

# All About Secondary Storage Devices



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



In this article, we will be discussing secondary storage devices in detail.

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## What is Secondary Storage?

**Secondary storage**, also known as auxiliary storage, is used for storing data that is not as frequently accessible as data in **primary storage**. This non-volatile memory preserves data until it has either been overwritten or deleted. This **type of memory** can be hosted on external devices or within the cloud.

Secondary storage devices allow organizations to store data from megabytes to petabytes. It complements primary storage. This means the data does not require primary storage and gets migrated to secondary storage devices. It helps free up space and improves the performance of primary storage devices. These devices are used as secondary storage for backup, data archival and disaster recovery data.

### Why is Secondary storage important?

Secondary storage is associated with external devices not directly connected to the production server. By default, the data gets saved to production storage tied to an active application or workload. Storing all the **data** in one place is risky. **Hardware and software** are affected by misconfiguration, malware, and other threats or errors. These events can hamper the production data and impact the organization adversely.

Data storage on a secondary storage platform isolated from the network and production environment prevents data loss to ensure recovery. It is a low-cost storage tier where the data is not immediately accessible. Organizations use secondary storage to ensure that one copy of business data remains inaccessible on the internal network or the **internet**.

## Types of Secondary Storage Devices

The different types of secondary storage devices include the following:

### 1. Magnetic Storage Devices

These secondary storage devices use magnetization to write, rewrite and access



data. Such storage devices store data in binary form as tiny and magnetized dots. Such dots are created, read and erased through magnetic fields that are created using tiny electromagnetics. The following are the different types of magnetic storage devices:

### **1.1 Hard disk drives (HDDs)**

A hard disk drive (HDD) is an electro-mechanical data storage device for storing and retrieving digital data using magnetic storage. This magnetic storage comes with one or multiple rigid rapid-rotating platters coated with magnetic material. Such platters are paired with magnetic heads arranged on a rotating actuator arm that reads and writes data to platter surfaces.

### **1.2 Magnetic tape drives**

A tape drive is a data storage device for reading and writing data on magnetic tape. It is used for archival and offline data storage. It provides sequential access storage that provides direct access storage. They can move to any position on the disk within a few milliseconds, but the tape drive must wind the tape between reels to read any data.

### **1.3 Floppy Disk Drive**

Also known as a floppy diskette, it is a disk storage type composed of thick and flexible storage made of magnetic storage medium. It stores digital data that can be read and written when the disk is inserted into a floppy disk drive that is connected to a computer. These secondary storage devices have become obsolete and have been replaced with memory cards, flash drives and cloud storage.

## **2. Solid-state drives (SSDs)**

These devices are also known as solid-state drives (**SSDs**) that use NAND-based flash memory for storing and retrieving data. Unlike traditional hard disk drives that use spinning disks to access data, SSDs do not have any moving parts.



## 2.1 Optical storage devices

These devices use optical storage technology for reading and writing data. This data gets digitally stored, and for reading and writing data, lasers are used.

### 2.2.1 Compact Disk (CD)

It is a digital optical disc data storage format adapted for general-purpose data storage. The capacity of compact discs is extended to 80 minutes and is 700 MiB by arranging the data more closely on the same-sized discs.

### 2.2.2 DVDs

DVD (Digital Video Disc) can store any digital data widely used for video programs or storing software. These can store 15 times CDs' data and rich multimedia files that require high storage capacity. DVDs are used in DVD-Video consumer digital video and DVD-Audio consumer digital audio formats.

### 2.2.3. Blu-Ray Disc

Also known as Blu-ray, it is a digital optical disc data storage format. High-definition videos are stored on Blu-ray discs with up to 1920 x 1080 pixel resolution at 24& 50/60 progressive or 50/60 interlaced frames per second. Besides hardware specifications, it is associated with a set of multimedia formats.

## Characteristics of Secondary Storage Devices

- **Non-Volatility:** Secondary storage devices are non-volatile, meaning they retain data even when not powered. This contrasts with primary storage devices like RAM, which lose data when power is lost. Non-volatility is crucial for long-term data storage.
- **Capacity:** Secondary storage devices typically have a high capacity, allowing them to store large amounts of data. The capacity of a secondary storage device can vary from a few gigabytes (GB) to several terabytes (TB), depending on the type of device.
- **Speed:** The speed of a secondary storage device refers to how quickly data can be read from or written to the device. While secondary storage devices are generally slower than primary storage devices, technological advancements have led to developing secondary storage devices with high data transfer rates.



- **Cost:** Generally, secondary storage devices are cost-effective, providing a large amount of storage space for a relatively low cost. However, the cost can vary depending on the type of device, with solid-state drives (**SSDs**) being more expensive than hard disk drives (HDDs), for example.

## How Secondary Storage Devices Work?

- **Data Writing Process:** When written to a secondary storage device, it is transferred from the primary storage (such as RAM) to the secondary storage device. The data is then stored on the device, allowing it to be retrieved later. The exact process of writing data can vary depending on the type of secondary storage device. For example, data is written in a hard disk drive by magnetizing a thin film of ferromagnetic material on a disk.
- **Data Reading Process:** When data is read from a secondary storage device, it is retrieved from the device and transferred to the primary storage (such as **RAM**), where the CPU can access it. The process of reading data can also vary depending on the type of secondary storage device. For example, in a hard disk drive, data is read by detecting the magnetized areas of the disk.

## Conclusion

Thus, the demand for efficient, durable, and high-capacity storage solutions will only grow as the digital universe expands exponentially. While today's devices already offer impressive capacities and speeds, the future promises even greater innovations.

## FAQs

What is the other name of secondary storage?



Is RAM secondary storage?



Is ROM secondary storage?



