18/6/23

# AWS Module 1

## Cloud Concepts Overview

Topics

→ Intro to CC (Cloud Computing)
→ ~~Advantages~~
→ Intro to AWS
→ AWS Cloud Adoption Framwork (AWS CAF)

## I) Intro to Cloud Computing

- Cloud computing is the **on-demand** delivery of compute power, database, storage, applications & other IT resources **via the internet**, with **pay-as-you-go** pricing.

→ They run on servers ~~centers~~ computers located in data centers located ~~in diff~~ across the world.

→ When we use cloud service provider (Ex. AWS, Azure), you use the computers owned by that service provider.

- Cloud computing enables you to **stop thinking of your infrastructure as hardware**, and instead **think of (and use) it as software.**

- Infrastructure as Hardware — Traditional Computing Model.

→ Hardware solutions :

↳ require space, staff, physical security, planning, capital Expenditure

↳ Having a long hardware procurement cycle.

↳ Require you to provision capacity by guessing theoretical maximum peaks.

- Infrastructure as Software — Cloud Computing Model

→ Software Solutions :

↳ Are flexible

↳ Can change more quickly, easily, & cost-effectively than hardware soln's.

↳ # Eliminate the undifferentiated Heavy-lifting tasks.

# Cloud Service Models

| IaaS | PaaS | SaaS |
| --- | --- | --- |
| Infrastructure as a Service | Platform as a Service | Software as a Service |

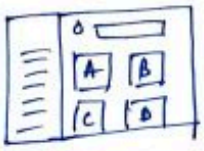
More Control over IT resources

Less Control over IT resources

Rough Analogy:

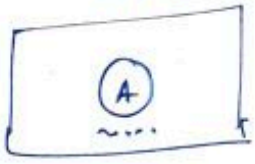
Managing the hardware components & OS of the device to the very apps

Ex Hardware, Maging Windows Os.



You are now only concerned with how the Service is maintained & the very apps using

Ex Windows kits apps




Only involved with the end-user -applic-ations.

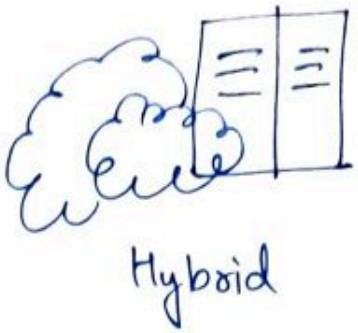
Ex Gmail

- Cloud & Deployment Models

Cloud

Cloud based App is fully deployed in cloud.

(App is either created in cloud / is migrated to it.)

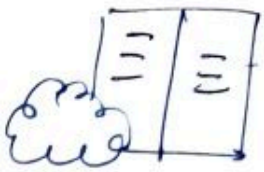


Hybrid

Deployment in Hybrid App connects your existing infrastructure & Apps to a cloud based App.

(located in physical facilities)

