

AWS Partner: AWS Cloud Practitioner Essentials

Course Overview

Agenda

Introduction: Course Overview

Module 1: Introduction to Amazon Web Services

Module 2: Compute in the Cloud

Module 3: Global Infrastructure and Reliability

Module 4: Networking

Module 5: Storage and Databases

Module 6: Security

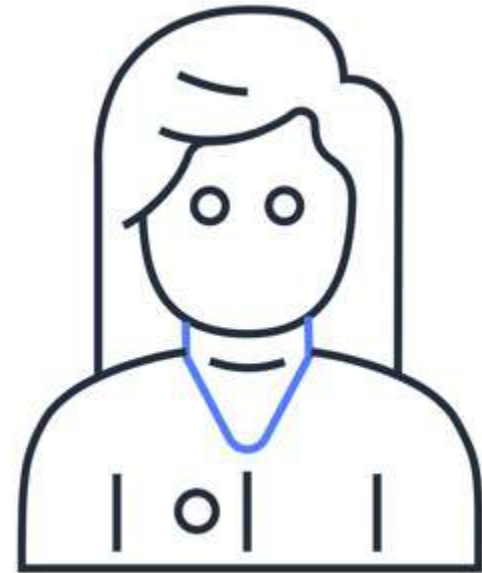
Module 7: Monitoring and Analytics

Module 8: Pricing and Support

Module 9: Migration and Innovation

Module 10: AWS Certified Cloud Practitioner Basics

- Name
- What you do for work
- What you hope to learn in this course
- What you like to do in your leisure time



Module 1

Introduction to Amazon Web Services

Module 1 objectives

In this module, you will learn how to:

- Describe three cloud computing deployment models
- Describe six benefits of cloud computing



Welcome to the coffee shop



Customer



A customer makes a request.



Barista



A barista fulfills the customer's request.

Client and server model



Client



A client makes a request.

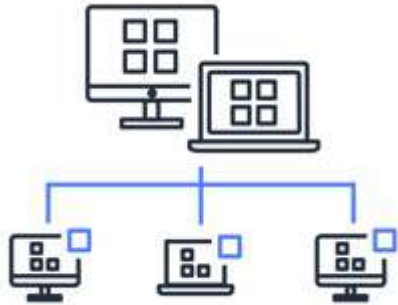


Server



A server fulfills the client's request.

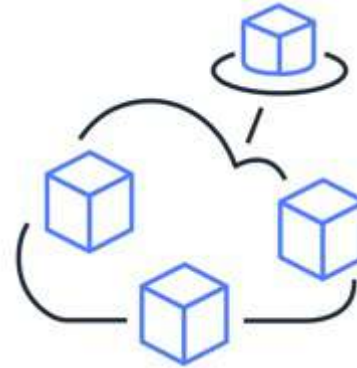
What is cloud computing?



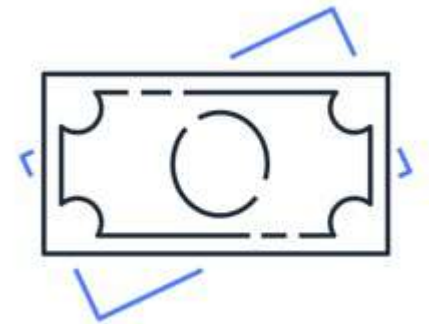
Access services
on demand



Avoid large upfront
investments



Provision computing
resources as needed



Pay only for what
you use

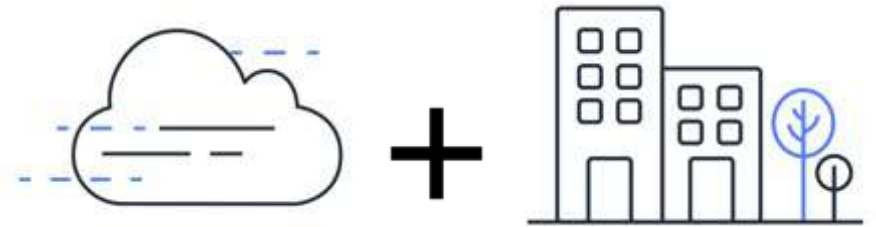
Cloud computing deployment models



Cloud



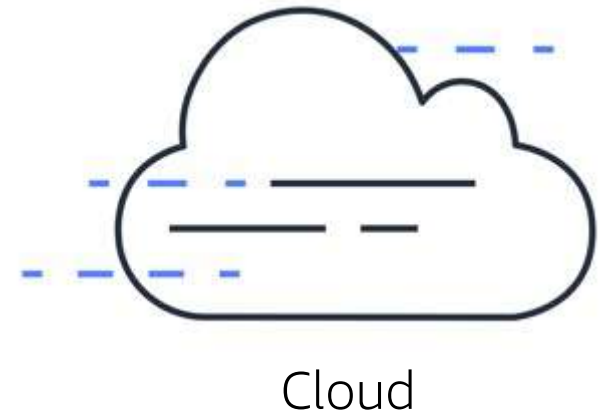
On premises



Hybrid

Cloud-based deployment

- Run all parts of the application in the cloud
- Migrate existing applications to the cloud
- Design and build new applications in the cloud



On-premises deployment

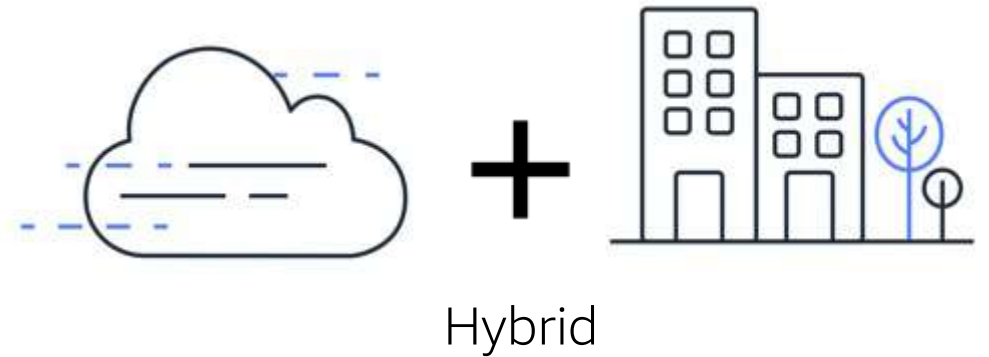
- Use virtualization and resource management tools to deploy resources
- Use application management and virtualization technologies to increase resource usage

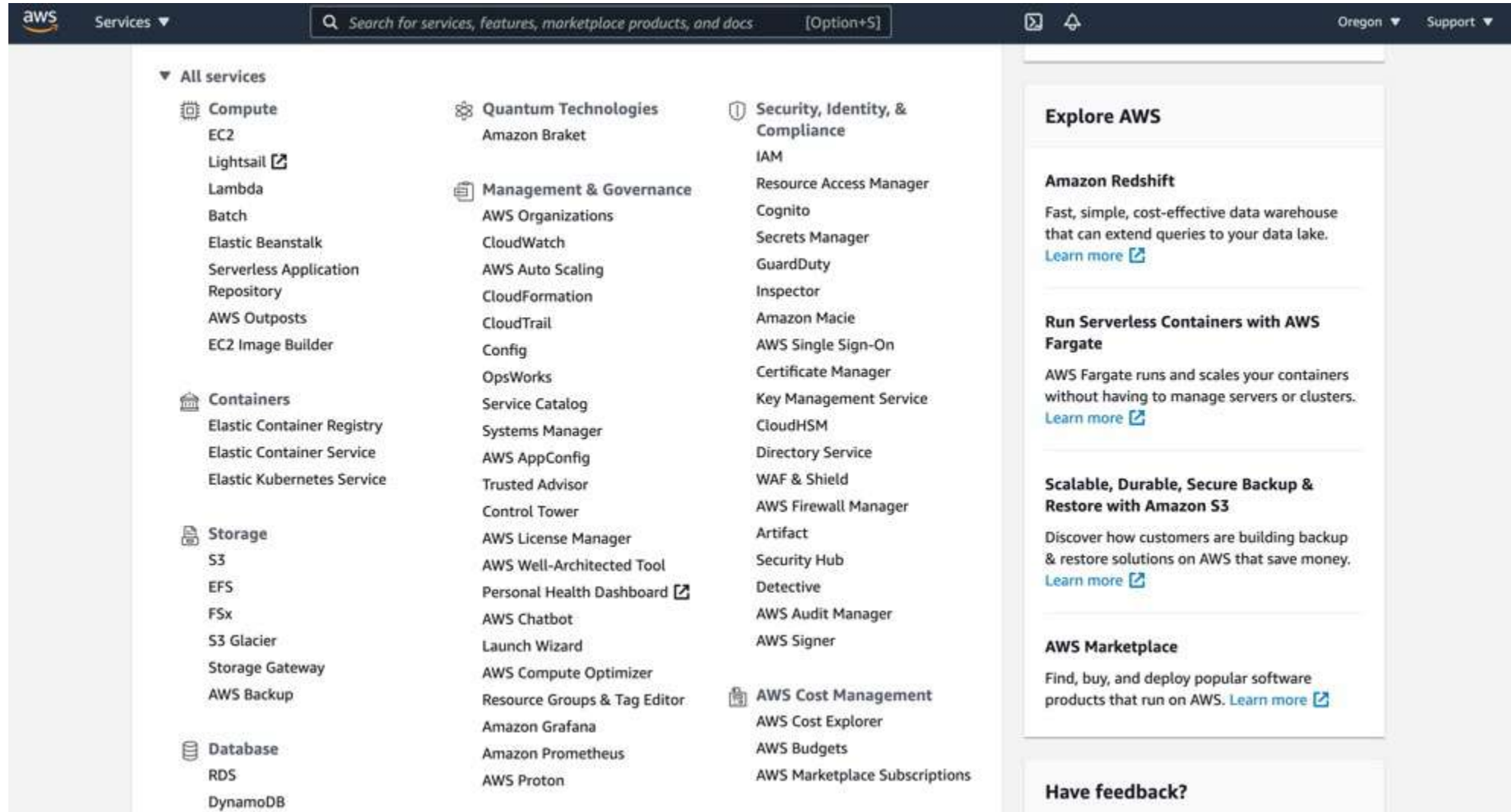


On premises

Hybrid deployment

- Connect cloud-based resources to on-premises infrastructure
- Integrate cloud-based resources with legacy IT applications





The screenshot displays the AWS Management Console's 'Services' page. At the top, there is a navigation bar with the AWS logo, a 'Services' dropdown, a search bar with the placeholder text 'Search for services, features, marketplace products, and docs', a keyboard shortcut '[Option+S]', and regional settings for 'Oregon' and 'Support'. The main content area is divided into a left-hand navigation pane and a central grid of service categories. The left pane lists 'All services' with expandable sections for 'Compute', 'Containers', 'Storage', and 'Database'. The central grid is organized into four columns: 'Compute' (listing services like EC2, Lambda, and Elastic Beanstalk), 'Quantum Technologies' (listing Amazon Braket), 'Management & Governance' (listing AWS Organizations, CloudWatch, and others), and 'Security, Identity, & Compliance' (listing IAM, Resource Access Manager, and others). A fifth column on the right, under the heading 'Explore AWS', features promotional cards for 'Amazon Redshift', 'Run Serverless Containers with AWS Fargate', 'Scalable, Durable, Secure Backup & Restore with Amazon S3', and 'AWS Marketplace', each with a brief description and a 'Learn more' link. At the bottom right, there is a 'Have feedback?' section.

aws Services ▾ Search for services, features, marketplace products, and docs [Option+S] Oregon ▾ Support ▾

▼ All services

- Compute
 - EC2
 - Lightsail
 - Lambda
 - Batch
 - Elastic Beanstalk
 - Serverless Application Repository
 - AWS Outposts
 - EC2 Image Builder
- Containers
 - Elastic Container Registry
 - Elastic Container Service
 - Elastic Kubernetes Service
- Storage
 - S3
 - EFS
 - FSx
 - S3 Glacier
 - Storage Gateway
 - AWS Backup
- Database
 - RDS
 - DynamoDB

Quantum Technologies

- Amazon Braket

Management & Governance

- AWS Organizations
- CloudWatch
- AWS Auto Scaling
- CloudFormation
- CloudTrail
- Config
- OpsWorks
- Service Catalog
- Systems Manager
- AWS AppConfig
- Trusted Advisor
- Control Tower
- AWS License Manager
- AWS Well-Architected Tool
- Personal Health Dashboard
- AWS Chatbot
- Launch Wizard
- AWS Compute Optimizer
- Resource Groups & Tag Editor
- Amazon Grafana
- Amazon Prometheus
- AWS Proton

Security, Identity, & Compliance

- IAM
- Resource Access Manager
- Cognito
- Secrets Manager
- GuardDuty
- Inspector
- Amazon Macie
- AWS Single Sign-On
- Certificate Manager
- Key Management Service
- CloudHSM
- Directory Service
- WAF & Shield
- AWS Firewall Manager
- Artifact
- Security Hub
- Detective
- AWS Audit Manager
- AWS Signer

AWS Cost Management

- AWS Cost Explorer
- AWS Budgets
- AWS Marketplace Subscriptions

Explore AWS

Amazon Redshift

Fast, simple, cost-effective data warehouse that can extend queries to your data lake. [Learn more](#)

Run Serverless Containers with AWS Fargate

AWS Fargate runs and scales your containers without having to manage servers or clusters. [Learn more](#)

Scalable, Durable, Secure Backup & Restore with Amazon S3

Discover how customers are building backup & restore solutions on AWS that save money. [Learn more](#)

AWS Marketplace

Find, buy, and deploy popular software products that run on AWS. [Learn more](#)

Have feedback?

Cloud computing benefits

Variable expenses

Upfront expenses



Invest in technology
resources before using
them

Variable expenses



Pay only for what you use

Cost optimization



Run data centers

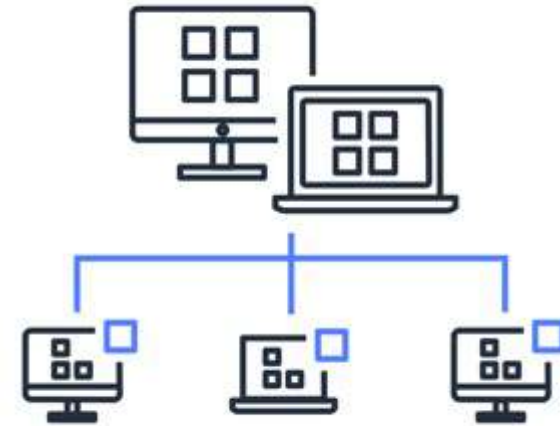


Focus on applications and customers

Investment



Stop guessing on your
infrastructure capacity
needs



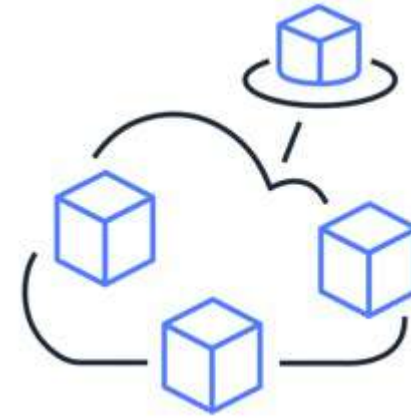
Scale in and scale out as
needed

Smaller scale



Pay higher prices based on
only your own usage

Economies of scale



Benefit from customers'
aggregated usage

Data centers



Weeks between wanting
resources and having
resources

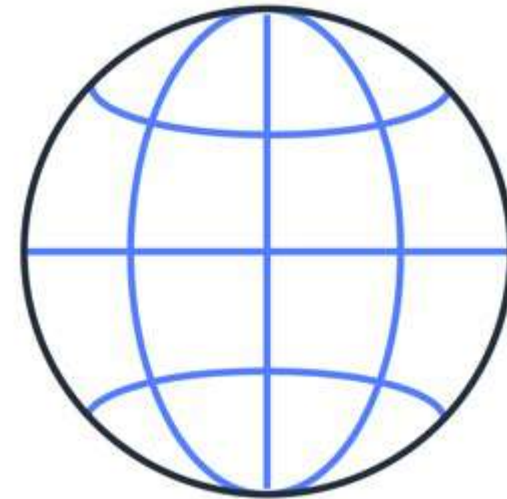
Cloud computing



Minutes between wanting
resources and having
resources

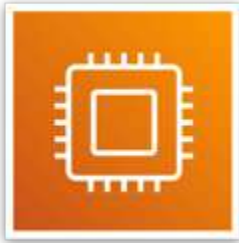


Quickly deploy applications
worldwide



Use the AWS global
infrastructure.

AWS core service categories



Compute



Networking and
Content Delivery



Storage



Database



Security, Identity,
and Compliance



Management
and Governance

Module 1

Knowledge check

Knowledge check question 1



What is cloud computing?

- A. Backing up files that are stored on desktop and mobile devices to prevent data loss
- B. Deploying applications that are connected to an on-premises infrastructure
- C. Using on-demand delivery of IT resources and applications through the internet
- D. Running code without needing to manage or provision servers

Knowledge check answer 1



What is cloud computing?

- A. Backing up files that are stored on desktop and mobile devices to prevent data loss
- B. Deploying applications that are connected to an on-premises infrastructure
- C. Using on-demand delivery of IT resources and applications through the internet (correct)
- D. Running code without needing to manage or provision servers

Knowledge check question 2



What is another name for on-premises deployment?

- A. Cloud-based application
- B. Hybrid deployment
- C. Private cloud deployment
- D. AWS Cloud

Knowledge check answer 2



What is another name for on-premises deployment?

- A. Cloud-based application
- B. Hybrid deployment
- C. Private cloud deployment (correct)
- D. AWS Cloud

Knowledge check question 3



How does the scale of cloud computing help you save costs?

- A. You do not have to invest in technology resources before using them.
- B. The aggregated cloud usage from a large number of customers results in lower pay-as-you-go prices.
- C. Accessing services on-demand helps prevent excess or limited capacity.
- D. You can quickly deploy applications to customers and provide low latency.

Knowledge check answer 3



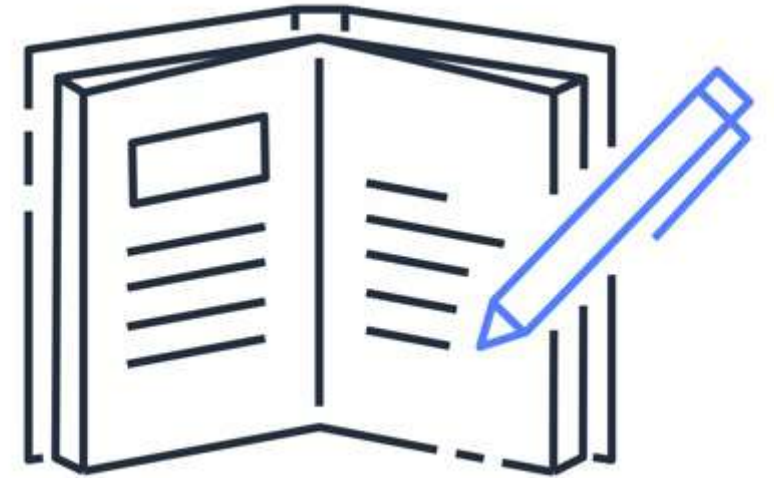
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- D. You can quickly deploy applications to customers and provide low latency.

Module 1 summary

In this module, you learned about:

- Three cloud computing deployment models
- Six benefits of cloud computing



Module 2

Compute in the Cloud

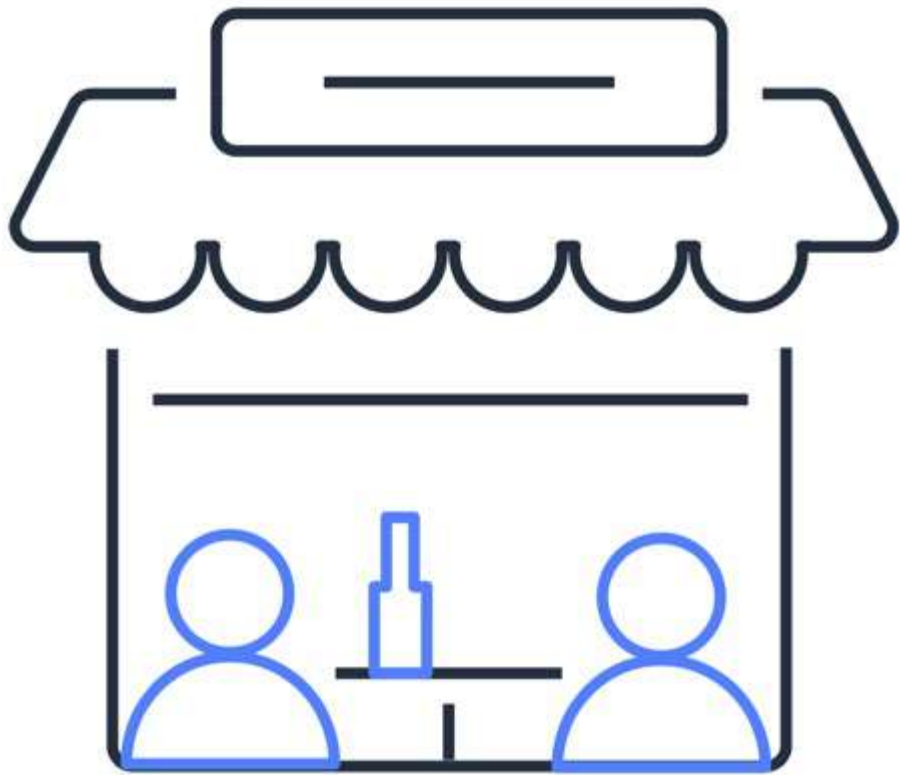
Module 2 objectives

In this module, you will learn how to:

- Describe Amazon EC2 benefits
- Identify the Amazon EC2 instance types
- Differentiate among Amazon EC2 billing options
- Summarize Amazon EC2 Auto Scaling benefits
- Summarize Elastic Load Balancing benefits
- Provide examples of Elastic Load Balancing uses
- Describe differences between Amazon SNS and Amazon SQS
- Summarize additional AWS compute options



Client and server model



Customer



A customer makes a request.



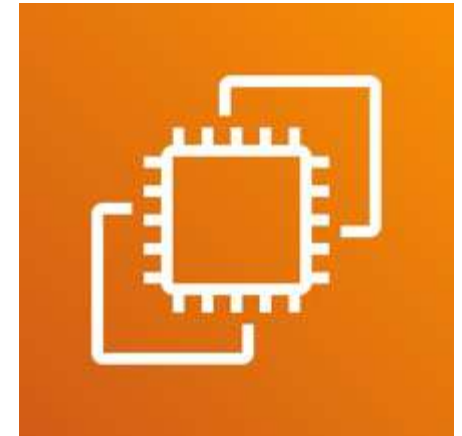
Barista



A barista fulfills the customer's request.

Amazon Elastic Compute Cloud (Amazon EC2)

- Use secure, sizable compute capacity
- Boot server instances in minutes
- Pay only for what you use

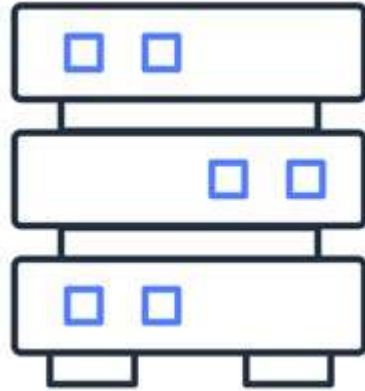


Amazon EC2

How Amazon EC2 works



Launch an
instance



Connect to the
instance

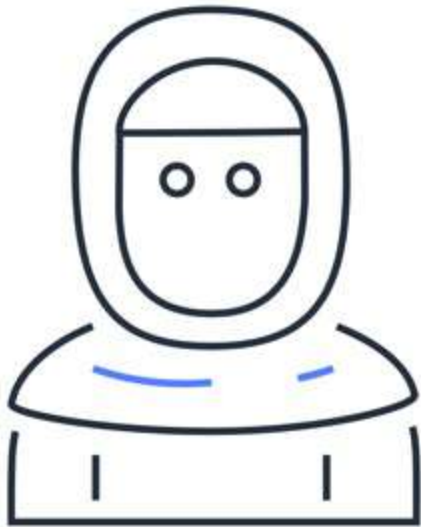


Use the instance

Amazon EC2 instance types

Coffee shop tasks

Employee 1



Employee 2

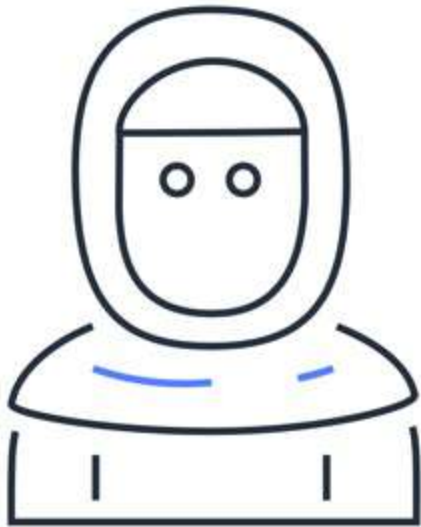


Employee 3



Coffee shop task specialization

Employee 1



Make coffee

Employee 2



Process transactions

Employee 3



Order supplies

Amazon EC2 instance types

General purpose

- Balances compute, memory, and networking resources
- Suitable for a broad range of workloads

Compute optimized

- Offers high-performance processors
- Ideal for compute-intensive applications and batch processing workloads

Memory optimized

- Delivers fast performance for memory-intensive workloads
- Well suited for high-performance databases

Accelerated computing

- Uses hardware accelerators to expedite data processing
- Ideal for application streaming and graphics workloads

Storage optimized

- Offers low latency and high input/output operations per second (IOPS)
- Suitable for workloads such as distributed file systems and data warehousing applications

Match: Amazon EC2 instance types

1. Ideal for high-performance databases

2. Suitable for data warehousing applications

3. Balances compute, memory, and networking resources

4. Offers high-performance processors

A. General purpose

B. Compute optimized

C. Memory optimized

D. Storage optimized

Match: Amazon EC2 instance types

1. Ideal for high-performance databases

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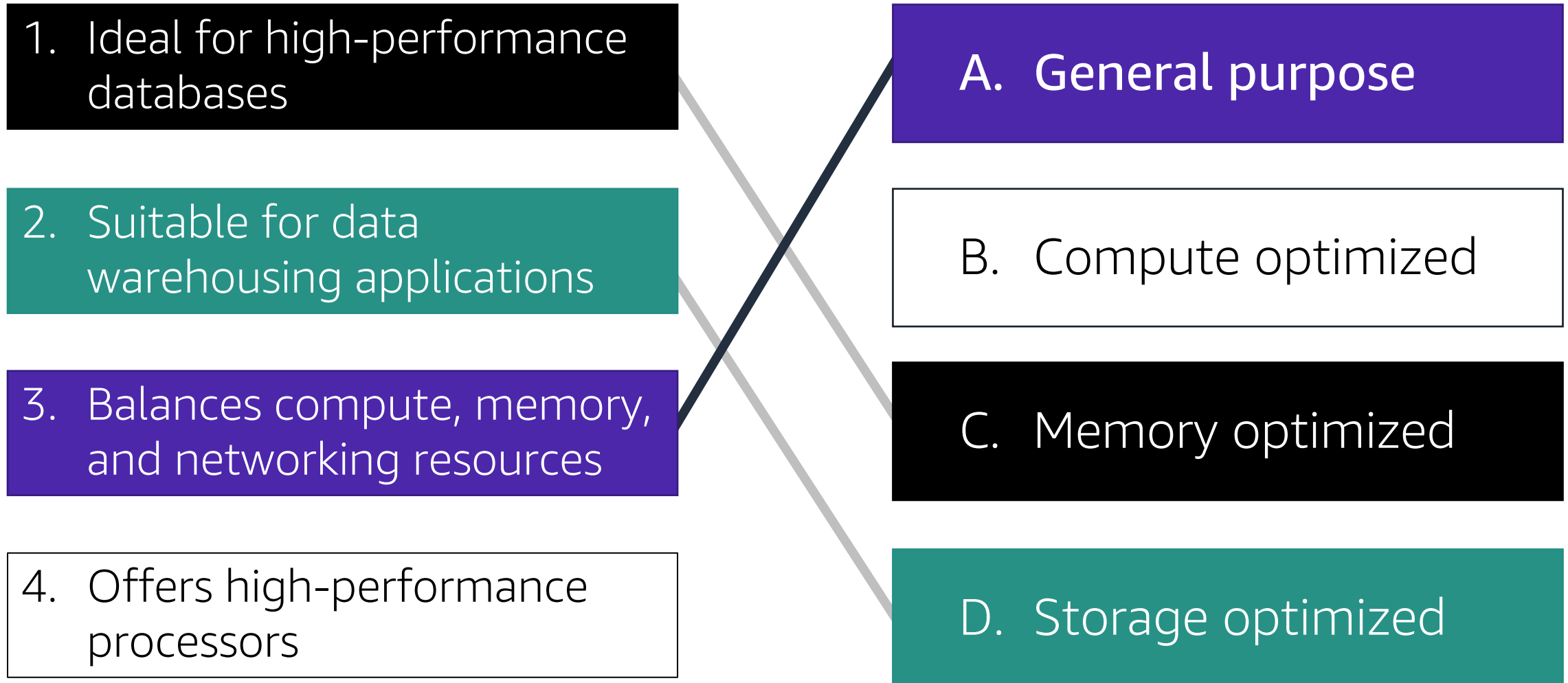
A. General purpose

B. Compute optimized

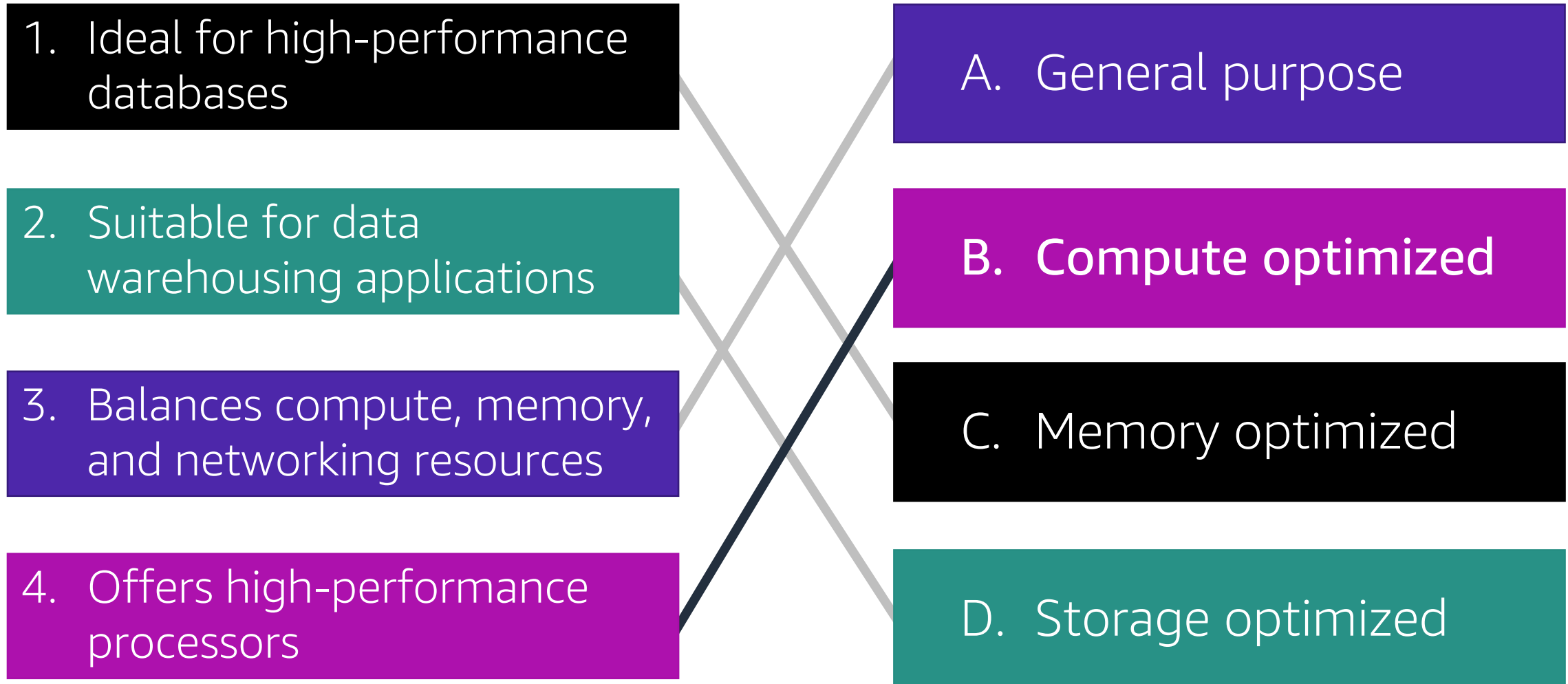
C. Memory optimized

D. Storage optimized

Match: Amazon EC2 instance types



Match: Amazon EC2 instance types



Amazon EC2 pricing

Amazon EC2 instance pricing options

On-Demand

- No upfront costs or minimum contracts
- Ideal for short-term, irregular workloads

Spot

- Ideal for workloads with flexible start and end times
- Offers savings over On-Demand prices

Amazon EC2 instance pricing options

Reserved

- Provides a billing discount over On-Demand pricing
- Requires a 1-year or 3-year term commitment

Compute Savings Plan

- Offers up to 72% savings over On-Demand costs for a consistent amount of compute usage
- Requires a 1-year or 3-year term commitment

Dedicated Instance

- An EC2 *instance* that runs in a VPC on hardware for a single customer
- Higher cost compared to standard Amazon EC2 instances

Dedicated Host

- A *physical server* with EC2 instance capacity for a single customer
- Most expensive Amazon EC2 option

Knowledge check question



What is the difference between
Compute Savings Plans and Spot
Instances?

Knowledge check answer

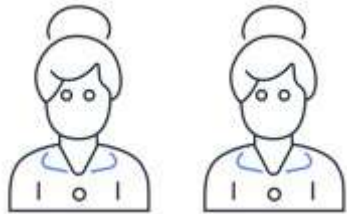


- Compute Savings Plans are ideal for workloads that involve a consistent amount of compute usage over a 1-year or 3-year term.
- Spot Instances are ideal for workloads with flexible start and end times, or that can withstand interruptions.

