Cloud Computing- 1

What is Cloud Computing

cloud com·put·ing

noun

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

On-Premise

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

Cloud Providers

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

AWS

Azure

VOL. 2

Alibaba Cloud

ORACLE

Google Cloud

Dedicated Server

One physical machine dedicated **to single a business**.
Runs a single web-app/site.
Very Expensive, High Maintenance, High Security*

Virtual Private Server

One physical machine dedicated **to a single business**.
The physical machine is virtualized **into sub-machines**
Runs multiple web-apps/sites

Shared Hosting

One physical machine, shared by **hundred of businesses**
Relies on most tenants under-utilizing their resources.
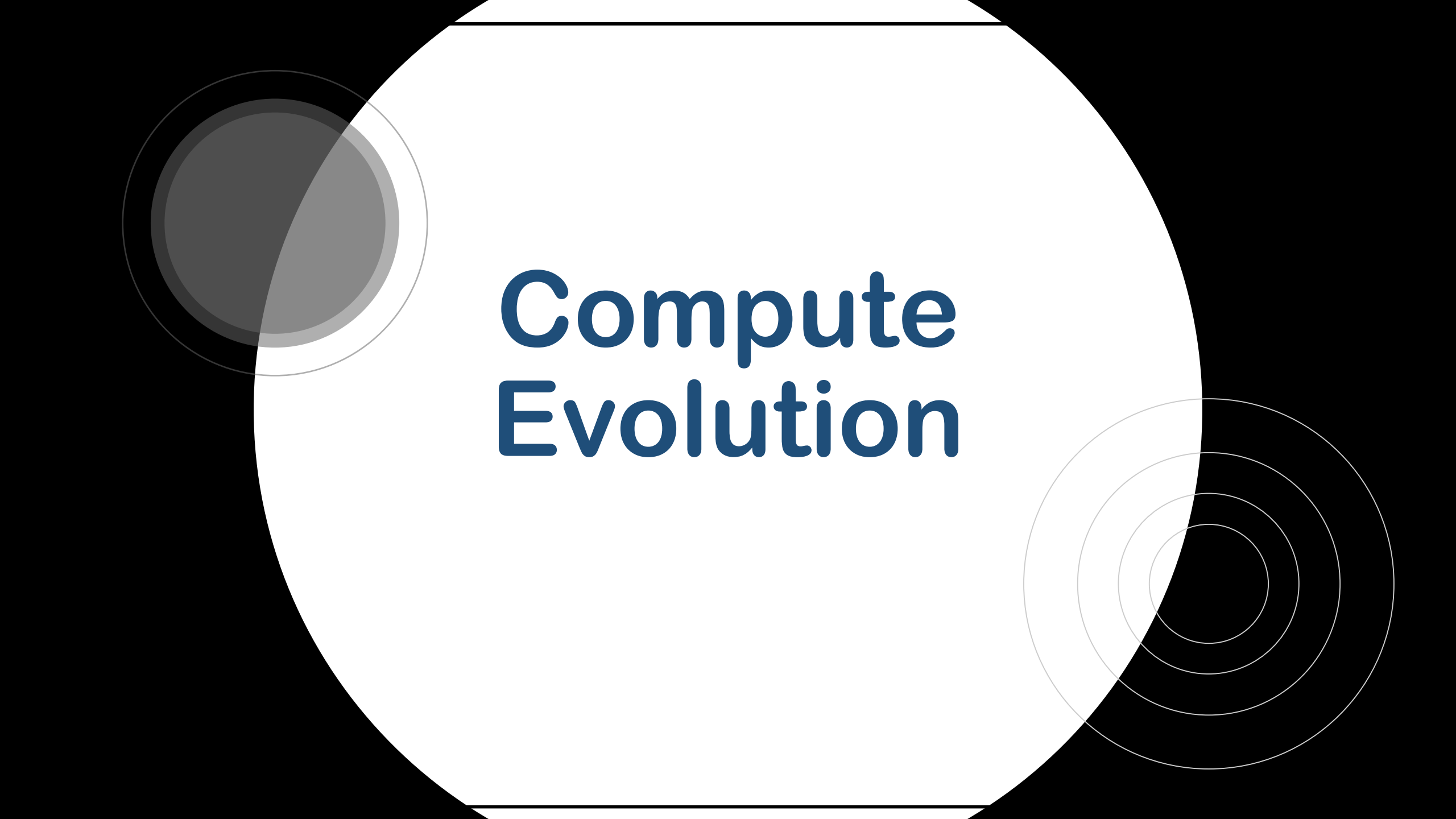**Very Cheap, Very Limited.**

