**SCENARIO-BASED LINUX QUESTIONS**

Here are some **scenario-based Linux questions** with explanations that are commonly asked in **interviews** or used for **real-world troubleshooting**.

**1. High CPU Usage Issue**

**Scenario:** Your application server is running slow. How do you check which process is consuming high CPU?

**Solution:**

bash

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top

htop # If installed, provides better UI

ps aux --sort=-%cpu | head -10 # Lists top 10 CPU consuming processes

**Follow-up:** How do you kill the high CPU-consuming process?

bash

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kill -9 <PID> # Replace <PID> with the process ID

**2. Out of Disk Space Issue**

**Scenario:** Your system is running out of disk space. How do you find large files and clear space?

**Solution:**

bash

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df -h # Check disk usage

du -sh /var/log/\* # Check size of log files

find / -type f -size +500M # Find files larger than 500MB

**Follow-up:** How do you remove old logs safely?

bash

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rm -rf /var/log/\*.log # Removes all logs

journalctl --vacuum-time=10d # Clears logs older than 10 days

**3. Network Connectivity Issue**

**Scenario:** Your server cannot reach an external website (e.g., google.com). How do you troubleshoot?  
**Solution:**

bash

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ping google.com # Check basic connectivity

nslookup google.com # Check DNS resolution

traceroute google.com # Identify network hops causing issues

curl -v google.com # Debug HTTP requests

**Follow-up:** What if DNS is not working?

bash

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cat /etc/resolv.conf # Check if correct DNS servers are set

systemctl restart systemd-resolved # Restart DNS service

**4. SSH Not Working**

**Scenario:** You are unable to SSH into a remote server. What steps do you take?  
**Solution:**

bash

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ping <server-ip> # Check if server is reachable

telnet <server-ip> 22 # Check if SSH port is open

systemctl status sshd # Check if SSH service is running

cat /etc/ssh/sshd\_config | grep Port # Verify SSH port

**Follow-up:** How do you restart SSH service?

bash

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systemctl restart sshd

**5. User Permission Issue**

**Scenario:** A user is unable to write to a file in /opt/app/. How do you troubleshoot?  
**Solution:**

bash

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ls -l /opt/app/ # Check file ownership and permissions

groups <username> # Check user's groups

**Fix:**

bash

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chmod u+w /opt/app/ # Grant write permission

chown user:usergroup /opt/app/ # Change ownership

**6. Killing a Stuck Process**

**Scenario:** A process is stuck and does not terminate with kill. How do you force kill it?  
**Solution:**

bash

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ps aux | grep process\_name # Find the process ID

kill -9 <PID> # Force kill process

**Alternative (If kill -9 fails)?**

bash

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echo 1 > /proc/<PID>/oom\_score\_adj # Ask kernel to kill process

**7. Scheduled Cron Job Not Running**

**Scenario:** You set up a cron job, but it's not executing. How do you debug?  
**Solution:**

bash

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crontab -l # Check if cron job is scheduled

cat /var/log/syslog | grep CRON # Check cron logs

**Common Issues & Fixes:**

* Ensure script has execute permission: chmod +x script.sh
* Check if cron service is running: systemctl status cron

**8. Process Keeps Restarting**

**Scenario:** A critical application crashes and restarts automatically. How do you find the cause?  
**Solution:**

bash

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journalctl -u app.service --since "1 hour ago" # Check logs

dmesg -T | tail -50 # Check system logs

**Follow-up:** How do you prevent auto-restarts?

bash

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systemctl disable app.service # Disable systemd service

**9. Mounting an Additional Disk**

**Scenario:** You attached a new disk to a Linux system. How do you mount it?  
**Solution:**

bash

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lsblk # List all attached disks

sudo mkfs.ext4 /dev/sdb1 # Format disk (if new)

sudo mount /dev/sdb1 /mnt/data # Mount disk

**Permanent Mount:**  
Add this line to /etc/fstab

bash

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/dev/sdb1 /mnt/data ext4 defaults 0 2

**10. Application Port Already in Use**

**Scenario:** You try to start an application, but it fails due to "Port already in use." How do you resolve it?  
**Solution:**

bash

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netstat -tulnp | grep :8080 # Check which process is using port 8080

lsof -i :8080 # Find process ID using the port

**Fix:**

bash

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kill -9 <PID> # Kill the process

or

bash

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sudo fuser -k 8080/tcp # Force free the port

These are practical **Linux troubleshooting scenarios** that **DevOps engineers, sysadmins, and developers** face daily.

Here are some **advanced Linux scenario-based questions** with step-by-step solutions. These cover real-world problems faced by **DevOps engineers, system administrators, and cloud engineers**.

**1. Application Randomly Crashes Without Logs**

**Scenario:**

Your production application crashes randomly, but there are no logs in /var/log/ or the application logs. How do you diagnose the issue?

