After setting AWS Linux image on Aws cloud. we are ready to learn.

Linux :- Linux is in simple word collection of number of OS. The general term Linux describe thousands of variations of Linux OS under one umbrella.

what makes Linux great -

- Linux is open source
- Gives easy access to a powerful and scriptable CLI.
- Linux is modular and operating systems components can easily be replaced or removed.

Open source softwares :- open source softwares are those softwares which are publically available to use and any one can alter or change their codebase as per his choice.
or source code

These open source softwares can be

freely used, studies, modied or shared by anyone, but the source code may be under the control of copy-right holder.

You can use the open source software commercially. Some licenses allow code to be reused in closed source software also.

Some main features of open source software:-

- Control - You can see the source code and change it make it better.
- Training - learn from real-world code and develop more effective applications.
- Security - Inspect sensitive code, fix with or without the original developer's help.
- Stability - Due to so many contributers it is high stable.

Headless servess:- Those systems which don't have keyboard or monitor to graphically input credentials to login are called Headless serves.

We need to connect these serves via other systems. We do so by terminal i.e.

We user command

username host add.

ssh remoteuser@remotehost

then password if needed.

In aws instance logging/connecting we use keypair instead of password.

ssh -i "key pair" remoteuser@remotehost

To exit or remove connection use command

exit or ctrl + D

bash (GNU Bourne-Again shell) is a program that interprets commands type in by the user.

Each string type into the shell has 3 parts:-

- Command → name of programs that are installed on the system. Each command has its own options and argument.
- Options → generally begin with - or --
- arguments → changes behaviour and working of commands.

If you want to write two commands on single line use semicolon (;) as a command separator. It is meta character and has special meaning in bash.

Output of both commands displayed before next shell prompt appears.

- whoami → Gives user name.
- date → Gives date & time.

  date +%.R → Give time
  (R: argument)

  date +%.x → Give date

- Passwd → It changes user's own password but before that you have to give current pass.

Linux doesn't require file name extension to classify files by type. The 'file' command scans a file and displays what type it is.

file /etc/passwd
(/etc/passwd: path of file.)

Viewing contents of file :-

There are many ways to view contents of the files, some to these commands are-

- cat → This command shows content of a file or multiple file by concatenating them together, or, it can also create one or multiple file.

~~cat /etc/passwd~~ cat /etc/passwd
shows content of this file.

cat file1 file2
concatenate content of both files and shows output

Cat command shows output in a single page, if a file is big it can't be easy. So, we use another command 'less'.

- less → this shows content of a file, one page at a time, which cat don't do, so, you can scroll through it or use arrow keys (↑, ↓) to traverse.

- head → it shows first 10 lines of content of a file.

- tail → it shows last 10 lines of content of a file.

we use use options with head & tail

- head -n 3 /etc/passwd

Shows first 3 files of content.

- tail -n 3 /etc/passwd

shows last 3 files of content

- wc → It's it counts lines, words and characters in a file content

~~we /etc/passwd~~ wc /etc/passwd will show output like

45 366 2457
↓ ↓ ↓
lines word characters

you also use options like

-l for line
-w for word
-c for character

wc -l /etc/passwd

only counts lines in this file.

Tab completion concept by Tab key :-

by using Tab key you allow OS to auto. complete the words or command you are typing.

To complete a file name or command you should type enough to make it unique, then only type Tab, if type something like file name half and press tab twice it will list all files name or commands that begin with the characters already typed.

Then type additional characters until the name in unique, then use tab to complete it.

Continuing a long command to another line :-

If a command become long enough to not fit in one line, to ensure reada-

-bility of cmd/command we can use backslash character (\) at the end. It tells shell that this command is continued to next line, and execute it after that.

\ is also called escape character.

ex.- Show content of two files

```
head -n 3 \
/etc/passwd \
/etc/group
```

- History command :- Shows all previous used command on machine.

```
history ↵
```

In case you went to rerun any of these command, we can do so by ! (bang) as,

```
! (no of that command)
```

ex-

```
! 10 ↵
```

If you want to run ~~recent command of~~ specific type of any command you can use

!(command)

ex-

!file ↵

It is will run recent file command file

file /etc/passwd ↵

There are some short-cuts to work faster & efficiencly in CLI or Linux.

