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Date: 19-03-2022

Experiment No.: 1

Aim

Identify the major components of a computer such as motherboard,RAM modules,daughter guards,bus slots,SMPS,internal storage devices and interfacing ports.

Motherboard

The motherboard is defined as a circuit board for the computer system, also called logic board or mainboard. 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.

- **Keyboard and mouse**

There are mainly 2 types of mouse and keyboard connectors. The first connector isknown as PS/2 & the second connector is known as USB.

- **Universal Serial Bus (USB)**

The USB port is used for connecting the computer system. In the computer system, thereis various type of devices that are connected with the USB port like keyboard, mouse, camera, scanner, printers, and another device. The main

use of a USB port is to connect the peripheral devices and computer motherboards.

- **Parallel port**

The old printers that are used in past use the parallel port to connect with the computer system. In the parallel port, multiple wires are used to send or receive multiple bits of thedata in a single instance. On the other hand, serial ports use only one wire at a time. In the parallel port, 25 pins female DB type connector is used.

- **CPU chip**

The central processing unit is the processor that controls all the functions of the computersystem. The overall flow of task and functions are controlled by the central processing unit. For the computer system, the central processing unit is called the brain of the computer system.

- **RAM slots**

The RAM slots are used for connecting the RAM (memory) in the computer system. In the general computer system, there are mainly two RAM slots but sometimes there can be four-plus slots in the motherboard to increase the memory of the computer system.

- **Floppy Controller**

The older motherboard chip contains a 34-pin type ribbon cable for connecting the computer system with a floppy drive.

- **IDE controller**

The integrated drive electronics are also known as ATA or Parallel ATA. The IDE is thetype of component that issued for hard drive control. In today's computer system, the IDE controller supports is not supported.

- **PCI slot**

The full form of PCI is a peripheral component interface. The PCI slot is mainly used to insert the expansion cards on the computer. The other PCI

devices can also be connectedlike a sound card, network card, video, card, modems, and other device3s. In today's computer system support for PCI expansion slots are not there.

- **ISA slot**

Industry-standard architecture (ISA) is defined as standard architecture for expansionbus. The ISA slot issued for connecting input devices and modems.

- **CMOS Battery**

The CMOS battery is used for storing the BIOS settings on the motherboard. The CMOSbattery is also capable of storing the time and data in it.

- **AGP slot**

AGP (Accelerated Graphics slot) is a type of computer slot that is used for attaching the video card to the system. This slot is a high-speed slot so that data transfer can be done athigh speed.

- **CPU slot**

The CPU slot is a type of port that is used to connect the central processing unit to themotherboard of the computer system.

- **Power supply slot**

The power supply slot is used for providing the electric supply to the computer system sothat it can start and perform its functions. The total power supply given to the system is around 110 ac power. In the power supply type connector, there are a total of 20-pins thatare used to maintain the power supply to the computer system.
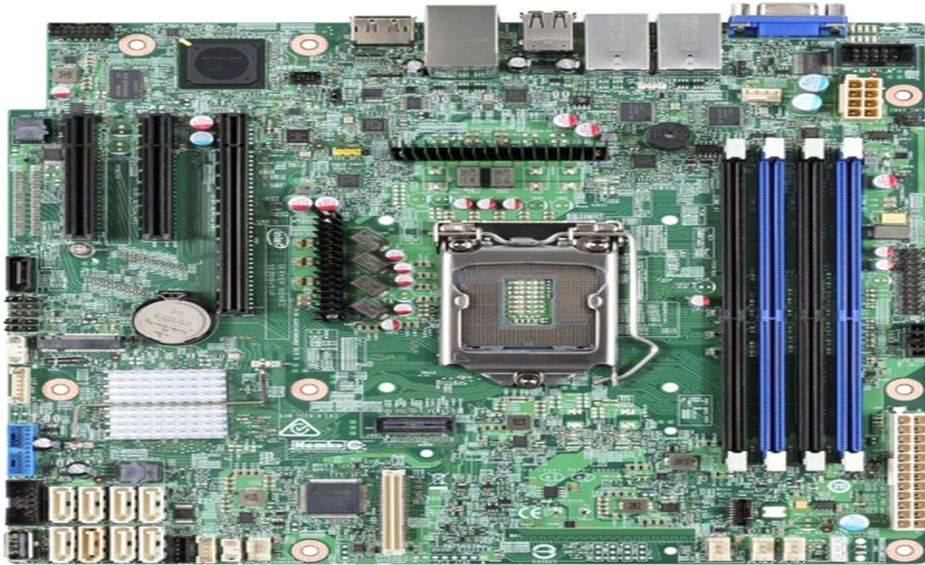
RAM Modules

