

# *AWS Cloud Practitioner Essentials*



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# *1. Introduction*

What do you need to know to pass exam  
Cloud Practitioner?

- ❖ **Compute:** EC2, Lambda
- ❖ **Storage:** S3, Glaciar
- ❖ **Databases:** RDS, DynamoDB
- ❖ **Security**
- ❖ **AWS Cost Management**
- ❖ **Network:** VPC, Route53, CloudFront



## *Region, AZ and Edge Location*

- **Region:** is a physical location in the world which consists of two or more Availability Zones
- **AZ:** is one or more data centers, each with redundant power, networking and connectivity, house in separate facilities
- **Edge Locations:** are endpoints for AWS which are used for caching content. Typically this consists of CloudFront, Amazon's CDN (Content Delivery Network)



## *Difference support packages:*

- **Basic:** Free
- **Developer:** \$29/month
- **Business:** \$100/month
- **Enterprise:** \$15.000/month

	BASIC	DEVELOPER	BUSINESS	ENTERPRISE
COST	FREE	\$29 A MONTH	\$100 A MONTH	\$15,000 A MONTH
Tech Support		Business hour access via email	24 x 7, email, chat & phone	24 x 7, email, chat & phone
TAM	NO	NO	NO	YES
Who can open cases?	None	1 Person / Unlimited Cases	Unlimited Contacts/ Unlimited Cases	Unlimited Contacts/ Unlimited Cases

# *Cost Management*

## AWS Budgets & Cost Explorer

- ❖ **Budgets:** is used to budget (or predict) costs **BEFORE** they are incurred, you have the ability to set custom budgets that alert you when your costs or usage exceed your budgeted amount.
- ❖ **Cost Explorer:** is used to explore costs **AFTER** they have been incurred, it has an easy-to-use interface that lets you visualize, understand, and manage your AWS costs and usage over time.

**There are three fundamental drivers of cost with AWS:**

- ❖ **Compute**
- ❖ **Storage**
- ❖ **Data Outbound**

# *Cost Management*

## **Capex vs Opex**

- ❖ **Capex:** stands for Capital Expenditure which where you pay up front. It's a fixed, sunk cost
- ❖ **Opex:** stand for Operational Expenditure which is where you pay for what you use.

## **AWS Free Services:**

- ❖ **VPC**
- ❖ **Elastic Beanstalk**
- ❖ **CloudFormation**
- ❖ **IAM**
- ❖ **Auto Scaling**
- ❖ **Opsworks**
- ❖ **Consolidated Billing**

## 2. S3

**Simple Storage Service** is one of the most fundamental services for AWS. S3 provides developers and IT teams with secure, durable, highly-scalable object storage.

Amazon S3 is easy to use, with a simple web services interface to store and recover any amount of data from anywhere on the web.



