**Linux Complete Guide**

1. **Navigation & File Commands Summary:**

**pwd**

Prints the full path of your current directory.

**ls**

Lists files and folders in the current directory.

**ls -l**

Lists files with detailed info like permissions, size, and modification date.

**ls -a**

Includes hidden files (starting with .) in the list.

**ls -lah**

Lists all files with detailed info, human-readable sizes, and hidden files.

**cd folder\_name**

Moves into the directory named folder\_name (relative path).

**cd /path/to/folder**

Moves to the specified absolute directory path.

**cd ..**

Moves up one directory (to parent folder).

**cd ~ or cd**

Moves to your home directory.

**cd -**

Moves back to your previous directory.

**cp source.txt destination.txt**

Copies the file source.txt to destination.txt.

**cp -r folder1 folder2**

Copies directory folder1 and all its contents recursively to folder2.

**mv file.txt /path/to/new/location/**

Moves file.txt to another directory.

**mv oldname.txt newname.txt**

Renames the file oldname.txt to newname.txt.

**rm file.txt**

Deletes the file named file.txt.

**rm -r folder\_name**

Deletes the folder folder\_name and everything inside it.

**mkdir new\_folder**

Creates a new directory called new\_folder.

**mkdir -p parent/child/grandchild**

Creates nested directories, creating parents if needed.

**touch newfile.txt**

Creates an empty file named newfile.txt or updates its timestamp.

**cat file.txt**

Prints the entire contents of file.txt to the terminal.

**less file.txt**

Opens file.txt in a scrollable viewer (good for large files).

**head file.txt**

Shows the first 10 lines of file.txt.

**head -n 20 file.txt**

Shows the first 20 lines of file.txt.

**tail file.txt**

Shows the last 10 lines of file.txt.

**tail -n 50 file.txt**

Shows the last 50 lines of file.txt.

1. **Text Processing & Searching Commands:**

**grep "pattern" file.txt**

Searches for lines containing "pattern" in file.txt.

**wc -l file.txt**

Counts the number of lines in file.txt.

**sort file.txt**

Sorts the lines of file.txt alphabetically.

**uniq file.txt**

Removes duplicate adjacent lines from file.txt.

**sort file.txt | uniq**

Sorts and then removes duplicates, giving unique sorted lines.

**command > file.txt**

Redirects the output of command into file.txt, overwriting it.

**command >> file.txt**

Appends the output of command to the end of file.txt.

**cat file.txt | grep error**

Pipes the contents of file.txt into grep to find lines containing "error".

1. **Command History & Shortcuts:**

**history**

Shows a list of recently run commands.

**!15**

Runs the 15th command from the history list.

**Ctrl + R**

Starts a reverse search through your command history.

**Tab completion**

Press Tab key to auto-complete commands or filenames.

1. **Aliases:**

**alias ll='ls -la'**

Creates a shortcut ll that runs ls -la.

1. **Shell Scripting Basics:**

**#!/bin/bash**

Shebang line indicating the script uses Bash shell.

**chmod +x script.sh**

Makes script.sh executable.

**./script.sh**

Runs the script.

**Example script snippet**

#!/bin/bash

echo "Setting up environment..."

python -m venv venv

source venv/bin/activate

pip install -r requirements.txt

1. **Process Monitoring Commands:**

**top**

Shows a live, updating list of running processes and resource usage.

**htop**

An enhanced, interactive version of top.

**sudo apt install htop**

Installs htop on Ubuntu/Debian systems.

**nvidia-smi**

Shows GPU usage, memory, and processes on NVIDIA GPUs.

1. **Crontab & Automation:**

**crontab -l**

Lists current user’s scheduled cron jobs.

**crontab -e**

Edits current user’s cron jobs.

1. **More Text Processing and File Commands:**

**sed 's/old/new/g' file.txt**

Replaces all occurrences of "old" with "new" in each line of file.txt.

**sed -i 's/old/new/g' file.txt**

Edits file.txt in place, performing the substitution.

**awk '{print $1, $3}' file.txt**

Prints the 1st and 3rd columns of each line in file.txt.

**awk -F: '{print $1, $3}' /etc/passwd**

Uses ":" as the delimiter and prints the 1st and 3rd fields from /etc/passwd.

**awk '$3 > 1000 {print $1}' /etc/passwd**

Prints usernames where the 3rd field (UID) is greater than 1000.

1. **File Permissions & Ownership:**

**chmod 755 script.sh**

Sets permissions: owner can read/write/execute, group and others can read/execute.

**chmod +x script.sh**

Adds execute permission to script.sh.

**chown user:group file.txt**

Changes owner and group of file.txt.

**ls -l**

Lists files with permissions, ownership, and more.

1. **Networking Basics in Linux:**

**ping google.com**

Sends ICMP packets to check connectivity.

**ifconfig or ip addr**

Displays network interfaces and IP addresses.

**netstat -tuln**

Lists open ports and listening services.

1. **Package Management (Ubuntu/Debian example):**

**sudo apt update**

Updates package list.

**sudo apt install package\_name**

Installs a package.

**sudo apt remove package\_name**

Removes a package.

**dpkg -l**

Lists installed packages.

1. **Environment Variables:**

**echo $PATH**

Displays the current PATH variable.

**export VAR=value**

Sets an environment variable for the session.

**echo $VAR**

Displays the value of the variable VAR.

1. **Miscellaneous Useful Commands:**

**clear**

Clears the terminal screen.

**date**

Shows current date and time.

**uptime**

Shows how long the system has been running.

**whoami**

Shows your current username.

**df -h**

Shows disk usage in human-readable format.

**du -sh folder\_name**

Shows disk usage of folder folder\_name.

1. **Advanced File & Process Management:**

**ps aux**

Lists all running processes with detailed info.

**kill <pid>**

Terminates process with process ID <pid>.

**kill -9 <pid>**

Forcefully kills a process.

**nohup command &**

Runs a command immune to hangups, in the background.

**jobs**

Lists background jobs started from the current shell.

**fg**

Brings a background job to the foreground.

1. **Disk & Storage:**

**mount**

Mounts a filesystem.

**umount /mnt/point**

Unmounts a mounted filesystem.

**lsblk**

Lists block devices (disks, partitions).

1. **Compression & Archiving:**

**tar -czvf archive.tar.gz folder/**

Creates a compressed archive (tarball) of folder.

**tar -xzvf archive.tar.gz**

Extracts a tarball.

**zip file.zip files**

Creates a zip archive.

**unzip file.zip**

Extracts a zip archive.

1. **User Management:**

**who**

Shows who is currently logged in.

**id**

Shows your user ID and group info.

**sudo**

Run command as superuser (admin).

**adduser username**

Adds a new user.

**passwd**

Changes your password.

1. **System Logs:**

**dmesg**

Shows kernel messages (boot and hardware info).

**tail -f /var/log/syslog**

Live follow of system log messages.