Hard Disk Drive (HDD)

Platter (aluminum coated with a thin magnetic layer)

- A circular hard surface
- Data is stored persistently by inducing magnetic changes to it
- Each platter has 2 sides, each of which is called a surface

Spindle

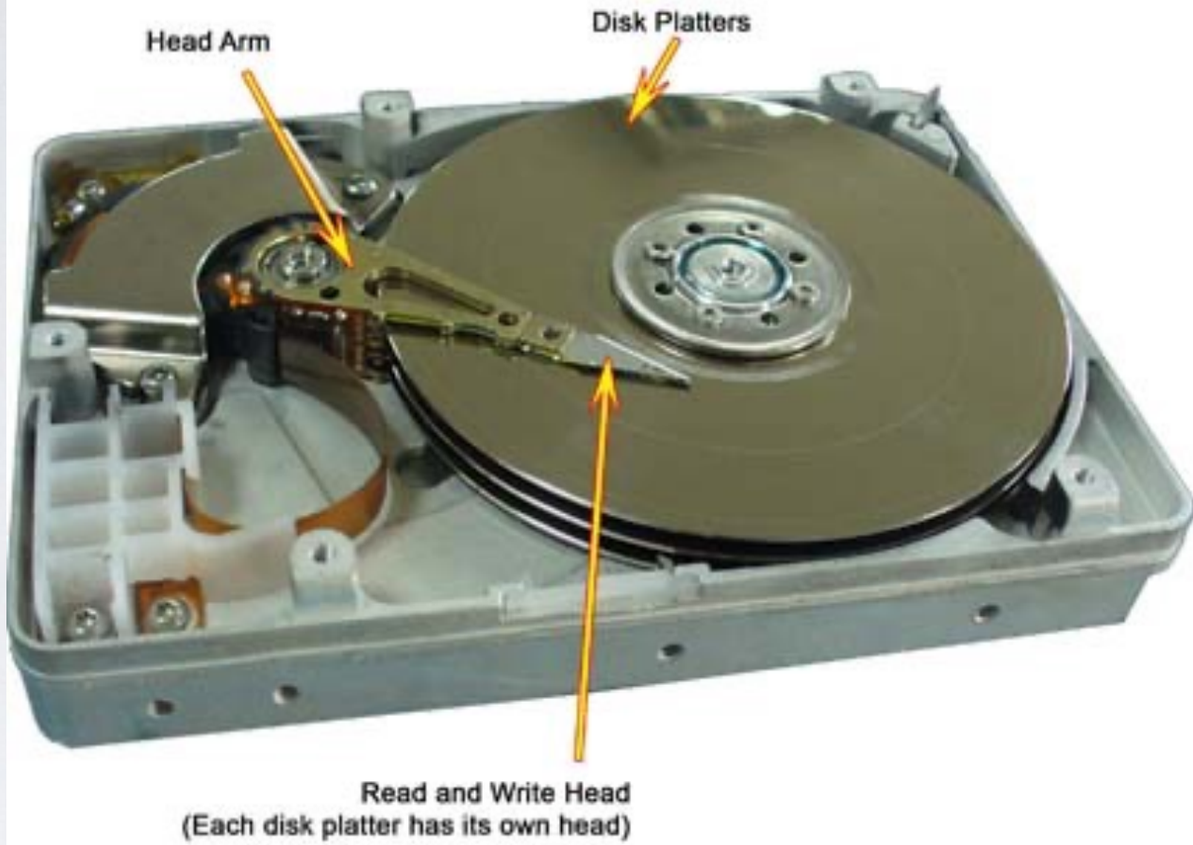
- Spindle is connected to a motor that spins the platters around
- The rate of rotations is measured in RPM (Rotations Per Minute)
  Typical modern values : 7,200 RPM to 15,000 RPM

Track

- Concentric circles of sectors
- Data is encoded on each surface in a track
- A single surface contains many thousands and thousands of tracks

Cylinder

- A stack of tracks of fixed radius
- Heads record and sense data along cylinders
- Generally only one head active at a time