Amazon EC2 Auto Scaling

Manual scaling

Low demand

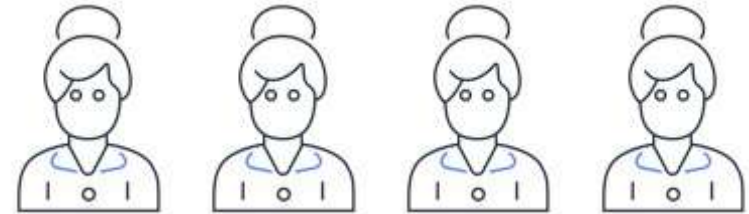


Customers



Barista

High demand



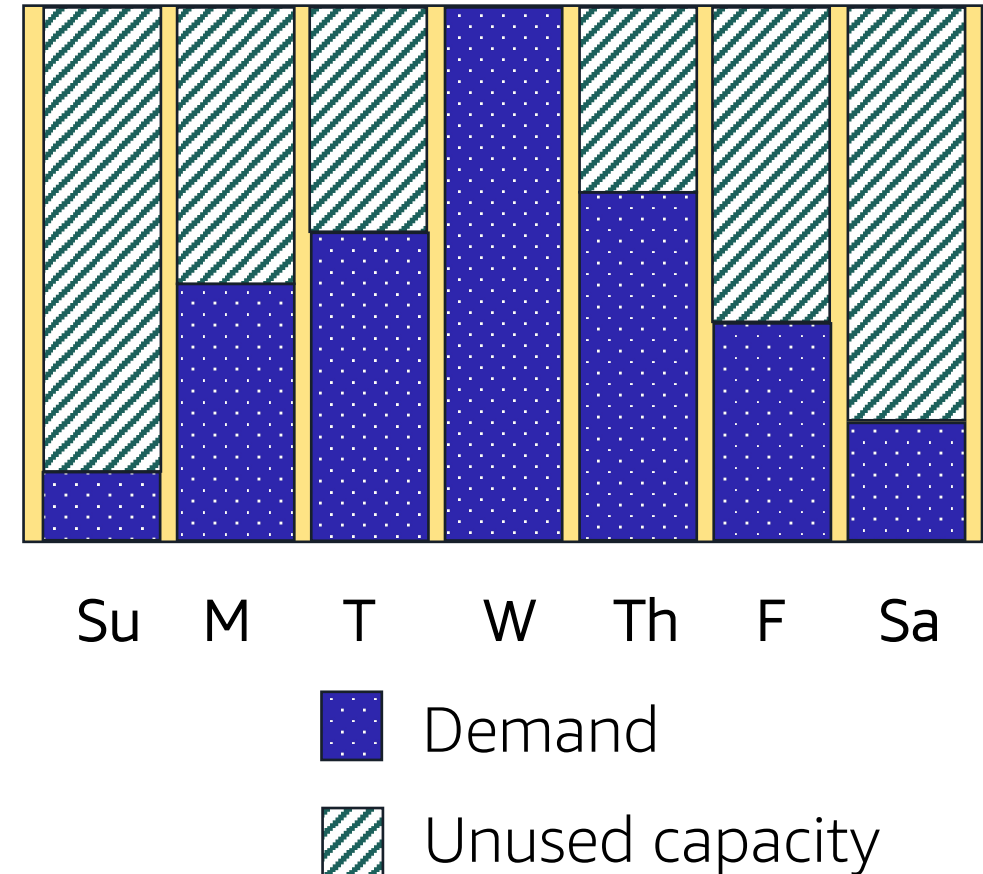
Customers



Baristas

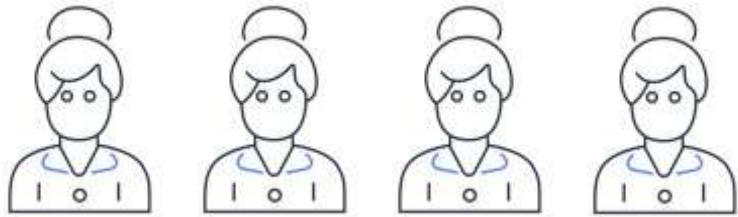
Amazon EC2 Auto Scaling

- Scale capacity as computing requirements change
- Use dynamic scaling and predictive scaling



Amazon EC2 Auto Scaling (cont.)

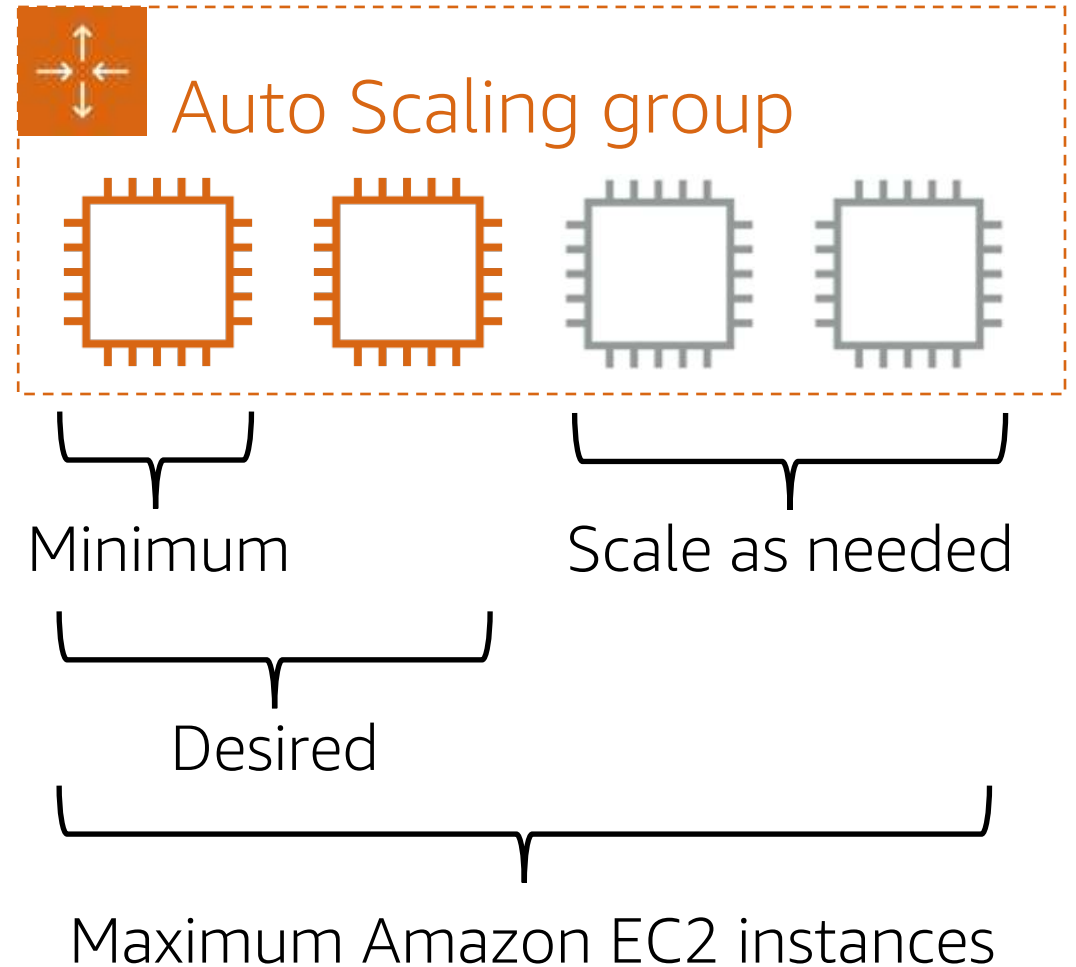
High demand



Customers



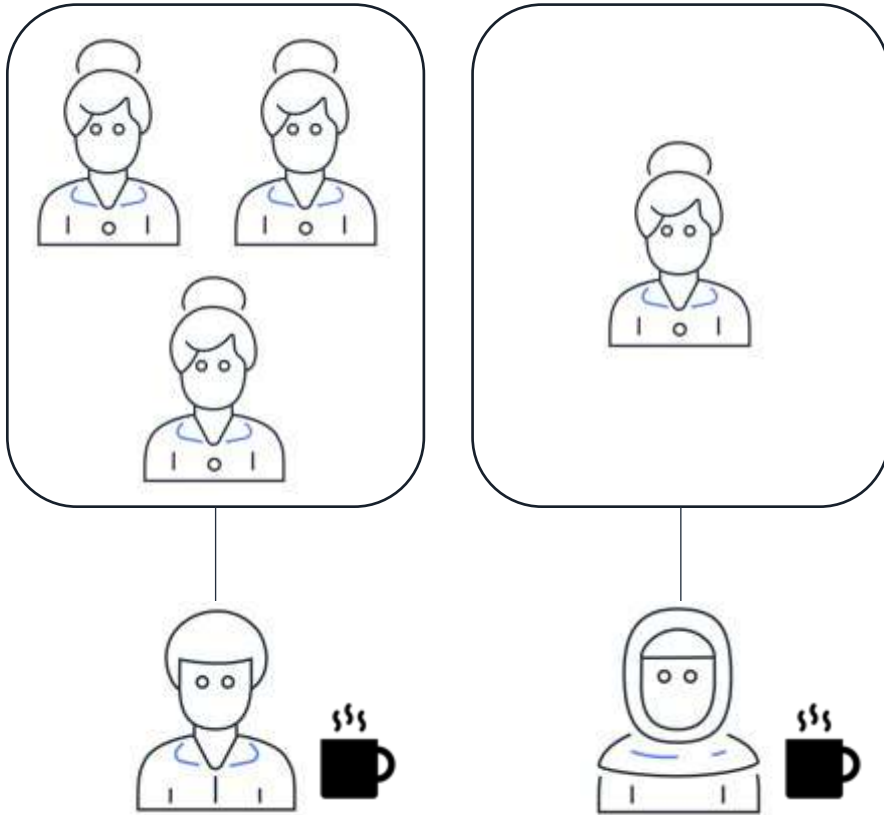
Baristas



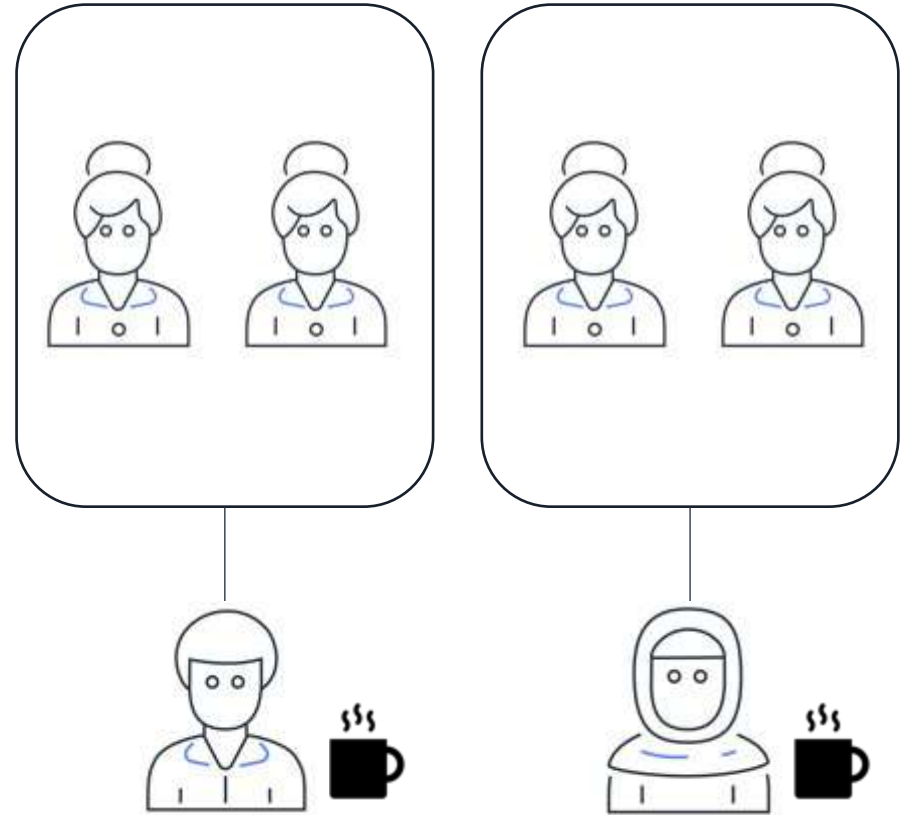
Elastic Load Balancing

Load balancing

Unbalanced workload



Balanced workload



Elastic Load Balancing

- Automatically distributes traffic across multiple resources
- Provides a single point of contact for your Auto Scaling group



Elastic Load Balancing

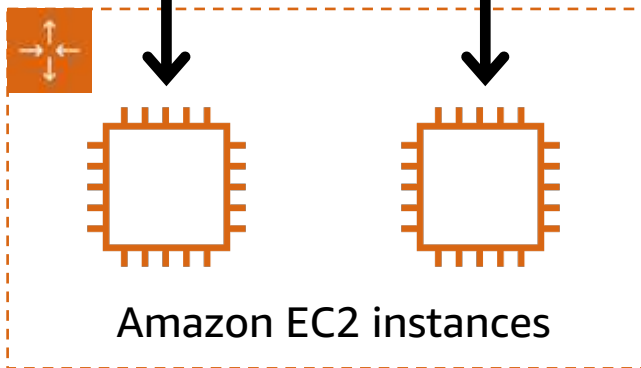
Scalability and load balancing

Low-demand period



Elastic Load Balancing

Auto Scaling group



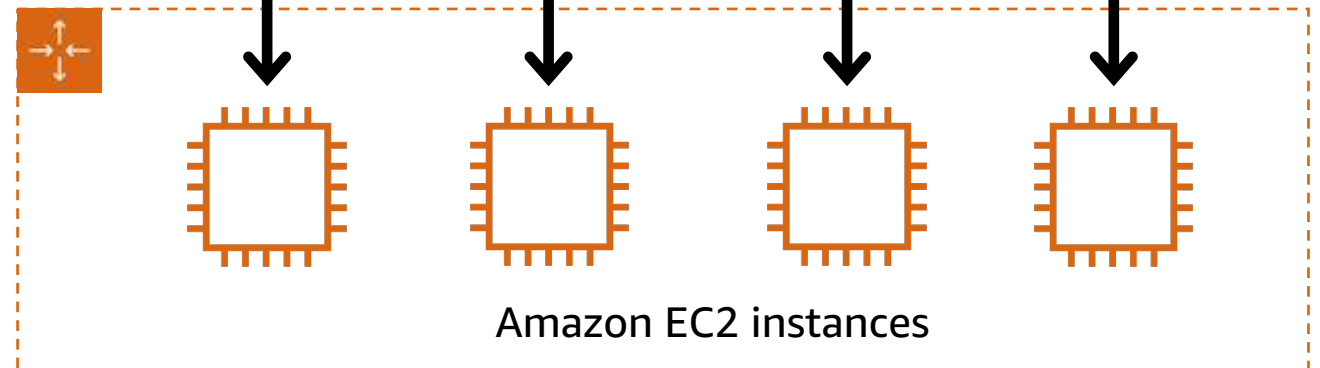
Amazon EC2 instances

High-demand period



Elastic Load Balancing

Auto Scaling group



Amazon EC2 instances

Auto Scaling and Elastic Load Balancing

Are these examples of **Auto Scaling** or **Elastic Load Balancing**?

Auto Scaling

1. Removes unneeded Amazon EC2 instances when demand is low

2. Adds a second Amazon EC2 instance during an online store's popular sale

Auto Scaling

Elastic Load Balancing

3. Distributes a workload across several Amazon EC2 instances

4. Ensures that no single EC2 instance has to carry the full workload on its own

Elastic Load Balancing

Auto Scaling

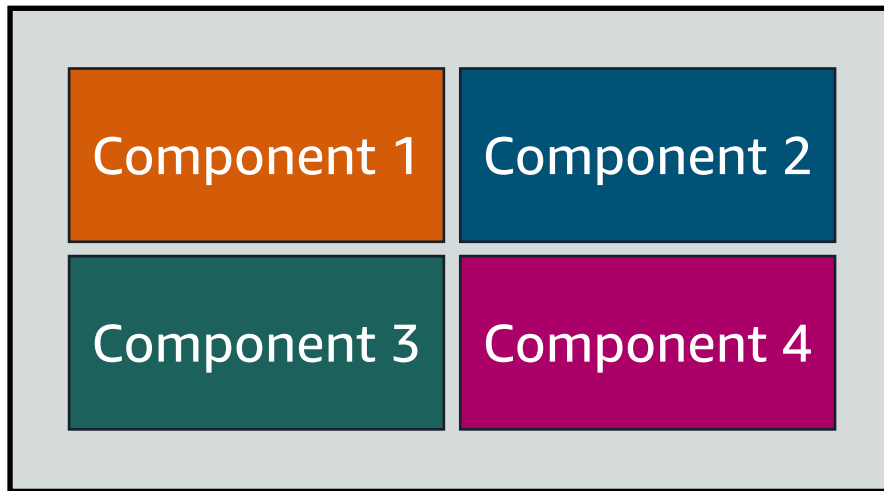
5. Automatically adjusts the number of Amazon EC2 instances to match demand

6. Provides a single point of contact for traffic into an Auto Scaling group

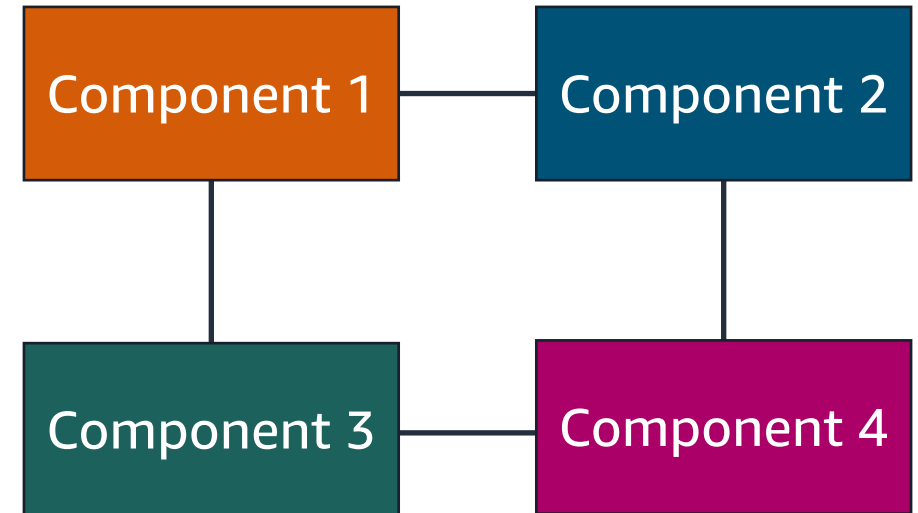
Elastic Load Balancing

AWS messaging services

Monolithic application

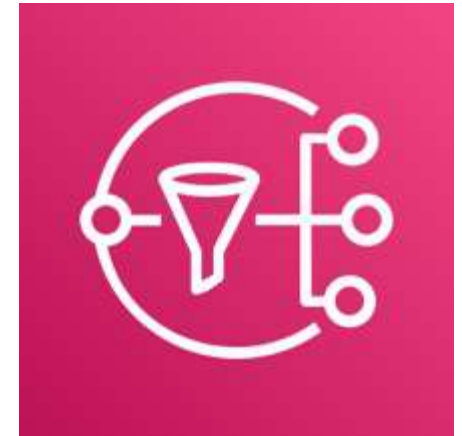


Microservices



Amazon Simple Notification Service

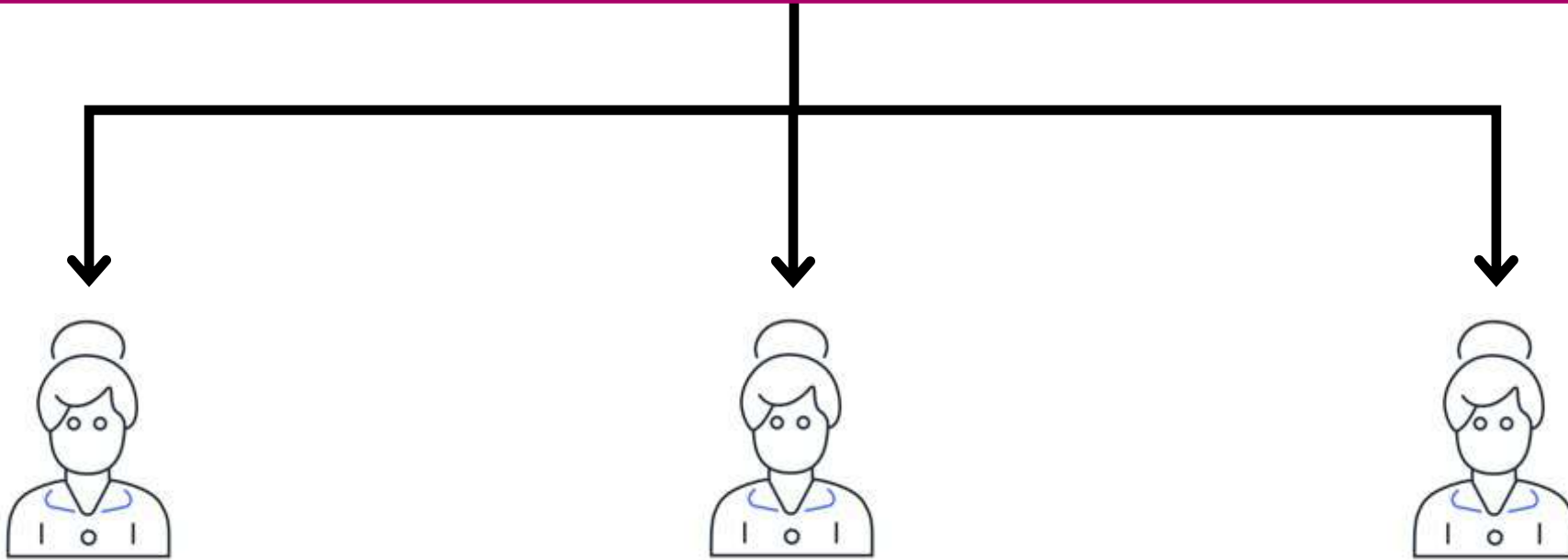
- Messages are published to topics.
- Subscribers immediately receive messages for their topics.



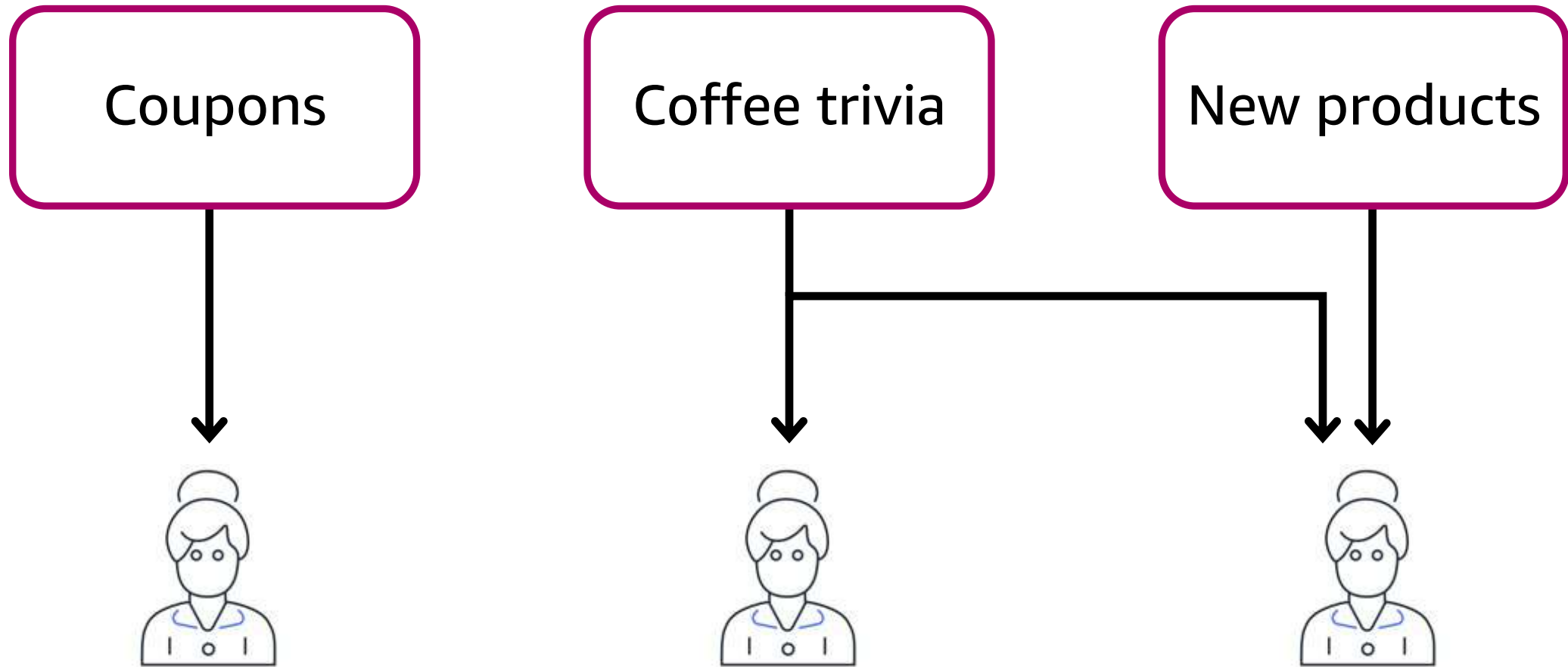
Amazon Simple
Notification Service
(Amazon SNS)

Publish updates from a single topic

Coupons, coffee trivia, and new products



Publish updates from multiple topics



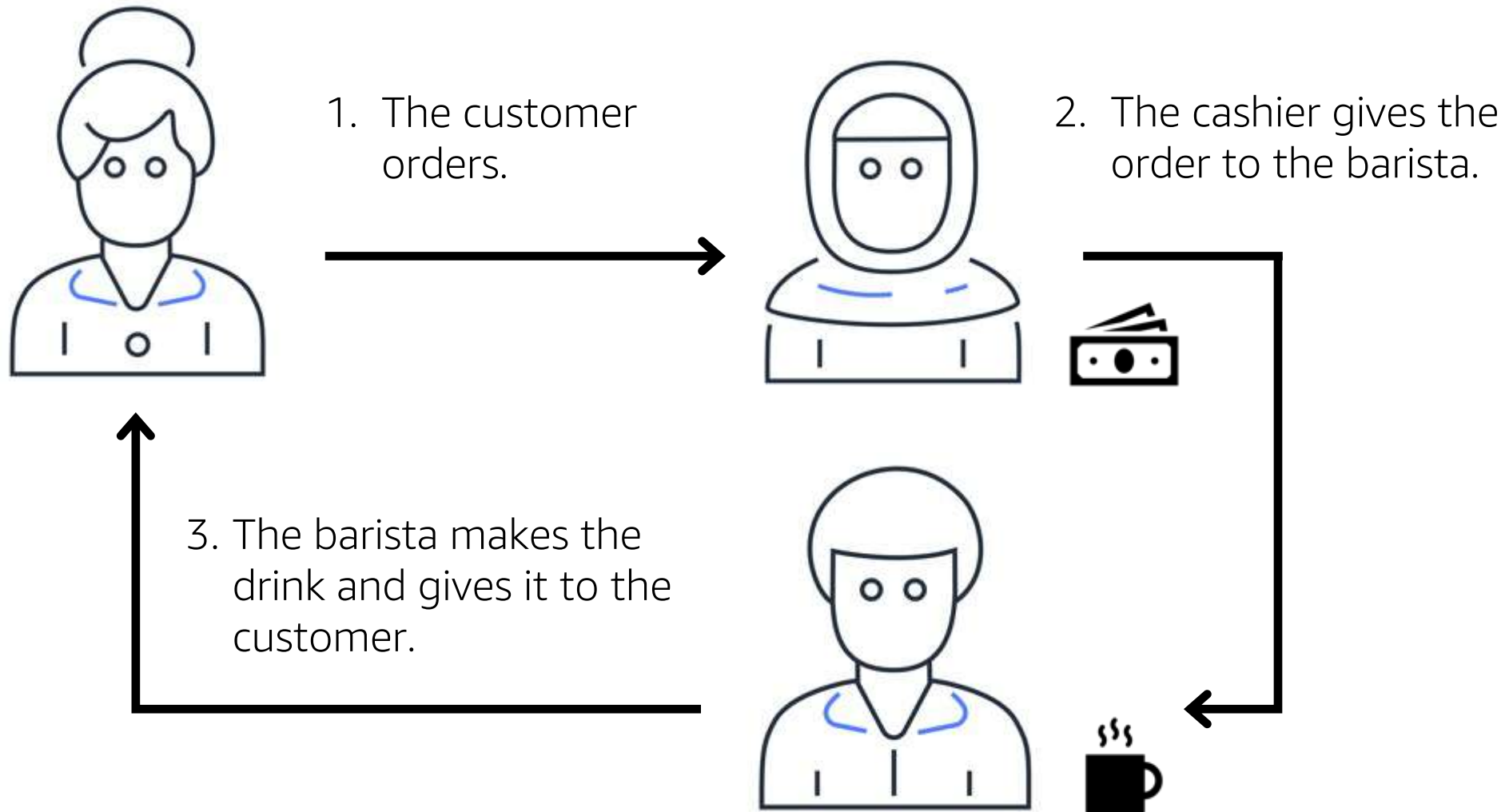
Amazon Simple Queue Service

- Send, store, and receive messages between software components
- Queue messages without requiring other services to be available

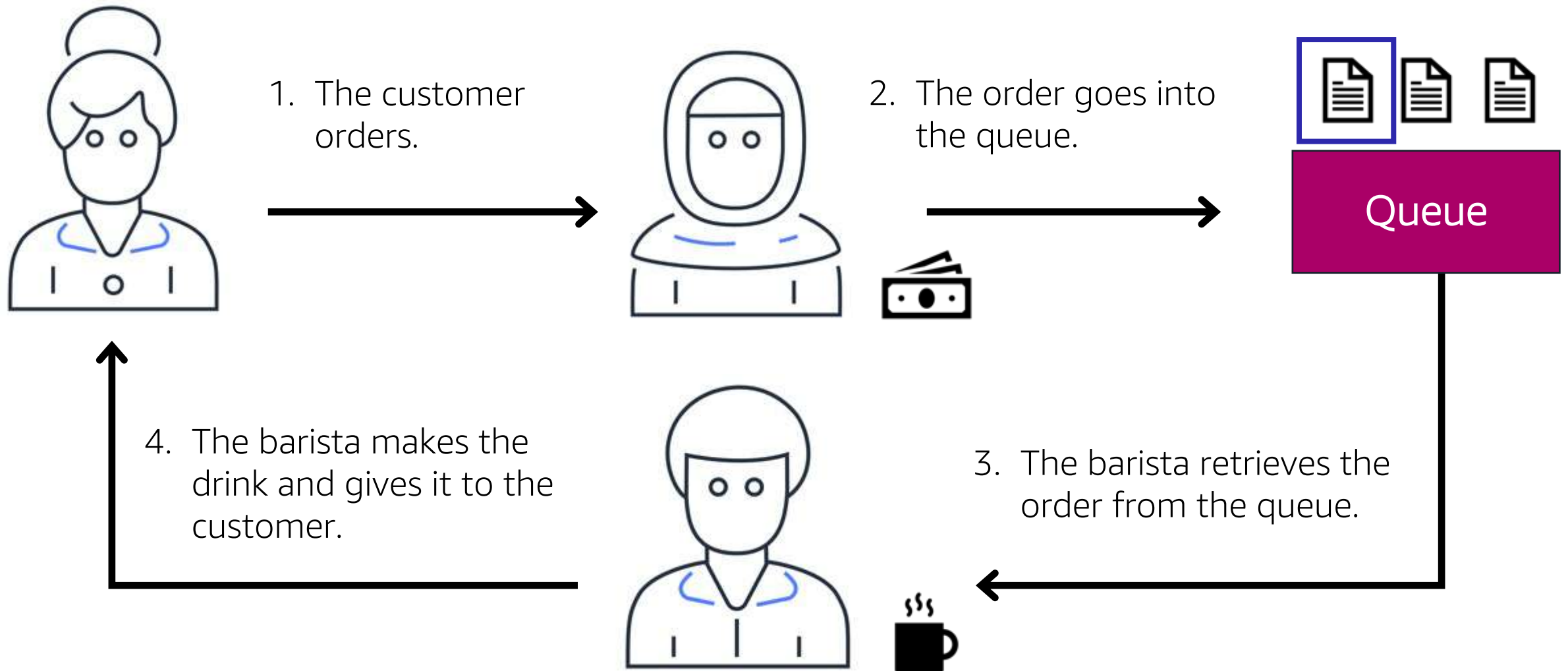


Amazon Simple
Queue Service
(Amazon SQS)

Example: Fulfill an order



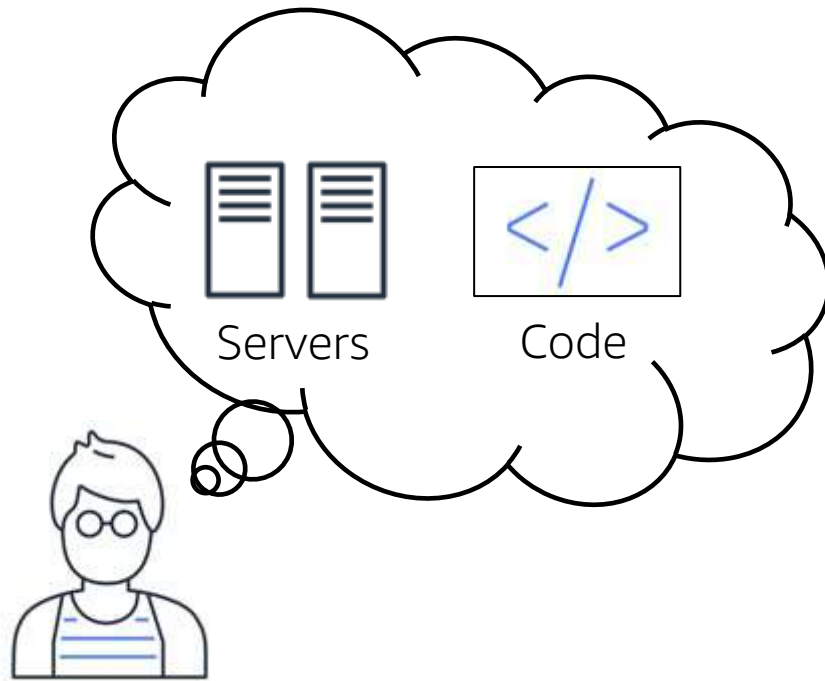
Example: Orders in a queue



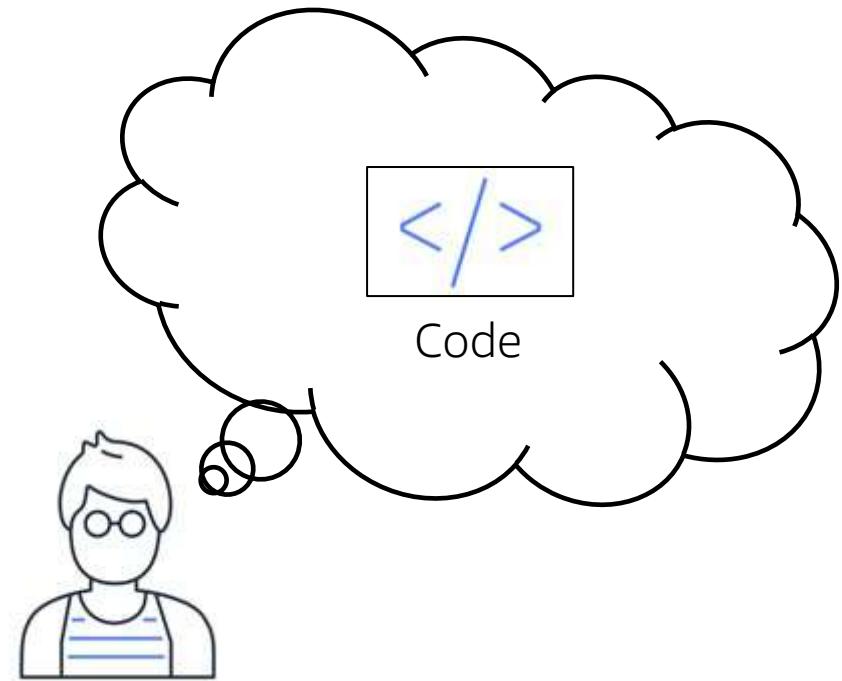
Serverless compute services

Serverless computing

Computing with virtual servers



Serverless computing



- Run code without provisioning or managing servers
- Pay only for compute time while code is running
- Use other AWS services to automatically trigger code



AWS Lambda

How AWS Lambda works



Upload code to
Lambda.



