NETWORKING & SYSTEM ADMINISTRATION LAB

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Experiment No: 1

Aim:-

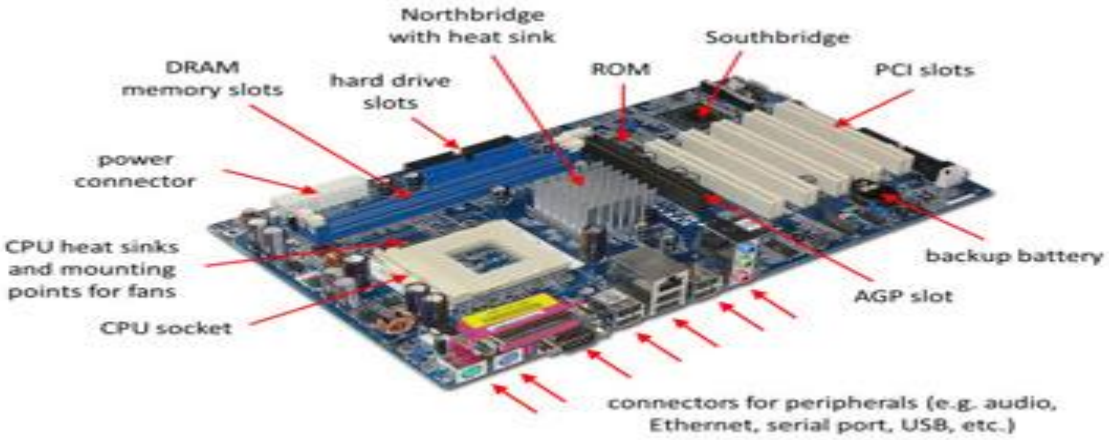
Identify major components of a computer system such as

- Motherboard
- Ram modules
- Daughters card
- Bus slots
- SMPS
- Internal storage devices
- Interfacing ports

Motherboard

The motherboard is defined as a circuit board for the computer system, also called logic board or mainboard. It allocates power and allows communication to and between the CPU, RAM, and all other computer hardware components. In the computer system, the biggest component is the motherboard that controls all the components of the computer system and establishes a link between all components. From the motherboard, different components like ROM, CPU, RAM, PCI slots, USB ports, and other components are connected. The controller's device is also attached to the motherboard like DVD< hard drive, mouse, and keyboard. The computer system starts using the motherboard and these components act as the backbone for starting the system.

The motherboard is the main component in the computer system that is used for connecting all the components of the computer system so that they can perform several tasks and functions in the system. The motherboard is considered as the spine of the system as all components are connected to a single circuit board for performing their functions. The motherboard is a costly device and once it gets damaged the user needs to spend a lot of money to buy a new motherboard for a computer system. The motherboard is a central device where all devices are get connected and maintain the flow in the computer system.


Northbridge
with heat sink
Southbridge
DRAM
memory slots
hard drive
slots
ROM
PCI slots
power
connector
CPU heat sinks
and mounting
points for fans
backup battery
AGP slot
CPU socket
connectors for peripherals (e.g. audio,
Ethernet, serial port, USB, etc.)

RAM modules

Random access memory (RAM) is a type of data storage used in computers that is generally located on motherboard. It is the main memory used by a computer for quick access since is much faster to read and write than other forms of storage—between 20-100 times faster than hard disks.

There are two main types of RAM: Dynamic RAM (DRAM) and Static RAM (SRAM). DRAM, is widely used as a computer's main memory. It can be thought of like a computer's short term memory. It works by storing common data that programs are in constant use of, rather than storing the data on a much slower medium like a Solid State Hard Drive (or SSD). RAM doesn't automatically have data saved on each chip though.

RAM chips can be installed individually on a motherboard or in sets of chips on a miniature circuit board that plugs into the motherboard. The three most common circuit boards are:

Single Inline Memory Module (SIMM)

