

1. Microservices Migration for Retail E-commerce

A retail e-commerce application faces **frequent downtime** due to tightly integrated **order and payment systems**.

- How can migrating to **microservices architecture** improve **system reliability**?
- Discuss the **implementation challenges** and **communication mechanisms** involved in such migration.

2. Serverless Computing for Netflix-like Workloads

Netflix experiences **sudden spikes in traffic** during popular releases.

- Why is **serverless computing** well-suited for handling **unpredictable and spiky workloads**?
- Discuss the **trade-offs**, including **cold start issues** and **debugging challenges**.

3. AWS Lambda and Stateless Computing

Netflix uses **AWS Lambda** for tasks such as:

- Image encoding
- Metadata extraction
- Real-time video analytics

Explain:

- How Netflix benefits from using **serverless functions (AWS Lambda)**
- Why **stateless computing** is important in this context
- What are the implications for **backend infrastructure design**?

4. IT Automation and DevOps

An IT company aims to automate repetitive tasks such as **user account creation** and **software installation**.

- Explain how **Ansible modules and playbooks** contribute to IT automation.
- Why is **automation a key goal of DevOps**?
- What are the implications of automation on **operational efficiency**?

5. Infrastructure as Code (IaC) and DevOps Tools

A company wants to automate **deployment, configuration, and scaling** using **Infrastructure as Code (IaC)**.

- Compare **Chef and Ansible** as DevOps tools.
- Why is **Ansible often preferred in cloud-native environments**?
- What are the implications of choosing Ansible for cloud infrastructure?

6. Microservices Granularity

A team is designing **microservices** for a **healthcare application** but is unsure about how **fine-grained** each service should be.

- Why is **microservices granularity** critical for **system performance and maintainability**?
- How can you determine the **right granularity**?
- Discuss how **coarse vs fine granularity** affects **system complexity and cost**.

7. Microservices Architecture and Communication

Explain the **microservices architecture** in detail.

- Discuss its **fundamental principles**.
- Explain the **communication protocols** used in microservices (REST, gRPC, messaging, etc.).

8. Cloud Infrastructure vs Serverless Computing

A company is planning to launch an application that serves users **worldwide**. They are choosing between:

- Traditional **cloud infrastructure using Virtual Machines (VMs)**, and
- **Serverless architecture**.

Explain:

- Advantages and drawbacks of **traditional cloud infrastructure**
- Advantages and drawbacks of **serverless architecture**
- Compare both in terms of **global scalability, cost efficiency, and maintenance**

9. Monolithic vs Microservices Architecture

Differentiate between **monolithic architecture** and **microservices architecture** for an **online shopping application**.

- Discuss the advantages of building an application using **microservices**.

10. Ansible for IT Automation at Scale

Discuss how **Ansible** streamlines IT automation at scale.

- Explain its advantages over **manual configuration management**.
- Describe how Ansible can be used for **deploying and configuring a web application across multiple servers** in a cloud environment.
- Highlight important **Ansible components and capabilities**.

11. DevOps Practices for Faster Deployment

A software development team is experiencing **frequent delays** in deploying new features.

- How can **DevOps practices** help streamline the **development and deployment process**?

12. Microservices for Amazon-like E-commerce Application

Justify the **microservices granularity** for an **Amazon-style e-commerce application**.

- Choose and explain an **appropriate microservices model**.