Linux Commands

🗂️ 1. File and Directory Management

Command	Description	Example
`ls`	Lists files/directories in the current directory.	`ls` → Lists all items.
`ls -l`	Long listing with permissions, ownership, etc.	`ls -l`
`cd`	Change directory.	`cd /home/user/Documents`
`pwd`	Show current directory.	`pwd`
`mkdir`	Make new directory.	`mkdir my_folder`
`rmdir`	Remove empty directory.	`rmdir old_folder`
`rm`	Delete a file.	`rm file.txt`
`rm -r`	Delete directory and contents.	`rm -r folder_name`
`cp`	Copy file or directory.	`cp file1.txt file2.txt`
`mv`	Move or rename file/directory.	`mv old.txt new.txt`
`touch`	Create empty file.	`touch file.txt`
`find`	Search for files.	`find / -name myfile.txt`
`locate`	Fast file search (needs `updatedb`).	`locate myfile.txt`
`tree`	Show directory structure.	`tree ~/projects` (Needs install: `sudo apt install tree`)

📄 2. File Viewing and Editing

Command	Description	Example
`cat`	Display file content.	`cat notes.txt`
`less`	Scroll through file content.	`less bigfile.txt`
`more`	Basic file viewer.	`more file.txt`
`head`	View first 10 lines.	`head file.txt`
`tail`	View last 10 lines.	`tail file.txt`

Command	Description	Example
`tail -f`	View live-updating logs.	`tail -f /var/log/syslog`
`nano`	Text editor in terminal.	`nano file.txt`
`vim`	Advanced text editor.	`vim file.txt`
`gedit`	GUI text editor.	`gedit file.txt`

🔍 3. File Search and Filters

Command	Description	Example
`grep`	Search text in files.	`grep "error" logfile.txt`
`grep -r`	Recursive search.	`grep -r "password" /etc/`
`find`	Search files by name, size, etc.	`find . -name "*.log"`
`locate`	Fast file lookup.	`locate report.pdf`
`which`	Show location of command.	`which python3`
`whereis`	Find binary, source, man page.	`whereis bash`

🖥️ 4. System Monitoring and Performance

Command	Description	Example
`top`	Real-time process viewer.	`top`
`htop`	Improved `top`.	`htop` (Install: `sudo apt install htop`)
`uptime`	System uptime info.	`uptime`
`vmstat`	Memory, CPU, and I/O stats.	`vmstat 1`
`free -h`	Human-readable memory usage.	`free -h`
`df -h`	Disk space usage.	`df -h`
`du -sh`	Size of a directory.	`du -sh Downloads/`
`iostat`	CPU and I/O stats.	`iostat`
`sar`	Historical performance data.	`sar -u 1 3`

👤 5. User Management

Command	Description	Example
`whoami`	Current logged-in user.	`whoami`
`id`	UID, GID, groups info.	`id`
`adduser`	Add a new user.	`sudo adduser bob`
`passwd`	Change password.	`passwd`
`deluser`	Delete user.	`sudo deluser bob`
`groupadd`	Create a new group.	`sudo groupadd devs`
`groups`	Show groups of current user.	`groups`
`su`	Switch user.	`su - bob`
`sudo`	Run command as root.	`sudo apt update`

🌐 6. Networking

Command	Description	Example
`ip a`	Show IP addresses.	`ip a`
`ip r`	Show routing table.	`ip r`
`ping`	Check network.	`ping google.com`
`traceroute`	Trace packet route.	`traceroute google.com`
`netstat -tulnp`	Show open ports.	`netstat -tulnp`
`ss -tulnp`	Like netstat, newer.	`ss -tulnp`
`nslookup`	DNS query.	`nslookup openai.com`
`dig`	DNS query (more detailed).	`dig openai.com`
`wget`	Download file.	`wget http://example.com/file.zip`
`curl`	Fetch data via URL.	`curl https://api.ipify.org`
`scp`	Secure copy over SSH.	`scp file.txt user@host:/tmp`
`rsync`	Efficient sync.	`rsync -av folder/ remote:/backup/`

📦 7. Package Management

APT (Debian/Ubuntu):

Command	Example	
`apt update`	`sudo apt update`	
`apt upgrade`	`sudo apt upgrade`	
`apt install`	`sudo apt install vim`	
`apt remove`	`sudo apt remove vim`	
`apt autoremove`	`sudo apt autoremove`	
`dpkg -i`	`sudo dpkg -i package.deb`	
`dpkg -l`	`dpkg -l	grep vim`	

YUM/DNF (RedHat/Fedora):

