

# AWS Certified Cloud Practitioner

Week 4 Content Review

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AWS

# Thank you for joining!

## AWS Certified Cloud Practitioner Week 4 Content Review

- This session will be recorded
- Please stay on mute
- Submit questions via chat function
- If you have other questions please contact

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# About the Exam

# AWS Certified Cloud Practitioner

## About the Exam

- 90 minutes
- 65 Questions
  - Scored 100 to 1000 (700+ pass)
- Immediate Result
- Multiple Response & Individual response questions
- In-Person & remote proctoring available
- Valid for 3 years



# AWS Certified Cloud Practitioner

## Key Exam Topics

% of Exam	Domain	Focus Areas
26%	Cloud Concepts	Value proposition of the cloud
25%	Security & Compliance	Shared responsibility model, core security services
33%	Technology	AWS global infrastructure, AWS services
16%	Billing & Pricing	Pricing/cost analysis tools, service pricing models, billing

# AWS Certified Cloud Practitioner

## Helpful Resources

### Training

- [AWS Partner Accreditation: Business](#)
- [AWS Partner Accreditation: Technical](#)
- [AWS Partner: Cloud Economics Accreditation](#)
- [AWS Partner: AWS Cloud Practitioner Essentials](#)

### White Papers

- [Overview of Amazon Web Services](#)
- [AWS Well-Architected Framework](#)
- [How AWS Pricing Works: AWS Pricing Overview](#)
- [Management and Governance Lens](#)
- [AWS Global Infrastructure](#)
- [Compare AWS Support Plans](#)
- [AWS Acceptable Use Policy](#)
- [Shared Responsibility Model](#)

### Exam Preparation

- [Quiz Show 1](#)
- [Quiz Show 2](#)
- [Quiz Show 3](#)
- [Quiz Show 4](#)
- [Sample Questions](#)
- [Schedule an Exam](#)

# Cloud Concepts

# Articulate the Value Proposition of AWS

## Cloud Concepts Domain Focus Areas

- Define the AWS Cloud and its value proposition
- Identify aspects of AWS Cloud economics
- Explain the different cloud architecture design principles

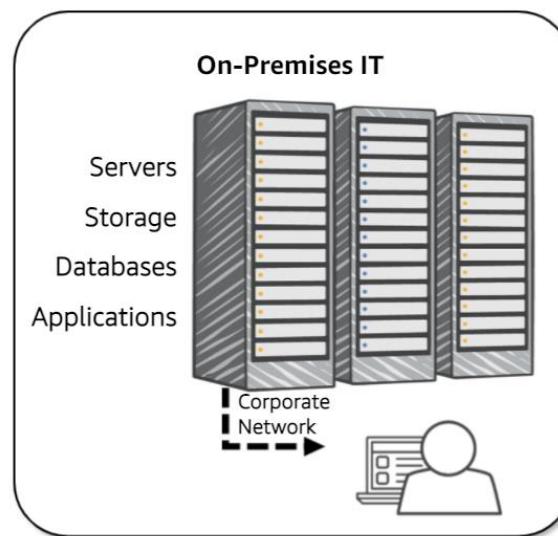
# What is Cloud?



The term "cloud computing" refers to the on-demand delivery of IT resources via the Internet with pay-as-you-go pricing. Instead of buying, owning, and maintaining your own data centers and servers, organizations can acquire technology such as compute power, storage, databases, and other services on an as-needed basis

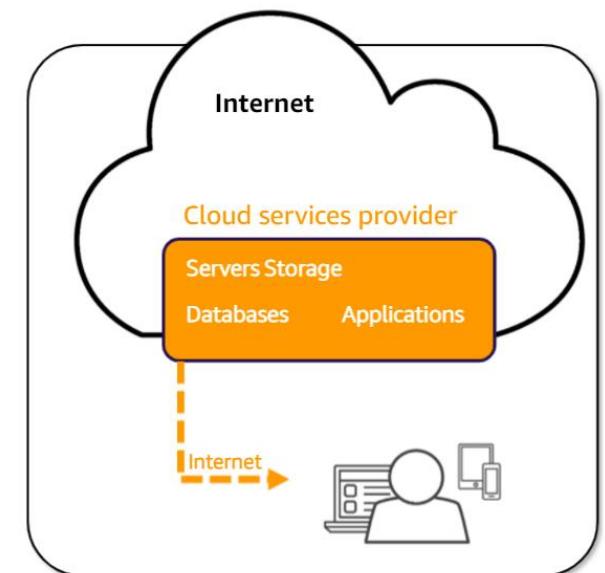
## On-Premises

Traditionally, a company had to invest in all the physical hardware necessary for running business systems at peak utilization.

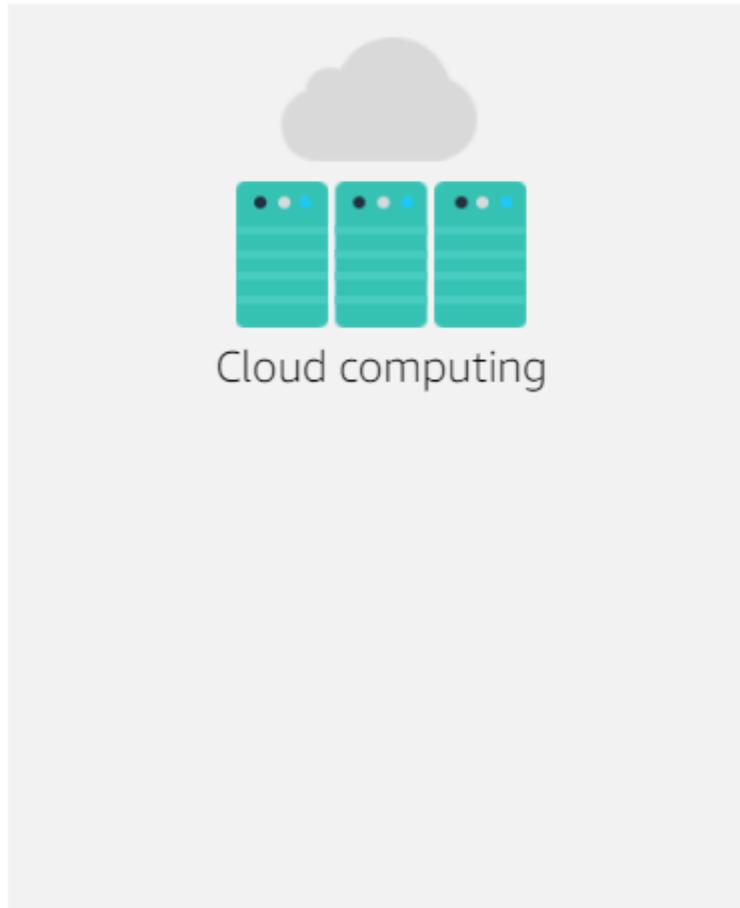


## Cloud

With Cloud Computing, companies can now access these resources via a Cloud Services Provider, like AWS, and only pay for what they actually use.



# Major Advantages of Cloud over On-Premises



- 01.** Trade capital expense for variable expense
- 02.** Benefit from massive economies of scale
- 03.** Stop guessing capacity
- 04.** Increase speed and agility
- 05.** Stop spending money running and maintaining data centers
- 06.** Go global in minutes

# AWS Global Infrastructure

# AWS Regions



A physical location around the world where AWS clusters data centers

## What's in a Region?

Each AWS Region consists of multiple, isolated, and physically separate Availability Zones.

## Why are they important?

AWS Regions are totally isolated from each other, creating the greatest possible fault tolerance and stability.





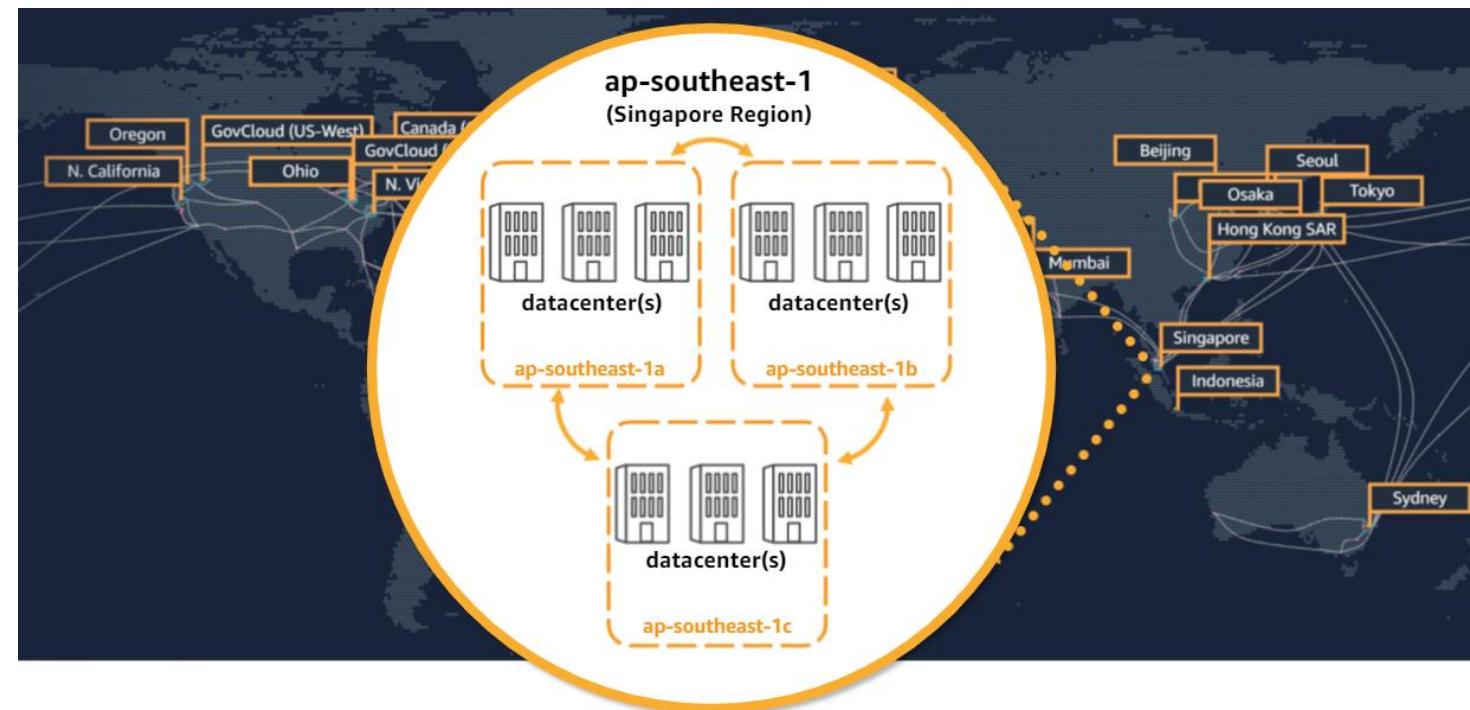
# AWS Availability Zones (AZs)

One or more discrete data centers with redundant power, networking, and connectivity in an AWS Region

## Why are they important?

AZs give customers the ability to operate production applications and databases that are more highly available, fault tolerant, and scalable than would be possible from a single data center.

AZs are connected to each other with fast, private fiber-optic networking, enabling you to easily architect applications that automatically fail-over between AZs without interruption.





# Edge Locations

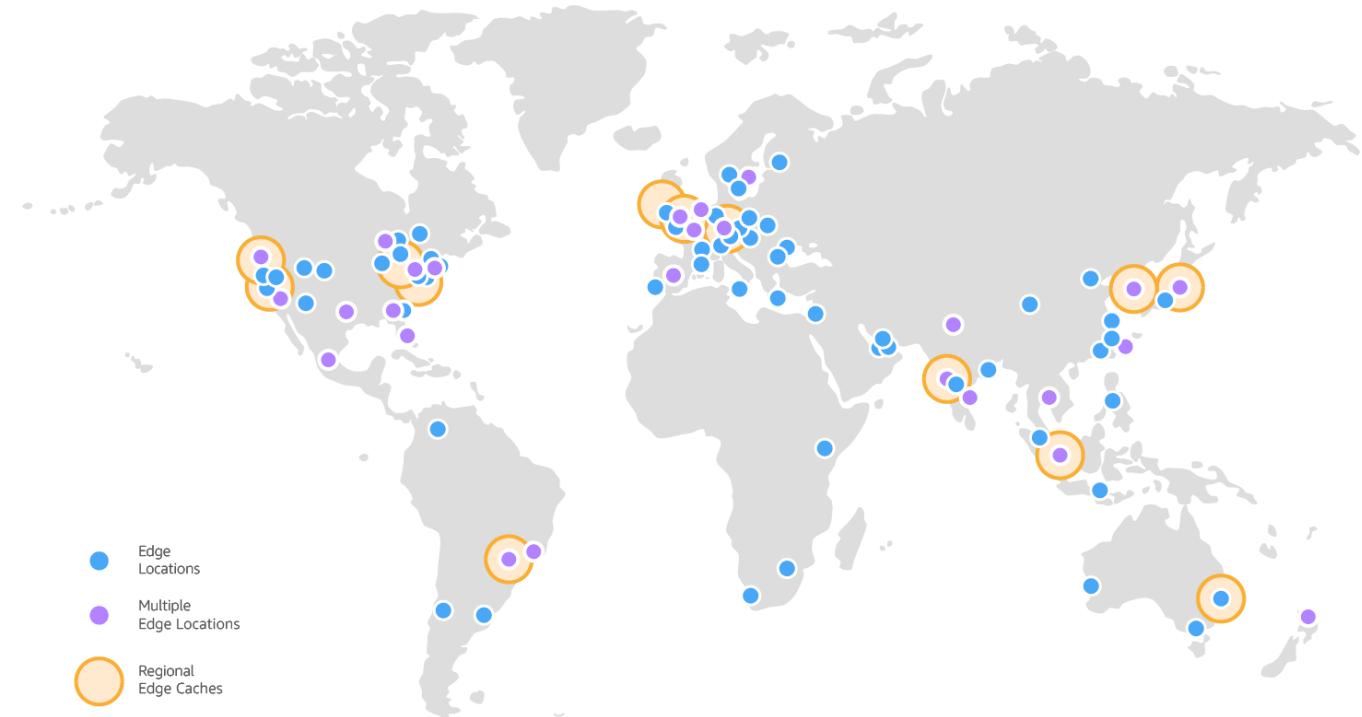
300+ Edge Locations and 13 regional mid-tier regional cache servers

## What are they?

Smaller endpoints used for hosting cached data.

## Why are they important?

Points of Presence enable Amazon CloudFront to securely deliver data, videos, applications, and APIs to customers globally with low latency and high transfer speeds, all within a developer-friendly environment.



