## File Systems FAT,FAT32,exFAT,NTFS,ReFS

| Feature | FAT | FAT32 | exFAT | NTFS | ReFS |
|---|---|---|---|---|---|
| Maximum volume size | 4 GB | 32 GB | 128 PB | 256 TB | 4.7 ZB (zettabytes) |
| Maximum file size | 4 GB | 4 GB | 16 EB (exabytes) | 18 EB (exabytes) | 18 EB (exabytes) |
| Maximum filename length | 8.3 characters | 255 characters | 255 characters | 255 characters | 255 characters |
| Maximum cluster size | 64 KB | 32 KB | 32 MB | 2048 KB | 64 KB |
| File compression | No | No | No | Yes | No |
| File encryption | No | No | No | Yes | No |
| Permissions | No | No | No | Yes | Yes |

## Backup Types

***Full backup***

Takes a full copy of the source and copies it to the desired destination

***Incremental backup***

Takes a backup of anything that has been changed or created since the last check. Looks for the "ready for archiving" bit to check if the file has been edited.

***Differential backup***

Similar to "Incremental backup" the first time it is performed. It copies all data changed from the previous backup. However, each time it runs afterwards, it will continue to copy all data cahnge since the previous FULL backup. It requires more storage and time to complete than "Incremental Backup"

***Block backup***

Block-level backup is a feature of incremental backup that allows uploading for only changed parts of files instead of whole files. In order to do that, it uses a snapshot technology.

***File backup***

Archive bit must be active on file

## Volume / Partition

***Volume***

A Volume is treated like a separate drive from the physical drive, formatting a volume will only affect the volume.

***Partition***

A Partition is the definition of a section on a drive, using partitions enables the user to divide a drive into multiple sectors also known as Logical Volumes.

## Basic Disk

- Max 4 partitions
- Supports Extended Partitions
- up to 26 logic drives
- introduced in MS-DOS

## Dynamic Disk

- Do not support OS
- Supports simple, Spanned, Triped, Mirrored & Raid 5 Volumes
- introduced in Windows 2000

## Shadow Copy

- Recovers Files and Folders
- VSS stands for Volume Shadow copy Service
- Storage area <= 300 Mb
- 64 changes/snapshots are recorded
- Only works on NTFS file systems
- Commands :
- vssadmin add shadowstorage
- vssadmin create shadowstorage
- vssadmin delete shadowstorage
- vssadmin resize shadowstorage
- vssadmin list shadowstorage
- vssadmin list providers
- vssadmin list volumes
- vssadmin list shadows
- vssadmin list writers
- vssadmin list shadows
- vssadmin resize shadowstorage

## Disk Quota

| | |
|---|---|
| FSRM | Stands for File Server Resource Manager |
| Quota | is a feature that tracks and can be used to restrict the amount of space that a user's files can use on an NTFS volume |
| Hard quotas | impose a hard limit on system resources; any operation that would result in exceeding the limit fails. The following settings create hard quotas: Disk Limit parameter Files Limit parameter |
| Soft quotas | send a warning message when resource usage reaches a certain level, but do not affect data access operations, so you can take appropriate action before the quota is exceeded. The following settings create soft quotas: Threshold for Disk Limit parameter Soft Disk Limit parameter Soft Files Limit parameter |



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# Backup-GR2 Cheat Sheet

by Nectus via cheatography.com/71634/cs/19130/

## RAID (Redudant Array Of Independent Disks)

| | |
|---|---|
| *Raid0* | Minimum 2 disks - Not redundant |
| *Raid1* | Minimum 2 disks - Mirroring |
| *Raid2* | Minimum 3 disks - Data is shared on bit-level on multiple disks |
| *Raid5* | Minimum 3 disks - Stripping with distributed partitions |
| *Raid6* | Minimum 4 disks - Stripping with double distributed partitions |
| *Raid10 (1+0)* | Minimum 4 disks - Stripping then mirroring |

## Windows Server Backup

```
DISKPART> select disk 1
Disk 1 is now the selected disk.
DISKPART> attribute disk clear readonly
Disk attributes cleared successfully.
DISKPART> convert dynamic
Selected disk is already a dynamic disk.
DISKPART> create volume raid size=30000 disk=1,2,3,4
DiskPart successfully created the volume.
```

***Remember to run:***

*# Attribute disk clear readonly*

*# convert dynamic*

***On ALL the drives for the RAID5***

## Raid Types

| *Volume Type* | *Characteristics* |
|---|---|
| *Mirrored Volume* | Stores data to two dublicate disk at the same time.<br>Fault Tolerant, can lose on disk as data is preserved on both.<br>The system automatically switches to the functioning disk to maintain service. |
| *Striped Volume* | Uses storage areas on several different disks.<br>Improves performance by writing to mulitple disk simultaneously.<br>Saves data from a single file to mulitple disks.<br>NOT fault tolerant, if one disk dies then all data is lost.<br>Can NOT contain system or boot files. |

## Raid Types (cont)

| | |
|---|---|
| *RAID5 Volume* | Contain three or more disks.<br>Like a striped volume, portions of a single file are written to each disc in the set.<br>RAID5 volumes add fault tolerance to striping through a process called parity (data recovery information is added to each disk).<br>Often called a striped set with parity. |

## GPT / MBR

| *MBR (Master Boot Record)* | *GPT (Guided Partition Table)* |
|---|---|
| A special type of boot sector at the very beginning of a physical storage device. | A standard for the layout of the partition table on a physical storage device. |
| Max Diskspace 2.2TB | Max Diskspace 1.8EB |
| Max 4 primary partitions | max 128 partitions |
| Supports only one extended partition (up to 26 total partitions) | Supports UEFI |

## Disk Administration

| | |
|---|---|
| MCC | diskmgmt.msc |
| CMD | diskpart.exe |

## Startup/Recovery Commands

To recover files or folders you can use either the Recovery Wizard or wbadmin start recovery

| | |
|---|---|
| BCD | Boot Configuration Data |
| EASYBCD | Software utility for BCD/BootMGR |
| DSRM | Directory Services Restore Mode |
| Bootrec.exe | Executable for troubleshooting startup issues |
| Ntdsutil.exe | Active Directory database maintenance tool |
| MSCONFIG | Command for accessing Microsoft System Configuration |
| BCDEDIT | Sets properties in boot database to control boot loading |
| CHKDSK | Checks a disk and displays a status report |




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## Startup/Recovery Commands (cont)

| | |
|---|---|
| DISKPART | Displays or configures disk partitions |
| WBADMIN | Enables you to back up and restore your operating system, volumes, files, folders, and applications from a command prompt. |
| AUTHOR-ITATIVE RESTORE | Used to restore AD data after executing the Ntdsut-il.exe command. When you perform an authoritative restore, you prevent specific objects from the backup from being overwritten by Active Directory replication. |
| UNAUTH-ORATIVE RESTORE | Any changes that took place since the backup are replicated to the restored domain controller. |

## AT commands Backup

at 23:00 cmd /c copy C:\Dokumenter. C:\Backups

at \\products 00:00 /every:M,T,W,Th,F backup



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