

AWS Academy Cloud Foundations

Module 1: Cloud Concepts 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)

Module 1: Cloud Concepts Overview

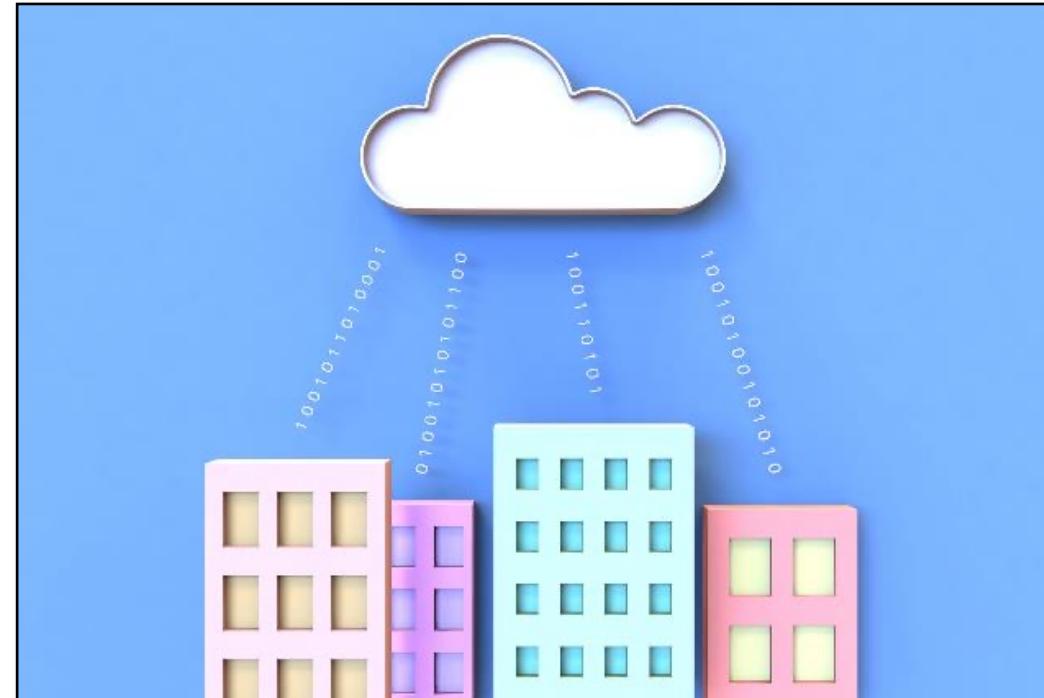
Section 1: Introduction to cloud computing

What is cloud computing?



Cloud computing defined

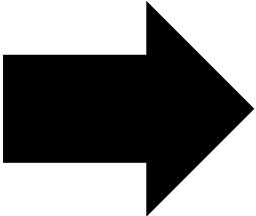
Cloud computing is the **on-demand** delivery of compute power, database, storage, applications, and other IT resources **via the internet** with **pay-as-you-go** pricing.



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

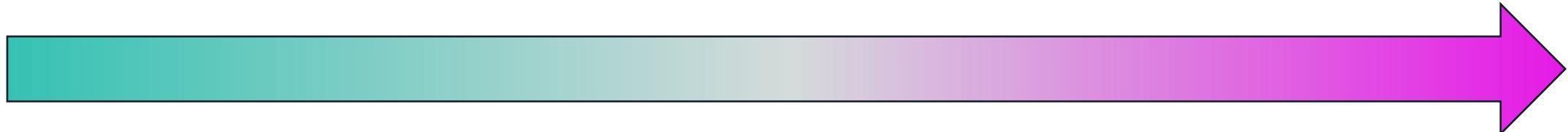
Cloud service models



IaaS
(infrastructure as a
service)

PaaS
(platform as a
service)

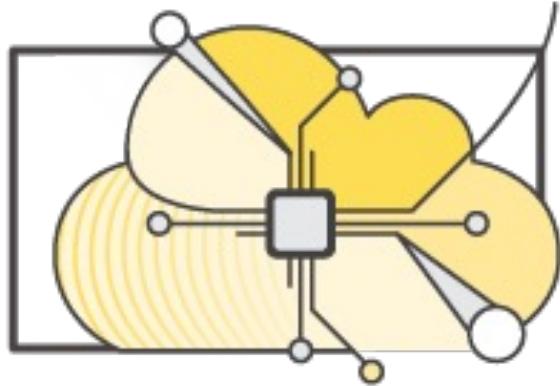
SaaS
(software as a
service)