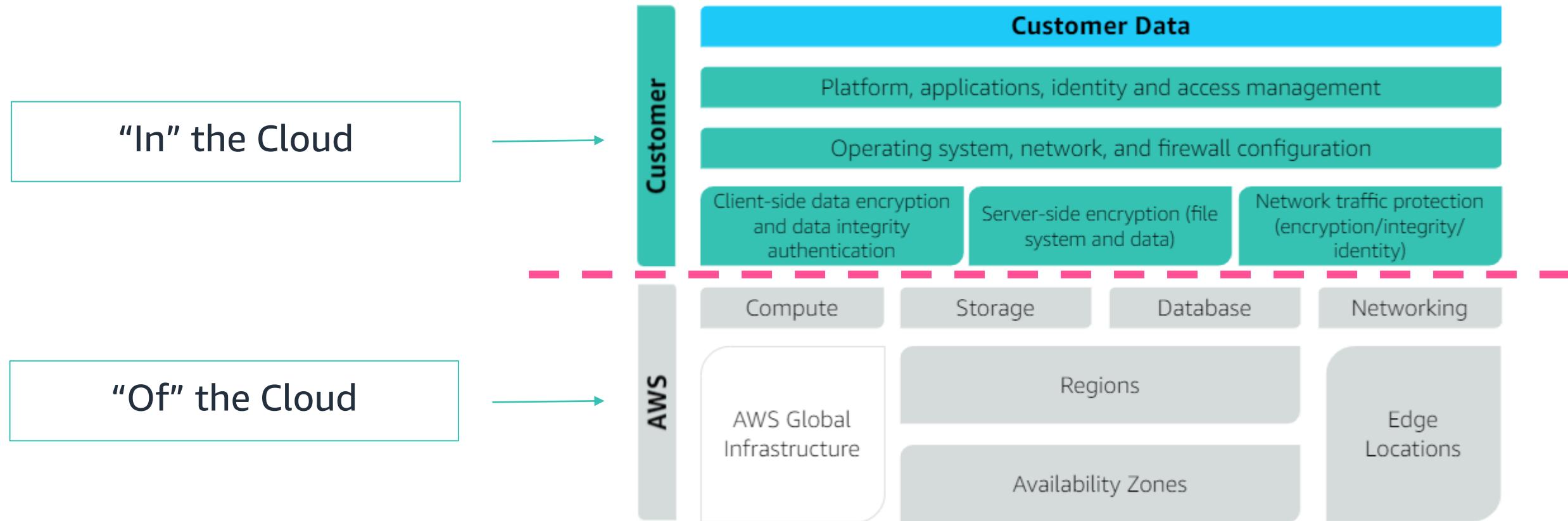
# Security & Compliance

# Build with the Highest Security Standards

## Security & Compliance Domain Focus Areas

- Define the AWS shared responsibility model
- Define AWS Cloud security and compliance concepts
- Identify AWS access management capabilities
- Identify resources for security support

# AWS Shared Responsibility Model





# AWS CloudTrail

## Track user activity & API usage

Provides event history of your AWS account activity, including actions taken through the AWS Management Console, AWS SDKs, command line tools, and other AWS services

### Compliance

AWS CloudTrail makes it easier to ensure compliance with internal policies and regulatory standards by providing a history of activity in your AWS account

### Security

You can perform security analysis and detect user behavior patterns by ingesting AWS CloudTrail events into your log management and analytics solutions

### How It Works





# Amazon CloudWatch

Observability of your AWS resources and applications on AWS and on-premises

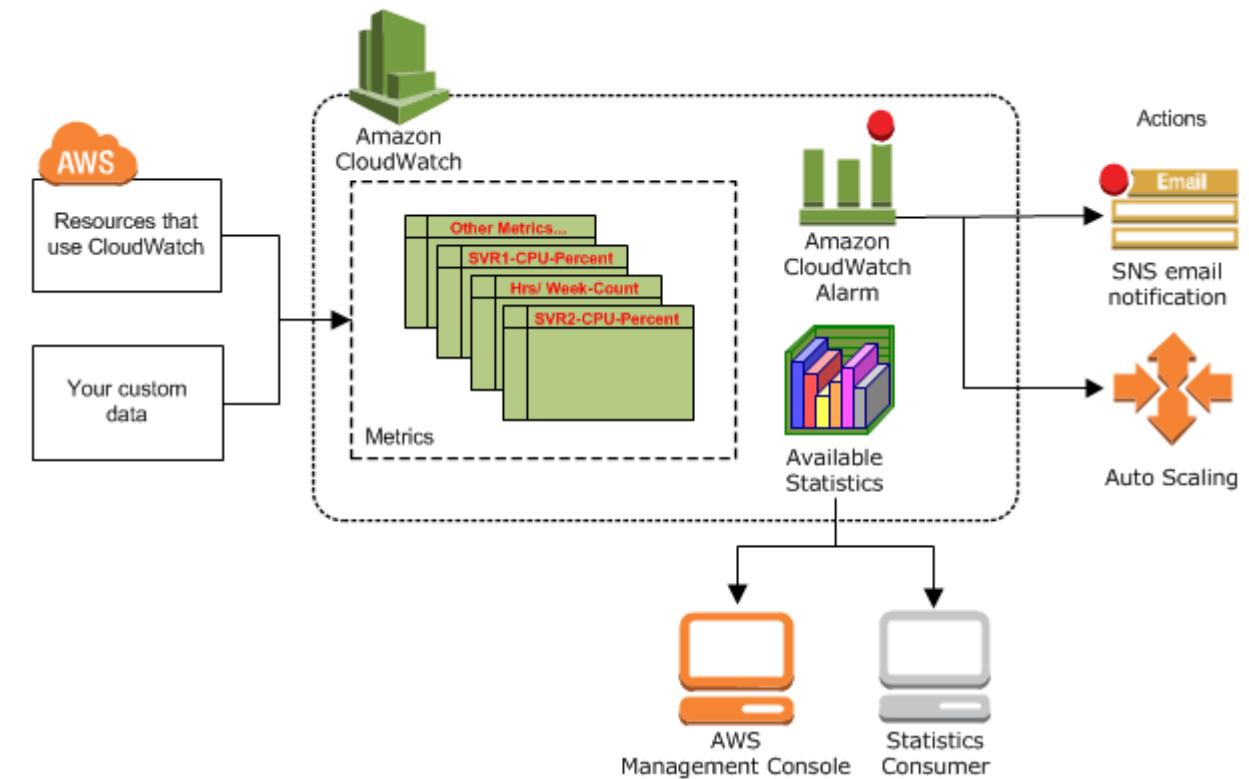
Data and insights to monitor your applications, respond to system-wide performance changes, optimize resource utilization, and get a unified view of operational health

## Infra. Monitoring

Monitor key metrics and logs, visualize your application and infrastructure stack, create alarms, and correlate metrics and logs

## Scalability

Take action automatically to enable Amazon EC2 Auto Scaling or stop an instance, for example, so you can automate capacity and resource planning.





# AWS Config

## Track resource inventory & changes

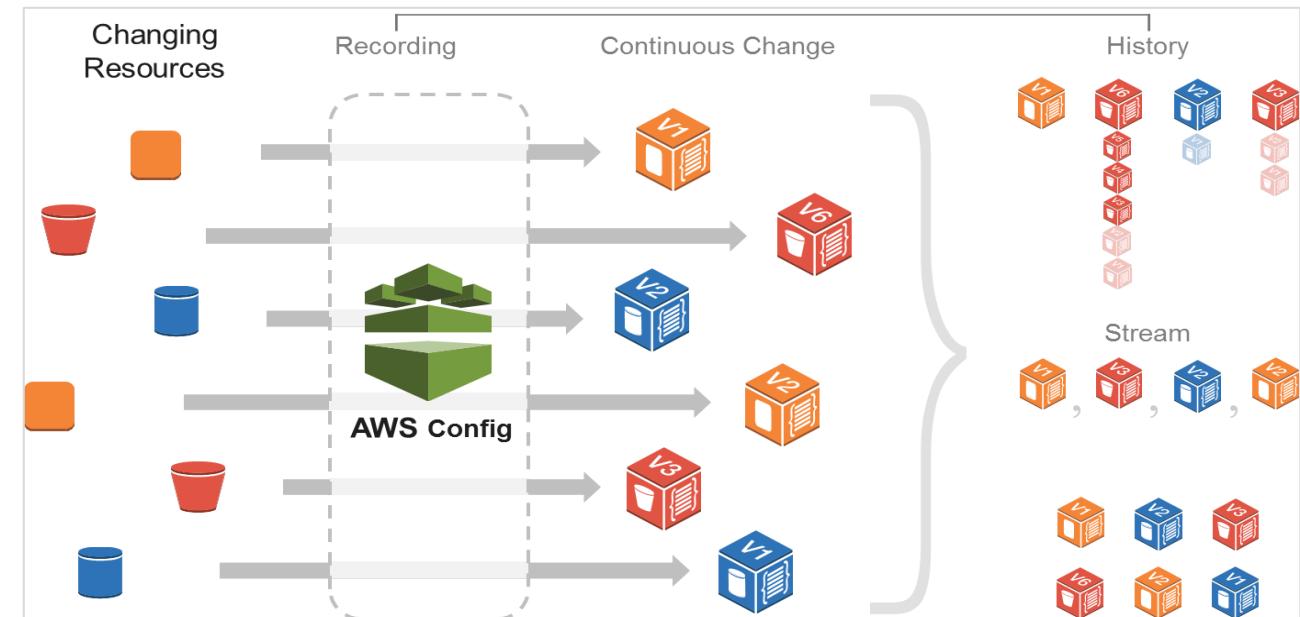
Enables you to assess, audit, and evaluate the configurations of your AWS resources. Continuously monitors and records your AWS resource configurations and allows you to automate the evaluation of recorded configurations against desired configurations

### Discovery

AWS Config will discover resources that exist in your account, record their current configuration, and capture any changes to these configurations

### Change Management

When your resources are created, updated, or deleted, AWS Config streams these configuration changes to Amazon Simple Notification Service (SNS), so that you are notified of all the configuration changes



# AWS Artifact



## AWS Compliance Reports and Agreements

Central resource for compliance-related information that matters to you. It provides on-demand access to AWS' security and compliance reports and select online agreements

### Reports

Several compliance reports from third-party auditors who have tested and verified our When new reports are released, they are made available in AWS Artifact

### Agreements

Enables you to review, accept, and manage agreements with AWS for an individual account, and for all accounts that are part of your organization

The screenshot shows the AWS Artifact interface with a search results page for 'SOC 2'. The search bar at the top shows 'SOC 2' and indicates '4 matches'. The results table has columns for 'Title', 'Reporting period', and 'Description'. There are three items listed:

Title	Reporting period	Description
Global Financial Services Regulatory Principles	November 1, 2016 to current	This document has been prepared for AWS Customers in the Financial Services Industry who require insight into how to manage governance, risk and compliance in the cloud. Although requirements vary by jurisdiction, AWS has identified five common principles related to Financial Services regulation that customers should consider when using AWS cloud services and specifically, applying the shared responsibility model to their regulatory requirements. For information about the services and AWS Regions that this document applies to, see the AWS SOC 2 report.
SOC Continued Operations Letter	April 1, 2020 to current	Based on AWS' full-year of coverage within our SOC 1 and 2 report cycles, we publish this SOC Continued Operations Letter instead of a bridge letter or gap letter. This document states that we continue to maintain the security controls and system environment that was audited and described in the latest SOC reports. For information about the services and AWS Regions that this document applies to, see the current AWS SOC 1 and SOC 2 reports.
Service Organization Controls (SOC) 2 Report - Current	October 1, 2019 to March 31, 2020	The AWS SOC 2 Type 2 report evaluates the AWS controls that meet the criteria for security, availability, and confidentiality in the American Institute of Certified Public Accountants (AICPA) TSP section 100, Trust Services Principles and Criteria. This is our most recent SOC 2 report. SOC reports are audits performed over a period of time and do not expire. Our auditors perform our SOC audits twice a year over a period of 6 months – Oct 1-Mar 31 and Apr 1-Sept 30. Once the audit period is over, our auditors prepare their audit report which is then released in May and November, respectively. Should you seek assurance that we have maintained the control environment described in this most recent SOC report, we make a SOC Continued Operations Letter available to you in Artifact. Scroll down to the bottom of the page to download it.



# Amazon Inspector

## Analyze Application Security

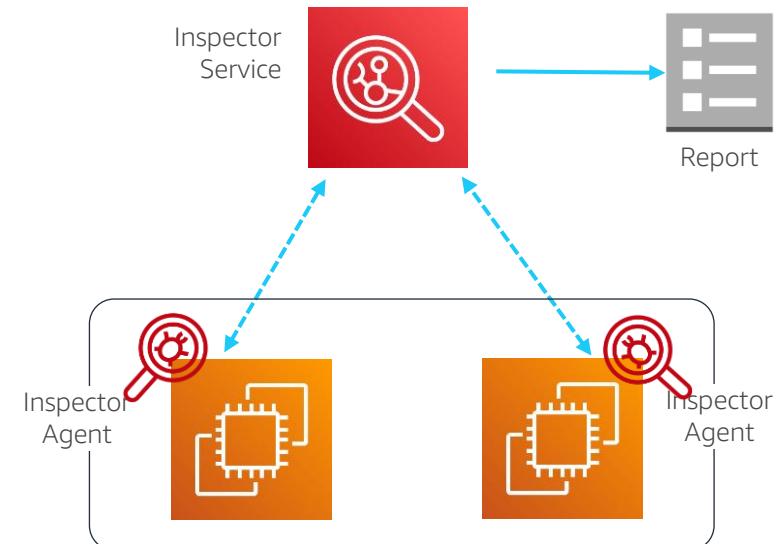
Automates security vulnerability assessments throughout your development and deployment pipelines or for static production systems - specifically for EC2

### Agent Based

A software agent that you can install on the EC2 instances that are included in the assessment target. The agent collects a wide set of configuration data (telemetry)

### Assessment Rules

A rules package corresponds to a security goal that you might have. You can specify your security goal by selecting the appropriate rules package when you create an Amazon Inspector assessment template





# Amazon GuardDuty

## Intelligent Threat Detection to Protect Your AWS Accounts and Workloads

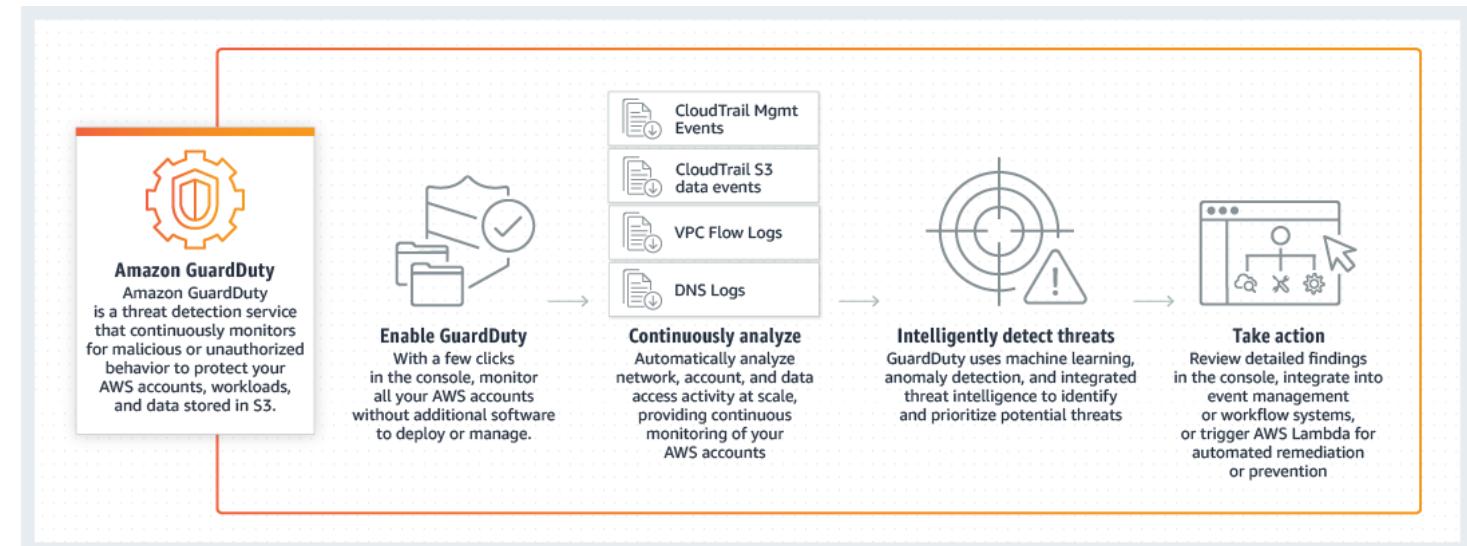
Threat detection service that continuously monitors for malicious activity and unauthorized behavior to protect your accounts, workloads, and S3 data

