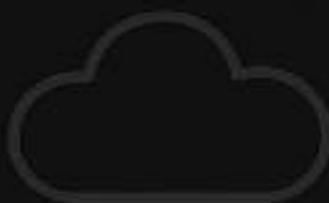# LINUX CHEAT SHEET

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🖥️ Basic Linux Commands

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1. ls – List Directory Contents

Option	Description	Example
(none)	List files and directories in current path	ls
-l	Long listing with permissions, owner, size, date	ls -l
-a	Show hidden files (starting with .)	ls -a
-h	Human-readable sizes	ls -lh
-R	Recursive listing of subdirectories	ls -R /etc
-t	Sort by modification time (newest first)	ls -lt
-S	Sort by file size	ls -lS
-r	Reverse the sort order	ls -lr
-d	Show directory itself, not contents	ls -ld /etc

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2. cd – Change Directory

Command	Description
cd /path/to/dir	Go to specific directory
cd ..	Move up one level
cd ~	Go to home directory
cd	Go to home directory
cd -	Switch to previous directory

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3. pwd – Print Working Directory

Option	Description	Example
(none)	Display absolute path of current directory	pwd
-L	Show logical path (follows symlinks)	pwd -L
-P	Show physical path (resolves symlinks)	pwd -P

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4. mkdir – Create a New Directory

Option	Description	Example
(none)	Create a single directory	mkdir newfolder
-p	Create parent directories as needed	mkdir -p /tmp/a/b/c
-v	Verbose output (show directories being created)	mkdir -v project
-m	Set permissions while creating	mkdir -m 755 logs

5. rmdir – Remove Empty Directory

Option	Description	Example
(none)	Remove empty directory	rmdir olddir
-p	Remove parent directories if empty	rmdir -p /tmp/a/b/c
-v	Verbose output	rmdir -v emptydir

6. rm – Remove Files or Directories

Option	Description	Example
-f	Force delete, no prompt	rm -f file.txt
-i	Ask confirmation before deleting	rm -i file.txt
-r	Delete directories recursively	rm -r folder
-v	Verbose output	rm -v file.txt
-rf	Force delete directory and contents	rm -rf /tmp/test

7. cp – Copy Files and Directories

Option	Description	Example
(none)	Copy file	cp file.txt /tmp/
-r	Copy directories recursively	cp -r folder /backup/
-i	Confirm before overwrite	cp -i file.txt backup/
-u	Copy only if newer	cp -u config.txt backup/
-p	Preserve attributes (mode, ownership, timestamp)	cp -p file.txt /backup/
-v	Verbose output	cp -v file1.txt /tmp/

Option	Description	Example
-a	Archive mode (recursive + preserve)	cp -a /etc /backup/

8. mv – Move or Rename Files and Directories

Option	Description	Example
(none)	Move file	mv file.txt /tmp/
-i	Ask confirmation before overwrite	mv -i old.txt new.txt
-v	Verbose output	mv -v file.txt /data/
-u	Move only newer files	mv -u *.log /backup/
-n	Do not overwrite existing files	mv -n file.txt /tmp/

9. touch – Create or Update File Timestamp

Option	Description	Example
(none)	Create an empty file	touch file.txt
-a	Update access time only	touch -a file.txt
-m	Update modification time only	touch -m file.txt
-c	Do not create if file doesn't exist	touch -c oldfile.txt
-t	Set custom time (YYYYMMDDhhmm)	touch -t 202510241130 file.txt

10. cat – Concatenate and Display File Content

Option	Description	Example
(none)	Display file content	cat file.txt
-n	Show line numbers	cat -n file.txt
-E	Show $ at line ends	cat -E file.txt
-A	Show hidden characters	cat -A file.txt
>	Redirect output (overwrite)	cat file1 > file2
>>	Append output	cat file1 >> file2

11. tac – Concatenate and Display File Content

Option	Description	Example
(none)	Display file content in reverse order	tac file.txt

📌 **Note:** All the cat command option are available to tac command and working as same.

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12. echo – Display a Line of Text

Option	Description	Example
(none)	Print text to terminal	echo "Hello World"
-n	No newline at end	echo -n "Hello"
-e	Enable escape sequences (\n, \t)	echo -e "Line1\nLine2"
>	Redirect output to file	echo "Data" > file.txt
>>	Append to file	echo "More Data" >> file.txt

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13. man – Display Manual Page for a Command

Option	Description	Example
(none)	Show manual page	man ls
-k	Search for keyword in all man pages	man -k directory
-f	Display short description (same as whatis)	man -f cat
/pattern	Search within manual page	/option

📌 **Navigation keys:**

- Space → Next page
- b → Previous page
- q → Quit

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14. Clear – Clear the Terminal Screen

Command	Description
clear	Clears the terminal display

(No options available)

15. history – Show Command History

Option	Description	Example
(none)	Show recent commands	history
-c	Clear history list	history -c
!<n>	Execute command number n	!10
!-<n>	Execute command from n lines back	!-2
!string	Run last command starting with string	!ls

16. alias – Create an Alias for a Command

Option	Description	Example
(none)	List all aliases	alias
alias name='command'	Create an alias	alias ll='ls -lh'
unalias name	Remove an alias	unalias ll

17. date – Display or Set System Date and Time

Option	Description	Example
(none)	Show current date and time	date
%Y	Full year (e.g., 2025)	date "+%Y"
%y	Last two digits of the year (e.g., 25)	date "+%y"
%m	Month as a number (01-12)	date "+%m"
%B	Full month name (e.g., October)	date "+%B"
%b	Abbreviated month name (e.g., Oct)	date "+%b"
%d	Day of the month (01-31)	date "+%d"
%A	Full weekday name (e.g., Friday)	date "+%A"
%a	Abbreviated weekday name (e.g., Fri)	date "+%a"
%H	Hour (00-23)	date "+%H"
%I	Hour (01-12)	date "+%I"
%M	Minute (00-59)	date "+%M"
%S	Second (00-59)	date "+%S"
%s	Seconds since Unix Epoch (January 1, 1970 UTC)	date "+%s"
%D	Date in MM/DD/YY format	date "+%D"

Option	Description	Example
%F	Date in YYYY-MM-DD format	date "+%F"
%T	Time in HH:MM:SS format	date "+%T"
+FORMAT	Custom output format	date "+%Y-%m-%d %H:%M:%S"
-d	Manipulating Dates	date -d "tomorrow" date -d "next Friday" date -d "next week" date -d "1 month hence" date -d "yesterday" date -d "last Monday" date -d "1 day ago" date -d "2 weeks ago"
-r file	Display the last modification time of a specified file.	date -r /etc/hosts
-u	Display UTC time	date -u
-s "STRING"	Set system date/time (requires sudo)	sudo date -s "25 Oct 2025 09:30:00"

18. cal – Display a Calendar

Option	Description	Example
(none)	Show current month calendar	cal
YEAR	Show full year calendar	cal 2025
MONTH YEAR	Show specific month/year	cal 10 2025
-y	Display full year calendar for current year	cal -y

19. bc – Basic Calculator

Option	Description	Example
(none)	Launch interactive calculator	bc
-l	Use standard math library (enables sin, sqrt)	bc -l
`echo "expression"	bc`	Run single calculation
Example (interactive)	Type scale=2; 5/2 → Output 2.50	

📁 Linux File and Directory Management Commands

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1. find – Search for Files in a Directory Hierarchy

Option / Example	Description
find /path -name "file.txt"	Search file by exact name
find /path -iname "*.log"	Case-insensitive search
find /path -type d	Search directories only
find /path -type f	Search files only
find /path -size +10M	Find files larger than 10MB
find /path -mtime -2	Modified within last 2 days
find /path -perm 644	Files with specific permissions
find /path -user username	Files owned by user
find . -name "*.log" -exec rm {} \;	Execute command on results
find /var -maxdepth 2 -name "*.conf"	Limit search depth

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2. grep – Search Text Using Patterns

Option	Description	Example
-i	Case-insensitive search	grep -i "error" logfile
-r	Recursive search in directories	grep -r "error" /var/log
-v	Invert match (exclude pattern)	grep -v "info" logfile
-n	Show line numbers	grep -n "root" /etc/passwd
-c	Count matching lines	grep -c "fail" logfile
-E	Use extended regex	`grep -E "error
-A <N>	Show N lines after match	grep -A2 "error" logfile
-B <N>	Show N lines before match	grep -B2 "error" logfile
-H	Print filename in output	grep -H "pattern" *.txt

3. grep – Extended Global Regular Expression Print

Option / Syntax	Description	Example
egrep 'pattern' file	Search for lines matching a pattern in a file	egrep 'error' /var/log/syslog
-i	Ignore case distinctions	egrep -i 'warning' /var/log/messages
-v	Invert match — show lines **not** matching the pattern	egrep -v 'INFO' app.log
-c	Count the number of matching lines	egrep -c 'fail' /var/log/auth.log
-n	Show line numbers with output	egrep -n 'timeout' server.log
-H	Print the filename for each match (default when multiple files)	egrep -H 'error' *.log
-h	Suppress the filename in output	egrep -h 'error' *.log
-l	Print only filenames containing matches	egrep -l 'disk full' *.log
-L	Print only filenames **without** matches	egrep -L 'disk full' *.log
-r or -R	Recursively search directories	egrep -r 'failed' /var/log/
-w	Match whole words only	egrep -w 'error' messages.log
-x	Match only entire lines	egrep -x 'Success' status.txt
-A <num>	Print <num> lines **after** match	egrep -A 2 'error' logfile.log
-B <num>	Print <num> lines **before** match	egrep -B 2 'error' logfile.log
-C <num>	Print <num> lines of **context** (before & after)	egrep -C 3 'error' logfile.log
--color=auto	Highlight matched text	egrep --color=auto 'success' output.txt
--exclude=<pattern>	Skip files matching a pattern	egrep -r 'error' /var/log --exclude='*.gz'
--include=<pattern>	Search only in files matching a pattern	egrep -r 'error' /var/log --include='*.log'

4. wc – Word, Line, and Character Count

Option	Description	Example
-l	Count lines	wc -l file.txt
-w	Count words	wc -w file.txt
-c	Count bytes	wc -c file.txt
-m	Count characters	wc -m file.txt

