Most famous operating systems

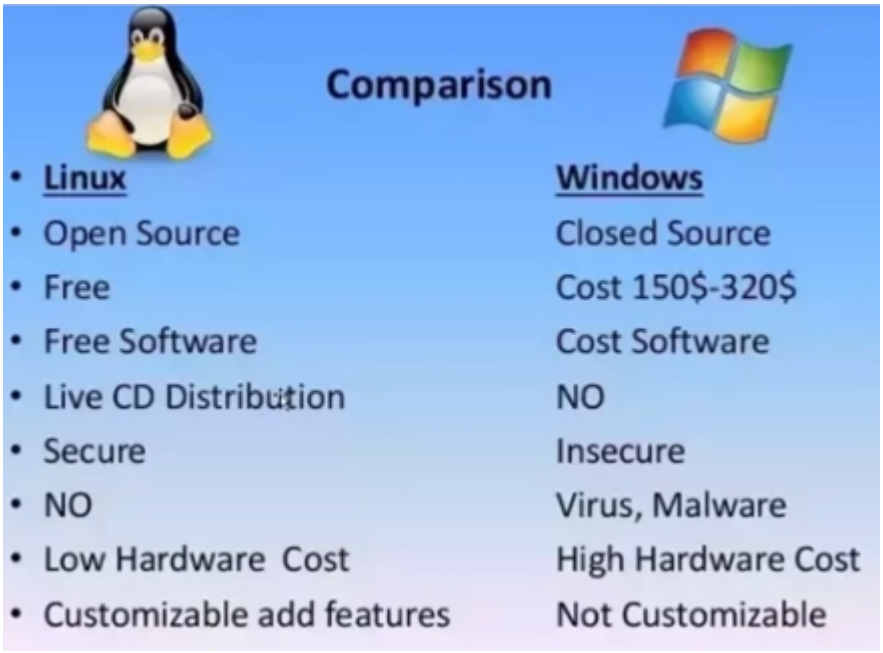
1- MAC
2- WINDOW
3- LINUX
4- UNIX
5- BSD(Berkeley Software Distribution)

Why linux

- its secure
- we can use this in old computers easily
- perfect for programing
- fast updates
- customization
- variety of distributions
- free to use
- its open source means its free
- better community support
- Reliability

- privacy

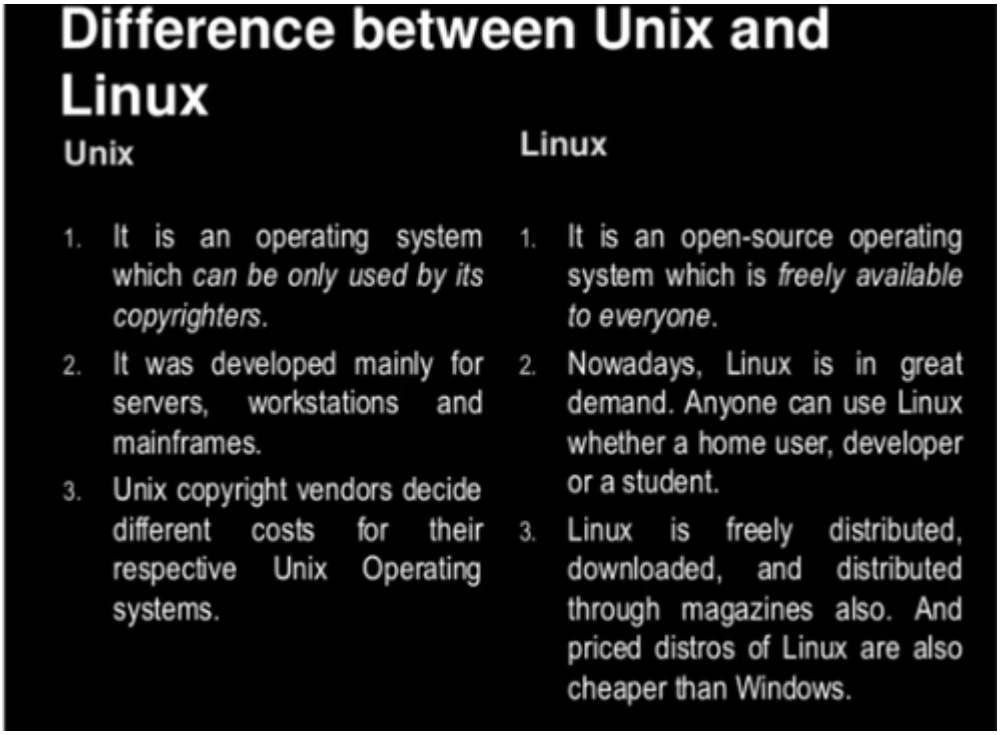
How does linux is deffer from other operating systems?



> **Live CD distribution**

A live CD and DVD is a CD-ROM or DVD-ROM contaning a bootable operation system.

> Difference between UNIX and LINUX



Who uses Linux

Every big company in the world using Linux as main proparitary operating system

1- Facebook

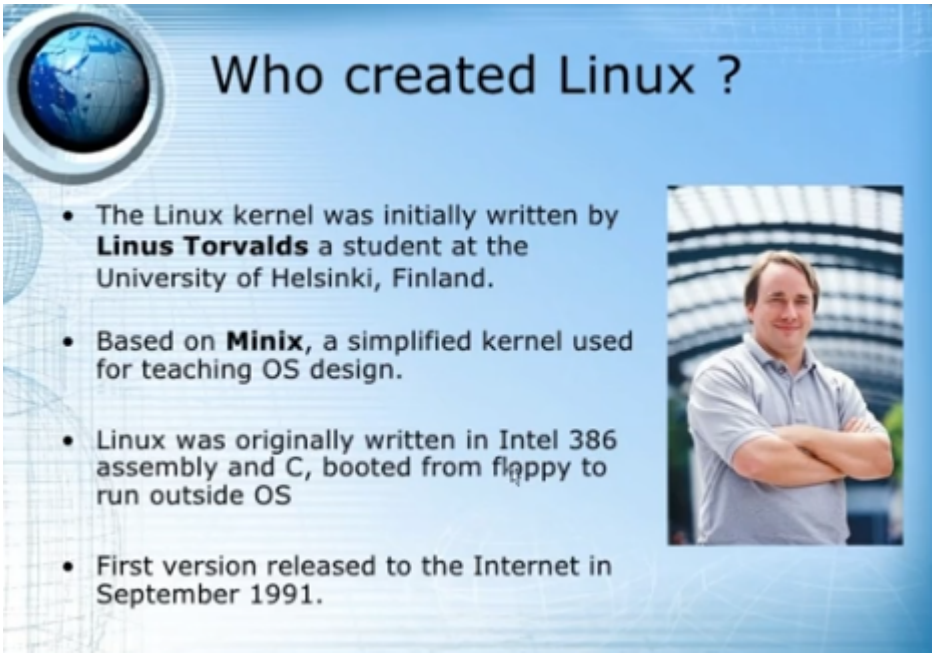
2- Microsoft

3- Google

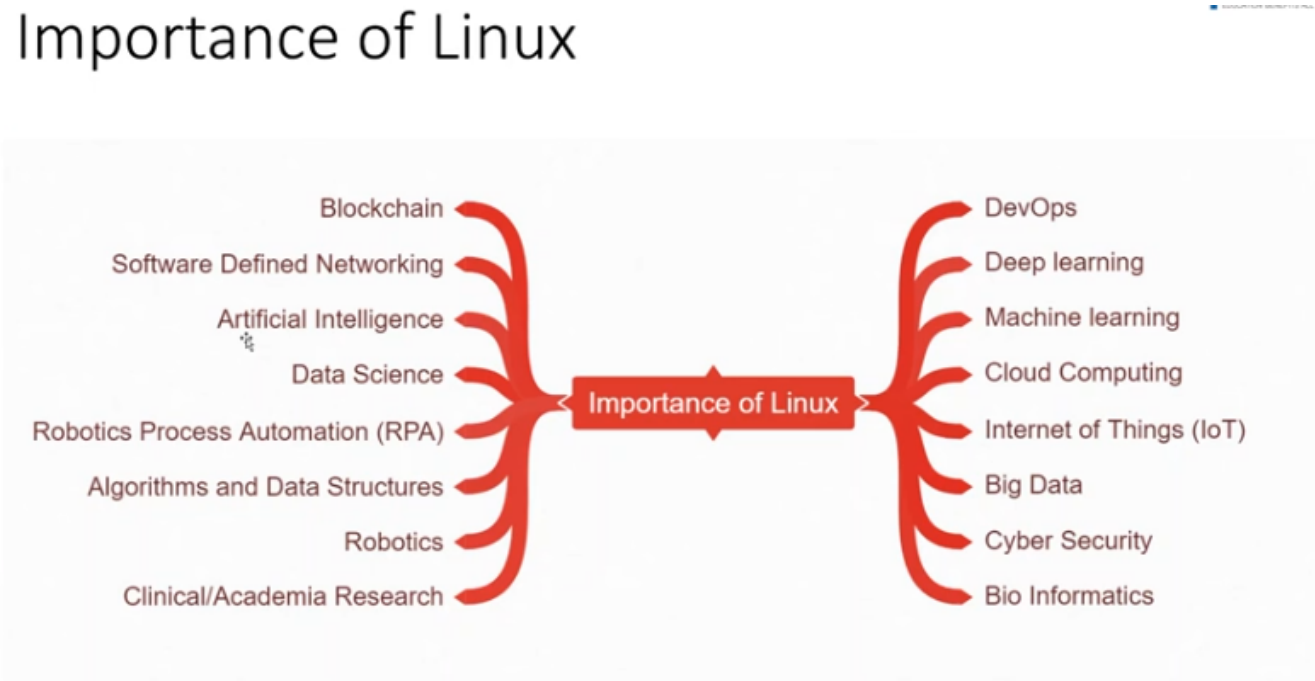
4- Amazon
these 4 big company use linux continuesly.

