Mobile

Basic Questions

1. What is Docker?

Answer:

Docker is a platform thats lets you build ship and run application in container

2. What is a Docker Container?

Answer:
A Docker container is a lightweight isolated environment for running application

3. What is a Docker Image?

Answer:
A Docker image is a lightweight, standalone, and executable package

4. What is a Dockerfile?

Answer:
A Dockerfile is a script containines instruction to build a docker image

Example:

dockerfile
CopyEdit

```
FROM ubuntu:latest
RUN apt-get update && apt-get install -y nginx
CMD ["nginx", "-g", "daemon off;"]
```

Intermediate Questions

5. What is the difference between an Image and a Container?

Feature	Docker Image	Docker Container
Definition	A blueprint for creating containers	A running instance of an image
State	Read-only	Read-Write
Creation	Created using `Dockerfile`	Created from an image using `docker run`
Persistence	Static (does not change)	Changes can be saved as a new image

6. How do you create a Docker container?

Answer:

sh
CopyEdit
```
docker run -d -p 8080:80 nginx
```

This command:

- Runs an `nginx` container in detached mode (`-d`)
- Maps port `8080` on the host to port `80` in the container (`-p 8080:80`)

7. What is the difference between Docker and Virtual Machines (VMs)?

Feature	Docker Containers	Virtual Machines
Size	Lightweight (MBs)	Heavy (GBs)
Boot Time	Seconds	Minutes
Performance	Near-native	Slower due to OS overhead
Isolation	Process-level	Full OS-level isolation

8. What is the purpose of `docker-compose`?

Answer:
`docker-compose` is used to manage multi-container applications using a YAML file (`docker-compose.yml`). It allows defining, running, and managing multiple services together.

Example `docker-compose.yml` file:

yaml
CopyEdit
```
version: "3"
services:
  web:
    image: nginx
    ports:
      - "8080:80"
  db:
    image: mysql
    environment:
      MYSQL_ROOT_PASSWORD: root
```

Run it using:

sh
CopyEdit
```
docker-compose up -d
```

Advanced Questions

9. What are Docker Volumes?

Answer:
Docker volumes are used to persist data generated by and used by Docker containers.

Example:

sh
CopyEdit
```
docker volume create myvolume
docker run -d -v myvolume:/data nginx
```

10. How do you copy files between a container and the host?

Answer:
Copy files from host to container:

sh
CopyEdit
```
docker cp file.txt mycontainer:/app/
```

Copy files from container to host:

sh
CopyEdit
```
docker cp mycontainer:/app/file.txt .
```

11. What is the difference between `COPY` and `ADD` in a Dockerfile?

Command	Usage	Additional Features
`COPY`	Copies files from host to container	Simple file copy
`ADD`	Copies files and extracts archives	Can download from URLs

12. How do you check running Docker containers?

Answer:

sh
CopyEdit
```
docker ps
```

To check all containers (running + stopped):

sh
CopyEdit
```
docker ps -a
```

13. What are Docker Networks?

Answer:
Docker provides different networking modes:

- **Bridge** (default) – Allows containers on the same host to communicate.
- **Host** – Shares the host network directly.
- **Overlay** – Used for multi-host networking in Swarm mode.
- **None** – Disables networking.

Create a network and connect a container:

sh
CopyEdit
```
docker network create mynetwork
docker run -d --network=mynetwork nginx
```

14. How do you remove a Docker container and image?

Answer:
Remove a container:

sh
CopyEdit
```
docker rm container_id
```

Remove an image:

sh
CopyEdit
```
docker rmi image_id
```

15. How to limit resources (CPU & Memory) for a Docker container?

Answer:

sh
CopyEdit
```
docker run -d --memory="500m" --cpus="1.5" nginx
```
E

This limits the container to **500MB RAM** and **1.5 CPU cores**.

Expert-Level Questions

16. What is Docker Swarm?

Answer:
Docker Swarm is Docker's native clustering and orchestration tool. It allows managing a cluster of Docker nodes as a single system.

17. How does Docker handle security?

Answer:

- Namespaces for process isolation
- Control groups (cgroups) for resource limits
- Seccomp and AppArmor profiles for syscall filtering
- Read-only file systems

18. What is the difference between ENTRYPOINT and CMD in Dockerfile?

Feature	CMD	ENTRYPOINT
Purpose	Default command	Executable command
Overridable	Yes	No (unless `--entrypoint` is used)
Example	`CMD ["nginx", "-g", "daemon off;"]`	`ENTRYPOINT ["nginx"]`

19. How do you restart a stopped container?

Answer:

sh
CopyEdit
```
docker start container_id
```

20. How do you debug a Docker container?

Answer:
Check logs:

sh
CopyEdit
```
docker logs container_id
```

Inspect container details:

sh
CopyEdit
```
docker inspect container_id
```

Execute a shell inside the container:

sh
CopyEdit
```
docker exec -it container_id /bin/bash
```

Basic AWS Interview Questions

1. What is AWS?

Answer:
AWS (Amazon Web Services) is a cloud computing platform that provides a variety of services such as computing power, storage, databases, machine learning, and networking on a pay-as-you-go basis.

2. What are the main components of AWS?

Answer:
AWS consists of several core services, including:

- **Compute** – EC2, Lambda
- **Storage** – S3, EBS, EFS
- **Databases** – RDS, DynamoDB
- **Networking** – VPC, Route 53, CloudFront
- **Security** – IAM, KMS, Shield
- **Monitoring** – CloudWatch, AWS Config

3. What is EC2?

Answer:
Amazon EC2 (Elastic Compute Cloud) provides resizable compute capacity in the cloud. It allows users to launch virtual machines (instances) with different configurations based on their requirements.

4. What is Amazon S3?

Answer:
Amazon S3 (Simple Storage Service) is an object storage service that allows users to store and retrieve data at any time. It offers high durability and scalability.

5. What are IAM Roles and Policies?

Answer:

- **IAM (Identity and Access Management)** allows users to manage access to AWS resources securely.
- **Roles** provide temporary permissions to users, applications, or AWS services.
- **Policies** define permissions and are attached to IAM users, groups, or roles.

