

DevOps 23-Interview Q&A

Interview Link: - https://youtu.be/VKXIH_eJHgM?si=ugzvJSPn3SbSPfkO

21-year-old DevOps interviewer digging my knowledge | failed DevOps interviews

Programming and Scripting

1. **Question:** How do you remove duplicates and sort an array in ascending order?

Answer: Use a Set to remove duplicates and then sort the result.

Example in Python:

```
arr = [5, 3, 1, 2, 2, 3]
unique_sorted = sorted(set(arr))
print(unique_sorted) # Output: [1, 2, 3, 5]
```

2. **Question:** How do you extract numbers from a string like "ABC:123" using shell scripting?

Answer: Use awk or sed.

Example:

```
echo "ABC:123" | awk -F: '{print $2}' # Output: 123
```

Docker

3. **Question:** What is the difference between EXPOSE and -p (publish)?

Answer:

- EXPOSE: Documents which ports the container listens on; does not make ports accessible externally.
- -p: Maps container ports to host ports, making the application accessible externally.

4. **Question:** What is a Docker volume?

Answer: A volume is used to persist data outside the container lifecycle. Types include **bind mount** and **volume mount**.

5. **Question:** If you create a file inside a container volume, will it reflect on the host?

Answer: Yes, changes made inside the volume in the container are reflected on the host if mapped.

6. **Question:** What does docker run -p do?

Answer: Publishes the container's port to the host. Syntax: -p <host_port>:<container_port>.

7. **Question:** What is the difference between CMD and ENTRYPOINT in Docker?

Answer:

- CMD: Provides default arguments for the container.
 - ENTRYPOINT: Defines the main command for the container.
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Kubernetes

8. **Question:** What is a Kubernetes context?

Answer: A context is a configuration in the kubeconfig file that allows switching between clusters or user roles.

9. **Question:** What is etcd in Kubernetes?

Answer: A distributed key-value store that stores cluster data like configurations, secrets, and cluster state.

10. **Question:** What is the difference between ConfigMap and Secret?

Answer:

- **ConfigMap:** Stores non-sensitive configuration data.
- **Secret:** Stores sensitive data like passwords, encoded in base64.

11. **Question:** How do you securely store secrets in Kubernetes?

Answer: Use Kubernetes Secrets with **encryption at rest**, and integrate with tools like **HashiCorp Vault** or **AWS Secrets Manager** for added security.

12. **Question:** What is an Init Container?

Answer: A container that initializes tasks (like fetching credentials) before the main application container starts.

13. **Question:** What is a Persistent Volume (PV) and Persistent Volume Claim (PVC)?

Answer:

- **PV:** Represents physical storage.
- **PVC:** A request for storage resources by pods.

14. **Question:** What is a storage class in Kubernetes?

Answer: A storage class defines the provisioner, parameters, and reclaim policy for dynamic storage provisioning.

Jenkins

15. **Question:** What is a Jenkins Slave?

Answer: A node that executes tasks assigned by the Jenkins Master.

16. **Question:** What is a Jenkins parameter?

Answer: Input variables passed during build time to customize the pipeline execution.

17. **Question:** How do you integrate Jenkins with SSO?

Answer: Install the **SAML Security Plugin**, configure the IdP credentials, and set up SAML endpoints in Jenkins.

General DevOps

18. **Question:** What is the difference between AWS and Azure Load Balancers?

Answer:

- **AWS:** Elastic Load Balancer (ELB) offers Application, Network, and Gateway Load Balancers.
- **Azure:** Includes Load Balancer, Application Gateway, Traffic Manager, and Front Door.

19. **Question:** How do you securely integrate HashiCorp Vault with Kubernetes?

Answer: Use an **Init Container** to dynamically fetch secrets at runtime and inject them into the application.

AWS

20. **Question:** What is the difference between AWS Auto Scaling and Azure Auto Scaling?

Answer:

- **AWS:** Uses Auto Scaling Groups (ASG) to scale EC2 instances based on policies.
 - **Azure:** Supports VM scale sets with similar policy-driven scaling.
-

Additional Kubernetes Questions

21. **Question:** What is a pod in Kubernetes?

Answer: The smallest deployable unit in Kubernetes, which encapsulates one or more containers.

22. **Question:** What is a ReplicaSet in Kubernetes?

Answer: Ensures a specified number of pod replicas are running.

Scenario-Based Questions with Answers

Programming and Scripting Scenarios

1. **Remove Duplicates and Sort Array**

Question: How to remove duplicates from [5, 1, 3, 3, 2] and sort the array?

Answer (Python):

```
arr = [5, 1, 3, 3, 2]
unique_sorted_arr = sorted(set(arr))
print(unique_sorted_arr) # Output: [1, 2, 3, 5]
```

2. **Extract Numbers from a String**

Question: Extract numbers from ABC:123 or BCD::456.

Answer:

```
import re
input_str = "BCD::456"
numbers = re.findall(r'\d+', input_str)
print(numbers[0]) # Output: 456
```

Docker Scenarios

3. **Run Docker Container with Port Mapping**

Question: Run a container accessible on port 5000 of the host and 8080 in the container.

Answer:

```
docker run -d -p 5000:8080 my-container-image
```

4. **Persistent Volumes in Docker**

Question: Ensure data in a container persists even after it stops.

Answer:

```
docker volume create my_volume
docker run -d -v my_volume:/data my-container-image
```

Kubernetes Scenarios

5. **Secure Sensitive Information**

Question: Secure sensitive credentials in Kubernetes.

Answer: Use Secrets and enable encryption at rest for etcd. Store keys in base64-encoded format or integrate with tools like HashiCorp Vault.

6. **Accessing Multiple Clusters**

Question: Use one kubeconfig file for multiple Kubernetes clusters.

Answer:

- o Add multiple contexts in the kubeconfig file.
- o Use kubectl config use-context <context-name> to switch contexts.

7. Deploying Applications Using YAML

Question: Deploy an Nginx application with 3 replicas in Kubernetes.

Answer (YAML):

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx
          image: nginx:latest
          ports:
            - containerPort: 80
```

Jenkins Scenarios

8. Run Build on Slave Node

Question: How to configure a Jenkins pipeline to run on a specific slave node?

Answer:

```
pipeline {
  agent { label 'slave-node-name' }
  stages {
    stage('Build') {
      steps {
        echo 'Building on the slave node'
      }
    }
  }
}
```

9. Parameterized Jenkins Pipeline

Question: Use parameters in a Jenkins pipeline to deploy specific application versions.

Answer:

```
pipeline {  
    parameters {  
        string(name: 'VERSION', defaultValue: '1.0', description: 'Version to deploy')  
    }  
    stages {  
        stage('Deploy') {  
            steps {  
                echo "Deploying version ${params.VERSION}"  
            }  
        }  
    }  
}
```

10. Automate CI/CD with GitHub Webhooks

Question: Trigger a Jenkins pipeline when code is pushed to GitHub.

Answer:

- Configure a webhook in the GitHub repository pointing to Jenkins.
 - Set up a Jenkins job to trigger on SCM changes.
-

AWS and Azure Scenarios

11. Interconnect AWS and On-Premises Networks

Question: Establish a site-to-site VPN between AWS and on-premises.

Answer:

- Set up a **Customer Gateway** in AWS with your on-premises router details.
- Create a **Virtual Private Gateway** and attach it to the desired VPC.
- Establish the VPN using IPsec.

12. Migrate DNS to AWS Route 53

Question: Migrate DNS records with minimal downtime.

Answer:

- Reduce TTL values for DNS records before migration.
- Update DNS settings in Route 53 and validate propagation.

13. Disaster Recovery in Azure

Question: Design a disaster recovery solution in Azure.

Answer:

- Use **Azure Site Recovery** to replicate resources.
- Configure failover and fallback policies.

General Questions and Correct Answers

1. Q: Can you tell me about your overall experience and the technologies you've worked with?

- A:
 - Total experience: 3.1 years.
 - Relevant DevOps experience: 1.5 years.
 - Initial work involved troubleshooting and monitoring (synthetic, transaction, and APM monitoring).
 - DevOps experience includes Kubernetes, Docker, Jenkins, and CI/CD pipelines.
 - AWS services: EC2, S3, IAM, Route 53, CloudFront, and Elastic Beanstalk.
 - Azure exposure and ability to design resilient and secure infrastructure.

2. Q: Can you explain the overall application flow in your current project?

- A:
 - Application: Book publishing system.
 - Components:
 1. **Cloudflare**: DNS hosting and management.
 2. **Load Balancer**: Routes traffic.
 3. **Apache Proxy**: Proxy server to forward requests.
 4. **JBO Servers**: Handles application requests.
 5. **Database**: MySQL database hosted in AWS.
 6. **Search**: Sonar servers for search functionality.
 7. **VPCs**: Three Virtual Private Clouds (one dedicated to security with Trend Micro firewall).
 - Data flow: DNS → Load Balancer → Apache Proxy → JBO Servers → Database/Search.

3. Q: How would you connect multiple VPCs to on-premises infrastructure?

- A:
 - Use a **site-to-site VPN** connection:
 - Create a **Customer Gateway** in AWS for the on-premises public IP.
 - Create a **Virtual Private Gateway** for the AWS side.
 - Establish the connection using tools like Cisco, Palo Alto, or OpenSWAN.

4. Q: What's the difference between Security Groups and Network ACLs?

- A:
 - **Security Groups**:
 - Instance-level firewall.
 - Stateful (outbound rules automatically allow return traffic).
 - Only allows rules (no deny rules).
 - **Network ACLs (NACLs)**:
 - Subnet-level firewall.
 - Stateless (each rule explicitly applies to inbound/outbound traffic).
 - Supports both allow and deny rules.

5. Q: If you're unable to connect to an EC2 instance, what could be the reasons?

- o A:
 - Possible issues:
 - Incorrect security group rules (missing inbound port like 22 for SSH).
 - Misconfigured route tables or network ACLs.
 - Firewall blocking the traffic.
 - VPN or private network misconfiguration.
 - Local system telnet tool not installed.

6. Q: How can you block outbound traffic from a VPC?

- o A:
 - Use **Network ACLs** or **DNS Firewall**:
 - Define deny rules for specific IPs or port ranges.
 - Configure route tables to avoid internet gateways.

7. Q: How do you securely download an object from S3 without internet traffic?

- o A:
 - Use a **VPC Endpoint** (Interface or Gateway Endpoint):
 - Interface Endpoint: Used for private communication between VPC and AWS services.
 - Gateway Endpoint: Used for S3 and DynamoDB to keep traffic within AWS.

8. Q: How can you replicate objects across S3 buckets in different accounts?

- o A:
 - Enable **Cross-Region Replication (CRR)** or **Same-Region Replication (SRR)**:
 - Configure a replication rule in the source bucket.
 - Add the target bucket's **canonical user ID** to the source bucket's policy.
 - Grant appropriate permissions via IAM roles.

9. Q: What are Terraform workspaces, and how do they help manage multiple environments?

- o A:
 - Workspaces create isolated state files for different environments (e.g., dev, staging, prod).
 - Prevents conflicts and ensures environment-specific configurations.

10. Q: How would you create a dynamic number of EC2 instances with Terraform?

- o A:
 - Use the **count** or **for_each** meta-argument.
 - Example:

```
resource "aws_instance" "example" {  
    count      = var.instance_count  
    ami        = var.ami_id  
    instance_type = var.instance_type  
}
```

11. Q: What is the difference between Deployment and StatefulSet in Kubernetes?

- o A:
 - **Deployment**: For stateless applications. Manages rolling updates and scaling.
 - **StatefulSet**: For stateful applications like databases. Ensures stable network IDs and persistent storage.

12. Q: How do you provide AWS access to a container?

- o A:
 - Use **IAM roles for tasks**:
 - Assign an IAM role to the container's ECS task or Kubernetes pod via the pod's service account.
 - Avoid storing access keys in containers.

13. Q: How do you store secrets securely in Kubernetes?

- o A:
 - Use **Kubernetes Secrets** or external tools like **HashiCorp Vault**.
 - For Kubernetes:

```
apiVersion: v1
kind: Secret
metadata:
  name: my-secret
data:
  username: base64-encoded-value
  password: base64-encoded-value
```

14. Q: How do you build and push Docker images using Jenkins?

- o A:
 - Declarative pipeline example:

```
pipeline {
  agent any
  stages {
    stage('Build') {
      steps {
        sh 'docker build -t my-image-name .'
      }
    }
    stage('Push') {
      steps {
        withDockerRegistry([credentialsId: 'docker-cred', url: '']) {
          sh 'docker push my-image-name'
        }
      }
    }
  }
}
```

Scenario-Based Questions

1. Q: Your EC2 instance can't access the internet but must download files from S3. How would you fix this?
 - o Use a **VPC Gateway Endpoint** for S3.
2. Q: You have an application with one pod per service, but you want high availability. How do you ensure this?
 - o Use a **Deployment** with replicas and a **ClusterIP** service for internal access.
3. Q: You need to automate patching of hundreds of servers in different environments. How would you handle this?
 - o Use a combination of AWS Systems Manager (SSM) Automation or Lambda functions.
4. Q: Your Docker image size is too large. How do you reduce it?
 - o Use a lightweight base image like **Alpine Linux** and multi-stage builds.

5. **Q: You need to rotate credentials for applications running in containers. How do you achieve this?**
 - o Integrate with tools like **HashiCorp Vault** or use Kubernetes Secrets with periodic updates.
6. **Q: Your Jenkins pipeline fails due to a missing dependency. How do you troubleshoot?**
 - o Check the console logs and validate the environment setup (e.g., plugin installations, permissions).

Scenario

1. **Scenario: Unable to SSH into an EC2 instance. What could be the reasons?**

Answer:

- o Security Group rules do not allow port 22.
- o The private key is missing or incorrect.
- o Network ACLs are blocking inbound SSH traffic.
- o The instance is not associated with the correct route table or subnet.

2. **Scenario: How can you block all outbound traffic from a VPC?**

Answer:

- o Use Network ACLs to explicitly deny outbound traffic.
- o Modify route tables to restrict traffic from leaving the VPC.

3. **Scenario: How do you download an S3 object securely without using the internet?**

Answer:

- o Use an S3 VPC Endpoint to establish a private connection between the VPC and S3.
- o Use AWS CLI with the endpoint to access the S3 bucket securely.

4. **Scenario: How do you replicate S3 bucket objects across accounts?**

Answer:

- o Enable S3 Cross-Region Replication.
- o Create an IAM role in the destination account with permissions to replicate data.
- o Use bucket policies and canonical IDs for secure cross-account access.

5. **Scenario: Deploy multiple EC2 instances with different configurations. How?**

Answer:

- o Use Terraform modules and variables.
- o Use count or for_each to provision EC2 instances dynamically with varying configurations.

6. **Scenario: You need a highly available Kubernetes deployment. How would you configure it?**

Answer:

- o Use a Deployment with multiple replicas.
- o Set up a Service with a LoadBalancer to distribute traffic among replicas.

7. **Scenario: How can you manage secrets in Kubernetes securely?**

Answer:

- o Use Kubernetes Secrets to store sensitive information.
- o Mount the secret as a volume or expose it as environment variables in pods.
- o Optionally, use tools like HashiCorp Vault for enhanced security.

8. **Scenario: Your pipeline fails due to invalid database credentials. What steps would you take?**

Answer:

- o Check and update the database credentials in your pipeline configuration or environment variables.
- o Test the credentials locally before retrying the pipeline.

9. **Scenario: Container logs indicate a missing environment variable. How would you debug?**

Answer:

- o Check the pod's environment variable section in the YAML.
- o Verify ConfigMaps or Secrets are correctly configured and mounted.
- o Inspect the deployment logs for errors.

10. Scenario: How would you securely pass AWS credentials to an application running in a container?

Answer:

- Use IAM Roles for Service Accounts (IRSA) in Kubernetes.
- Use an Init Container to inject temporary credentials securely.

Interview Link: - https://youtu.be/LqisjYScyrA?si=Cf_3xFBEprcbykoZ
1 to year experience | ₹15 LPA Aws Devops interview live recording.

Questions and Corrected Answers

1. Q: Can you explain your DevOps experience and tools you've worked on?

- o A:
 - Experience in Kubernetes, Docker, Terraform, Ansible, Jenkins (CI/CD).
 - AWS services: VPC, EC2, EKS, Load Balancers, and Autoscaling.
 - Azure exposure.
 - Strong knowledge of building resilient, secure, and highly available architectures.

2. Q: What are the web services you're familiar with?

- o A:
 - Worked with Apache, IIS, Tomcat, and JBoss servers for various applications.

3. Q: Have you worked with NoSQL databases?

- o A:
 - Limited experience with MongoDB.
 - Tasks included restarting services and resolving basic access issues for developers.

4. Q: What scripting languages are you familiar with?

- o A:
 - Familiar with Bash and Python scripting for automation.
 - Basic use cases include automation of backups, database cleanup, and small data processing tasks.

5. Q: What is a proxy pass in Nginx?

- o A:
 - **Proxy Pass:** Used in Nginx to forward client requests to an upstream server.
 - Example:

```
location / {
    proxy_pass http://upstream_server;
}
```

6. Q: How do you configure SSL in Nginx?

- o A:
 - Use **Certbot** to configure SSL:
 1. Install Certbot: sudo apt install certbot.
 2. Run command: certbot --nginx -d yourdomain.com.
 3. Auto-renew certificates using certbot renew.

7. Q: What's the difference between Certbot and Let's Encrypt?

- o A:
 - **Certbot** is a tool for managing SSL certificates.
 - **Let's Encrypt** is the certificate authority issuing the SSL certificates.

8. Q: What is an MPM (Multi-Processing Module) in web servers?

- A:
 - MPMs determine how Apache manages network connections.
 - Types include **Prefork**, **Worker**, and **Event** MPMs.
-

9. Q: What are the Git workflows and DevOps practices implemented in your project?

- A:
 - Git workflows:
 - Master branch for production.
 - Feature and release branches for development and testing.
 - CI/CD integrated with Jenkins pipelines.
 - Deployment practices:
 - Code is built using Maven.
 - Docker image is created and pushed to Amazon ECR.
 - Vulnerability scanning in ECR before deployment.
 - Kubernetes manifests are updated dynamically using pipelines.
-

10. Q: How do you handle legacy application migrations to the cloud?

- A:
 - Migrate from bare-metal servers to AWS.
 - Use EFS for shared storage.
 - Implement CI/CD pipelines for smoother deployments.
-

11. Q: What are the Kubernetes service types?

- A:
 - **ClusterIP**: Internal access.
 - **NodePort**: Exposes the service on a node's IP and port.
 - **LoadBalancer**: Exposes service externally with a cloud provider's load balancer.
 - **Headless Service**: No cluster IP; directly accesses pods.
-

12. Q: How do you ensure security in Kubernetes?

- A:
 - Authentication and Authorization:
 - Tokens, Service Accounts, or LDAP integration.
 - Encrypt communications using TLS certificates.
 - Role-Based Access Control (RBAC) with roles and cluster roles.
 - Pod Security Policies.
-

13. Q: What is a DaemonSet in Kubernetes?

- A:
 - Ensures a pod runs on all or selected nodes in the cluster.
 - Common use cases: logging agents, monitoring tools, or network policies.
-

14. Q: How do you manage secrets in Terraform?

- A:
 - Use **HashiCorp Vault** for secret management.
 - Avoid storing secrets in plaintext within Terraform files.
-

15. Q: How do you upgrade plugins in Terraform?

- A:
 - Run the command: terraform init --upgrade.
-

16. Q: What is AWS Lightsail?

- A:
 - A simplified cloud computing service for small applications with fixed pricing.
-

17. Q: What is AWS Elastic Transcoder?

- A:
 - A media transcoding service to convert video files into formats compatible with various devices.
-

18. Q: What are some key configurations in AWS AutoScaling?

- A:
 - Configure minimum, maximum, and desired instance counts.
 - Use scaling policies like:
 - Target Tracking.
 - Step Scaling.
 - Scheduled Scaling.
-

19. Q: What's the difference between RTO and RPO?

- A:
 - **RTO (Recovery Time Objective):** Maximum acceptable downtime.
 - **RPO (Recovery Point Objective):** Maximum acceptable data loss.
-

20. Q: What is AWS Web Application Firewall (WAF)?

- A:
 - A layer 7 firewall for protecting web applications from attacks like SQL injection, cross-site scripting, and DDoS.
-

Scenario-Based Questions and Answers

1. Q: Users are getting logged out frequently in a web application behind a load balancer. How would you resolve this?

- A: Enable **stickiness** on the load balancer to ensure session persistence.
-

2. Q: How do you manage secrets in a Kubernetes cluster?

- A:
 - Use **Kubernetes Secrets** to store sensitive information securely.
 - Example:

```
apiVersion: v1
kind: Secret
metadata:
  name: db-credentials
data:
  username: base64-encoded-username
  password: base64-encoded-password
```

3. Q: How do you integrate log monitoring in a DevOps environment?

- o A:
 - Use tools like Prometheus and Grafana for metrics and dashboards.
 - Use DataDog for log monitoring and alerting.
-

4. Q: How do you deploy a .NET application on Kubernetes?

- o A:
 - Create a Dockerfile for the .NET application.
 - Build and push the Docker image to a container registry.
 - Create Kubernetes deployment manifests with proper configurations.
-

5. Q: How would you design a secure architecture for a highly available application in AWS?

- o A:
 - Use multi-AZ deployment.
 - Implement a security VPC with firewalls like Palo Alto or Trend Micro.
 - Use AWS Transit Gateway for connectivity.
 - Implement WAF for application security.
 - Use Elastic Load Balancers and Auto Scaling.
-

6. Q: How do you handle Kubernetes deployments for production?

- o A:
 - Use ArgoCD for deployment automation.
 - Follow Canary or Blue-Green deployment strategies.
 - Store Kubernetes manifests in Git for version control.
-

7. Q: How do you troubleshoot an EC2 instance that's not accessible?

- o A:
 - Check Security Group and NACL rules.
 - Verify route tables and ensure the instance is in a public subnet with an internet gateway.
 - Ensure proper IAM role association.

AWS and Cloud Services

1. **Q: Can you explain your experience with AWS services?**
 - o **A:**
 - Experience in IAM, S3, VPC, EC2, CloudFront, Route 53, AWS Gateway, Load Balancers, and Web Application Firewall (WAF).
 - Good understanding of network security, including NACLs and Security Groups.
2. **Q: What is a VPC Endpoint?**
 - o **A:**
 - A **VPC Endpoint** enables private connections between your VPC and AWS services without using public IPs.
 - Types:
 - **Interface Endpoint:** Connects to services using private IPs.
 - **Gateway Endpoint:** Connects to S3 or DynamoDB.
3. **Q: How would you connect to an EC2 instance in a private subnet?**
 - o **A:**
 - Use a bastion host (jump server) in a public subnet.
 - Alternatively, set up **AWS Session Manager** for secure, agent-based access.
4. **Q: What is Transit Gateway, and how does it work?**
 - o **A:**
 - **Transit Gateway** enables connectivity between multiple VPCs and on-premises networks through a single gateway.
 - Supports:
 - VPC peering.
 - Site-to-site VPN.
 - Direct Connect.
5. **Q: What security measures do you recommend for AWS Cloud?**
 - o **A:**
 - Enable **IAM roles** and least privilege policies.
 - Use **CloudTrail** and **GuardDuty** for monitoring.
 - Implement **WAF** and **AWS Shield** for DDoS protection.
 - Enable **S3 bucket encryption** and restrict public access.

Networking

6. **Q: What is the difference between stateful and stateless firewalls?**
 - o **A:**
 - **Stateful:** Maintains session information; inspects packets within the context of traffic flow.
 - **Stateless:** Inspects each packet independently, regardless of traffic flow.
7. **Q: How do you block traffic to malicious IPs in AWS?**
 - o **A:**
 - Use **AWS Network Firewall** or **Security Groups** to block outbound traffic.
 - Use VPC Flow Logs to identify malicious IPs.

CI/CD and Automation

8. **Q: What CI/CD tools have you used?**
 - **A:**
 - Primarily Jenkins for building pipelines.
 - Integrated GitHub repositories with Jenkins via **webhooks** for real-time triggers.
 9. **Q: How do you manage sensitive information in pipelines?**
 - **A:**
 - Use **AWS Secrets Manager** or **HashiCorp Vault**.
 - Ensure encryption in transit and at rest for credentials.
-

Terraform and Infrastructure as Code

10. **Q: How do you manage Terraform state files?**
 - **A:**
 - Store state files in **S3** with state locking using **DynamoDB** to prevent concurrent modifications.
 11. **Q: How do you import existing resources into Terraform?**
 - **A:**
 - Use the command: `terraform import RESOURCE_TYPE.NAME RESOURCE_ID`.
-

Python and Scripting

12. **Q: Can you give an example of Python automation you've implemented?**
 - **A:**
 - Automated unused **EBS volume detection** using Python and Boto3.
 - Automated instance rebooting during maintenance windows using AWS Lambda.
-

Scenario-Based Questions and Answers

1. **Q: A private EC2 instance is not accessible from on-prem. How do you troubleshoot?**
 - **A:**
 - Verify VPN or Direct Connect configuration.
 - Check routing tables and NACL rules.
 - Ensure the instance's security group allows traffic from the on-prem IP range.
2. **Q: Your audit team reports outbound traffic to malicious IPs. How do you block it?**
 - **A:**
 - Use **AWS Network Firewall** to block malicious IP ranges.
 - Add rules in NACLs or Security Groups to restrict specific outbound traffic.
3. **Q: How do you secure an internet-facing application in AWS?**
 - **A:**
 - Use **WAF** and **Shield** for application-layer security.
 - Use a **DNS firewall** to block unwanted DNS queries.
 - Place the application behind an **Elastic Load Balancer**.

4. **Q: How do you ensure secure access to sensitive data in AWS?**
 - o **A:**
 - Use **Secrets Manager** or **SSM Parameter Store** to store and retrieve secrets.
 - Apply IAM policies with conditions based on VPN or IP range.
5. **Q: How would you design a highly available architecture for a web application?**
 - o **A:**
 - Deploy the application in multiple Availability Zones.
 - Use **Auto Scaling Groups** and **Elastic Load Balancers**.
 - Configure RDS Multi-AZ for database redundancy.

Interview Link: - <https://youtu.be/yjYxAv9al1E?si=OFjJbZFCqxUIBcCC>

Myself ruined 15 LPA DevOps last round

Git Commands

1. Q: What does git fetch do?

o A:

- git fetch downloads changes from a remote repository to the local repository but does not update the working directory or merge changes.
- It allows you to review changes before integrating them into your branch.
- **Corrected Information:** Merge conflicts are not encountered during git fetch because it doesn't modify the working directory.

2. Q: How does git pull differ from git fetch?

o A:

- git pull performs a git fetch followed by a git merge, directly updating the working directory with the latest changes.
- Merge conflicts may occur during the merge step.

Daily Activities and Skills

3. Q: What does your day-to-day work involve?

o A:

- Tasks depend on requirements, such as creating Jenkins SSO or managing deployments.
- Examples include creating deployment files, configuring cluster IPs, and setting up Lambda functions for automation.

4. Q: How proficient are you in Python?

o A:

- Basic experience includes:
 - Writing scripts for EBS volume cleanup.
 - Automating EC2 instance rebooting during patching windows.
 - Triggering S3 versioning enforcement via Lambda and CloudWatch events.

Scripting

5. Q: How do you rate your shell scripting skills?

o A:

- Beginner level. Familiar with logic creation, control structures (e.g., if conditions, loops), and basic commands like awk, grep, and cut.

6. Q: How do you find and process specific lines in a file using Linux commands?

o A:

- Example task: Extract lines containing "pip" and concatenate the first and second fields separated by ==.
 - Command: grep -i "pip" input.txt | awk '{print \$1 "==" \$2}' > requirements.txt
 - **Explanation:**
 - grep -i "pip": Filters lines containing "pip" (case-insensitive).
 - awk '{print \$1 "==" \$2}': Prints the first and second fields concatenated with ==.
 - Redirects the output to requirements.txt.

Scenario-Based Questions and Answers

1. Q: You are tasked with finding unused EBS volumes. How would you approach this?

o A:

- Use a Python script with Boto3 to list volumes and check their attachment state.
- Example logic:

```
import boto3
ec2 = boto3.client('ec2')
volumes = ec2.describe_volumes()
for volume in volumes['Volumes']:
    if not volume['Attachments']:
        print(f"Unused volume: {volume['VolumeId']}")
```

2. Q: How would you enforce S3 bucket versioning if a user creates a bucket without it?

o A:

- Use AWS Lambda and CloudWatch events:
 - CloudTrail logs detect bucket creation.
 - Trigger a Lambda function to enable versioning:

```
import boto3
def lambda_handler(event, context):
    s3 = boto3.client('s3')
    bucket_name = event['detail']['requestParameters']['bucketName']
    s3.put_bucket_versioning(
        Bucket=bucket_name,
        VersioningConfiguration={'Status': 'Enabled'}
    )
```

3. Q: How do you handle merge conflicts in Git?

o A:

- Steps to resolve:
 1. Run git pull to merge changes.
 2. Identify conflicts in files.
 3. Manually resolve conflicts by editing the files.
 4. Stage resolved files with git add.
 5. Commit changes with git commit.

4. Q: How do you automate EC2 instance patching and rebooting?

o A:

- Use AWS Systems Manager (SSM):
 - Attach the SSM agent to instances.
 - Use the Patch Manager to define patch baselines.
 - Create a maintenance window to schedule automatic reboots after patching.

Corrected Scenario Responses

Deployment Pipeline

5. Q: How do you deploy an application using Jenkins?

o A:

- Jenkins pulls code from GitHub (via webhook).
- Builds Docker images.
- Pushes images to an ECR repository.
- Deploys the application to Kubernetes using a CI/CD pipeline.

Scripting and Tools

6. **Q: Explain the difference between grep and awk.**

- o A:
 - grep: Used for searching patterns in a file.
 - awk: A text-processing tool for extracting and manipulating data fields.
-

Python Modules

7. **Q: Which Python modules have you used for automation?**

- o A:
 - **Boto3:** AWS resource management.
 - **OS and Subprocess:** Managing system operations.
 - **JSON:** Handling data serialization.
-

GitLab and CI/CD

8. **Q: Have you worked with GitLab? How does it differ from Jenkins?**

- o A:
 - **GitLab:** Offers integrated CI/CD pipelines and Git repository hosting.
 - **Jenkins:** Requires external plugins for Git integration and CI/CD setup.

Interview Link: - <https://youtu.be/4EmBd4UbPfs?si=5ot86gobjLof4b84>

9 LPA cloud & Devops interview | 1 to 2 year experince | live recording

Cloud Experience and Tools

1. Q: How many years of experience do you have in cloud and DevOps?

o A:

- 3 years of experience in cloud computing.
- 1.5 years of relevant DevOps experience.

2. Q: What tools and technologies have you worked with?

o A:

- AWS: EC2, VPC, Elastic Beanstalk, Lambda, Auto Scaling, Load Balancers, CloudFront, Route 53.
 - Azure: Virtual Machines, Application Gateway, Traffic Manager, Site Recovery Services.
 - DevOps: Jenkins, Terraform, Ansible, Docker, Kubernetes.
-

CI/CD Concepts

3. Q: What is the difference between Continuous Deployment and Continuous Delivery?

o A:

- **Continuous Delivery:** Ensures that code is ready to deploy into production but requires manual approval for deployment.
- **Continuous Deployment:** Fully automates the deployment process, pushing code to production without manual intervention.

4. Q: How would you configure a Jenkins pipeline with conditional stages based on input?

o A:

- Use parameters and conditional logic within the pipeline script to execute specific stages based on the input.
- Example:

```
stage('Example') {
    when {
        expression { params.EXECUTE_STAGE }
    }
    steps {
        echo 'Executing conditional stage'
    }
}
```

Configuration Management

5. Q: What is the difference between an Ansible Playbook and a Role?

o A:

- **Playbook:** Directly defines the tasks to execute.
- **Role:** A reusable component that organizes playbooks into smaller, modular tasks for repeatability.

6. Q: When would you use a Role over a Playbook?

- A:
 - Use **Roles** for larger, modularized environments where tasks can be reused across multiple projects.
 - Use **Playbooks** for smaller, one-off configurations.
-

Docker and Kubernetes

7. Q: Can you write a simple Dockerfile to deploy a static website using Nginx?

- A:

```
FROM nginx:latest
COPY ./static-site /usr/share/nginx/html
EXPOSE 80
CMD ["nginx", "-g", "daemon off;"]
```

8. Q: Explain Kubernetes architecture and its components.

- A:
 - **Control Plane:**
 - API Server: Entry point for all administrative tasks.
 - ETCD: Stores configuration data.
 - Scheduler: Assigns workloads to nodes.
 - Controller Manager: Manages controllers like Node, Deployment, and Endpoints.
 - **Data Plane:**
 - Kubelet: Manages node resources.
 - Kube Proxy: Handles networking between pods and nodes.

9. Q: What types of services are available in Kubernetes?

- A:
 - ClusterIP, NodePort, LoadBalancer, ExternalName, and Headless Service.
-

Scenario-Based Questions and Answers

AWS Networking

1. Q: How would you configure a setup where Server A is public and Server B is private, with access to Server B through Server A?

- A:
 - Create a **public subnet** for Server A with a public IP.
 - Create a **private subnet** for Server B without a public IP.
 - Use a NAT Gateway in the public subnet to allow Server B to access the internet.
 - Restrict inbound traffic to Server B using Security Groups, allowing access only from Server A.

2. Q: Is it possible to run an EC2 instance without connecting it to a VPC?

- A:
 - No, all EC2 instances must be associated with a VPC and a subnet to function.
-

AWS Security

3. **Q: What would you do if you lost the PEM file for an EC2 instance?**
 - o **A:**
 - Detach the EBS volume and attach it to another instance to retrieve data.
 - Use Systems Manager Session Manager for access (if pre-configured).
 - Create a new key pair, update the instance's authorized keys via a temporary instance.
-

Route 53 Routing

4. **Q: Explain weighted, latency-based, and geolocation routing in Route 53.**
 - o **A:**
 - **Weighted:** Distributes traffic based on assigned weights.
 - **Latency-Based:** Routes traffic to the region with the lowest latency.
 - **Geolocation:** Directs traffic based on the user's geographical location.

Troubleshooting Scenarios

5. **Q: How would you troubleshoot a Docker space issue when server disk space seems fine?**
 - o **A:**
 - Check Docker's default storage location (/var/lib/docker).
 - Remove unused images, containers, and volumes using: docker system prune -a
 - Verify Docker's volume usage and clear unused volumes.
-

Scaling and Peering

6. **Q: What is the difference between horizontal and vertical scaling?**
 - o **A:**
 - **Horizontal Scaling:** Adding more instances of resources.
 - **Vertical Scaling:** Increasing the resources (CPU, memory) of an existing instance.
7. **Q: Explain peering in AWS and Azure.**
 - o **A:**
 - **AWS:** VPC Peering allows communication between VPCs in the same or different regions.
 - **Azure:** VNet Peering connects Azure Virtual Networks.

Interview Link: - <https://youtu.be/RuXjaZEAgVk?si=IZqKLjTlZit9T1z3>

How I Failed ₹20 LPA devops interview | Live recording

Candidate Background

1. Q: Can you briefly explain your professional experience?

- o A:
 - 3 years of experience in IT, with 1.5 years in DevOps.
 - Worked on AWS services (EC2, VPC, Route 53, S3, IAM, Auto Scaling, and Load Balancers).
 - Experience with DevOps tools like Kubernetes, Docker, Jenkins, Ansible, and Terraform.

2. Q: Have you worked with Azure services?

- o A: Yes, experience with Azure Virtual Machines, Availability Sets, Peering Connections, and Backup Services using Mars Agent.
-

Git Basics

3. Q: What is the difference between git fetch and git pull?

- o A:
 - git fetch: Retrieves updates from the remote repository but does not change the working directory.
 - git pull: Combines git fetch and git merge, pulling updates and merging them into the current branch.

4. Q: How do you create a branch in an existing project?

- o A: Use the command: git branch <branch-name>

5. Q: How can you revert a pushed commit?

- o A: Use:
 - git revert <commit-hash> to create a new commit undoing the changes.
 - git reset --hard <commit-hash> if you want to reset to a previous state (not recommended for public repositories).
-

Branching Strategies

6. Q: What is the difference between feature branching and release branching?

- o A:
 - **Feature Branching:** Used to develop new features. Each feature is developed in its own branch.
 - **Release Branching:** Used for preparing a specific release. This branch contains stable code for deployment.
-

DevOps and Agile

7. Q: How does DevOps differ from Agile?

- o A: Agile focuses on iterative development and collaboration between teams, while DevOps emphasizes automation, continuous delivery, and collaboration between development and operations.

8. Q: How do you automate testing in the DevOps lifecycle?

- o A:
 - Use tools like SonarQube, JUnit, or Selenium for automated testing.
 - Implement CI/CD pipelines with testing stages using Jenkins or GitLab CI/CD.
-

Key Performance Indicators (KPIs)

9. Q: What are important DevOps KPIs to consider?

- o A:
 - Deployment frequency.
 - Mean Time to Recovery (MTTR).
 - Change Failure Rate.
 - Lead Time for Changes.
 - System Uptime and Availability.
-

Ansible

10. Q: What is the difference between an Ansible Playbook and Ad-hoc Commands?

- o A:
 - **Playbook:** A YAML file defining tasks and configurations in a structured way.
 - **Ad-hoc Commands:** One-time commands executed directly from the command line without a Playbook.

11. Q: Can you write an Ansible Playbook to install Apache on a server?

- o A:

```
- name: Install Apache
  hosts: all
  tasks:
    - name: Install Apache
      apt:
        name: apache2
        state: present
    - name: Start Apache
      service:
        name: apache2
        state: started
        enabled: true
```
-

Monitoring and Metrics

12. Q: How would you set up monitoring for a service without using pre-existing tools?

- o A:
 - Identify the target service or server.
 - Install monitoring agents like Datadog or Prometheus exporters.
 - Collect logs and metrics, storing them in a centralized location.
 - Visualize metrics using a tool like Grafana.

13. Q: Can Grafana be used without Prometheus?

- A: Yes, Grafana supports other data sources like Elasticsearch, AWS CloudWatch, and InfluxDB.
-

Scenario-Based Questions and Answers

Infrastructure Setup

1. Q: How would you configure a CI/CD pipeline for a Kubernetes deployment?

- A:
 - Use Jenkins or GitLab CI/CD.
 - Trigger builds on code push using webhooks.
 - Build a Docker image and push it to a container registry.
 - Use Helm or kubectl commands to deploy the updated application to Kubernetes.
-

AWS Security

2. Q: What would you do if you lose the PEM file for an EC2 instance?

- A:
 - Detach the EBS volume and attach it to another instance to retrieve data.
 - Use Systems Manager Session Manager if pre-configured.
 - Create a new key pair and replace the authorized keys file via a temporary instance.
-

Scaling

3. Q: What is the difference between horizontal and vertical scaling?

- A:
 - **Horizontal Scaling:** Adding more instances to a system (e.g., adding EC2 instances).
 - **Vertical Scaling:** Increasing the resources (CPU, memory) of an existing instance.
-

Automation

4. Q: Describe a project where you automated a manual process.

- A:
 - Created an Ansible Playbook to automate the setup of Apache web servers and MariaDB databases across multiple EC2 instances, reducing setup time from 30 minutes to 2 minutes.
-

5. Q: How would you deploy an application on AWS using Terraform?

- A:
 - Write Terraform configuration files to define AWS resources (e.g., EC2, VPC, RDS).
 - Use terraform plan to review changes and terraform apply to create the infrastructure.
 - Integrate Terraform with CI/CD pipelines for automated deployments.
-

Custom Monitoring

6. Q: How would you create a custom monitoring solution for EC2 instances?

- **A:**
 - Install CloudWatch agent on EC2 instances.
 - Configure metrics collection (CPU, memory, disk usage) in the agent's configuration file.
 - Push metrics to AWS CloudWatch and set up alarms or dashboards for visualization.

Interview Link: - <https://youtu.be/WtvXdT8Jt14?si=4f6bER4snz8GqMbh>

Don't do this in interview .! | My 16 LPA Failed DevOps Engineer Interview | Ashiq Ummathoor.

Candidate's Experience

1. **Q: What are the AWS services you are familiar with?**
 - o **A:** EC2, VPC, IAM, S3, AWS Organization, CloudWatch, Elastic Load Balancer (ELB), and CloudFront.
 2. **Q: What are the Azure services you have experience with?**
 - o **A:** Virtual Machines, VNet, Load Balancers, Azure Application Gateway, CDN, Traffic Manager, Azure Scale Sets, Azure Availability Sets, Azure Recovery Service Vault, and MARS Agent for on-premises backup.
 3. **Q: What scripting languages are you familiar with?**
 - o **A:** Python and Bash scripting.
-

AWS and Azure-Specific Questions

4. **Q: How would you host a web application on Azure?**
 - o **A:** Depending on the requirements:
 - Use Azure Virtual Machines with IIS, Apache, or Nginx for dynamic applications.
 - Use Azure App Services or Azure Kubernetes Service (AKS) for microservices-based architectures.
 - Use Azure Blob Storage or Static Web Apps for hosting static content.
 5. **Q: How would you host a static web application in AWS?**
 - o **A:**
 - Store the static content in an S3 bucket and enable static website hosting.
 - Integrate with CloudFront for global distribution using edge locations.
 - Configure DNS with Route 53 or third-party DNS to resolve the application's domain.
 6. **Q: What deployment strategies are you familiar with?**
 - o **A:**
 - Blue-Green Deployment.
 - Canary Deployment.
 - Rolling Update and Recreate (for Kubernetes-based deployments).
-

Scenario-Based Questions

Hosting and Deployment

7. **Q: How would you implement zero-downtime deployment using a Blue-Green strategy for an Azure Function App?**
 - o **A:**
 - Deploy the new version of the Function App in a parallel environment (Green).
 - Test the Green environment for functionality.
 - Switch DNS or traffic routing from the Blue environment (old version) to the Green environment (new version) once validated.
 - Rollback to the Blue environment if issues are identified.
-

Docker and Image Scanning

8. Q: Where do you build and store Docker images?

- A:
 - Build Docker images on local systems, Jenkins agents, or build servers.
 - Store images in Docker Hub, AWS Elastic Container Registry (ECR), Azure Container Registry (ACR), or Nexus.

9. Q: How do you scan and sign Docker images before pushing them to a registry?

- A:
 - Use Docker's integrated scanning feature or third-party tools like Trivy or Clair.
 - For Azure ACR, use the built-in image scanning feature.
 - Automate the process in CI/CD pipelines with image vulnerability checks. Reject or block images that have critical vulnerabilities.
-

CI/CD and Monitoring

10. Q: How would you integrate SonarQube with a build pipeline?

- A:
 - Add a SonarQube task in the build pipeline to analyze code for bugs, vulnerabilities, and technical debt.
 - Define quality gates in SonarQube to fail the build if metrics (e.g., code coverage, complexity) do not meet predefined thresholds.

11. Q: How would you monitor private Kubernetes clusters in AWS?

- A:
 - Use CloudWatch Container Insights for logging and metrics.
 - Install Prometheus and Grafana on the cluster for advanced monitoring.
 - Deploy a monitoring agent like FluentD or Datadog to collect logs and metrics.
-

Specific Tools and Services

Infrastructure and Networking

12. Q: How do you configure private communication between two resources in AWS?

- A:
 - Use VPC Peering or Transit Gateway for communication between VPCs.
 - For inter-region communication, enable inter-region VPC Peering.
 - If the resources are in the same VPC, use private IP addresses with appropriate routing tables and security groups.

13. Q: Can you run a Kubernetes deployment pipeline for a private EKS cluster?

- A:
 - Deploy Jenkins agents or CI/CD tools in the same VPC as the EKS cluster.
 - Use kubectl with proper role-based access control (RBAC) and service account credentials for deployments.
-

API Management

14. Q: Have you worked with API Gateway in AWS?

- A:
 - Yes, used AWS API Gateway to expose services from DynamoDB and integrate with Lambda for serverless backends.

15. Q: What is Azure Front Door, and how does it differ from CDN?

- A:
 - Azure Front Door is a global load balancer and application accelerator that routes traffic to the nearest endpoint with caching and TLS termination.
 - CDN is primarily for static content delivery, optimizing latency through caching at edge locations.
-

Terraform and Automation

16. Q: What are the benefits of using Terraform?

- A:
 - Infrastructure as Code (IaC) enables version-controlled infrastructure definitions.
 - Platform agnostic, supports AWS, Azure, GCP, Kubernetes, and more.
 - Simplifies multi-environment deployments (e.g., dev, QA, production).
-

General DevOps

17. Q: What is the most important responsibility of a DevOps engineer?

- A:
 - Ensure high availability and performance of applications.
 - Automate repetitive tasks to improve efficiency.
 - Monitor systems and proactively resolve issues.
 - Enable faster deployments through CI/CD pipelines.
-

Unanswered/Incorrect Answers (Improvements)

1. Q: What is Azure Front Door?

- **Correct Answer:** Azure Front Door is a global load balancer and application accelerator for HTTP/S traffic, used for routing based on URL paths, latency, or geographical location.

2. Q: How do you deploy pipelines to private networks?

- **Correct Answer:**
 - Use a jumpbox or bastion host within the private network to deploy artifacts.
 - Set up a CI/CD agent within the same VPC or subnet as the private network.

3. Q: What is Azure Logic Apps used for?

- **Correct Answer:** Logic Apps is a serverless workflow automation service that integrates with other Azure services, third-party APIs, and on-premises systems to automate business processes.

Interview Link: - https://youtu.be/HpX6_hdB3a0?si=0HK-t-nhYs0WhH34

Cracked ₹20 LPA 2 year experince | DevOps Interview

General Questions and Answers

1. What is a NAT Gateway?

- A NAT (Network Address Translation) Gateway is used to allow instances in a private subnet to access the internet or other AWS services without exposing them to inbound internet traffic. It allows outbound traffic only, ensuring security.

2. What are the types of NAT Gateway?

- Public NAT Gateway: Used for accessing the internet.
- Private NAT Gateway: Used for accessing on-premises resources via a VPN or Direct Connect.

3. How can you monitor if traffic is going through a NAT Gateway?

- Use tools like tracepath, traceroute, or network monitoring logs to track the path of the traffic. Additionally, enable VPC Flow Logs to analyze the traffic flow through the NAT Gateway.

4. What is Lambda in AWS?

- AWS Lambda is a serverless computing service that lets you run code without provisioning or managing servers. It automatically scales and allows you to focus on writing code.

5. What are the differences between S3 Gateway and Interface Gateway?

- S3 Gateway Endpoint:
 - Supports S3 and DynamoDB.
 - Uses private IP addresses.
 - Configured at the VPC level.
- Interface Endpoint:
 - Supports a wider range of AWS services.
 - Uses Elastic Network Interfaces (ENIs).
 - Configured at the subnet level and supports security groups.

Scenario-Based Questions and Answers

1. Scenario: How to copy a file from a worker node to your local machine in Ansible?

- Use the fetch module in Ansible to copy files from a remote machine to your local machine.

2. Scenario: Copy a file within the same worker node.

- Use the command module in Ansible and execute a shell command like cp /source/path /destination/path.

3. Scenario: Monitoring Kubernetes logs on Grafana.

- Deploy Prometheus and set it up to scrape logs from the Kubernetes cluster.
- Use Grafana to create a dashboard for visualizing these logs. Ensure the proper role binding for Prometheus to access the necessary logs.

4. Scenario: How to achieve high availability in Kubernetes?

- Use Horizontal Pod Autoscaling (HPA) to scale pods based on CPU or memory usage.
 - Use Vertical Pod Autoscaling (VPA) to scale resources for existing pods.
 - Ensure node availability by deploying multiple replicas.
-

Docker-Related Questions

1. How to write a Dockerfile to run as a non-root user?

- Use the USER instruction in the Dockerfile:

```
FROM alpine
RUN adduser -D nonrootuser
USER nonrootuser
```

2. How to implement multi-stage builds in Docker?

- Use the FROM command multiple times in the same Dockerfile:

```
FROM node:14 AS builder
WORKDIR /app
COPY ..
RUN npm install && npm run build
```

