Introduction to Cloud Computing

- Cloud computing is the on-demand delivery of the Compute Power, Databases, networking, Storage, Applications and other IT resources.

- It is a pay-as-you-go platform. This means the service will be available as long as you want or need it. If you disabled a service, you won’t have to pay anymore.

- Cloud allows you to adapt the right type and size of computing resources you need for how much time.

- Example: If you want 32GB of RAM, for 2 days, it will be available in one click.

- You don’t have to wait for any time specific bound for acquiring a service, it will be yours as soon as you click the button.

- There will be a simple way to access servers, storage, database and a set of Application Services.

- Amazon Web Services owns and maintains the network and the hardware requirements for the application services, which the users can access via the Web applications.

- So as the company grows, instead of having its own data centre, it will shift to the cloud.

The cloud will have the data secure, maintainability of H/W and Networking, space, etc.

The top examples of the cloud services we use in our daily life are:

1. Gmail
2. Netflix
3. Dropbox.

The deployment Models of the Cloud:

1. Private Cloud:

- These are the cloud services which are used by a single organization.

- They are not available for external users.

- Means these private cloud providers do not callow access to the resources if you are not authorized.

- They are very secure and cannot afford to lose the database. They have Complete Control.

- Meet specific Business needs.

1. Public Cloud:

- These are the cloud services which are allowed to the public.

- These are resources owned by the third-party cloud service provider and are available over the Internet.

- That means There is an Application Gmail which uses the database and various other services which is publicly available for the users for some extent of data.

- The 3 main Public Cloud Services provider are:

Amazon Web Services, Microsoft Azure, Google Cloud.

Hybrid Cloud:

- The hybrid cloud is the combination of the Private and Public cloud.

- It Provides the easy access over the Public Cloud and the security over the Private cloud for the database.

- It is like a bank which offers the personal info to you on the application or the website, but simultaneously stores the data of the other clients in the private cloud, which should not be accessed by normal users.

Five Characteristics of Cloud Computing:

1. On-Demand Self Service:

- Users can access the services whenever they want without Human Interaction from the service provider.

1. Broad Network Access:

- These resources are available over the Internet and can be accessed by anyone over the Internet.

1. Multi-Tenancy and Resource pulling:

- Multiple customers can share the same resources, Infrastructures and Applications with high security and privacy.

- Multiple customers can share the same physical resources as well.

- When we use any resources from AWS, we temporarily use it. These resources (RAM, GPU, Networking devices, etc) or applications can be reused by other clients as well. No data is stored or fetched by anonymous users. Privacy and Security is well established.

1. Rapid Elasticity and Scalability:

- We can use the resources on-demand, whether they are high or low.

- We can Enable and disable these resources anytime we want.

- The resources can be increased or decreased according to the need.

- Example: If we want 64GB of RAM to a computer, we can directly acquire the resources for the time you need. After that time, you can scale down to the original RAM of the computer after disabling the service.

1. Measured Service:

- It follows Pay-as-you-go, hence the services will be charged based on the services we use or enable for a specific period.

- It can be a plan for days, hours or even minutes and seconds.

Six Advantages of Cloud Computing:

1. Trade Capital Expense (CAPEX) for Operational Expense (OPEX):

- Pay on demand is available; we do not have to buy the hardware resources.

1. Benefit from Large Scale:

- As the time goes and the number of users increase with the large scale, the prices of the AWS services will eventually decrease.

- Efficiency will also increase.

1. Stop Guessing Capacity:

- The capacity can be scalable from time to time according to the requirement.

- It can increase or decrease according to the need.

1. Increased Speed:

- Increased speed occurs when the resources are optimally used over time to time.

1. Stop Spending money on running and maintaining data centres.
2. Go Global in minutes; leverage the global AWS infrastructure.

Problems solved by the Cloud:

1. Flexibility: Change resources type when we need. That is we can change the Processor for example Intel to AMD for the time we need, and then switch back to the default or another resource.
2. Cost-Effectiveness: We can rent out the services provided by the Cloud service provider and disable the service when we want. There is no need to buy and maintain the hardware.
3. Scalability: Can change the hardware and IT resource requirements when needed.
4. Elasticity: Can scale-out(increase) or scale-in(decrease) the resource whenever not needed.
5. Fault-Tolerant and High-Availability:

- Can be available anytime we can access over the regional zone and acquire the resources ad the IT resources that are given by the websites.

- Can give the data faster using different routes if error occurs.

1. Agility:

- rapidly develop, launch and test software applications.

- This is because the services offer faster availability of the changes to the resources whenever required.