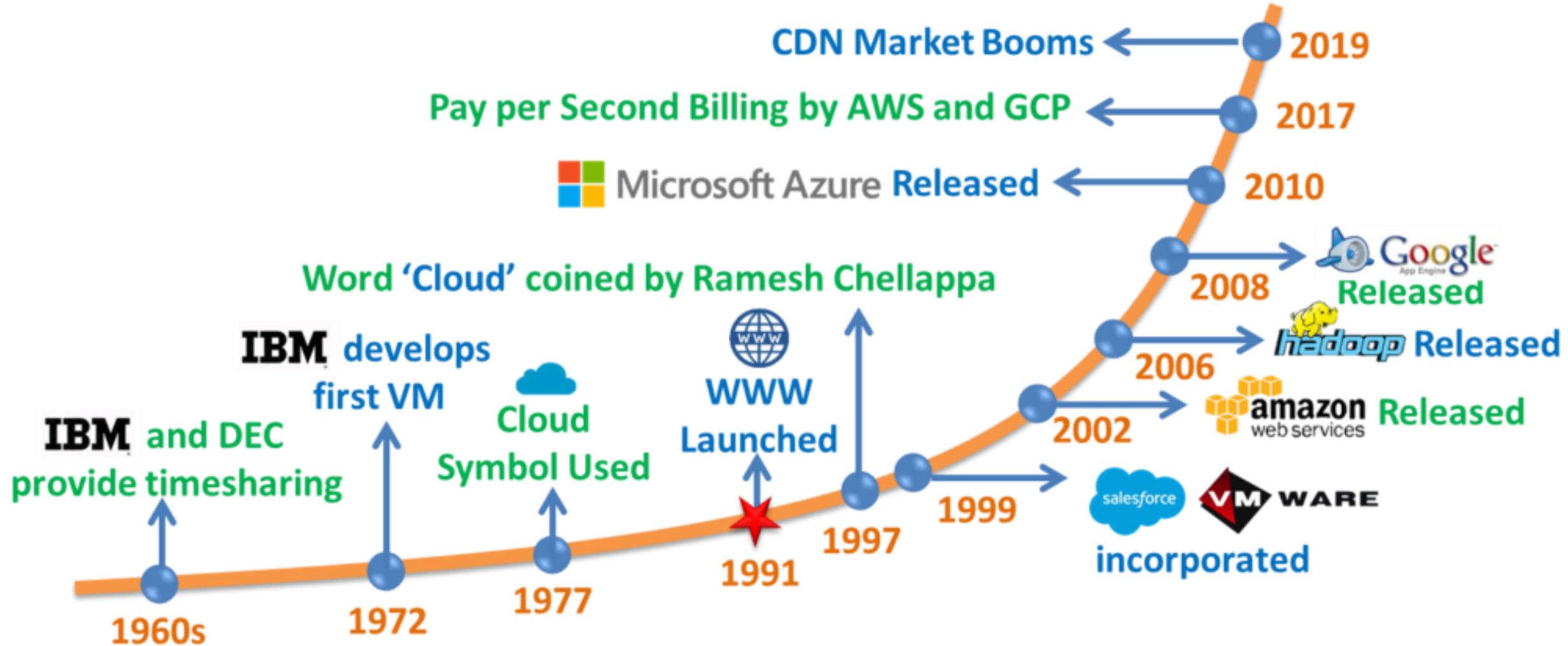




# Cloud Computing- AWS

Amith Ashokan

# History Of Cloud Computing:



# Earlier Challenges with Computing

- ▶ **Setup Cost:  
Heavy Investment for Setup**
- ▶ **Resource Intensive**
- ▶ **Scalability to Core business**
- ▶ **Security Risk**



# Cloud computing with AWS

- ❑ Most functionality
- ❑ Largest community of customers and partners
- ❑ Most secure
- ❑ Fastest pace of innovation



# Careers in Cloud Technologies



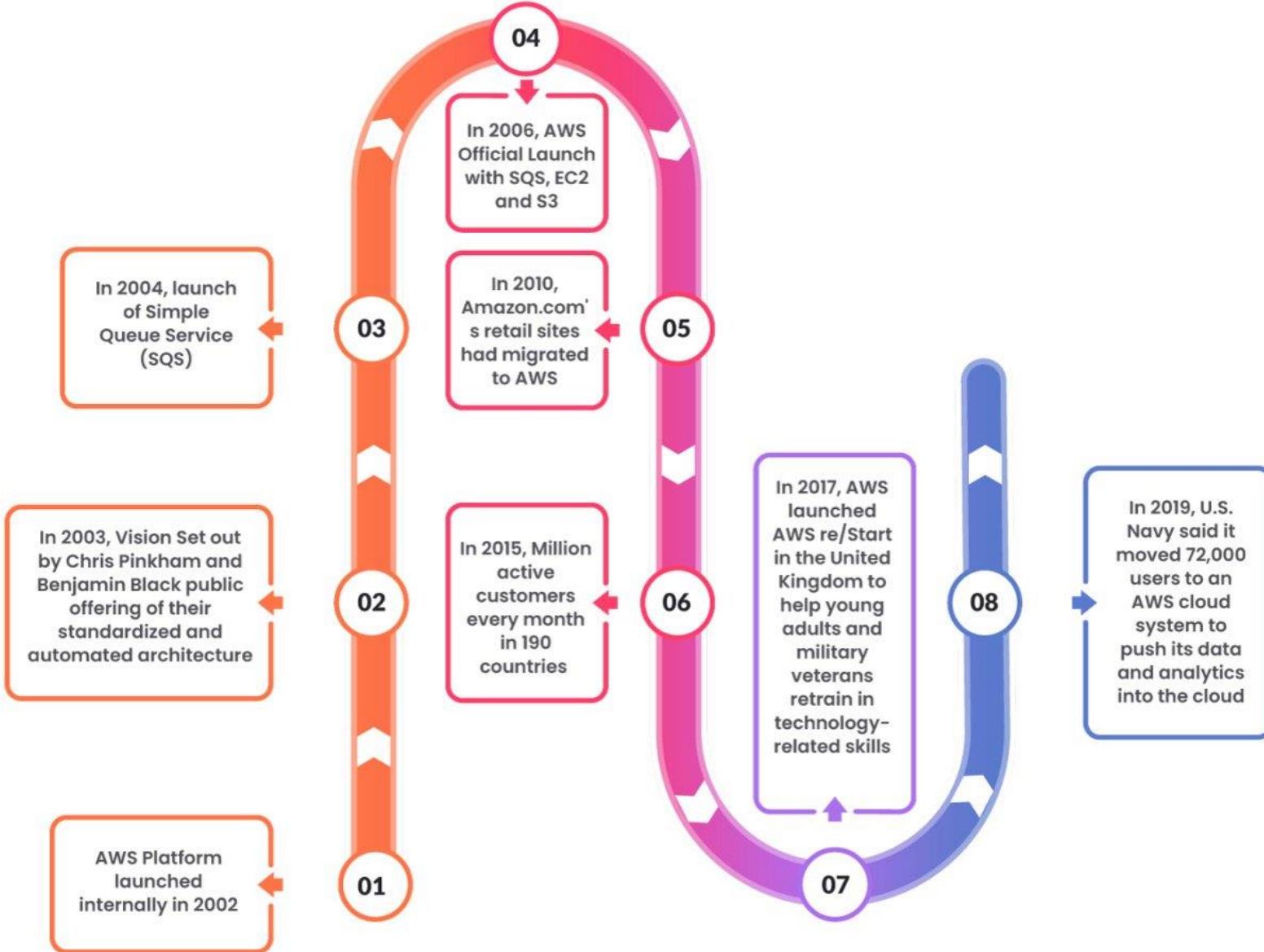
- ▷ **Computer System Analyst**
  - ▷ **Cloud Network Engineer**
  - ▷ **Cloud Solutions Architect**
- ... many more.

# What Motivates You?

What are Top 5 Best Paying Related AWS Jobs in the U.S.

Job Title	Annual Salary	Weekly Pay
AWS Solution Architect Professional	\$163,525	\$3,145

# Quick History Of AWS:



# AWS Regions:



# What is Cloud Computing : Know –How



**Cloud computing refers to the practice of utilizing remote servers over the internet to access and employ computer services, such as program execution or data storage, rather than relying on local resources on one's own device.**

# Characteristics Cloud Computing

- Broad Network Access**
- On-Demand Self-Service**
- Resource Pooling**
- Rapid Elasticity**
- Measured Service**

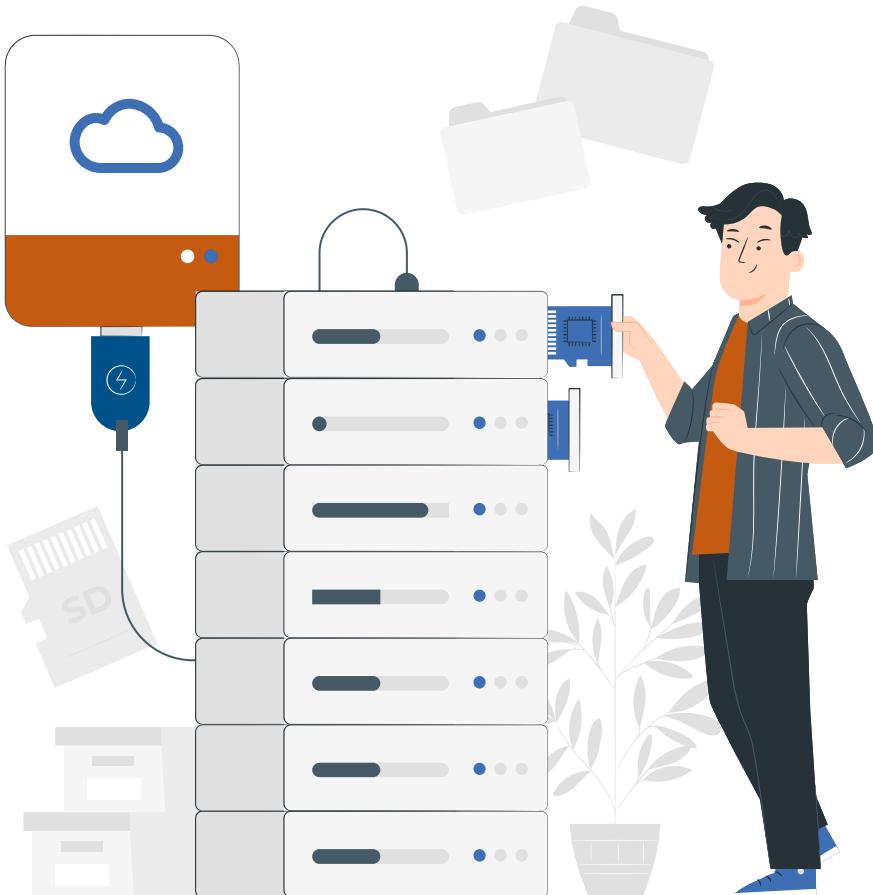


# Cloud Computing : Delivery Models



- ▷ **Software as a Service (SaaS)**
- ▷ **Platform as a Service (PaaS)**
- ▷ **Infrastructure as a Service (IaaS)**

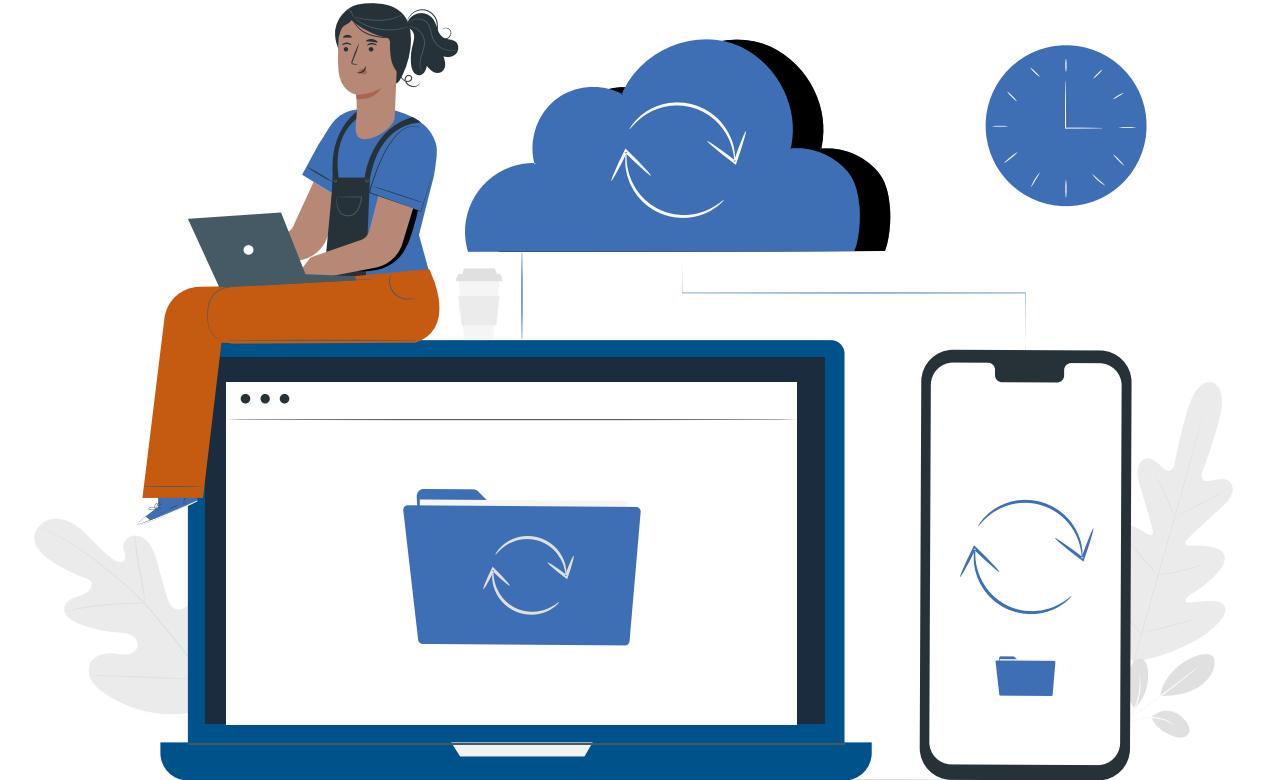
# Infrastructure as a Service (IaaS)



**IaaS (Infrastructure as a Service)** involves the utilization of essential computing resources, including processing capabilities, storage capacity, networking components, and middleware, by the user.