Cloud Hosting

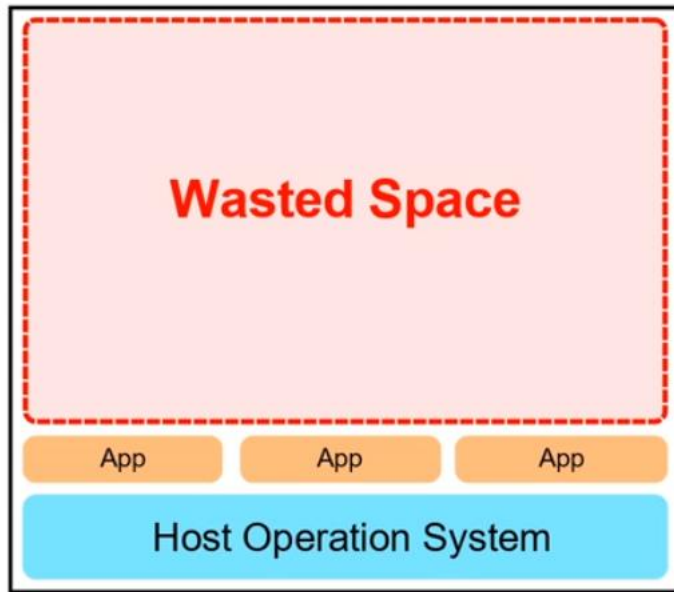**Multiple physical machines** that act as one system.
The system is abstracted into multiple **cloud services**
Flexible, Scalable, Secure, Cost-Effective, High Configurability
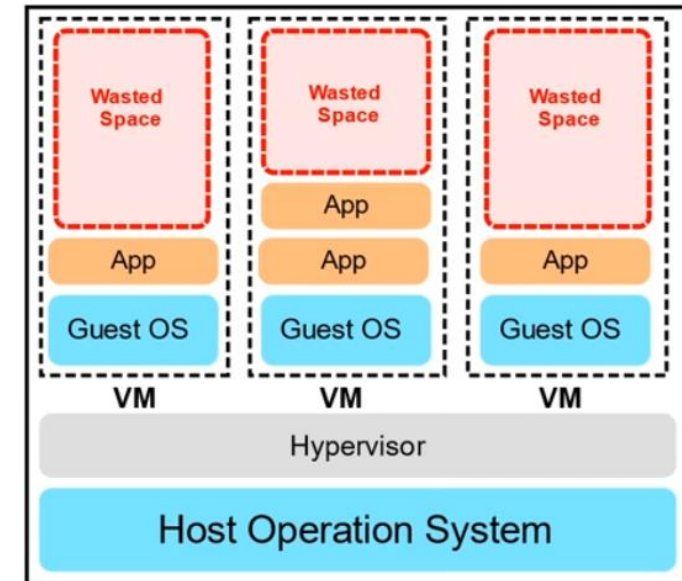
Compute Evolution

