Linux Commands: From Basics to Advanced

Introduction to Linux

Linux is a free and open-source operating system used on servers, desktops, and mobile devices. It's known for being fast, secure, and reliable.

Purpose of Linux

- **Free to Use**: No license needed.
- **Multiuser**: Many users can work at the same time.
- **Stable**: Works non-stop without crashing.
- **Secure**: Harder for viruses to affect.
- **Flexible**: Can be customized however you want.

Basic Linux Commands

Navigation:

It refers moving around or changing locations within the file system directories

Command	Description	Example
pwd	(Present working Directory) Show current directory path	pwd → /home/user/aswini
ls	List files and directories	ls → file.txt folder/
ls -l	List in long format	ls -l → -rw-r--r-- 1 user...
ls -a	Show hidden files	ls -a → .bashrc .git file
cd <dir>	Change to a directory	cd frontend/
cd ..	Go up one directory level	cd ..
mkdir <dir>	Create a new directory	mkdir project
rmdir <dir>	Delete an empty directory	rmdir temp_folder
rm -r <dir>	Delete directory and its contents	rm -r old_backup/
rm <file>	Delete a file	rm notes.txt
cp <src> <dest>	Copy a file	cp file.txt /tmp/
cp -r <src> <dest>	Copy a directory recursively	cp -r mydir/ backup/

Command	Description	Example
mv <src><dest>	Move or rename file/directory	mv old.txt new.txt
touch <file>	Create an empty file	touch log.txt
find <dir> -name <name>	Search for files by name	find /home -name file.txt

File Viewing & Editing:

Checking the file content and Make Changes to file content

Command	Description	Example
cat <file>	View file contents	cat readme.txt
less <file>	View file one page at a time	less bigfile.log
head <file>	View first 10 lines	head report.txt
tail <file>	View last 10 lines	tail report.txt
nano <file>	Edit file using Nano editor	nano notes.txt
vi <file> or vim <file>	Edit file using Vim	vi script.sh

Modes:

They are three types of modes. There are

1. Command mode
2. Insert mode
3. Save & exit mode

1.Command Mode

Command	Description	Example
gg	First line of file	
Shift g / G	Last line of file	
10 gg	10^{th} line of a file	

Command	Description	Example
:10	”	
yy	Copy a single line of file	
p	Paste for one time	
dd	Delete a single line	
u	To undo (get back line)	
ndd	No. of multiple lines delete	5dd (5 lines deleted)
nyy	No. of multiple lines copies	10yy (10 lines copied)
np	No. of multiple lines paste	3p (3 lines paste)
:se nu	Serial number for lines	:se nu
:se nonu	No. of serial number for lines	:se 6nu (1,2,3,4,5,6)
Sort filename	To get the ascending order	Sort File 1
Sort –r filename	To get the descending order	Sort -r file1

2.Insert Mode:

Command	Description	Example
i	Insert the content	
A	Coming end of line	
I	Starting of line	
O	Create new line above existing	
o	Create new line below existing	

3.Save & Exit Mode

Command	Description	Example
:w	Save	
:q	Exit/Quit	
:wq	Save & exit at a time	

Intermediate Commands

Searching & Finding

GREP : Global Regular Expression Print (It is used to search files / a word outside of a file)

Command	Description	Example
grep "<text>" <file>	Search for text in a file	grep "error" app.log
grep -r "<text>" <dir>	Recursive search in directory	grep -r "TODO" src/
find / -name <filename>	To find the files location	find / -name config.yaml
find/ -type	To get the block files	
find / -type c	To get the Characters	
find/ -type d	To get the directories	
find/ -type f	To get the all files in OS	
find/ -size	To get the all sizes files	find/ -size 10k (we get all 10kb files)
find/ -size +	To get the all more than sizes files	find/ -size +50k (we get all 50kb more than files)
find/ -user name	To get all user files	find/ -user aswini (to get all aswini user files)
find/ -group name	To get all group files	find/ -group aswini (to get all aswini group accessible files)
locate <filename>	Quickly find files (uses index)	locate sshd_config

Archiving and Compression

Archiving : Combination of multiple files

Compression : Reducing the files size

Command	Description	Example
tar -cvf archive.tar file1	Archive multiple files	tar -cvf logs.tar *.log
gzip file.txt	Compress file	gzip bigdata.txt

Command	Description	Example
gunzip file.txt.gz	Decompress file	gunzip bigdata.txt.gz

Package Management

Process of installing , updating and removing the packages.

Command	Description	Example
apt update	Updates the list of available packages from repositories.	sudo apt update
apt upgrade	Installs the newest versions of all currently installed packages.	sudo apt upgrade
apt install <package>	Install software package on ubuntu	sudo apt install nginx
apt remove <package>	Removes the package but keeps configuration files.	sudo apt remove nginx
apt purge <package>	Removes the package along with its configuration files.	sudo apt purge nginx
yum update	Updates all installed packages to the latest available versions.	sudo yum update
yum install<package>	Installs the specified package on RHEL/CentOS systems.	sudo yum install httpd
yum remove <package>	Removes the specified package.	sudo yum remove httpd

User Management:

To manage the resource to the operating system . We have 3 types of users in linux

1. Root user
2. System user
3. Normal user

1.Root user

Command	Description	Example
useradd <username>	To create a user	useradd aswini
Usermod –l <username>	To modify a username	Usermod –l aswini Aswini
userdel <username>	To delete a user account but keeps the user's home directory and files.	Userdel aswini
passwd	To set or change password	xxxx

Advanced Linux Commands

Process Management

It handles running process and it includes starting, killing, stopping etc.

Command	Description	Example
ps aux	Show all running processes	ps aux | grep apache
top / htop	Real-time system monitor	top
kill <PID>	Kill a process by ID	kill 1234
killall <name>	Kill all processes by name	killall firefox

Networking

It refers configuration, management, and troubleshooting of network connection

Command	Description	Example
ping <host>	Test network connection	ping google.com
netstat -tuln	Show open ports and connections	netstat -tuln
ss -tuln	Same as netstat (modern)	ss -tuln
curl <url>	Access or download URL content	curl https://example.com
wget <url>	Download files from internet	wget https://file.com/data.zip

System Monitoring

Process of observing and checking the performance and health of a Linux system

Command	Description	Example
df -h	Show disk space usage	df -h
du -sh *	Show size of each item in directory	du -sh *
free -m	Show RAM usage	free -m
uptime	Show how long system is running	uptime
uname -a	Show system information	uname -a
dmesg | less	View boot and kernel messages	dmesg | less
vmstat 1 5	Memory and CPU stats (5 updates)	vmstat 1 5
iostat -xz 1 3	CPU and disk stats (3 updates)	iostat -xz 1 3

Conclusion:

This document covered essential Linux commands from beginner to advanced level.