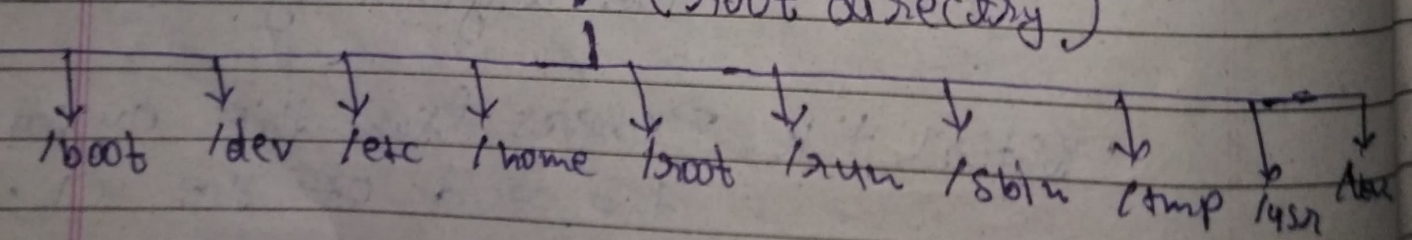
- Ctrl + A → Jump to the beginning of the command line.
- Ctrl+E → Jump to the end of CL.
- Ctrl+U → Clear from the cursor to the beginning of the CL.
- Ctrl+K → clear from the cursor to the end of the CL.
- Ctrl + leftarrow → Jump to the beginning of the previous word on CL.

- Ctrl + Rightarrow → Jump to the end of the next word on the CL.
- Ctrl + R → search the history list of commands for a pattern.

All of these given command Ctrl + R is most useful, it will start a new type of cursor and if you are typing some command it will auto-complete it with most recent matched command.

→ Creating, deleting, moving & managing files on CL :-

In Unix there is hierarchy of directory / files.



Here, point to be noted that / (root directory) and /root directory are diff.

/ (root directory) is the biggining of this whole directory system, whereas /root is a sub directory of / (root directory), which is used by super user as home directory.

now, let's see some purpose of these directories.

/usr → it includes installed software, shared libraries and the files that typically used for read only program data.

/usr/bin :- include user command
/usr/sbin :- System administration commands
/usr/local :- local customized software.

/etc → System configuration files.

/var → variable data files that dynamically change, such as database, cache directories, log files or website content

/run → containg runtime data files since the last boot. It includes ID files

and lock files. The contents of this directory are recreated on reboot.

/home ⇒ Home directory where regular user store their personal data and configuration files.

/root ⇒ home directory for the superuser administrative account root.

/tmp ⇒ It is world-writable space for temporary files. You should not store sensible data here, as any file which not accessed or modified for 10 days in here, automatically deleted.
another temp. directory exist i.e. /var/tmp, if a file not accessed or modified for 30 days in here, will deleted.

/boot ⇒ Files needed in order to start boot process.

/dev ⇒ special device files that used by System to access hardware.

- cd absolute path
  - start with /
  - To traverse to any file/direct
- cd relative path
  - doesn't start with /

- cd ..
  - go back to parent directory of current working directory
- cd ../..
  - go back to two previous directory
- cd ~
  - go to /home/user directory

- touch
  - It will create a file with name which already not existed or update the time stap of access to a file that already exist.

'ls' command can also used with different options and arguments.

- ls
  list all files in cussent directory
- ls .
  also list all files in cussent directory.
- ls location
  list all files in that given location.
- ls -l
  list all files with some extra information.
- ls -a
  list all files including hidden files.
- ls -al
  list hidden files with extra information.
- ls -R
  list files in given directry also list if any files in these files.

- cd -
  go back to last working directory.

Managing files using command-line tools :-

- mkdir «directory»
  Create a directory
- cp «file» «new-file»
  copy a file to new file
- cp -r «directory» «new-directory»
  copy a directory with its contents
- mv «file» «new-file»
  move or rename a file or directory
- rm «file»
  remove a file
- rm -r «directory»
  remove a directory with content.

• rmdir <<directory>>

remove empty directory.

NOTE:- . : dot denote current directory/location whereas .. : dash denote last directory.

file extension	file type
.txt	text file
.mp3	audio file
.jpg	pictures
.avi	videos.

→ Matching file name by path name extension:-

→ Pattern maching:-

In this what we do is, ~~that~~, we search for file with same pattern name.

We use different pattern with 'ls' command to search for files