Set code to trigger
from an event
source.



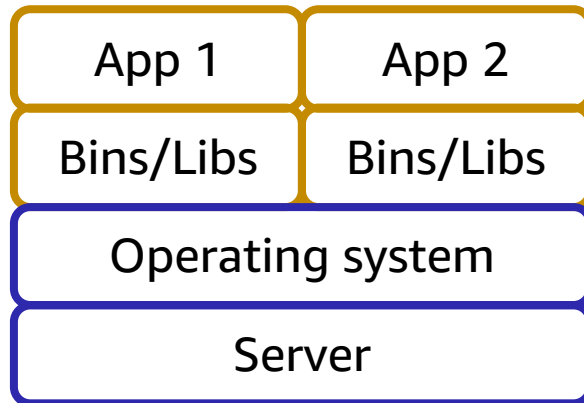
Code runs only
when triggered.



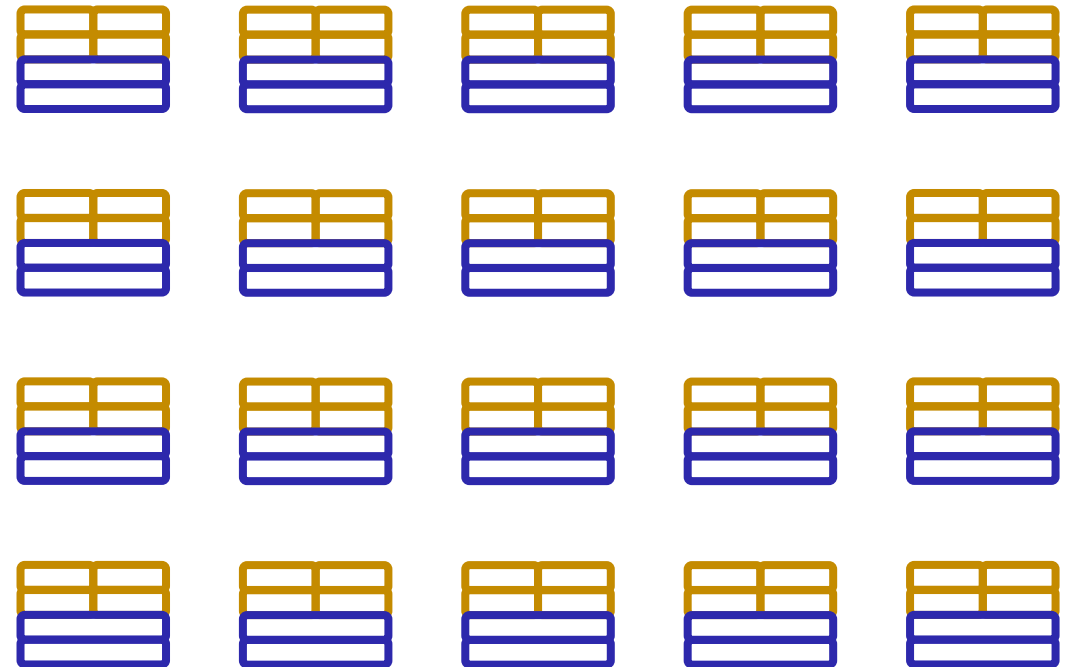
Pay only for the
compute time
you use.

AWS container services

One host with multiple
containers



Tens of hosts with hundreds of
containers





Amazon Elastic Container Service (Amazon ECS)

- Run and scale containerized applications
- Use simple API calls to control Docker-enabled applications



Amazon Elastic Kubernetes Service (Amazon EKS)

- Run and scale Kubernetes applications
- Readily update applications with new features

- Run serverless containers with Amazon ECS or Amazon EKS
- Pay only for the resources you use



AWS Fargate

Module 2

Knowledge check

Knowledge check question 1



A customer wants to use an Amazon EC2 instance for a batch processing workload. Which Amazon EC2 instance type should they use?

- A. General purpose
- B. Compute optimized
- C. Memory optimized
- D. Storage optimized

Knowledge check answer 1



A customer wants to use an Amazon EC2 instance for a batch processing workload. Which Amazon EC2 instance type should they use?

- A. General purpose
- B. Compute optimized (correct)**
- C. Memory optimized
- D. Storage optimized

Knowledge check question 2



What are the contract length options for Amazon EC2 Reserved Instances? (Select TWO.)

- A. 1 year
- B. 2 years
- C. 3 years
- D. 4 years
- E. 5 years

Knowledge check answer 2



What are the contract length options for Amazon EC2 Reserved Instances? (Select TWO.)

- A. 1 year (correct)
- B. 2 years
- C. 3 years (correct)
- D. 4 years
- E. 5 years

Knowledge check question 3



A customer has a workload that will run for a total of 6 months and can withstand interruptions. What would be the most cost-efficient Amazon EC2 instance purchasing option?

- A. Reserved Instance
- B. Dedicated Instance
- C. On-Demand Instance
- D. Spot Instance

Knowledge check answer 3



A customer has a workload that will run for a total of 6 months and can withstand interruptions. What would be the most cost-efficient Amazon EC2 instance purchasing option?

- A. Reserved Instance
- B. Dedicated Instance
- C. On-Demand Instance
- D. Spot Instance (correct)

Knowledge check question 4



A customer wants to give users messages for the specific topics to which they have subscribed. Which service should they use?

- A. Amazon Simple Notification Service (Amazon SNS)
- B. AWS Lambda
- C. Amazon Simple Queue Service (Amazon SQS)
- D. Amazon Elastic Kubernetes Service (Amazon EKS)

Knowledge check answer 4



A customer wants to give users messages for the specific topics to which they have subscribed. Which service should they use?

- A. **Amazon Simple Notification Service (Amazon SNS) (correct)**
- B. AWS Lambda
- C. Amazon Simple Queue Service (Amazon SQS)
- D. Amazon Elastic Kubernetes Service (Amazon EKS)

Module 2 summary

In this module, you learned how to:

- Describe Amazon EC2 benefits
- Identify the Amazon EC2 instance types
- Differentiate among Amazon EC2 billing options
- Summarize Amazon EC2 Auto Scaling benefits
- Summarize Elastic Load Balancing benefits
- Provide examples of Elastic Load Balancing uses
- Describe differences between Amazon SNS and Amazon SQS
- Summarize additional AWS compute options



Module 3

Global Infrastructure and Reliability

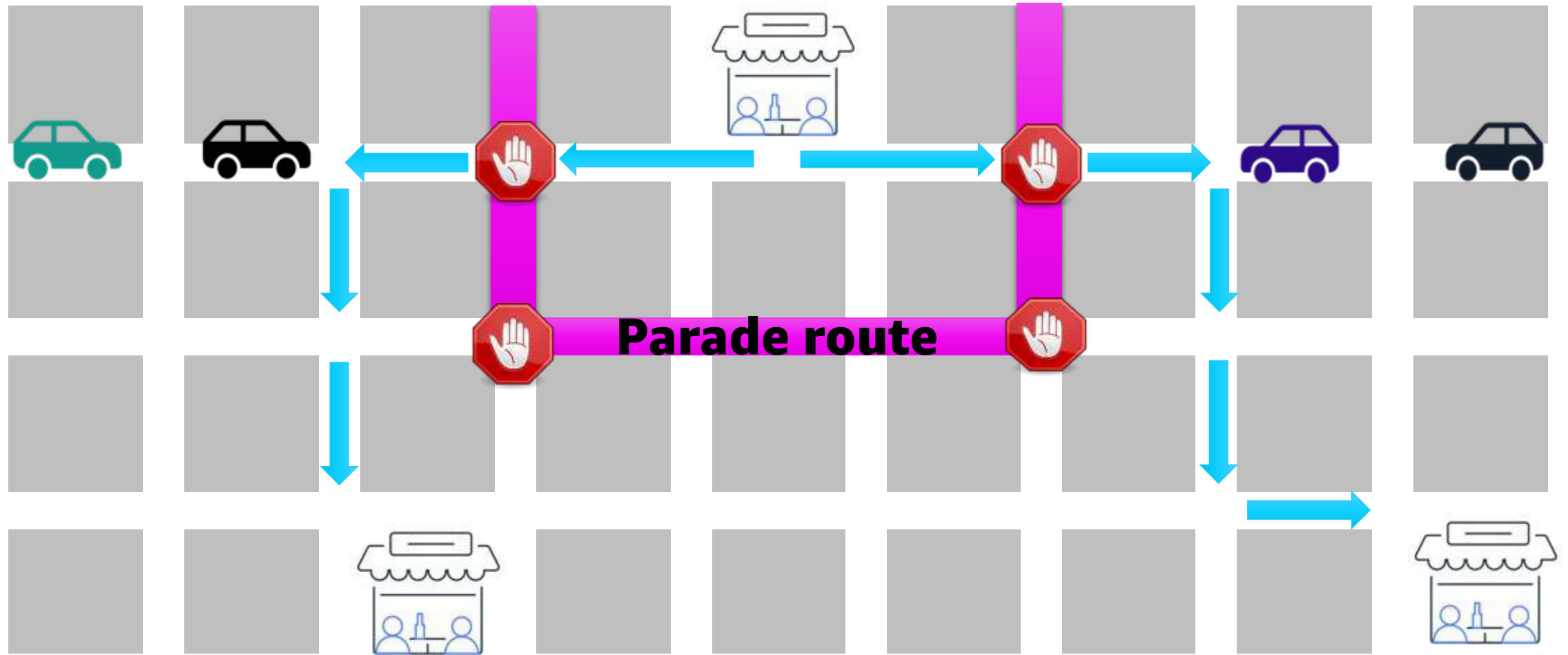
Module 3 objectives

In this module, you will learn how to:

- Summarize the AWS Global Infrastructure benefits
- Describe Availability Zones
- Describe the benefits of Amazon CloudFront and edge locations.
- Compare methods for provisioning AWS services.



Build a global footprint



Demo: Explore the AWS Global Infrastructure

Select a Region

Determine the right Region for your services, data, and applications based on:



Compliance with data
governance and legal
requirements



Proximity to your
customers

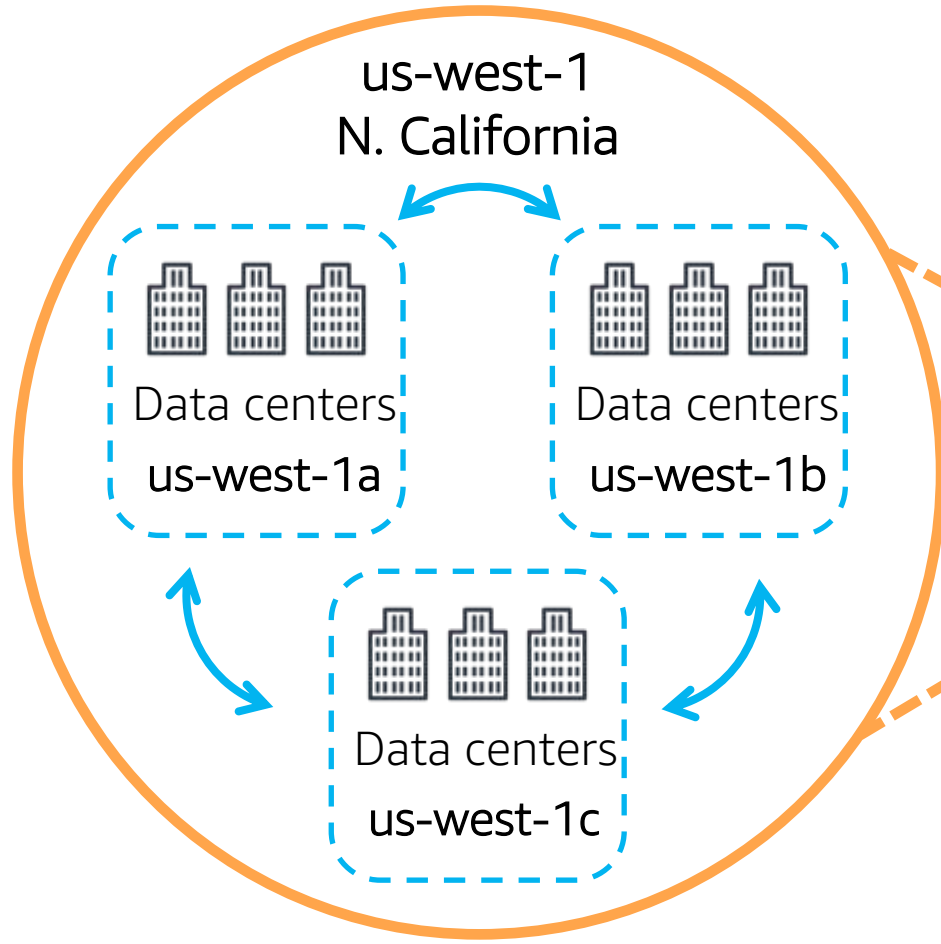


Available services
within a Region



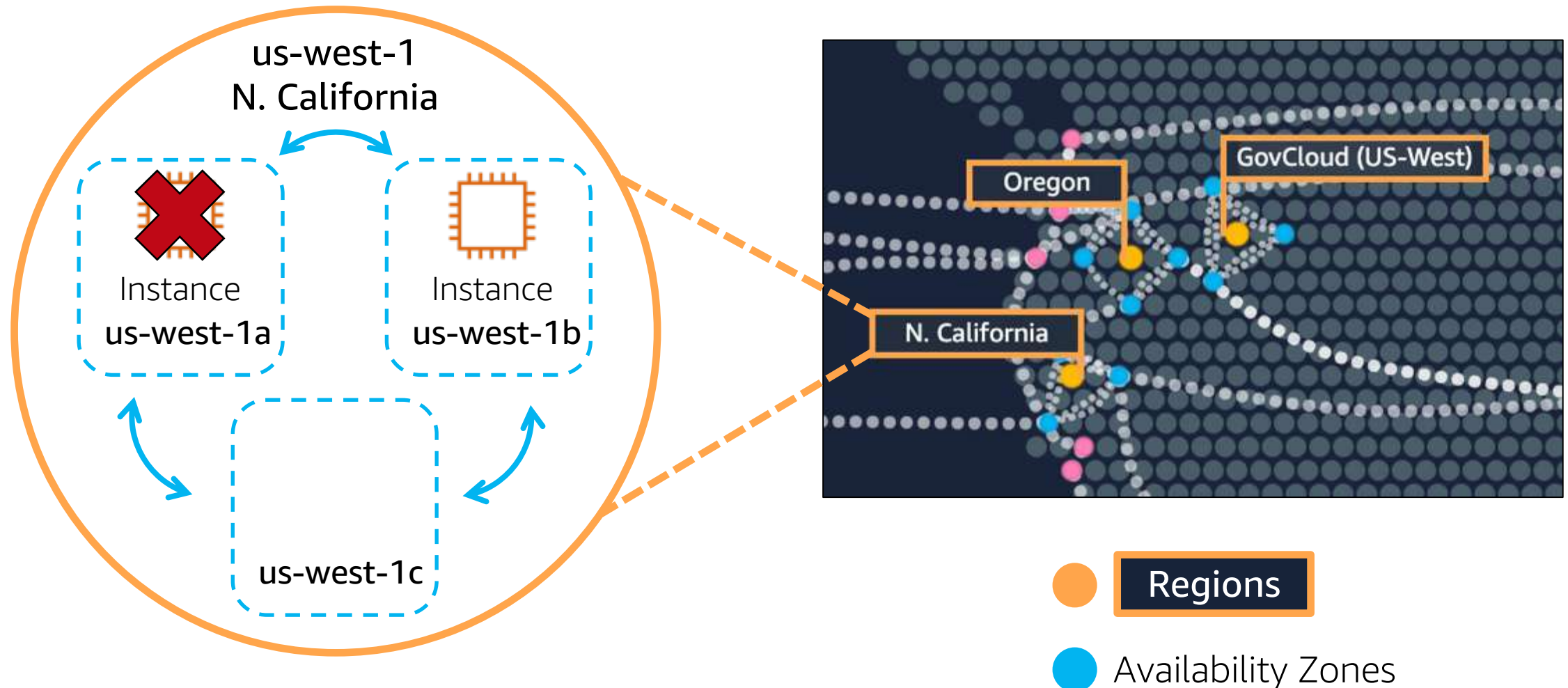
Pricing

Availability Zones



- **Regions**
- Availability Zones

Amazon EC2 instances in multiple AZs

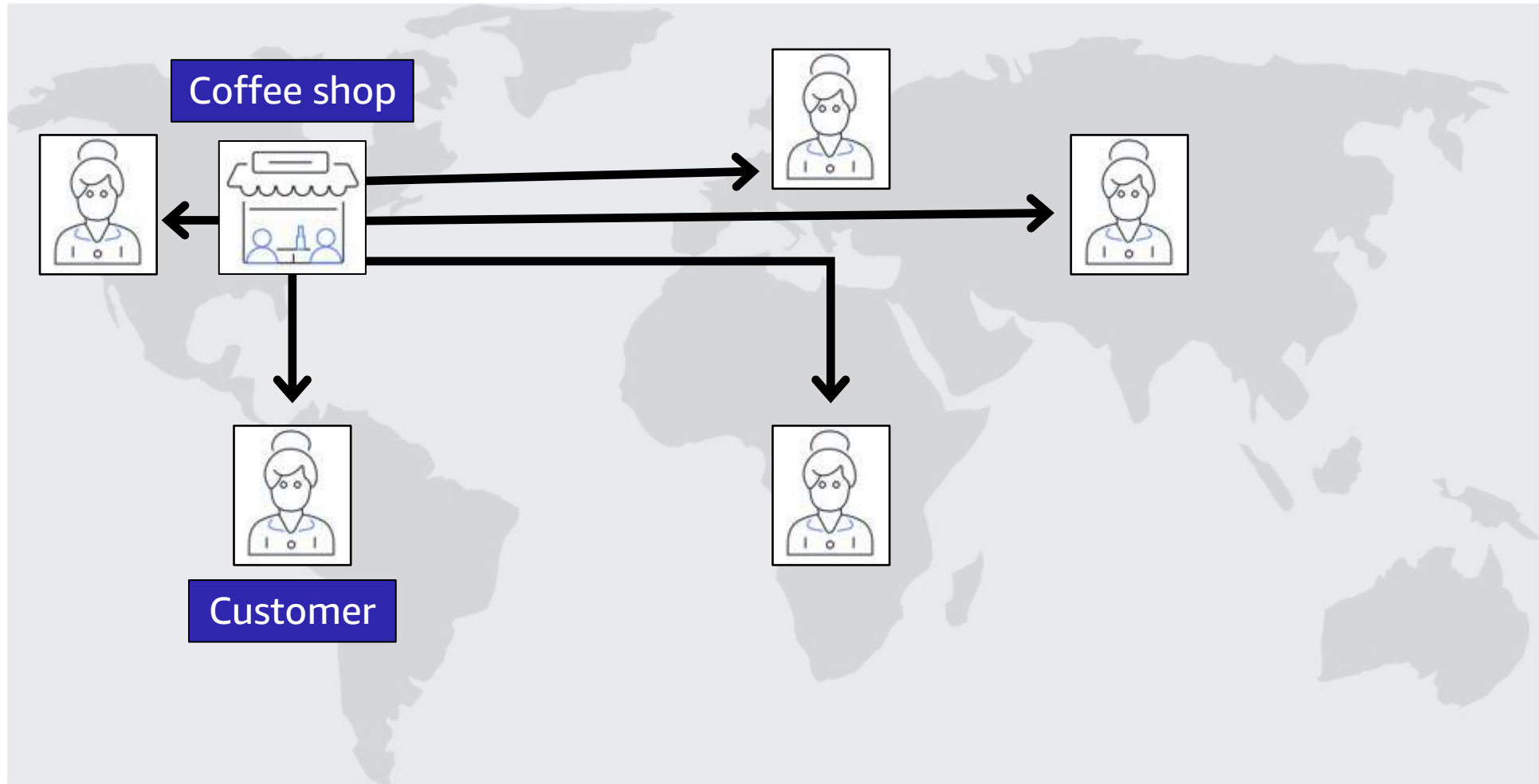


Discussion

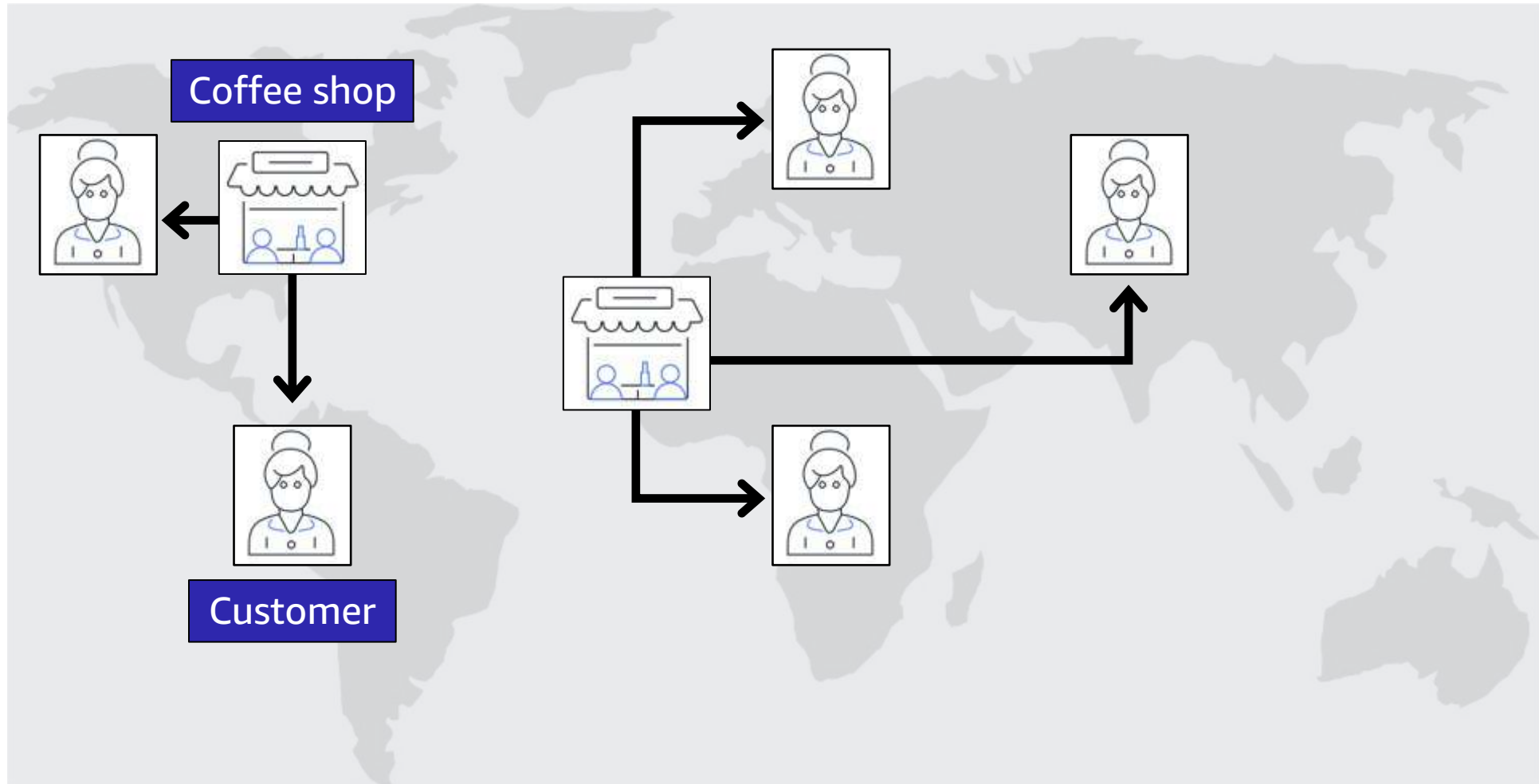
What is the relationship between Regions and Availability Zones?

Get closer to your customers

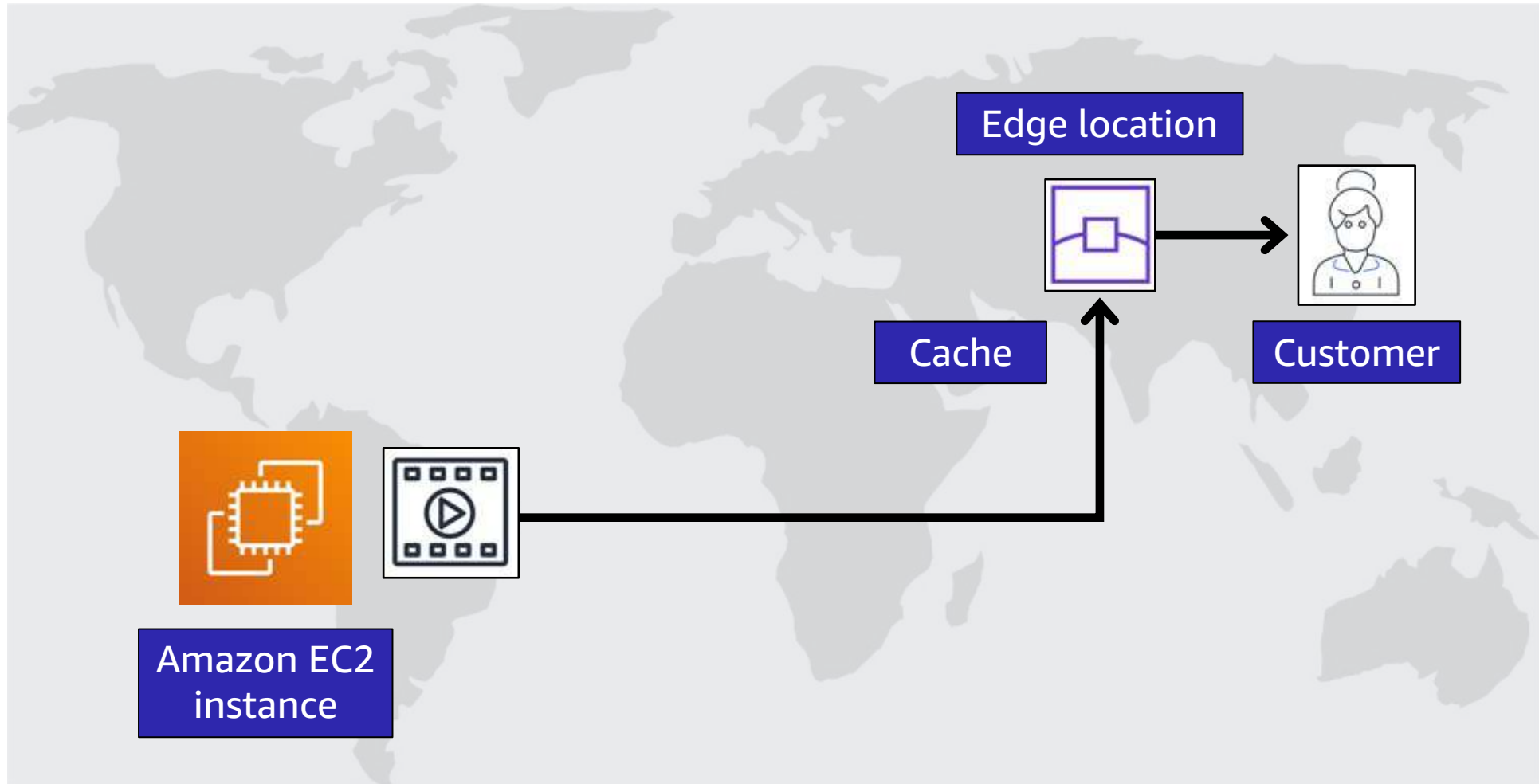
Global content delivery



Global content delivery

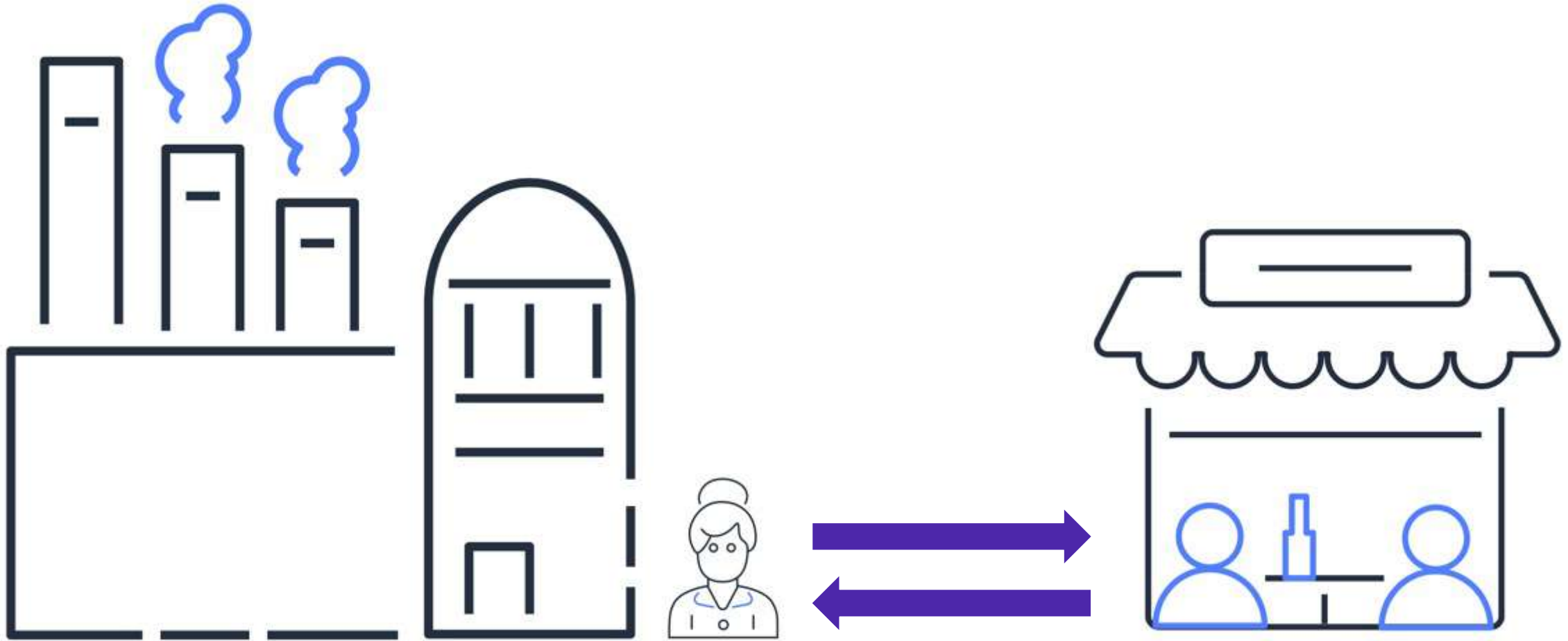


Amazon CloudFront delivers content



AWS Outposts

Get products from the coffee shop



Get products from the coffee shop





AWS Outposts

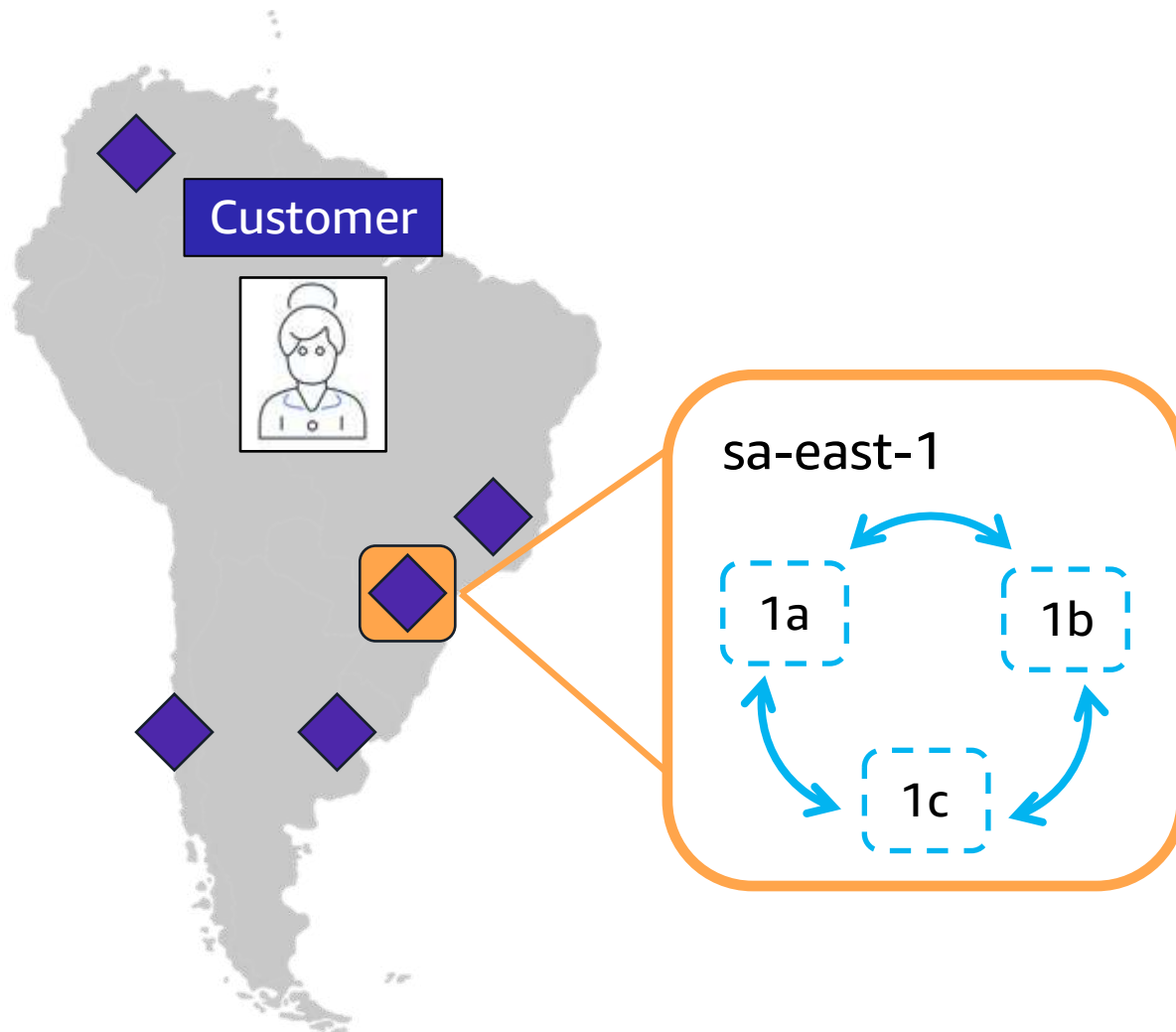


Extend AWS infrastructure and services to your on-premises data center

Discussion

When choosing an AWS Region for your services, data, and applications, why should you consider a Region's proximity to your customers?