### Threat Identification

A software agent that you can install on the EC2 instances that are included in the assessment target. The agent collects a wide set of configuration data (telemetry)

### Automation

A rules package corresponds to a security goal that you might have. You can specify your security goal by selecting the appropriate rules package when you create an Amazon Inspector assessment template





# AWS Identity & Access Management (IAM)

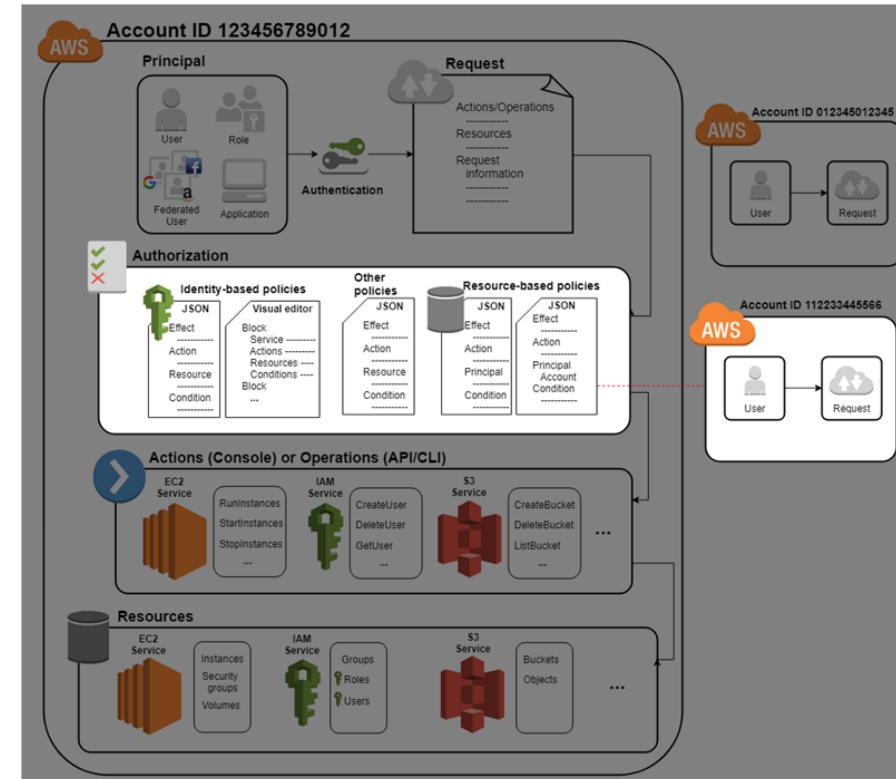
Securely manage access to AWS services and resources

Using IAM, you can create and manage AWS users and groups, and use permissions to allow and deny their access to AWS resources

## Access control

IAM enables your users to control access to AWS service APIs and to specific resources.

IAM also enables you to add specific conditions such as time of day to control how a user can use AWS, their originating IP address, whether they are using SSL, or whether they have authenticated with a multi-factor authentication device





# AWS Shield

## Managed DDoS protection

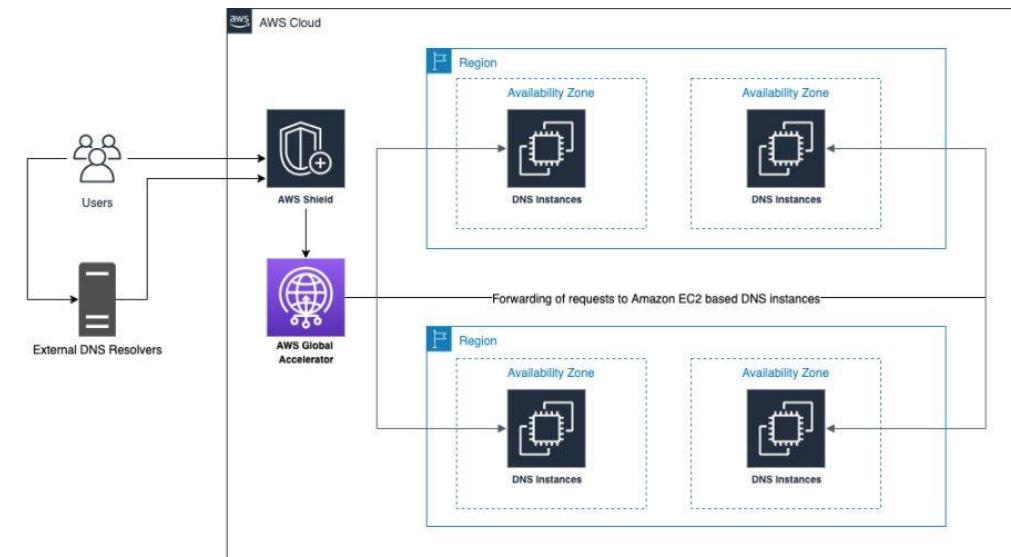
Managed Distributed Denial of Service (DDoS) protection service that safeguards applications running on AWS

### Integration

Your AWS resources automatically have AWS Shield Standard and are protected from common, most frequently occurring network and transport layer DDoS attacks

### Visibility

With AWS Shield Standard you get always-on heuristics-based network flow monitoring and inline mitigation against common, most frequently occurring network and transport layer DDoS attacks.



# Technology

# Deploy Globally with Customer Focused Services

## Technology Domain Focus Areas

- Define methods of deploying and operating in the AWS Cloud
- Define the AWS global infrastructure
- Identify the core AWS services
- Identify resources for technology support

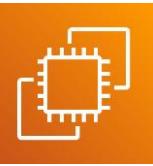
# Compute Resources

# AWS Compute Services

How will you deliver the application executables?

- Instances
  - Amazon EC2
- Containers
  - Amazon ECS
  - Amazon EKS
  - AWS Fargate
- Serverless
  - AWS Lambda





# Amazon EC2

Secure and resizable compute capacity to support virtually any workload

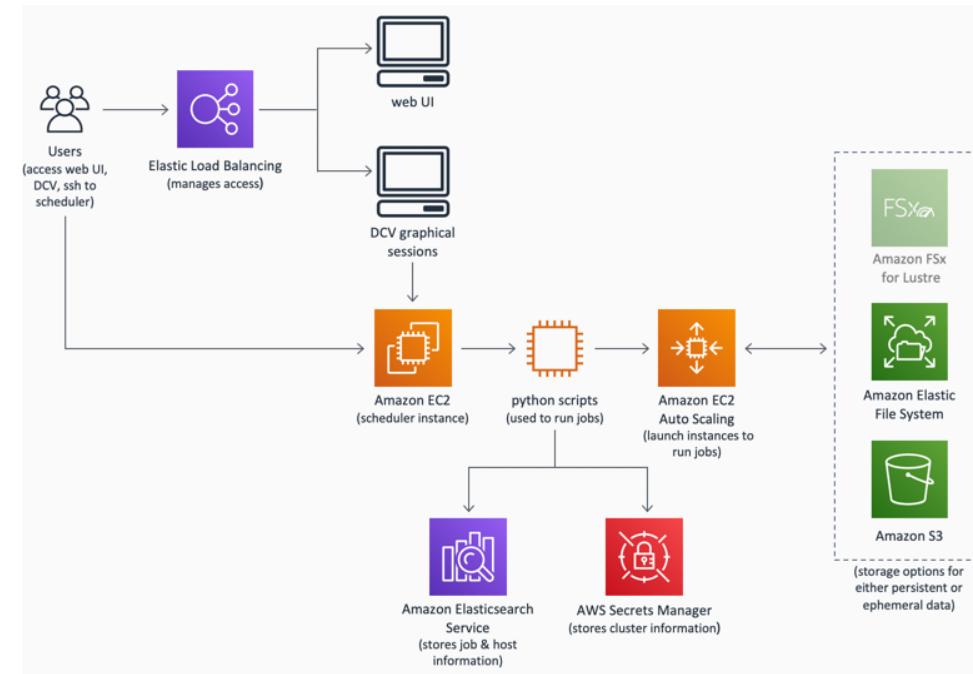
A web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers

## Scale

Increase or decrease capacity within minutes and provide 99.99% availability for each Amazon EC2 region

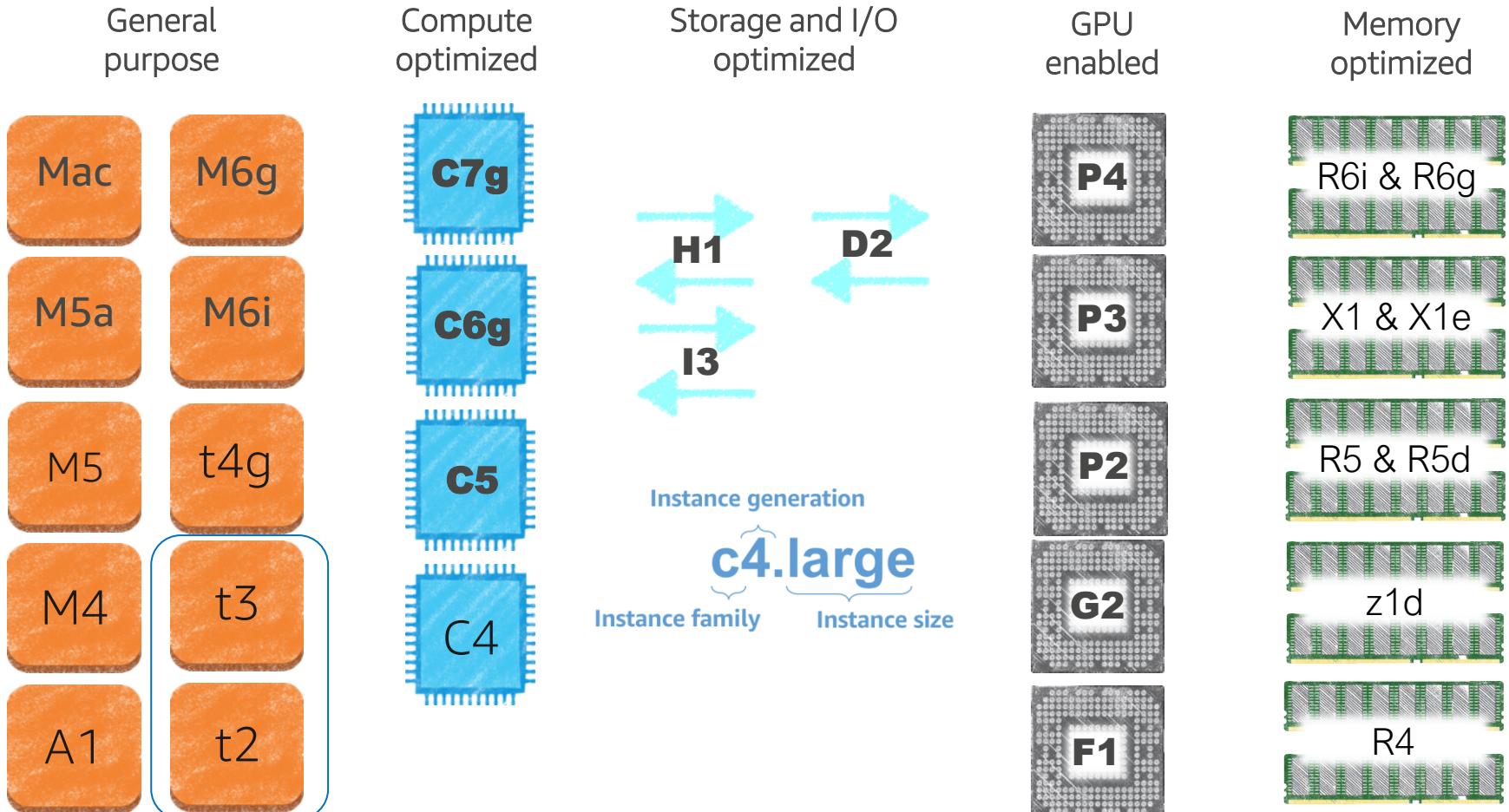
## Save

Offers five pricing models to pay for Amazon EC2 instances: On-Demand, Savings Plans, Dedicated Hosts, Spot Instances and Per Second Billing.



# EC2 Types

Use different EC2 instances for different applications



# Amazon Machine Images (AMI)



## Critical information needed when launching EC2 instances

An Amazon Machine Image (AMI) might include the following information at launch:

**(Note:** You must specify an AMI when you launch an instance)

- One or more EBS snapshots **or** a template for the root volume of an instance
- Launch permissions that control which AWS account can use the AMI to launch instances
- A block device mapping that specifies the volumes to attach to the instance when launch



# EC2 Pricing

Instance Type	Benefits	When to Position	Workload Type
On Demand	<ul style="list-style-type: none"><li>Billing by the hour or second</li><li>Modify compute capacity</li></ul>	<ul style="list-style-type: none"><li>Customer seeking to avoid long contracts and upfront payments</li></ul>	<ul style="list-style-type: none"><li>Short-Term/Fluctuates</li><li>Desired to Run to Completion</li><li>Dev/Test</li></ul>
Standard – Reserved Instance	<ul style="list-style-type: none"><li>50%-70% less than On-Demand instances</li></ul>	<ul style="list-style-type: none"><li>Customer able to commit to 1yr, 3 year term</li></ul>	<ul style="list-style-type: none"><li>Steady-state applications</li></ul>
Spot Instance	<ul style="list-style-type: none"><li>Discounts compared to on-demand pricing</li><li>Run continuously for a set duration at lower pricing</li></ul>	<ul style="list-style-type: none"><li>When workloads can continue after interruptions; for diversification across multiple instance types and AZs</li></ul>	<ul style="list-style-type: none"><li>Batch processing, Hadoop workflow, HPC grid</li><li>Encoding, rendering, modeling, analysis, or continuous integration</li></ul>
Dedicated Hosts	<ul style="list-style-type: none"><li>A physical EC2 instance assigned for your use</li><li>Can help reduce costs by allowing use of server-bound software licensing</li></ul>	<ul style="list-style-type: none"><li>Existing/new software licensing needs to be used</li><li>Specific compliance or data-privacy requirements</li></ul>	<ul style="list-style-type: none"><li>Steady-state applications that required enhanced compliance requirements or software licensing</li></ul>

# EC2 Access

There are 3 ways to access an EC2 instance

## Management Console

AWS Management Console

The screenshot shows the AWS Management Console interface. At the top, there's a search bar labeled "Find Services" with a placeholder "You can enter names, keywords or acronyms." Below it, a "Recently visited services" section lists "Compute" (EC2, Lightsail, ECR, ECS, EKS, Lambda, Batch, Elastic Beanstalk, Serverless Application Repository), "Storage" (S3, EFS, FSx, S3 Glacier, Storage Gateway, AWS Backup), and "Database" (RDS). The main "All services" section is expanded, showing categories like "Management & Governance" (CloudWatch, AWS Auto Scaling, CloudFormation, CloudTrail, Config, OpsWorks, Service Catalog, Systems Manager, Trusted Advisor, Managed Services, Control Tower, AWS License Manager, AWS Well-Architected Tool, Personal Health Dashboard), "AWS Cost Management" (AWS Cost Explorer, AWS Budgets, AWS Marketplace Subscriptions), "Mobile" (AWS Amplify, Mobile Hub, AWS AppSync, Device Farm), "AR & VR" (Amazon Sumerian), "Application Integration" (Step Functions, Amazon MQ, Simple Notification Service, Simple Queue Service, SWF), and "Media Services" (Elastic Transcoder, Kinesis Video Streams, MediaConnect, MediaConvert).

