

Secondary storage

Secondary storage is also known as backing storage.

Data is written from memory to secondary storage when data is no longer being actively used, for retrieval at a later time.

INTERESTING FACT





The first commercial hard disk drives had the capacity to store approximately 5 MB and were the size of a dining room table. They were also called a *Winchester Drive*.

The time a computer takes to access data stored on secondary storage is **longer** than the time taken accessing data from memory.

Data Capacity

Data capacity is the amount of data a storage device can hold measured in Kilobytes (Kb), Megabytes (MB), Gigabytes (GB) and Terabytes (TB).

The most frequently used backing storage media are:

Media	Suitability	Typical capacity	Durability	Portability	Speed
 Flash drive	Moving relatively small files from work to home	2 GB – 64 GB	★★★★	✓	★★★★
 External hard drive	Backing up a home computer system	500 GB – 4 TB	★	✓	★★★
 CD/DVD/Blu-ray disk	Storing multimedia files	650 MB (CD) 9 GB (DVD) 50 GB (Blu-ray)	★★★	✓	★★
 Magnetic tape	Backing large commercial servers on multiple tapes	200 GB – 400 GB	★★	✓	★

Different types of data can create files that vary in size. In general, text based files are relatively small but audio and video files are much larger. Here are some typical file sizes.

File size	Typical contents
1 B	A single key stroke or a number from 0 to 255
70 B	One line of text
1 KB	A third of a page of text or a short email
8 KB	A school logo
30 KB	A basic web page
100KB	Maximum size for all elements of a web page
500 KB	A five page word processed document or a PDF for downloading
1 MB	One minute of audio when stored as an MP3
5 GB	DVD Movie
10 GB	HD Movie
25 GB	Blu-ray Movie
700 MB	Maximum amount of data on one CD-ROM

It is important to consider the type of data that is going to be stored when you are choosing a storage device.

Technologies such as: optical, magnetic, solid state, storage in the cloud

Optical



Optical storage media uses technology such as lasers. Laser beams are projected onto a CD/DVD or Blu-ray disk and if light is reflected back, then data is read as a 1 and if light is not reflected back, data is read as a 0. Lasers are used to read and write information to a disk.

KEY INFORMATION

Binary digiT (BIT): In computer systems, data is represented by either a 1 or a 0.

Magnetic

This technology is used in hard disks and tapes. Data is stored on a magnetic medium, which can be a disk or a tape, by writing data using a write-head. Data can then be read by the read-head.

Solid state

Solid state technology is used in storage media such as USB flash memory sticks. The technology is called solid state as it does not have any moving parts, such as a read-head in magnetic storage. Solid state storage technology

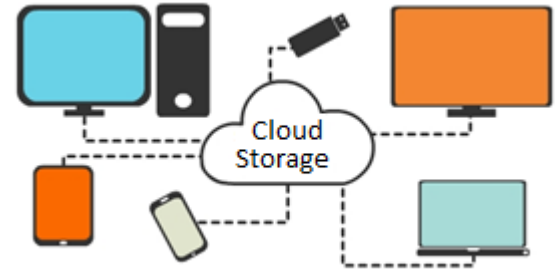


is increasingly used to replace both magnetic and optical storage, especially in mobile devices, where its low power consumption and high speed access is advantageous.

Storage in the cloud

Storage in the cloud is a contemporary data storage facility that allows users to store their data on third-party servers. They can then access that data from many computing devices.

There are many **advantages** to this, such as maintenance tasks, backup and data replication. Purchasing additional storage devices becomes the responsibility of the cloud storage service provider.



A **disadvantage** of storage in the cloud is that an Internet connection is required to access the data. Some other disadvantages include the concern for some organisations that personal data held on a third-party server could be physically stored in a country where adequate data protection legislation does not exist. Another disadvantage is that users are solely reliant on the cloud storage provider when it comes to ensuring that their data is stored safely and can be retrieved at a later date.

Storage requirements

Computer systems can only store and process Binary digits, also known as BITS. A BIT is either a 1 or 0. When 8-bits are stored as a binary number, they are collectively called a byte.

	Symbol	Value
Byte	B	8 bits
Kilobyte	Kb	1024 bytes
Megabyte	MB	1024 Kb
Gigabyte	GB	1024 MB
Terabyte	TB	1024 GB
Petabyte	PB	1024 TB
Exabyte	EB	1024 PB
Zettabyte	ZB	1024 EB
Yottabyte	YB	1024 ZB

INTERESTING FACT
Half a byte (4 bits) is called a nybble.