

Difference Between Primary Memory and Secondary Memory



Rashmi Karan ✓

Manager - Content

Updated on Apr 4, 2025 11:35 IST

Computer memory is simply the computer's brain where data and information are stored for easy retrieval. Memory is the computer's storage space that temporarily or permanently stores data or programs. Learn what primary and secondary memory is, what their types are, and the difference between primary and secondary memory. The article covers the concepts of primary memory and secondary memory, along with the difference between both.

Difference Between Primary & Secondary Memory



Content

- [Difference between Primary and Secondary Storage](#)
- [What is Primary Memory?](#)
 - [Types of Primary Memory:](#)
- [What Is Secondary Memory?](#)



Disclaimer: This PDF is auto-generated based on the information available on Shiksha as on 05-Apr-2025.

- [Types of Secondary Memory](#)
- [Comparison Between Primary and Secondary Memories](#)

Courses ALERT: Explore [FREE Online Courses](#) by **top online course providers**

like Coursera, edX, Udemy, NPTEL, etc., across various domains, like [Technology](#), Data Science, Management, [Finance](#), etc., and improve your hiring chances.

Difference between Primary and Secondary Memory – Comparison Table

Primary memory is used for temporarily storing data that is actively being used by the computer's CPU, while secondary memory (storage) is used for long-term data storage, such as files and programs that are not currently in use. Listed below are some other primary and secondary memory differences.

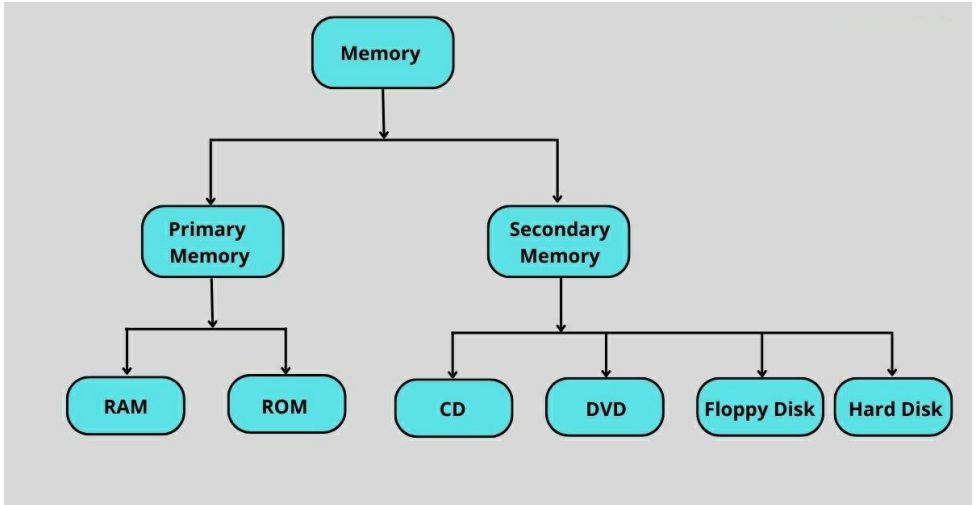
Comparison Parameters	Primary Memory	Secondary Memory
Storage Validity	Primary memory is the main memory and stores data temporarily.	Secondary memory is the external memory and stores data permanently.
Access	The CPU can directly access the data from the Primary Memory	The CPU cannot directly access the data from Secondary Memory.
Volatility	Primary memory is volatile. It loses data in case of a power outage.	Secondary memory is non-volatile; data is stored even during a power failure.



Storage	Data is stored inside costly semiconductor chips.	Data is stored on external hardware devices like hard drives, floppy disks, etc.
Division	Primary memory can be divided into RAM and ROM .	Secondary memory does not have such classification. Secondary memories are permanent storage devices like CDs, DVDs, etc.
Examples	RAM (Random Access Memory), ROM (Read-Only Memory).	HDD (Hard Disk Drive), SSD (Solid State Drive), USB drives, CDs, DVDs, Blu-ray, and cloud storage.
Speed	Faster	Slower
Stored data	Saves the data that the computer is currently using.	It can save various types of data in various formats and huge sizes.
Cost	More expensive per GB due to high-speed and advanced semiconductor technology.	More affordable per GB due to the availability of diverse storage technologies like HDDs and SSDs.
Power Dependency	Operates only when the computer is powered on. Data is wiped off in case of power loss.	Functions independently of power status. Data remains saved in the storage device.



Usage	Essential for the execution of programs and real-time processing by the CPU.	Primarily used for long-term data storage and archival purposes.
-------	--	--




Now that you know how to differentiate between primary and secondary memory let us understand what primary memory and secondary memory are.

