linux features->

open source

secure-> need cmd to run

-> fragment size is 512bytes so need to run cmd if file with more kb come then need to run cmd

no hardware specific req (portable)

fast -> disk partion size is fix to 8 and then fancing comes and if crosses it then it becomes slow and linux new v size is 4 gb

plug and play

windows server reboot ones every 3 yr but linux din't reboot untill hardware life

no need of antivirus

type of file systems

ext2

ext3

ext4 \*

jfs

ReiserFS

XFS

Btrfs

gpl -> genral poublic licence.

gpl -> avalable for free for everyone

MBR(512byte)-> Master Boot Record. (divided in 3 parts)

446byte | 64byte | 2byte

->lilo loader (partition) (flag)

(not used) (is all running good or not )

->grab loader

(now uses)

vmlinuz

(kernel

image file)

(virtual

machine linuz)

->Initrd

(initialze

ram disk launches

initial or imp files)

\*\*it is in compress gunzip unzip it after loading.

by default ubuntu at top make it at last or at other position.

directories in linux->

2.) /sbin->System binary

bniary commands run by user admin both but sys bin ony admin.

-> Fdformate(flppy disk formate) ,mkFs (make file system) ,mkFs-ext-2 ,mkFs-ext-3,mkfs-ext-4,Fdisk(formate disk (for partion),

reboot;

3. /boot -> Alll configuration file to boot system

-> MBR

-> all booting info

4. /root-> admin(linux) administrator ( windows )

5. /home -> every user has different different home directories

* **/boot-** It contains all the boot-related information files and folders such as conf, grub, etc.
* **/dev –** It is the location of the device files such as dev/sda1, dev/sda2, etc.
* **/lib –** It contains kernel modules and a shared library.
* **/lost+found –** It is used to find recovered bits of corrupted files.
* **/media –** It contains subdirectories where removal media devices inserted.
* **/mnt –** It contains temporary mount directories for mounting the file system.
* **/proc**– It is a virtual and pseudo-file system to contains info about the running processes with a specific process ID or PID.
* **/run –** It stores volatile runtime data.
* **/sbin –** binary executable programs for an administrator.
* **/srv –** It contains server-specific and server-related files.
* **/sys –** It is a virtual filesystem for modern Linux distributions to store and allows modification of the devices connected to the system.

If we create 2 users then it shows 3 one is root , root can access all the users home directories

[

windows confg file

-> io.sys - check io devices are connected correctly or not if not then display it

-> msDos.sys - issential hardware operations launch by it

-> command.com - it is ven file (if it not run then nothing can load in main memory)

]

What is unix architecture ->

h\w

* Kernel

->Shel

->App no.

->user

kernel -> is low level programming it is heart of os , interface between shell and hardware , always perform low level tasks(01010101) device management , memory management etc are work of kernel.

Various types of kernels present name them -:

shell -> high level programming collection of unix commands .

command prompt -> shell

collection of commands

different types of shells available

applications-> packages (soft. or applications)

if root user gives permissions to normal user then normal user can also get some root user features normal user can also get but root is root it have always priority.

N can equivalent but not up

Structure of unix is hirarchy or tree structure

Directories

* /(slash -> root or main directory)
* Predefined directories (some pred d are also called as system directories)
* Case sensitive os( predefined directories are always in small characters)
* Bin-> it contains all executable files available to the user(exe) contains internal cmd of linux
* dev-> contains all device drivers
* boot-> start and restart info of system
* home -> predefined directory contains all user list / sub user list
* etc-> (imp) contains system configuration files related to admin also contains super user related info.

**Unix files system org -> it contains block (it is of 4 parts)**

1. boot block -> all bootable info
2. super block -> all file type info , indicated by # and normal user by $

super user is system user and system admin

1. inode block-> index of files, types of files ,mode of files, data block , real data stores in the block
2. data block->

*alt ctr t open terminal*

**Unix file colors->**

Used for identify for each and every file with the help of related color

Dark blue -> folder or directory

Green-> executable file

Sky blue-> linked file

Yellow with black background -> device file

Pink-> graphic image file

Red-> archive or zip file

For black and white monitor

* ordinary or regular file

d directory

c character special file

b block special file

l symbolic links

s socket file(collection b\w client to server)

\*executable fiel

@ linked file

**Command** -> executable program or pre compiled program

Every cmd is in the form of .exe

Every cmd is in lower case(case sensitive)

Every command starts with alphabet character

Cmds are reserved word or keywords

logname and whomi are same

man-> help file tells about the cmd like man who tell about who

who –count -> no. of user count

cal -> calander

how to create normal file -> cat

cat -> create a file - cat > file1.txt (> standard o\p re-directional operator ) to save file ctrl+d

cat <file1.txt( for input) - < optional

to see the content of file

displaying the file content

* the file content

cat >> f2

* concatenation of 2 files

cat f3 >> f4 -> also create new file with concatenating the previous file to it.

cd ~ default location when user login

touch is used to create empty file

to check whether file is empty or not

lsblk-> cmd

pendrive make file in mnt or media

change file meta data ->

meta character (wild card character)->

?-> matches single character at a time

\*-> all character in lsit (one or more character at time)

[]-> matches any one character in list

- -> upto a given range

Cat ? content of single character file

Ls \*a all file end with a

Rm -r -> remove all file and dir.

