• Create AWS Free Tire Account and Create Linux Machine using AWS EC2 service

Introduction to Linux :

• Bell laborartory in 1964 started a project to create O.S which supports multi tasking and Multi User
• They shutdow the above project in 1969
• Dennis Ritchie and Ken Thompson started working on the said Project with the name UNICS(Uniplexed Information and Computing Services) which is free and made source code available to all
• In 1975 new version released UNIX V6
• With UNIX code many vendors created their flavour of UNIX,like IBM-AIX,Sun-Solaris,Apple-MAC OS,HP-UX etc and started selling them
• Andrew Tanenbaum created an O.S named MINIX to teach students which insipres Linus Torvalds to create his Linux Kernel
• Linus Torvalds in 1991 created an Kernel named Linux
• Many GNU Softwares were added to LInux Kernel to create entire O.S....
• Linux is Just a Kernel and not an entire Operating System....SO Flavours of Linux like Redhat,Debian,Arch are actually GNU/Linux not just Linux
• Popular Flavours of Linux are Redhat,Debian,Fedora,Arch,Manjaro,Suse Linux,Kali Linux,CentOs,Ubuntu,Deepin etc..
• O.S had two Types of Interfaces.One is Command Line Interface(CLI) and another one is Graphical User Interface(GUI)

Linux Keypoints :

• Linux is Kernel not entire O.S
• Linux is not a UNIX derivative.It was wriiten from scratch
• A Linux distribution is the Linux kernel and a collection of softwares that together,creates an entire O.S

Linux Features :

• Open Source
• Secure
• Simplified updates for an installed software
• Light Weight
• Multiuser-MultiTask
• Multiple distribution-Redhat.Debian,Fedora,Arch,Deepin etc

Linux VS Windows :

Linux System Architecture : User-→ Shell-→ Kernel -→ Hardwrae

Windows System Architecture : User -→ Shell -→ O.S -→ Hardware

Some Terminology Difference Between Windows & Linux :

•Folder in Windows & Directory in Linux
• Administrator in Windows & Root user in Linux
• Software in Windows & Package in Linux

File System Hierarchy :

Windows -→ c:\ -→ Programfiles Users ProgramFiles(x86) Preflogs

Linux :

/ : Top level root Directory
/home : home directory of other users
/root : Home directory of root user
/boot : It contains bootable files for linux.Eg : initrd
/etc : It contains all configuration files
/usr : By default software are installed in this directly
/bin : Contains commands used by all users
/sbin : Contains commands used by only root user
/opt : Optional application software packages
/dev : Essential device files.This includes terminal devices or any device attached to the system

Linux Commands and thier Use Cases :

1.Creating a File : cat,touch,vi/vim,nano

A.Cat Command : The cat command is one of the most universal tools,yet all it does is copy standard input to standard output

cat can :
• create files : creates single file
• concatinate files : to add more than one file into a single file
• copy files : to copy the content of x into y
• tac : to see the content from bottom to top

Using cat :

□ cat >file1 -→ hit enter --→ add content --→ hit ctrl+d
ls to view file1
cat file1 to view content

□ cat >file2 -→ hit enter -→ add content -→ hit ctrl+d
ls to view file1 & file2
cat file2 to view file2 content

□ cat >>file2 --→ hit enter -→ add new content(append) -→ hit ctrl+d
cat file2

□ cat file1 file2 >all -→ hit enter

ls to view file1 file2 all
cat all

□ cat file1 >file2 -→ hit enter
cat file2 to view updated content

□ tac file1 -→ hit enter
this prints content from bottom to top

B.Touch Command :

• Create and empty file
• create multiple files
• change all timestamps of a file
• update only access time of file,modified time of file

Timestamp : stat filename will show following info
□ Access time(last time when a file was accessed)....touch -a
□ Modify time(last time when a files was modified)....touch -m
□ Change time(ast time when a file metadata is changed)

Using Touch :