# Platform as a Service (PaaS)

**PAAS (Platform as a Service)  
involves the utilization of a  
hosting environment by the  
consumer for their  
applications.**

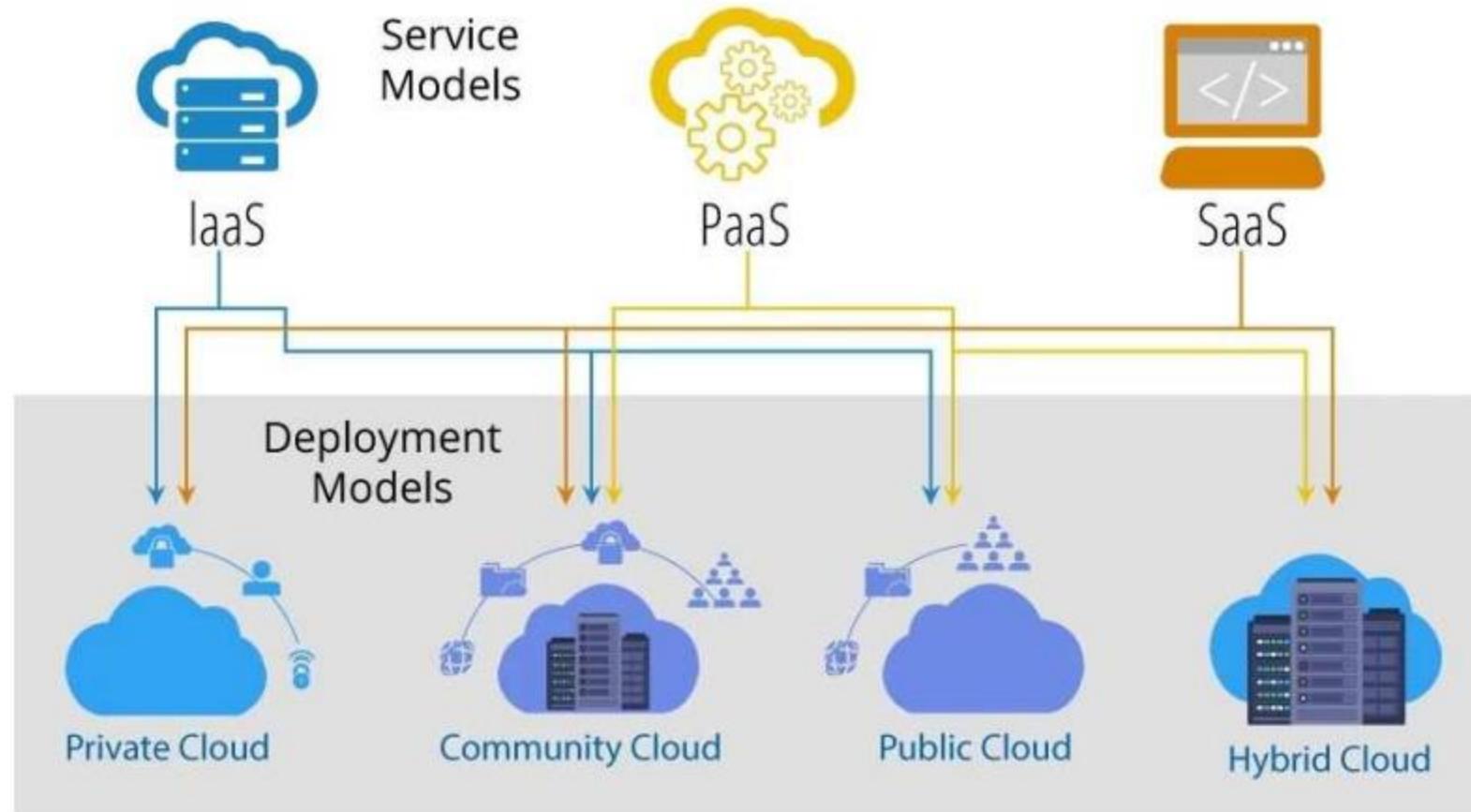


# Software as a Service (SaaS)

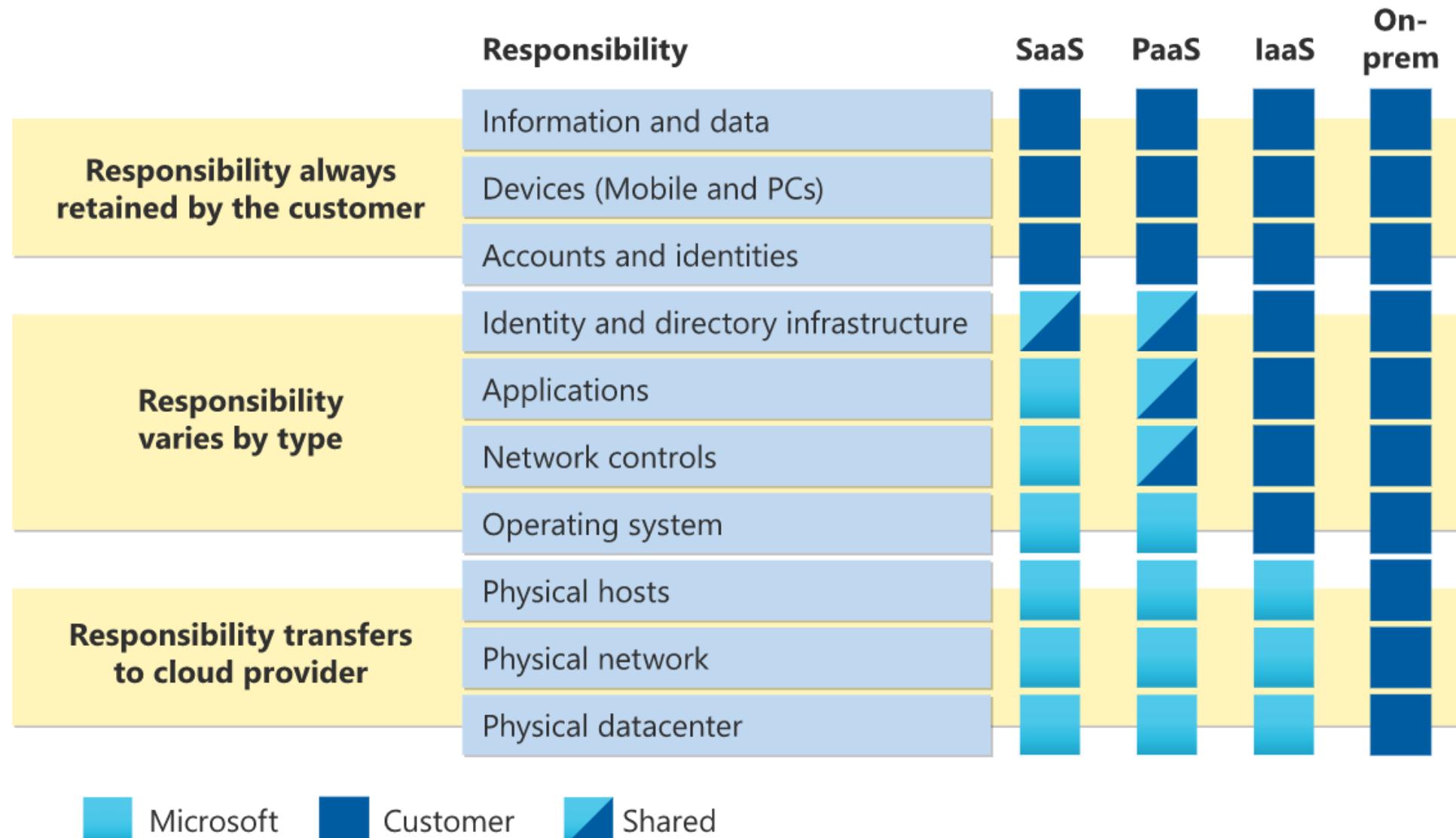


**SAAS (Software as a Service)** involves the utilization of an application by the consumer, without having control over the underlying operating system, hardware, or network infrastructure on which it operates.

