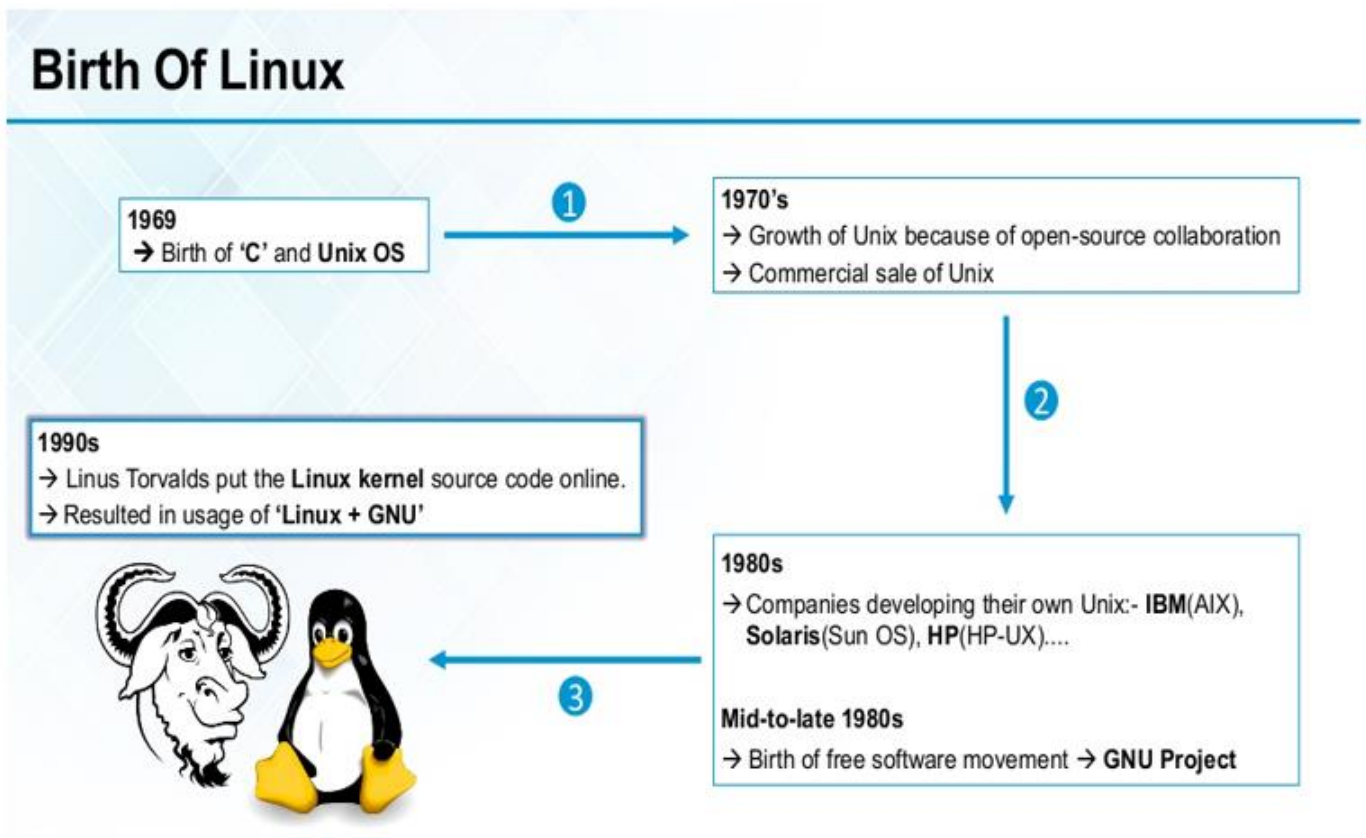


Linux Simple Notes

Check below Linux Fundamentals for beginners post for more information

https://www.linkedin.com/posts/vijaykumar-biradar-29b710161_linux-fundamentals-ugcPost-6834000725429903360-dE4t



Linux's Features



Why Use Linux

Why use Linux?