□ touch file3 file4 file5 -→ hit enter
ls to view newly created files
stat file1 -→ hit enter -→ this prints timestamp
touch file1
stat file1 -→ hit enter -→ prints updated timestamp

□ touch -a file2 -→ hit enter
stat file2 -→ hit enter -→ this only changes access time
touch -m file2 -→ hit enter
stat file2 -→ hit enter -→ this only access modified time

C.vi Editor :

• A programmer text editor
• It can be used to edit all kind of plain text,it is specially useful for editing programs mainly used for unix programs

Note :
:w -→ To save
:wq or :x -→ to save & quit
:q -→ quit
:q! -→ force quit,no save

• 'Vi' is a standard whereas 'nano' has to be available depending on the linux we use.

Using vi :

□ vi file5 -→ hit enter
hit i to enter insert mode-→ add content -→ hit esc to enter in command mode -→ hit :wq to save & quit
cat file5 to view content

□ vi file5 -→ hit enter
hit i to enter insert mode -→ add new content -→ hit esc to enter in command mode -→ hit :wq to save & quit
cat file5 to view updated content

D.nano Editor :

□ nano filename -→ add content -→ ctrl+x -→ y
□ ls to view file and cat to view file content

Using nano :

□ nano file6 -→ hit enter -→ add content -→ hit ctrl+x -→ hit y to save
cat file6 to view file6 content

□ nano file6 -→ hit enter -→ add new content -→ ctrl+o -→ hit enter or (change file name say file7 then hit y) to save -→ hit ctrl+x
cat file6 or file7 to view content

2.Creating & Removing Directories, Change Directories,pwd,creating hidden files & Dir's :

Creating Directory :

A.mkdir command :

□ mkdir dir1----creates dir1
□ mkdir -p dir2/dir3/dir4 ----creates dir2 and dir3 under dir2 and dir4 under dir3

B.cd command -→ change directory :

□ cd dir2 ----changes working directory to dir2
□ cd dir3 ----changes working directory to dir3 from dir2
□ cd .. ----changes working directory to parent directory
□ cd ../.. ----changes working directory to parents parent directory

C. pwd....print working directory

D.Creating hidden file or directory

□ touch .file1 ----Creates hidden file1
□ mkdir .dir5 ----creates hidden dir1
□ ls -a ------shows hidden files and directories

E.Removing File & Directories

□ rmdir ----Remove specified directory(Only empty directory)
□ rmdir -p -----Remove both the parenta nd child Directories
□ rmdir -pv ----Removes all the parent & subdirectories along with the verbose
□ rm -rf ----Removes even non-empty file & directories
□ rm -rp -----Removes non-empty directories including parent & Subdirectories
□ rm -d -----Removes empty directories

3.Copying,Moving & Renaming Files & Dir's

A.cp command : copy

□ cp file1 file2 -----Copies & Creates file2 in same directory with file1 contents
□ cp /home/user/file1 /home/user/test/file1 -----Copies file1 from /home/user to /home/user/test
□ cp -R /home/user/dir1 /home/user/test/dir1 ----Copies dir1 from /home/user to /home/user/test

B.mv command : moving & renaming

□ mv file1 file2 ------Renames file1 as file2 in same directory
□ mv /home/user/file1 /home/user/test/file1 ----Moves file1 from /home/user to /home/user/test
□ mv /home/user/dir1 /home/user/test/dir1 ----Copies dir1 from /home/user to /home/user/test

4.Head & Tail

A. head command ----Displays first 10 lines of file
□ head file1

B.tail command ----Displays last 10 lines of file
□ tail file1

5.Less & More

A. less and more Commands -----Displays files contents in pager.....Use q to exit

6.hostname & ifconfig

A.hostname Command ---- Prints Name of the Linux machine
□ hostname -i ---- prints ip of linux machine

B. ifconfig Command ---- Prints network interfaces and corrosponding Ip addresses and Netmask etc

C. cat /etc/os-release --- prints Opertaing System related info like Name,Build ID,Release Version etc

7. yum --- Yellowdog updater,Modified

A. yum ----yellowdog updater,Modified------Uses to install,update,remove packages

□ yum install httpd ----- Installs apache2
□ yum remove httpd ---- Removes apache2
□ yum update httpd ---- Updates apache2 to latest version
□ yum list installed --- lists all installed packages

