1. Linux Directory Commands

1. pwd Command

The pwd command is used to display the location of the current working directory.

Syntax: pwd

2. mkdir Command

The mkdir command is used to create a new directory under any directory.

Syntax: mkdir <directory name>

3. rmdir Command

The rmdir command is used to delete a directory.

Syntax: rmdir <directory name>

4. ls Command

The ls command is used to display a list of content of a directory.

Syntax: ls

5. cd Command

The cd command is used to change the current directory.

Syntax: cd <directory name>

2. Linux File commands

1. touch Command

The touch command is used to create empty files. We can create multiple empty files by executing it once.

Syntax: touch <file name>   OR

touch <file1> <file2> ....

2. cat Command

The cat command is a multi-purpose utility in the Linux system. It can be used to create a file, display content of the file, copy the content of one file to another file, and more.

Syntax: cat > <file name>

// Enter file content …Press "CTRL+ D" keys to save the file.

To display the content of the file, execute it as follows:

cat <file name>

3. rm Command

The rm command is used to remove a file.

Syntax: rm <file name>

3. cp Command

The cp command is used to copy a file or directory.

Syntax: cp <existing file name> <new file name>

4. mv Command

The mv command is used to move a file or a directory form one location to another location.

Syntax: mv <file name> <directory path>

You can use mv to rename file as wel

Syntax: mv <oldfilename> < newfilename>

3. Linux User Commands

1. su command

It provides administrative access to another user.

Syntax: sudo su

2. useradd Command

The useradd command is used to add a user on a Linux server.

Syntax: useradd username

3. userdel command

The userdel command is used to delete a user on a Linux server.

Syntax: useradd username

4. passwd Command

The passwd command is used to create and change the password for a user.

Syntax: passwd <username>

5. groupadd Command

The groupadd command is used to create a user group.

Syntax: groupadd <group name>

6 .groupdel command

The groupdel command is used to delete a group.

Syntax: groupdel <group name>

7. gpasswd command

It is used to add members in group.

Syntax: gpasswd –a <username> <groupname>

8. getent command

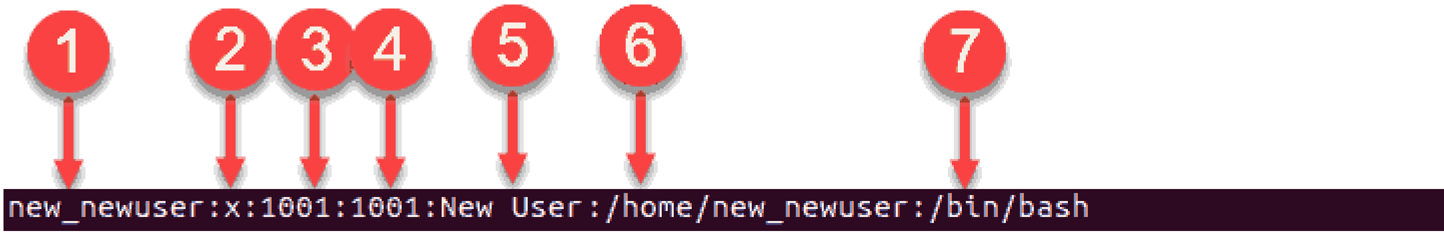
It is used to display all usernames and its information from database.

Syntax: getent passwd

Each line represents **one user** and has **seven** (7) fields.

The fields are separated by **:** (colons) and each line includes the following information:

1. Username
2. The encrypted password (represented by **x**, located in the **/etc/shadow** file)
3. User ID number (known as **UID**)
4. User group ID (known as **GID**)
5. User full name
6. User home directory
7. The login shell (by default set to **bin/bash**)



```
new_newuser:x:1001:1001:New User:/home/new_newuser:/bin/bash
```

To search for existing usernames in Linux:

to check whether a user is present on the system.

Syntax : 1. getent passwd | grep username OR

2. getent passwd username

4. Linux Filter Commands

1. head Command

The head command is used to display the content of a file. It displays the first 10 lines of a file.

Syntax: head <file name>

2. tail Command

The tail command is similar to the head command. The difference between both commands is that it displays the last ten lines of the file content. It is useful for reading the error message.

Syntax: tail <file name>

3. tac Command

The tac command is the reverse of cat command, as its name specified. It displays the file content in reverse order (from the last line).