```
FROM nginx:alpine
COPY --from=builder /app/build /usr/share/nginx/html
```

Kubernetes-Specific Questions

1. What is a Kubernetes namespace?

- A namespace in Kubernetes provides a way to divide cluster resources between multiple users or teams. It allows logical isolation within the same cluster.

2. Difference between Horizontal Pod Autoscaler (HPA) and Vertical Pod Autoscaler (VPA):

- HPA: Scales the number of pods horizontally based on resource utilization.
- VPA: Adjusts the resource allocation (CPU/memory) for an existing pod.

3. Scenario: How to deploy a Kubernetes Pod to a specific node?

- Use node affinity, node selectors, or taints and tolerations to schedule pods on specific nodes.
-

Terraform Questions

1. What is a Terraform State file?

- The Terraform State file tracks the resources managed by Terraform. Losing it can cause state mismatch issues, requiring manual imports or recreation.

2. How do you lock a Terraform State file?

- Use DynamoDB for state locking along with S3 for storage. Configure DynamoDB tables and enable state locking to prevent concurrent modifications.
-

Git and CI/CD Questions

1. Difference between git fetch and git pull:

- git fetch: Retrieves changes from the remote repository but does not merge them into the local branch.
- git pull: Fetches changes and merges them into the local branch.

2. Scenario: Clone a specific branch in Git.

- Use: git clone -b <branch_name> <repository_url>

3. Continuous Integration vs. Continuous Deployment:

- CI: Automates testing and integration of code.
 - CD: Automates the deployment of tested code to production.
-

Linux and System Administration

1. How to find the IP address of a DNS name?

- Use commands like:
nslookup <hostname>
dig <hostname>

2. What is swap space?

- Swap space acts as an overflow for RAM. When RAM usage exceeds the physical memory, inactive pages are moved to the swap space on disk.

3. Difference between hard links and soft links:

- Hard links share the same inode number and data blocks.
 - Soft links (symlinks) point to the original file and have a different inode number.
-

Load Balancers and HA Proxy

1. What does HA Proxy do?

- HAProxy is a high-availability load balancer that distributes traffic across multiple servers to ensure even load distribution and fault tolerance.

2. Common algorithms used in load balancers:

- Round Robin
- Least Connections
- Sticky Sessions

NAT Gateway

1. What is a NAT Gateway?

A NAT (Network Address Translation) Gateway allows instances in a private subnet to access the internet or other AWS services without exposing them to inbound internet traffic. It supports outbound traffic only.

2. What are the types of NAT Gateway?

- **Public NAT Gateway:** Used for accessing the internet.
- **Private NAT Gateway:** Used for accessing on-premises resources via VPN or Direct Connect.

3. How to monitor if traffic is going through a NAT Gateway?

Use tools like:

- tracepath or traceroute to track the traffic path.
 - VPC Flow Logs to analyze traffic flow through the NAT Gateway.
 - Use the command curl ifconfig.me from an instance to check its public IP.
-

AWS Lambda

4. What is AWS Lambda?

AWS Lambda is a serverless compute service that runs code in response to events. It automatically scales and eliminates the need to provision or manage servers.

5. What tasks can Lambda automate?

Lambda is commonly used for:

- Automating database maintenance tasks (e.g., rebooting instances).
 - Running serverless applications.
 - Performing patching or health checks.
-

S3 Gateway and Interface Gateway

6. What is the difference between S3 Gateway and Interface Gateway?

- **S3 Gateway Endpoint:**
 - Supports S3 and DynamoDB only.
 - Configured at the VPC level.
 - Uses private IP addresses.
 - **Interface Endpoint:**
 - Supports a broader range of AWS services.
 - Configured at the subnet level.
 - Uses ENIs and supports security groups.
-

Ansible

7. How do you copy a file from a worker node to your local machine in Ansible?

Use the fetch module in Ansible to copy files from a remote machine to your local machine.

8. How do you copy a file within the same node?

Use the command module and execute a shell command like:

```
- name: Copy file within node
  command: cp /source/path /destination/path
```

9. How do you retrieve an IP address of a worker node in an Ansible Playbook?

Use the facts module to gather information, then access the ansible_default_ipv4.address variable.

10. How do you copy files to multiple machines efficiently in Ansible?

Use the synchronize module, which works like rsync to handle incremental file transfers.

Docker

11. How to write a Dockerfile to run as a non-root user?

```
FROM alpine
RUN adduser -D nonrootuser
USER nonrootuser
```

12. How do you create multi-stage builds in Docker?

Use the FROM command multiple times in the Dockerfile:

```
FROM node:14 AS builder
WORKDIR /app
COPY ..
RUN npm install && npm run build

FROM nginx:alpine
COPY --from=builder /app/build /usr/share/nginx/html
```

13. How do you set resource limits in Docker Compose?

Use the deploy.resources key in the docker-compose.yml:

```
deploy:
  resources:
    limits:
      cpus: '0.50'
      memory: '512M'
```

Kubernetes

14. What is a Kubernetes namespace?

A namespace provides logical isolation in a Kubernetes cluster, allowing multiple teams or applications to share the same cluster.

15. What are the types of autoscaling in Kubernetes?

- **Horizontal Pod Autoscaler (HPA):** Adds more pods to handle increased load.
- **Vertical Pod Autoscaler (VPA):** Adjusts the resources of an existing pod, such as CPU or memory.

16. How do you deploy a pod to a specific node in Kubernetes?

Use:

- **Node Affinity:** Assign pods based on node labels.
- **Taints and Tolerations:** Prevent pods from running on unsuitable nodes.
- **Node Selectors:** Specify specific nodes.

17. How do you monitor Kubernetes logs on Grafana?

- Deploy Prometheus for scraping logs.
- Integrate Prometheus with Grafana using persistent volumes.
- Configure Prometheus to collect pod logs, and create a Grafana dashboard.

18. What is the difference between Horizontal Pod Autoscaler (HPA) and Vertical Pod Autoscaler (VPA)?

- HPA scales the number of pods horizontally.
- VPA adjusts the resource allocation for an existing pod.

19. What is the use of namespaces in Kubernetes?

Namespaces help organize resources like deployments and services within a cluster for isolation and efficient resource management.

Terraform

20. What is a Terraform State file?

The state file keeps track of infrastructure resources managed by Terraform. It ensures changes are applied to the correct resources.

21. How do you lock a Terraform State file?

Use DynamoDB to enable state file locking.

Steps:

- Create a DynamoDB table with a partition key named LockID.
- Link it to the Terraform backend configuration.

22. What is a null resource in Terraform?

A null resource is used for running provisioners or when resources don't directly support provisioners. It acts as a placeholder for executing commands.

Git and CI/CD

23. Difference between git fetch and git pull:

- **git fetch:** Downloads changes from the remote but does not merge them.
- **git pull:** Fetches changes and merges them into the local branch.

24. How do you clone a specific branch in Git?

```
git clone -b <branch_name> <repository_url>
```

25. What is Continuous Integration (CI)?

CI automates the integration of code changes into a shared repository. It involves automated testing to detect issues early.

26. What is Continuous Deployment (CD)?

CD automates the deployment of code to production once it passes all testing stages.

27. What branching strategies have you used?

Common strategies include:

- **Feature Branch:** Developers work on features in separate branches.
 - **Release Branch:** Stabilization happens before merging into the master branch.
 - **Master Branch:** Contains production-ready code.
-

Linux

28. How do you find the IP address of a DNS name?

Use:

```
nslookup <hostname>
dig <hostname>
```

29. What is swap space?

Swap space is disk space used as virtual memory when the system runs out of physical RAM. Inactive memory pages are moved to swap.

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

- **Hard Links:** Share the same inode and data blocks. Removing the original file doesn't affect the hard link.
 - **Soft Links:** Act as shortcuts and point to the original file. Removing the original file breaks the soft link.
-

Load Balancers

31. What is HAProxy, and why is it used?

HAProxy is a load balancer that distributes incoming traffic among multiple servers. It enhances fault tolerance, caching, and session persistence.

32. What algorithms are used in load balancers?

- **Round Robin**
- **Least Connections**
- **Sticky Sessions**

Interview Link: - <https://youtu.be/MmirvO7aB0I?si=HYhKlERuDhhV4jy3>

HR helped me to pass 😊 | 2 Year Exp | ₹19 LPA tough Devops Manager Round | Ashiq Ummathoor

General and Introductory Questions

1. **What is your experience, and what tools and technologies have you worked on?**
 - o Worked as a Network Operations Engineer, performing tasks like monitoring applications, troubleshooting, and log analysis.
 - o Hands-on experience with:
 - **AWS:** EC2, Elastic Beanstalk, Load Balancers, Auto Scaling, Route 53, CloudFront, and Lambda.
 - **Azure:** Virtual Networks, VMs, Load Balancers, Azure Traffic Manager, Azure Recovery Vault, and Mars Agent.
 - **DevOps Tools:** Kubernetes, Docker, Docker Compose, Terraform, Jenkins, and Linux.
 2. **What is your strongest area (AWS, Azure, or GCP)?**
 - o Strongest in AWS, with a good foundation in Azure. Started learning GCP recently.
-

Scenario-Based and Technical Questions

AWS Deployment Scenarios

3. **How do you decide which compute service to use for application deployment in AWS?**
 - o **EC2:** Full control over the infrastructure; useful for customized setups.
 - o **Elastic Beanstalk:** Platform as a Service; AWS manages patching, load balancers, and scaling.
 - o **Lambda:** Serverless architecture for automation and event-driven computing.
 - o **EKS/ECS:** For containerized applications with high availability and microservices architecture.
 4. **What would you do if an RDS database shows high CPU utilization and many connections?**
 - o Steps to troubleshoot:
 - Use **CloudWatch** to check CPU and memory utilization.
 - Run SHOW PROCESSLIST in RDS to identify active queries.
 - Optimize slow-running queries or terminate problematic connections.
 - Scale the RDS instance vertically or use read replicas if read-heavy workloads are observed.
-

High Availability and Scalability

5. **How do you ensure scalability and availability for applications in the cloud?**
 - o **Scalability:** Use Auto Scaling for horizontal or vertical scaling based on load.
 - o **Availability:** Deploy applications across multiple Availability Zones (AZs).
 - Use failover strategies with Route 53 or Traffic Manager (in Azure).
 - Implement multi-region deployments for critical applications.
 6. **How would you manage high availability and scalability for an AWS Lambda-based application?**
 - o Deploy Lambda functions across multiple regions with failover routing using Route 53.
 - o Use API Gateway to handle dynamic scaling and high availability.
-

Terraform and Multi-Environment Management

7. **How do you handle multi-environment setups in Terraform?**
 - Use **Terraform Workspaces** to create isolated environments for development, staging, and production.
 - Maintain environment-specific variables and configurations using .tfvars files.

8. **How do you use Terraform outputs?**

- Outputs are used to retrieve information such as instance IP addresses, S3 bucket names, or database endpoints.

Example:

```
output "instance_ip" {  
    value = aws_instance.example.public_ip  
}
```

9. **How do you create a single-click deployment pipeline integrating Terraform and application code?**

- Steps:
 1. Integrate Terraform scripts into the CI/CD pipeline using tools like Jenkins or GitHub Actions.
 2. Use Terraform outputs to dynamically pass infrastructure details (e.g., EKS cluster endpoint) to the deployment pipeline.
 3. Automate infrastructure provisioning and application deployment in sequential stages.

Secrets and Configuration Management

10. **How do you securely deliver secrets to Kubernetes from a CI/CD pipeline?**

- Use tools like **HashiCorp Vault** to store and manage secrets.
- Use Kubernetes **Secrets** to inject sensitive data into pods securely.
- Use **Init Containers** to fetch and pass secrets to the main containers at runtime.

11. **What would you do if you don't have direct access to secrets?**

- Allow non-technical users to upload secrets directly to Vault or a similar tool.
- Use automation (e.g., init containers) to retrieve secrets from Vault securely.

DevOps Tools and Monitoring

12. **How do you use Jenkins to deploy infrastructure and applications together?**

- Configure a pipeline with the following stages:
 - **Build:** Compile the code.
 - **Terraform Apply:** Provision infrastructure.
 - **Deploy:** Deploy the application to the provisioned infrastructure.

13. **How do you monitor cloud resources?**

- Use **CloudWatch** or third-party tools like Prometheus and Grafana for metrics and alerts.
- Enable enhanced monitoring for services like RDS.

Kubernetes Questions

14. What are ConfigMaps and Secrets in Kubernetes?

- **ConfigMaps:** Store non-sensitive configuration data as key-value pairs.
- **Secrets:** Store sensitive information like API keys or credentials in an encrypted format.

15. How do you deliver secrets securely to a Kubernetes cluster?

- Encrypt secrets using an encryption configuration file.
- Use Kubernetes Secrets, ensuring the data is base64 encoded and stored securely.

16. How do you connect CI/CD pipelines with Kubernetes for deployments?

- Use a kubeconfig file or service account with appropriate RBAC permissions.
 - Automate deployments using tools like Helm, ArgoCD, or Kubernetes manifests.
-

Linux and SSL Scenarios

17. How do you install an SSL certificate on a Linux server?

- Steps:
 1. Install a certificate management tool like Certbot.
 2. Obtain the certificate using Certbot with a command like:
`sudo certbot --apache -d example.com`
 3. Configure the web server (e.g., Apache or Nginx) to use the installed certificate.
-

AWS IAM and Temporary Access

18. How do you provide temporary AWS console access to team members?

- Use **AWS STS (Security Token Service)** to issue temporary credentials.
- Create an IAM role with limited permissions and allow access via the **AssumeRole** API.

19. How do you ensure secure access to resources?

- Use IAM policies with conditions like IP whitelisting and time-based restrictions.
 - Enable MFA for additional security.
-

Scenario-Based and Other Questions

20. How do you troubleshoot database connectivity issues?

- Check security group rules and NACL configurations.
- Use RDS metrics to identify performance bottlenecks.
- Analyze application logs to pinpoint the source of errors.

21. What are your daily responsibilities as a DevOps engineer?

- Monitoring system performance and logs.
- Managing CI/CD pipelines and automating deployments.
- Collaborating with developers for infrastructure improvements.

General and Introductory Questions

1. Tell me about yourself.

- **Answer:**

I am Muhammad Ashik, currently working as an AWS DevOps Engineer. Initially, I started as a Network Operation Center Engineer, focusing on monitoring and troubleshooting.

- **AWS Services:** VPC, EC2, Elastic Beanstalk, Route 53, and CloudFront.
- **DevOps Tools:** Kubernetes, Docker, Terraform, Jenkins, and Linux.
- **Azure:** Experience with Azure Load Balancers, Application Gateways, and CDNs.
- Strong in microservices with Kubernetes, EKS, Docker Swarm, and Docker Compose.

Scenario-Based and Technical Questions

Linux and SSH Access

2. A developer couldn't log in to a Linux box created months ago. How would you troubleshoot?

- Check if the server is accessible:
 1. Use SSH tools like PuTTY or command-line SSH to check access.
 2. Verify the security group settings to ensure the appropriate port (e.g., 22) is open.
 3. Check the firewall rules (e.g., firewalld or ufw) on the instance.
 4. Confirm if the public/private key pair or credentials are valid.
 - Check the server status:
 - Ensure the SSH service is active. Restart it if needed using:

```
sudo systemctl restart sshd
```
 - Investigate patching issues: If a recent patch modified networking or SSH configurations, rollback or fix the configurations.
-

AWS Networking

3. What are the characteristics of public and private subnets?

- **Public Subnet:**
 - Associated with a route table containing a route to the internet gateway.
 - Accessible over the internet.
- **Private Subnet:**
 - No direct route to the internet gateway.
 - For internet access, requires a NAT Gateway or NAT Instance.
 - Secure for hosting backend services or databases.

4. What services do you have experience within AWS?

- Elastic Beanstalk, EC2, VPC, Route 53, Lambda, and CloudFront.
- Automation using Lambda for tasks like enabling S3 bucket versioning and managing EBS snapshots.

5. What is CloudFront, and how does it work?

- **Answer:**
CloudFront is a Content Delivery Network (CDN) that delivers content globally with low latency. It caches data at Edge locations closer to users, reducing latency.
Example: A static website hosted in S3 can use CloudFront to distribute content worldwide efficiently.

6. How can you implement path-based routing in CloudFront?

- Configure CloudFront behaviors for specific paths (e.g., /images/*) to route requests to different origins or backends.
-

AWS Load Balancers

7. What are the types of load balancers in AWS?

- **Application Load Balancer (ALB):** Works at Layer 7; supports HTTP, HTTPS, and WebSockets. Ideal for microservices and content-based routing.
- **Network Load Balancer (NLB):** Works at Layer 4; supports TCP, UDP, and TLS. Used for high-performance scenarios with low latency.
- **Gateway Load Balancer:** Used for distributing traffic to virtual appliances like firewalls or monitoring systems.
- **Classic Load Balancer:** Deprecated; replaced by ALB and NLB.

8. How can you ensure SSL traffic is encrypted until the node level?

- Terminate SSL at the load balancer and re-encrypt traffic to the backend instances using backend certificates.
-

AWS Lambda and Automation

9. What scripts or automation have you implemented using AWS Lambda?

- Automated tasks like enabling versioning on S3 buckets and creating snapshots of EBS volumes.
 - Example:

```
import boto3
def lambda_handler(event, context):
    ec2 = boto3.client('ec2')
    response = ec2.create_snapshot(
        VolumeId='vol-xxxxxxxx',
        Description='Snapshot created by Lambda'
    )
```
-

Terraform and Infrastructure Management

10. How do you structure Terraform code using modules?

- Create reusable modules for resources like VPCs, subnets, and EC2 instances.
- Example of a VPC module:

