AWS Academy Cloud Foundations

Module 1: Cloud Concepts Overview

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Module overview

Topics

- Introduction to cloud computing

- Advantages of cloud computing

- Introduction to Amazon Web Services (AWS)

- AWS Cloud Adoption Framework (AWS CAF)

Knowledge check

Module objectives

After completing this module, you should be able to:

- Define different types of cloud computing models
- Describe six advantages of cloud computing
- Recognize the main AWS service categories and core services
- Review the AWS Cloud Adoption Framework (AWS CAF)

Section 1: Introduction to cloud computing

What is cloud computing?

Cloud computing defined

Cloud computing is the **on-demand** delivery of compute power, database, storage, applications, and other IT resources **via the internet** with **pay-as-you-go** pricing.

Infrastructure as software
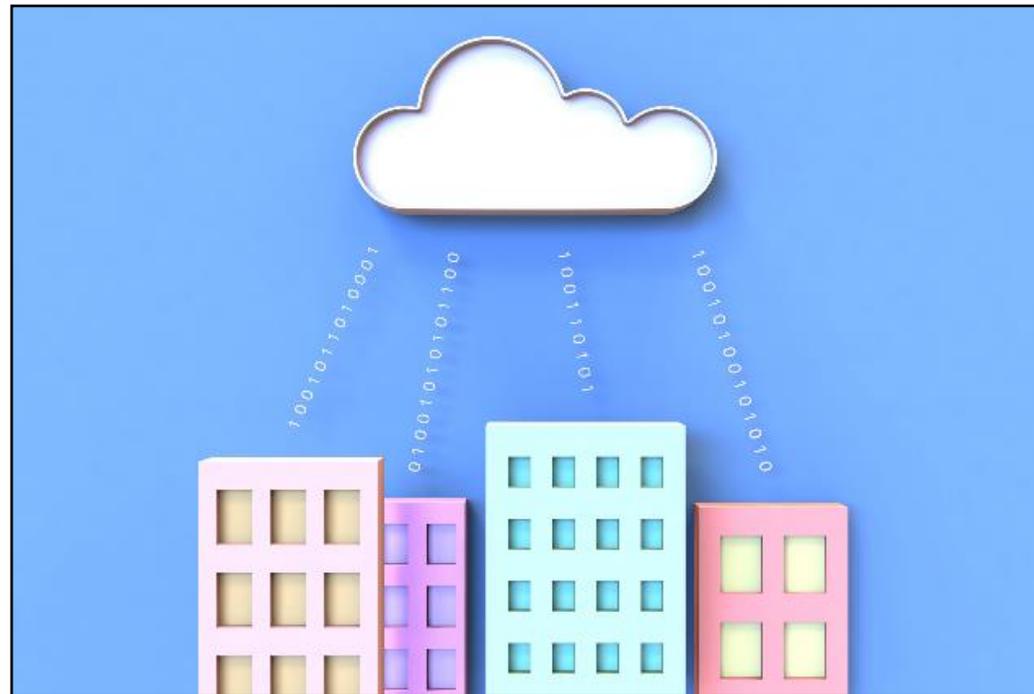
Cloud computing enables you to **stop thinking of your infrastructure as hardware**, and instead **think of (and use) it as software.**

Traditional computing model
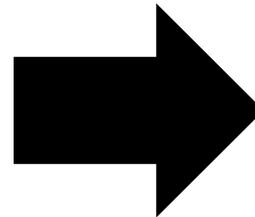
- Infrastructure as hardware
- Hardware solutions:
  - Require space, staff, physical security, planning, capital expenditure
  - Have a long hardware procurement cycle
  - Require you to provision capacity by guessing theoretical maximum peaks

Cloud computing model

- Infrastructure as software

- Software solutions:
  - Are flexible
  - Can change more quickly, easily, and cost-effectively than hardware solutions
 - Eliminate the undifferentiated heavy-lifting tasks

Cloud service models

IaaS
(infrastructure as a service)

PaaS
(platform as a service)

SaaS
(software as a service)