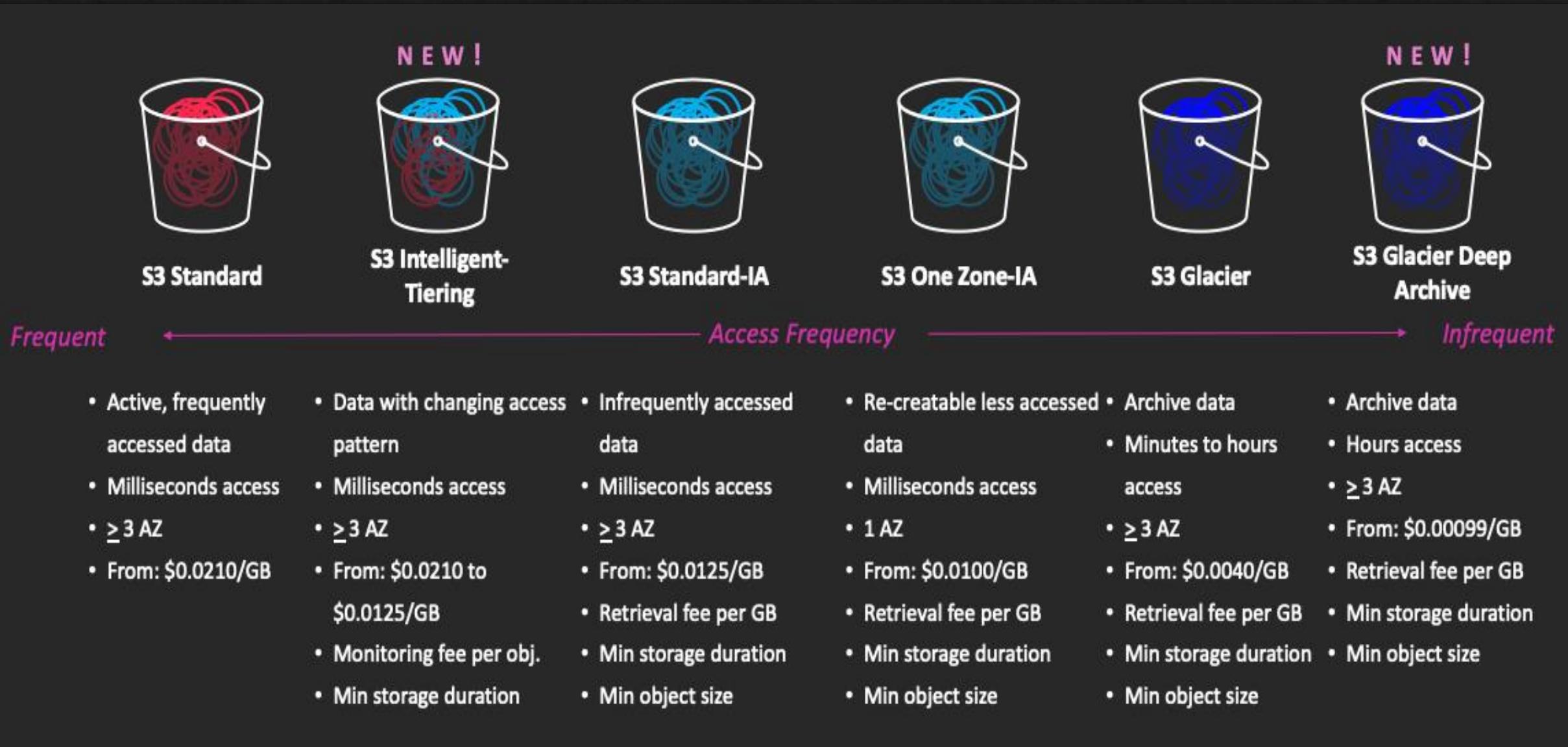
## *S3 features*

- ❖ Easy to use
- ❖ Durable (99.9999999999%)
- ❖ Available (99.99%)
- ❖ High performance
- ❖ Scalable
- ❖ Secure
- ❖ Integration

## *The basics of S3 (Buckets and Objects)*

- ❖ S3 is Object-based, so it allows you to upload files
- ❖ File can be from 0 Bytes to 5 TB
- ❖ There is unlimited storage
- ❖ Files are stored in **Buckets** (are folders in the cloud)
- ❖ Bucket name are unique globally and DNS-compliant, must be between 3 and 63 char. long (ex. <https://my-s3bucket.s3.amazonaws.com/>)
- ❖ When you upload a file to S3, you will receive a HTTP 200 code if the upload was successful.

# S3 Storage Classes



### 3. *EC2*

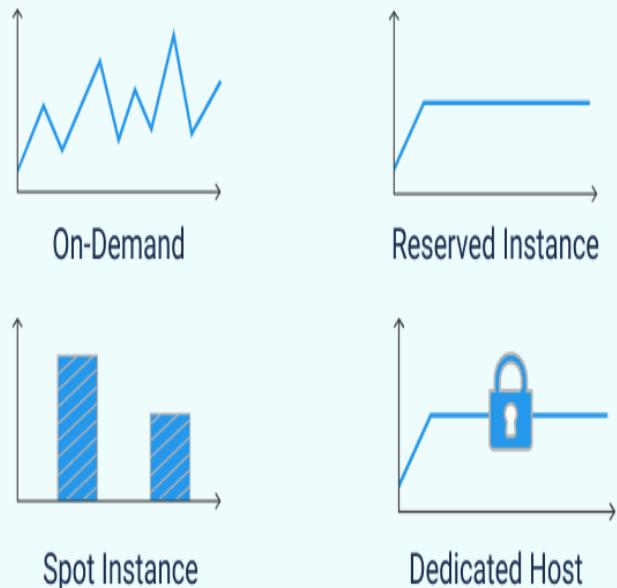
**Amazon Elastic Compute Cloud** is just a virtual server in the cloud.

EC2 reduces the time required to obtain and boot new server instances to hours to minutes, allowing you to quickly scale capacity, both up down, as your computing requirements change.

EC2 is a compute based service, it is not serverless. It's a server.