```
module "vpc" {
  source = "./modules/vpc"
  cidr_block = "10.0.0.0/16"
}
```

11. Explain multi-environment setups in Terraform.

- Use **workspaces** to isolate environments like dev, staging, and prod.
 - Manage environment-specific variables using .tfvars files.
-

Docker and Kubernetes**12. What are the key instructions in a Dockerfile?**

- **FROM:** Base image.
- **RUN:** Execute commands during the build.
- **COPY/ADD:** Add files to the image.
- **EXPOSE:** Specify port to expose.
- **CMD/ENTRYPOINT:** Define the container's runtime behavior.

13. What is the difference between CMD and ENTRYPOINT?

- **CMD:** Provides default arguments to ENTRYPOINT or runs commands directly if ENTRYPOINT is absent.
- **ENTRYPOINT:** Specifies the main process to run. CMD acts as arguments to ENTRYPOINT.

14. How do you ensure secure traffic between Kubernetes services?

- Use **Ingress** for SSL termination and manage backend communication using **cluster IPs** with encrypted traffic.

15. What are labels and annotations in Kubernetes?

- **Labels:** Key-value pairs used for identification and selection of Kubernetes objects.
 - **Annotations:** Metadata to attach information like configurations or external references to Kubernetes objects.
-

CI/CD and Jenkins**16. What stages would you include in a CI/CD pipeline?**

- **Build:** Compile and package the code.
- **Test:** Run unit, integration, and performance tests.
- **Artifact Storage:** Store artifacts in a repository (e.g., Nexus, Artifactory).
- **Deploy:** Deploy to Kubernetes or other platforms.

17. How do you configure Jenkins Master-Slave architecture?

- Install Java on the slave node.
 - Configure the slave node in Jenkins by adding credentials and setting up node properties.
 - Use the slave node in pipeline jobs for task distribution.
-

Linux and Monitoring**18. How do you find a running process in Linux?**

- Use: ps -aux | grep <process_name>

19. How can you monitor CPU and memory usage for a process?

- Use top, htop, or pidstat for real-time monitoring.
- Example for historical data: sar -u 1 3600

20. What are common Linux commands you use?

- ls, grep, awk, sed, chmod, chown, scp, rsync, find, df, du.
-

Scenario-Based Questions

- 1. How would you shift traffic from one pod to another in Kubernetes?**
 - Use kubectl drain <node_name> to safely evict pods from a node.
 - Update service labels or Ingress rules to reroute traffic.
- 2. How do you securely deliver secrets to Kubernetes?**
 - Use tools like **HashiCorp Vault** or **Kubernetes Secrets**.
 - Enable encryption at rest for secrets using Kubernetes Encryption Configuration.

General and Introductory Questions

1. Can you tell me about your current experience and role?

- **Answer:**

- I have three years of IT experience. Currently, I work in a mid-sized company managing cloud-based applications, including a UK-based college scheduling system and a book publishing application.
- My role as a DevOps engineer involves deployment, monitoring, enabling multi-factor authentication, and automation of various processes.

2. What are you looking for in your next role?

- **Answer:**

- I aim to work with multiple cloud environments (AWS, Azure) and gain exposure to all aspects of deployment and maintenance. I am seeking opportunities where I can contribute significantly and work on a diverse set of technologies.

3. What is your notice period?

- **Answer:** Two months. I have already served 25–26 days and expect to complete my notice period by the end of the next month.

4. What is your expected salary?

- **Answer:** INR 15 LPA.

Technical Questions

Terraform

5. How would you rate yourself in Terraform on a scale of 1 to 10?

- **Answer:** 6–7 out of 10.

6. Can you create a Terraform script to deploy a VPC with three subnets and EC2 instances in a loop?

- **Answer** (key steps include):

- Create variables for CIDR blocks and availability zones.
- Use a for_each loop to create subnets dynamically.
- Use a loop to deploy EC2 instances in each subnet.
- Example:

```
variable "subnet_cidrs" {  
  default = ["10.0.1.0/24", "10.0.2.0/24", "10.0.3.0/24"]  
}
```

```
resource "aws_subnet" "example" {  
  for_each = var.subnet_cidrs  
  vpc_id  = aws_vpc.main.id  
  cidr_block = each.value  
  availability_zone = "us-east-1a"  
}
```

```

resource "aws_instance" "example" {
  for_each = aws_subnet.example
  ami      = "ami-12345678"
  instance_type = "t2.micro"
  subnet_id = each.value.id
  user_data = <<-EOF
    #!/bin/bash
    echo "Hello, World" > /var/www/html/index.html
  EOF
}

```

7. How can you dynamically assign availability zones in Terraform?

- **Answer:**

- Use a map or list to map subnets to availability zones.
- Example:

```

variable "zones" {
  default = ["us-east-1a", "us-east-1b", "us-east-1c"]
}

```

```

resource "aws_subnet" "example" {
  for_each = toset(var.zones)
  vpc_id   = aws_vpc.main.id
  cidr_block = "10.0.1.0/24"
  availability_zone = each.value
}

```

AWS

8. What AWS services do you have experience with?

- **Answer:**

- EC2, VPC, S3, EFS, Route 53, CloudFront, Lambda, and ELB.

9. Why do people dislike EBS-based persistent volumes in Kubernetes?

- **Answer:**

- EBS volumes are zonal, meaning they cannot be attached to instances in different availability zones.
- If a node using an EBS volume goes down and a new node comes up in a different availability zone, the application cannot access the volume.

10. What is the solution for handling zonal limitations of EBS in Kubernetes?

- **Answer:** Use EFS (Elastic File System) or take regular snapshots of the EBS volume and recreate it in the required zone.

Kubernetes

11. How would you rate yourself in Kubernetes on a scale of 1 to 10?

- **Answer:** 6–7 out of 10.

12. What is a Custom Resource Definition (CRD) in Kubernetes?

- **Answer:**
 - A CRD allows you to define custom objects that Kubernetes doesn't support out-of-the-box. It is used to extend Kubernetes functionality by creating new object types.

13. What are some common issues with Ingress objects in Kubernetes?

- **Answer:**
 - Complexity: Requires additional configurations like services and load balancers.
 - Lack of built-in TLS support for internal communications without manual configuration.
 - Difficult to debug routing issues in large-scale deployments.

14. When should you use a service of type LoadBalancer vs. Ingress in Kubernetes?

- **Answer:**
 - Use LoadBalancer when you need direct external access to a single service.
 - Use Ingress when you need to manage multiple services and perform path- or host-based routing.

15. Is the communication between an Ingress and pods encrypted by default?

- **Answer:** No, unless you configure TLS for the communication between the Ingress and backend services. Use client and server certificates to enable encryption.
-

General Cloud Concepts

16. What persistent volumes have you worked with?

- **Answer:** EBS and EFS.

17. What is the difference between EBS and EFS?

- **Answer:**
 - **EBS:** Block storage, tied to a single availability zone.
 - **EFS:** Network file system, can be shared across multiple instances in multiple zones.
-

Scenario-Based Questions

1. Deploy VPC with Subnets and EC2 Instances Using Terraform:

- Dynamically create VPC, subnets, and EC2 instances using loops and variables in Terraform.
- Ensure subnets are evenly distributed across availability zones.

2. Persistent Volume Failure in Kubernetes:

- **Scenario:** If a pod using an EBS volume crashes and comes up in a different zone.
- **Solution:** Use snapshots to recreate the volume in the required zone or switch to a zonal-independent storage solution like EFS.

3. Dynamic Availability Zone Assignment:

- Use Terraform's list/map structure to distribute subnets or instances across multiple AZs evenly.

4. TLS Encryption Between Ingress and Pods:

- Use TLS certificates to encrypt traffic between Ingress and backend pods for secure communication.

Interview Link: - <https://youtu.be/gvlsaPhuYtE?si=yZx82CWHQI-h62zG>

DevOps Interview for 4 Years+ with DevOps Architect

1. Give me brief information about you.
2. Can you define your rolls and responsibility in our previous company?
3. How much you rate yourself in Ansible, Terraform, Docker and Jenkins?
4. Why did Devops method is popular as compared to Agile and waterfall method?
5. Can you tell difference between git fetch and git pull?
6. Can you differentiate git bash and git merge?
7. What is cherry-pick in git?
8. How do you create a new branch?
9. What command you use to delete branch and change the branch in git?
10. How to resolve merge conflict?
11. How git works/area of git working?
12. What is difference between SCM and VCS?
13. What is git stash?
14. What are status code 200, 404, 501,502, etc?
15. How to undo changes in local repository?
16. Differentiate between git revert and git reset?
17. In what team you working?
18. Is it possible to push the code from one local repo to another local repo?
19. Do you know shell script?
20. what is mean by \$\$, \$*, \$# ?
21. could you please share your screen and write the shell script to print 1 to 10?
22. what is bin directory?
23. What is softlink and hardlink?
24. Can you explain Maven lifecycle?
25. Can you explain Kubernetes architecture?
26. Can you write syntax for pipeline script in jenkins?

1. Brief information about you: I am [Your Name], with a strong background in DevOps practices and tools. I have experience in implementing CI/CD pipelines, managing cloud infrastructures, automating deployments, and enhancing development workflows using tools like Jenkins, Docker, Kubernetes, Terraform, and Ansible. I am passionate about improving system reliability and efficiency through automation.

2. Roles and responsibilities in the previous company:

- Designed and implemented CI/CD pipelines using Jenkins.
 - Automated infrastructure provisioning using Terraform and Ansible.
 - Managed containerized applications using Docker and Kubernetes.
 - Monitored application performance using Prometheus and Grafana.
 - Collaborated with development and operations teams to improve deployment processes.
-

3. Rate yourself in Ansible, Terraform, Docker, and Jenkins:

- Ansible: 7/10 – Familiar with writing playbooks, managing inventory, and automating server configuration.
 - Terraform: 8/10 – Skilled in creating infrastructure as code, using modules, and managing state files.
 - Docker: 8/10 – Proficient in containerization, writing Dockerfiles, and managing multi-container applications.
 - Jenkins: 9/10 – Extensive experience in creating pipelines, integrating tools, and automating builds and deployments.
-

4. Why is DevOps more popular compared to Agile and Waterfall methods? DevOps bridges the gap between development and operations, enabling continuous integration, delivery, and deployment. Unlike Agile, which focuses on development iterations, DevOps emphasizes automation and collaboration across the entire software lifecycle. Waterfall, being linear, lacks flexibility, while DevOps provides faster feedback loops and better adaptability to changes.

5. Difference between git fetch and git pull:

- git fetch: Downloads changes from a remote repository but does not apply them to your working directory.
 - git pull: Fetches changes from the remote repository and merges them into your current branch.
-

6. Differentiate git rebase and git merge:

- git rebase: Reapplies commits from your branch onto another branch, creating a linear commit history.
 - git merge: Combines two branches while preserving their commit history.
-

7. What is cherry-pick in Git? git cherry-pick applies a specific commit from one branch onto another branch, allowing selective incorporation of changes.

8. How do you create a new branch? Use the command:

```
git branch <branch_name>
```

9. Command to delete and change branches in Git:

- Delete: git branch -d <branch_name>
 - Change: git checkout <branch_name> or git switch <branch_name>.
-

10. How to resolve merge conflicts?

1. Identify conflicting files using git status.
 2. Open the conflicting files and resolve conflicts manually.
 3. Mark conflicts as resolved using git add <file>.
 4. Complete the merge with git commit.
-

11. How Git works (areas of Git working)? Git has three main areas:

- **Working directory:** Where files are modified.
 - **Staging area:** Where changes are added using git add.
 - **Repository:** Where changes are committed using git commit.
-

12. Difference between SCM and VCS:

- **SCM (Source Code Management):** Encompasses broader functionalities, including version control, branching, merging, and CI/CD integration.
 - **VCS (Version Control System):** A subset of SCM, focusing on tracking file changes and managing versions.
-

13. What is git stash? git stash temporarily saves changes in the working directory without committing them, allowing you to work on something else.

14. HTTP status codes:

- **200:** OK (success).
 - **404:** Not Found.
 - **501:** Not Implemented.
 - **502:** Bad Gateway.
-

15. How to undo changes in the local repository?

- Discard unstaged changes: git checkout -- <file>
 - Unstage changes: git reset HEAD <file>
 - Undo commit: git reset --soft <commit_id>
-

16. Difference between git revert and git reset:

- **Revert:** Creates a new commit that undoes the changes from a specific commit.
 - **Reset:** Moves the HEAD pointer to a previous commit, discarding all subsequent commits.
-

17. In what team are you working? Currently, I am part of the [Development/Operations/SRE/DevOps] team, focusing on CI/CD pipelines, infrastructure automation, and application monitoring.

18. Can you push code from one local repository to another? Yes, by adding another repository as a remote and pushing changes:

```
git remote add <alias> <path_to_local_repo>
git push <alias> <branch_name>
```

19. Do you know shell scripting? Yes, I have experience writing shell scripts for task automation, log parsing, and deployment scripts.

20. What do \$\$, \$*, and \$# mean?

- **\$\$:** Process ID of the current shell.
 - **\$*:** All positional parameters as a single word.
 - **\$#:** Number of positional parameters.
-

21. Shell script to print 1 to 10:

```
#!/bin/bash
for i in {1..10}
do
echo $i
done
```

22. What is the bin directory? The bin directory contains executable binaries and scripts required for system operations and user commands.

23. What are soft links and hard links?

- **Soft link (symbolic link):** A shortcut to another file. Deleting the original file breaks the link.
 - **Hard link:** A direct reference to the file's data. Deleting the original file doesn't affect the hard link.
-

24. Maven lifecycle phases:

- **Clean:** Cleans project artifacts.
 - **Validate:** Validates the project.
 - **Compile:** Compiles source code.
 - **Test:** Runs tests.
 - **Package:** Packages the application.
 - **Install:** Installs the package locally.
 - **Deploy:** Deploys to a remote repository.
-

25. Kubernetes architecture:

- **Control Plane:** Includes API server, etcd, scheduler, and controller manager.
 - **Worker Nodes:** Includes kubelet, kube-proxy, and container runtime.
 - **Networking:** Manages communication between nodes and pods.
-

26. Jenkins pipeline syntax example:

```
pipeline {
    agent any
    stages {
        stage('Build') {
            steps {
                echo 'Building...'
                sh 'make build'
            }
        }
        stage('Test') {
            steps {
                echo 'Testing...'
                sh 'make test'
            }
        }
        stage('Deploy') {
            steps {
                echo 'Deploying...'
                sh 'make deploy'
            }
        }
    }
}
```

Interview Link: - https://youtu.be/5Yjjkv3BWrl?si=QdW_Y6rH9smKDCih

Wipro Bangalore first round DevOps Engineer 4+

AWS Services and Cloud Concepts

1. **Q: What is a NAT Gateway in AWS, and what is its purpose?**
 - o **A:** A NAT Gateway allows instances in a private subnet to access the internet without exposing them to inbound traffic from the internet. It ensures secure and managed outbound internet access for resources in a private subnet.
2. **Q: How do you configure auto-scaling for EC2 instances?**
 - o **A:** Auto-scaling can be configured using an Auto Scaling Group (ASG) in AWS. It involves setting minimum, maximum, and desired instance counts and scaling policies (based on CPU utilization, memory usage, or custom metrics). These settings allow instances to scale dynamically to handle varying workloads.

Containerization and Orchestration

3. **Q: How do you manage logs from Kubernetes Pods in a centralized system like Grafana?**
 - o **A:** You can use Fluentd or Loki as a log collector, configured to scrape logs from Kubernetes Pods. Logs are sent to Grafana as a data source for visualization. Prometheus may also be integrated for metrics collection and monitoring.
4. **Q: What is the purpose of namespaces in Kubernetes?**
 - o **A:** Namespaces are used to divide a Kubernetes cluster into multiple virtual clusters. They help in isolating resources for different teams or applications, enabling resource quotas and access control at the namespace level.

Infrastructure as Code (IaC)

5. **Q: What is Terraform, and how does it help in infrastructure management?**
 - o **A:** Terraform is an Infrastructure as Code (IaC) tool that allows you to define cloud resources in code format. It ensures consistent provisioning, supports multiple cloud providers, and tracks resource states using a state file.
6. **Q: What is the role of a state file in Terraform, and how do you secure it?**
 - o **A:** The Terraform state file keeps a mapping of resources created and their configurations. To secure it, use remote storage like an S3 bucket with DynamoDB for state locking, ensuring consistency and avoiding concurrent updates.

CI/CD and Automation

7. **Q: What is the difference between Continuous Integration (CI) and Continuous Delivery (CD)?**
 - o **A:**
 - **CI:** Automates the integration of code changes into a shared repository, ensuring builds and tests are run frequently.
 - **CD:** Extends CI by automating the release process, ensuring code changes are deployable to production after successful testing.

8. Q: How do you implement blue-green deployment in a Kubernetes environment?

- **A:** Blue-green deployment can be implemented using Kubernetes services and ingress. Two environments (blue and green) are maintained. The blue environment handles production traffic, and the green environment is prepared for the new release. Switching traffic to the green environment involves updating the service or ingress configuration.

Monitoring and Alerting

9. Q: What monitoring tools are commonly used for DevOps workflows?

- **A:** Popular monitoring tools include Prometheus (metrics collection), Grafana (visualization), and ELK Stack (logging). Alerts can be configured in Grafana or Prometheus Alertmanager to notify teams about critical issues.

10. Q: How do you troubleshoot a container crash in Kubernetes?

- **A:**
 - Check events: kubectl describe pod <pod-name>
 - View logs: kubectl logs <pod-name>
 - Inspect resource usage and limits.
 - Investigate Pod and Node health metrics via monitoring tools like Prometheus.

Version Control

11. Q: What are the differences between git pull and git fetch?

- **A:**
 - **git fetch:** Downloads changes from the remote repository but does not merge them into the local branch.
 - **git pull:** Combines the actions of git fetch and git merge, downloading changes and merging them into the current branch.

12. Q: How do you clone a specific branch in Git?

- **A:** Use the command: git clone -b <branch-name> <repository-url>

Scenario-Based Questions

13. Q: You need to connect two private subnets across regions in AWS. How would you achieve this?

- **A:** Use VPC peering or AWS Transit Gateway. Update route tables in both subnets to route traffic through the peering connection or Transit Gateway.

14. Q: How do you ensure high availability for a web application hosted on Kubernetes?

- **A:**
 - Use multiple replicas of the application in a Deployment.
 - Configure a Kubernetes service with a LoadBalancer or Ingress for traffic distribution.
 - Enable auto-scaling with HPA.
 - Monitor cluster health with tools like Prometheus.

Interview Link: - https://youtu.be/XnhhIHnwFm0?si=tK3_YA6fgXkK8xCq

Interview With DevOps Architect for 4 Years (Mock)

Linux Basics

1. **Q: Tell me about yourself.**
 - o **A:** A personalized answer should include your professional background, relevant DevOps tools or projects you've worked on, and a brief mention of certifications or achievements.
2. **Q: How good are you in Linux?**
 - o **A:** Mention your experience with Linux, including shell scripting, system administration tasks, managing permissions, and working with core Linux utilities like grep, sed, awk, and top.
3. **Q: How can you know all the files opened by a process?**
 - o **A:** Use the lsof command:
`lsof -p <process-id>`
4. **Q: What is a daemon process in Linux?**
 - o **A:** A daemon is a background process that runs without user interaction and provides services such as logging (syslog), scheduling (cron), or network services (sshd).
5. **Q: What is Bashrc, and why do we use it in Linux?**
 - o **A:** .bashrc is a shell script executed whenever a new terminal session starts. It is used to set environment variables, aliases, and custom functions for user convenience.
6. **Q: What is the difference between a soft link and a hard link?**
 - o **A:**
 - **Soft Link:** A pointer to the file's name; breaks if the target file is deleted.
 - **Hard Link:** A direct reference to the file's inode; remains functional even if the original file is deleted.
7. **Q: What is the difference between initd and systemd?**
 - o **A:**
 - initd is the older initialization system with a sequential startup process.
 - systemd is a modern system manager with parallel startup, better performance, and advanced features like socket activation.
8. **Q: What are the runlevels in Linux?**
 - o **A:** Runlevels define the state of the system:
 - 0: Halt
 - 1: Single-user mode
 - 2: Multi-user without networking
 - 3: Multi-user with networking
 - 4: Undefined
 - 5: Graphical interface
 - 6: Reboot
9. **Q: What are the responsibilities of the kernel in Linux?**
 - o **A:** The kernel manages hardware resources, process scheduling, memory management, file systems, and networking.
10. **Q: What are namespaces in Linux?**
 - o **A:** Namespaces isolate resources such as processes, network interfaces, and file systems. Common namespaces include PID, NET, and MNT.

Jenkins and CI/CD

11. Q: What is the Jenkins CLI?

- A: The Jenkins CLI allows administrators to perform tasks like managing jobs, querying logs, and updating configurations from the command line.

12. Q: What is a multi-branch pipeline, and how do you use it?

- A: A multi-branch pipeline automatically creates and manages pipelines for each branch in a repository. It's used to test changes in separate branches independently.

13. Q: What are the global credentials in Jenkins, and how do you manage them?

- A: Global credentials are stored securely in Jenkins to be shared across jobs. They can be managed in the "Manage Jenkins" > "Credentials" section.
-

Docker and Containers

14. Q: What are Cgroups (Control Groups) in Docker?

- A: Cgroups limit and isolate resource usage (CPU, memory, disk I/O) for Docker containers.

15. Q: What is the Docker daemon, and what is its role?

- A: The Docker daemon is the core service that runs in the background, managing containers, images, networks, and volumes.

16. Q: What are build contexts in Docker?

- A: The build context refers to the directory from which the docker build command is executed, containing the Dockerfile and required files.

17. Q: How do you list failed containers and debug them?

- A: Use the following commands:
 - List: docker ps -a | grep Exited
 - Debug: docker logs <container-id> or docker inspect <container-id>

18. Q: What is the difference between awk and sed?

- A:
 - AWK: Processes and analyzes text patterns; used for complex reports.
 - SED: Stream editor used for text substitution and file modification.

19. Q: Is indentation required in Linux shell scripting?

- A: While indentation is not required, it is a best practice to improve script readability and maintenance.
-

Kubernetes and Orchestration

20. Q: What is the Ingress controller in Kubernetes?

- A: An Ingress controller manages HTTP/HTTPS traffic to Kubernetes services using Ingress resources.

21. Q: What is the difference between liveness probe and readiness probe?

- A:
 - **Liveness Probe:** Ensures a container is running; restarts the container if it fails.
 - **Readiness Probe:** Ensures a container is ready to handle traffic.

22. Q: What is the difference between Node Affinity and Tolerations?

- A:
 - **Node Affinity:** Places Pods on specific Nodes based on labels.
 - **Tolerations:** Allows Pods to run on Nodes with specific taints.

23. Q: What is Anti-Affinity in Kubernetes?

- **A:** Anti-affinity ensures Pods are scheduled on different Nodes, improving availability.

24. Q: What is a static Pod in Kubernetes?

- **A:** Static Pods are created by the Kubelet on a specific Node, independent of the API server.
-

AWS Concepts

25. Q: What is NACL, VPC, and VPC Peering?

- **A:**
 - **NACL (Network Access Control List):** Controls inbound and outbound traffic at the subnet level.
 - **VPC (Virtual Private Cloud):** Isolated virtual network in AWS.
 - **VPC Peering:** Connects two VPCs to allow communication.

26. Q: What are the storage classes in S3?

- **A:** S3 storage classes include:
 - Standard
 - Intelligent-Tiering
 - Standard-IA
 - One Zone-IA
 - Glacier
 - Glacier Deep Archive

27. Q: What is the difference between EBS and S3?

- **A:**
 - **EBS:** Block storage for EC2 instances; suitable for running databases.
 - **S3:** Object storage for unstructured data; suitable for backups and archival.

28. Q: How can you convert a public subnet to a private subnet in a VPC?

- **A:** Remove the route to the Internet Gateway in the route table associated with the subnet. Replace it with a route to a NAT Gateway or NAT Instance.

Interview Link: - <https://youtu.be/yyVYR3S1Mm8?si=ZhFGBVJbcKamYwf3>

DevOps Interview for Big MNC Bangalore round-1

Introduction and Background

1. Q: Tell me about yourself.

- o **Correct Answer:** Provide a clear and concise summary of your experience, tools expertise, roles, and responsibilities. Example:

"I have three and a half years of experience as a DevOps Engineer. My expertise includes tools like Docker, Kubernetes, Jenkins, Git, Nexus, and AWS services. My primary responsibilities include setting up infrastructure from scratch, configuring VPCs, EC2 instances, implementing security services like CloudTrail, GuardDuty, and CloudWatch, and building CI/CD pipelines. Additionally, I monitor infrastructure using tools like Prometheus, Grafana, and the EFK stack."

Kubernetes Questions

2. Q: What happens if two selectors with the same name exist in the same namespace?

- o **Correct Answer:** This leads to ambiguity, causing Kubernetes to misroute services to the correct Pods. Always ensure unique labels to avoid such conflicts.

3. Q: Can you write a Kubernetes manifest file for an NGINX container?

- o **Correct Answer:**

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
spec:
  replicas: 1
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx
          image: nginx:1.19
      ports:
        - containerPort: 80
```

4. Q: What is the difference between declarative and imperative Kubernetes management?

- o **Correct Answer:**

- **Declarative:** Define desired state using manifests (YAML/JSON). Example: kubectl apply -f <file>.yaml.
- **Imperative:** Execute direct commands. Example: kubectl run nginx --image=nginx.

5. Q: What happens if a liveness probe fails?

- o **Correct Answer:** Kubernetes restarts the container to maintain application health. Traffic to the faulty container is stopped.

6. **Q: What happens if a readiness probe fails?**
 - **Correct Answer:** The container is temporarily removed from the service's endpoint list, preventing traffic from being routed to it until it becomes ready again.
 7. **Q: How do you troubleshoot Pods in a pending state?**
 - **Correct Answer:**
 - Use kubectl get pods and kubectl describe pod <pod-name> to identify issues.
 - Check cluster capacity: kubectl get nodes.
 - Analyze Pod logs: kubectl logs <pod-name>.
 - Increase node capacity if necessary or adjust resource requests/limits.
 8. **Q: What logging tools have you used with Kubernetes?**
 - **Correct Answer:**

Tools include EFK (Elasticsearch, Fluentd, Kibana) and Fluent Bit with CloudWatch for log aggregation and visualization.
-

Docker Questions

9. **Q: How can you copy files to/from a Docker container?**
 - **Correct Answer:** Use the docker cp command:
`docker cp <source-path> <container-id>:<destination-path>`
 10. **Q: How do you expose a Docker container publicly?**
 - **Correct Answer:** Use port binding during container creation:
`docker run -d -p <host-port>:<container-port> <image-name>`
 11. **Q: Write a Dockerfile to deploy a web server.**
 - **Correct Answer:**

```
FROM nginx:latest
COPY index.html /usr/share/nginx/html/
EXPOSE 80
CMD ["nginx", "-g", "daemon off;"]
```
 12. **Q: What is docker system prune?**
 - **Correct Answer:** It removes unused containers, images, networks, and build cache to free up space.
 13. **Q: What is docker inspect?**
 - **Correct Answer:** This command provides detailed information about a Docker container or image in JSON format, including IP address, ports, and metadata.
-

AWS and CI/CD

14. **Q: What is ECR, and how do you configure it?**
 - **Correct Answer:**

ECR (Elastic Container Registry) is AWS's managed Docker registry.
Steps to configure:
 - Create a repository via AWS Management Console or CLI.
 - Push/pull Docker images using provided CLI commands.
15. **Q: What is the difference between a registry and a repository?**
 - **Correct Answer:**
 - **Registry:** Software for storing repositories (e.g., DockerHub, AWS ECR).
 - **Repository:** A collection of related images.

Scenario-Based and Miscellaneous Questions

16. **Q: What is the purpose of an ingress in Kubernetes?**
 - **Correct Answer:** Ingress manages external access to services within a cluster. It provides features like host-based, path-based, and SSL termination routing.
17. **Q: How do you persist data in Kubernetes?**
 - **Correct Answer:** Use Persistent Volumes (PV) and Persistent Volume Claims (PVC). For example, AWS EBS can be used to store data outside the cluster.
18. **Q: How is containerization different from virtualization?**
 - **Correct Answer:**
 - **Virtualization:** Abstracts hardware to run multiple OS instances on a single machine.
 - **Containerization:** Packages applications and dependencies into lightweight containers.
19. **Q: What are deployment strategies in Kubernetes?**
 - **Correct Answer:**
 - **Rolling Update:** Updates Pods incrementally with zero downtime.
 - **Recreate:** Terminates all old Pods before creating new ones.
20. **Q: What is Docker Compose, and why is it used?**
 - **Correct Answer:** Docker Compose simplifies multi-container deployments by defining services in a YAML file and deploying them with a single command.

Interview Link: - https://youtu.be/_1GSVoUVPXo?si=A5V_h7pp8hkPB3AJ

Fist round for MNC Devops interview

General Questions

1. Q: Tell me about yourself and your day-to-day activities.

○ A:

"I have 4 years of experience as a DevOps Engineer with expertise in tools like Git, SVN, Bitbucket, GitLab, SonarQube, Nexus, Docker, Kubernetes, and AWS. My daily activities include:

- Managing CI/CD pipelines using Jenkins.
- Containerizing applications and deploying them to Kubernetes clusters.
- Monitoring infrastructure with tools like CloudWatch and Prometheus.
- Handling storage solutions such as S3 and EBS.
- Implementing security policies using IAM and NACLs."

AWS Questions

2. Q: What AWS services have you worked on apart from EC2 and VPC?

○ A:

- **Networking:** Route 53.
- **Compute:** Lambda, Auto Scaling Groups.
- **Storage:** S3, EBS.
- **Security:** IAM, NACL.
- **Monitoring:** CloudWatch.
- **Databases:** RDS (MySQL, PostgreSQL).

3. Q: How do you register a container registry in AWS ECR?

○ A:

- Go to the ECR service in the AWS console.
- Create a new repository and configure it as private or public.
- Use the default push/pull commands provided by AWS to interact with the repository.

4. Q: How do you fetch a file from S3 to an EC2 instance?

○ A:

- Attach an IAM role to the EC2 instance with S3 full access.
- Use the AWS CLI:

```
aws s3 cp s3://<bucket-name>/<file-name> /path/to/destination
```

5. Q: How do you access a private EC2 instance from outside?

○ A:

Use a bastion host:

- Deploy a public EC2 instance in the public subnet.
- Configure security groups to allow SSH access from the bastion host to the private instance.

6. Q: What is the difference between NACL and Security Groups?

○ A:

- **NACL:** Operates at the subnet level, supports both allow and deny rules.
- **Security Groups:** Operates at the instance level, only supports allow rules.

7. Q: What is Elastic Beanstalk?

○ A: A managed AWS service for deploying and scaling web applications automatically.

8. Q: What is SQS, and when do you use it?

- A: SQS is a message queuing service to decouple application components. It is used for scenarios like processing S3 events or managing job queues.

Kubernetes Questions

9. Q: How do you create an EKS cluster?

- A:
 - Use the AWS Management Console or eksctl CLI tool.
 - Specify details like VPC, subnets, and node groups.
 - Use the IAM roles for EKS, EC2, and ECR for proper access.

10. Q: What is the lifecycle of a kubectl command?

- A:
 - The command is sent to the API server.
 - The API server communicates with etcd, scheduler, and controller-manager.
 - Finally, kubelet executes instructions on worker nodes.

11. Q: What is a pod in Kubernetes?

- A:
 - A Pod is the smallest deployable unit in Kubernetes, which encapsulates one or more containers.

12. Q: How do you implement load balancing in Kubernetes?

- A:
 - Use Kubernetes services:
 - **ClusterIP:** Balances traffic within the cluster.
 - **NodePort:** Exposes services to external traffic.
 - **LoadBalancer:** Integrates with external load balancers like AWS ELB.

13. Q: What is the difference between a LoadBalancer and a Headless Service?

- A:
 - **LoadBalancer:** Distributes traffic using round-robin or other algorithms.
 - **Headless Service:** Directs traffic to backend pods without load balancing.
-

Docker Questions

14. Q: How do you inspect details of a Docker container?

- A: Use the docker inspect <container-id> command to get information in JSON format.

15. Q: What is Minikube?

- A: Minikube is a tool for running a single-node Kubernetes cluster on local machines, often used for testing or POC purposes.

16. Q: How do you increase Docker volume size?

- A: Modify the daemon.json configuration file in /etc/docker and restart Docker with the updated volume size.

17. Q: What is Docker Compose?

- A: A tool for defining and running multi-container applications with a YAML configuration file.
-

CI/CD and Jenkins Questions

18. Q: How do you manage users in Jenkins?

- A: Use the "Role-Based Access Control" plugin to assign specific roles and privileges to users.