Some of the reasons to use Linux are:

- Low cost and very stable (some Linux servers are not rebooted for over a year, try that with Windows server!)
- Best computing power and inbuilt network support.
- Fastest developing OS, with the most number of developers.
- Most secure OS.
- Configurability
- Convenience
- freedom

Unix Vs Linux

Today Linux is in great demand. You can see the use of Linux everywhere. It's dominating on our servers, desktop, smartphones and even used in some electrical devices like refrigerators.

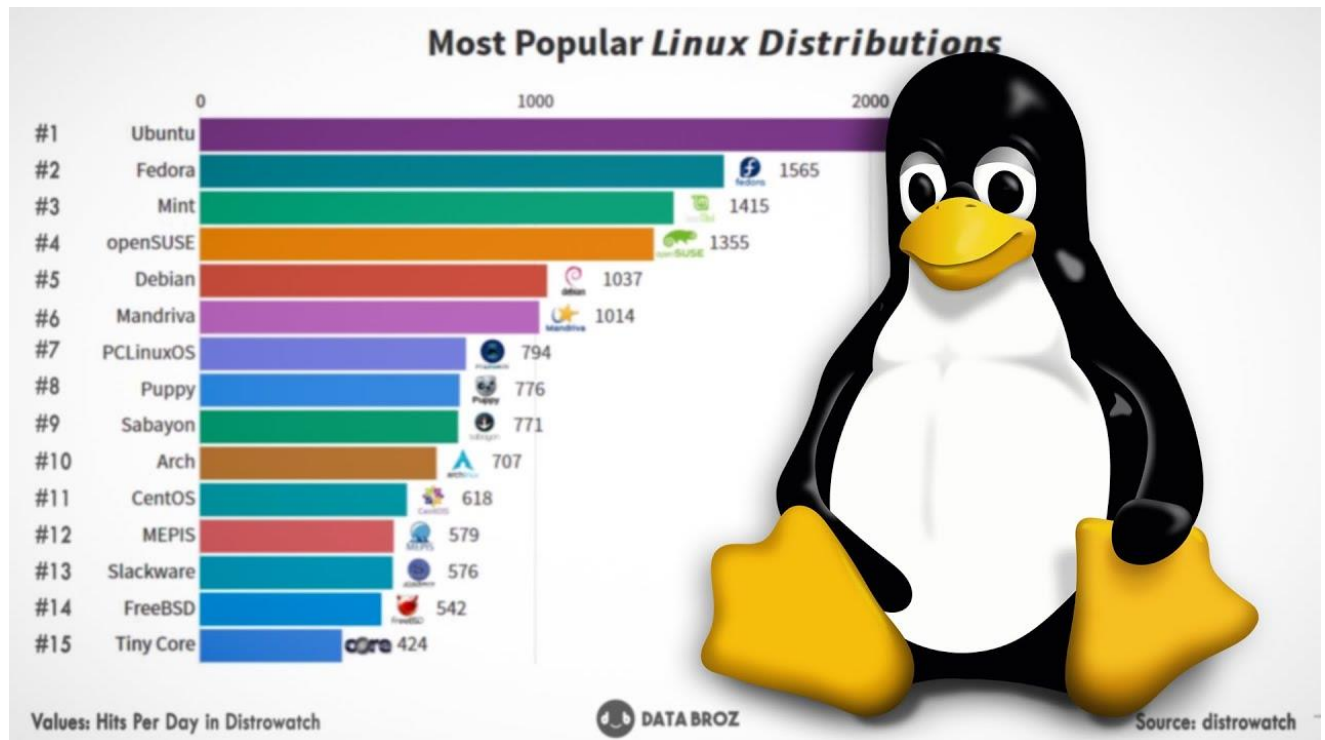
Some people think Unix and Linux as synonyms, but that's not true. Many operating systems were developed to be like Unix but none of them got the popularity as Linux. Linux is the clone of Unix. It has several features similar to Unix, still have some key differences. Before Linux and Windows, computer world was dominated by Unix. Unix is a copyrighted name and IBM AIX, HP-UX and Sun Solaris are only Unix operating system remained till date.