# Cloud Computing models

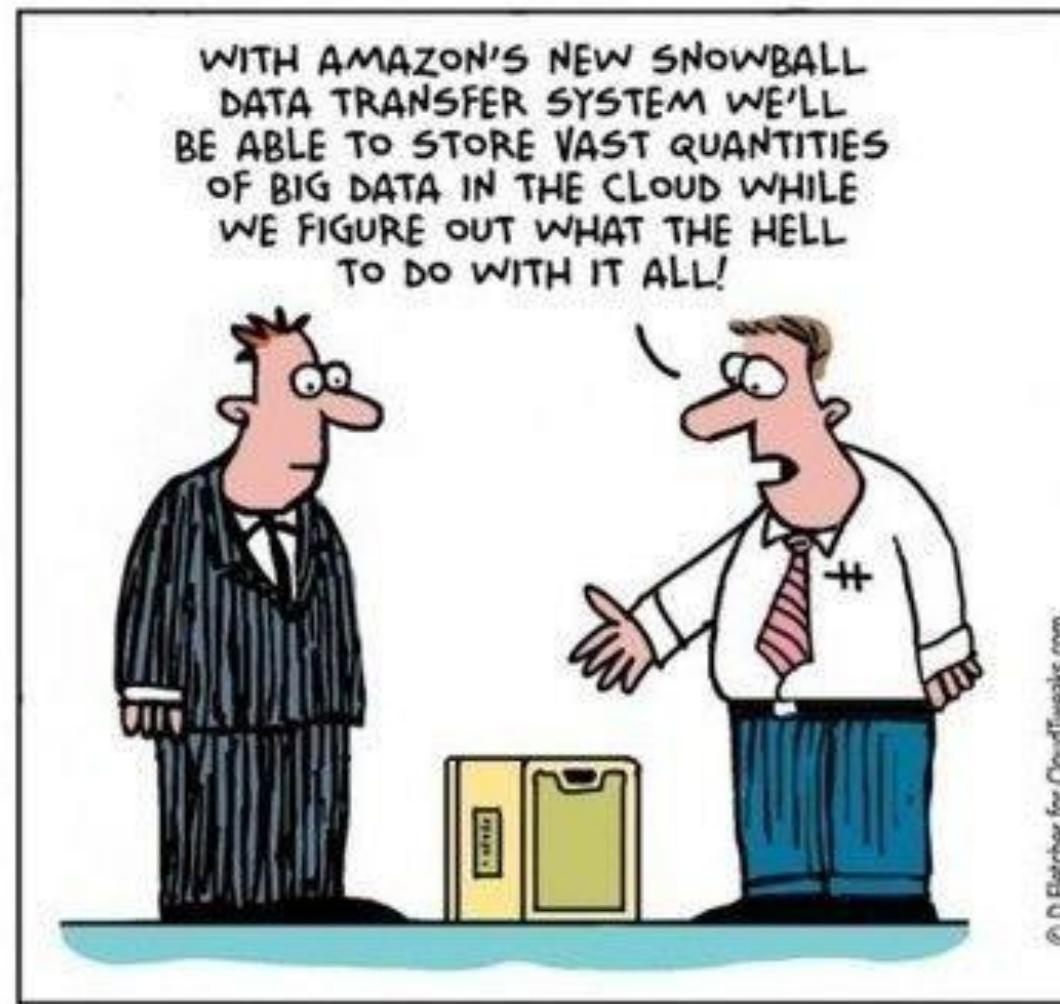


# Understanding : The Responsibility Model –(ref.Microsoft/AWS)

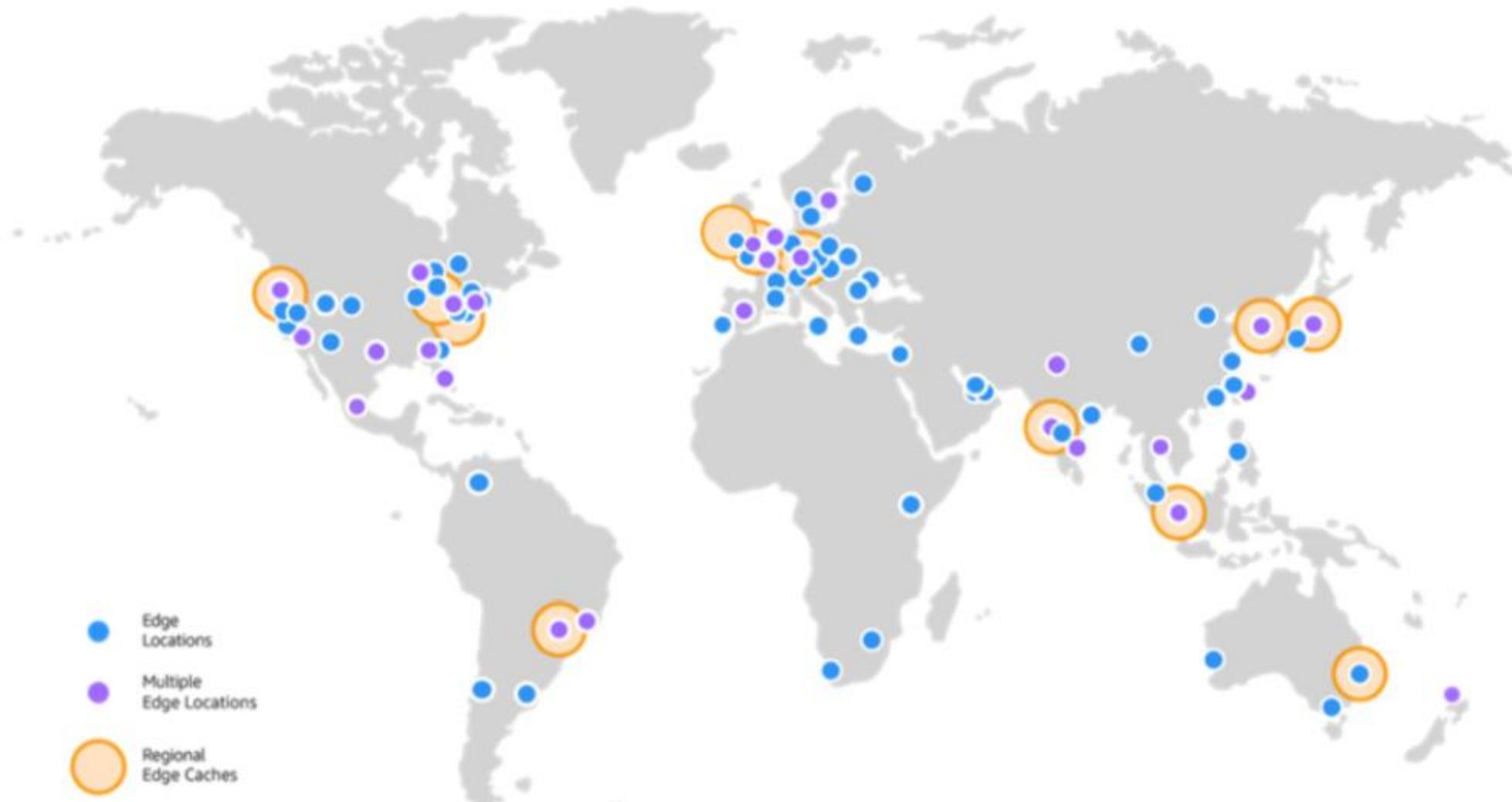


Ref: Microsoft

# Cloud Computing Implementation



# Edge Locations



# Data Movement

## Data movement

AWS Database Migration Service (AWS DMS) | Snowball | Snowmobile | Kinesis Data Firehose | Kinesis Data Streams | Amazon MSK

### Data lake



Amazon S3 Glacier



Lake Formation  
Data lakes

AWS Glue

ETL & AWS Glue Data Catalog

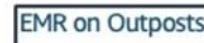
### Analytics



Amazon Redshift  
Data warehousing



Amazon EMR  
Hadoop + Spark



Amazon Athena  
Interactive analytics



OpenSearch Service  
Real-time search, monitoring,  
and analysis of business and  
operational data



Kinesis Data Analytics  
Real time



Aurora  
MySQL, PostgreSQL



Amazon RDS  
MySQL, PostgreSQL,  
MariaDB, Oracle, SQL  
Server,  
RDS on VMware



DynamoDB  
Key value, Document



Amazon DocumentDB  
Document



Neptune  
Graph



Amazon QLDB  
Ledger Database



ElastiCache  
Redis, Memcached



Timestream  
Time Series



\* Amazon Keyspaces  
Wide column

### Business intelligence & machine learning

AWS Data Exchange  
Data exchange

QuickSight  
Visualizations

SageMaker  
ML

Amazon Comprehend  
NLP

Amazon Transcribe  
Speech-to-text

Amazon Textract  
Extract text

Amazon Personalize  
Recommendation

Forecast  
Forecasts

Amazon Translate  
Translation

CodeGuru  
Code reviews

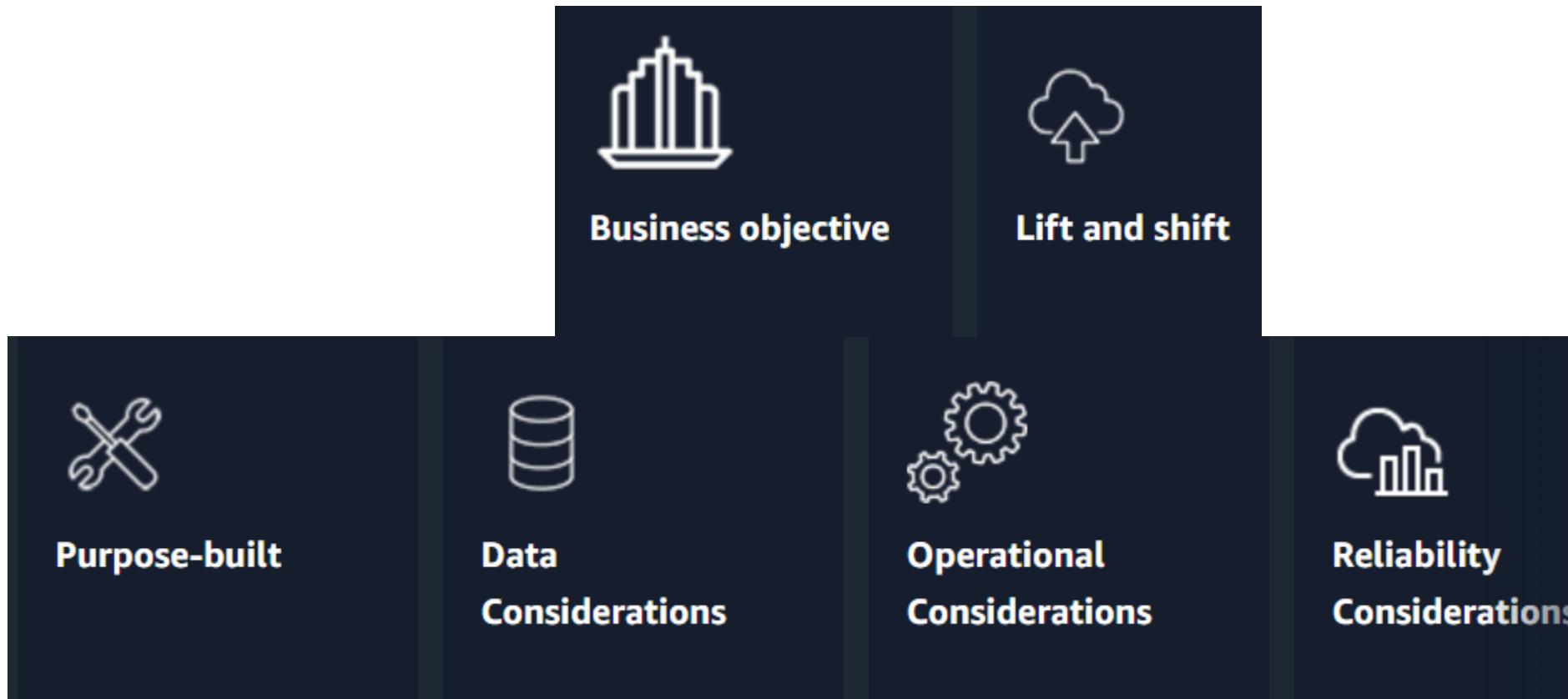
Amazon Kendra  
Enterprise search

# Use Case : Logistics and Project Management in the Cloud

- ▷ **Manage with Cloud**
  - Storage
  - Virtual Machine
  - Kubernetes Service
  - ... Many more



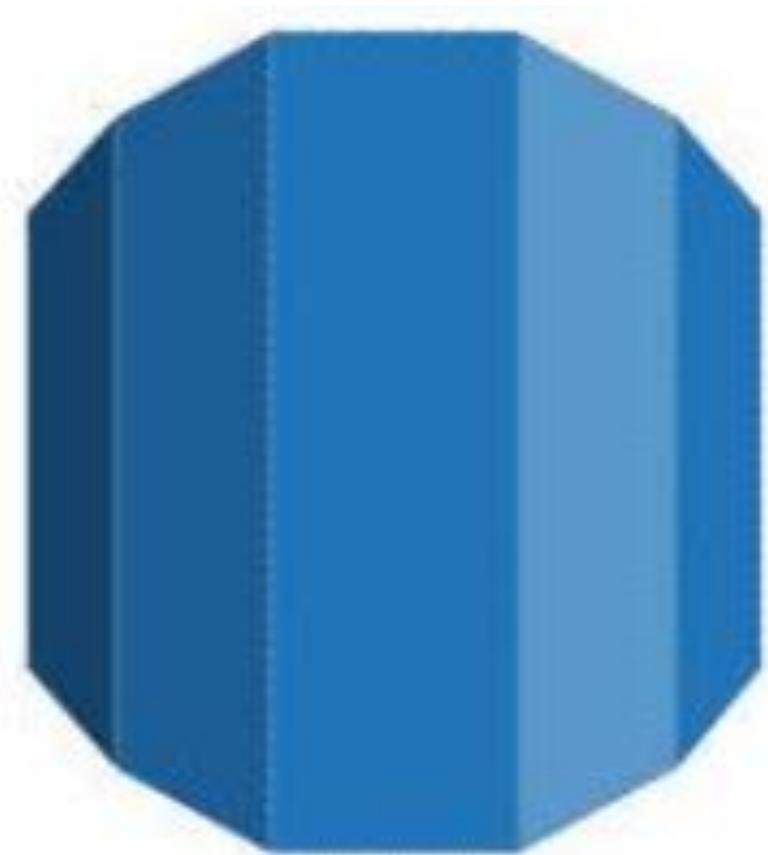
# How to Choose a Database on AWS



<https://aws.amazon.com/getting-started/decision-guides/databases-on-aws-how-to-choose/>

# Amazon Relational Database Service: Amazon RDS

- Scalability**
- Automated Backups and Recovery**
- Multi-AZ deployment**
- Easy Management**
- Security**



Amazon RDS

# DO's and Don'ts Of Cloud Computing

## DO'S

Strategize your cloud migration

Review cloud computational models

Include automated testing

Remember the risk and compliances



## DON'TS

Assume everything should move to the cloud

Forget about security

Start the project with rigid views of the outcome

Overlook the importance of a governance infrastructure

# Understanding cloud environments and technologies

## □ Public clouds



Pools of virtual resources developed from hardware owned and managed by a third party company like Amazon Web Services (AWS), Google Cloud, IBM, and Microsoft. These resources are automatically provisioned and allocated among multiple clients through self-service interfaces. .

<https://www.redhat.com/rhdc/managed-files/ma-hybrid-cloud-automation-e-book-f32113-202210-en.pdf>  
<https://www.pragimtech.com/blog/cloud/what-is-a-hybrid-cloud/>

# Understanding cloud environments and technologies

## Public Cloud

### Benefits

- No upfront capex
- Pay as you go
- No maintenance
- Highly scalable
- Highly reliable

### Limitations

- Low visibility and control
- Compliance and legal risks
- Cost concerns

### Use Case

- Unlimited scalability
- Varying peak demands
- Fast growing businesses
- Backup & disaster recovery solutions

# Understanding cloud environments and technologies

## **Private clouds**

Cloud environments that are dedicated to a single end user group or organization. They are typically owned and managed by the organization and operated within its firewall.



# Understanding cloud environments and technologies

## Private Cloud

### Benefits

- Better security
- Better control
- Predictable costs
- Legal compliance

### Limitations

- Limited scalability
- Huge initial capex
- Limited access

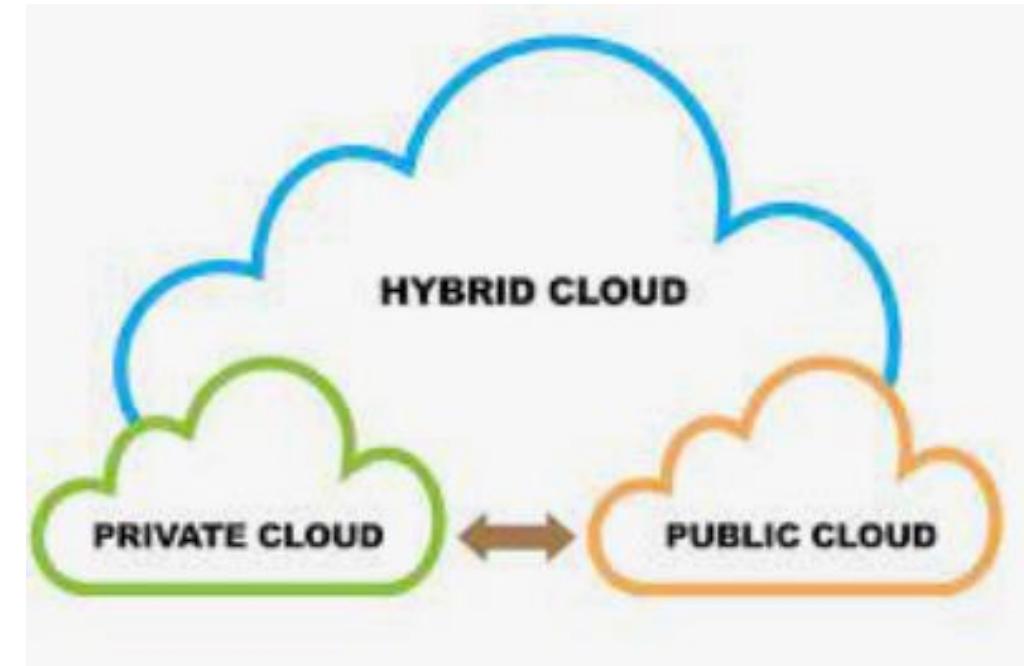
### Use Case

- Highly regulated businesses
- Tech companies that require complete control
- Large companies that require custom solutions

# Understanding cloud environments and technologies

## □ Hybrid clouds

IT is a IT architecture that incorporates some degree of workload portability, orchestration, and management across two or more environments, including private cloud, public cloud, virtualized, and bare-metal environments..



