DevOps With AWS Interview Questions

1. What is a Static IP and a Public IP?

- Static IP: A fixed IP address assigned to a resource that does not change over time.
- Public IP: An IP that allows your resource to be accessible over the internet. Can be dynamic (changes on restart) or static (Elastic IP in AWS).

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2. Difference between Security Group and Network ACL (NACL)?

Security Groups act like a firewall for EC2 instances. They are stateful, so if you allow inbound traffic, the return traffic is automatically allowed. They only support allow rules. For example, you can allow inbound SSH on port 22 to your instance.

Network ACLs, or NACLs, act at the subnet level and are stateless, meaning you must explicitly allow both inbound and outbound traffic. They support allow and deny rules. For instance, you can deny all traffic except HTTP and HTTPS for a subnet.

3. What are policies in AWS, and types of policies?

- Policies: JSON documents that define permissions (who can do what on which resources).
- Types:
  - Managed Policies (AWS-managed / Customer-managed)
  - Inline Policies (attached to single IAM user/group/role)

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4. How do you create S3 Cross-Region Replication (CRR)?

1. Enable versioning on both source and destination buckets.
2. Go to Management → Replication Rules → Add Rule in AWS S3 console.
3. Select source prefix or objects, choose destination bucket & region, assign IAM role, enable replication.

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5. If a file in Bucket A is deleted, what happens in Bucket B?

- By default: File remains in Bucket B.
- Explanation: S3 CRR only replicates new objects or updates. Deletion in source does not remove

destination unless Delete Marker replication is enabled.

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6. Explain what happens in this case.

- **If Delete Marker replication is not enabled:**
  - **Deleting in source → no effect in destination.**
- **If enabled:**
  - **Deletion is replicated to the destination bucket.**

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7. What is Virtualization?

- **Running multiple virtual machines (VMs) on a single physical server using a hypervisor.**
- **Example: VMware ESXi, KVM.**

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8. What is Containerization?

- **Packaging application + dependencies into a lightweight container that can run anywhere.**
- **Example: Docker, Podman.**

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9. What is a Dockerfile?

- **A text file that contains instructions to build a Docker image.**

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10. Could you write a Dockerfile?

```
FROM node:18-alpine

WORKDIR /app

COPY package*.json ./

RUN npm install

COPY . .

EXPOSE 3000

CMD ["node", "server.js"]
```

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11. What is a Docker network?

- **A virtual network that allows containers to communicate with each other and with the host.**

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12. What is the default Docker network?

- **bridge — isolated network created by Docker automatically.**

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13. How do you create a Docker network?

```
docker network create my-network
```

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14. How do you create a Docker container?

docker run -d --name my-container my-image

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15. How do you run a Dockerfile?

docker build -t my-image .

docker run -d --name my-container my-image

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16. What is a Deployment in Kubernetes?

- **A Kubernetes object that manages replicas of Pods, ensures desired state, and supports rolling updates.**

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17. Explain a Pod to a 5-year-old

- **A Pod is like a lunchbox. Inside, it can have one or more containers (food items), and all containers in a pod share resources like network and storage.**

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18. Types of Deployments in Kubernetes

- **Rolling Update: Gradual update of Pods.**
- **Recreate: Deletes old Pods, creates new Pods.**
- **Canary / Blue-Green: Partial traffic routing for testing new versions (advanced).**

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19. What is a StatefulSet?

- **Manages stateful applications with stable network IDs, storage, and ordered deployment.**
- **Example: Databases like MySQL, Cassandra.**

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20. What is a DaemonSet, and how is it used?

- **Ensures a copy of a Pod runs on every node in the cluster.**
- **Use case: Log collectors, monitoring agents (Fluentd, Prometheus Node Exporter).**

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21. What is a Service in Kubernetes?

- **Provides a stable IP and DNS name to access a set of Pods.**
- **Types: ClusterIP, NodePort, LoadBalancer, ExternalName.**

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22. What is a LoadBalancer and an Ingress Controller?

- **LoadBalancer: Exposes Service externally with a cloud provider LB.**
- **Ingress Controller: Manages HTTP/HTTPS routing to multiple Services using a single external endpoint.**

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23. Difference between LoadBalancer and Ingress Controller

Feature	LoadBalancer	Ingress Controller
Purpose	Expose single Service	Route traffic to multiple Services
Layer	L4 (TCP/UDP)	L7 (HTTP/HTTPS)
Cost	One per Service (cloud LB cost)	Single entry point for many Services

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24. Can you create a Pod without a Deployment?

- Yes, using a Pod manifest directly.
- Limitation: No auto-healing, scaling, or rolling updates.

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25. Can you write a Terraform script for EC2 and S3?

```
provider "aws" {
  region = "us-east-1"
}


# S3 bucket
resource "aws_s3_bucket" "my_bucket" {
  bucket = "my-bucket-terraform-demo"
```

```
  acl    = "private"
}

# EC2 instance
resource "aws_instance" "my_ec2" {
  ami           = "ami-0c02fb55956c7d316"
  instance_type = "t2.micro"
  tags = {
    Name = "TerraformDemo"
  }
}
```

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26. Briefly explain the Terraform script

- Provider sets AWS region.
- aws_s3_bucket creates a private S3 bucket.
- aws_instance launches a t2.micro EC2 instance with a given AMI and tags.

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27. How do you set up Kubernetes on AWS using EKS?

1. Create EKS cluster via console, CLI, or Terraform.
2. Create node groups (managed or self-managed).

3. **Configure kubectl using aws eks update-kubeconfig --name <cluster-name>.**
4. **Deploy applications using kubectl apply or Helm charts.**