Command	Example	
`dnf install`	`sudo dnf install vim`	
`dnf remove`	`sudo dnf remove vim`	
`rpm -ivh`	`sudo rpm -ivh package.rpm`	
`rpm -qa`	`rpm -qa	grep httpd`	

🔐 8. Permissions and Ownership

Command	Description	Example
`chmod`	Change permissions.	`chmod +x script.sh`
`chown`	Change owner.	`sudo chown user:group file.txt`
`chgrp`	Change group.	`sudo chgrp staff file.txt`
`umask`	Set default permissions.	`umask 022`
`ls -l`	Show file permissions.	`ls -l file.txt`

🗜️ 9. Compression and Archiving

Command	Description	Example
`tar -cvf`	Create tar archive.	`tar -cvf backup.tar folder/`
`tar -xvf`	Extract archive.	`tar -xvf backup.tar`
`tar -czvf`	Compress to gzip.	`tar -czvf backup.tar.gz folder/`

Command	Description	Example
`tar -xzvf`	Extract gzip.	`tar -xzvf backup.tar.gz`
`gzip`	Compress.	`gzip file.txt`
`gunzip`	Decompress.	`gunzip file.txt.gz`
`zip`	Zip files.	`zip archive.zip file1 file2`
`unzip`	Extract zip.	`unzip archive.zip`

🔁 10. Process Management

Command	Description	Example
`ps`	Show processes.	`ps aux`
`top`	Real-time monitor.	`top`
`kill`	Kill by PID.	`kill 1234`
`killall`	Kill by name.	`killall firefox`
`bg`	Resume background job.	`bg`
`fg`	Bring job to front.	`fg`
`jobs`	Show background jobs.	`jobs`
`nice`	Set process priority.	`nice -n 10 command`
`renice`	Change priority.	`renice -n -5 1234`

💬 11. Disk and Filesystem

Command	Description	Example

`df -h` | Disk usage. | `df -h` |
`du -sh`	Directory size.	`du -sh /var/log`
`mount`	Mount device.	`sudo mount /dev/sdb1 /mnt`
`umount`	Unmount device.	`sudo umount /mnt`
`lsblk`	Show block devices.	`lsblk`
`blkid`	Device UUID info.	`blkid`
`fdisk`	Partition disk.	`sudo fdisk /dev/sdb`
`mkfs`	Format device.	`sudo mkfs.ext4 /dev/sdb1`

⚙️ 12. System Management

Command	Description	Example	
`hostname`	Show/set hostname.	`hostname`	
`date`	Show current time.	`date`	
`timedatectl`	Manage date/time.	`timedatectl set-timezone UTC`	
`shutdown`	Shutdown system.	`sudo shutdown now`	
`reboot`	Reboot system.	`sudo reboot`	
`systemctl`	Manage services.	`systemctl restart apache2`	
`service`	Older service manager.	`service apache2 restart`	
`crontab -e`	Schedule recurring tasks.	`crontab -e`	
`at`	Schedule one-time task.	`echo "shutdown now" | at 10pm`	

🧪 13. Scripting and Shell Features

Command	Description	Example				
`echo`	Print text.	`echo "Hello World"`				
`read`	Get user input.	`read name; echo "Hi $name"`				
`if` / `else`	Conditional logic.	`if [ -f file.txt ]; then echo "Exists"; fi`				
`for`	Looping.	`for i in *.txt; do echo $i; done`				
`&&`	Run if previous succeeded.	`mkdir test && cd test`				
`||`		`||`	Run if previous failed.	`false`		`echo "Failed"`
`>` / `>>`	Output redirection.	`echo "hi" > file.txt`				
`|`	`|`	Pipe output.	`ls`	`grep txt`		
`xargs`	Use output as argument.	`cat list.txt`	`xargs rm`			

Command	Description	Example				
`source`	Run script in current shell.	`source ~/.bashrc`				

📑 14. Logs and Troubleshooting

Command	Description	Example	
`dmesg`	Kernel messages.	`dmesg	tail`
`journalctl`	Systemd logs.	`journalctl -xe`	
`tail -f /var/log/syslog`	View logs live.	`tail -f /var/log/syslog`	
`last`	Show login history.	`last`	
`who`	Who is logged in.	`who`	
`w`	Who is doing what.	`w`	

🧰 15. Miscellaneous Utilities

Command	Description	Example	
`alias`	Create shortcut.	`alias ll='ls -la'`	
`history`	Show command history.	`history`	
`time`	Time a command.	`time ls`	
`watch`	Run repeatedly.	`watch -n 2 df -h`	
`man`	Show manual.	`man ls`	
`cal`	Show calendar.	`cal`	
`bc`	Calculator.	`echo "5+3"	bc`
`env`	Show environment vars.	`env`	
`export`	Set environment var.	`export VAR=value`	