More control
over IT resources

Less control
over IT resources
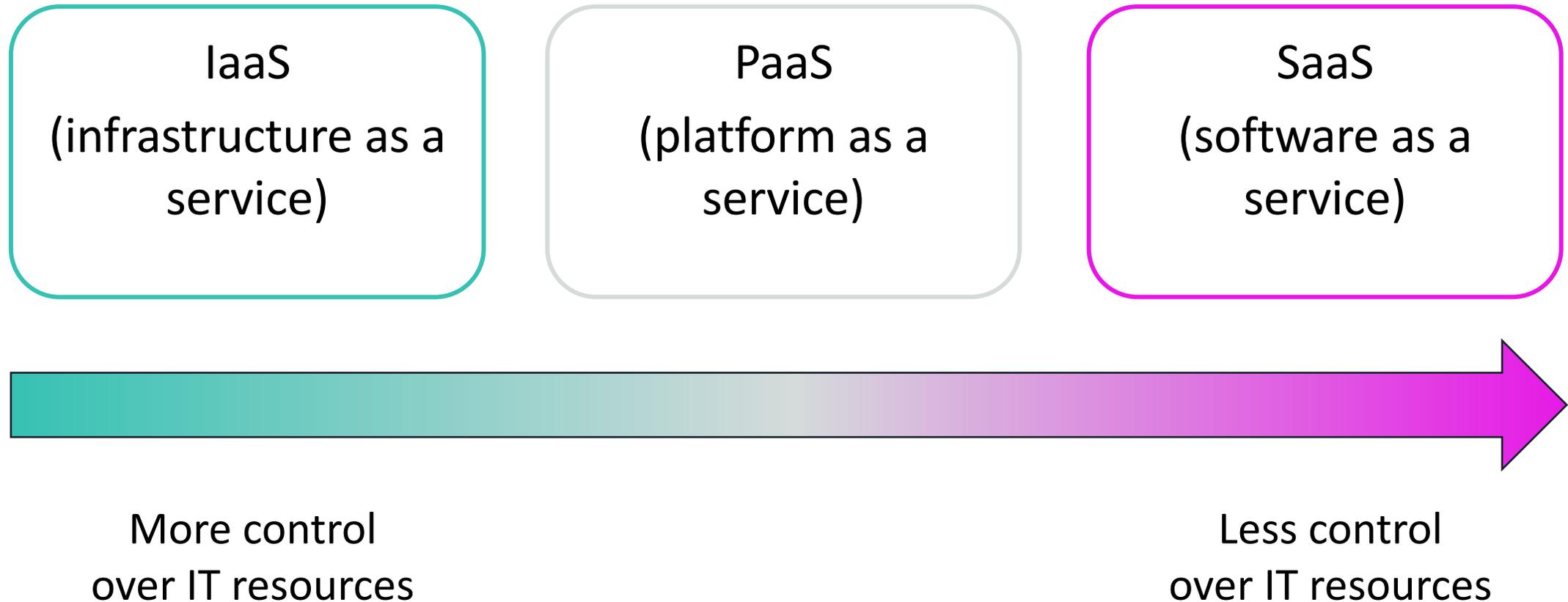
Cloud computing deployment models
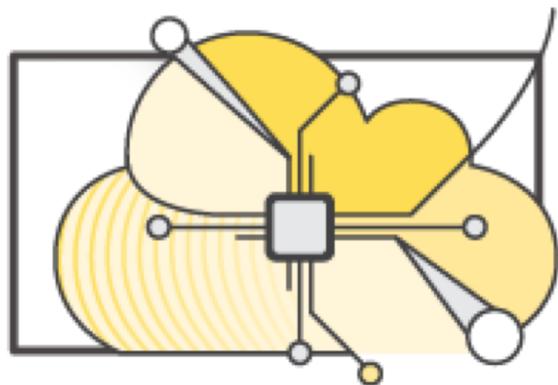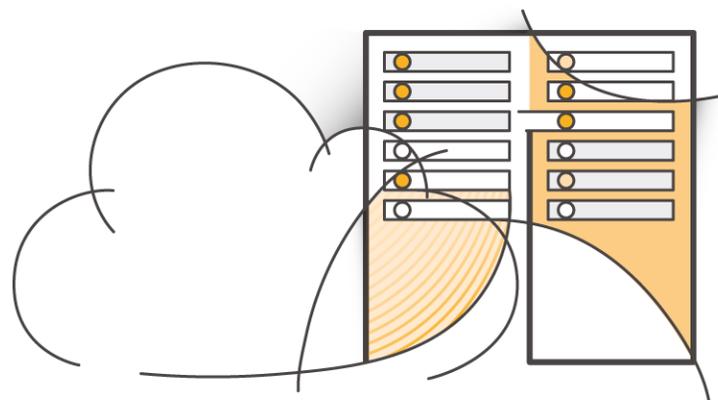
Cloud

