

Cloud Computing

Module -1

- **What is cloud computing?**

Cloud computing is on-demand access, via the internet, to computing resources—applications, servers (physical servers and virtual servers), data storage, development tools, networking capabilities, and more—hosted at a remote data center managed by a cloud services provider (or CSP).

- **Describe cloud computing deploy model.**

Cloud computing deploy model is a way of describing how cloud infrastructure is deployed and accessed. There are four main types of cloud computing deploy models:

- ✓ **Public cloud:** The name says it all. It is accessible to the public. Public deployment models in the cloud are perfect for organizations with growing and fluctuating demands. It also makes a great choice for companies with low-security concerns. Thus, you pay a cloud service provider for networking services, compute virtualization & storage available on the public internet. It is also a great delivery model for the teams with development and testing. Its configuration and deployment are quick and easy, making it an ideal choice for test environments.
- ✓ **Private cloud:** Now that you understand what the public cloud could offer you, of course, you are keen to know what a private cloud can do. Companies that look for cost efficiency and greater control over data & resources will find the private cloud a more suitable choice. It means that it will be integrated with your data center and managed by your IT team. Alternatively, you can also choose to host it externally. The private cloud offers bigger opportunities that help meet specific organizations' requirements when it comes to customization. It's also a wise choice for mission-critical processes that may have frequently changing requirements.
- ✓ **Community cloud:** The community cloud operates in a way that is similar to the public cloud. There's just one difference - it allows access to only a specific set of users who share common objectives and use cases. This type of deployment model of cloud computing is managed and hosted internally or by a third-party vendor.
- ✓ **Hybrid cloud:** As the name suggests, a hybrid cloud is a combination of two or more cloud architectures. While each model in the hybrid cloud functions differently, it is all part of the same architecture. Further, as part

of this deployment of the cloud computing model, the internal or external providers can offer resources.

Let's understand the hybrid model better. A company with critical data will prefer storing on a private cloud, while less sensitive data can be stored on a public cloud. The hybrid cloud is also frequently used for 'cloud bursting'. It means, supposes an organization runs an application on-premises, but due to heavy load, it can burst into the public cloud.

○ **Describe different type of cloud service**

Cloud computing is a revolutionary technology transforming how we store, access, and process data. It simply refers to delivering computing resources, such as servers, storage, databases, software, and applications, over the Internet. Cloud computing uses a network of remote computer systems housed on the net to save and process data rather than relying on physical infrastructure.

Cloud service companies use advanced security techniques, which include encryption, firewalls, and access restrictions, to secure your data from unauthorized access. Moreover, because your information is saved in the cloud, it is secure even if your nearby devices are damaged, misplaced, or stolen. Redundancy and cloud backups guarantee that your data may be restored promptly and effectively in case of any unexpected situations.

- ✓ Public Cloud
- ✓ Private Cloud
- ✓ Hybrid Cloud
- ✓ Community Cloud
- ✓ Multi Cloud

○ **Describe cloud computing Architecture**

As we know, cloud computing technology is used by both small and large organizations to store the information in cloud and access it from anywhere at anytime using the internet connection.

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

Cloud computing architecture is divided into the following two parts -

Front End

The front end is used by the client. It contains client-side interfaces and applications that are required to access the cloud computing platforms. The front

end includes web servers (including Chrome, Firefox, internet explorer, etc.), thin & fat clients, tablets, and mobile devices.

Back End

The back end is used by the service provider. It manages all the resources that are required to provide cloud computing services. It includes a huge amount of data storage, security mechanism, virtual machines, deploying models, servers, traffic control mechanisms, etc.

- **What is components of cloud computing?**

Client infrastructure, application, service, runtime cloud, storage, infrastructure, management and security all these are the components of cloud computing architecture.

1. **Client Infrastructure**

Client infrastructure is a significant part of the frontend system that offers a graphical user interface (GUI) for seamless cloud communication.

2. **Application**

It can either be a piece of software or a platform. The application delivers the outcome to the user along with the resources in the back end, depending on the client's needs.

