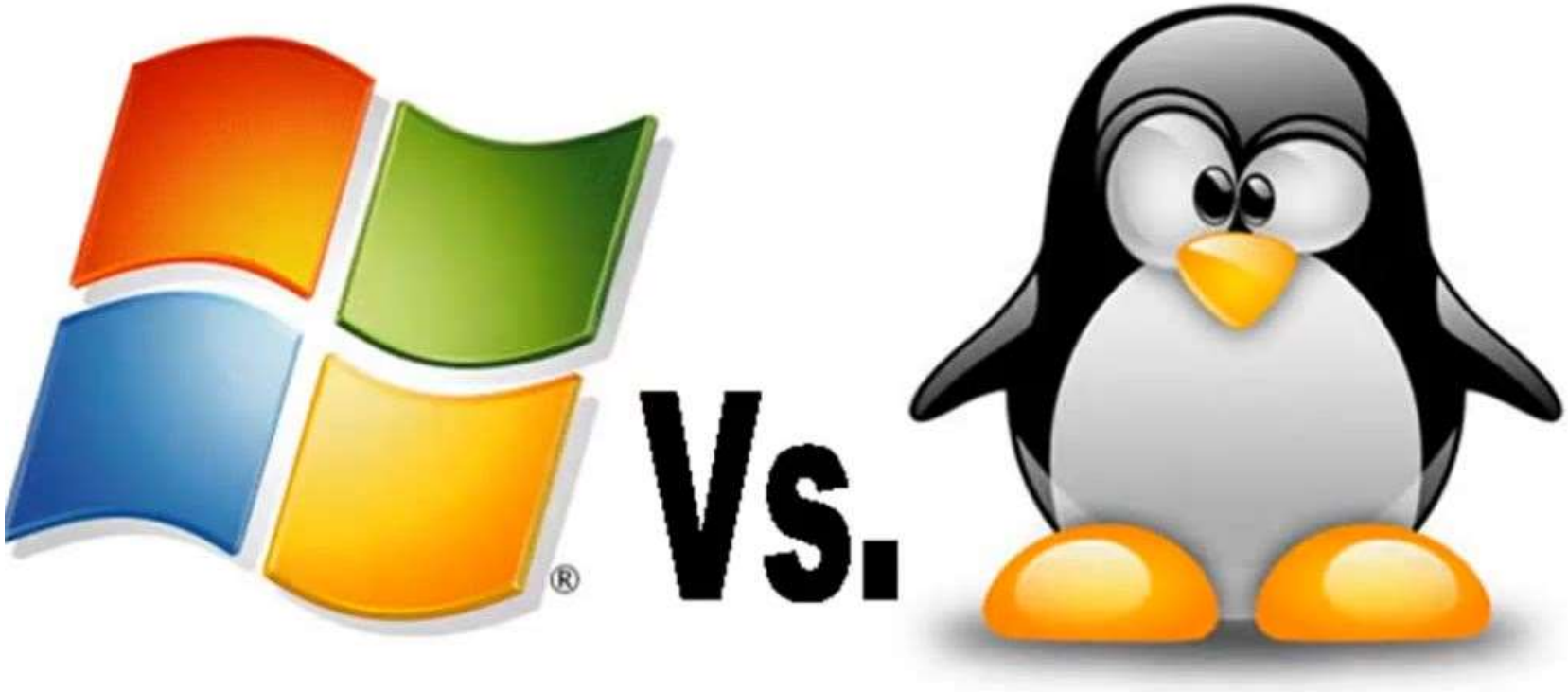
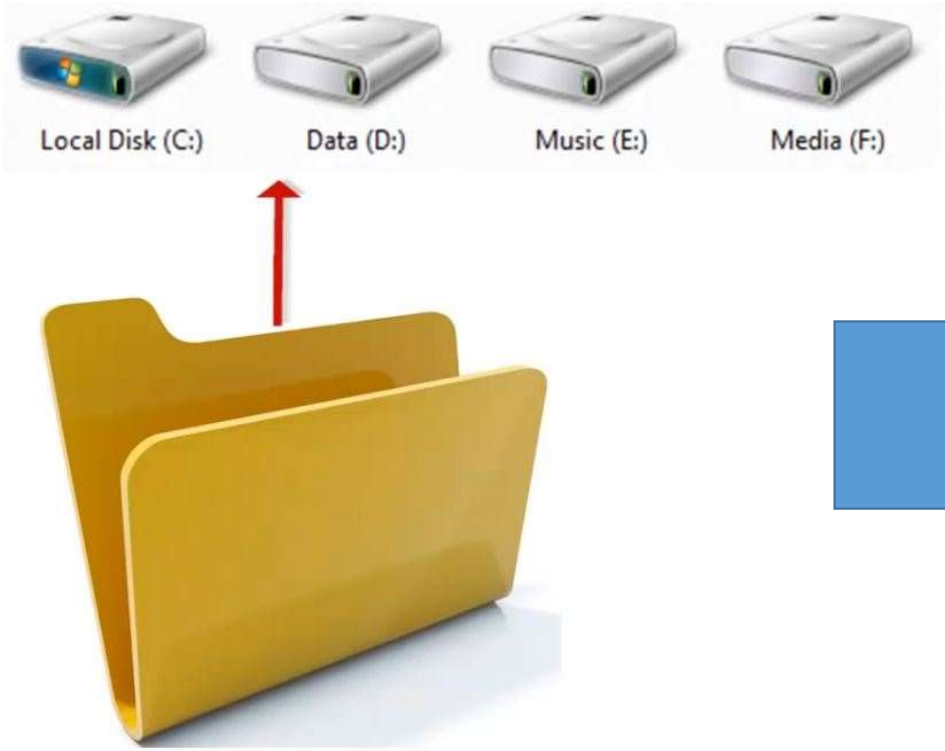
Windows vs. Linux Comparisons