Review: AWS Global Infrastructure



Region:

- São Paulo



Availability Zones:

- sa-east-1a
- sa-east-1b
- sa-east-1c



Edge locations

Interact with AWS services

Perform actions through API requests



Order a cup of coffee.

Ask for a refill.

Check your rewards balance.



Launch an Amazon EC2 instance.

Create a load balancer.

Invoke an AWS Lambda function.

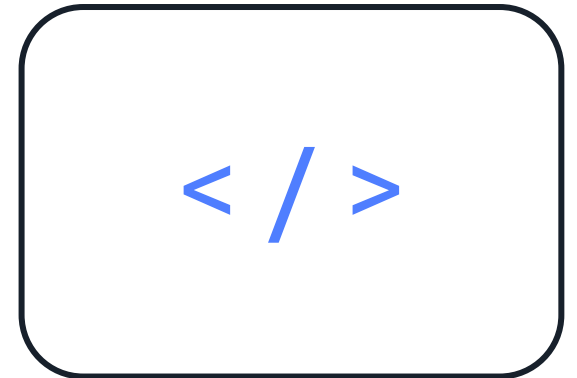
Interact with AWS services



AWS Management Console



AWS Command Line
Interface (AWS CLI)



Software development kits
(SDKs)

Demo: AWS Management Console

Module 3

Knowledge check

Knowledge check question 1



Which of the following is TRUE for the AWS Global Infrastructure?

- A. An Availability Zone consists of a single Region.
- B. An Availability Zone consists of two or more Regions.
- C. A Region consists of a single Availability Zone.
- D. A Region consists of two or more Availability Zones.

Knowledge check answer 1



Which of the following is TRUE for the AWS Global Infrastructure?

- A. An Availability Zone consists of a single Region.
- B. An Availability Zone consists of two or more Regions.
- C. A Region consists of a single Availability Zone.
- D. A Region consists of two or more Availability Zones. (correct)

Knowledge check question 2



Which factors should be considered when selecting a Region? (Select TWO.)

- A. Compliance with data governance and legal requirements
- B. Proximity to your customers
- C. Access to 24/7 technical support
- D. Ability to assign custom permissions to different users
- E. Access to the AWS Command Line Interface (AWS CLI)

Knowledge check answer 2



Which factors should be considered when selecting a Region? (Select TWO.)

- A. Compliance with data governance and legal requirements (correct)
- B. Proximity to your customers (correct)
- C. Access to 24/7 technical support
- D. Ability to assign custom permissions to different users
- E. Access to the AWS Command Line Interface (AWS CLI)

Knowledge check question 3



Which statement best describes Amazon CloudFront?

- A. A service that allows you to run infrastructure in a hybrid cloud approach
- B. A serverless compute engine for containers
- C. A service that allows you to send and receive messages between software components through a queue
- D. A global content delivery service

Knowledge check answer 3



Which statement best describes Amazon CloudFront?

- A. A service that allows you to run infrastructure in a hybrid cloud approach
- B. A serverless compute engine for containers
- C. A service that allows you to send and receive messages between software components through a queue
- D. **A global content delivery service (correct)**

Knowledge check question 4



Which site does Amazon CloudFront use to cache copies of content for faster delivery to users at any location?

- A. Edge location
- B. Region
- C. Availability Zone
- D. Origin

Knowledge check answer 4



Which site does Amazon CloudFront use to cache copies of content for faster delivery to users at any location?

- A. **Edge location (correct)**
- B. Region
- C. Availability Zone
- D. Origin

Knowledge check question 5



Which actions can you perform with AWS Outposts?

- A. Automate actions for AWS services and applications through scripts
- B. Access wizards and automated workflows to perform tasks in AWS services
- C. Extend AWS infrastructure and services to your on-premises data center
- D. Develop AWS applications in supported programming languages

Knowledge check answer 5



Which actions can you perform with AWS Outposts?

- A. Automate actions for AWS services and applications through scripts
- B. Access wizards and automated workflows to perform tasks in AWS services
- C. Extend AWS infrastructure and services to your on-premises data center (correct)**
- D. Develop AWS applications in supported programming languages

Module 3 summary

In this module, you learned about:

- Three aspects of the AWS Global Infrastructure
- Four factors to consider when selecting an AWS Region
- Three ways to interact with AWS services



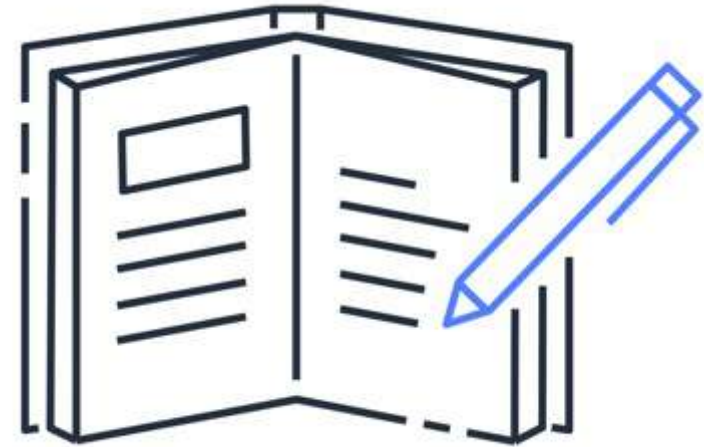
Module 4

Networking

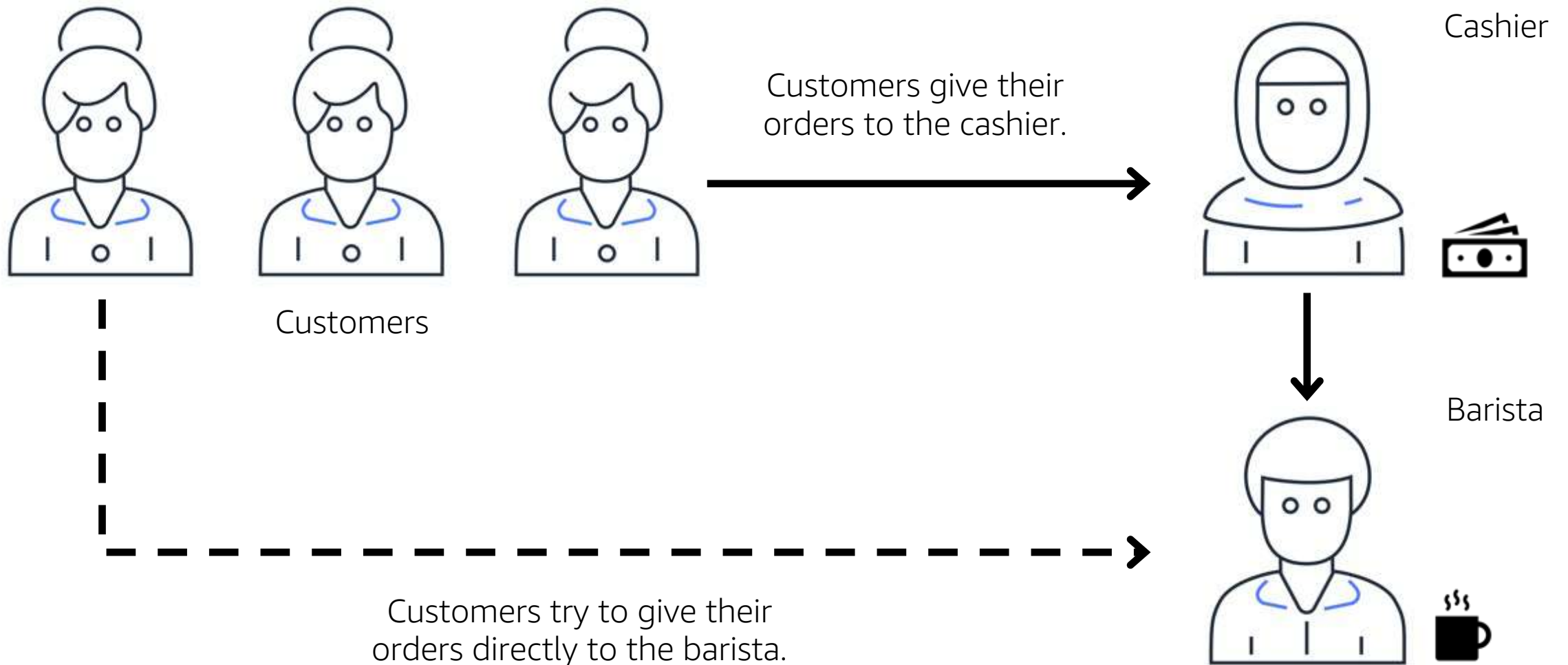
Module 4 objectives

In this module, you will learn how to:

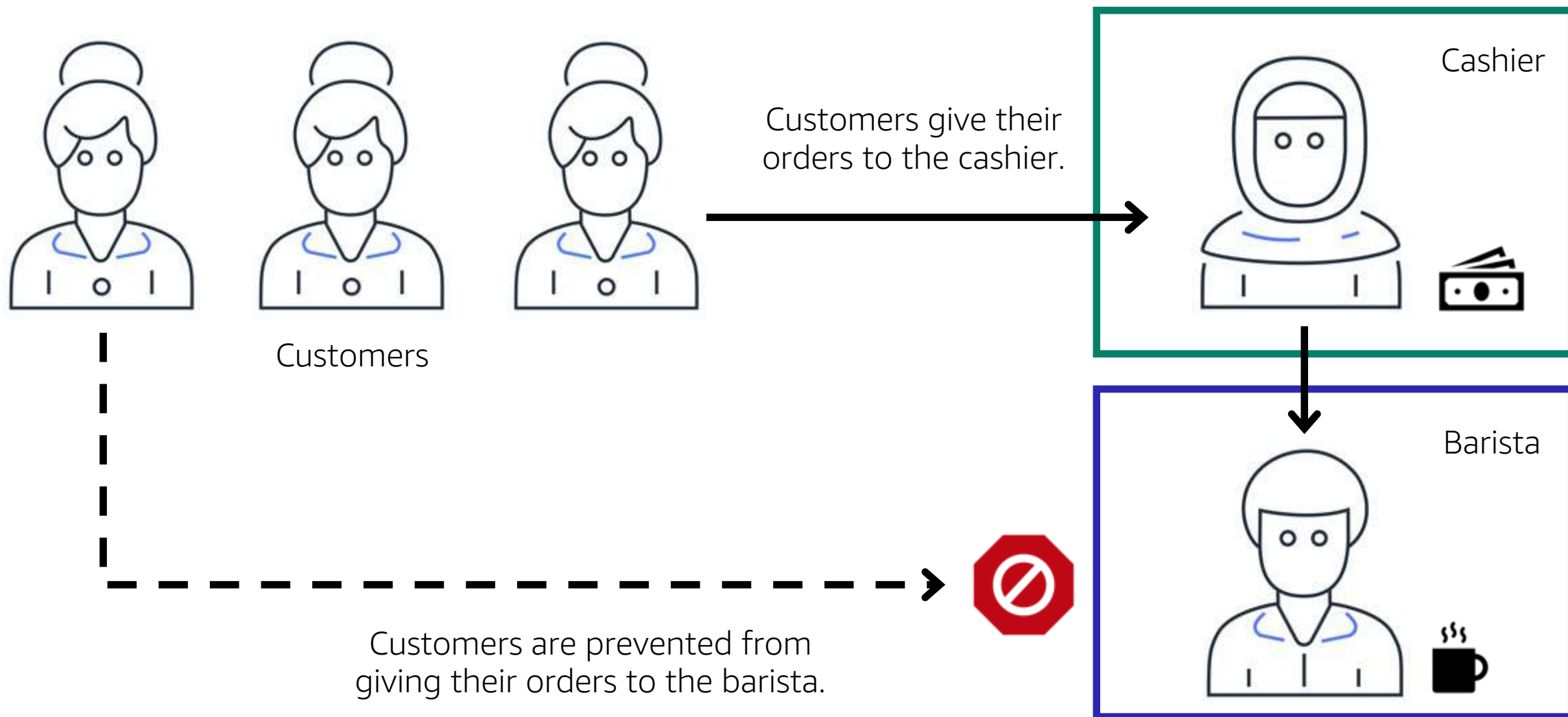
- Describe basic networking concepts
- Describe the differences between public and private networking resources
- Explain a virtual private gateway using a real-life scenario
- Explain a VPN using a real-life scenario
- Describe AWS Direct Connect benefits
- Describe hybrid deployment benefits
- Describe the layers of security in an IT strategy
- Describe the services customers use to interact with the AWS global network



Traffic in the coffee shop



Traffic in the coffee shop



Amazon Virtual Private Cloud (Amazon VPC)



Amazon Virtual Private Cloud (Amazon VPC) enables you to launch resources in a virtual network that you define.

Counter area

Public workstation

Cashier



Private workstation

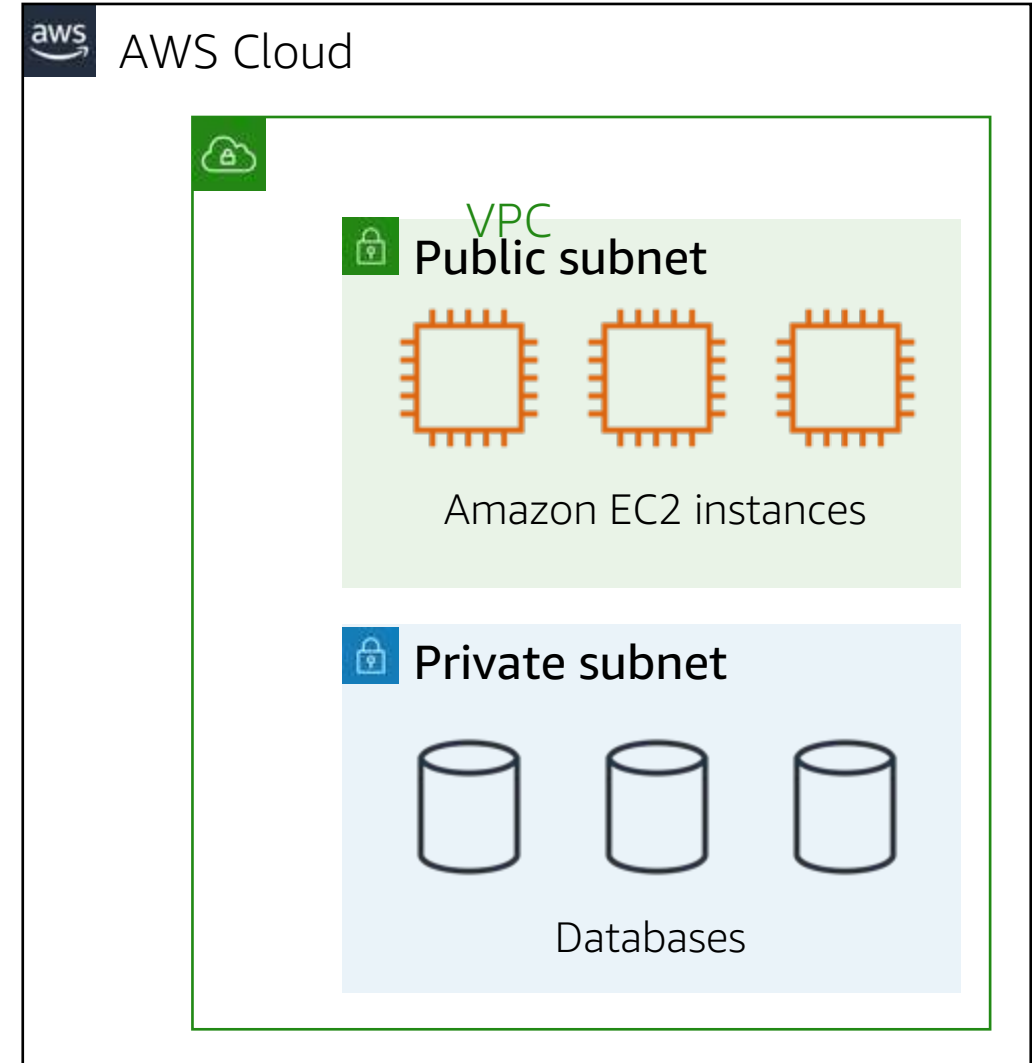
Barista



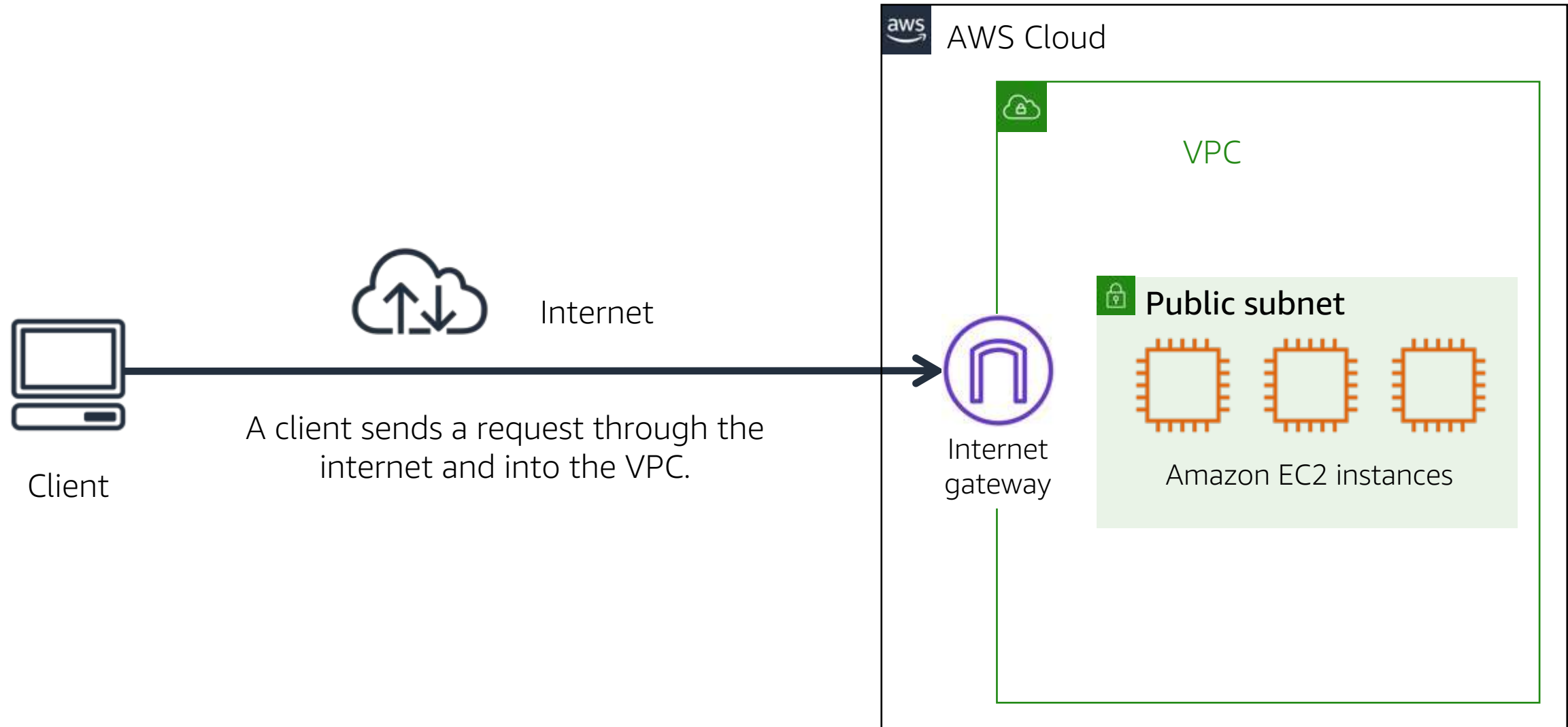
A subnet

is a section in a VPC in which you can place groups of isolated resources.

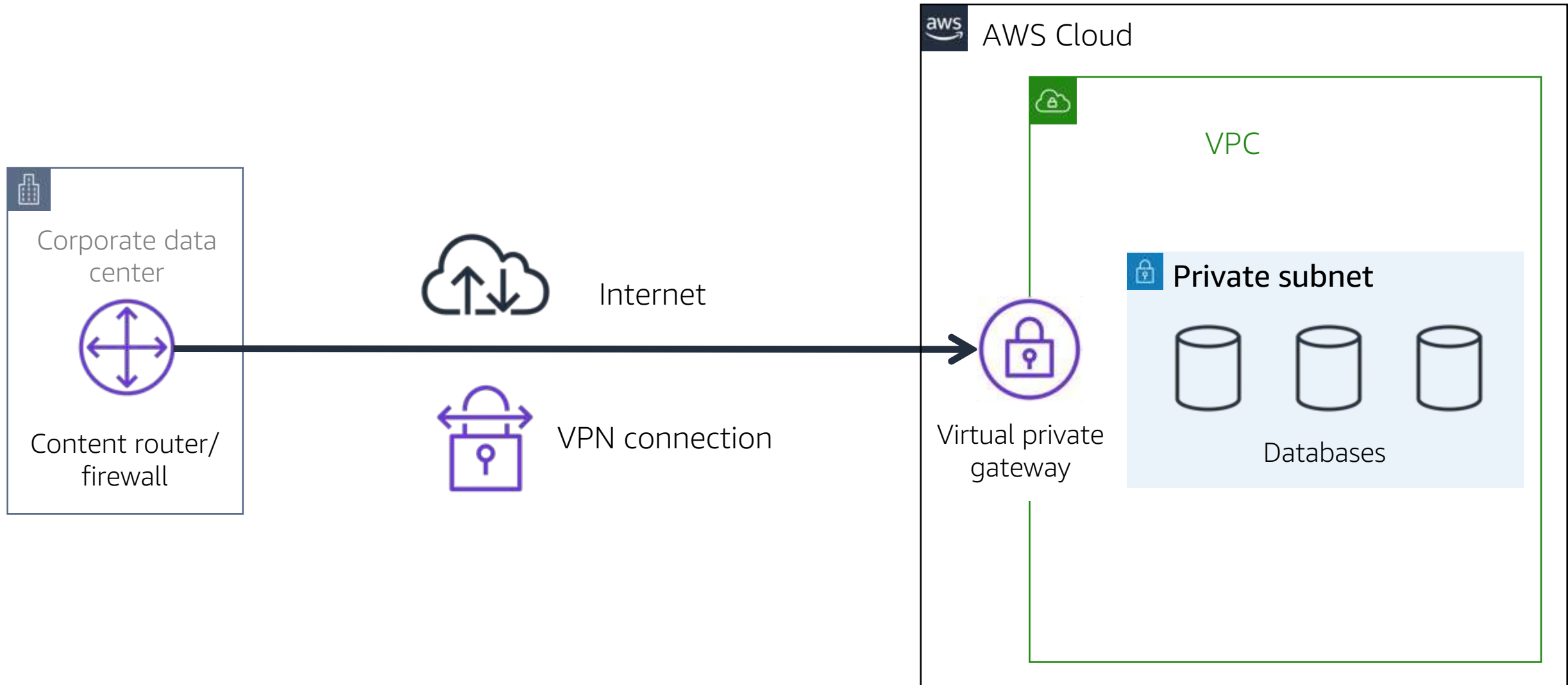
A subnet can be public or private.