Hybrid
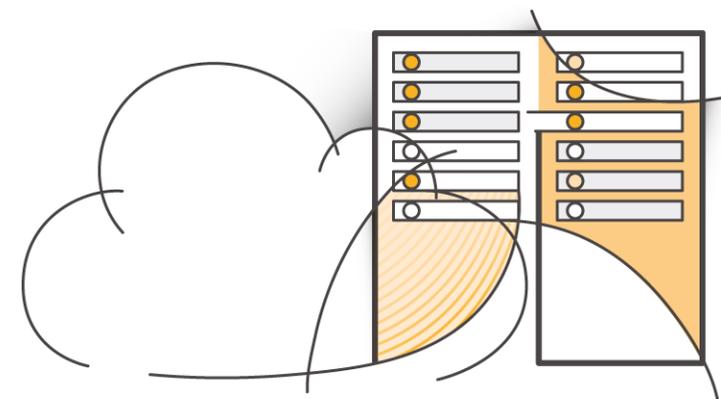
**On-premises
(private cloud)**

Similarities between AWS and traditional IT

Traditional, on-premises IT space

AWS

			Security			
Firewalls	ACLs	Administrators		Security groups	Network ACLs	IAM

			Networking		
Router	Network pipeline	Switch		Elastic Load Balancing	Amazon VPC

		Compute		
On-premises servers			AMI	Amazon EC2 instances

				Storage and database				
DAS	SAN	NAS	RDBMS		Amazon EBS	Amazon EFS	Amazon S3	Amazon RDS
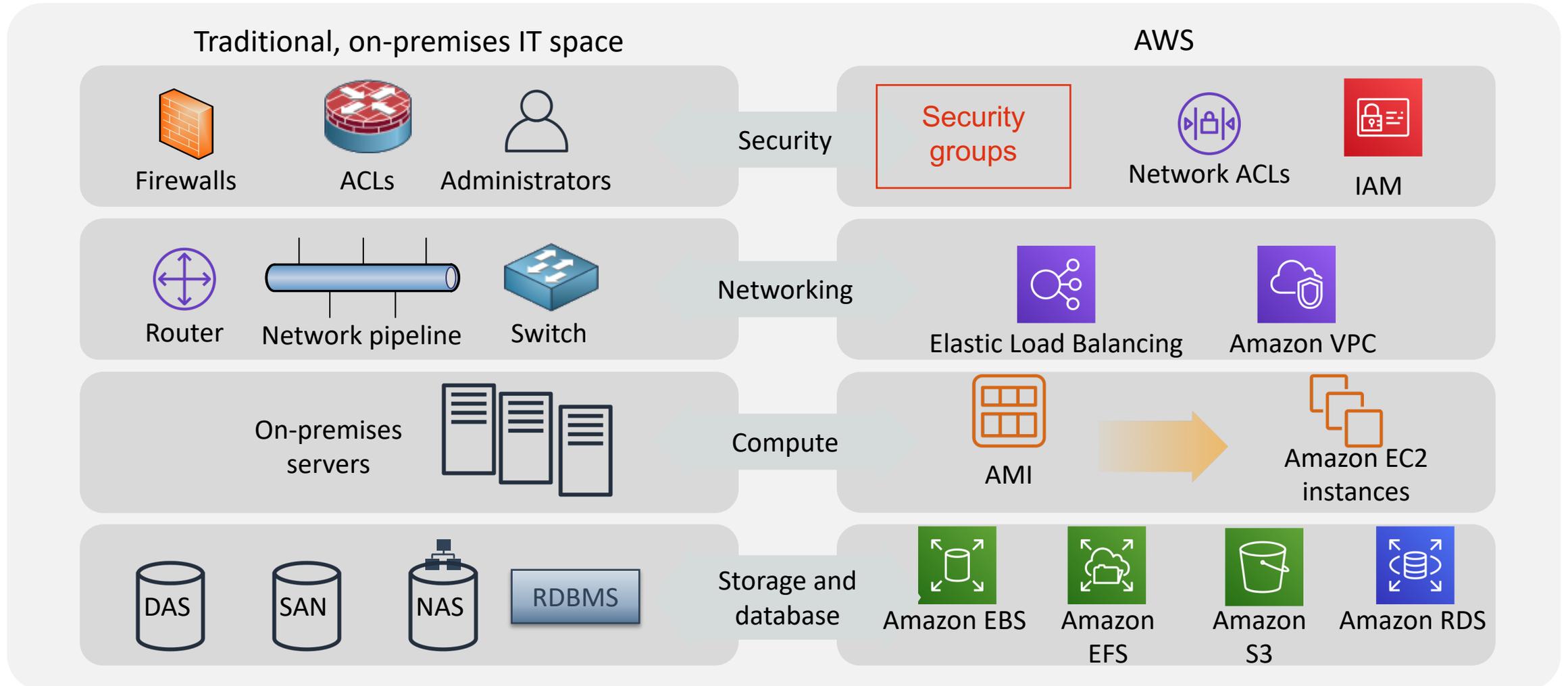
Section 1 key takeaways

- Cloud computing is the on-demand delivery of IT resources via the internet with pay-as-you-go pricing.

- Cloud computing enables you to think of (and use) your infrastructure as software.

- There are three cloud service models: IaaS, PaaS, and SaaS.

- There are three cloud deployment models: cloud, hybrid, and on-premises or private cloud.

- Almost anything you can implement with traditional IT can also be implemented as an AWS cloud computing service.

Module 1: Cloud Concepts Overview

Section 2: Advantages of cloud computing

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Trade capital expense for variable expense

Capital

Data center investment
based on forecast
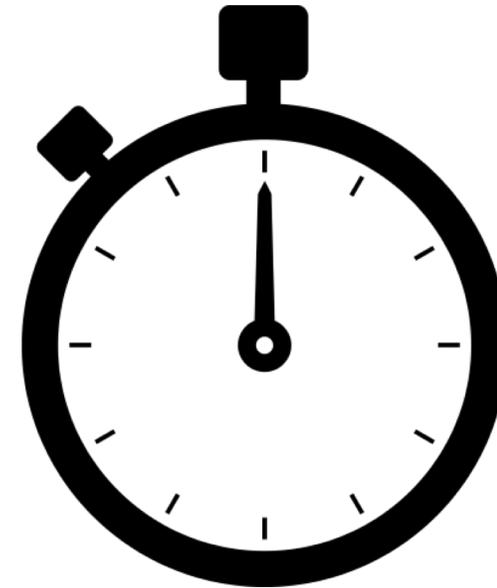
Pay only for the amount
you consume

Massive economies of scale

Because of aggregate usage from all customers, AWS can achieve higher economies of scale and pass savings on to customers.
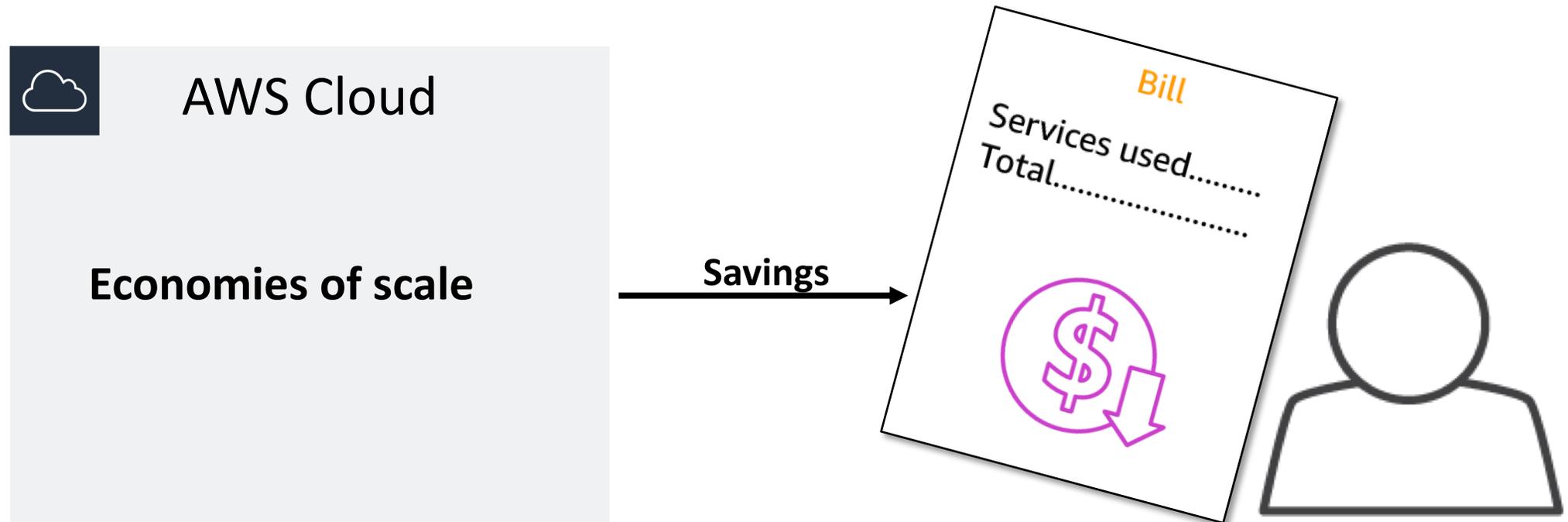
Stop guessing capacity