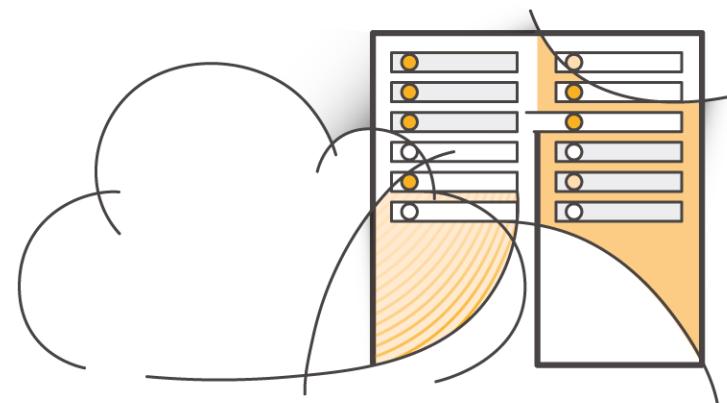
More control
over IT resources

Less control
over IT resources

Cloud computing deployment models



Cloud

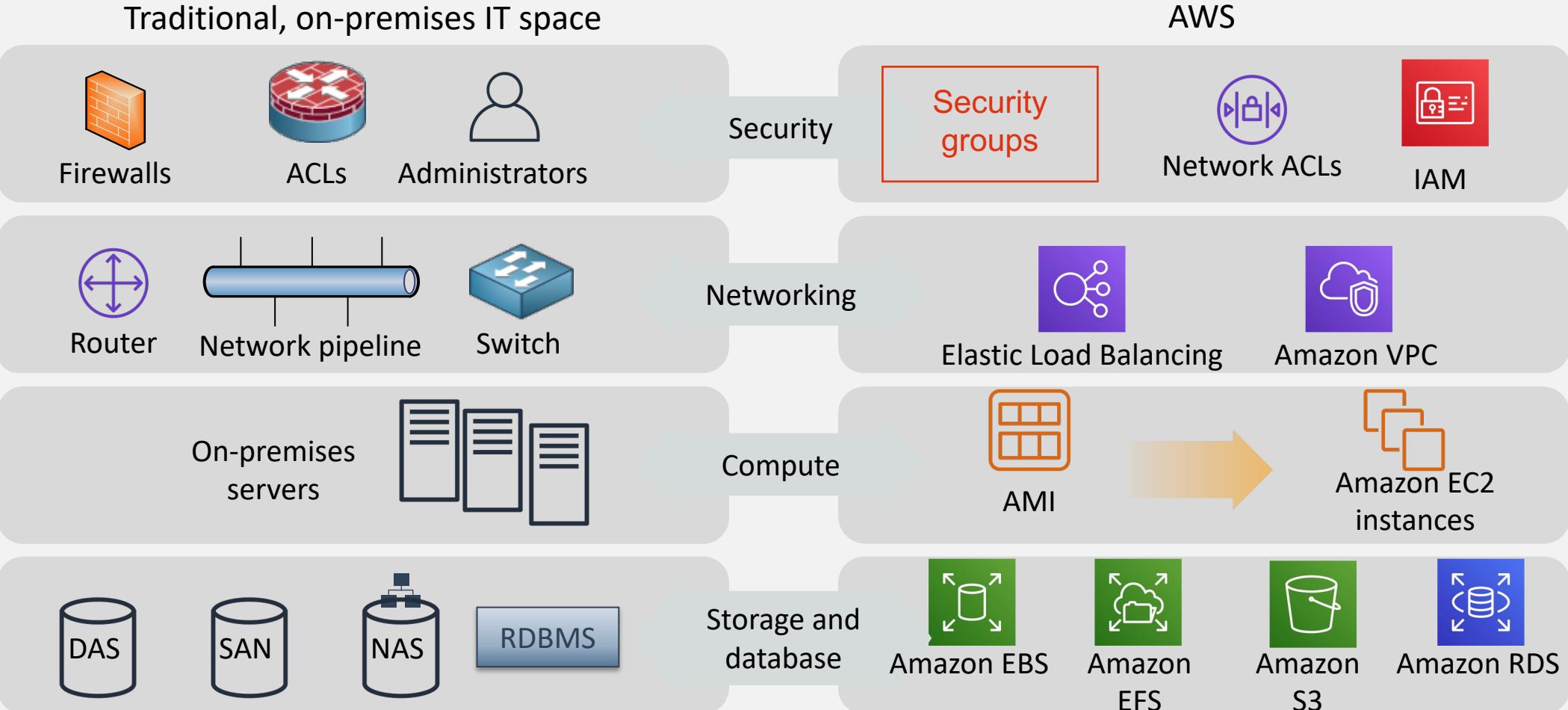


Hybrid



**On-premises
(private cloud)**

Similarities between AWS and traditional IT



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.

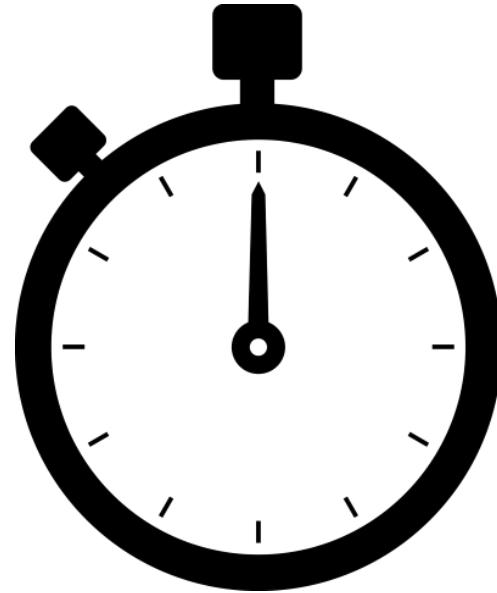
Module 1: Cloud Concepts Overview

Section 2: Advantages of cloud computing

Trade capital expense for variable expense



Data center investment
based on forecast



Pay only for the amount
you consume

Massive economies of scale

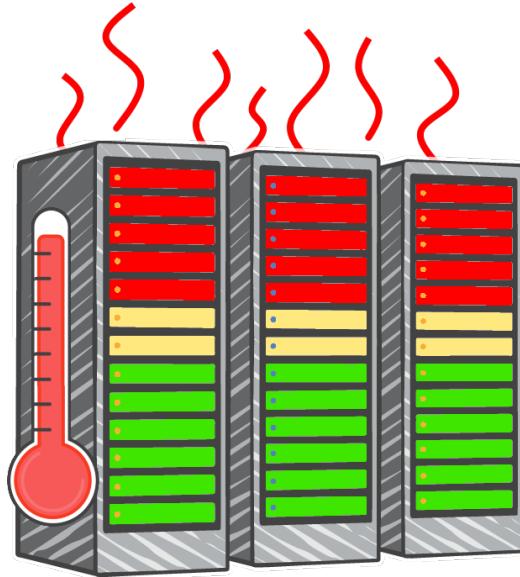
Because of aggregate usage from all customers, AWS can achieve higher economies of scale and pass savings on to customers.