Ex Hybrid App that connects cloud to on premises App

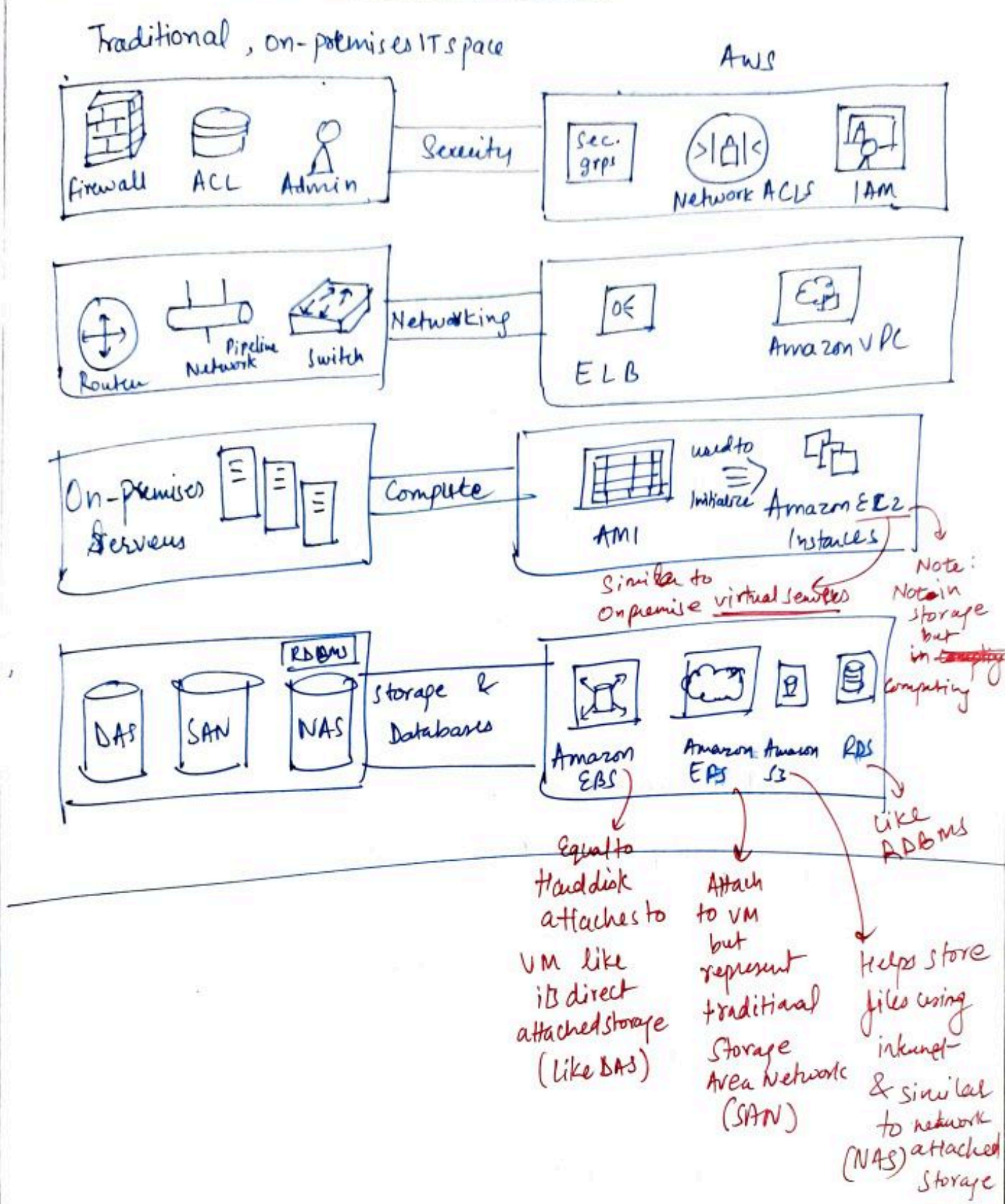


(Private Cloud) On Premises

Onpremises App deploy using private cloud.

Doesn't provide many of ~~the~~ cloud's abilities its chosen for its ability to provide dedicated resources.

• Similarities b/w AWS & traditional IT



## II) Advantages of Cloud Computing (Why move to cloud?)

1.) Trade capital expense for variable expense

Capital Expense — Funds companies use to acquire & maintain physical assets such as property, industry buildings or equipment.

Variable Cost — Attenable and/or avoidable costs that can be done using cloud computing. Pay only for amount you consume. ∴ Saving money.

- Reduced maintenance
- Adapt easily based on needs.

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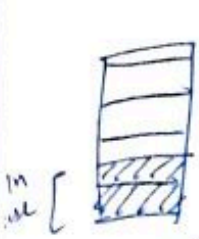
2.) Benefit from massive economics of scale.

Lower costs than using on your own.

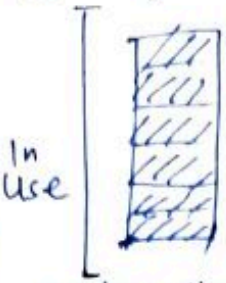
Because of aggregate useage from all customers, AWS can achieve higher economies of scale & pass savings on to customers.

∴ lower pay-as-you-go prices.

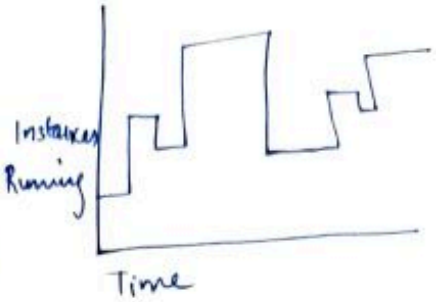
3.) Stop guessing capacity




Overestimated Server Capacity




Underestimated Server Capacity




Scaling on demand.

Eliminating guessing your infrastructure capacity needs.
Avoiding to have expensive idle resources or deal with limited capacity.

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4.) Increase Speed & Agility.

Reducing the time it takes to make your desired resources available, from weeks, down to minutes.

↑ Agility ∵ cost & time taken to experiment & develop are significantly lower.

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5.) Stop spending money on running & maintaining data centers

Running Data Centers ⟷ Investment Business & Customers

6.) Go Global in minutes

Deploy on servers global locations from around the world, providing lower latency & better experience to customers around the globe.

