

Cloud Computing: An Overview

1. What is cloud computing?

Cloud computing is a model of delivering computing resources—such as servers, storage, databases, networking, software, and analytics—over the internet (“the cloud”) on demand. Instead of owning and managing physical infrastructure, users can access scalable resources from cloud service providers and pay based on usage.

2. Is cloud computing a new technology per se?

Cloud computing is not an entirely new technology but rather an integration of existing technologies, such as virtualization, distributed computing, high-speed networks, and web services into a new delivery model. The unique features of cloud computing include:

- On-demand self-service: Users can provision resources without provider intervention.
- Broad network access: Services are available over the internet on multiple devices.
- Resource pooling: Resources are shared dynamically among multiple users.
- Rapid elasticity: Resources can be scaled up or down quickly.
- Measured service: Users pay based on consumption, similar to utilities.

3. What are the three major cloud service models?

- Infrastructure as a Service (IaaS): Provides virtualized computing resources such as servers and storage (e.g., Amazon EC2, Google Compute Engine).
- Platform as a Service (PaaS): Provides a platform for developing, running, and managing applications without dealing with underlying infrastructure (e.g., Google App Engine, Microsoft Azure App Service).
- Software as a Service (SaaS): Provides ready-to-use applications delivered over the internet (e.g., Gmail, Salesforce, Microsoft 365).

4. Real-world domains where cloud computing is enabling and effective:

- Healthcare: Enables storage and secure sharing of medical records, telemedicine, and big data analytics for diagnosis.
- Education: Provides online learning platforms, collaboration tools, and scalable infrastructure for virtual classrooms.
- Business/Finance: Supports secure online banking, fraud detection, and data analytics.
- Other domains: Entertainment (Netflix, Spotify), smart cities, and scientific research.

5. Economic/Business model of cloud computing:

Cloud computing follows a utility-based, pay-as-you-go model. Instead of heavy upfront investments in hardware and software, organizations rent computing resources based on demand. This reduces capital expenditure (CapEx) and shifts spending to operational

expenditure (OpEx). Providers gain recurring revenue from subscriptions or usage fees, while customers benefit from scalability, flexibility, and reduced IT maintenance costs.