Here are some commonly used **system commands** in Linux for managing the system, files, processes, and user tasks. These commands are essential for interacting with and controlling various aspects of a Linux-based operating system.

**System Information and Management Commands**

1. **uname**: Displays system information.
   * uname -a: Shows detailed information about the system (kernel, version, architecture, etc.).
2. **hostname**: Displays or sets the system's hostname.
   * hostname: Shows the current hostname.
   * hostname new\_name: Sets a new hostname.
3. **top**: Displays real-time system information, including CPU usage, memory usage, and processes.
4. **htop**: A more user-friendly, interactive version of top with better visuals and controls.
5. **free**: Displays memory usage.
   * free -h: Shows memory in human-readable format.
6. **df**: Displays disk space usage for mounted filesystems.
   * df -h: Shows human-readable disk space.
7. **du**: Displays disk usage of files and directories.
   * du -sh /path/to/dir: Shows the total disk usage of a directory in human-readable format.
8. **ps**: Displays a list of currently running processes.
   * ps aux: Shows all running processes with detailed information.
   * ps -ef: Another format for displaying running processes.
9. **uptime**: Shows how long the system has been running, along with the load average.
10. **who**: Displays information about who is logged into the system.
11. **last**: Displays a list of the most recent logins.
12. **dmesg**: Displays system boot messages and kernel ring buffer messages.
13. **lscpu**: Displays information about the CPU architecture.
14. **lsblk**: Lists information about block devices (e.g., hard drives, SSDs).
15. **lspci**: Displays information about PCI devices (e.g., graphics cards, network adapters).
16. **lsusb**: Displays information about USB devices connected to the system.
17. **vmstat**: Provides information about system processes, memory, paging, block IO, and more.

**User and Group Management**

1. **whoami**: Displays the current logged-in user.
2. **id**: Displays the user and group IDs of the current user or specified user.
   * id username: Shows the IDs of the specified user.
3. **useradd**: Adds a new user.
   * useradd username: Creates a new user.
4. **usermod**: Modifies user attributes.
   * usermod -aG groupname username: Adds the user to a group.
5. **userdel**: Deletes a user.
   * userdel username: Deletes the specified user.
6. **groupadd**: Creates a new group.
   * groupadd groupname: Creates a new group.
7. **groupdel**: Deletes a group.
   * groupdel groupname: Deletes the specified group.
8. **passwd**: Changes the password of a user.
   * passwd username: Changes the password for a specific user.
9. **chown**: Changes file or directory ownership.
   * chown owner:group filename: Changes the owner and group of a file.
10. **chmod**: Changes file permissions.
    * chmod 755 filename: Sets the permissions of a file to rwxr-xr-x.

**File and Directory Management**

1. **ls**: Lists files and directories.
   * ls -l: Lists files in long format, including details like permissions, size, and modification date.
   * ls -a: Shows all files, including hidden files (those starting with .).
2. **cd**: Changes the current directory.
   * cd /path/to/directory: Changes to the specified directory.
   * cd ..: Moves up one directory level.
3. **pwd**: Prints the current working directory.
4. **cp**: Copies files or directories.
   * cp source destination: Copies a file or directory to the destination.
5. **mv**: Moves or renames files and directories.
   * mv source destination: Moves or renames the source file or directory.
6. **rm**: Removes files or directories.
   * rm filename: Removes a file.
   * rm -r directory: Recursively removes a directory and its contents.
7. **mkdir**: Creates a new directory.
   * mkdir directory\_name: Creates a new directory.
8. **rmdir**: Removes an empty directory.
   * rmdir directory\_name: Deletes an empty directory.
9. **find**: Searches for files and directories.
   * find /path -name "filename": Searches for a file by name.
10. **locate**: Finds files by name (based on an updated index).
    * locate filename: Finds files matching the name.
11. **touch**: Creates an empty file or updates the timestamp of an existing file.
    * touch filename: Creates or updates the file.
12. **file**: Determines the file type.
    * file filename: Shows the type of the specified file.