## Command Line Interface (CLI)

```
Command Prompt - aws ec2 help
ec2
^^^

Description
*****
Amazon Elastic Compute Cloud (Amazon EC2) provides secure and
resizable computing capacity in the AWS cloud. Using Amazon EC2
eliminates the need to invest in hardware up front, so you can develop
and deploy applications faster.

To learn more about Amazon EC2, Amazon EBS, and Amazon VPC, see the
following resources:

* Amazon EC2 product page
* Amazon EC2 documentation
* Amazon EBS product page
-- More --
```

## AWS Systems Manager

The screenshot shows the "Start a session" screen in AWS Systems Manager. It displays a list of target instances:

Instance name	Instance ID	Instance state	Availability zone	Platform
sk2	i-0b9043266de0d09e9	running	us-east-1e	Amazon Linux
sk1	i-05a1e3e5887525d41	running	us-east-1e	Amazon Linux
sk3-win	i-0016fa622aacd7e55	running	us-east-1c	Microsoft Windows Server 2016 Datacenter
DevInstance	i-0989f0574ac27bcc5	running	us-east-1b	Amazon Linux AMI
sk4-win	i-0ce52b70672b1576a	running	us-east-1c	Microsoft Windows Server 2016 Datacenter

At the bottom right, there are "Cancel" and "Start session" buttons.



# AWS CloudFormation

Speed up cloud provisioning with infrastructure as code

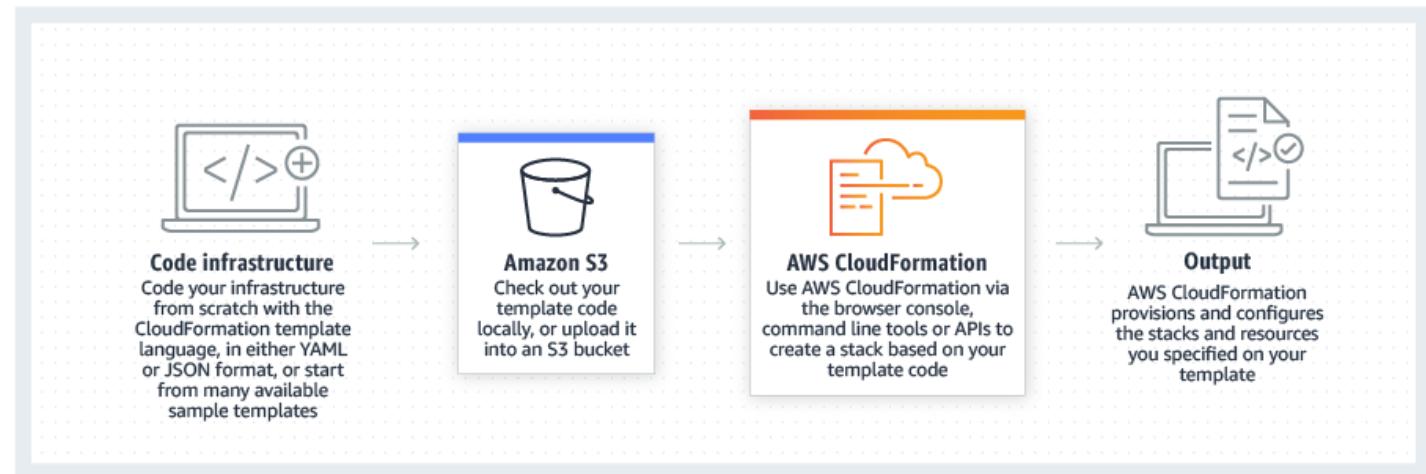
A CloudFormation template describes your desired resources and their dependencies so you can launch and configure them together as a stack

## How it Works

AWS CloudFormation lets you model, provision, and manage AWS and third-party resources by treating infrastructure as code.

## Use Cases

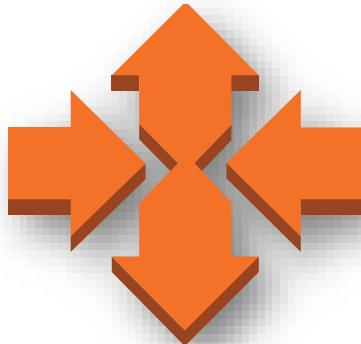
Common use cases for CloudFormation include managing infrastructure with DevOps through automated, test and deploy infrastructure templates and scaling production stacks at scale.



# Auto Scaling

Automatically launch or terminate Amazon EC2 instances

- User-defined policies driven by CloudWatch
- Health status checks
- Schedules
- Manually using set-desired-capacity in the CLI



Scale out to meet demand, scale in to reduce costs.



# AWS Fargate

## Serverless compute for containers

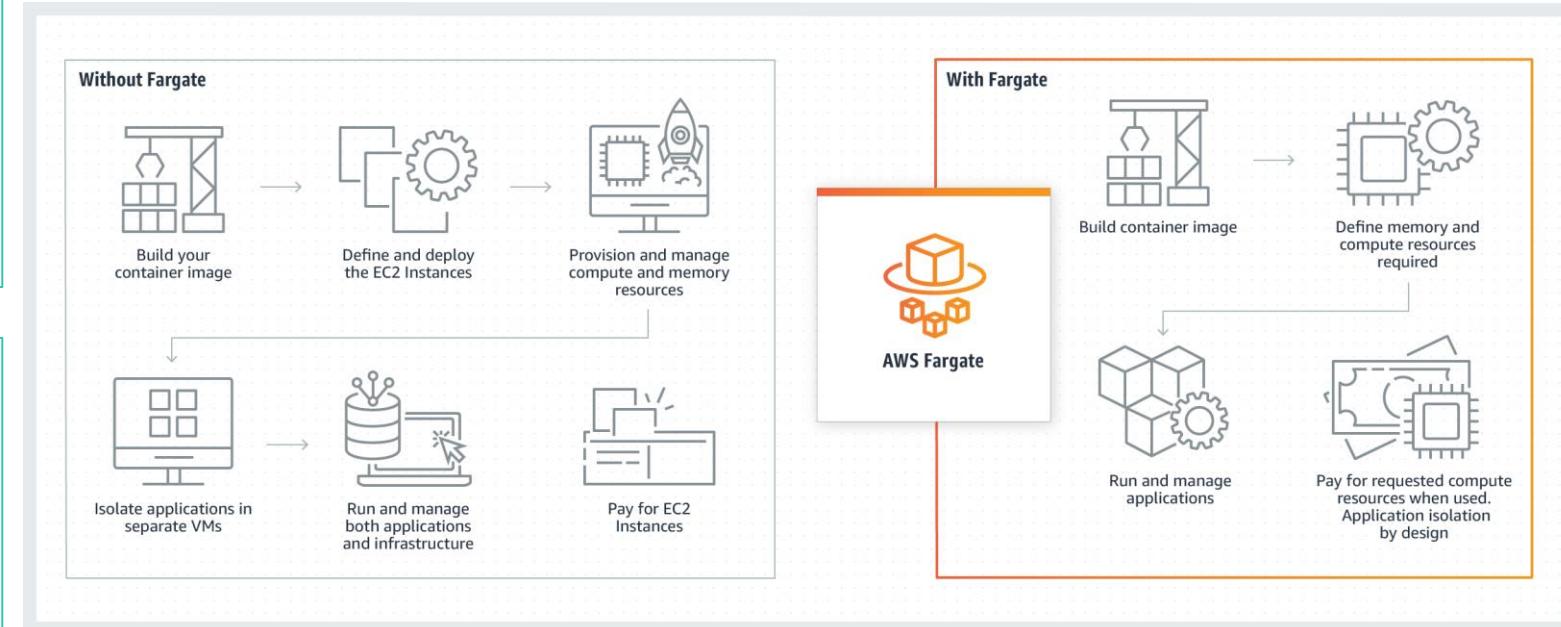
Serverless, pay-as-you-go compute engine that lets you focus on building applications without managing servers

### Scale Containers

Use Fargate with Amazon ECS or Amazon EKS to easily run and scale your containerized data processing workloads.

### Build Microservices

Fargate removes the need to own, run, and manage the lifecycle of a compute infrastructure





# Amazon Elastic Container Service

Highly secure, reliable, and scalable way to run containers

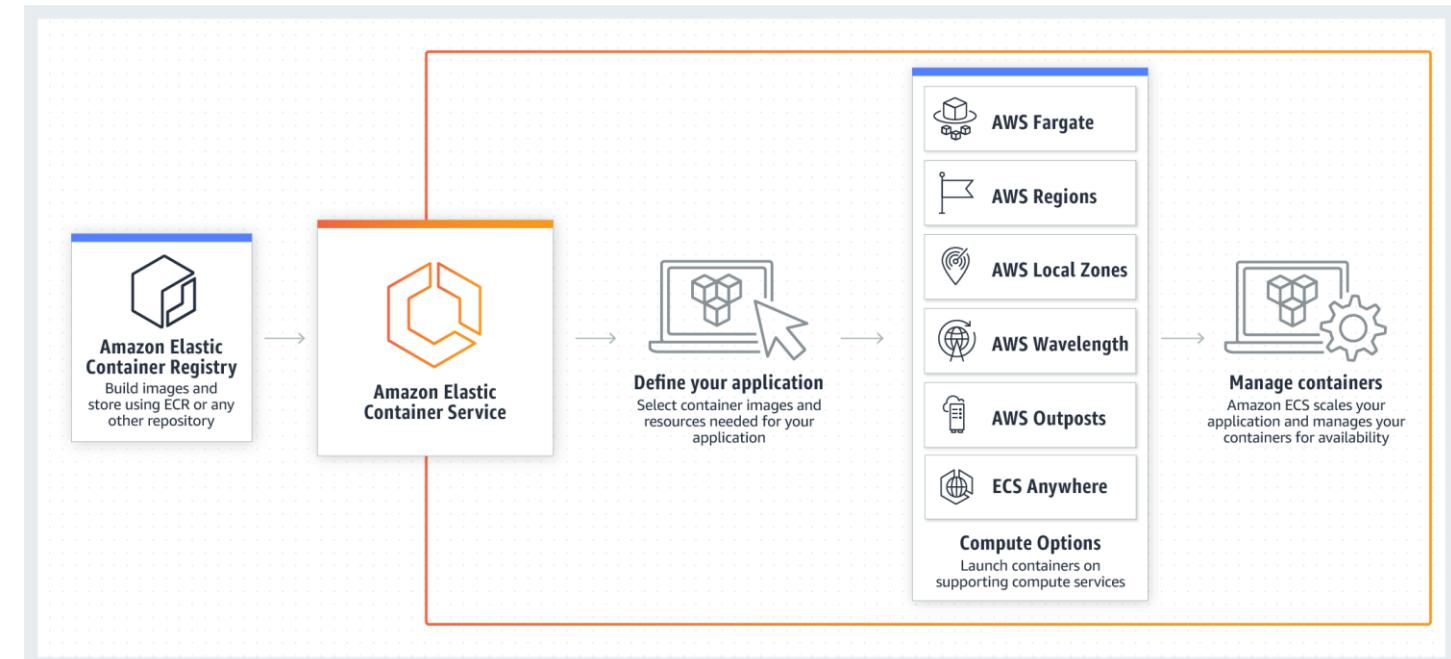
Fully managed container orchestration service that helps you easily deploy, manage, and scale containerized applications

## Manage

Amazon ECS enables you to launch and stop your container-based applications by using simple API calls

## Offload

With Amazon ECS, you don't have to operate your own cluster management and configuration management systems or worry about scaling your management infrastructure





# Amazon Elastic Kubernetes Service

The most trusted way to run Kubernetes

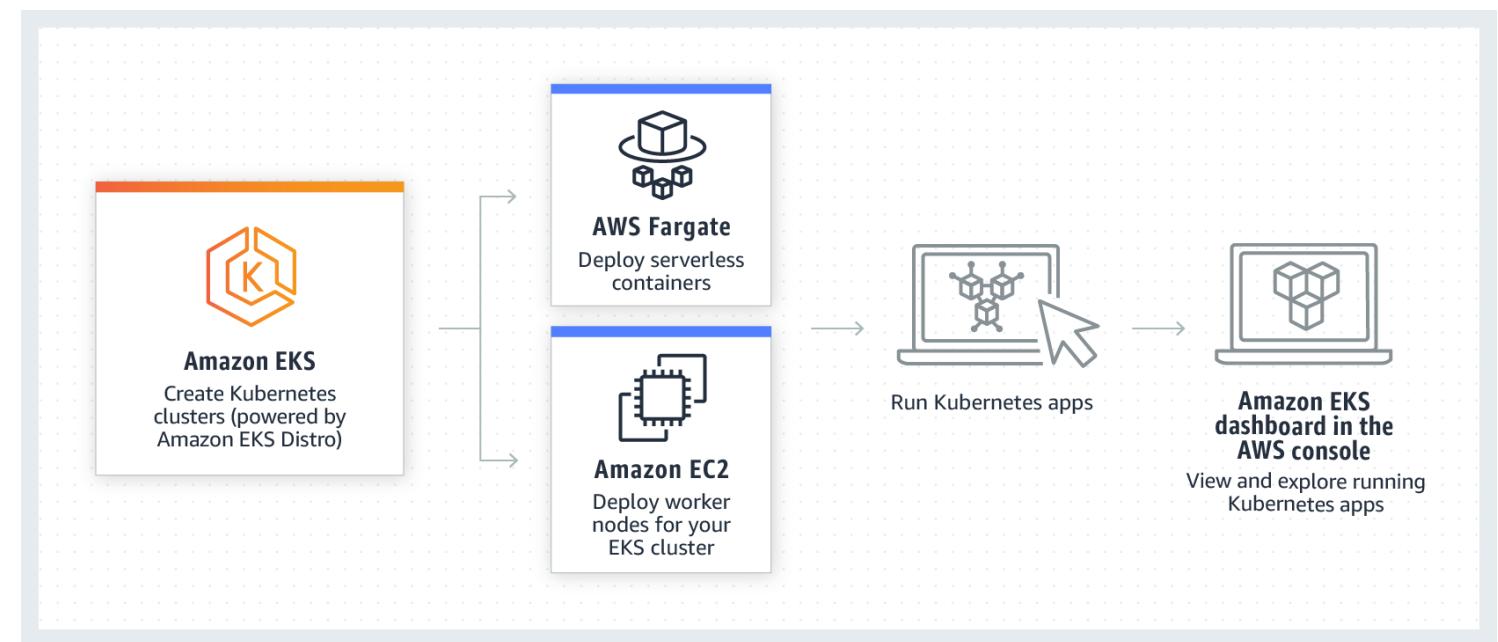
Gives you the flexibility to start, run, and scale Kubernetes applications in the AWS Cloud or on-premises. Runs upstream Kubernetes and is certified Kubernetes conformant

## Availability

EKS runs the Kubernetes control plane across multiple Availability Zones, automatically detects and replaces unhealthy control plane nodes, and provides on-demand, zero downtime upgrades and patching

## Scalability

With EKS managed node groups, you don't need to separately provision compute capacity to scale your Kubernetes applications





# AWS Lambda

Run code without thinking about servers or clusters. Only pay for what you use.