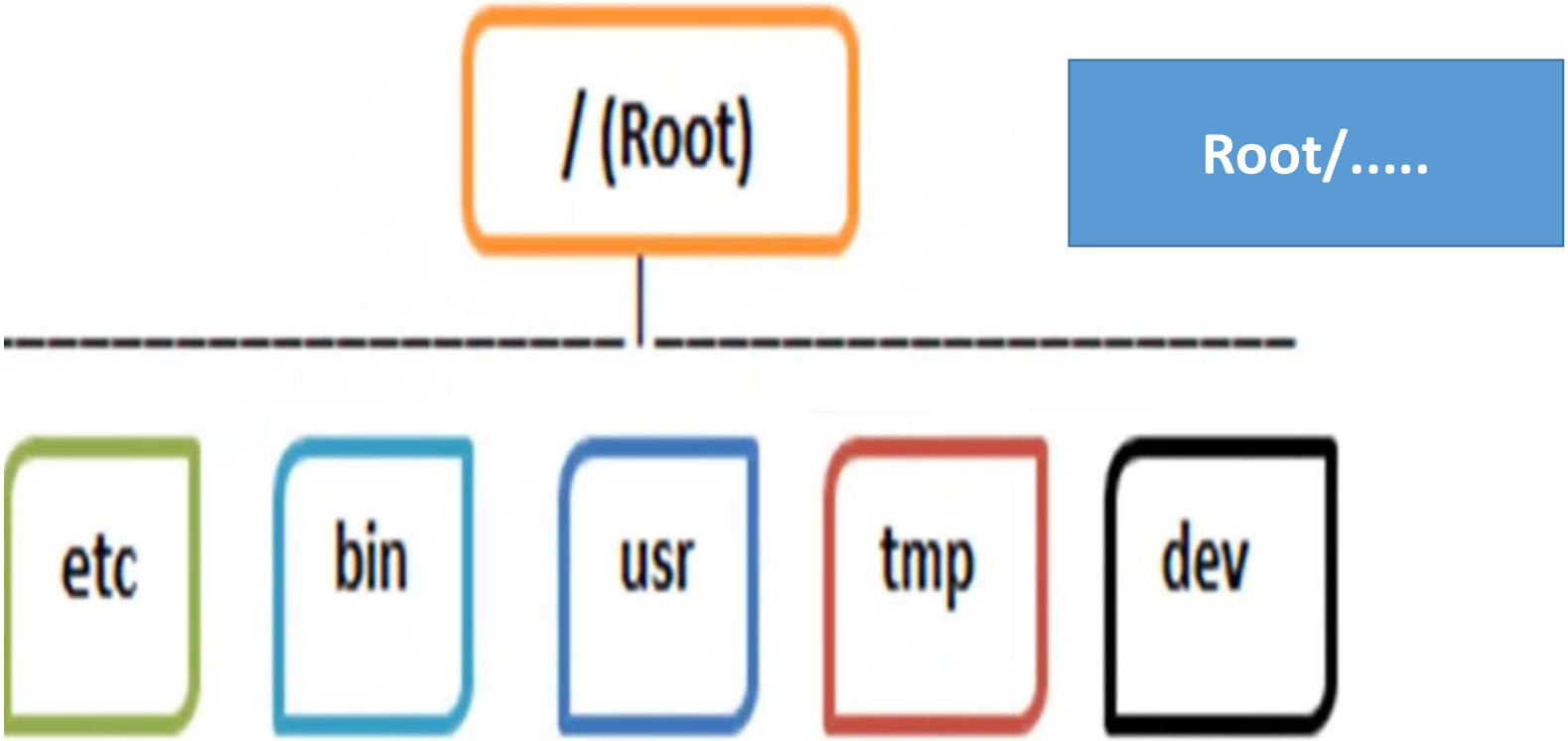


Windows - Files are stored in “Folders” residing on logical volumes



C:\.....

Linux – Files are stored in a "Directory Tree" file system starting with the Root directory



In Linux and Unix EVERYTHING is a File

- Directories are files
- Files are files
- Devices are files (printer, mouse, keyboard, etc)

General Files

- Also called ***Ordinary files***
- Contain image, video, program or simply text
- **ASCII** or a **Binary** format
- Most commonly used files