Inside Hard Disk

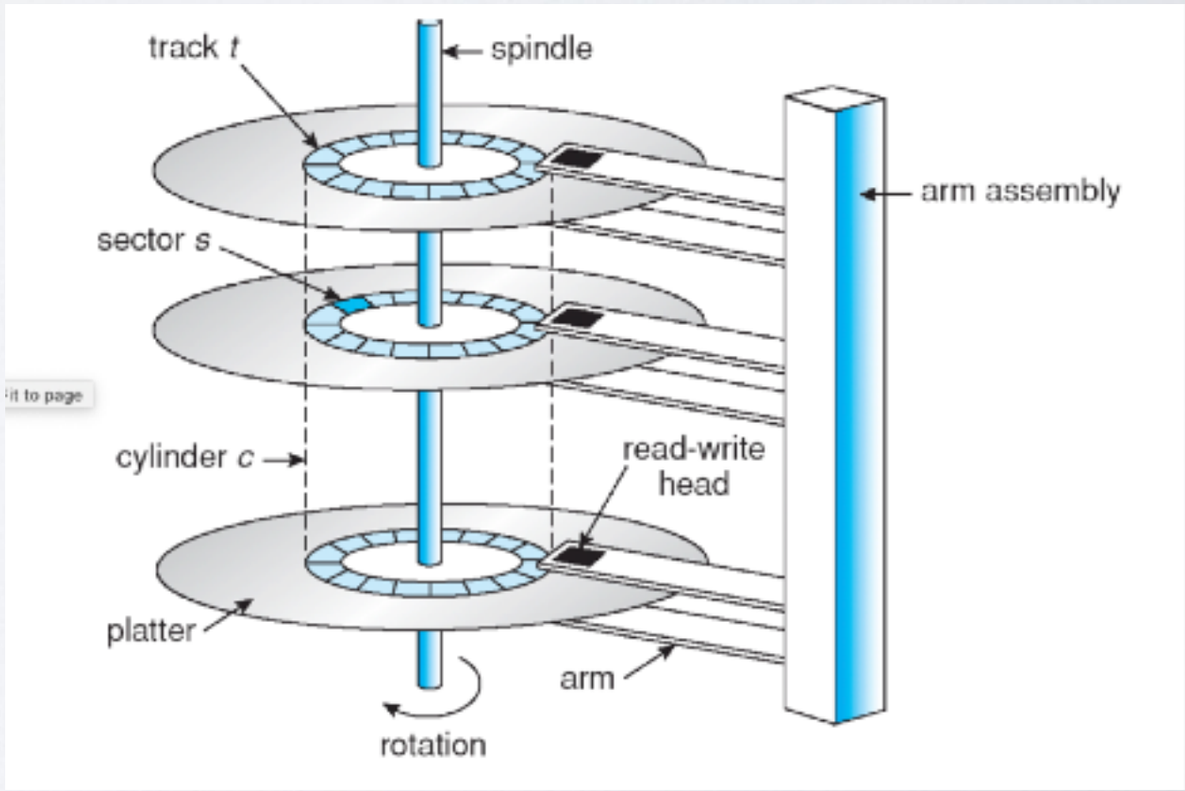
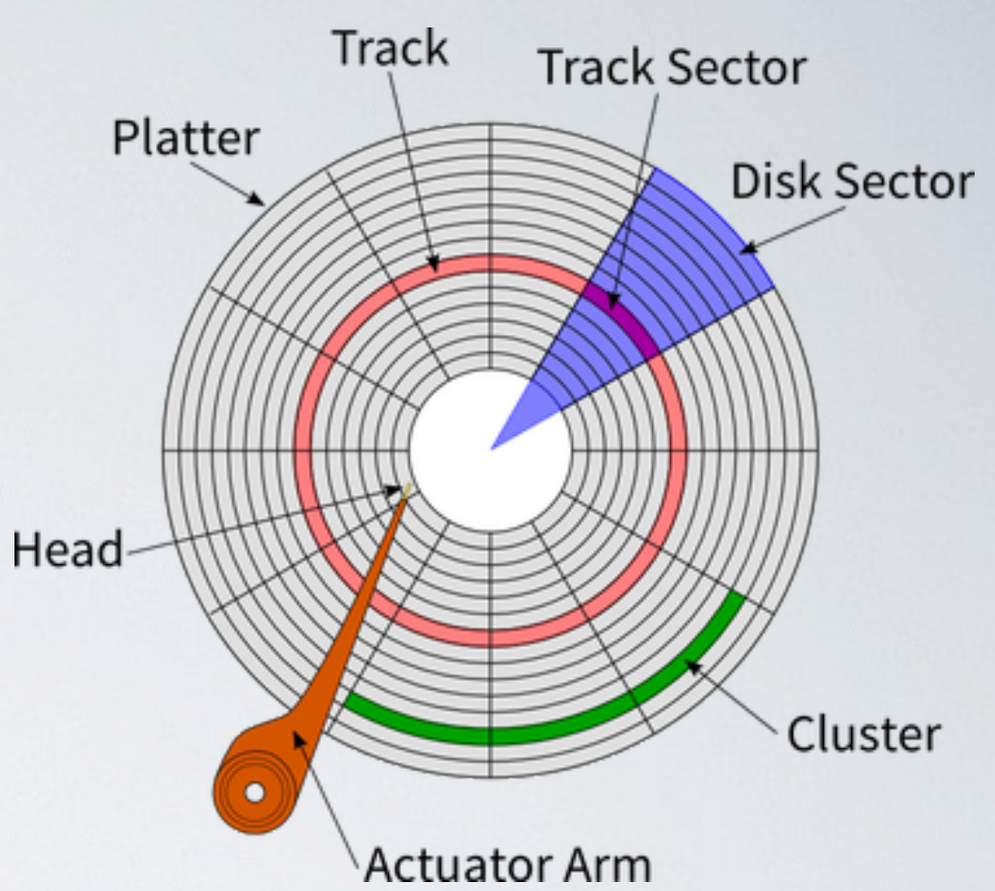


image source: https://blogs.umass.edu/Techbytes/2017/04/04/hard-drives-how-do-they-work/

HDD Interface



➡ Disk interface presents linear array of sectors

- Historically 512 Bytes but 4 KiB in "advanced format" disks
- Written atomically (even if there is a power failure)

✓ Disk maps logical sector #s to physical sectors

✓ OS doesn't know logical to physical sector mapping

image source: https://blogs.umass.edu/Techbytes/2017/04/04/hard-drives-how-do-they-work/