Option	Description	Example
(none)	Show lines, words, bytes	wc file.txt

5. sort – Sort Lines of Text Files

Option	Description	Example
(none)	Sort alphabetically	sort names.txt
-r	Reverse order	sort -r names.txt
-n	Numeric sort	sort -n numbers.txt
-k	Sort by specific column	sort -k2 data.txt
-u	Unique sort (remove duplicates)	sort -u names.txt
-t	Define delimiter	sort -t, -k2 file.csv

6. uniq – Report or Omit Repeated Lines

Option	Description	Example
(none)	Remove consecutive duplicates	uniq names.txt
-c	Prefix count of occurrences	uniq -c names.txt
-d	Show only duplicates	uniq -d names.txt
-u	Show only unique lines	uniq -u names.txt
-i	Ignore case	uniq -i file.txt

7. cut – Remove or Extract Columns from Text

Option	Description	Example
-f	Extract field N	cut -f1 names.txt
-d	Define delimiter	cut -d',' -f1,3 file.csv
-c <N>	Extract character positions	cut -c1-5 data.txt

8. paste – Merge Lines of Files

Option	Description	Example
(none)	Merge corresponding lines	paste file1 file2

Option	Description	Example
-d <DELIM>	Use custom delimiter	paste -d ':' file1 file2
-s	Merge sequentially (serial mode)	paste -s file1

9. diff – Compare Files Line by Line

Option	Description	Example
(none)	Compare two files	diff file1.txt file2.txt
-y	Side-by-side comparison	diff -y file1.txt file2.txt
-q	Report only if files differ	diff -q file1 file2
-r	Recursive compare of directories	diff -r dir1 dir2
-u	Unified format	diff -u file1.txt file2.txt
-c	Context format	diff -c file1.txt file2.txt
-i	Ignore case	diff -i file1.txt file2.txt
-w	Ignore all whitespace	diff -w file1.txt file2.txt

10. chmod – Change File Permissions

Option	Description	Example
chmod 755 file	rwxr-xr-x (Owner full, others read/exec)	chmod 755 file1.txt
chmod u+x file	Add execute to user	chmod u+x file.sh
chmod g-w file	Remove write for group	chmod g-w file.sh
chmod a+r file	Add read to all	chmod a+r file
chmod -R 644 dir	Recursive set permissions	chmod -R 644 config

11. chown – Change File Owner and Group

Example	Description	Example
chown user file	Change owner	chown azher file1.txt
chown user:group file	Change owner and group	chown azher:admin file1.txt
chown -R user:group /data	Recursive ownership change	chown -R azher:admin /data

12. ln – Create Links

Option	Description	Example
(none)	Create hard link	ln file.txt hard.txt
-s	Create symbolic (soft) link	ln -s /data/file.txt link.txt
-v	Verbose output	ln -sv file.txt soft.txt
-f	Force overwrite	ln -sf file.txt link.txt

13. unlink – remove Links

Option	Description	Example
(none)	Remove hard link and softlink link	unlink hard.txt unlink link.txt

25. stat – Display File or Filesystem Status

Option	Description	Example
(none)	Display file status (shows permissions, owner, size, last access, modification, change times)	stat /etc/passwd
-f	Display filesystem status	stat -f /home

14. file – Determine File Type

Example	Description
file file.txt	Identify file type
file /bin/ls	Identify binary/executable type

15. tree – Directory Tree View

Option	Description	Example
(none)	Display tree of directories	tree /etc
-L <N>	Limit depth	tree -L 2 /var
-d	Show directories only	tree -d /usr
-a	Include hidden files	tree -a
-h	Show human-readable file sizes	tree -h /var/log

16. shred – Securely Delete Files

Option	Description	Example
-u	Remove file after shredding	shred -u secret.txt
-n <N>	Overwrite N times	shred -n 5 file.txt
-z	Final overwrite with zeros	shred -z file.txt

17. xargs – Build and Execute from Input

Example	Description
find . -name "*.log" | xargs rm	This example finds all .log files in the current directory and its subdirectories, then uses xargs to safely remove them. Executing Commands on Multiple Inputs.
cat list.txt | xargs -n1 mkdir	This is a shell pipeline that reads a list of directory names from a list.txt file and creates those directories -n1: Ensures that mkdir is called once per argument (i.e., one directory at a time)
echo "one two three" | xargs -n1	xargs -n1 echo takes each word and runs echo on it separately line.

18. rename – Rename Multiple Files

Example	Description
rename 's/.txt/.bak/' *.txt	Change .txt to .bak
rename 's/old/new/' *	Replace "old" with "new" in filenames

19. touch – Create or Update File Timestamps

Example	Description
touch newfile.txt	Create empty file
touch -c existing.txt	update timestamp only, no new file
touch -t 202510241200 file.txt	Set custom timestamp

20. basename & dirname – Extract file or directory names from path

Example	Description
basename /home/user/file.txt	Output: file.txt
basename /home/user/file.txt .txt	Output: file

Example	Description
dirname /home/user/file.txt	Output: /home/user

21. split – Split File into Parts

Option	Description	Example
(none)	Split into 1000-line chunks	split large.txt
-l <N>	Split by N lines	split -l 500 file.txt
-d	Use numeric suffix	split -d -l 100 file.txt part_
-b <Size>	Split by bytes	split -b 1M file.txt part_

22. truncate – Shrink or Extend File Size

Option	Description	Example
-s <SIZE>	Set file size	truncate -s 1M file.txt
-r <FILE>	Reference size from another file	truncate -r ref.txt file.txt

23. mktemp – Create Temporary File/Directory

Option	Description	Example
(none)	Create temp file	mktemp
-d	Create temp directory	mktemp -d
--suffix=.log	Add suffix	mktemp --suffix=.log

24. dd – Convert and Copy Files (Low-level)

Option	Description	Example
if=	Input file	dd if=/dev/sda of=/backup.img
of=	Output file	dd if=file.img of=/dev/sdb
bs=	Block size	dd if=file of=copy bs=1M
count=	Number of blocks	dd if=file of=copy bs=1M count=100
status=progress	Show progress	dd if=/dev/zero of=file bs=1M count=100 status=progress

25. time – Measure the Time Taken to Execute a Command

Option / Syntax	Description	Example
time <command>	Measure real (wall clock), user (CPU), and sys (system) time for a command	time ls -l
-p	Display output in a POSIX portable format (real, user, sys)	time -p sleep 2
/usr/bin/time -v <command>	Verbose mode — shows detailed resource usage (CPU, memory, etc.)	/usr/bin/time -v tar -czf backup.tar.gz /var/log
-o <file>	Write timing results to a file	time -o timing.log ls /etc
-a -o <file>	Append output to an existing file	time -a -o timings.txt du -sh /var

25. tee – Read from Standard Input and Write to Standard Output and Files

Option / Syntax	Description	Example
sudo dmesg	tee <file>	sudo dmesg	tee /var/log/dmesg_backup.log
-a	Append output to an existing file instead of overwriting	df -h		tee -a /home/azher/df.log
-i	Ignore interrupts (useful in long-running pipelines)	find / -name "*.log"	tee -i /home/azher/mylog.log
tee >(command)	Send output to multiple commands using process substitution	echo "Test"	tee /home/myinputfile.txt

27. pv – Monitor the Progress of Data Through a Pipeline

(*pv = Pipe Viewer, requires installation: sudo apt install pv or sudo yum install pv*)

Option / Syntax	Description	Example
pv <file>	Show progress of reading a file	pv largefile.iso > /dev/null
pv <file> > <output>	Copy file with progress	pv backup.tar.gz > /mnt/usb/backup.tar.gz
pv -t	Show elapsed time	pv -t file.iso > /dev/null
pv -r	Show data transfer rate	pv -r file.iso > /dev/null
pv -b	Show amount of data transferred in bytes	pv -b file.iso > /dev/null
pv -p	Show progress percentage	pv -p file.iso > /dev/null
pv -e	Show ETA (estimated time of completion)	pv -e bigfile.zip > /tmp/bigfile.zip

Option / Syntax	Description	Example
pv -W	Show average rate after completion	pv -W bigdata.dat > /tmp/bigdata.dat
pv -L <rate>	Limit data transfer rate (bytes per second)	pv -L 500k file.img > /dev/sdb
pv -B <size>	Set buffer size	pv -B 1M source > destination

📦 Archive / Compress Files

1. tar – Archive Files

Option	Description	Example
-c	Create new archive	tar -cvf backup.tar /home/user
-x	Extract archive	tar -xvf backup.tar
-t	List contents	tar -tvf backup.tar
-z	Use gzip compression	tar -czvf backup.tar.gz /data
-j	Use bzip2 compression	tar -cjvf backup.tar.bz2 /data
-v	Verbose output	tar -xvzf backup.tar.gz
-f	Specify archive filename	tar -cf myarchive.tar files/

2. gzip – Compress Files

Option	Description	Example
(none)	Compress file	gzip file.txt
-d	Decompress	gzip -d file.txt.gz
-k	Keep original file	gzip -k file.txt
-r	Recursive compression	gzip -r /data
-v	Verbose output	gzip -v file.txt

3. gunzip – Extract Compress Files

Option	Description	Example
(none)	Extract Compressed file	gunzip backup.gzip
-l	List contents	gunzip -l archive.gzip
-d DIR	Extract to specific directory	gunzip archive.gzip -d /tmp
-o	Overwrite existing files	gunzip -o archive.gzip

4. zip – Package and Compress Files

Option	Description	Example
(none)	Create zip archive	zip archive.zip file1 file2
-r	Recursive directory zip	zip -r backup.zip /data
-d	Delete file from archive	zip -d backup.zip file1
-u	Update files in archive	zip -u backup.zip newfile

5. unzip – Extract Zip Files

Option	Description	Example
(none)	Extract zip file	unzip backup.zip
-l	List contents	unzip -l archive.zip
-d DIR	Extract to specific directory	unzip archive.zip -d /tmp
-o	Overwrite existing files	unzip -o archive.zip

6. bzip2 – Compress Files Using bzip2

Option	Description	Example
(no option)	Compress file (creates .bz2)	bzip2 file.txt
-k	Keep original file	bzip2 -k file.txt
-f	Force over write if .bz2 exists	bzip2 -f file.txt
-v	Verbose output	bzip2 -v file.txt
-z	Compress even if file looks compressed	bzip2 -z file.txt
-9	Maximum compression	bzip2 -9 file.txt
-1	Fastest compression	bzip2 -1 file.txt

7. bunzip2 – Decompress bzip2 Files

Option	Description	Example
(no option)	Decompress .bz2 file	bunzip2 file.txt.bz2
-k	Keep compressed file	bunzip2 -k file.txt.bz2
-f	Force overwrite	bunzip2 -f file.txt.bz2

