

## Linux – A Beginner-Friendly Guide with Essential Commands for Cloud & DevOps



### **What is Linux?**

Linux is a powerful, open-source operating system (OS) based on UNIX. Unlike Windows or macOS, Linux gives users deep control over the system—perfect for servers, developers, and system administrators.

At its core, Linux is made up of:

- The kernel (the heart of the OS)
- Shell/command line (to interact with the system)
- Utilities (for managing files, users, processes, etc.)

### **Why Linux is Popular**

- Open-source & free – No licensing fees
- Secure & stable – Fewer viruses and malware
- Highly customizable – You can modify it as needed
- Efficient & lightweight – Great for performance-critical environments
- Dominates servers & cloud – Linux powers most of the internet, data centers, and cloud platforms (like AWS, Google Cloud, Azure)

## Linux Distributions

A Linux distribution (often called a Linux distro) is a complete version of the Linux operating system that includes:

- The Linux kernel (the core of the OS)
- System tools
- Software packages
- And a package manager to install or update software.

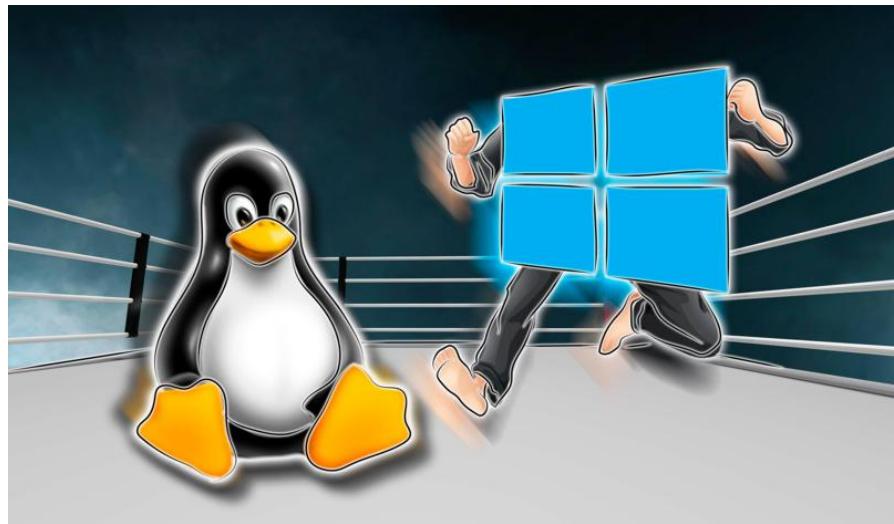
Think of it like different "flavors" of Linux—each designed for different users or tasks, but all based on the same core Linux system.



## Why So Many Distributions?

Each distribution is built with a specific purpose in mind. Some are made for beginners, some for enterprises, some for developers, and others for cybersecurity experts.

## Windows vs Linux



 <b>Windows</b>	 <b>Linux</b>
➤ Paid (license required)	➤ Free and open-source
➤ Mostly uses a graphical interface (GUI)	➤ Command-line based
➤ Heavier on system resources	➤ Lightweight and faster
➤ More prone to viruses and malware	➤ More secure and less vulnerable
➤ Limited customization options	➤ Highly customizable
➤ Frequent updates that need restart	➤ Updates can be applied without reboot
➤ May lag or crash under heavy load	➤ Very stable under heavy workloads
➤ Supported in cloud, but not preferred	➤ Preferred by AWS, GCP, Azure, etc.

# Essential Linux Commands with Real-Time Examples

A beginner-friendly list of the most important Linux commands used regularly by Cloud and DevOps engineers, along with practical use cases.

## 1. **pwd – Print Working Directory**

Shows the full path of your current directory in the filesystem.

**Use Case:** Check your current location after SSH into a remote server to avoid running commands in the wrong directory.

```
[root@linux-server emp1]# pwd  
/opt/devops/emp1  
[root@linux-server emp1]# |
```

---

## 2. **ls – List Directory Contents**

Lists files and directories in the current folder.

**Use Case:** Use ls -l or ls -a to view permissions, hidden files, or timestamps in /var/log or /home.

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## 3. **cd – Change Directory**

Used to move between folders in the system.

**Use Case:** Navigate to your application folder for deployment: cd /var/www/html.

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## 4. **mkdir – Make Directory**

Creates a new directory inside your current location or specified path.

**Use Case:** Create a folder to store log files: mkdir Devops

```
[root@linux-server opt]# mkdir Devops  
[root@linux-server opt]# ll  
total 0  
drwxr-xr-x. 2 root root 6 Jun 11 09:58 Devops
```

## 5. touch – Create Empty File

Creates a new empty file or updates the timestamp of an existing file.

**Use Case:** Create a dummy config file for testing: touch aws

---

## 6. rm – Remove Files or Directories

Deletes files or directories. Use -r for recursive deletion and -f to force remove.