## Hybrid Cloud

### Benefits

- Best of both the worlds
- Better Control
- Cost-effective

### Limitations

- Low visibility and control
- Additional complexity
- Compliance and legal risks
- Cost concerns

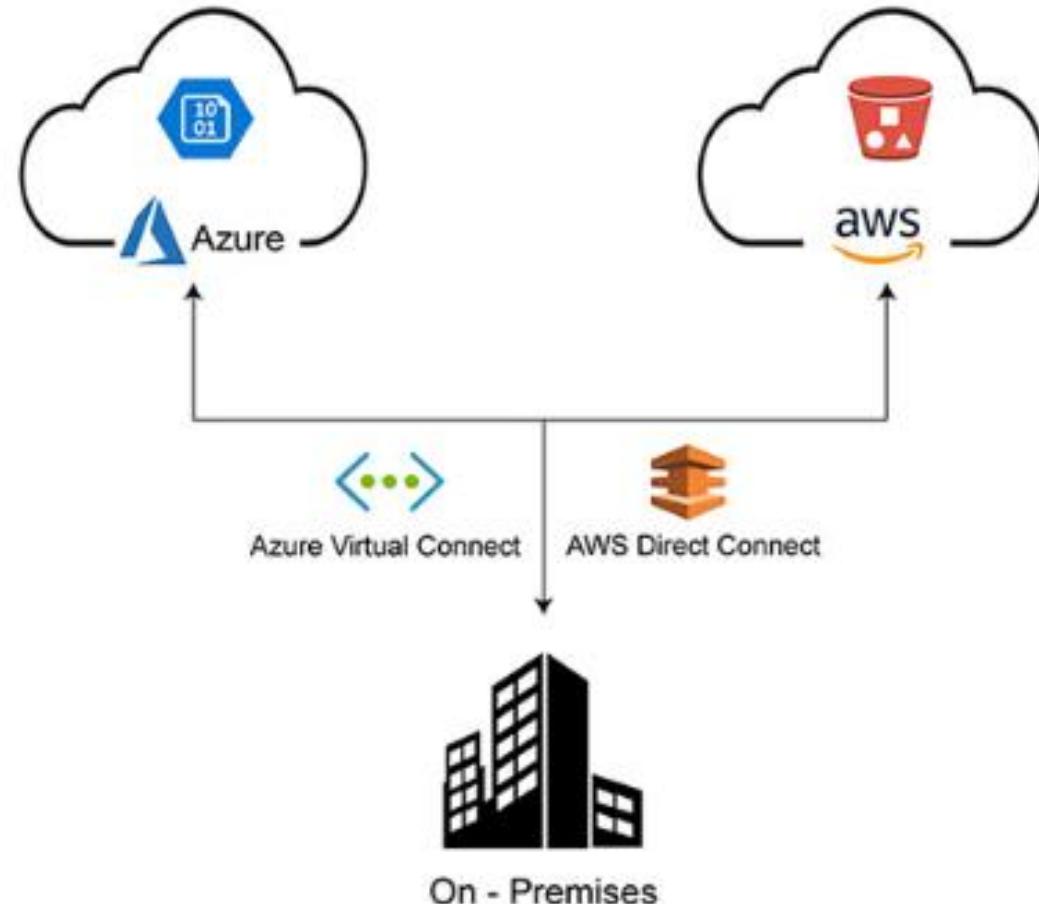
### Use Case

- Best of both the worlds
- Switch between different delivery models based on security & scalability requirements

# Understanding cloud environments and technologies

## □ Multi cloud

It is a cloud approach made up of more than one cloud service, from more than one private or public cloud vendor.



# Understanding cloud environments and technologies

## Community cloud



Community cloud computing refers to a shared cloud computing service environment that is targeted to a limited set of organizations or employees (such as banks or heads of trading firms).

# Understanding cloud environments and technologies

	<b>Private Cloud</b>	<b>Public Cloud</b>	<b>Hybrid Cloud</b>
Cloud Hardware	The entire cloud infrastructure (i.e the physical servers, storage, networking etc) must be procured by the organisation that owns the private cloud	The public cloud service provider like Amazon or Microsoft provides the infrastructure	For the private cloud, your organisation must provide the infrastructure whereas the public cloud service provider provides the infrastructure for the public cloud
Tenancy	Single-tenancy. A private cloud is usually used by a single organisation.	Multi-tenancy: A public cloud is used by multiple organizations.	The private part of the hybrid cloud is used by a single organisation. The public part of the hybrid cloud is used by multiple organisations.

<https://www.pragimtech.com/blog/cloud/private-vs-public-vs-hybrid-cloud/>

# Understanding cloud environments and technologies

	Private Cloud	Public Cloud	Hybrid Cloud
Data Center Location	Inside the organization's corporate network.	Anywhere on the Internet. Public cloud (like AWS and Azure) data centers for example, are typically located in many countries across the entire world.	The private cloud data center is typically inside the organisation's corporate network and the public cloud data center could be anywhere on the internet.
Scalability	Private cloud scalability is limited by the amount of infrastructure. Beyond certain point it is impossible to scale up, unless the organisation procures additional hardware and set it up.	We never run out of resources in a public cloud. It provides near-unlimited scalability.	The scalability of the private cloud services and resources is limited by the underlying available infrastructure, whereas with the public cloud services we do not have such a limitation.

# Understanding cloud environments and technologies

	Private Cloud	Public Cloud	Hybrid Cloud
Cloud Maintenance	The organization itself is responsible for setting up and maintaining the private cloud.	The cloud service provider is responsible for setting up and maintaining the public cloud. Organizations and even general public can use the public cloud services by paying a monthly fee.	The private cloud is managed by the organization that owns it where as the public cloud is managed by the cloud service provider.
Costs	Invloves huge initial capital expenditure as the organization must purchase all the cloud hardware, set it up and maintain there on. To maintain the private cloud, the organization needs to hire work force. So there is monthly operating expenditure as well.	With the public cloud there is no initial capital expenditure, but you pay a monthly fee for the public cloud services you use. The more you use the services, the more you have to pay. The overall price tag may be higher than what you anticipated, especially if you use lot of public cloud services for a long time.	With the private cloud, the organization is faced with both, the intital capital expenditure as well as monthly operating expenses to maintain it. With the public cloud you pay a monthly fee for the services and resources you use.
Accessibility	Only the organization that owns the private cloud can access private cloud resources and services.	A public cloud is exposed to the public. So, anyone can access it's resources and services.	Private cloud services can be accessed only by the organization that owns it where as public cloud services can be accessed by anyone.

## **Understanding : Cloud Computing**

### **What you mean by Cloud Scalability?**

Cloud scalability in cloud computing refers to the ability to increase or decrease IT resources as needed to meet changing demand.

Scalability is one of the hallmarks of the cloud and the primary driver of its exploding popularity with businesses.

## **Understanding : Cloud Computing**

### **What is the Concept of Time to Market(TTM) in Cloud Computing?**

Time to market (TTM) is the total length of time it takes to bring a product from conception to market availability. Companies use time-to-market metrics during new product development (NPD) and new product introduction (NPI) as they strive to gain first-mover advantages (e.g., market share, sales revenue).

.

## **Understanding : Content Delivery Network (CDN)**

**Customers use Amazon CloudFront to stream video to viewers across the globe using a wide variety of protocols that are layered on top of HTTP.**

The Amazon [Content Delivery Network \(CDN\)](#) can be used with AWS Elemental Media Services to implement two different types of video streaming.

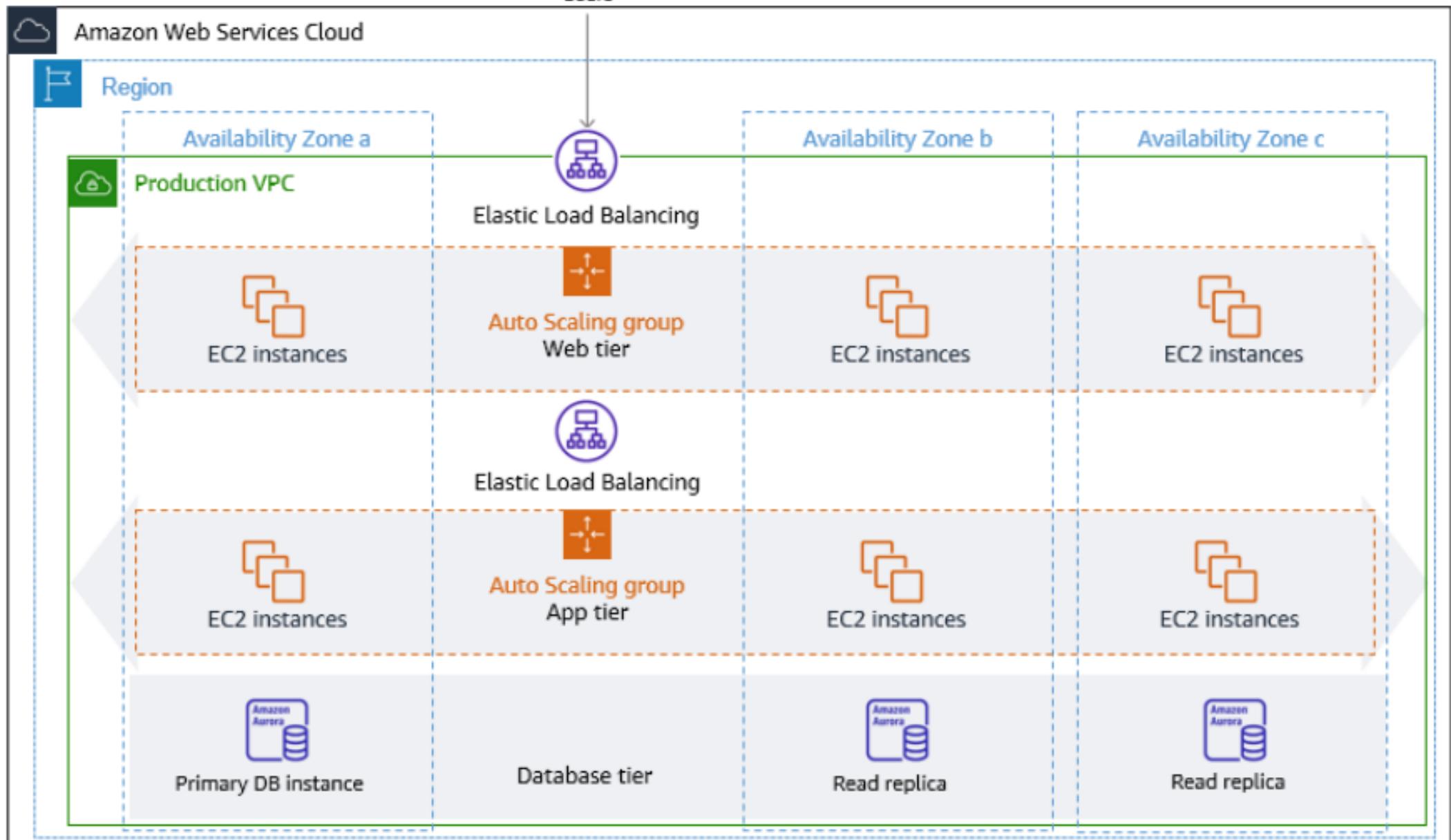
First, we will take a look at on-demand streaming of content stored in Amazon Simple Storage Service (Amazon S3).

After that, we'll examine live streaming of events or 24x7 channels.

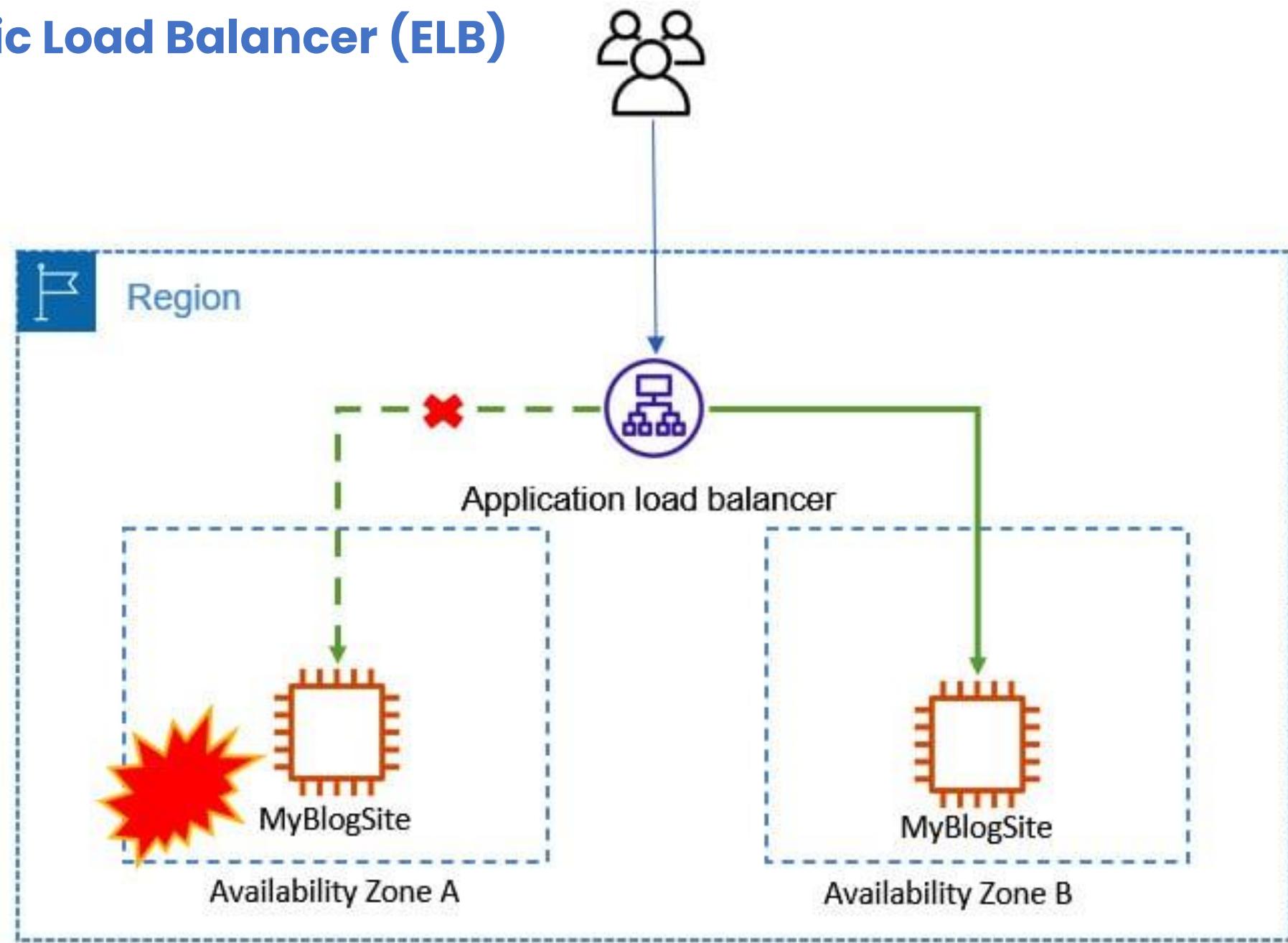
For best practices, read the [Amazon CloudFront for Media White Paper](#).

