

Memory

Computer memory plays vital role in the computer industry because without **computer memory** entire system like as plastic box. There are two types

- **Primary Memory (Storage Device)**
- **Secondary Memory (Storage Device)**

What is Primary Memory(Main Memory)?

Definition – Primary memory is known as “**Main Memory**” or “**Internal Memory**” or “**Primary Storage Device**” or “**Internal Storage Device**” as well as they play vital role in **computer**, because those memories are capable to access all data directly from **CPU** with the help of various buses. These memories have limited capacity for storage and made by integrated circuits (IC) or semiconductor components.

Types of Primary Memory(Storage Devices)

RAM

RAM is primary memory and RAM stands for “**Random Access Memory**“. Ram is capable to access any data randomly any time as well as from any location to **computer**. This is volatile storage memory means to temporary memory in nature, because entire data goes delete while computer get turn off mode. RAM regains all data from CPU in run-time and sends to control unit, and it is a fastest memory to hard disk.

RAM Types are:

Static RAM

Static RAM is also volatile **primary memory**, and it made by flipflop. Static Ram works in computer as a form of Cache Memory, but it consumes more

power as well as more costly to DRAM. In Static RAM uses six transistors, and each transistor use for one bit.

Dynamic RAM

Dynamic RAM is other types of RAM, and volatile also in nature. In which use the capacitors for storing data in few milliseconds when power turn on. Dynamic RAM has slow speed as well as consume low power but has capable to store more data compare to SRAM. DRAM is cost effective as well.

ROM

ROM is primary memory and ROM stands for “Read Only Memory”. This memory is able to store data in permanently means to have non-volatile in nature. ROM is programmable chip because in which stored all instructions that are most required when to start computer. This process is known as “Bootstrap”. ROM is not limited for computer because these chips use in other equipment like as washing machine and microwave as well.

There are four **types of ROM** such as:

MROM

MROM stands for “**Masked ROM**”. MROM has to contain the all pre-planned programs like as piece of instructions, and cheaper as well.

PROM

PROM Stands for “**Programmable Read Only Memory**”. Users can store any data as per their requirement because these ROM is available in market in blank. But in which store instructions (programs) only one time because after filling programs it cannot delete.

EPROM

EPROM Stands for “**Erasable and Programmable**”. In these types of ROM, users have power to editing (erase) the stored instruction (program) in EPROM. EPROM is erasable by ultra-violet light for some time like as 40 minutes.

EEPROM

EEPROM Stands for “**Electrically Erasable and Programmable Read Only Memory**“. In EEPROM, all activities such as programming and erasing are performed by electrically. This EEPROM is able to reprogrammed and erased in more than ten thousand time. Entire chip cannot be erased one time, only erase one byte at once.

What is Secondary Memory

Definition – **Secondary Memory** is also called “**storage device**” and “**auxiliary memory**“, “**external memory**“. **Secondary storage devices** are volatile in nature, it means that data does not discard while power turn-off, in which all data store for long time. **Secondary memory** has the speed of access of data is very slow compare to **primary memory**, and cheaper as well. Without primary memory, those **secondary storage devices** are useless because for processing the secondary memory must be needed the **primary memory**, first of all data are transferred into **primary memory** then these data make for executable.

Magnetic Storage Devices

In the **Magnetic storage devices**, all data are stored with using magnetized medium, and those types of data saved in that medium in the binary form like as 0 and 1. This magnetic storage has also non-volatile storage nature. Today’s, mostly people are preferred to magnetic medium because on the magnetic **storage devices** can be performed read/write activities very easily. Magnetic storage devices have huge capacities for storing data that it’s more attractive point. These **storage devices** are not more costly but their data accessing power is slow, but this magnetic

mechanism also to be used in the RAM that have good data accessing power to other.

Examples Are:

- **Floppy diskette**
- **Hard drive**
- **Magnetic strip**
- **SuperDisk**
- **Tape cassette**
- **Zip diskette**

Optical Storage Devices

In the **optical storage devices**, all read and write activities are performed by light. All recording information stores at an optical disk. As per the opinions of data scientist that compact space is most useful for huge data storage. Their big advantages are not more costly, light weight, and easy to transport because it is removable device unlike hard drive.

Examples Are:

- **Blu-ray disc**
- **CD-ROM disc**
- **CD-R and CD-RW disc.**
- **DVD-R, DVD+R, DVD-RW, and DVD+RW disc.**

Flash Memory Devices

Flash Memory was introduced by Dr. Fujio Masuoka in 1980. Flash memory is also known as electronically erasable programmable read only memory (EEPROM), because in which piece of code like as programming can be write and erased by electrically. Flash memory also uses for the storing data to computers as well as electronic devices such as USB flash drives, MP3 players, digital cameras and solid-state drives. Flash memory is non volatile in nature because all data are persisted in the memory when power is turn-off.

Examples Are:

- USB flash drive, jump drive, or thumb drive.
- CF (CompactFlash)
- M.2
- Memory card
- MMC
- NVMe
- SDHC Card
- SmartMedia Card
- Sony Memory Stick
- SD card
- SSD
- xD-Picture Card

Online Cloud System

Clouding is systematically model for storing data in computer, and in which entire data are stored in logically nature. Those clouding system are managed by other hosting companies. With the help of online clouding, all data can be access by couples of users anytime and anywhere. Big advantages are not place limitation as well as no need carry any storage device.

There are some types:

- **Cloud storage**
- **Network media**
- **Cache Memory**
 - This **cache memory** has higher speed for accessing data, and allows to computer for storing piece of data in temporary nature. Cache memory is place at near the **CPU** and RAM. Cache memory speed is very fast because its travel distance is short between RAM to Cache memory. There are three types of **Cache memory** such as – Level 1 cache, Level 2 cache, Level 3 cache.

Difference Between Primary and Secondary Memory

- Primary Memory can be volatile and non volatile.
- Secondary Memory only has non volatile in nature.
- Data buses are used by primary memory for accessing data.
- I/O channels are used by secondary memory.
- Processing unit is capable to access data directly.
- Data access indirectly means all data are transfer secondary memory to primary memory then it can access by CPU.
- Primary memory is also known as internal memory.
- Secondary memory is called also Backup or Auxiliary memory.
- Primary memory has two categories like as RAM and ROM.
- Secondary memory has four categories like as Magnetic Storage, Optical Storage, Flash storage, and Online Cloud System.
- Primary memory is more costly to secondary memory.
- Secondary memory is cheaper to primary memory.
- Primary memory has low capacity compare to secondary memory.
- Secondary memory has to more power for storing data up to terabyte.
- All data goes to loss while power is turn off.
- In secondary memory, all data can be access anytime either power is on or not.
- In which, all data are saved in semiconductor chip.
- In which, entire data are stored in storage devices such as hard drive, CD, and more.
- Primary memory is faster than to secondary memory.
- Secondary memory is slow compare to primary memory.