Data

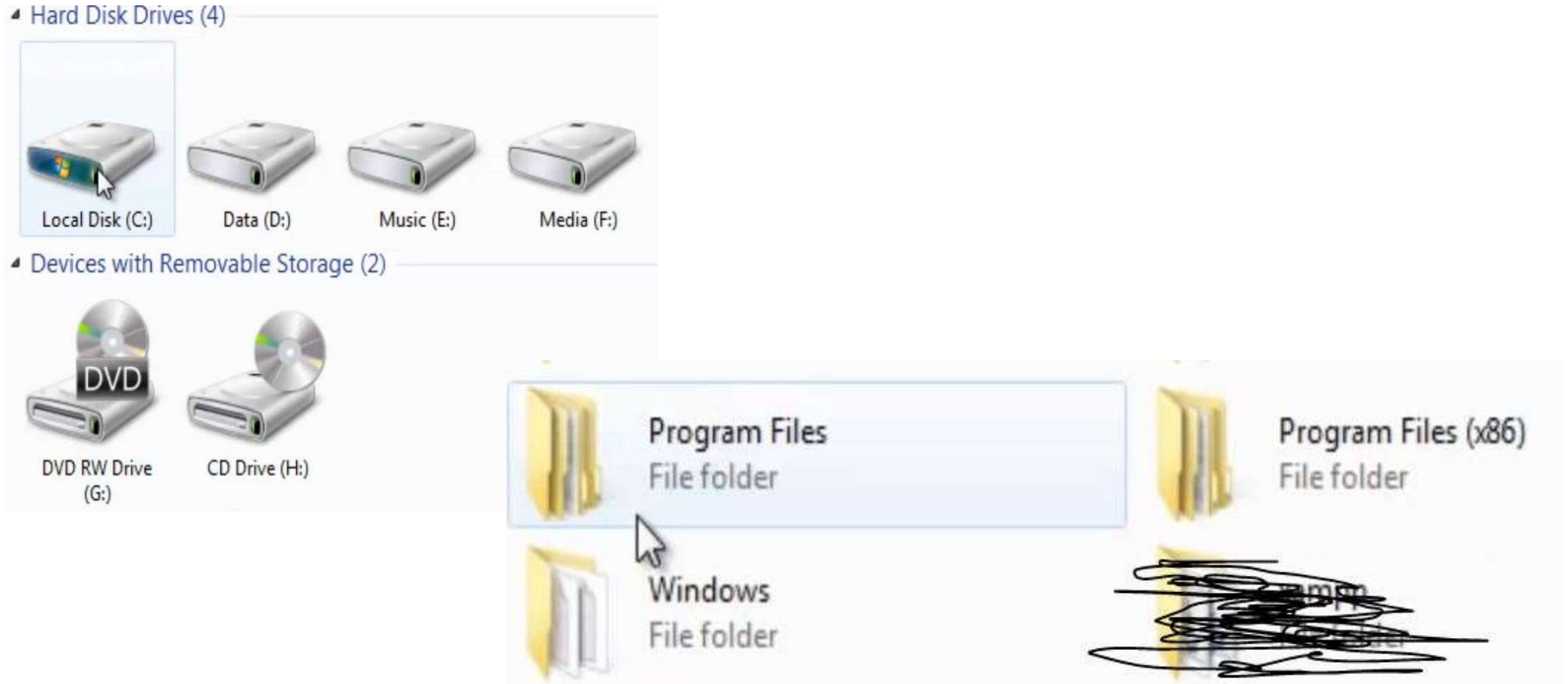
Directory Files

- A warehouse for other file types
- Directory file within a directory

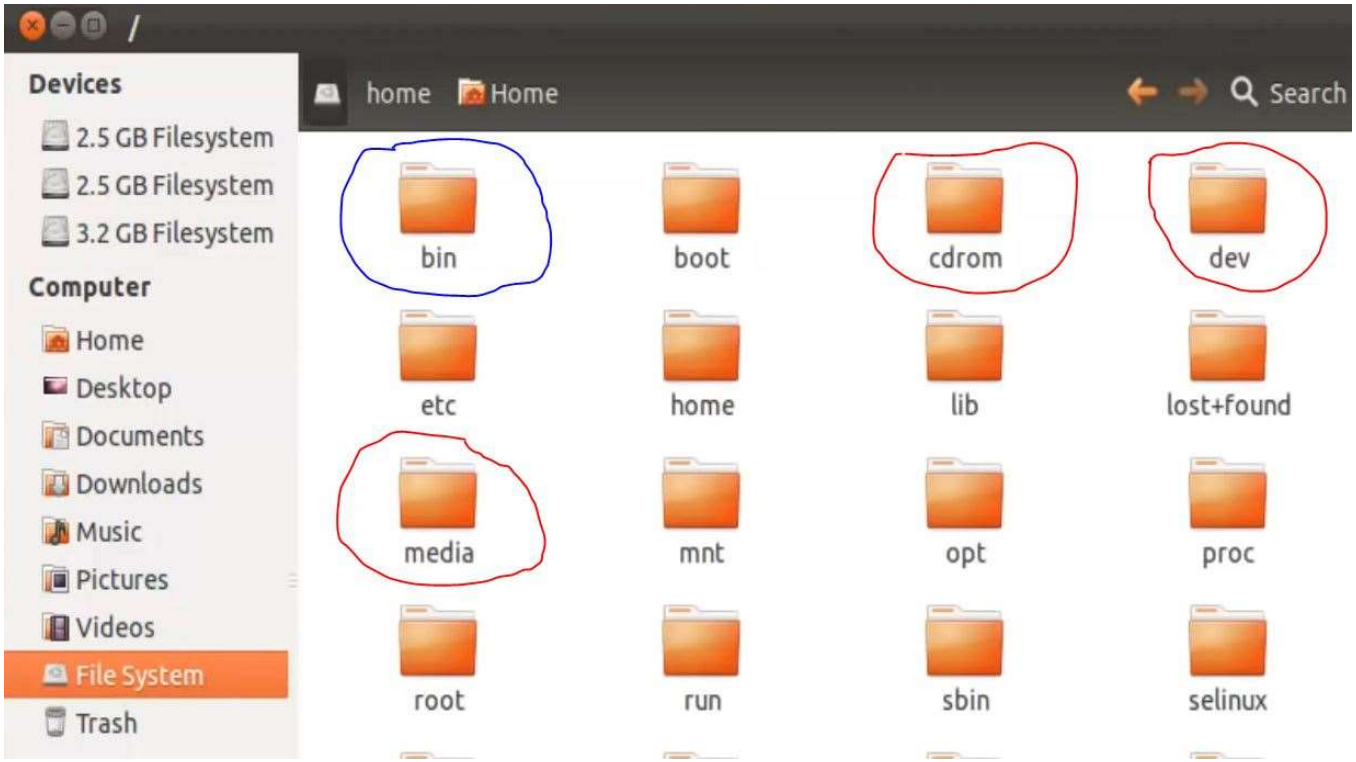
This similar to the concept of folders found in Windows operating system.

From this point is where the difference between Linux and Windows becomes significant. →