<https://aws.amazon.com/cloudfront/streaming/>

# Multi-Tier Architecture



# Amazon Elastic Load Balancer (ELB)



# All about Projects : WebApp on Amazon ECS

aws.amazon.com/getting-started/guides/deploy-webapp-ecs/

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Getting Started Resource Center Getting Started Community Learning AWS re:Post Libraries More Resources

## Deploy a Container Web App on Amazon ECS

TUTORIAL

1 INTRODUCTION  
2 UNDERSTANDING ECS  
3 DEPLOY APPLICATION  
4 CLEAN UP RESOURCES

### Introduction

Follow step-by-step instructions to build and deploy a container-based web application using Amazon Elastic Container Service (Amazon ECS)

## Overview

In this guide, you will learn how to deploy a containerized application on Amazon Elastic Container Service (Amazon ECS).

Amazon ECS is a fully managed container orchestration service that helps you easily deploy, manage, and scale containerized applications. It integrates with the rest of the AWS platform to provide a secure and easy-to-use solution for running container

✓ AWS experience	Beginner
⌚ Time to complete	15–20 minutes
\$ Cost to complete	Less than \$0.02 USD if completed in under an hour.

# All about Projects : WebApp on AWS Amplify

The screenshot shows a browser window displaying the AWS website at [aws.amazon.com/getting-started/guides/deploy-webapp-amplify/](https://aws.amazon.com/getting-started/guides/deploy-webapp-amplify/). The page title is "Deploy a Web Application on AWS Amplify". The main content area is titled "GETTING STARTED GUIDE" and contains four numbered steps: 1. CREATE AMPLIFY PROJECT, 2. CONNECT API, 3. AUTOMATE DEPLOYMENT, and 4. CLEAN UP RESOURCES. Each step has a corresponding icon and a link. To the right of the steps is a vertical sidebar with social sharing icons (Facebook, Twitter, LinkedIn) and a feedback button. At the bottom, there is an "Overview" section and a "Beginner" experience level indicator.

Deploy a Web Application on AWS Amplify

Getting Started Resource Center      Getting Started ▾      Community      Learning      AWS re:Post      Libraries ▾      More Resources ▾

## Deploy a Web App on AWS Amplify

### GETTING STARTED GUIDE

INTRODUCTION      CREATE AMPLIFY PROJECT      CONNECT API      AUTOMATE DEPLOYMENT      CLEAN UP RESOURCES

**1** CREATE AMPLIFY PROJECT      **2** CONNECT API      **3** AUTOMATE DEPLOYMENT      **4** CLEAN UP RESOURCES

**Introduction**  
Follow step-by-step instructions to build and deploy your first web application using AWS Amplify

Overview

In this guide, we will take you through deploying a web application with AWS Amplify.

AWS Experience: Beginner

# All about Projects : Run Serverless : AWS Lambda

← → ⌂ aws.amazon.com/getting-started/hands-on/run-serverless-code/?pg=gs&sec=lyfa

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Getting Started Resource Center Getting Started ▾ Community Learning AWS re:Post Libraries ▾ More Resources ▾

[Getting Started / Hands-on / ...](#)

# Run a Serverless "Hello, World!" with AWS Lambda

TUTORIAL

## Overview

In this tutorial, you will learn the basics of running code on AWS Lambda without provisioning or managing servers. We will walk through how to create a Hello World Lambda function using the AWS Lambda console. We will then show you how to manually invoke the Lambda function using sample event data and review your output metrics.

Everything done in this tutorial is [Free Tier](#) eligible.

✓ AWS experience	Beginner
⌚ Time to complete	10 minutes
\$ Cost to complete	Free Tier
↳ Requires	<ul style="list-style-type: none"><li>AWS account</li><li>Recommended browser: The latest version of Chrome or Firefox</li></ul>

[\*\*]Accounts created within the past 24 hours might not yet have access to the

# All about Projects : WebApp on Amazon ECS

aws.amazon.com/getting-started/guides/deploy-webapp-ecs/

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Getting Started Resource Center Getting Started Community Learning AWS re:Post Libraries More Resources

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TUTORIAL

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### Introduction

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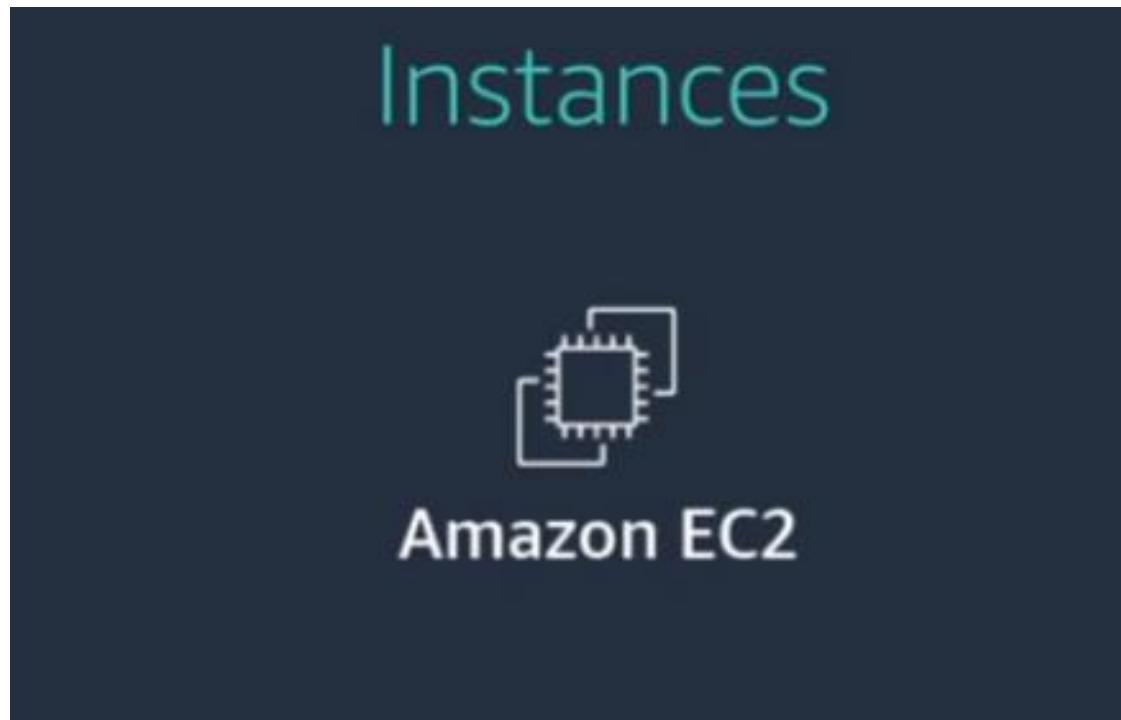
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✓ AWS experience	Beginner
⌚ Time to complete	15–20 minutes
\$ Cost to complete	Less than \$0.02 USD if completed in under an hour.

# What is AWS Instances ?



# Support Plan For AWS

Basic	Developer	Business	Enterprise
Offers only non-technical customer support	Technical support offered during business hours alone (8:00 a.m. to 6:00 p.m.—customer local time zone)	24/7 phone, email, and chat access to Cloud Support engineers	24/7 phone, email, and chat access to Cloud Support engineers
	General guidance offered within 24 business hours	General guidance offered within 24 hours	General guidance offered within 24 hours
	System impaired troubleshooting offered within 12 business hours	System impaired troubleshooting offered within 12 hours	System impaired-troubleshooting offered within 12 hours
		Production system-impaired support within 4 hours	Production system-impaired support within 4 hours
		Production system-down support within 1 hour	Production system-down support within 1 hour
			Business-critical-system down support within 15 minutes

## AWS : Cloud data lifecycle phases

Organizations can use AWS Cloud services in each stage of the data lifecycle to quickly and cost-effectively prepare, process, and present data to derive more value from it. The five data lifecycle stages include:

- Data ingestion,**
- Data staging,**
- Data cleansing,**
- Data analytics and visualization, and**
- Data archiving.**

<https://pages.awscloud.com/data-lifecycle-reference-guide.html>

# Introduction : EC2



← → ⌂ 🔒 us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Home: 🔎 🌐 ⭐ 🛡️ 🏆 🎉 🎯 🎵 🎧

Services  [Alt+S]

New EC2 Experience [Tell us what you think](#) N. Virginia

**EC2 Dashboard**

- EC2 Global View
- Events
- Tags
- Limits

**Instances**

- Instances
- Instance Types
- Launch Templates
- Spot Requests
- Savings Plans

**Resources**

You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:

Instances (running)	0	Auto Scaling Groups	0	Dedicated Hosts	0
Elastic IPs	0	Instances	3	Key pairs	3
Load balancers	0	Placement groups	0	Security groups	4
Snapshots	0	Volumes	3		

Easily size, configure, and deploy Microsoft SQL Server Always On availability groups on AWS using the AWS Launch Wizard for SQL Server. [Learn more](#) X