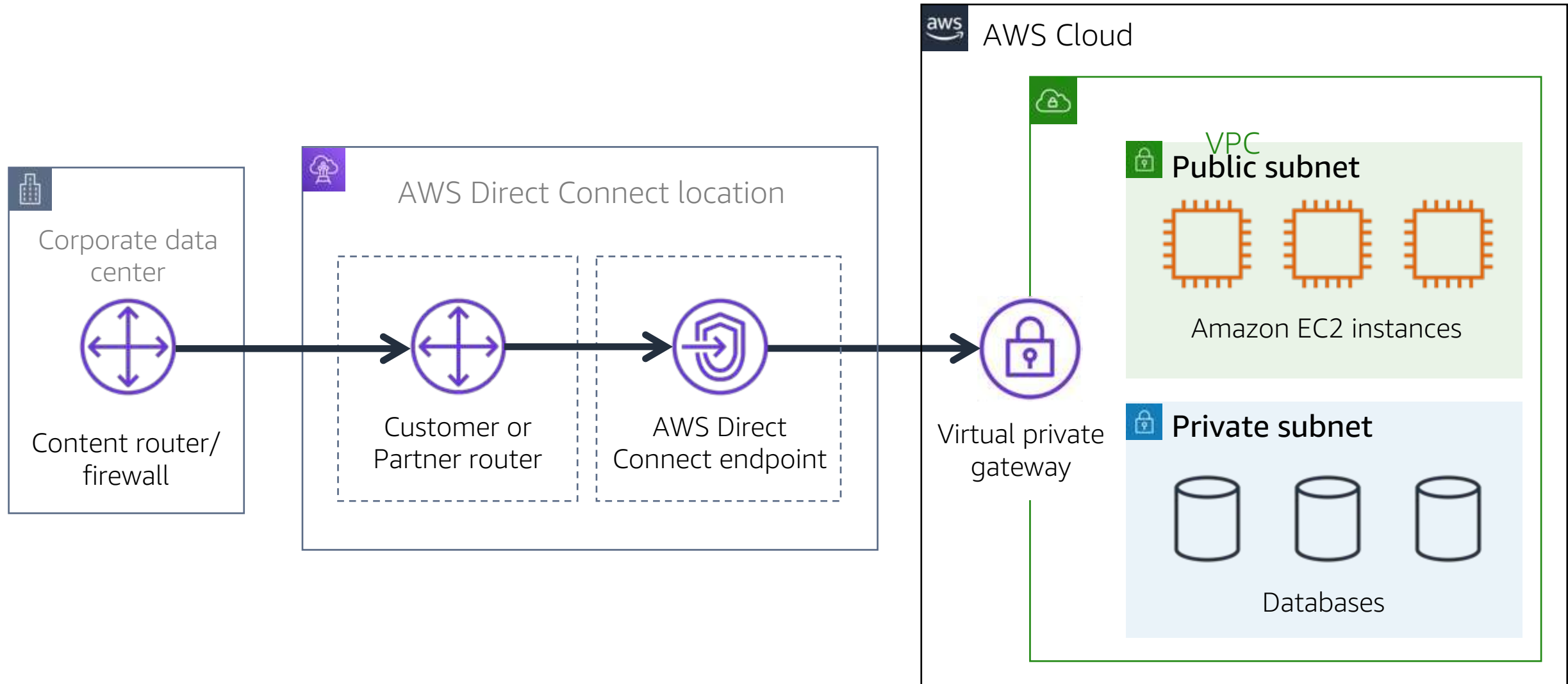
Internet gateway



Virtual private gateway



AWS Direct Connect



Match: VPC components

1. Isolate databases containing customers' personal information

2. Create a VPN connection between the VPC and the internal corporate network

3. Support a customer-facing website

4. Establish a dedicated connection between an on-premises data center and the VPC

A. Public subnet

B. Private subnet

C. Virtual private gateway

D. AWS Direct Connect

Match: VPC components

1. Isolate databases containing customers' personal information

2. Create a VPN connection between the VPC and the internal corporate network

3. Support a customer-facing website

4. Establish a dedicated connection between an on-premises data center and the VPC

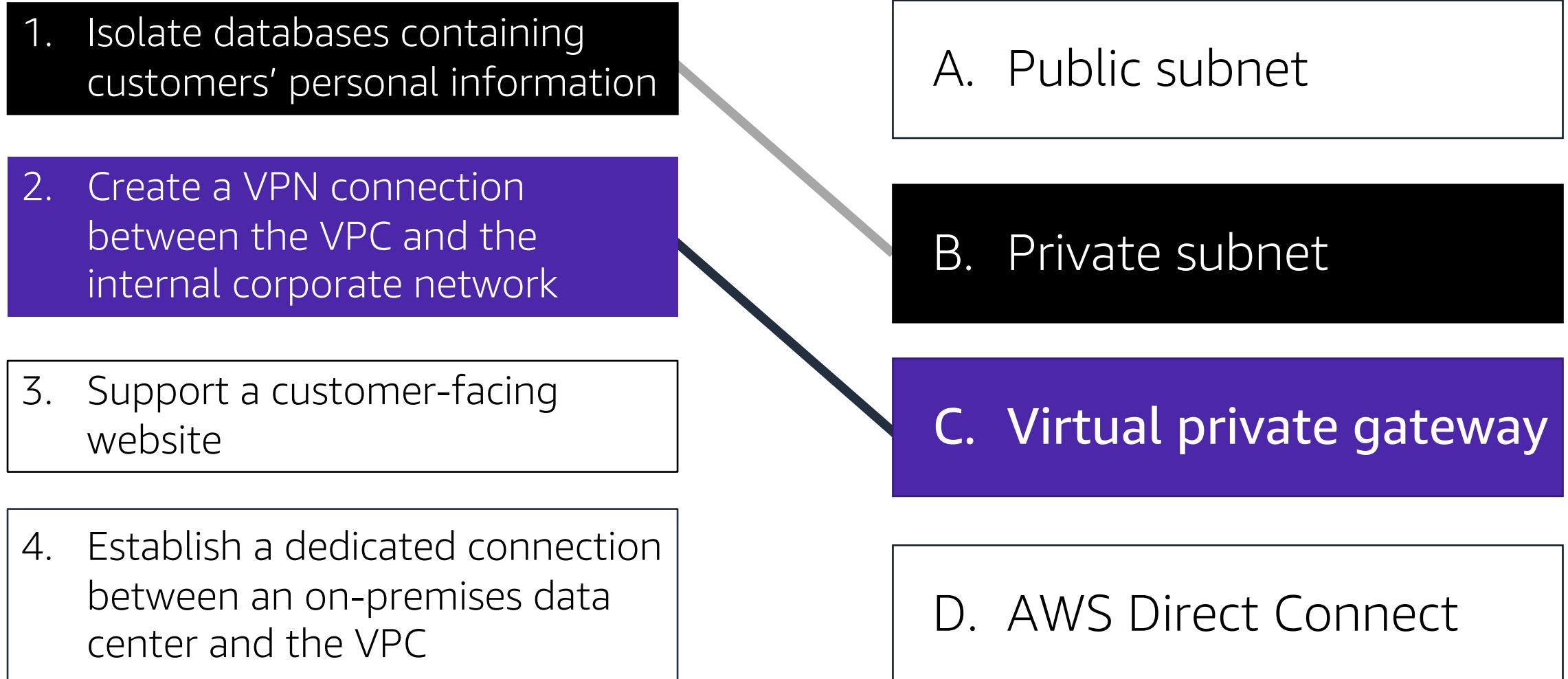
A. Public subnet

B. Private subnet

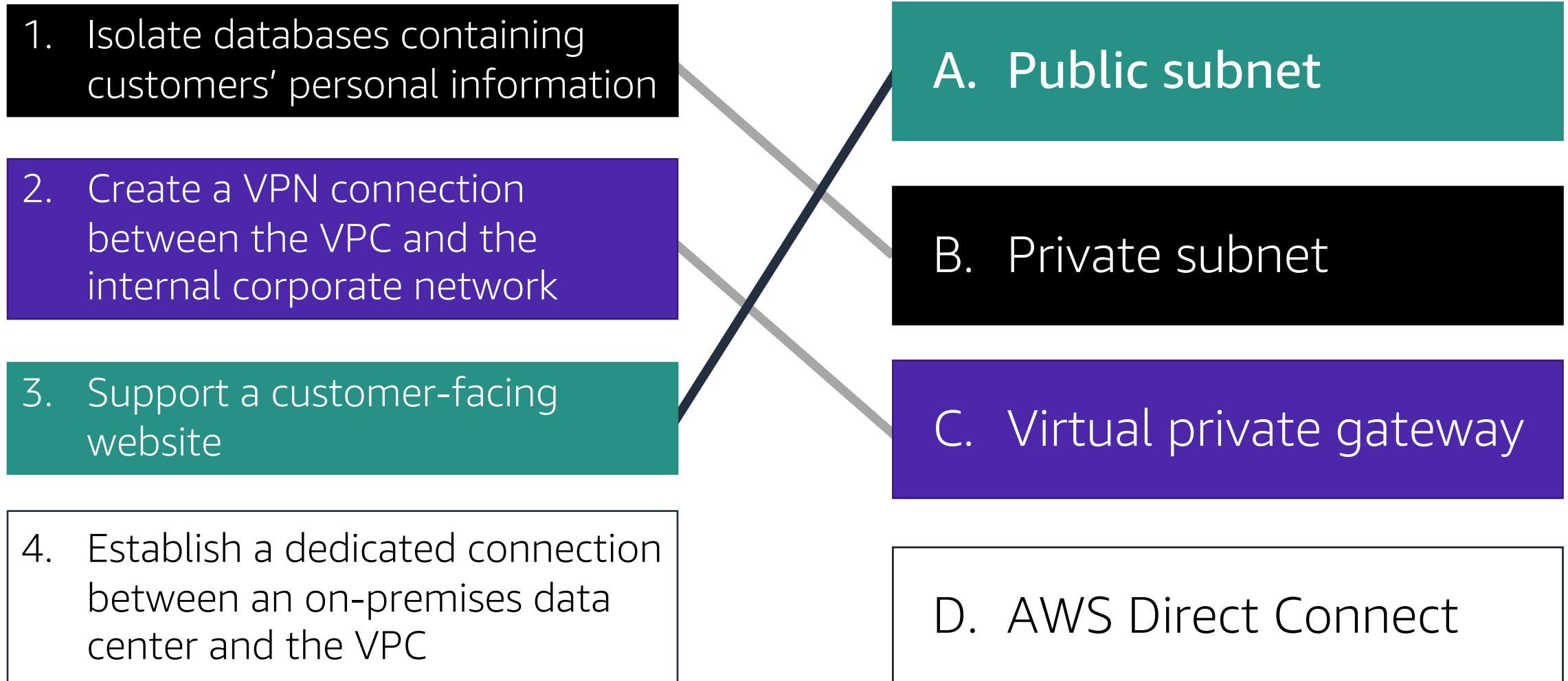
C. Virtual private gateway

D. AWS Direct Connect

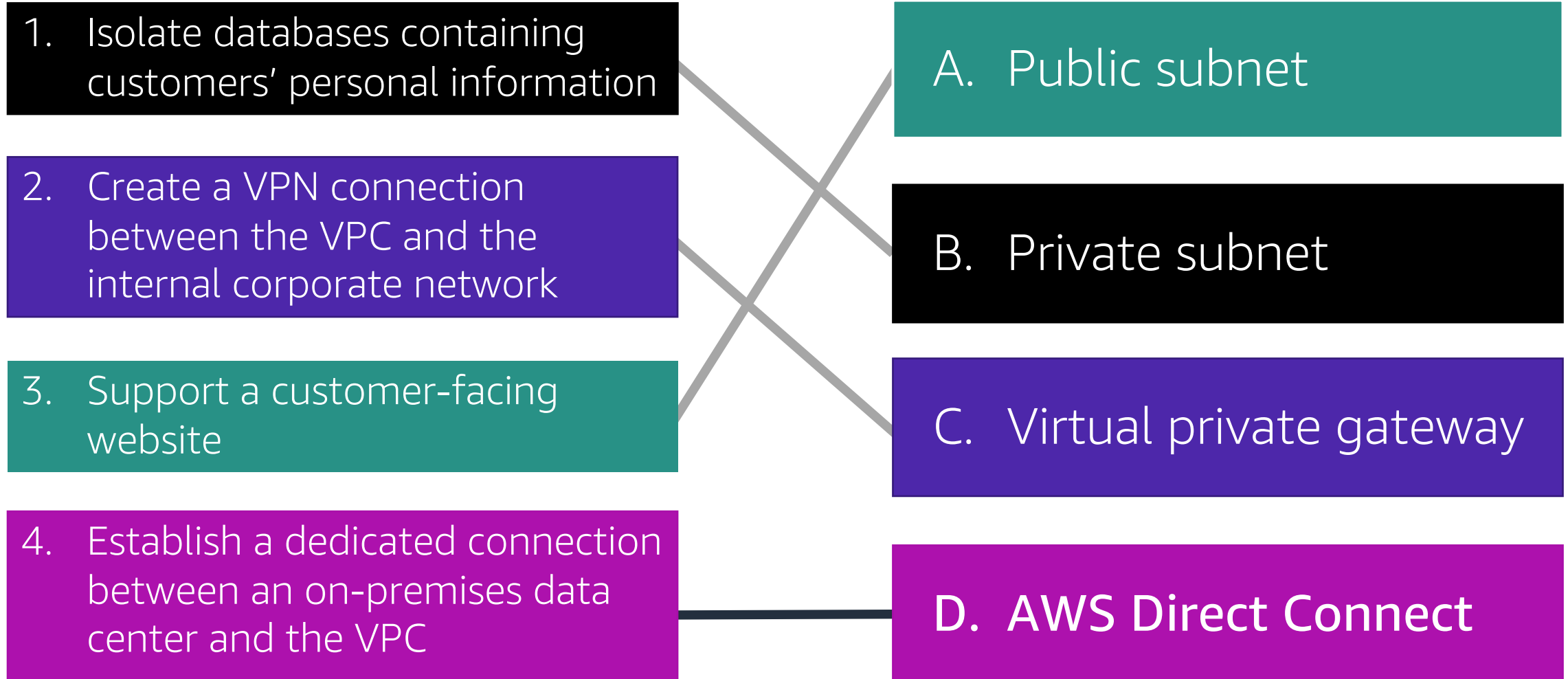
Match: VPC components



Match: VPC components

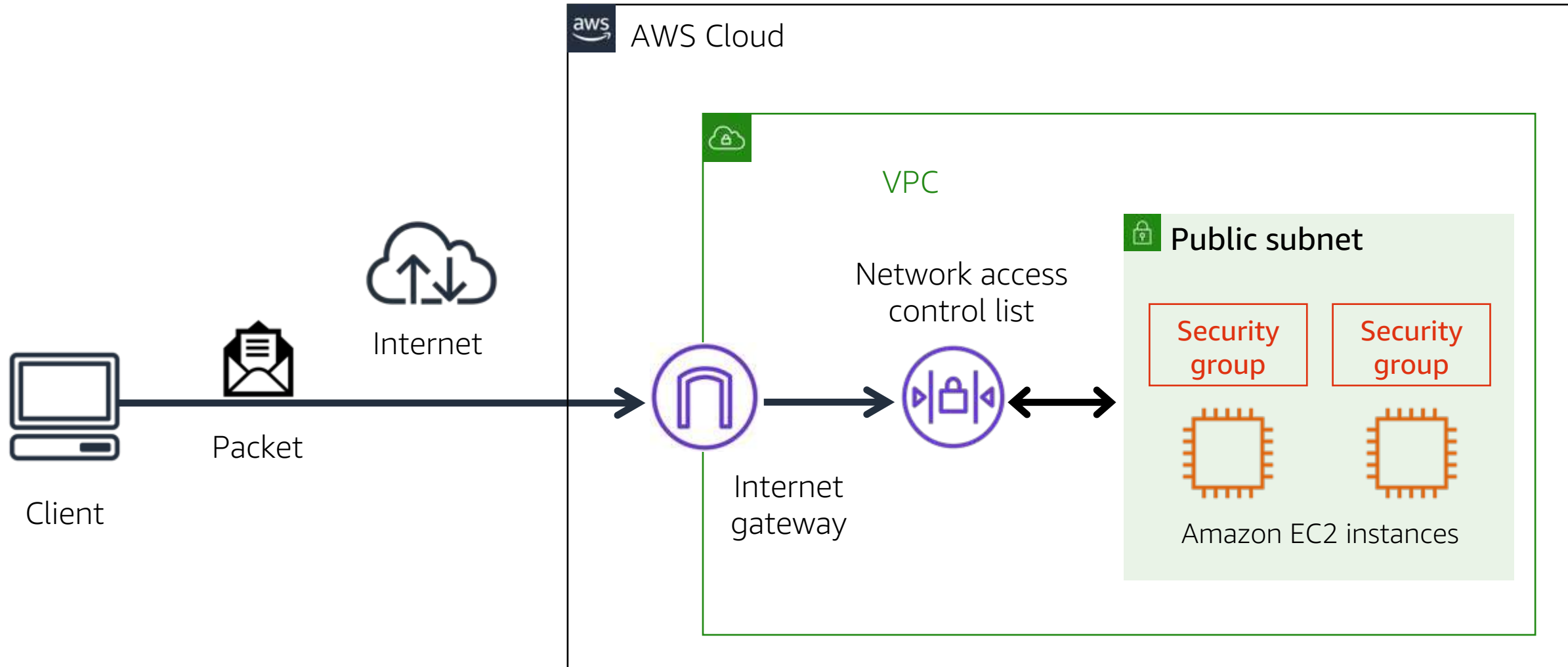


Match: VPC components



Network access control lists and security groups

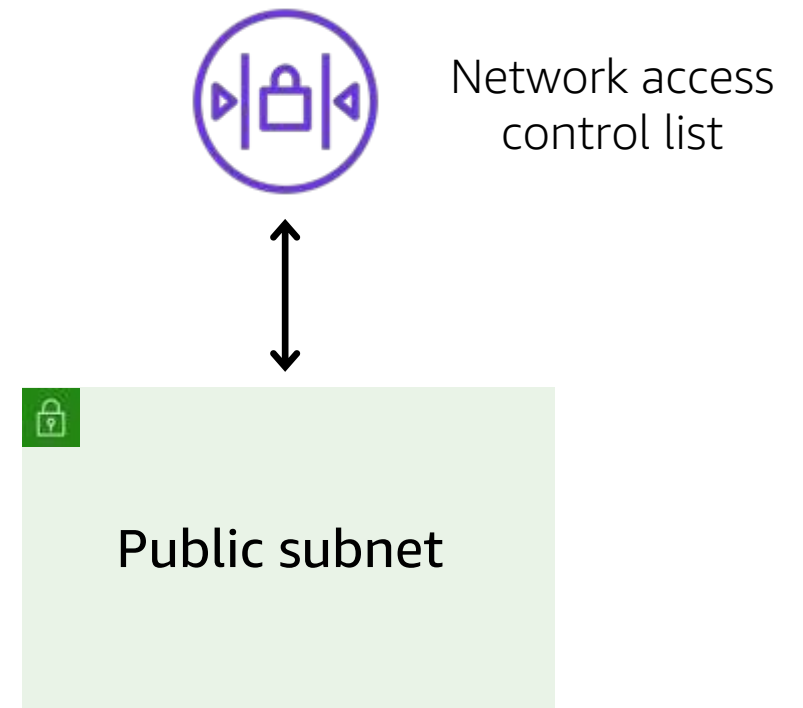
Network traffic in a VPC



Network access control lists

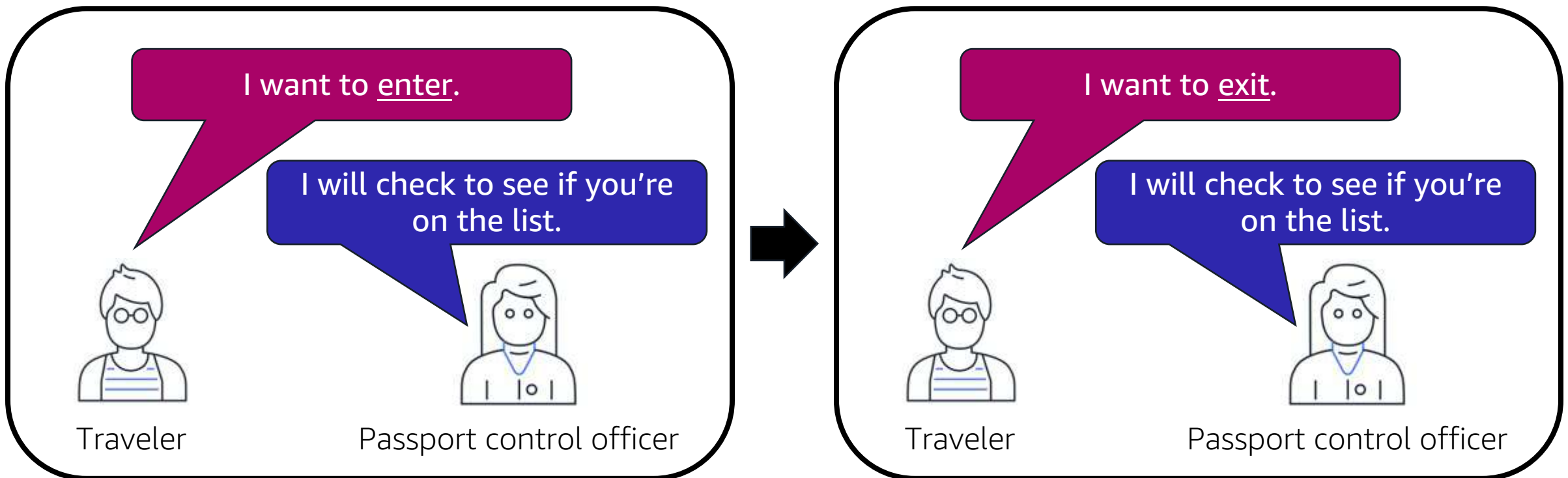
A **network access control list (network ACL)** is a virtual firewall for a subnet. By default:

- The default network ACL allows all inbound and outbound traffic.
- Custom network ACLs deny all inbound and outbound traffic.



Stateless packet filtering

- Network ACLs perform **stateless** packet filtering.
- Before a packet can exit a subnet, it must be checked against the outbound rules.

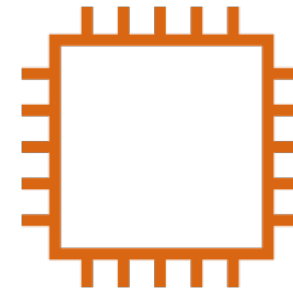


Security groups

A **security group** is a virtual firewall for an Amazon EC2 instance.

By default, a security group denies all inbound traffic and allows all outbound traffic.

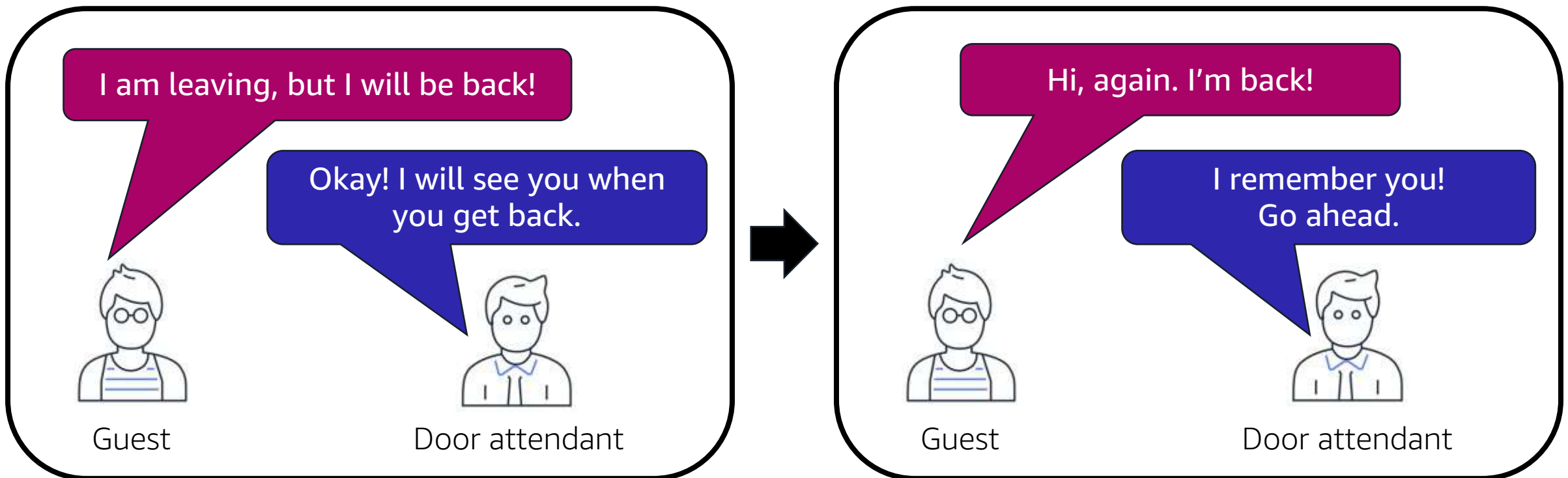
Security group



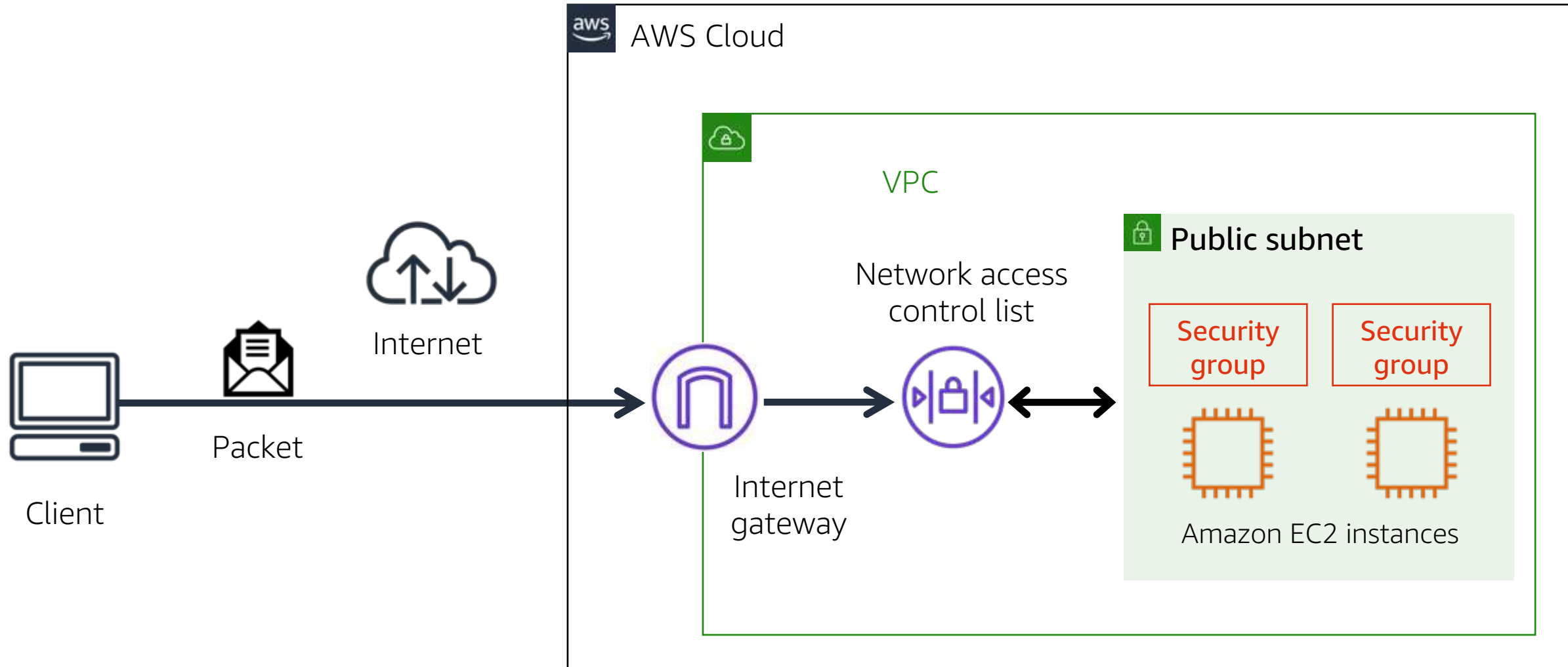
Amazon EC2 instance

Stateful packet filtering

- Security groups perform **stateful** packet filtering.
- They remember previous decisions that were made for incoming packets.



Network traffic in a VPC



Knowledge check



What are the differences between network access control lists and security groups?

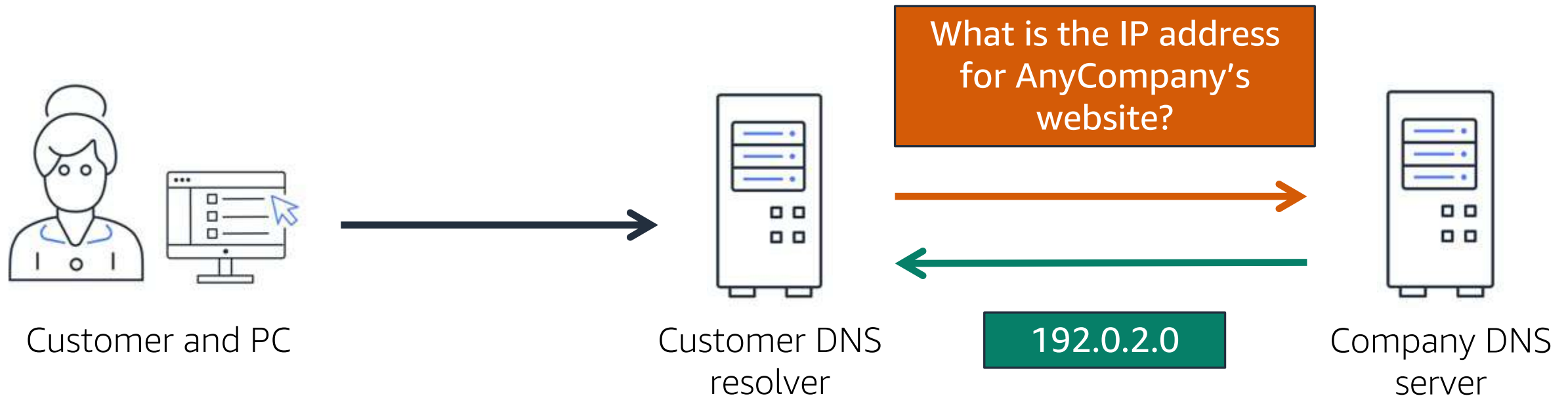
Knowledge check



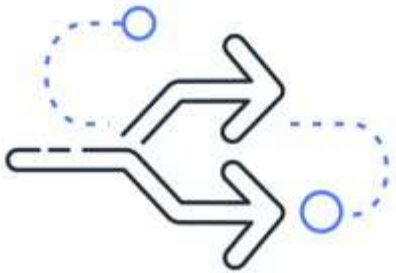
- Network access control lists are virtual firewalls for subnets. They perform stateless packet filtering.
- Security groups are virtual firewalls for Amazon EC2 instances. They perform stateful packet filtering.

Interact with the AWS global network

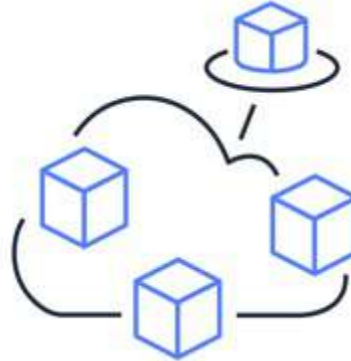
Domain Name System (DNS)



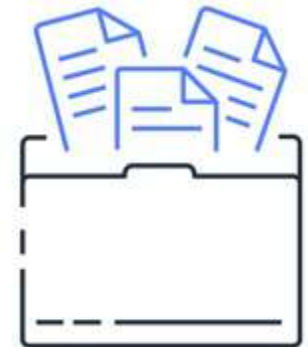
Amazon Route 53



Route users to internet applications

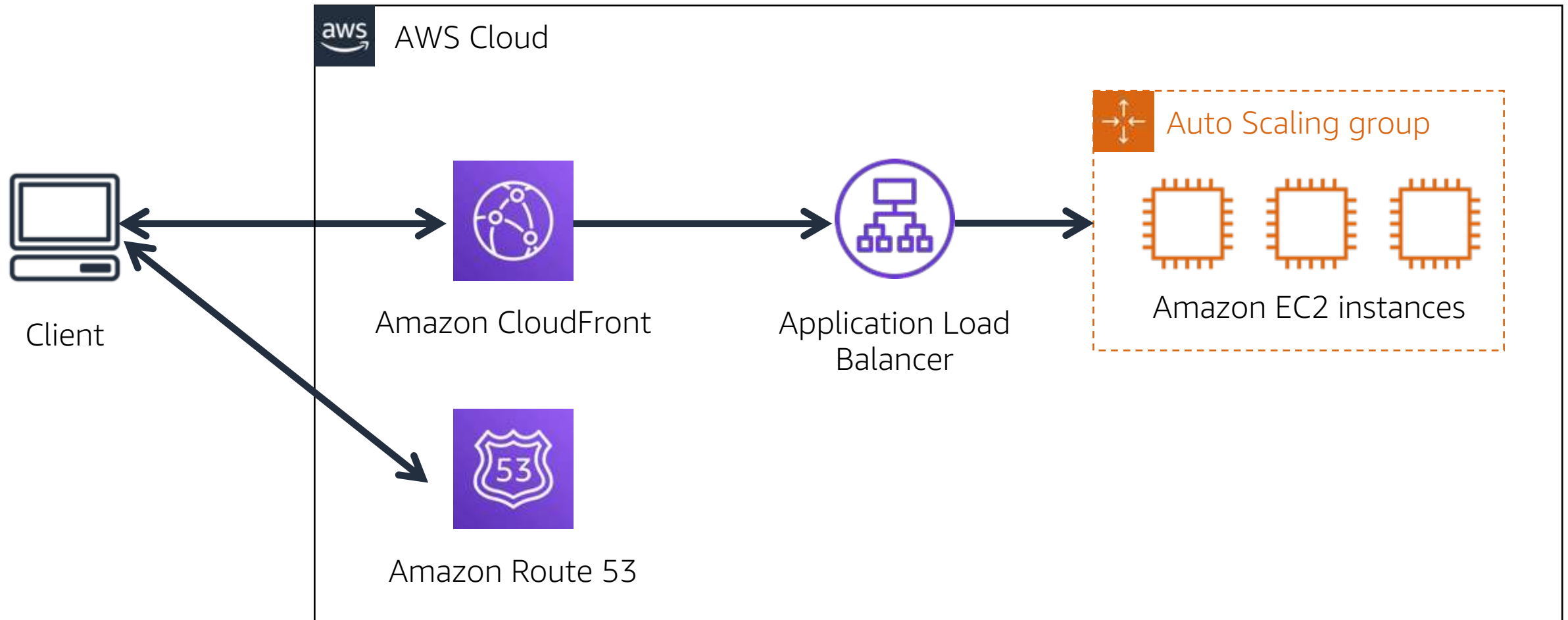


Connect user requests to infrastructure in AWS and outside of AWS



Manage DNS records for domain names

Amazon Route 53 and CloudFront



Module 4

Knowledge check

Knowledge check question 1



Which component can be used to establish a private dedicated connection between a company's data center and AWS?

- A. Private subnet
- B. DNS
- C. AWS Direct Connect
- D. Virtual private gateway

Knowledge check answer 1



Which component can be used to establish a private dedicated connection between a company's data center and AWS?

- A. Private subnet
- B. DNS
- C. **AWS Direct Connect (correct)**
- D. Virtual private gateway

Knowledge check question 2



Which statement describes security groups?

- A. They are stateful and allow all inbound traffic by default.
- B. They are stateful and deny all inbound traffic by default.
- C. They are stateless and allow all inbound traffic by default.
- D. They are stateless and deny all inbound traffic by default.

Knowledge check answer 2



Which statement describes security groups?

- A. They are stateful and allow all inbound traffic by default.
- B. They are stateful and deny all inbound traffic by default. (correct)**
- C. They are stateless and allow all inbound traffic by default.
- D. They are stateless and deny all inbound traffic by default.

Knowledge check question 3



Which component is used to connect a VPC to the internet?

- A. Internet gateway
- B. Public subnet
- C. Edge location
- D. Security group

Knowledge check answer 3



Which component is used to connect a VPC to the internet?

- A. Internet gateway (correct)
- B. Public subnet
- C. Edge location
- D. Security group

Knowledge check question 4



Which service is used to manage the DNS records for domain names?

- A. Amazon Virtual Private Cloud
- B. AWS Direct Connect
- C. Amazon CloudFront
- D. Amazon Route 53

Knowledge check answer 4



Which service is used to manage the DNS records for domain names?

- A. Amazon Virtual Private Cloud
- B. AWS Direct Connect
- C. Amazon CloudFront
- D. Amazon Route 53 (correct)

Knowledge check question 5



Which statement describes DNS resolution?

- A. Launching resources in a customer-defined virtual network
- B. Storing local copies of content at edge locations around the world
- C. Connecting a VPC to the internet
- D. Translating a domain name to an IP address

Knowledge check answer 5



Which statement describes DNS resolution?

- A. Launching resources in a customer-defined virtual network
- B. Storing local copies of content at edge locations around the world
- C. Connecting a VPC to the internet
- D. Translating a domain name to an IP address (correct)

Module 4 summary

In this module, you learned about:

- Structuring and connecting to a VPC
- Securing VPC resources with network access control lists and security groups
- Using Amazon Route 53 and Amazon CloudFront to deliver content



Module 5

Storage and Databases

Module 5 objectives

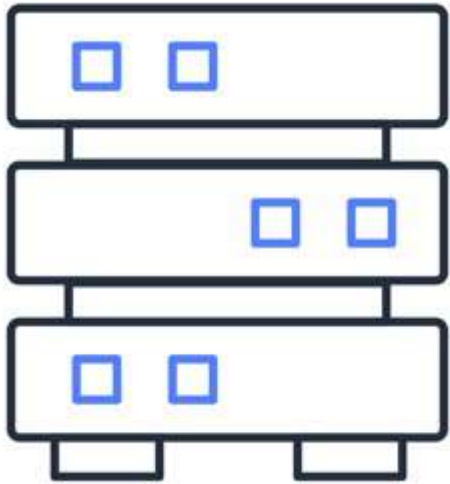
In this module, you will learn how to:

- Summarize the basic concept of storage and databases
- Describe Amazon Elastic Block Store (Amazon EBS) benefits
- Describe Amazon Simple Storage Service (Amazon S3) benefits
- Describe Amazon Elastic File System (Amazon EFS) benefits
- Summarize various storage solutions
- Describe Amazon Relational Database Service (Amazon RDS) benefits
- Describe Amazon DynamoDB benefits
- Summarize various database services



AWS storage

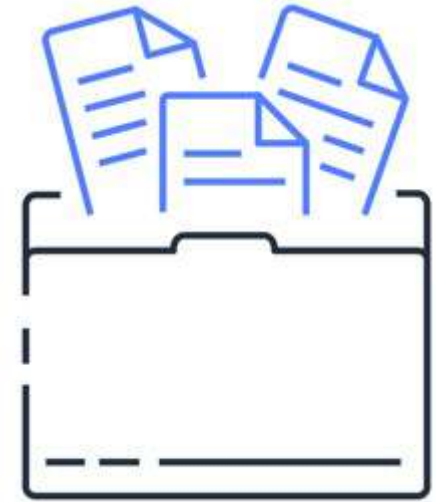
AWS storage types



Block storage



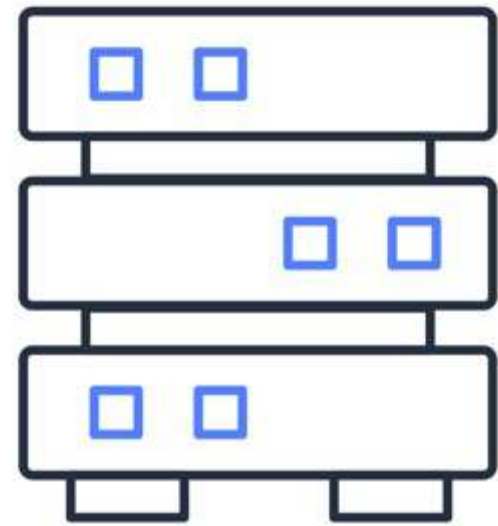
Object storage



File storage

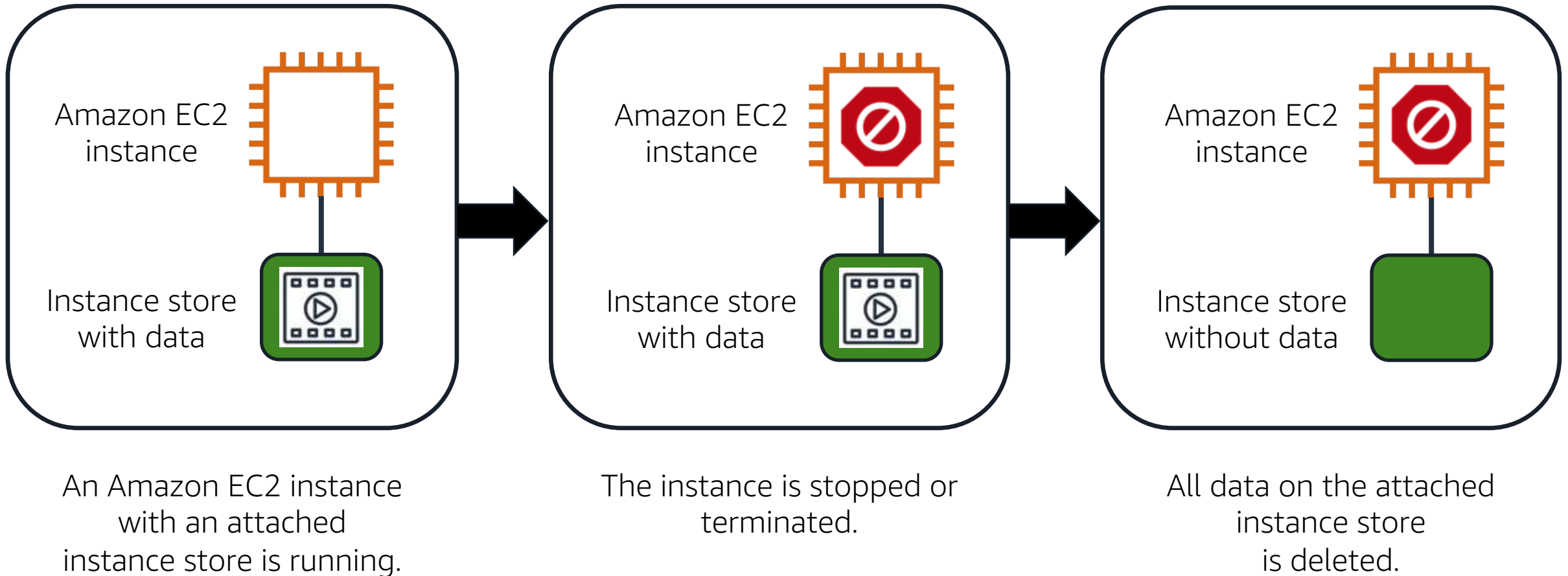
Block storage

- In **block storage**, files are separated into equal-sized pieces (blocks) of data.
- Block storage is used for applications that run on Amazon EC2 instances.

