

AWS CLOUD & DEVOPS INTERVIEW – Q&A GUIDE

1. PROFILE / INTRODUCTION QUESTIONS

Q1. Tell me about your AWS experience. What services have you worked on?

A:

In my current role as a DevOps / Cloud Engineer, I work mainly on AWS infrastructure and automation. I'm hands-on with:

- Compute & Networking: EC2, AMIs, Auto Scaling Groups, Load Balancers (ALB/NLB), VPC, Subnets, Internet Gateway,
- Storage & Databases: EBS, EFS, S3 (lifecycle, versioning, encryption), RDS (MySQL/Postgres/Aurora), DynamoDB, ElastiCache
- Monitoring & Logging: CloudWatch metrics, alarms, dashboards, CloudWatch Logs/Agents, CloudTrail, VPC Flow Logs.
- Security & IAM: IAM Users/Groups/Roles, Policies, KMS, Secrets Manager, Parameter Store, ACM, WAF, Shield, Security Groups
- Containers & Serverless: ECR, ECS, Fargate, EKS basics, Lambda, API Gateway.
- Networking & DNS: Route 53 hosted zones, records, routing policies, health checks.
- Automation & IaC: Terraform, CloudFormation, user data, ASG launch templates.
- DevOps & CI/CD: CodeCommit, CodeBuild, CodeDeploy, CodePipeline, Jenkins integrations.

I mainly focus on designing, provisioning, securing, monitoring, and optimizing AWS infrastructure for highly available and scalable applications.

Q2. What are your roles and responsibilities in your current AWS/DevOps role?

A:

My day-to-day responsibilities include:

- Provisioning & Automation
 - Creating and managing VPCs, subnets, EC2, RDS, S3, EKS/ECS using Terraform / CloudFormation.
 - Writing user data and automation scripts for bootstrapping servers.
- Monitoring & Reliability
 - Setting up CloudWatch metrics, logs, dashboards, alarms, and integrating notifications via SNS/Email.
 - Implementing backup and disaster recovery (EBS/RDS snapshots, cross-region backups).
- Security & Compliance
 - Managing IAM users/roles/policies (least-privilege).
 - Enabling MFA, KMS encryption, ACM certificates, WAF/Shield, VPC flow logs.
- Troubleshooting
 - Debugging issues with instances, networking, DNS, load balancers, deployments.
- Cost Optimization
 - Right-sizing instances, using Reserved/Spot instances, S3 lifecycle, and cleaning unused resources.
- DevOps / CI-CD
 - Setting up CodePipeline/CodeBuild/CodeDeploy or Jenkins pipelines to deploy apps to EC2/ECS/Lambda.

I basically own the end-to-end lifecycle of cloud infrastructure: from design to implementation, monitoring, optimization and cost management.

2. CLOUD COMPUTING BASICS

Q3. What is cloud computing? Explain IaaS, PaaS, and SaaS with examples.

A:

Cloud computing is on-demand access to computing resources (servers, storage, databases, services) over the internet with pay-as-you-go pricing.

- IaaS (Infrastructure as a Service)
 - Provider offers virtual machines, storage, networking.
 - You manage OS, runtime, apps.
 - Examples: Amazon EC2, EBS, VPC.
- PaaS (Platform as a Service)
 - Provider manages infrastructure + runtime/platform; you just deploy code.
 - Examples: AWS Elastic Beanstalk, RDS, AWS Lambda (often considered FaaS).
- SaaS (Software as a Service)
 - Ready-to-use applications delivered over the internet.
 - Examples: Gmail, Salesforce, Office 365.

Q4. What are public, private, and hybrid clouds?

A:

- Public Cloud:
 - Cloud resources shared across multiple customers over the public internet.
 - Example: AWS, Azure, GCP.
- Private Cloud:
 - Cloud infrastructure dedicated to a single organization, usually on-prem or hosted.
 - Example: VMware private cloud, OpenStack.
- Hybrid Cloud:
 - Combination of on-prem/private cloud + public cloud.
 - Workloads can move or integrate between both using VPN/Direct Connect.

3. EC2, EBS AND SCALING

Q5. What is an EC2 instance? Explain basic EC2 terminology.

A:

Amazon EC2 is a resizable virtual machine in the cloud.