**Package and Software Management**

1. **apt**: Package management for Debian-based distributions (e.g., Ubuntu).
   * apt update: Updates package lists.
   * apt upgrade: Upgrades all installed packages.
   * apt install package\_name: Installs a new package.
   * apt remove package\_name: Removes an installed package.
2. **yum**: Package management for Red Hat-based distributions (e.g., CentOS, Fedora).
   * yum install package\_name: Installs a package.
   * yum update: Updates installed packages.
3. **rpm**: Package management for RPM-based systems.
   * rpm -i package.rpm: Installs a package.
   * rpm -e package\_name: Removes a package.
4. **snap**: Manages snap packages.
   * snap install package\_name: Installs a snap package.
5. **dpkg**: Low-level package manager for Debian-based systems.
   * dpkg -i package.deb: Installs a .deb package.

**Networking and Internet Commands**

1. **ping**: Tests network connectivity to a host.
   * ping hostname\_or\_ip: Sends ICMP echo requests to the specified host.
2. **ifconfig**: Displays or configures network interfaces (deprecated, replaced by ip).
   * ifconfig: Displays the configuration of network interfaces.
3. **ip**: A modern tool to manage network interfaces.
   * ip a: Shows IP addresses and network interfaces.
4. **netstat**: Displays network connections, routing tables, interface statistics.
   * netstat -tuln: Shows active listening ports and network connections.
5. **ssh**: Secure shell to remotely access another machine.
   * ssh user@hostname: Connects to a remote machine over SSH.
6. **scp**: Secure copy for copying files between hosts.
   * scp file user@host:/path/to/destination: Copies a file to a remote host.
7. **wget**: Downloads files from the internet.
   * wget http://example.com/file: Downloads a file from the specified URL.
8. **curl**: Transfers data to/from a server using various protocols.
   * curl http://example.com: Fetches data from the given URL.

**Process Management**

1. **ps**: Displays currently running processes.
   * ps aux: Displays all running processes with detailed information.
2. **top**: Displays real-time process and system information.
3. **kill**: Terminates a process by PID.
   * kill PID: Terminates the process with the specified PID.
4. **killall**: Kills all processes by name.
   * killall process\_name: Terminates all processes with the specified name.
5. **bg**: Resumes a suspended job in the background.
   * bg %job\_number: Resumes a specific job in the background.
6. **fg**: Brings a background job to the foreground.
   * fg %job\_number: Brings a specific background job to the foreground.
7. **jobs**: Lists current jobs running in the background or suspended.
   * jobs: Shows all background jobs.

**Log Files**

1. **journalctl**: Views system logs.
   * journalctl: Shows all logs managed by systemd.
2. **tail**: Displays the end of a file (commonly used with log files).
   * tail -f /var/log/syslog: Continuously monitors a log file.
3. **cat**: Concatenates and displays the contents of a file.
   * cat filename: Displays the content of a file.
4. **less**: Views the contents of a file page-by-page.
   * less filename: Opens the file in a paginated view.

**System Shutdown and Reboot**

1. **shutdown**: Shuts down the system.
   * shutdown -h now: Shuts down the system immediately.
2. **reboot**: Reboots the system.
   * reboot: Reboots the system.
3. **halt**: Halts the system.
   * halt: Immediately halts the system.
4. **poweroff**: Powers off the system.
   * poweroff: Turns off the system.

These commands form the foundation of system administration and user interaction on Linux-based systems. Knowing these commands allows you to manage the system, files, packages, users, and processes efficiently.

Linux commands are tools that help you interact with the operating system to perform various tasks like file management, process control, system monitoring, networking, and more. Below is a more detailed list of **Linux commands** that you will commonly use. These commands are categorized by their functionality, with explanations and examples for each.

**1. File and Directory Management Commands**

**ls — List Directory Contents**

* **Description**: Displays the contents of a directory.
* **Usage**:
  + ls: Lists files and directories in the current directory.
  + ls -l: Lists in long format, showing permissions, ownership, size, and modification date.
  + ls -a: Lists all files, including hidden ones (those starting with .).
  + ls -h: Displays file sizes in a human-readable format (e.g., KB, MB).

**cd — Change Directory**

* **Description**: Changes the current working directory.
* **Usage**:
  + cd /path/to/directory: Moves to the specified directory.
  + cd ..: Moves up one directory level.
  + cd ~: Moves to the home directory.
  + cd -: Returns to the previous directory.

**pwd — Print Working Directory**

* **Description**: Displays the absolute path of the current working directory.
* **Usage**:
  + pwd: Shows the current directory path.