Intermediate AWS Interview Questions

6. What is the difference between EC2 and Lambda?

Feature	EC2	Lambda
Compute Type	Virtual Machine	Serverless
Cost	Pay for running instances	Pay per execution
Management	Full control over OS & software	Managed by AWS
Use Case	Long-running applications	Event-driven applications

7. What is an Elastic Load Balancer (ELB)?

Answer:
ELB distributes incoming network traffic across multiple EC2 instances to ensure better availability and fault tolerance.

8. What are the types of ELBs?

Answer:

- **Application Load Balancer (ALB)** – Layer 7, used for HTTP/HTTPS traffic.
- **Network Load Balancer (NLB)** – Layer 4, used for TCP/UDP traffic.
- **Classic Load Balancer (CLB)** – Older generation, works at both Layer 4 and Layer 7.

9. What is an AWS VPC?

Answer:
Amazon VPC (Virtual Private Cloud) allows users to create a logically isolated network within AWS, providing complete control over networking, subnets, and routing.

10. What is the difference between a Public and Private Subnet?

Subnet Type	Public Subnet	Private Subnet
Internet Access	Yes (via Internet Gateway)	No (unless NAT Gateway is used)
Use Case	Hosting web servers	Hosting databases, backend services

11. What is Auto Scaling?

Answer:
Auto Scaling automatically adjusts the number of EC2 instances based on traffic load, ensuring cost efficiency and high availability.

12. What is AWS CloudFront?

Answer:
AWS CloudFront is a Content Delivery Network (CDN) that speeds up the delivery of static and dynamic web content by caching it in edge locations worldwide.

13. What is Route 53?

Answer:
Route 53 is AWS's DNS (Domain Name System) web service that provides domain registration, DNS routing, and health checking.

14. What is the difference between RDS and DynamoDB?

Feature	RDS	DynamoDB
Type	Relational (SQL)	NoSQL
Scalability	Vertical Scaling	Horizontal Scaling
Use Case	Structured data	Unstructured or semi-structured data

15. What is an AWS Security Group?

Answer:
A Security Group acts as a virtual firewall for EC2 instances, controlling inbound and outbound traffic based on defined rules.

---

domain

Advanced AWS Interview Questions

16. What is AWS Lambda, and how does it work?

Answer:
AWS Lambda is a serverless compute service that runs code in response to events without provisioning or managing servers. It executes functions triggered by services like S3, API Gateway, and DynamoDB.

17. What is an AWS Auto Scaling Group (ASG)?

Answer:
An ASG automatically manages the number of EC2 instances in a fleet based on defined policies, ensuring cost efficiency and high availability.

18. How does AWS handle high availability?

Answer:
AWS ensures high availability through:

- Multi-AZ deployment in RDS
- Auto Scaling for EC2
- ELB for distributing traffic

- Fault-tolerant architecture in services like S3 and DynamoDB

19. What is AWS CloudFormation?

Answer:
AWS CloudFormation allows users to define infrastructure as code using YAML or JSON templates. It automates the provisioning and management of AWS resources.

20. What is AWS Fargate?

Answer:
AWS Fargate is a serverless compute engine for containers, allowing users to run ECS and EKS containers without managing EC2 instances.

21. How do you monitor AWS resources?

Answer:
AWS provides several monitoring tools:

- **CloudWatch** – Logs, metrics, and alarms
- **AWS X-Ray** – Distributed tracing
- **AWS Config** – Tracks resource changes

22. What is AWS Direct Connect?

Answer:
AWS Direct Connect provides a dedicated network connection between an on-premises data center and AWS for improved performance and security.

23. What are AWS Organizations?

Answer:
AWS Organizations allows managing multiple AWS accounts under a single umbrella, enabling consolidated billing and access control.

24. What is AWS WAF?

Answer:
AWS Web Application Firewall (WAF) protects web applications from common exploits like SQL injection and cross-site scripting.

25. What is the difference between EBS and EFS?

Feature	EBS	EFS
Type	Block Storage	File Storage
Instance Dependency	Attached to a single EC2	Can be mounted on multiple instances
Use Case	Databases, OS storage	Shared file storage

Expert-Level AWS Interview Questions

26. How do you secure an S3 bucket?

Answer:

- Enable **bucket policies** to restrict access.
- Use **IAM roles and policies**.
- Enable **server-side encryption**.
- Use **AWS WAF** to prevent malicious access.
- Enable **S3 versioning** for recovery.

27. What is AWS Snowball?

Answer:
AWS Snowball is a physical data transport solution used to migrate large amounts of data (up to petabytes) to AWS.

28. What is AWS Control Tower?

Answer:
AWS Control Tower provides centralized governance and best practices for managing multiple AWS accounts.

29. What is AWS Redshift?

Answer:
AWS Redshift is a fully managed data warehouse service optimized for analytics and big data workloads.

30. How does AWS Elastic Beanstalk work?

Answer:
Elastic Beanstalk automates application deployment, including provisioning infrastructure, load balancing, scaling, and monitoring.

Basic Linux Interview Questions

- **General Linux Basics**

1. What is Linux?

Linux is an open-source, Unix-like operating system kernel that is widely used for servers, desktops, embedded systems, and more. It is known for its stability, security, and flexibility.

2. What are the basic differences between Linux and Windows?

Feature	Linux	Windows
Source Code	Open Source	Closed Source
Cost	Free	Paid (mostly)
CLI Usage	Command-line centric	GUI-centric
File System	ext4, xfs, btrfs, etc.	NTFS, FAT
Security	Generally more secure	More targeted by malware

3. What are the different types of Linux distributions (distros)?

Popular distros include:

Debian-based: Ubuntu, Linux Mint

Red Hat-based: RHEL, CentOS, Fedora

Arch-based: Arch Linux, Manjaro

Others: SUSE, Alpine, Gentoo

4. What is the Linux kernel?

The kernel is the core part of the Linux operating system that manages hardware, memory, processes, and system calls.

5. What is the difference between Unix and Linux?

Unix is a proprietary OS originally developed in the 1970s.

Linux is a free and open-source Unix-like OS inspired by Unix.

- **File System and Directory Structure**

6. What is the Linux directory structure?

It is a hierarchical structure starting from the root (/). Everything in Linux is a file or directory under /.