Windows – System and Program files are generally saved in drive C



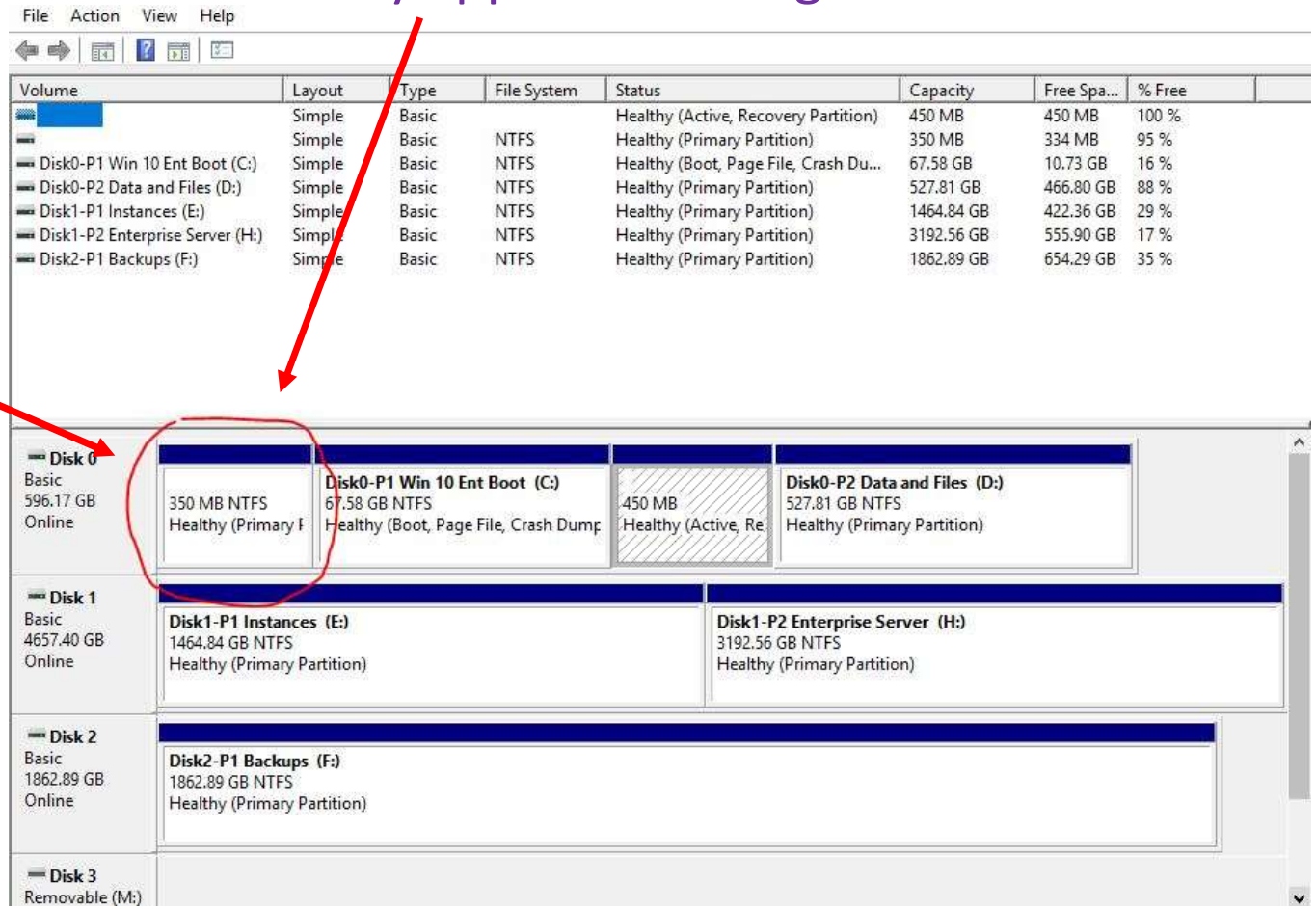
Linux Directories - Programs are in /bin. Removable media devices are in /media. Cdroms are in /cdrom. Printers, peripherals, disks, mouse, keyboard, e.t.c ~~and mounted volumes~~ are in /dev. Mounted volumes are in /mnt.
Remember, these identities are files as everything in Linux and Unix is a file.



Directories are found under "File System" or "Computer" when using the GUI.

Windows – Mounted logical volumes using assigned drive letters. (Drive letters are a must in order for users, GUI functions or any applications to gain access the volume).

UEFI

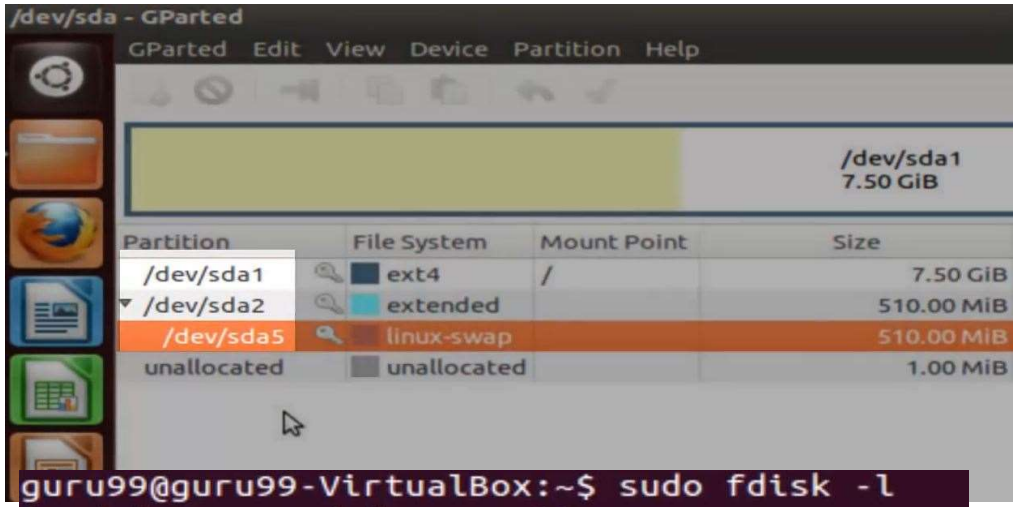


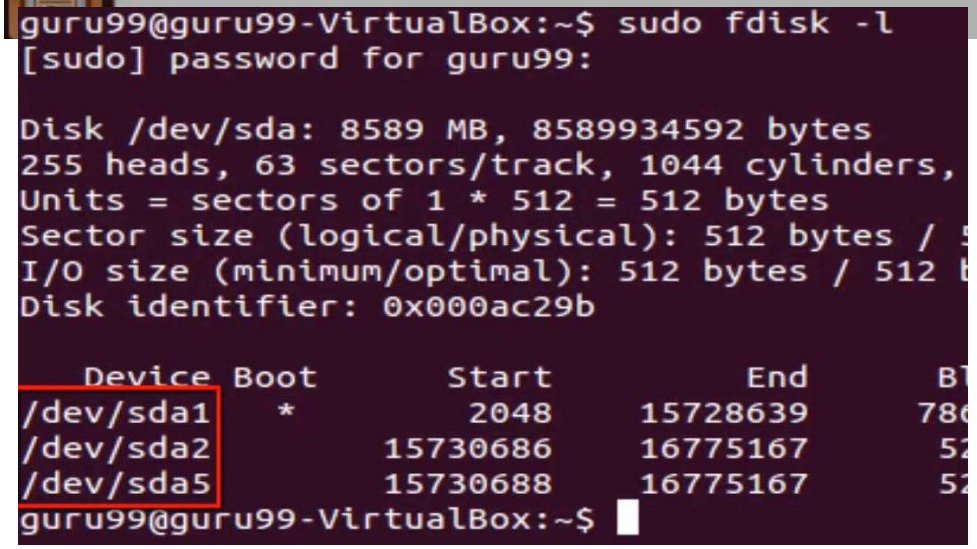
When you assign a drive letter, the drive is ***mounted***.

