What is AWS?

- AWS stands for **Amazon Web Services**.
- The AWS service is provided by the Amazon that uses distributed IT infrastructure to provide different IT resources available on demand. It provides different services such as infrastructure as a service (IaaS), platform as a service (PaaS) and packaged software as a service (SaaS).
- Amazon launched AWS, a cloud computing platform to allow the different organizations to take advantage of reliable IT infrastructure.

Uses of AWS

- A small manufacturing organization uses their expertise to expand their business by leaving their IT management to the AWS.
- A large enterprise spread across the globe can utilize the AWS to deliver the training to the distributed workforce.
- An architecture consulting company can use AWS to get the high-compute rendering of construction prototype.
- A media company can use the AWS to provide different types of content such as ebox or audio files to the worldwide files.

Advantages of AWS

1) Flexibility

- We can get more time for core business tasks due to the instant availability of new features and services in AWS.
- It provides effortless hosting of legacy applications. AWS does not require learning new technologies and migration of applications to the AWS provides the advanced computing and efficient storage.
- AWS also offers a choice that whether we want to run the applications and services together or not. We can also choose to run a part of the IT infrastructure in AWS and the remaining part in data centres.

2) Cost-effectiveness

AWS requires no upfront investment, long-term commitment, and minimum expense when compared to traditional IT infrastructure that requires a huge investment.

3) Scalability/Elasticity

Through AWS, autoscaling and elastic load balancing techniques are automatically scaled up or down, when demand increases or decreases respectively. AWS techniques are ideal for handling unpredictable or very high loads. Due to this reason, organizations enjoy the benefits of reduced cost and increased user satisfaction.

4) Security

- AWS provides end-to-end security and privacy to customers.
- AWS has a virtual infrastructure that offers optimum availability while managing full privacy and isolation of their operations.
- Customers can expect high-level of physical security because of Amazon's several years of experience in designing, developing and maintaining large-scale IT operation centers.

Features of AWS

The following are the features of AWS:

- Flexibility
- Cost-effective
- Scalable and elastic
- Secure
- Experienced

AWS Global Infrastructure

- AWS is a cloud computing platform which is globally available.
- Global infrastructure is a region around the world in which AWS is based. Global infrastructure is a bunch of high-level IT services which is shown below:
- AWS is available in 19 regions, and 57 availability zones in December 2018 and 5 more regions 15 more availability zones for 2019.

The following are the components that make up the AWS infrastructure:

- Availability Zones
- Region
- Edge locations
- Regional Edge Caches

What is S3?

- S3 is a safe place to store the files.
- It is Object-based storage, i.e., you can store the images, word files, pdf files, etc.
- The files which are stored in S3 can be from 0 Bytes to 5 TB.
- It has unlimited storage means that you can store the data as much you want.
- Files are stored in Bucket. A bucket is like a folder available in S3 that stores the files.

Advantages of Amazon S3

- Create Buckets
- Storing data in buckets
- Download data
- Permissions

- Standard interfaces
- Security

Amazon S3 Concepts

- Buckets
- Objects
- Keys
- Regions
- Data Consistency Model

EC2

- EC2 stands for Amazon Elastic Compute Cloud.
- Amazon EC2 is a web service that provides resizable compute capacity in the cloud.
- Amazon EC2 reduces the time required to obtain and boot new user instances to minutes rather than in older days, if you need a server then you had to put a purchase order, and cabling is done to get a new server which is a very time-consuming process. Now, Amazon has provided an EC2 which is a virtual machine in the cloud that completely changes the industry.
- You can scale the compute capacity up and down as per the computing requirement changes.

EC2 Pricing Options

On Demand

- It allows you to pay a fixed rate by the hour or even by the second with no commitment.
- Linux instance is by the second and windows instance is by the hour.
- On Demand is perfect for the users who want low cost and flexibility of Amazon EC2 without any up-front investment or long-term commitment.
- It is suitable for the applications with short term, spiky or unpredictable workloads that cannot be interrupted.