Option	Description	Example
-v	Verbose output	bunzip2 -v file.txt.bz2

8. xz – Compress Files Using LZMA

Option	Description	Example
(no option)	Compress file (creates .xz)	xz file.txt
-k	Keep original file	xz -k file.txt
-f	Force overwrite	xz -f file.txt
-v	Verbose output	xz -v file.txt
-9	Maximum compression	xz -9 file.txt
-1	Fastest compression	xz -1 file.txt
-T <N>	Use N threads	xz -T4 file.txt

9. unxz – Decompress LZMA Files

Option	Description	Example
(no option)	**Decompress .xz file**	**unxz file.txt.xz**
-k	Keep compressed file	unxz -k file.txt.xz
-f	Force overwrite	unxz -f file.txt.xz
-v	Verbose output	unxz -v file.txt.xz

10. zipinfo – List Contents of a Zip File

Option	Description	Example
(no option)	List files in a zip archive	zipinfo archive.zip
-1	List filenames only	zipinfo -1 archive.zip
-t	Show totals at end	zipinfo -t archive.zip
-l	Long listing	zipinfo -l archive.zip
-v	Verbose	zipinfo -v archive.zip
-h	Display help	zipinfo -h

11. 7z / 7za – 7-Zip compression (High compression ratio with multiple formats**)**

Command	Example
7z a archive.7z folder/	Create 7z archive
7z x archive.7z	Extract 7z archive
7z l archive.7z	List contents

🧠 System Information Commands

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1. uname – Print System Information

Option	Description	Example
(none)	Print OS name	uname
-a	Print all info	uname -a
-r	Kernel release	uname -r
-v	Kernel version	uname -v
-m	Machine hardware name	uname -m
-n	Network hostname	uname -n
-s	Kernel name	uname -s

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2. hostname – Show or Set System Hostname

Option	Description	Example
(no option)	Display the system hostname	hostname
-I	Show IP addresses associated with the hostname	hostname -I
-f	Show Fully Qualified Domain Name (FQDN)	hostname -f

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3. hostnamectl – Control System Hostname (systemd-based systems)

Option	Description	Example
(no option)	Display current hostname information	hostnamectl
status	Display hostname status	hostnamectl status
set-hostname <name>	Set a new hostname	sudo hostnamectl set-hostname server01

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4. uptime – Show System Uptime and Load Average

Option	Description	Example
(no option)	Show uptime and load average	uptime
-p	Show uptime in pretty (readable) format	uptime -p
-s	Show system boot time	uptime -s

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5. du – Disk Usage Summary

Option	Description	Example
-h	Human-readable	du -h /var
-s	Summary only	du -sh /etc
-a	Show all files	du -ah /home
--max-depth=N	Limit recursion	du -h --max-depth=1 /var

6. df – Report File System Disk Space

Option	Description	Example
-h	Human-readable	df -h
-T	Show filesystem type	df -Th
-i	Show inode info	df -i
--total	Show total usage	df -h --total

7. top – Display Real-Time Process and System Information

Option	Description	Example
(no option)	Show interactive process list	top
-u <user>	Show processes for a specific user	top -u root
-n <count>	Run top for a given number of iterations	top -n 3
-p <pid>	Monitor specific process	top -p 1234
-d <seconds>	Refresh delay	top -d 5 (refresh every 5 seconds)
-b	Batch mode (non-interactive)	top -b -n 1 > top.txt

8. htop – Interactive Process Viewer

Option	Description	Example
(no option)	Launch htop (interactive mode)	htop
F6	Change sorting column (interactive key)	Press F6 in htop
F9	Kill a process (interactive key)	Press F9 in htop
/	Search a process by name	Press / in htop

9. free – Display Memory Usage

Option	Description	Example
-h	Human-readable format (MB/GB)	free -h
-m	Show memory in MB	free -m
-g	Show memory in GB	free -g
-t	Show total memory summary	free -t

10. vmstat – Virtual memory statistics

Option	Description	Example
<interval>	Update every N seconds	vmstat 5
-s	Summary statistics	vmstat -s
-m	Show memory in MB	vmstat -m

11. lscpu – Display CPU Architecture Information

Option	Description	Example
(no option)	Show CPU details (cores, threads, architecture)	lscpu

12. lsblk – List Block Devices

Option	Description	Example
-f	Show filesystem and UUID	lsblk -f
-a	List all devices (including empty)	lsblk -a
-o	Customize output columns	lsblk -o NAME,SIZE,MOUNTPOINT

13. blkid – Locate/Print Block Device Attributes

Option	Description	Example
(no option)	Display block device UUID and filesystem type	blkid

14. lspci – List PCI Devices

Option	Description	Example
-v	Verbose output	lspci -v
-t	Display devices in a tree format	lspci -t

15. lsusb – List USB Devices

Option	Description	Example
(no option)	List all connected USB devices	lsusb
-v	Show detailed info about USB devices	lsusb -v

16. dmesg – Print Kernel Ring Buffer Messages

Option	Description	Example
-T	Show timestamps in readable format	dmesg -T
-H	Human-readable	dmesg -H
`	Filter for specific term	dmesg | grep <keyword>`

17. lshw – Display Hardware Configuration

Option	Description	Example
-short	Show summary format	sudo lshw -short
-class <type>	Show specific hardware class (cpu, memory, network)	sudo lshw -class cpu

18. dmidecode – Display BIOS and Hardware Information

Option	Description	Example
-t bios	Show BIOS info	sudo dmidecode -t bios
-t memory	Show memory details	sudo dmidecode -t memory
-t system	Show system info (model, manufacturer)	sudo dmidecode -t system

19. ip – Show or Configure Network Interfaces

Option	Description	Example
a	Show all IP addresses	ip a
addr	Show IP addresses	ip addr show
link	Show interfaces	ip link show
route	Show routing table	ip route show
-s	Show statistics	ip -s link
add	Add IP	ip addr add 192.168.1.10/24 dev eth0
del	Delete IP	ip addr del 192.168.1.10/24 dev eth0

20. ifconfig – Display or Configure Network Interfaces (Deprecated)

Option	Description	Example
(no option)	Show active interfaces	ifconfig
-a	Show all interfaces (even inactive)	ifconfig -a

21. nmcli – Network manager CLI

Option	Description	Example
connection show	List connections	nmcli connection show
device status	Show device status	nmcli device status
connection up <name>	Bring connection up	nmcli connection up "Wired connection 1"
connection down <name>	Bring connection down	nmcli connection down "Wired connection 1"

22. timedatectl – Manage system date/time

Command	Example
timedatectl	Show date/time and timezone
timedatectl set-time "2025-10-24 10:30:00"	Set date/time
timedatectl set-timezone Asia/Kolkata	Change timezone
timedatectl set-ntp yes	Enable NTP

23. netstat – Display Network Connections and Statistics

Option	Description	Example
-a	Display all connections (listening and non-listening sockets)	netstat -a
-t	Show TCP connections only	netstat -t
-u	Show UDP connections only	netstat -u
-n	Show numerical addresses (no DNS resolution)	netstat -n
-l	Show listening sockets only	netstat -l
-p	Show PID and program name for each connection	sudo netstat -p
-r	Display the kernel routing table	netstat -r
-i	Display network interface statistics	netstat -i
-s	Display per-protocol statistics (TCP, UDP, ICMP)	netstat -s
-c	Continuously display network status (refresh every second)	netstat -c
-e	Show extended information such as user, inode, etc.	netstat -e
-g	Display multicast group memberships	netstat -g
-M	Display masquerade connections	netstat -M
-W	Do not truncate long addresses (show full width)	netstat -W
--numeric-hosts	Show numerical host addresses only	netstat --numeric-hosts
--numeric-ports	Show numerical ports only	netstat --numeric-ports
--numeric-users	Show numerical user IDs	netstat --numeric-users
--protocol=<proto>	Display connections for specific protocol (tcp, udp, etc.)	netstat --protocol=udp

24. ss – Display Socket Statistics (Modern netstat)

Option	Description	Example
-t	TCP connections	ss -t
-u	UDP connections	ss -u
-l	Listening ports	ss -l
-p	Show process using socket	ss -tp
-n	Show numeric IP/port	ss -tn
-s	Show summary statistics	ss -s

🌐 Networking Commands

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1. ping – Check Network Connectivity

Option	Description	Example
(no option)	Send ICMP echo requests to a host	ping google.com
-c <count>	Stop after sending specified number of packets	ping -c 5 google.com
-i <interval>	Set time interval between packets (seconds)	ping -i 2 google.com
-s <size>	Specify packet size in bytes	ping -s 100 google.com
-t	Set time-to-live (TTL) value	ping -t 64 google.com
-4	Use IPv4 only	ping -4 google.com
-6	Use IPv6 only	ping -6 google.com

2. curl – Transfer Data to or from a Server

Option	Description	Example
curl <URL>	Fetch the content of a URL (basic usage)	curl https://example.com
-s	Silent mode: No progress bar or error messages displayed. (Use with scripts)	curl -s https://example.com
-S	Show errors even in silent mode (use with -s)	curl -s -S https://example.com
-o <file>	Write output to a file instead of stdout	curl -o output.html https://example.com
-O	Save with the same name as remote file	curl -O https://example.com/file.zip
-L	Follow redirects (useful for moved URLs)	curl -L https://example.com/redirect
-I	Fetch only HTTP headers (HEAD request)	curl -I https://example.com
-X <method>	Specify HTTP method (GET, POST, PUT, DELETE, etc.)	curl -X POST https://api.example.com/data
-d "<data>"	Send POST data (key=value pairs)	curl -d "user=admin&pass=1234" -X POST https://example.com/login
-H "<header>"	Add a custom header to the request	curl -H "Content-Type: application/json" https://example.com
-u <user:pass>	Provide username and password for authentication	curl -u admin:password https://example.com/login
-k	Ignore SSL certificate validation	curl -k https://self-signed.example.com
-v	Verbose mode (show request/response details)	curl -v https://example.com