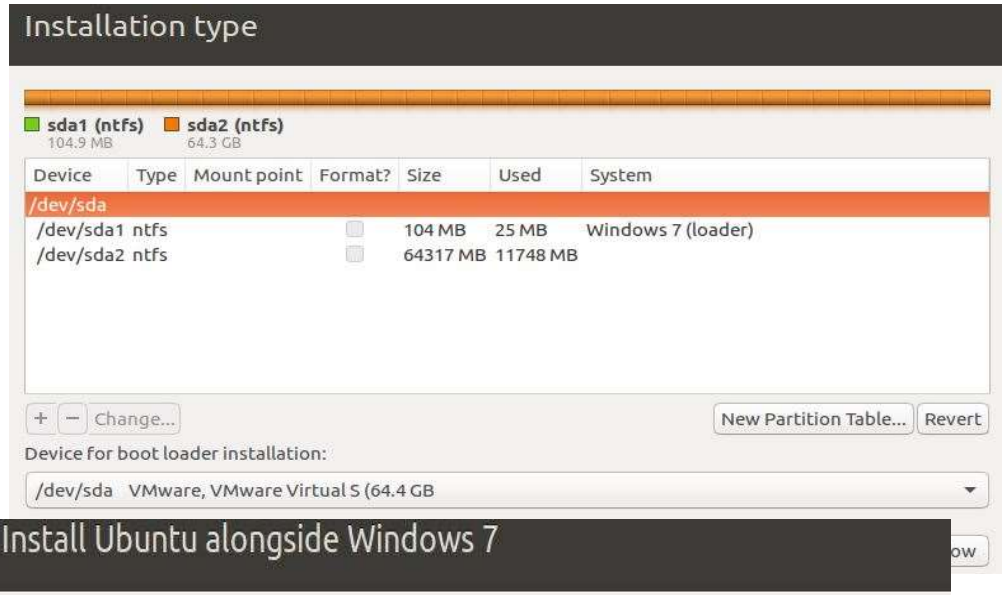
When you completely remove a drive letter, the drive is then ***unmounted***.

eg: chkdks /f

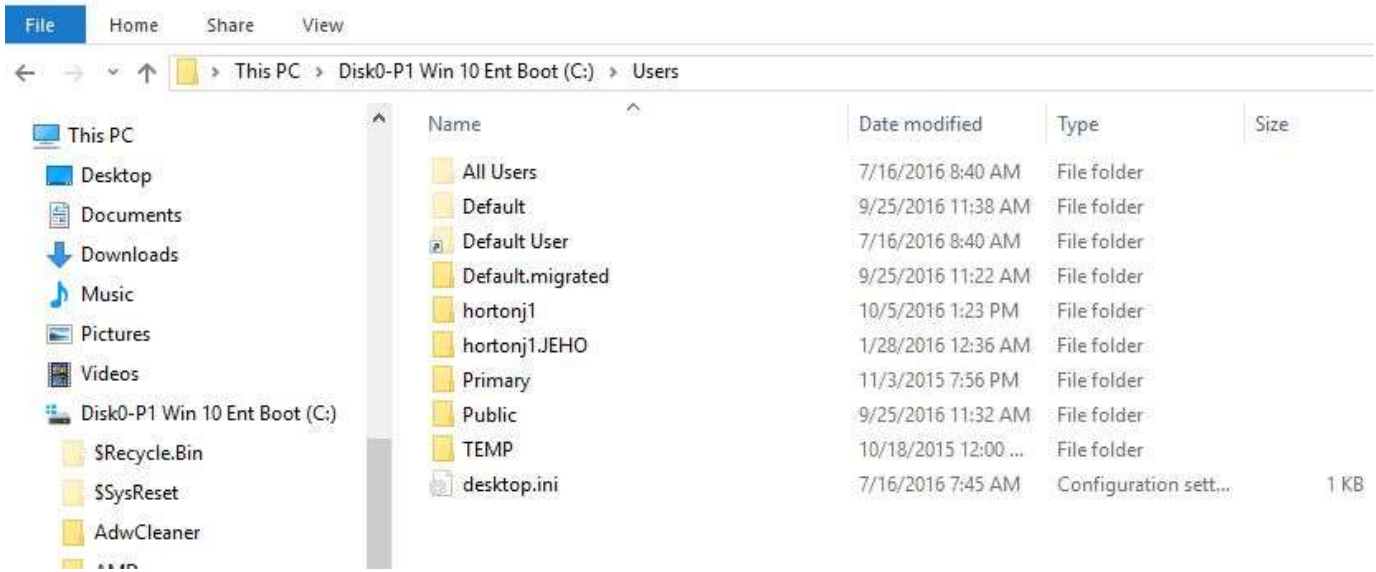
Linux – Disks in /dev. (Linux does NOT use drive letters to designate the volumes).







Windows – User Accounts (Profiles)



Linux – **Regular (Standard) User**. Note: your user account is accessible via /home, as it is a regular user so you do not have access to other user accounts, nor any visual aspect of any possibly existing accounts, on the system unless you are logged on as “root”. (similar to Windows but more security due to reduced attack surface)


home
Computer
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
File System
Trash
Network
Browse Net...
home
Home
Videos
guru99
/home/guru99 default working directory for user 'guru99'
home
Computer
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
File System
Trash
Network
Browse Net...
home
Home
Videos
guru99
/home/guru99 = Home directory

Root User

- Can access restricted files, install software and has administrative privileges

The SUDO Command

Typical/Ordinary users *do not* have administrative privileges. If a specific command requires administrative root permissions in order to run, these users **must** elevate to that level via **sudo <command>**.

Of coarse, with all elevation of this type, password authentication will be required.

Note: this elevation is only temporary during the execution of that specific command. Immediately after the command is completed, elevation and administrative access will end automatically.

Note: For security reasons, the typed password is not displayed. You do not need to enter your password again for the next five minutes.

- Can access restricted files, install software and has administrative privileges

Information about the Root Account

The Root account has full administrative rights, similar to Administrator Group account members in Windows. But with Windows, you can add as many administrative accounts as you like to the Administrator Group.

And unlike Windows, in Linux "there can be only one", the Root account. There is no Linux Administrator Group that you can add members to. Root stands alone. Also unlike Windows, the Root account has complete UNRESTRICTED access to absolutely ALL levels of the OS.

The Root account in Linux Desktops is default "disabled", simply by not having a password assigned to it (note: the Administrator account on Windows Desktops is also disabled by default). "Enabling" the Root account in Linux Desktops is not recommended.