3. **Service**

Based on the client's needs, a cloud computing architecture service controls the type of service you can access. Cloud architecture computing provides three types of services, including: Understand the 3 major types of cloud service models.

- **Software as a Service (SaaS):** SaaS is also called cloud application services. SaaS apps typically run immediately via the web browser, eliminating the need for download and installation. Cisco WebEx, Google Apps, HubSpot, and Salesforce are a few examples of SaaS.
- **Platform as a Service (PaaS):** It is also called Service for Cloud Platforms. It has much resemblance with SaaS. While PaaS offers a platform for seamless software development, SaaS allows you to access the software through the Internet without any hassle. OpenShift and Magento Commerce Cloud are two good examples.
- **Infrastructure as a Service (IaaS):** it is also referred to as cloud infrastructure services. It is in charge of overseeing the runtime, middleware, and data environments for applications. AWS EC2, Cisco Metapod, and Google Compute Engine are a few examples of IaaS.

4. **Runtime Cloud**

Virtual machines can access a runtime and execution environment via the runtime cloud.

5. **Storage**

Storage is yet another crucial element of cloud computing architecture. It offers a sizable quantity of cloud storage space for managing and storing data.

6. **Infrastructure**

Cloud architecture offers network-level, application-level, and host-level services. To support the concept of cloud computing architecture, cloud infrastructure comes with software and hardware elements, including storage, virtualization software network devices, and other storage resources.

7. **Management**

This component oversees the management of backend components such as storage infrastructure, runtime clouds, storage applications, and other security-related issues. Also, it promotes coordination among them.

8. **Security**

Security is a core component of a backend cloud architecture. It offers users secure access to cloud architecture, resources, information, and systems. Also, it leverages virtual firewalls to deploy security management services to the cloud server. This aids in data loss prevention.

9. **Internet**

A backend and frontend can interact and communicate with one another thanks to an internet connection, which serves as a mediator or bridge between them.

○ **cloud computing advantage and disadvantage**

Advantages of Cloud Computing

As we all know that Cloud computing is trending technology. Almost every company switched their services on the cloud to rise the company growth.

1) Back-up and restore data

Once the data is stored in the cloud, it is easier to get back-up and restore that data using the cloud.

2) Improved collaboration

Cloud applications improve collaboration by allowing groups of people to quickly and easily share information in the cloud via shared storage.

3) Excellent accessibility

Cloud allows us to quickly and easily access store information anywhere, anytime in the whole world, using an internet connection. An internet cloud infrastructure increases organization productivity and efficiency by ensuring that our data is always accessible.

4) Low maintenance cost

Cloud computing reduces both hardware and software maintenance costs for organizations.

5) Mobility

Cloud computing allows us to easily access all cloud data via mobile.

6) iServices in the pay-per-use model

Cloud computing offers Application Programming Interfaces (APIs) to the users for access services on the cloud and pays the charges as per the usage of service.

7) Unlimited storage capacity

Cloud offers us a huge amount of storing capacity for storing our important data such as documents, images, audio, video, etc. in one place.

8) Data security

Data security is one of the biggest advantages of cloud computing. Cloud offers many advanced features related to security and ensures that data is securely stored and handled.

Disadvantages of Cloud Computing

A list of the disadvantage of cloud computing is given below -

1) Internet Connectivity

As you know, in cloud computing, every data (image, audio, video, etc.) is stored on the cloud, and we access these data through the cloud by using the internet connection. If you do not have good internet connectivity, you cannot access these data. However, we have no any other way to access data from the cloud.

2) Vendor lock-in

Vendor lock-in is the biggest disadvantage of cloud computing. Organizations may face problems when transferring their services from one vendor to another.

As different vendors provide different platforms, that can cause difficulty moving from one cloud to another.

3) Limited Control

As we know, cloud infrastructure is completely owned, managed, and monitored by the service provider, so the cloud users have less control over the function and execution of services within a cloud infrastructure.

4) Security

Although cloud service providers implement the best security standards to store important information. But, before adopting cloud technology, you should be aware that you will be sending all your organization's sensitive information to a third party, i.e., a cloud computing service provider. While sending the data on the cloud, there may be a chance that your organization's information is hacked by Hackers.