

# MICROSERVICES

INTERVIEW QUESTIONS & CASE STUDIES



*To ace your Tech interview*



## \*Disclaimer\*

**Everyone learns uniquely.**

What matters is developing the problem solving ability to solve new problems.

This Doc will help you with the same.

# INTERVIEW QUESTIONS

## 1. What are microservices?

An application is broken down into small, independent services handling specific business functionality in a microservices architecture. The services are then developed, deployed, and scaled independently.

## 2. How do microservices differ from monolithic architecture?

In monolithic architecture, an application's components function together, tightly integrated and deployed as one package. However, microservices separate the application into a collection of independently deployable and scalable services.

## 3. What are the benefits of using microservices?

Benefits of microservices include independent development and deployment, improved scalability, fault isolation, technology diversity, and better alignment with business functions.

## **4. Why are microservices beneficial?**

Microservices provide scalability, flexibility, and fault isolation, which are crucial for software engineering. They allow different data processing components (e.g., ingestion, transformation, analysis, and visualization) to be developed and scaled independently. This ensures that heavy data workloads don't impact other application functionalities.

## **5. How can microservices improve real-time software systems?**

Microservices enable real-time software systems to operate more efficiently by isolating functionalities into independently deployable services. Using event-driven architecture and tools like Apache Kafka, Redis Streams, or gRPC, microservices process data in parallel, reducing latency and improving responsiveness. This modular approach enhances fault tolerance, scalability, and faster issue resolution, making it ideal for building high-performance real-time applications such as live notifications, fraud detection, or real-time tracking systems.

## **6. What challenges do organizations face when implementing microservices?**

Some challenges include managing service communication, data consistency across services, increased operational complexity, deployment automation, and monitoring distributed services.

## **7. How does API Gateway help in a microservices architecture?**

An API Gateway acts as a single entry point for client requests, handling routing, authentication, load balancing, and rate limiting. It simplifies service discovery and reduces direct service exposure.

## **8. How do microservices handle database management and data consistency?**

Microservices often use decentralized data management with independent databases per service. Techniques like event sourcing, CQRS (Command Query Responsibility Segregation), and distributed transactions (e.g., Saga Pattern) help maintain data consistency.

## **9. What role does machine learning play in applications built on microservices?**

Microservices enable modular ML model deployment, allowing training, inference, and data processing services to scale independently. This flexibility ensures efficient model updates, retraining, and real-time predictions.

## **10. How do containerization and orchestration (e.g., Docker & Kubernetes) benefit microservices ?**

Containers provide a consistent runtime environment, improving portability and deployment. Kubernetes automates service scaling, load balancing, and fault recovery, ensuring high availability for data-heavy applications.

# Case Studies

## Netflix

Netflix shifted from a monolithic architecture to microservices to handle massive global user growth and ensure high availability. They now run over 700 microservices, each responsible for functions like user profiles, recommendations, streaming, and billing. Services communicate via REST and gRPC, with tools like Eureka for service discovery and Hystrix for fault tolerance. Hosted on AWS, Netflix uses CI/CD pipelines for rapid deployment. The architecture enables independent team ownership, scalability on demand, and fault isolation. Tools like Chaos Monkey test resilience by simulating failures. Microservices have empowered Netflix to innovate rapidly and deliver a seamless, resilient streaming experience worldwide.



## Uber

Uber started with a monolithic Node.js backend but faced scaling issues as it expanded globally. To manage growing complexity, it adopted a microservices architecture, with thousands of services for tasks like geolocation, fare calculation, trip matching, and payments. Services are written in Go, Java, and Python, and communicate via gRPC and Thrift. Uber uses tools like Ringpop for distributed coordination and custom service discovery systems. Microservices enable independent development and deployment, allowing faster iteration and better fault tolerance. This shift gave Uber the flexibility to scale in new markets and introduce services like Uber Eats without disrupting core ride-sharing operations.



## Amazon

Amazon transitioned from a tightly coupled monolith to a microservices-based, service-oriented architecture to improve scalability and team productivity. Each service manages a specific domain—such as product listings, orders, reviews, or payments—and owns its own database and API. Teams follow the “you build it, you run it” DevOps model, encouraging autonomy and accountability. Services communicate through well-defined APIs, with a strong focus on reliability and fault isolation. This modularity enabled Amazon to scale its e-commerce platform globally and laid the groundwork for AWS, which provides microservices tools like Lambda, S3, and DynamoDB to other developers and enterprises.





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