Computer - Introduction to Memory

The Role of Memory

The term "**memory**" applies to any electronic component capable of temporarily storing data. There are two main categories of memories:

- **internal memory** that temporarily memorises data while programs are running. Internal memory uses microconductors, i.e. fast specialized electronic circuits. Internal memory corresponds to what we call random access memory (RAM).
- **auxiliary memory** (also called *physical memory* or *external memory*) that stores information over the long term, including after the computer is turned off. Auxiliary memory corresponds to magnetic storage devices such as thehard drive, optical storage devices such as CD-ROMs and DVD-ROMs, as well as read-only memories.

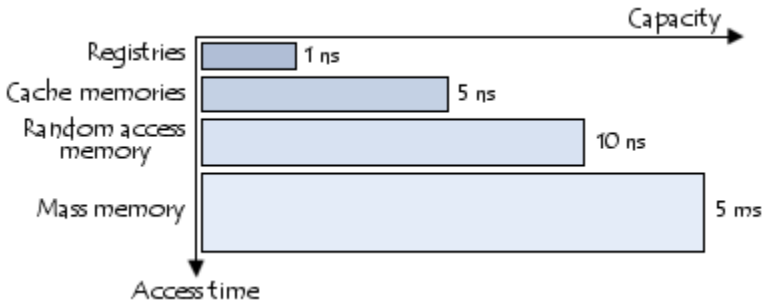
Technical Characteristics

The main characteristics of a memory are:

- **Capacity**, representing the global volume of information (in bits) that the memory can store
- **Access time**, corresponding to the time interval between the read/write request and the availability of the data
- **Cycle time**, representing the minimum time interval between two successive accesses
- **Throughput**, which defines the volume of information exchanged per unit of time, expressed in bits per second
- **Non-volatility**, which characterises the ability of a memory to store data when it is not being supplied with electricity

The ideal memory has a large capacity with restricted access time and cycle time, a high throughput and is non-volatile.

However, fast memories are also the most expensive. This is why memories that use different technologies are used in a computer, interfaced with each other and organized hierarchically.



The fastest memories are located in small numbers close to the processor. Auxiliary memories, which are not as fast, are used to store information permanently.

Types of Memories

Random Access Memory

Random access memory, generally called **RAM** is the system's main memory, i.e. it is a space that allows you to temporarily store data when a program is running.

Unlike data storage on an auxiliary memory such as a hard drive, RAM is volatile, meaning that it only stores data as long as it supplied with electricity. Thus, each time the computer is turned off, all the data in the memory are irremediably erased.

Read-Only Memory

Read-only memory, called **ROM**, is a type of memory that allows you to keep the information contained on it even when the memory is no longer receiving electricity. Basically, this type of memory only has read-only access. However, it is possible to save information in some types of *ROM* memory.

Flash Memory

Flash memory is a compromise between RAM-type memories and ROM memories. Flash memory possesses the non-volatility of ROM memories while providing both read and write access However, the access times of flash memories are longer than the access times of RAM.

Source: http://en.kioskea.net/contents/396-computer-introduction-to-memory