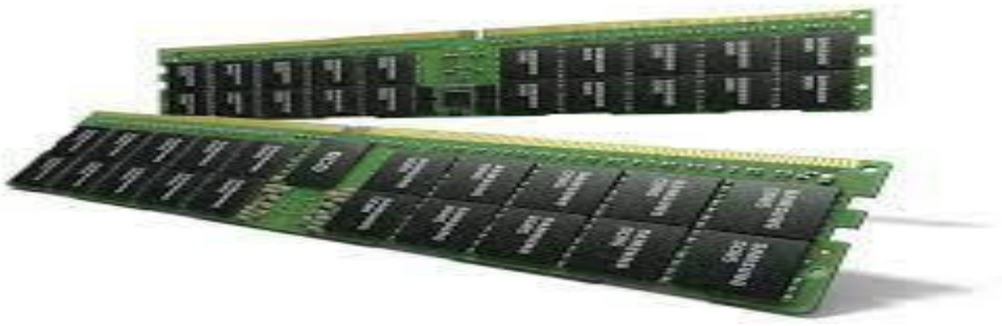
A single in-line memory module with a 32-bit data path

Rambus Inline Memory Module (RIMM)

Similar to SIMM but with a higher memory speed (RDRAM). Both SIMM and RIMM modules are installed in matched pairs.

Dual Inline Memory Module (DIMM)

Has a separate electrical connector on both sides of the module. It stores each bit of data in a separate capacitor, providing direct access to the motherboard through the system bus.



Daughter cards

A daughterboard (or *daughter board* , *daughter card* , or *daughtercard*) is a circuit board that plugs into and extends the circuitry of another circuit board. A daughterboard is type of circuit board that plugs in or is attached to the motherboard or similar expansion card to extend its features and services. A daughterboard complements the existing functionality of a motherboard or an expansion card.

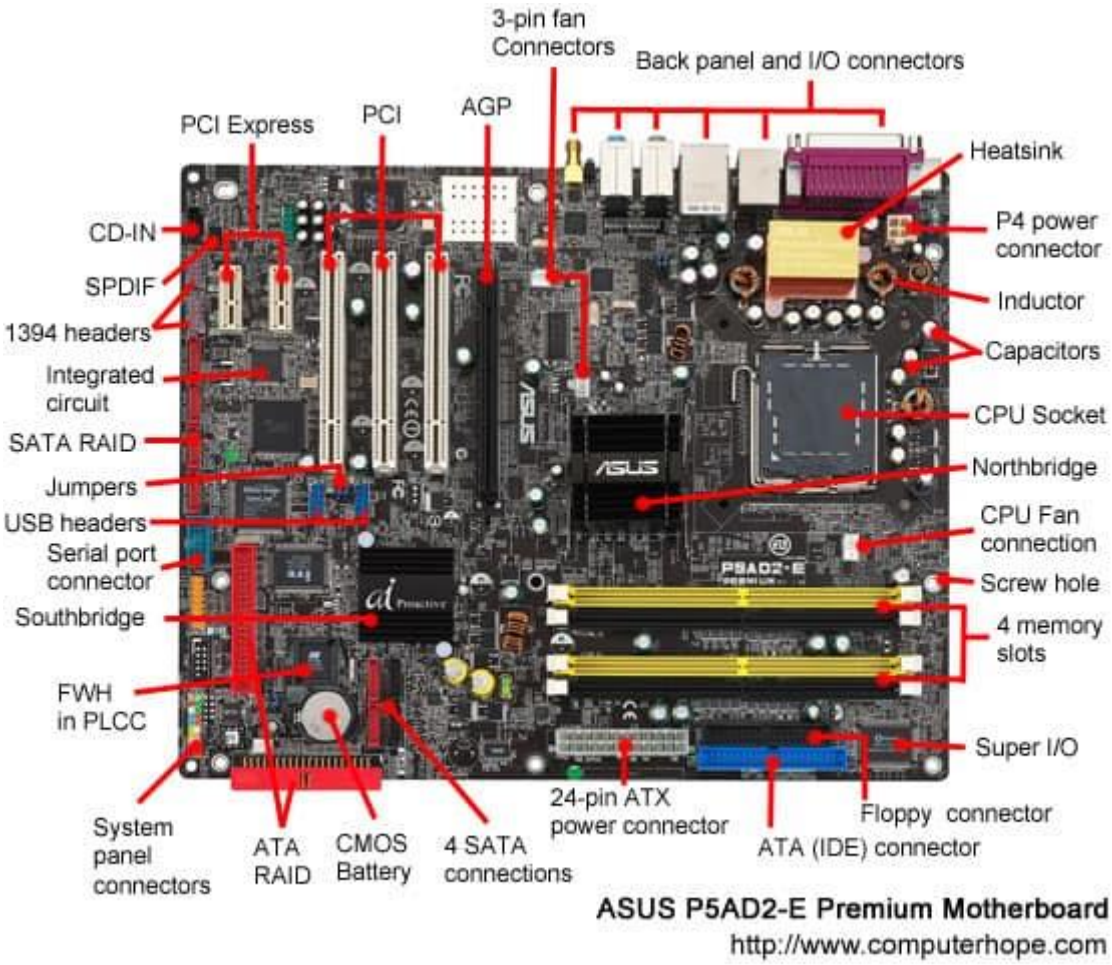
A daughterboard is also known as daughter card, piggyback board, riser card or mezzanine board. A mezzanine card is a kind of daughterboard that is installed in the same plane as but on a second level above the motherboard.

