**Cloud Computing**

* Cloud computing is the on-demand delivery of IT resources over the Internet with pay-as-you-go pricing. Instead of buying, owning, and maintaining physical data centers and servers, you can access technology services, such as computing power, storage, and databases, on an as-needed basis from a cloud provider like Amazon Web Services (AWS).
* Organizations of every type, size, and industry are using the cloud for a wide variety of use cases, such as data backup, disaster recovery, email, virtual desktops, software development and testing, big data analytics, and customer-facing web applications. For example, healthcare companies are using the cloud to develop more personalized treatments for patients. Financial services companies are using the cloud to power real-time fraud detection and prevention. And video game makers are using the cloud to deliver online games to millions of players around.
* *Benefits of cloud computing:*
* Agility:

The cloud gives you easy access to a broad range of technologies so that you can innovate faster and build nearly anything that you can imagine.You can deploy technology services in a matter of minutes, and get from idea to implementation several orders of magnitude faster than before. This gives you the freedom to experiment, test new ideas to differentiate customer experiences, and transform your business.

* Deploy globally in minutes:

With the cloud, you can expand to new geographic regions and deploy globally in minutes. For example, AWS has infrastructure all over the world, so you can deploy your application in multiple physical locations with just a few clicks. Putting applications in closer proximity to end users reduces latency and improves their experience.

* ***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 Components

##### [Amazon EC2](https://docs.aws.amazon.com/ec2/?icmpid=docs_homepage_featuredsvcs)

Create and run virtual servers in the cloud. Amazon Elastic Compute Cloud (Amazon EC2) provides on-demand, scalable computing capacity in the Amazon Web Services (AWS) Cloud.

##### [Amazon S3](https://docs.aws.amazon.com/s3/?icmpid=docs_homepage_featuredsvcs)

##### Object storage built to retrieve any amount of data from anywhere. Amazon Simple Storage Service (Amazon S3) is an object storage service offering industry-leading scalability, data availability,security, and performance

##### [Amazon DynamoDB](https://docs.aws.amazon.com/dynamodb/?icmpid=docs_homepage_featuredsvcs)

##### Managed NoSQL database service.  DynamoDB offers built-in security, continuous backups, automated multi-Region replication, in-memory caching, and data import and export tools.

##### [Amazon RDS](https://docs.aws.amazon.com/rds/?icmpid=docs_homepage_featuredsvcs)

Set up, operate, and scale a relational database in the cloud.

* [AWS Lambda](https://docs.aws.amazon.com/lambda/?icmpid=docs_homepage_featuredsvcs)

Run code without thinking about servers. AWS Lambda is a compute service that runs your code in response to events and automatically manages the compute resources, accelerating your journey from an idea to a modern, production application.

##### [Amazon VPC](https://docs.aws.amazon.com/vpc/?icmpid=docs_homepage_featuredsvcs)

Isolated cloud resources.

Amazon Ec2

* Amazon Elastic Compute Cloud (Amazon EC2) provides on-demand, scalable computing capacity in the Amazon Web Services (AWS) Cloud. Using Amazon EC2 reduces hardware costs so you can develop and deploy applications faster. You can use Amazon EC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage. You can add capacity (scale up) to handle compute-heavy tasks, such as monthly or yearly processes, or spikes in website traffic. When usage decreases, you can reduce capacity (scale down) again.
* Amazon EC2 provides the following high-level features:
* **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).

* **Elastic IP addresses**

Static IPv4 addresses for dynamic cloud computing.

* **Tags**

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