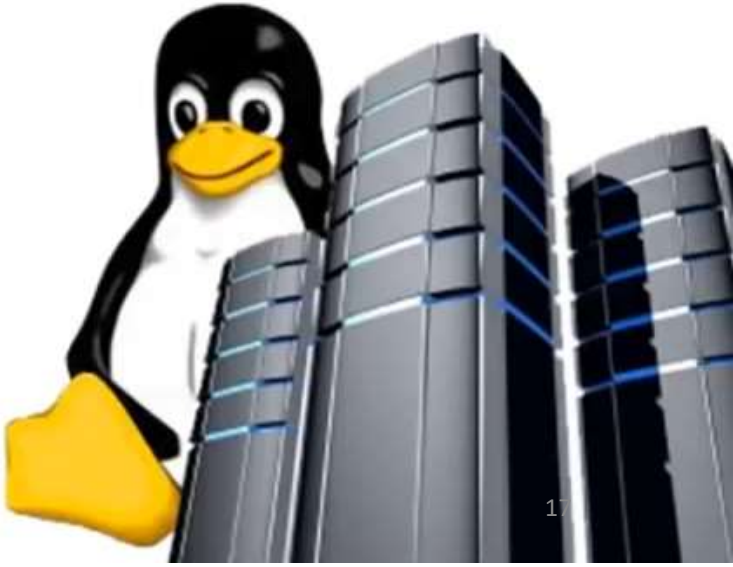
Note: Windows Servers and Linux Servers both have their Administrator Account and their Root Account enabled out of the box.

Oh boy, here we go. You could enable the Desktop Root account (i.e. set a password). This process is described via CLI command "man sudo_root"

