AWS

# **Basics**

Before getting to know about AWS we need to know some basic topics like:

* Why cloud?
* What is cloud?
* What is server?
* What is virtualization?
* What is a data centre?
* Benefits of cloud
* Types of cloud
* Public vs Private vs Hybrid
* Capital Expenditure vs Operational Expenditure
* Consumption- based model
* Cloud services types
* What are AWS?
* Why AWS?
* What are the most used AWS services?

**Why Cloud:**

Before the cloud concept,

* IT uses the physicals hardware’s and own data centre’s which has to be managed by the individual companies.
* Local storage and each individual have to use their desktop and each system has to install preferred applications and there should be constant backups.
* Accessibility, Scalability become the major problem
* Investment is high, Global reach is less and whatever risk is there should be bare by the individuals. Here where the concept of cloud computing came.

**Cloud:**

The cloud is a network of remote servers accessible via the internet, offering storage, computing power, and various services, enabling users to access and manage data and applications from anywhere.

**Server:**

A server is a computer system or software that responds to requests from other devices or programs, providing services or resources over a network.

Servers store, manage, and share data, files, websites, or applications, facilitating communication and interactions within a network or over the internet.

**Virtualization:**

Virtualization is the process of creating a simulated, virtual version of computer hardware, software, storage, or networks to run multiple operating systems or applications on a single physical machine.

**Data centre:**

A data centre is a centralized facility housing computing hardware, servers, networking equipment, and storage systems to store, manage, and process data.

**Benefits of cloud:**

* **High availability**
* **Elasticity**
* **Scalability**
* **Reliability**
* **Predictability**
* **Security**
* **Governance**
* **Manageability**

**Types of cloud:**

1. **Private Cloud:** Cloud maintained by single organization

Data centres are maintained by organizations

Provide access to users within the organization, external user is not allowed

Org create a cloud environment in their data centre and org is responsible for operating the services they provide

**Example: Own Car**

1. **Public Cloud:** Open to all

Owned by cloud services or hosting providers

Data centres are maintained by 3rd party

Provide access to multiple organizations and multiple users

Accessed via secure network connection

**Example: Taxi car (Ola, Uber), AWS, Azure**

1. **Hybrid Cloud:** Combines both public and private clouds to allow apps to run in most appropriate location

Use cases:

If there are seven ppl and we have one own car with seating capacity of 4 what we do we book a cab for other 3 which is a combination of public and private

Another use case is IT and Hospitals- IT has some legal requirements. So, registration form, receipts and all visible to users which is public, and the legal docs will be in private cloud

**Public vs Private vs Hybrid:**

|  |  |  |
| --- | --- | --- |
| **Public** | **Private** | **Hybrid** |
| Fit for all, no heavy investment | Hardware must be purchased for start-up and maintainance | Provides the most flexibility |
| Provisions can be quickly created, deleted and updated  Apps can be quickly provisioned and deprovisioned | Organizations have complete control over resources and security | Organizations determine where to run their applications |
| No capital expenditure to scale up  Organizations pay only for what they use | Organizations are responsible for hardware maintenance and updates | Organizations control security, compliance, or legal requirements |

**Capital Expenditure vs Operational Expenditure:**

**Capital Expenditure:** pay now and wait for ROI (Return of Investments)

**Example:** school- pay fee, study and get the job

**Operational Expenditure:** Use now and pay later, pay as you go and get billed immediately

**Example:** Electricity- use now and pay later in month ending with a bill

**Consumption- based model:** pay as you go

Cloud service providers operates on a consumption-based model, means end users only pay for the resources they used

* + Better cost prediction
  + Prices for individual resources and services
  + Billing is based on actual usage

**Cloud services types:**

1. **Infrastructure as a Service (IaaS):**

Build pay-as-you-go IT infrastructure by renting servers, virtual machines, storage, networks and Operating Systems from cloud providers.

CPU, SSD and other servers we can choose but installing is not our responsibility we simple use

Example: We have a fully furnished kitchen, cooking and cleaning is our responsibility

1. **Platform as a Service (PaaS):**

Basic infra of our app, provides environment for building, testing & deploying software applications without focusing on managing underlying infrastructure

Simply PaaS focus on App development not focusing on backend

Example: Ordering food online, AWS, AZURE, SQL, DB

1. **Software as a Service (SaaS):**

Software as a Service (SaaS) delivers software applications over the internet, accessible via a web browser, without the need for installation, allowing users to use the software on a subscription basis.

Example: Salesforce, CRM (Customer Relation Management), Netflix- without installing or downloading we can watch movies or series in website

**AWS (Amazon Web Services):**

AWS, or Amazon Web Services, is a comprehensive cloud computing platform offering various scalable and on-demand services such as computing power, storage, and databases accessible via the internet.

**Why AWS?**

* AWS has the first come advantage, means they are the one who invented this cloud concept for the first time.
* AWS has the large market share, most of the companies prefer AWS first then AZURE then GCP

**Most used AWS services:**

* **Security and Identity:**

**Secret Manager, Certificate Manager, IAM, KMS, Cognito**

* **Storage Services:**

**S3, EBS, EFS, Glacier**

* **Database Services:**

**RDS, DynamoDB, Elastic Cache**

* **Management & Monitoring Services:**

**Service Catalog, Auto Scaling, Cloud Formation, Cloud Watch, Cloud Trial, Config**

* **Developer Tools:**

**Code Pipeline, Code Build, Code Deploy**

* **Application Integration Services:**

**SQS, SNS, Step Functions, Event Bridge**

* **Compute services:**

**EC2, Lambda**

* **Containers:**

**EKS, ECS, Elastic Container Registry**

* **Networking Services:**

**VPC, Route53, API Gateway, Cloud front**