

# AWS CP Exam Format

- 24% Domain 1: Cloud Concepts  
→ 15-16 questions
- 30% Domain 2: Security & Compliance  
→ 19-20 questions
- 34% Domain 3: Cloud Tech & Services  
→ 22 questions
- 12% Domain 4: Billing, Pricing & Support  
→ 8 questions

Passing Score → 70 %

Total Questions → 65 questions

→ 50 Scored ①  
→ 15 Unscored ②

# What is Cloud Computing?

→ the practice of using a network of remote servers hosted on the Internet to store, manage, and process the data, rather than a local server or a personal computer

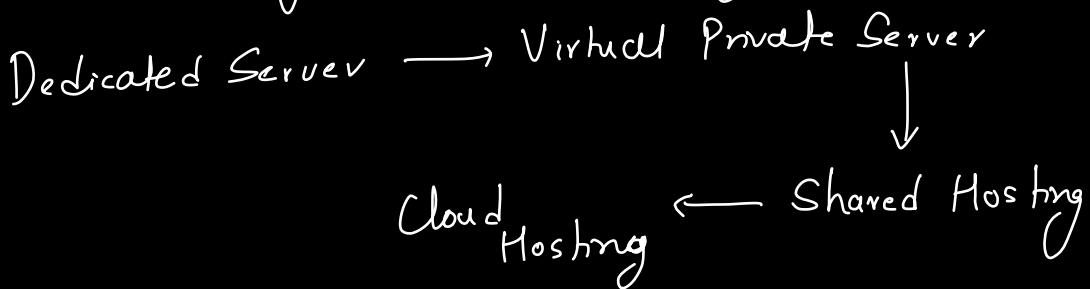
## On premise

- You own the servers
- You hire IT people
- You pay the rent or real-estate
- You take all the risk

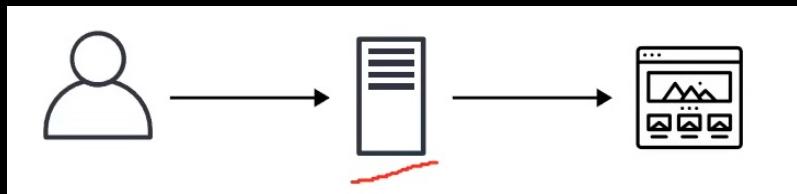
## Cloud Providers

- Someone else owns the servers
- Someone else hires IT people
- Someone else pays the real estate
- You are responsible for your configuring cloud services and code, someone else takes care of the rest

# Evolution of Cloud Hosting



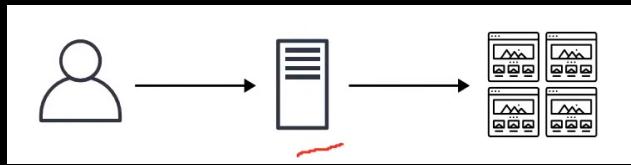
## ① Dedicated Server:



One physical machine dedicated to single business. Runs a single web-app / site.

Very expensive, High maintenance  
High security

## ② Virtual Private Server (VPS)



→ one physical machine dedicated to  
single business

→ The physical machine is virtualized into  
sub-machines, and runs multiple web-apps/sites

Better utilization & Isolation of Resources

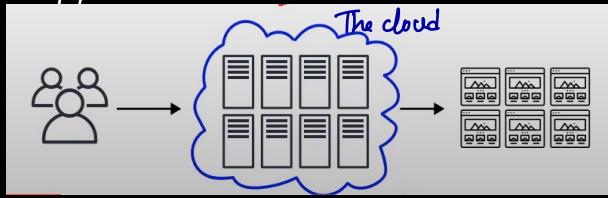
## ③ Shared Hosting



→ One physical machine, shared by hundreds  
of businesses. Relies on most tenants on utilizing  
their resources

Very Cheap, limited functionality, Poor isolation

## ④ Cloud Hosting



- Multiple physical machines that act as one system
- The system is abstracted into multiple cloud services

flexible, Scalable, Secure, Cost Effective,  
High Configurability

# What is Amazon Web Services?

→ AWS is a cloud provider Service (CSP).

## Timeline of Services:

- S QS 2004
- Simple Storage Service (S3) 2006
- Elastic Compute Cloud (EC2) 2006

## What is CSP?

- A CSP is a company which
  - ① provides multiple cloud services eg: tens to hundreds of services
  - ② those cloud services can be chained together to create cloud architectures
  - ③ those cloud services are accessible via single unified API eg: AWS API.
  - ④ those cloud services utilize metered billing based on usage eg: per second / per hour
  - ⑤ those cloud services have rich monitoring built in eg: AWS Cloud Trail

- (f) Those cloud services have an infrastructure as a Service (IaaS) offering
- (g) Those cloud services offer automation via infrastructure as code (IaC).