# EC2 Pricing Models

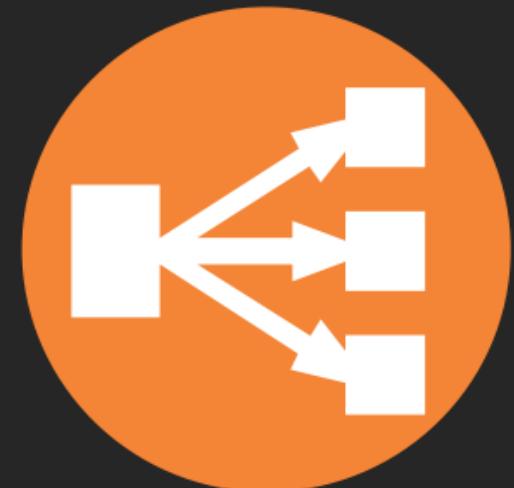


- ❖ **On Demand:** allows you to pay a fixed rate by the hour (or by second) with no commitment. It is the most flexible buying option, you can create, start, stop, and terminate at any time, although is the most expensive.
- ❖ **Reserved:** provides you with a capacity reservation, and offer a significant discount on the hourly charge for an instance. Contract Terms are 1 year or 3 year.
- ❖ **Spot:** enables you to bid whatever price you want for instance capacity, providing for even greater savings if your applications have flexible start and end times (lets you take advantage of unused EC2 capacity in the AWS Cloud and provides up to a 90% discount compared to On-Demand)
- ❖ **Dedicated Hosts:** Physical EC2 server dedicated for your use. Dedicated Hosts can help you reduce costs by allowing you to use your existing server-bound software licenses.

## *4. Elastic Load Balancing*

Elastic Load Balancing automatically distributes incoming application traffic across multiple targets, such as Amazon EC2 instances, containers, IP addresses, and Lambda functions. It can handle the varying load of your application traffic in a single Availability Zone or across multiple Availability Zones.

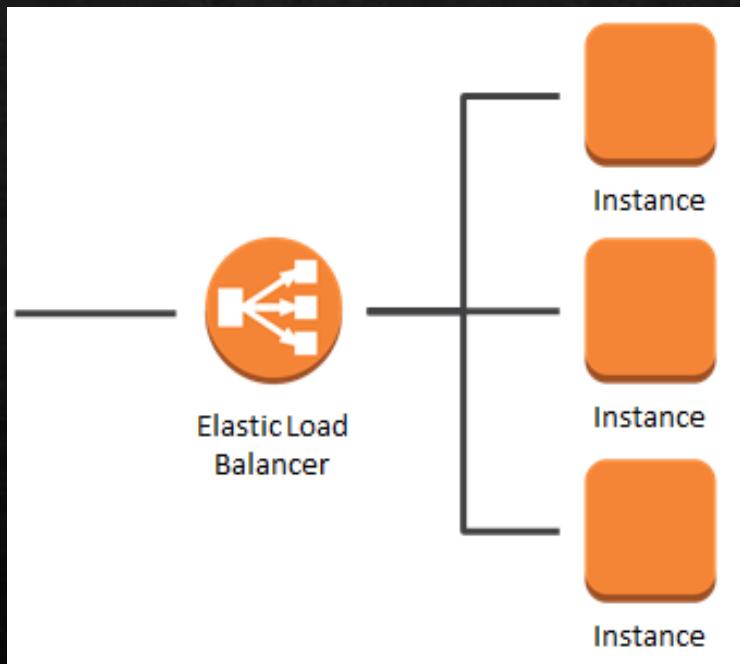
Achieve fault tolerance for any application by ensuring scalability, performance, and security.



# Three types of load balancer

Elastic Load Balancing offers three types of load balancers that all feature the high availability, automatic scaling, and robust security necessary to make your applications fault tolerant.

- **Application Load Balancer:** is best suited for load balancing of HTTP and HTTPS traffic and provides advanced request routing targeted at the delivery of modern application architectures, including microservices and containers. Operating at the Layer 7.
- **Network Load Balancer:** is best suited for load balancing of TCP, UDP and TLS traffic where extreme performance is required. Operating at the Layer 4.
- **Classic Load Balancer:** provides basic load balancing across multiple Amazon EC2 instances and operates at both the request level and connection level.



# *Auto Scaling*

**AWS Auto Scaling** monitors your applications and automatically adjusts capacity to maintain steady, predictable performance at the lowest possible cost. Using AWS Auto Scaling, it's easy to setup application scaling for multiple resources across multiple services. The service provides a simple, powerful user interface that lets you build scaling plans for resources including EC2 Spot instances, ECS tasks, DynamoDB tables, and Amazon Aurora Replicas.