> Who "own" Linux

- linus Benedict Torvalds



> **importance of linux**



All IOT(internet of things) things are using linux

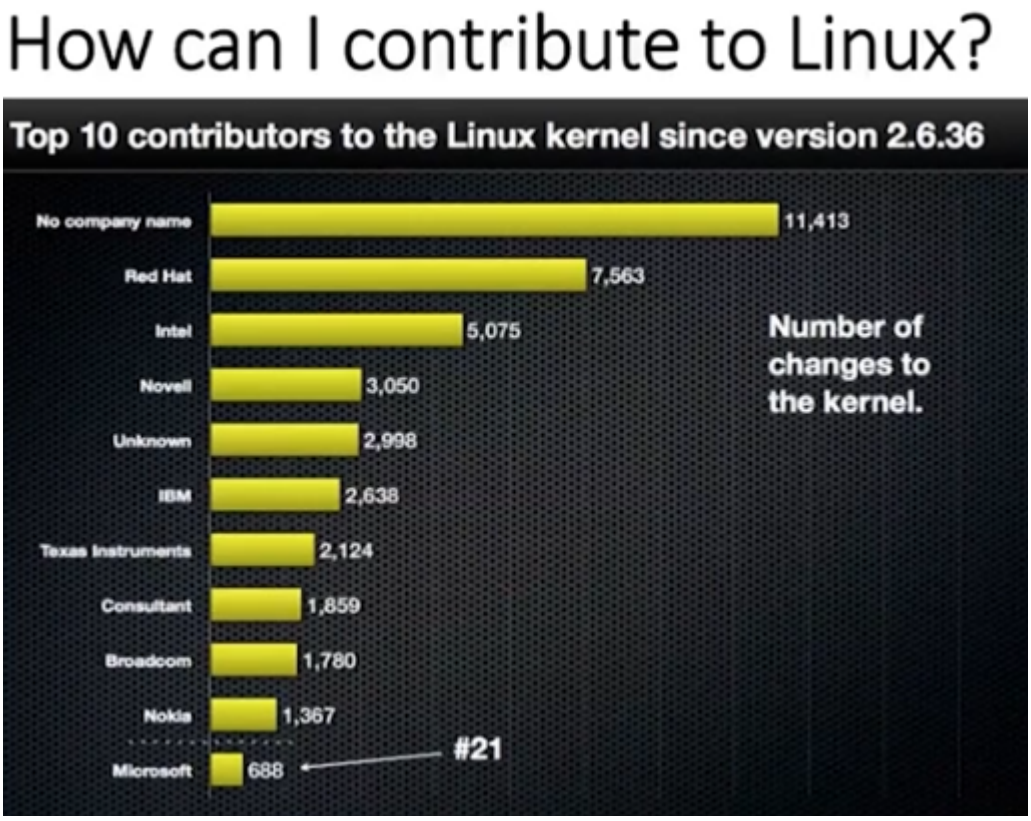
differents hacking distros

autonomous driving also uses on linux

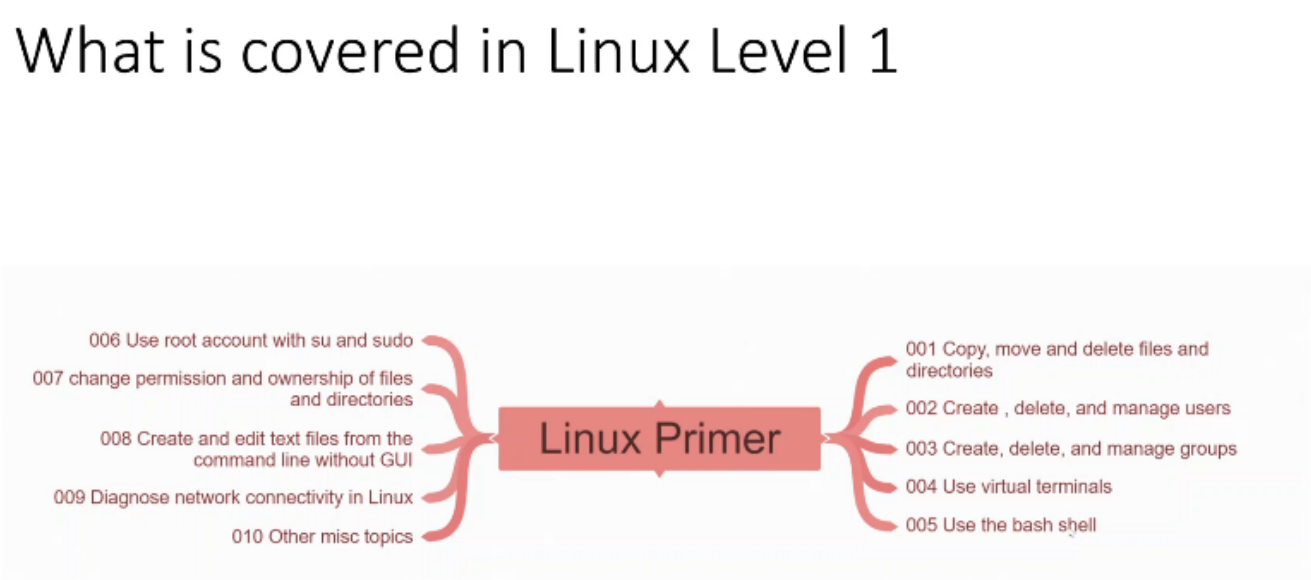
Linux Importance IoT (internet of things)

- ALL machine learning tools are using 99% linux
- Deep learning tool are alomst 99% use linux
- AI also use 99% linux
- Cloud computing also use linux
- satellite is also use linux operating system