Use case: Remove an old backup directory:

rm -r <file/folder name>

**rm -rf \*** => **Dangerous Command** (Deletes all files /folders in that path)

### Before using rm -rf \* (Many Files)

```
[root@linux-server opt]# ll
total 0
drwxr-xr-x. 2 root root 6 Jun 11 09:58 Devops
-rw-r--r--. 1 root root 0 Jun 11 09:58 aws
drwxr-xr-x. 2 root root 6 Jun 11 10:01 emp1
drwxr-xr-x. 2 root root 6 Jun 11 10:01 emp2
drwxr-xr-x. 2 root root 6 Jun 11 10:01 emp3
-rw-r--r--. 1 root root 0 Jun 11 10:00 file1
-rw-r--r--. 1 root root 0 Jun 11 10:00 file2
-rw-r--r--. 1 root root 0 Jun 11 10:00 file3
```

### After Running rm -rf \* Command ( 0 Files)

```
[root@linux-server opt]# rm -rf *
[root@linux-server opt]# ll
total 0
[root@linux-server opt]#
```

---

## 7. ll – List files with detailed information

The ll command lists files and directories in the current location with details like permissions, size, owner, and modified date.

Use case: To view detailed information of log files in /var/log:

## **8. cat – View File Content**

Displays the content of a file directly in the terminal.

Example: Just checking what's inside the file1

```
[root@linux-server opt]# ll  
total 4  
drwxr-xr-x. 3 root root 18 Jun 11 10:05 devops  
-rw-r--r--. 1 root root 142 Jun 11 10:10 file1  
[root@linux-server opt]# cat file1
```

```
Heyy This is Sandeep. Hope You're doing good..!  
I am working as a devops engineer in xyz company  
Thats it from my side. Keep learning....!!
```

```
[root@linux-server opt]#
```

---

## **9. cp – Copy Files or Directories**

Copies files or directories from one location to another. Use the -r flag to copy directories recursively.

Use case:

```
cp -r <Source Path> <Destination Path>
```

---

## **10. mv – Move or Rename Files**

Moves files or folders to a different location, or renames them.

Use case: Rename a .log file after processing:

```
mv <Source> <Destination>
```

---

## **11. echo – Print Text or Variables**

Prints a line of text or environment variable; widely used in scripting.

Use case: Add a status message to a log file:

```
echo "Deployment successful" >> /var/log/deploy.log
```

---

## **12. uptime – Shows how long the system has been running**

The uptime command displays how long the system has been running, along with the current time, number of users, and system load.

Use case: To check how long your EC2 instance has been running:  
uptime

```
[root@linux-server opt]# uptime  
10:14:54 up 25 min, 2 users, load average: 0.00, 0.00, 0.01
```

---

### 13. yum install <package name>

The yum install command is used to download and install software packages on systems that use the YUM package manager (like Amazon Linux, CentOS, RHEL).

Use case: To install Java on an EC2 instance:  
sudo yum install java -y

---

### 14. yum remove <package name>

The yum remove command is used to uninstall or remove a software package from the system.

Use case: To remove Java if it's no longer needed:  
sudo yum remove java -y

---

### 15. tree – Display directory structure in a tree format

The tree command shows the directory and file structure in a nested, tree-like format. It helps visualize folder hierarchies.

Note: You need to install it first using sudo yum install tree -y.

Use case: To view the structure of files inside a project folder:

### Using ll Command:

```
[root@linux-server opt]# ll  
total 4  
drwxr-xr-x. 2 root root 50 Jun 11 10:27 AWS  
drwxr-xr-x. 3 root root 18 Jun 11 10:05 devops  
-rw-r--r--. 1 root root 142 Jun 11 10:10 file1  
-rw-r--r--. 1 root root 0 Jun 11 10:25 shell.sh
```

### Using tree command:

```
root@linux-server opt]# tree
.
+-- AWS
|   |-- AMI
|   |-- EC2
|   |-- ELB
|   `-- VPC
.
+-- devops
|   `-- emp1
|       |-- sandeep
|           |-- bash
|           |-- git
|           |-- jenkins
|           `-- linux
.
`-- file1
-- shell.sh

1 directories, 10 files
root@linux-server opt]#
```

---

## 16. top – Monitor system resource usage in real time

The top command displays real-time information about system processes, CPU and memory usage, uptime, and more.

Use case: To monitor resource consumption and identify high-CPU or memory-consuming processes on a server:

Example usage:

Run top and observe which processes are consuming the most CPU or RAM during peak traffic.

```
[root@linux-server opt]# top
top - 10:33:21 up 43 min,  2 users,  load average: 0.00, 0.00, 0.00
Tasks: 102 total,   1 running, 101 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :   949.4 total,   207.7 free,   131.4 used,   610.3 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   674.2 avail Mem

 PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM     TIME+ COMMAND
  1 root      20   0 106804 17180 10668 S  0.0  1.8  0:01.05 systemd
  2 root      20   0      0      0      0 S  0.0  0.0  0:00.00 kthreadd
  3 root      0 -20      0      0      0 I  0.0  0.0  0:00.00 rcu_gp
  4 root      0 -20      0      0      0 I  0.0  0.0  0:00.00 rcu_par_gp
  5 root      0 -20      0      0      0 I  0.0  0.0  0:00.00 slab_flushwq
```

## 17. grep – Search for text in a file

The grep command is used to search for specific words or patterns inside a file. It prints the lines that match the given text.