Option	Description	Example
--limit-rate <speed>	Limit data transfer speed	curl --limit-rate 500k https://example.com/file.zip
-C -	Resume a previous download	curl -C - -O https://example.com/file.zip
-T <file>	Upload file to server (with PUT)	curl -T upload.txt https://example.com/upload
--connect-timeout <seconds>	Set max time to establish connection	curl --connect-timeout 10 https://example.com
--max-time <seconds>	Set max time for whole operation	curl --max-time 30 https://example.com
-w "%{http_code}\n"	Display HTTP response code only	curl -s -o /dev/null -w "%{http_code}\n" https://example.com
--head	Same as -I (fetch headers only)	curl --head https://example.com

3. wget – Download Files from the Web

Option	Description	Example
(no option)	Download a file from the web	wget https://example.com/file.zip
-O <file>	Save output to specified filename	wget -O newname.zip https://example.com/file.zip
-c	Continue an incomplete download	wget -c https://example.com/file.zip
-b	Run in background	wget -b https://example.com/large.iso
-q	Quiet mode (no output)	wget -q https://example.com/file.zip
--limit-rate=<rate>	Limit download speed	wget --limit-rate=500k https://example.com/file.zip
-r	Download files recursively	wget -r https://example.com/docs/

4. ssh – Secure Shell (Remote Login)

Option	Description	Example
(no option)	Connect to a remote host	ssh user@192.168.1.10
-p <port>	Specify SSH port	ssh -p 2222 user@192.168.1.10
-i <key>	Use a private key file	ssh -i ~/.ssh/id_rsa user@server
-v	Verbose mode for debugging	ssh -v user@server
-X	Enable X11 forwarding	ssh -X user@server

Option	Description	Example
-t	Force pseudo-terminal allocation	ssh -t user@server 'sudo su -'

5. scp – Securely Copy Files Between Hosts

Option	Description	Example
(no option)	Copy file between local and remote	scp file.txt user@remote:/tmp/
-r	Copy directories recursively	scp -r /data user@192.168.1.20:/backup/
-P <port>	Specify SSH port	scp -P 2222 file.txt user@server:/home/user/
-i <key>	Use identity (private key) file	scp -i ~/.ssh/key.pem file.txt user@server:/home/
-v	Verbose output for debugging	scp -v file.txt user@server:/tmp/

6. ftp – File Transfer Protocol Client

Option	Description	Example
(no option)	Start FTP session	ftp ftp.example.com
-p	Enable passive mode	ftp -p ftp.example.com
-n	Disable auto-login	ftp -n ftp.example.com
-v	Verbose mode	ftp -v ftp.example.com

📌 **FTP session example:**

    ftp> open ftp.example.com

    ftp> user username password

    ftp> put localfile.txt

    ftp> get remotefile.txt

    ftp> bye

7. sftp – Secure File Transfer Protocol

📌 **SFTP session example:**

    sftp azher@192.168.1.10   → enter interactive mode

    sftp> put file.txt   → upload file

    sftp> get file.txt   → download file

    sftp> ls / cd   → navigate remote filesystem

    sftp> exit   → exit remote session

8. traceroute – Trace the Route Packets Take

Option	Description	Example
(no option)	Trace route to host	traceroute google.com
-n	Don't resolve hostnames (faster)	traceroute -n google.com
-m <hops>	Set maximum number of hops	traceroute -m 20 google.com
-w <sec>	Set wait time per probe	traceroute -w 2 google.com
-I	Use ICMP ECHO instead of UDP	traceroute -I google.com

9. nslookup – Query DNS Information

Option	Description	Example
(no option)	Interactive mode	nslookup
<domain>	Query specific domain	nslookup example.com
server <IP>	Use a specific DNS server	nslookup example.com 8.8.8.8

10. dig – DNS Lookup Utility

Option	Description	Example
(no option)	Query domain's A record	dig example.com
@<server>	Use specific DNS server	dig @8.8.8.8 example.com
+short	Display concise output	dig +short example.com
-t <type>	Specify record type (A, MX, TXT, etc.)	dig -t MX example.com
+trace	Trace delegation path from root	dig +trace example.com
ANY	Query all records	dig example.com ANY
MX	Mail records	dig example.com MX

11. route – Show or Manipulate IP Routing Table

Option	Description	Example
(no option)	Display routing table	route
-n	Numeric addresses (no DNS lookup)	route -n
add default gw <gateway>	Add default route	sudo route add default gw 192.168.1.1
del default gw <gateway>	Delete default route	sudo route del default gw 192.168.1.1

12. whois – Query Information About a Domain

Option	Description	Example
(no option)	Lookup domain registration info	whois example.com
--verbose	Show full raw output	whois --verbose example.com

13. nmap – Network Exploration Tool / Port Scanner

Option	Description	Example
-sP	Ping scan (check which hosts are up)	nmap -sP 192.168.1.0/24
-sT	TCP connect scan	nmap -sT 192.168.1.10
-sS	SYN scan (stealth)	sudo nmap -sS 192.168.1.10
-O	Detect OS of host	sudo nmap -O 192.168.1.10
-p <port>	Scan specific port	nmap -p 22 192.168.1.10
-A	Enable OS + version detection + script scanning	sudo nmap -A 192.168.1.10
-v	Verbose output	nmap -v 192.168.1.0/24

14. arp – View or Modify ARP Cache

Option	Description	Example
(no option)	Display ARP table	arp
-n	Show numerical addresses	arp -n
-d <IP>	Delete ARP entry	sudo arp -d 192.168.1.10
-s <IP> <MAC>	Add static ARP entry	sudo arp -s 192.168.1.10 00:0c:29:ab:cd:ef

15. mtr – Combine ping and traceroute

Option	Description	Example
(no option)	Run MTR in interactive mode	mtr google.com
-r	Generate report mode (non-interactive)	mtr -r google.com
-c <count>	Number of ping tests per hop	mtr -r -c 10 google.com
-n	Disable hostname resolution	mtr -n google.com
-4	Use IPv4	mtr -4 google.com
-6	Use IPv6	mtr -6 google.com

16. tcpdump – Capture network packets

Option	Description	Example
-i <interface>	Specify network interface	tcpdump -i eth0
-nn	Numeric IP/port, no hostname resolution	tcpdump -nn -i eth0
-c <count>	Capture limited packets	tcpdump -c 10 -i eth0
-w <file>	Save capture	tcpdump -i eth0 -w capture.pcap
port <number>	Filter by port	tcpdump -i eth0 port 80

🧠 Process Management Commands

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1. ps – Report a Snapshot of Current Processes

Option	Description	Example
(no option)	Show processes for current shell	ps
-e	Show all processes	ps -e
-f	Full-format listing	ps -ef
-u <user>	Show processes for a specific user	ps -u root
-aux	BSD-style display	ps aux
--forest	Show process hierarchy tree	ps aux –forest
-o <format>	Customize output	ps -eo pid,ppid,cmd,%mem,%cpu
--sort <field>	Sort by field	ps -eo pid,cmd,%mem --sort=-%mem

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2. kill – Terminate a Process by PID

Option	Description	Example
(no option)	Kill process by PID using SIGTERM	kill 1234
-9	Force kill using SIGKILL	kill -9 1234
-15	Graceful termination (default)	kill -15 1234
-l	List all available signals	kill -l
-s <signal>	Send specific signal	kill -s SIGSTOP 1234

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3. pgrep / pkill – Find or kill process by name

Command	Description	Example
(no option)	Find process IDs by name	pgrep firefox
-u <user>	Find process for a specific user	pgrep -u john sshd
-l	Show PID and process name	pgrep -l sshd
-f	Match full command line	pgrep -f "python script.py"
Pgrep <process>	returns process IDs	pgrep nginx
pkill	terminate the processes with name	pkill -f apache2

4. killall – Kill Processes by Name

Option	Description	Example
(no option)	Kill all processes by name	killall firefox
-u <user>	Kill processes of a specific user	killall -u john firefox
-9	Force kill	killall -9 firefox
-v	Verbose output	killall -v firefox

5. fuser – Identify processes using files

Option	Description	Example
-k	Kill processes using file	fuser -k /mnt/data
-v	Verbose output	fuser -v /var/log/messages

6. bg – Resume a Suspended Job in Background

Option	Description	Example
(no option)	Resume the last suspended job in background	bg
<job>	Resume a specific job	bg %2

7. fg – Bring a Background Job to Foreground

Option	Description	Example
(no option)	Bring most recent job to foreground	fg
<job>	Bring specific job to foreground	fg %1

8. jobs – List Active Jobs

Option	Description	Example
(no option)	List jobs in current shell	jobs
-l	Show PID of each job	jobs -l
-p	Show only PIDs	jobs -p

9. nohup – Run Command Immune to Hangups

Option	Description	Example
(no option)	Run command ignoring hangup signals	nohup ./script.sh &
-p	Print PID (depends on version)	nohup ./script.sh &
> file 2>&1	Redirect output to file	nohup ./script.sh > output.log 2>&1 &

10. nice – Run Command with Modified Scheduling Priority

Option	Description	Example
-n <priority>	Set nice value (-20 to 19)	nice -n 10 ./script.sh
(no option)	Run with default priority	nice ./script.sh

11. renice – Alter Priority of Running Processes

Option	Description	Example
-n <priority>	Set new nice value	renice -n 5 -p 1234
-u <user>	Change priority for all user processes	renice -n 10 -u john
-g <gid>	Change priority for group processes	renice -n 0 -g 1001

12. pstree – Display a Tree of Processes

Option	Description	Example
(no option)	Show process tree	pstree
-p	Show PIDs	pstree -p
-u	Show user IDs	pstree -u
-a	Show command line arguments	pstree -a

13. watch – Execute Program Periodically

Option	Description	Example
(no option)	Run command every 2 seconds by default	watch df -h
-n <seconds>	Specify interval in seconds	watch -n 5 ls -l
-d	Highlight differences between iterations	watch -d cat /proc/meminfo
-t	Turn off header	watch -t free -h

14. strace – Trace System Calls and Signals

Option	Description	Example
(no option)	Trace program execution	strace ls
-p <PID>	Attach to running process	strace -p 1234
-o <file>	Save output to file	strace -o output.txt ls
-e trace=<syscall>	Trace specific system calls	strace -e trace=open ls
-f	Follow child processes	strace -f ./script.sh
-c	Count system calls	strace -c ls

15. lsof – List Open Files

Option	Description	Example
(no option)	List all open files	lsof
-p <PID>	Show files opened by a specific process	lsof -p 1234
-u <user>	Show files opened by a user	lsof -u john
-i	Show network connections	lsof -i
+D <directory>	Show files opened under directory	lsof +D /var/log