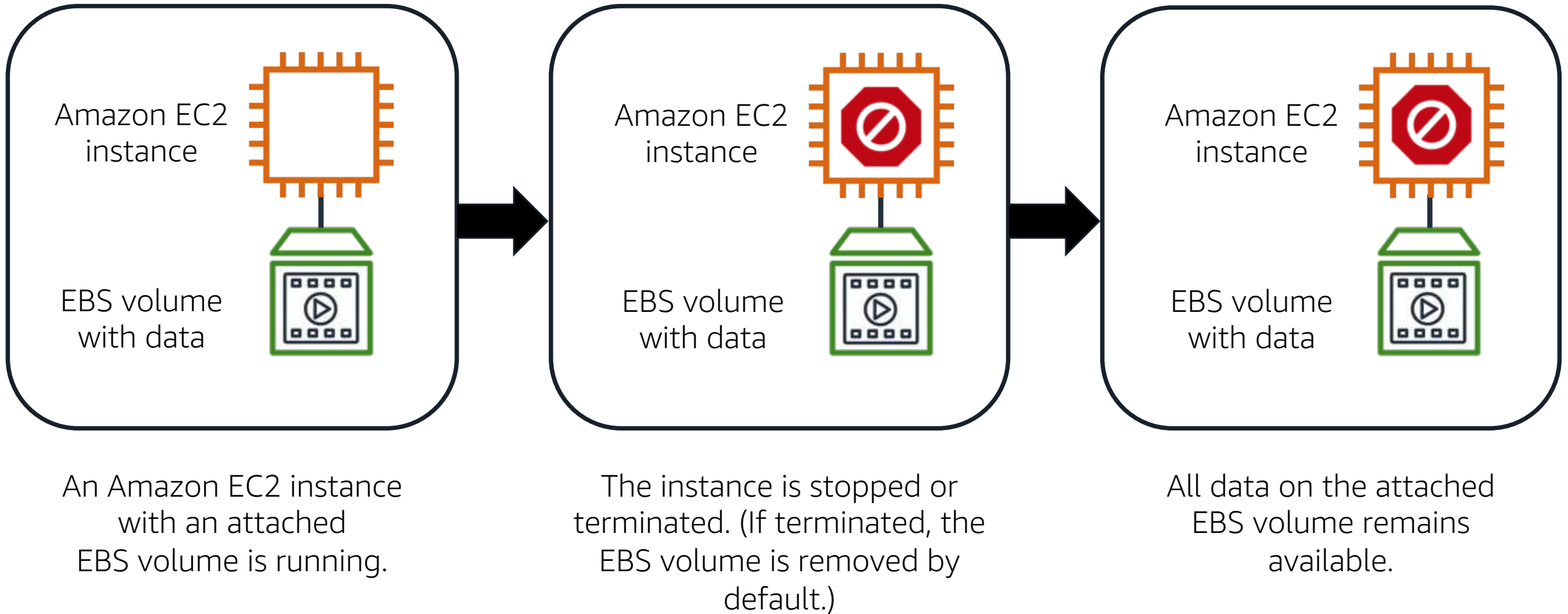


Block storage

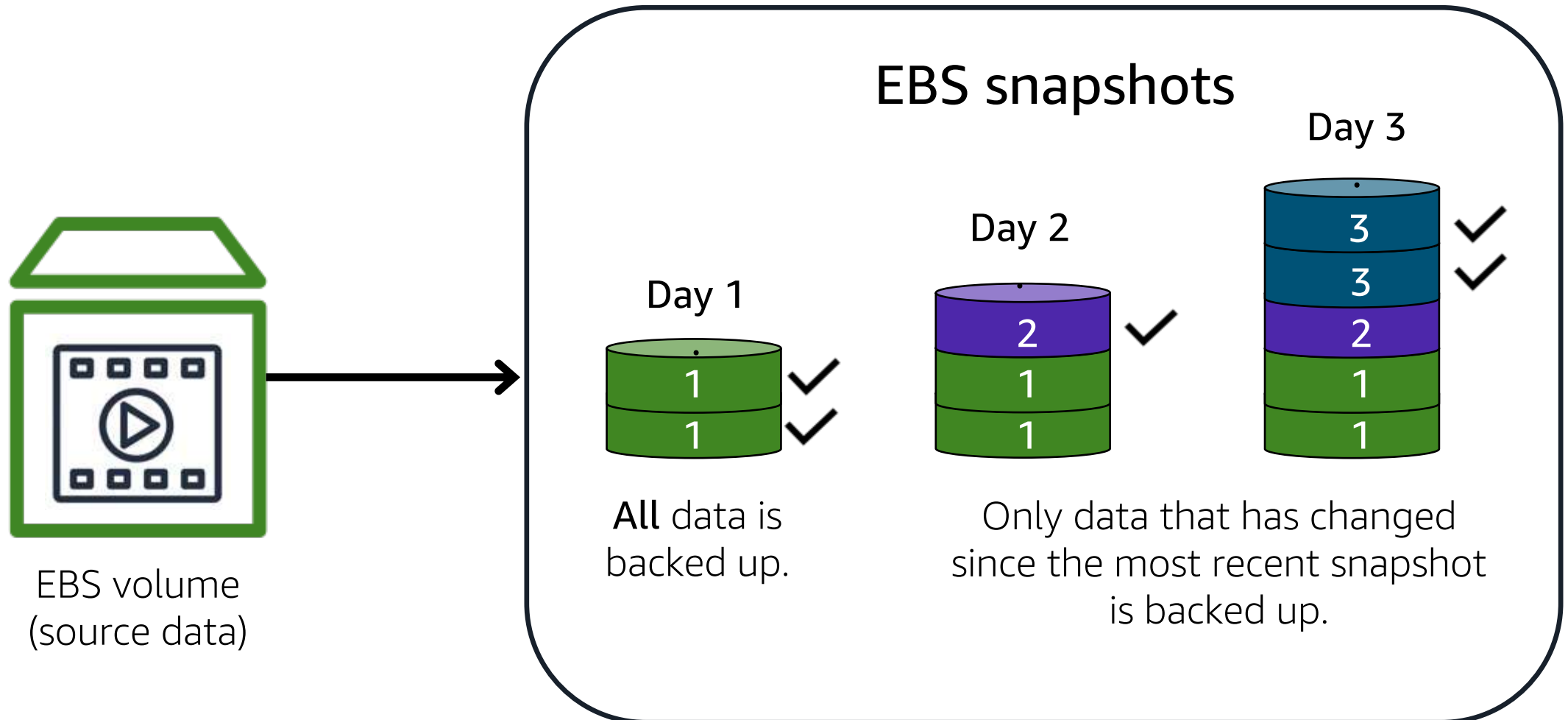
Instance store



Amazon EBS volumes



Amazon EBS snapshots



Knowledge check



What are the differences between instance stores and Amazon EBS volumes?

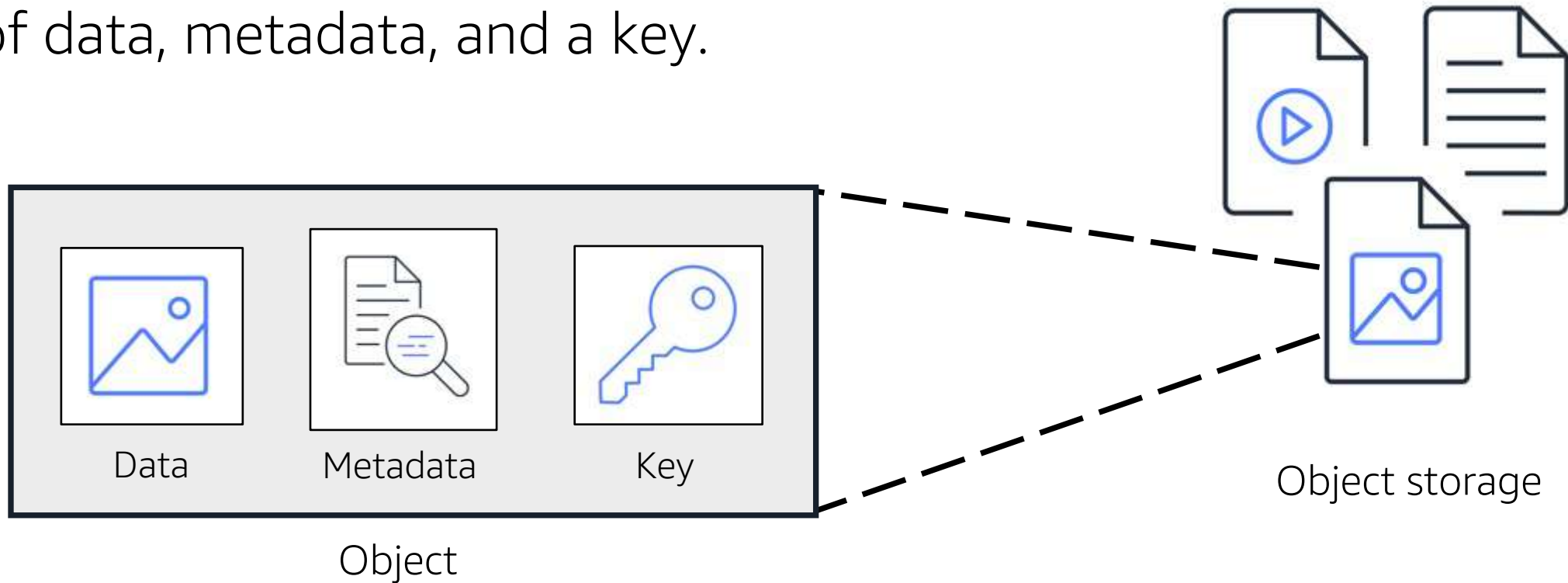
Knowledge check



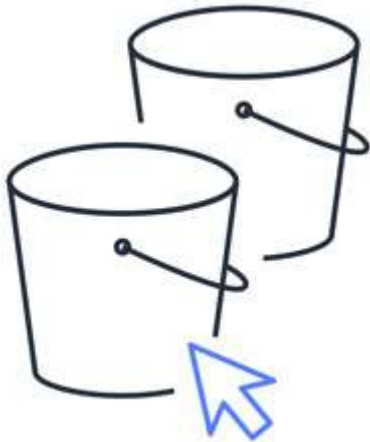
- Instance stores are ideal for temporary data not kept long term.
- Amazon EBS volumes are ideal for data that requires retention.

Object storage

In **object storage**, each object consists of data, metadata, and a key.



Amazon Simple Storage Service



Store objects in buckets



Set permissions to control
access to objects



Choose from a range of
storage classes for
different use cases

Amazon S3 storage classes

S3 Standard

- Designed for frequently accessed data
- Stores data in a minimum of three Availability Zones

S3 Standard-IA

- Ideal for infrequently accessed data
- Similar to S3 Standard but has a lower storage price and higher retrieval price

S3 One Zone-IA

- Stores data in a single Availability Zone
- Has a lower storage price than S3 Standard-IA

Amazon S3 storage classes

S3 Intelligent-Tiering

- Ideal for data with unknown or changing access patterns
- Requires a small monthly monitoring and automation fee per object

S3 Glacier

- Low-cost storage designed for data archiving
- Able to retrieve objects within a few minutes to hours

S3 Glacier Deep Archive

- Lowest-cost object storage class
- Able to retrieve objects within 12 hours

Knowledge check



You want to store data that is infrequently accessed but must be immediately available when needed. Which Amazon S3 storage class should you use?

- A. S3 Intelligent-Tiering
- B. S3 Glacier Deep Archive
- C. S3 Standard-IA
- D. S3 Glacier

Knowledge check

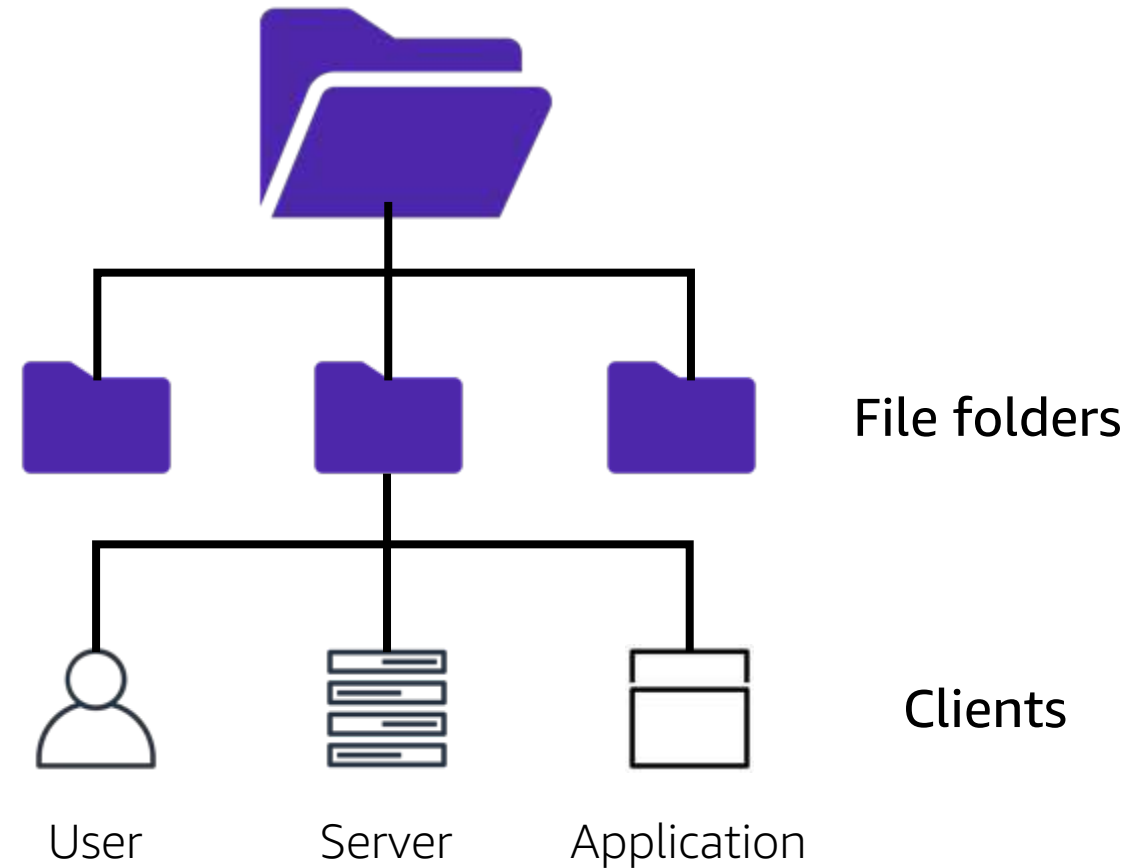


You want to store data that is infrequently accessed but must be immediately available when needed. Which Amazon S3 storage class should you use?

- A. S3 Intelligent-Tiering
- B. S3 Glacier Deep Archive
- C. **S3 Standard-IA (correct)**
- D. S3 Glacier

File storage

In **file storage**, multiple clients can access data that is stored in shared file folders.



Amazon Elastic File System



Store data in a scalable
file system



Provide data to thousands
of Amazon EC2 instances
concurrently



Store data in and across
multiple Availability
Zones

AWS databases

Relational database

ID	Product name	Size	Price
1	Medium roast ground coffee	12 oz.	\$5.30
2	Dark roast ground coffee	20 oz.	\$9.27

Nonrelational database

Key	Value
1	Name: John Doe Address: 123 Any Street Favorite drink: Medium latte
2	Name: Mary Major Address: 100 Main Street Birthday: July 5, 1994

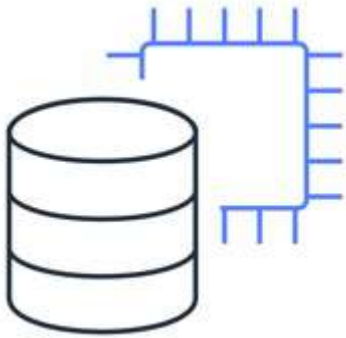
Relational databases

- In a **relational database**, data is stored in a way that relates it to other pieces of data.
- Relational databases use **structured query language (SQL)** to store and query data.

ID	Product name	Size	Price
1	Medium roast ground coffee	12 oz.	\$5.30
2	Dark roast ground coffee	20 oz.	\$9.27

Example of data in a relational database

Amazon Relational Database Service



Operate and scale a
relational database in
the AWS Cloud



Automate time-consuming
administrative tasks



Store and transmit
data securely

Amazon RDS database engines

- Amazon Aurora
- PostgreSQL
- MySQL
- MariaDB
- Oracle Database
- Microsoft SQL Server



Amazon RDS

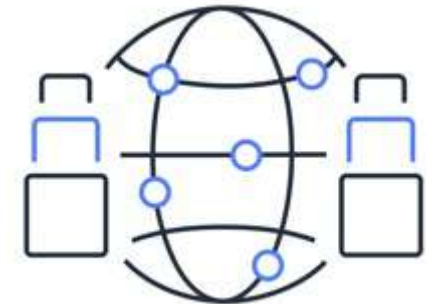
Amazon Aurora



Store data in an enterprise-class relational database



Reduce database costs by eliminating unnecessary input/output (I/O) operations



Replicate six copies of data across three Availability Zones

Discussion

One of the employees at the coffee shop has an idea for the new inventory management system.

They believe they should maintain data in a text file in Amazon S3.

Do you agree with their suggestion?

Why or why not?

Nonrelational databases

- A **nonrelational database** uses structures other than rows and columns to organize data.
- For example, with **key-value pairs**, data is organized into items (keys), and items have attributes (values).

Key	Value
1	Name: John Doe Address: 123 Any Street Favorite drink: Medium latte
2	Name: Mary Major Address: 100 Main Street Birthday: July 5, 1994

Example of data in a nonrelational database

Amazon DynamoDB



Amazon DynamoDB is a serverless key-value database.



It automatically scales to adjust for capacity changes and maintain consistent performance.



It is designed to handle over 10 trillion requests per day.

AWS Database Migration Service

Migrate relational databases, nonrelational databases, and other types of data stores

Example



MySQL database
(Source)



AWS Database
Migration Service
(AWS DMS)



Amazon Aurora
(Target)

Amazon RDS and Amazon DynamoDB

For each scenario, should you use **Amazon RDS** or **Amazon DynamoDB**?

Amazon RDS

1. Storing data in a relational database

2. Running a serverless database

DynamoDB

DynamoDB

3. Storing data in a key-value database

4. Using SQL to organize data

Amazon RDS

DynamoDB

5. Scaling up to 10 trillion requests per day

6. Storing data in an Amazon Aurora database

Amazon RDS

Additional database services

Additional database services



Amazon Redshift

Query and analyze data across a data warehouse



Amazon DocumentDB

Run MongoDB workloads in a document database service



Amazon Neptune

Run applications that use highly connected datasets



Amazon QLDB

Review a complete history of changes to your application data

Additional database services



Amazon Managed Blockchain

Run a decentralized ledger database



Amazon ElastiCache

Add caching layers to improve database read times



Amazon DynamoDB Accelerator

Improve DynamoDB response times from single-digit milliseconds to microseconds

Module 5

Knowledge check

Knowledge check question 1



Which Amazon S3 storage classes are optimized for archival data? (Select TWO.)

- A. S3 Standard
- B. S3 Glacier
- C. S3 Intelligent-Tiering
- D. S3 Glacier Deep Archive
- E. S3 Standard-IA

Knowledge check answer 1



Which Amazon S3 storage classes are optimized for archival data? (Select TWO.)

- A. S3 Standard
- B. S3 Glacier (correct)
- C. S3 Intelligent-Tiering
- D. S3 Glacier Deep Archive (correct)
- E. S3 Standard-IA

Knowledge check question 2



Which option is TRUE about Amazon EBS volumes and Amazon EFS file systems?

- A. EBS volumes store data in a single Availability Zone. Amazon EFS file systems store data across multiple Availability Zones.
- B. EBS volumes store data across multiple Availability Zones. Amazon EFS file systems store data in a single Availability Zone.
- C. EBS volumes and Amazon EFS file systems both store data in a single Availability Zone.
- D. EBS volumes and Amazon EFS file systems both store data across multiple Availability Zones.

Knowledge check answer 2



Which option is TRUE about Amazon EBS volumes and Amazon EFS file systems?

- A. EBS volumes store data in a single Availability Zone. Amazon EFS file systems store data across multiple Availability Zones. (correct)
- B. EBS volumes store data across multiple Availability Zones. Amazon EFS file systems store data in a single Availability Zone.
- C. EBS volumes and Amazon EFS file systems both store data in a single Availability Zone.
- D. EBS volumes and Amazon EFS file systems both store data across multiple Availability Zones.

Knowledge check question 3



A customer wants to store data in an object storage service. Which AWS service should the customer use for this type of storage?

- A. Amazon Managed Blockchain
- B. Amazon Elastic File System (Amazon EFS)
- C. Amazon Elastic Block Store (Amazon EBS)
- D. Amazon Simple Storage Service (Amazon S3)

Knowledge check answer 3



A customer wants to store data in an object storage service. Which AWS service should the customer use for this type of storage?

- A. Amazon Managed Blockchain
- B. Amazon Elastic File System (Amazon EFS)
- C. Amazon Elastic Block Store (Amazon EBS)
- D. Amazon Simple Storage Service (Amazon S3) (correct)

Knowledge check question 4



Which statement describes Amazon DynamoDB?

- A. A service that allows customers to run relational databases in the AWS Cloud
- B. A serverless key-value database service
- C. A service that customers can use to migrate relational databases, nonrelational databases, and other types of data stores
- D. An enterprise-class relational database

Knowledge check answer 4



Which statement describes Amazon DynamoDB?

- A. A service that allows customers to run relational databases in the AWS Cloud
- B. A serverless key-value database service (correct)**
- C. A service that customers can use to migrate relational databases, nonrelational databases, and other types of data stores
- D. An enterprise-class relational database

Knowledge check question 5



Which service is used to query and analyze data across a data warehouse?

- A. Amazon Neptune
- B. Amazon DocumentDB
- C. Amazon ElastiCache
- D. Amazon Redshift

Knowledge check answer 5



Which service is used to query and analyze data across a data warehouse?

- A. Amazon Neptune
- B. Amazon DocumentDB
- C. Amazon ElastiCache
- D. Amazon Redshift (correct)

Module 5 summary

In this module, you learned about:

- AWS storage services and resources
- Amazon S3 storage classes
- AWS database services



Module 6

Security

Module 6 objectives

In this module, you will learn how to:

- Explain the benefits of the shared responsibility model
- Describe multi-factor authentication (MFA)
- Differentiate among the AWS Identity and Access Management (IAM) security levels
- Explain AWS Organizations benefits
- Describe security policies
- Summarize the benefits of compliance with AWS
- Explain additional AWS security services



Shared responsibility model

Shared responsibility model

Customers	Customer Data		
	Platform, Applications, Identity and Access Management		
	Operating Systems, Network and Firewall Configuration		
	Client-side Data Encryption	Server-side Encryption	Networking Traffic Protection

AWS	Software			
	Compute	Storage	Database	Networking
	Hardware/AWS Global Infrastructure			
	Regions	Availability Zones	Edge Locations	

Customers: Security **IN** the cloud

Customers	Customer Data		
	Platform, Applications, Identity and Access Management		
	Operating Systems, Network and Firewall Configuration		
	Client-side Data Encryption	Server-side Encryption	Networking Traffic Protection

Examples of customer responsibilities include:

- Instance operating system
- Applications
- Security groups
- Host-based firewalls
- Account management

AWS: Security **OF** the cloud

AWS	Software			
	Compute	Storage	Database	Networking
	Hardware/AWS Global Infrastructure			
	Regions	Availability Zones	Edge Locations	

Examples of AWS responsibilities include:

- Physical security of data centers
- Hardware and software infrastructure
- Network infrastructure
- Virtualization infrastructure

Review: Shared responsibility model

Are these tasks the responsibilities of **customers** or **AWS**?

Customers

1. Configuring security groups on Amazon EC2 instances

2. Maintaining network infrastructure

AWS

AWS

3. Implementing physical security controls at data centers

4. Patching software on Amazon EC2 instances

Customers

AWS

5. Maintaining servers that run Amazon EC2 instances

6. Setting permissions for Amazon S3 objects

Customers

AWS Identity and Access Management (IAM)

Security in the coffee shop



A new cashier begins working at the coffee shop.



The cashier is given an account that has permission to access the point of sale system.



The cashier uses their account to access the point of sale system.



AWS Identity and Access Management (IAM) allows you to manage access to AWS services and resources.

IAM features



IAM user



IAM policy



IAM group

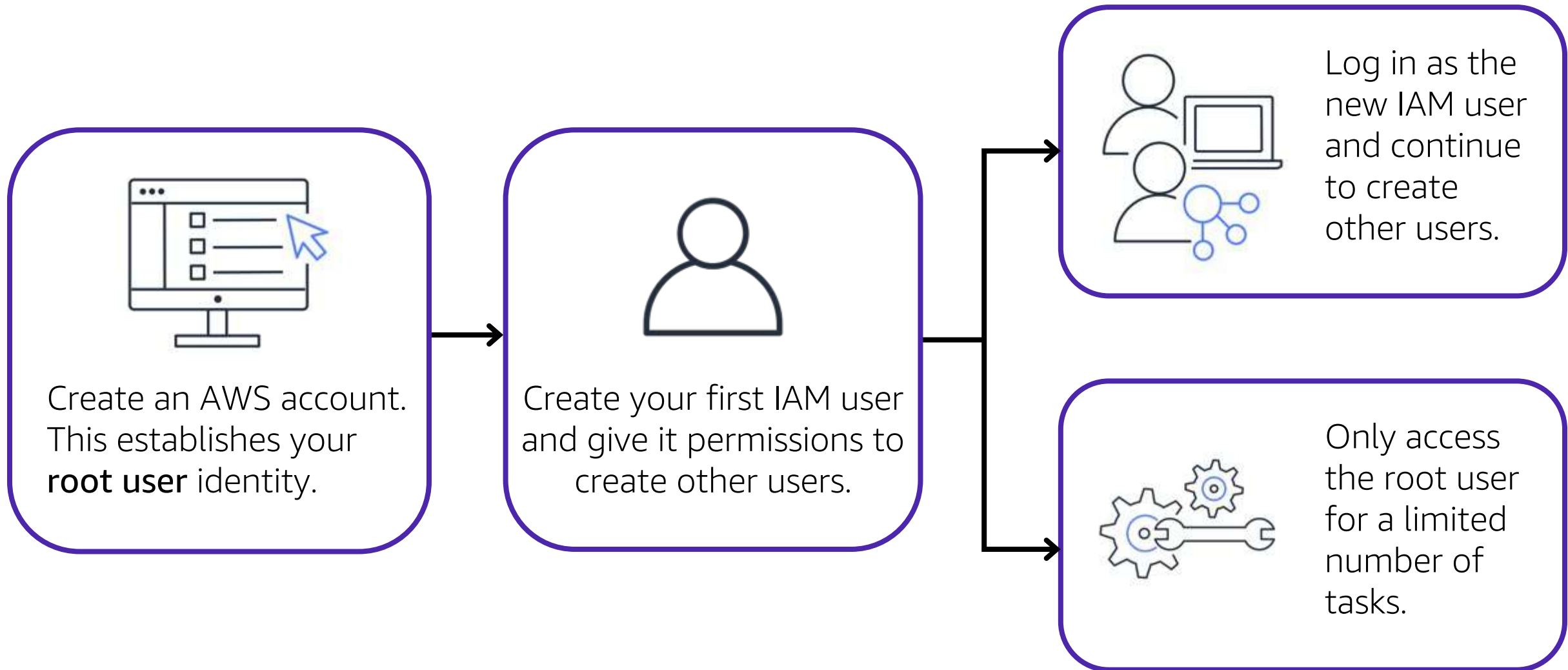


IAM role



Multi-factor authentication

AWS account root user



An **IAM user** is an identity that represents a person or application that interacts with AWS services and resources.

Best practice: Create individual IAM users for each person who needs to access AWS.



IAM user

An **IAM policy** is a document that grants or denies permissions to AWS services and resources.

Best practice: Follow the security principle of least privilege.



IAM policy

Example: IAM policy

This sample IAM policy allows permission to access the objects in the Amazon S3 bucket with ID: *awsdoc-example-bucket*.

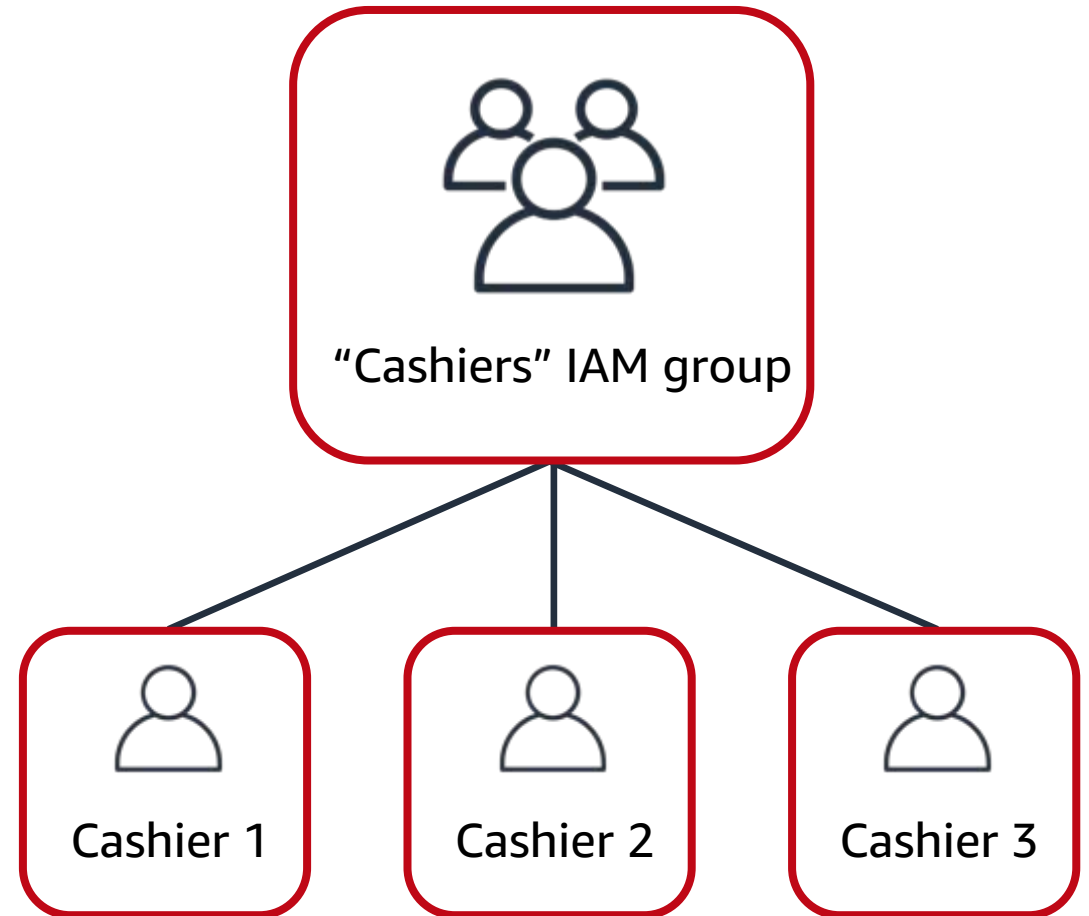
```
{
  "Version": "2012-10-17",
  "Statement": {
    "Effect": "Allow",
    "Action": "s3:ListObject",
    "Resource": "arn:aws:s3:::
awsdoc-example-bucket"
  }
}
```

IAM groups

An **IAM group** is a collection of IAM users.

Best practice: Attach IAM policies to IAM groups, rather than to individual IAM users.

Members inherit the policies assigned to the group.



An **IAM role** is an identity that you can assume to gain temporary access to permissions.



The owner gives the employee permissions to switch to specific roles.



"Cashier" role

The employee assumes the "Cashier" role.
This grants them access to the cash register system.



"Cashier" role

The employee assumes the "Inventory" role.

This grants them access to the inventory system and revokes their access to the cash register system.



"Inventory" role

Multi-factor authentication

Multi-factor authentication provides an extra layer of protection for your AWS account.

IAM user ID: AIDACKCEVSQ6C2EXAMPLE

Password: *****

To sign in to an AWS website, a user enters their IAM user ID and password.



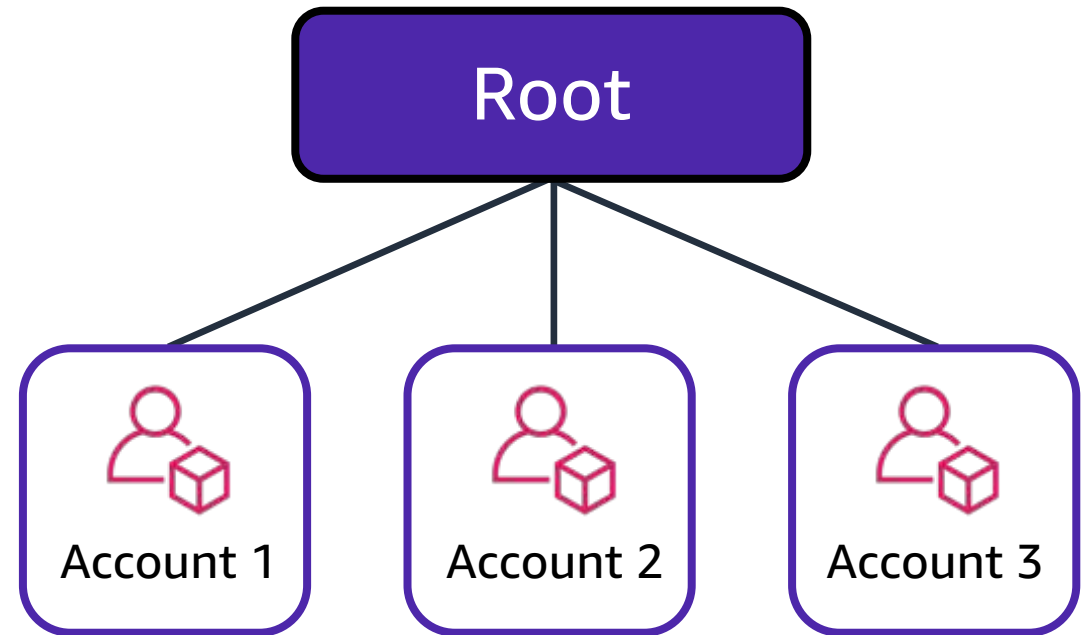
The user is prompted to provide an authentication response from their AWS MFA device.



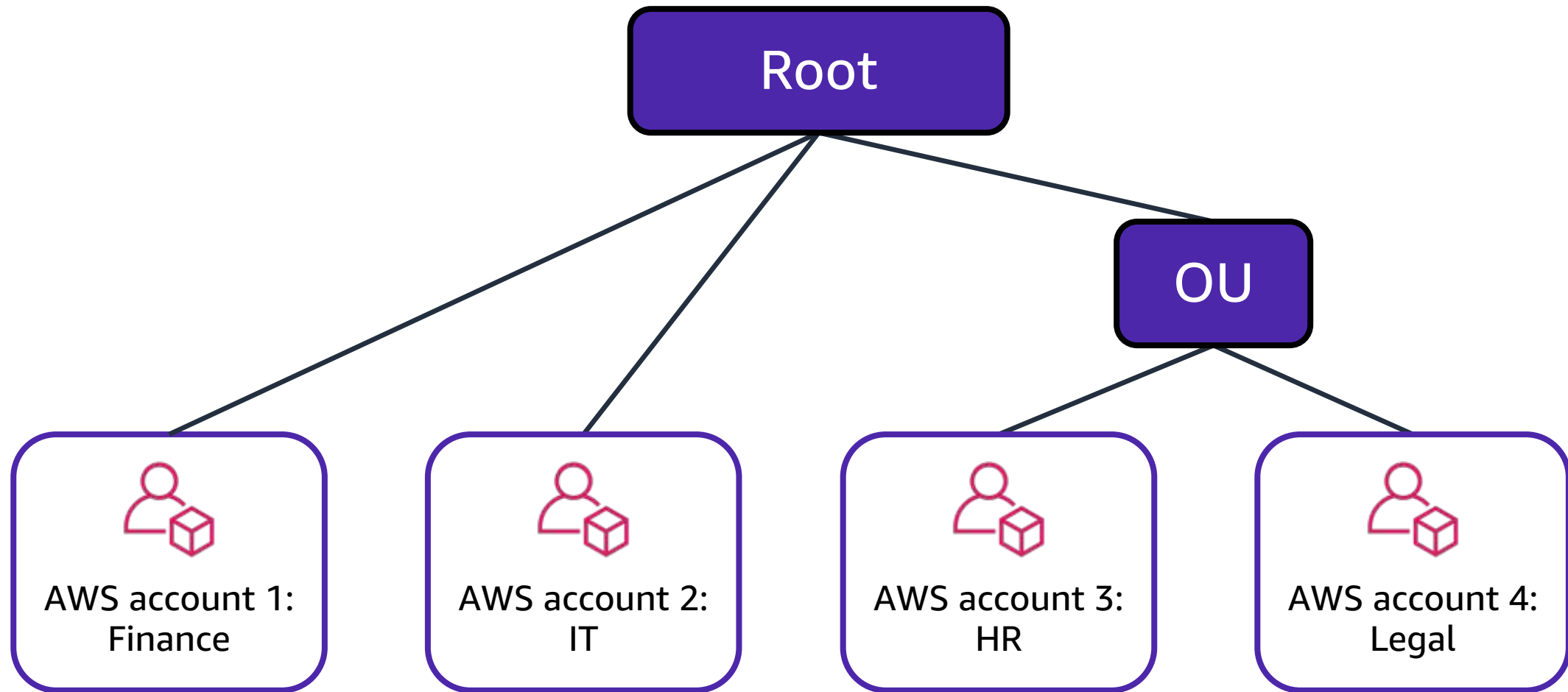
The user is successfully authenticated and can access the requested AWS services or resources.