Volatile Memory Module-RAM The RAM memory chip, referred to as a main memory,is a storage location that allows information to be stored and accessed quickly from random location with memory module. The memory cell which can be accessed for information transfer to or from any desired random location is called a Random Access Memory.
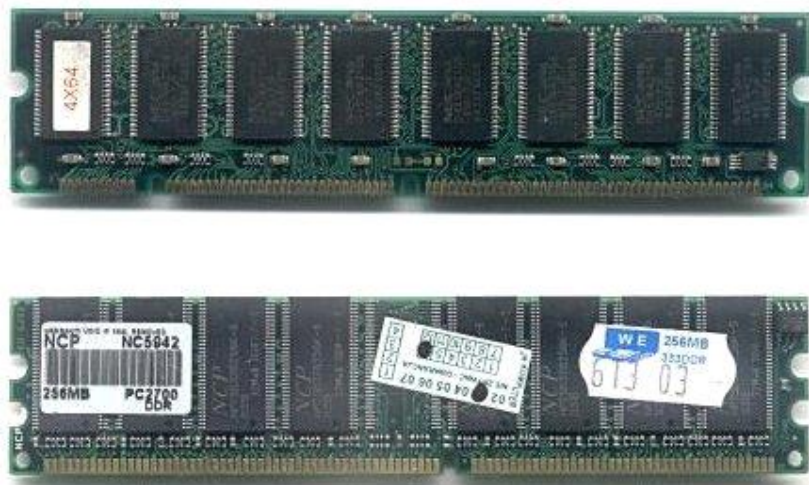
Bus Slots

Alternatively known as a **bus slot** or **expansion port**, an **expansion slot** is a connectionor port inside a [computer](#) on the [motherboard](#) or [riser card](#). It provides an installation point for a hardware expansion card to be connected. For example, if you wanted to

install a new video card in the computer, you'd purchase a video expansion card andinstall that card into the compatible expansion slot.

Below is a listing of expansion slots commonly found in a computer and the devices associated with those slots. Clicking any of the links below provide you with additionaldetails.

- **[AGP](#) HYPERLINK "https://www.computerhope.com/jargon/a/agp.htm"** - [Video](#) HYPERLINK "https://www.computerhope.com/jargon/v/video-card.htm" HYPERLINK "https://www.computerhope.com/jargon/v/video-card.htm"[card](#).
- **[AMR](#) HYPERLINK "https://www.computerhope.com/jargon/a/amr.htm"** - [Modem](#), [sound](#) HYPERLINK "https://www.computerhope.com/jargon/s/souncard.htm" HYPERLINK "https://www.computerhope.com/jargon/s/souncard.htm"[card](#).
- **[CNR](#) HYPERLINK "https://www.computerhope.com/jargon/c/cnr.htm"** - Modem, [network](#) HYPERLINK "https://www.computerhope.com/jargon/n/nic.htm" HYPERLINK "https://www.computerhope.com/jargon/n/nic.htm"[card](#), sound card.
- **[EISA](#) HYPERLINK "https://www.computerhope.com/jargon/e/eisa.htm"** - [SCSI](#), network card, video card.
- **[ISA](#) HYPERLINK "https://www.computerhope.com/jargon/i/isa.htm"** - Network card, sound card, video card.

- **PCI** HYPERLINK **"https://www.computerhope.com/jargon/p/pci.htm"** - Network card, SCSI, sound card, video card.
- **PCI HYPERLINK "https://www.computerhope.com/jargon/p/pciexpre.htm" HYPERLINK "https://www.computerhope.com/jargon/p/pciexpre.htm"Express HYPERLINK "https://www.computerhope.com/jargon/p/pciexpre.htm"** - Video card, modem, sound card, network card.
- **VESA HYPERLINK "https://www.computerhope.com/jargon/v/vesa.htm"** - Video card.