Overestimated
server capacity
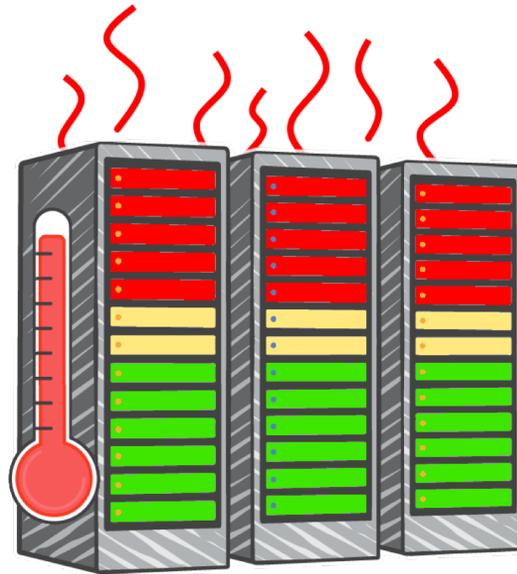
Underestimated
server capacity
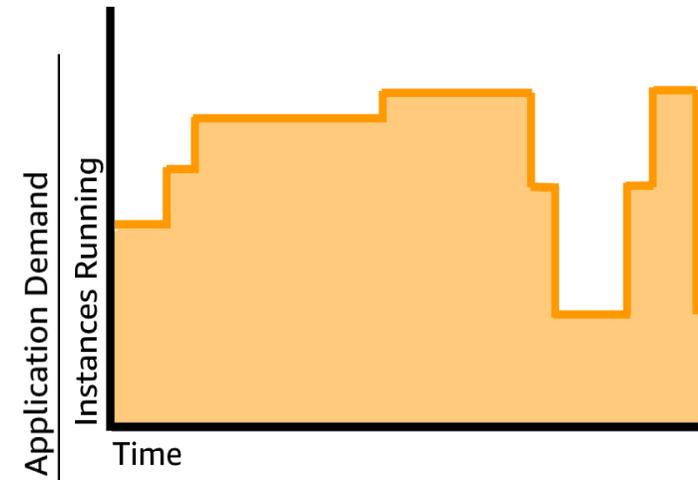
Scaling on demand

Increase speed and agility

Purchasing Request

Management Approval — waiting ...
Finance Approval ...
PO# Received ...
Item Ordered ...
Order Pulled ...
Order Shipped ...
Order Delivered ...
Order Unpacked ...

Weeks between wanting resources and having resources

Launch
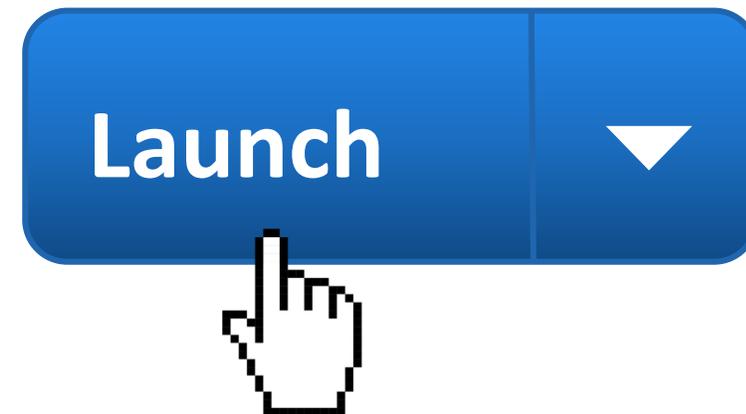
Minutes between wanting resources and having resources