## 5. *VPC*

**Amazon VPC** lets you provision a logically isolated section of the AWS Cloud where you can launch AWS resources in a virtual network that you define. You have complete control over your virtual networking environment, including selection of your own IP address range, creation of subnets, and configuration of route tables and network gateways. You can use both IPv4 and IPv6 in your VPC for secure and easy access to resources and applications.



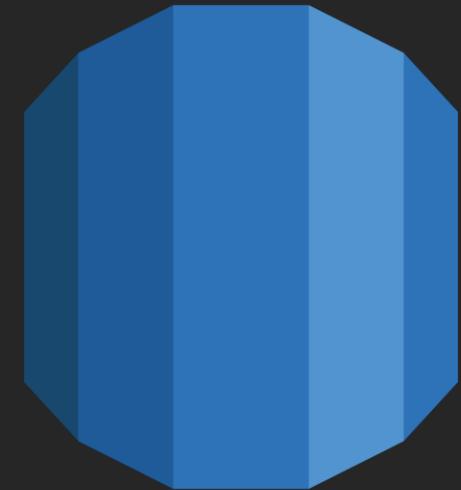
# 6. *Databases*

Tipo di database	Casi d'uso	Servizio AWS
Relazionale	Applicazioni tradizionali, ERP, CRM ed e-commerce	 <b>Amazon Aurora</b>  <b>Amazon RDS</b>  <b>Amazon Redshift</b>
Valore chiave	App web a traffico elevato, sistemi e-commerce, applicazioni per videogiochi	 <b>Amazon DynamoDB</b>
In memoria	Caching, gestione sessioni, classifiche per videogiochi, applicazioni geospatiali	 <b>Amazon ElastiCache for Memcached</b>  <b>Amazon ElastiCache for Redis</b>

# RDS

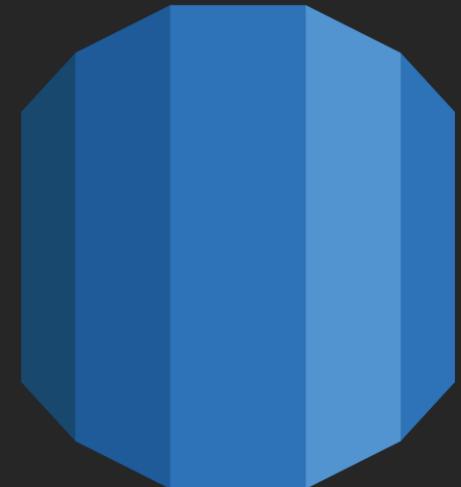
The Amazon Relational Database (**RDS**) Service is a web service that makes it easier to set up, operate, and scale a relational database in the cloud. It provides cost-efficient and resizable capacity while automating time-consuming administration tasks such as hardware provisioning, database setup, patching and backups.

RDS is available on several database instance types: *Aurora, PostgreSQL, MySQL, MariaDB, Oracle Database, and SQL Server.*



# *Aurora*

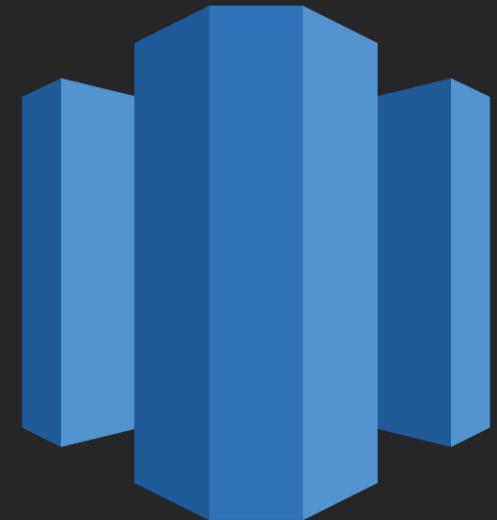
**Amazon Aurora** is a MySQL and PostgreSQL-compatible relational database built for the cloud, that combines the performance and availability of traditional enterprise databases with the simplicity and cost-effectiveness of open source databases. Aurora is up to five times faster than standard MySQL databases and three times faster than standard PostgreSQL databases. It provides the security, availability, and reliability of commercial databases at 1/10th the cost. Aurora's system auto-scales up to 64TB per database instance. It delivers high performance and availability, continuous backup to S3, and replication across three AZs.



Aurora is fully managed by **RDS**.