Many of the expansion card slots above are obsolete. You're most likely only going to encounter AGP, PCI, and PCI Express when working with computers today. The picturebelow is an example of what expansion slots may look like on a motherboard. In this picture, there are three different types of expansion slots: PCI Express, PCI, and AGP.

ASUS P5AD2-E Motherboard - http://www.computerhope.com
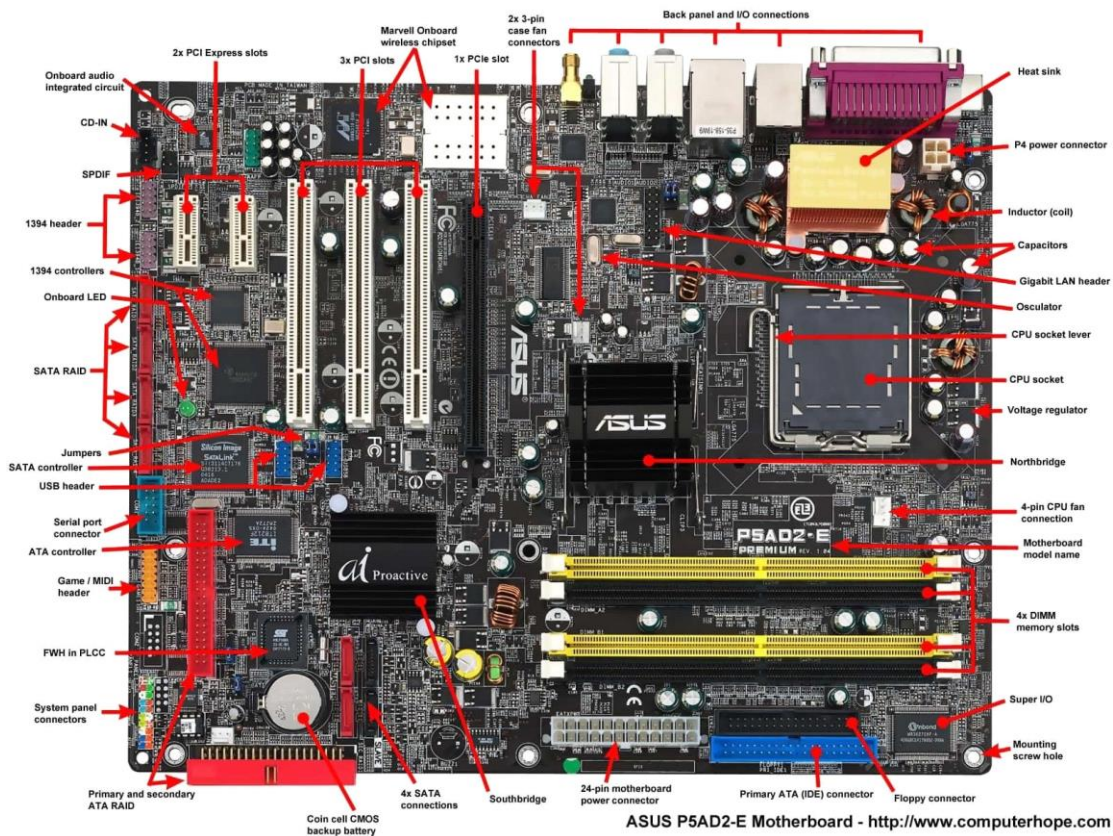
SMPS

A switched-mode power supply (SMPS) is an electronic circuit that converts power usingswitching 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 stableand efficient power supply.

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

Advantages of switched-mode power supplies:

- Higher efficiency of 68% to 90%
- Regulated and reliable outputs regardless of variations in input supply voltage
- Small size and lighter
- Flexible technology
- High

power density

Disadvantages:

- Generates electromagnetic interference
- Complex circuit design
- Expensive compared to linear supplies

Switched-mode power supplies are used to power a wide variety of equipment such as computers, sensitive electronics, battery-operated devices and other equipment requiringhigh efficiency.

Internal Storage Devices

A storage device is any type of computing hardware that is used for storing, porting or extracting data files and objects. Storage devices can hold and store information both temporarily and permanently. They may be internal or external to a computer, server orcomputing device.

A storage device may also be known as a storage medium or storage media depending onwhether it is seen as discrete in nature (for example, "a hard drive" versus "some hard drive space.")

