Course: Artificial Intelligence and Machine Learning Code: 20CS51I

WEEK- 2 Cloud Computing

- ✓ **Serverless Services**
- ✓ **Major Cloud Service Providers**
- ✓ **Virtualization Explore the cloud service providers and services offered by them - T**

Session No. 4

Serverless Services

Serverless computing is a method of providing backend services on an as-used basis. A serverless provider allows users to write and deploy code without the hassle of worrying about the underlying infrastructure. A company that gets backend services from a serverless vendor is charged based on their computation and do not have to reserve and pay for a fixed amount of bandwidth or number of servers, as the service is auto-scaling.

Serverless computing allows developers to purchase backend services on a flexible 'pay-as-you-go' basis, meaning that developers only have to pay for the services they use. This is like switching from a cell phone data plan with a monthly fixed limit, to one that only charges for each byte of data that actually gets used.

Serverless is a cloud-native development model that allows developers to build and run applications without having to manage servers. There are still servers in serverless, but they are abstracted away from app development

What are the advantages of serverless computing?

- ✓ **Lower costs** - Serverless computing is generally very cost-effective, as traditional cloud providers of backend services (server allocation) often result in the user paying for unused space or idle CPU time.
- ✓ **Simplified scalability** - Developers using serverless architecture don't have to worry about policies to scale up their code. The serverless vendor handles all of the scaling on demand.
- ✓ **Simplified backend code** - With FaaS, developers can create simple functions that independently perform a single purpose, like making an API call.

- **Quicker turnaround** - Serverless architecture can significantly cut time to market. Instead of needing a complicated deploy process to roll out bug fixes and new features, developers can add and modify code on a piecemeal basis.

Major Cloud Service Providers

The top 10 cloud service providers globally in 2022 are ranked in the following table, which includes the number of regions and availability zones that each vendor possesses:

#	Cloud Service Provider	Regions	Availability Zones
1	Amazon Web Services (AWS)	26	84
2	Microsoft Azure	60	116
3	Google Cloud Platform (GCP)	34	103
4	Alibaba Cloud	27	84
5	Oracle Cloud	38	46
6	IBM Cloud (Kyndryl)	11	29
7	Tencent Cloud	21	65
8	OVHcloud	13	33
9	DigitalOcean	8	14
10	Linode (Akamai)	11	11

Virtualization in Cloud Computing

Virtualization is the "creation of a virtual (rather than actual) version of something, such as a server, a desktop, a storage device, an operating system or network resources".

In other words, Virtualization is a technique, which allows to share a single physical instance of a resource or an application among multiple customers and organizations. It does by assigning a logical name to a physical storage and providing a pointer to that physical resource when demanded.

Ex : VM WARE, Dockerc, virtual Box

What is the concept behind the Virtualization?

Creation of a virtual machine over existing operating system and hardware is known as Hardware Virtualization. A Virtual machine provides an environment that is logically separated from the underlying hardware.

The machine on which the virtual machine is going to create is known as **Host Machine** and that virtual machine is referred as a **Guest Machine.**

Types of Virtualization:

1. Hardware Virtualization.
2. Operating system Virtualization.
3. Server Virtualization.
4. Storage Virtualization.

Amazon Web Services (AWS)

Amazon Augmented AI (Amazon A2I)
Amazon CodeGuru
Amazon CodeWhisperer
Amazon DevOps Guru
Amazon Elastic Inference
Amazon Forecast
Amazon Fraud Detector
Amazon Kendra
Amazon Elastic Container Service (Amazon ECS)
Amazon Comprehend
Amazon Monitron
Amazon Lex
Amazon Lookout for Equipment

Amazon Lookout for Metrics
Amazon Lookout for Vision
Amazon Monitron
Amazon Personalize
Amazon Polly
AWS Cost and Usage Reports
AWS Inferentia
AWS Panorama
Apache MXNet on AWS
AWS Deep Learning Containers
AWS deepracer
AWS deepcomposer
AWS Inferentia
Computer vision
Analyse images and videos
Detect defects and automate inspection
Utilize computer vision at the edge
Extract text and data
Acquire insights