7. What is the purpose of /etc, /var, /bin, /usr, and /home?

/etc: System configuration files

/var: Variable files like logs

/bin: Essential command binaries

/usr: User-installed software and libraries

/home: Users' personal directories

8. What is an inode?

An inode is a data structure that stores metadata about a file (like size, owner, permissions), except its name.

9. What is the difference between a hard link and a soft link?

Hard link: Direct reference to the inode of a file. Same file, different name.

Soft link (symlink): A shortcut that points to another file's name/path.

- **Linux Commands**

10. What does the ls command do?

Lists files and directories in the current directory.

11. How do you view the contents of a file?

cat filename

less filename

more filename

tail filename

head filename

12. What is the purpose of chmod, chown, and chgrp commands?

chmod: Change file permissions

chown: Change file owner

chgrp: Change file group

13. What is the difference between su and sudo?

su: Switch user (usually to root)

sudo: Run a single command as another user (default: root)

14. How do you find a file in Linux?

find /path -name filename

locate filename

15. How do you search inside files for a string?

grep "text" filename

- **Process and Service Management**

16. How do you list running processes?

ps aux

top

htop

17. What does the top or htop command show?

Real-time view of system processes, CPU, memory usage.

18. How do you kill a process in Linux?

kill PID

kill -9 PID (forcefully)

19. What is the difference between a service and a process?

Process: An instance of a running program.

Service: A background process managed by init/systemd.

20. How do you start/stop a service using systemctl or service?

systemctl start|stop|restart service

service service_name start|stop|restart

- **User and Permission Management**

21. How do you create a new user and group?

useradd username

groupadd groupname

22. How do Linux file permissions work (rwx)?

Each file has permissions:

r: read

w: write

x: execute

They apply to user, group, and others.

23. What does chmod 755 file mean?

Owner: read, write, execute

Group & Others: read, execute

24. How do you check what groups a user belongs to?

groups username

id username

25. What is the /etc/passwd and /etc/shadow file?

/etc/passwd: User account information

/etc/shadow: Encrypted user passwords and aging info

- **Networking**

26. How do you check your IP address?

ip a

ifconfig (older)

27. How do you check if a host is reachable?

ping hostname/IP

28. What is the purpose of /etc/hosts and /etc/resolv.conf?

/etc/hosts: Local name resolution

/etc/resolv.conf: DNS server settings

29. How do you open a specific port on a Linux server?

Using firewalld or iptables

firewall-cmd --add-port=80/tcp --permanent && firewall-cmd --reload

30. What does the netstat or ss command do?

Shows network connections, ports, and sockets

- **Package Management**

31. How do you install software on Linux?

Debian/Ubuntu:

apt install package

dpkg -i package.deb

RHEL/CentOS:

yum install package

dnf install package

rpm -ivh package.rpm

32. How do you update the system?

Debian: apt update && apt upgrade

RHEL: yum update or dnf upgrade

- **Disk and File System**

33. How do you check disk usage?

df -h: Filesystem usage

du -sh /path: Directory size

34. How do you mount and unmount drives?

Mount: mount /dev/sdX /mnt

Unmount: umount /mnt

35. What is a partition and how is it different from a filesystem?

Partition: A logical division of a disk

Filesystem: Organizes and stores files on a partition (e.g., ext4, xfs)

- **Other Essentials**

36. What is a shell?

A command-line interface to interact with the OS (e.g., Bash, Zsh).

37. What is Bash?

Bash (Bourne Again SHell) is the most common Linux shell used for scripting and commands.

38. What are environment variables?

Variables that define system behavior and are inherited by child processes (e.g., PATH, HOME).

39. What is a cron job? How do you schedule tasks?

A cron job is a scheduled task.

Use crontab -e to edit user cron jobs.

Example: 0 5 * * * /path/to/script.sh (runs at 5 AM daily)

40. What is a log file and where are system logs stored?

Log files record system events.

Stored in /var/log/ (e.g., /var/log/syslog, /var/log/messages

1. What is Linux?

Answer:
Linux is an open-source, Unix-like operating system that manages hardware and software resources. It is widely used in servers, embedded systems, and cloud computing.

2. What are the key components of Linux?

Answer:

- **Kernel** – Core of the OS, manages hardware resources.
- **Shell** – Interface for users to execute commands.
- **File System** – Organizes files and directories.
- **Daemons** – Background services (e.g., SSH, cron).

3. What are some popular Linux distributions?

Answer:

- **Debian-based** – Ubuntu, Kali Linux
- **RHEL-based** – CentOS, Fedora, Rocky Linux
- **SUSE-based** – openSUSE
- **Arch-based** – Manjaro, EndeavourOS

4. How do you check the Linux kernel version?

Answer:

bash
CopyEdit
```
uname -r
```

5. How do you check system uptime?

Answer:

bash
CopyEdit
```
uptime
```

6. What is the difference between Linux and Unix?

Feature	Linux	Unix
Source	Open-source	Proprietary & open-source variants
Usage	Servers, desktops, mobile	Servers, mainframes
Distributions	Multiple	Few (AIX, HP-UX, Solaris)

7. How do you list files in a directory?

Answer:

bash
CopyEdit
```
ls -l
```

8. How do you check disk usage?

Answer:

bash
CopyEdit
```
df -h
du -sh /path
```

9. What is a Linux process?

Answer:
A process is an executing instance of a program. Every process has a unique **PID (Process ID)**.

