Difference Between Volatile and Non-Volatile Memory

Rashmi Karan
Manager - Content

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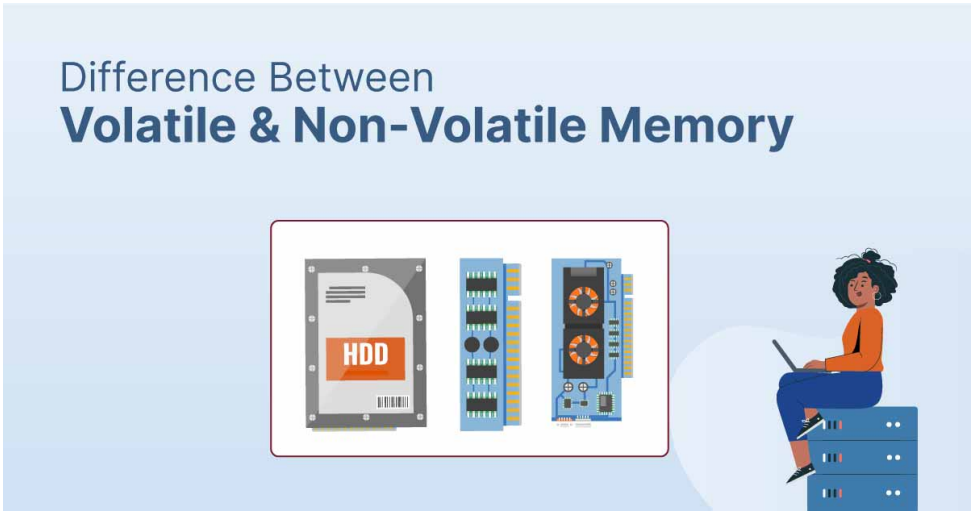
In a computer, memory is crucial for its performance and data retention. There are two primary types of hardware-based memory, volatile and non-volatile. The main difference between both is that volatile memory is any data storage that does not retain its information when powered off, while non-volatile memory is any data storage that retains its information even when the device is turned off or loses power. The data is lost once it is overwritten or deleted by an operator. The article defines Volatile Memory and Non-Volatile Memory, and covers the main differences between Volatile Memory and Non-Volatile Memory.



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- What Is Volatile Memory?
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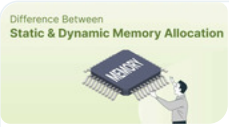
Comparison Table

	Volatile Memory	Non-Volatile Memory
Memory Type	Temporary. It stores the data only until the power is supplied.	Permanent. The data is stored even after the system is turned off.
Data Storage	Stores data that are currently in process by the CPU	Stores the system's information, BIOS, and all the other kinds of data
Speed	The fastest type of memory.	Slower as compared to volatile memories.
CPU Access	CPU can access data stored in volatile memory.	CPU can access data if it is copied from non-volatile memory to volatile memory.
Location	Volatile memory chips are usually kept in memory slots.	The non-volatile memory chip is embedded in the motherboard.
Costs	Volatile memory is inefficient in terms of cost; thus, higher costs are involved.	Less costly.



Difference Between Static and Dynamic Memory... Allocation

This article includes the difference between static and dynamic memory allocation with examples and applications

Virtual Memory with Real-life analogy

This article will explain virtual memory concept in detail and with example.

What is Volatile Memory?

Volatile memory or temporary memory is the kind of computer memory that stores data temporarily. It is also referred to as temporary memory. The data present in the volatile memory is stored only until it receives electrical power. After you disconnect the power supply, the data stored in volatile memory deletes automatically.

Some of the common examples of volatile memory are RAM and cache. Dynamic memory is another example of volatile memory since it requires that stored information be refreshed periodically or read and rewritten without modifications.

Volatile memory stores only the frequently used data due to its temporary nature. The data of the programs running on the processor is stored in volatile memory. Volatile memory is fast, efficient, and rapidly accessible, directly affecting the computer system's performance.

The higher the volatile memory, the more effective the computer system's performance.

Here are some examples of volatile memory:

- System RAM (DRAMs)
- Video RAM (VRAM)
- Processor L1 and L2 cache
- HDD and SSD drive cache

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What Is Non-Volatile Memory?

Non-volatile memory is also a type of computer storage that can store saved data even if the computer system is not receiving any power. Unlike volatile storage, non-volatile storage does not require storage data to be updated periodically. It is commonly used for secondary storage or consistent long-term storage.

Non-volatile storage is widely used in USB flash drives and digital camera storage chips. Non-volatile storage eliminates the need for relatively slow secondary storage systems, including hard drives.

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There are two main types of non-volatile data storage –

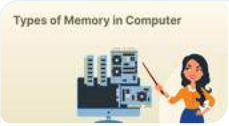
Mechanically directed systems – These systems use a contact structure to write to and read from a selected storage medium. The amount of data stored in this way is far greater than is possible in systems with electrical addressing. Some examples of

mechanically addressable systems are optical disks, hard drives, holographic memory, and magnetic tape.

Electrically Directed Systems – Electrically addressed systems are classified according to the writing mechanism. They are expensive but faster than mechanically steered, affordable, slow systems. Some examples of electrically addressable systems are flash memory, FRAM, and MRAM.

Some examples of NVM include:

- All types of read-only memory
- Flash memory
- Most magnetic storage devices, such as hard drives, magnetic tapes, and floppy disks
- Previous computer storage solutions, including punched cards and paper tape
- Optical Discs



Different Types of Memory in Computer

For a system to function properly, it is important to have different types of memory in computer. It stores information that the CPU uses for processing and completing instructions. There**...read more**

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Differences Between Volatile Memory And Non-Volatile Memory

- Volatile storage requires a power source to retain information, while non-volatile storage does not. If the power supply of the volatile memory is turned off, the information in the volatile memory will be deleted quickly. If the nonvolatile memory power supply is turned off, the nonvolatile memory retains its data.

- Volatile memory is often used because it is faster and better suited for retaining sensitive information because turning off a power source can quickly delete that information. Random Access Memory, or RAM, is a form of volatile memory. RAM temporarily stores the data needed to run programs and applications on an electronic device.
- Non-volatile storage is better suited for long-term information retention. An example of a non-volatile storage device is a hard drive, which stores files and documents.

FAQs - Differences Between Volatile And Non-Volatile Memory

What is the primary purpose of volatile memory?

How is non-volatile memory used in computing?

Which type of memory is faster: volatile or non-volatile?

What are the advantages of volatile memory?

What are the advantages of non-volatile memory?

Why do computers use both volatile and non-volatile memory?