Advanced DevOps and Kubernetes Interview Questions & Answers

## 2. How do you securely authenticate your cloud with Terraform?

- AWS: Use IAM roles, environment variables, or AWS profiles.  
- Best Practice: Use IAM roles and avoid hardcoding credentials.  
- Vault Integration: HashiCorp Vault can dynamically generate cloud credentials.

## 3. How do you store secrets in Terraform?

- Avoid storing secrets in .tf or state files.  
- Use Terraform Cloud/Enterprise, environment variables, Vault provider, or SOPS.

## 4. What is a backend in Terraform? Why do we use it?

- Backend defines where Terraform stores its state file.  
- Enables remote state storage, state locking, and collaboration.

## 5. How do you replicate existing AWS infrastructure into Terraform state?

- Use terraform import command.  
- Define the resource manually in .tf files.  
- Tools: Terraformer, AWS Config, CloudFormer.

## 6. If you lose a .pem key, how can you connect to your server?

- Create a new key pair and modify authorized\_keys.  
- Use SSM Session Manager or EC2 Instance Connect.

## 7. CI/CD pipeline: Build artifacts in one S3 bucket, deploy to another in a different AWS account — how to connect?

- Use cross-account access via bucket policies and IAM roles with trust relationships.

## 8. What is VPC Peering and Transit Gateway?

- VPC Peering: Direct connection between two VPCs.  
- Transit Gateway: Central hub for connecting multiple VPCs with transitive routing.

## 9. Common issues with CloudFront?

- Caching issues, invalidation costs, SSL misconfigurations, origin access issues, geo restrictions.

## 10. Types of Load Balancers in AWS — usage scenarios?

- ALB: Layer 7, used for microservices.  
- NLB: Layer 4, used for TCP-heavy apps.  
- CLB: Legacy, used in older architectures.

## 11. Difference between CMD and ENTRYPOINT in Docker?

- CMD: Default command, can be overridden.  
- ENTRYPOINT: Fixed command, CMD acts as arguments.

## 12. Basic Dockerfile for Node.js app

FROM node:18  
WORKDIR /app  
COPY package\*.json ./  
RUN npm install  
COPY . .  
EXPOSE 3000  
CMD ["node", "index.js"]

## 13. Deployment vs StatefulSet in Kubernetes

- Deployment: Stateless apps, auto-scaling, rolling updates.  
- StatefulSet: Stateful apps, persistent identity, stable storage.

## L2 Interview Questions (Hands-On & Advanced)

## 1. Jenkins Declarative Pipeline with post section

pipeline {  
 agent any  
 stages {  
 stage('Build') {  
 steps {  
 echo 'Building...'  
 }  
 }  
 }  
 post {  
 success {  
 echo 'Build succeeded!'  
 }  
 failure {  
 echo 'Build failed!'  
 }  
 }  
}

## 2. COPY vs ADD in Docker

- COPY: Copies files/directories.  
- ADD: Also extracts archives and supports remote URLs.

## 3. Multistage vs Distroless Dockerfile

- Multistage: Reduces image size by separating build and runtime stages.  
- Distroless: Minimal base image with no shell, improves security.

## 4. Multistage Dockerfile for Node.js

# Build stage  
FROM node:18 AS builder  
WORKDIR /app  
COPY . .  
RUN npm install && npm run build  
  
# Production stage  
FROM node:18-slim  
WORKDIR /app  
COPY --from=builder /app/dist ./dist  
COPY --from=builder /app/package\*.json ./  
RUN npm install --only=production  
CMD ["node", "dist/index.js"]

## 5. Kubernetes Architecture

- Master Components: API Server, Scheduler, Controller Manager, etcd.  
- Node Components: kubelet, kube-proxy, container runtime.

## 6. Check Jenkins version

jenkins-cli version  
Or check in Jenkins UI footer.

## 7. Kubernetes Deployment YAML

apiVersion: apps/v1  
kind: Deployment  
metadata:  
 name: my-app  
spec:  
 replicas: 3  
 selector:  
 matchLabels:  
 app: my-app  
 template:  
 metadata:  
 labels:  
 app: my-app  
 spec:  
 containers:  
 - name: app  
 image: my-app:latest  
 ports:  
 - containerPort: 3000

## 8. Shell script to create an S3 bucket

#!/bin/bash  
BUCKET\_NAME="my-unique-bucket-name"  
aws s3api create-bucket --bucket $BUCKET\_NAME --region us-east-1 --create-bucket-configuration LocationConstraint=us-east-1