Linux for DevOps and Cloud Engineer

1. Linux Basics

- History and importance of Linux in DevOps.
- Linux distributions (Ubuntu, CentOS, Red Hat, etc.).

Basic commands:

- File and directory management (ls, cd, mkdir, rm, etc.).
- Viewing and editing files (cat, less, more, nano, vim).
- Copying and moving files (cp, mv).
- Permissions (chmod, chown, umask).
- File system structure and hierarchy (/, /etc, /var, /opt, etc.).

2. User and Group Management

- Adding, deleting, and managing users.
- Understanding groups and group permissions.
- Password policies.
- Sudo access management.

3. File Permissions and Ownership

- Read, write, and execute permissions.
- Special permissions: setuid, setgid, sticky bit.
- Access Control Lists (ACLs).

4. Networking

- Basic networking commands (ifconfig, ip, ping, netstat, ss, traceroute).
- Configuring network interfaces.
- Understanding DNS, DHCP, and NAT.
- SSH configuration and key-based authentication.

5. File Management

- Archiving and compressing files (tar, gzip, bzip2, xz).
- Disk usage analysis (df, du, lsblk).
- Mounting and unmounting file systems.

6. Package Management

- Installing, updating, and removing software:
- Apt, yum, dnf, zypper.
- Managing repositories.

7. Process Management

- Viewing running processes (ps, top, htop, jobs).
- Killing processes (kill, pkill, killall).

- Understanding nice and renice.

8. **System Monitoring and Performance Tuning**

- Tools: top, htop, iotop, nmon, sar.
- Log analysis (journalctl, /var/log files).
- Analyzing system bottlenecks.

9. **Shell Scripting**

- Writing and debugging Bash scripts.
- Automating tasks.
- Using variables, loops, and conditions.
- Working with cron jobs (crontab) for scheduling.

10. **Linux Security**

- Firewall setup (e.g., iptables, firewalld, ufw).
- SELinux basics.
- System hardening.
- Auditing logs for security breaches.

11. **Storage and Filesystems**

- Partitioning disks (fdisk, parted).
- Managing Logical Volumes (LVM).
- Filesystem types and their uses (ext4, xfs, zfs).
- Mounting and unmounting drives.

12. **Service Management**

- Managing services using systemd (systemctl).
- Understanding init vs. Systemd.
- Troubleshooting service failures.

13. **Version Control (Git Basics)**

- Installing and configuring Git on Linux.
- Basic Git commands: git clone, commit, push, pull, branch.

14. **Linux in Virtualization and Cloud**

- Working with Linux on VMs (e.g., VirtualBox, KVM).
- Using Linux in AWS, Azure, or GCP environments.

15. **Docker and Container Basics**

- Installing and managing Docker on Linux.
- Running containers and managing images.
- Basic container and bnetworking.

16. **Ansible and Automation**

- Installing and configuring Ansible on Linux.
- Writing playbooks and managing infrastructure.

17. Linux Tools for DevOps

- Grep, awk, sed, cut, find.
- Monitoring tools like Nagios, Prometheus, Grafana.
- Configuration management tools (Ansible, Chef, Puppet).

18. Debugging and Troubleshooting

- Analyzing logs and troubleshooting issues.
- Debugging network issues.
- Kernel and boot troubleshooting