NETWORKING & SYSTEM ADMINISTRATION LAB

Name: Swetha Prakash
Roll No: 46
Batch: B
Date: 04/04/2022

Experiment No.: 2

Aim

Familiarization of the hardware components in a computer.

Procedure

★ KEYBOARD

The keyboard is the primary input device for the computer system. The board is divided into a number of sections:

• Typing keys: This section contains the letter and number keys. The shift keys, spacebar, return key etc. are also included in this section.

• Numeric keypad: These keys are arranged as on a calculator and are used in Banks etc. They allow numeric data to be entered much more quickly than using the numbers at the top of the typing keys.

• Function keys: These are programmable keys used by software for special functions. E.g. - F1 is always used for help.

• Control keys: The control keys are used for screen and cursor control. The arrow keys control the cursor. The Home, End, Page up etc. keys control cursor in software applications.

★ <u>**MOUSE**</u>

A mouse in an input device that uses point and click technology to interact with software applications. There are two main types:

• Ball mouse: This uses a ball to roll across the surface and move rollers attached to sensors inside the mouse that reflect the ball movement as cursor movement. These are efficient devices but the ball picks up dust and looses friction with the rollers. As a result, the cursor movement becomes erratic. A mouse mat is needed to aid friction between the ball and the surface.

• Optical mouse: This uses a camera to take thousands of images per second and sent them for digital processing. The red LED lights up the surface for the camera. The digital processor compares images and can sense the movement of the mouse. This movement is reflected on the screen as cursor movement. The great advantage of the optical mouse is that it is not effected by dust as a ball mouse is and a mouse mat is not required. It does not work well on glass surfaces.

★ <u>**POWER SUPPLIES**</u>

Computers use a power supply to convert AC power into a lower voltage DC power required by internal components.

Desktop computer power supply form factors include:

• Advanced Technology (AT) – original power supply for legacy computer systems

• AT Extended (ATX) – updated version of the AT

• ATX12V – the most common power supply on the market today

• EPS12V – originally designed for network servers but is now commonly used in high-end desktop models.

★ <u>CONNECTORS</u>

A power supply includes several different connectors. They are used to power various internal components such as the motherboard and disk drives.

Some examples are:

• 20-pin or 24-pin slotted connector

• SATA keyed connector

• Molex keyed connector

• Berg keyed connector

• 4-pin to 8-pin auxiliary power connector

• 6/8-pin PCIe power connector

★ **MOTHERBOARD**

The motherboard is the key circuit board holding the essential processing parts of a computer. It allows all the parts of your computer to receive power and communicate with one another. It is usually screwed to the case along its largest face, which could be the bottom or the side of the case depending on the form factor and orientation. The form factor describes the shape and layout of the motherboard. It affects where individual components go and the shape of the computer's case. Attached directly to the motherboard are the CPU, RAM, expansion cards, networking, video, and audio components.

★ **CHIPSET**

Chipset consists of the integrated circuits on the motherboard that control how system hardware interacts with the CPU and motherboard.

Most chipsets consist of the following two types:

• Northbridge – Controls high speed access to the RAM and video card.

• Southbridge – Allows the CPU to communicate with slower speed devices including hard drives, Universal Serial Bus (USB) ports, and expansion slots.

★ **CPU**

The central processing unit (CPU) is responsible for interpreting and executing commands. The CPU is a small microchip that resides within a CPU package. The CPU socket is the connection between the motherboard and the processor.

Modern CPU sockets and processor packages are built in following architectures:
• Pin Grid Array (PGA) - the pins are on the underside of the processor package and is inserted into the motherboard CPU socket.

• Land Grid Array (LGA) - the pins are in the socket instead of on the processor.
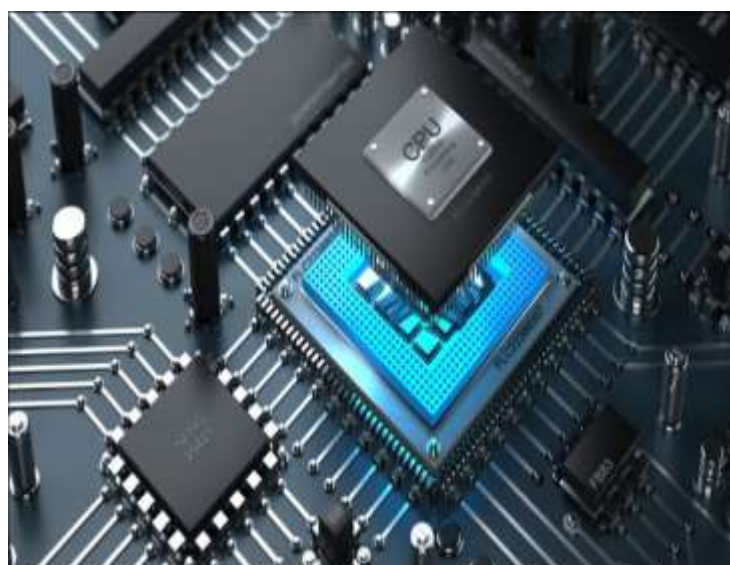
★ RAM

Random access memory (RAM) is a series of small cards or modules plugged into slots on the motherboard. The CPU can request any data in RAM. It is then located, opened, and delivered to the CPU for processing in a few billionths of a second. Since all the contents of RAM are erased when you turn off the computer, RAM is the temporary or volatile storage location for the computer.

