# CLF-C01

## Overview

### AWS Cloud Computing

Cloud Computing is the on-demand delivery of compute power, database storage, applications, and other IT resources through a cloud services platform via the internet with pay-as-you-go pricing

AWS Cloud Services Platform provides rapid access to flexible and low cost IT resources

Pay-as-you-go pricing? Pay only for what you use, when you use it !

3 major serivce model: IaaS, PaaS, SaaS, the differences between them are Functionalityand Tasks' Ownership & Flexibility

#### Deployment Model

- On-Premises, also known as Private Cloud
  - Resources are deployed in your on-premises DC, using virtualization and resource management tools - VMWare, Hyper-V, OpenStack
  - Offters 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 responsibile for management and OS patching
- Hybrid
  - Can be an intermediate step, whiel you are on the way to fully migrating to the AWS cloud
  - a way to connect infra and apps between cloud-based resources and existing resources that are not located in the cloud
  - The most common method of hybrid deployment is between the cloud and your existing on-premises infra in order to extend or grow your organizations' infra
- Cloud
  - application is fully deployed in the cloud and all components of the application run in the cloud
  - Applications in the cloud have either been created in the cloud or have been migrated from an existing infra to take advantage of the cloud benefits
  - Migrating an App from on-prem to cloud is typically called "lift-and-shift"; this refers to taking the App as is, without modifying it, and running it on cloud-native resources

### 6 Advantages of AWS Cloud Computing

1) Trade capital expense for variable expense
   - You can now pay only when you consume computing resources, and pay only for how much you consume
   - No upfront commitment "pay-as-you-use"
2) Benefit from massive economies of scale
   - You can achieve a lower variable cost than you can get on your own
   - Because usage from hundreds of thousands of customers is aggregated in the cloud, providers such as AWS can achieve higher economies of scale, which translates into lower pay-as-you-go prices
3) Stop guessing about capacity
   - Eliminate guessing on your infra capacity needs
   - While guessing, you often end up either sitting on expensive idel resources or dealing with limited capacity
   - You can access as much as little capacity as you need and scale up and down as required
4) Increase speed and agility
   - Reduce the time to make IT resources available to your developers from weeks to just minutes
   - This results in a dramatic in a dramatic increase in agility for the org, since the cost and time it takes to experiment and develop is significantly lower
   - New server to PROD time?
5) Stop spending money running and maintaining DCs
   - You focus on project that differentiate your business, not the infra; let AW take care of the infra! STOP Wasting Money!
   - AWS will take care of the actual room (DC), power, cooling, racks, servers, cabling, storage, network, security equipment, guards
   - Focus on your business!
6) Go global in minutes
   - Easily deploy your app in multiple regions aournd the world with just a few clicks
   - This means you can provide lower latency and a better experience for your customers at minimal cost
   - Global Reach: R (Regions) | AZ (Availability Zones)
     Low Latency: E (Edge Locations_

### AWS Global Infra, 3 building blocks

- Regions
  - An AWS Region is a physical location in the world that consists of multiple (2 or more) Availability Zones
  - All AWS Regions are completely isolated one from each other: Highest Standards fault tolerance and stability
  - Regions are isolated one from each other, AZs are isolated one from each other, BUT ... the AZs in the same Region are connected through low-latency links (2 or more)!
- AZs (Availability Zones)
  - Represents one or more discrete data centers, each DC with redundant power, networking, and connectivity, housed in separate facilities
  - Running your Apps or services in multiple AZs, you can easily achieve high availability, fault tolerance and scalability
  - This is not possible if running Apps in a single on-prem data center
  - One Availability Zone = One Data Center
  - What's inside the "box"?
    - Servers
    - Networking
    - Storage
    - Balancers equipment
- Edge Locations
  - Amazon CloudFront is a fast content delivery network (CDN) service that securely delivers data, videos, apps to customers globally with low latency and high transfer speeds
  - Amazon CloudFront uses a global network of 166 Points of Presense (155 Edge Locations and 11 Regional Edge Caches) in 65 cities across 29 countries)
  - Edge Locations vs. Regional Edge Caches
    - CloudFront helps you deliver your web content faster to your end users, thus providing a better user experience
    - CloudFront Edge Locations bring the web content closer to your viewers and make sure that popular content can be served quickly
    - CloudFront Regional Edge Caches really help when the content is not popular enough to stay at a CloudFront Edge Location and improve delivery performance for that content

### AWS Mgmt Interfaces: AWS provides 3 distinct options in order to interact with the AWS Cloud Platform

- AWS Management Console
  - A graphical user interface (GUI) for accessing a wide range of AWS Cloud services and managing compute, storage, and other cloud resources
  - A web applications that comprises and refers to a broad collection of software consoles for managing Amazon Web Services
- AWS Command Line Interface (CLI)
  - A unified tool to manage AWS services
  - With just one tool to download and configure, you can control multiple AWS services from the command line and automate them through scripts
  - After AWS CLI tool installation, you can begin making calls to your AWS services from the command line
- AWS Software Development Kits (SDKs)
  - A set of tools that allow developers to create software or apps for a specific platform, OS, computer system or device
  - Using SDKs, you can access and manage AWS services with your preferred development language or platform

## AWS Core Services

- Billing Alarm for AWS 子主题 1
- Identity Access Management (IAM)
- Virtual Private Cloud (VPC)
- Elastic Compute Cloud (EC2)
- Security Groups (SGs)
- Elastic Block Store (EBS)
- Simple Storage Service (S3)