**File System Structure**

**Windows –** During the initial days, they have only MS DOS, ON MS DOS they used to run all operations, computations and games. Windows are installed on top of MS DOS.

Just by using WIN button, windows used to boot-up. They have used ‘A & B’ letters for the removable drives, ‘C’ is used for operating system, and programs and the next available letters are assigned to the other disks. The File directory stayed in the same structure**.**

**Common file system types are –**

**FAT -** File allocation table

**FAT12 -** a FAT12 file system contains 1.5 bytes per cluster within the file allocation table. – Max 32 MB

**FAT16 –** a FAT16 file system contains 2 bytes per cluster within the file allocation table. – Max 2 GB – Was used on portable devices such as music players.

**FAT32 -** a FAT32 file system includes 4 bytes per cluster within the file allocation table. – Max 2 TB – Used in gaming consoles

**NTFS –** Windows NT File System – supports Min 32TB for 8kb clusters.

NTFS is faster than FAT. Advanced than FAT. Easy to read, write and retrieve the data.

**exFAT – Extended FAT**

Introduces in 2006 and Used for USB flash drives and SD cards.

Max- 128 PB- Peta Bytes – (1 Peta Byte = 1024 Tera Bytes)

**LINUX Folder structure**

**Linux –** The file system naming convention inherited from UNIX BSD (Berkley Software Distribution).

**/bin –** Contains all Binaries. For Ex, all commands like “cat”, “cd”, “ls”, etc..

**/sbin –** System binaries – Only Admin users has access to this.

**/boot –** It has all the necessary files to boot your OS (boot loaders).

**/dev** – this is where your device files are placed. All hardware config files are place here.

**/etc –** Editable configuration files etc..

**/etc/apt –** Applications,Sources and configurations.

**/home** – It contains each folder for each user. Where it stores user’s personal files and documents. Only the specific user has access to their folder unless the admin permits to. It also has several hidden files such as icons, themes, cache and config etc..

**/lib** – this contains all the libraries to perform various functions.

**/media** – Usually nothing. But, Some distros mounts other disks into media.

**/mnt –** this is the Mount area where other disks are located. Like secondary hard drive and USB drives.

**/opt –** This is an optional folder where vendor software’s are located.

**/proc** – It contains psudo files. Which contains information about resources. Every process has a directory here. With the process id.

**/root** – root users home. Only root user has access to it.

**/run** – It’s like the temp file system. Used for storing the files of ram. Once the process is completed, the file will be disappeared.

**/snap –** Contains snap packages. Mainly used in Ubuntu. These are different packages from the regular packages.

**/srv –** This is a service directory where the service data is stored. Mostly in desktops it’s empty. If you run any FTP server or web server. The files, which are accessible to the external sources, will be kept here. To better access and security.

**/sys –** The files in sys are used to interact with kernel. This is not a physical directory. It gets created during system boot-up.

**/tmp –** A temporary directory where the temporary files or log files are places during the application session.

**/usr –** this is an user application space where user specific apps are installed. These are mostly non-essential for basic system operations.

**/var –** Variable directory. It contains files and directories that expect to grow in size. For example, Logs and printer spools.

* Linux naming convention is case sensitive

-rw-r--r-- 1 user user 0 Jan 8 10:05 TEst

-rw-r--r-- 1 user user 0 Jan 8 10:05 tEst

-rw-r--r-- 1 user user 0 Jan 8 10:05 teSt

-rw-r--r-- 1 user user 0 Jan 8 10:04 tesT

-rw-r--r-- 1 user user 0 Jan 8 10:04 test

**Linux file system Types:**

**Ext, Ext2, Ext3, Ext4 -** It means extended file system. The most latest version is Ext4. This is the faster version of Ext and compatible for SSD’s and it’s default in most of Linux distros.

**JFS -** It means Journaled file system. Developed by IBM for AIX.

**ReiserFS -** Alternative to Ext3 and it’s improved in performance and has some advanced features.

**Xfs -** It is like a High speed JFS. NASA is still using it for 300+ TB storage drives.

**Btrfs -** Btrfs stands for the **B tree file system**. It is used for fault tolerance, repair system, fun administration, extensive storage configuration, and more. It is not a good suit for the production system.

**Swap -** The swap file system is used for memory paging in Linux operating system during the system hibernation. A system that never goes in hibernate state is required to have swap space equal to its RAM size.