Ls[ab cd]-> gives all files and directories with a,b,c,d

Ls[a,b,c,d]->same

Rm[a,b,c,d]-> remove all cmds with a,b,c,d

Removes works with starting always

Rm -r -> file with directories.

Ls -a -> attributes

Ls -la hidden files and attributes.

Range->

ls [A-D]-> all the file names starting with A to D

case sensitive may be

user attriburte

usermod -u 10007 -g 10002 -d /home/ramesh -s /bin/cvsh ramesh

ser

groupadd bankingSystem

addu

ed editor

#ed file file1

Ex editor

# ex abc

vi editor -> visual editor

vim-> visual improve editor

screen editor

character editor

ls -l

-rw-r--r-- 1 kali kali 0 Jul 15 01:36 A

| | |

User group others

Remove permission form file

* chmod -w filename (write permission remove)
* chmod -r filename (read permission remove)

to give access->

* chmod +w filename
* chmod +wr filename
* chmod u+x,g+x,o+x,x+r filename -> for giving permission to the user other and group

chmod 777 or more numbers

chmod 653

r w x

4 2 1

---- --- ---

-rwx rwx rwx

User group others

Changing owner of file

Chown username filename

Group change cmd->

chgrp ramesh A -> change group

Q->mkdir ggits

copy 5 file ->data in kb

tar archiv decomress

tar xvf filename.tar

gunzip filename\_tar.gz

sdb ->

how ot create linked file->

making clone of same file with same data

type -> soft -> delete one file then linked file or file 2 will never open(it remains in the system but does not work)

and hard->file one delete but file 2 or linked file will work.

* Cmd
* ln B bclone-> for hard
* ln -s B bclone-> for soft

**Communication in linux environment->**

3 modes

**System initialization level**

Total 7 levels available

* run level 0 -> for halting purpose -> init 0(temp)
* run level 1 -> for single user only -> init 1(temp)
* run level 2 -> multiuser mode , without networking (GUI will not shown)does not read ip addresses init 2(temp)
* run level 3 -> multiuser mode , with networking(GUI will not shown) read ip addresses init 3(temp)
* run level 4 -> reserved for future use (on running by default runs level 3 it is for future ) init 4(temp) not in use cmd run but
* run level 5 -> GUI mode init 5(temp)
* run level 6 -> reboot init 6(temp)

methods to select run level -> temporary and permanent

systemctl get-default

runlevel-> to get run level

**permanent->**

**Note ->*कृपया अपने सिस्टम में रान न करे*🙏🏻🙏🏻**

**यश सेन द्वारा स्वमहित में जरी**

run level 0-> systemctl set-default poweroff.target

run level 1-> systemctl set-default resume.target

run level 2 , 3 and 4 -> systemctl set-default multiuser.target

for networking use init 2 and 3

run leve 5 -> systemctl set-default graph.target

run level 6-> systemctl set-default reboot.target

df-> disk free

df -h ->in human readable format

du -> disk use

file system vfat -> used for booting process

login user od-> id

w-> all login info with date.

whereis

* under procs
* sd -> scesy disk
* sdb3 -> rom (booting )firmware
* sdb5 -> hard disk

do not called rom it is firmware or inbuilt device

**Echo command->**

Print and append also

Echo “hello”>>filename

**which cmd->**

it shows the direct binary path of a particular cmd or shows binary file

binary files does not contain source code

all cmds are in .exe format

a=5

b=4

echo $[a-b]

bc -> basic calculator

dc->

file creation with unique

unique colo1

does not takes repeated values or words

script -> gives complete info about the cmds and operation from start to end of script

what is the purpose of umask->

**Networking ->**

NIC-> 48bits

IP address -> provided by isp (internet service provider) for accessing the net in system

Path:

When you define a path starting with a slash ('/') sign, then root of the file is assumed. If you don't put a '/' then the current directory is assumed to be the starting point.

Root always have a userid of 0

When a user run **passwd** command, it executes with the root credentials

Advance File Permissions:

* Sticky bit on directory
  + File is protected in directory form getting remove by other users who don’t own it
  + It is displayed at the same location as x permissions to for others .
  + It is represented by a **t** (x is also there) or a**T** (no x is there)
* Generally, sticky bit is found on **/tmp** directory.

setgid Bit on Directory

To make sure all the files in the directories are owned by the group owner of directory, setgid can be used.

setgid and setuid on Regular Files

# **Linux File Links**

* A link is a connectivity between the filename and the actual data byte in the disk space.
* More than one filename can **link** to the same data.
  + There are 2 types of file links :
  + Hard and soft links.

Hard Links-> They are the low-level links.

It links more than one filename with the same Inode

represents the physical location of a file.

## Soft Links (Symbolic Links)

-> It represents a virtual or abstract location of the file. It is just like the shortcuts created in Windows

 A soft link doesn't contain any information or content of the linked file

Can cross file system boundaries

Finger command-> more informative than who cmd

* Have to install finger cmd it is not there by default.