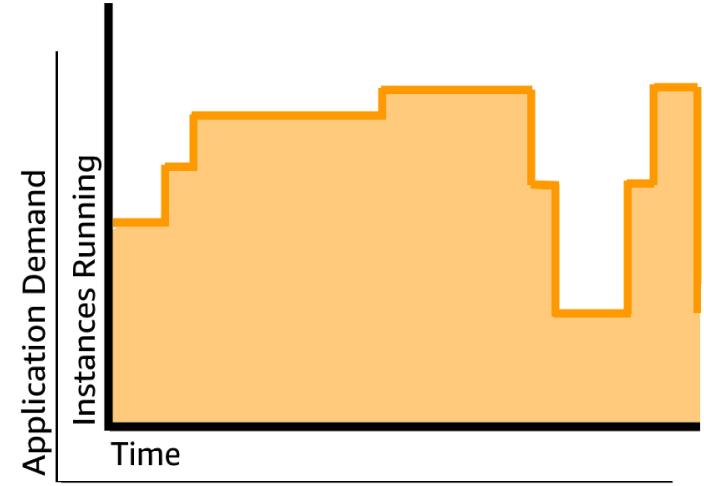
Stop guessing capacity



Overestimated
server capacity



Underestimated
server capacity

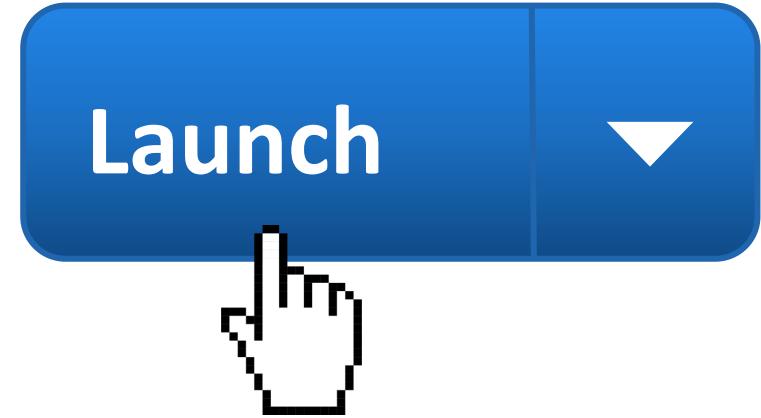


Scaling on demand

Increase speed and agility

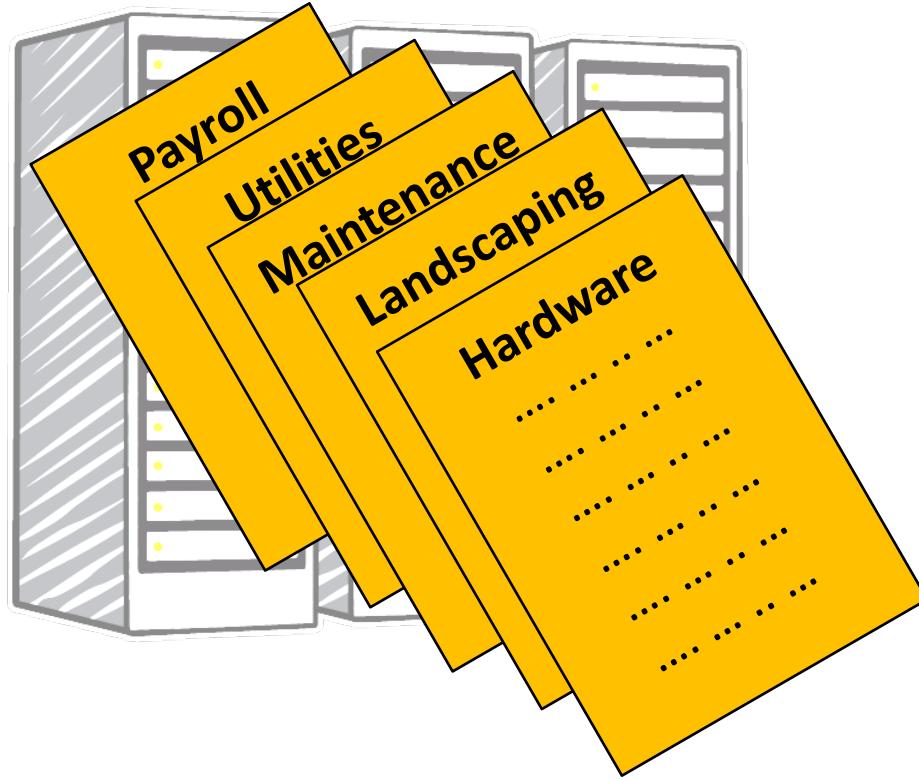


Weeks between wanting
resources and having resources

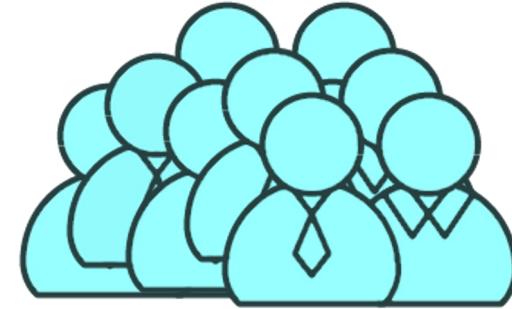
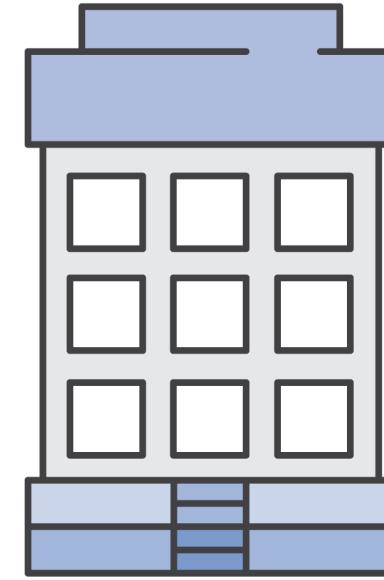
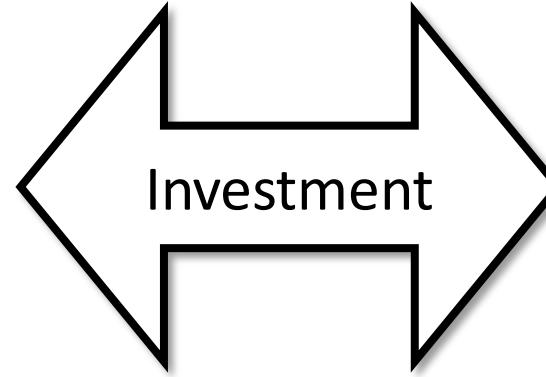