AWS Organizations

- **AWS Organizations** helps customers consolidate and manage multiple AWS accounts in a central location.
- Use **service control policies (SCPs)** to centrally control permissions for the accounts in your organization.



Example: Organizational units



Knowledge check



A customer is configuring service control policies (SCPs) in AWS Organizations. Which identities and resources can SCPs be applied to? (Select TWO.)

- A. IAM users
- B. IAM groups
- C. An individual member account
- D. IAM roles
- E. An organizational unit (OU)

Knowledge check



A customer is configuring service control policies (SCPs) in AWS Organizations. Which identities and resources can SCPs be applied to? (Select TWO.)

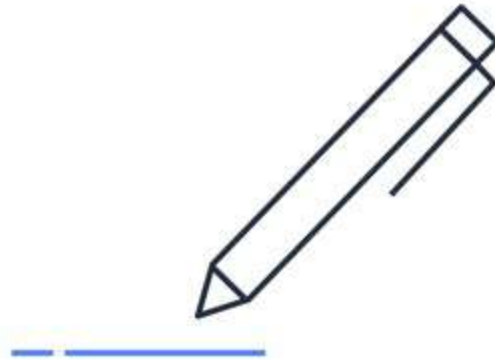
- A. IAM users
- B. IAM groups
- C. An individual member account (correct)
- D. IAM roles
- E. An organizational unit (OU) (correct)

Compliance

AWS Artifact provides on-demand access to security and compliance reports and select online agreements.



Access AWS compliance reports on demand



Review, accept, and manage agreements with AWS



Access compliance reports from third-party auditors

Assurance programs

Global



USA

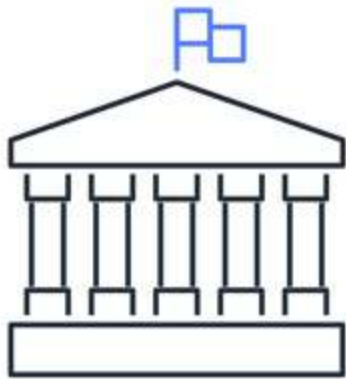


Asia Pacific

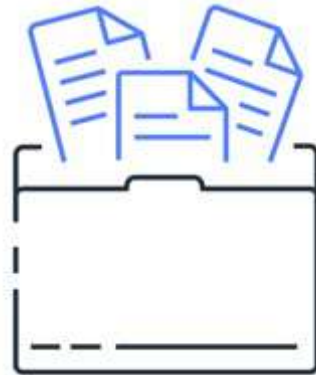


Customer Compliance Center

The **Customer Compliance Center** contains resources to help you learn more about AWS compliance.



Discover compliance stories from companies in regulated industries



Access compliance technical papers and documentation



Complete the auditor learning path

Knowledge check



Which tasks can you complete in AWS Artifact? (Select TWO.)

- A. Access AWS compliance reports on-demand
- B. Consolidate and manage multiple AWS accounts in a central location
- C. Create users to allow people and applications to interact with AWS services and resources
- D. Set permissions for accounts by configuring service control policies
- E. Review, accept, and manage agreements with AWS

Knowledge check

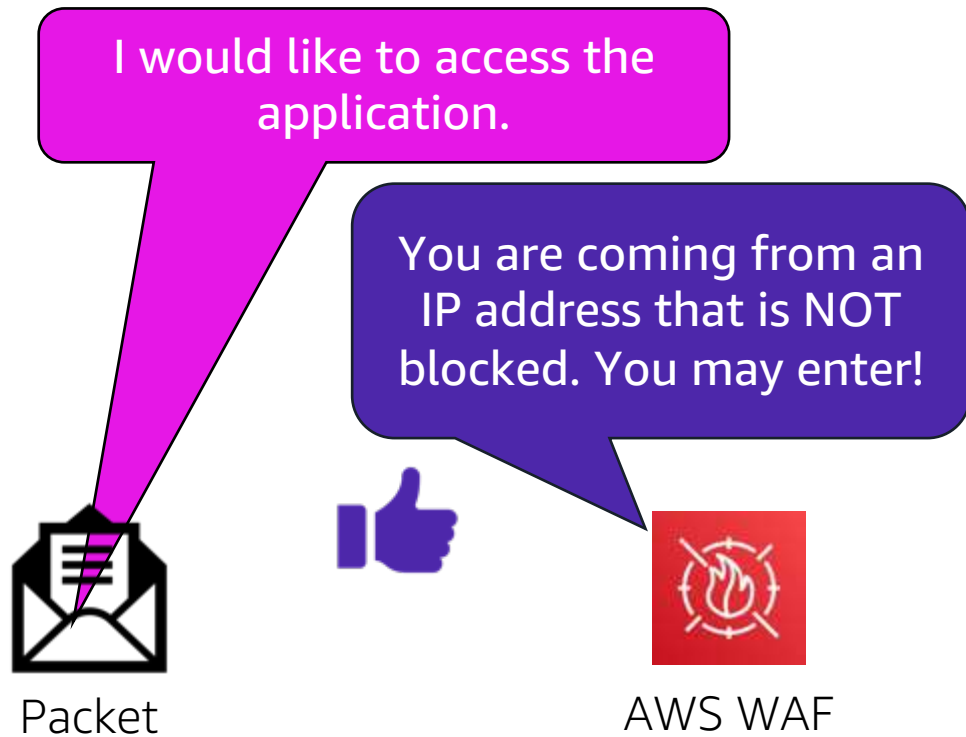


Which tasks can you complete in AWS Artifact? (Select TWO.)

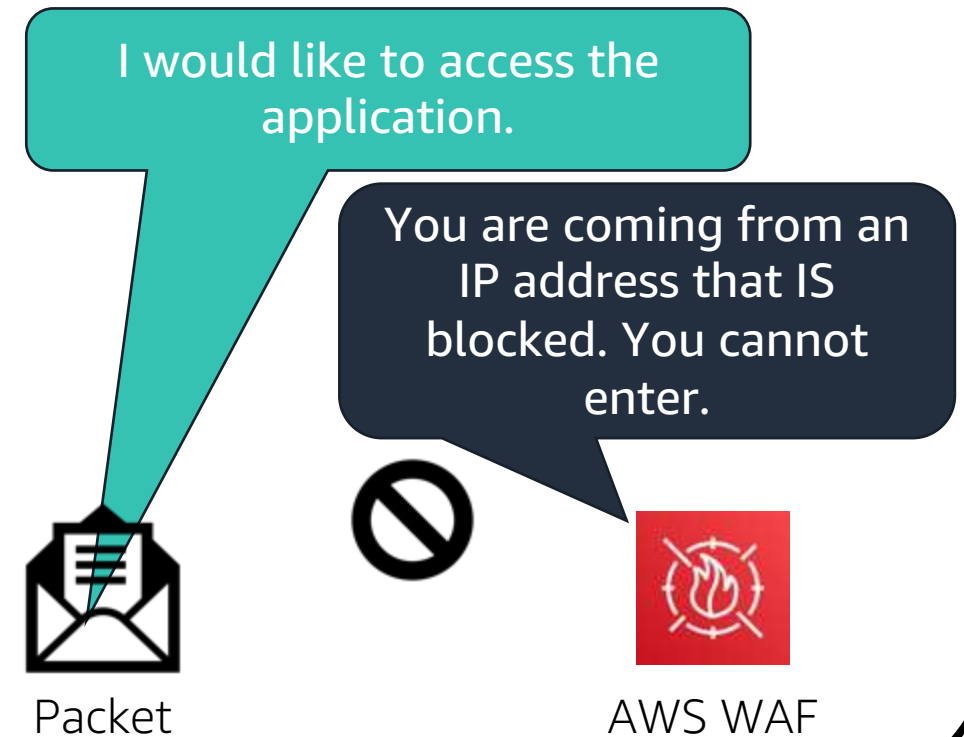
- A. Access AWS compliance reports on-demand (correct)
- B. Consolidate and manage multiple AWS accounts in a central location
- C. Create users to allow people and applications to interact with AWS services and resources
- D. Set permissions for accounts by configuring service control policies
- E. Review, accept, and manage agreements with AWS (correct)

Application security

Request from a customer

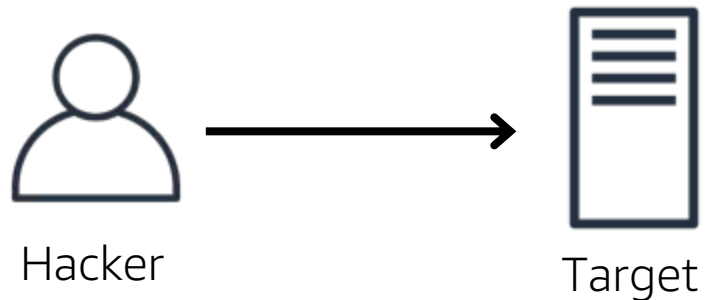


Malicious request from a hacker



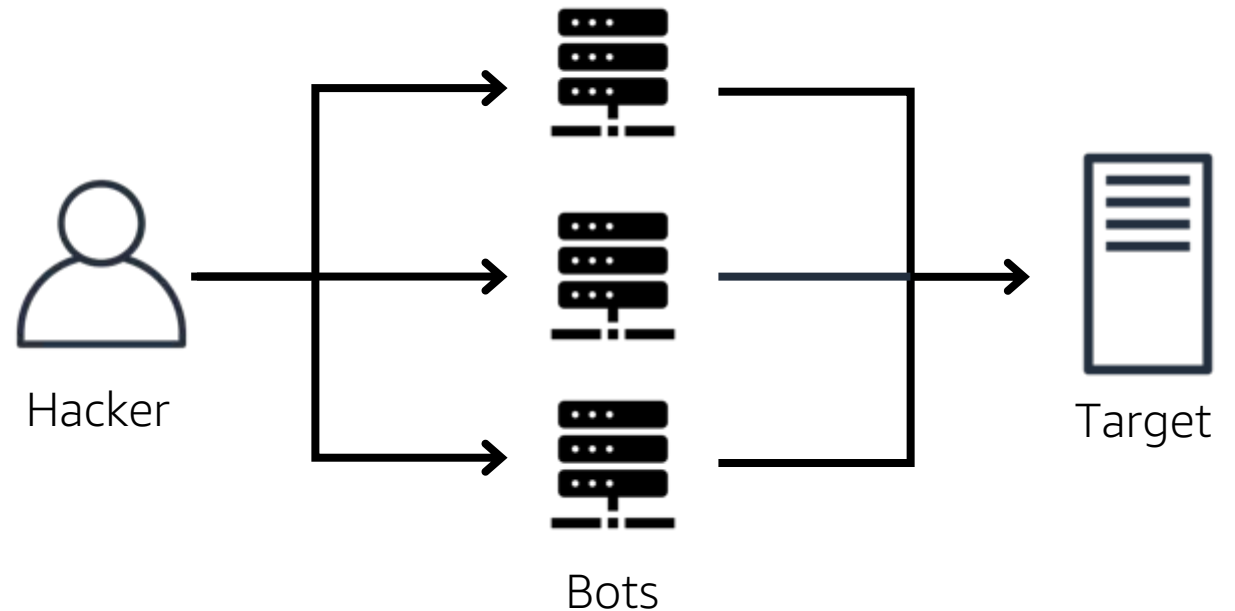
DoS and DDoS attacks

Denial of service attack



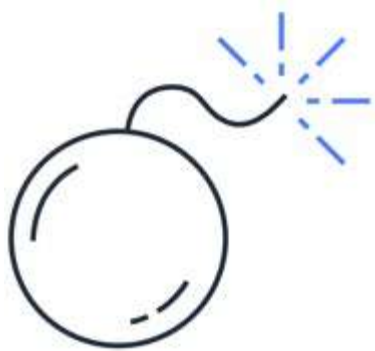
The attack originates from a **single** source.

Distributed denial of service attack



The attack originates from **multiple** sources.

AWS Shield provides protection against distributed denial of service (DDoS) attacks.



Protect applications
against DDoS attacks



Integrate AWS Shield
Advanced with other
AWS services



Write custom web ACL
rules with AWS WAF to
mitigate complex
DDoS attacks

Amazon Inspector allows you to perform automated security assessments on your applications.



Automatically conduct
application security
assessments



Identify security
vulnerabilities and deviations
from best practices



Receive recommendations
for how to fix security
issues

Additional security services

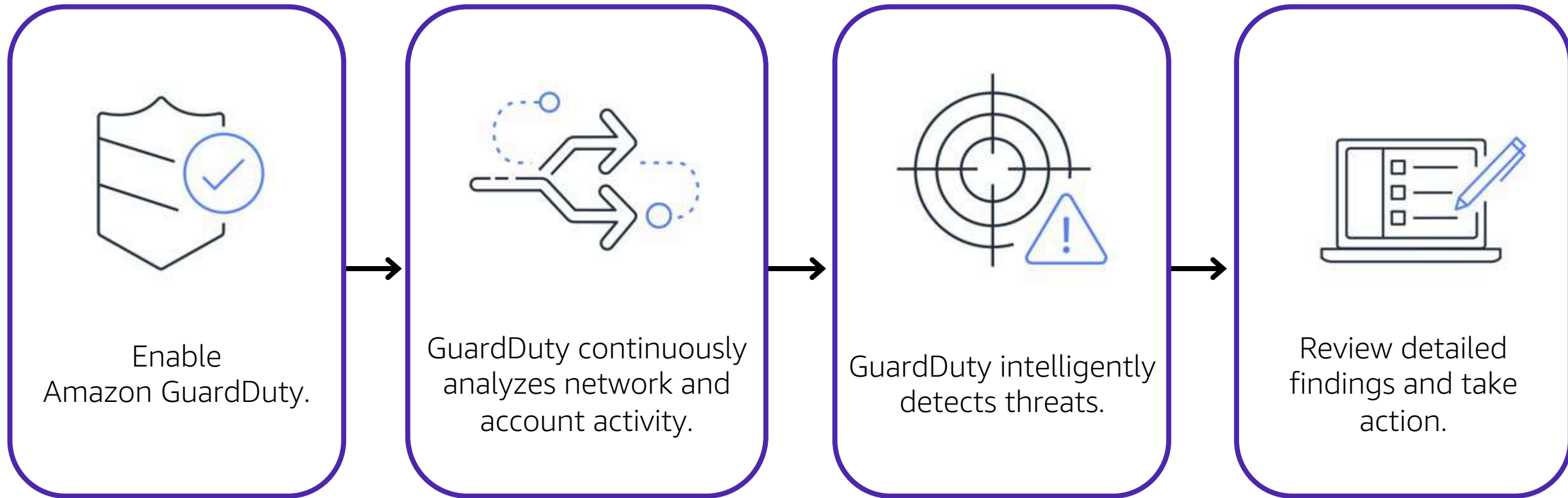
- **AWS Key Management Service (AWS KMS)** helps customers perform encryption operations through the use of cryptographic keys.
- You can choose the specific levels of access control that you need for your keys.



AWS KMS

Amazon GuardDuty

Amazon GuardDuty provides intelligent threat detection for AWS products and services.



Module 6

Knowledge check

Knowledge check question 1



Which statement describes an IAM policy?

- A. An authentication process that provides an extra layer of protection for your AWS account
- B. A document that grants or denies permissions to AWS services and resources
- C. An identity that you can assume to gain temporary access to permissions
- D. The identity that is established when you first create an AWS account

Knowledge check answer 1



Which statement describes an IAM policy?

- A. An authentication process that provides an extra layer of protection for your AWS account
- B. A document that grants or denies permissions to AWS services and resources (correct)**
- C. An identity that you can assume to gain temporary access to permissions
- D. The identity that is established when you first create an AWS account

Knowledge check question 2



An employee requires temporary access to create several Amazon S3 buckets. Which option should be used for this task?

- A. AWS account root user
- B. IAM group
- C. IAM role
- D. Service control policy

Knowledge check answer 2



An employee requires temporary access to create several Amazon S3 buckets. Which option should be used for this task?

- A. AWS account root user
- B. IAM group
- C. IAM role (correct)
- D. Service control policy

Knowledge check question 3



Which option describes the concept of least privilege?

- A. Adding an IAM user into at least one IAM group
- B. Granting only the permissions that are needed to perform specific tasks
- C. Checking a packet's permissions against an access control list
- D. Performing a denial of service attack that originates from at least one device

Knowledge check answer 3



Which option describes the concept of least privilege?

- A. Adding an IAM user into at least one IAM group
- B. Granting only the permissions that are needed to perform specific tasks (correct)
- C. Checking a packet's permissions against an access control list
- D. Performing a denial of service attack that originates from at least one device

Knowledge check question 4



Which service helps protect your applications against distributed denial of service (DDoS) attacks?

- A. Amazon GuardDuty
- B. Amazon Inspector
- C. AWS Artifact
- D. AWS Shield

Knowledge check answer 4



Which service helps protect your applications against distributed denial of service (DDoS) attacks?

- A. Amazon GuardDuty
- B. Amazon Inspector
- C. AWS Artifact
- D. **AWS Shield (correct)**

Knowledge check question 5



Which task can AWS Key Management Service (AWS KMS) perform?

- A. Configure multi-factor authentication (MFA)
- B. Update the AWS account root user password
- C. Create cryptographic keys
- D. Assign permissions to users and groups

Knowledge check answer 5



Which task can AWS Key Management Service (AWS KMS) perform?

- A. Configure multi-factor authentication (MFA)
- B. Update the AWS account root user password
- C. Create cryptographic keys (correct)
- D. Assign permissions to users and groups

Module 6 summary

In this module, you learned about:

- Shared responsibility model
- AWS Identity and Access Management features
- Methods of managing multiple accounts in AWS Organizations
- AWS services for application security and encryption
- AWS compliance resources



Module 7

Monitoring and Analytics

Module 7 objectives

In this module, you will learn how to:

- Summarize approaches to monitoring in AWS
- Describe Amazon CloudWatch benefits
- Describe AWS CloudTrail benefits
- Describe AWS Trusted Advisor benefits



Amazon CloudWatch

Coffee shop metrics

Metrics

Thresholds

Actions



Average customer wait time
over the past hour

Greater than 5 minutes

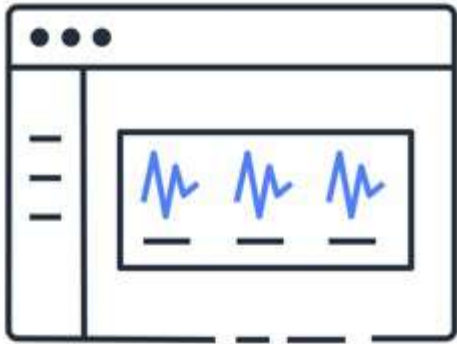
Open another register



Number of remaining
pastries for sale

Fewer than 10 pastries

Bake another batch
of pastries



Monitor your AWS and on-premises infrastructure and resources in real time



Access all of your metrics from a single location



Configure automatic alerts and actions in response to metrics

Amazon CloudWatch dashboard

Amazon RDS metrics

2.06 % 20.1 GB 0.38 /s 0.23 /s

CPUUtilization

FreeStorageSpace

WriteIOPS

ReadIOPS

Amazon EC2 metrics

xa

Bytes

26.7k

18.0k

9.35k

13:00

13:30

14:00

14:30

15:00

15:30

NetworkIn NetworkOut

Amazon EBS metrics

xa

Bytes

8.13k

7.70k

7.26k

13:00

13:30

14:00

14:30

15:00

15:30

VolumeWriteBytes

AWS CloudTrail

Coffee shop events

3 days ago



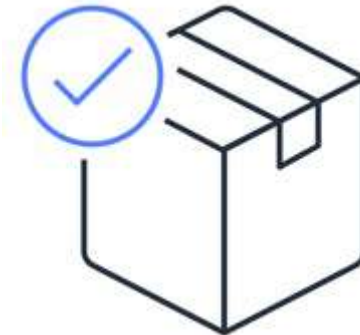
The cashiers process a large number of transactions.

2 days ago



To avoid running out of supplies, the inventory specialist places an extra order.

Today



A shipment of coffee beans is delivered to the coffee shop.



Track user activities and API requests throughout your AWS infrastructure



Filter logs generated by API calls to assist with operational analysis and troubleshooting



Automatically detect unusual account activity

AWS CloudTrail event

What happened?

New IAM user (Mary) created



Who made the request?

IAM user John



When did this occur?

January 1, 2021 at 9:00 AM



How was the request
made?

Through the AWS Management Console



Knowledge check question



Which tasks can you perform using AWS CloudTrail? (Select TWO.)

- A. Monitor your AWS infrastructure and resources in real time
- B. Track user activities and API requests throughout your AWS infrastructure
- C. View metrics and graphs to monitor the performance of resources
- D. Filter logs to assist with operational analysis and troubleshooting
- E. Configure automatic actions and alerts in response to metrics

Knowledge check answer

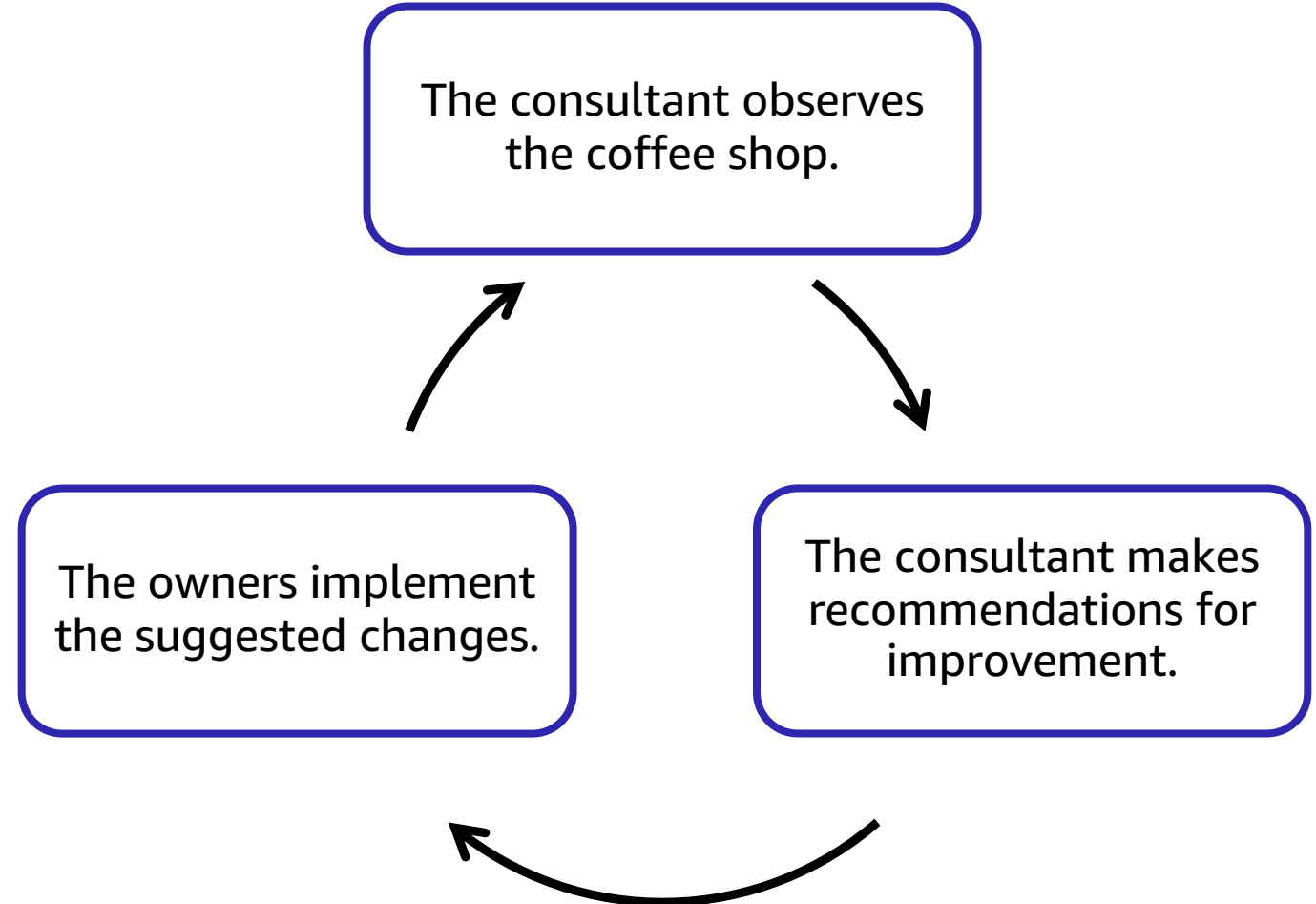


Which tasks can you perform using AWS CloudTrail? (Select TWO.)

- A. Monitor your AWS infrastructure and resources in real time
- B. Track user activities and API requests throughout your AWS infrastructure (correct)**
- C. View metrics and graphs to monitor the performance of resources
- D. Filter logs to assist with operational analysis and troubleshooting (correct)**
- E. Configure automatic actions and alerts in response to metrics

AWS Trusted Advisor

Coffee shop improvements

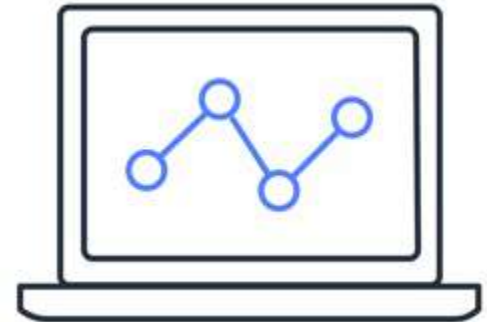




Receive real-time guidance for improving your AWS environment



Compare your infrastructure to AWS best practices in five categories



Evaluate and implement guidance at all stages of deployment

AWS Trusted Advisor dashboard



Number of items for which **no problems** have been detected



Number of recommended **investigations**



Number of recommended **actions**

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

Module 7

Knowledge check

Knowledge check question 1



Which actions can you perform using Amazon CloudWatch? (Select TWO.)

- A. Monitor your resources' usage and performance
- B. Receive real-time guidance for improving your AWS environment
- C. Compare your infrastructure to AWS best practices in five categories
- D. Access metrics from a single dashboard
- E. Automatically detect unusual account activity

Knowledge check answer 1



Which actions can you perform using Amazon CloudWatch? (Select TWO.)

- A. Monitor your resources' usage and performance (correct)
- B. Receive real-time guidance for improving your AWS environment
- C. Compare your infrastructure to AWS best practices in five categories
- D. Access metrics from a single dashboard (correct)
- E. Automatically detect unusual account activity

Knowledge check question 2



Which service can you use to review the security of your Amazon S3 buckets by checking for open access permissions?

- A. Amazon CloudWatch
- B. AWS CloudTrail
- C. AWS Trusted Advisor
- D. Amazon GuardDuty

Knowledge check answer 2



Which service can you use to review the security of your Amazon S3 buckets by checking for open access permissions?

- A. Amazon CloudWatch
- B. AWS CloudTrail
- C. **AWS Trusted Advisor (correct)**
- D. Amazon GuardDuty

Knowledge check question 3



Which categories are included in the AWS Trusted Advisor dashboard? (Select TWO.)

- A. Reliability
- B. Performance
- C. Scalability
- D. Elasticity
- E. Fault tolerance

Knowledge check answer 3



Which categories are included in the AWS Trusted Advisor dashboard? (Select TWO.)

- A. Reliability
- B. Performance (correct)**
- C. Scalability
- D. Elasticity
- E. Fault tolerance (correct)**

Module 7 summary

In this module, you learned about:

- Amazon CloudWatch
- AWS CloudTrail
- AWS Trusted Advisor



Module 8

Pricing and Support

Module 8 objectives

In this module, you will learn how to:

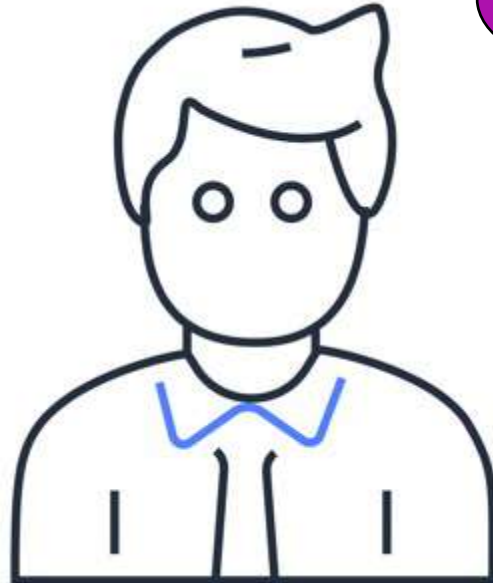
- Describe AWS pricing and support models
- Describe the AWS Free Tier
- Describe key benefits of AWS Organizations and consolidated billing
- Explain AWS Budgets benefits
- Explain AWS Cost Explorer benefits
- Explain AWS Pricing Calculator benefits
- Distinguish among the AWS Support plans
- Describe AWS Marketplace benefits



AWS pricing and support

How can I budget
and pay for AWS
services?

Where can I find
support and third-
party software?



AWS pricing

AWS Free Tier categories



Always free



12 months free



Trials

Pay as you go

Pay only for the resources that you use without provisioning capacity in advance


Pay less when you reserve

Reduce costs by reserving capacity in services such as Amazon Elastic Compute Cloud (Amazon EC2) and Amazon Relational Database Service (Amazon RDS)

Pay less with volume-based discounts

Receive savings through volume-based discounts as your usage increases

AWS Pricing Calculator

 pricing calculator

FeedbackEnglish▼Contact Sales

[AWS Pricing Calculator](#) > [My Estimate](#) > [Add Amazon EC2](#)

Step 1
[Select service](#)

Step 2
Configure Amazon EC2

Configure Amazon EC2 [Info](#)

Region

US East (Ohio) ▼

☒ **Quick estimate**
Choose this option for fast and easy route to a ballpark estimate based on minimum requirements or a specific instance search. The estimate assumes consistent utilization.

☐ **Advanced estimate**
Choose this option for a more detailed estimate that accounts for workload, data transfer costs, additional storage options, and other, less common instance requirements. For example, you know that you get a lot of traffic on Mondays but not much traffic throughout the rest of the week, and you want an estimate that takes this workload into account.

EC2 instance specifications [Info](#)

Operating system
Choose which operating system you'd like to run Amazon EC2 instances on.

Linux ▼

AWS Lambda pricing

- Pay only for the compute time you use
- Pay for the number of requests for your functions
- Save by signing up for a Compute Savings Plan



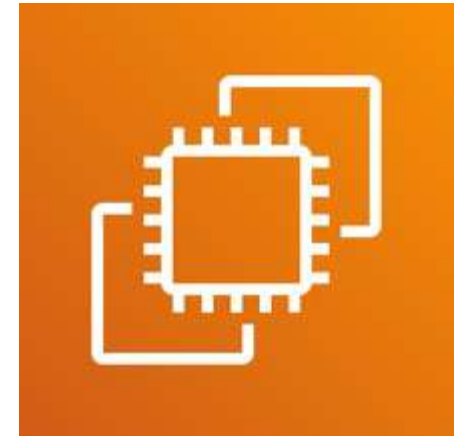
AWS Lambda

Example: AWS Lambda service charges

▼ Lambda			\$0.00
▼ US East (N. Virginia)			\$0.00
AWS Lambda Lambda-GB-Second			\$0.00
AWS Lambda - Compute Free Tier - 400,000 GB-Seconds - US East (Northern Virginia)	254.575 seconds		\$0.00
AWS Lambda Request			\$0.00
AWS Lambda - Requests Free Tier - 1,000,000 Requests - US East (Northern Virginia)	680.000 Requests		\$0.00

Amazon EC2 pricing

- Pay only for the time that your On-Demand Instances run
- Reduce costs by using Spot Instances for recommended use cases
- Save by signing up for a Compute Savings Plan
- Amazon EC2 pricing:
<https://aws.amazon.com/ec2/pricing>
-



Amazon Elastic Compute
Cloud

Example: Amazon EC2 service charges

▼ Elastic Compute Cloud		\$0.00
▼ US East (N. Virginia)		\$0.00
Amazon Elastic Compute Cloud running Linux/UNIX		\$0.00
\$0.00 per Linux t2.micro instance-hour (or partial hour) under monthly free tier	106.512 Hrs	\$0.00
EBS		\$0.00
\$0.00 per GB-month of General Purpose (SSD) provisioned storage under monthly free tier	11.294 GB-Mo	\$0.00
Elastic Load Balancing - Application		\$0.00
\$0.00 per Application LoadBalancer-hour (or partial hour) under monthly free tier	268.000 Hrs	\$0.00

Amazon S3 pricing is based on four factors:

- Storage
- Requests and data retrievals
- Data transfer
- Management and replication



Amazon Simple Storage
Service

Example: Amazon S3 service charges

▼ Simple Storage Service		\$0.00
▼ US East (N. Virginia)		\$0.00
Amazon Simple Storage Service Requests-Tier1		\$0.00
\$0.00 per request - PUT, COPY, POST, or LIST requests under the monthly global free tier	185.000 Requests	\$0.00
Amazon Simple Storage Service Requests-Tier2		\$0.00
\$0.00 per request - GET and all other requests under the monthly global free tier	923.000 Requests	\$0.00
Amazon Simple Storage Service TimedStorage-ByteHrs		\$0.00
\$0.000 per GB - storage under the monthly global free tier	0.159 GB-Mo	\$0.00
▼ US East (Ohio)		\$0.00
Amazon Simple Storage Service USE2-Requests-Tier2		\$0.00
\$0.00 per request - GET and all other requests under the monthly global free tier	4.000 Requests	\$0.00
Amazon Simple Storage Service USE2-TimedStorage-ByteHrs		\$0.00
\$0.000 per GB - storage under the monthly global free tier	0.000001 GB-Mo	\$0.00

Demo: Billing dashboard in the AWS Management Console

Knowledge check question



The AWS Free Tier includes offers that are available to new AWS customers for a certain period of time following their AWS sign-up date. What is the duration of this period?

- A. 3 months
- B. 6 months
- C. 9 months
- D. 12 months

Knowledge check answer



The AWS Free Tier includes offers that are available to new AWS customers for a certain period of time following their AWS sign-up date. What is the duration of this period?

