Difference Between Volatile Memory and Non-Volatile Memory

The difference between volatile and non-volatile memory is an important part of the GATE CSE syllabus. Non-volatile memory (ROM) and hard disc drives (HDD) are two types of non-volatile memory. Let us discuss the key difference between volatile and non-volatile memory listed below.

Key Difference Between Volatile Memory and Non-Volatile Memory

Volatile Memory	Non-Volatile Memory
It's a sort of temporary computer memory that only saves data and information until it receives a constant power source.	It is a computer memory that keeps and preserves data long after the user has turned the machine off.
The quickest kind of memory in nature is volatile memory. These memories save the most frequently used information, and any user may rapidly retrieve them.	Non-volatile memory is a type of memory that is slower than volatile memory. Accessing data from a non-volatile memory is slower than accessing data from volatile memory.
One example is volatile memory, such as RAM (Random Access Memory).	The non-volatile memory includes ROM (Read Only Memory).
It requires less storage capacity.	It requires more storage capacity.
Volatile memory is inefficient in terms of cost. Here, the cost of a unit is quite high.	Non-volatile memory is quite inexpensive. Memory is less costly per unit here.
In volatile memory, the information or data is not permanent.	In non-volatile memory, the information or data is permanent.

Volatile and Non-Volatile Memory

Computer memory is divided into two types:

- Volatile Memory
- Non-Volatile Memory

Volatile memory is used to store real-time computer programs and data that the CPU requires, and it is wiped once the machine is turned off. Non-volatile memory, on the other hand, is permanent and stays in the computer even after it is turned off.

What is a Volatile Memory?

Volatile memory is memory hardware that fetches/stores data at high speed. It is also referred to as temporary memory. The data in the volatile memory is retained for as long as the system is operational, but once the system is shut off, the data is immediately erased. It includes things like RAM (Random Access Memory) and cache memory. Data retrieval and storage are quick and cost-effective here.

RAM is Volatile or Nonvolatile?

RAM is a volatile memory. Static RAM and Dynamic RAM are two forms of volatile memory. Simple random access memory (Static RAM) is a kind of random access memory. Each data bit is stored using flip-flops. When the system's electric power is turned off, the RAM also loses its data. Even when the system is turned on, dynamic RAM loses its data in a very short period. Because it is tiny and inexpensive, this memory is the primary memory.

Cache memory is an example of volatile memory.

It is faster than non-volatile memory, and accessing system files takes the least time. The principal source of memory, volatile memory, has a variety of applications. It can protect critical data by making it unavailable if the power is interrupted. With volatile memory, data transfer is difficult, and any processor or device can read it.

What is a Non-Volatile Memory?

Non-volatile memory is a sort of memory in which data or information is retained even after the power is turned off. The most prevalent type of non-volatile memory is ROM (Read Only Memory). Compared to volatile memory, it is less cost-effective and slower to acquire and store data but can store a larger amount of data.

Non-volatile memory is used to store information that must be kept for a long period of time. This type of memory greatly influences the storage capacity of a system. Some examples of non-volatile memory are- ROM (Read-Only Memory) and HDD (Hard Disk Drive).

Non-volatile memory has a significant impact on a system's capacity. It's a form of digital memory that doesn't lose any data if the power source is cut off. It is not necessary to refresh it regularly. This memory is also known as permanent memory since the system can readily recover the stored data and information even after the user turns the power off.