# *Redshift*

**Redshift** service manages all of the work of setting up, operating, and scaling a data warehouse. These tasks include provisioning capacity, monitoring and backing up the cluster, and applying patches and upgrades to the Amazon Redshift engine.



# *DynamoDB*

DynamoDB is a **Non-Relational Database (NoSQL)**.

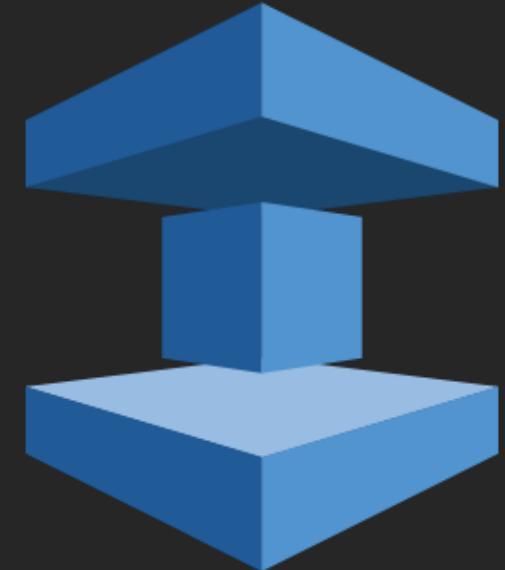
Amazon DynamoDB is a key-value and document database that delivers single-digit millisecond performance at any scale. It's a fully managed, multiregion, multimaster, durable database with built-in security, backup and restore, and in-memory caching for internet-scale applications.



# *ElastiCache*

ElastiCache allows you to set up, run, and scale popular open-source compatible in-memory data stores in the cloud. ElastiCache is a popular choice for real-time use cases like Caching, Session Stores, Gaming, Geospatial Services, Real-Time Analytics, and Queuing.

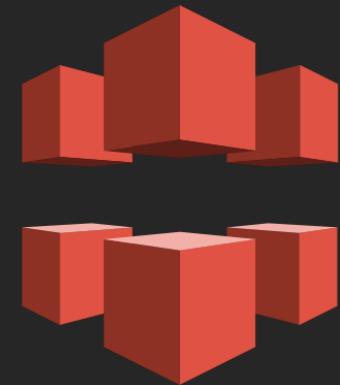
ElastiCache offers fully managed [Redis](#) and [Memcached](#) for your most demanding applications that require sub-millisecond response times.



## 8. *CloudFront*

**AWS CloudFront** can be used to deliver your entire website, including dynamic, static, streaming, and interactive content using a global network of edge locations. Requests for content are automatically routed to nearest edge location.

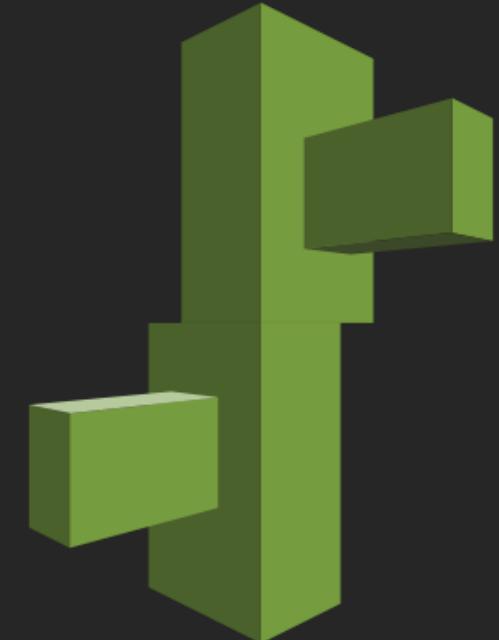
A **CDN (Content Delivery Network)** is a system of distributed servers that delivery webpages and other web content to a user based on the geographic locations of the user, the origin of the webpage, and a content delivery server.



## 9. *Elastic Beanstalk*

**Elastic Beanstalk** is an easy-to-use service for deploying and scaling web applications and services developed with Java, .NET, PHP, Python, Ruby, Go on familiar servers such as Apache, Nginx.

You can simply upload your code and Elastic Beanstalk automatically handles the deployment, from capacity provisioning, load balancing, auto-scaling to application health monitoring. At the same time, you retain full control over the AWS resources powering your application and can access the resources at any time.