Minutes between wanting
resources and having resources

Stop spending money on running and maintaining data centers

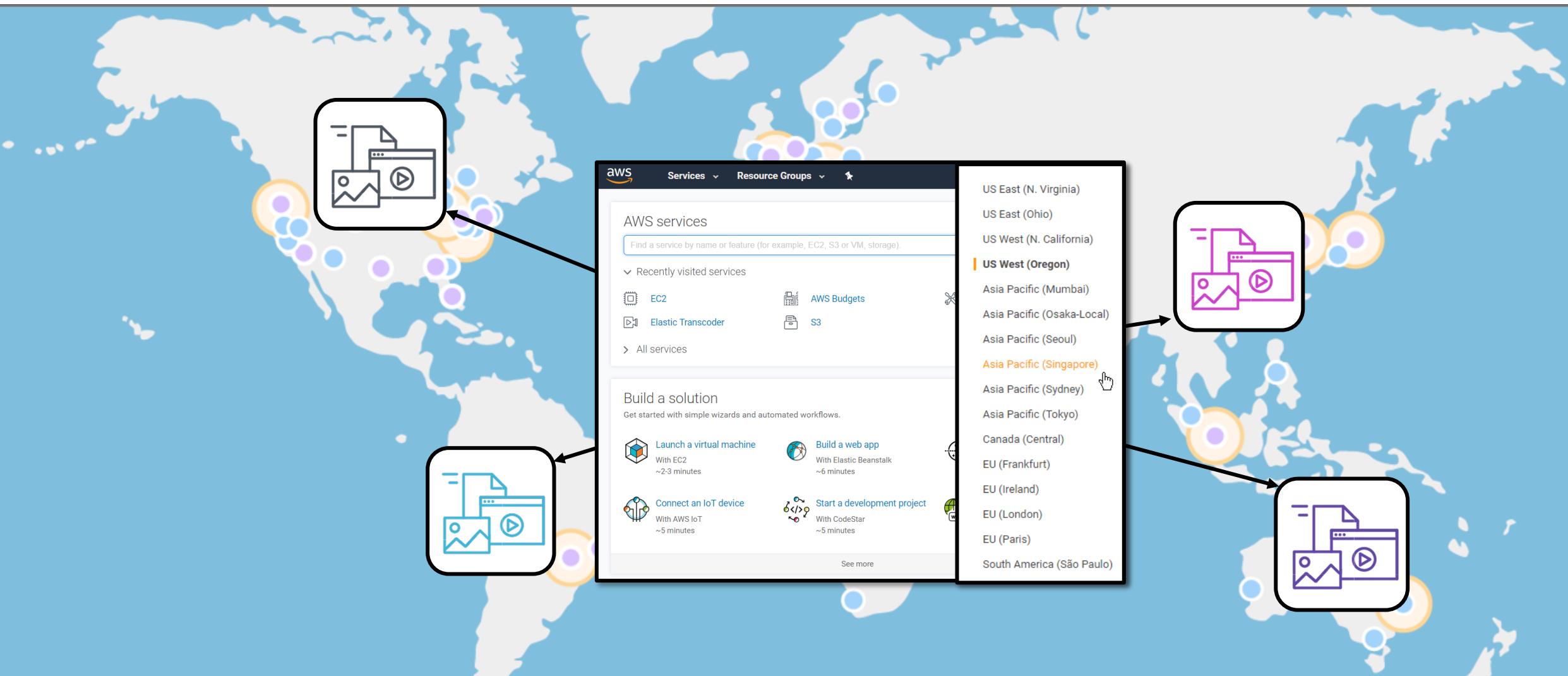


Running data centers



Business and customers

Go global in minutes



Section 2 key takeaways



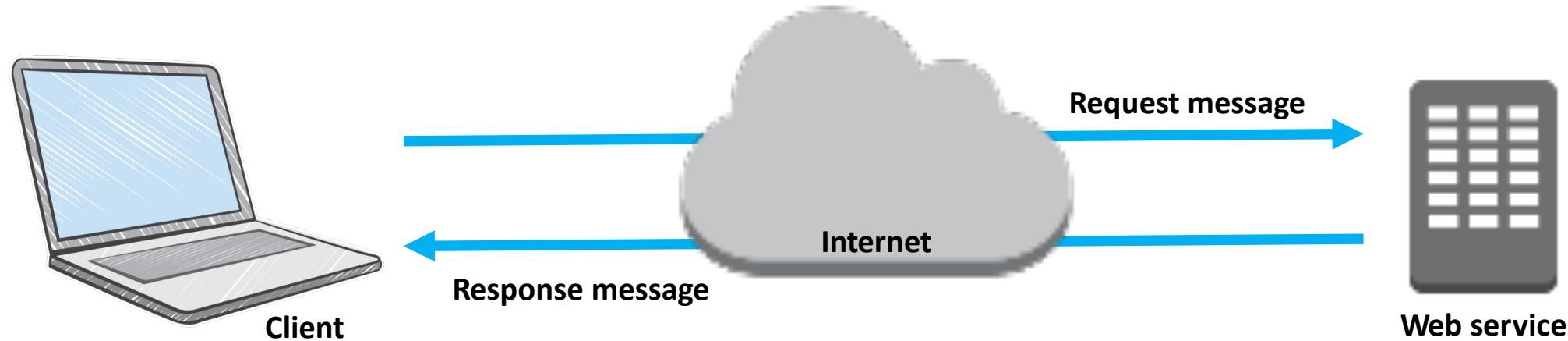
- Trade capital expense for variable expense
- Benefit from massive economies of scale
- Stop guessing capacity
- Increase speed and agility
- Stop spending money on running and maintaining data centers
- Go global in minutes

Module 1: Cloud Concepts Overview

Section 3: Introduction to Amazon Web Services (AWS)

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**.