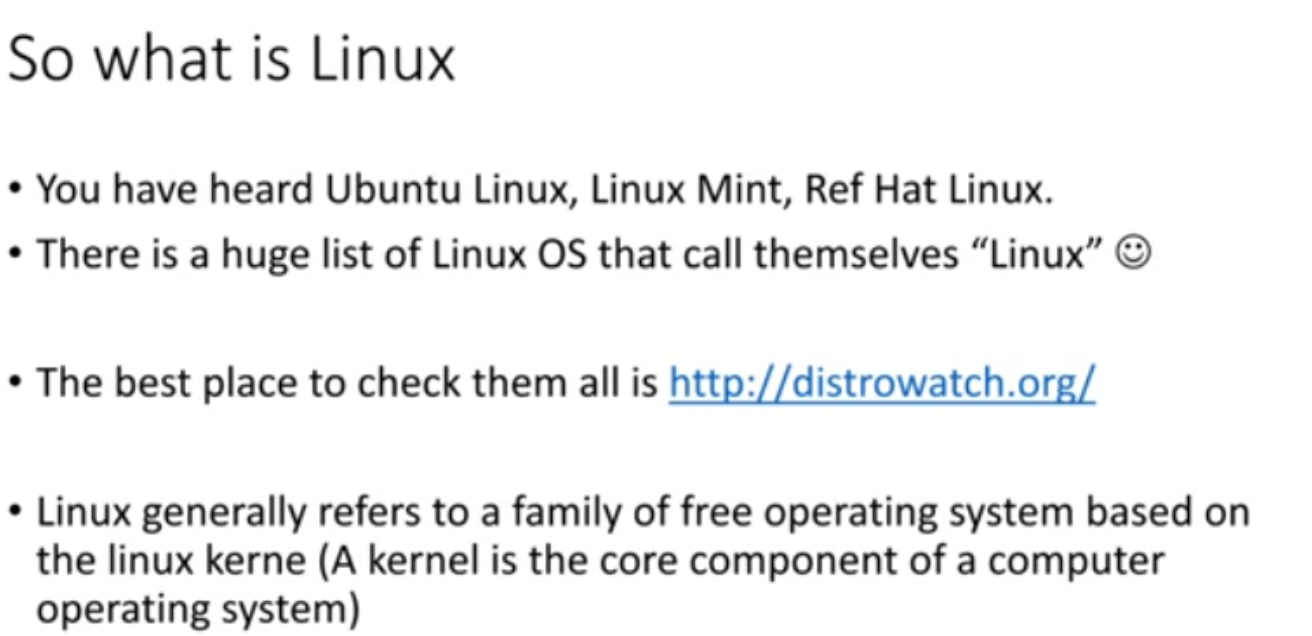
> **contribute to linux**



linux primer

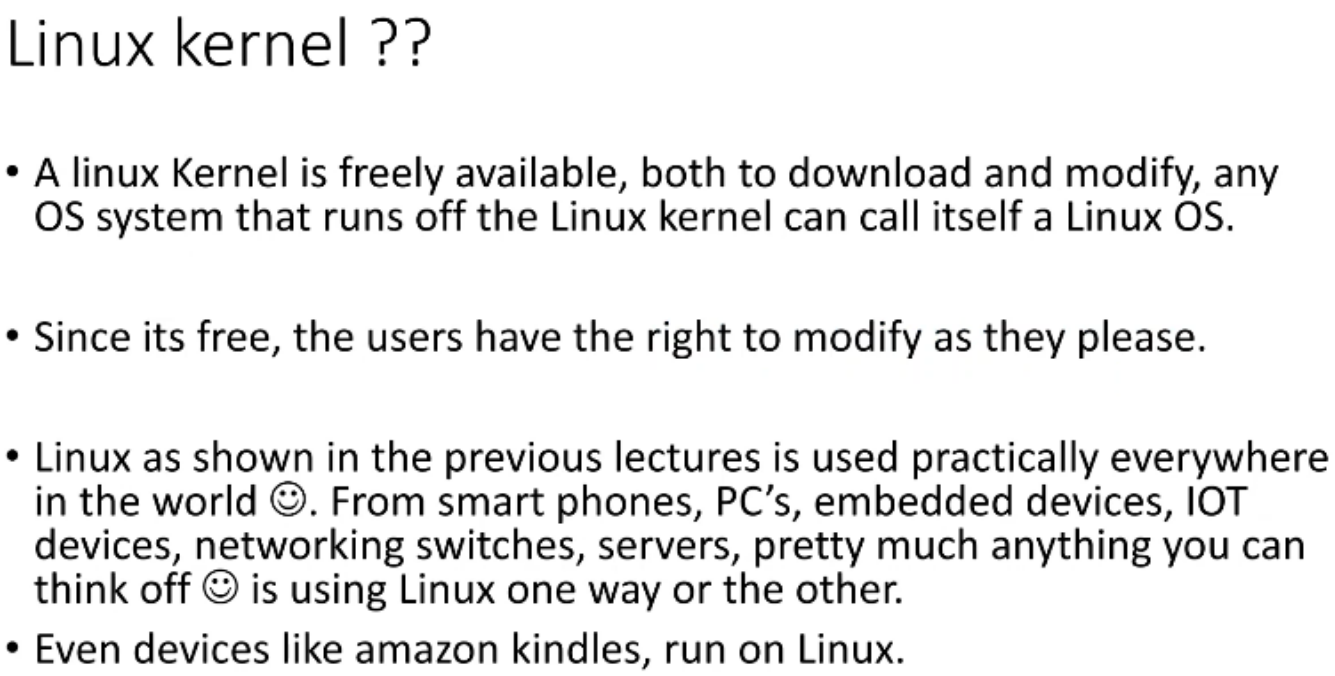


> **What is linux?**




```
Distrowatch.com
here is all the linux distribution we can see all the distribution of linux by
using this website.
```

> Linux kernal

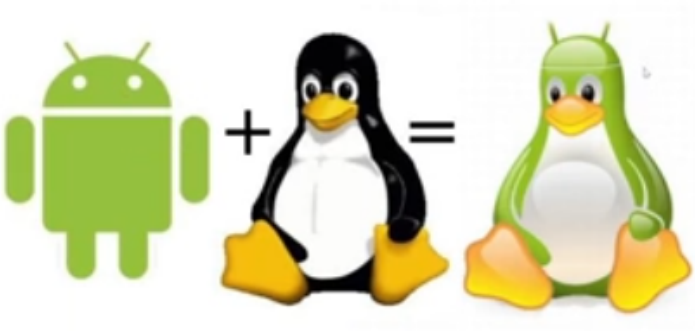


> Smart phones and linux

90 to 98% market phones ki andrioad ka pas ha because ya bht sasta ha or ya linux operation system use krta ha

Smart phones and Linux

- Android is a mobile operating system developed by Google. It is based on a modified version of the Linux kernel and other open source software, and is designed primarily for touchscreen mobile devices such as smartphones and tablets.



More on distro

More on Distros

- Anyone can create a Linux Distro. But they have to be supported commercially or through a community of users who are willing to put their time and effort in developing, maintaining, and testing a given Linux version.
- Like Red Hat is a commercial version of Linux or SuSE linux
- Knoppix or Fedora, are free and community supported. Some like Ubuntu, fall in the middle and are offered free to the public while supported commercially by an organization.

So what is command line

- Linux Primer or Linux Level 1 is all about command line!!
- Command line is shorthand for command line interface or CLI.
- Most modern computers use Graphical user interface or GUI
- The command line eschews graphical elements entirely.
- Users only see a prompt to launch programs. If GUI breaks, then CLI always works ☺ pretty much 99.99% of the time

Linux Level Primer is all about what ?

- This level is all about Command Line Interface. And will give you all the basics you need to be proficient and effective in learning the ropes

Many distros of Linux

- Sometime one command may not work on another distro of linux. But fear not you will learn you way through inshAllah. This tends to happen only with more exotic or esoteric commands and utilities, but it does happen.
- You best source of help is the specific linux source documentation ☺ just like Quran and Hadiath is the original source of documentation for us. We will learn how to navigate that in the final lectures of this course.

Linux Primer

> Livepatch

baisecally this is use to automatically update of new version we can aso do this manually
CLI(command line interface)

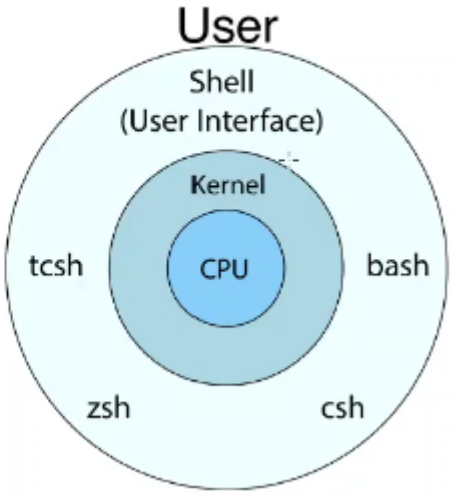
Linux Shell

But Shell in Linux means a program that serves as the interface between the user and the computer operating system. When we use a computer we do not communicate directly with the operating system. Instead we issue command through a shell, then then passes the instructions on to the Operating System for us. Both the graphical user interface and command line interface qualify as a shell. There are numerous different command-line shells available for Linux – the sh shell, the zsh shell, the c shell, and others. The most common shell by far is the bash shell, which we will discuss in the next section.

Types of shell in Linux

There are numerous different command-line shells available for Linux – the sh shell, the zsh shell, the c shell, and others.

The most common shell by far is the bash shell.



Starting of machine commands.

- `cd` is used to change diectry.
- `ls` is used to show list any file
- `cd ..` is used to go back to the previos directry
- `rm` is used to remove any file
- `ls` is used to show list
- `ls -l` , `ls -lh` is used to long lasting list, detail list but ls -lh show us the storage of directry
- `cd /bin` is used to see all the commands
- `cd /dev` is used to see the development things
- `etc` command show whole of the configation
- `sbin` command is used to see all the useful commands. only super user can use this commands
- `tmp` this command is use to see all the temporary files
- `mkdir` is used to make directry
- `rmdir` is used to remove directry
- `cd ~` is used to go to home directry
- `rm` is used to remove file
- `touch filename` is used to make a new file

- `sudo -i` is used to switch to simple user to root

```
root@osboxes:~# cd /home
root@osboxes:/home# cd osboxes
root@osboxes:/home/osboxes# ls
Desktop  Documents  Downloads  Music  Pictures  Public  snap  Templates  Videos
root@osboxes:/home/osboxes#
```

- `mv file name` is used to rename any file
- `cat` command is used to see what is in the file.if i want to view in any file we can use this command
- `sudo -i` command is used go to the root
- `su` this command is used to switch user
- `chmod u+x file name` this command is used to give full permission to any file.
- `chmod g+x groupname` this command is used to execute permission to any group.
- `chmod o+x` this command is used to give permission to everyone.
- `chmod u+x,g+x,o+x filename` this command is used to give permission to all privilliges.
- `chmod u-x,g-x,o-x filename` this command is used to take away all the permission from privilliges

```
The Read permission is assigned the number 4, Write the
number 2, and Execute the number 1. Having no permissions
is represented by a zero.
```

- `ls -l >> filename` this key is use to creat a new file.
- `touch filename` is used to directing all the input to that file.
- `cat -b filename` is used to see number of lines.
- `head filename` his command is used to view the begning of the text file.
- `head -n documentname` this command is used to view the numbers of line(such like if we want to see first 10 lines we have to write head -10 filename).