Difference between Linux and Unix

| Comparison | Linux | Unix |
|-------------|---|--|
| Definition | It is an open-source operating system which is <i>freely available to everyone</i> . | It is an operating system which <i>can be only used by its copyrighters</i> . |
| Examples | It has different distros like Ubuntu, Redhat, Fedora, etc | IBM AIX, HP-UX and Sun Solaris. |
| Users | Nowadays, Linux is in great demand. Anyone can use Linux whether a home user, developer or a student. | It was developed mainly for servers, workstations and mainframes. |
| Usage | Linux is used everywhere from servers, PC, smartphones, tablets to mainframes and supercomputers. | It is used in servers, workstations and PCs. |
| Cost | Linux is freely distributed, downloaded, and distributed through magazines also. And priced distros of Linux are also cheaper than Windows. | Unix copyright vendors decide different costs for their respective Unix Operating systems. |
| Development | As it is open source, it is developed by sharing and collaboration of codes by world-wide developers. | Unix was developed by AT&T Labs, various commercial vendors and non-profit organizations. |

| | | |
|------------------------------|---|---|
| Manufacturer | Linux kernel is developed by the community of developers from different parts of the world. Although the father of Linux, Linus Torvalds oversees things. | Unix has three distributions IBM AIX, HP-UX and Sun Solaris. Apple also uses Unix to make OSX operating system. |
| GUI | Linux is command based but some distros provide GUI based Linux. Gnome and KDE are mostly used GUI. | Initially it was command based OS, but later Common Desktop Environment was created. Most Unix distributions use Gnome. |
| Interface | The default interface is BASH (Bourne Again SHell). But some distros have developed their own interfaces. | It originally used Bourne shell. But is also compatible with other GUIs. |
| File system support | Linux supports more file system than Unix. | It also supports file system but lesser than Linux. |
| Coding | Linux is a Unix clone, behaves like Unix but doesn't contain its code. | Unix contain a completely different coding developed by AT&T Labs. |
| Operating system | Linux is just the kernel. | Unix is a complete package of Operating system. |
| Security | It provides higher security. Linux has about 60-100 viruses listed till date. | Unix is also highly secured. It has about 85-120 viruses listed till date |
| Error detection and solution | As Linux is open-source, whenever a user post any kind of threat, developers from all over the world start working on it. And hence, it provides faster solution. | In Unix, users have to wait for some time for the problem to be resolved. |

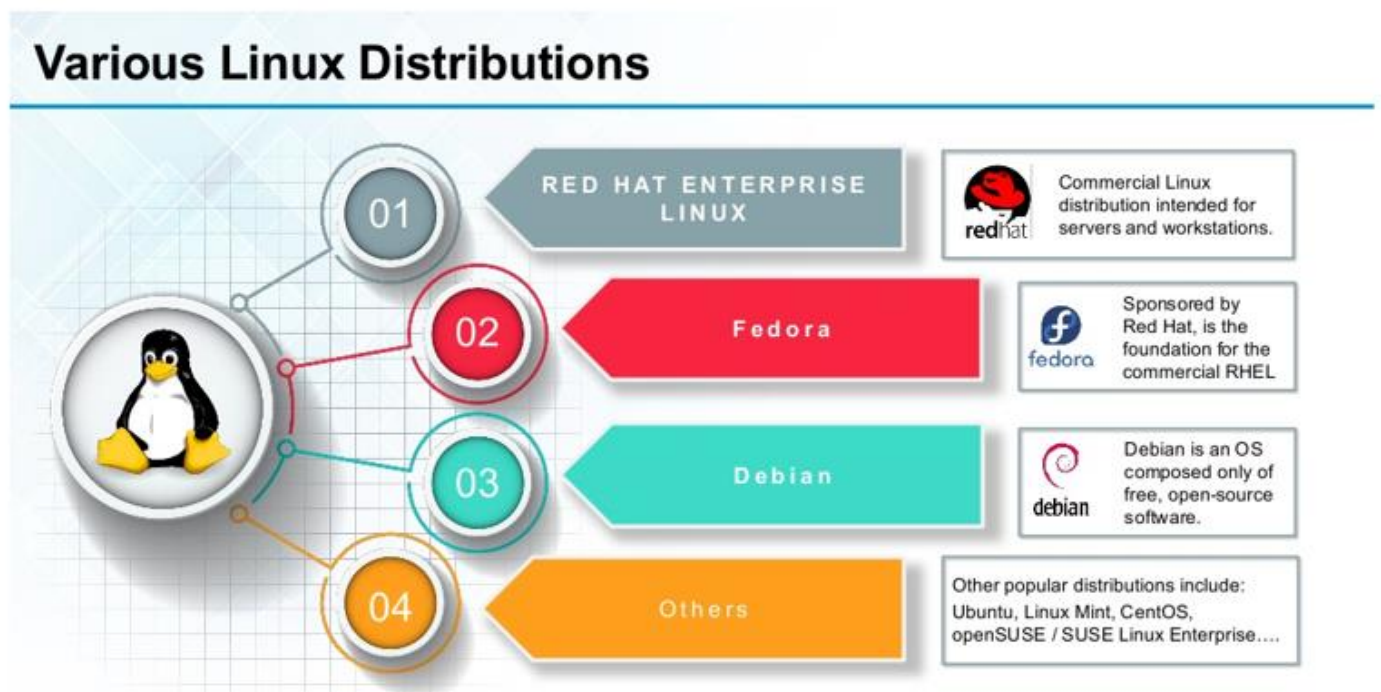
Linux Distributions (Distros)