What is Primary Memory?

Primary memory is a computer system's internal memory. It stores and retrieves data, instructions, and information. The CPU directly and randomly accesses primary memory, also called Random Access Memory (RAM). Primary memory is volatile and loses data and instructions when the power turns off.

Difference Between Static & Dynamic Memory Allocation



Difference Between Static and Dynamic Memory Allocation



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

[Read Later](#)



Memory Management Techniques in Operating System

Memory management is very important aspect of operating system performance. In this article we have covered different memory management techniques like paging, swapping, compaction and segmentation. This article covers different topics related to...read more

[Read Later](#)

Types of Primary Memory:

RAM (Random Access Memory)

Random Access Memory, or RAM, is usually provided as the computer system's main memory. It is also regarded as temporary or cache memory constantly being written to and read. Information saved in primary memory will be lost when the computer or laptop's power supply turns off. Simply put, RAM is a primary memory from which you can only read information.

Must Read – [What is an Operating System?](#)

ROM (Read-Only Memory)

ROM is a non-volatile memory containing data that we cannot change. In this case, information is not lost when the power supply is turned off. The computer manufacturer determines ROM information. It is permanently stored at the time of



manufacture so that the user cannot overwrite it.

Develop a strong foundation in **memory management** with specialized online **operating systems courses**. Gain hands-on experience in RAM, ROM, **flash memory**, and **next-gen memory solutions** for high-speed computing.

Types of Memory in Computer



Types of Memory in Computer: Primary Memory, Secondary Memory, Cache Memory, Virtual Memory and Flash Memory

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

[Read Later](#)

Difference Between Volatile & Non-Volatile Memory



Difference Between Volatile and Non-Volatile Memory

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...read more

[Read Later](#)

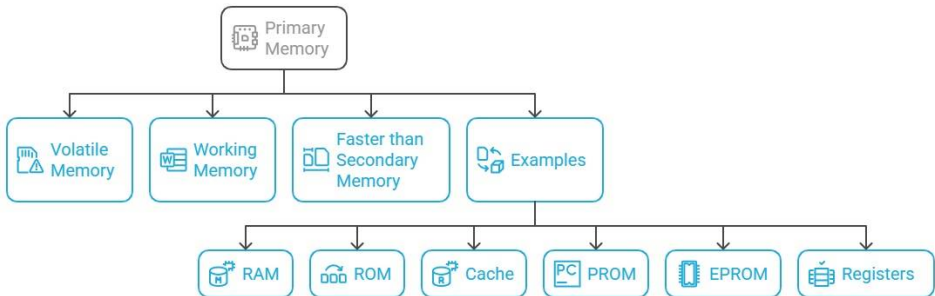
Primary Memory Characteristics

- The computer cannot function without primary memory.
- Primary memory is also known as the main memory.
- You may lose data in case the power is off



- Also known as volatile memory
- It is the working memory of the computer.
- It is faster as compared to secondary memory.
- Examples: RAM, ROM, cache, PROM, EPROM, registers, etc.

Primary Memory Characteristics



Limitations of Primary Memory:

- **Size is Limited:** Primary memory holds less than the storage size in secondary memory, often just a few GBs.
- **Not Volatile:** It is lost when the computer is shut off or faces a power failure.
- **Costly:** Primary memory is expensive and considering its inability to store huge data volume, it can sometimes prove to be impractical.
- **Saves Data Temporarily:** Data is stored in primary memory only when used. So, one cannot keep any files stored permanently there.



Types of Operating Systems

There are different types of operating system. This article includes important types of operating systems with diagrams. This article covered types of operating systems multiprogramming, multiprocessor, distributed, batch, time-sharing, and multitasking...read more

[Read Later](#)



Process Scheduling: Operating System

Have you ever wondered how your computer juggles multiple tasks simultaneously? To know that, you must read this blog on process scheduling in the operating system! This article includes...read more

[Read Later](#)

What is Secondary Memory?

Secondary memory is a permanent storage device that the CPU cannot access directly.

The CPU accesses these devices through an input/output channel. Data is first transferred to primary from secondary storage before its assessment. Modern computers often use hard drives and optical storage devices (CDs, DVDs) as secondary storage devices.



Difference Between Paging And Segmentation



The main difference between Paging and Segmentation is that Paging divides memory into fixed-size blocks called pages, while Segmentation divides memory based on data type or function into variable-sized segments.

[Read Later](#)



Operating System Interview Questions

In this article you will find important operating system questions which are likeable to be asked in interview.

[Read Later](#)

A secondary storage device organizes data into files and directories based on a file system. It also allows the user to access or use additional information like access permissions, owner, last access time, etc. Also, secondary memory temporarily keeps less used data when primary memory is full.