Output Piping and Redirects

The bash shell has two features called “output piping” and “output redirects.”

ls | grep bash

`grep` command is used to show this list of thata data which we want to see.

ls > list

This command will redirect output to a plain text file named list. If we do not have the file, then it will be created on a spot in the current working directory.

> ls > file is use to list all file and collect their data in the given file it also delete the data of given file.

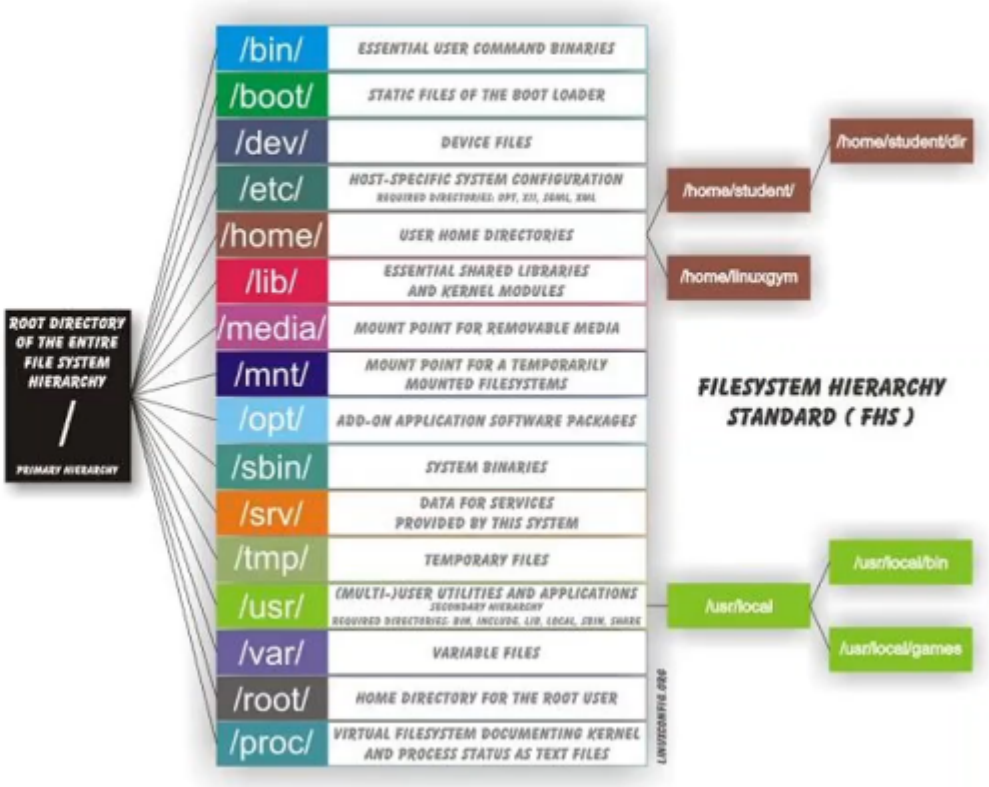
> ls >> this command is also use for list all file and their data in the given file but in this the data not lost it add the all data in a file

> ls >> listfile
>
> This variation of the command will append the output from the ls command to the list file, keeping any data from being overwritten.

Linux file system

file system mean how to organize a file

Files and directories



Different between kali and ubuntu linux

Ubuntu ma ham default user hota ha or kali ma ham by default root user hota ha. kali is used for super user or root user because we have to run all the command in kali linux.
if we run all these command in ubtuntu that will not run. its show that permisson denied.

- the name which name is typed in blus is directry and which is in white is file.

Root

Root basically a superuser which can do any work on machine. we can do all task on root which we cant done on defaut user.

- **absolute path** kisi b directry ma sa kisi or directry ma file ko remove kr skta ha absolute path sa.

```
root@ubuntu:/home/alnafi/Documents# ls
'key file'   newcheckfile   test-file.odt
root@ubuntu:/home/alnafi/Documents# rm /home/alnafi/Downloads/download-checkfil
e
```

Archive and Compressing file

```
tar -cf filename.tar ~/Documents

tar -czf filename.tar.gz ~/Documents

tar -czvf filename.tar.gz ~/Documents
```

- **tar -cf filename.tar ~/Documents**
  This is used to zip as it file its does not compress the file the file convert in the zip as its current size
- **tar -cvf filename.tar ~/Documents**
  This is used to zip any file its also compress the file size. its is very good command if want to compress the file.
- **tar -czvf filename.tar.gz ~/Documents**
  its work very neatly .its pack the file very clearly and gives us the output very clearly.

```
tar -xvf filename.tar

tar -xzvf filename.tar.
```

use for that file which is compress with ".gz"

- tar -xzvf filename.tar.gz basically vf is used for variety of functions

---

```
zip -r filename.zip ~/Documents

unzip filename.zip
```

- for zip any file we use "zip -r filename ~/Doucement".
- for unzip any file use "unzip filename.zip"

While card

This is used to delete multiple files.basically while card is defined with a "?" in superuser. we have to use to while card with extenshion "?.txt"(rm filename?.txt)

- Asterisk this also a while card its also use tp delete all data from files.its symbol is " * " (rm *filename.txt)

Linux user types

Linux Users Types

Standard user nd root user

- Standard user is a simple user. its a default user we cannot run all commands in it.
- Root user basically a admin user we can run all the file in root. we have to work in root very carefully. because if any file delete then its permanenty delete.

> **vi passwd** is used to modify in passwd command if we open it so we have to come to pervious directry by using "Esc then :q "
>
> - basically "vi" is used for modification.

Shadow

"cat shadow" is used to show the file data. we can open this file by using root used we cannt open this file on kernal."cat" use for to shoe any file."*" in shadow astric mean we cannot login with this account as a system because that is not a system login account.

- **gshadow** in this file all the paswords are store in incripted foam.

Group

"cat group" by using this command we can see all the groups and users.

- add group

```
root@ubuntu:/etc# groupadd mujahid
root@ubuntu:/etc#
```

to move any group ("usermod -G groupname move group name ")

```
root@ubuntu:/etc# usermod -G mujahid umer
```

```
removing a user from a group

gpasswd -d umer mujahid \
```

- remove a user from group
- delete any group

```
deleting a group

groupdel mujahid
```

Add user

- We can add user by typing "useradd username" we can only do this on root user. its not work on standard user
- if we want to give home directry to new user then type "useradd -m username"
- if we want to give access of bash and bin then (useradd -m -s "/bin/bash" username)

```
useradd abdullah

--------------
useradd -m abdullah

-----------------------

useradd -m -s "/bin/bash" abdullah

---------------------------------

useradd -c "Abullah Ibn Az Zubyar" -m -s "/bin/bash"
abdullah
```

delete user

- for delete user just type "userdel username"

Password change

"paswd username" by using this commant we can change the pasword of any user but we can only change pasword from root user

if we want to block/lock acces of any user then

```
usermod -L abdullah

locking the account
```

usermod -L username

- For unlock/unblock any user

```
usermod -U abdullah

uncking the account
```

if want to change user name then

```
---------------------------
usermod -l abdullah ibn umer abdullah

usermod -c "Abullah ibn Umer" abdullah
```

if we want to delete the user also from home directry then

userdel -r username

- **use "exit" for come out from root user to standart user**

Different between kali and ubuntu

- In kali user are admin by default.
- in ubtuntu user are standerd by default.