## 10. *CloudWatch*

**Amazon CloudWatch** is a monitoring service to monitor your AWS resources, you can configure Billing Alarm.



# *CloudWatch Features*

- ❖ CloudWatch is used for monitoring performance
- ❖ CloudWatch can monitor most of AWS as well as your applications that run on AWS
- ❖ CloudWatch with EC2 will monitor events every 5 minutes by default
- ❖ You can have 1 minute intervals by turning on detailed monitoring
- ❖ You can create CloudWatch alarms which trigger notifications
- ❖ CloudWatch is all about performance

## **CloudWatch can monitor things like:**

- ❖ Compute
- ❖ Storage & Content Delivery

# 11. *CloudFormation*

**AWS CloudFormation** is a service that helps you model and set up your Amazon Web Services resources so that you can spend less time managing those resources and more time focusing on your application that run in AWS.

You create a template that describes all the AWS resources that you want (like EC2 instances or RDS DB instances), and AWS CloudFormation takes care of provisioning and configuring those resources for you. You don't need to individually create and configure AWS resources.



## Identity & Access Management



AWS IAM



AWS Directory Service



AWS Organizations

## Detective Controls



AWS CloudWatch



AWS Trusted Advisor

## Infrastructure Protection



AWS GuardDuty



AWS WAF



AWS VPC



AWS Shield

## Data Protection



AWS Macie



AWS KMS



AWS CloudHSM



AWS Elastic Load Balancer

## Incident Response



AWS CloudTrail



AWS CloudWatch Alarm



AWS SNS

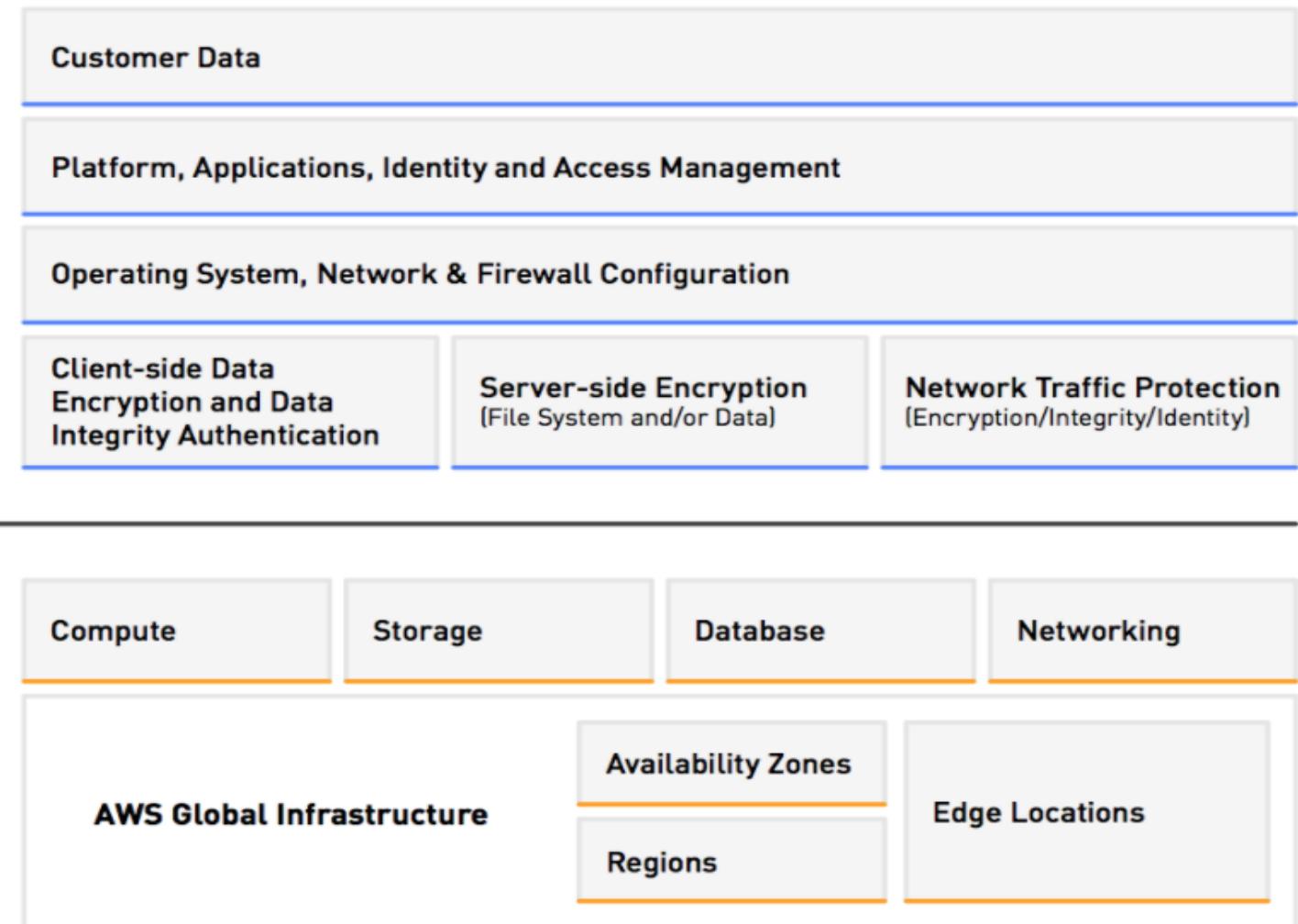
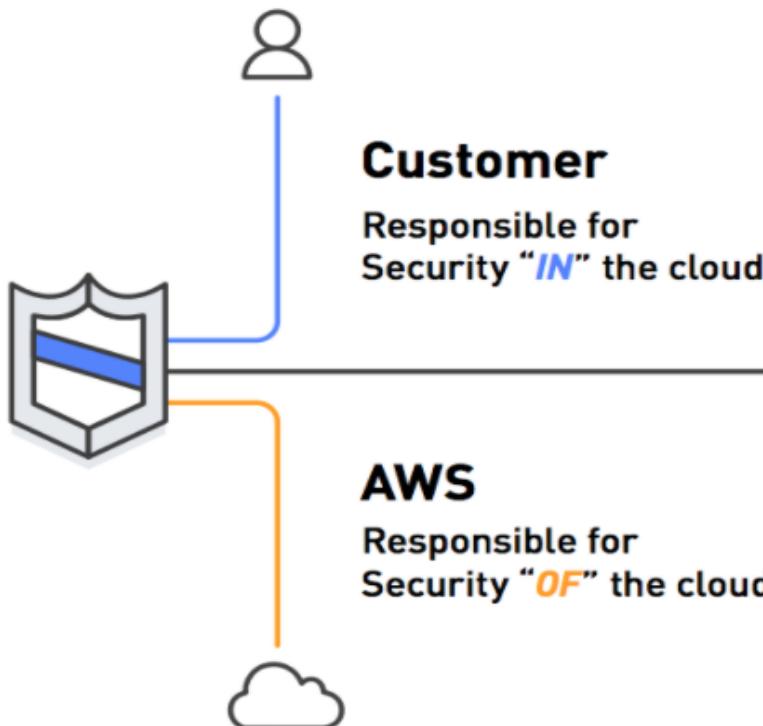
## Application Protection