10. How do you check running processes?

Answer:

bash
CopyEdit
```
ps aux
top
htop
```

Intermediate Linux Interview Questions

11. What is the difference between a hard link and a soft link?

Feature	Hard Link	Soft Link
Points To	Original file's inode	File name
Works After Deletion?	Yes	No
Across Filesystems?	No	Yes

12. How do you create a symbolic link?

Answer:

bash
CopyEdit

```
ln -s /path/to/file /path/to/symlink
```

13. How do you find a file in Linux?

Answer:

bash
CopyEdit

```
find / -name "filename"
locate filename
```

14. How do you find a specific word inside a file?

Answer:

bash
CopyEdit

```
grep "word" filename
```

15. What is the difference between `cron` and `at`?

Feature	cron	at
Scheduling	Repeats tasks	One-time task
Configuration	`crontab -e`	`at HH:MM`

16. How do you view system logs?

Answer:

bash
CopyEdit

```
journalctl -xe
tail -f /var/log/syslog
```

17. How do you check network configuration?

Answer:

bash
CopyEdit

```
ip a
ifconfig
```

18. How do you check open ports?

Answer:

bash
CopyEdit
```
ss -tulnp
netstat -tulnp
```

19. How do you check memory usage?

Answer:

bash
CopyEdit
```
free -h
top
```

20. What is the difference between `/dev/null`, `/dev/zero`, and `/dev/random`?

Device	Purpose
`/dev/null`	Discards all data written to it
`/dev/zero`	Infinite stream of null bytes
`/dev/random`	Random data generator

Advanced Linux Interview Questions

21. What is the difference between a process and a thread?

Feature	Process	Thread
Memory Space	Separate	Shared
Speed	Slower	Faster

22. How do you kill a process?

Answer:

bash
CopyEdit
```
kill PID
```

```
kill -9 PID
pkill process_name
```

23. What is a zombie process?

Answer:
A process that has completed execution but remains in the process table until its parent retrieves its exit status.

24. What is LVM?

Answer:
Logical Volume Manager (LVM) allows flexible disk management.

- **Commands:**

bash
CopyEdit

```
pvcreate /dev/sdb
vgcreate my_vg /dev/sdb
lvcreate -L 10G -n my_lv my_vg
mkfs.ext4 /dev/my_vg/my_lv
mount /dev/my_vg/my_lv /mnt
```

25. How do you check the firewall status?

Answer:

bash
CopyEdit

```
sudo ufw status   # Ubuntu
sudo systemctl status firewalld   # RHEL
```

26. What is SELinux and AppArmor?

Answer:
Security-enhanced Linux (SELinux) and AppArmor are security modules that enforce mandatory access control.

27. How do you set file permissions?

Answer:

bash
CopyEdit

```
chmod 755 file
chown user:group file
```

28. How do you find the top 5 largest files in a directory?

Answer:

bash
CopyEdit
```
du -ah /path | sort -rh | head -5
```

29. What is RAID in Linux?

Answer:
RAID (Redundant Array of Independent Disks) is a storage solution for redundancy and performance.

- **RAID 0** – Striping, no redundancy
- **RAID 1** – Mirroring
- **RAID 5** – Striping with parity

30. How do you monitor system performance?

Answer:

bash
CopyEdit
```
vmstat
iostat
sar
```

Expert-Level Linux Interview Questions

31. How do you debug a Linux server crash?

Answer:

- Check logs: `journalctl -xe`, `/var/log/syslogu`
- Analyze memory: `free -m`, `dmesg | grep -i oom`
- Check disk usage: `df -h`, `iostat`

32. What is the difference between systemd and init?

Feature	systemd	init
Boot Speed	Faster	Slower
Process Handling	Parallel	Sequential

33. How do you recover a lost root password?

Answer:

1. Boot into **single-user mode**.
2. Run:

bash
CopyEdit

```
mount -o remount,rw /
passwd root
```

3. Reboot.

34. What is `strace` and `lsof`?

Answer:

- `strace` – Traces system calls
- `lsof` – Lists open files

35. What is `chroot`?

Answer:
`chroot` changes the root directory, isolating processes.

bash
CopyEdit

```
chroot /mnt/newroot /bin/bash
```

🔄 How DNS Works (Step-by-Step):

1. **User types a URL** (e.g., www.example.com) in the browser.
2. **Browser checks local cache** – If it finds the IP, it uses it directly.
3. If not found, the request goes to a **DNS resolver** (usually your ISP).
4. The resolver asks the **root DNS server** where to find .com domains.
5. The root server replies with the address of a **TLD server** (Top-Level Domain, like .com).
6. The resolver then asks the TLD server for example.com.
7. The TLD server points to the **authoritative DNS server** for example.com.
8. The authoritative server responds with the **IP address**.

9. The resolver gives this IP to your browser.

10. The browser connects to the IP address and loads the website.

Basic Ansible Interview Questions

1. What is Ansible?

Answer:
Ansible is an open-source automation tool used for **configuration management, application deployment, and task automation**

---

2. How does Ansible work?

Answer:
Ansible works by:

1. Connecting to **remote servers** using **SSH** (Linux) or **WinRM** (Windows).
2. Executing **tasks** defined in YAML-based **playbooks**.
3. Applying **desired configurations** on managed nodes.

---

3. What are the key components of Ansible?

Answer:

- **Control Node** – The machine where Ansible runs.
- **Managed Nodes** – Systems that Ansible configures.
- **Inventory** – A list of servers
- **Playbooks** – YAML files containing automation tasks.
- **Modules** – Predefined module
- **Roles** – collection of a plabook

---

4. How do you check the Ansible version?

Answer:

bash
CopyEdit

```
ansible --version
```

---

5. What is the default location of the Ansible inventory file?

Answer:
`/etc/ansible/hosts`

To define a custom inventory file:

bash
CopyEdit
```
ansible -i /path/to/inventory all --list-hosts
```

---

6. What is an Ansible Playbook?

Answer:
A **playbook** is a YAML file that defines tasks to automate. Example:

yaml
CopyEdit
```
- name: Install Apache on Ubuntu
  hosts: webservers
  tasks:
    - name: Install Apache
      apt:
        name: apache2
        state: present
```

---

7. What are Ansible Modules?

Answer:
Ansible **modules** are reusable scripts used to execute tasks.

- **Examples:**
  - File management (`file`, `copy`, `fetch`)
  - Package management (`apt`, `yum`, `dnf`)
  - User management (`user`, `group`)

Run a module ad-hoc:

bash
CopyEdit
```
ansible all -m ping
```

---

8. What is the Ansible ad-hoc command?

Answer:
An ad-hoc command runs a single task without using a playbook.

Example:

bash
CopyEdit
```
ansible all -m ping
ansible webservers -m command -a "uptime"
```

---

9. What is Ansible Galaxy?

Answer:
Ansible Galaxy is a repository for **pre-built Ansible roles** that can be shared and reused.

Install a role from Galaxy:

bash
CopyEdit
```
ansible-galaxy install geerlingguy.apache
```

---

10. What is Ansible Vault?

Answer:
Ansible Vault encrypts sensitive data like passwords.