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



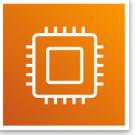
AR and VR



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

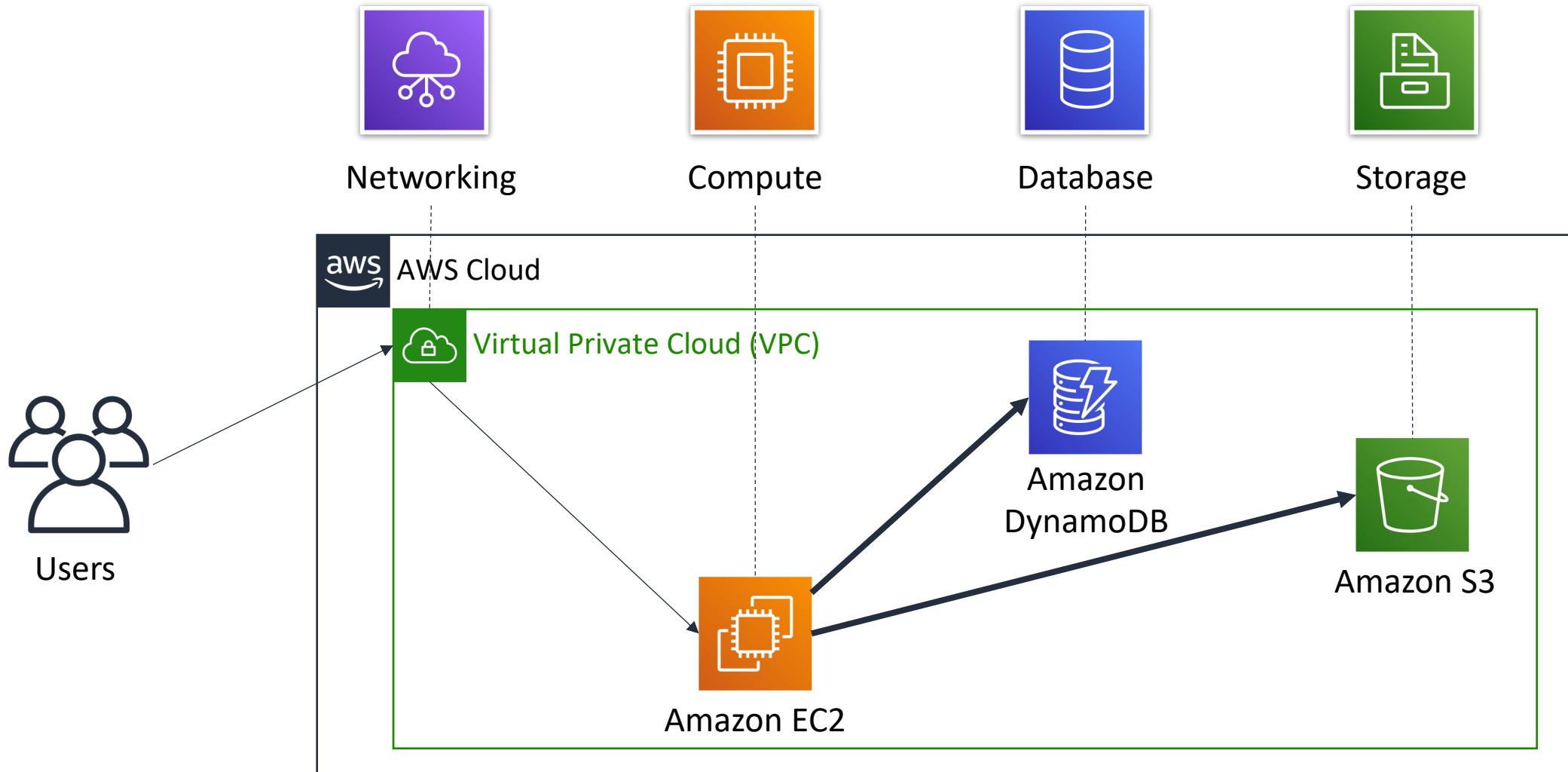


Security, Identity, and
Compliance



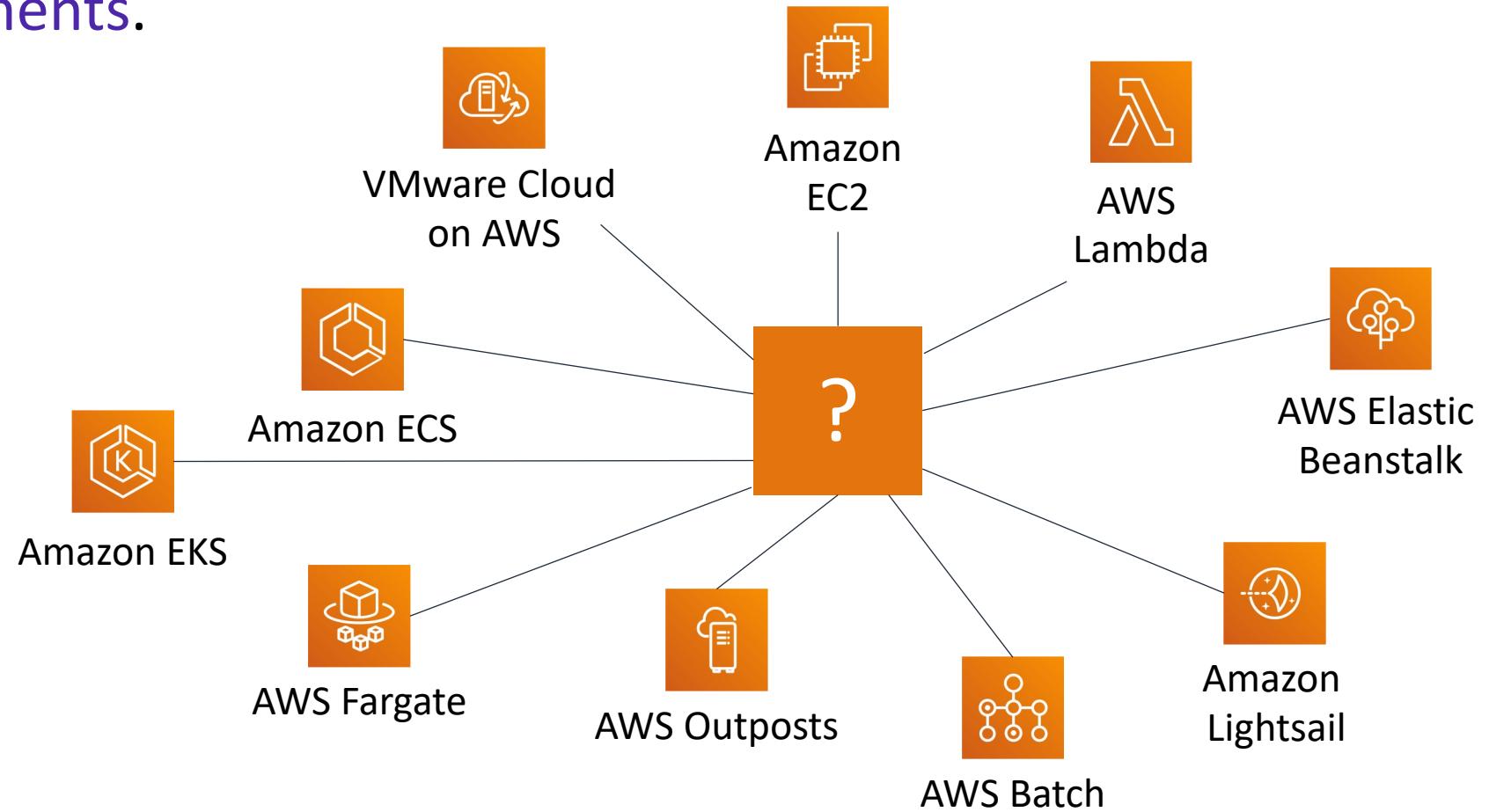
Storage

Simple solution example



Choosing a service

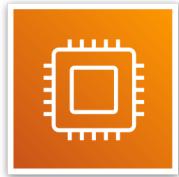
The service you select **depends on your business goals and technology requirements.**



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



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



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



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

```
AWS Storage Gateway Network Configuration
1: Describe Adapter
2: Configure DHCP
3: Configure Static IP
4: Reset all to DHCP
5: Set Adapter IP Address
6: View DNS Configuration
7: View Routes

Press "x" to exit
Enter command: 2
Available adapters: eth0
Enter Network Adapter: eth0
Reset to DHCP [y/n]: y
Adapter eth0 set to use DHCP
You must exit Network Configuration to complete this configuration.
Press Return to Continue...
```

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.

Module 1: Cloud Concepts Overview

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

AWS Cloud Adoption Framework (AWS CAF)



