

Linux Commands

1. File and Directory Management

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

2. File Viewing and Editing

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

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



3. File Search and Filters

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



4. System Monitoring and Performance

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



5. User Management

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

6. Networking

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

7. Package Management

APT (Debian/Ubuntu):

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

YUM/DNF (RedHat/Fedora):

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

8. Permissions and Ownership

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

9. Compression and Archiving

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

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

10. Process Management

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

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

13. Scripting and Shell Features

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

Command	Description	Example				
<code>source</code>	Run script in current shell.	<code>source ~/.bashrc</code>				

14. Logs and Troubleshooting

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

15. Miscellaneous Utilities

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