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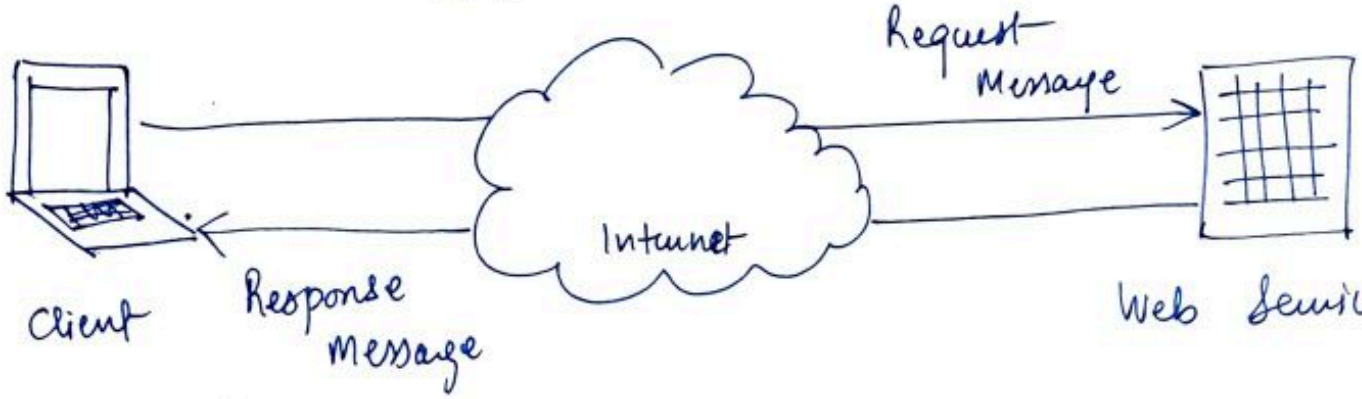
## III) Amazon Web Services (AWS)

→ What are web services?

A web service is any piece of software that makes itself available over the internet & uses a standardized format — such as Extensible Markup Language (XML) or JavaScript Object Notation (JSON) — for the request & the response of an application programming interface (API) interaction.

∴ Web service is an application, provisioned over the internet.



→ we are no longer concerned about the implementation.
→ Its not tied to OS, or language used to develop software

## → What is AWS ?

AWS is a secure platform that offers a broad set, an ecosystem of web services.

↳ Delivered over internet

↳ On-demand access to resources

↳ Immediate provisioning

↳ flexibility : update on demand, scaled up & down, optimize spending

↳ Operational Expense instead of Capital Expense.

## → Categories of AWS Service :

AWS has several categories of services based on their functionalities.