SU command

```
abdullah@ubuntu:/root$ su alnafi
Password:
alnafi@ubuntu:/root$ su abdullah
Password:
```

su is used to switch users if we want to go from one user to other without termination the sesion

sudo command

sudo stand for "switch user do"

modify any used

```
usermod -L abdullah


sudo usermod -L abdullah
```

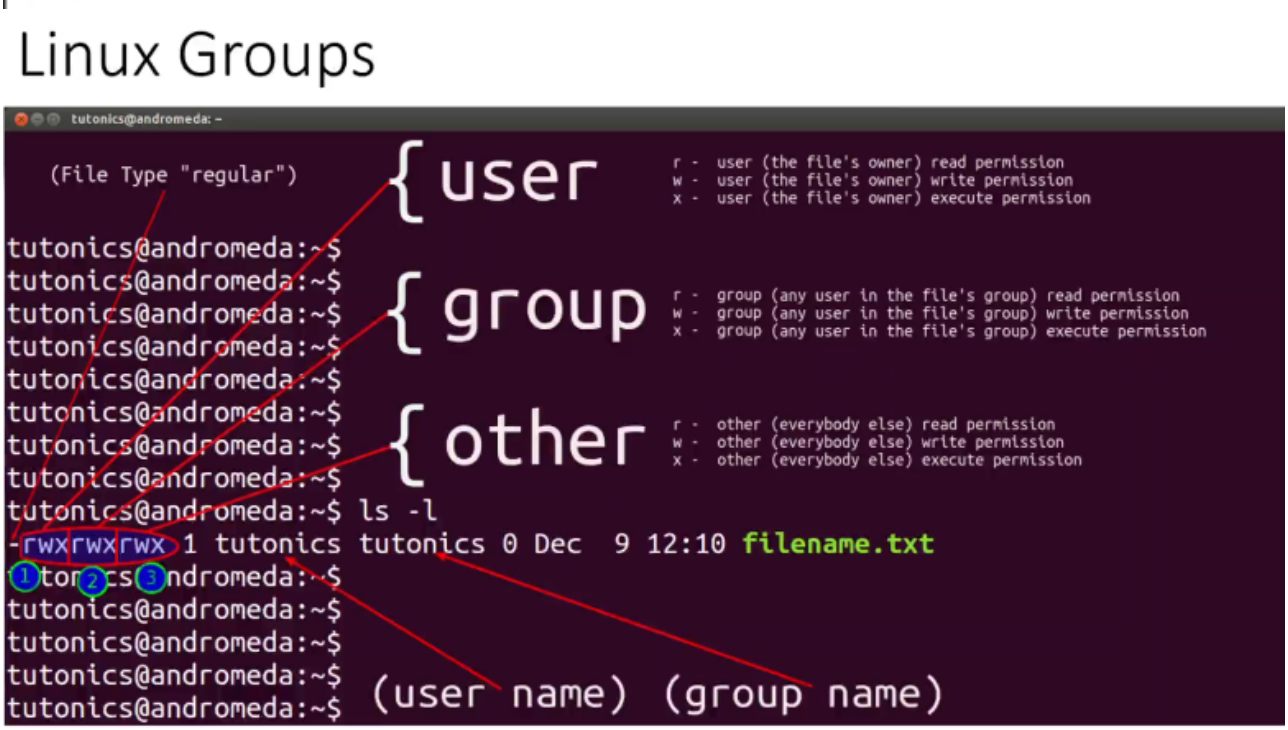
Groups

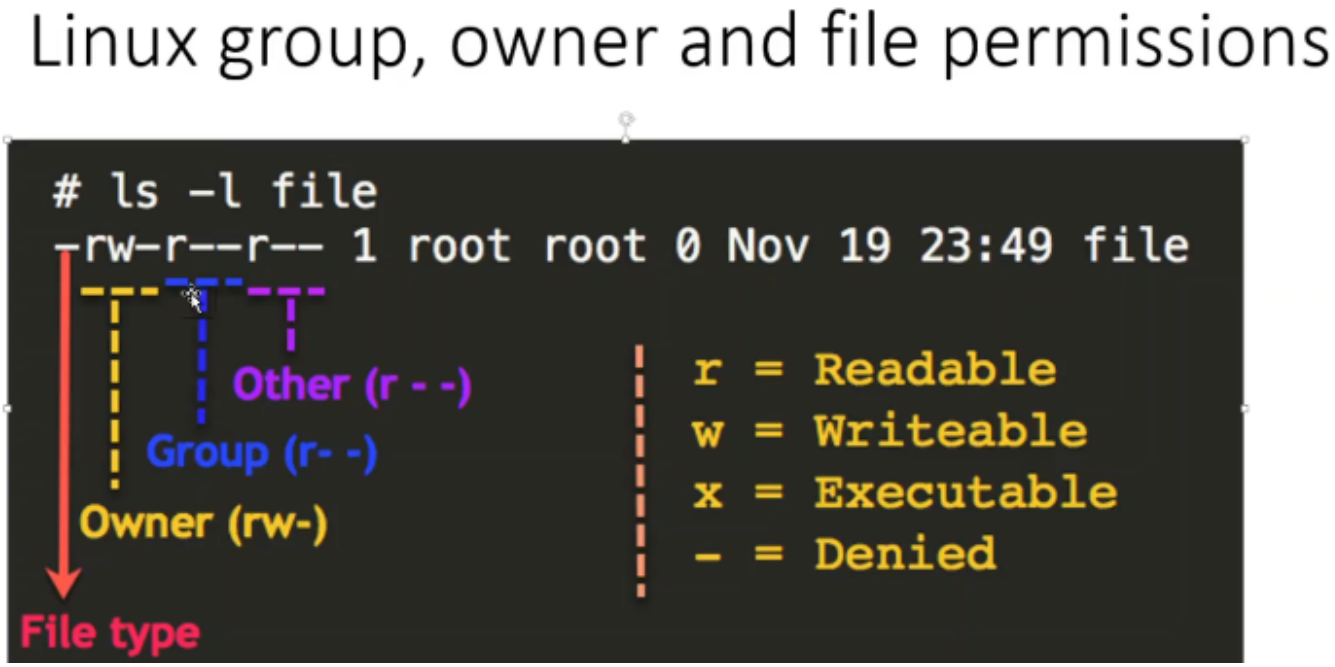
basic purpose of the group is to simply the management of the groups

- first group is primary group which have normal users
- 2nd group is admin group

```
2 Types of groups

user group
admin group
```





how to view logs files

```
How to view log files

cat/etc/var/auth.log
```

sudoers

"cat sudoers" is used to see all the groups and their access

group idz

"cat passwd" is used to see all the group idz

Chnging ownership

for change the owner of any file we have to use this command (chown newname foldername)

```
drwxr-x---  2    1001    1001  4096 Aug  8 05:57 abdullah
drwxr-x---  2 abullah abullah  4096 Aug  8 06:08 abullah
drwxr-x--- 14 bilal   bilal    4096 Aug  8 10:17 bilal
drwx------  2 root    root    16384 Apr 22  2022 lost+found
drwxr-x--- 16 bilal   osboxes  4096 Aug  7 16:26 osboxes
```

- we can chnage the owner by using this command

```
root@osboxes:/home# chown bilal osboxes
```

```
#Changing owners

chown abdullah file name

chown abdullah /home/abdullah/file name
```

- for change ownership from a standard user without changing the user

```
alnafi@ubuntu:~/Documents$ sudo chown -R alnafi Test\ Text\ File
```

changing group

for change the group

```
#changing group

chgrp alnafi file name
```

- changing group from standard user

```
#without changing the user to root user

sudo chgrp -R alnafi file name
```

how to search for a specific name within a file

is ma hm kisi b file ma sa special words ko dkh skta h ya kisi pargraph ma sa words ko search krna ka lia use rta ha

```
#how to search for a specific name within a file
inal
cat filename | grep keyword
```

Display less commands

`less filename` agr ham file ko thora thora kr ka dkhana chahta ha tu ya command use kr ka hm dkh skta han. end ka bad is file sa exit ka lia `cntrl+z` press krna para ga.

Editing text file

agr hm kisi file ma likhna chahta hain ya edit krna chahta ha tu `vi filename` command sa hm us file ko edit kr skta ha or is file sa bhr ana ka lia `Esc+ shift+: is ka bad q` likh ka file sa bhr ae skta ha agr hm us file ko save b sath krna chahta ha tu `shift+: is ka bad wq` sa kr skta ha.

what is IP adress

IP stand for internet protocol. kisi b device ko internet pa jana ka lia ip adress ki zarorat hoti h.its a network acces for our computer. `ip addr show` ip adress dkhna k lia ya command use ki jati h. IP adress ko ham setting sa ja ka b dkh skta ha.