19. Q: Write a Jenkins pipeline to build and push a Docker image.

- A:

```
pipeline {
    agent any
    environment {
        DOCKER_IMAGE = 'my-app'
        DOCKER_REGISTRY = 'my-registry-url'
    }
    stages {
        stage('Build') {
            steps {
                script {
                    docker.build("${DOCKER_REGISTRY}/${DOCKER_IMAGE}")
                }
            }
        }
        stage('Push') {
            steps {
                script {
                    docker.image("${DOCKER_REGISTRY}/${DOCKER_IMAGE}").push('latest')
                }
            }
        }
    }
}
```

Git Questions

20. Q: What is the difference between Git Pull and Git Fetch?

- A:

- **Git Pull:** Fetches and merges changes from a remote branch.
- **Git Fetch:** Only fetches changes without merging.

21. Q: What is Git Rebase?

- A:

- Reapply commits on top of another base tip, creating a linear commit history.

22. Q: How do you undo a specific commit in Git?

- A: Use git revert <commit-id> to create a new commit that undoes changes from the specified commit.

Scenario-Based Questions

1. How do you fetch S3 data into EC2 using object IDs?

- Use the GetObject API with proper IAM permissions.

2. How do you troubleshoot Pods stuck in a pending state?

- Check events with kubectl describe pod.
- Verify node resources with kubectl get nodes.
- Check scheduling constraints like affinity or taints.

Interview Link: - https://youtu.be/_3kzfQg_ful?si=EHdaQCtIftAZC7yl

DevOps Enginner interview for TECHMO Round -1 (video)

General Questions

1. Q: Can you introduce yourself?

- o A:

"I have four years of experience as a DevOps Engineer. I have worked on tools like Git, Jenkins, SonarQube, Nexus, Docker, Kubernetes, and AWS. My most recent project involved deploying containers on EKS clusters and creating CI/CD pipelines using Jenkins. I also have experience in infrastructure management, such as setting up VPCs, EC2 instances, and monitoring with tools like CloudWatch and GuardDuty."

2. Q: What are your day-to-day activities?

- o A:

- Setting up AWS infrastructure (VPC, EC2, CloudWatch alarms, GuardDuty).
- Implementing CI/CD pipelines using Jenkins.
- Writing Kubernetes manifest files for deployment.
- Troubleshooting issues in pods, nodes, and clusters.
- Providing backend support for tickets related to infrastructure and application downtime.

Kubernetes Questions

3. Q: Can you explain the Kubernetes architecture?

- o A:

Kubernetes architecture has two main components:

- **Control Plane (Master Node):**
 - **API Server:** Acts as the front-end of the cluster and processes REST requests.
 - **etcd:** A distributed key-value store for storing all cluster data.
 - **Scheduler:** Assigns workloads (pods) to available nodes based on resource requirements.
 - **Controller Manager:** Ensures the desired state of the cluster, handling tasks like replication and node monitoring.
- **Worker Node:**
 - **kubelet:** An agent that ensures the containers are running in a pod.
 - **kube-proxy:** Manages network rules and routing to allow communication.
 - **Container Runtime:** Runs the containers, e.g., Docker, containerd.

4. Q: What is a namespace in Kubernetes?

- o A:

A namespace provides logical isolation within a Kubernetes cluster, allowing separation of resources like pods and services. For example, you can create a namespace for monitoring and another for application workloads.

5. Q: What is an Ingress controller, and why is it used?

- o A:

- An Ingress controller manages external access to services within a Kubernetes cluster, usually via HTTP/HTTPS.
- It sits behind the Load Balancer (e.g., ELB) and routes traffic to the appropriate service using host-based or path-based rules.
- It reduces the cost of creating separate load balancers for every service.

Docker Questions

6. **Q: What is the difference between CMD and ENTRYPOINT in a Dockerfile?**
 - o **A:**
 - **CMD:** Provides default instructions to execute when starting a container. It can be overridden by arguments passed during container runtime.
 - **ENTRYPOINT:** Defines the main command that will always run. It cannot be overridden but can accept arguments from CMD.
 - **Combination:** CMD is often used to provide default arguments to the ENTRYPOINT.
 7. **Q: How do you get inside a running Docker container?**
 - o **A:**

Use the following command: docker exec -it <container_name> /bin/bash
 - -it allows interactive mode for the terminal.
 8. **Q: Why do we use the -it option in docker exec?**
 - o **A:**

The -it option enables interactive mode, allowing you to interact with the container terminal. Without it, commands might not provide output or allow user interaction.
-

Monitoring Questions

9. **Q: What monitoring tools have you used?**
 - o **A:**
 - I have set up Prometheus and Grafana using Helm charts in a dedicated namespace.
 - While I configured the tools, the admin team managed dashboards.
 - I also used CloudWatch for log monitoring and alarms.
-

CI/CD and Jenkins Questions

10. **Q: How does code move from Git to production in your CI/CD pipeline?**
 - o **A:**
 1. **GitHub Webhook:** Triggers Jenkins when new code is committed.
 2. **Build Stage:** Jenkins pulls the code and builds it using tools like Maven.
 3. **Code Quality:** SonarQube checks code quality and coverage using quality gates.
 4. **Artifact Storage:** Built artifacts are pushed to Nexus or ECR.
 5. **Containerization:** Docker images are created from Dockerfiles.
 6. **Deployment:** Kubernetes deploys the images to EKS using deployment YAML files, typically with a rolling update strategy.
 11. **Q: What is Git rebase?**
 - o **A:**

Git rebase integrates changes from one branch into another by rewriting commit history. Unlike a merge, rebase preserves commit history and creates a linear sequence of commits.
-

AWS Questions

12. Q: What AWS services have you used?

o A:

- Compute: EC2, Auto Scaling Groups.
- Networking: VPC, Route 53.
- Storage: S3, EBS.
- Monitoring: CloudWatch, GuardDuty.
- Load Balancing: ELB.

13. Q: How do you install Git and Jenkins on a Linux server using a Dockerfile?

o A:

```
FROM ubuntu:latest
RUN apt-get update && apt-get install -y git openjdk-11-jdk
RUN wget -q -O - https://pkg.jenkins.io/debian/jenkins.io.key | apt-key add - \
    && echo "deb http://pkg.jenkins.io/debian-stable binary/" > /etc/apt/sources.list.d/jenkins.list \
    && apt-get update && apt-get install -y jenkins
CMD ["systemctl", "start", "jenkins"]
```

Scenario-Based Questions

1. Q: How do you troubleshoot a pod stuck in a pending state?

o A:

- Check the pod events using: kubectl describe pod <pod_name>.
- Verify if sufficient resources are available on the node using: kubectl get nodes.
- Inspect affinity, taints, or tolerations preventing scheduling.

2. Q: How do you scale a deployment in Kubernetes?

o A:

Use the following command to scale pods:

```
kubectl scale deployment <deployment_name> --replicas=<desired_count>
```

3. Q: How do you handle a private EC2 instance that needs access from outside?

o A:

- Use a bastion host deployed in a public subnet.
- Configure the bastion host security group to allow SSH access.
- SSH into the bastion host, then into the private EC2 instance.

4. Q: How do you set up Ingress for a microservices application?

o A:

- Deploy an Ingress controller (e.g., NGINX).
- Create an Ingress YAML file with path-based or host-based routing rules.
- Apply the YAML file using kubectl apply.

Interview Link: - https://youtu.be/p3xmuFBrRDM?si=qGn7w0Z0Se5Rhh_j

DevOps Interview for Big MNC Bangalore round – 2

- 1) What playbooks have you written on Ansible?
- 2) How can you check if a particular package is installed or not in a host in ansible?
- 3) Diff between a package module and a shell module?
- 4) What is Ansible task?
- 5) What is a handler in Ansible?
- 6) How can you install a python module on a host using ansible
- 7) Brief about ansible architecture?
- 8) How can you create a K8 cluster? Can you create a K8 cluster in on prem? Whats the diff between cloud and on prem?
- 9) Roles in AWS and what access do you have?
- 10) What monitoring tools you have worked on?
- 11) Wht doe Prometheus and Grafana do?
- 12) How many TF providers you have worked on?
- 13) If state.tf is lost, and if I apply TF apply, what happens?
- 14) Diff between Ansible and TF?
- 15) Can I use Ansible for IAC?
- 16) What is PVC and storage volume in K8?
- 17) What is Affinity, taint on tolerance and
- 18) Can I schedule a pod on master?
- 19) What are minions in k8?
- 20) What is kube proxy and CNI in K8?
- 21) What is Esthio? – load balance, pod to pod management, traffic managining?
- 22) Why should we go for containers?
- 23) Explain K8 architechture?

Ansible

1. **What playbooks have you written on Ansible?**
 - o Playbooks for user management, installing and configuring web servers (e.g., Apache, Nginx), database setup (e.g., MySQL, PostgreSQL), and deploying applications.
 - o Tasks for package installation, file copy, service restart, and deploying Docker containers.
 - o Monitoring agent installations such as Prometheus Node Exporter setup.
2. **How can you check if a particular package is installed on a host in Ansible?**
 - o Use the ansible.builtin.package_facts module:
 - name: Check if package is installed
 - ansible.builtin.package_facts:
 - Check the result in the ansible_facts.packages dictionary.
3. **Difference between a package module and a shell module?**
 - o **Package module:** Uses specific package managers (e.g., yum, apt, dnf) to manage packages. It is idempotent.
 - o **Shell module:** Executes shell commands directly. It is not idempotent unless explicitly handled.
4. **What is an Ansible task?**
 - o A task is a single unit of action within a playbook. For example, installing a package or restarting a service.

5. What is a handler in Ansible?

- A handler is a task triggered by an event, such as a change in configuration. It only executes when notified by other tasks using the notify keyword.

6. How can you install a Python module on a host using Ansible?

- Use the ansible.builtin.pip module:

```
- name: Install Python module
  ansible.builtin.pip:
    name: <module_name>
```

7. Brief about Ansible architecture?

- **Controller Node:** Runs Ansible commands and manages playbooks.
 - **Managed Nodes:** Target machines configured via SSH.
 - **Inventory:** Defines target hosts.
 - **Modules:** Perform specific tasks.
 - **Playbooks:** YAML files defining automation workflows.
-

Kubernetes

8. How can you create a K8s cluster? Can you create a K8s cluster on-prem? Difference between cloud and on-prem?

- Use tools like kubeadm, minikube, or managed services (e.g., EKS, AKS).
- On-prem: Set up the control plane, worker nodes, and networking manually.
- Cloud vs. On-Prem: Cloud providers manage control plane and scaling; on-prem requires manual management.

9. What is PVC and storage volume in K8s?

- **Persistent Volume (PV):** A cluster-wide storage resource.
- **Persistent Volume Claim (PVC):** A user's request for storage in K8s.
- PVCs abstract storage requests, allowing pods to use them.

10. What is affinity, taint, and tolerance in Kubernetes?

- **Affinity:** Controls which nodes a pod can run on based on rules.
- **Taint:** Restricts pods from running on specific nodes.
- **Tolerance:** Allows pods to override taints and schedule on those nodes.

11. Can I schedule a pod on the master?

- Yes, but the master must be taint-free or the pod should have tolerations to bypass the default taints on master nodes.

12. What are minions in K8s?

- Minions are worker nodes that run workloads (pods). They communicate with the control plane.

13. What is kube-proxy and CNI in K8s?

- **kube-proxy:** Manages network routing for service discovery and communication.
- **CNI (Container Network Interface):** A framework for configuring network interfaces and connectivity.

14. What is Istio?

- A service mesh that manages service-to-service communication, traffic routing, load balancing, and security in Kubernetes.
-

Terraform

15. How many TF providers have you worked on?

- Common providers include AWS, Azure, Kubernetes, and Docker.

16. If state.tf is lost and you apply terraform apply, what happens?

- Terraform will recreate all resources because it has no record of existing infrastructure. This can cause conflicts or resource duplication.

17. Difference between Ansible and Terraform?

- **Terraform:** Focused on infrastructure provisioning (IAC). Declarative.
- **Ansible:** Focused on configuration management. Can perform ad-hoc tasks. Procedural and declarative.

18. Can I use Ansible for IAC?

- Yes, but it is less efficient than Terraform for infrastructure provisioning. Ansible is better suited for configuration management.
-

Monitoring

19. What monitoring tools have you worked on?

- Prometheus, Grafana, CloudWatch, and ELK Stack.

20. What do Prometheus and Grafana do?

- **Prometheus:** Collects metrics from targets via a pull model and stores them.
 - **Grafana:** Visualizes data from Prometheus and other sources in dashboards.
-

Containers and Kubernetes

21. Why should we go for containers?

- Portability, scalability, efficient resource utilization, and fast deployment.

22. Explain K8s architecture?

- Control Plane:
 - API Server, etcd, Scheduler, Controller Manager.
- Worker Nodes:
 - kubelet, kube-proxy, container runtime.
- Add-ons:
 - DNS, Ingress Controller, Dashboard.

Interview Link: - https://youtu.be/hLT31WO-ZAQ?si=leA_OPdqU0j2Z50C

APT 2nd Round: DevOps Engineer Job

General Experience and Tools:

1. **What tools have you worked with?**
 - o **Answer:** Git, Maven, SonarQube, Nexus, Jenkins, Docker, Kubernetes, and AWS. Also worked with microservices deployment on EKS.
 2. **Have you worked on any source code management tool other than Git?**
 - o **Answer:** No, primarily worked with Git.
 3. **What tasks have you performed on Git, and what branching strategy is followed?**
 - o **Answer:**
 - Tasks: Repository creation, branch management, and access control for users.
 - Branching strategy: Development, staging, production, feature branches for new features, and bug-fix branches for temporary fixes.
 4. **What technology stack have you created CI/CD pipelines for?**
 - o **Answer:** Primarily for Java-based applications.
 5. **Any experience with .NET-based CI/CD pipelines?**
 - o **Answer:** No experience with .NET; primarily worked on Java.
 6. **What is your team structure for CI/CD and infrastructure management?**
 - o **Answer:** A team of seven DevOps engineers. Infrastructure is managed by a dedicated AWS team, and DevOps team has limited IAM access (L2 access).
-

CI/CD and Jenkins:

7. **What are the main stages in your Jenkins pipelines?**
 - o **Answer:**
 - Source: Pull code from GitHub.
 - SonarQube: Analyze code quality and enforce quality gates.
 - Build: Use Maven for building the application.
 - Push artifacts to Nexus.
 - Create Docker images and push them to ECR.
 - Deploy images to Kubernetes.
 8. **What kind of pipelines are you using in Jenkins?**
 - o **Answer:** Migrated from Freestyle jobs to Declarative pipelines.
 9. **What is the architecture of Jenkins?**
 - o **Answer:**
 - Jenkins Master-Slave architecture.
 - Nodes are primarily Linux-based (Red Hat).
 10. **Have you integrated testing in your CI/CD pipelines?**
 - o **Answer:** Basic code coverage and unit testing using JaCoCo plugin. Testing teams handle functional and smoke testing.
 11. **What happens in case of a build failure?**
 - o **Answer:** Analyze Jenkins console logs. Common issues include out-of-memory errors or Java exceptions. Troubleshooting involves restarting nodes or informing developers about specific errors.
-

Docker and Kubernetes:

12. What types of Dockerfiles have you created?

- **Answer:**

- Used commands like FROM, RUN, CMD, ENTRYPOINT, COPY, and WORKDIR.
- CMD executes the last specified command, and ENTRYPOINT uses CMD as arguments.

13. What kind of Kubernetes deployments have you worked on?

- **Answer:**

- Wrote Kubernetes manifests for deploying applications on EKS.
- Resolved issues like pod memory allocation and readiness/liveness probe failures.

14. What artifact type is generated in your builds?

- **Answer:** WAR files.

15. What tools do you use for artifact management?

- **Answer:** Nexus and ECR.

16. Have you worked with Helm charts?

- **Answer:** Yes, used Helm charts for deploying Prometheus monitoring stack with default node exporters and alert manager.

17. How did you handle Kubernetes auto-scaling issues?

- **Answer:** Developed a script to fix discrepancies between Kubernetes pod auto-scaling and AWS node group scaling.

AWS and Infrastructure:

18. What AWS services have you worked on?

- **Answer:** VPC, EC2, ELB, Auto Scaling Groups, and EKS. IAM roles are managed by the AWS team.

19. Do you manage AWS infrastructure?

- **Answer:** No, the AWS team manages it, while the DevOps team supports deployments and configuration.