**mkdir — Make Directory**

* **Description**: Creates a new directory.
* **Usage**:
  + mkdir directory\_name: Creates a directory with the specified name.
  + mkdir -p /path/to/parent/directory: Creates parent directories if they don't exist.

**rmdir — Remove Directory**

* **Description**: Removes an empty directory.
* **Usage**:
  + rmdir directory\_name: Removes the specified directory, but only if it's empty.

**rm — Remove Files or Directories**

* **Description**: Deletes files or directories.
* **Usage**:
  + rm file\_name: Removes a file.
  + rm -r directory\_name: Recursively removes a directory and its contents.
  + rm -f file\_name: Forces the deletion of a file without asking for confirmation.

**cp — Copy Files or Directories**

* **Description**: Copies files or directories from one location to another.
* **Usage**:
  + cp source destination: Copies a file to a specified destination.
  + cp -r source\_directory destination\_directory: Copies directories recursively.

**mv — Move or Rename Files**

* **Description**: Moves or renames files and directories.
* **Usage**:
  + mv source destination: Moves a file or directory to a new location.
  + mv old\_name new\_name: Renames a file or directory.

**touch — Create Empty Files or Update File Timestamps**

* **Description**: Creates an empty file or updates the timestamp of an existing file.
* **Usage**:
  + touch file\_name: Creates an empty file if it doesn't exist or updates the file's timestamp.

**find — Search for Files**

* **Description**: Searches for files and directories based on conditions like name, size, and modification time.
* **Usage**:
  + find /path -name "filename": Finds files with a specific name.
  + find /path -type f: Finds all files.
  + find /path -type d: Finds all directories.

**locate — Locate Files by Name**

* **Description**: Quickly searches for files using a pre-built index.
* **Usage**:
  + locate filename: Finds files matching the specified name.
  + updatedb: Updates the locate database (usually run by root).

**ln — Create Hard and Symbolic Links**

* **Description**: Creates links to files or directories.
* **Usage**:
  + ln file link\_name: Creates a hard link.
  + ln -s file link\_name: Creates a symbolic (soft) link.

**2. System Information and Monitoring Commands**

**uname — Display System Information**

* **Description**: Displays information about the system.
* **Usage**:
  + uname -a: Shows detailed information about the system (kernel, architecture, etc.).
  + uname -r: Displays the kernel version.

**top — Task Manager**

* **Description**: Displays a dynamic real-time view of system processes.
* **Usage**:
  + top: Shows processes with resource usage like CPU, memory, and time.
  + Press q to quit top.

**htop — Enhanced Task Manager**

* **Description**: An interactive and enhanced version of top.
* **Usage**:
  + htop: Provides an interactive process viewer with color-coded output and customizable options.

**ps — Display Running Processes**

* **Description**: Shows a list of running processes.
* **Usage**:
  + ps aux: Displays all running processes with detailed information.
  + ps -ef: Shows processes in a different format.

**df — Disk Space Usage**

* **Description**: Displays information about disk space usage for all mounted filesystems.
* **Usage**:
  + df: Displays disk space usage.
  + df -h: Displays in human-readable format (e.g., KB, MB, GB).

**du — Disk Usage of Files and Directories**

* **Description**: Displays the disk usage of files and directories.
* **Usage**:
  + du /path/to/dir: Displays the disk usage of the specified directory.
  + du -sh /path/to/dir: Shows total disk usage in a human-readable format.

**free — Display Memory Usage**

* **Description**: Shows the total, used, and free memory (RAM and swap).
* **Usage**:
  + free: Displays memory usage.
  + free -h: Shows the output in human-readable format.

**uptime — System Uptime**

* **Description**: Displays how long the system has been running and the load averages.
* **Usage**:
  + uptime: Shows the system's uptime, current time, and load averages.

**lscpu — CPU Information**

* **Description**: Displays information about the system's CPU architecture.
* **Usage**:
  + lscpu: Shows detailed information about CPU architecture, cores, threads, and more.

**3. Process Management Commands**

**kill — Terminate Processes**

* **Description**: Sends a signal to a process, usually to terminate it.
* **Usage**:
  + kill PID: Terminates the process with the specified PID.
  + kill -9 PID: Forces termination of a process (SIGKILL).