Secondary memory devices are less expensive and can store vast amounts of data, audio, video, and multimedia files. Organizations can store the equivalent of a roomful of data on disks that consume dramatically and significantly less physical space.

Types of Secondary Memory

- Solid-state storage devices, such as USB memory sticks.
- Optical storage devices, such as CDs, DVDs, and Blu-ray discs.
- **Examples:** Magnetic storage devices include zip, floppy, and hard disk drives.



Secondary Memory Characteristics

- These are magnetic and optical memories.
- It is a type of non-volatile memory.
- Data is permanently stored even when the computer is turned off
- It helps store data on a computer
- The computer can function without secondary memory
- Slower than primary memory
- **Examples:** magnetic tapes, optical discs, floppy disks, flash memory [USB drives], paper tape, punched cards, etc.



Characteristics of Secondary Memory



Limitations of Secondary Memory

- **Slower Access:** Secondary memory is slower than primary memory, which can delay data retrieval.
- **Indirect Access:** The CPU cannot directly access data from secondary memory; it must first be loaded into primary memory.
- **Damage Risk:** External devices like hard drives and USBs are susceptible to physical damage, leading to data loss.
- **Dependence on Devices:** Secondary memory depends on additional hardware, which might fail or require regular maintenance.



What is Private Cloud Storage? – Private Cloud Examples

This article explains what private cloud storage is – its capabilities, benefits, and challenges along with some use cases.

[Read Later](#)



All About Secondary Storage Devices

Secondary storage devices are any non-volatile storage device that is either internally or externally present within the computer. These can be an7 device that helps provide permanent data storage.

[Read Later](#)

Comparison Between Primary And Secondary Memories

- Primary memory is the computer's main memory and stores data temporarily.
- Secondary memory is external memory and saves data permanently.
- Data stored in primary memory can be directly accessed by the CPU, which cannot be accessed in secondary memory.
- Primary memory is lost during a power outage, while secondary memory saves the data.
- Secondary memory is non-volatile, while primary memory is volatile.



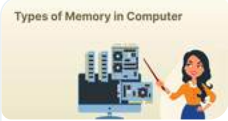
- Primary memory is stored on semiconductor chips, while secondary memory is stored on external devices.
- Primary memory is classified into cache and random access memory, while secondary memory has no such categories.
- Secondary memory can save data in various formats that can be accessed anytime, while primary memory uses the computer's current data.
- Primary memory is faster.

Conclusion

Both types of memory have several differences. Although different, they work together to allow the computer to run smoothly. Primary memory itself can't save more than a few gigabytes of data, but secondary memory fills that gap by providing up to a terabyte of space. While the latter lags in processing data, primary memory is faster and easily accessible.

Both primary and secondary memories are crucial for a computer's effortless and efficient functioning, and they complement each other. I hope this article helped you to differentiate between primary and secondary memory, or understand the difference between primary and secondary storage.

Recommended Reads



Types of Memory in Computer

Types of Memory in Computer: Primary Memory, Secondary Memory, Cache Memory, Virtual Memory and Flash Memory

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

Read Later



DVD Full Form

Learn the full form of DVD. Delve into the fascinating world of DVDs, which brought high-quality video and audio into homes worldwide. Learn about the rise, evolution, and enduring relevance...read more

Read Later



Working of Cache Memory in Computer

This article is focussed on cache memory and its different types. It also explains the working of cache memory in computer. Cache memory in computer is a small amount of random-access memory...read more

Read Later



Examples of Computer Hardware: Understanding the Components that Power Your PC

Discover a wide range of computer hardware examples, from fast processors to handy peripherals. Our article explores the essential components that power your digital devices in simple, easy-to-



understand language. In...read more

Read Later

Types of Microcomputer



What are Examples of Microcomputers?

Microcomputers are compact computing devices primarily designed for individual use. Examples include desktop computers like Apple's iMac, portable laptops like Dell's Inspiron series, and single-board computers like Raspberry Pi. hey...read more

Read Later

Generation of Computers



Exploring the Evolution of Generations of Computers

Computers have gone through many changes over time. The first generation of computers started around 1940 and since then there have been five generations of computers until 2023. Computers evolved...read more

Read Later



ROM Full Form: Read Only Memory

What is ROM (Read Only Memory) –It is the type of computer memory that stores data that can only be read, not written. In simple terms, it's like a book...read more



Read Later

FAQs

How is primary memory different from secondary memory in terms of speed?



Can programs be directly executed from secondary memory?



What is the capacity difference between primary memory and secondary memory?



Can primary memory be upgraded or expanded?



Which memory type is more expensive: primary or secondary?