Stop spending money on running and maintaining data centers

Payroll
Utilities
Maintenance
Landscaping
Hardware

Investment
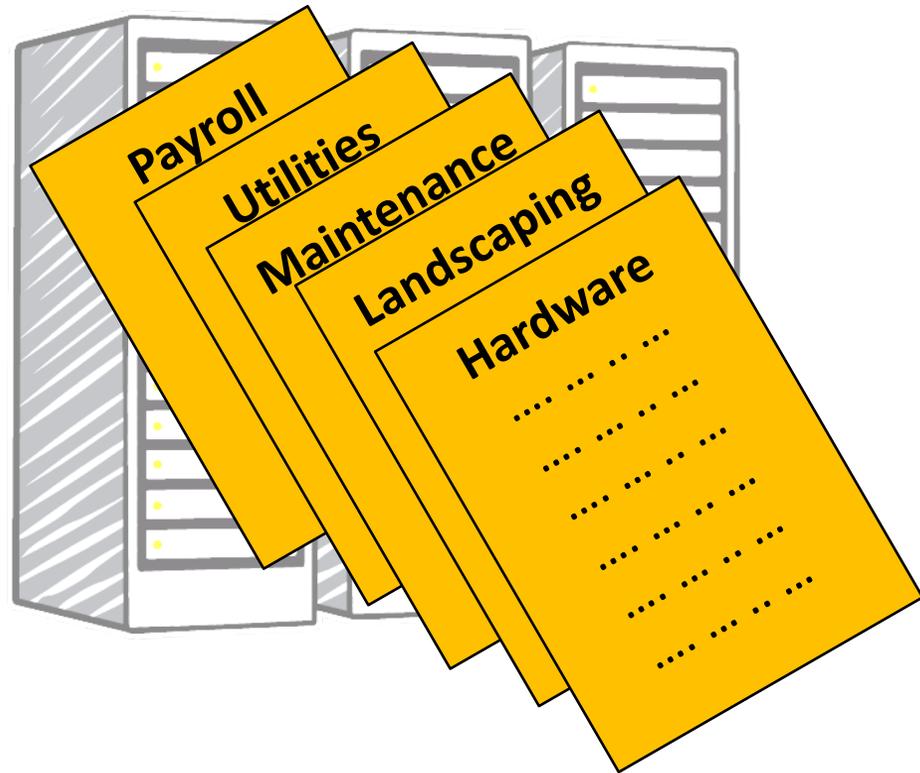
Running data centers
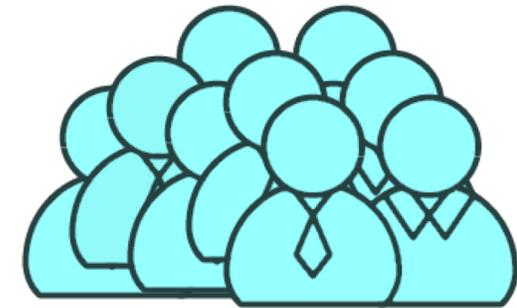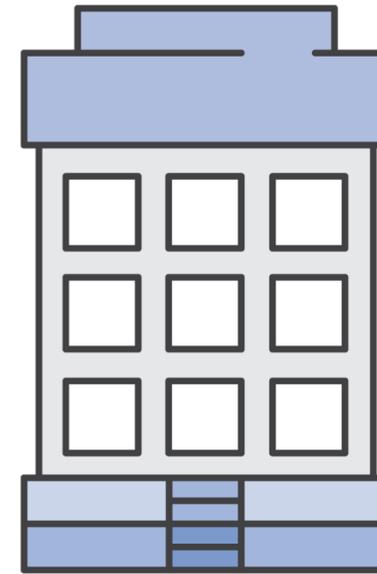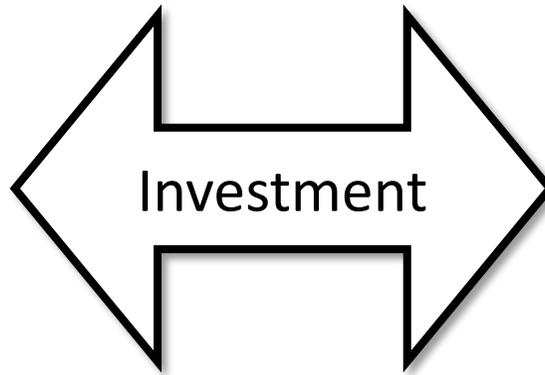
Business and customers

Go global in minutes

Section 2 key takeaways

- Trade capital expense for variable expense
- Benefit from massive economies of scale
- Stop guessing capacity
- Increase speed and agility
- Stop spending money on running and maintaining data centers
- Go global in minutes

Section 3: Introduction to Amazon Web Services (AWS)

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What are web services?

A **web service** is any piece of software that makes itself available over the internet and uses a **standardized format**—such as Extensible Markup Language (XML) or JavaScript Object Notation (JSON)—for the request and the response of an **application programming interface (API) interaction**.

Request message

Response message

Internet

Client

Web service
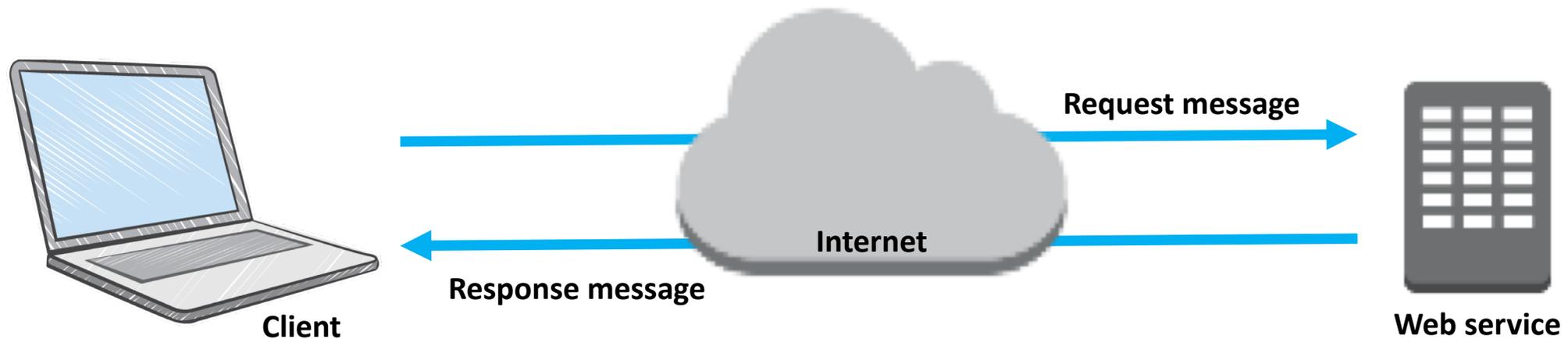
What is AWS?

