

Introduction to Hard Disk (HDD)

A hard drive is a mass storage device found in all PCs (with some - [exclusions]) that is used to store permanent data such as the operating system, programs and user files.

The data on hard drives can be erased and/or overwritten, the hard drive is classed as a non-volatile storage device which means it doesn't require a constant power supply in order to retain the information stored on it (unlike RAM).

Inside every hard drive are small round disk-like objects made of either an aluminium/alloy or a glass/ceramic composite, these are called platters, each platter is coated with a special magnetic coating enabling them to store data magnetically.

Hovering above these platters are read/write heads that transfer data to and from the platters.

Hard Drive Capacities

Hard drives come with many different storage capacities, hard drive capacity is measured in bytes, with common capacities being stated in MB (Megabytes) and GB (Gigabytes).

To understand these figures correctly you need to know the basics of how data is stored/processed in digital systems such as PCs.

Digital data is a series of 1's (ones) and 0's (zeroes) which are referred to as bits (Binary digITs), a byte is made up of 8 of these bits, so a single byte of data may look like 01001011 (8 consecutive bits).

- 1 Bit = either a 0 (zero) or a 1 (one)
- 1 Byte = 8 bits
- 1 KB (Kilobyte) = 1024 bytes (2¹⁰)
- 1 MB (Megabyte) = 1024 Kilobytes (2²⁰)
- 1 GB (Gigabyte) = 1024 Megabytes (2³⁰)
- 1 TB (Terabyte) = 1024 Gigabytes (2⁴⁰)

In the old days it was common to find hard drives with a capacity of just 5MB, nowadays it is hard to buy a new hard drive with less than 40GB, that's 40,960 Megabytes !

Common hard drive capacities these days range from 40GB up to and exceeding 120GB.

As a real world example let's take a colour photo, and let's say the photo takes up 500 Kilobytes of storage space on a hard drive, so if you had a 40GB hard drive you could potentially store up to 81,290 colour photos.

This is obviously hypothetical due to the fact that on the hard drive you would need your operating system and programs which would take up some of the storage space, but you can see the point.

When you consider that an average letter written in a word processor is around 30KB it becomes apparent that the storage capacity of modern hard drives is massive!

Hard Drive RPM Speeds

You will often see hard drives advertised as being capable of a certain RPM (Revolutions Per Minute), this figure (as the name suggests) refers to how many times the spindle makes a complete 360° turn in any single minute.

The higher the RPM, the faster the data can be read from the platters, which increases overall performance.

RPM values range from about 5,400RPM to 12,000RPM and above.

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