Encrypt a file:

bash
CopyEdit
```
ansible-vault encrypt secrets.yml
```

Decrypt a file:

bash
CopyEdit
```
ansible-vault decrypt secrets.yml
```

Intermediate Ansible Interview Questions

11. What are handlers in Ansible?

Answer:
Handlers execute only **when notified** by a task.

Example:

yaml
CopyEdit

```yaml
- name: Restart Apache if needed
  hosts: webservers
  tasks:
    - name: Install Apache
      apt:
        name: apache2
        state: present
      notify: Restart Apache

  handlers:
    - name: Restart Apache
      service:
        name: apache2
        state: restarted
```

---

12. How do you run Ansible playbooks?

Answer:

bash
CopyEdit

```bash
ansible-playbook playbook.yml
```

To run with a specific inventory file:

bash
CopyEdit

```bash
ansible-playbook -i inventory playbook.yml
```

---

13. How do you use conditionals in Ansible?

Answer:
Use `when` to apply conditions.

Example:

yaml
CopyEdit

```yaml
- name: Install Apache only on Ubuntu
```

```
  hosts: webservers
  tasks:
    - name: Install Apache
      apt:
        name: apache2
        state: present
      when: ansible_os_family == "Debian"
```

---

14. How do you use loops in Ansible?

Answer:
Use `with_items` or `loop`.

Example:

yaml
CopyEdit

```
- name: Install multiple packages
  apt:
    name: "{{ item }}"
    state: present
  loop:
    - apache2
    - mysql-server
    - php
```

---

15. What is the difference between `copy` and `template` modules?

Module	Purpose
`copy`	Copies a file as-is to remote nodes
`template`	Uses Jinja2 templates for dynamic content

Example of `template`:

yaml
CopyEdit

```
- name: Configure Apache
  template:
    src: apache.conf.j2
    dest: /etc/apache2/apache2.conf
```

---

16. How do you execute a playbook with elevated privileges?

Answer:
Use `become: yes`.

Example:

yaml
CopyEdit
```
- name: Install Apache with sudo
  hosts: webservers
  tasks:
    - name: Install Apache
      apt:
        name: apache2
        state: present
      become: yes
```

---

17. How do you test an Ansible playbook without applying changes?

Answer:

bash
CopyEdit
```
ansible-playbook playbook.yml --check
```

---

18. How do you list all available Ansible modules?

Answer:

bash
CopyEdit
```
ansible-doc -l
```

---

19. How do you define environment variables in Ansible?

Answer:
Use the `environment` directive.

Example:

yaml
CopyEdit
```
- name: Set environment variables
  hosts: webservers
```

```
  tasks:
    - name: Run script with environment variable
      shell: echo $APP_ENV
      environment:
        APP_ENV: production
```

---

20. How do you debug Ansible playbooks?

Answer:
Use the `debug` module:

yaml
CopyEdit

```
- name: Debugging output
  debug:
    msg: "The OS is {{ ansible_os_family }}"
```

Advanced Ansible Interview Questions

21. What is an Ansible Role?

Answer:
A role is a structured way to organize playbooks.

Create a role:

bash
CopyEdit

```
ansible-galaxy init myrole
```

Directory structure:

python
CopyEdit

```
myrole/
├── tasks/
├── handlers/
├── templates/
├── files/
├── vars/
├── defaults/
└── meta/
```

Use the role in a playbook:

yaml
CopyEdit

```
- name: Apply role
  hosts: webservers
  roles:
    - myrole
```

---

22. How do you run Ansible in parallel?

Answer:
Increase the number of forks:

bash
CopyEdit

```
ansible-playbook playbook.yml -f 10
```

---

23. How do you use facts in Ansible?

Answer:
Facts are system information collected automatically.

Example:

yaml
CopyEdit

```
- name: Print OS version
  debug:
    msg: "OS Version: {{ ansible_distribution_version }}"
```

---

24. How do you optimize Ansible performance?

Answer:

- Use `forks` for parallel execution.
- Use `async` for long tasks.
- Use `gather_facts: no` if facts are not needed.

---

25. How do you handle errors in Ansible?

Answer:
Use `ignore_errors: yes`.

yaml
CopyEdit

```
- name: Continue even if a task fails
  command: /bin/false
  ignore_errors: yes
```

Linux Commands – Interview Questions

1. What is the command to check the Linux kernel version?

Answer:

bash
CopyEdit
`uname -r`

---

2. How do you check the current working directory?

Answer:

bash
CopyEdit
`pwd`

---

3. How do you list files in a directory?

Answer:

bash
CopyEdit
`ls`

Options:

- `ls -l` → Detailed list with permissions
- `ls -a` → Show hidden files
- `ls -lh` → Human-readable sizes

---

4. How do you create a new file in Linux?

Answer:

bash
CopyEdit
```
touch filename
```

or

bash
CopyEdit
```
echo "Hello" > filename
```

---

5. How do you create a directory?

Answer:

bash
CopyEdit
```
mkdir new_directory
```

---

6. How do you remove a file and a directory?

Answer:

bash
CopyEdit
```
rm filename
rm -r directoryname  # Remove directory
```

---

7. How do you copy and move files in Linux?

Answer:
Copy a file:

bash
CopyEdit
```
cp file1 file2
```

Move/rename a file:

bash
CopyEdit
```
mv oldname newname
```

---

8. How do you view the contents of a file?

Answer:

bash
CopyEdit

```
cat filename
less filename   # Scroll through the file
more filename   # View file page-by-page
```

---

9. How do you search for a string inside a file?

Answer:

bash
CopyEdit

```
grep "search_term" filename
```

Options:

- `grep -i` → Case insensitive
- `grep -r "text" /directory` → Search recursively

---

10. How do you display the last 10 lines of a file?

Answer:

bash
CopyEdit

```
tail filename
```

To show **real-time updates**:

bash
CopyEdit

```
tail -f filename
```

Intermediate Linux Commands Interview Questions

11. How do you find the process ID (PID) of a running process?

Answer:

bash

CopyEdit

```
ps aux | grep process_name
pidof process_name
pgrep process_name
```