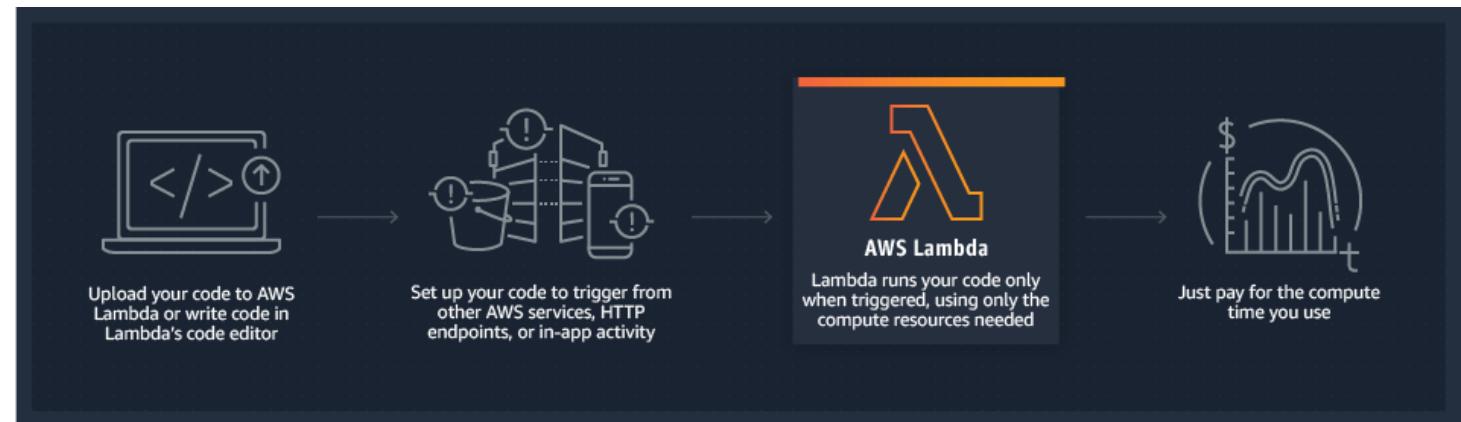
Serverless compute service that lets you run code without provisioning or managing servers, creating workload-aware cluster scaling logic, maintaining event integrations, or managing runtimes

## Reduced Management

Automatically runs code without requiring you to provision or manage infrastructure. Just write the code and upload it to Lambda either as a ZIP file or container image

## Continuous Scaling

Automatically scales your application by running code in response to each event



# Storage



# Managing Data Within AWS

## Data Storage



EFS

FSx

EBS

S3

S3 Glacier

File

Block

Object

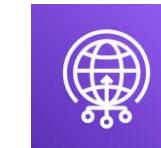
## Data Transfer



AWS Direct  
Connect



AWS  
Snowball



S3 Transfer  
Acceleration



Storage  
Gateway



Amazon Kinesis  
Firehose

# AWS Data Storage Services on the Exam



# Amazon Elastic File System

Simple, serverless, set-and-forget, elastic file system

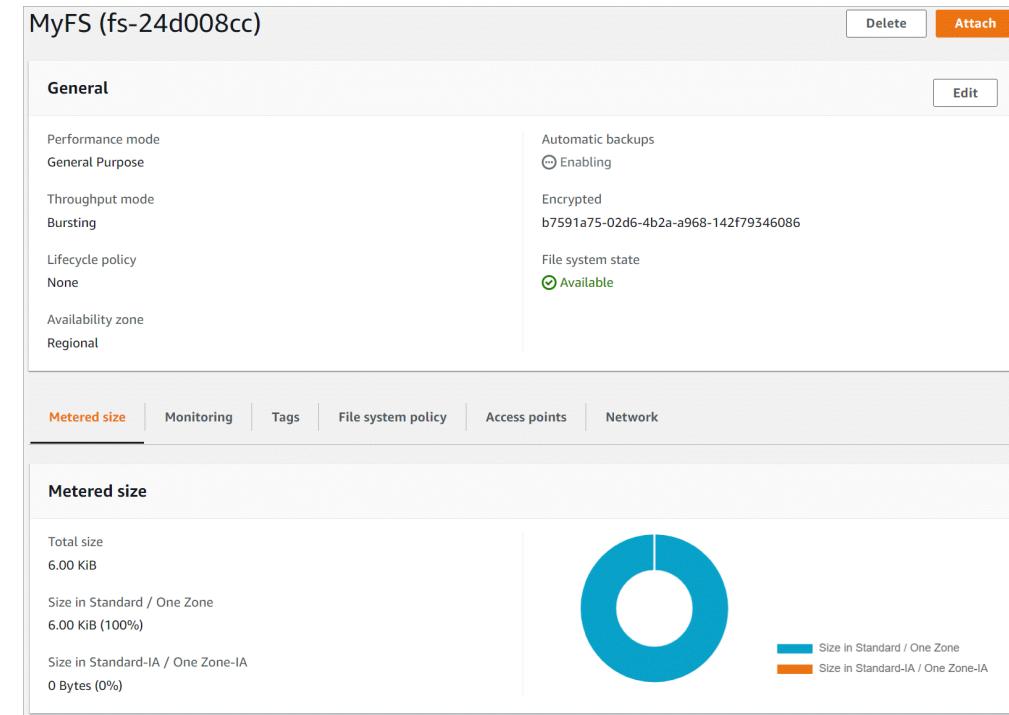
Amazon Elastic File System (EFS) automatically grows and shrinks as you add and remove files with no need for management or provisioning

## Simplify

Share code and other files in a secure, organized way to increase DevOps agility and respond faster to customer feedback.

## Enhance

Simplify persistent storage for modern content management system (CMS) workloads. Get your products and services to market faster, more reliably, and securely at a lower cost.



# Amazon FSx

FSx

Launch and run feature-rich and highly-performant file systems with just a few clicks

Launch and run popular file systems that are fully managed by AWS

## FSx for Windows

Provides you with the compatible Windows features and performance that your applications require from a windows file system

## FSx for Lustre

Provides sub-millisecond latencies, up to hundreds of gigabytes per second of throughput, and millions of IOPS. Can be linked to S3 buckets. For high I/O compute workloads

The screenshot shows the AWS Directory Service console with the following details:

Setting	Value
Directory type	Microsoft AD
Edition	Standard
Directory ID	d-9767100d92
Directory DNS name	example.com
Directory NetBIOS name	example
Description	This is an example directory
VPC	vpc-1dfdcf7a
Subnets	subnet-47ffe520, subnet-53c5510b
Availability zones	ap-southeast-2a, ap-southeast-2c
DNS address	172.31.9.241, 172.31.27.108
Status	Active
Last updated	Wednesday, December 11, 2019
Launch time	Wednesday, December 11, 2019

# Amazon Elastic Block Store (EBS)



Easy to use, high performance block storage at any scale

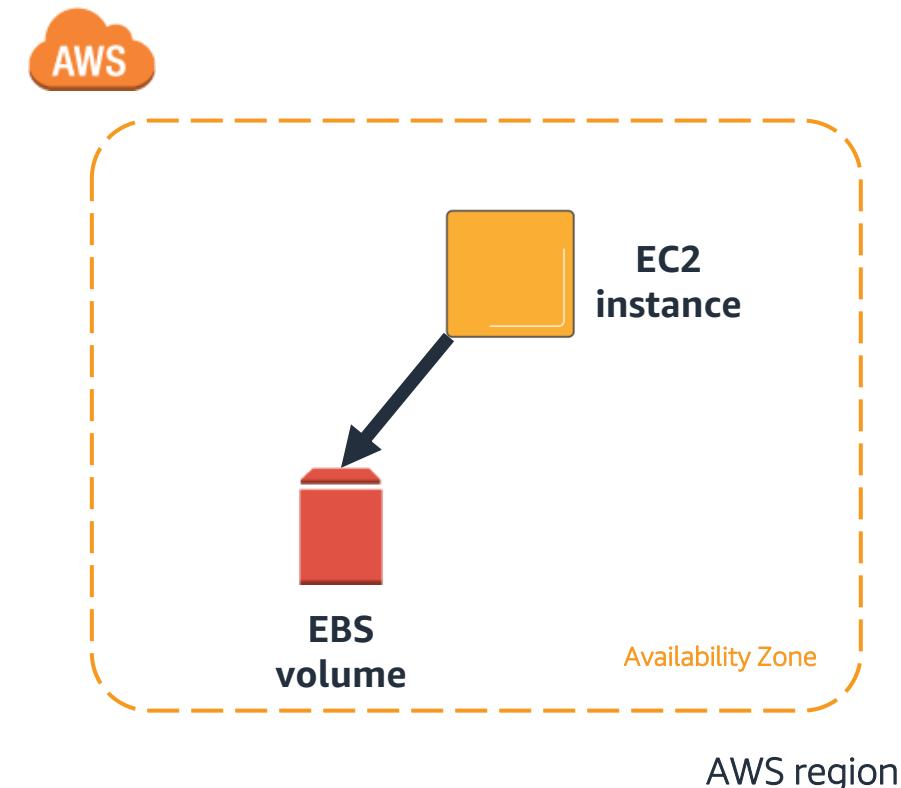
Provides block level storage volumes for use with EC2 instances

## Improve Performance

Attach high availability block storage for mission-critical applications and increase volume size without disrupting your users.

## Access Quickly

EBS volumes are particularly well-suited for use as the primary storage for file systems, databases, or for any applications that require fine granular updates and access to raw, unformatted, block-level storage



# Amazon S3



Object storage built to store and retrieve any amount of data from anywhere

Object storage service that offers industry-leading scalability, data availability, security, and performance

## Build

Run big data analytics, artificial intelligence (AI), machine learning (ML), and high-performance computing (HPC) applications to unlock data insights.

## Back Up

Meet Recovery Time Objectives (RTO), Recovery Point Objectives (RPO), and compliance requirements with S3's robust replication features.

The screenshot shows a 'Recommended For You' section with links to EC2 instances and storage options. Below it is a 'AWS Services' section titled 'Storage & Content Delivery'. The 'S3' service is highlighted with a red box. Other services listed include CloudFront, Glacier, Import/Export Snowball, Compute, Database, Networking, Developer Tools, Management Tools, Analytics, Internet of Things, Mobile Services, Application Services, and Enterprise Applications.

Recommended For You

- GET STARTED QUICKLY
  - Launch a Linux Virtual Machine quickly and easily
- AMAZON EC2 INSTANCES
  - Learn more about the available Amazon EC2 instance types
- AMAZON EC2 STORAGE
  - Learn more about Amazon EC2 storage options

AWS Services SHOW ALL SERVICES

Storage & Content Delivery

S3 Scalable Storage in the Cloud

Elastic File System PREVIEW Fully Managed File System for EC2

Import/Export Snowball Large Scale Data Transport

CloudFront Global Content Delivery Network

Glacier Archive Storage in the Cloud

Storage Gateway Hybrid Storage Integration

Compute Database Networking Developer Tools Management Tools Security & Identity

Analytics Internet of Things Mobile Services Application Services Enterprise Applications

# Amazon S3 Glacier & S3 Glacier Deep Archive



Long-term, secure, durable Amazon S3 object storage classes for data archiving

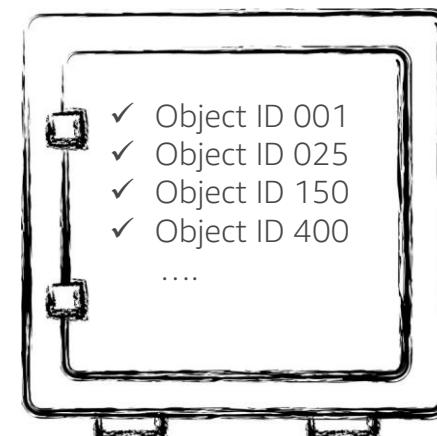
Secure, durable, and extremely low-cost Amazon S3 cloud storage classes for data archiving and long-term backup

## Scientific Data Storage

RO's generate, analyze, and archive vast amounts of data. Avoid the complexities of hardware and facility management and capacity planning by using glacier

## Healthcare Archiving

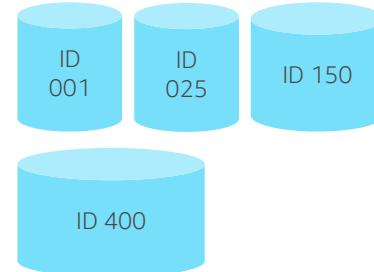
Amazon S3 Glacier and S3 Glacier Deep Archive storage classes help you reliably archive patient record data securely at a very low cost



Archive retrieval job

- Expedited: 1~5min
- Standard: 3~5hs
- Bulk: 5~12hs

Ready to download!