RAM contains multiplexing and demultiplexing circuitry, to connect the data lines to the addressed storage for reading or writing the entry. Usually more than one bit of storage is accessed by the same address, and RAM devices often have multiple data lines and are said to be "8-bit" or "16-bit", etc. devices.

★ ROM

Read-only memory, or ROM, is a type of computer storage containing non-volatile, permanent data that, normally, can only be read, not written to. ROM contains the programming that allows a computer to start up or regenerate each time it is turned on. ROM also performs large input/output (I/O) tasks and protects programs or software instructions. Once data is written on a ROM chip, it cannot be removed.

Almost every computer incorporates a small amount of ROM that contains the start-up firmware. This boot firmware is called the basic input/output system (BIOS). This

software consists of code that instructs the boot-up processes for the computer -- such as loading the operating system (<u>OS</u>) into the random access memory (<u>RAM</u>) or running hardware diagnostics. Consequently, ROM is most often used for firmware updates.

★ <u>SEMICONDUCTOR MEMORY</u>

Semiconductor memory is used in any electronics assembly that uses computer processing technology. Semiconductor memory is the essential electronics component needed for any computer based PCB assembly.

In addition to this, memory cards have become commonplace items for temporarily storing data - everything from the portable flash memory cards used for transferring files, to semiconductor memory cards used in cameras, mobile phones and the like.

The use of semiconductor memory has grown, and the size of these memory cards has increased as the need for larger and larger amounts of storage is needed.

To meet the growing needs for semiconductor memory, there are many types and technologies that are used. As the demand grows new memory technologies are being introduced and the existing types and technologies are being further developed.

★ BUSES

A bus is a set of wires through which data can be sent to the different parts of the computer system. Buses connect the major computer derives to each other. The chipset uses the buses to send data around the motherboard.

The main buses are:

• Front side bus: Connects the processor to the northbridge.

• Memory bus: Connects the northbridge to the main memory.

• Graphics bus: Connects the northbridge to the PCI-Express or AGP graphics slot.

• Internal bus: Connects the northbridge to the southbridge

• PCI bus: Connects the PCI slots and the onboard graphics to the southbridge

• LPC bus: Connects low bandwidth devices to the southbridge. These include the BIOS chip and the Super I/O chip which controls the keyboard, mouse, parallel, serial ports etc.
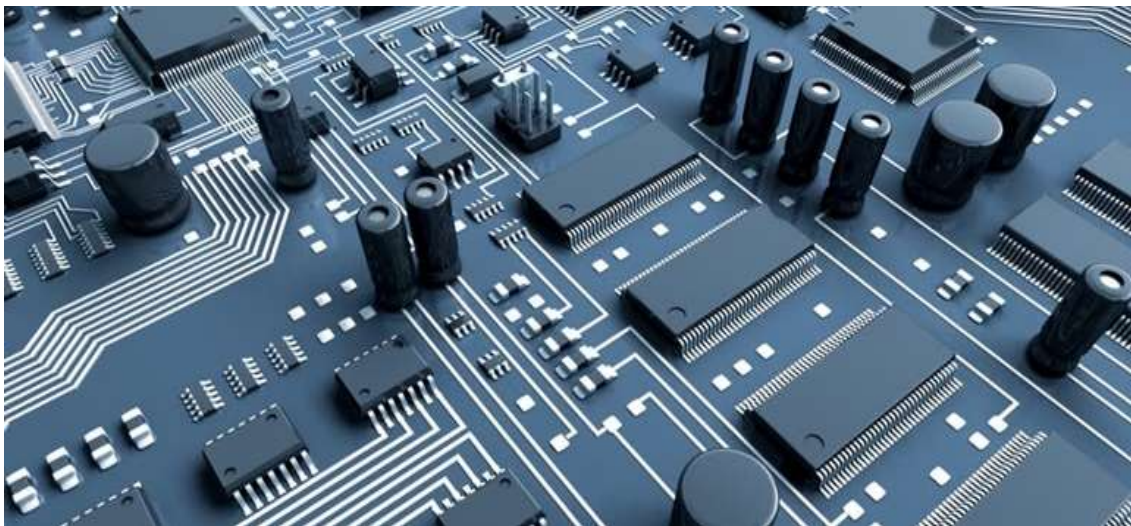
★ PORTS

In computer hardware, a port serves as an interface between the computer and other computers or peripheral devices. In computer terms, a port generally refers to the part of a computing device available for connection to peripherals such as input and output devices. Computer ports have many uses, to connect a monitor, webcam, speakers,

or other peripheral devices. On the physical layer, a computer port is a specialized outlet on a piece of equipment to which a plug or cable connects. Electronically, the several conductors where the port and cable contacts connect, provide a method to transfer signals between devices.

Bent pins are easier to replace on a cable than on a connector attached to a computer, so it was common to use connectors for the fixed side of an interface.

Computer ports in common use cover a wide variety of shapes such as round (PS/2, etc.), rectangular (FireWire, etc.), square (Telephone plug), trapezoidal (D-Sub — the old printer port was a DB-25), etc. There is some standardization to physical properties and function. For instance, most computers have a keyboard port (currently a Universal Serial Bus USB-like outlet referred to as USB Port), into which the keyboard is connected.