- AWS is a **secure cloud platform** that offers a **broad set of global cloud-based products**.

- AWS provides you with **on-demand access** to compute, storage, network, database, and other IT resources and management tools.

- AWS offers **flexibility**.

- You **pay only for the individual services you need**, for **as long as you use them**.

- AWS services **work together** like building blocks.

Categories of AWS services

Analytics

Application Integration

AR and VR

Blockchain

Business Applications
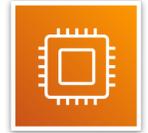
Compute

Cost Management

Customer Engagement

Database

Developer Tools

End User Computing

Game Tech

Internet of Things

Machine Learning

Management and Governance

Media Services

Migration and Transfer

Mobile

Networking and Content Delivery

Robotics

Satellite

Security, Identity, and Compliance

Storage

Simple solution example
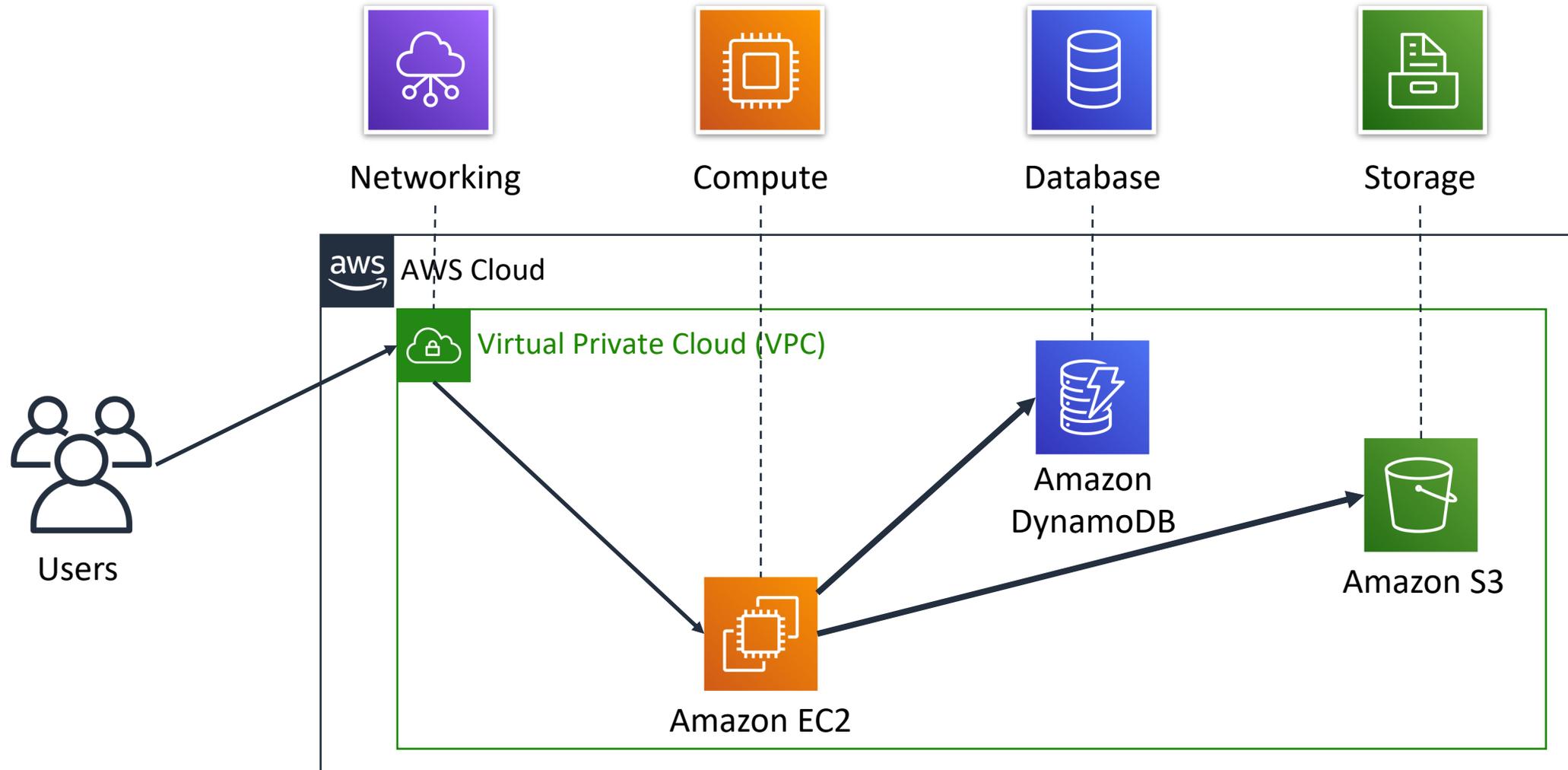
Choosing a service