---

12. How do you kill a process?

Answer:

bash
CopyEdit

```
kill PID
kill -9 PID  # Force kill
```

or

bash
CopyEdit

```
pkill process_name
```

---

13. How do you check system resource usage?

Answer:

bash
CopyEdit

```
top      # Live process monitoring
htop     # Interactive process viewer
free -m  # Memory usage
df -h    # Disk usage
```

---

14. How do you check open ports in Linux?

Answer:

bash
CopyEdit

```
netstat -tulnp
ss -tulnp
```

Options:

- `-t` → TCP connections

- `-u` → UDP connections
- `-l` → Listening ports

---

15. How do you schedule a cron job?

Answer:
Edit crontab:

bash
CopyEdit
```
crontab -e
```

Example: Run a script every day at 2 AM

bash
CopyEdit
```
0 2 * * * /path/to/script.sh
```

---

16. How do you find files modified in the last 2 days?

Answer:

bash
CopyEdit
```
find /path -type f -mtime -2
```

---

17. How do you change file permissions?

Answer:

bash
CopyEdit
```
chmod 755 filename
```

Options:

- `7` → Read, Write, Execute (Owner)
- `5` → Read, Execute (Group & Others)

or

bash
CopyEdit
```
chmod u+rwx,g+rx,o+rx filename
```

---

18. How do you change file ownership?

Answer:

bash
CopyEdit
```
chown user:group filename
```

---

19. How do you check disk usage of a directory?

Answer:

bash
CopyEdit
```
du -sh /path/to/directory
```

---

20. How do you extract a tar.gz file?

Answer:

bash
CopyEdit
```
tar -xvzf archive.tar.gz
```

To create a `.tar.gz` file:

bash
CopyEdit
```
tar -cvzf archive.tar.gz directory/
```

Advanced Linux Commands Interview Questions

21. How do you find the top 10 largest files in a directory?

Answer:

bash
CopyEdit
```
du -ah /directory | sort -rh | head -10
```

---

22. How do you check which users are logged into the system?

Answer:

bash
CopyEdit
```
who
w
```

---

23. How do you check system uptime?

Answer:

bash
CopyEdit
```
uptime
```

---

24. How do you set environment variables?

Answer:
Temporarily:

bash
CopyEdit
```
export VAR_NAME=value
```

Permanently (add to `~/.bashrc` or `~/.bash_profile`):

bash
CopyEdit
```
echo 'export VAR_NAME=value' >> ~/.bashrc
source ~/.bashrc
```

---

25. How do you find and replace text in a file?

Answer:
Using `sed`:

bash
CopyEdit
```
sed -i 's/oldtext/newtext/g' filename
```

---

26. How do you view the system logs?

Answer:

bash
CopyEdit
```
journalctl -xe
dmesg | tail
```

---

27. How do you monitor real-time logs?

Answer:

bash
CopyEdit
```
tail -f /var/log/syslog
```

---

28. How do you restart a service in Linux?

Answer:

bash
CopyEdit
```
systemctl restart service_name
```

Check service status:

bash
CopyEdit
```
systemctl status service_name
```

---

29. How do you create a symbolic link?

Answer:

bash
CopyEdit
```
ln -s /path/to/file link_name
```

---

30. How do you find the number of lines, words, and characters in a file?

Answer:

bash
CopyEdit
```
wc filename
```

- `wc -l` → Count lines
- `wc -w` → Count words
- `wc -c` → Count characters

Bonus: Linux Command Scenarios in Interviews

1. Find all files with `.log` extension and delete them.

bash
CopyEdit
```
find /path -name "*.log" -type f -delete
```

---

2. Compress a directory into a `.zip` file.

bash
CopyEdit
```
zip -r archive.zip directory/
```

---

3. How do you display the first 10 lines of a file?

bash
CopyEdit
```
head filename
```

---

4. Restart a system after 10 minutes.

bash
CopyEdit
```
shutdown -r +10
```

---

5. Remove duplicate lines from a file.

bash
CopyEdit
```
sort filename | uniq > newfile
```

Basic Linux, Nginx, and Apache Interview Questions

1. What is Linux?

Answer:
Linux is an open-source, Unix-like operating system that is widely used in servers, cloud computing, and embedded systems.

---

2. What is the difference between a process and a thread?

Answer:

- **Process**: A running instance of a program, having its own memory space.
- **Thread**: A lightweight process that shares the same memory space with other threads within a process.

---

3. How do you check which Linux distribution you are using?

Answer:

bash
CopyEdit
```
cat /etc/os-release
```

or

bash
CopyEdit
```
lsb_release -a
```

---

4. How do you check running processes?

Answer:

bash
CopyEdit
```
ps aux
top
htop
```

---

5. How do you check system logs?

Answer:

bash
CopyEdit

```
journalctl -xe
tail -f /var/log/syslog
```

---

6. What is the difference between hard links and soft links?

Answer:

Hard Link: Points directly to the data on disk. Even if the original file is deleted, the data remains.
bash
CopyEdit

```
ln file1 file2
```

-

Soft Link (Symbolic Link): Points to the file's path. If the original file is deleted, the link breaks.
bash
CopyEdit

```
ln -s file1 file2
```

-

Nginx Interview Questions

7. What is Nginx?

Answer:
Nginx is a high-performance web server that also functions as a reverse proxy, load balancer, and caching server.

---

8. How do you install Nginx on Linux?

Answer:
For **Ubuntu/Debian**:

bash
CopyEdit

```
sudo apt update
sudo apt install nginx
```

For **CentOS/RHEL**:

bash
CopyEdit
```
sudo yum install nginx
```

---

9. How do you start, stop, and restart Nginx?

Answer:

bash
CopyEdit
```
sudo systemctl start nginx
sudo systemctl stop nginx
sudo systemctl restart nginx
```

---

10. How do you check the status of Nginx?

Answer:

bash
CopyEdit
```
sudo systemctl status nginx
```

---

11. Where is the default Nginx configuration file located?

Answer:
The main configuration file is:

bash
CopyEdit
```
/etc/nginx/nginx.conf
```

For virtual hosts:

bash
CopyEdit
```
/etc/nginx/sites-available/
```

---

12. How do you test the Nginx configuration for errors?

Answer:

bash
CopyEdit
```
sudo nginx -t
```

---

13. How do you enable a website in Nginx?

Answer:
Create a configuration file under `/etc/nginx/sites-available/` and then create a symbolic link:

bash
CopyEdit
```
ln -s /etc/nginx/sites-available/site.conf /etc/nginx/sites-enabled/
sudo systemctl reload nginx
```