Key terms:

- AMI: Template image used to launch instances (OS + preinstalled software).
- Instance Type: Hardware config (vCPU, memory, network) like t3.medium, m5.large.
- Security Group: Virtual firewall at instance level; controls inbound/outbound.
- Key Pair: SSH/RDP authentication using public/private key.
- EBS Volume: Block storage attached to EC2.
- Region / Availability Zone: Geographic area / isolated data centers.

Q6. How do you increase the size of an EBS volume for a Linux instance?

A:

1. Stop or keep running the instance (EBS supports online resizing for many OSes).
2. Go to EBS > Volumes, select the volume → Modify Volume → increase size.
3. Wait for the volume modification to complete.
4. Inside the instance:
 - Check disk: lsblk
 - Extend the partition (e.g., using growpart or fdisk).
 - Extend the filesystem (e.g., sudo resize2fs for ext4, xfs_growfs for XFS).
5. Verify the new size with df -h.

In production, take snapshots before resizing.

Q7. What is the difference between vertical scaling and horizontal scaling in AWS?

A:

- Vertical Scaling (Scale Up / Down):
 - Increase/decrease size of a single instance (e.g., m5.large → m5.2xlarge).
 - Simple but has hardware limits and may require downtime.
- Horizontal Scaling (Scale Out / In):
 - Add/remove multiple instances behind a Load Balancer.
 - Implemented using Auto Scaling Groups.
 - Better for high availability and handling large traffic.

In AWS, we prefer horizontal scaling for production, especially stateless apps.

Q8. How do you backup and restore EC2 instances?

A:

- Backup:
 - Use EBS Snapshots (manual or automated via Snapshot Lifecycle Policy).
 - Optionally create AMI from instance (includes root volume + attached EBS).
- Restore:
 - Create a new volume from snapshot and attach to instance, or
 - Launch a new instance using the AMI.

For production, we use scheduled snapshot lifecycle policies with retention.

4. AWS GLOBAL INFRASTRUCTURE

Q9. Explain AWS regions, availability zones, edge locations, and local zones.

A:

- Region:
 - Geographical area (e.g., ap-south-1 for Mumbai). Contains multiple AZs.
- Availability Zone (AZ):
 - One or more data centers inside a region, isolated but interconnected.
 - We design for multi-AZ high availability.
- Edge Location:
 - Used by CloudFront and Route 53 to cache content and serve DNS closer to users.
- Local Zone / Wavelength Zone:
 - Provide compute and storage closer to users/devices for ultra-low latency use cases.

5. STORAGE: EBS, EFS, S3

Q10. Difference between EBS, EFS, and S3? When do you use each?

A:

- EBS (Elastic Block Store):
 - Block storage attached to a single EC2 instance (per AZ).
 - Good for OS disks, databases, applications needing low-latency block storage.
- EFS (Elastic File System):
 - Managed NFS file system, can be mounted by multiple instances (Linux) across AZs.
 - Good for shared storage between multiple EC2 instances or containers.
- S3 (Simple Storage Service):
 - Object storage for files/blobs (objects). Highly durable.
 - Good for backups, logs, static website hosting, data lakes.

Q11. What are EBS volume types and which one would you choose?

A:

Common EBS volume types:

- gp2/gp3: General Purpose SSD, balance of price and performance; default choice.
- io1/io2: Provisioned IOPS SSD for high I/O, latency-sensitive workloads.
- st1: HDD – Throughput optimized for big data, log processing.
- sc1: Cold HDD for infrequent access.

In most cases, I start with gp3 and move to io1/io2 if I need guaranteed IOPS.

Q12. Explain S3 storage classes and lifecycle policies.

A:

Storage Classes:

- Standard: Frequent access, low latency.
- Standard-IA (Infrequent Access): Cheaper storage, retrieval fee.
- One Zone-IA: Like Standard-IA but in a single AZ.
- Intelligent-Tiering: Automatically moves data between frequent/IA based on access.
- Glacier / Glacier Deep Archive: Long-term backup and archival with higher retrieval time.

Lifecycle Policies:

- Rules to automatically move objects between classes or expire/delete objects.
- Example:
 - After 30 days → move from Standard to Standard-IA.
 - After 180 days → move to Glacier.
 - After 365 days → delete.

This helps optimize cost for S3.

Q13. How can an EC2 instance in a private subnet access an S3 bucket?