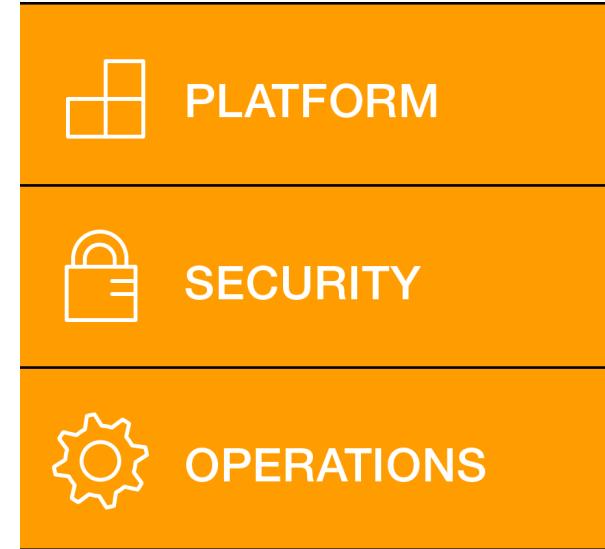
AWS CAF perspectives

- 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

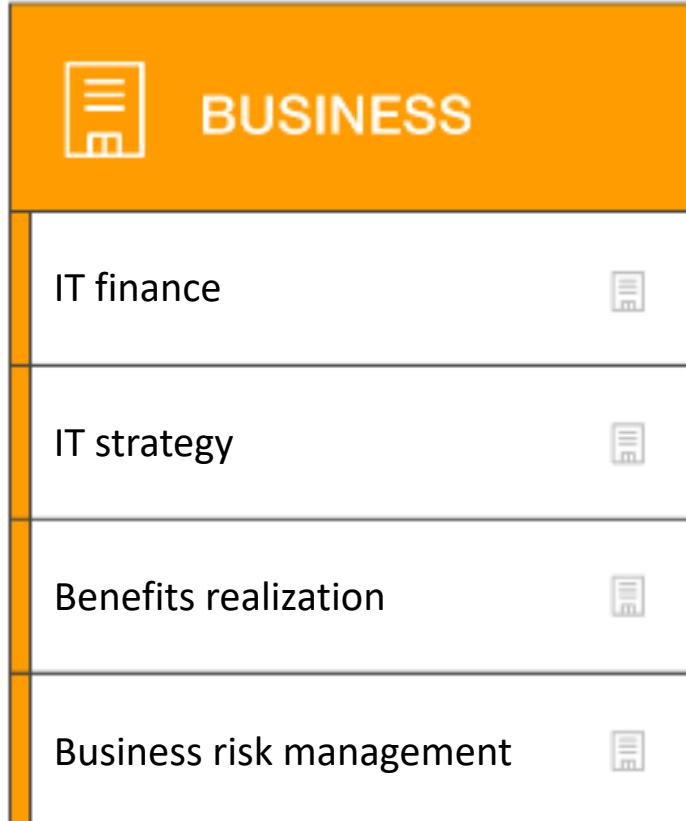


Focus on **business**
capabilities



Focus on **technical**
capabilities

Business perspective



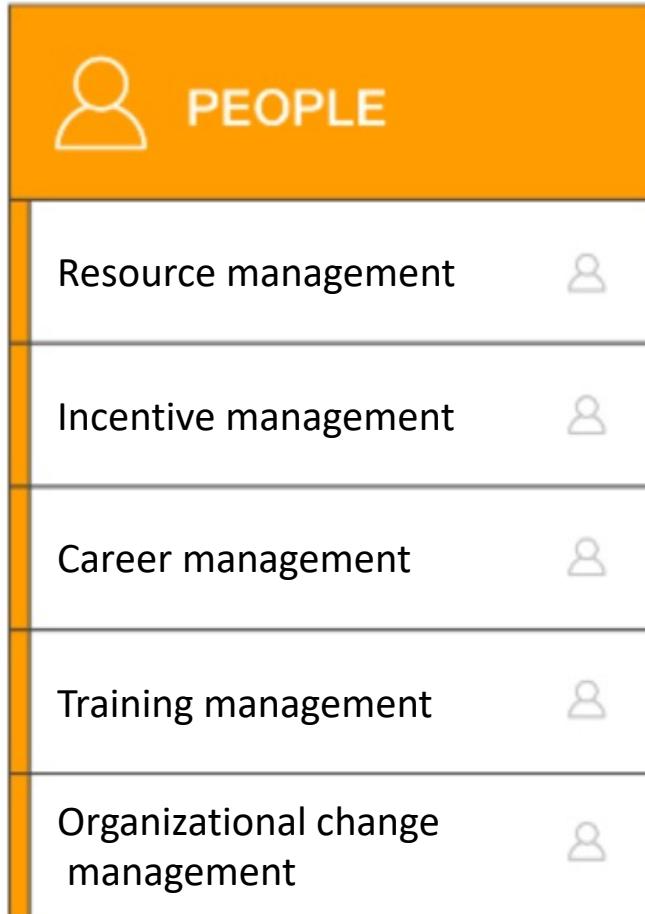
Business perspective capabilities

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 perspective capabilities

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



Human resources, staffing,
and people managers

Governance perspective



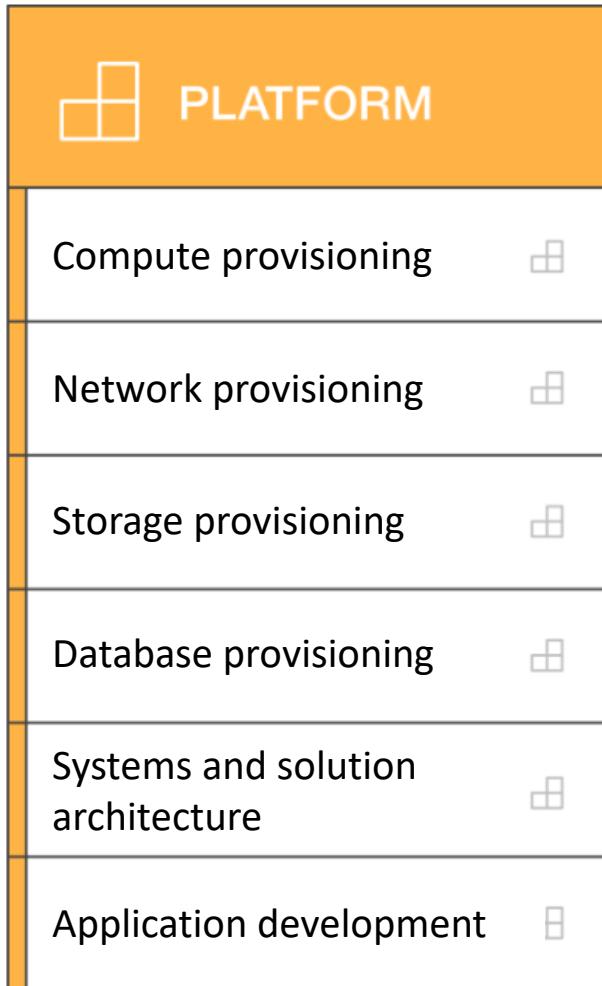
Governance perspective capabilities

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



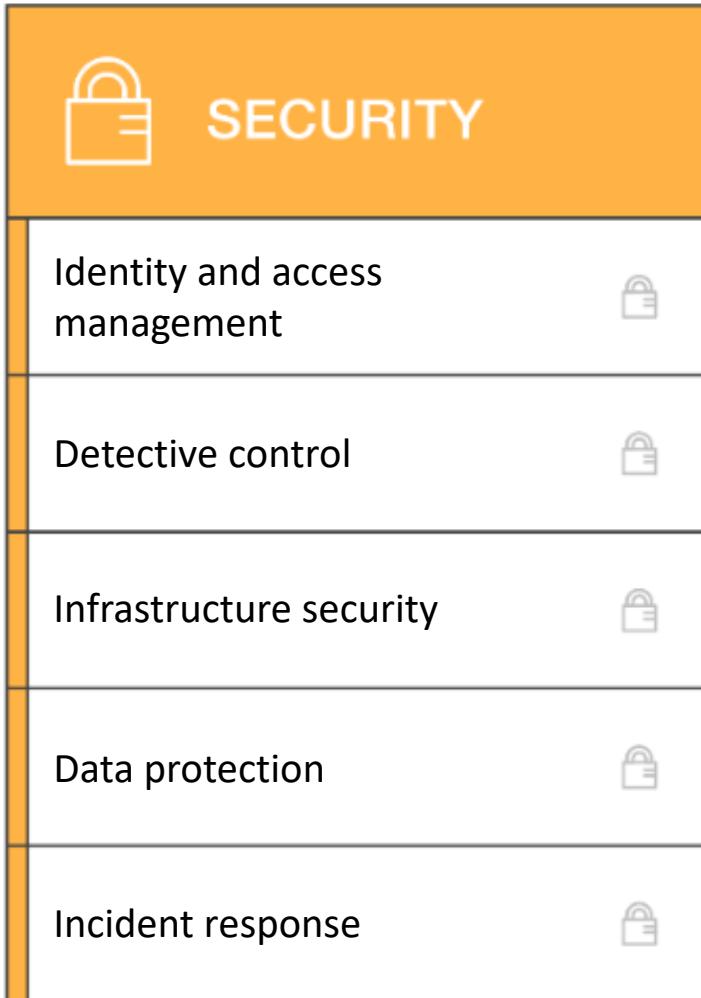
We must **understand and communicate the nature of IT systems and their relationships**. We must be able to **describe the architecture of the target state environment** in detail.



CTO, IT managers, and solutions architects

Platform perspective capabilities

Security perspective



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



CISO, IT security managers,
and IT security analysts

Security perspective capabilities

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	

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.



Café business case introduction

Welcome to AWS Academy Cloud Architecting

Café business scenario

- Frank and Martha opened a café and bakery in their retirement.
- Their staff and a few AWS consultants who are also customers are helping them use the cloud to address the needs of their growing business.



Café business owners and staff



Frank

- Co-owner of the café
- Retired from the navy
- Likes to bake
- Nontechnical

Martha

- Co-owner of café
- Retired accountant
- Knows how to use spreadsheets but otherwise, nontechnical

Sofía

- Daughter of Frank and Martha
- Supply chain manager for the café
- Future business administration student
- Has technical skills that include programming

Nikhil

- Café employee with visual design skills
- Interested in learning cloud computing
- Might take on more responsibilities at the café when Sofía starts her university studies

Café visitors who are AWS consultants



Olivia

- AWS solutions architect
- Has technical skills that include a specialty in databases and network technologies



Faythe

- Developer
- Has experience with AWS programming interfaces
- Is knowledgeable about cloud security



Mateo

- Systems administrator and engineer
- Likes to find ways to automate and to create repeatable solutions
- Knows the importance of backups and disaster recovery in solution design

The evolving café architecture

Version	Business Reason for Update	Technical Requirements and Architecture Update
V1	Build a static website for a small business.	Host the website on Amazon S3.
V2	Update the website to support dynamic content and online ordering.	Deploy the web application and database on Amazon EC2.
V3	Reduce the effort to maintain the database and secure its data.	Separate web and database layers. Migrate the database to Amazon RDS on a private subnet.
