which server to use.

7. **Display.** Allows the user to change the display characteristics of their computer e.g. desktop background, e.t.c.

8. **Folder Options.** This item allows for configuration of how folders and files are presented in Windows Explorer.

CONTROL PANEL

9. **Fonts.** Displays all fonts installed on the computer. Users can remove fonts, install new fonts or search for fonts using font characteristics.

10. **Internet Options.** Allows the user to change the way the computer manages internet connections and browser settings.

11. **User Accounts.** This allows the user to configure their account and other accounts used in the system, should they have sufficient privileges.

CONTROL PANEL

12.Windows firewall. It enables the user to set security privileges for a computer to control external illegal users like hackers.

CREATING A FOLDER

i. **On the Windows Desktop.**

a. Navigate to the Windows Desktop.

b. Right-click with your mouse on any blank portion of the Desktop.

c. In the menu that appears (like that shown in the picture to the right), click **New** and then **Folder**.

d. A new folder will appear. Type the name of the folder you want to use and then press Enter.

CREATING A FOLDER

i.   **Create a new folder using a shortcut key.**

While in Windows Explorer you can press **Ctrl+Shift+N** to create a new folder without using the mouse.

ADVANTAGES OF USING FOLDERS

1. Folders enables the user to share several files across a network.

2. They store several files and other sub folders in a small space.

3. They keep the desktop tidy / neat.

4. Folders enable the user to protect files against deletion by folder locking them.

5. With folders, a user can compress files i.e. making them take small disk space.

MAJOR DESKTOP ICONS

Definition: An **icon** is a small graphical representation of a program or file. Major icons include:

i. **My Computer**. Shows disks and drives connected to this computer.

ii. **Recycle bin**. It contains files and folders a user has temporarily deleted.

iii. **Network places**. Accesses computers and devices in a network.