**Account attributes**

**Supported platforms**

- VPC

**Default VPC**   
vpc-071a44ac54f10b0e0

Settings

EBS encryption

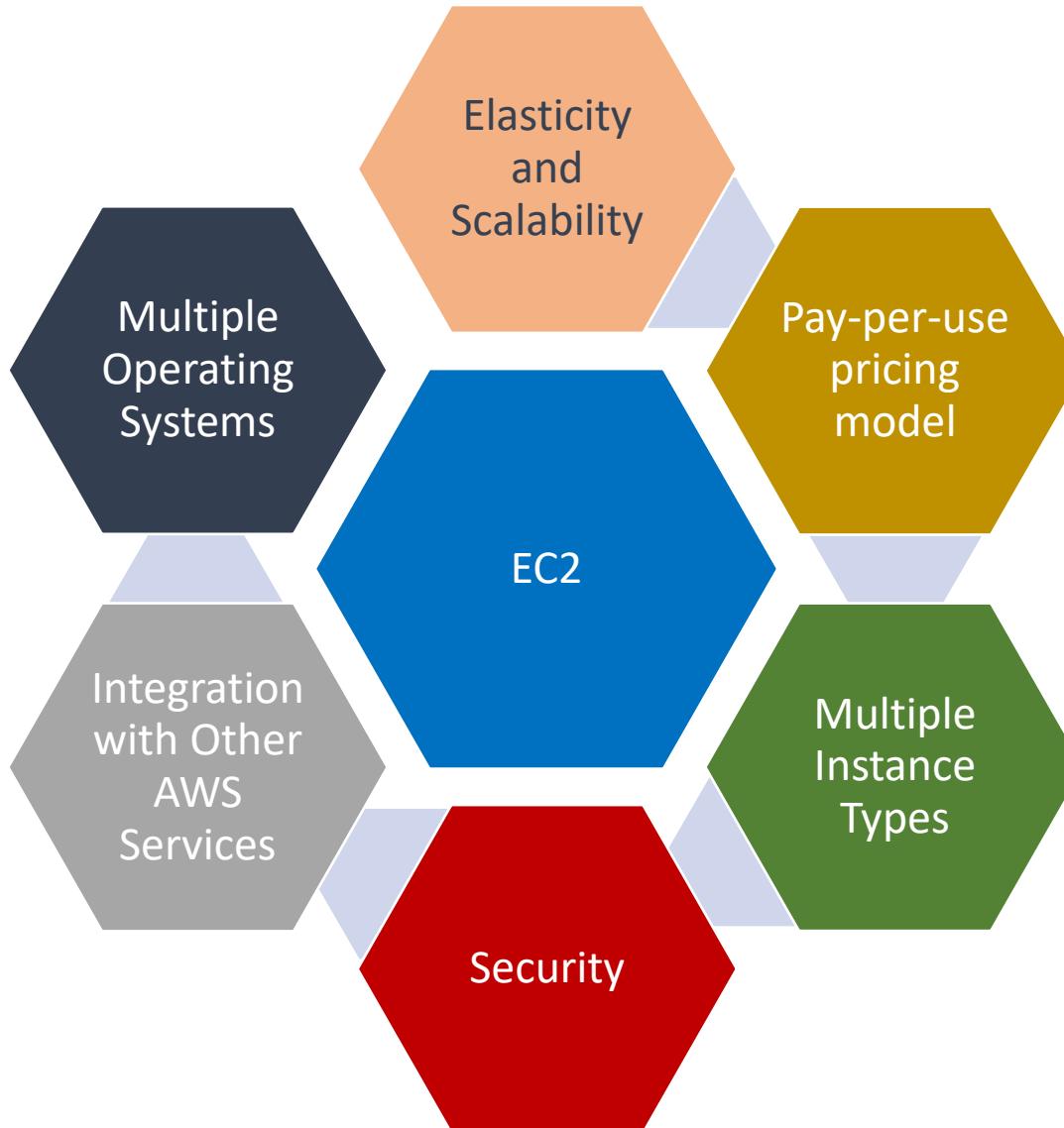
Zones

EC2 Serial Console

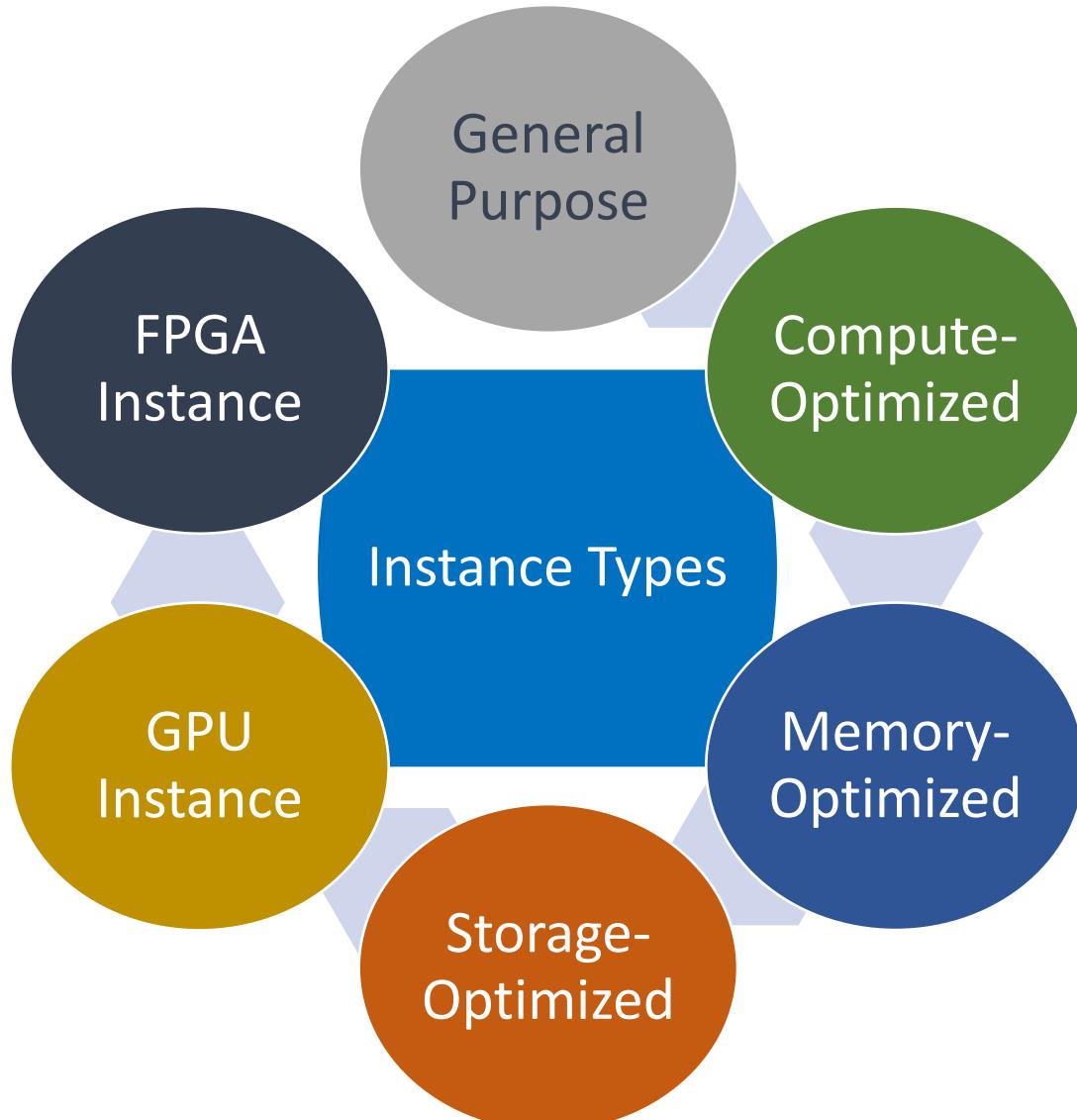
Default credit specification

Console experiments

# Introduction : Features of EC2



## EC2 Instance Types :



# Introduction : Creating New Images of Running Instances

le.aws.amazon.com/ec2/home?region=us-east-1#Home:

The screenshot shows the AWS EC2 Home page. At the top, there is a search bar with the placeholder text 'Search resources' and a button labeled '[Alt+S]'. Below the search bar, the word 'Resources' is displayed in bold. To the right of 'Resources' are three icons: 'EC2 Global view' with a magnifying glass icon, a circular refresh icon, and a gear icon. A message below the title states: 'You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:' followed by a grid of resource counts. The resources and their counts are: Instances (running) 0, Auto Scaling Groups 0, Dedicated Hosts 0; Elastic IPs 0, Instances 3, Key pairs 3; Load balancers 0, Placement groups 0, Security groups 4; Snapshots 0, Volumes 3. At the bottom of the page, there is a blue callout box containing the text: 'Easily size, configure, and deploy Microsoft SQL Server Always On availability groups on AWS using the AWS Launch Wizard for SQL Server. [Learn more](#)' with a close button 'X'.

Instances (running)	0	Auto Scaling Groups	0	Dedicated Hosts	0
Elastic IPs	0	Instances	3	Key pairs	3
Load balancers	0	Placement groups	0	Security groups	4
Snapshots	0	Volumes	3		

<https://docs.aws.amazon.com/imagebuilder/latest/userguide/create-images.html>

# Introduction : EC2 Image Builder

The screenshot shows the AWS EC2 Home page in the US East (N. Virginia) Region. The left sidebar includes links for EC2 Dashboard, Global View, Events, Tags, Limits, Instances (with sub-links for Instances, Instance Types, Launch Templates, Spot Requests, and Savings Plans), and a New EC2 Experience survey. The main content area displays a grid of resources: Instances (running) 0, Auto Scaling Groups 0, Dedicated Hosts 0, Elastic IPs 0, Instances 3, Key pairs 3, Load balancers 0, Placement groups 0, Security groups 4, Snapshots 0, and Volumes 3. A callout box provides information about creating Microsoft SQL Server Always On availability groups. The right sidebar lists Account attributes such as Supported platforms (VPC), Default VPC (vpc-071a44ac54f10b0e0), Settings, EBS encryption, Zones, EC2 Serial Console, Default credit specification, and Console experiments.

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Home:

New EC2 Experience  
Tell us what you think

EC2 Dashboard

EC2 Global View

Events

Tags

Limits

Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Services

Search [Alt+S]

EC2 Global view

Resources

You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:

Instances (running)	0	Auto Scaling Groups	0	Dedicated Hosts	0
Elastic IPs	0	Instances	3	Key pairs	3
Load balancers	0	Placement groups	0	Security groups	4
Snapshots	0	Volumes	3		

Easily size, configure, and deploy Microsoft SQL Server Always On availability groups on AWS using the AWS Launch Wizard for SQL Server. [Learn more](#)

Account attributes

Supported platforms

- VPC

Default VPC

vpc-071a44ac54f10b0e0

Settings

EBS encryption

Zones

EC2 Serial Console

Default credit specification

Console experiments

<https://docs.aws.amazon.com/imagebuilder/latest/userguide/create-images.html>

# AutoScaling : EC2

## Amazon EC2 Auto Scaling

Add or remove compute capacity to meet changing demand

Improve fault tolerance through automatic detection and replacement of unhealthy instances.

Increase availability with predictive or dynamic scaling policies with the right amount of compute capacity.

Optimize workload performance and cost by combining purchase options and instance types.

Reduce the complexity of configuration changes and application deployments with instance refresh.

 **Recommendation to not use launch configurations**

X

Amazon EC2 Auto Scaling no longer adds support for new EC2 features to launch configurations and will stop supporting new EC2 instance types after December 31, 2022. We recommend that customers using launch configurations migrate to launch templates. For more information, [see the documentation](#) 

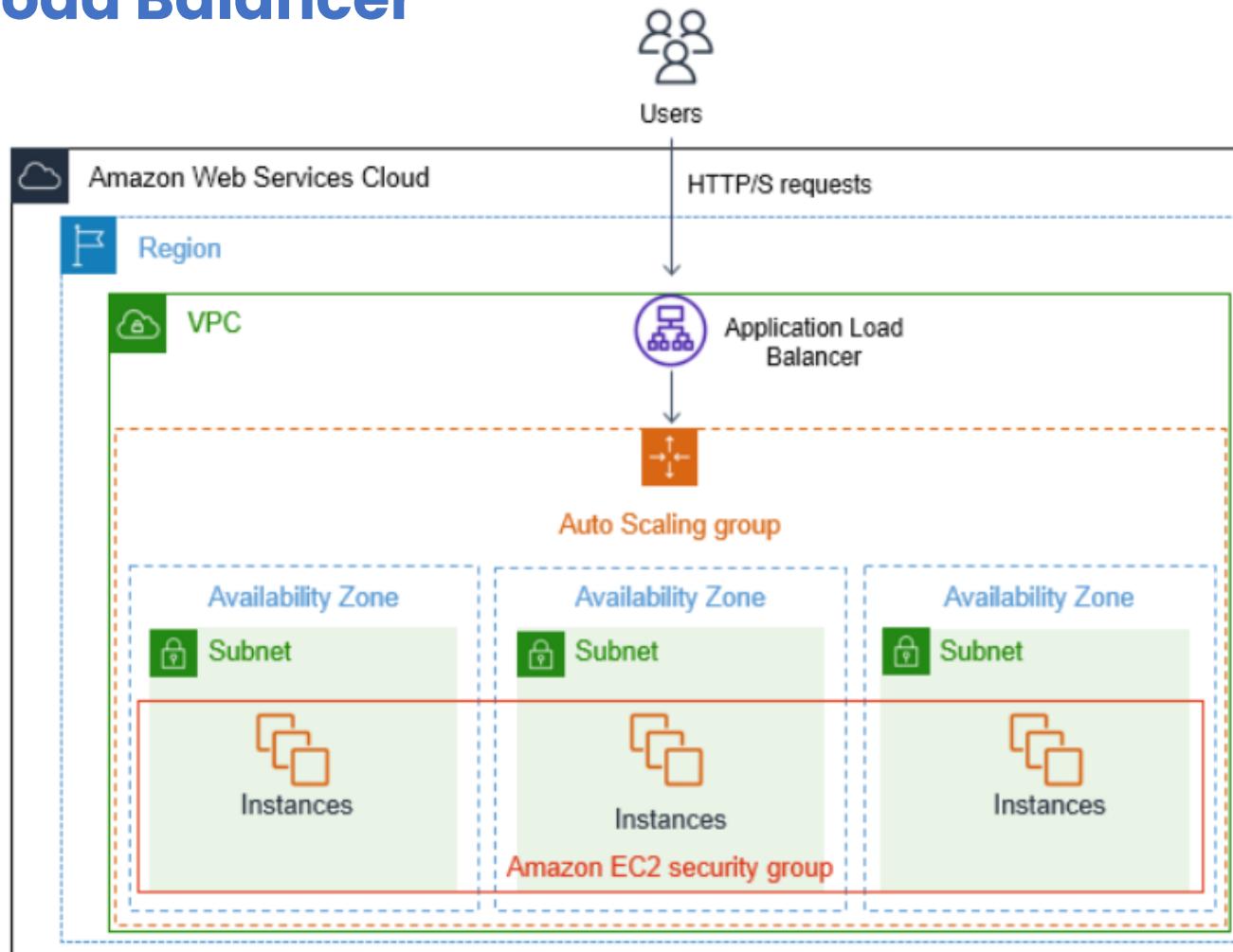
<https://docs.aws.amazon.com/autoscaling/ec2/userguide/get-started-with-ec2-auto-scaling.html>

# AWS : Elastic Beanstalk

AWS Elastic Beanstalk makes it even easier for developers to quickly deploy and manage applications in the AWS Cloud. Developers simply upload their application, and Elastic Beanstalk automatically handles the deployment details of capacity provisioning, load balancing, auto-scaling, and application health monitoring.



# EC2 : Auto Scaling Load Balancer



<https://docs.aws.amazon.com/autoscaling/ec2/userguide/tutorial-ec2-auto-scaling-load-balancer.html>

## AMI : Amazon Machine Image



An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance.