A:

Two main ways:

1. VPC Endpoint for S3 (Gateway Endpoint):
 - Create an S3 VPC endpoint.
 - Update route tables to use the endpoint.
 - Use bucket policies to allow access from that VPC/endpoint.
 - No internet access required.
2. NAT Gateway + Internet Gateway:
 - Route private subnet traffic to NAT Gateway, which goes out via IGW.

Best practice: Use S3 VPC Endpoint + IAM role on EC2 for access.

6. IAM AND SECURITY

Q14. What is IAM? Explain Users, Groups, Roles, and Policies.

A:

AWS IAM controls who can do what in AWS.

- User: Represents a person/app that needs long-term access.
- Group: Collection of users sharing the same policies/permissions.
- Role: Identity with a set of permissions assumed by AWS services or users.
- Policy: JSON document defining allow/deny permissions on AWS resources.

Best practice: Use roles instead of access keys, and follow least privilege.

Q15. What is the difference between Security Groups and NACLs?

A:

- Security Group (SG):
 - Instance-level virtual firewall.
 - Stateful: Response traffic is automatically allowed.
 - Only allow rules.
- Network ACL (NACL):
 - Subnet-level firewall.
 - Stateless: Return traffic must be allowed explicitly.
 - Supports allow and deny rules.

Usually, I use Security Groups as primary control and NACLs for extra subnet-level protection.

Q16. How do you secure an AWS environment? Mention some best practices.

A:

- Enable MFA for root and important IAM users.
- Do not use root account for daily operations.
- Use IAM roles instead of access keys; regularly rotate keys if used.
- Restrict Security Groups (no 0.0.0.0/0 for SSH/RDP in production).
- Encrypt data at rest using KMS (EBS, RDS, S3, etc.).
- Use ACM for SSL/TLS certificates and enforce HTTPS.
- Enable CloudTrail, Config, GuardDuty, Security Hub.
- Implement WAF in front of public web apps.
- Regularly review IAM policies and CloudTrail logs.

7. LOAD BALANCERS AND AUTO SCALING

Q17. What are the types of Load Balancers in AWS and when do you use each?

A:

1. Application Load Balancer (ALB):
 - Layer 7 (HTTP/HTTPS).
 - Supports path-based, host-based routing, header-based rules.
 - Integrates with ECS/EKS, Lambda, WAF.
 - Used for web and microservices APIs.

2. Network Load Balancer (NLB):

- Layer 4 (TCP/UDP).
- Static IP, can handle millions of requests, very low latency.
- Used for high-performance or non-HTTP protocols.

3. Gateway Load Balancer:

- For deploying/scaling third-party network appliances (firewalls, IDS).

4. Classic Load Balancer:

- Legacy; generally replaced by ALB/NLB.

Q18. How do Auto Scaling Groups work? What policies can you use?

A:

An Auto Scaling Group (ASG) manages a group of EC2 instances based on scaling policies:

- You define:
 - Min, Max, and Desired capacity.
 - Launch template/config (AMI, instance type, SG, subnets).
- It automatically:
 - Launches instances when scaling out.
 - Terminates instances when scaling in.
- Scaling policies:
 - Target tracking: Keep a metric (e.g., CPU at 60%).
 - Step/simple scaling: If CPU > 80% for X minutes, add N instances.
 - Scheduled scaling: Scale at specific times.
 - Manual scaling: Manually change desired capacity.

8. VPC & NETWORKING

Q19. What is a VPC? Why do we create custom VPCs instead of using default?

A:

A VPC (Virtual Private Cloud) is your isolated virtual network in AWS.

We create custom VPCs because:

- We control CIDR ranges, IP planning.
- We design public and private subnets across multiple AZs.
- We control route tables, NAT gateways, VPN/direct connect, VPC endpoints.
- Better security and compliance with tightly controlled traffic flows.

Q20. Difference between Internet Gateway and NAT Gateway?

A:

- Internet Gateway (IGW):
 - Attached to a VPC to allow public internet access.
 - Instances in public subnets with public IPs access internet via IGW.
- NAT Gateway:
 - Used by private subnet instances to access the internet without exposing them.
 - Private instances route 0.0.0.0/0 to NAT, NAT to IGW.

Q21. What is VPC Peering?

A:

VPC Peering connects two VPCs so instances can communicate privately using private IPs.