Service User

Security
Of
Your
Computer

Apache

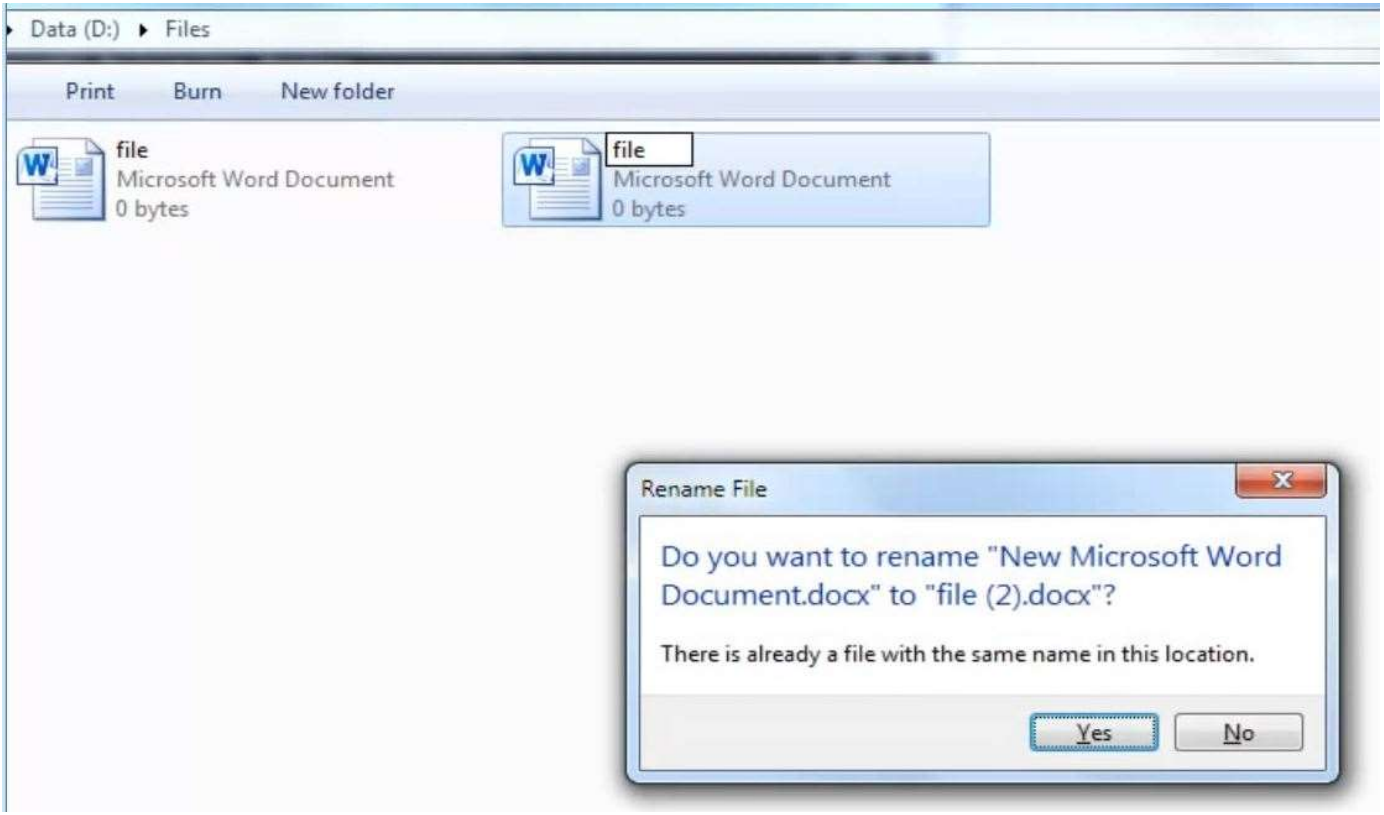


NOTE

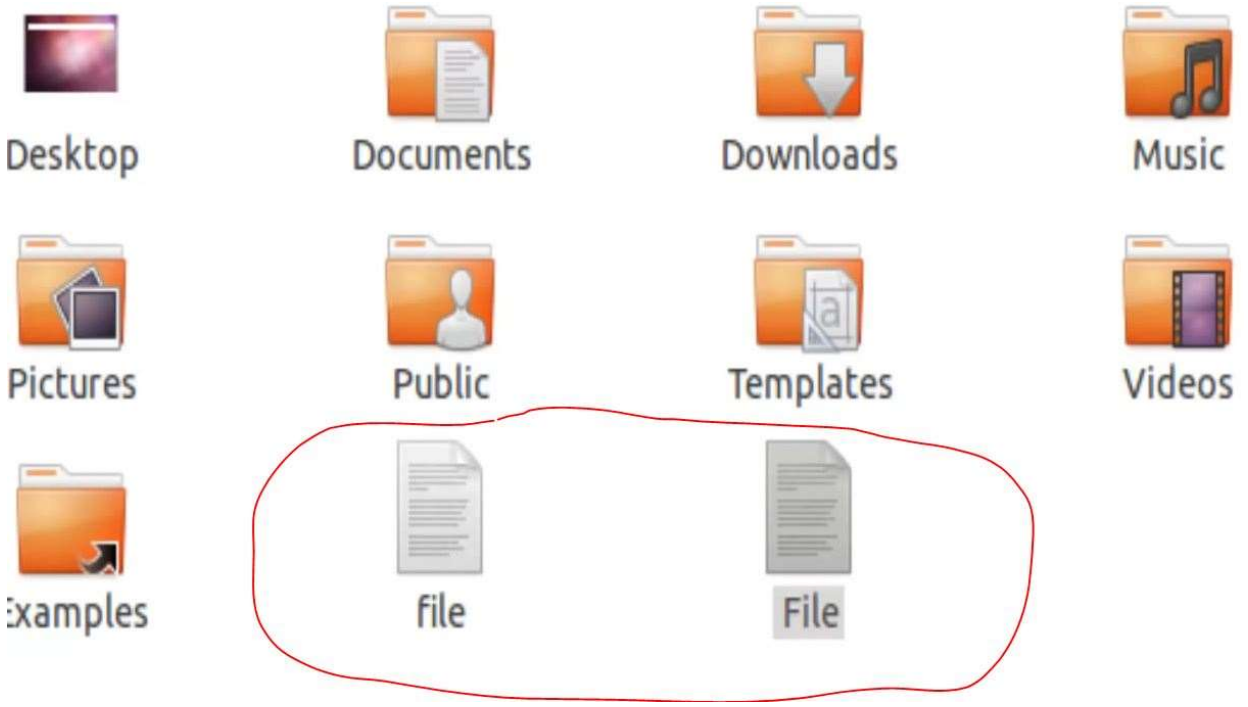
You will **not** see service accounts in Linux Desktop version but Linux Server editions will have them.

This is exactly the same principle when talking about Windows Server and Window workstations (Win7, Win8, Win10)

Windows – file name convention, you **cannot** have 2 files with the same name in the same folder.



Linux – file name convention, you **can** have 2 files with the same name in the same directory providing the name use different cases (once again, Linux is case-sensitive).



Technical Comparisons – *File System*

Microsoft Windows

- FAT16 (used in DOS and Windows 3.x)
- **FAT32** (used in Win95, Win98)
- ExFAT (for flash-based storage)
- **NTFS** (used in XP until present)
- ReFS (optional use in Server 2012, Server 2016)

Linux Distros

- Ext2
- Ext3
- **Ext4**

FEATURE	FAT32	NTFS
Max. Partition Size	2TB	2TB
Max. File Name	8.3 Characters	255 Characters
Max. File Size	4GB	16TB
File/Folder Encryption	No	Yes
Fault Tolerance	No	Auto Repair
Security	Only Network	Local and Network
Compression	No	Yes
Conversion	Possible	Not Allowed
Compatibility	Win 95/98/2K/2K3/XP	Win NT/2K/XP/Vista/7

Some of the many reasons why more admins are beginning to implement Linux into their infrastructures for File Servers and Web Servers.

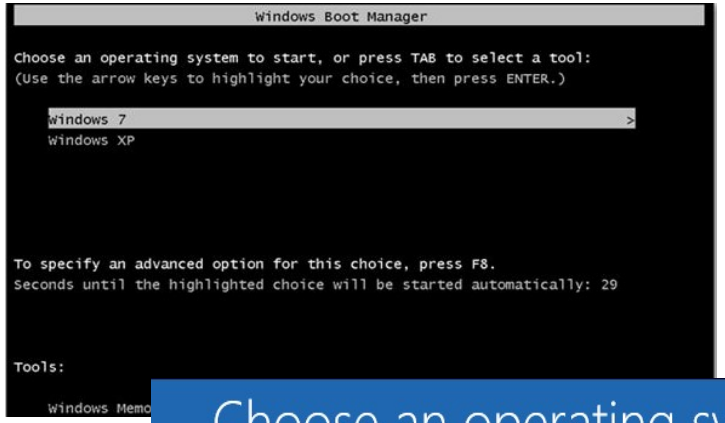
Windows NTFS has a practical maximum partition limit of 2TB (*ACL is limited if higher*). But, unlike Windows, Linux Ext4 has a fully applicable maximum partition size 16TB.

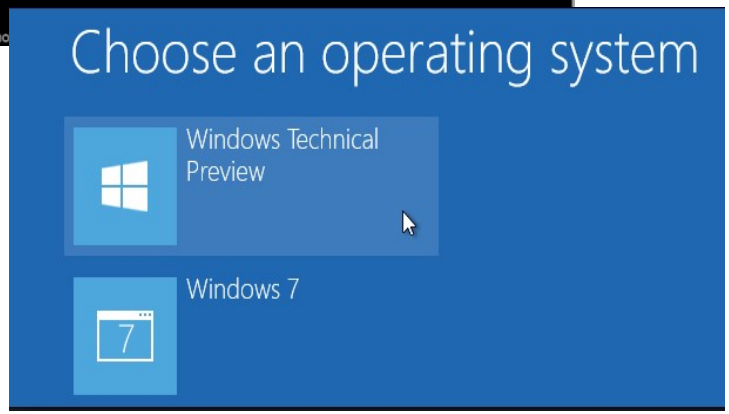
For Windows NTFS, this is also the maximum path length. But, unlike Windows, Linux Ext4 has a maximum path length of 4096.

