Primary Storage

Primary Memory is RAM and ROM

Computer data storage or Computer memory is mainly divided into two types. First is Primary Storage also known as Primary Memory or Main Memory or Online Memory. It consists of RAM and ROM. Random Access Memory (RAM) is the temporary (volatile) storage area whereas Read-Only Memory (ROM) is the permanent (non-volatile) memory. In the hierarchy of storage, Secondary Storage or Secondary Memory or Offline Memory comes next. Secondary Storage include hard disk, floppy disk, CD, DVD etc.

RAM

In Random Access Memory (RAM) there is Static Random-Access Memory (SRAM) and Dynamic Random-Access Memory (DRAM). SRAM is fast and costly compared to DRAM which is slow and cheap. SRAM uses transistors and is used in processors i.e, cache memory which will do prefetch function. DRAM uses capacitors which must be periodically refreshed. The refresh circuit prevents data to discharge when the power in ON.

Random Access Memory (RAM) is of the following types:

1. **Single Inline Pin Package (SIPP)**
2. **Dual In-line Package (DIP)**
3. **Single In-Line Memory Module (SIMM)** which has white colour slot and 30 (1 MB/slot) to 72 pins (4-32 MB/slot). RAM type used is Extended Data Out (EDO) and its speed is (6-66)MHz
4. **Dual In-Line Memory Module (DIMM)** is further divided into DIMM1 & DIMM2.
    - In DIMM1 slot Synchronous Dynamic RAM (SDRAM) is used with maximum 512MB/slot. It has 2 notches and 168 pins and the speed in (66-200)MHz
    - DIMM2 houses Dual Data Read (DDR) RAM with a maximum of 1GB/slot. DDR RAM has 184 pins with 1 notch and its speed is (200-650)MHz
5. **Rambus In-Line Memory Module (RIMM)** uses Rambus Dynamic RAM (RDRAM) which has 184 pins with dual notch and per slot 1 GB to 32 GB can be inserted.

ROM

ROM chip stores BIOS program containing system settings and needs 24 hrs power supply which is provided by CMOS battery (3V) even when the computer is switched off. CMOS stand for Complementary Metal Oxide Semiconductor.

ROM identification is done through manufactures name and they are – American Megatrends Incorporated (AMI), Award, Phoenix and Flash. ROM is classified into following types:

1. **Mask ROM** is the first ROM chip. Circuit is integrated and manufacturer is the programmer on Mask ROM.
2. **Programmable Read-Only Memory (PROM)** is blank ROM chip which can be programmed. PROM programmers program the blank ROM chip.
3. **Erasable Programmable Read-Only Memory (EPROM)** as the name suggests is capable of erasing first time program and reprogram it. 20 minutes passage of UV rays causes erasing. On top of EPROM there's transparent window and after first programming when programmers erase it and reprogram it is covered with an opaque layer on transparent window. The main disadvantage of EPROM is exposing to sunlight may erase the program.
4. **Electrically Erasable Programmable Read-Only Memory (EEPROM)** erases the program in ROM when voltage more than normal is given. But particular location erasability feature is not available and the entire program has to be erased if we want to erase. Switch Mode Power Supply (SMPS) plays a very important role in EEPROM.
5. **Electrically Alterable Read-Only Memory (EAROM)** is same as EEPROM but there are extra features enabled using which erasability according to locations is possible. EAROM is less used due to very slow writing or running process.
6. **Flash ROM** is the modern type of EEPROM and also called as flash EEPROM or flash memory which can be erased and rewritten faster.