Syntax: tac <file name>

4. sort command

sorting file content in ascending or descending order

Ex: sort file_name

a. sort –r filename(reverse order)

b. sort –g filename (numeric content sort)

5. tr Command

The tr command is used to translate the file content like from lower case to upper case.

Syntax: command | tr <'old'> <'new'>

6. uniq Command

The uniq command is used to form a sorted list in which every word will occur only once.

Syntax: command <fileName> | uniq

7. wc Command

The wc command is used to count the lines, words, and characters in a file.

Syntax: wc <file name>

8. sort Command

The sort command is used to sort files in alphabetical order.

Syntax: sort <file name>

9. grep Command

The grep is the most powerful and used filter in a Linux system. The 'grep' stands for "global regular expression print." It is useful for searching the content from a file. Generally, it is used with the pipe.

Syntax: command | grep <searchWord>

Options Description :

-c : This prints only a count of the lines that match a pattern .

-h : Display the matched lines, but do not display the filenames.

-i : Ignores, case for matching .

-n : Display the matched lines and their line numbers.

-v : This prints out all the lines that do not matches the pattern .

-w : Match whole word.

-o : Print only the matched parts of a matching line, with each such part on a separate output line.

'^' = **always matches starting character**

'$' = **always matches with ending character**

10. gzip Command

The gzip command is used to truncate the file size. It is a compressing tool. It replaces the original file by the compressed file having '.gz' extension.

Syntax: gzip <file1> <file2> <file3>...

11. gunzip Command

The gunzip command is used to unzip the file size. It replaces the compressed file by the original file.

Syntax: gunzip <file1> <file2> <file3>...

5. Linux Utility Commands

1. locate Command

The locate command is used to search a file by file name. It is quite similar to find command; the difference is that it is a background process. It searches the file in the database, whereas the find command searches in the file system. It is faster than the find command. To find the file with the locates command, keep your database updated.

Syntax: locate <file name>

2. date Command

The date command is used to display date, time, time zone, and more.

Syntax: date

3. cal Command

The cal command is used to display the current month's calendar with the current date highlighted.

Syntax: 1. Cal

2. cal month year // to display a particular month and year

Eg. 1) cal –y 2017 2)cal –m 3 2020 3) cal –j 10 2015

4. df Command

The df command is used to display the disk space used in the file system. It displays the output as in the number of used blocks, available blocks, and the mounted directory.

Syntax: df

5. exit Command

Linux exit command is used to exit from the current shell. It takes a parameter as a number and exits the shell with a return of status number.

Syntax: exit

6. clear Command

Linux clear command is used to clear the terminal screen.

Syntax: clear

7. zcat command

To display the data of zip file.

Syntax: zcat <filename>

8. time command

to display the execution time of commands.

Syntax: time

9. sleep command

go to the terminal in sleep mode.

Syntax: sleep <time in seconds>

10. history command

To display the terminal history.

Syntax: history

6. Linux Networking Commands:

1. ip command

To assign an ip address, initialize an interface, disable an interface.

Syntax: ip a OR hostname -i

2. mail command

To send e-mails from the command line.

Syntax: mail –s “subject” <recipient’s email address>

3. ping command (Packet Internet Groper)

To check the connectivity between two nodes i.e. whether the server is connected.

Syntax: ping <destination> //destination = domain name

To stop this command press ctrl + c OR ctrl + z

4. host command

To display the IP address for a given domain name. It performs the DNS lookups for the DNS Query.

Syntax: host <domain name>

5. ssh command

The ssh command provides a secure encrypted connection between two hosts over an insecure network.

Syntax: ssh user_name@host(IP/Domain_name)

Eg. ssh sample.ssh.com

File permissions in Linux:

Every file in Unix has the following attributes −

- Owner permissions − The owner's permissions determine what actions the owner of the file can perform on the file.

- Group permissions − The group's permissions determine what actions a user, who is a member of the group that a file belongs to, can perform on the file.
- Other (world) permissions − The permissions for others indicate what action all other users can perform on the file.

The Permission Indicators

While using ls -l command, it displays various information related to file permission as follows −

```
$ls -l /home/amrood
-rwxr-xr--  1 amrood   users 1024  Nov 2 00:10  myfile
drwxr-xr--- 1 amrood   users 1024  Nov 2 00:10  mydir
```

File Access Modes

The permissions of a file are the first line of defense in the security of a Unix system. The basic building blocks of Unix permissions are the read, write, and execute permissions, which have been described below −

Read

Grants the capability to read, i.e., view the contents of the file.

