

- **Partitioning:** Electronically subdividing the physical HDD (minimum 1)
 - **Basic:** (uses Master Boot Record)
 - **MBR :** First sector → MBR record → Contains Partition Table (tells MBR where to look)
 - **Dynamic disk :** (Microsoft)
 - **GUID Partition Table:** (GPT)
 - **Types :** limit of 4 primary + extended
 - **Primary :** supports bootable OS
 - **Extended :** only for storage
 - **Other :**
 - **Hidden :** Not visible to OS, for backup or recovery
 - **Swap :** Only for Linux and BSD, similar to a **page file**

- **Dynamic Disks**
 - Since Windows 2000
 - Partitions = **Volumes**
 - Software RAID supported

- **GUID - Partition table**
 - Unlimited Partitions
 - 2.2 TB per partition
 - Arranged by **LBA**

- **When to create a Partition**
 - **New OS**
 - **New HDD**
- **Formatting :** configures a partition to hold files
 - Creates a **file system**
 - Creates a **root directory**
- **Fragmentation :** Occurs when files are spread across clusters
- **File Systems :**
 - **FAT (FAT16) :**
 - File Allocation Table
 - 4 hexadecimal digits to number sectors
 - “2 column spreadsheet”
 - Bad Sector = FFF7
 - Good Sector = 0000
 - Sector size limit = 512 bytes
 - 32 MB max in early drives (16 bit can address only 64 K sectors)
 - **Clustering :**
 - Combines contiguous sectors
 - Up to 2 GB partition
 - **FAT32 :**
 - Since Windows 95
 - Up to 2TB

- File size up to 4GB
- 32 Bits for cluster
- **NTFS :**
 - **New Technology File System**
 - **6 major improvements :**
 - **Redundancy** : uses **MFT** (Master File Table)
 - **Security** : File and Folder **ACL** (Access Control List)
 - **Compression** : compressed files → blue
 - **Encryption: EFS** (encrypting file system)
 - **Disk quotas:** Control how users can use space
 - **Cluster sizing** : Rarely done
- **FAT64 (exFAT) :**
 - File size up to 16 exabytes (EB)
 - Up to 64 zettabytes (ZB)
 - No NTFS features
- **Mount Partitions as Folders (Mount Point) :** Assign a drive as a folder on another drive
- **Error-checking** : scans for bad clusters on HDD
 - CHKDSK
- **Disk Defragmenter**
 - DEFRAG
 - **Don't defrag SSD!**
- **HDD failures**
 - **Connectivity :**
 - Check cables
 - Reset controller (if expansion card)
 - Use auto detection in CMOS
 - Check jumpers
 - Some PATA drives are incompatible on the same controller
 - **Partitions :**
 - Failing → Invalid drive specification error
 - Making wrong size or type of partition
 - **Format :**
 - Failing to format
 - Drive not accessible
 - Invalid media type
 - **“Trying to recover lost allocation unit” = Dying HDD**
 - **Data corruption :**
 - **Caused by :**
 - Power surges
 - Accidental shutdowns
 - Viruses
 - **Show as :**
 - File is missing or corrupt
 - Download location information is damaged

- Unable to load file
 - Cannot find command.com
 - Error loading OS
 - Invalid boot.ini
 - **Dying HDD**
 - **Sounds :**
 - High-pitched squeal
 - Clack, short pause, more clack
 - Grinding or rumbling
 - **“No boot device present”**
 - **Doesn't show up**
 - **RAID Issues**
 - Check Drivers
 - **HDD failed :**
 - **RAID 0 : BSoD → “OS cannot be found”**
 - **RAID X: Notification**
 - **Faulty Controllers or Dead Drives**
-

References :

- Mike Meyers - CompTIA A+ Certification All-In-One Exam Guide 8th edition