Linux interview questions for DevOps roles:

1. Basic Linux Commands

- **What are some commonly used Linux commands in DevOps?**
  - `ls, cd, pwd, cp, mv, rm, cat, echo, grep, find, awk, sed, tar, zip, unzip`
- **How do you check disk usage and memory consumption in Linux?**
  - Use `df -h` for disk usage and `free -m` for memory consumption.
- **What is the difference between `df -h` and `du -sh`?**
  - `df -h` shows disk usage of file systems, while `du -sh` shows the disk usage of a specific directory.
- **How do you find a file in Linux? (e.g., using `find` or `locate`)**
  - Use `find /path -name "filename"` or `locate filename` (after running `updatedb`).
- **How do you count the number of lines in a file?**
  - Use `wc -l filename`.

2. User and Permission Management

- **How do you create a new user and assign them sudo privileges?**
  - `useradd username && passwd username && usermod -aG sudo username`
- **What are file permissions in Linux? How do you modify them using `chmod`, `chown`, and `chgrp`?**
  - Use `chmod` to change permissions, `chown` to change file owner, and `chgrp` to change group ownership.
- **How do you find which users are currently logged in?**
  - Use `who`, `w`, or `users` command.
- **What is the difference between `su` and `sudo`?**
  - `su` switches to another user, `sudo` executes a command as another user.
- **Explain how Linux groups work and how to add a user to a group.**
  - Groups manage user permissions; add a user using `usermod -aG groupname username`.

3. Process Management

- **How do you check running processes in Linux?**
  - Use `ps aux`, `top`, or `htop`.
- **How do you terminate a process using `kill`, `killall`, or `pkill`?**
  - Use `kill PID`, `killall process_name`, or `pkill process_name`.
- **What is the difference between `nice` and `renice`?**
  - `nice` sets priority for a new process, `renice` changes priority of a running process.
- **How do you check CPU and memory usage of a process?**
  - Use `top`, `htop`, or `ps aux --sort=-%mem | head -5`.

- **What does the `top` and `htop` command do?**
  - `top` shows running processes, `htop` is a more user-friendly version of `top`.

4. Package Management

- **What is the difference between `apt`, `yum`, `dnf`, and `zypper`?**
  - `apt` (Debian-based), `yum` & `dnf` (RHEL-based), `zypper` (SUSE-based) are package managers.
- **How do you install, remove, and update packages in Linux?**
  - `apt install/remove/update package` (Debian), `yum/dnf install/remove/update package` (RHEL).
- **How do you find the location of an installed package?**
  - Use `which package` or `dpkg -L package`.
- **What is the difference between `dpkg` and `rpm`?**
  - `dpkg` is for Debian-based systems, `rpm` is for RHEL-based systems.

5. Networking Commands

- **How do you check open ports in Linux?**
  - Use `netstat -tulnp` or `ss -tulnp`.
- **What is the difference between `netstat` and `ss`?**
  - `ss` is faster and more powerful than `netstat`.
- **How do you test network connectivity using `ping`?**
  - Use `ping destination_IP`.
- **How do you check DNS resolution in Linux?**
  - Use `nslookup` or `dig domain.com`.
- **How do you find your system's IP address?**
  - Use `ip a` or `hostname -I`.
- **How do you permanently change the hostname of a Linux machine?**
  - Modify `/etc/hostname` and restart the system.
  - Using this command : hostnamectl set-hostname "vaibhav"

6. Log Management

- **Where are system logs stored in Linux?**
  - In `/var/log/` directory.
- **How do you check system logs using `journalctl`?**
  - Use `journalctl -xe`.
- **How do you filter logs using `grep`?**
  - Use `grep "keyword" /var/log/syslog`.
- **What is the purpose of `/var/log/messages` and `/var/log/syslog`?**
  - They store system messages and logs.

7. SSH and Remote Access

- **How do you set up passwordless SSH authentication?**
  - Use `ssh-keygen` and `ssh-copy-id user@remote-host`.

- **How do you change the default SSH port?**
  - o Modify `Port` in `/etc/ssh/sshd_config` and restart `sshd`.
- **How do you copy files between servers using `scp` or `rsync`?**
  - o `scp file user@remote:/path/` or `rsync -av file user@remote:/path/`.
- **How do you configure an SSH jump host?**
  - o Use `ssh -J user@jumphost user@target-host`.

8. Disk Management

- **How do you check disk partitions in Linux?**
  - o Use `lsblk` or `fdisk -l`.
- **How do you mount and unmount a file system?**
  - o Use `mount /dev/sdX /mnt` and `umount /mnt`.
- **How do you create a new partition using `fdisk` or `parted`?**
  - o Use `fdisk /dev/sdX`, then create partitions interactively.
- **What is LVM, and how do you create an LVM partition?**
  - o LVM allows flexible disk management; use `pvcreate`, `vgcreate`, and `lvcreate`.