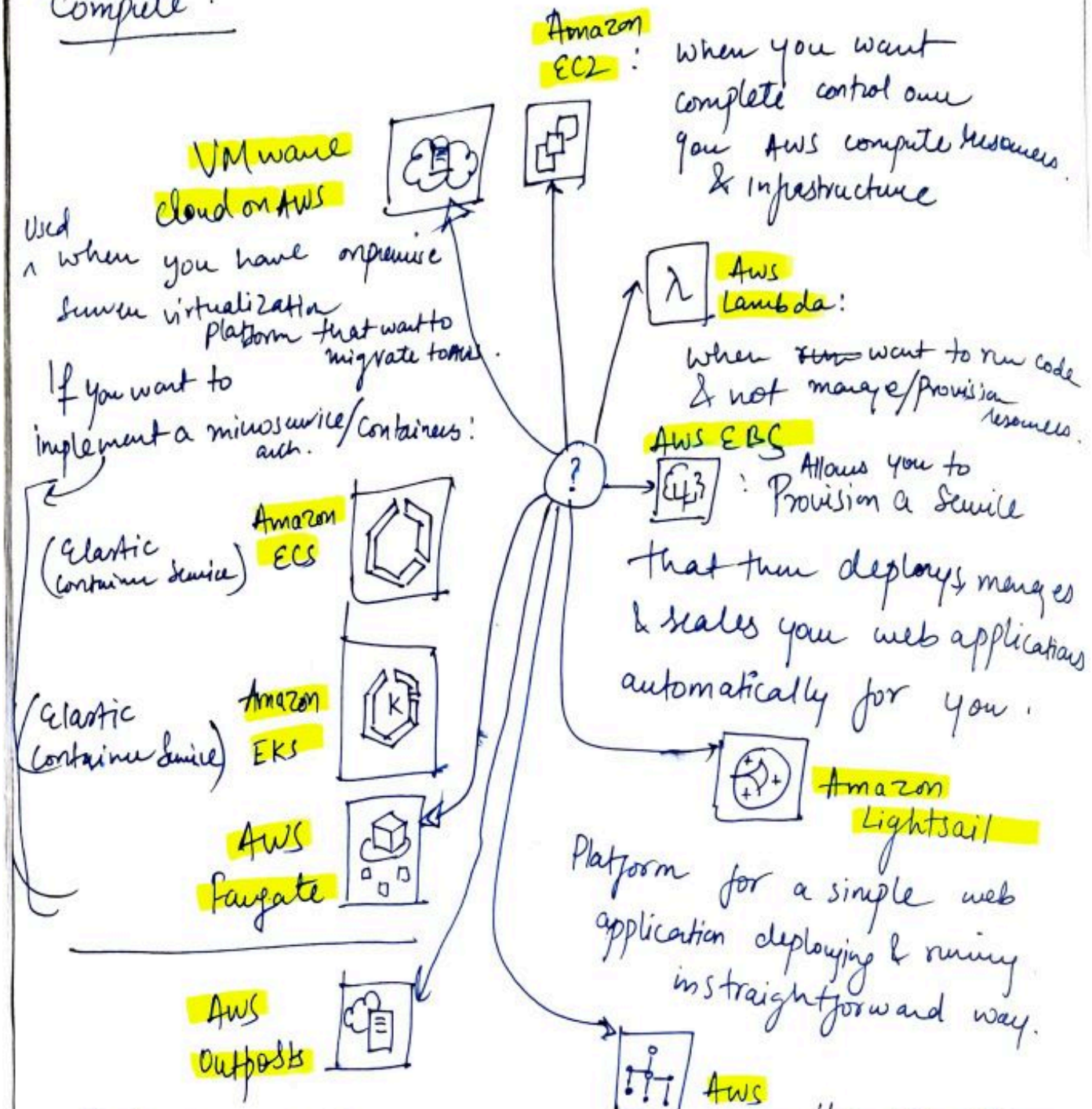
## → Choosing a Service

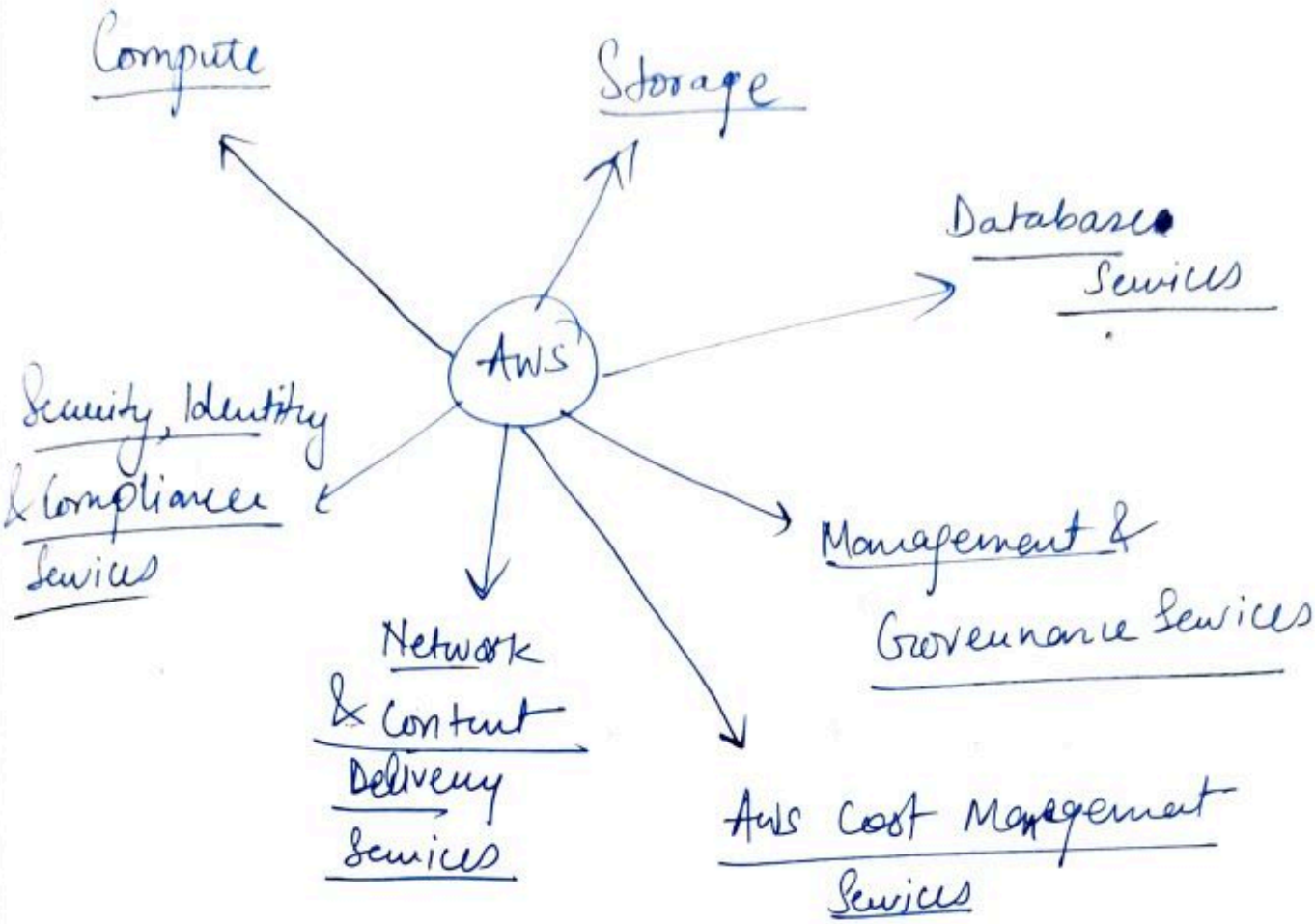
The service you select depends on your business goals & technology requirements