Write

Grants the capability to modify, or remove the content of the file.

Execute

User with execute permissions can run a file as a program.

Directory Access Modes

Directory access modes are listed and organized in the same manner as any other file. There are a few differences that need to be mentioned −

Read

Access to a directory means that the user can read the contents. The user can look at the filenames inside the directory.

Write

Access means that the user can add or delete files from the directory.

Execute

Executing a directory doesn't really make sense, so think of this as a traverse permission.

A user must have execute access to the bin directory in order to execute the ls or the cd command.

Changing Permissions

To change the file or the directory permissions, you use the chmod (change mode) command. There are two ways to use chmod — the symbolic mode and the absolute mode.

Using chmod in Symbolic Mode

The easiest way for a beginner to modify file or directory permissions is to use the symbolic mode. With symbolic permissions you can add, delete, or specify the permission set you want by using the operators in the following table.

Sr.No.	Chmod operator & Description
1	+ Adds the designated permission(s) to a file or directory.
2	- Removes the designated permission(s) from a file or directory.
3	= Sets the designated permission(s).

- chmod +rwx filename to add permissions.
- chmod -rwx directoryname to remove permissions.
- chmod +x filename to allow executable permissions.
- chmod -wx filename to take out write and executable permissions

Using chmod with Absolute Permissions

The second way to modify permissions with the chmod command is to use a number to specify each set of permissions for the file.

Each permission is assigned a value, as the following table shows, and the total of each set of permissions provides a number for that set.

Number	Octal Permission Representation	Ref
0	No permission	---
1	Execute permission	--x
2	Write permission	-w-
3	Execute and write permission: 1 (execute) + 2 (write) = 3	-wx
4	Read permission	r--
5	Read and execute permission: 4 (read) + 1 (execute) = 5	r-x
6	Read and write permission: 4 (read) + 2 (write) = 6	rw-

7	All permissions: 4 (read) + 2 (write) + 1 (execute) = 7	rwx

Difference between Windows and Linux :

Windows	Linux
\	/
Folder	directory
File	file
Software	package
Administrator	root user/ super user
NT kernel	kernel

File System of Linux: (Hierarchical)

1. /home : home directory for other user.
2. /root : home directory for root user.
3. /boot : bootable files.
4. /etc: all configuration files of system or programs
5. /usr: by default software installed in this directory

   (Unix System Resources)
6. /bin: commands used by all users

7. /sbin: commands used by only root user

8. /opt: optional application / software packages

9. /dev: essential device files **Eg.** USB, printer ,scanner

10. /lib: data library for compiler

11. /media: videos, audios,pictures/images

12. /proc: to store the logical and physical info of system

Directory type	**Types of files stored**
Binary directories	Contains binary or compiled source code files, eg, /bin, /sbin, etc.
Configuration directories	Contains configuration files of the system, eg, /etc, /boot.
Data directories	Stores data files, eg, /home, /root, etc.
Memory directories	Stores device files which doesn't take up actual hard disk space, eg, /dev, /proc, /sys.
Usr (Unix System Resources)	Contains sharable, read only data, eg, /usr/bin, /usr/lib, etc.
var (variable directory)	Contains larger size data, eg, /var/log, /var/cache, etc.
Non-standard directories	Directories which do not come under standard FHS, eg, lost+found, /run, etc.

VI Editor

1. **To insert text :**

i: start typing before the current character

I: start typing at the start of current line

a: start typing after the current character

A: start typing at the end of current line

o: start typing on a new line after a current line

O: start typing on a new line before a current line

2. **To move the cursor around a file:**

j: to move down

k: to move up

h: to move left

l: to move right

3. **To delete :**

x: Delete the current character

X: Delete the character before the cursor

r: Replace the current character

R: Overwrite characters from cursor onward

xp: Switch two characters

dd: Delete the current line

D: Delete the current line from current character

dG: Delete from the current line to the end of the file

dw: Delete word

C: Delete contents of a line after the cursor and insert new text.

4. To repeat, undo and join line:

u: Undo the last command

U: Undo all changes to the entire line

. : Repeat the last command

J: Join two lines

yyp: Repeat the current line

ddp: Swap two lines

5. copy and paste:

yw: copy one word

yy: Copy a line

p: Paste after the current line

P: Paste before the current line

s: Substitute one character under cursor continue to insert

S: Substitute entire line and begin to insert at the beginning of the line

~: Change case of individual character

cw: Change word

w: Move one word forward

b: Move one word backward