- DHCP stand for domane host configration protocol

ifconfig

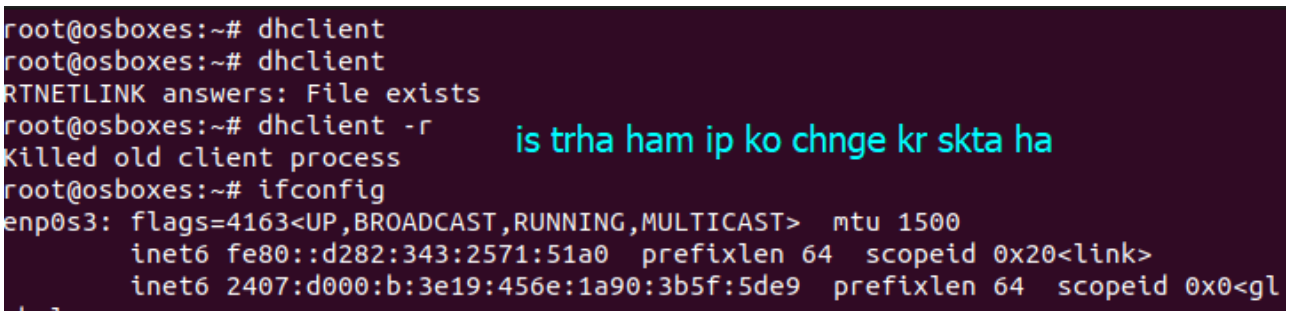
is command sa IP wgra show hota ha or ya ubunto ma default instal nhi hota hma ya install krna prta ha `sudo apt install net-tools` is command sa hm esa install kr skta ha.agr ham root sa install krta h tu sudo nhi likha ga.agr ham is ma sa koch chzian dkhna chahta ha tu hm `ifconfig | grep specificword` tu hma ya us words ki sari details show kr da ga.

finding default gateway

default gateway asi chz h jis sa hama pata chlta ha ka hm internet pa kaha ja rha ha.`ip route` sa hm gateway dkh skta ha

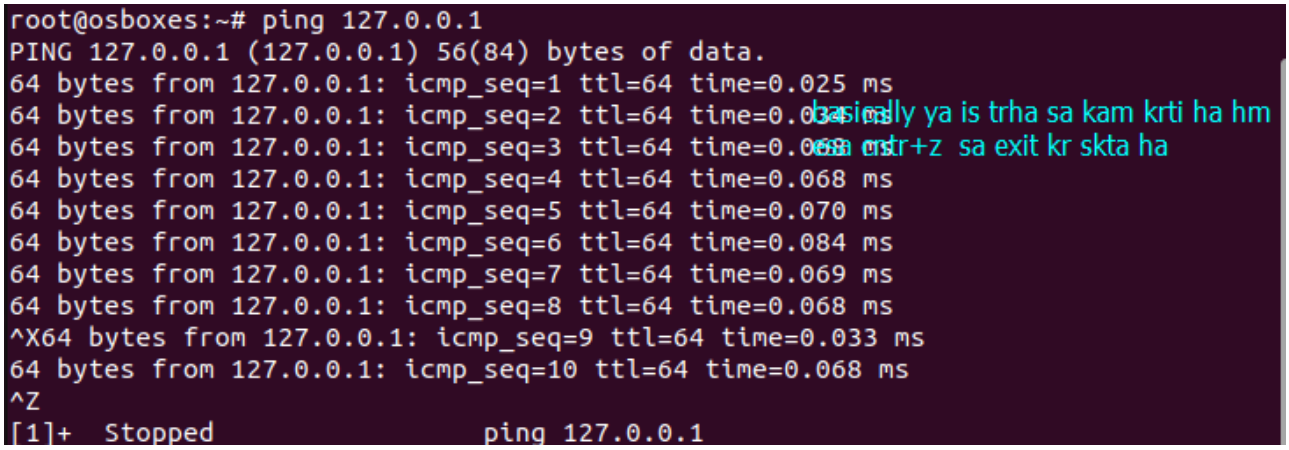
dhclient

`dhclient` ya command RTNETLINK file dkhna ka lia use hoti ha agr apka pass manually DSCP(Differentiated Services Code Point) server ha tu. DSCP classify or network traffic ko manage or quaity of service provide krna ka lia use hota ha. agr ham apni ip ko release ya chnge kerna chahta ha tu `dhclient -r` sa kr skta ha



what is ping

A ping (Packet Internet or Inter-Network Groper) is a basic Internet program that allows a user to test and verify if a particular destination IP address exists. ham es sa bhr ana ka lia `cntrl+z` ko use krta ha.



Disk space usage

`df` sa ham dkh skta ha k konsi drive ma kitni space ha or konsi konsi drive na kitni space cover ki ha or kitni baki ha. agr giga bite ya mega bite ma space dkhni ho tu hm `df -h` use krta ha

For checking the permission of any directry or target file

`du -sh /var` ya command use kr ka hm kisi b file ya directry ki permission dkh skta ha. or ya hma var ki size dkna ka lia use hota ha

unmounting removable media disk

is sa hm kisi b media sa data ko unmount kr skta ha isa use krna ka lia `unmount /media /USBdrive` is sa hm kisi b drive ko un mount kr skta ha.

```
osboxes@osboxes:/$ cd media
osboxes@osboxes:/media$ ls
osboxes@osboxes:/media$ ls -l
total 0
```

forcing usb to unmount agr hmra pass koi file open ho tu hm unmount kra to wo phla opetion da ga k phla files bnd kra is ka lia hm forcing unmount ki command use kr ka usa bnd kr skta ha `unmount -f /media /USBdrive`

Process in linux

linux ma process aik asa procedure ha jis ma ap spacific task kr skta ha

- `ps` ma hm running process dkh skta h jo process hora hta ha basically ya itna kam ki comand nhi ha but ya hma default ma 2 process dkhae ga (bash,ps)

```
osboxes@osboxes:/media$ ps
    PID TTY          TIME CMD
  54271 pts/2    00:00:00 bash
  54544 pts/2    00:00:00 ps
```

- But agr hm `ps -e` use krta h tu ya hma extent runing sari process dkhta ha jo k extandard version m hoti ha

```
osboxes@osboxes:/media$ ps -e
    PID TTY          TIME CMD
      1 ?        00:00:17 systemd
      2 ?        00:00:00 kthreadd
      3 ?        00:00:00 rcu_gp
      4 ?        00:00:00 rcu_par_gp
      6 ?        00:00:00 kworker/0:0H-events_highpri
      9 ?        00:00:00 mm_percpu_wq
     10 ?        00:00:00 rcu_tasks_rude_
     11 ?        00:00:00 rcu_tasks_trace
     12 ?        00:00:05 ksoftirqd/0
```

- agr ham is ko listing ki trha dkhna ha tu hm `ps -el` sa dkh skta ha
- agr ham listing ka sath uski dates b dkhna chahta ha tu hma `ps -elf` use krna para ga

Top

`top` command aik standard command ha. ya bht useful command h agr hm linux ki maintainess krta ha tu.is sa pata chat jae ga ka cpu memory kon zyda istamal kr ra ha. is ma cpu% ma btya jata ha time btya jata h or ham command kon kon sa use kr skta h. ya kis command sa kon kon sa kam hoa ha

- agr koi process background ma chal rha ha tu hm us ka PID nmbr dkh ka "kill" cmnd sa usa bnd kr skta ha

Different between linux and window

- linux ma apka pass zyda powerfull applications h. apka ps control zyda h "CLI" ka.
- jbka window ma is chz ko ht minimize kia gya ha
- linux ma code apka smna hota h jisa manipulate kr skta h chnge kr skta ha
- jb ka window ma asa bilkul b nh ha

- dono ma software pakage intalliation ka bht different ha window ma hm setup file sa install krta ha jbka linus ma instal krna ka tarika or hota ha

installization

agr ham linux ma koi chz install krna chahta ha tu us ka lia `dpkg -i installer.deb name` agr koi chz remove krna chahta h tu hm `dpkg -r installer.debname`

installing advance pakage tools

agr ham koi pakagr install krna chahta ha tu hm `apt-get install(pakage name )` isi trha ham agr kooi pakage remove krna chahta ha tu ham `apt-get remove(pakage name)` ya command use kr ka remove kr skt ha **installing RPM pakages** `rpm -i installer.rpm` agr ham rpm ki koi b file pkg install krni h tu is trha sa hm usa install kr ksta ha

- `rpm -e installer.rpm` ya command use kr ka hm us isntall file ko rmove kr skta ha

YUM (Yellow dog updater)

basically yum b kisi pakage ko install krna ka lia use hota ha hm esa use kr ka pakage intall kr skta ha `yum install(name of pakage)` agr hm same command use krta hoa kisi pkage ko uninstall krna chahta h tu `yum remove(name of pakae)`

