Magnetic Disk

A magnetic disk is a storage device that uses a magnetization process to write, rewrite and access data. It is covered with a magnetic coating and stores data in the form of tracks, and sectors. **Magnetic disk**s are flat circular plates of metal or plastic, coated on both sides with iron oxide. Input signals, which may be audio, video, or data, are recorded on the surface of a disk as magnetic patterns or spots in circular or spiral tracks. The data on a magnetic disk is read and written using a magnetization process. There's just a large shiny, circular "plate" of magnetic material called a **platter**, divided into billions of tiny areas. Each one of those areas can be independently magnetized (to store a 1) or demagnetized (to store a 0). Magnetism is used in computer storage because it goes on storing information even when the power is switched off.

Hard disks, zip disks and floppy disks are common examples of magnetic disks. Magnetic disks have traditionally been used as primary storage in computers. With the advent of solid-state drives (SSDs), magnetic disks are no longer considered the only option, but are still commonly used.

On a disk we can perform two operations. **One is a read another one is write**. These plates look thing is knows as platter. Separata disks are there, they are known as platters. All these platters are rigidly fixed on the central rod known as spindle rod. Spindle rod is the central rod where disk platters are rigidly connected/ That means all the disks will rotate when the spindle rod will rotate. This is call read-write arms. At the tip of the arms, there are read-write heads on there. On the disks, we can perform read- write operation on both sides. We know there are two sides on a disk, up side and down side and we can perform read- write on both the sides. That's why read-write arms have read- write heads on both sides of the disks. These read- write heads can move front and back direction. And slightly right and left so that the disk surface can be accessed. In combination of spindle rod rotation, and movement of read-write head, full disk data can be accessed. Data is organized on the disk in the form of tracks and sectors, where tracks are the circular divisions of the disk. Tracks are further divided into sectors that contain blocks of data. All read and write operations on the magnetic disk are performed on the sectors.

On a disk, we are having some concentric circles, and they are known as **tracks**. The thinner the tracks, the more storage. The data bits are recorded as tiny magnetic spots on the tracks.

And the disk will be divided radially into multiple zones. Each zone is known as **sector**. So, we can say, the disk is having co-ordinate system. This co-ordinate system will consist tracks and sectors. All the tracks available on the all the surfaces having the same radius is called a cylinder. There will be tracks of different radius on each disk, so there will be tracks of same radius on each disk. And they will form cylinder. Form the count of cylinder. We can understand how many tracks are there in total disk.

Allocation unit: The portion of the track, enclosed within a sector, is known as allocation unit. A hard disk can have 2Kb of allocation unit size. Remember one thing, allocation unit cannot be partially allocated. Example: when we open a text file , and write hello world there, we will see, the size of the file is only 10 Bytes, and we save that file, you will notice that your total hard disk will be reduced by size not by the size of the file of 10Bytes rather by the size of the allocation unit. That means 2KB. So, either it will be allocated totally or not all.

Read – Write Mechanism:

We have magnetic bubbles in the disk, and this magnetic bubbles or magnetic particles, these bubbles will be on the up direction or in the down direction which will indicate either 0 or 1. There magnetic particles are used in disk surface to hold data. In case or write operation, through this particular read-write arms, and to e specific through this read-write head, **electric current** will flow and due to the flow of the current, **magnetic field** will be generated. Due to the presence of magnetic field, the **magnetic particles will align accordingly, north-south or south north** orientation, that will indicate whether it is holding the value 0 or 1. In case of read operation, these aligned magnetic particles will produce a **magnetic particles** in the read-write head and that read-write head, **due to presence of magnetic field, will have some micro – current** and the current direction will indicate whether it has read 0 or whether it has read 1.

Outcomes:
There are three outcomes are possible from these read and write operations. One is successful, another one is partial and the last one is total failure. Successful read-write means we have done the operation fruitfully. Partial means some of the disk data are falling on the bad sector. Bad sector means it cannot contain data. Or if you write data there, you cannot restore that one. In this case, we have a partial failure. These are the total outcomes.

Disk Partition:

Logical partition: A disk can be partitioned into multiple drives. In our pc, we usually partition out total hard disk into multiple drives. There are also, some softwares and by using them, we can partition our disk space into multiple drives and this is called as logical partition.

Physical Partition: When we will have multiple disks operating in a same system then it will be called as physical partition.

Bad Sector:

We have magnetic bubbles in the disk, and this magnetic bubbles or magnetic particles, these bubbles will be on the up direction or in the down direction which will indicate either 0 or 1. There magnetic particles are used in disk surface to hold data, but for some reason they might have lost their magnetic property. Then what will happen, when we will write or read data from there, they will not be affected by magnetic fields. IF the magnetic particle of disk surface lost its magnetic property, then we cannot affect its alignment north-south or south – north. Then it will form bad- sector.

Reasons of Bad-Sector:

If you do the hammering on the disk, if some spark can be taken place on room if you drop the hard-disk from your hand on the floor, then the disk can be hurt can be affected so what magnetic property can be lost.