P.T.O

Eg

# Compute:


Amazon EC2: When you want complete control over your AWS compute resources & infrastructure
VMware cloud on AWS
Used when you have onpremise server virtualization platform that want to migrate to AWS.
If you want to implement a microservice/containers: such.
(Elastic container service) Amazon ECS
(Elastic container service) Amazon EKS
AWS Fargate
AWS Outposts
Used when want to run AWS infrastructure in your on premises data center.
AWS Lambda: When want to run code & not manage/provision resources.
AWS EBS: Allows you to Provision a service that then deploys, manages & scales your web applications automatically for you.
Amazon Lightsail
Platform for a simple web application deploying & running in straightforward way.
AWS Batch: You use when you run hundreds of batch workloads & want to run them reliably




→ 3 ways to Interact with AWS

**AWS Magement Console**

Easy-to-use graphical interface

**Command Line Interface** (AWS CLI)

Access to services by discrete commands or scripts

**Software Development kits** (SDKs)

Access Services directly from your code (Ex Java, Python, etc).

AWS ~~Built~~ are built using a REST like application programming interface. (REST) Representational State Transfer

# (IV) The AWS Cloud Adoption Framework (AWS CAF)

## — Moving to the AWS Cloud

Cloud Adoption from onpremises requires the organization to consider multiple factors.

This CAF is a document ~~to~~ created to help Organizations designs & travel an accelerated path to successful cloud adoption.

### AWS CAF

→ It provides guidance & best practices to help organizations build a comprehensive approach to cloud computing accross the organizations & throughout the IT lifecycle to accelerate succesful cloud adoptim.

→ AWS CAF is organized into six perspectives

1. Business
2. People
3. Governance
4. Platform
5. Security
6. Operations.

→ These perspectives consists of sets of capabilities.

 Business
 People
 Governance

 Platform
 Security
 Operations

focus on business Capabilities

focus on Technical Capabilities.

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1. Business Perspective 

Stakeholders from business ensure that IT is aligned with business needs, and that IT investments can be traced to demonstrate business results.

→ IT Finance
→ IT Strategy
→ Benefits Realization
→ Business Risk Management.

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2. People Perspective 

Prioritize training, staffing, and organizational changes to build agile organization.

→ Resource Management
→ Incentive Management
→ Career ~~change~~ Management
→ Training Management
→ Organizational Change Management.

3. Governance Perspective 

Ensure that skills & processes align IT strategy & goals with business strategy & goals. So, the organization can maximize business value of its IT investment & minimize business risks.

→ Portfolio Management
→ Project & Program Management
→ Business Performance Measurement
→ License Management

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4. Platform Perspective 

Aim to understand & communicate the nature of IT systems & their relationships. Must be able to describe the architecture of target state environment in detail.

→ Compute
→ Network
→ Storage
→ Database
→ Sys & Soln arch.
→ App dev.

4. Security Perspective

Aim to ensure that the organization meets its security objectives

- → Identity & access management
- → Detective Control
- → Infrastructure Security
- → Data Protection
- → Incident Response

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5) Operations Perspective 

Define how day-to-day, quarter-to-quarter & year-to-year business will be ~~~~ conducted.

- → Service Monitoring
- → APP Performance monitoring
- → Res. Inventory management
- → Release management/ Change management
- → Reporting & analytics
- → Business Continuity / Disaster Recovery
- → IT Service Catalog.