**Cloud Computing: ( basic types of cloud services are compute, storage and Network).**

It is global cloud platform.

It allows to host and manage the services on the Internet

It can be used to create and deploy any type of application in the cloud.

**Types of Cloud Computing:**

* **Deployment Model:**
  + Public cloud. [AWS, Microsoft Azure, IBM’S Blue Cloud, Google Cloud and Sun Cloud]
  + Private cloud. [ AWS, VMware]
  + Hybrid cloud.
* **Service Model:**
  + **Infrastructure as a Service**: if business only needs Virtual Machine and have expertise to install s/w on top it and run.
  + **Platform as a Service**: if the business requires a platform for building software products.
  + **Software as a Service**: if the business doesn’t want to maintain any IT equipment.

**Life cycle of a Cloud Computing Solution:**

Define the purpose [Business needs]

Define the Hardware [ EC2, Lambda, Elastic Container Service].

Define the Storage [S3, EFS, Glacier]/ backup and archive.

Define the Network [VPC, Route 53, Direct Connect].

Define Security [IAM, KMS, Cognito].

Define Management process and Tools [CloudWatch, Autoscaling, CloudFormation]/deployment.

Testing Process [ CodeStar, CodeBuild, CodePipeLine]/Testing.

Analytics [Athena, EMR, CloudSearch]/ Analyzing and Visualize the data.

**AWS: Amazon Web Services:**

Benefits AWS:

* Billing is per hour. Every instance or every service had micro billing.
* Easy sign up process.
* Available in matter of seconds.
* Scalability.
* Can launch server without buying any hardware.
* Server state is stable.
* Trusted Vendor
* AWS:
* Is a cloud service from Amazon
* It provides services over the Internet.
* AWS services can be used to create and deploy any type of application in the cloud.
* AWS uses the subscription pricing model (pay for what you use).
* [ Examples: AWS, Microsoft Azure, IBM’S Blue Cloud, Google and Sun Cloud].

AWS Service:

* **EC2 [ Elastic Compute Cloud]:**

It Is a basic service. they give a machine which we can launch and run our software on those.

* **VPC [ Virtual Private Cloud]**: virtual privet network.

VPC allows us to create networks in the cloud and run our servers on those networks.

* **S3 [ Simple Storage Service]**:

Gives us opportunity to upload and share files. Mostly storage and share files.

* **Relational Database Service**:

This allows run and manage databases, they all flavors of databases.

* **Route 53**:

Is DNS where we can point to our DNS to Amazon and they take care of.

* **ELB [ Elastic Load Balancing]**:

Is service to load balance incoming traffic to multiple machines, so this way can scale up multiple user to web application.

**Elastic Cloud Compute (EC2): provides compute capacity in the cloud.**

To use EC2, we need to create an AMI (Amazon Machine Image).

* Choosing an AMI - is a template that used to create new instance/Virtual Machine / Machine / Computer (h/w, s/w, o/s). AMI’s types – Amazon’s pre-defined AMI and custom AMI.
* Choosing an instance type -hardware specifications based (i.e. compute optimized, memory optimized, GPU optimized, Storage optimized, General purpose)
* Configuring instance – billing info, public IP, IAM role, Shut down behavior etc.
* Adding storage – types of storage Ephemeral storage (temporary and free), Amazon Elastic Block store (permanent and paid), Amazon S3.
* Adding tags – to label a machine.
* Configuring security groups – configure in-bound out-bound
* Review –
* Launch the EC2 instance.
* Before launch, we will get key pair (public and private). Private key is for user.( .pem file).

To access EC2 instance, we need PuTTY and PuTTY generator tools to convert .pem to ppk file. When we want to connect windows to Linux system. Then we get opened with terminal.

* SNS to notify Users
* Linking EC2 and S3

**AWS CloudFormation: On AWS platform, Managing the infrastructure with multiple services can be difficult.**

CloudFormation is service provides users with a simple way to create and manage a collection of AWS resource by provisioning and updating then in an orderly and predictable way.

**AWS CloudFormation enables you to manage the complete infrastructure or AWS resource through a text file in JSON or YAML language (called Template). (Infrastructure as a code).**

Collection of AWS resources the template provisioned is called stack.