Technical Comparisons – *Boot Loaders*

Microsoft Windows

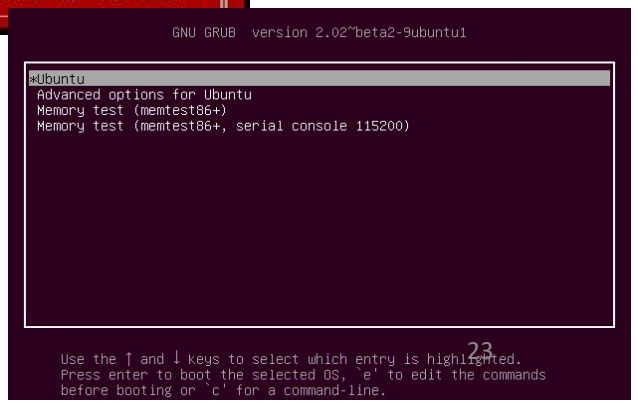
- NTLDR





Linux Distros

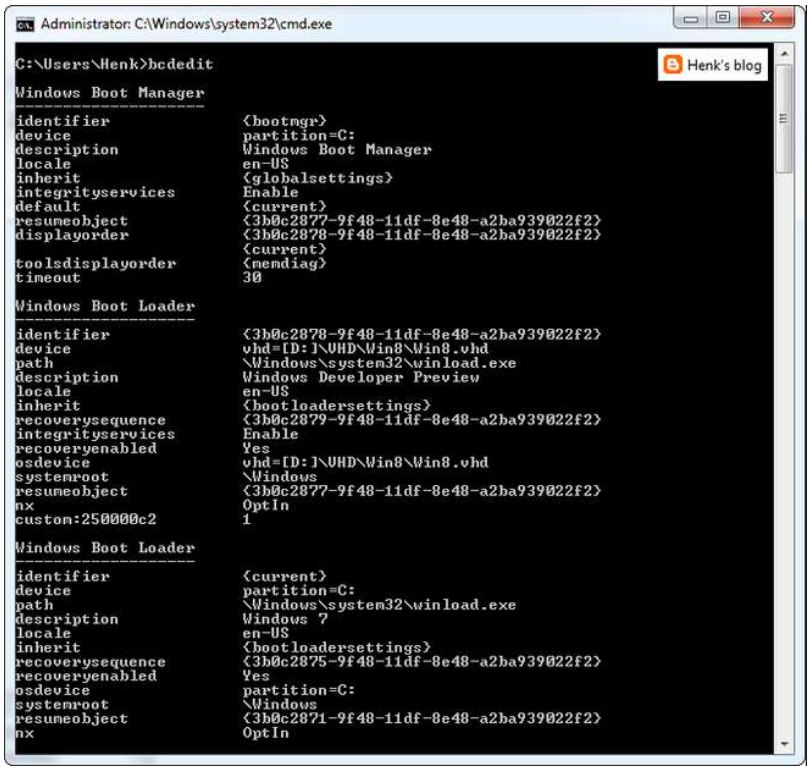
- LILO
- GRUB, GRUB2



Technical Comparisons - *Bootloader Configurations*

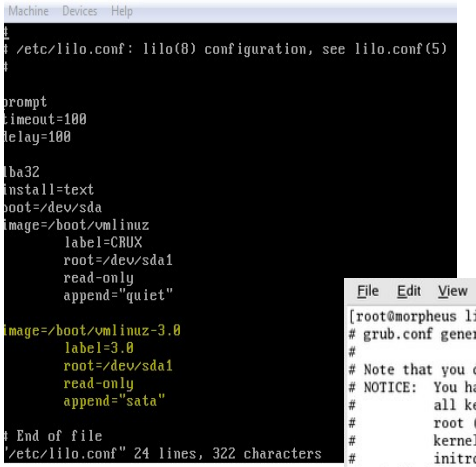
Microsoft NTDLR editor

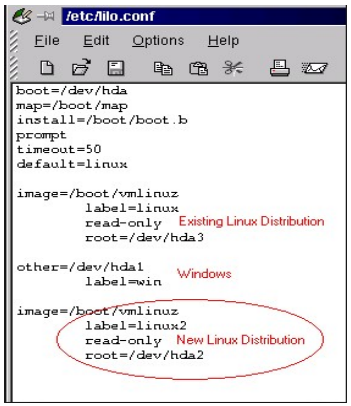
- Bcdedit

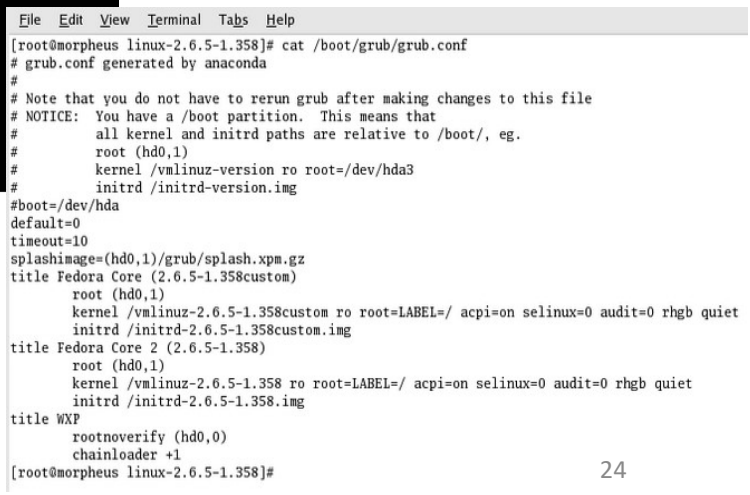


Linux configuration files

- /etc/lilo.conf
- /boot/grub/grub.conf



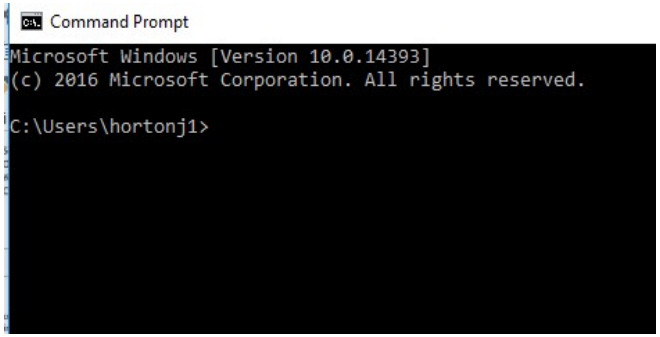


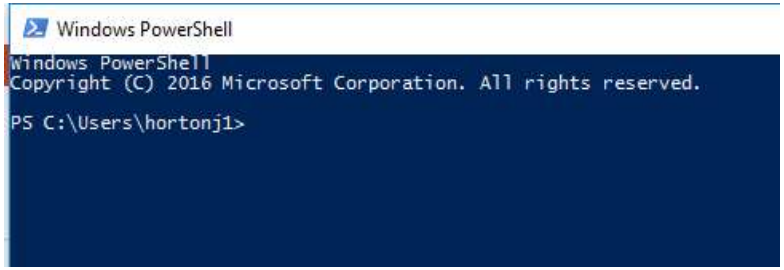


Technical Comparisons – *Command Line Interface (CLI)*

Microsoft Windows

- Command Prompt (cmd)
- PowerShell
- [elevate as administrator]





Linux Distros

- Terminal
- *Note: there are also a wide variety of optional open source terminal packages available from various repositories.*
- [elevate as root via sudo]