

Cloud Unit 1

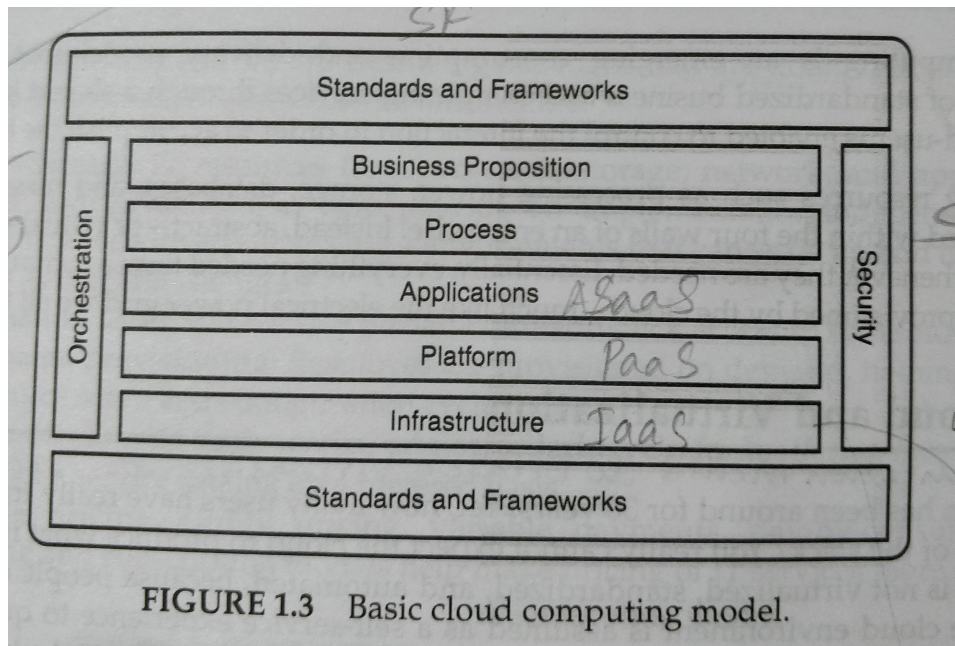
Q1 Define Cloud computing. List how cloud computing will help to address business challenges

Cloud computing is providing different IT services to customers over the Internet. It is the ability to deliver computing service over the Internet to the end-users on-demand or on a pay-as-you-go basis.

Advantages of Cloud Computing in Business

- **Flexibility:** Remote cloud servers offer almost unlimited bandwidth and storage space, which allows businesses to instantly scale up and down their capacities to support growth and cope when website traffic increases. This removes the need to purchase, configure and install equipment on-site.
- **Business Continuity:** By investing in cloud computing, businesses can guarantee reliable disaster recovery and backup solutions without the hassle of setting them up on a physical device.
- **Cost Efficiency:** The most significant advantage of cloud computing is the IT operational cost savings. Using remote servers removes the need for in-house storage equipment and application requirements, as well as overhead costs such as software updates, management, and data storage.
- **Scalability and Performance:** Cloud technology is designed to be scaled to meet a business's changing IT requirements. As a company grows, it is inevitable that more storage space and bandwidth will be required to cope with increasing traffic to the website. Cloud servers can be deployed automatically to help businesses scale up and down and ensure optimum performance under heavy loads.
- **Automatic Software Updates:** Many cloud service providers offer regular system updates to ensure IT requirements are consistently met. They ensure round-the-clock maintenance of cloud servers – including security updates.

Block diagram of Basic Cloud Computing Model



Q2 What is virtualization? How virtualization of cloud computing has benefited various organizations.

Virtualization

Virtualization is the process of running a virtual instance of a computer system in a layer abstracted from the actual hardware. Most commonly, it refers to running multiple operating systems on a computer system simultaneously.

Benefits

- Reduced operating costs.
- Minimal downtime
- Increase in IT productivity & efficiency
- Faster provisioning of applications and resources.
- Greater business continuity and disaster recovery.
- Simplified data center management.
- High availability
- Increased efficiency

Q3 List and explain the initiatives that provide cloud dynamic infrastructure

- **Service management:** Provide visibility, control, and automation across all the business & assets to deliver higher-value services.
- **Asset-Management:** Use of asset management solutions to maximize the value of business assets.
- **Virtualization and Consolidation:** Reduces costs, improve responsiveness, fully utilize resources.
- **Information Infrastructure:** Helps in achieving information compliance, availability, retention, and security goals.
- **Energy-Efficiency:** Addresses energy, environmental, and sustainability challenges and opportunities.
- **Security:** Provide risk management, end-to-end industry customized governance.
- **Resilience:** Maintain business & IT operations continuously while adapting & responding to risks and opportunities.

Q4 Characteristics of Cloud Computing

Learn 4-5 points only

- **On-demand self-service:** The Cloud computing services do not require any human administrators, users themselves are able to provision, monitor, and manage computing resources as needed.
- **Broad network access:** The Computing services are generally provided over standard networks and heterogeneous devices.
- Clouds implement a 'pay-as-you-go' billing model.
- No lock-in of resources and no upfront investment in procuring resources.
- **Resource pooling:** Resources are shared across multiple applications and occupants in an uncommitted manner. Multiple clients are provided service from the same physical resource.
- **Rapid elasticity:** The Computing services should have IT resources that are able to scale out and quickly and on a needed basis. Whenever the user

requires services it is provided to him and it is scale-out as soon as its requirement gets over.

- **Measured service:** The resource utilization is tracked for each application and occupant, it will provide both the user and the resource provider with an account of what has been used. This is done for various reasons like monitoring billing and effective use of resources.

Q5 Cloud computing deployment models

Public

In this, the business rents the services that are required and pays for what is utilized on-demand. The resources are owned, maintained & operated by a third-party cloud service provider, and delivered over the internet. Eg: AWS, GCP, Microsoft Azure, etc

Private

Private cloud refers to a cloud deployment model operated exclusively to a single organization. It provides computing services to a private internal network and selected users, instead of the public in general. Eg: HP Data Centers, Elastra-private cloud, Ubuntu, etc.

Hybrid

Enterprises deploy workloads in private IT environments or public clouds and move between them as computing needs and costs change. These give greater control over their private data. An organization can store sensitive data on a private cloud and also on a local data center and leverage resource utilization in a robust way.

Workloads:

- **Suitable on Public Cloud**
 - Web Pages
 - Public Wikis and Blogs
 - Online storage solutions
 - Online backup & restore solutions

- Jobs with lower security constraints
- **Not suitable on Public Cloud**
 - Workloads which are composed of other services
 - Workloads needing high-level accountability
 - Requiring high output online transaction processing
 - Workloads that depend on sensitive data

Q6 Barriers in Implementing Cloud Computing