8. Service & chkconfig

□ service httpd start ---- Puts apache2 in active state
□ service httpd status ----- Checks the curent status of apache2

□ chkconfig httpd on --- Auto start httpd service at every boot
□ chkconfig httpd off ---- Disables apache2 service to start at boot

9.which,whoami,echo

A.which ---- prints the path of the executable file of installed package
□ which ls

B.whoami ----- Prints the currently loggen in user like root.....username....

C. echo ------ Prints the output of the message typed along

□ echo “Hello” ---- Prints echo on terminal
□ echo can be used in scripts and be used to provide messages to users
□ echo “Hello” > file1 ---- Creates file1 and redirects echo command output to file1
□ echo > file1 ----- Empties file1

10.grep & sort

A. grep --- global regualr expression print ---- used to search the strings or characters
□ grep root /etc/passwd ---- Searches and prints root in /etc/paswd

B. sort ---- Sorts the contents accordingly like alphabatically

11.useradd,groupadd,gpasswd

A.useradd ---- Used to create new users

□ useradd bhupinder
□ cat /etc/passwd | grep bhupinder

B.groupadd ---- Used to create new groups

□ groupadd techguftgu
□ cat /etc/group | grep techguftugu

C.gpasswd -a / -M ---- To add user to group,to add multiple users

□ useradd ajay
□ useradd vikas
□ gpasswd -a bhupinder techguftgu
□ gpasswd -M ajay,vikas techguftgu
□ cat /etc/group

12.ln --- Hard & Softlinks

A.ln -s ---- Softlink

□ cat >>file1 -----and add content then ctrl+d
□ ln -s file1 softlinkfile1
□ ls -l
□ cat softlinkfile1
□ cat >>softlinkfile1 ----add content then ctrl+d
□ cat file1 ----- verify new content added to file1
□ rm file1
□ rm -rf softlinkfile1

B.ln ---- Hardlink

□ cat >>file2 ----add content and then ctrl+d
□ ln file2 hardlinkfile2
□ cat >>hardlinkfile2 ----add content then ctrl+d
□ cat file2 ----verify content added
□ cat >>file2 ----add content then ctrl+d
□ cat hardlinkfile2 ----verify content added
□ rm file2

13.tar & gzip

A. tar ---- It is a archiver used to combine multiple files into one

□ tar -cvf dirx.tar dirx

B.gzip ----gzip is a compression tool used to reduce the size of the archive/file

□ gzip dirx.tar
□ gunzip dirx.tar.gz
□ tar -xvf dirx.tar
□ rm -rf dirx

14.wget

A.wget ---- It is a non-interactive network downloader

□ wget <"paste url"> then hit enter
□ ls ---- to check downloaded file
□ yum install downloaded file.rpm
□ rm -rf * ------ removes everything in directory

15.Changing Permissions of a File or Directory :chmod,chown,chgrp

• Access Mode/Permissions :

Access Mode		**File**	**Directory**
r	4	To display the content	To list the content
w	2	To Modify	To create or remove
x	1	To execute the file	To enter into directory

A.chmod ---- used to change the access mode of file

□ sudo su
□ touch file1
□ mkdir dir1
□ ls
□ useradd bhupinder
□ groupadd linux
□ ls -l
□ chmod 777 dir1
□ chmod 700 dir1
□ ls -l
□ chmod 755 file1
□ ls -l
□ chmod g=r,o=rw dir1
□ ls -l
□ chmod u=r,g=rwx,o=x dir1
□ ls -l
□ chmod u+w,g-w,o+r file1
□ ls -l
□ chmod 000 file1
□ ls -l

B.chown -----used to change the owner of the directory/file

□ chown bhupinder dir1

C.chgrp ----- used to change the group of dir/file

□ chgrp linux file1