**There are three major types of cloud services available:**

**Infrastructure as a Service (IaaS)** contains the basic building blocks for cloud IT and typically provides access to networking features, computers and data storage space. IaaS provides the highest level of flexibility and management control over the infrastructure. Example of IaaS is EC2.

**Platform as a Service (PaaS)** removes the need for your organization to manage the underlying infrastructure (HW and Oss) and allows you to focus on the deployment and management of your applications. This helps you to be more efficient as you don’t need to worry about resource procurement, capacity planning, software maintenance or patching. Example of PaaS is AWS Lambda.

**Software as a Service (SaaS)** provides you a complete product that run and manage by service provider. With SaaS you do not 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 the App. A common example of SaaS application is web-based email.

**Three Cloud Deployment models**

* On-premises (Private Cloud) – you run everything in your own DC.
* Hybrid – you run some of your Apps in your DC and some in the AWS Public Cloud.
* Cloud – you run all your Apps Public Cloud.

On-premises (Private Cloud), resources are deployed in your on – premises DC, using virtualization and resource management tools – VMware, Hyper-V (From Microsoft), OpenStack (Open source).

Private cloud option offers the ability to provide dedicated resources, not split between users or end customers (only your Apps sit on the actual hardware)

You have full control over your infrastructure and are responsible for management and OS patching.

A hybrid deployment is a way to connect infrastructure and applications between cloud-based resources and existing resources that are not located in the cloud. The hybrid deployment can be an intermediate step, while you are on your way to fully migrating to the AWS cloud.

* DynamoDB is a fast and flexible nonrelational database service for any scale. DynamoDB enables customers to offload the administrative burdens of operating and scaling distributed databases to AWS so that they don’t have to worry about hardware provisioning, setup and configuration, throughput capacity planning, replication, software patching, or cluster scaling
* The SDK and CLI tools use the access keys to cryptographically sign your request. If you don’t use AWS tools, you must sign the request yourself. DynamoDB supports *Signature Version 4*, a protocol for authenticating inbound API requests. For more information about authenticating requests, see [Signature Version 4 Signing Process](https://docs.aws.amazon.com/general/latest/gr/signature-version-4.html) in the *AWS General Reference*.
* An Elastic Beanstalk application is a logical collection of Elastic Beanstalk components, including environments, versions, and environment configurations. In Elastic Beanstalk an application is conceptually similar to a folder. AWS Elastic Beanstalk enables you to manage all of the resources that run your application as environments.

With Elastic Beanstalk, you can quickly deploy and manage applications in the AWS Cloud without having to learn about the infrastructure that runs those applications. Elastic Beanstalk reduces management complexity without restricting choice or control. You simply upload your application, and Elastic Beanstalk automatically handles the details of capacity provisioning, load balancing, scaling, and application health monitoring.

Elastic Beanstalk supports applications developed in Go, Java, .NET, Node.js, PHP, Python, and Ruby. When you deploy your application, Elastic Beanstalk builds the selected supported platform version and provisions one or more AWS resources, such as Amazon EC2 instances, to run your application.

There is no additional charge for Elastic Beanstalk. You pay only for the underlying AWS resources that your application consumes.

* AWS cloud computing environment supports OracleDB under RDS in both licensing models, BYOL and Licensed Included.
* AWS scalability of Regions and Availability Zones is AWS responsibility under AWS shared Responsibility.
* The root users and privileged IAM users can create policies in IAM.
* EC2 autoscaling allows the cloud operators to automatically deploy or terminate EC2 instances based on the defined criteria. Criteria can be based on CPU utilization of server or based on a schedule or based on other metrices monitored by CloudWatch.
* IAM policy is a document written in JSON (Java Script Object Notation) format.

1. 7x24 access to the customer service- Basic
2. Business hour access to the cloud technical support-Developer will provide
3. More than one customer (2 customers) contacts, Business level will give that
4. Architecture review of customers AWS environment is a full service – Enterprise will do (15K/month)

* AWS Storage Gateway solution offers on-premise servers to be able to use AWS cloud storage solutions enabling hybrid storage. It can be used in cached, volume, or tape library configurations.

1. Reserved instances provide a substantial cost if paid up front for 5 years. Reserved instances are suitable for *steady state workload* that is required to be running for one year or more. Because of upfront payment for at least a year period of time we get up to 60% discount on demand.
2. Specialize applications need dedicated Instances.
3. On demand host is a default choice.

* Business and Enterprise AWS support plans provides access to the full set of Trusted Advisor checks. At a minimum the customer needs business support plan.
* Amazon Aurora is MySQL and Postgres compatible fully manage relational database that provides up to 5 times performance than MySQL.
* TCO stands for Total Cost for Ownership. It is a financial metric used to estimate direct as well as indirect costs of a product or a service.
* DynomoDB and AWS RDS are highly scalable database services from AWS.
* IAM -manage access control for mobile apps with web identity providers and also integrate with our corporate directory.
* Amazon Snowball appliance allows such large amount of one time or infrequent data transfer from on premise environment to AWS S3 or other services within AWS. Snowball is a secure petabyte-scale transfer appliance that can be shipped securely t he customer for safe, convenient, and speedy data transfer from on premise storage environment to the AWS environment. In this case data is transfer via Direct Connect not via internet.
* We cannot stop and re-start an EBS backed EC2 spot instances. This is a limitation of a spot instance with AWS.
* Enterprise support plan provides launch day support to the customers during launch of their application. AWS support team will be standing by for any issue that may arise during the launch.
* Only certain AWS services can be penetration tested by its customers. The following is the list of these services.

1. EC2
2. RDS
3. Aurora
4. CloudFront
5. API Gateway
6. Lambda
7. Lightsail
8. DNS Zone Walking

* AWS bills on a per second usage basis for EC2 Linux instances and on a per hour usage basis for EC2 Windows instances.

1. Elastic File System (EFS) provides simple and scalable file system like storage for EC2 instances to store files. Multiple EC2 instances can share EFS mount points and share the files.
2. Elastic Block Storage (EBS) – can only mount ONE EC2 instances at a time, S3 is not a block storage and not a file system like block storage.
3. Instance Store - it only can mount to ONE EC2 instances at the same time.

* Spot Instances from spot instance launch wizard is used for big data which reduces the amount of time it takes to complete, so keeping operational cost down.
* EC2 will give customer the complete control from OS and up. Customer can install and configure anything they want on EC2 instances.
* The root users and Privileged IAM users can create policies in IAM.

IAM- best practices

1. Turn on CloudTrail audit to monitor IAM activities
2. Use IAM roles to share access.