Dedicated Servers

physical server

- ✓ Single customer usage & Single OS
- ✓ High Security and control
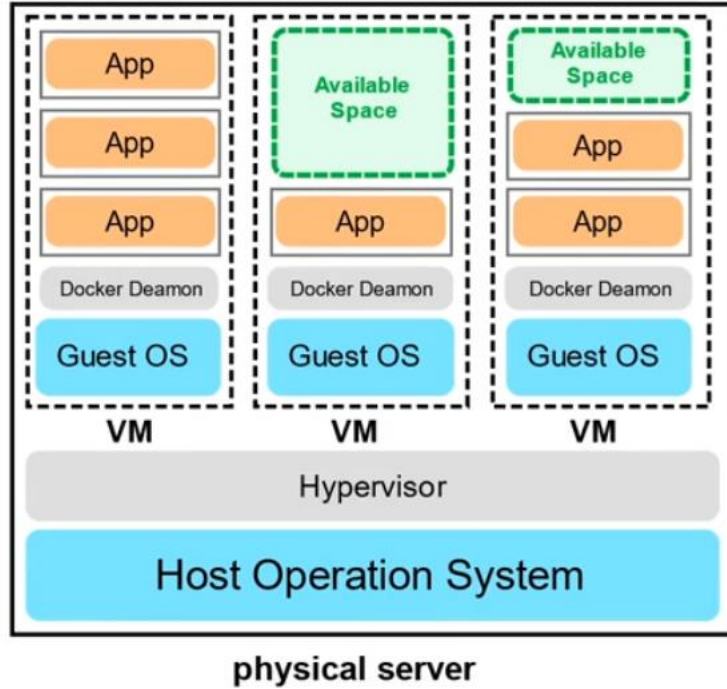- ✓ Costly upgrades & maintenance

Virtual Machines
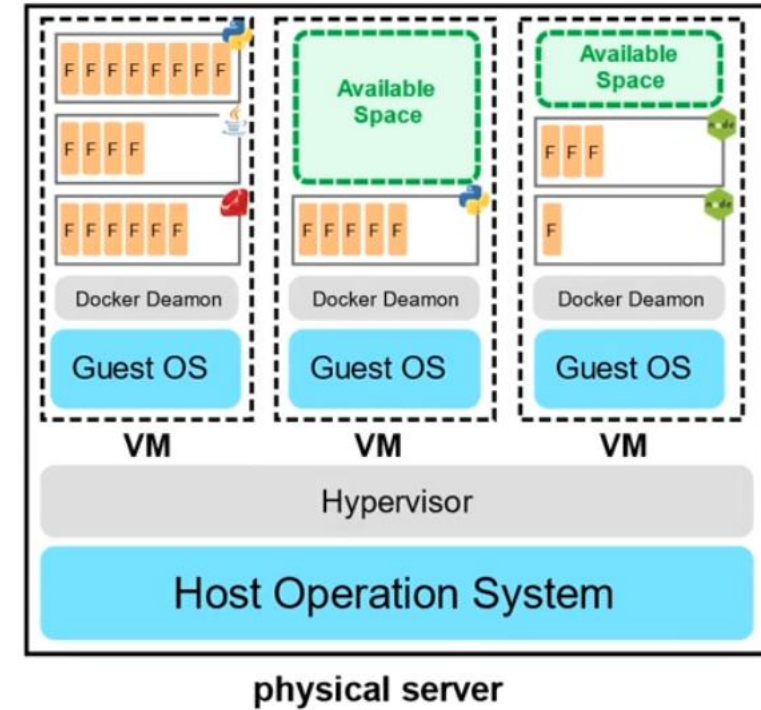

physical server

- ✓ Multiple VMs on single machine
- ✓ Pay for part of server
- ✓ Costly as you overpay for underutilised compute as well

Containers

- ✓ VMs running containers
- ✓ Multiple apps can run side by side
- ✓ Server based

Functions

- ✓ Serverless Compute
- ✓ Cost effective, pay as you run/use
- ✓ Cold-Starts

Cloud Services Types

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.

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# 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.

