Moiz Zubair – Bytewise Fellowship – Cloud Computing track – Day # 01

Task 1: Cloud Fundamentals

Cloud Computing is the on-demand delivery of IT assets such as compute, storage, databases and other related technology services on pay-as-you-go basis (pay for what you use only).

Cloud providers -> Amazon Web Services, Azure, Google Cloud Platform and Alibaba cloud etc.

Traditional Architecture VS Cloud Architecture

Traditional Architecture	Cloud Architecture
Costly (pay for the whole datacenter and its resources used)	Only pay for the resources that you use
Time taking (scaling up and down takes time to acquire resources)	Scaled up and down with a single click
Limited resources (you need time, money and space to acquire resources)	Limitless resources (you can acquire anything available by the cloud provider)
Needs workforce for monitoring resources	Resource monitoring handled by cloud provider and software's
No solutions for preventing natural disasters	Multiple data centers made available incase one is affected by a disaster

Characteristics of Cloud Computing:

- **On-Demand Self-Service:** no direct access to resource required for starting the service and can be accessed via a single click.
- **Broad Network Access:** All services are made readily available across al networks
- **Resource Pooling:** Multiple pools of resources are made available for use of clients. Many different users are accessing the resource from the same pool.
- **Rapid Elasticity:** Resources and services made available there and then when required by the user. So, the clients can easily scale in and out when required.
- **Measured Service:** All the services can be tracked and measured for the billing purposes, you will only pay for what you have used.

Benefits of Cloud:

Scalability: scale up/scale down as quickly according to need, rather than purchasing or provisioning the expensive upgrades yourself, cloud service provider handles all this.

Flexibility: Most flexible as everything required is within the access of the client

Cost: Less costly than the traditional architects as you only pay for the resource used. You do not have to pay for the location, cooling, maintenance and upgradation of the resource, neither for the team

Location Constraints: no location constraints as you can access the service from anywhere using internet. If data access needed, you can connect to your virtual office quickly and easily.

Disaster Recovery: Many different resources are made available for the use of the clients so if one resource location is affected then users are allocated to the other resource center. So no downtime is guided towards the clients and services are provided seamlessly

Fault Tolerance: High availability gives the benefit of fault tolerance. Resources are made highly available, by using a load balancer the clients are accommodated as such that no faults or downtimes occur during the usage of the resource.

Security: The services and resources are made highly secured as it is the main priority of the clients. So the cloud providers provide the best practices for making the services and accounts secure.

Cloud Service Models:

IAAS	PAAS	SAAS
Most flexible, rents hardware for use	Gives ready-to-use development environment	Complete product is provided for usage
Gives complete control over hardware	Hardware managed by the cloud provider and user creates applications quickly	Software hosted online and made available for use by clients on a subscription model
Best flexibility and management control over hardware resources	Client can scale the resources and new features	No worrying about the maintenance and handling of the resource and hardware
Examples: Virtual machines, storage and networking	Examples: Lambda/ cloud functions, databases etc	Examples: Microsoft Office 365, Gmail, Dropbox

Cloud Deployment Models

Pubic	Private	Hybrid
Offered by third party providers	offers a proprietary environment dedicated to a single business or organization	Combination of 2 or more cloud solutions
Available to anyone over the internet	Access provided via physical cables	Most popular and used by big organizations
Scales quickly and convinently	Most secure as it is on premises	Combines the best features of both the public and the private infrastructure
Examples: AWS, Azure, GCP	Examples: HP Datacenters, Microsoft	Examples: Google cloud Anthos, AWS Outpost, Microsft Azure stack