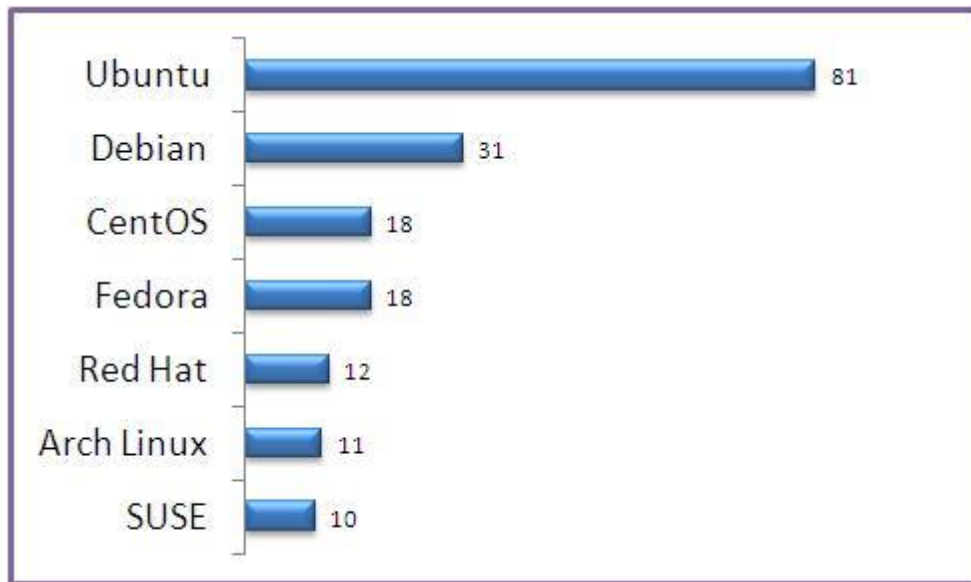
Choosing a Linux Distro

| Distribution | Why To Use |
|--------------------|--|
| UBuntu | It works like Mac OS and easy to use. |
| Linux mint | It works like windows and should be use by new comers. |
| Debian | It provides stability but not recommended to a new user. |
| Fedora | If you want to use red hat and latest software. |
| Red hat enterprise | To be used commercially. |

| | |
|------------|--|
| CentOS | If you want to use red hat but without its trademark. |
| OpenSUSE | It works same as Fedora but slightly older and more stable. |
| Arch Linux | It is not for the beginners because every package has to be installed by yourself. |



Top Linux Distribution



Linux Commands List

Hardware Information

Show **bootup messages**:

```
dmesg
```

See **CPU information**:

```
cat /proc/cpuinfo
```

Display **free and used memory** with:

```
free -h
```

List **hardware configuration** information:

```
lshw
```

See information about **block devices**:

```
lsblk
```

Show **PCI devices** in a tree-like diagram:

```
lspci -tv
```

Display **USB devices** in a tree-like diagram:

```
lsusb -tv
```

Show **hardware information** from the BIOS:

```
dmidecode
```

Display **disk data** information:

```
hdparm -i /dev/disk
```

Conduct a **read-speed test** on device/disk:

```
hdparm -tT /dev/[device]
```

Test for **unreadable blocks** on device/disk:

```
badblocks -s /dev/[device]
```