Cloud Hosting

	Cost	Security	Level of Configuration	Technical Knowledge
Public Cloud	👍 Most cost-effective	👍 Security Controls by Default 👎 Might not meet security requirements	👎 Limited based on what the Cloud Service Provider exposes to you.	👍 You don't need in-depth knowledge of underlying infrastructure
Private Cloud	👎 Most expensive	👎 no guarantee its secure 👍 can meet any security compliance requirement if you put in the work.	👍 You can configure the infrastructure however you like.	👎 You need to know in-depth how to configure all levels of your infrastructure
Hybrid	👍👎 Could be more cost-effective based on what you offload to the cloud.	👎 you now have to secure your connection to the cloud 👍 can meet all security requirements	👍 You get the best of both worlds.	👎 You need to know in-depth how to configure all levels of your infrastructure and know the CSPs services.

Why Cloud?

Capex **vs** **Opex**
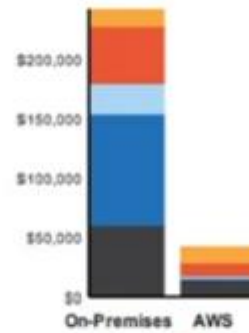
Cloud Architecture Terminology

Availability - Your ability to ensure a service remains available
Highly Available (HA)

Scalability – Your ability to grow rapidly or unimpeded

Elasticity – Your ability to shrink and grow to meet the demand

Fault Tolerance – Your ability to prevent a failure

Disaster Recovery - Your ability to recover from a failure
Highly Durable (DR)

High Availability
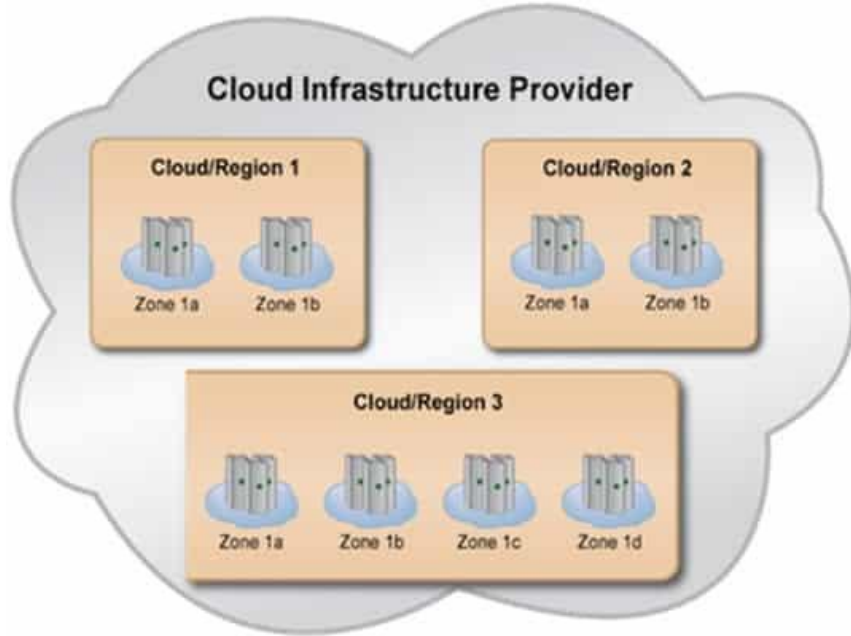
Cloud Infrastructure Provider

Cloud/Region 1
- Zone 1a
- Zone 1b

Cloud/Region 2
- Zone 1a
- Zone 1b

Cloud/Region 3
- Zone 1a
- Zone 1b
- Zone 1c
- Zone 1d

Scalability

Vertical Scaling
Scaling **Up**

Horizonal Scaling
Scaling **Out**

Elasticity

Compute

Amazon Elastic Compute Cloud (Amazon EC2)

Amazon EC2	Instance	Instances	AMI	DB on Instance	Instance with CloudWatch	Elastic IP

Amazon Elastic MapReduce

Amazon Elastic MapReduce	Cluster	HDFS Cluster	Auto Scaling

Auto Scaling

Storage

Amazon Simple Storage Service (Amazon S3)

Amazon S3	Bucket	Bucket with Objects	Object

Amazon Elastic Block Storage (Amazon EBS)

