

LEC1

why Linux?

devOps

- ⇒ deployment
- ⇒ light weight
- ⇒ security
- ⇒ easier
- ⇒ dealing with big data
- ⇒ open source (free)



→ open Source

- paid
- Can access Source Code

→ Free /open Source

- Free
- Can access Source Code
- can modify and distribute these modifications

Most free /open Source software is covered under a public License . The most common public license is the (GNU) General Public License (GPL)

Example :. Firefox ⇒ has GNU Public License GPL so it's approved
what is the advantages of being an open Source ?

- marketing
- free testing
- bug fixing
- Can create Enterprise features
- maintenance is paid (for companies ex: bank)
-

- Unix time Stamp 1-1-1970.
- kernel → Core of the operating system .
- In 1991 Linus Torvalds created Linux kernel .
- There are many flavors so that each associated with different Hardware .

Unix flavors :-

- IBM → AIX
- Sun → Solaris
- Hewlett-Packard → HP/UX
- Silicon Graphics → IRIX

⇒ All operate in a same manner

→ Unix first version created in Bell Labs in 1969

- In 1991 Linus Torvalds created Linux kernel

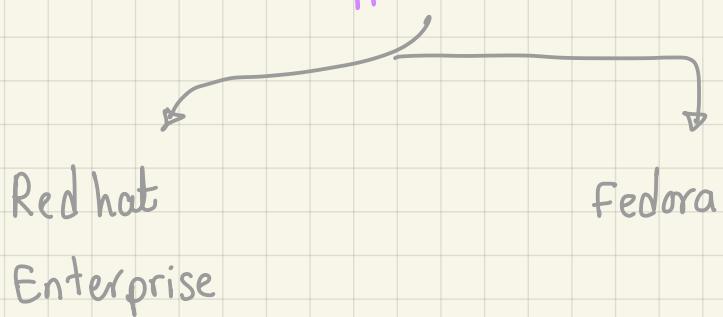
→ In 1992 Linux and GNU developers worked to integrate GNU components with Linux to make a fully functional and free operating system

• sudo apt install cal

• sudo apt install tree

• Redhat was found on 26/3/1993

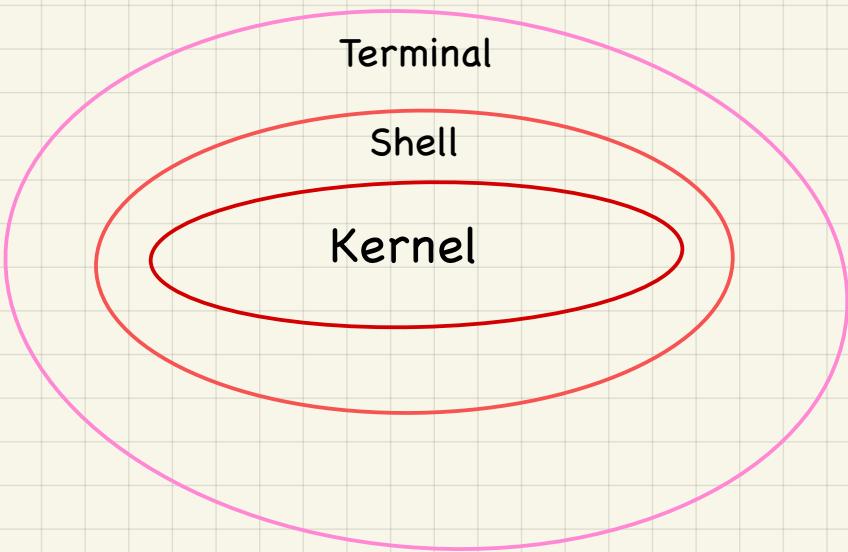
• Redhat Linux first appearance was in 1994



* centos same as Redhat but removed any features or logos

Types of installation :-

- ① Automated installation
- ② Graphical installation
] → needs flash memory
- ③ Remote installation → connected to network



Zsh → Linux & windows

kernel → Core of operating system
 → contains drivers for hardware
 → it loads into RAM when the machine boots and stays resident in RAM until the machine powers off

shell → translating the instructions and command from terminal to kernel
 → bash is the most commonly used shell on Linux
 → provides an interface by which the user can communicate with the kernel

from terminal →
to kernel

Terminal → between user and the shell

* there are a lot of shells:-

- ① Bourne shell (sh)
- ② Korn shell (ksh)
- ③ C shell (csh)
- ④ Bourne Again shell (bash)

Commands

Command is done in which Argument

Syntax \Rightarrow Command

[options]

[Arguments]