Searching

Search for a specific pattern in a file with grep:


```
grep [pattern] [file_name]
```

Recursively search for a pattern in a directory:

```
grep -r [pattern] [directory_name]
```

Find all files and directories related to a particular name:

```
locate [name]
```

List names that **begin with a specified character** [a] in a specified location [/folder/location] by using the find command:

```
find [/folder/location] -name [a]
```

See files larger than a specified size [+100M] in a folder:

```
find [/folder/location] -size [+100M]
```

File Commands

List files in the directory:

```
ls
```

List all files (shows hidden files):

```
ls -a
```

Show directory you are currently working in:

```
pwd
```

Create a new directory:

```
mkdir [directory]
```

Remove a file:

```
rm [file_name]
```

Remove a directory recursively:

```
rm -r [directory_name]
```

Recursively remove a directory without requiring confirmation:

```
rm -rf [directory_name]
```

Copy the contents of one file to another file:

```
cp [file_name1] [file_name2]
```

Recursively copy the contents of one file to a second file:

```
cp -r [directory_name1] [directory_name2]
```

Rename [file_name1] to [file_name2] with the command:

```
mv [file_name1] [file_name2]
```

Create a symbolic link to a file:

```
ln -s /path/to/[file_name] [link_name]
```

Create a new file:

```
touch [file_name]
```

Show the contents of a file:

```
more [file_name]
```

or use the cat command:

```
cat [file_name]
```

Append file contents to another file:

```
cat [file_name1] >> [file_name2]
```

Display the first 10 lines of a file with:

```
head [file_name]
```

Show the last 10 lines of a file:

```
tail [file_name]
```

Encrypt a file:

```
gpg -c [file_name]
```

Decrypt a file:

```
gpg [file_name.gpg]
```

Show the **number of words, lines, and bytes** in a file:

```
wc
```

Directory Navigation

Move **up one level** in the directory tree structure:

```
cd ..
```

Change **directory** to `$HOME`:

```
cd
```

Change location to a specified directory:

```
cd /chosen/directory
```

File Compression

Archive an existing file:

```
tar cf [compressed_file.tar] [file_name]
```

Extract an archived file:

```
tar xf [compressed_file.tar]
```

Create a **gzip compressed tar file** by running:

```
tar czf [compressed_file.tar.gz]
```

Compress a file with the `.gz` extension:

```
gzip [file_name]
```

File Transfer

Copy a file to a server directory securely:

```
scp [file_name.txt] [server/tmp]
```

Synchronize the contents of a directory **with a backup directory** using the **rsync** command:

```
rsync -a [/your/directory] [/backup/]
```

Users

See details about the **active users**:

```
id
```

Show **last system logins**:

```
last
```

Display who is **currently logged into the system** with the `who` command:

```
who
```

Show which users are **logged in** and **their activity**:

```
w
```

Add a new group by typing:

```
groupadd [group_name]
```

Add a new user:

```
adduser [user_name]
```

Add a user to a group:

```
usermod -aG [group_name] [user_name]
```

Temporarily **elevate user privileges** to superuser or root using the sudo command:

```
sudo [command_to_be_executed_as_superuser]
```

Delete a user:

```
userdel [user_name]
```

Modify user information with:

```
usermod
```

Package Installation

List all installed packages with `yum`:

```
yum list installed
```

Find a package by a **related keyword**:

```
yum search [keyword]
```

Show **package information and summary**:

```
yum info [package_name]
```

Install a package using the **YUM package manager**:

```
yum install [package_name.rpm]
```

Install a package using the **DNF package manager**:

```
dnf install [package_name.rpm]
```

Install a package using the **APT package manager**:

```
apt-get install [package_name]
```

Install an `.rpm` package from a local file:

```
rpm -i [package_name.rpm]
```

Remove an `.rpm` package:

```
rpm -e [package_name.rpm]
```

Install software from **source code**:

```
tar zxvf [source_code.tar.gz]
cd [source_code]
./configure
make
make install
```