Amazon Elastic Block Storage (EBS)	Volume	Snapshot

AWS Import/Export

AWS Import/Export

AWS Storage Gateway Service

AWS Storage Gateway Service

AWS Glacier

Amazon Glacier

Database

Amazon DynamoDB

DynamoDB	Table	Item	Items	Attribute	Attributes

Amazon Relational Database Service (Amazon RDS)

Amazon RDS	RDS DB Instance	RDS DB Instance Standby (Multi-AZ)	RDS DB Instance Read Replica	MySQL DB Instance	Oracle DB Instance

Amazon ElastiCache

Amazon ElastiCache	ElastiCache Cache Node

Networking

Amazon Route 53

Amazon Route 53	Hosted Zone	Route Table

Amazon Elastic Load Balancing

Elastic Load Balancer

AWS Direct Connect

AWS Direct Connect

Amazon Virtual Private Cloud (VPC)

Amazon VPC	Router	Internet Gateway	Customer Gateway	VPN Gateway	VPN Connection

Content Delivery

Amazon Cloudfront

Amazon Cloudfront	Download Distribution	Streaming Distribution	Edge Location

Elastic Network Instance

Elastic Network Instance

Application Services

Amazon Simple Queue Service (SQS)

Amazon SQS	Queue	Message

Amazon Cloudsearch

Amazon CloudSearch

Amazon Simple Email Service (SES)

Amazon SES	Email

Amazon Simple Workflow (SWF)

Amazon SWF	Decider	Worker

Amazon Simple Notification Service (SNS)

Amazon SNS	Email Notification	HTTP Notification	Topic

Deployment and Management

Amazon Elastic Beanstalk

Amazon Elastic Beanstalk	Application

AWS Identity and Access Management (IAM)

AWS IAM	IAM Add-on

AWS CloudFormation

AWS CloudFormation	Template	Stack

Monitoring

Amazon CloudWatch

Alarm	Amazon CloudWatch

Non-Service Specific

AWS Cloud	AWS Management Console	User	Users	Internet	Client	Mobile Client	Multimedia	Traditional Server	Corporate Data Center

Groups

Auto scaling Group	Availability Zone	Region	Security Group	Elastic Beanstalk Container	EC2 Instance Contents	VPC Subnet	Server Contents	Virtual Private Cloud	AWS Cloud	Corporate Data Center