Reserved

- It is a way of making a reservation with Amazon or we can say that we make a contract with Amazon. The contract can be for 1 or 3 years in length.
- In a Reserved instance, you are making a contract means you are paying some upfront, so it gives you a significant discount on the hourly charge for an instance.
- It is useful for applications with steady state or predictable usage.

Types of Reserved Instances:

- Standard Reserved Instances
- Convertible Reserved Instances
- Scheduled Reserved Instances

Spot Instances

- It allows you to bid for a price whatever price that you want for instance capacity, and providing better savings if your applications have flexible start and end times.
- Spot Instances are useful for those applications that have flexible start and end times.
- It is useful for those applications that are feasible at very low compute prices.
- It is useful for those users who have an urgent need for large amounts of additional computing capacity.

Dedicated Hosts

- A dedicated host is a physical server with EC2 instance capacity which is fully dedicated to your use.
- The physical EC2 server is the dedicated host that can help you to reduce costs by allowing you to use your existing server-bound software licenses. For example, Vmware, Oracle, SQL Server depending on the licenses that you can bring over to AWS and then they can use the Dedicated host.

What is EBS?

- EBS stands for **Elastic Block Store**.
- EC2 is a virtual server in a cloud while EBS is a virtual disk in a cloud.
- Amazon EBS allows you to create storage volumes and attach them to the EC2 instances.
- Once the storage volume is created, you can create a file system on the top of these volumes, and then you can run a database, store the files, applications or you can even use them as a block device in some other way.

EBS Volume Type

Amazon EBS provides two types of volume that differ in performance characteristics and price. EBS Volume types fall into two parts:

- SSD-backed volumes
- HDD-backed volumes

What is DynamoDB?

- Amazon DynamoDB is a fast and flexible NoSQL database service for all applications that require consistent single-digit millisecond latency at any scale.
- It is a fully managed database that supports both document and key-value data models.
- Its flexible data model and performance makes it a great fit for mobile, web, gaming, ad-tech, IOT, and many other applications.
- It is stored in SSD storage.

What is Aurora?

- It is a database engine developed in RDS.
- It is actually a spoke database engine developed by an Amazon.
- It was announced in re: invent 2014.
- It can run only on AWS infrastructure. It's not like a MySQL database that can be installed on a local device.
- It is a MySQL -compatible, relational database engine that combines the speed and availability of high-end commercial databases with the simplicity and cost-effectiveness of open source databases.

What is Redshift?

- Redshift is a fast and powerful, fully managed, petabyte-scale data warehouse service in the cloud.
- Customers can use the Redshift for just $0.25 per hour with no commitments or upfront costs and scale to a petabyte or more for $1,000 per terabyte per year.

What is SQS?

- SQS stands for **Simple Queue Service**.
- SQS was the first service available in AWS.
- Amazon SQS is a web service that gives you access to a message queue that can be used to store messages while waiting for a computer to process them.
- Amazon SQS is a distributed queue system that enables web service applications to quickly and reliably queue messages that one component in the application generates to be consumed by another component where a queue is a temporary repository for messages that are awaiting processing.

What is SWF?

- SWF stands for **Simple Workflow Service**.
- It is a web service used to build scalable and resilient applications.
- It provides simple API calls which can be executed from code written in any language and can be run on your EC2 instance or any of your machines located anywhere in the world that access the internet.

What is SNS?

- SNS stands for Simple Notification Service.
- It is a web service which makes it easy to set up, operate, and send a notification from the cloud.
- It provides developers with the highly scalable, cost-effective, and flexible capability to publish messages from an application and sends them to other applications.

API Gateway

- API Gateway is a gateway that consists of a bunch of Lambda functions that create a serverless learning management system.
- API Gateway is a fully managed service that makes it easy for developers to publish, maintain, monitor, and secure APIs at any scale.
- With a few clicks in the AWS Management Console, you can create an API that acts as a "front door" for applications to access data, business logic, or functionality from your back-end services such as applications running on Amazon Elastic Compute Cloud (Amazon EC2), code running on AWS Lambda, or any web application.