**Tutorial No. - 1**

**1.Difference between mac os, linux os and windows os?**

**Ans :**Windows will be extremely familiar and therefore easy to use; Windows is the “standard” operating system bundled with new PCs. Windows is designed to run on PCs, whether bought new or built cheaply, so hardware costs are essentially determined by the consumer. However, the cost of buying the latest version of Windows can be prohibitive and the restrictive licensing inevitably forces each user to purchase a copy as they cannot be shared. Windows XP is still the most widely used version.   
Windows continues to be the most popular OS worldwide, with Microsoft estimated to be holding on to roughly 90% of desktop users. Windows still represents the extent of many home users’ experience with operating systems.

Linux has the immediate benefit of being free to obtain, and available for use without restrictions. It is open source with a large, supportive community building a seemingly infinite range of free applications for use on Linux machines. Linux may be the cheapest, most easily available and customizable of the three, but the continued dominance of Windows often deters home users from changing to this unfamiliar platform. Additionally, while Linux may have a large number of community-sourced applications available, it does not offer as many professional quality one as the other systems. Minority use means some third party software such as popular PC games is yet to have a Linux release. . Linux may have the smallest share of home users, however commercial use is huge. Servers, mainframes and supercomputers commonly use Linux, as do the film industry, governments both nationally and locally, and many portable device manufacturers. Similar to OS X, Linux is less vulnerable to attack than a Windows PC.

Apple's Macintosh OS is even older than Windows. It is the first ever successful graphical-based operating system, being released one year before it's Microsoft counterpart.Mac OS remains popular with professionals – particularly those in creative industries such as graphic design and video editing – due to the quality and performance of programs such as Photoshop on OS . Apple Macs get almost no viruses. This is mostly due to Window's superior market share. Macs only run on Apple computers, and are thus less prone to hardware and software crashing.Most of the time, Mac just looks better than Windows.Mac costs even more than Windows.Mac os is only available on Apple computers.Comatiability of mac os is less since only a few programs will run on Mac, and almost no games.

**2.Compare and list linux file system ?**

**Ans :**

The Linux file system is a hierarchically structured tree where every location has its distinct meaning. A file system is always stored on media e.g. hard drive, a CD or a memory fragment.

**Structure**

The file system is a tree-shaped structure. The root of the tree, which coincidentally is called the *file system root* but is always depicted as being above all other, is identified by the slash character: "/". It is the highest place you can go to. Beneath it are almost always only directories:

~$ **cd /**

~$ **ls -F**

bin/ home/ opt/ srv/ var/

boot/ lib/ proc/ sys/

dev/ media/ root/ tmp/

etc/ mnt/ sbin/ usr/

The **ls -F** command shows the content of the root location but appends an additional character to special files. For instance, it appends a "/" to directories, an "@" to symbolic links and a "\*" to executable files.

### Mounting File Systems

The root of a file system is stored somewhere. Most of the time, it is stored on a partition of a disk. In many cases you would want to combine multiple partitions for a single file system. Combining one partition with the file system is called mounting a file system.

#### File Systems

Each medium which can contain files is internally structured. How this structure looks like is part of the file system it uses. The following is a small list of popular file systems around, each with a brief explanation on its advantages and disadvantages...

* The **ext2** file system is Linux' old, yet still used file system. It stands for extended 2 file system and is quite simple. It has been in use almost since the birth of Linux and is quite resilient against file system fragmentation - although this is true for almost all Linux file systems. It is however slowly being replaced by journaled file systems.
* The **ext3** file system is an improvement on the ext2 file system, adding, amongst other things, the concept of journaling.
* The **ext4** file system is an improvement on the ext3 file system, adding, amongst other things, support for very large file systems/files, extents (contiguous physical blocks), pre-allocation and delayed allocation and more. The ext4 file system is backwards compatible with ext3 as long as you do not use extents. Ext4 is frequently seen as the default file system of choice amongst administrators and distributions.
* The **reiserfs** file system is written from scratch. It provides journaling as well, but its main focus is on speed. The file system provides quick access to locations with hundreds of files inside (ext2 and ext3 are much slower in these situations) and keeps the disk footprint for small files small (some other file systems reserve an entire block for every file, reiserfs is able to share blocks with several files). Although quite popular a few years back, the file system has been seeing a lack of support through its popular years (harmful bugs stayed in for quite some time) and is not frequently advised by distributions any more. Its successor, reiser4, is still quite premature and is, due to the imprisonment of the main developer Hans Reiser, not being developed that actively any more.
* The **btrfs** file system is a promising file system. It addresses concerns regarding huge storage backend volumes, multi-device spanning, snapshotting and more. Although its primary target was enterprise usage, it also offers interesting features to home users such as online grow/shrink (both on file system as well as underlying storage level), object-level redundancy, transparent compression and cloning.
* The **xfs** file system is an enterprise-ready, high performance journaling file system. It offers very high parallel throughput and is therefore a common choice amongst enterprises.
* The **zfs**file system (ZFSonLinux) is a multi-featured file system offering block-level checksumming, compression, snapshotting, copy-on-write, deduplication, extremely large volumes, remote replication and more. It has been recently ported from (Open)Solaris to Linux and is gaining ground.