Additional Tools and Knowledge:

20. Do you have experience with Azure DevOps?

- **Answer:** No, but willing to learn if required.

21. Have you worked with Ansible or Terraform?

- **Answer:** Limited knowledge of Terraform and Ansible. Worked mostly on Kubernetes and Docker.

22. Have you performed any automation or scripting?

- **Answer:** Minimal scripting; developed a script for fixing Kubernetes-AWS node scaling issues.

Scenario-Based Questions and Answers:

1. Scenario: If a build fails, what steps will you take?

Answer:

- Check Jenkins console output for error logs.
- Identify issues like out-of-memory errors or build configuration mismatches.
- Restart nodes or coordinate with the development team for resolution.

2. **Scenario:** How would you troubleshoot readiness/liveness probe failures?

Answer:

- Analyze pod logs to identify specific issues.
- Verify configuration of readiness and liveness probes in manifest files.
- Adjust timeouts and thresholds based on application requirements.

3. **Scenario:** How would you handle a scaling issue in a Kubernetes cluster?

Answer:

- Investigate the node group and pod scaling configuration.
- Write a script to synchronize AWS auto-scaling with Kubernetes pod scaling.
- Deploy the script in the ASG to resolve scaling bottlenecks.

4. **Scenario:** If SonarQube fails a quality gate, what actions will you take?

Answer:

- Review SonarQube reports to identify code quality issues.
- Inform the development team to address the issues.
- Re-trigger the pipeline after fixing the reported bugs or vulnerabilities.

5. **Scenario:** How do you handle high memory usage in a Kubernetes pod?

Answer:

- Review resource requests and limits in the manifest file.
- Adjust memory allocation for the pod.
- Monitor metrics using tools like Prometheus and Grafana.

Interview Link: - <https://youtu.be/P24lUgF8eu0?si=i2yRsqwY8rlS8pc->

Hr Round: DevOps Engineer Job (APT)

Correct Answers:

1. **Tell me something about yourself, how many years of experience do you have, what skills you are working on, what is your current designation, which company you are associated with, and what is the reason for change.**
 - **Answer:**

I have 4 years and 4 months of experience as a DevOps Engineer. I am skilled in Kubernetes, Docker, AWS, Git, Maven, Jenkins, Terraform, and Ansible. Currently, I am with [Current Company], and I am looking for a change to enhance my career growth. My current organization doesn't have active projects, and I am on the bench.
2. **Do you have some Python knowledge and how much exposure do you have with AWS?**
 - **Answer:**

I have basic Python knowledge. Regarding AWS, I have extensive experience over the past four years working with services like EC2, VPC, S3, Lambda, ELB, and IAM.
3. **Do you have any other cloud knowledge?**
 - **Answer:**

No, I primarily work on AWS. However, I am open to learning and adapting to other cloud platforms if needed.
4. **Where do you use SonarQube?**
 - **Answer:**

SonarQube is used for code quality analysis and management. It ensures that the source code meets the required quality standards by identifying bugs, vulnerabilities, and code smells. Once the quality gates are passed, the code is ready to move from one environment to another.
5. **Do you have any exposure to CloudFormation?**
 - **Answer:**

Yes, I have worked on CloudFormation for one project. I can use it to define and provision infrastructure as code effectively.
6. **Which projects are you working on?**
 - **Answer:**

I was working on the M1 Self-Care project, a telecom domain project. My responsibilities included creating EKS clusters, writing Kubernetes manifest files, and implementing CI/CD pipelines using Jenkins.
7. **What is your current designation?**
 - **Answer:**

DevOps Engineer.
8. **What is the reason you are looking for a change right now?**
 - **Answer:**

I am seeking career growth and better opportunities. Currently, my organization does not have active projects, and I am on the bench.
9. **Are you holding any offers?**
 - **Answer:**

I have cleared two rounds with Infosys and WhiteHat Junior, but the final processes are delayed. I was also offered a position by another company, but the offer release was delayed after my resignation.

10. Any other companies you are getting interviews with or holding an offer?

- **Answer:**
Yes, I am in process with Infosys and WhiteHat Junior. Both are in the pipeline with pending final rounds or decisions.

11. What is the offer discussion you had with them?

- **Answer:**
Infosys and WhiteHat Junior have both completed two rounds and are delaying further processes due to the year-end. Another company delayed releasing the offer after initially asking for my resignation.

12. What is your current CTC?

- **Answer:**
My current CTC is 6 LPA.

13. Have you shared the documents with us?

- **Answer:**
Yes, I have shared my offer letter and other required documents. If any are missing, I will provide them promptly.

14. Tell me something about your education, from where you have completed your graduation.

- **Answer:**
I completed my B.Tech in Electronics and Communication Engineering (ECE) from JNTU Hyderabad in 2013. Later, I pursued an MBA in Human Resources from JNTU Hyderabad, which I completed in 2017.

15. What is your expected CTC?

- **Answer:**
My expected CTC is 10 LPA.

Interview Link: - <https://youtu.be/PzL61yU9-FA?si=bdjpdPr6-2r0My6Y>

APT First Round Devops Engineer

1. What is a Docker multi-stage file?

- **Answer:**

A Docker multi-stage file allows you to use multiple FROM instructions in a single Dockerfile. It helps build lightweight and efficient images by separating the build environment from the runtime environment. For example, you can build your application in one stage with all necessary dependencies and then copy only the required artifacts into the final image.

2. I have all the images in it, so how can it be lightweight?

- **Answer:**

Multi-stage builds are lightweight because the intermediate stages are discarded, and only the final stage is included in the image. Unnecessary files, dependencies, and build tools used in earlier stages do not exist in the final image.

3. I have an Ubuntu machine and a Git repo with code. Explain the end-to-end flow of continuous deployment.

- **Answer:**

1. **Pull Code:** Use Jenkins or any CI/CD tool to pull code from the Git repository.
2. **Build Artifact:** Build the code using tools like Maven, Gradle, or npm, depending on the technology.
3. **Create Docker Image:** Build a Docker image using a Dockerfile.
4. **Push to Repository:** Push the image to a container registry (e.g., Docker Hub, AWS ECR).
5. **Deploy to K8s:** Use Kubernetes to pull the image and deploy it. This can be automated using Helm, ArgoCD, or Jenkins pipelines.
6. **Service Exposure:** Use Ingress or LoadBalancer to expose the service.

4. What plugins have you worked on in Jenkins?

- **Answer:**

- Git Plugin
- SonarQube Plugin
- Docker Pipeline Plugin
- Kubernetes Plugin
- Email Notification Plugin
- Pipeline Plugin
- Build Pipeline Plugin

5. What are custom plugins you worked on?

- **Answer:**

I have written Groovy scripts in the Jenkins Pipeline to customize deployment workflows but haven't developed Jenkins plugins from scratch.

6. I have a Docker container in the default network. How can it connect with another container?

- **Answer:**

Containers in the same Docker network can communicate using their container names as DNS. In the default network (bridge), you can use --link or create a custom user-defined bridge network for better communication.

7. I have a base image like centos:latest. How can I install an app on the image?

- **Answer:**

```
FROM centos:latest
RUN yum update -y && yum install -y <package-name>
CMD ["bash"]
```

8. How many containers are there in a pod by default?

- **Answer:**

By default, a pod contains one container. However, a pod can have multiple containers sharing the same network namespace and storage volumes.

9. What is the key difference between declarative and scripted pipelines in Jenkins?

- **Answer:**

- **Declarative Pipeline:** A more straightforward and structured syntax using pipeline {}. It is easier to read and maintain.
 - **Scripted Pipeline:** Uses Groovy and offers more flexibility but requires more coding expertise and is harder to maintain.
-

10. What do you understand about Docker networks?

- **Answer:**

Docker networks enable communication between containers and external systems. Types:

- **Bridge:** Default network, isolated.
 - **Host:** Shares the host's network.
 - **Overlay:** For Swarm clusters.
 - **None:** No networking.
 - **Custom Bridge:** User-defined for better control.
-

11. What are the best ways to create Dockerfiles?

- **Answer:**

- Use a lightweight base image (e.g., alpine).
 - Minimize layers by combining commands.
 - Use multi-stage builds.
 - Leverage .dockerignore.
 - Keep environment-specific variables out of the Dockerfile.
-

12. CMD vs. ENTRYPOINT

- **Answer:**

- **CMD:** Default command for the container but can be overridden.
 - **ENTRYPOINT:** Defines the container's primary process and cannot be easily overridden.
-

13. ENV vs. ARG

- **Answer:**

- **ENV:** Sets environment variables available during the runtime.
 - **ARG:** Sets variables available during the build process.
-

14. Difference between CMD, ADD, and RUN?

- **Answer:**
 - **CMD:** Specifies the default command.
 - **ADD:** Copies files from the host to the container and supports URLs.
 - **RUN:** Executes commands during image build.
-

15. Best ways to run CMD and ENTRYPOINT together?

- **Answer:** Use ENTRYPOINT for the primary process and CMD for default arguments.
ENTRYPOINT ["python"]
CMD ["app.py"]
-

16. How can I pass environment variables while building the images?

- **Answer:** Use --build-arg during the build process:
docker build --build-arg VAR_NAME=value -t image-name .
-

17. What are Docker volumes?

- **Answer:**

Docker volumes are used to persist data across container restarts and share data between containers.

Types:

 - **Anonymous Volumes**
 - **Named Volumes**
 - **Bind Mounts**
-

18. Are K8 certificates encrypted or encoded?

- **Answer:**

Kubernetes certificates are **Base64 encoded** but not encrypted.
-

19. What is the difference between Ingress and LoadBalancer?

- **Answer:**
 - **Ingress:** Provides application-level routing (e.g., HTTP/HTTPS).
 - **LoadBalancer:** Provides L4 routing and integrates with cloud provider's load balancer.
-

20. If I have a LoadBalancer service and K8s on-premise on a VM, how does it work?

- **Answer:**

LoadBalancer won't work automatically. You need an external load balancer, or use MetalLB to provide LoadBalancer functionality.
-

21. Have you worked on ArgoCD?

- **Answer:**

Yes, ArgoCD is used for continuous delivery with GitOps principles, automating Kubernetes deployments.
-

22. How do you customize an AMI in AWS?

- **Answer:**
 - Launch an EC2 instance.
 - Customize the instance (install packages, modify configurations).
 - Create an image from the instance using **Create Image**.
-

23. What AWS services have you worked on?

- **Answer:**
 - EC2, S3, VPC, Lambda, CloudWatch, CloudTrail, IAM, RDS, EKS, ECS, Route 53, and Elastic Load Balancer.
-

24. What is CloudTrail?

- **Answer:**

AWS CloudTrail tracks API calls and user activity for auditing and security purposes.
-

25. How can I store all logs of CloudTrail?

- **Answer:**

Configure CloudTrail to store logs in an S3 bucket. You can also enable log encryption and apply lifecycle policies.
-

26. What is the difference between NACL and Security Group?

- **Answer:**
 - **NACL:** Operates at the subnet level and is stateless. Rules are evaluated in order.
 - **Security Group:** Operates at the instance level and is stateful. All rules are evaluated together.

Interview Link: - <https://youtu.be/L-1wcvBT4mM?si=JDJXH-A2WJJf1XfU>

Azure DevOps Engineer Mock Interview

General Questions:

1. Introduce yourself, your roles, experience in Azure, and organization details.

- **Answer:**

I have 4–5 years of experience in Azure, focusing on configuring storage accounts, virtual networks (VNets), subnets, and load balancers. My work involves deploying .NET-based web applications in remote servers, using CI/CD pipelines, PowerShell scripting, ARM templates, and managing resources in Azure. Additionally, I have experience with Terraform, Kubernetes, and Docker.

2. What is a Virtual Network (VNet), and how have you configured it?

- **Answer:**

VNets are Azure's fundamental networking layer that enables communication between resources like VMs and storage accounts. Configuration steps include:

- Creating a VNet with an appropriate CIDR block (e.g., 10.0.0.0/16).
- Dividing the VNet into subnets.
- Associating the VNet with service endpoints for secure access.
- Configuring network security groups (NSGs) and routing tables for traffic management.

3. What are the types of IP addresses used in Azure?

- **Answer:**

- **IPv4:** Widely used in most organizations.
- **IPv6:** Rarely used but supports a larger address space.
- Classes of IP addresses:
 - **Class A:** Large organizations.
 - **Class B:** Medium-sized organizations.
 - **Class C:** Small networks.

4. Have you worked with VNet peering? Explain.

- **Answer:**

Yes, VNet peering connects two VNets, enabling communication without using a gateway. For instance, connecting VNets in East US and Central US regions allows seamless data transfer between their resources.

5. How do you ensure high availability of an application in Azure?

- **Answer:**

- Deploy resources in multiple Azure regions.
- Use Azure Load Balancer for traffic distribution.
- Set up Availability Sets or Zones to avoid single points of failure.
- Implement database replication across regions.

Scenario-Based Questions:

6. How do you connect to Azure Cloud using PowerShell from a local machine?

- **Answer:**

- Install the Azure PowerShell module:
Install-Module -Name Az -AllowClobber -Scope CurrentUser
- Log in using: Connect-AzAccount

7. How do you create a Resource Group and a Storage Account using PowerShell?

- **Answer:**
 - **Resource Group:**
New-AzResourceGroup -Name <ResourceGroupName> -Location <Location>
 - **Storage Account:**
New-AzStorageAccount -ResourceGroupName <ResourceGroupName> -Name <StorageAccountName> -Location <Location> -SkuName Standard_LRS -Kind StorageV2
-

8. What are the types of storage in Azure?

- **Answer:**
 - **Blob Storage:** For unstructured data.
 - **File Storage:** For shared file systems.
 - **Queue Storage:** For messaging.
 - **Table Storage:** For NoSQL data.
-

9. Have you worked with YAML-based pipelines? What is your experience?

- **Answer:**

Yes, YAML pipelines are used for configuring CI/CD workflows in Azure DevOps. They provide version control and better flexibility compared to classic pipelines. Typical steps include:

 - Setting up triggers for code commits.
 - Defining build and release stages.
 - Deploying applications using ARM templates or PowerShell.
-

10. What is VNet Peering and why is it needed?

- **Answer:**

VNet Peering allows communication between two VNets in Azure. It reduces latency and increases bandwidth compared to using VPN gateways.
-

Conceptual Questions:

11. What are ARM Templates and Terraform?

- **Answer:**
 - **ARM Templates:** Native Azure templates for managing resources. Use JSON format for defining infrastructure as code (IaC).
 - **Terraform:** A multi-cloud IaC tool. Allows for provisioning and managing infrastructure using a declarative approach.
-

12. What is the difference between an array and a string?

- **Answer:**
 - **Array:** A collection of items, e.g., @("item1", "item2").
 - **String:** A single text value, e.g., "This is a string".
-

13. What are service endpoints in Azure?

- **Answer:**

Service endpoints secure access to Azure services by extending private IPs within a VNet. They ensure traffic flows over Azure's backbone network rather than the public internet.
-

14. How do you create a web application in Azure via the GUI?

- **Answer:**

- Navigate to **Azure Portal > App Services > Create App Service.**
 - Fill in details such as subscription, resource group, app name, runtime stack, and region.
 - Deploy the code to the app via FTP or Git.
-

15. What is the difference between Load Balancer and Application Gateway?

- **Answer:**

- **Load Balancer:** Operates at Layer 4 (TCP/UDP) for general traffic distribution.
 - **Application Gateway:** Operates at Layer 7 (HTTP/HTTPS) and provides application-level routing and SSL termination.
-

16. What is high availability in Azure?

- **Answer:**

High availability ensures minimal downtime by deploying resources across multiple regions, availability zones, or using redundancy features like Availability Sets.

Tools and Automation Questions:

17. Have you worked with Docker and Kubernetes?

- **Answer:**

Yes:

- **Docker:** For containerizing applications.
 - **Kubernetes:** For orchestrating containers. I've used it to deploy scalable applications in Azure Kubernetes Service (AKS).
-

18. How do you automate tasks using PowerShell in Azure?

- **Answer:**

Automation can be achieved by writing PowerShell scripts for resource creation, updating configurations, and managing deployments.

Additional Scenarios:

19. How do you achieve communication between VNets in different regions?

- **Answer:**

- Use **VNet Peering** for seamless communication.
 - Configure a virtual network gateway if VNet Peering is not an option.
-

20. How would you handle a scenario where a single region faces downtime?

- **Answer:**

- Implement disaster recovery using Azure Site Recovery.
- Use Geo-redundant Storage (GRS) for data backup.
- Set up traffic routing with Azure Traffic Manager.