A daughterboard is connected directly to the motherboard. Daughterboards are usually directly embedded through soldering. Like a motherboard, a daughterboard has sockets, pins, plugs and connectors to be attached to other boards. Typically, daughterboards are released as a post-launch update to a motherboard or expansion card. For example, a MIDI daughterboard is used to add on the functionality of the sound card.

Bus Slots

If a computer is to be useful, the CPU must communicate with the outside world, including other motherboard components and adapters plugged into the motherboard. An expansion slot is used to add an adapter to the motherboard. It has rules that control how many bits can be transferred at a time to the adapter, what signals are sent over the adapter's gold connectors, and how the adapter is configured.

Expansion slots used in PCs are usually some form of PCI (Peripheral Component Interconnect), AGP (Accelerated Graphics Port), or PCIe (PCI Express). Other types of expansion slots that have been included with older PCs are ISA (Industry Standard Architecture), EISA (Extended Industry Standard Architecture), MCA (Micro Channel Architecture), and VL-bus (sometimes called VESA [video electronics standards association] bus).



SMPS

A switched-mode power supply(SMPS) is an electronic circuit that converts power using switching devices that are turned on and off at high frequencies, and storage components such as inductors or capacitors to supply power when the switching device is in its non-conduction state.

Switching power supplies have high efficiency and are widely used in a variety of electronic equipment, including computers and other sensitive equipment requiring stable and efficient power supply.

A switched-mode power supply is also known as a switch-mode power supply or switching -mode power supply.

Applications of the switched-mode power supply

- It is used in machine-tool industries.
- It is used for security systems.
- It is used in personal computers.
- It is used in closed circuit cameras.
- It is used in mobile phone chargers.
- It is used to support supplies with PLC's.

Benefits of SMPS

- The switch-mode power source is small in scale.
- The SMPS is very lightweight.
- SMPS is strongly anti-interference.
- The SMPS production range is large.

Limitations of SMPS

- The complexity of SMPS is very large.
- The production reflection is high and its control is weak in the case of SMPS.
- Use of SMPS can only be a step-down regulator.
- In SMPS, the voltage output is just one.

Internal storage devices

A storage unit is a part of the computer system which is employed to store the information and instructions to be processed. A storage device is an integral part of the computer hardware which stores information/data to process the result of any computational work.

Internal storage can mean several different things, but most often refers to a computer's internal hard drive. This is the primary storage device used to store a user's files and applications. If a computer has multiple internal hard drives, they are all considered part of the computer's internal storage.

Another popular type of internal storage is flash memory. It serves the same purpose as a hard drive, but stores data electronically rather than magnetically. Flash memory is the most common type of internal storage used by portable electronic devices, such as mobile phones and portable music players. Some computers now use flash drives rather than hard drives as well.

Internal storage can be contrasted with external storage, which includes devices such as external hard drives, network drives, and removable media, such as CDs and DVDs.

1. Hard Disk Drives

A hard disk drive (also known as a hard drive, HD, or HDD) can be found installed in almost every desktop and laptop computer. It stores files for the operating system and software programs as well as user documents, such as photographs, text files, videos, and audio. The hard drive uses magnetic storage to record and retrieve digital information to and from one or more fast-spinning disks.

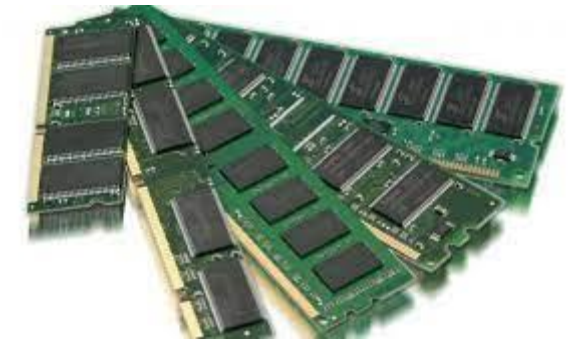
2. Floppy Disks

Also know as a diskette, floppy, or FD, the floppy disk is another type of storage medium that uses magnetic storage technology to store information. Floppy disks were once a common storage device for computers and were very common from the mid-1970s through to the start of the 21st century.

