

Module 1, Section 1: Cloud Concepts Overview



What's In This Module



- Part 1: What is Cloud Computing?
- Part 2: Six Advantages of Cloud Computing
- Part 3: What is Amazon Web Services (AWS)?
- Part 4: The AWS Cloud Adoption Framework (CAF)

Module Objectives

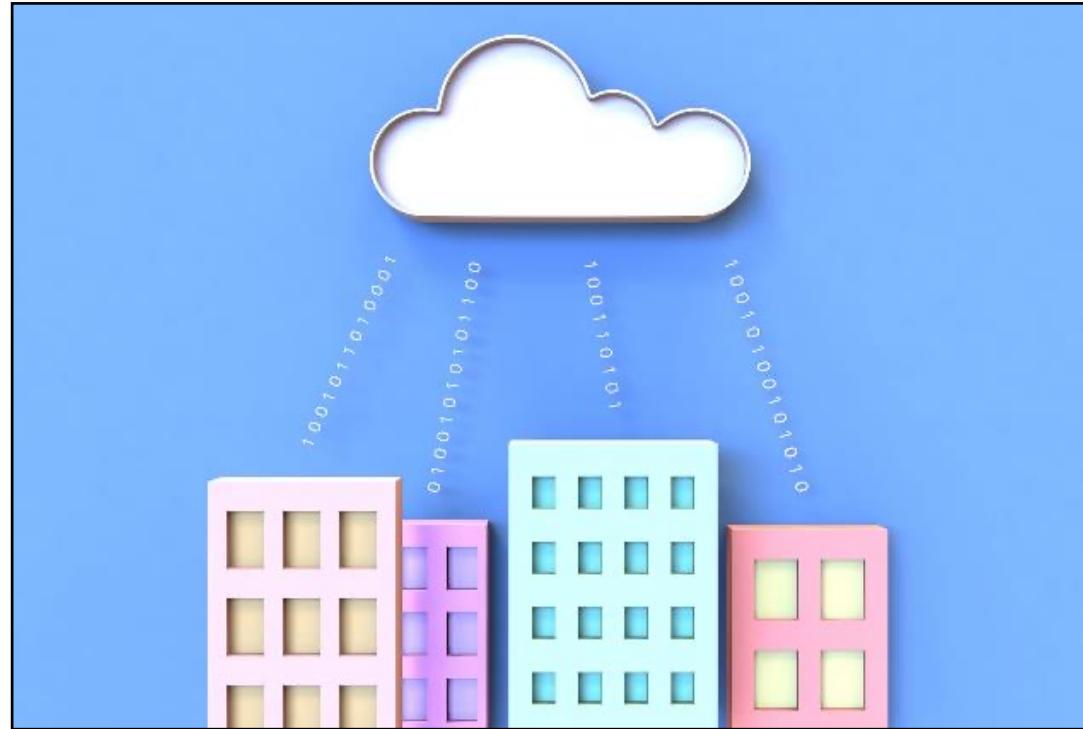


Discuss key concepts related to cloud computing and the advantages of cloud computing:

- Define different types of cloud computing.
- Describe six advantages of cloud computing.
- Describe cloud deployment models.
- Review the AWS Cloud Adoption Framework (CAF).