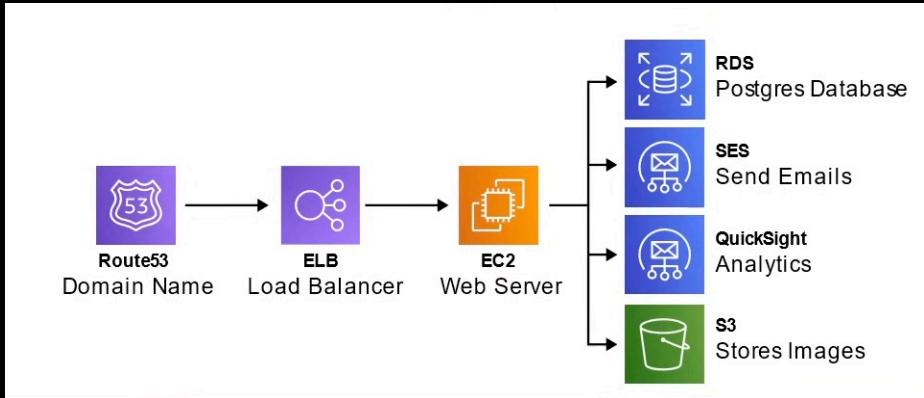


Fig: A simple web app running on EC2.

If a company offers multiple cloud services under a single unit but do not meet most or all of those requirements, it would be referred as Cloud platform e.g. Twilio, HashCorp, Databricks etc.

# landscape of Cloud Service Providers (CSP)

**Tier-1 (Top Tier)** – Early to market, wide offering, strong synergies between services, well recognized in the industry



Amazon Web Services (AWS)



Microsoft Azure



Google Cloud Platform (GCP)



Alibaba Cloud

**Tier-2 (Mid Tier)** – Backed by well-known tech companies, slow to innovate and turned to specialization.



IBM Cloud



Oracle Cloud



HUAWEI  
Huawei Cloud



Tencent Cloud

**Tier-3 (Light Tier)** – Virtual Private Servers (VPS) turned to offer core IaaS offering. Simple, cost-effective



Vultr



Digital Ocean



Akamai Connected Cloud (Linode)

**Tier-4 (Private Tier)** Infrastructure as Service software deployed to run in an organization's own private data center.



OpenStack (Rackspace)



Apache CloudStack



\*Vmware vSphere



## Gartner Magic Quadrant for cloud

- Magic Quadrant (MQ) is a series of market research published by IT consulting firm Gartner that rely on proprietary qualitative data analysis methods to demonstrate market trends, such as direction, maturity & participants.

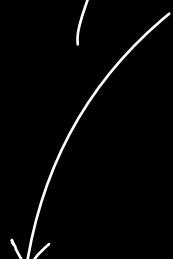
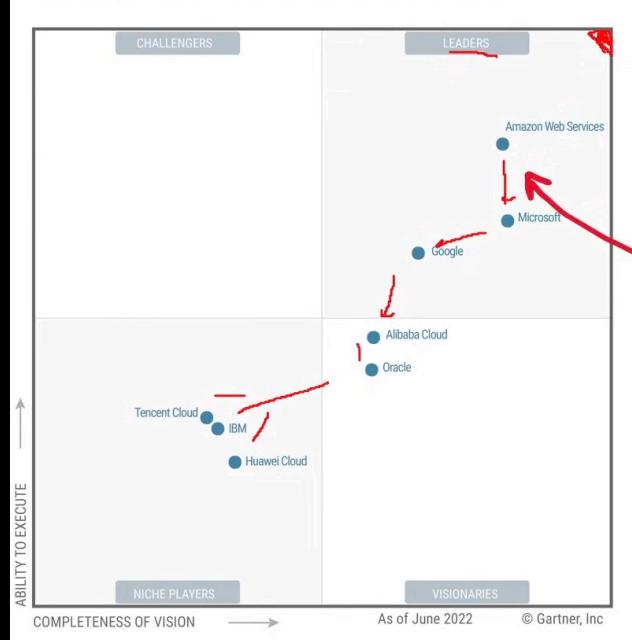


Figure 1: Magic Quadrant for Cloud Infrastructure and Platform Services



# Common Cloud Services

A cloud service provider can have hundreds of cloud services that are grouped into various types of services. The four most common types of CS are the 4 core for Infrastructure as a Service (IaaS)

## ① Compute:

→ Imagine having a virtual computer that can run application, programs & code



## ② Networking

→ Imagine having virtual network defining internet connections or network isolation between services or outbound to the internet.