---

14. How do you set up Nginx as a reverse proxy?

Answer:
Edit the Nginx config file:

nginx
CopyEdit
```
server {
    listen 80;
    server_name example.com;

    location / {
        proxy_pass http://127.0.0.1:5000;  # Backend application
        proxy_set_header Host $host;
        proxy_set_header X-Real-IP $remote_addr;
    }
}
```

Restart Nginx:

bash
CopyEdit
```
sudo systemctl restart nginx
```

---

15. How do you check Nginx logs?

Answer:

Access logs:
bash
CopyEdit
```
tail -f /var/log/nginx/access.log
```

-

Error logs:
bash
CopyEdit
```
tail -f /var/log/nginx/error.log
```

-

Apache Web Server Interview Questions

16. What is Apache?

Answer:
Apache is an open-source web server software used for hosting websites.

---

17. How do you install Apache on Linux?

Answer:
For **Ubuntu/Debian**:

bash
CopyEdit
```
sudo apt update
sudo apt install apache2
```

For **CentOS/RHEL**:

bash
CopyEdit
```
sudo yum install httpd
```

---

18. How do you start, stop, and restart Apache?

Answer:
For **Ubuntu/Debian**:

bash
CopyEdit
```
sudo systemctl start apache2
sudo systemctl restart apache2
sudo systemctl stop apache2
```

For **CentOS/RHEL**:

bash
CopyEdit
```
sudo systemctl start httpd
sudo systemctl restart httpd
sudo systemctl stop httpd
```

---

19. Where is Apache's configuration file located?

Answer:

- **Ubuntu/Debian**: `/etc/apache2/apache2.conf`
- **CentOS/RHEL**: `/etc/httpd/conf/httpd.conf`

---

20. How do you enable and disable an Apache site?

Answer:
Enable a site:

bash
CopyEdit
```
sudo a2ensite site.conf
sudo systemctl reload apache2
```

Disable a site:

bash
CopyEdit
```
sudo a2dissite site.conf
sudo systemctl reload apache2
```

---

21. How do you change the default port of Apache?

Answer:
Edit the configuration file:

bash
CopyEdit
```
sudo nano /etc/apache2/ports.conf
```

Change:

mathematica
CopyEdit
```
Listen 80
```

to

yaml
CopyEdit
```
Listen 8080
```

Restart Apache:

bash
CopyEdit
```
sudo systemctl restart apache2
```

---

22. How do you check if Apache is running?

Answer:

bash
CopyEdit
```
sudo systemctl status apache2
```

---

23. How do you configure Apache Virtual Hosts?

Answer:
Create a new file in `/etc/apache2/sites-available/yourdomain.conf`:

apache
CopyEdit
```
<VirtualHost *:80>
```

```
    ServerAdmin admin@yourdomain.com
    ServerName yourdomain.com
    DocumentRoot /var/www/yourdomain
    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>
```

Enable site and restart Apache:

bash
CopyEdit

```
sudo a2ensite yourdomain.conf
sudo systemctl restart apache2
```

---

24. How do you check Apache logs?

Answer:

Access logs:
bash
CopyEdit

```
tail -f /var/log/apache2/access.log
```

-

Error logs:
bash
CopyEdit

```
tail -f /var/log/apache2/error.log
```

-

---

25. What is the difference between Apache and Nginx?

Feature	Apache	Nginx
Architecture	Process-based	Event-driven
Performance	Slower under high load	High performance
Reverse Proxy	Supported	Built-in reverse proxy
Load Balancing	Requires modules	Built-in support

Configuration	`.htaccess` for per-directory settings	Centralized config

Basic Git & GitHub Interview Questions

1. What is Git?

Answer:
Git is a **distributed version control system** that allows multiple developers to track changes in source code during software development.

---

2. What is the difference between Git and GitHub?

Answer:

- **Git** is a version control tool.
- **GitHub** is a web-based platform that hosts Git repositories and allows collaboration.

---

3. What command is used to create a local Git repository?

Answer:

bash
CopyEdit
```
git init
```

---

4. How do you clone a repository from GitHub?

Answer:

bash
CopyEdit
```
git clone https://github.com/username/repo-name.git
```

---

5. What is the purpose of `git add` and `git commit`?

Answer:

- `git add` stages changes for commit.
- `git commit` saves the staged changes in the repository history.

---

6. What is the difference between `git pull` and `git fetch`?

Answer:

- `git fetch` downloads changes but does not merge.
- `git pull` = `git fetch` + `git merge`.

---

7. How do you push code to a GitHub repo?

Answer:

bash
CopyEdit
```
git push origin branch-name
```

---

8. How do you check the status of your Git repo?

Answer:

bash
CopyEdit
```
git status
```

---

9. What is a merge conflict?

Answer:
A merge conflict happens when **two people change the same part of the same file**, and Git doesn't know which version to keep.

---

10. How do you resolve a merge conflict?

Answer:

- Open the file.
- Look for `<<<<<<<`, `=======`, `>>>>>>>`.
- Choose the correct version or merge both.
- Save the file.

Run:

bash
CopyEdit
```
git add conflicted-file
git commit
```

-

---

11. What is `.gitignore`?

Answer:
A file where you list **files or folders to exclude** from being tracked by Git. Example:

bash
CopyEdit
```
node_modules/
*.log
.env
```

---

12. How do you create a new branch and switch to it?

Answer:

bash
CopyEdit
```
git checkout -b new-branch-name
```

---

13. What is a pull request (PR) in GitHub?

Answer:
A request to merge your changes from one branch (usually a feature branch) into another (usually `main`), and allows for code review and collaboration.

---

14. What is forking in GitHub?

Answer:
Forking means creating a **copy of someone else's repository** to your own GitHub account, so you can work on it independently.

---

15. How can you revert a commit?

```
git revert <commit-id>
```

Basic Kubernetes Interview Questions

1. **What is Kubernetes?**
   → Kubernetes (K8s) is an open-source container orchestration tool used to automate deployment, scaling, and management of containerized applications.