3. Tapes

In the past, magnetic tape was often used for digital data storage because of its low cost and ability to store large amounts of data. The technology essentially consisted of a thin, magnetically coated piece of plastic wrapped around wheels. Its relative slowness

and unreliability compared to other data storage solutions have resulted in it now being largely abandoned as a storage medium.



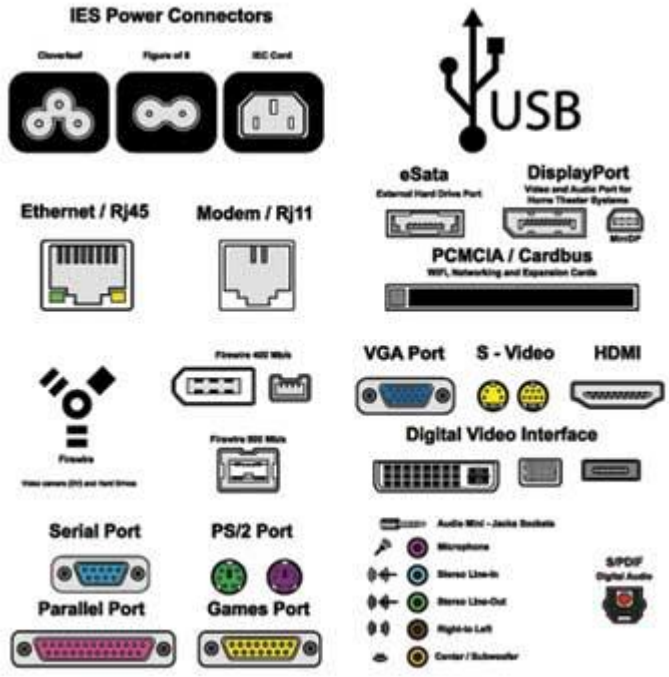
Interfacing ports

A port is a physical docking point using which an external device can be connected to the computer. It can also be programmatic docking point through which information flows from a program to the computer or over the Internet.

Characteristics of Ports

A port has the following characteristics −

- External devices are connected to a computer using cables and 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.



Let us now discuss a few important types of ports −

Serial Port

- Used for external modems and older computer mouse
- Two versions: 9 pin, 25 pin model
- Data travels at 115 kilobits per second

Parallel Port

- Used for scanners and printers
- Also called printer port
- 25 pin model
- IEEE 1284-compliant Centronics port

PS/2 Port

- Used for old computer keyboard and mouse
- Also called mouse port
- Most of the old computers provide two PS/2 port, each for the mouse and keyboard
- IEEE 1284-compliant Centronics port

Universal Serial Bus (or USB) Port

- It can connect all kinds of external USB devices such as external hard disk, printer, scanner, mouse, keyboard, etc.
- It was introduced in 1997.
- Most of the computers provide two USB ports as minimum.
- Data travels at 12 megabits per seconds.
- USB compliant devices can get power from a USB port.

VGA Port

- Connects monitor to a computer's video card.
- It has 15 holes.
- Similar to the serial port connector. However, serial port connector has pins, VGA port has holes.

Power Connector

- Three-pronged plug.
- Connects to the computer's power cable that plugs into a power bar or wall socket.

Firewire Port

- Transfers large amount of data at very fast speed.

- Connects camcorders and video equipment to the computer.
- Data travels at 400 to 800 megabits per seconds.
- Invented by Apple.
- It has three variants: 4-Pin FireWire 400 connector, 6-Pin FireWire 400 connector, and 9-Pin FireWire 800 connector.

Modem Port

- Connects a PC's modem to the telephone network.

Ethernet Port

- Connects to a network and high speed Internet.
- Connects the network cable to a computer.
- This port resides on an Ethernet Card.
- Data travels at 10 megabits to 1000 megabits per seconds depending upon the network bandwidth.

Game Port

- Connect a joystick to a PC
- Now replaced by USB

Digital Video Interface, DVI port

- Connects Flat panel LCD monitor to the computer's high-end video graphic cards.
- Very popular among video card manufacturers.

Sockets

- Sockets connect the microphone and speakers to the sound card of the computer.