The service you select depends on your business goals and technology requirements.
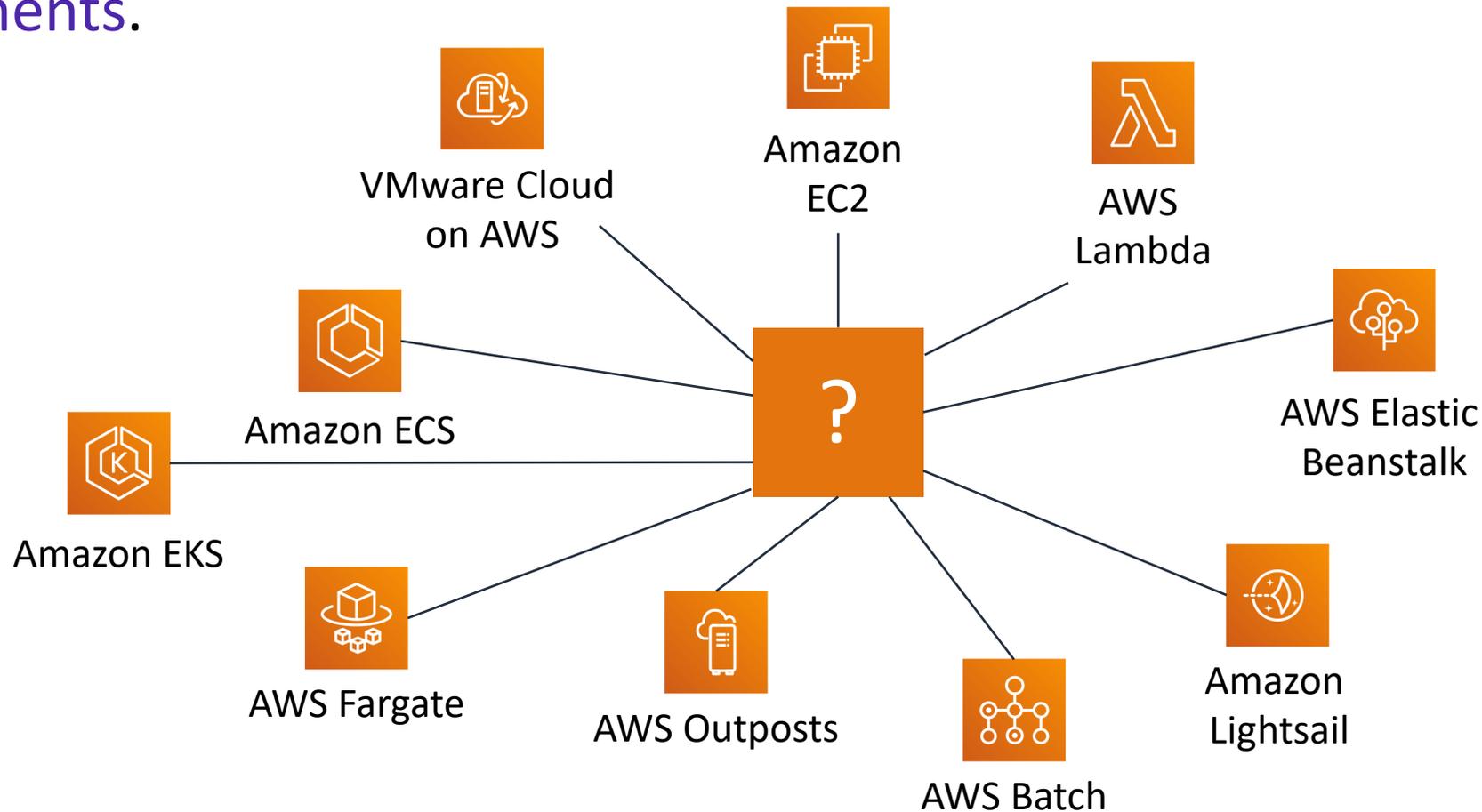
Services covered in this course

Compute services –
- Amazon EC2
- AWS Lambda
- AWS Elastic Beanstalk
- Amazon EC2 Auto Scaling
- Amazon ECS
- Amazon EKS
- Amazon ECR
- AWS Fargate
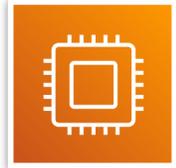
Storage services –
- Amazon S3
- Amazon S3 Glacier
- Amazon EFS
- Amazon EBS

Database services –
- Amazon RDS
- Amazon DynamoDB
- Amazon Redshift
- Amazon Aurora

Management and Governance services –
- AWS Trusted Advisor
- AWS CloudWatch
- AWS CloudTrail
- AWS Well-Architected Tool
- AWS Auto Scaling
- AWS Command Line Interface
- AWS Config
- AWS Management Console
- AWS Organizations

Security, Identity, and Compliance services –
- AWS IAM
- Amazon Cognito
- AWS Shield
- AWS Artifact
- AWS KMS

Networking and Content Delivery services –
- Amazon VPC
- Amazon Route 53
- Amazon CloudFront
- Elastic Load Balancing

AWS Cost Management services –
- AWS Cost & Usage Report
- AWS Budgets
- AWS Cost Explorer

Three ways to interact with AWS
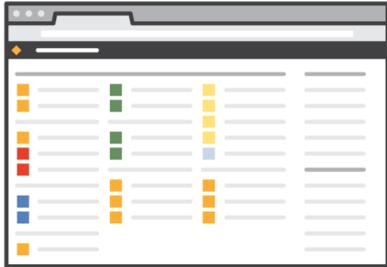
AWS Management Console

Easy-to-use graphical interface

Command Line Interface (AWS CLI)

Access to services by discrete commands or scripts
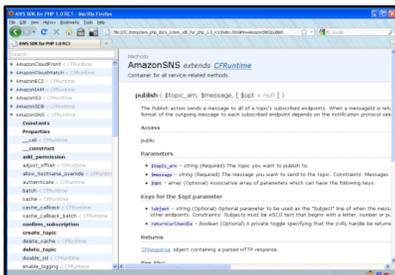
Software Development Kits (SDKs)

Access services directly from your code (such as Java, Python, and others)

Section 3 key takeaways

- AWS is a secure cloud platform that offers a broad set of global cloud-based products called services that are designed to work together.

- There are many categories of AWS services, and each category has many services to choose from.

- Choose a service based on your business goals and technology requirements.

- There are three ways to interact with AWS services.

Section 4: Moving to the AWS Cloud – The AWS Cloud Adoption Framework (AWS CAF)

AWS Cloud Adoption Framework (AWS CAF)

AWS CAF perspectives

- **AWS CAF provides guidance and best practices to help organizations** build a comprehensive approach to cloud computing across the organization and throughout the IT lifecycle to **accelerate successful cloud adoption**.