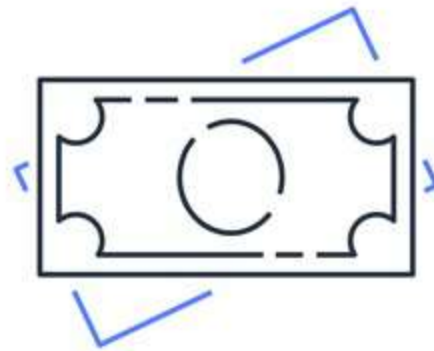
- A. 3 months
- B. 6 months
- C. 9 months
- D. 12 months (correct)

Consolidated billing

Consolidated billing



Receive a single bill
for all the AWS
accounts in your
organization

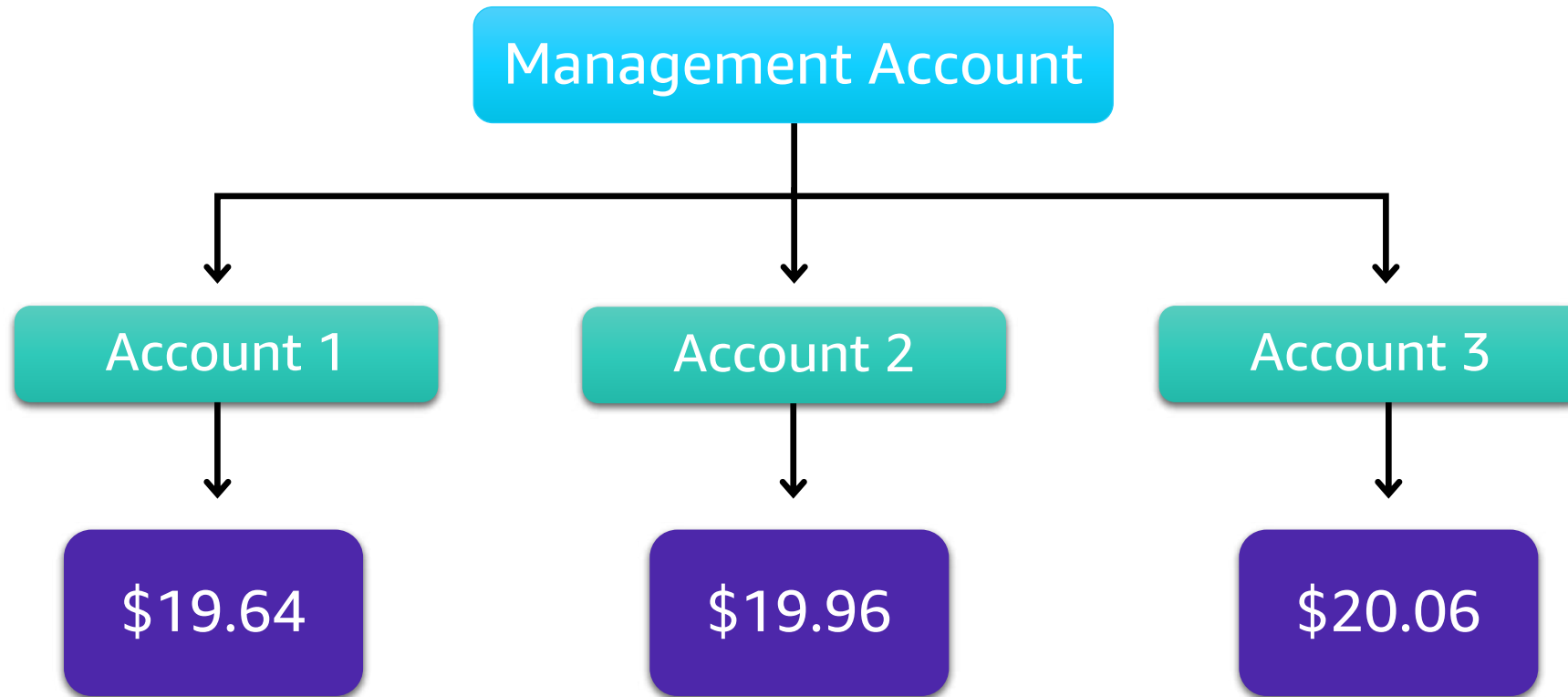


Review itemized
charges that have been
incurred by each
account



Share savings across
the accounts in your
organization

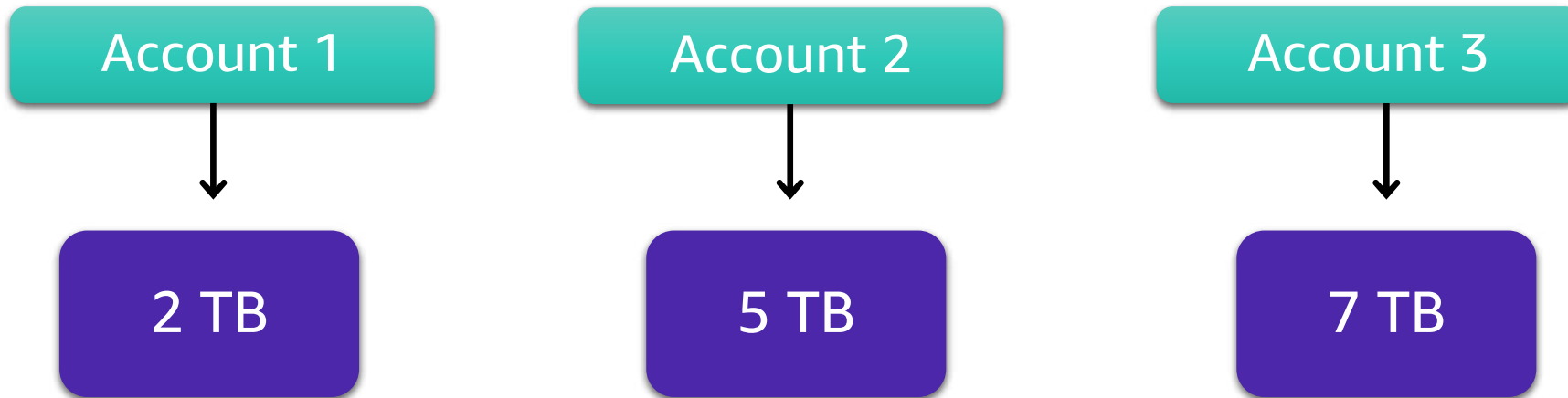
Example: Consolidated billing



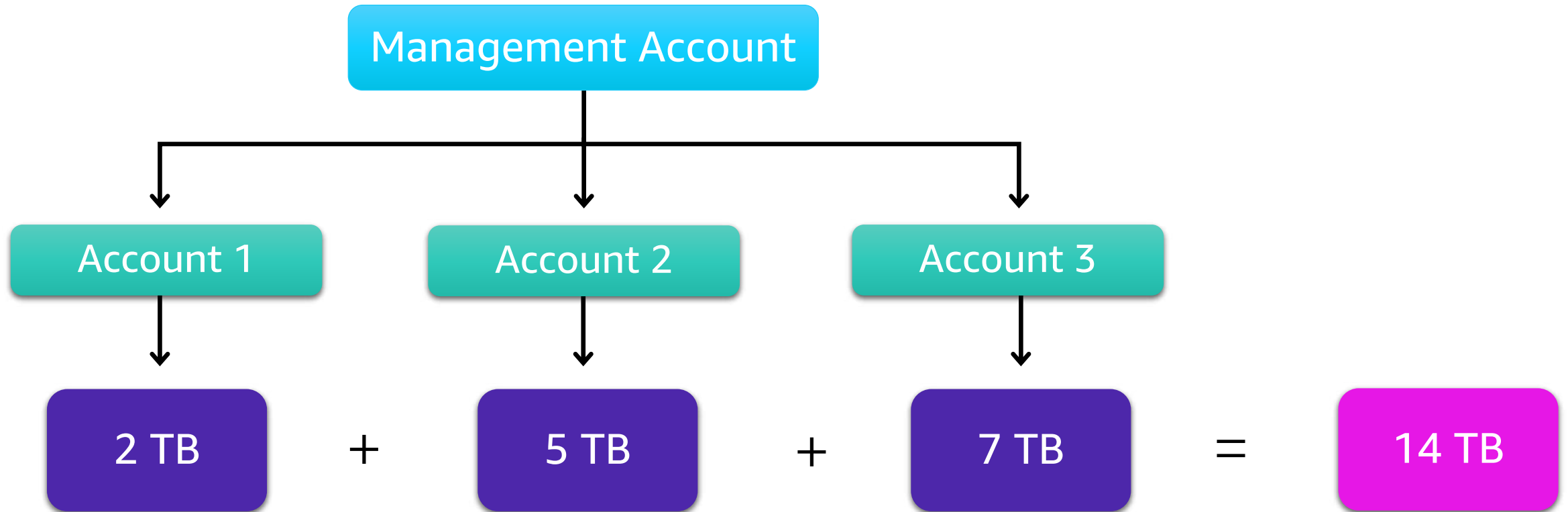
Monthly Consolidated Bill

Management Account	\$14.14
Account 1	\$19.64
Account 2	\$19.96
Account 3	\$20.06
Total charged to paying account:	\$73.80

Example: Volume pricing in Amazon S3



Example: Volume pricing in Amazon S3



AWS pricing tools

AWS Budgets

AWS Budgets is a tool that you can use to set thresholds for your AWS service usage and costs.

AWS Budgets

Filter by budget name

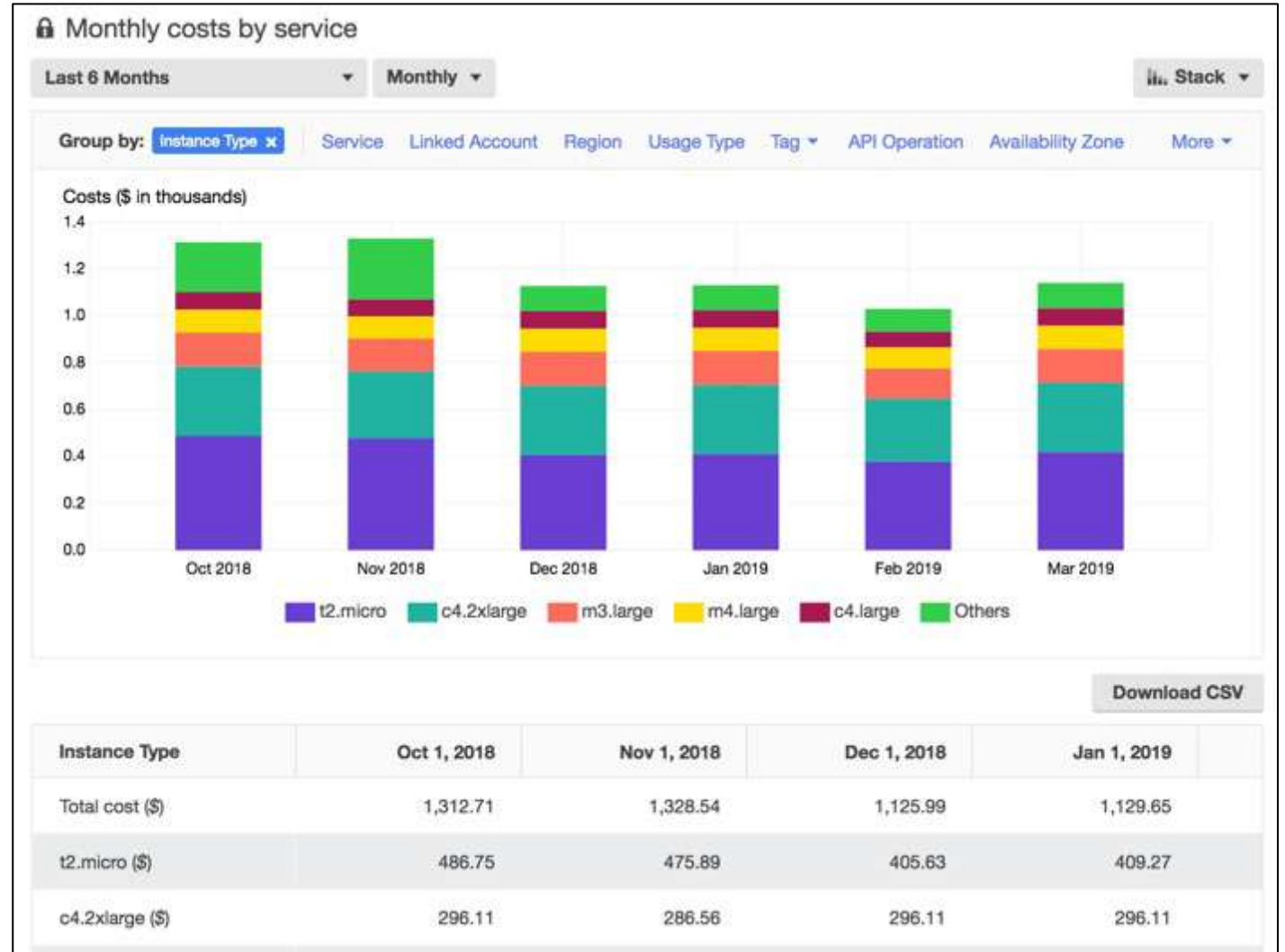
Download CSV

Create budget

All budgets (7)	Cost budgets (5)	Usage budgets (2)	Reservation budgets (0)				
Budget name	Budget type	Current	Budgeted	Forecasted	Current vs. budgeted	Forecasted vs. budgeted	
Project Nemo Cost Budget	Cost	\$43.90	\$45.00	\$56.33	<div><div></div></div> 97.55%	<div><div></div></div> 125.17%	...
Eastern US Regional Budget	Cost	\$85.21	\$100.00	\$125.28	<div><div></div></div> 85.21%	<div><div></div></div> 125.28%	...
Total Monthly Cost Budget	Cost	\$141.50	\$175.00	\$187.00	<div><div></div></div> 80.86%	<div><div></div></div> 106.86%	...
Total EC2 Cost Budget	Cost	\$136.90	\$200.00	\$195.21	<div><div></div></div> 68.45%	<div><div></div></div> 97.61%	...
S3 Usage Budget	Usage	3,601 Requests	5,500 Requests	4,675.75 Requests	<div><div></div></div> 65.47%	<div><div></div></div> 85.01%	...

AWS Cost Explorer

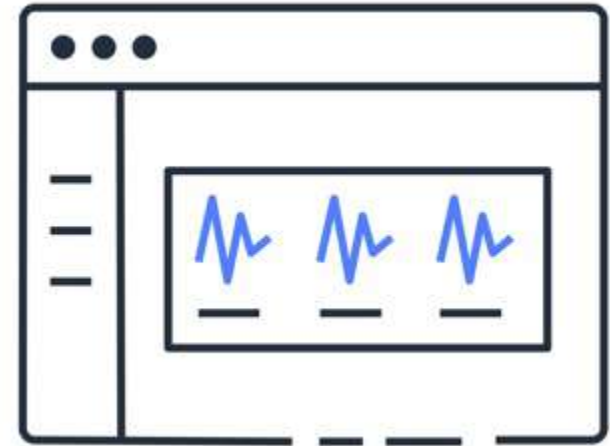
AWS Cost Explorer is a tool that you can use to visualize, understand, and manage your AWS costs and usage over time.



AWS Support plans

Basic Support is free for all AWS customers and includes access to:

- Technical papers, documentation, and support communities
- AWS Personal Health Dashboard
- A limited selection of AWS Trusted Advisor checks



Developer

- Best-practice guidance
- Client-side diagnostic tools
- Building-block architecture support

Business

- Use-case guidance
- All AWS Trusted Advisor checks
- Limited support for third-party software

Enterprise

- Application architecture guidance
- Infrastructure event management
- Technical Account Manager (TAM)

Technical Account Manager (TAM)

The **Technical Account Manager** is your primary point of contact at AWS.

- Technical Account Managers are included only with the Enterprise Support plan.
- They provide guidance, technical expertise, and best practices.



Knowledge check question



Which of the following is the lowest-cost AWS Support plan that includes all AWS Trusted Advisor checks?

- A. Business
- B. Developer
- C. Enterprise
- D. Basic

Knowledge check answer



Which of the following is the lowest-cost AWS Support plan that includes all AWS Trusted Advisor checks?

- A. **Business (correct)**
- B. Developer
- C. Enterprise
- D. Basic

AWS Marketplace

AWS Marketplace is a digital catalog that provides listings of third-party software that runs on AWS.



Discover thousands
of software products
that run on AWS



Access detailed
information and
reviews for each
product listing



Explore software
solutions by industry
and use case

AWS Marketplace categories



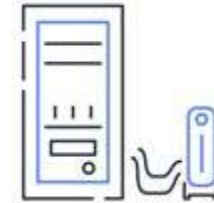
Business
Applications



Data and
Analytics



DevOps



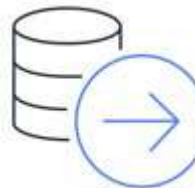
Infrastructure
Software



Internet of
Things (IoT)



Machine
Learning



Migration



Security

Module 8

Knowledge check

Knowledge check question 1



Which action can a customer perform with consolidated billing?

- A. Review how much cost predicted AWS usage will incur by the end of the month
- B. Create an estimate for the cost of use cases on AWS
- C. Combine usage across accounts to receive volume pricing discounts
- D. Visualize and manage AWS costs and usage over time

Knowledge check answer 1



Which action can a customer perform with consolidated billing?

- A. Review how much cost predicted AWS usage will incur by the end of the month
- B. Create an estimate for the cost of use cases on AWS
- C. **Combine usage across accounts to receive volume pricing discounts (correct)**
- D. Visualize and manage AWS costs and usage over time

Knowledge check question 2



Which pricing tool is used to visualize, understand, and manage AWS costs and usage over time?

- A. AWS Pricing Calculator
- B. AWS Budgets
- C. AWS Cost Explorer
- D. AWS Free Tier

Knowledge check answer 2



Which pricing tool is used to visualize, understand, and manage your AWS costs and usage over time?

- A. AWS Pricing Calculator
- B. AWS Budgets
- C. **AWS Cost Explorer (correct)**
- D. AWS Free Tier

Knowledge check question 3



Which pricing tool can a customer use to receive alerts when their service usage exceeds a customer-defined threshold?

- A. Billing dashboard in the AWS Management Console
- B. AWS Budgets
- C. AWS Free Tier
- D. AWS Cost Explorer

Knowledge check answer 3



Which pricing tool can a customer use to receive alerts when their service usage exceeds a customer-defined threshold?

- A. Billing dashboard in the AWS Management Console
- B. AWS Budgets (correct)**
- C. AWS Free Tier
- D. AWS Cost Explorer

Knowledge check question 4



A company wants to receive support from an AWS Technical Account Manager (TAM). Which support plan should they choose?

- A. Developer
- B. Basic
- C. Enterprise
- D. Business

Knowledge check answer 4



A company wants to receive support from an AWS Technical Account Manager (TAM). Which support plan should they choose?

- A. Developer
- B. Basic
- C. Enterprise (correct)
- D. Business

Knowledge check question 5



Which service or resource is used to find third-party software that runs on AWS?

- A. AWS Marketplace
- B. AWS Free Tier
- C. AWS Support
- D. Billing dashboard in the AWS Management Console

Knowledge check answer 5



Which service or resource is used to find third-party software that runs on AWS?

- A. **AWS Marketplace (correct)**
- B. AWS Free Tier
- C. AWS Support
- D. Billing dashboard in the AWS Management Console

Module 8 summary

In this module, you learned about:

- AWS Free Tier
- Consolidated billing
- Tools for planning, estimating, and reviewing AWS costs
- AWS Support plans
- AWS Marketplace benefits



Module 9

Migration and Innovation

Module 9 objectives

In this module, you will learn how to:

- Describe migration and innovation in the AWS Cloud
- Summarize the AWS Cloud Adoption Framework (AWS CAF)
- Summarize the six key factors of a cloud migration strategy
- Describe the benefits of AWS data migration solutions
- Summarize the broad scope of innovative solutions that AWS offers
- Summarize the five pillars of the AWS Well-Architected Framework



AWS Cloud Adoption Framework

- Provides advice to your company to enable a quick and smooth migration to AWS
- Organizes guidance into six areas of focus, called **perspectives**



Perspectives

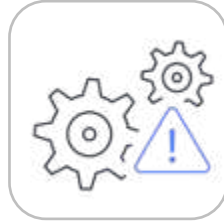
Business



People



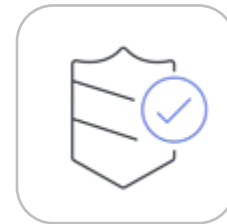
Governance



Business capabilities



Platform



Security

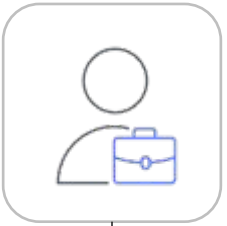


Operations

Technical capabilities

Business perspective

Business



People



Governance



Goal

Ensures that IT aligns with business needs and IT investments link to key business results

Common roles

- Business managers
- Finance managers
- Budget owners
- Strategy stakeholders



Platform



Security



Operations

People perspective

Business



People



Governance



Platform



Security



Operations

Goal

Supports development of an organization-wide change management strategy for successful cloud adoption

Common roles

- Human resources
- Staffing
- People managers

Governance perspective

Business



People



Governance



Platform



Security



Operations

Goal

Focuses on the skills and processes to align IT strategy with business strategy

Common roles

- Chief information officer (CIO)
- Program managers
- Enterprise architects
- Business analysts
- Portfolio managers

Platform perspective

Business



People



Governance



Platform



Security



Operations

Goal

Includes principles and patterns for implementing new solutions in the cloud, and migrating on-premises workloads to the cloud

Common roles

- Chief technology officer (CTO)
- IT managers
- Solutions architects

Security perspective

Business



People



Governance



Platform



Security



Operations

Goal

Ensures that the organization meets security objectives for visibility, auditability, control, and agility

Common roles

- Chief information security officer (CISO)
- IT security managers
- IT security analysts

Operations perspective

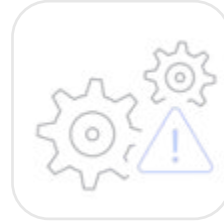
Business



People



Governance



Platform



Security



Operations

Goal

Helps you to enable, run, use, operate, and recover IT workloads to the level agreed on with your business stakeholders

Common roles

- IT operations managers
- IT support managers

Knowledge check question



Which AWS Cloud Adoption Framework perspective helps customers design, implement, and optimize their AWS solution based on their business goals and perspectives?

- A. Business perspective
- B. Platform perspective
- C. Operations perspective
- D. People perspective

Knowledge check answer

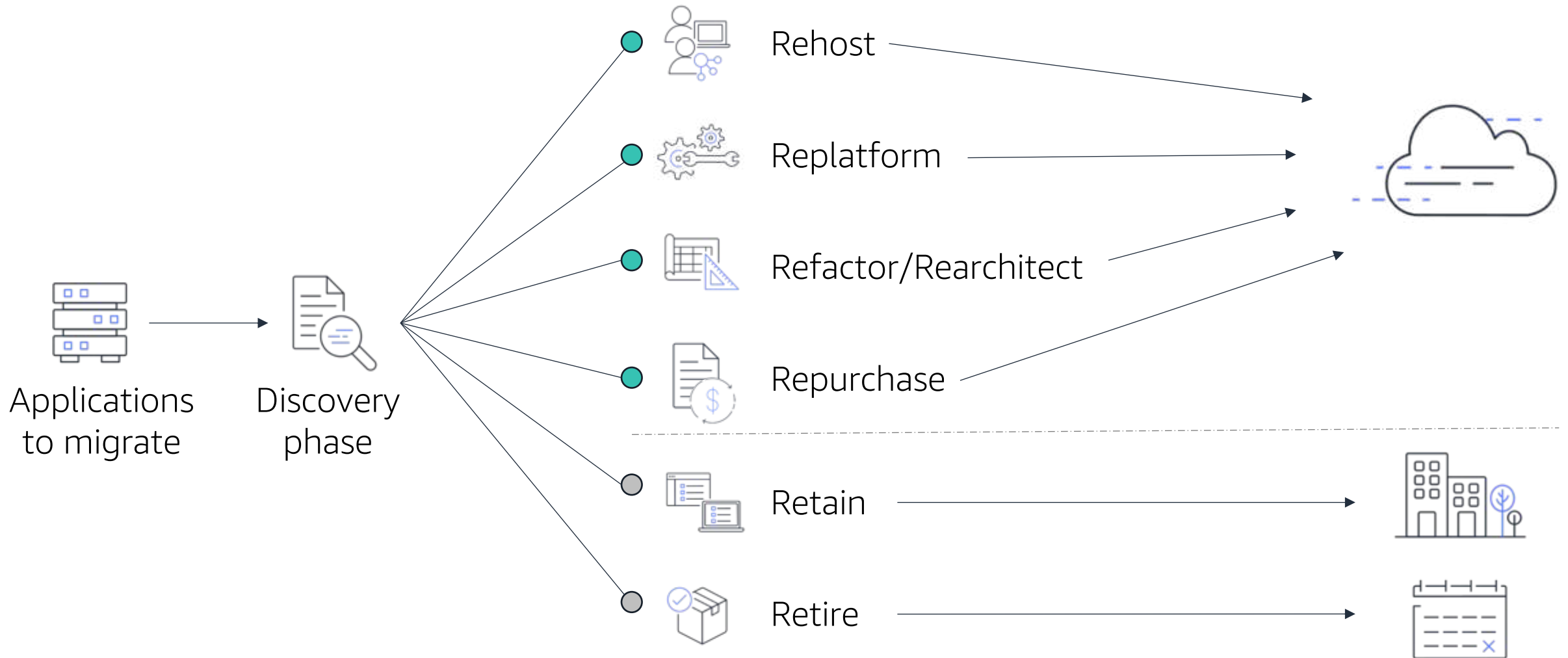


Which AWS Cloud Adoption Framework perspective helps customers design, implement, and optimize their AWS solution based on their business goals and perspectives?

- A. Business perspective
- B. Platform perspective (correct)**
- C. Operations perspective
- D. People perspective

Migration strategies

Six migration strategies



Knowledge check question



Which migration strategy involves moving from a traditional license to a software as a service model?

- A. Refactoring
- B. Retiring
- C. Replatforming
- D. Repurchasing

Knowledge check answer



Which migration strategy involves moving from a traditional license to a software as a service model?

- A. Refactoring
- B. Retiring
- C. Replatforming
- D. Repurchasing (correct)

AWS Snow Family

AWS Snowcone

- Small, rugged, and secure edge computing and data transfer device
- Features 8 TB of usable storage

AWS Snowball devices

- AWS Snowball Edge Storage Optimized
- AWS Snowball Edge Compute Optimized

AWS Snowmobile

- Exabyte-scale data transfer service for moving large amounts of data to AWS
- Transfers up to 100 PB of data

Innovation with AWS

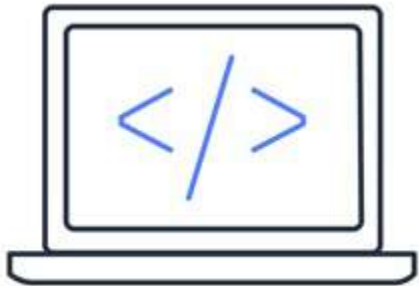
Driving innovation in the cloud involves clearly articulating the following conditions:

- Current state
- Desired state
- Problems you are trying to solve



Innovation paths

Consider some of the following innovation paths as you continue on your cloud journey.



Serverless
applications



Artificial intelligence
(AI)



Machine learning
(ML)

AWS Well-Architected Framework

Well-Architected Framework

The **Well-Architected Framework** helps you understand how to design and operate reliable, secure, efficient, and cost-effective systems in the AWS Cloud.

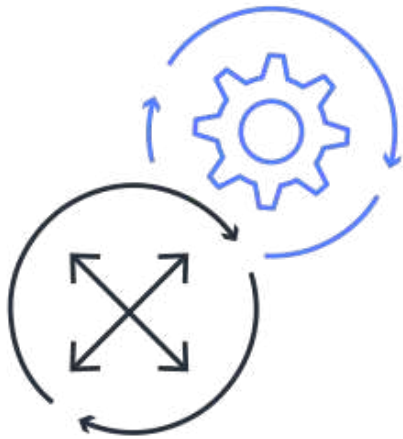
It is based on five pillars:

- Operational excellence
- Security
- Reliability
- Performance efficiency
- Cost optimization



Operational excellence

Run and monitor systems to deliver business value and to continually improve supporting processes and procedures



- Perform operations as code
- Annotate documentation
- Anticipate failure
- Refine operations procedures frequently
- Make frequent, small, reversible changes

Protect information, systems, and assets while delivering business value through risk assessments and mitigation strategies



- Automate security best practices
- Apply security at all layers
- Protect data in transit and at rest

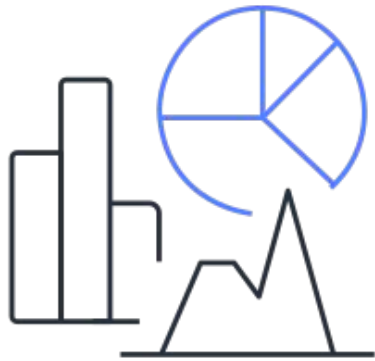
Test recovery procedures, scale horizontally to increase aggregate system availability, and automatically recover from failure



- Recover from infrastructure or service disruptions
- Dynamically acquire computing resources to meet demand
- Mitigate disruptions such as misconfigurations or transient network issues

Performance efficiency

Use computing resources efficiently to meet system requirements and maintain that efficiency as demand changes and technologies evolve



- Experiment more often
- Use serverless architectures
- Go global in minutes

Cost optimization

Run systems to deliver business value at the lowest price point



- Adopt a consumption model
- Analyze and attribute expenditure
- Use managed services to reduce cost of ownership

Module 9

Knowledge check

Knowledge check question 1



Which AWS Cloud Adoption Framework perspective helps you structure the selection and implementation of permissions?

- A. Governance perspective
- B. Security perspective
- C. Operations perspective
- D. Business perspective

Knowledge check answer 1



Which AWS Cloud Adoption Framework perspective helps you structure the selection and implementation of permissions?

- A. Governance perspective
- B. Security perspective (correct)**
- C. Operations perspective
- D. Business perspective

Knowledge check question 2



Which strategies are included in the six strategies for application migration? (Select TWO.)

- A. Revisiting
- B. Retaining
- C. Remembering
- D. Redeveloping
- E. Rehosting

Knowledge check answer 2



Which strategies are included in the six strategies for application migration? (Select TWO.)

- A. Revisiting
- B. Retaining (correct)
- C. Remembering
- D. Redeveloping
- E. Rehosting (correct)

Knowledge check question 3



What is the storage capacity of AWS Snowmobile?

- A. 40 PB
- B. 60 PB
- C. 80 PB
- D. 100 PB

Knowledge check answer 3



What is the storage capacity of AWS Snowmobile?

- A. 40 PB
- B. 60 PB
- C. 80 PB
- D. 100 PB (correct)

Knowledge check question 4



What is the storage capacity of Snowball Edge Storage Optimized?

- A. 40 TB
- B. 60 TB
- C. 80 TB
- D. 100 TB

Knowledge check answer 4



What is the storage capacity of Snowball Edge Storage Optimized?

- A. 40 TB
- B. 60 TB
- C. 80 TB (correct)
- D. 100 TB

Knowledge check question 5



Which AWS Well-Architected Framework pillar includes the ability to recover from infrastructure or service disruptions?

- A. Cost optimization
- B. Operational excellence
- C. Performance efficiency
- D. Reliability

Knowledge check answer 5



Which AWS Well-Architected Framework pillar includes the ability to recover from infrastructure or service disruptions?

- A. Cost optimization
- B. Operational excellence (correct)**
- C. Performance efficiency
- D. Reliability

Module 9 summary

In this module, you learned about:

- AWS Cloud Adoption Framework
- Six strategies for migration
- AWS Snow Family
- Innovation with AWS services
- Five pillars of the AWS Well-Architected Framework



Module 10

AWS Certified Cloud Practitioner Basics

Module 10 objectives

In this module, you will learn how to:

- Determine resources for preparing for the AWS Certified Cloud Practitioner exam
- Evaluate types of questions that are included on the AWS Certified Cloud Practitioner exam



Exam details

Exam domains

Domain	% of Exam
Domain 1: Cloud Concepts	26%
Domain 2: Security and Compliance	25%
Domain 3: Technology	33%
Domain 4: Billing and Pricing	16%
Total	100%

Learn more at: <https://aws.amazon.com/certification/certified-cloud-practitioner>

Recommended experience

For this exam, you should have:

- Basic understanding of IT services
- At least 6 months experience with the AWS Cloud



Exam details

- You must complete the exam within 90 minutes.
- The minimum passing score is 700 (the maximum score is 1,000).
- The exam consists of multiple choice and multiple response questions.
- The exam is available in English, Indonesian (Bahasa), Japanese, Korean, and Simplified Chinese.
- A 30-minute time extension is available upon request to non-native English speakers who are taking an exam in English.



- There is no penalty for guessing.
- Unanswered questions are scored as incorrect.
- You can flag questions to review before submitting the exam.



Technical papers and resources

We recommend that you review the following technical papers and resources:

- Overview of Amazon Web Services:
<https://d1.awsstatic.com/whitepapers/aws-overview.pdf>
- Compare AWS Support Plans:
<https://aws.amazon.com/premiumsupport/plans/>
- How AWS Pricing Works:
http://d1.awsstatic.com/whitepapers/aws_pricing_overview.pdf



Exam strategies

1. Read the full question.
2. Predict the answer before looking at the response options.
3. Exclude incorrect response options.



Sample question 1

Multiple choice



AWS Certified Cloud Practitioner exam results are reported as a score from 100–1,000. What is the minimum passing score?

- A. 650
- B. 700
- C. 850
- D. 900

Sample question 1

Multiple choice



AWS Certified Cloud Practitioner exam results are reported as a score from 100–1,000. What is the **minimum** passing score?

- A. 650
- B. 700
- C. 850
- D. 900

Sample question 1

Multiple choice



AWS Certified Cloud Practitioner exam results are reported as a score from 100–1,000. What is the **minimum** passing score?

- A. 650
- B. 700 (correct)**
- C. 850
- D. 900

Sample question 2

Multiple response



Which domains are included on the AWS Certified Cloud Practitioner exam? (Select TWO.)

- A. Security and Compliance
- B. Automation and Optimization
- C. Monitoring and Reporting
- D. Billing and Pricing
- E. Deployment and Provisioning

Sample question 2

Multiple response



Which **domains** are included on the **AWS Certified Cloud Practitioner** exam? (Select TWO.)

- A. Security and Compliance
- B. Automation and Optimization
- C. Monitoring and Reporting
- D. Billing and Pricing
- E. Deployment and Provisioning

Sample question 2: Multiple response



Which **domains** are included on the **AWS Certified Cloud Practitioner** exam? (Select TWO.)

- A. **Security and Compliance (correct)**
- B. Automation and Optimization
- C. Monitoring and Reporting
- D. **Billing and Pricing (correct)**
- E. Deployment and Provisioning

End of course assessment

Complete the end of course assessment to review your understanding of AWS Cloud concepts:

AWS Partners:

<https://partnercentral.awspartner.com/LmsSsoRedirect?RelayState=%2flearningobject%2fwbc%3fid%3d70046>

Thank you