

1. File and Directory Management

ls – List directory contents

cd – Change directory

pwd – Print working directory

cp – Copy files and directories

mv – Move or rename files and directories

rm – Remove files or directories

mkdir – Make directories

rmdir – Remove empty directories

touch – Change file timestamps or create empty files

find – Search for files in a directory hierarchy

locate – Find files by name

tree – Display directories in a tree-like format

chmod – Change file permissions

chown – Change file owner and group

chgrp – Change group ownership

stat – Display file or file system status

2. File Viewing and Editing

cat – Concatenate and display file content

tac – Concatenate and display file content in reverse

more – View file content interactively (page by page)

less – View file content interactively (scrollable)

head – Output the first part of a file

tail – Output the last part of a file

nano – Text editor (terminal-based)

vim / vi – Advanced text editors

emacs – Text editor

grep – Search text using patterns

sed – Stream editor for filtering and transforming text

awk – Pattern scanning and processing language

cut – Remove sections from each line of files

sort – Sort lines of text files

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uniq – Report or omit repeated lines

3. Process Management

ps – Report a snapshot of current processes

top – Display Linux tasks

htop – Interactive process viewer (advanced top)

kill – Send a signal to a process, typically to terminate

killall – Terminate processes by name

bg – Resume a suspended job in the background

fg – Bring a job to the foreground

jobs – List active jobs

nice – Run a program with modified scheduling priority

renice – Alter priority of running processes

uptime – Show how long the system has been running

time – Measure program running time

4. Disk Management

df – Report file system disk space usage

du – Estimate file space usage

fdisk – Partition table manipulator for Linux

lsblk – List information about block devices

mount – Mount a file system

umount – Unmount a file system

parted – A partition manipulation program

mkfs – Create a file system

fsck – File system consistency check and repair

blkid – Locate/print block device attributes

5. Networking

ifconfig – Configure network interfaces

ip – Show/manipulate routing, devices, and tunnels

ping – Send ICMP Echo requests to network hosts

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netstat – Network statistics

ss – Socket statistics (faster than netstat)

traceroute – Trace the route packets take to a network host

nslookup – Query Internet name servers interactively

dig – DNS lookup utility

wget – Non-interactive network downloader

curl – Transfer data with URLs

scp – Secure copy files between hosts

ssh – Secure shell for remote login

ftp – File Transfer Protocol client

6. User and Group Management

useradd – Add a user to the system

usermod – Modify a user account

userdel – Delete a user account

groupadd – Add a group to the system

groupdel – Delete a group

passwd – Change user password

chage – Change user password expiry information

whoami – Print the current logged-in user

who – Show who is logged in

w – Show who is logged in and what they're doing

id – Display user and group information

groups – Show user's groups

7. System Information and Monitoring

uname – Print system information

hostname – Show or set the system's hostname

uptime – How long the system has been running

dmesg – Boot and system messages

free – Display memory usage

top – Display Linux tasks

vmstat – Report virtual memory statistics

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lscpu – Display information about the CPU architecture

lsusb – List USB devices

lspci – List PCI devices

lshw – List hardware configuration

8. Archiving and Compression

tar – Archive files

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tar -czf archive.tar.gz /path/to/directory – Compress files using gzip

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tar -xzf archive.tar.gz – Extract gzipped tarball

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tar -cf archive.tar /path/to/directory – Create a tarball

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`tar -xf archive.tar` – Extract tarball

zip – Package and compress files into a ZIP archive

unzip – Extract files from a ZIP archive

gzip – Compress files using the gzip algorithm

gunzip – Decompress files compressed with gzip

bzip2 – Compress files using the bzip2 algorithm

bunzip2 – Decompress files compressed with bzip2

xz – Compress files using the xz algorithm

unxz – Decompress files compressed with xz

9. Package Management (Depends on Distribution)

Debian-based (e.g., Ubuntu)

apt-get – APT package handling utility

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`apt-get install <package>` – Install a package