**killall — Kill Processes by Name**

* **Description**: Terminates all processes with a specific name.
* **Usage**:
  + killall process\_name: Kills all processes with the given name.

**bg — Resume a Suspended Job in the Background**

* **Description**: Resumes a suspended job and runs it in the background.
* **Usage**:
  + bg %job\_number: Resumes a specific job in the background.

**fg — Bring a Job to the Foreground**

* **Description**: Brings a background job to the foreground.
* **Usage**:
  + fg %job\_number: Brings a specific job to the foreground.

**jobs — List Background Jobs**

* **Description**: Lists all background jobs and their statuses.
* **Usage**:
  + jobs: Displays background jobs, their job IDs, and statuses.

**4. User and Group Management Commands**

**whoami — Display Current User**

* **Description**: Displays the currently logged-in user.
* **Usage**:
  + whoami: Prints the current user’s name.

**id — Display User and Group Information**

* **Description**: Displays user and group IDs.
* **Usage**:
  + id: Displays information about the current user.
  + id username: Displays information about a specific user.

**useradd — Add a New User**

* **Description**: Adds a new user to the system.
* **Usage**:
  + useradd username: Adds a new user with the specified name.

**usermod — Modify User Information**

* **Description**: Modifies an existing user's attributes.
* **Usage**:
  + usermod -aG groupname username: Adds a user to a group.

**userdel — Delete a User**

* **Description**: Deletes a user from the system.
* **Usage**:
  + userdel username: Removes the specified user.

**groupadd — Add a New Group**

* **Description**: Creates a new group.
* **Usage**:
  + groupadd groupname: Adds a new group.

**passwd — Change User Password**

* **Description**: Changes the password of a user.
* **Usage**:
  + passwd username: Changes the password of the specified user.
  + passwd: Changes the password of the current user.

**5. File Permission and Ownership Commands**

**chmod — Change File Permissions**

* **Description**: Changes the read, write, and execute permissions of a file.
* **Usage**:
  + chmod 755 filename: Sets read, write, and execute permissions for the owner, and read/execute for others.
  + chmod +x filename: Adds execute permission to a file.

**chown — Change File Owner and Group**

* **Description**: Changes the ownership of a file or directory.
* **Usage**:
  + chown user:group filename: Changes the owner and group of a file.
  + chown -R user:group directory: Recursively changes ownership of files in a directory.

**chgrp — Change Group Ownership**

* **Description**: Changes the group ownership of a file.
* **Usage**:
  + chgrp groupname filename: Changes the group of a file.

**6. Networking and Internet Commands**

**ping — Test Network Connectivity**

* **Description**: Sends ICMP echo requests to test if a host is reachable.
* **Usage**:
  + ping hostname\_or\_ip: Sends a ping request to the specified host or IP address.

**ifconfig — Configure Network Interfaces (Deprecated, use ip instead)**

* **Description**: Displays or configures network interfaces.
* **Usage**:
  + ifconfig: Displays network interface details.
  + ifconfig eth0: Configures the eth0 interface.

**ip — Network Interface Configuration**

* **Description**: A modern tool to configure network interfaces and routes.
* **Usage**:
  + ip a: Displays all network interfaces.
  + ip link set eth0 up: Brings the eth0 interface up.

**netstat — Network Statistics**

* **Description**: Displays active network connections, routing tables, and interface statistics.
* **Usage**:
  + netstat -tuln: Displays listening ports and active connections.

**ssh — Secure Shell for Remote Login**

* **Description**: Logs into a remote machine securely.
* **Usage**:
  + ssh username@hostname\_or\_ip: Connects to a remote system via SSH.

**7. System Shutdown and Reboot Commands**

**shutdown — Shutdown the System**

* **Description**: Shuts down or reboots the system.
* **Usage**:
  + shutdown now: Shuts down the system immediately.
  + shutdown -r now: Reboots the system immediately.

**reboot — Reboot the System**

* **Description**: Reboots the system.
* **Usage**:
  + reboot: Reboots the system.

**poweroff — Power Off the System**

* **Description**: Powers off the system immediately.
* **Usage**:
  + poweroff: Turns off the system.

These are some of the most important **Linux commands** to know. Mastering these commands will help you manage your system, files, processes, users, and network configurations effectively.