# Top DevOps Interview Questions (Terraform, Ansible, Kubernetes)

### Q: What is Terraform? How is it different from CloudFormation?

A: Terraform is an Infrastructure as Code tool that works across multiple providers (AWS, Azure, GCP). CloudFormation is AWS-specific.

### Q: What is a Terraform provider?

A: A provider is a plugin that allows Terraform to interact with external APIs (e.g., AWS, Azure, Kubernetes).

### Q: What is the difference between Terraform modules and resources?

A: Resources represent individual infrastructure objects. Modules are reusable collections of resources packaged together.

### Q: What is 'terraform state'?

A: Terraform state is a local or remote file that tracks the current state of managed infrastructure, so Terraform knows what to change.

### Q: How do you manage Terraform state in teams?

A: By storing state remotely using backends like S3 with DynamoDB locking, Terraform Cloud, or Consul.

### Q: What is 'terraform plan' and 'terraform apply'?

A: 'terraform plan' shows the changes that will be made, while 'terraform apply' executes them to provision resources.

### Q: How do you handle secrets in Terraform?

A: Use environment variables, Vault, AWS Secrets Manager, or SSM Parameter Store instead of hardcoding secrets in code.

### Q: What is Ansible, and how does it work?

A: Ansible is a configuration management and automation tool. It connects via SSH (or WinRM for Windows) and executes YAML playbooks.

### Q: What is an Ansible inventory file?

A: It defines managed nodes (servers) and groups. Inventories can be static (INI/YAML) or dynamic (cloud plugins).

### Q: What are Ansible Playbooks and Roles?

A: Playbooks are YAML files with tasks. Roles are structured directories for reusability of tasks, handlers, templates, and variables.

### Q: What are Ansible facts?

A: Facts are system properties (OS, IP, CPU, memory, etc.) gathered automatically from managed nodes.

### Q: How do handlers work in Ansible?

A: Handlers are triggered only when a task reports a 'changed' status, useful for restarting services after config updates.

### Q: How do you secure sensitive data in Ansible?

A: Use Ansible Vault to encrypt variables, files, or entire playbooks.

### Q: What is Kubernetes, and why is it used?

A: Kubernetes (K8s) is a container orchestration system that automates deployment, scaling, and management of containerized apps.

### Q: What is the difference between a Pod, ReplicaSet, and Deployment?

A: Pod = smallest unit with one or more containers. ReplicaSet ensures multiple replicas of Pods. Deployment manages ReplicaSets for rolling updates.

### Q: What are Services in Kubernetes?

A: Services expose Pods to the network. Types: ClusterIP (internal), NodePort (external via port), LoadBalancer (external via LB).

### Q: What is the difference between ConfigMaps and Secrets?

A: ConfigMaps store non-sensitive config data. Secrets store sensitive data (passwords, tokens, keys) in base64-encoded form.

### Q: What is the role of etcd in Kubernetes?

A: etcd is a distributed key-value store that holds the entire cluster state.

### Q: What is a StatefulSet in Kubernetes?

A: StatefulSets manage stateful applications (like databases) ensuring stable identities, network names, and persistent storage.

### Q: How do you monitor and troubleshoot Kubernetes clusters?

A: Use kubectl commands, logs, metrics-server, Prometheus + Grafana, and Kubernetes events.