AWS Inspector

12. *AWS Security*

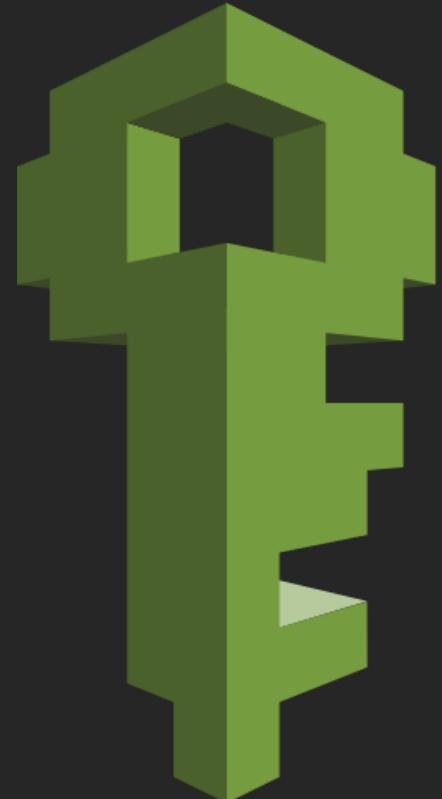
# AWS Shared Responsibility Model



# IAM

AWS Identity and Access Management (**IAM**) enables you to manage access to AWS services and resources securely. Using IAM, you can create and manage AWS users and groups, and use permissions to allow and deny their access to AWS resources.