# AMI : Amazon Machine Image

EC2 > Instances > Launch an instance > AMIs

## Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Search for an AMI by entering a search term e.g. "Windows" Clear

[Quickstart AMIs \(47\)](#) Commonly used AMIs    [My AMIs \(0\)](#) Created by me    [AWS Marketplace AMIs \(7651\)](#) AWS & trusted third-party AMIs    [Community AMIs \(500\)](#) Published by anyone

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**Refine results**

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[Free tier only](#) Info

[▼ OS category](#)

[... more](#)

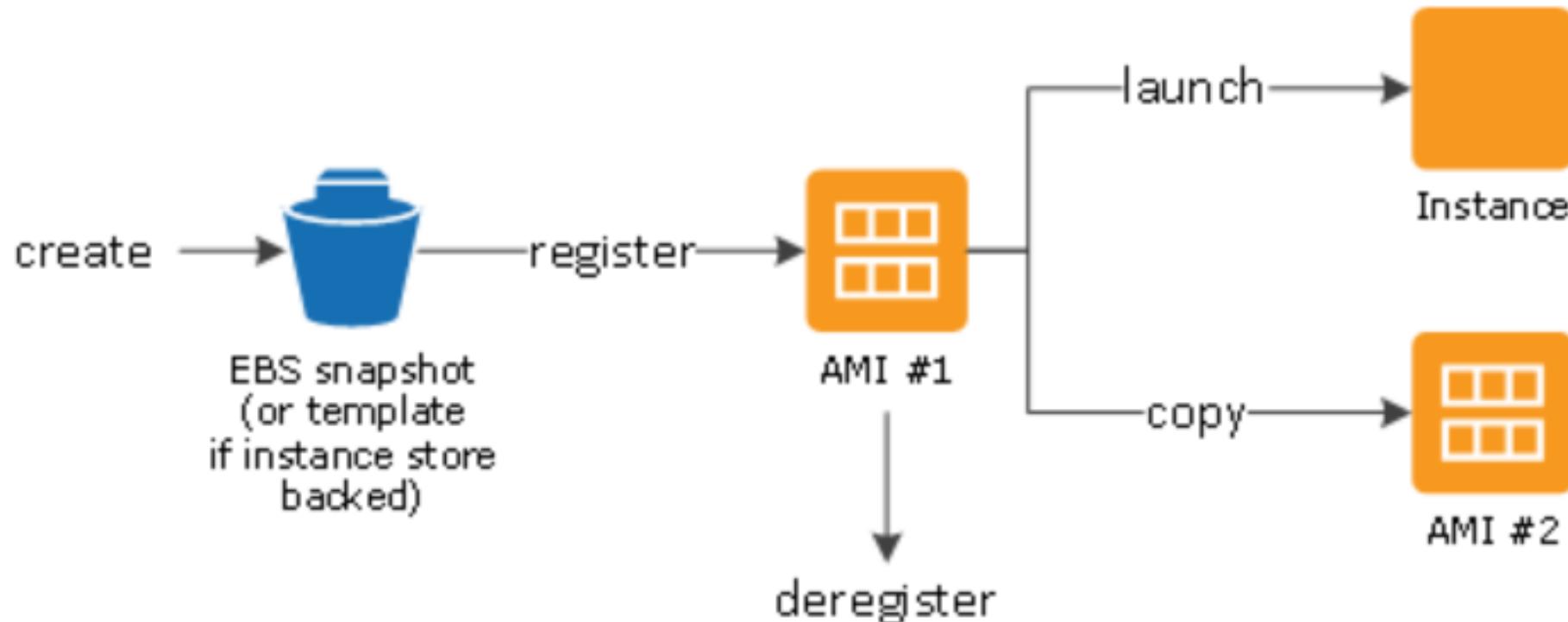
**All products (47 filtered, 47 unfiltered)**

< 1

 Amazon Linux	<p><b>Amazon Linux 2023 AMI</b></p> <p>ami-02f3f602d23f1659d (64-bit (x86), uefi-preferred) / ami-05fab674de2157a80 (64-bit (Arm), uefi)</p> <p>Amazon Linux 2023 is a modern, general purpose Linux-based OS that comes with 5 years of support.</p> <p><input checked="" type="radio"/> 64-bit (x86), uefi-</p>
---	---

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance.

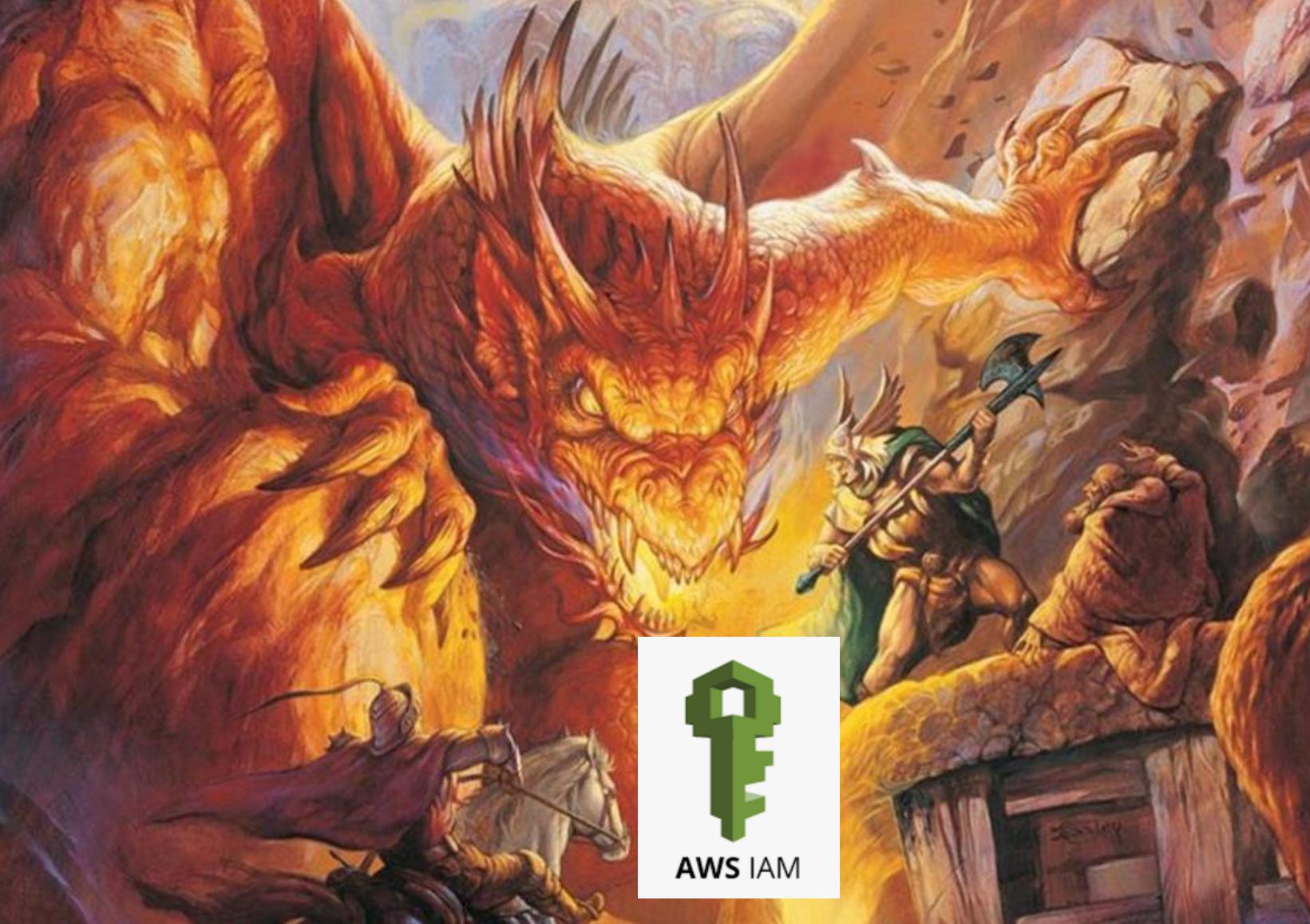
# HOW To : Modify Existing Amazon Machine Images (AMIs)



<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/AMIs.html>

<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ComponentsAMIs.html>

# AWS : AWS Identity and Access Management (IAM)



# AWS : AWS Identity and Access Management (IAM)

(IAM) is a web service that helps you securely control access to AWS resources.

With IAM, you can centrally manage permissions that control which AWS resources users can access.



You use IAM to control who is authenticated (signed in) and authorized (has permissions) to use resources.

# Understanding : IAM

The screenshot shows the AWS IAM Management Console interface. The left sidebar contains navigation links for Identity and Access Management (IAM), including Access management, Access reports, and Credential report. The main content area displays "My security credentials (root user)" with account details and MFA information.

**Account details**

Account name	Email address
Aysdev	solvedbyamith@gmail.com
AWS account ID	Canonical user ID
294144811340	f1494c0250f7f918ae88bab281a8d220889675663afde32d3c88114a58c 1f285

**Multi-factor authentication (MFA) (1)**

Use MFA to increase the security of your AWS environment. Signing in with MFA requires an authentication code from an MFA device. Each user can have a maximum of 8 MFA devices assigned. [Learn more](#)

Device type	Identifier	Created on
Virtual	arn:aws:iam::294144811340:mfa/root-account-mfa-device	435 days ago

**Navigation and Footer**

Top bar: IAM Management Console, Services, Search, Global, Aysdev, Help icon.

Bottom footer: Feedback, Language, © 2023, Amazon Web Services India Private Limited or its affiliates., Privacy, Terms, Cookie preferences.

# Understanding : IAM

The screenshot shows the AWS IAM Management Console dashboard. The left sidebar contains navigation links for Identity and Access Management (IAM), including Access management, Access reports, and IAM resources. The main content area displays security recommendations, IAM resources (User groups: 4, Users: 8, Roles: 60, Policies: 41, Identity providers: 0), and an AWS Account summary.

**Identity and Access Management (IAM)**

**IAM dashboard**

**Security recommendations** (2)

- Root user has MFA**  
Having multi-factor authentication (MFA) for the root user improves security for this account.
- Deactivate or delete access keys for root user**  
Deactivate or delete the access keys for the root user. Instead, use access keys attached to an IAM user to improve security.  
[Manage access keys](#)
- Update your access permissions for AWS Billing, Cost Management, and Account consoles**  
We are replacing the following IAM actions for Billing, Cost Management, and Account consoles with granular IAM actions: aws-portal:ViewBilling, aws-portal:ModifyBilling, aws-portal:ViewAccount, aws-portal:ModifyAccount, aws-portal:ViewPaymentMethods, aws-portal:ModifyPaymentMethods, aws-portal:ViewUsage, purchase-orders:ViewPurchaseOrders, and purchase-orders:ModifyPurchaseOrders. To ensure you don't lose access to AWS Billing, Cost Management, and Account console based features, update your existing IAM policies to include the new IAM actions before July 2023. Examples of features impacted include AWS Cost Explorer, AWS Budgets, Billing console, and more. For more information, please visit [blog](#).

**IAM resources**

User groups	Users	Roles	Policies	Identity providers
4	8	60	41	0

**AWS Account**

Account ID: 294144811340  
Account Alias: 294144811340 [Create](#)  
Sign-in URL for IAM users in this account: <https://294144811340.siginin.aws.amazon.com/console>

**Quick Links**

[My security credentials](#)  
Manage your access keys, multi-factor authentication (MFA) and other credentials.

**Tools**

[Policy simulator](#)  
The simulator evaluates the policies that you choose and determines the effective permissions for each of the actions that you specify.

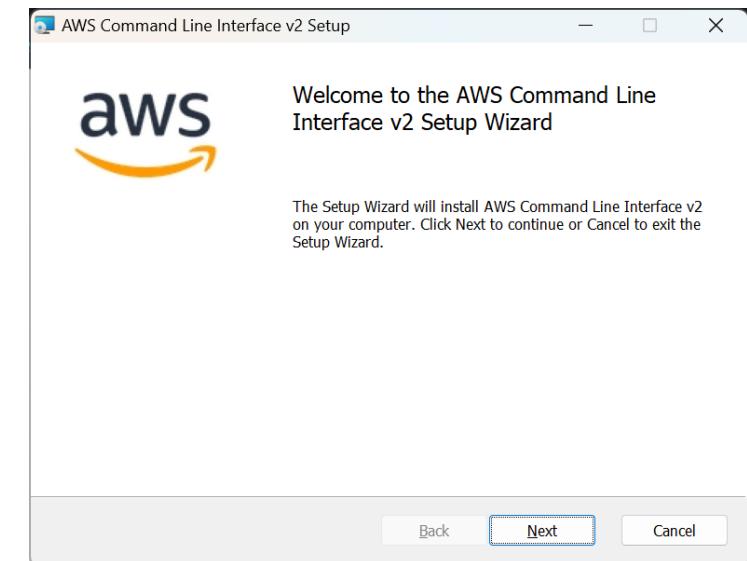
# AWS : Installing / Updating Latest version of AWS CLI

**AWS Command Line Interface (AWS CLI) is a unified tool that provides a consistent interface for interacting with all parts of Amazon Web Services.**

Download and run the AWS CLI MSI installer for Windows (64-bit):

<https://awscli.amazonaws.com/AWSCLIV2.msi>

run the `msiexec` command to run the MSI installer.