16. pidof – Find Process ID of Running Program

Option	Description	Example
(no option)	Display PID of a program	pidof sshd
-s	Show only the first PID	pidof -s sshd

17. systemctl – Control systemd Services

Option	Description	Example
start <service>	Start a service	sudo systemctl start nginx
stop <service>	Stop a service	sudo systemctl stop nginx
restart <service>	Restart a service	sudo systemctl restart nginx
reload	Reload configuration	systemctl reload nginx
status <service>	Show status of a service	systemctl status nginx

Option	Description	Example
enable <service>	Enable service at boot	sudo systemctl enable nginx
disable <service>	Disable service at boot	sudo systemctl disable nginx
is-active <service>	Check if service is active	systemctl is-active nginx

18. service – Control System Services

Option	Description	Example
start <service>	Start service	sudo service apache2 start
stop <service>	Stop service	sudo service apache2 stop
restart <service>	Restart service	sudo service apache2 restart
status <service>	Show service status	service apache2 status

19. at – Schedule Command to Run Once

Option	Description	Example
(no option)	Enter interactive mode to schedule command	at 15:30
-f <file>	Execute commands from a file	at -f script.sh 18:00
-l	List scheduled jobs	at -l
-d <job>	Delete a scheduled job	at -d 2

👤 User Management Commands in Linux

1. adduser – Add a New User

Option	Description	Example
(no option)	Add a new user interactively	sudo adduser john
--home <dir>	Specify home directory	sudo adduser --home /home/john john
--shell <shell>	Set login shell	sudo adduser --shell /bin/bash john
--ingroup <group>	Assign primary group	sudo adduser --ingroup developers john
--disabled-password	Create account without password	sudo adduser --disabled-password guest

2. deluser – Remove a User

Option	Description	Example
(no option)	Remove a user account	sudo deluser john
--remove-home	Remove user's home directory	sudo deluser --remove-home john
--group	Remove a group	sudo deluser --group developers

3. passwd – Change User Password

Option	Description	Example
(no option)	Change password for current user	passwd
<username>	Change password for specific user	sudo passwd john
-d <username>	Delete user's password	sudo passwd -d john
-l <username>	Lock user account	sudo passwd -l john
-u <username>	Unlock user account	sudo passwd -u john
-e <username>	Expire password immediately	sudo passwd -e john

4. groups – Show Groups a User Belongs To

Option	Description	Example
(no option)	Show groups of current user	groups
<username>	Show groups for a specific user	groups john

5. whoami & who – Display Current Username

Command	Description
whoami	Prints the currently logged-in user (current session user)
who	Prints the all logged-in user
Who -a	Show all details (idle time, login time)

6. su – Switch User

Option	Description	Example
(no option)	Switch to root user	su
<username>	Switch to specific user	su john
-	Start login shell of user	su - john

7. sudo – Execute Command as Another User

Option	Description	Example
(no option)	Execute command as root	sudo apt update
-u <user>	Run command as a specific user	sudo -u john whoami
-i	Start interactive login shell as root	sudo -i
-s	Start a shell as root	sudo -s

8. visudo – Safely Edit the sudoers File

Option	Description	Example
(no option)	Open sudoers file in default editor	sudo visudo
-c	Check sudoers syntax without editing	sudo visudo -c
-f <file>	Edit custom sudoers file	sudo visudo -f /etc/sudoers.d/custom

9. chage – Change User Password Expiry Info

Option	Description	Example
-l <username>	List password aging info	sudo chage -l john
-m <days>	Minimum days before password change	sudo chage -m 5 john
-M <days>	Maximum days before password expiration	sudo chage -M 90 john

Option	Description	Example
-W <days>	Warn user before password expires	sudo chage -W 7 john
-I <days>	Account inactive after expiration	sudo chage -I 10 john
-E <date>	Set account expiry date (YYYY-MM-DD)	sudo chage -E 2025-12-31 john

10. usermod – Modify a User Account

Option	Description	Example
-l <newname>	Change login name	sudo usermod -l johnny john
-d <dir>	Change home directory	sudo usermod -d /home/johnny john
-m	Move contents to new home	sudo usermod -d /home/johnny -m john
-s <shell>	Change login shell	sudo usermod -s /bin/zsh john
-aG <group>	Add user to supplementary groups	sudo usermod -aG sudo,developers john
-U	Unlock user account	sudo usermod -U john
-L	Lock user account	sudo usermod -L john

11. userdel – Delete a User Account

Option	Description	Example
(no option)	Delete user account	sudo userdel john
-r	Delete user and home directory	sudo userdel -r john
-f	Force removal	sudo userdel -f john

12. id – Print User and Group IDs

Option	Description	Example
(no option)	Display current user info	id
<username>	Display info for specific user	id john

13. finger – Display Information About Users

Option	Description	Example
(no option)	Show info of current user	finger

Option	Description	Example
<username>	Show info of specific user	finger john

14. last – Show Last Logged In Users

Option	Description	Example
(no option)	Display login history	last
-n <count>	Limit number of lines	last -n 5
-f <file>	Show log from specific file	last -f /var/log/wtmp.1

15. newgrp – Log in to a New Group

Option	Description	Example
(no option)	Change current group	newgrp developers
-	Start a new login shell with new group	newgrp - developers

16. getent – Get Entries from Administrative Databases

Option	Description	Example
passwd <username>	Get user info	getent passwd john
group <groupname>	Get group info	getent group sudo
hosts <hostname>	Query hosts database	getent hosts example.com

17. chsh – Change Login Shell

Option	Description	Example
(no option)	Change shell for current user interactively	chsh
-s <shell>	Set shell explicitly	chsh -s /bin/zsh john

📦 File Search and Text Processing Commands

1. locate – Find Files by Name

Option	Description	Example
(no option)	Search files using the database	locate file.txt
-i	Case-insensitive search	locate -i README
-c	Count matching entries	locate -c log
-r <pattern>	Search using regular expressions	locate -r ".*\.conf"
--limit <N>	Limit number of results	locate --limit 10 report

2. sed – Stream Editor for Text Transformations

Option	Description	Example
(no option)	Basic substitution	sed 's/foo/bar/' file.txt
-i	Edit file in-place	sed -i 's/foo/bar/' file.txt
-n	Suppress automatic printing	sed -n '1,5p' file.txt
-e <script>	Execute script	sed -e 's/foo/bar/' -e 's/old/new/' file.txt
-r	Enable extended regex	sed -r 's/[0-9]+/NUM/' file.txt
s/pattern/replacement/g	Substitute	sed 's/error/ERROR/g' file.txt
D	Delete matching lines	sed '/^#/d' file.txt
P	Print matching lines	sed -n '/root/p' /etc/passwd

3. awk – Pattern Scanning and Processing Language

Option	Description	Example
{print $1}	Print specific column	awk '{print $1}' file.txt
-F <delimiter>	Specify field separator	awk -F: '{print $1}' /etc/passwd
$NF	Print last field	awk '{print $NF}' file.txt
NR	Record (line) number	awk 'NR==5' file.txt
length($0)	Length of line	awk '{print length($0)}' file.txt
'{pattern}{action}'	Pattern/action syntax	awk '/error/ {print $0}' file.log
'{sum += $1} END {print sum}'	Perform calculations	awk '{sum+=$3} END {print sum}' data.txt

4. head – Output the First Part of Files

Option	Description	Example
(no option)	Show first 10 lines	head file.txt
-n <lines>	Show specific number of lines	head -n 5 file.txt
-c <bytes>	Show first N bytes	head -c 20 file.txt
-q	Suppress headers when multiple files	head -q file1 file2

5. tail – Output the Last Part of Files

Option	Description	Example
(no option)	Show last 10 lines	tail file.txt
-n <lines>	Show specific number of lines	tail -n 20 file.txt
-f	Follow file in real-time	tail -f /var/log/syslog
-c <bytes>	Show last N bytes	tail -c 50 file.txt
--pid=<PID>	Terminate when process ends	tail -f --pid=1234 /var/log/syslog

6. tr – Translate or Delete Characters

Option	Description	Example
(no option)	Translate characters	`echo "abc"
-d	Delete characters	`echo "abc123"
-s	Squeeze repeated characters	`echo "aaabbb"
-c	Complement set	`echo "abc123"

7. fmt – Simple Text Formatter

Option	Description	Example
(no option)	Wrap text to default width	fmt file.txt
-w <width>	Set output width	fmt -w 50 file.txt
-c	Do not split sentences across lines	fmt -c file.txt
-u	Uniform spacing	fmt -u file.txt

8. nl – Number Lines of Files

Option	Description	Example
(no option)	Number lines	nl file.txt
-b <style>	Number body lines (a=all, t=non-blank)	nl -b t file.txt
-v <number>	Start numbering from N	nl -v 100 file.txt
-n <format>	Line number format (ln, rn, rz)	nl -n rz file.txt

9. join – Join Lines of Two Files on a Common Field

Option	Description	Example
(no option)	Join two files on first field	join file1.txt file2.txt
-1 <field>	Field in first file	join -1 2 file1.txt file2.txt
-2 <field>	Field in second file	join -2 3 file1.txt file2.txt
-t <delimiter>	Specify field delimiter	join -t: file1.txt file2.txt
-a <file>	Include unpaired lines	join -a1 file1 file2

10. shuf – Generate Random Permutations

Option	Description	Example
(no option)	Shuffle lines of a file	shuf file.txt
-n <count>	Print only N lines	shuf -n 5 file.txt
-i <lo-hi>	Shuffle range of numbers	shuf -i 1-10
-o <file>	Save output to file	shuf file.txt -o shuffled.txt

11. od – Dump Files in Octal and Other Formats

Option	Description	Example
(no option)	Default octal dump	od file.bin
-c	ASCII characters	od -c file.bin
-b	Octal bytes	od -b file.bin
-x	Hexadecimal words	od -x file.bin

Option	Description	Example
-t <type>	Specify output type (x, d, u, f)	od -t x1 file.bin

12. rev – Reverse Lines of a File

Option	Description	Example
(no option)	Reverse each line	rev file.txt
-s <string>	Reverse string (alternative input)	`echo "hello"

13. readlink / realpath - Resolve symlinks and absolute paths

Option	Description	Output
readlink -f /usr/bin/python	Resolve symlinks	/usr/bin/python3.11
realpath ./script.sh	absolute paths	/home/azher/projects/script.sh

14. less / more – View files page by page

Option	Description	Example
less	Resolve symlinks	less /var/log/messages
more	absolute paths	more /var/log/messages