Customize Command behavior

* / → is the root → first thing

* any command or any software is a file located in /bin

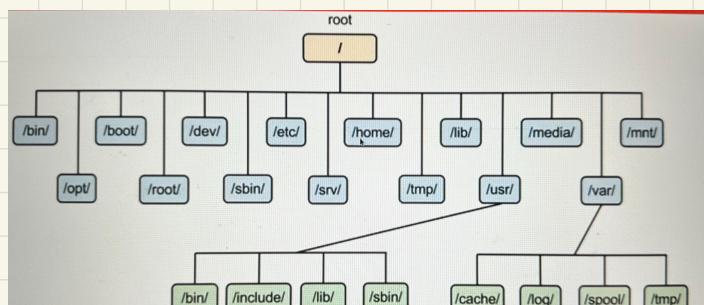
* if these command or software used by administrator you will find it in /sbin/ or /usr/sbin/

↳ s stands for super user

* /etc/ → has configurations (user files) ex.: username & passwd

* /home/ → each user has home directory has his data

* /mnt/ → the data of external disk or USB connected



Directories

bin	Common programs
boot	Kernel and other boot files
dev	Device files
etc	Configuration files
home	User's home directory
lib	Shared libraries
lost+found	Damaged files
misc	Miscellaneous files
mnt	Mounted file systems
proc	Directories and files that report system status
root	The root user's home directory
sbin	System administration programs
tmp	Temporary files
usr	
var	Logs, spool files, and other dynamic

• Pathnames

- ▶ Absolute pathname
- ▶ Relative pathname

⇒ # → is used for comments in the terminal

cd /home/noha ⇒ will not be done

⇒ if cd .. in / it will do nothing

⇒ cd - → will return you back to where you were (Go back) to where I was

⇒ only cd or cd ~ ⇒ will led you to home/israa/ ⇒ direct

→ ls home / israa / Pictures / Screenshots /
ls Pictures / Screenshots
ls ~/ Pictures / Screenshots

} the same

→ ls -a → show all including hidden files & folders

→ Inside home

- .. → Refer to current directory location
- .. → refer to (have) parent directory location

ls -l → prints files with whole information about files & folder

ls -F → shows folders as myfolder/ not myfolder

ls -ld Desktop/ ⇒ drwxr- ... etc (all information but just for specific folder not all)

ls -R ⇒ Recursion

↳ show file:
folders and files

and displays the content of each folder within it

↳ is equal to tree /pictures (has better visualization)

cat → read file content

more → as cat but the size of screen only

↳ space page by page
↳ ↑↓ line by line

tree (vs) cat
↳ displays content

- head /etc/passwd → print first 10 lines in file
- tail /etc/passwd → print last 10 lines in file
- head -n1 /etc/passwd → reads first line in file
- tail -n5 /etc/passwd → reads last 5 lines in file

Mega Character :-

- ls -l *t All files & directories ends with t
- ls -l t* All files & directories starts with t
- ls -l ??t 3 characters the 3rd is t
- * Zero or more characters
- ? single character

- ls [ab]* starts with a or b
- ls ab* starts with ab
- ls [a-f]* starts with any char from a to f

Copy & paste :-

- cp israa mycv ⇒ will over write the data
- cat mycv ⇒ will print the content in israa also
- cp -i israa mycv ⇒ will ask if you want to over write or not
cat mycv
- to copy file in folder → first create the folder or will create it as file
- ex cp israa cvs

`cp -r cvs ai_cv` \Rightarrow if ai_cv available
 ↴ will copy cvs and its content
 ↴ if not
 ↴ will just copy the content

Rename :-

`mv israa mycv` \Rightarrow just rename

-i

preventing
from over write

Remove :-

`rm file_name` \Rightarrow delete file

`rm dir folder_name` \Rightarrow if folder is empty

`rm -r folder_name` \Rightarrow if folder is not empty

Linux | Unix | man |



important

Chapters
in manual

1 - 5 - 8 \rightarrow administration

Commands

file Configuration

man ls → show info about ls

man -k passwd → show commands

whatis cp → cp(1) → copy files

one line description

chapter

brief info

cp --help → detailed info from manual

man man → info about manual

sleep 5000 → sleep for

man 5 passwd ⇒ reads data from

man passwd ⇒ reads from chapter 5

To move to
home directory:-

① cd /home/user1

② cd ..

