

HARD DRIVE

The role of the hard drive

The **hard drive** is the component which is used to permanently store data, as opposed to [RAM](#), which is erased whenever the computer is restarted, which is why the term *mass storage device* is sometimes used to refer to hard drives.

The hard drive is connected to the motherboard using a **hard drive controller** which acts as an interface between the processor and the hard drive. The hard drive controller manages the drives linked to it, interprets commands sent by the processor and routes them to the drive in question. Hard drives are generally grouped by interface as follows:

- [IDE](#)
- [SCSI](#)
- [Serial ATA](#)

When the [USB](#) standard appeared, external cases which could connect a hard drive using a USB port were released, making hard drives easy to install and increasing storage capacity for making backups. These are called **external hard drives**, as opposed to internal hard drives which are plugged directly into the [motherboard](#); still, they are the same disks, even though they are connected to the computer using a case plugged into a USB port.

Technical specifications

Capacity: Amount of data which can be stored on a hard drive.

Transfer rate: Quantity of data which can be read or written from the disk per unit of time. It is expressed in [bits](#) per second.

Rotational speed: The speed at which the platters turn, expressed in rotations per minute (*rpm* for short). Hard drive speeds are on the order of 7200 to 15000 rpm. The faster a drive rotates, the higher its transfer rate. On the other hand, a hard drive which rotates quickly tends to be louder and heats up more easily.

Latency (also called rotational delay): The length of time that passes between the moment when the disk finds the track and the moment it finds the data.

Average access time: Average amount of time it takes the read head to find the right track and access the data. In other words, it represents the average length of time it takes the disk to provide data after having received the order to do so. It must be as short as possible.

Cache memory (or buffer memory): Amount of memory located on the hard drive. Cache memory is used to store the drive's most frequently-accessed data, in order to improve overall performance;

Interface: This refers to the connections used by the hard drive. The main hard drive interfaces are:

- [IDE/ATA](#)
- [Serial ATA](#)
- [SCSI](#)

However, there are external cases used for connecting hard drives with [USB](#) or [FireWire](#) ports.