There are two different types of storage devices:

Primary storage devices: Generally smaller in size, primary storage devices are designed to hold data temporarily and are internal to the computer. They have the fastestdata access speed. These types of devices include RAM and cache memory.

Random Access Memory, or RAM, is the primary storage of a computer. When you'reworking on a file on your computer, it will temporarily store data in your RAM. RAM allows you to perform everyday tasks like opening applications, loading webpages, editing a document or playing games. It also allows you to jump from one task to anotherwithout losing your progress. In essence, the larger the RAM of your computer, the smoother and quicker it is for you to multitask.
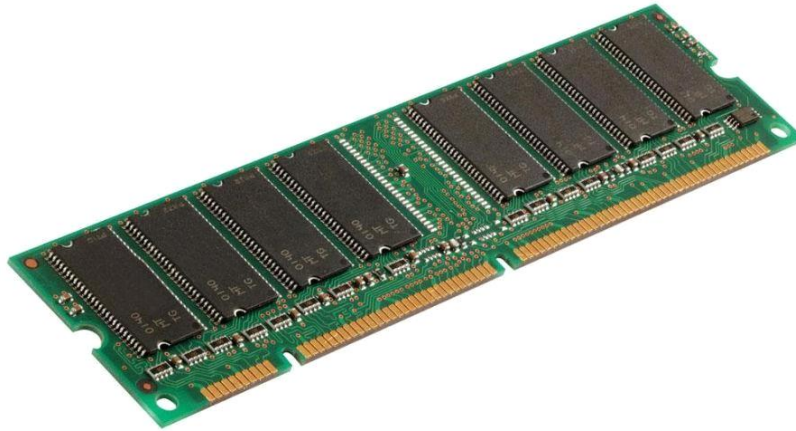
Secondary storage devices: Secondary storage devices usually have larger storage capacity, and they store data permanently. They can be either internal or external to the computer. These types of devices include the hard disk, the optical disk drive and USB storage device. In addition to RAM, every computer also has another storage drive that's used for storing information on a long-term basis. This is secondary storage. Any file youcreate or download saves to the computer's secondary storage. There are two types of storage device used as secondary storage in computers: HDD and SSD.

Hard Disk Drives (HDD) : The hard disk drive (HDD) is the original hard drive. Theseare magnetic storage devices that have been around since the 1950s, though they've evolved over time. A hard disk drive is comprised of a stack of spinning metal disks known as platters. Each spinning disk has trillions of tiny fragments that can be magnetized in order to represent bits (1s and 0s in binary code). An actuator arm with a read/write head scans the spinning platters and magnetizes fragments in order to write digital information onto the HDD, or detects magnetic charges to read information fromit.

Solid-State Drives (SSD) : Solid-state drives emerged far more recently, in the '90s. SSDs don't rely on magnets and disks, instead they use a type of flash memory called NAND. In an SSD, semiconductors store information by changing the electrical currentof circuits contained within the drive. This means that unlike HDDs, SSDs don't requiremoving parts to operate. Because of this, SSDs not only work faster and smoother than HDDs (HDDs take longer to gather information due to the mechanical nature of their platters and heads), they also generally last longer than HDDs (with so many intricate moving parts, HDDs are vulnerable to damage and wear). Outside of newer

PCs and high-end laptops, you can find SSDs in smartphones, tablets, and sometimes video cameras

Hard Disk Drive   Solid State Drive

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 pluggedin.

- Examples of external devices attached via ports are the mouse, keyboard, monitor,microphone, speakers, etc.

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.
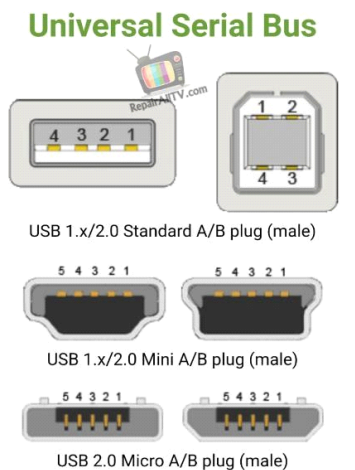
VGA Port

- Connects monitor to a computer's video card.

- It has 15 holes.

- Similar to the serial port connector. However, serial port connector has pins, VGAport 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 thenetwork 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.