99.99999999% durability of objects over a given year

# AWS Data Transfer Services on the Exam



# AWS Direct Connect

Use AWS Direct Connect to securely link your on-premise environment to AWS

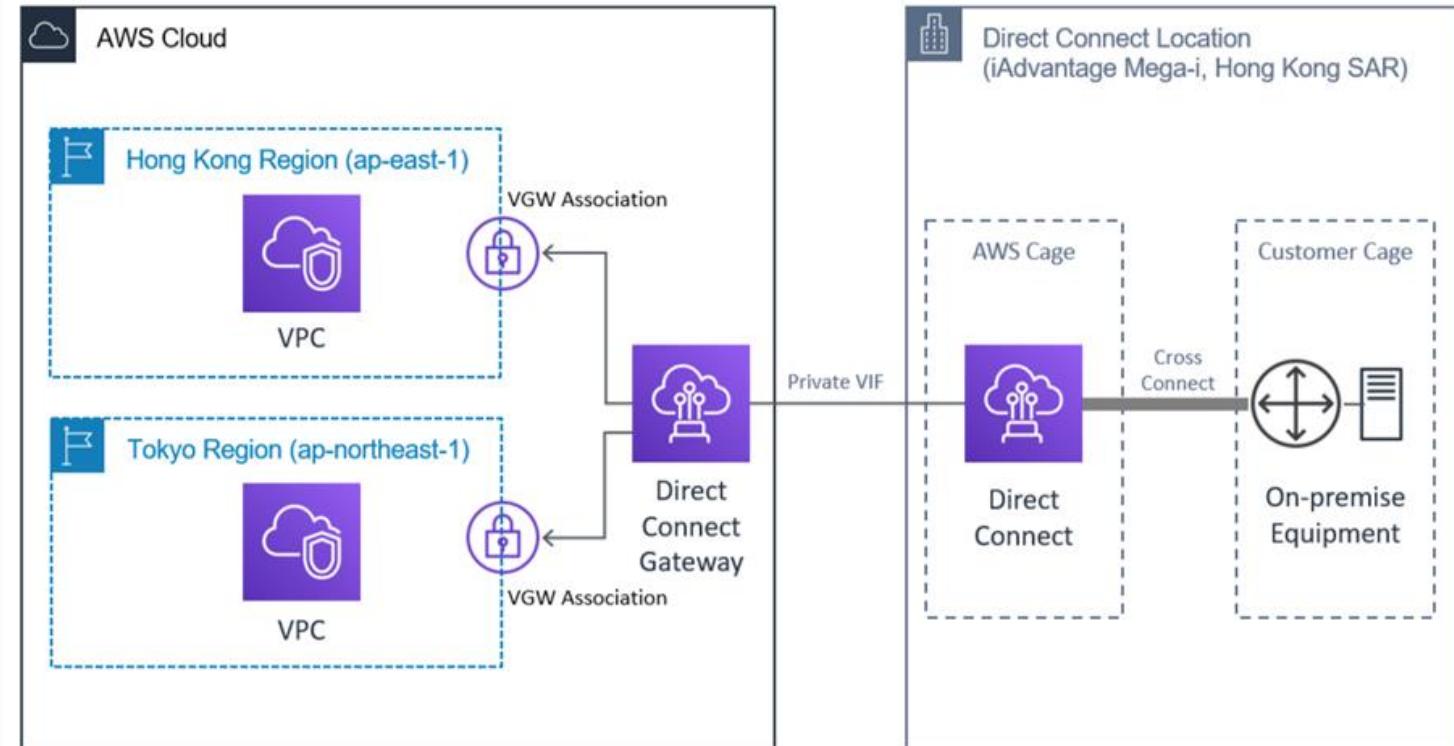
Directly connect your data center to AWS over a standard 1 gigabit or 10 gigabit Ethernet fiber-optic connection

## Hybrid connectivity

Hybrid environments allow you to combine the elasticity and economic benefits of AWS and continue to use your existing infrastructure

## Working with large datasets

Transfer your business critical data directly from your datacenter, office, or colocation environment into and from AWS, bypassing your internet service provider and removing network congestion



# AWS Snowball



Petabyte-scale data transport with on-board storage and compute capabilities

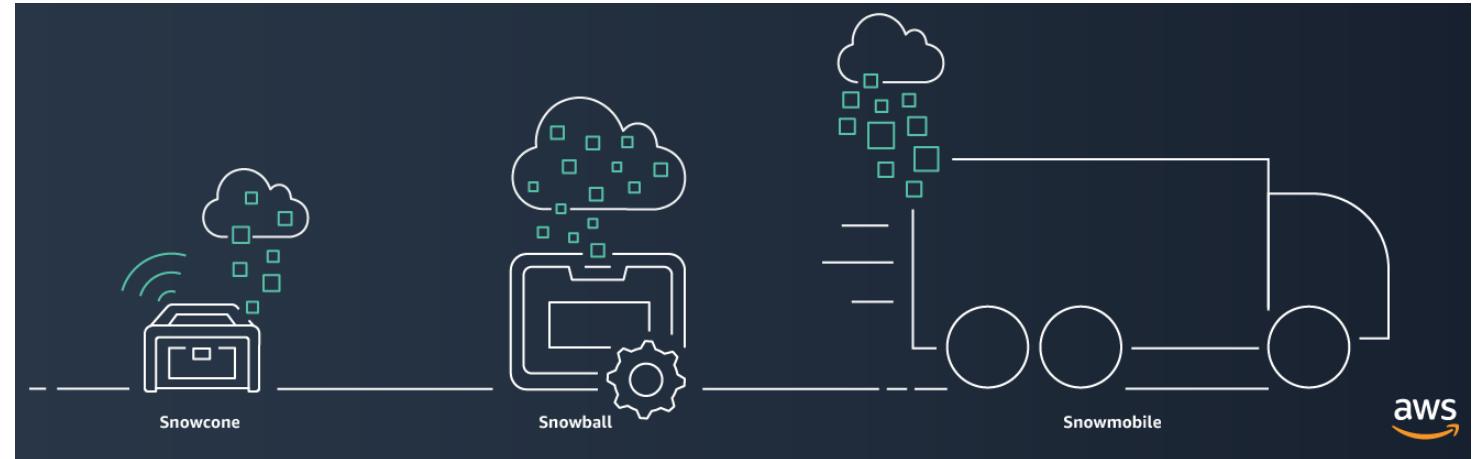
Learn more about the entire [AWS Snow family](#) for your exam!

## Snowball Data Transfer

Petabyte-scale data transport solution that uses secure appliances to transfer large amounts of data into and out of the AWS cloud

## Snowball Edge

Edge computing applications, to collect data, process the data to gain immediate insight, and then transfer the data to AWS. Transfer data that is continuously generated by sensors or machines online to AWS from hospitals, factory floors, or at other edge locations



# S3 Transfer Acceleration



## Faster long-distance S3 uploads & downloads

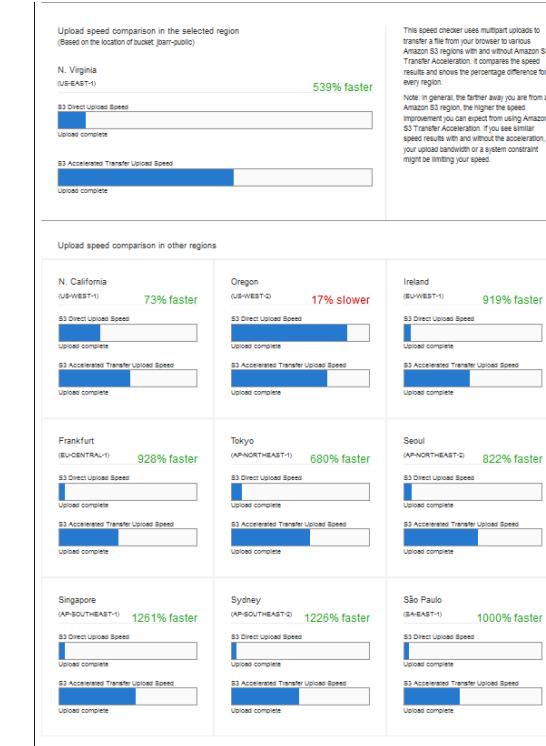
Reduces the variability in Internet routing, congestion and speeds that can affect transfers, and logically shortens the distance to S3 for remote applications

### Move Data Fast

S3TA can accelerate long-distance transfers to and from your Amazon S3 buckets. The longer the distance between your client application (mobile, web application, or upload tool) and the target S3 bucket, the more S3TA can help

### Exchange Data

For sharing of large data sets between companies, customers can set up special access to their S3 buckets with accelerated uploads



# AWS Storage Gateway



On-premises access to virtually unlimited cloud storage

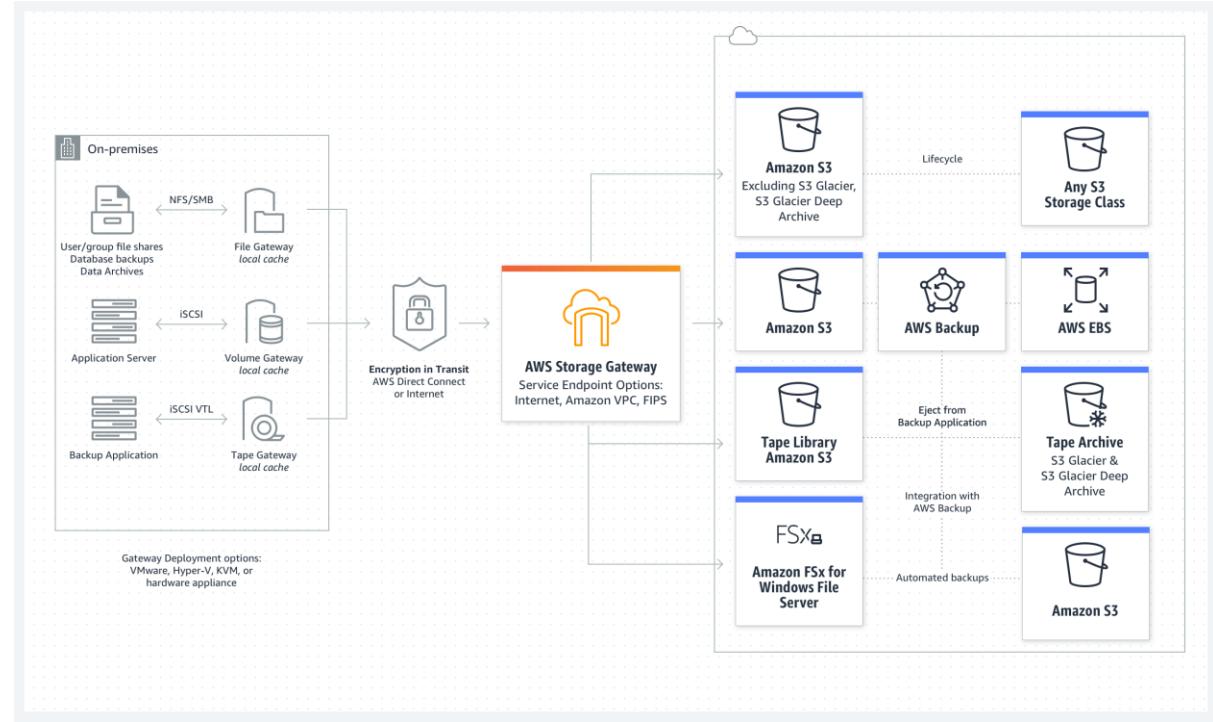
Integrate AWS Cloud storage with existing on-site workloads to simplify storage management and reduce costs for key hybrid cloud storage use cases

## Backup

Enables you to securely and easily store backups in the cloud. These include database backups, file share backups, tape archives, and more

## Low Latency Access

Storage Gateway enables on-premises applications to use cloud storage by providing low-latency data access over standard storage protocols



# Amazon Kinesis Data Firehose



Prepare and load real-time data streams into data stores and analytics services

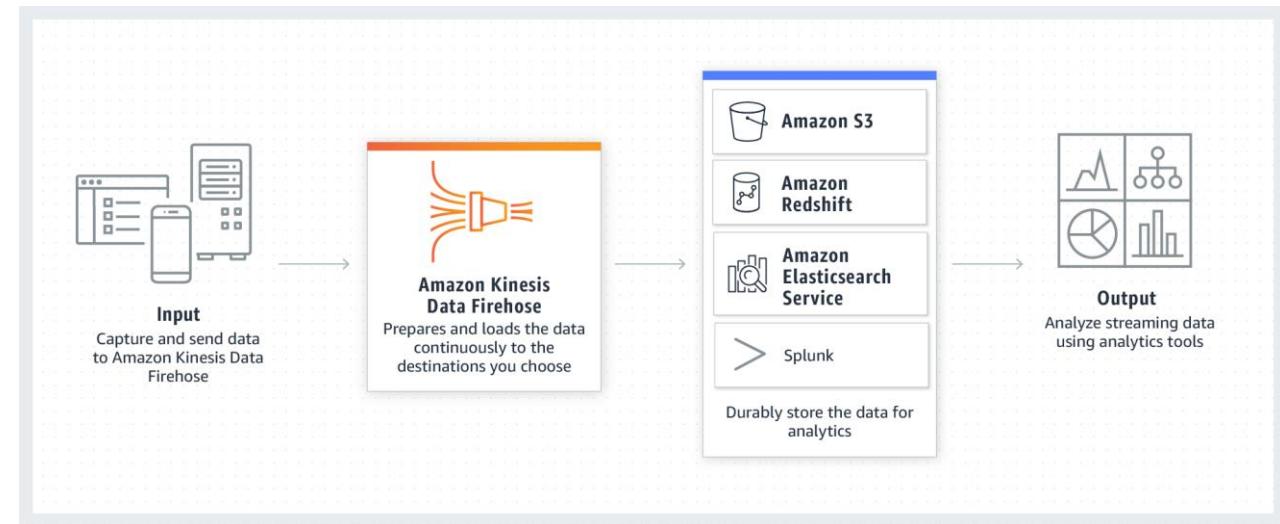
Fully managed service that automatically scales to match the throughput of your data and requires no ongoing administration. Can batch, compress, transform, and encrypt.

## Data Streaming

Kinesis Data Firehose enables high volume data ingestion into your Amazon S3 based data lake and data warehouse

## Security monitoring

Capture and send network traffic flow logs to Kinesis Data Firehose, which can transform, enrich, and load the data into your SIEM. With this solution, you can monitor network security in real-time and alert when a potential threat arises



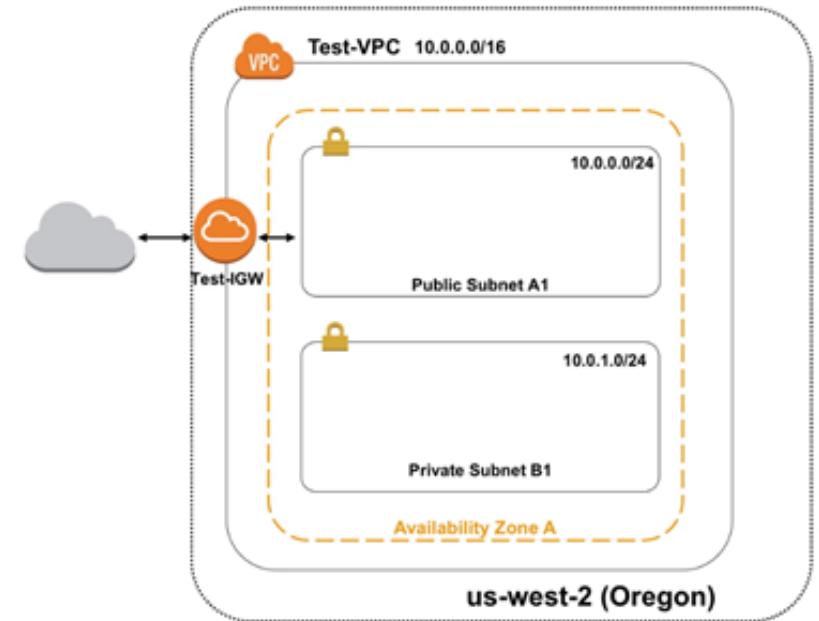
# Networking

# Amazon VPC



## Provision a Logically Isolated Section of the AWS Cloud

- Control your virtual networking environment
  - Subnets
  - Route tables
  - Security Groups
  - Network ACLs
- Connect to your on-premises network via VPN or Direct Connect
- Control if and how your instances access the internet





# Elastic Load Balancing

Distribute network traffic to improve the scalability of your applications

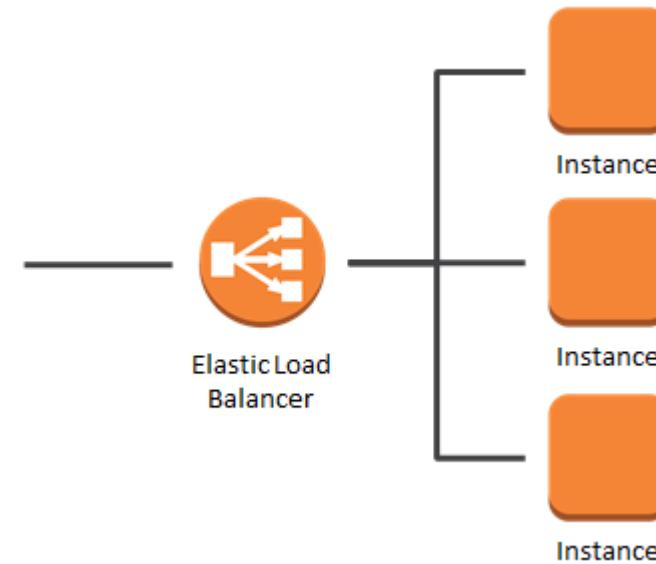
Automatically distributes incoming application traffic across multiple targets, such as Amazon EC2 instances, containers, IP addresses, Lambda functions, and virtual appliances