2. **Who developed Kubernetes?**
   → Developed by Google, now maintained by the **Cloud Native Computing Foundation (CNCF)**.

3. **What is a Pod?**
   → A Pod is the smallest deployable unit in Kubernetes. It can contain one or more containers that share storage and network resources.

4. **What is a Node?**
   → A Node is a worker machine (VM or physical) in Kubernetes where Pods are scheduled and run.

5. **What is a Cluster?**
   → A Cluster is a group of nodes managed by the Kubernetes control plane.

6. **What is kubelet?**
   → The kubelet runs on each node and ensures that containers are running in a Pod as expected.

7. **What is kubectl?**
   → kubectl is the command-line tool to interact with the Kubernetes API server.

8. **What is a Namespace?**
   → Namespaces are used to divide cluster resources between multiple users or applications.

9. **What is a Deployment?**
   → A Deployment manages replica sets and ensures the desired number of Pods are running.

10. **What is a ReplicaSet?**
    → ReplicaSet ensures a specified number of Pod replicas are running at all times.

🟡 Intermediate Kubernetes Questions

11. **Difference between ReplicaSet and ReplicationController?**
    → ReplicaSet is a newer version that supports set-based selectors; ReplicationController supports equality-based selectors only.

12. **What is a Service in Kubernetes?**
    → A Service is an abstraction that defines a logical set of Pods and a policy to access them (LoadBalancer, ClusterIP, NodePort).

13. **Types of Kubernetes Services?**
    - **ClusterIP** – default; accessible only within cluster.
    - **NodePort** – exposes service on node IP at a static port.
    - **LoadBalancer** – exposes service externally via cloud load balancer.
    - **ExternalName** – maps service to an external DNS name.

14. **What is Ingress?**
    → Ingress manages external HTTP/HTTPS access to services in a cluster.

15. **What is etcd?**
    → etcd is a distributed key-value store used by Kubernetes to store cluster state and configuration.

16. **What are Labels and Selectors?**
    → Labels are key-value pairs attached to objects; Selectors are used to filter resources based on labels.

17. **What is a DaemonSet?**
    → Ensures that a copy of a Pod runs on all (or some) nodes in the cluster (e.g., for logging, monitoring).

18. **What is a StatefulSet?**
    → Used for applications that require persistent identity and storage (like databases).

19. **What is a Job and CronJob?**
    → **Job** runs a Pod to completion.

CronJob runs Jobs on a schedule (like a Linux cron).

20. **What is a ConfigMap?**
    → Used to store non-confidential configuration data in key-value pairs.

21. **What is a Secret?**
    → Used to store sensitive data such as passwords, tokens, or keys (Base64 encoded).

22. **How do you perform rolling updates in Kubernetes?**
    → By updating the Deployment; Kubernetes automatically replaces Pods one by one.

23. **What is the difference between a Pod and a Container?**
    → A Pod can contain multiple containers that share the same network and storage, whereas a container is a single running instance.

24. **What happens when a Pod crashes?**
    → Kubernetes automatically restarts or reschedules the Pod based on its controller (ReplicaSet or Deployment).

25. **What is a Persistent Volume (PV) and Persistent Volume Claim (PVC)?**
    → PV is a piece of storage in the cluster; PVC is a request for storage by a user.

🔵 Advanced Kubernetes Questions

26. **Explain the architecture of Kubernetes.**

    - **Master Node (Control Plane)**: API Server, Scheduler, Controller Manager, etcd
    - **Worker Node**: kubelet, kube-proxy, container runtime

27. **What is the role of the Scheduler?**
    → Assigns Pods to available nodes based on resource requirements and policies.

28. **What is a Helm chart?**
    → Helm is a package manager for Kubernetes. Helm charts are pre-configured Kubernetes resources.

29. **How does Kubernetes handle networking?**
    → Each Pod gets its own IP address; all Pods can communicate with each other without NAT (flat network).

30. **What is a CNI plugin?**
    → Container Network Interface plugin provides networking capabilities to Pods (e.g., Calico, Flannel, Weave).

31. **What is taint and toleration?**
    → Used to control which Pods can be scheduled on which nodes.
    - **Taint**: Applied to nodes.
    - **Toleration**: Applied to Pods.

32. **What are Node Affinity and Pod Affinity?**
    → Define scheduling preferences based on labels and resource proximity.

33. **What is a ResourceQuota?**
    → Limits resource consumption (CPU, memory) per namespace.

34. **What is Horizontal Pod Autoscaler (HPA)?**
    → Automatically scales the number of Pods based on CPU/memory usage.

35. **What is Vertical Pod Autoscaler (VPA)?**
    → Adjusts resource requests and limits for Pods automatically.

36. **What is Cluster Autoscaler?**
    → Adds or removes nodes in a cluster automatically based on workloads.

37. **How do you secure a Kubernetes cluster?**
    →
    - Use RBAC (Role-Based Access Control)
    - Use Network Policies
    - Enable audit logs
    - Secure API server with TLS

38. **What is RBAC in Kubernetes?**
    → Role-Based Access Control defines who can do what within the cluster.

39. **How do you troubleshoot a failing Pod?**
    →
    - `kubectl get pods`
    - `kubectl describe pod <pod-name>`
    - `kubectl logs <pod-name>`
    - `kubectl exec -it <pod-name> -- /bin/bash`

40. **How do you expose a Deployment to the outside world?**
    → Using a **Service** (type NodePort or LoadBalancer) or **Ingress**.

---

41. **How do you perform zero downtime deployment in Kubernetes?**
    → Use rolling updates with Deployments and readiness probes.

42. **What is a readiness probe vs liveness probe?**
    →
    - **Liveness Probe**: Checks if container is alive; restarts if it fails.
    - **Readiness Probe**: Checks if container is ready to receive traffic.

43. **What's the difference between `kubectl apply` and `kubectl create`?**
    → `apply` is used for updates and declarative configs; `create` is for first-time resource creation.

44. **How do you connect Pods across Namespaces?**
    → Using the full DNS name: `<service>.<namespace>.svc.cluster.local`.

45. **How do you back up and restore etcd data?**
    → Use `etcdctl snapshot save` and `etcdctl snapshot restore`.