- Can be between same or different regions and accounts.
- Non-transitive.
- Route tables must be updated in both VPCs.

Q22. What are VPC Endpoints (Interface vs Gateway)?

A:

- Gateway Endpoint:
 - For S3 and DynamoDB.
 - Targets a route in the route table.
- Interface Endpoint:
 - For many AWS services via PrivateLink.
 - Creates an ENI with private IP in your subnet.

They allow private communication to AWS services without internet or NAT.

9. ROUTE 53 AND DNS

Q23. What is Route 53? What are hosted zones and record types?

A:

Route 53 is AWS's DNS and domain registration service.

- Hosted Zone:
 - Container for DNS records for a domain.
 - Types:
 - Public Hosted Zone: For public internet.
 - Private Hosted Zone: For VPC-internal DNS.
- Common record types:
 - A / AAAA: Maps name → IPv4/IPv6 address.
 - CNAME: Alias one name to another.
 - MX: Mail exchange.
 - NS, SOA: Name servers and start of authority.
 - Alias: AWS-specific mapping to ELB, CloudFront, S3 website.

Q24. What are Route 53 routing policies?

A:

- Simple: Single record, no special routing.
- Weighted: Split traffic based on weight.
- Latency-based: Route to region with lowest latency.
- Failover: Health-based primary/secondary.
- Geolocation / Geoproximity: Route based on user location.
- Multivalue Answer: Return multiple healthy records.

10. S3 – EXTRA INTERVIEW POINTS

Q25. How do you host a static website using S3?

A:

1. Create an S3 bucket.
2. Enable Static website hosting in bucket properties.
3. Upload index.html and error.html.
4. Make objects public (or use CloudFront + OAC).
5. Optionally use Route 53 to map domain to S3 website endpoint or CloudFront.

Q26. What is S3 Versioning and Object Lock?

A:

- Versioning:
 - Keeps multiple versions of an object.
 - Helps recover from accidental delete/overwrite.
- Object Lock:
 - WORM (Write Once Read Many) protection.
 - Used for compliance – prevents deletion/modification for a set retention period.

11. RDS / DATABASES

Q27. Why use RDS instead of installing database on EC2?

A:

RDS is a managed relational database service. Benefits:

- Automated backups, snapshots, retention.
- Multi-AZ for high availability.
- Automatic minor version upgrades, monitoring.
- Easy scale up/down.
- Integrated encryption and read replicas.

This reduces administrative overhead compared to self-managed DB on EC2.

12. MONITORING: CLOUDWATCH & CLOUDTRAIL

Q28. Difference between CloudWatch and CloudTrail?

A:

- CloudWatch:
 - For metrics, logs, dashboards, alarms.
- CloudTrail:
 - For API call auditing (who did what, from where, and when).

Q29. What metrics do you usually monitor in CloudWatch?

A:

For EC2:

- CPUUtilization
- DiskReadOps / DiskWriteOps
- NetworkIn / NetworkOut
- StatusCheckFailed
- Memory, Disk space (via CloudWatch Agent)

For RDS:

- CPUUtilization, FreeableMemory
- FreeStorageSpace
- Read/WriteLatency
- DatabaseConnections

For ALB/NLB:

- RequestCount
- TargetResponseTime
- HTTPCode_ELB_4XX/5XX
- HealthyHostCount/UnHealthyHostCount

13. INFRASTRUCTURE AS CODE – CLOUDFORMATION & TERRAFORM

Q30. What is CloudFormation? How is it different from Terraform?

A:

- CloudFormation:
 - AWS-native Infrastructure as Code service.
 - Uses YAML/JSON templates.
 - Manages stacks, stack sets, change sets, drift detection.
- Terraform:
 - Multi-cloud IaC tool by HashiCorp.
 - Uses HCL.
 - Can manage AWS + many other providers.

In practice, I've used Terraform for multi-cloud / complex setups and CloudFormation for AWS-specific stacks.

14. SECURITY & ENCRYPTION SERVICES

Q31. How do you encrypt data in AWS (EBS/RDS/S3)?

A:

- EBS:
 - Enable encryption using KMS key when creating volume or AMI.
 - For unencrypted existing volumes, create encrypted snapshot → new encrypted volume.
- RDS:
 - Enable encryption at instance creation using KMS.
 - For existing unencrypted, create snapshot and restore to encrypted instance.
- S3:
 - Enable default encryption (SSE-S3, SSE-KMS).
 - Use bucket policies + KMS key policies for stricter control.