## Availability

Elastic Load Balancing is part of the AWS network, with native awareness of failure boundaries like AZs to keep your applications available across a region

## Monitoring

monitor the health of your applications and their performance in real time with Amazon CloudWatch metrics, logging, and request tracing





# Amazon Route 53

A reliable and cost-effective way to route end users to Internet applications

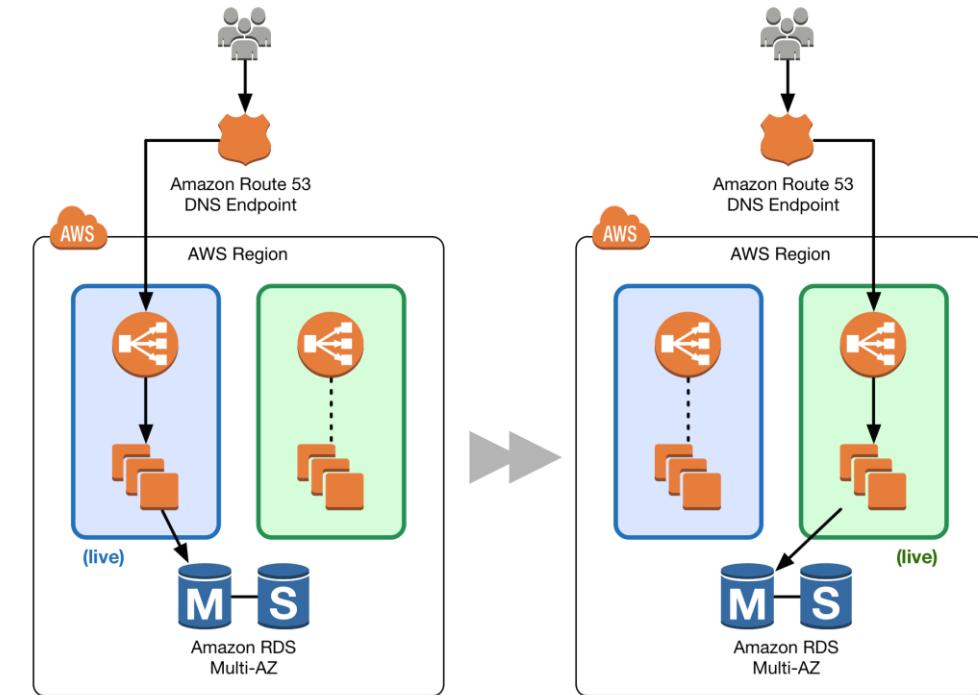
Connects user requests to infrastructure running in AWS. Highly available and scalable cloud Domain Name System (DNS) web service

## Simplicity

Amazon Route 53 Traffic Flow makes it easy to set up sophisticated routing logic for your applications

## Speed

Using a global anycast network of DNS servers around the world, Amazon Route 53 is designed to automatically route your users to the optimal location depending on network conditions



# Database



# Amazon Relational Database Service (RDS)

Set up, operate, and scale a Relational (SQL) database in the cloud

Cost-efficient and resizable capacity while automating time-consuming administration tasks such as hardware provisioning, database setup, patching and backups

## Familiarity

Provides you with six familiar database engines to choose from, including Amazon Aurora, PostgreSQL, MySQL, MariaDB, Oracle Database, and SQL Server.

## Availability

When you provision a Multi-AZ DB Instance, Amazon RDS synchronously replicates the data to a standby instance in a different Availability Zone (AZ)

### Amazon RDS database engines





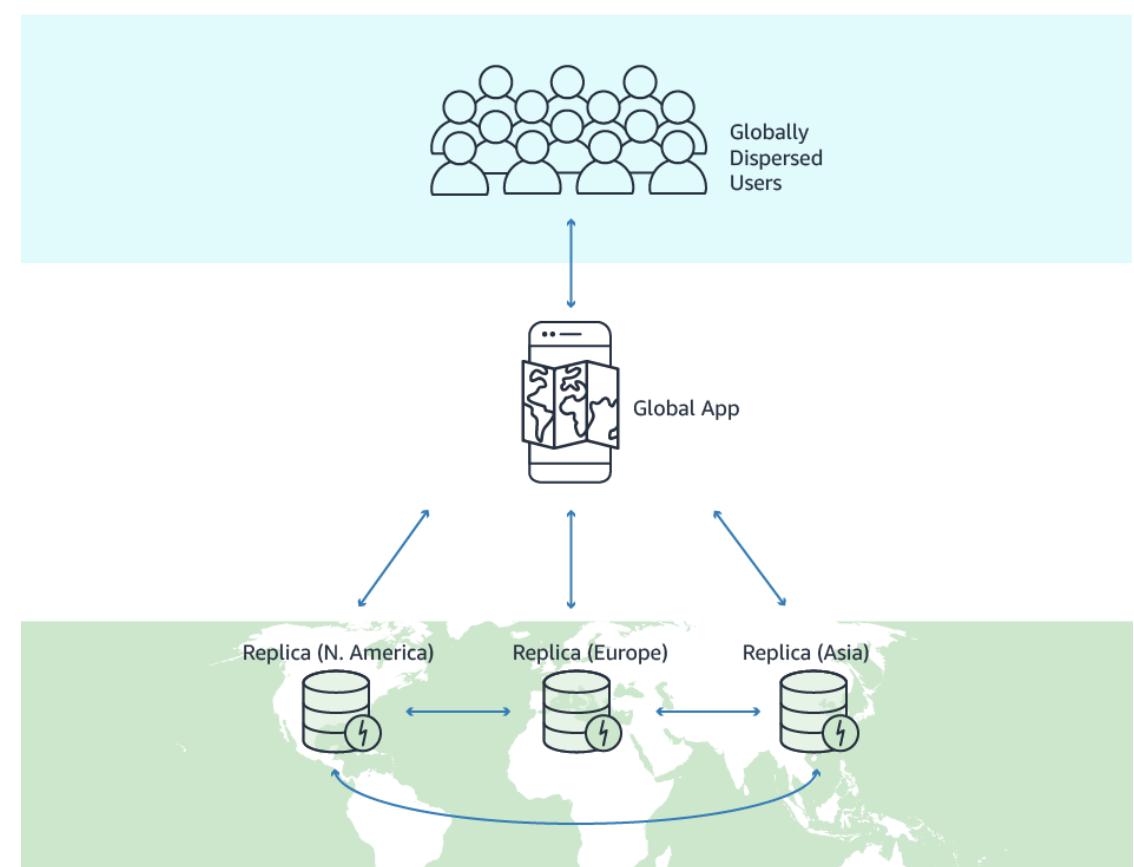
# Amazon DynamoDB

Fast and flexible NoSQL database service for any scale

Key-value and document database that delivers single-digit millisecond performance at any scale

## Industry Focus: Ad Tech

Companies in the advertising technology (ad tech) vertical use DynamoDB as a key-value store for storing various kinds of marketing data, such as user profiles, user events, clicks, and visited links. Applicable use cases include real-time bidding (RTB), ad targeting, and attribution.





# Amazon Aurora

Delivered as a Managed Service on Top of RDS

MySQL and PostgreSQL-compatible relational database built for the cloud. Performance and availability of commercial-grade databases at 1/10th the cost



- Speed and availability** of high-end commercial databases
- Up to 64TiB of **auto-scaling SSD storage**
- Automatic backup** (1 – 35 days)
- Automatic upgrade**
- Drop-in **compatibility** with MySQL and PostgreSQL
- Simple pay as you go pricing**



# Amazon ElastiCache

Fully managed in-memory data store

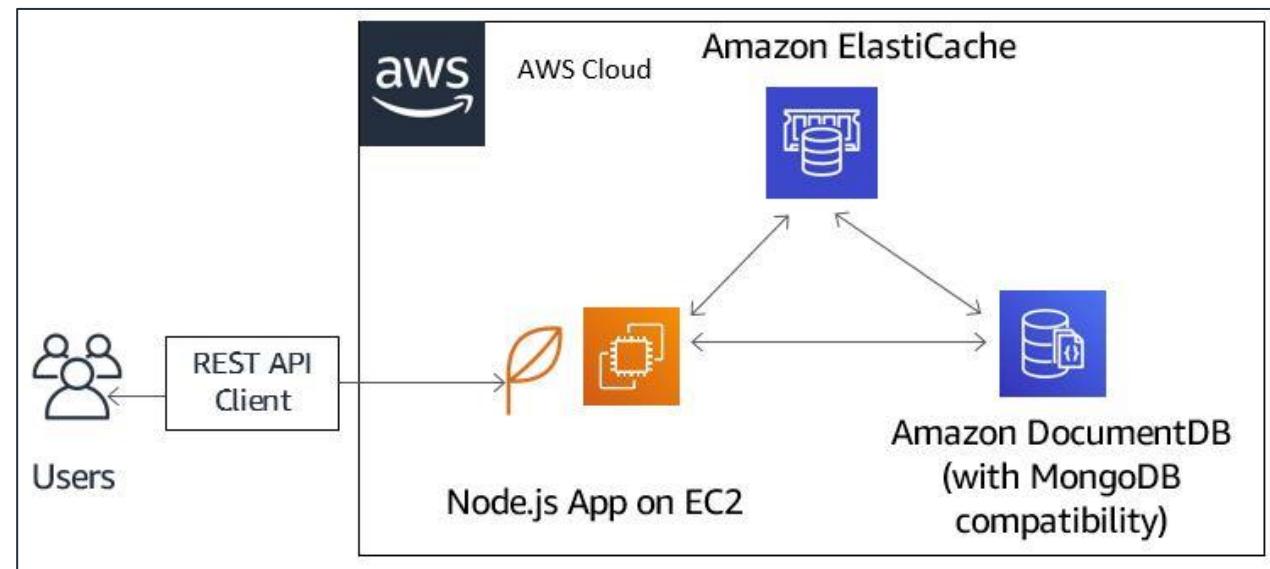
Power real-time applications with sub-millisecond latency

## Performance

Works as an in-memory data store and cache to support the most demanding applications requiring sub-millisecond response times

## Scalability

Amazon ElastiCache can scale-out, scale-in, and scale-up to meet fluctuating application demands. Write and memory scaling is supported with sharding. Replicas provide read scaling.



# Billing & Pricing

# Deploy Globally with Customer Focused Services

## Billing & Pricing Domain Focus Areas

- Compare and contrast the various pricing models for AWS
- Recognize the various account structures in relation to AWS billing and pricing
- Identify resources available for billing support
- Identify resources for technology support

# Available AWS Cost Management Services

Know and understand when to use each of the available AWS services

The screenshot shows the AWS Services Catalog interface. At the top, there's a search bar with placeholder text "Find a service by name or feature (for example, EC2, S3 or VM, storage)." Below the search bar, there are sections for "Recently visited services" and "All services". The "Recently visited services" section includes links for AWS Budgets, Billing, and AWS Cost Explorer. The "All services" section is organized into categories: Compute, Management Tools, AWS Cost Management, and Mobile Services. The "Compute" category lists EC2, Lightsail, Elastic Container Service, EKS, Lambda, Batch, and Elastic Beanstalk. The "Management Tools" category lists CloudWatch, AWS Auto Scaling, CloudFormation, CloudTrail, Config, OpsWorks, Service Catalog, and Systems Manager. The "AWS Cost Management" category, which is highlighted with a green rounded rectangle, lists AWS Cost Explorer and AWS Budgets. The "Mobile Services" category lists Mobile Hub, AWS AppSync, and Device Farm.

AWS services

Find a service by name or feature (for example, EC2, S3 or VM, storage).

Recent visited services

AWS Budgets Billing AWS Cost Explorer

S3

All services

Compute

- EC2
- Lightsail
- Elastic Container Service
- EKS
- Lambda
- Batch
- Elastic Beanstalk

Management Tools

- CloudWatch
- AWS Auto Scaling
- CloudFormation
- CloudTrail
- Config
- OpsWorks
- Service Catalog
- Systems Manager

AWS Cost Management

- AWS Cost Explorer
- AWS Budgets

Mobile Services

- Mobile Hub
- AWS AppSync
- Device Farm

# AWS Budgets



## Set Custom Budgets and Receive Alerts

Set custom budgets to track your cost and usage from simple, monthly reminders to customized budgets by service.

### Monitor

Monitor your AWS cost and usage, or RI and Savings Plans' coverage and utilization

### Respond

Set up custom actions, such as Identity and Access Management (IAM) policies, Service Control Policies (SCPs), or target running instances (EC2 or RDS) that can be executed automatically when a budget target has been met or exceeded

Home

Cost Management

Cost Explorer

**Budgets**

Budgets Reports

Cost & Usage Reports

Cost allocation tags

Billing

Bills

Orders and invoices

Credits

Preferences

Billing preferences

Payment methods

Consolidated billing

Tax settings

### AWS Budgets

You currently have no budgets. AWS Budgets lets you quickly create custom budgets that will automatically alert you when your AWS costs or usage exceed, or are forecasted to exceed, the thresholds you set.

Create a budget



#### Create and manage budgets

Set custom cost and usage budgets to more easily manage your AWS spend. Monitor your budget status from the Budgets Dashboard.



#### Refine your budget using filters

Track your cost or usage across multiple dimensions by adding filters related to Service, Linked Account(s), Availability Zone, and more.



#### Add notifications to your budget

Set up to five alert thresholds for each budget. Each alert can notify up to ten email recipients as well as publish updates to an Amazon SNS topic of your choice.



# AWS Cost Explorer

## Visualize and Explore Your AWS Costs and Usage

Visualize, understand, and manage your AWS costs and usage over time by creating custom reports

### Visualize

A set of default reports are included to help you quickly gain insight into your cost drivers and usage trends

### Forecast

Use forecasting to get a better idea of what your costs and usage may look like in the future based on historical usage patterns.



# AWS Savings Plans (Cost Explorer Feature)



Flexible pricing model that can provide savings of up to 72% on AWS usage

This model offers prices on Amazon EC2 instances usage, regardless of instance family, size, OS, tenancy or AWS Region, and also applies to AWS Fargate Usage. AWS Cost Explorer will help you choose a Savings Plan, and will guide you through the purchase process

## Compute

These plans automatically apply to EC2 instance usage, AWS Fargate, and AWS Lambda service usage regardless of instance family, size, AZ, region, OS, or tenancy

## EC2 & SageMaker

Provides the lowest prices, in exchange for commitment to usage of individual instance families in a selected region

Recommendation options

Savings Plans type <input checked="" type="radio"/> Compute <input type="radio"/> EC2 Instance	Savings Plans term <input type="radio"/> 1-year <input checked="" type="radio"/> 3-year	Payment option <input checked="" type="radio"/> All upfront <input type="radio"/> Partial upfront <input type="radio"/> No upfront	Based on the past <input type="radio"/> 7 days <input type="radio"/> 30 days <input checked="" type="radio"/> 60 days
--	---	---	--

Recommendation: Purchase a Compute Savings Plan at a commitment of \$2.40/hour

You could save an estimated \$1,173 monthly by purchasing the recommended Compute Savings Plan.

