

# Hard Drive Types

There are a few kinds of drives. Spinning disks - either 3.5" @ 7200rpm (faster) or 2.5" @ 5400rpm (slower). Then there are solid state drives (SSDs), there are the 2.5" versions of this (fast) and the NVME version of this (fastest). In addition there are RAIDs, which is a collection of drives in a specific configuration. RAIDs can be made up of all kinds drives, or a mix of drive types. They work best when the drive type is the same IMHO.

External SSD hard drives that can be USB-C or USB-A run faster R/W with USB-C even if the USB-A port is rated at the same speed as USB-C. This is confusing but tested on MAC and PC with Sandisk Extreme Pro

The interfaces below can communicate with a computer in various ways - directly via PCIE or SATA or through a external enclosure and a secondary interface such as USB or Thunderbolt.

Hard Drive Type	Interface	Max R/W Speed <i>Sequential</i>	Average R/W Sustained Speeds <i>Sustained</i>
Spinning Disk Drive 3.5" @ 7200 RPM	SATA I/II/III	210 MB/s	85 MB/s
Spinning Disk Drive 2.5" @ 5400 RPM	SATA I/II/III	120 MB/s	60 MB/s
Solid State Drive 2.5"	SATA III	600 MB/s	450-550 MB/s
Solid State Drive NVMe Gen 3	PCIE 3	3,500/3,000 MB/s	250-1,500 MB/s Depending on temperature and cache
Solid State Drive NVMe Gen 4	PCIE 4	7,400/6,800 MB/s	Haven't used one - theoretical
Solid State Drive NVMe Gen 5	PCIE 5	14,000/10,000 MB/s	Haven't used one - theoretical

## Format Types

- FAT
  - ExFAT - Cross Platform, but no journaling, so drive caches re-index. If you haven't plugged one in a while, it takes some time to re-index.
  - FAT 32 - Legacy
  - NTFS - Windows Systems
  - APFS - Newer Mac Systems
  - HFS+ (Mac Os Extended) - Older Mac Systems
  - EXT4 - Linux
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