Available AWS Certifications

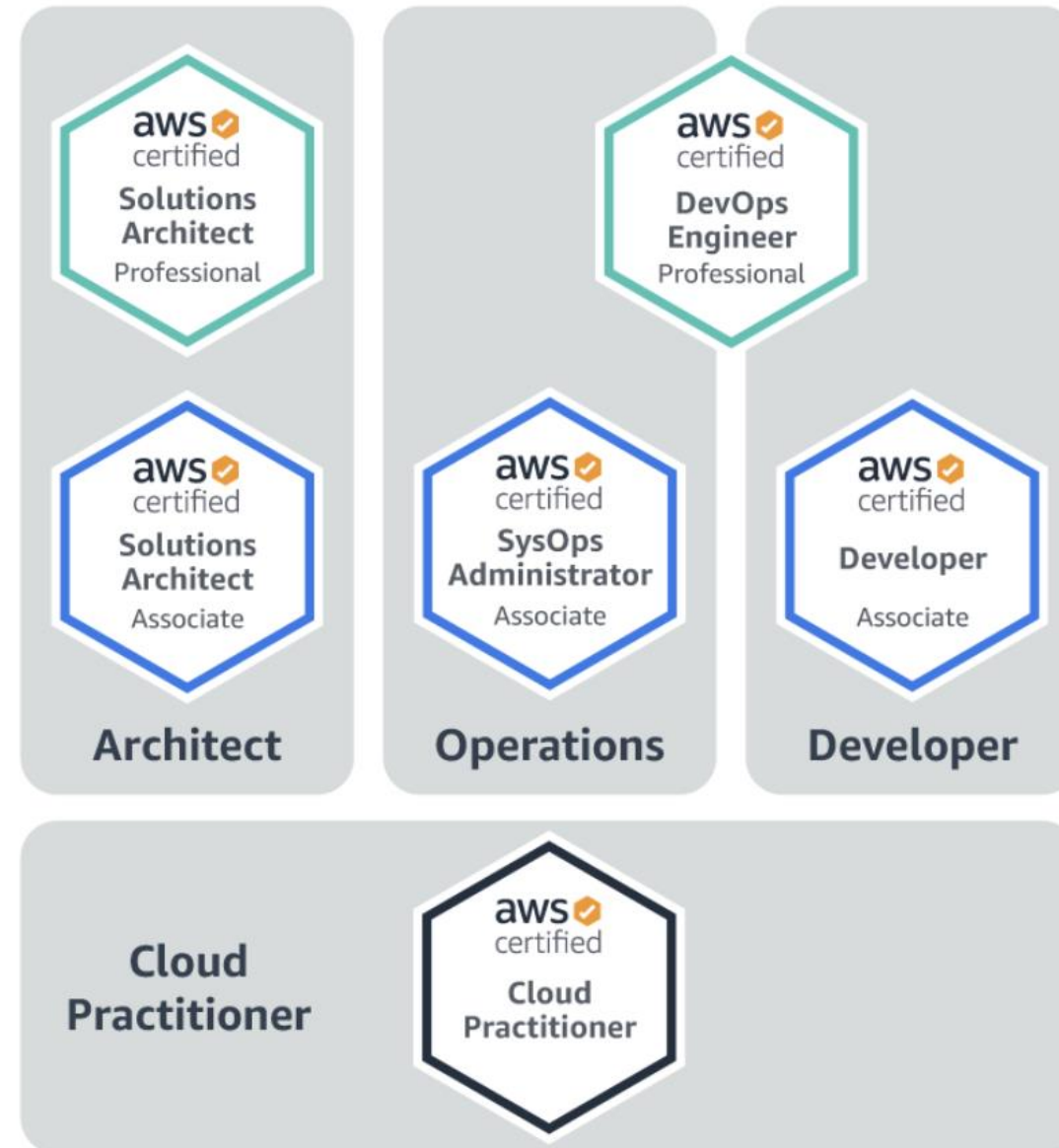aws certified
Updated May 2019

Professional
Two years of comprehensive experience designing, operating, and troubleshooting solutions using the AWS Cloud

Associate
One year of experience solving problems and implementing solutions using the AWS Cloud

Foundational
Six months of fundamental AWS Cloud and industry knowledge

Specialty
Technical AWS Cloud experience in the Specialty domain as specified in the **exam guide**

Architect
- aws certified **Solutions Architect** Professional
- aws certified **Solutions Architect** Associate

Operations
- aws certified **SysOps Administrator** Associate

Developer
- aws certified **DevOps Engineer** Professional
- aws certified **Developer** Associate

Cloud Practitioner
- aws certified **Cloud Practitioner**

Specialty
- aws certified **Advanced Networking** Specialty
- aws certified **Big Data** Specialty
- aws certified **Security** Specialty
- aws certified **Machine Learning** Specialty
- aws certified **Alexa Skill Builder** Specialty

Fundamentals

Microsoft Certified Azure Fundamentals

AZ-900
Fundamentals

Associate

Administrator
- AZ-103

Developer
- AZ-203

AI Engineer
- A1-100

Data Scientist
DP-100

Data Engineer
- DP-200
- DP-201

Security
- AZ-500

Expert

Solutions Architect Expert
- AZ-300
- AZ-301

DevOps Engineer Expert
- AZ-400

Specialty
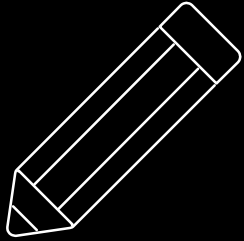
Azure for SAP Workloads
- AZ-120

IoT Developer
- AZ-220

TO-DO

1)Create a Free Tier account
2)Understand the category of services

Next

1) EC2 – Elastic Cloud Computing
2) S3 - Simple Storage Service