Q32. What are AWS KMS, ACM, and Secrets Manager?

A:

- KMS (Key Management Service):
 - Manages encryption keys for EBS, RDS, S3, etc.
- ACM (AWS Certificate Manager):
 - Issues and manages SSL/TLS certificates for ELB, CloudFront, API Gateway.
- Secrets Manager:
 - Stores and rotates secrets (DB passwords, API keys).

15. CONTAINERS: ECR, ECS, EKS, FARGATE

Q33. What is ECR, ECS, and Fargate?

A:

- ECR (Elastic Container Registry):
 - Private Docker image registry.
- ECS (Elastic Container Service):
 - Container orchestration service.
 - Manages tasks, services, clusters.
- Fargate:
 - Serverless compute engine for containers.
 - You run containers without managing EC2 instances.

Q34. When would you use ECS vs EKS?

A:

- ECS:
 - AWS-native, simpler to manage.
 - Good for teams that want managed orchestration without full Kubernetes complexity.
- EKS:
 - Managed Kubernetes control plane.
 - Preferred if the organization standardizes on Kubernetes across environments.

16. SERVERLESS: LAMBDA, API GATEWAY, COGNITO, DYNAMODB

Q35. What is AWS Lambda? What are its limits?

A:

Lambda is a serverless compute service where you run code without managing servers.

Key points:

- Pay only for compute time used.
- Supports languages like Python, Node.js, Java, etc.
- Max execution timeout is typically 15 minutes.
- Scales automatically with number of requests.
- Use cases: API backends, event processing, cron jobs.

Q36. How do you trigger Lambda functions?

A:

Lambda can be triggered by:

- API Gateway
- S3 events
- SQS messages
- SNS topics
- CloudWatch Events / EventBridge
- DynamoDB Streams, Kinesis Streams

Q37. What is Cognito and DynamoDB used for in serverless apps?

A:

- Cognito:
 - Manages user sign-up, sign-in, and access control.
 - Provides JWT tokens, integrates with API Gateway and Lambda.
- DynamoDB:
 - Fully managed NoSQL key-value and document database.
 - Serverless scaling, high performance; often used in Lambda-based apps.

17. DEVOPS ON AWS (CODECOMMIT, CODEBUILD, CODEDEPLOY, CODEPIPELINE)

Q38. How do you build a CI/CD pipeline in AWS?

A:

Using AWS DevOps tools:

1. CodeCommit / GitHub as Source.
2. CodeBuild to build and test code, create artifacts/Docker images.
3. CodeDeploy / ECS / Lambda to deploy builds to EC2, ECS, or Lambda.
4. CodePipeline to orchestrate stages (Source → Build → Test → Deploy).

Alternatively, Jenkins can integrate with AWS (using IAM roles, CLI, SDK).

18. MIGRATION & ARCHITECTURE

Q39. How would you design and deploy a 3-tier web application in AWS?

A:

- Network:
 - Custom VPC with multiple AZs.
 - Public subnets: ALB, NAT gateways.
 - Private subnets: App servers and DB.
- Compute:
 - Auto Scaling group of EC2 instances or ECS/EKS for app tier.
- Database:
 - RDS (Multi-AZ) for relational DB.
- Storage:
 - S3 for static content, backups, logs.
- Security:
 - Security groups per tier.
 - WAF + ACM HTTPS on ALB.
- DNS & CDN:
 - Route 53 + CloudFront if required.
- Monitoring & Logging:
 - CloudWatch, CloudTrail, VPC flow logs, alarms.

Q40. Describe a migration from on-prem to AWS.

A:

- Assessment:
 - Analyze existing VMs (vCPU, RAM, disk, dependencies).
- Strategy:
 - Decide rehost (lift-and-shift) vs re-platform (move DB to RDS, app to ECS/Lambda).

- Tools:
 - Use AWS Application Migration Service / Database Migration Service.
- Execution:
 - Create target VPC, subnets, security, IAM.
 - Migrate DB using DMS with continuous replication and cutover.
 - Migrate app servers as AMIs/instances or containerize and deploy to ECS/EKS.
- Post-migration:
 - Switch DNS to AWS.
 - Validate app, performance, monitoring, backups.