## ③ Storage

→ Imagine having a virtual hard drive that can store files

## ④ Databases

→ Imagine a virtual database for storing, reporting data or a database for general purpose web-application

# AWS Technology Overview

Cloud Service Provider (CSPs) that are Infrastructure as a Service (IaaS) will always have **4 core cloud service** offerings:



Compute



EC2 Virtual Machines



Storage



EBS Virtual Hard drives



Database



RDS SQL databases



Networking and Content Delivery



VPC Private Cloud Network



Analytics



Application Integration



AR & VR



AWS Cost Management



Blockchain



Business Applications



Containers



Customer Engagement



Developer Tools



End User Computing



Game Tech



Internet of Things



Machine Learning



Management & Governance



Media Services



Migration & Transfer



Mobile



Quantum Technologies



Robotics



Satellites

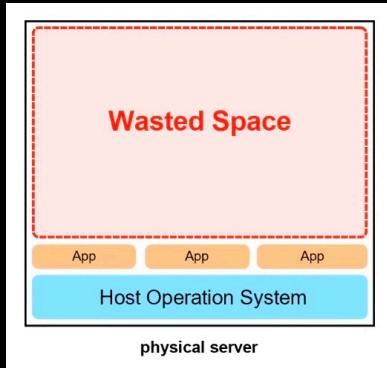


Security, Identity & Compliance



# Evolution of Computing

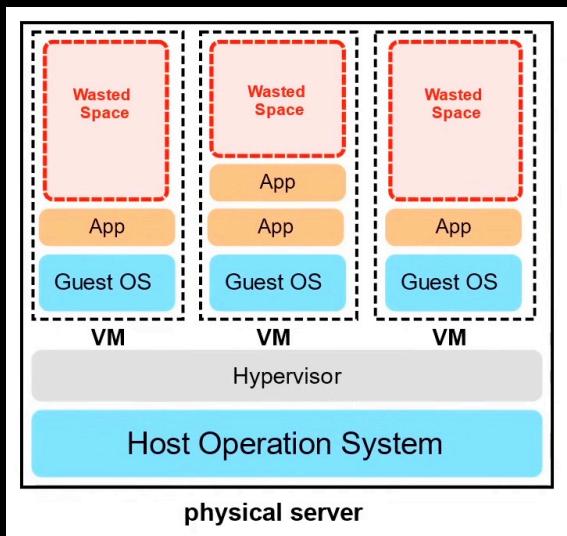
## ① Dedicated



- a physical server wholly utilized by a single computer
- you have to guess your capacity
- you will overpay for an underutilized server
- you can't vertical scale, you need a manual migration

- Replacing a server is very difficult
- You are bounded by your host operating system
  - ↳ Multiple apps can result in conflicts in resource sharing
- You have a \* guaranteed security, privacy, & full utility of underlying resources.

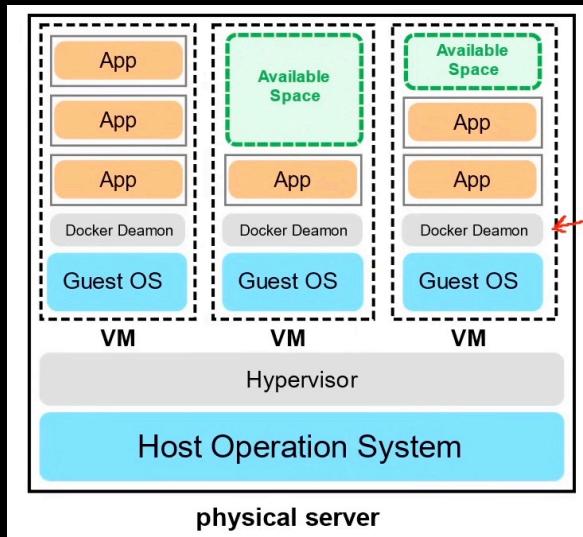
## ② Virtual Machine



- you can run multiple VMs on one machine
- Hypervisor is a software layer that lets you run VMs
- A physical server shared by multiple customers
- You'll overpay for an underutilized VM.

- You are limited to your Guest OS
- Multiple app on single VM can result in conflict in resource sharing.
- Easy to export / import images for migration
- Easy to vertically / horizontally scale.

### ③ Containers

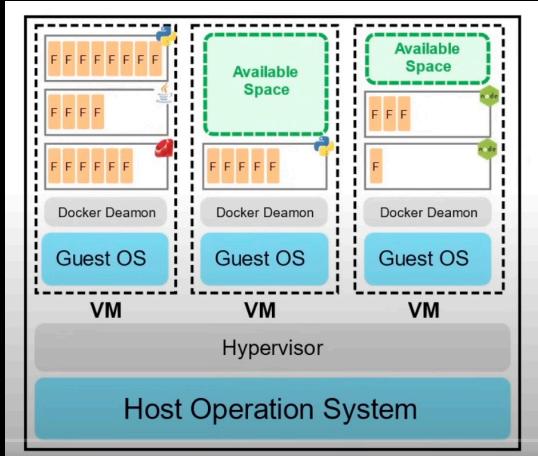


- VM running multiple containers!
- Docker Daemon is the name of the software layer that lets you run multiple containers

- You can maximize the utilization of the available capacity which is more cost effective.
- Your containers share the same underlying OS so containers are more efficient than VMs.
- Multiple apps can run side by side without being limited to the same OS requirements and will not cause conflicts during resources sharing.