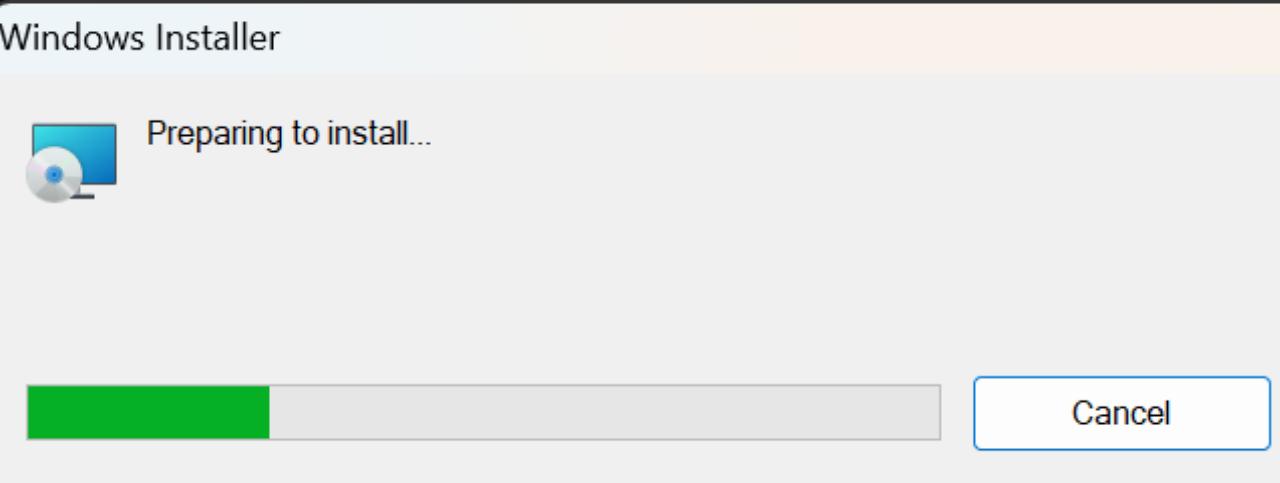


<https://docs.aws.amazon.com/cli/latest/userguide/getting-started-install.html>

<https://github.com/awsdocs/aws-doc-sdk-examples>

# AWS : Installing / Updating Latest version of AWS CLI

```
C:\Users\amith>aws  
'aws' Windows Installer  
operating system command,  
Preparing to install...  
C:\Users\amith>aws.com/AWSCLIV2.msi /qn  
command,  
C:\Users\amith>'aws' [progress bar] Cancel  
C:\Users\amith>msiexec.exe /i https://awscli.amazonaws.com/AWSCLIV2.msi
```



The screenshot shows a terminal window with a command-line interface. It starts with 'aws' followed by a command to download and install the AWS CLI. A Windows Installer dialog box is overlaid on the terminal, indicating the process is 'Preparing to install...' with a progress bar. The progress bar is mostly green, suggesting the process is nearly complete. In the background, the terminal continues with the command 'aws.com/AWSCLIV2.msi /qn' and ends with 'command,'. Below the terminal, there is a URL 'https://awscli.amazonaws.com/AWSCLIV2.msi' and a link to 'msiexec.exe /i'. At the bottom right of the terminal window, there are 'Back', 'Next', and 'Cancel' buttons.

<https://docs.aws.amazon.com/cli/latest/userguide/getting-started-install.html>

<https://github.com/awsdocs/aws-doc-sdk-examples>

# AWS : Installing / Updating Latest version of AWS CLI

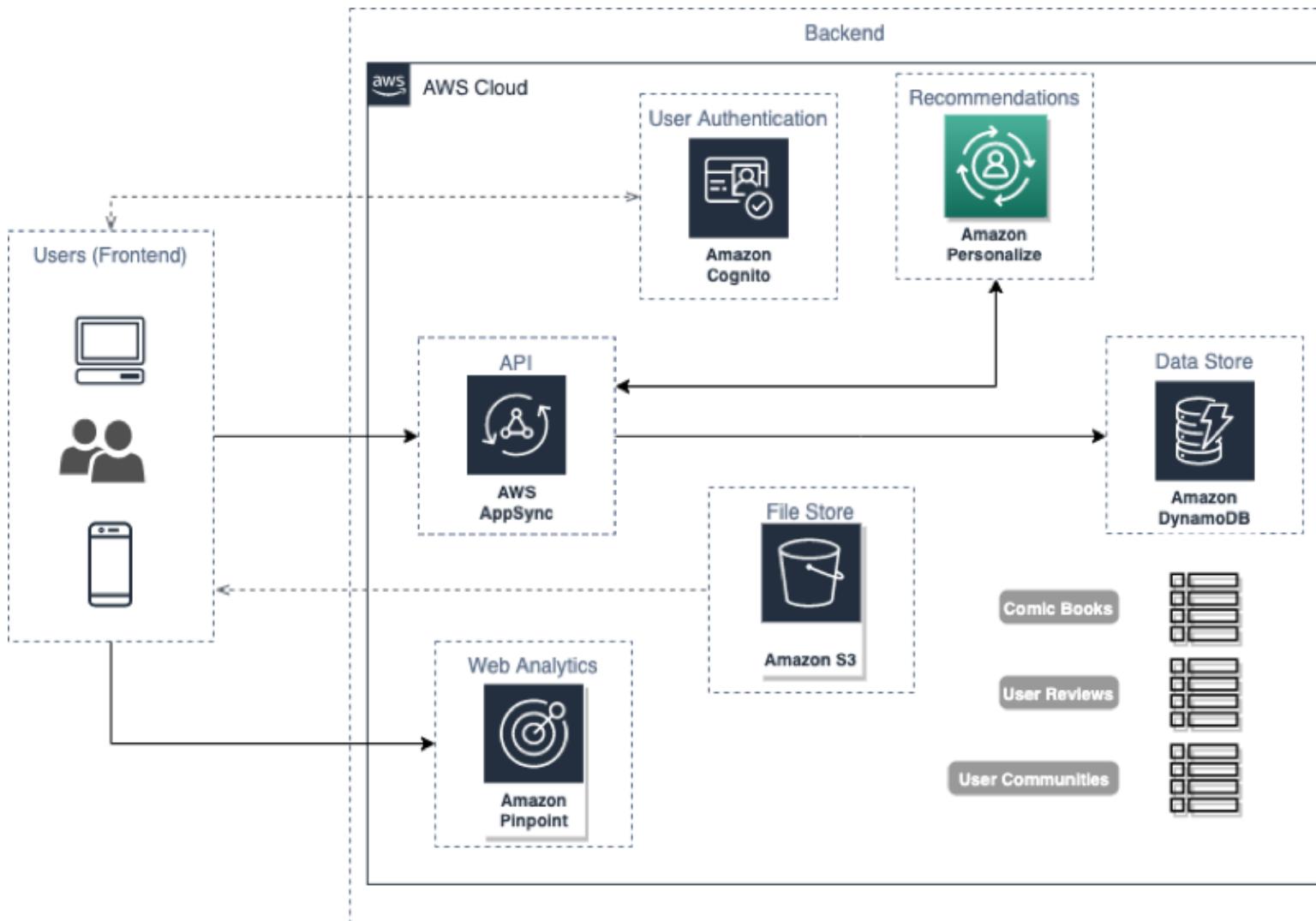
**AWS Command Line Interface (AWS CLI) is a unified tool that provides a consistent interface for interacting with all parts of Amazon Web Services.**

```
$ aws configure
AWS Access Key ID [None]: AKIAIOSFODNN7EXAMPLE
AWS Secret Access Key [None]: wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY
Default region name [None]: us-west-2
Default output format [None]: ENTER
```

<https://docs.aws.amazon.com/cli/latest/userguide/getting-started-install.html>

<https://github.com/awsdocs/aws-doc-sdk-examples>

# Overview : Building a Web-App



<https://aws.amazon.com/startups/start-building/how-to-build-a-web-app/>

## AWS : WEBSITE on Wordpress | Ubuntu | EC2

```
ubuntu@[REDACTED]:~$ sudo ufw allow OpenSSH
Rules updated
Rules updated (v6)
ubuntu@[REDACTED]:~$ sudo ufw allow in "Apache Full"
Rules updated
Rules updated (v6)
ubuntu@[REDACTED]:~$ sudo ufw enable
Command may disrupt existing ssh connections. Proceed with operation (y|n)? y
Firewall is active and enabled on system startup
ubuntu@[REDACTED]:~$ sudo ufw status
Status: active

To                         Action      From
--                         --          --
OpenSSH                     ALLOW       Anywhere
Apache Full                 ALLOW       Anywhere
OpenSSH (v6)                ALLOW       Anywhere (v6)
Apache Full (v6)             ALLOW       Anywhere (v6)
```

## AWS : Elastic IPs

AWS Elastic IPs are **permanently reserved IP addresses** that you can associate with a running EC2 instance, and that persist across reboots and even server changes, so you won't have to change your DNS whenever your server restarts.

### **What is an elastic IP address?**

An Elastic IP address is a static IPv4 address designed for dynamic cloud computing. An Elastic IP address is allocated to your AWS account, and is yours until you release it. By using an Elastic IP address, you can mask the failure of an instance or software by rapidly remapping the address to another instance in your account.

<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/elastic-ip-addresses-eip.html>

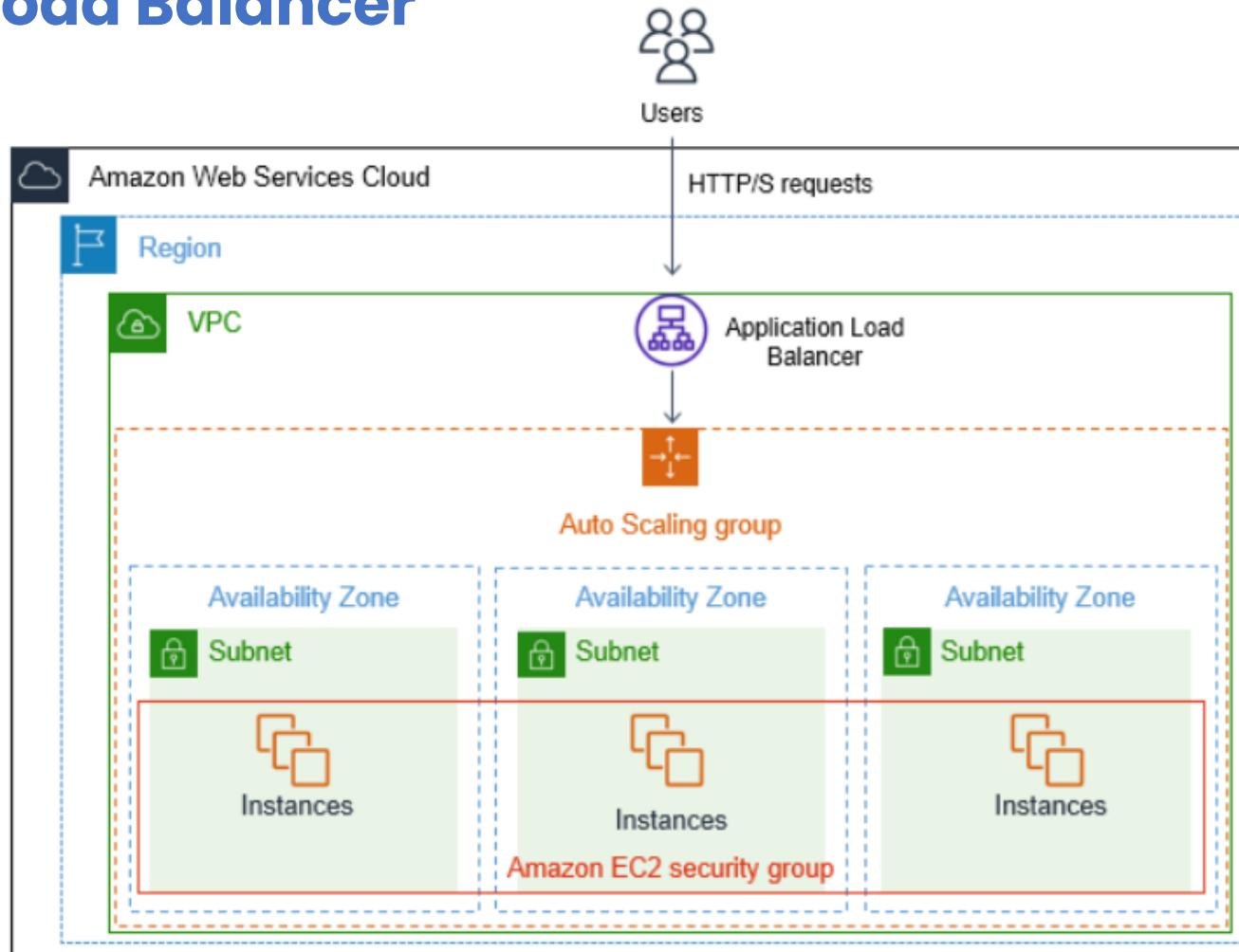
## AWS : Elastic Load Balancing

### What is Elastic Load Balancing?

- ❑ Elastic Load Balancing automatically distributes your incoming traffic across multiple targets, such as EC2 instances, containers, and IP addresses, in one or more Availability Zones.
- ❑ It monitors the health of its registered targets, and routes traffic only to the healthy targets.
- ❑ Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.

<https://docs.aws.amazon.com/elasticloadbalancing/latest/userguide/what-is-load-balancing.html>

# EC2 : Auto Scaling Load Balancer



<https://docs.aws.amazon.com/autoscaling/ec2/userguide/tutorial-ec2-auto-scaling-load-balancer.html>

## AWS : Terms to Remember

- ❑ Amazon Web Services (AWS): A cloud-based computing platform that provides a range of services, including computing, storage, networking, database, and analytics.
- ❑ Elastic Compute Cloud (EC2): A web service that provides resizable compute capacity in the cloud. EC2 instances can be launched and terminated as needed, and users only pay for the compute time they use.
- ❑ Simple Storage Service (S3): A scalable object storage service that provides secure and durable data storage for a wide range of applications.
- ❑ Relational Database Service (RDS): A fully managed service that makes it easy to set up, operate, and scale a relational database in the cloud.
- ❑ Elastic Load Balancing (ELB): A service that automatically distributes incoming application traffic across multiple EC2 instances, making it easier to handle varying levels of traffic and improve application availability.

## AWS : Terms to Remember

- ❑ Auto Scaling: A service that automatically adjusts the number of EC2 instances in a group based on changes in demand for the application.
- ❑ Virtual Private Cloud (VPC): A virtual network that provides a secure and isolated environment for running resources in the cloud.
- ❑ Lambda: A serverless computing service that allows users to run code without provisioning or managing servers.
- ❑ Identity and Access Management (IAM): A service that allows users to manage access to AWS resources by creating and managing AWS users and groups, and setting permissions and policies.
- ❑ CloudFormation: A service that allows users to define and deploy infrastructure as code, making it easier to manage and automate AWS resources.