LINUX-2023

**Linux** : Linux is an open source operating system(OS). An operating system is the software that directly manages a system's hardware and resources, like CPU, memory, and storage. The OS sits between applications and hardware and makes the connections between all of your software and the physical resources that do the work.

Linux is known for its stability, security, flexibility, and scalability, making it an ideal choice for *DevOps* practices.

**Features of Linux :**

1. Open source
2. Portable
3. Multi-user
4. Multi-Programming
5. Hierarchical File system
6. Shell
7. Security

**Basic Commands in Linux :**

These commands are fundamental for DevOps engineers working with Linux servers. They help us navigate the file system, manage files and directories, monitor processes, and perform various administrative tasks.

1. **ls** : List directory contents. Use it to view files and directories in the current directory.
2. **cd** : Change the current working directory.
3. **pwd** : Print the working directory. It shows you the current directory you are in.
4. **mkdir** : Create a new directory.
5. **rmdir** : Remove a directory.
6. **cp** : Copy files or directories from one location to another.
7. **mv** : Move or rename files and directories.
8. **rm** : Remove files or directories.
9. **touch** : Create an empty file or update the access timestamp of an existing file.
10. **cat** : Concatenate and display file contents. Useful for reading text files.
11. **grep** : Search for patterns in text using regular expressions.
12. **find** : Search for files and directories in a directory hierarchy.
13. **chmod** : Change file permissions.
14. **chown** : Change file ownership.
15. **ps** : Display information about running processes.
16. **top** : Monitor system processes in real-time. Useful for system performance analysis.
17. **df** : Display disk space usage.
18. **du** : Estimate file and directory space usage.
19. **wget** : Download files from the internet.
20. **ssh** : Securely connect to remote servers.

***“ Curl ”*** *is a versatile command-line tool for making network requests, supporting various protocols and offering more customization options. It supports various protocols, including HTTP, HTTPS, FTP, SCP, and for making HTTP requests, sending data to web services, and performing a wide range of network-related tasks.*

*“* ***wget “*** *is a simpler command-line tool primarily used for downloading files from the internet with fewer options for complex tasks.*

**Networking Commands :**

* **ifconfig** : This command is used to display and configure network interfaces. It shows information about all network interfaces on your system, such as IP addresses, MAC addresses, and network-related statistics.
* **ip** : The **ip** command is a powerful tool for configuring and managing network interfaces, routing tables, and more. It's more versatile and modern than **ifconfig.**
* **ping** : The **ping** command is used to test network connectivity to a remote host by sending ICMP echo requests. It's invaluable for diagnosing network issues and checking the availability of network resources.
* **netstat** : The **netstat** command provides various network-related information, including routing tables, active network connections, and network interface statistics.
* **traceroute** : Traceroute is used to trace the route that packets take from your local machine to a destination host. It helps in identifying network hops and latency issues.
* **iptables** : In DevOps, managing firewall rules is essential for securing your systems. **iptables** is a powerful tool for configuring and managing firewall rules in Linux.

**Directory Structure :** Key directories in the Linux file system include:

* + **/bin**: Essential system binaries.
  + **/etc**: Configuration files.
  + **/home**: Home directories for users.
  + **/var**: Variable data like logs and temporary files.
  + **/tmp**: Temporary files.
  + **/dev**: Device files.
  + **/mnt**: Mount points for external devices.
  + **/usr**: User-related programs and files.
  + **/lib**: Library files.
  + **/opt**: Optional software packages.
  + **/proc**: Virtual file system providing process information.

**3 Types of file permissions Numerical Notation 3 Types of users**

Read – r 4 Owner – u

Write – w 2 Group -- g

Execute – x 1 Others – o