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`apt-get update` – Update package list

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`apt-get upgrade` – Upgrade installed packages

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`apt-get remove <package>` – Remove a package

apt-cache – Query APT cache

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`apt-cache search <package>` – Search for a package

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`apt-cache show <package>` – Show package details

Red Hat-based (e.g., CentOS, Fedora)

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yum – Package manager for RPM-based systems

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yum install <package> – Install a package

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yum update – Update installed packages

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yum remove <package> – Remove a package

dnf – Next-generation package manager (Fedora, CentOS 8+)

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dnf install <package> – Install a package

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dnf update – Update installed packages

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dnf remove <package> – Remove a package

General Commands

rpm – RPM package manager

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rpm -i <package.rpm> – Install an RPM package

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rpm -e <package> – Remove an RPM package

dpkg – Debian package manager

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dpkg -i <package.deb> – Install a Debian package

◦

dpkg -r <package> – Remove a Debian package

System Services and Daemon Management

systemctl – Control the systemd system and service manager

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systemctl start <service> – Start a service

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`systemctl stop <service>` – Stop a service

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`systemctl restart <service>` – Restart a service

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`systemctl enable <service>` – Enable a service to start on boot

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`systemctl disable <service>` – Disable a service from starting on boot

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`systemctl status <service>` – Check service status

service – Older service management command (used in non systemd systems)

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`service <service> start` – Start a service

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`service <service> stop` – Stop a service

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`service <service> restart` – Restart a service

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`service <service> status` – Check service status

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10. Scheduling Tasks

cron – Daemon for running scheduled commands

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`crontab -e` – Edit cron jobs for the current user

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`crontab -l` – List the current user's cron jobs

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`crontab -r` – Remove the current user's cron jobs

at – Run commands at a specified time

- at 09:00 – Schedule a command to run at 09:00 AM
- batch** – Run commands when the system load is low
- sleep** – Delay for a specified time
- sleep 5s – Sleep for 5 seconds

11. File Permissions and Security

- chmod** – Change file permissions
- chown** – Change file owner and group
- chgrp** – Change the group ownership of a file
- umask** – Set default permissions for new files
- setfacl** – Set file access control lists (ACL)
- getfacl** – Get file access control lists (ACL)
- sudo** – Execute a command as another user (usually root)
- visudo** – Edit the sudoers file safely
- passwd** – Change a user's password
- sudoers** – Manage sudo access for users
- gpasswd** – Administer group password
- ss** – Display socket statistics (for secure network connections)

12. System Backup and Restore

- rsync** – Remote file and directory synchronization
- rsync -avz source/ destination/ – Synchronize files
- rsync -avz -e ssh source/ user@remote:/destination/ –
Sync
over SSH

cpio – Copy files to and from archives

dd – Low-level copying and backup of entire

filesystems

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- **dd if=/dev/sda of=/path/to/backup.img** – Backup a disk/partition

- **dd if=/path/to/backup.img of=/dev/sda** – Restore a disk/partition

13. System Diagnostics and Troubleshooting

dmesg – Print the kernel ring buffer messages (system boot and

hardware-related messages)

journalctl – Query and view logs from systemd's journal

strace – Trace system calls and signals

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strace <command> – Trace a command's system calls

lsof – List open files (useful for debugging)

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lsof <file> – Show processes using a specific file

vmstat – Report virtual memory statistics

iostat – Report CPU and I/O statistics

mpstat – Report CPU usage statistics

pidstat – Report statistics by process

free – Display memory usage

uptime – How long the system has been running

watch – Execute a program periodically, showing output

- `watch -n 1 free` – Watch memory usage every second

lshw – List hardware configuration

htop – Interactive process viewer (better than top)

netstat – Network statistics (deprecated in favor of ss)

ss – Show socket statistics (more efficient than netstat)