- AWS CAF is organized into **six perspectives**.

- Perspectives consist of sets of **capabilities**.

Six core perspectives

| BUSINESS |
| PEOPLE |
| GOVERNANCE |
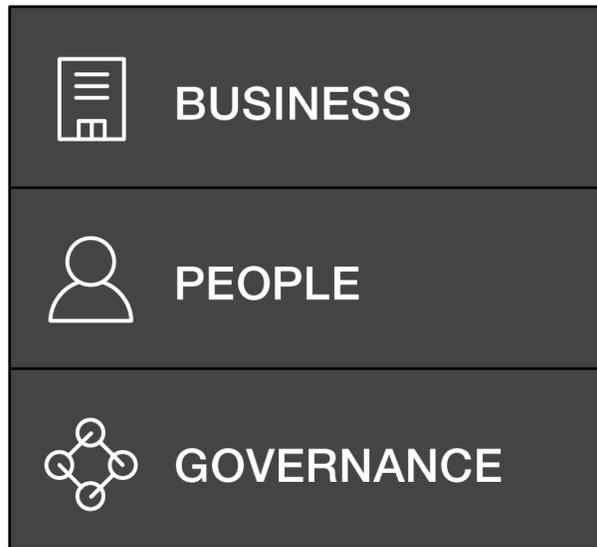
Focus on **business** capabilities

| PLATFORM |
| SECURITY |
| OPERATIONS |
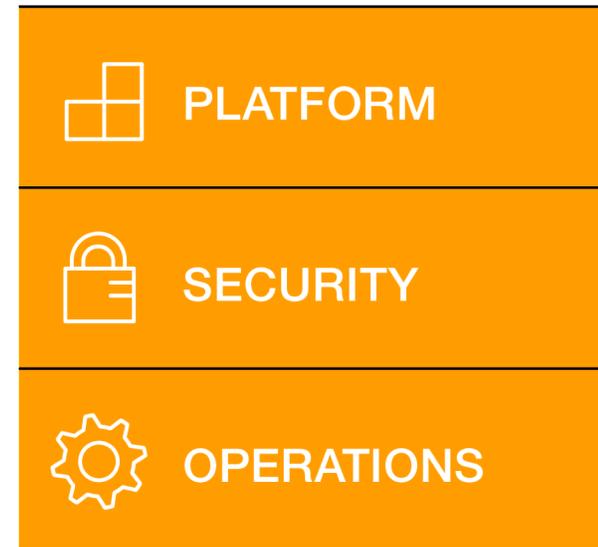
Focus on **technical** capabilities

Business perspective

BUSINESS
IT finance
IT strategy
Benefits realization
Business risk management

Business perspective capabilities

We must ensure that **IT is aligned with business needs**, and that IT investments can be traced to demonstrable business results.

Business managers, finance managers, budget owners, and strategy stakeholders

People perspective

PEOPLE
Resource management
Incentive management
Career management
Training management
Organizational change management

People perspective capabilities

We must prioritize **training, staffing, and organizational changes** to build an agile organization.

Human resources, staffing, and people managers

Governance perspective

Governance perspective capabilities

GOVERNANCE

- Portfolio management
- Program and project management
- Business performance measurement
- License management

We must ensure that **skills and processes align IT strategy and goals with business strategy and goals** so the organization can maximize the business value of its IT investment and minimize business risks.

CIO, program managers, enterprise architects, business analysts, and portfolio managers

Platform perspective

Platform perspective capabilities

We must **understand and communicate the nature of IT systems and their relationships**. We must be able to **describe the architecture of the target state environment** in detail.

CTO, IT managers, and solutions architects

Security perspective

SECURITY
Identity and access management 🔒
Detective control 🔒
Infrastructure security 🔒
Data protection 🔒
Incident response 🔒

Security perspective capabilities

We must ensure that the organization **meets its security objectives**.

CISO, IT security managers, and IT security analysts

Operations perspective

OPERATIONS

- Service monitoring
- Application performance monitoring
- Resource inventory management
- Release management/ change management
- Reporting and analytics
- Business continuity/ Disaster recovery
- IT service catalog

Operations perspective capabilities

We align with and support the operations of the business, and **define how day-to-day, quarter-to-quarter, and year-to-year business will be conducted**.

IT operations managers and IT support managers

Section 4 key takeaways

- Cloud adoption is not instantaneous for most organizations and requires a thoughtful, deliberate strategy and alignment across the whole organization.

- The AWS CAF was created to help organizations develop efficient and effective plans for their cloud adoption journey.

- The AWS CAF organizes guidance into six areas of focus, called perspectives.

- Perspectives consist of sets of business or technology capabilities that are the responsibility of key stakeholders.

Module 1: Cloud Concepts Overview

Module wrap-up

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Module summary

In summary, in this module you learned how to:

- Define different types of cloud computing models

- Describe six advantages of cloud computing

- Recognize the main AWS service categories and core services

- Review the AWS Cloud Adoption Framework

Complete the knowledge check

Sample exam question

Why is AWS more economical than traditional data centers for applications with varying compute workloads?

A. Amazon Elastic Compute Cloud (Amazon EC2) costs are billed on a monthly basis.

B. Customers retain full administrative access to their Amazon EC2 instances.

C. Amazon EC2 instances can be launched on-demand when needed.

D. Customers can permanently run enough instances to handle peak workloads.

Additional resources

- [What is AWS?](#) YouTube video

- [Cloud computing with AWS](#) website

- [Overview of Amazon Web Services](#) whitepaper

- [An Overview of the AWS Cloud Adoption Framework](#) whitepaper

- [6 Strategies for Migrating Applications to the Cloud](#) AWS Cloud Enterprise Strategy blog post

Thank You

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