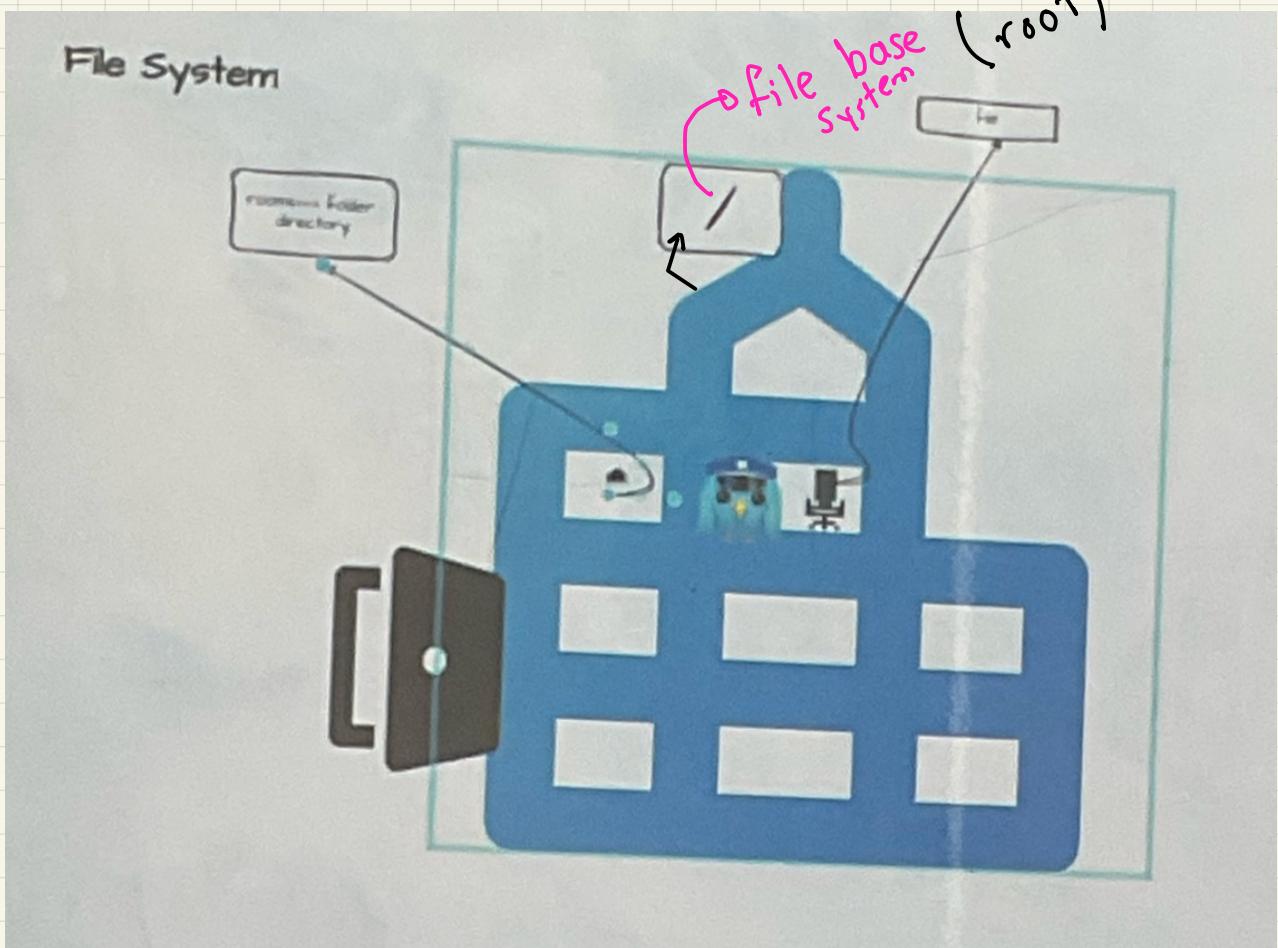
③ cd ~

④ cd -

Interrupt

ctrl + C

ctrl + Z



→ sbin → supervisor bin

→ etc → users Configuration (passwords of users)

→ in home we can find files by the name of users

→ boot has the kernel and other boot files → failure
in boot causes failure in the whole system

- Linux don't need extensions

- "mkdirectory^{abc}" then touch^{abc} \Rightarrow no thing will happen

- touch abc then mkdir abc \rightarrow error

- no extensions in linux

- the importance (need) of extensions is giving extra features

manual page consists of:-

- Name

- syntax of the command

- description

- files

- known bugs and errors

- other commands related to this one

- Author

- options

- * man -k passwd \rightarrow where did passwd located in manual

- * whatis cp \rightarrow give you information about cp command

- * cp --help \rightarrow give you more detailed information

ctrl + C

\hookrightarrow end the current operation with no return to continue

ctrl + Z

\hookrightarrow end the current operation but with the ability to go back

Commands Used

uname → Linux

uname -n → user

uname -a → Linux user

date → date of the day

cal

cal 2024

touch myfile

date ; cal ; uname

whoami

pwd → print current working directory

cd → change directory

tree

ls -R

ls -a

ls -F

cp -i file1 file2 → -i prevent from over writing (ask you)

whatis cp

cp --help

man -k passwd

man man

sleep 5000

System info

TASK

* ls -ld dir1

drwxr-xr-x 2 fatma 51237 May 29 16:06 dir1

Can be

d :- directory

- :- file

c :- device file reads or write character by character ex:- keyboard

b :- block device file such as USB_drive or hard disk

S :- Socket \Rightarrow used for communication between different programs
on the same computer or over a network

P :- special file that acts as a pipeline allowing processes to
communicate with each other

I :- Represents an inode without any associated data blocks used
in a special file systems (unCommon)

D :- Door \Rightarrow found in some Unix like systems such as Solaris

\Downarrow A special inter-process communication file \Downarrow

Not common in Linux