Process Related

See a **snapshot of active processes**:

```
ps
```

Show **processes in a tree-like diagram**:

```
pstree
```

Display a **memory usage map** of processes:

```
pmap
```

See **all running processes**:

```
top
```

Terminate a Linux process under a **given ID**:

```
kill [process_id]
```


Terminate a process under a **specific name**:

```
pkill [proc_name]
```

Terminate all processes **labelled "proc"**:

```
killall [proc_name]
```

List and resume stopped jobs in the background:

```
bg
```

Bring the most **recently suspended job** to the foreground:

```
fg
```

Bring a **particular job** to the foreground:

```
fg [job]
```

List **files opened by running processes**:

```
lsof
```

System Information

Show **system information**:

```
uname -r
```

See kernel release information:

```
uname -a
```

Display **how long the system has been running**, including load average:

```
uptime
```

See system **hostname**:

```
hostname
```

Show the **IP address** of the system:

```
hostname -i
```

List system **reboot history**:

```
last reboot
```

See current **time and date**:

```
date
```

Query and **change the system clock** with:

```
timedatectl
```

Show current **calendar** (month and day):

```
cal
```

List **logged in users**:

```
w
```

See which **user you are using**:

```
whoami
```

Show **information about a particular user**:

```
finger [username]
```

Disk Usage

See **free and used space** on mounted systems:

```
df -h
```

Show **free inodes** on mounted filesystems:

```
df -i
```

Display **disk partitions, sizes, and types** with the command:

```
fdisk -l
```

See disk usage for all files and directory:

```
du -ah
```

Show **disk usage of the directory** you are currently in:

```
du -sh
```

Display **target mount point** for all filesystem:

```
findmnt
```

Mount a device:

```
mount [device_path] [mount_point]
```

SSH Login

Connect to host as user:

```
ssh user@host
```

Securely **connect to host via SSH** default port 22:

```
ssh host
```

Connect to host **using a particular port**:

```
ssh -p [port] user@host
```

Connect to host **via telnet default port 23**:

```
telnet host
```

File Permission

Chown command in Linux changes file and directory ownership.

Assign **read, write, and execute permission** to everyone:

```
chmod 777 [file_name]
```

Give **read, write, and execute permission to owner**, and **read and execute permission to group and others**:

```
chmod 755 [file_name]
```

Assign **full permission to owner**, and **read and write permission to group and others**:

```
chmod 766 [file_name]
```

Change the **ownership of a file**:

```
chown [user] [file_name]
```

Change the **owner and group ownership of a file**:

```
chown [user]:[group] [file_name]
```

Network

List **IP addresses and network interfaces**:

```
ip addr show
```

Assign an **IP address to interface eth0**:

```
ip address add [IP_address]
```

Display **IP addresses of all network interfaces** with:

```
ifconfig
```

See **active (listening) ports** with the **netstat** command:

```
netstat -pnltu
```

Show **tcp** and **udp ports** and their programs:

```
netstat -nutlp
```

Display more **information about a domain**:

```
whois [domain]
```

Show **DNS information** about a domain using the **dig** command:

```
dig [domain]
```

Do a **reverse lookup on domain**:

```
dig -x host
```

Do **reverse lookup of an IP address**:

```
dig -x [ip_address]
```

Perform an **IP lookup for a domain**:

```
host [domain]
```

Show the **local IP address**:

```
hostname -I
```

Download a file from a domain using the **wget command**:

```
wget [file_name]
```

Linux Keyboard Shortcuts

Kill process running in the terminal:

```
Ctrl + C
```

Stop **current process**:

```
Ctrl + Z
```

The process can be **resumed** in the **foreground** with `fg` or in the **background** with `bg`.

Cut **one word before the cursor** and add it to clipboard:

```
Ctrl + W
```

Cut **part of the line before the cursor** and add it to clipboard:

```
Ctrl + U
```

Cut **part of the line after the cursor** and add it to clipboard:

```
Ctrl + K
```

Paste from clipboard:

```
Ctrl + Y
```

Recall last command that matches the provided characters:

```
Ctrl + R
```

Run the previously recalled command:

```
Ctrl + O
```

Exit command history without running a command:

```
Ctrl + G
```

Run the last command again:

```
!!
```

Log out of current session:

```
exit
```