**Solution:**

**Check system logs**

bash

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journalctl -xe --since "1 hour ago"

dmesg -T | tail -50

**Check for Out of Memory (OOM) issues**

bash

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dmesg | grep -i 'oom'

cat /var/log/syslog | grep -i 'oom'

**If you see OOM-Killer messages, it means the kernel is killing the process due to high memory usage.**

**Find processes consuming high memory**

bash

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ps aux --sort=-%mem | head -10

**Fix:** Increase swap memory

bash

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sudo fallocate -l 4G /swapfile

sudo chmod 600 /swapfile

sudo mkswap /swapfile

sudo swapon /swapfile

**2. Root Password is Lost, How to Recover?**

**Scenario:**

You lost the root password and cannot log in to the system. How do you reset it?

**Solution:**

**Reboot and enter GRUB mode**

1. Restart the system and hold Shift (or Esc) to enter the **GRUB menu**.
2. Select the **recovery mode** or press e on the default entry.

**Modify boot parameters**

* Find the line starting with linux /boot/vmlinuz-...
* Add **rw init=/bin/bash** at the end.

**Boot into shell & change password**

bash

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passwd root # Set a new root password

**Reboot the system**

bash

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exec /sbin/init

**3. Docker Container Fails to Start Due to Port Conflict**

**Scenario:**

Your Docker container fails to start, saying:  
❌ **"Bind for 0.0.0.0:8080 failed: port is already allocated."**

**Solution:**

**Find the process using port 8080**

bash

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netstat -tulnp | grep :8080

lsof -i :8080

**Kill the conflicting process**

bash

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kill -9 <PID>

or

bash

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fuser -k 8080/tcp

**Restart the container**

bash

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docker restart <container-id>

**4. Slow SSH Login Issue**

**Scenario:**

SSH login to a remote server takes too long. How do you troubleshoot and fix it?

**Solution:**

**Check if DNS resolution is causing delays**  
Edit the SSH config:

bash

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sudo nano /etc/ssh/sshd\_config

Set:

bash

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UseDNS no

GSSAPIAuthentication no

Then restart SSH:

bash

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systemctl restart sshd

**Check network latency**

bash

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ping -c 5 remote-server

traceroute remote-server

**Check authentication logs**

bash

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cat /var/log/auth.log | tail -20

**5. High Load Average but Low CPU Usage**

**Scenario:**

Your server shows a high **load average** (uptime shows 10.00, 9.80, 8.90) but **CPU usage is low**. How do you investigate?

**Solution:**

**Check running processes**

bash

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top

htop

**Check disk I/O bottlenecks**

bash

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iostat -x 1 10 # High 'await' value indicates disk I/O issues

iotop # Show which process is consuming disk I/O

**Check zombie processes**

bash

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ps aux | grep Z

**Fix:**

* If disk I/O is high, check disk space:

bash

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df -h

du -sh /\*

* Restart services consuming high I/O

bash

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systemctl restart <service-name>

**6. Debugging a Stuck Process**

**Scenario:**

A process is stuck and doesn’t respond to kill -9. How do you debug it?

**Solution:**

**Check the process state**

bash

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ps -eo pid,stat,command | grep <process-name>

**Check if it’s waiting on I/O**

bash

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strace -p <PID>

**Forcefully terminate using SIGKILL**

bash

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kill -9 <PID>

echo 1 > /proc/<PID>/oom\_score\_adj

**7. Unable to Mount an NFS Share**

**Scenario:**

Your NFS share /mnt/data is not mounting. How do you fix it?

**Solution:**

**Check NFS server status**

bash

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systemctl status nfs-server

showmount -e <NFS-server-IP>

**Mount manually**

bash

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mount -t nfs <NFS-server-IP>:/data /mnt/data

**Fix firewall issues**

bash

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iptables -A INPUT -p tcp --dport 2049 -j ACCEPT

**8. Crontab Job Not Running**

**Scenario:**

A scheduled cron job is not running. How do you troubleshoot?

**Solution:**

**Check if the cron job exists**

bash

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crontab -l

**Check logs for cron job execution**

bash

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cat /var/log/syslog | grep CRON

**Ensure script has execute permission**

bash

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chmod +x /path/to/script.sh

**9. Hard Disk Suddenly Becomes Read-Only**

**Scenario:**

Your file system suddenly becomes **read-only**. How do you recover?

**Solution:**

**Check kernel logs for disk errors**

bash

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dmesg | tail -20

**Remount the filesystem**

bash

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mount -o remount,rw /

**Check and repair the disk**

bash

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fsck -y /dev/sda1

**10. Linux Server Reboots Randomly**

**Scenario:**

Your server is **randomly rebooting** without any error messages. How do you investigate?

**Solution:**

**Check last reboot time**

bash

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last reboot

**Check kernel panic logs**

bash

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journalctl -k -b -1

**Check if power issues exist**

bash

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cat /var/log/syslog | grep "power"

These are some real-world **advanced Linux troubleshooting** scenarios.