Use case: To find lines containing the word “failed” in a log file:

```
grep "failed" /var/log/auth.log
```

---

## 18. awk – Pattern scanning and processing

The awk command is used to extract and process specific columns or patterns from text or files. It’s very useful when working with logs or structured data.

Use case: To display just the usernames from the /etc/passwd file:

**Command:** `awk -F: '{ print $1 }' /etc/passwd`

---

## 19. df -h – Show disk space usage in human-readable format

The df -h command displays disk space usage for all mounted filesystems in a human-readable format (MB, GB).

Use case: To check if a server is running low on disk space:

```
[root@linux-server opt]# df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        4.0M    0  4.0M   0% /dev
tmpfs          475M    0  475M   0% /dev/shm
tmpfs          190M  436K  190M   1% /run
/dev/xvda1       8.0G  1.9G  6.1G  24% /
tmpfs          475M    0  475M   0% /tmp
/dev/xvda128     10M  1.3M  8.7M  13% /boot/efi
tmpfs           95M    0   95M   0% /run/user/1000
[root@linux-server opt]# |
```

---

## 20. chmod – Change file permissions

The chmod command is used to change the permissions of a file or directory, such as making a script executable.

Use case: To make a shell script executable before running it:  
chmod +x deploy.sh

---

## 21. chown – Change file ownership

The chown command changes the ownership of a file or directory to a specific user and group.

Use case: To give ownership of a file to the ec2-user:  
chown ec2-user:ec2-user /home/ec2-user/app.log

---

## 22. hostnamectl set-hostname – Set or change the system hostname

The hostnamectl set-hostname command is used to change the system's hostname (the name your system identifies as on a network).

Use case: To rename your Linux machine to "Linux-server":

```
[ec2-user@ip-172-31-1-149 ~]$ sudo hostnamectl set-hostname "linux-server"
[ec2-user@ip-172-31-1-149 ~]$ sudo su -
[root@linux-server ~]# hostname
linux-server
[root@linux-server ~]# |
```

---

## 23. systemctl – Manage system services

The systemctl command is used to start, stop, enable, disable, or check the status of services on systems using systemd.

Use case: To restart the nginx web server:  
sudo systemctl restart nginx

---

## 24. sed – Stream editor for modifying text in files

The sed command is used to find and replace text, insert or delete lines, and perform other text transformations in files.

Use case: To replace the word "staging" with "production" in a config file:

**Command:** `sed -i 's/staging/production/g' config.yaml`

## 25. Connecting to an EC2 Instance Using SSH

To access your AWS EC2 Linux instance, you use an SSH client along with the .pem key file provided during instance creation. This allows secure access to your remote server from your local machine.

Use case: Connect to your EC2 instance using its public IP address.

**Command:** `ssh -i "my-keypair.pem" ec2-user@<public-ip>`

Note: Replace my-keypair.pem with your actual key file name and <public-ip> with your instance's public IP address.

```
sande@sandeep MINGW64 ~/OneDrive/desktop/keypairs
$ ssh -i "devops-practice-key.pem" ec2-user@43.204.217.107
The authenticity of host '43.204.217.107 (43.204.217.107)' can't be established.
ED25519 key fingerprint is SHA256:ss7gKkRYGIBvue0uCQgxX1NT5jb3z7ksavW2h7t7Tow.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '43.204.217.107' (ED25519) to the list of known hosts.

      #_
     ~\_ #####_          Amazon Linux 2023
     ~~ \#####`_
     ~~  \###|_
     ~~   #/ , ___
     ~~   V~ , ' ->
     ~~   ~-.  /`_
     ~~   /` , /`_
     ~~   /m` , /`_
[ec2-user@ip-172-31-11-222 ~]$
```



## Conclusion & Personal Takeaways

Over the past few days, I dove deep into the world of Linux — exploring, experimenting, and learning how it forms the backbone of modern cloud infrastructure.

As part of my DevOps journey, I focused on understanding not just the commands, but **how Linux really works in real-world environments** — especially in cloud platforms like AWS where Linux-based instances are the norm.

Here's what I gained from this hands-on learning experience:

- How to navigate the Linux file system.
- How to securely connect to remote Linux servers (EC2) via SSH.
- Install and manage packages using yum.

- Monitor servers using tools like top, df -h, and uptime.
- Search and manipulate data using grep, awk, and sed.
- Manage services, permissions, and automate tasks using systemctl, chmod, crontab, and more.

This document brings together **25 essential Linux commands** that I personally found to be the most practical and frequently used. Every command is paired with real use cases that I either tried myself or learned by simulating real-world scenarios.

I'm still learning — but this phase has shown me how powerful Linux is when you're building and managing systems in the cloud.

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### Let's Connect and Grow Together!

If you're learning Linux, working in DevOps, or simply enjoy geeking out over cloud tech — let's connect, collaborate, and learn from each other.

- **LinkedIn:** <https://www.linkedin.com/in/sandeep-akula-360716244/>

Feel free to drop your thoughts, suggestions, or questions — I'd love to hear how you use Linux in your workflow!