See container vs VM

## ④ Functions



- Are managed by VMs running managed containers
- Known as serverless compute
- You upload a piece of code & data, nothing else
- Very cost effective, only pay for the time code is running
- Cold-starts is a side effect of this setup

# Types of Cloud Computing

## ① SaaS

(Software as a service)

A product that is run and managed by service provider. It remains available & works for user.

## ② PaaS

(Platform as a Service)

Focus on the deployment and management of your apps. Don't worry about provisioning, configuring or understanding the hardware or OS.

## ③ IaaS

(Infrastructure as a Service)

The building blocks for cloud IT. Provides access to networking features, computers & data storage space.

## Types of Cloud Computing

Cheat sheets, Practice Exams and Flash cards [www.exampro.co/clf-c02](http://www.exampro.co/clf-c02)

### SaaS Software as a Service For Customers



A product that is run and managed by the service provider.  
Don't worry about how the service is maintained.  
It just works and remains available.

### PaaS Platform as a Service For Developers



Focus on the deployment and management of your apps.  
Don't worry about provisioning, configuring or understanding the hardware or OS.

### IaaS Infrastructure as a Service



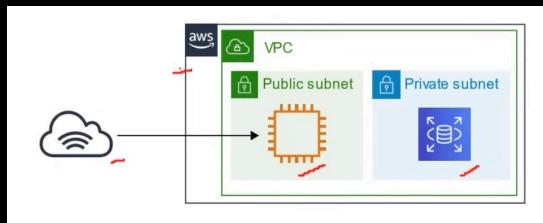
The basic building blocks for cloud IT. Provides access to networking features, computers and data storage space.  
Don't worry about IT staff, data centers and hardware.

# Cloud Computing Deployment Models

## Public cloud

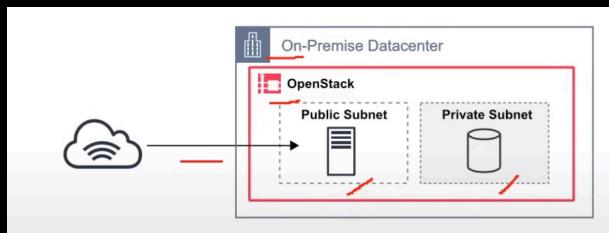
→ Everything (the workload or project) is built on the CSP

\* Also called: Cloud Native / Cloud First



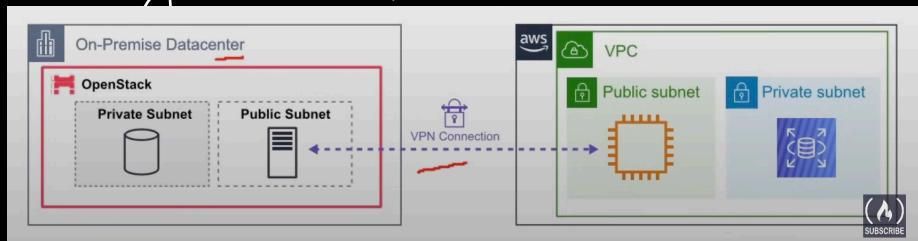
## Private cloud

→ Everything built on company's datacentres also known as On-Premise. The cloud could be open stack.



# Hybrid

→ Using both On-premise and CSP



# Cross-cloud

→ Using multiple cloud providers

Aka multi-cloud / "hybrid cloud"



# Cloud Computing Deployment Models

## In general

### Cloud

Fully utilizing cloud computing



Companies that are starting out today, or are small enough to make the leap from a VPS to a CSP.

- Startups
- SaaS offerings
- New projects and companies

### Hybrid

Using both Cloud and On-Premise



Organizations that started with their own datacenter, can't fully move to cloud due to effort of migration or security compliance

- Banks
- FinTech, Investment Management
- Large Professional Service providers
- Legacy on-premise

### On-Premise

Deploying resources on-premises, using virtualization and resource management tools, is sometimes called "private cloud".



Organizations that cannot run on cloud due to strict regulatory compliance or the sheer size of their organization

- Public Sector eg. Government
- Super Sensitive Data eg. Hospitals
- Large Enterprise with heavy regulation eg. Insurance Companies

There really isn't reason to be fully on-prem 