9. Cron Jobs and Automation

- **How do you schedule a cron job to run every day at 5 AM?**
  - o Add `0 5 * * * command` to `crontab -e`.
- **Where are cron jobs stored in Linux?**
  - o In `/var/spool/cron/` and `/etc/crontab`.
- **What is the difference between `cron` and `anacron`?**
  - o `cron` runs jobs at scheduled times; `anacron` runs missed jobs.
- **How do you list all scheduled cron jobs for a user?**
  - o Use `crontab -l`.

10 System Performance and Troubleshooting

- **How do you analyze system performance using vmstat, iostat, or sar?**
  - o `vmstat`: Provides real-time system performance metrics such as CPU usage, memory, swap, and I/O activity (`vmstat 5 10` shows stats every 5 seconds for 10 iterations).
  - o `iostat`: Displays CPU and disk I/O statistics (`iostat -x 5` provides extended disk statistics every 5 seconds).
  - o `sar`: Collects, reports, and saves system activity (`sar -u 5` shows CPU usage every 5 seconds).
- **How do you check the system uptime?**
  - o Use the `uptime` command to display how long the system has been running, along with load averages.
  - o Alternative: `cat /proc/uptime` shows uptime in seconds.
- **How do you debug a slow server?**
  - o **Check CPU and memory usage**: `top` or `htop`.
  - o **Check disk usage and I/O wait**: `df -h`, `du -sh /path`, `iostat`.

- **Monitor running processes**: `ps aux --sort=-%mem` or `ps aux --sort=-%cpu`.
- **Analyze network usage**: `netstat -tulnp`, `ss -tulnp`, or `iftop`.
- **Check logs for errors**: `journalctl -xe`, `dmesg | tail`, or `/var/log/syslog`.

- **How do you find the system's load average?**
  - Use `uptime` or `cat /proc/loadavg` to check the 1-minute, 5-minute, and 15-minute load averages.
  - `top` and `htop` also display system load averages at the top.
  - A load average close to the number of CPU cores indicates full utilization.

11. File Systems and Storage

- **What is the difference between ext3, ext4, and xfs?**
  - **ext3**: Supports journaling, max file size of 2TB, and limited performance.
  - **ext4**: Improved journaling, supports larger file sizes (16TB) and larger volumes, faster performance.
  - **XFS**: High-performance journaling file system, supports parallel I/O operations, best for large-scale storage.
- **How do you check disk space usage using df and du?**
  - `df -h`: Shows disk space usage for all mounted filesystems in a human-readable format.
  - `du -sh /path/to/dir`: Displays the size of a directory and its contents.
- **How do you format a new disk partition?**
  - Use `mkfs.ext4 /dev/sdX` (replace X with the partition name) to format a partition with ext4.
- **What is an inode in Linux?**
  - An inode is a data structure storing metadata about a file (permissions, ownership, timestamps), but not the filename or actual data.

12. SELinux and Security

- **What is SELinux? How do you disable it?**
  - SELinux (Security-Enhanced Linux) is a security module that enforces mandatory access control policies.
  - Disable temporarily: `setenforce 0`
  - Disable permanently: Edit `/etc/selinux/config` and set `SELINUX=disabled`.
- **How do you check firewall rules in Linux?**
  - `iptables -L -v -n` (for older systems)
  - `firewalld` systems: `firewall-cmd --list-all`
- **How do you block an IP address using iptables or firewalld?**
  - iptables: `iptables -A INPUT -s <IP> -j DROP`
  - firewalld: `firewall-cmd --permanent --add-rich-rule='rule family="ipv4" source address="<IP>" reject'`
- **What are the different SELinux modes?**
  - **Enforcing**: SELinux policies are enforced.
  - **Permissive**: Policies are not enforced but logged.
  - **Disabled**: SELinux is turned off.

13. Systemd and Service Management

- **How do you start, stop, restart, and check the status of a service?**
  - Start: `systemctl start <service>`
  - Stop: `systemctl stop <service>`
  - Restart: `systemctl restart <service>`
  - Status: `systemctl status <service>`
- **What is the difference between systemctl and service commands?**
  - `systemctl` is used in modern Linux distributions (systemd-based) and provides more functionality.
  - `service` is used in older distributions that use SysVinit.
- **How do you enable a service to start at boot?**
  - `systemctl enable <service>` ensures the service starts automatically on boot.

14. Linux Kernel and Boot Process

- **Explain the Linux boot process step by step.**
  1. **BIOS/UEFI** initializes hardware and loads the bootloader.
  2. **Bootloader (GRUB)** loads the kernel into memory.
  3. **Kernel Initialization** sets up device drivers and mounts the root filesystem.
  4. **init/systemd** runs initialization scripts.
  5. **User Space Initialization** starts services and login prompts.
- **How do you check the current Linux kernel version?**
  - Use `uname -r` to display the current kernel version.
- **How do you update the Linux kernel?**
  - On Debian-based systems: `sudo apt update && sudo apt upgrade -y`
  - On RHEL-based systems: `sudo yum update kernel -y`
  - Verify with `uname -r` after reboot.