CLOUD COMPUTING

Cloud computing is the on-demand delivery of compute power, database, storage, applications,and other IT resources via the internet with pay-as-you-go pricing. These resources run on server computers that are located in large data centers in different locations around the world. When you use a cloud service provider like AWS, that service provider owns the computers that you are using. These resources can be used together like building blocks to build solutions that help meet business goals and satisfy technology requirements.

Types of cloud computing:

IaaS (Infrastructure As A Service):

IaaS contains the basic building blocks for cloud IT. It typically provides access to networking features, computers (virtual or on dedicated hardware), and data storage space. IaaS gives you the highest level of flexibility and management control over your IT resources. It is most similar to the existing IT resources with which many IT departments and developers are familiar.

PaaS (Platform as a Service):

PaaS removes the need for you to manage underlying infrastructure (usually hardware and operating systems), and allows you to focus on the deployment and management of your applications. This helps you be more efficient as you don’t need to worry about resource procurement, capacity planning, software maintenance, patching, or any of the other undifferentiated heavy lifting involved in running your application.

SaaS(Software as a Service):

SaaS provides you with a complete product that is run and managed by the service provider. In most cases, people referring to SaaS are referring to end-user applications (such as web-based email). With a SaaS offering, you don’t have to think about how the service is maintained or how the underlying infrastructure is managed. You only need to think about how you will use that particular software.

AWS and it’s Components

AWS (AMAZON WEB SERVICE):

1.AWS is a secure cloud platform that offers a broad set of global cloud based products.

2.AWS provides you with on-demand accessto compute, storage, network,database, and other IT resources and management tools.

3.AWS offers flexibility.

4.You pay only for the individual services you need, for as long as you use them.

5.AWS services work together like building blocks.

AWS Components:

1.Amazon EC2:

Amazon Elastic Compute Cloud (Amazon EC2) provides virtual machines where you can host the same kinds of applications that you might run on a traditional on-premises server.

2.Amazon S3:

Amazon S3(Simple Storage Service) is object-level storage, which means that if you want to change a part of a file, you must make the change and then re-upload the entire modified file.AmazonS3 stores data as objects within resources that are called buckets.

3.Amazon Aurora:

Amazon Aurora is a MySQL-and PostgreSQL-compatible relational database that is

built for the cloud.Itcombines the performance and availability of high-end commercial databases with the simplicity and cost-effectiveness of open-source databases.

4.Amazon DynamoDB:

•NoSQL database tables

•Virtually unlimited storage

•Items can have differing attributes

•Low-latency queries

•Scalable read/write throughput DynamoDB is a fast and flexible NoSQL database

service for all applications that need consistent, single-digit-millisecond latency at any scale.

5.AWS Lambda:

AWS Lambda is an event-driven, serverless compute service. Lambda enables you to run code without provisioning or managing servers.

You create a Lambda function,which is the AWS resource that contains the code that you upload. You then set the Lambda function to be triggered, either on a scheduled basisor in response to an event. Your code only runs when it is triggered.

You pay only for the compute time you consume—youare notcharged when your code is not running

6.Amazon VPC:

•Enables you to provision a logically isolated section of the AWS Cloud where you can launch AWS resources in a virtual network that you define

•Gives you control over your virtual networking resources, including:

•Selection of IP address range

•Creation of subnets

•Configuration of route tables and network gateways

•Enables you to customize the network configuration for your VPC

•Enables you to use multiple layers of security

7.Amazon SNS:

Amazon Simple Notification Service (Amazon SNS) sends notifications two ways, A2A and A2P. A2A provides high-throughput, push-based, many-to-many messaging between distributed systems, microservices, and event-driven serverless applications.

8.Amazon SageMaker:

Amazon SageMaker is a cloud based machine-learning platform that enables developers to create,train,and deploy machine-learning models on the cloud.It also enables developers to deploy ML models on embedded systems and edge-devices.

9.AWS Cloud9 IDE:

AWS Cloud9 is a cloud-based integrated development environment (IDE) that lets you write, run, and debug your code with just a browser. It includes a code editor, debugger, and terminal. Cloud9 comes prepackaged with essential tools for popular programming languages, including JavaScript, Python, PHP, and more, so you don’t need to install files or configure your development machine to start new projects.

10.AWS DataExchange:

AWS Data Exchange is a service that makes it easy for AWS customers to find,subscribe to,and use third-party data in the AWS cloud.As a subscriber,you can find and subscribe to thousands of products from qualified data provider.

11.AWS QuickSight:

Amazon QuickSight is a very fast, easy-to-use, cloud-powered business analytics service that makes it easy for all employees within an organization to build visualizations, perform ad-hoc analysis, and quickly get business insights from their data,anytime,on any device.

12.Amazon Forecast:

Amazon Forecast is a fully managed service that uses statistical and machine learning algorithms to deliver highly accurate time-series forecasts. Based on the same technology used for time-series forecasting at Amazon.com, Forecast provides state-of-the-art algorithms to predict future time-series data based on historical data, and requires no machine learning experience.

13. AWS Data glue:

AWS Glue is a serverless data integration service that makes it easier to discover, prepare, move, and integrate data from multiple sources for analytics, machine learning (ML), and application development.

14.Amazon EventBridge:

EventBridge is a serverless service that uses events to connect application components together, making it easier for you to build scalable event-driven applications.

15.AWS Lake Formation:

AWS Lake Formation is a service that makes it easy to set up a secure data lake in days. A data lake is a centralized, curated, and secured repository that stores all your data, both in its original form and prepared for analysis.

Amazon EC2 and it’s Components:

Amazon EC2:

Amazon Elastic Compute Cloud (Amazon EC2) provides virtual machines where you can host the same kinds of applications that you might run on a traditional on-premises server.

It provides secure, resizable compute capacity in the cloud. EC2 instances can support a variety of workloads. Common uses for EC2 instances include, but are not limited to:

•Application servers

•Web servers

•Database servers

•Game servers

•Mail servers

•Media servers

•Catalog servers

•File servers

•Computing servers

•Proxy servers

Components of Amazon EC2:

**Instances-**Virtual servers.

**Amazon Machine Images (AMIs):**

Preconfigured templates for your instances that package the components you need for your server (including the operating system and additional software).

**Instance types:**

Various configurations of CPU, memory, storage, networking capacity, and graphics hardware for your instances.

**Key pairs:**

Secure login information for your instances. AWS stores the public key and you store the private key in a secure place.

**Instance store volumes:**

Storage volumes for temporary data that is deleted when you stop, hibernate, or terminate your instance.

**Amazon EBS volumes:**

Persistent storage volumes for your data using Amazon Elastic Block Store (Amazon EBS).

**Regions, Availability Zones, Local Zones, AWS Outposts, and Wavelength Zones:**

Multiple physical locations for your resources, such as instances and Amazon EBS volumes.

**Security groups:**

A virtual firewall that allows you to specify the protocols, ports, and source IP ranges that can reach your instances, and the destination IP ranges to which your instances can connect.

**Elastic IP addresses:**

Static IPv4 addresses for dynamic cloud computing.

**Tags:**

Metadata that you can create and assign to your Amazon EC2 resources.

**Virtual private clouds (VPCs):**

Virtual networks you can create that are logically isolated from the rest of the AWS Cloud. You can optionally connect these virtual networks to your own network.