🔴 Disk Usage and Management Commands

1. fdisk – Partition Table Manipulator

Option	Description	Example
(no option)	Interactive mode on a device	sudo fdisk /dev/sda
-l	List partitions on all devices	sudo fdisk -l
-u	Display sectors (legacy)	sudo fdisk -u /dev/sda
-s	Display partition size	sudo fdisk -s /dev/sda1
-t <type>	Specify partition type	sudo fdisk -t ext4 /dev/sda

2. mount – Mount a File System

Option	Description	Example
(no option)	Mount device to a directory	sudo mount /dev/sda1 /mnt
-t <type>	Specify file system type	sudo mount -t ext4 /dev/sda1 /mnt
-o <options>	Mount options (ro, rw, loop, etc.)	sudo mount -o ro /dev/sda1 /mnt
-a	Mount all filesystems in /etc/fstab	sudo mount -a

3. umount – Unmount a File System

Option	Description	Example
(no option)	Unmount mounted device	sudo umount /mnt
-l	Lazy unmount	sudo umount -l /mnt
-f	Force unmount	sudo umount -f /mnt
-a	Unmount all	sudo umount -a

4. fsck – Check and Repair File Systems

Option	Description	Example
(no option)	Check a filesystem	sudo fsck /dev/sda1
-y	Automatically answer yes to fixes	sudo fsck -y /dev/sda1
-n	Do not modify the filesystem	sudo fsck -n /dev/sda1

Option	Description	Example
-f	Force check even if clean	sudo fsck -f /dev/sda1
-C	Show progress	sudo fsck -C /dev/sda1

5. dd – Convert and Copy Files

Option	Description	Example
if=	Input file	dd if=/dev/sda of=/backup.img
of=	Output file	dd if=file.img of=/dev/sdb
bs=	Block size	dd if=file of=copy bs=1M
count=	Number of blocks	dd if=file of=copy bs=1M count=100
status=progress	Show progress	dd if=/dev/zero of=file bs=1M count=100 status=progress

6. parted – Partition Manipulation Program

Option	Description	Example
(no option)	Interactive mode	sudo parted /dev/sda
-l	List partitions	sudo parted -l
mklabel <type>	Create partition table	sudo parted /dev/sda mklabel gpt
mkpart <name> <fs> <start> <end>	Create partition	sudo parted /dev/sda mkpart primary ext4 0% 50%
resizepart <num> <end>	Resize partition	sudo parted /dev/sda resizepart 1 100GB

7. mkfs – Create a File System

Option	Description	Example
-t <type>	Specify filesystem type	sudo mkfs -t ext4 /dev/sda1
-c	Check device for bad blocks	sudo mkfs -t ext4 -c /dev/sda1
-L <label>	Assign filesystem label	sudo mkfs -t ext4 -L DATA /dev/sda1
-F	Force creation	sudo mkfs.ext4 -F /dev/sda1

8. xfs_growfs – Expand XFS filesystem

Option	Description	Example
xfs_growfs <File System>	Grow mounted XFS filesystem expand filesystem to full device size	xfs_growfs /mnt/data

9. tune2fs – Adjust Ext2/3/4 Parameters

Option	Description	Example
-l <device>	List filesystem info	sudo tune2fs -l /dev/sda1
-c <count>	Max mounts before check	sudo tune2fs -c 20 /dev/sda1
-i <interval>	Check interval	sudo tune2fs -i 6m /dev/sda1
-L <label>	Change filesystem label	sudo tune2fs -L DATA /dev/sda1

10. badblocks – Search for Bad Sectors

Option	Description	Example
(no option)	Scan device	sudo badblocks /dev/sda1
-v	Verbose	sudo badblocks -v /dev/sda1
-n	Non-destructive read-write	sudo badblocks -n /dev/sda1
-b <blocksize>	Specify block size	sudo badblocks -b 4096 /dev/sda1

11. resize2fs – Resize Ext2/3/4 File Systems

Option	Description	Example
(no option)	Resize filesystem	sudo resize2fs /dev/sda1 50G
(no size)	Auto-expand to partition size	sudo resize2fs /dev/sda1
-p	Show progress	sudo resize2fs -p /dev/sda1 50G

12. mount -o loop – Mount a File as Filesystem

Option	Description	Example
-o loop	Mount ISO or image file	sudo mount -o loop file.iso /mnt
-t <type>	Specify filesystem type	sudo mount -o loop -t iso9660 file.iso /mnt

13. hdparm – Get/Set SATA/IDE Device Parameters

Option	Description	Example
-i	Show device info	sudo hdparm -i /dev/sda
-t	Test read speed	sudo hdparm -t /dev/sda
-T	Test cache speed	sudo hdparm -T /dev/sda
-I	Detailed device info	sudo hdparm -I /dev/sda
-S <value>	Set standby timeout	sudo hdparm -S 120 /dev/sda

📊 System Monitoring and Logs Commands

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1. dmesg – Print or Control Kernel Ring Buffer

Option	Description	Example
(no option)	Show all kernel messages	dmesg
-C	Clear ring buffer	sudo dmesg -C
-T	Show human-readable timestamps	dmesg -T
-l <level>	Filter by log level	dmesg -l err
-f <facility>	Filter by facility	dmesg -f kern
-n <level>	Set console log level	sudo dmesg -n 3

---

2. journalctl – Query Systemd Journal

Option	Description	Example
(no option)	Show all journal logs	journalctl
-b	Show logs from current boot	journalctl -b
-u <unit>	Show logs for a service	journalctl -u sshd
-f	Follow logs in real-time	journalctl -f
--since <date>	Logs since specific date	journalctl --since "2025-10-01"
-p <priority>	Filter by priority (0-7)	journalctl -p err
-n <lines>	Show last N lines	journalctl -n 50

---

3. syslog – System Log File

Option	Description	Example
(no option)	View system log	cat /var/log/syslog
tail -f	Follow syslog in real-time	tail -f /var/log/syslog
grep <pattern>	Search specific logs	grep ssh /var/log/syslog

---

4. vmstat – Report Virtual Memory Statistics

Option	Description	Example
(no option)	Show single report	vmstat
<delay>	Continuous update every N seconds	vmstat 2
<delay> <count>	Update N times at interval	vmstat 2 5

5. sar – Collect and Report System Activity

Option	Description	Example
-u	CPU utilization report	sar -u 1 5
-r	Memory usage	sar -r
-d	I/O statistics	sar -d
-n DEV	Network interface stats	sar -n DEV
-f <file>	Read from specific data file	sar -u -f /var/log/sa/sa25
-P <CPU>	Specific CPU	sar -P ALL 1 5
-s <time>	Start time	sar -u -s 10:00
-e <time>	End time	sar -u -e 12:00

6. iostat – Report CPU and I/O Statistics

Option	Description	Example
(no option)	Show CPU and device stats	iostat
<interval>	Refresh every N seconds	iostat 2
<interval> <count>	N updates at interval	iostat 2 5
-x	Extended statistics	iostat -x
-d	Device statistics only	iostat -d

7. mpstat – Report Processor Statistics

Option	Description	Example
(no option)	Show CPU usage	mpstat
<interval>	Refresh every N seconds	mpstat 2

Option	Description	Example
<interval> <count>	N updates at interval	mpstat 2 5
-P ALL	Show all CPUs separately	mpstat -P ALL 2 5

8. pidstat – Report Statistics by Process

Option	Description	Example
(no option)	Show CPU usage by process	pidstat
<interval>	Refresh every N seconds	pidstat 2
<interval> <count>	N updates at interval	pidstat 2 5
-u	CPU usage	pidstat -u
-r	Memory usage	pidstat -r
-d	I/O statistics	pidstat -d

9. watch – Execute Command Periodically

Option	Description	Example
(no option)	Run command every 2 seconds	watch ls -l
-n <seconds>	Set interval	watch -n 5 df -h
-d	Highlight changes	watch -d cat /proc/meminfo
-t	Disable header	watch -t free -h

10. iftop – Display Bandwidth Usage (requires installation)

Option	Description	Example
(no option)	Run on default interface	sudo iftop
-i <interface>	Specify network interface	sudo iftop -i eth0
-n	Do not resolve hostnames	sudo iftop -n
-P	Show ports	sudo iftop -P
-B	Display in bytes/sec	sudo iftop -B

11. nload – Visualize Network Traffic (requires installation)

Option	Description	Example
(no option)	Launch nload on default interface	nload
-u <unit>	Display in Kbps/Mbps	nload -u M
-t <ms>	Refresh interval	nload -t 500
-m	Multiple interfaces mode	nload -m
-i <max>	Max incoming bandwidth	nload -i 1000

12. iotop – Display I/O Usage by Processes (requires installation)

Option	Description	Example
(no option)	Show real-time I/O	sudo iotop
-o	Show only processes doing I/O	sudo iotop -o
-b	Batch mode	sudo iotop -b
-n <count>	Number of iterations	sudo iotop -b -n 5
-d <seconds>	Delay between updates	sudo iotop -d 2

🔧 Miscellaneous Linux Commands

1. bc – Arbitrary Precision Calculator

Option	Description	Example
(no option)	Start interactive calculator	bc
-l	Load math library for advanced functions	`echo "scale=5; 3/7"
-q	Quiet mode (no startup message)	bc -q
-i <file>	Execute commands from file	bc -i calc.txt

2. expr – Evaluate Expressions

Option	Description	Example
(no option)	Evaluate arithmetic	expr 3 + 5
:	Regex match	expr "hello" : 'h.*o'
substr	Extract substring	expr substr "abcdef" 2 3
length	Get string length	expr length "hello"

3. yes – Output a String Repeatedly

Option	Description	Example
(no option)	Print y repeatedly	yes
<string>	Repeat custom string	yes Hello
Ctrl+C	Stop output	`yes

4. sleep – Delay Execution

Option	Description	Example
<seconds>	Sleep for N seconds	sleep 5
<fraction>	Sleep with decimal seconds	sleep 0.5
<seconds>	Combine multiple values	sleep 1h 30m 10s

5. echo $PATH – Display Current PATH

Option	Description	Example
(no option)	Show PATH variable	echo $PATH
(with text)	Print text	echo "Hello World"
-n	Do not print newline	echo -n "Hello"
-e	Enable escape characters	echo -e "Line1\nLine2"

6. env – Display Environment Variables

Option	Description	Example
(no option)	Show all environment variables	env
<var>=<value>	Run command with modified environment	env PATH=/bin ls
-i	Start with empty environment	env -i bash