14. Networking & Remote Management

ifconfig – Configure network interfaces (older command, replaced by ip)

ip – A more modern alternative for managing network interfaces and routing

- `ip addr` – Show IP addresses

- `ip link` – Show or manipulate network interfaces

- `ip route` – Show or manipulate routing tables

ss – Display socket statistics (useful for diagnosing network issues)

nmap – Network exploration tool (can be used for security auditing)

telnet – User interface to the TELNET protocol (less common nowadays)

nc (Netcat) – Network utility for reading and writing from network

connections

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`nc -l -p 1234` – Listen on port 1234

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`nc <host> <port>` – Connect to a host and port

iptables – Administration tool for IPv4 packet filtering and NAT

(Network Address Translation)

firewalld – Frontend for managing firewall rules (used in some

distros like Fedora and CentOS)

ufw – Uncomplicated firewall (front-end for iptables)

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`ufw enable` – Enable firewall

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`ufw allow <port>` – Allow traffic on a specific port

tcpdump – Command-line packet analyzer

curl – Transfer data from or to a server using various protocols

(HTTP, FTP, etc.)

wget – Download files from the web via HTTP, HTTPS, FTP

scp – Secure copy over SSH (used to copy files between systems)

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`scp file.txt user@remote:/path/to/destination/` – Copy file to remote server

rsync – Remote file and directory synchronization (often used for

backups)

- rsync -avz /local/path/ remote:/remote/path/ – Sync directories

15. Text Processing Utilities

grep – Search for patterns within files

- grep 'pattern' file.txt – Search for a pattern in a file
- grep -r 'pattern' /dir/ – Recursively search for a pattern

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sed – Stream editor for filtering and transforming text

- sed 's/old/new/g' file.txt – Replace old with new globally

awk – A powerful text processing language

- awk '{print \$1}' file.txt – Print the first column of each line in a file

cut – Remove sections from each line of a file

- cut -d ':' -f 1 /etc/passwd – Print the first field of each line, delimited by ":"

sort – Sort lines of text files

- sort file.txt – Sort file content in ascending order

uniq – Report or omit repeated lines in a file

- sort file.txt | uniq – Sort and remove duplicate lines

tee – Read from standard input and write to standard output and

files

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`echo "text" | tee file.txt` – Write to file and show output on screen

tr – Translate or delete characters

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`echo "hello" | tr 'a-z' 'A-Z'` – Convert lowercase to uppercase

paste – Merge lines of files

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`paste file1.txt file2.txt` – Combine lines of file1 and file2 side

by side

wc – Word, line, character, and byte count

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`wc -l file.txt` – Count lines in a file

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`wc -w file.txt` – Count words in a file

16. System Shutdown and Reboot

shutdown – Shut down the system

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`shutdown -h now` – Immediately shut down

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`shutdown -r now` – Reboot the system

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`shutdown -h +10` – Shut down after 10 minutes

reboot – Reboot the system

halt – Halt the system immediately (equivalent to turning off

power)

poweroff – Power off the system

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init – Change the runlevel (old-style system manager)

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init 0 – Shutdown

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init 6 – Reboot

17. File System Mounting and Management

mount – Mount a file system

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mount /dev/sda1 /mnt – Mount partition to a directory

umount – Unmount a file system

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umount /mnt – Unmount the file system mounted at /mnt

fstab – File system table (configuration file for mounting file systems)

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/etc/fstab – View and configure persistent mount points

blkid – Display block device attributes

fsck – Check and repair a file system

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fsck /dev/sda1 – Check and repair /dev/sda1

18. Filesystem Permissions and Security

chmod – Change file permissions

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chmod 755 file.txt – Give read, write, and execute permissions to owner, and read-execute permissions to others

chown – Change file owner and group

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`chown user:group file.txt` – Change owner and group of a file

chgrp – Change group ownership of a file

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`chgrp group file.txt` – Change the group of a file

umask – Set default permissions for new files

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`umask 022` – Set default permissions for newly created files

to 755

setfacl – Set access control lists (ACL) for file permissions

getfacl – Get access control lists (ACL) for file permissions