Based on your past 60 days of usage, we recommend purchasing a Savings Plan with a commitment of \$2.40/hour for a 3-year term. With this commitment, we project that you could save an average of \$1.61/hour - representing a 40% savings compared to On-Demand. To account for variable usage patterns, this recommendation maximizes your savings by leaving an average \$0.04/hour of On-Demand spend.

Before recommended purchase	After recommended purchase (based on your past 60 days of usage)
Monthly On-Demand spend <small>(40 hours/month)</small>	Estimated monthly spend <small>(40 hours/month)</small>
\$2,955 (\$4.05/hour)	\$1,782 (\$2.44/hour)
Based on your On-Demand spend over the past 60 days	Your recommended \$2.40/hour Savings Plans commitment - an average \$0.04/hour of On-Demand spend

This recommendation examines your usage over the past 60 days (including your existing Savings Plans and EC2 Reserved Instances) and calculates what your costs would have been had you purchased the recommended Savings Plans. See applicable rates for Savings Plans [here](#). To generate this recommendation, AWS simulates your bill for different commitment amounts and recommends the commitment amount that provides the greatest estimated savings. [Learn more](#)

Recommended Compute Savings Plans

x	Term	Payment option	Recommended commitment	Estimated hourly savings
<input checked="" type="checkbox"/>	3-year	All upfront	\$2.40/hour	\$1.61 (40%)

\*Average hourly spend and minimum hourly spend based on your current on-demand spend for the given instance family.



# AWS Organizations

## Central Governance and Management Across AWS Accounts

Programmatically create new AWS accounts and allocate resources, group accounts to organize your workflows, apply policies to accounts or groups for governance, and simplify billing by using a single payment method for all of your accounts

### Automate

Automate the creation of new AWS accounts by adding them to user-defined groups in your organization for instant security policy application, touchless infrastructure deployments and auditing

### Share

Share critical central resources across your accounts such as Active Directory

AWS Organizations > AWS accounts

### AWS accounts

Add an AWS account

The accounts listed below are members of your organization. The organization's management account is responsible for paying the bills for all accounts in the organization. You can use the tools provided by AWS Organizations to centrally manage these accounts. [Learn more](#)

Organization	Actions ▾
Organizational units (OUs) enable you to group several accounts together and administer them as a single unit instead of one at a time.	Hierarchy List
<input type="text"/> Find AWS accounts by name, email, or account ID. Find an OU by the exact OU ID.	
Organizational structure	Account created/joined date
▼ □ Root [REDACTED]	Joined 2021/08/23
□ [REDACTED] [REDACTED] management account [REDACTED]	



# AWS Pricing Calculator (formerly TCO Calculator)

Configure a cost estimate that fits your unique business needs with AWS

Explore AWS services and create an estimate for the cost of your use cases on AWS

## Estimate

Estimate the cost to migrate your architecture setup to the cloud, or explore what an expansion of your business might look like

## Right Size

Enter your minimum requirements to identify the most cost effective EC2 Instance for your use case.

The screenshot shows the AWS Pricing Calculator interface. At the top, there's a navigation bar with the AWS logo, 'aws pricing calculator', 'Feedback', 'English', and 'Contact Sales'. Below the navigation, the page title is 'AWS Pricing Calculator > My Estimate > Add service'. The main area is titled 'Select service' with a 'Info' link. A search bar contains the placeholder 'AWS services (120)'. Below the search bar, there are four service cards arranged in a grid:

- Amazon API Gateway**: Described as a fully managed service for creating, publishing, maintaining, monitoring, and securing APIs at any scale. It acts as the front door for applications to access data, business logic, or functionality from your backend services. Includes 'Product page' and 'Configure' buttons.
- Amazon Athena**: An interactive query service that makes it easy to analyze data in Amazon S3 using standard SQL. It is serverless, so there is no infrastructure to manage, and you pay only for the queries that you run. Includes 'Product page' and 'Configure' buttons.
- Amazon Aurora MySQL-Compatible**: An Amazon Aurora MySQL Compatible relational database built for the cloud, that combines performance and availability of traditional enterprise databases with the simplicity and cost-effectiveness of open source databases. Includes 'Product page' and 'Configure' buttons.
- Amazon Aurora PostgreSQL-Compatible DB**: 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. Includes 'Product page' and 'Configure' buttons.
- Amazon Braket**: A fully managed quantum computing service that helps researchers and developers get started with the technology to accelerate research and discovery. Amazon Braket provides a development environment for you to explore and build quantum algorithms, test them on quantum circuit simulators, and run them on different quantum hardware technologies. Includes 'Product page' and 'Configure' buttons.
- Amazon Carrier IP**: A Carrier IP address is the address that you assign to a network interface, which resides in a subnet in a Wavelength Zone (for example an EC2 instance). Includes 'Product page' and 'Configure' buttons.



# AWS Trusted Advisor

Reduce costs, improve performance, improve security

Provides recommendations that help you follow AWS best practices

## Cost Optimization

Trusted Advisor can help you save cost, such as recommending you to delete unused or idle resources, or use reserved capacity.

## Security

Trusted Advisor can improve the security of your application by recommending you to enable AWS security features, and review your permissions.

### Cost Optimization



0 ✓ 9 ▲ 0 !  
\$7,516.85

Potential monthly savings

### Performance



3 ✓ 7 ▲ 0 !

### Security



2 ✓ 4 ▲ 11 !

### Fault Tolerance



0 ✓ 15 ▲ 5 !

### Service Limits



37 ✓ 0 ▲ 1 !

# AWS Well-Architected

# AWS Well-Architected Framework

Build secure, high-performing, resilient, and efficient infrastructure



## Operational Excellence

Pillar focused on running and monitoring systems, and continually improving processes and procedures. Key topics include change automation, event response, and standards for managing daily operations.

## Security

Pillar focused on protecting information and systems. Key topics include confidentiality and integrity of data, managing user permissions, and establishing controls to detect security events.

## Reliability

Pillar focused on workloads performing their intended functions and how to recover quickly from failure to meet demands. Key topics include distributed system design, recovery planning, and adapting to changing requirements.

## Performance Efficiency

Pillar focused on structured and streamlined allocation of IT and computing resources. Key topics include selected resource types and sizes optimized for workload requirements, and maintaining efficiency as business needs evolve.

## Cost Optimization

Pillar focused on avoiding unnecessary costs. Key topics include understanding spend over time and controlling fund allocation, selecting resources of the right type and quantity, and scaling to meet business needs without overspending.

## Sustainability

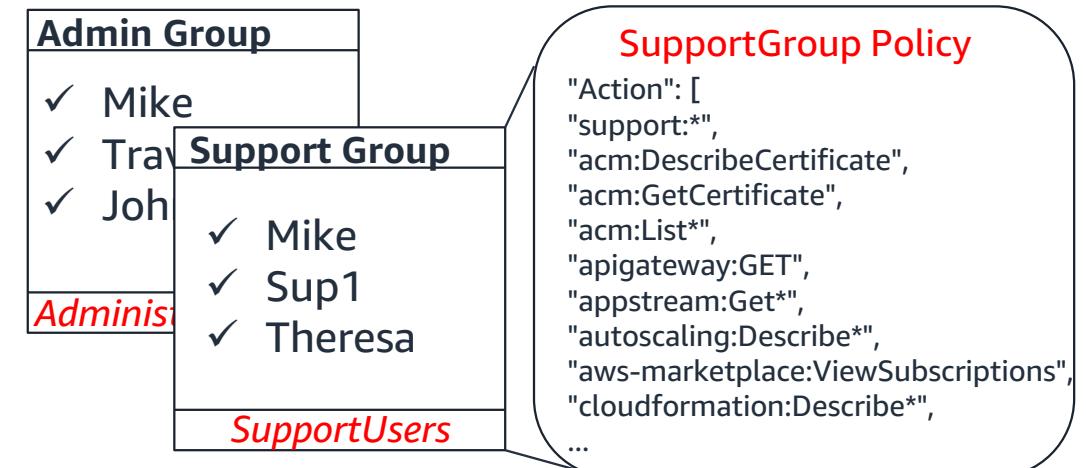
Pillar focused on minimizing the environmental impacts of running cloud workloads. Key topics are shared responsibility model for sustainability, understanding impact, and maximizing utilization to minimize required resources, reducing downstream impact.

# Appendix

# Security 'Best Practices' on the Exam

## Exam specific topics (not a consultative security recommendation)

- You can control access to buckets and objects with:
  - Access Control Lists (ACLs)
  - Bucket policies
  - Identity and Access Management (IAM) policies
- You can upload or download data to Amazon S3 via SSL encrypted endpoints.
- You can encrypt data using AWS SDKs.
- Encrypt data in transit & at rest
- Rotate encryption keys
- IAM
  - Follow principal of least privilege
  - Do not use the root user for your everyday tasks
  - Securely lock away the root user credentials
  - Delete any programmatic keys
  - Enable MFA on Root Account
  - Change the Root password to a strong password
- Use temporary security credentials





# AWS Systems Manager

Gain operational insights and take action on AWS resources

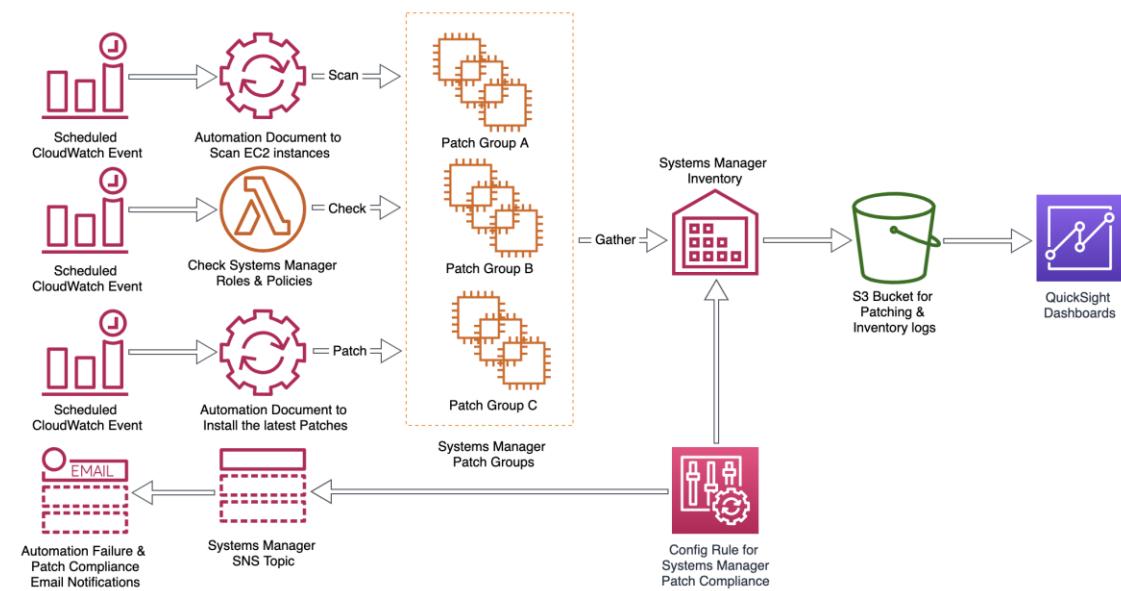
Operations hub for AWS. provides a unified user interface so you can track and resolve operational issues across your AWS applications and resources from a central place

## Automate

With automated approval workflows and runbooks with rich text descriptions, you can reduce human error and simplify maintenance and deployment tasks on AWS resources.

## Secure

AWS Systems Manager helps maintain security and compliance by scanning your instances against your patch, configuration, and custom policies.



# Amazon Kinesis Data Firehose



Prepare and load real-time data streams into data stores and analytics services

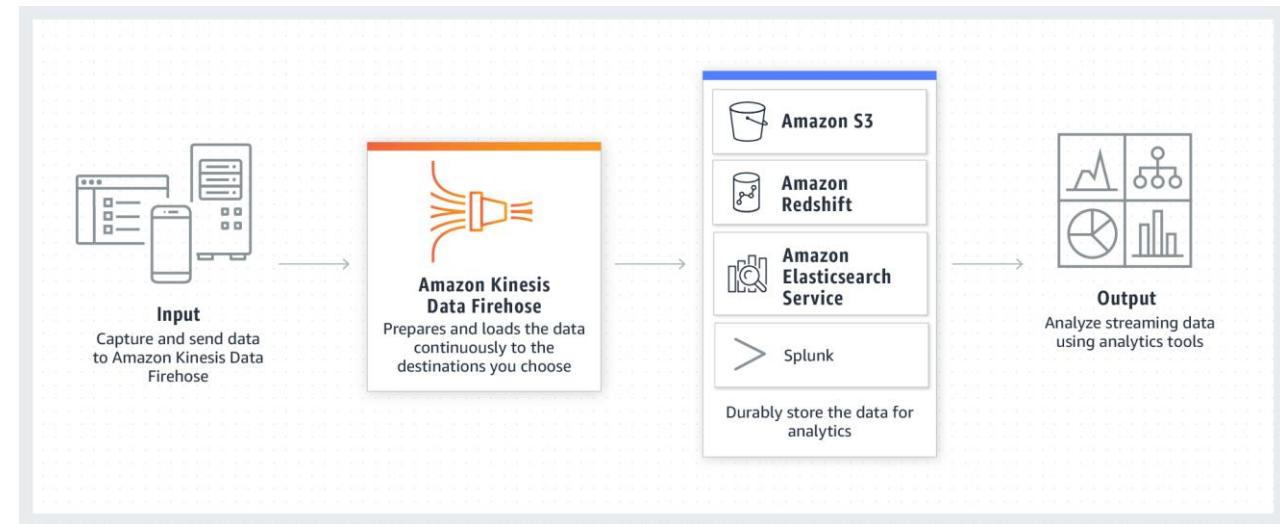
Fully managed service that automatically scales to match the throughput of your data and requires no ongoing administration. Can batch, compress, transform, and encrypt.

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## Security monitoring

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# Amazon FSx

FSx

Launch and run feature-rich and highly-performant file systems with just a few clicks

Launch and run popular file systems that are fully managed by AWS

## FSx for Windows

Provides you with the compatible Windows features and performance that your applications require from a windows file system

## FSx for Lustre

Provides sub-millisecond latencies, up to hundreds of gigabytes per second of throughput, and millions of IOPS. Can be linked to S3 buckets. For high I/O compute workloads

The screenshot shows the AWS Directory Service console with a Microsoft AD directory named 'example'. The 'Directory details' section displays the following information:

Setting	Value
Directory type	Microsoft AD
VPC	vpc-1dfdcf7a
Status	Active
Edition	Standard
Subnets	subnet-47ffe520, subnet-53c5510b
Last updated	Wednesday, December 11, 2019
Directory ID	d-9767100d92
Availability zones	ap-southeast-2a, ap-southeast-2c
Launch time	Wednesday, December 11, 2019
Directory DNS name	example.com
DNS address	172.31.9.241, 172.31.27.108
Description	This is an example directory

Below the main details, there are tabs for 'Application management', 'Scale & share', 'Networking & security', and 'Maintenance'. At the bottom, there is a 'Create' button and a note about the application access URL.

# The EC2 Platform

## Powering cloud applications

- Virtual machine instance
- Linux and Microsoft Windows AMI's
- Amazon Machine Image: is the image of the Operating System that will be loaded in the instance.
- Client has full control of the Operating System and its applications as admin
- Multiple types and sizes of instances
- Remote access via SSH or Remote Desktop