7. printenv – Print Environment Variables

Option	Description	Example
(no option)	Print all environment variables	printenv
<variable>	Print specific variable	printenv PATH

8. set – Set Shell Options and Parameters

Option	Description	Example
(no option)	Display all shell variables	set
-o <option>	Enable shell option	set -o noclobber
+o <option>	Disable shell option	set +o noclobber
<name>=<value>	Assign variable	set VAR=value

9. trap – Execute Command on Signal

Option	Description	Example
<command> <signal>	Run command on signal	trap "echo Caught SIGINT" SIGINT
-l	List all signals	trap -l

Option	Description	Example
-	Reset trap	trap - SIGINT

10. export – Set Environment Variables

Option	Description	Example
<var>	Export variable to child processes	export PATH=$PATH:/new/path
-p	List exported variables	export -p

11. unset – Remove Variable or Function

Option	Description	Example
<var>	Remove variable	unset VAR
-f	Remove function	unset -f myfunc

12. source – Execute Commands in Current Shell

Option	Description	Example
<file>	Execute commands from file	source ~/.bashrc
.	Alternative syntax	. ~/.bashrc

13. sh – Start Bourne Shell

Option	Description	Example
(no option)	Start interactive shell	sh
<script>	Execute script	sh script.sh
-c	Execute command	sh -c "echo Hello"

14. bash – Start Bash Shell

Option	Description	Example
(no option)	Start interactive bash shell	bash
<script>	Execute script	bash script.sh
-c	Execute command	bash -c "echo Hello"
--login	Start as login shell	bash --login

15. fgrep – Search Fixed Strings in Files

Option	Description	Example
(no option)	Search fixed string	fgrep "text" file.txt
-i	Ignore case	fgrep -i "text" file.txt
-v	Show lines NOT matching	fgrep -v "text" file.txt
-r	Recursive search	fgrep -r "text" /dir

16. egrep – Extended Grep for Regex

Option	Description	Example
(no option)	Search using extended regex	`egrep "error
-i	Ignore case	`egrep -i "error
-v	Show lines NOT matching	egrep -v "DEBUG" file.txt
-r	Recursive search	`egrep -r "TODO
-n	Show line numbers	egrep -n "pattern" file.txt

📦 Package Management (Debian/Ubuntu)

1. apt update – Update Package Index

Option	Description	Example
(no option)	Updates list of available packages	sudo apt update
-y	Assume "yes" for all prompts	sudo apt -y update
-qq	Quiet mode	sudo apt -qq update

2. apt upgrade – Upgrade Installed Packages

Option	Description	Example
(no option)	Upgrade all upgradable packages	sudo apt upgrade
-y	Automatically confirm upgrade	sudo apt upgrade -y
--with-new-pkgs	Install new packages if needed	sudo apt upgrade --with-new-pkgs

3. apt install – Install a Package

Option	Description	Example
<pkg>	Install specified package	sudo apt install nginx
-y	Assume "yes" for all prompts	sudo apt install -y curl
--reinstall	Reinstall a package	sudo apt install --reinstall vim
--no-install-recommends	Avoid optional dependencies	sudo apt install --no-install-recommends firefox

4. apt remove – Remove a Package

Option	Description	Example
<pkg>	Remove package but keep config files	sudo apt remove nginx
-y	Automatically confirm removal	sudo apt remove -y apache2
--purge	Remove package and config files	sudo apt remove --purge mysql-server

5. apt search – Search for a Package

Option	Description	Example
<keyword>	Search for packages containing keyword	apt search python3

Option	Description	Example
--names-only	Search only in package names	apt search --names-only nginx

6. apt show – Display Package Details

Option	Description	Example
\<pkg\>	Show detailed info about a package	apt show git
Multiple packages	Show info for multiple packages	apt show nginx apache2

7. apt autoremove – Remove Unused Packages

Option	Description	Example
(no option)	Remove packages installed automatically but no longer needed	sudo apt autoremove
-y	Automatically confirm removal	sudo apt autoremove -y

8. dpkg -i – Install a .deb Package

Option	Description	Example
-i	Install package file	sudo dpkg -i package.deb
--configure	Reconfigure packages	sudo dpkg --configure -a
--force-all	Force installation even if issues	sudo dpkg -i --force-all package.deb

9. dpkg --list – List Installed Packages

Option	Description	Example
--list	List all installed packages	dpkg --list
-l \<pattern\>	Filter packages by name	dpkg -l nginx
-L \<pkg\>	List files installed by package	dpkg -L vim

10. apt-cache policy – Show Package Version Info

Option	Description	Example
\<pkg\>	Show installed and candidate version	apt-cache policy openssh-server
(no option)	Show all available packages	apt-cache policy

11. apt-mark hold – Prevent Package Upgrade

Option	Description	Example
<pkg>	Mark package to hold updates	sudo apt-mark hold nginx
Multiple packages	Hold multiple	sudo apt-mark hold nginx apache2

12. apt-mark unhold – Allow Package Upgrade

Option	Description	Example
<pkg>	Remove hold status	sudo apt-mark unhold nginx
Multiple packages	Unhold multiple	sudo apt-mark unhold nginx apache2

13. apt list --upgradable – List Upgradable Packages

Option	Description	Example
--upgradable	List only upgradable packages	apt list --upgradable
--installed	List installed packages	apt list --installed
--all-versions	Show all versions available	apt list --all-versions

14. apt full-upgrade – Intelligent Upgrade

Option	Description	Example
(no option)	Upgrade packages and manage dependencies automatically	sudo apt full-upgrade
-y	Automatically confirm	sudo apt full-upgrade -y

15. apt edit-sources – Edit Repository Sources

Option	Description	Example
(no option)	Opens /etc/apt/sources.list for editing	sudo apt edit-sources
(alternative)	Manually edit using nano	sudo nano /etc/apt/sources.list

📦 Package Management (Red Hat / CentOS / RHEL)

1. yum update – Update Packages

Option	Description	Example
(no option)	Update all installed packages to latest version	sudo yum update
-y	Automatically answer "yes" to prompts	sudo yum update -y
--security	Apply only security updates	sudo yum update --security
--exclude=<pkg>	Exclude specific package from update	sudo yum update --exclude=httpd

2. yum install – Install a Package

Option	Description	Example
<pkg>	Install specified package	sudo yum install httpd
-y	Automatically confirm installation	sudo yum install -y git
--skip-broken	Skip packages with dependency issues	sudo yum install nginx --skip-broken
--enablerepo=<repo>	Enable a specific repository	sudo yum install epel-release --enablerepo=epel

3. yum remove – Remove a Package

Option	Description	Example
<pkg>	Remove the specified package	sudo yum remove httpd
-y	Automatically confirm removal	sudo yum remove -y nginx
--remove-leaves	Remove unused dependencies	sudo yum remove --remove-leaves

4. dnf update – Update Packages (Newer RHEL/CentOS 8+)

Option	Description	Example
(no option)	Update all system packages	sudo dnf update
-y	Assume "yes" for all prompts	sudo dnf update -y
--refresh	Refresh metadata before updating	sudo dnf update --refresh

5. dnf install – Install a Package (Newer Versions)

Option	Description	Example
<pkg>	Install specified package	sudo dnf install tree
-y	Automatically confirm installation	sudo dnf install -y vim
--setopt=install_weak_deps=False	Skip weak dependencies	sudo dnf install httpd --setopt=install_weak_deps=False
--enablerepo=<repo>	Use specific repo	sudo dnf install php --enablerepo=epel

6. rpm -i – Install an RPM Package

Option	Description	Example
-i	Install package file	sudo rpm -i package.rpm
-v	Verbose output	sudo rpm -iv package.rpm
-h	Show progress with hash marks	sudo rpm -ivh package.rpm
--replacepkgs	Reinstall even if already installed	sudo rpm -ivh --replacepkgs package.rpm

7. rpm -qa – Query All Installed RPM Packages

Option	Description	Example
-qa	List all installed RPMs	rpm -qa
`	grep <pkg>`	Filter for a specific package

8. yum search – Search for a Package

Option	Description	Example
<keyword>	Search packages containing keyword	yum search mysql
all	Search all repositories	yum search all java

9. yum clean all – Clean Cached Files

Option	Description	Example
all	Clean all cached data	sudo yum clean all
packages	Remove downloaded packages only	sudo yum clean packages

Option	Description	Example
metadata	Remove repository metadata	sudo yum clean metadata

10. dnf search – Search for a Package (RHEL 8+)

Option	Description	Example
<keyword>	Search available packages	dnf search nginx
--available	Show only available (not installed) packages	dnf search --available docker

11. dnf autoremove – Remove Unused Packages

Option	Description	Example
(no option)	Remove dependencies no longer needed	sudo dnf autoremove
-y	Automatically confirm removal	sudo dnf autoremove -y

12. rpm -q – Query a Specific RPM Package

Option	Description	Example
<pkg>	Check if a package is installed	rpm -q httpd
-qi	Show detailed package info	rpm -qi bash
-ql	List files installed by package	rpm -ql vim
-qc	List configuration files	rpm -qc ssh

13. yum info – Display Information About a Package

Option	Description	Example
<pkg>	Show package details	yum info nginx
available	Show only available packages	yum info available git

14. dnf info – Display Information About a Package (Newer Versions)

Option	Description	Example
<pkg>	Show package details	dnf info httpd
installed	Show info about installed package	dnf info installed curl

15. yum history – Show Transaction History

Option	Description	Example
(no option)	Show list of all transactions	yum history
info <ID>	Show details for specific transaction	yum history info 15
undo <ID>	Undo a transaction	sudo yum history undo 15
redo <ID>	Redo a transaction	sudo yum history redo 15
list	List all transaction history	yum history list

16. snap – Install Snap packages (Install universal packages across Linux distributions)

Option	Description	Example
install	Install snap	snap install code --classic
remove	Remove snap	snap remove code
list	List installed snaps	snap list
refresh	Update snaps	snap refresh code

17. flatpak – Flatpak package manager (Universal package management like Snap)

Option	Description	Example
install	Install flatpak	flatpak install flathub org.gimp.GIMP
uninstall	Remove flatpak	flatpak uninstall org.gimp.GIMP
list	List installed flatpaks	flatpak list
update	Update flatpaks	flatpak update

18. reboot / shutdown – Restart or shutdown

Command	Description
reboot	restart system
shutdown -h now	Halt immediately
shutdown -r +10	Restart after 10 minutes
shutdown -c	Cancel scheduled shutdown