V4	Enhance the security of the web application.	Use Amazon VPC features to configure and secure public and private subnets.
V5	Ensure that the website can handle an expected increase in traffic and remain highly available and resilient to failure.	Add a load balancer, implement auto scaling on the EC2 instances, and distribute compute and database instances across two Availability Zones.
V6	Automate deployments so that the café can consistently deploy, manage, and update café resources across Regions.	Build a version-controlled CloudFormation template to deploy the network and application layers. Deploy the CloudFormation stack to another Region.
V7	Add reporting capabilities while reducing the operational and maintenance burden, improving performance, and reducing costs.	Deploy Lambda functions that connect to the Amazon RDS database and generate a report based on a schedule.





Roles in cloud computing

Welcome to AWS Academy Cloud Architecting

IT professional



Common skills and responsibilities include the following:

- Act as a generalist and might manage an application
- Often manage a production environment
- Highly technical
- Might have significant or limited experience in cloud technologies
- Might specialize in one area (such as security or storage)

Job titles include the following:

- IT administrator
- Systems administrator
- Network administrator

IT leader



Common skills and responsibilities include the following:

- Lead a team of IT professionals
- Responsible for day-to-day operations
- Manage a budget, stay informed about technologies, and choose new technologies
- Hands on during the early stages of a project, and then delegate the team to take over

Job titles include the following:

- IT manager
- IT director
- IT supervisor

Developer



Common skills and responsibilities include the following:

- Write, test, and fix code
- Think about projects at the application level
- Work with APIs and SDKs
- Might use sample code
- Might specialize in one area (such as security or storage)

Job titles include the following:

- Software developer
- System architect
- Software development manager

DevOps engineer



Common skills and responsibilities include the following:

- Build out the infrastructure that applications run on, often in the cloud
- Follow the guidelines of the cloud architect
- Experiment to improve deployments

Job titles include the following:

- DevOps engineer
- Build engineer
- Reliability engineer

Cloud architect



Common skills and responsibilities include the following:

- Stay up to date with new technologies and help decide which ones to use
- Provide documentation, processes, and tooling to developers
- Give developers freedom to innovate
- Resolve challenges using best practices for cost optimization, performance, reliability, and security

Job titles include the following:

- Cloud architect
- Systems engineer
- Systems analyst

Module 1: Cloud Concepts Overview

Module wrap-up

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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