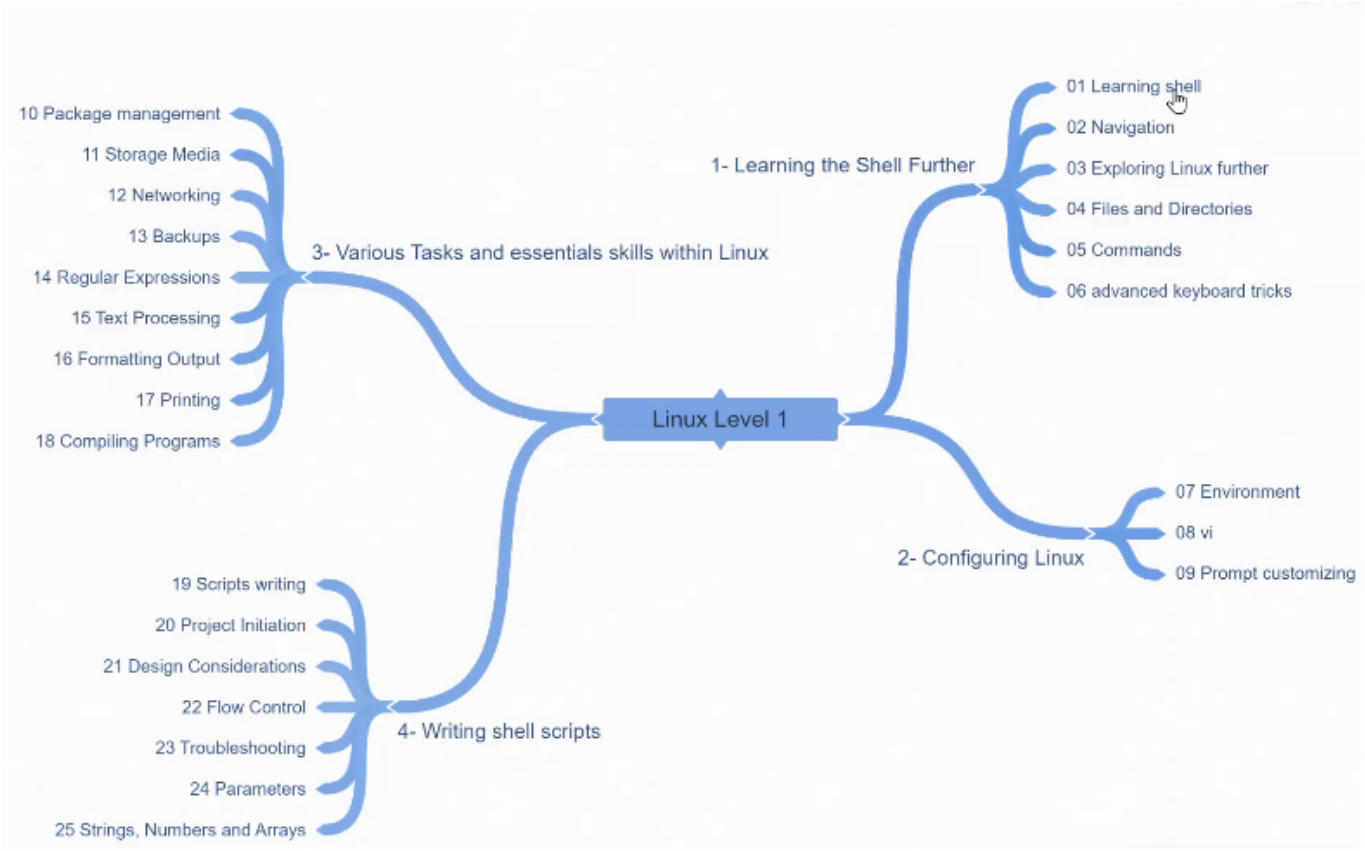
Apropos ext3

agr hama koi help chae tu hm is commad ka use kr skta ha. basically ya linux ka buliding manual ha jisa hm use kr skta ha

Man nslookup

man page basically aik manual page hota h jisa hm apna hisab sa managae kr skta ha maintain kr skta ha. programer isma command store kr skta ha is sa exit ka lia hm `q` ka use krta ha

Linux level 1



Pwd

`pwd` sa ham apni location dkh skta h ka hm kis jaga pa ha mtl kis directry ma ha.

word count

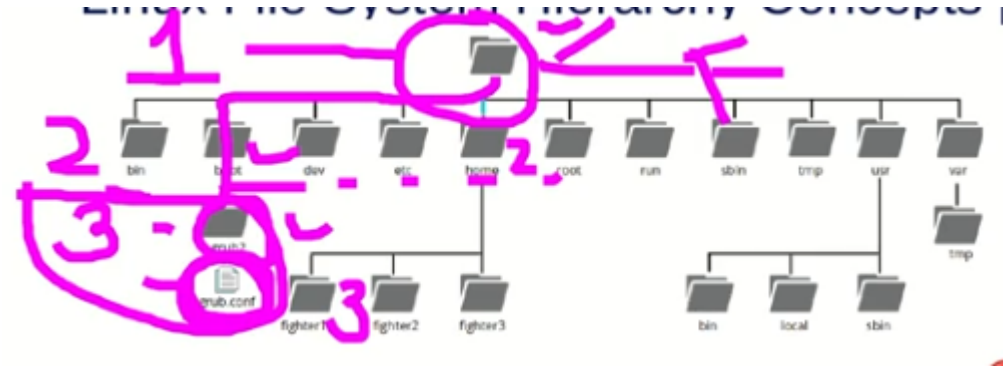
`wc` use kr ka ham word ko count kr skta ha

```
[root@osboxes bin]# wc mount
  128  1373 44264 mount
```

How to make multiple file

multiple files bnana a lia `touch filename{1....100}`likha ga tu 100 files bn jae gy. ya kam hm root pa rah ka kr skta ha. standard user pa ya kam nhi ho skta

Folders distribution



sb sa phli file father file hoti ha us ka bad dosri files ati ha jis directry khta ha us ka bad us sa nicha wali files ko sub-directry kahta ha. or ham path ka use kr k file to file ja skta ha.

id

`id` commad sa ha apna user dkh skta ha is ssa hama pata chlta ha ka hmna konsa user sa login kia ha.

- isi trha `whoami` sa b ham same dkh skta ha but is sa hma sirf ya btata ha ka hm na kha sa login kia ha.

snapshot

is sa ham backup m aik file creat kr skta ha. agr hmri machine crash ho jae tu hm yha sa usa whi sa run kr skta ha. ya file aik trha sa backup ka lia use hoti ha.

Lost+found

is folder ma hmri recover files ati ha jo hmri del ho jati ha jb usa recover kia jata ha tu is file ma ata ha.

lost+found	this directory contains data recoverd files

Copy paste and edit

`vi` ko use kr ka hm kisi b file ko edit kr skta ha or file ma sa del krn ka lia `dd` double ta krna prta ha d ko copy k lia hm `yy` istamal krta ha or paste ka lia hm `p` word ko use krta ha is sa hmri. file ma enter hona ka bad insert

mode `i` sa hm file ko edit kr skta ha mtlb usma koch likh skta ha.

1. "vi filename" open the file in RW format
2. press "i" for insert mode – where all text typed becomes file contents
3. pressing "Esc" key returns to command mode and the ":" begins extended command mode for tasks such as writing ":w" . ":wq" for saving & quit . ":wq!" override/forcefully
4. ":q" quit without save
5. "dd" to delete a single line. If you want to delete 3 lines then "3dd"
6. "yy" to copy a line & "p" for paste. To copy 4 lines "4yy"
7. "dw" delete word
8. "ye" copy word
9. "x" delete single letter
10. "u" for undo

vi command ko use krna ka tarika is trha hm vi ko use kr skta ha

- words ko replace krna k lia or password file protect k lia

11. ":%s/word/replaceword/g" search & replace
12. ":X" to protect file with password with vim editor

- we can protect key by using vim command after enter in the file we have to `Esc` button and then we have to press `cntrl+x` then hma pasword set krna ha.

