

Module 1

Cloud Computing is the delivery of computing services including servers, storage, db over the Internet.
Example of Cloud Service Providers are

- (i) Azure
- (ii) Google Cloud
- (iii) AWS.

Benefits Of Cloud Computing:

(i) Cost

- Eliminate capital expense of buying hardware and software.
- We only pay for cloud service we use.

(ii) Speed

- It deploys the services within few mouse clicks.

(iii) Productivity

- Cloud Computing removes the need for many tasks like packing and stacking etc, so that the IT team can focus on important business goal.

(iv) Global Scale

- Cloud Computing has the ability to scale elastically. So we can deliver the right amount of IT resources at the right place at right time.

(v)

(v) Performance

→ Cloud computing offers several benefits including reduced network latency for applications and greater economies of scale.

(vi) Reliability

→ Cloud Computing makes data backup, disaster recovery etc easier and less expensive because data can be mirrored at multiple redundant sites on cloud providers network.

(vii) Security

→ Cloud Provider offers broad set of policies that control and strengthen the overall security and helps to protect data, apps and infrastructure from threats.

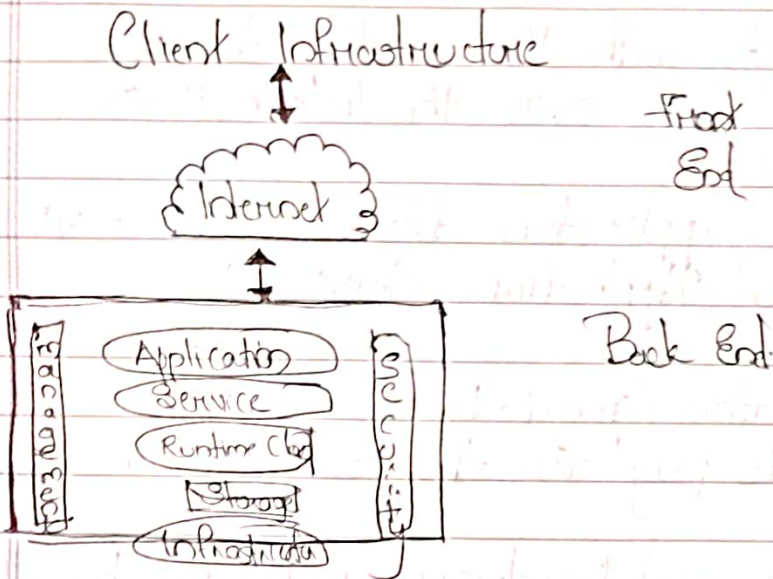
Advantages

- (i) Backup and restore data
- (ii) Improved Collaboration
- (iii) Mobility
- (iv) Low Maintenance Cost
- (v) Data Security

Disadvantage

- Internet Connectivity
- Low Bandwidth
- Security Issues
- Lack of Support

Cloud Architecture.



Cloud Computing Architecture is a combination of service oriented and event-driven architecture.

It is divided into 2 parts:

- (i) **Front End** → It is used clients: It includes web servers, thin and fat clients and mobile devices.
- (ii) **Back End** → Is used by service provider. It manage all resources that are required to provide cloud computing services.

Components

- (i) **Client Infrastructure**
 - Is a front end component
 - Provide GUI to interact with cloud.
- (ii) **Application**
 - Its a platform or software that the client want to access
- (iii) **Services**
 - There are 3 types of Services

Type Of Cloud Services

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* SaaS (Software As Service)

(Take Taxi)

- It provides clients with the ability to use software application over the Internet via subscription basis.
- * Client can access application from anywhere via Web
- * Also knowns Cloud Application Service.

Eg:- Google Application (Gmail, Drive)

- * We only need to pay for the services we are utilizing.
- * Entire software and hardware is hosted by the provider and is made available to the users over Wide Area Network (WAN)
- * It eliminates the need for maintenance, software licensing, installation
- * Provide Scalability
- * Provide flexibility.
- * Disadvantage :- Limited Customization and Slower Speed

* PaaS (Platform As Service) (Rent Car)

- * It provide a platform where clients can deploy their own applications and host them.
- * Also known as Cloud Platform Service
- * In PaaS, the client manage application and data and provider offer computing services like storage, virtualization and network.
- * Benefit of PaaS is :- Simplicity and Convenience
- * Eg :- AWS
- * Main disadvantage :- Security

Hardware As Service IaaS (Infrastructure As Service) - (Lease like)

- Provider provides only the hardware and network
- The client should install and develop software application
- Also known as Cloud Infrastructure Service.
- The client manages Application, Data, Runtime, OS, and Middle ware.
- The provider supplies additional services like load balancing, data backup, recovery, and storage.
- Client handles most of the workload of maintaining and managing software layers.

Eg: IBM, AWS

Advantage: Enable Innovation, Increased Security

Disadvantage: Network Connectivity, Cost

(iv) Runtime Cloud

- Provide execution and runtime environment to VMs

(v) Storage

- It's the Important component of Cloud Computing
- Benefits.

- (i) Total Cost Of Ownership
- (ii) Time To Deployment
- (iii) Information Management

Requirement of Cloud Storage.

- (i) Durability (Data should be redundantly stored)
- (ii) Availability (All data must be available whenever needed)
- (iii) Security (All data must be encrypted)

Types of Cloud Storage

(1) Object Storage (S3 Bucket)
→ It's an object storage for large unstructured data
→ It helps data easier to access and analyse
→ It's cost effective (Stored in repositories)

(2) File Storage (Amazon EFS Elastic File System)

→ It stores data in hierarchical folder or file format
→ Also known as Network Attached Storage.

(3) Block Storage (Amazon Elastic Block Store (EBS))

→ Data is stored in block
→ Each block represents separate hardware
→ Better performance

(vi) Infrastructure

→ It provides services on host, application and network level.

(vii) Management

→ It's used to manage components like application, storage service etc.

(viii) Security.

→ It's a built-in backend component.

(ix) Internet

→ It's a medium through which front and backend interact with each other.

Type Of Deployment Models

(i) Public Cloud

- It is accessible to the public
- Used by organization with growing and fluctuating demands and is used for companies with low-security.
- Advantages
 - * Minimal Investment
 - * No Infrastructure Management
 - * No Hardware Set.
- Disadvantage
 - * Data Security
 - * Reliability.
- * Eg :- AWS, Azure
- Owned by 3rd party cloud service provider

Private Cloud (Corporate Cloud)

- Its a cloud owned by a specific organization or company
- Cannot be accessed by public users
- Used by companies that look for cost efficiency and data security.
- Advantage
 - * Data Privacy
 - * Security
- Disadvantage
 - * Cost
 - * Scalability
 - * Maintenance.

Eg :- Cisco, VMware.

~~Cloud~~ Hybrid Cloud (Combination of Public and Private Cloud)

- Non critical activities are performed by public cloud
- Critical activities are performed private cloud
- Used in healthcare and finances
- Eg:- Amazon, Google

Advantage

- * Flexible
- * Cost Effective

Disadvantage

- Networking
- Reliability