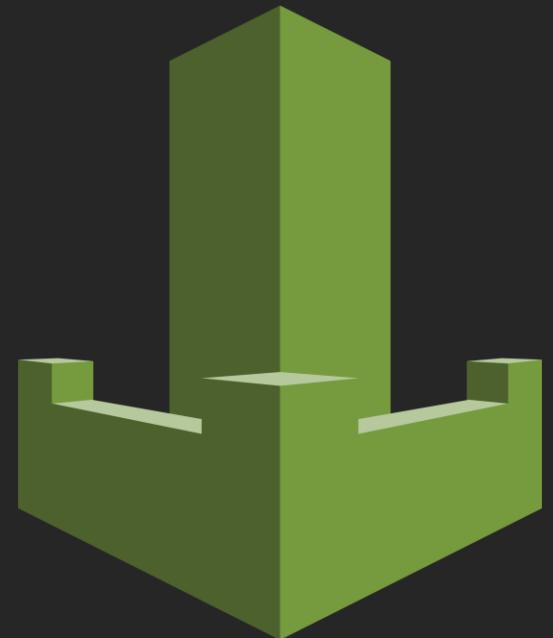
IAM is a feature of your AWS account offered at no additional charge. You will be charged only for use of other AWS services by your users.



# AWS WAF

**AWS WAF (Web Application Firewall)** is a web application firewall that helps protect your web applications from common web exploits that could affect application availability, compromise security, or consume excessive resources.

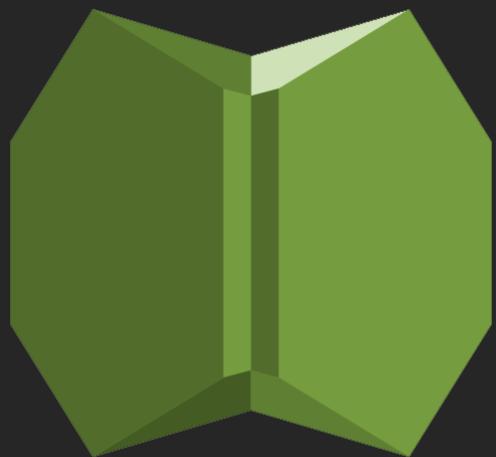
**AWS WAF is designated to stop hackers.**



# AWS *Shield*

**AWS Shield** is a managed DDoS (Distributed Denial of Service) protection service that safeguards web applications running on AWS. There are two tiers of AWS Shield: Standard and Advanced.

**AWS Shield is designed to stop DDOS attacks.**

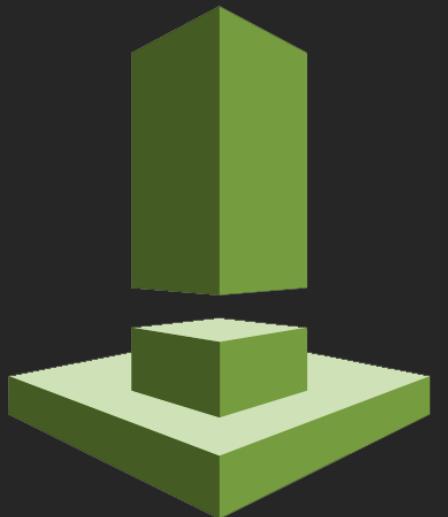


AWS Shield

# *AWS Inspector*

**AWS Inspector** is an automated security assessment service that helps improve the security and compliance of applications deployed on AWS. Amazon Inspector automatically assesses applications for vulnerabilities or deviations from best practices.

**AWS Inspector is used for inspecting EC2 instances for vulnerabilities.**



# *AWS Trusted Advisor*

**AWS Trusted Advisor** is an online resource to help you reduce cost, increase performance, and improve security by optimizing your AWS environment, it help you provision your resources following AWS best practices.

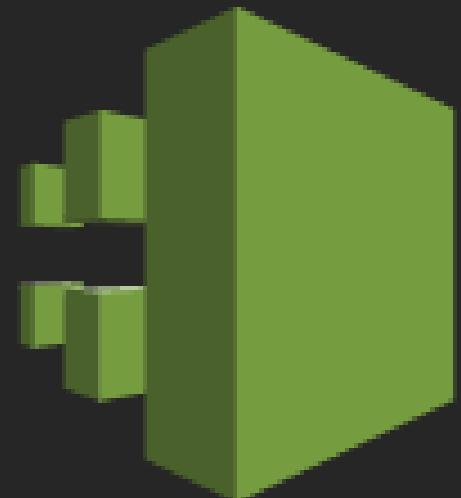
**Advisor will advise you on Cost Optimization, Performance, Security, Fault Tolerance.**



# AWS CloudTrail

**AWS CloudTrail** increases visibility into your user and resource activity by recording AWS Management Console actions and API calls.

You can identify which users and accounts called AWS, the source IP address from which the calls were made, and when the calls occurred.



# AWS Config

**AWS Config** is used to monitor configurations of your AWS Resources, are related to one another and how they were configured in the past so that you can see how the configurations and relationships change over time.