🔒 Security and Permissions Commands

1. ssh-keygen – Generate SSH Keys

Option / Syntax	Description	Example
ssh-keygen	Generate a new RSA SSH key pair (default: ~/.ssh/id_rsa)	ssh-keygen
-t rsa	Specify key type (RSA, DSA, ECDSA, ED25519)	ssh-keygen -t rsa
-b 4096	Specify key length (in bits)	ssh-keygen -t rsa -b 4096
-C "comment"	Add a label/comment (e.g., email)	ssh-keygen -t ed25519 -C "admin@server"
-f <filename>	Specify key file name/path	ssh-keygen -f ~/.ssh/myserver_key
-N <passphrase>	Set or change key passphrase	ssh-keygen -N "mypassword"
-y	Extract public key from a private key	ssh-keygen -y -f ~/.ssh/id_rsa > id_rsa.pub

2. ssh-copy-id – Install Public Key on Remote Machine

Option / Syntax	Description	Example
ssh-copy-id user@host	Copy your public SSH key to a remote host for passwordless login	ssh-copy-id root@192.168.1.10
-i <keyfile>	Specify which public key to copy	ssh-copy-id -i ~/.ssh/myserver_key.pub user@server

3. setfacl – Set File Access Control Lists (ACLs)

Option / Syntax	Description	Example
setfacl -m u:<user>:<perm> <file>	Give specific user permissions (r, w, x)	setfacl -m u:john:rwx /data/file1
setfacl -m g:<group>:<perm> <file>	Assign group permissions	setfacl -m g:devs:rx /data/app
setfacl -x u:<user> <file>	Remove a user's ACL	setfacl -x u:john /data/file1
setfacl -b <file>	Remove all ACL entries	setfacl -b /data/app
setfacl -R -m u:john:rwx <dir>	Apply recursively	setfacl -R -m u:john:rwx /var/www

4. getfacl – Get File Access Control Lists

Option / Syntax	Description	Example
getfacl <file>	Show ACLs for a file	getfacl /data/file1
getfacl -R <directory>	Display ACLs recursively	getfacl -R /var/www

5. iptables – Configure Packet Filtering Rules

Option / Syntax	Description	Example
iptables -L	List all rules	sudo iptables -L -v -n
iptables -A INPUT -p tcp --dport 22 -j ACCEPT	Allow SSH connections	sudo iptables -A INPUT -p tcp --dport 22 -j ACCEPT
iptables -A INPUT -p tcp --dport 80 -j ACCEPT	Allow HTTP traffic	sudo iptables -A INPUT -p tcp --dport 80 -j ACCEPT
iptables -A INPUT -j DROP	Drop all other incoming traffic	sudo iptables -A INPUT -j DROP
-D	Delete rule	iptables -D INPUT -p tcp --dport 22 -j ACCEPT
-I	Insert rule at position	iptables -I INPUT 1 -p tcp --dport 80 -j ACCEPT
iptables-save > /etc/iptables/rules.v4	Save current rules	sudo iptables-save > /etc/iptables/rules.v4
iptables -F	Flush (delete) all rules	sudo iptables -F

6. firewall-cmd – Manage Firewalld Rules (RHEL/CentOS/Fedora)

Option / Syntax	Description	Example
firewall-cmd --state	Check if firewalld is running	sudo firewall-cmd --state
firewall-cmd --list-all	List current zone settings	sudo firewall-cmd --list-all
firewall-cmd --add-port=8080/tcp --permanent	Open port 8080 permanently	sudo firewall-cmd --add-port=8080/tcp --permanent
firewall-cmd --reload	Reload firewall after changes	sudo firewall-cmd --reload
firewall-cmd --zone=public --add-service=http	Allow HTTP service	sudo firewall-cmd --zone=public --add-service=http

7. ufw – Uncomplicated Firewall (Ubuntu/Debian)

Option / Syntax	Description	Example
ufw enable	Enable UFW	sudo ufw enable
ufw status	Check firewall status	sudo ufw status verbose
ufw allow 22/tcp	Allow SSH	sudo ufw allow 22/tcp

Option / Syntax	Description	Example
ufw allow from <ip>	Allow access from specific IP	sudo ufw allow from 192.168.1.100
ufw deny 80	Deny HTTP port	sudo ufw deny 80
ufw delete allow 22/tcp	Remove a rule	sudo ufw delete allow 22/tcp
ufw disable	Disable UFW	sudo ufw disable

8. fail2ban – Protect Against Brute-Force Attacks

Option / Syntax	Description	Example
fail2ban-client status	View active jails	sudo fail2ban-client status
fail2ban-client status sshd	View details for SSH jail	sudo fail2ban-client status sshd
fail2ban-client set sshd unbanip <IP>	Unban an IP	sudo fail2ban-client set sshd unbanip 192.168.1.10
Config file location	/etc/fail2ban/jail.local	Edit configuration as needed
start / stop	Start or stop fail2ban service	systemctl start fail2ban

9. auditd – Linux Auditing System

Option / Syntax	Description	Example
systemctl start auditd	Start audit daemon	sudo systemctl start auditd
auditctl -l	List current audit rules	sudo auditctl -l
auditctl -w <path> -p <perm> -k <key>	Watch file for access	sudo auditctl -w /etc/passwd -p war -k passwd_changes
ausearch -k <key>	Search audit logs by key	sudo ausearch -k passwd_changes
aureport -f	Report accessed files	sudo aureport -f
-a <action> -S <syscall>	Audit a syscall	auditctl -a always,exit -S open

10. chattr – Change File Attributes

Option / Syntax	Description	Example
chattr +i <file>	Make file immutable (cannot be modified or deleted)	sudo chattr +i /etc/passwd
chattr -i <file>	Remove immutable attribute	sudo chattr -i /etc/passwd
chattr +a <file>	Allow only appending data	sudo chattr +a /var/log/messages
lsattr	List file attributes	lsattr /etc/passwd

11. rsync – Fast Incremental File Copy and Backup

Option / Syntax	Description	Example
rsync -av <source> <dest>	Archive and verbose mode	rsync -av /home/data /backup/
rsync -avz <src> <user>@<host>:<dest>	Copy files over SSH	rsync -avz /data/ user@server:/backup/
rsync --delete	Delete files not present in source	rsync -av --delete /source/ /dest/
rsync -n	Dry-run (show what will happen)	rsync -av --dry-run /src /dest
-e	Specify SSH	rsync -av -e "ssh -p 2222" /local/dir remote:/backup/dir

12. cpio – Copy Files via Standard Input/Output

Option / Syntax	Description	Example
cpio -ov > backup.cpio	Create archive from file list	find . -type f | cpio -ov > backup.cpio
cpio -id < backup.cpio	Extract files from archive	cpio -id < backup.cpio
cpio -tv < backup.cpio	List contents of archive	cpio -tv < backup.cpio

13. chroot – Change root directory (Run a process in an isolated environment.)

Option / Syntax	Description	Example
chroot	start bash in new root filesystem	chroot /mnt/newroot /bin/bash

14. openssl – Certificates & encryption (Generate keys, certificates, and test encryption)

Option	Description	Example
req -new -x509 -days 365 -key key.pem -out cert.pem	Create self-signed cert	openssl req -new -x509 -days 365 -key key.pem -out cert.pem
s_client -connect <host:port>	Test SSL connection	openssl s_client -connect google.com:443
genrsa	Generate RSA key	openssl genrsa -out key.pem 2048

15. gpg – Encrypt / decrypt files (Secure files with public/private key encryption)

Command	Example
gpg --gen-key	Generate key pair

Command	Example
gpg -e -r azher file.txt	Encrypt for user azher
gpg -d file.txt.gpg	Decrypt file
gpg --list-keys	List keys

🐚 Shell Scripting and Automation Commands

1. source script.sh – Run a Script in the Current Shell

Option / Syntax	Description	Example
source script.sh	Run the script **in the current shell**, preserving environment variables	source ~/.bashrc
. script.sh	Alternative to source	. env_setup.sh

2. for – Loop Through a Set of Commands

Option / Syntax	Description	Example
for var in list; do commands; done	Loop through items in a list	for file in *.log; do echo "$file"; done
for i in {1..5}; do commands; done	Loop over a sequence	for i in {1..5}; do echo "Count $i"; done
for ((i=1; i<=5; i++)); do commands; done	C-style for loop	for ((i=1; i<=5; i++)); do echo "Loop $i"; done

Example Output:

Count 1

Count 2

Count 3

Count 4

Count 5

3. while – Execute Commands as Long as a Condition is True

Option / Syntax	Description	Example
while [condition]; do commands; done	Loop while a condition remains true	while [$count -lt 5]; do echo $count; ((count++)); done
while read line; do commands; done < file	Read a file line by line	while read line; do echo $line; done < names.txt

4. if – Execute Commands Based on a Condition

Option / Syntax	Description	Example
if [condition]; then commands; fi	Run commands if condition is true	if [-f /etc/passwd]; then echo "File exists"; fi
if [condition]; then ... else ... fi	If-else statement	if [$USER == "root"]; then echo "Admin"; else echo "User"; fi

Option / Syntax	Description	Example
if [condition1]; then ... elif [condition2]; then ... fi	If-elif-else structure	if [$age -lt 18]; then echo "Minor"; elif [$age -lt 60]; then echo "Adult"; else echo "Senior"; fi

5. case – Execute Commands Based on a Pattern

Option / Syntax	Description	Example
case $var in pattern1) commands ;; pattern2) commands ;; *) default ;; esac	Compare a variable against multiple patterns	

Example:

case $1 in

start) echo "Starting service" ;;

stop) echo "Stopping service" ;;

restart) echo "Restarting service" ;;

*) echo "Usage: $0 {start|stop|restart}" ;;

Esac

6. set -e – Exit Immediately on Error

Option / Syntax	Description	Example
set -e	Exit script immediately if any command fails	

Example:

set -e

cp file1.txt /backup/

rm important_file.txt # If this fails, script stops

7. set -x – Print Commands as They Are Executed

Option / Syntax	Description
set -x	Enable debugging (shows commands as they run
Set +x	Stop debugging (shows commands as they run

8. cron / crontab – Scheduled backups

Command	Example
crontab -e	Edit user cron jobs

Command	Example
crontab -l	List cron jobs
systemctl status crond	Check cron service status

-------------------------------------- THE END --