Softlink and hard link

soft link ko hm kisi b file sa link krna ka lia use krta ha is sa hm aik directry sa dosri directry a b link bna skta ha is ka lia `ln -s` ki command use hoti ha jis sa hm. agr hm isi parent file ko delete kr da tu data child file sa rmv ho jae ga. soft lin k inode nmbr different hota ha losg listing ka dosran '-->' sa link shw krta ha. is ma arrow sa pata chal jata ha ka konsi file kis sa link ha !

```
[root@server1 opt]# ln -s <filename> <linkfilename>
```

- symlinks can cross partitions
-

Advanatges of Soft links

Easy to access

Soft links can cross partition & can also be created over dirs

Disadvantage:

If parent get deleted child becomes orphan – no use

Hard link

hard link ko bnana ka lia `ln` ka istamal krta ha . hard link ma hm `-s` ko istamal nhi krta or is ma hm kisi dosri directry sa file ko link b nhi kr skta. isa bs hm apni same directry ma link kr skta ha. agr hm iski parent file delete kra ga tu data child file sa b rmv nhi ho ga. hardlink ka inode nmbr same hota ha. ya one time of backup sa b jama jata ha. is ma sa agr paarents file sa data remove kr d tu child file sa data rmv nhi hoga. is ma link uski listing krna par starting nmbr sa dkhta ha.is ma hma pata nhi chkta konsi file kis sa link ha. `ls -`

`il` sa inode number ka sath list sa link file b dkha dta ha

```
root@server1 opt]# ln  <filename> <linkfilename>
```

```
[root@server1 usr]# find /usr/ -inum 441280
/usr/nginx
/usr/nginx2
/usr/nginx3
```

agr hm `find /usr/ -inum inodenumber` likha tu hma ya uski details btae ga ka konsa file kis sa link ha.mtln unka inode nmbr aik hi ha or wo sari aik dosra sa link h. or ya sb hm same directry ma rah ka kr skta ha

- hardlinks cannot cross partitions
  - **Advantages of Hard Links**
  - Type of backup
  - If parent is deleted, no impact on child
  - **Disadvantages**
  - Cannot cross partitions & cannot be created over dirs

  ls -l sa ham inki long listing dkh skta ha

  ### inod

  inod nmbr basically file ki properties ko apna pas save rkhta ha. inod dkhna ka lia `ls -i` ki key use kr ka dkh skta ha. hr file ka aik specific inod nmbr hota ha

```
441280 /usr/nginx
[root@server1 usr]# ls -i /usr/nginx2
441280 /usr/nginx2
[root@server1 usr]# ls -i /usr/nginx3
```

`ls -il` sa hm iski long listing check krta ha. jis sa hama links ka relate sari informationd khta ha.inod nmbe jasa hi hm file bnta ha usa assign ho jata ha oe inod aik unique nmbr hota ha. inod number ka jo father hota ha usa `inode table` khta ha. inode table ka jo father ha usa `super block` khta ha or jo inode table ka jo father ha usa `file system` khta ha. hr partation pa depend krta h ka uska inode ktna ha. agr ham dkhna chahta ha ka partiation kitna ha tu `df -i` sa dkh skta ha.

  Every file will have a unique inode number.

  Inode keep attributes of a file [properties]

  Command to see inode is "ls -i filename"

  Inode are unique inside that partitions & are assigned random

  "ls -il" for for long list & inode details of file

  Hardlink – link files inode number will be same

  Softlink – link files inode number will be different

Partations

basically partations hard drive ko devide krna ko khta ha partation creat kr k hm hard drive ko chota chota hisso ma divide kr skta ha or hr hisa ki aik specific storage or place rkh skta ha

how to creat hidden files

hm linux ma hidden file bna skta ha jisa ham `touch .filename` sa bnta ha. isa ham ls kr ka list nhi kr skta isa list krna ka lia ls ka sath a likh ka hm isa list kr ksta ha `ls -a` sa hama sari regular or hidden dono dkhae ga. agr hma hidden file ka inode dkhna ha tu hm `ls -ia` command use kraa ga is sa sari regular file ka sath is ka b inode nmbr dkhae ga. agr ham sirf hidden file ka inode dkhna chahta ha tu `ls -ia .filename` ya command use kr ka dkh skta ha

copying files in linux

`cp` command sa ham backup la skta ha kisi b file ka or wo hm different locations pa la skta ha. backup wo hota ha jisa ham kisi dosri location ma rakh skta ha .is ki command `cp <filename> <path to copy>`. is sa hm kisi b file ko copy kr skta ha ya backup kr skta ha. is sa ham kisi b directory ko copy nhi kr skta .cp command sa hm kisi b partation ma backup la skta ha

- agr hm kisi directory ko copy krna chahta ha tu hma cp ka sarh `-r` use krna ha.

```
[root@server1 var]# cp /var/oracle/ /mnt/
cp: omitting directory '/var/oracle/'
[root@server1 var]# cp -r /var/oracle/ /mnt/
[root@server1 var]#
```

mv

`mv` commad sa hm kisi b file ko cut ya paste kr skta ha isa copy krna ka lia full path dia jata ha.is sa file ko move kr skta ha.

```
[root@server1 var]#
[root@server1 var]# mv /var/dynamodb/ /mnt/
[root@server1 var]#
[root@server1 var]#
```

2nd mv

`mv` command sa ham cut paste ki ki bjae hm is sa name b chnge kr skta ha but is ka lia hama full path nhi dana prta is ka lia hm `mv filename chngfilename` kr ka hm isa change krta ha

```
[root@osboxes var]# mv abc.txt bilal
[root@osboxes var]# ls
account  cache  empty   kerberos  lock  nis     preserve  tmp
adm      crash  games   lib       log   opt     run       yp
bilal    db     gopher  local     mail  oracle  spool
```

chapter 5

overview and installation

phla ham osboxes sa centos ki image ko downlod kra ga then usko virtul box ma run kra ga.

cheack centos version

hm apna centos machine ka version b root sa check kr skta ha ka hm is ka konsa version use kr ra ha. `cat /etc/redhat-release` is command sa hm centos k version dkhta ha.kisi version ma redhat ksa name sa file

nhi hoti us ka lia ham `cat /etc/os-release` use krta ha.

```
[osboxes@osboxes etc]$ cat os-release
NAME="CentOS Linux"
VERSION="7 (Core)"
ID="centos"
ID_LIKE="rhel fedora"
VERSION_ID="7"
PRETTY_NAME="CentOS Linux 7 (Core)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:centos:centos:7"
HOME_URL="https://www.centos.org/"
BUG_REPORT_URL="https://bugs.centos.org/"
```

isma etc ma ae k dkha ha wsa absolute path sa bhi dkh skta ha

architecture

agr hm centos ka architecture dkhna chahta ha tu hma `arch` command use krni hogy. is ka ellwa b commands ha jis sa hm is ka architecture dkh skta ha. `uname -m` ya command b arhitecture ka lia use hoti ha

```
[osboxes@osboxes /]$ arch
x86_64
[osboxes@osboxes /]$ uname -m
x86_64
```

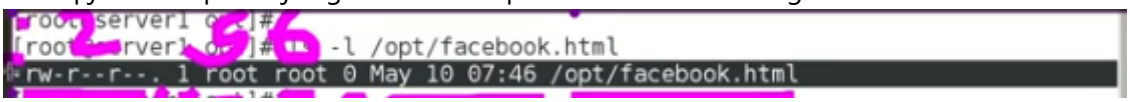
linux kernal

linux ma kernal ka version dkhna ka lia b command use hoti ha jis sa hm apna linux kernal ka versoin dkh skta ha. `uname -r` iski command ha.

```
[osboxes@osboxes /]$ uname -r
3.10.0-1160.el7.x86_64
```

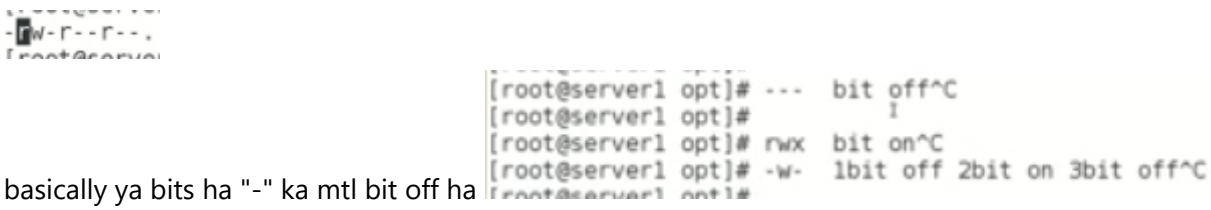
ownership and permission

sb sa pjla ham opt ma jae ga then ham opt ma aik file creat kra ga.



is picture ma 2,5,6 ya fields ha file ki or isma 2 peermissions ha file ki jo jo file ko permissions di gy ha. organization ma user ko right nhi hota ka wo sb koch access kra.principle of least privilege ka jo concept ha apko user ko uthna hi access da ga jitna uska kam ha

Bit



basically ya bits ha "-" ka mtl bit off ha jitna hiffens hoga uthna hi bits off hogy mtlb uthni permissions off hogy "---" ka mtlb is user ko koi permission nhi ha. "rwx" ka mtlb is user ko read write and execute ki permission ha isi trha dosri b ha agr kisi ko write ki permission ha tu -w- likha hoga is ka mtlb baki permissions off ha is ki. agr --- haffens ka ad kisi user ka name ata ha jasa ka "--- umar" iska mtlb is user ko koi permission nhi ha

```
[root@server1 opt]# #000  umar
You have new mail in /var/spool/mail/root
[root@server1 opt]#
[root@server1 opt]#
[root@server1 opt]# #111- ali FULL permission
```

binary form ma "000" ka mtlb nill permission hot ha jbka "111" ka mtlb full permission hota ha.

POLP(principle of least privilege)

The principle of least privilege (PoLP) is an information security concept which maintains that a user or entity should only have access to the specific data, resources and applications needed to complete a required task.