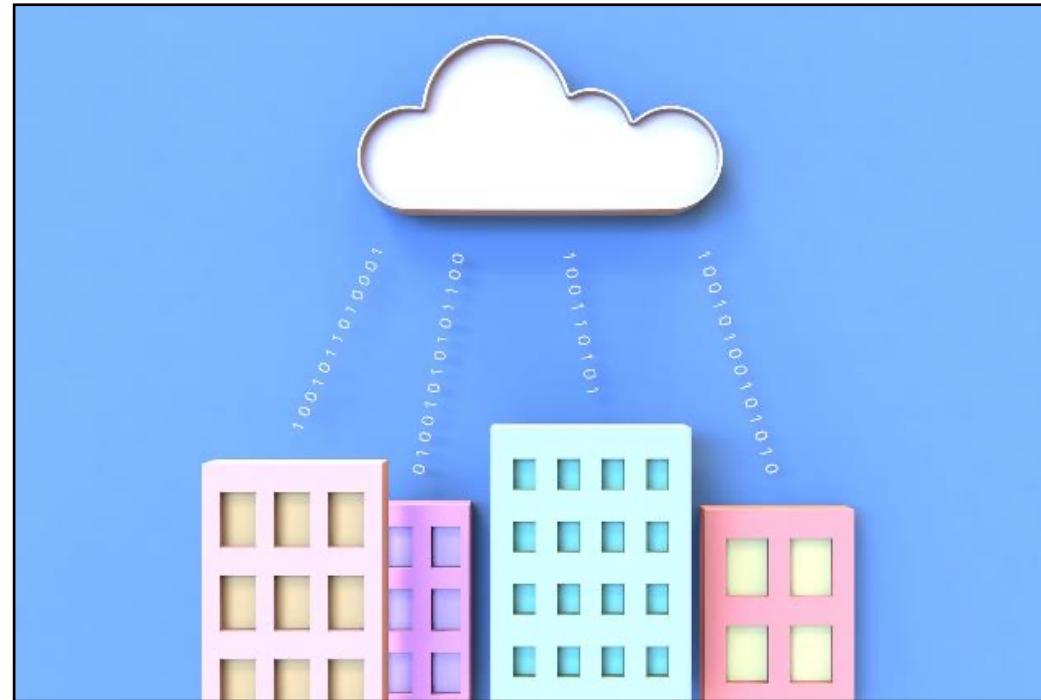
Part 1: What is Cloud Computing?

What is Cloud Computing?



What is Cloud Computing?

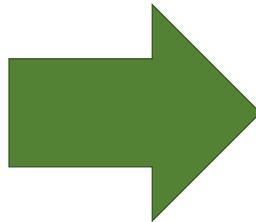
Cloud computing is the **on-demand** delivery of compute power, database storage, applications, and other IT resources through a cloud services platform **via the internet** with **pay-as-you-go** pricing.



Before Cloud Computing



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



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Before Cloud Computing



- Hardware solutions are **physical**. This means they require:
 - Space
 - Staff
 - Physical security
 - Planning
 - Capital expenditure
- Guess at theoretical maximum peaks
 - Is there enough resource capacity?
 - Do we have sufficient storage?

What if your needs change?

You have to go through the **time, effort, and cost** required to change all these.

Utilizing Cloud Computing



Software is flexible.

If your needs change, your software can change much more **quickly, easily, and cost-effectively** than your hardware.

Three Models of Cloud Computing



IaaS

Infrastructure
as a Service

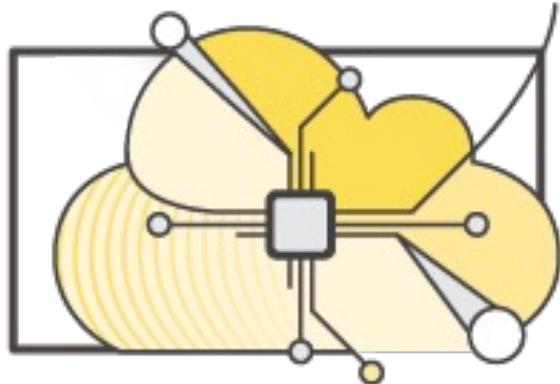
PaaS

Platform
as a Service

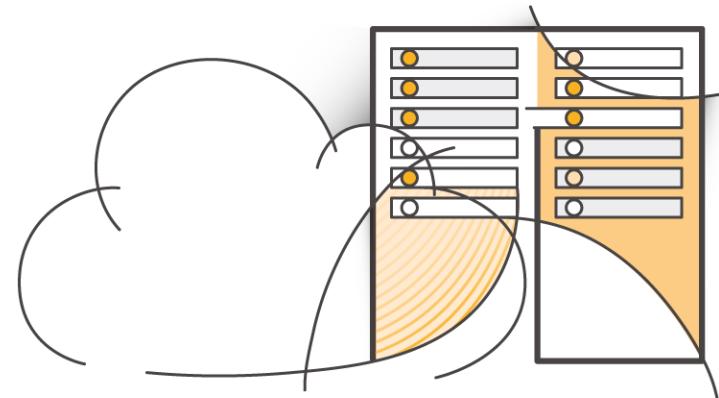
SaaS

Software
as a Service

Three Cloud Deployment Models



All-In Cloud

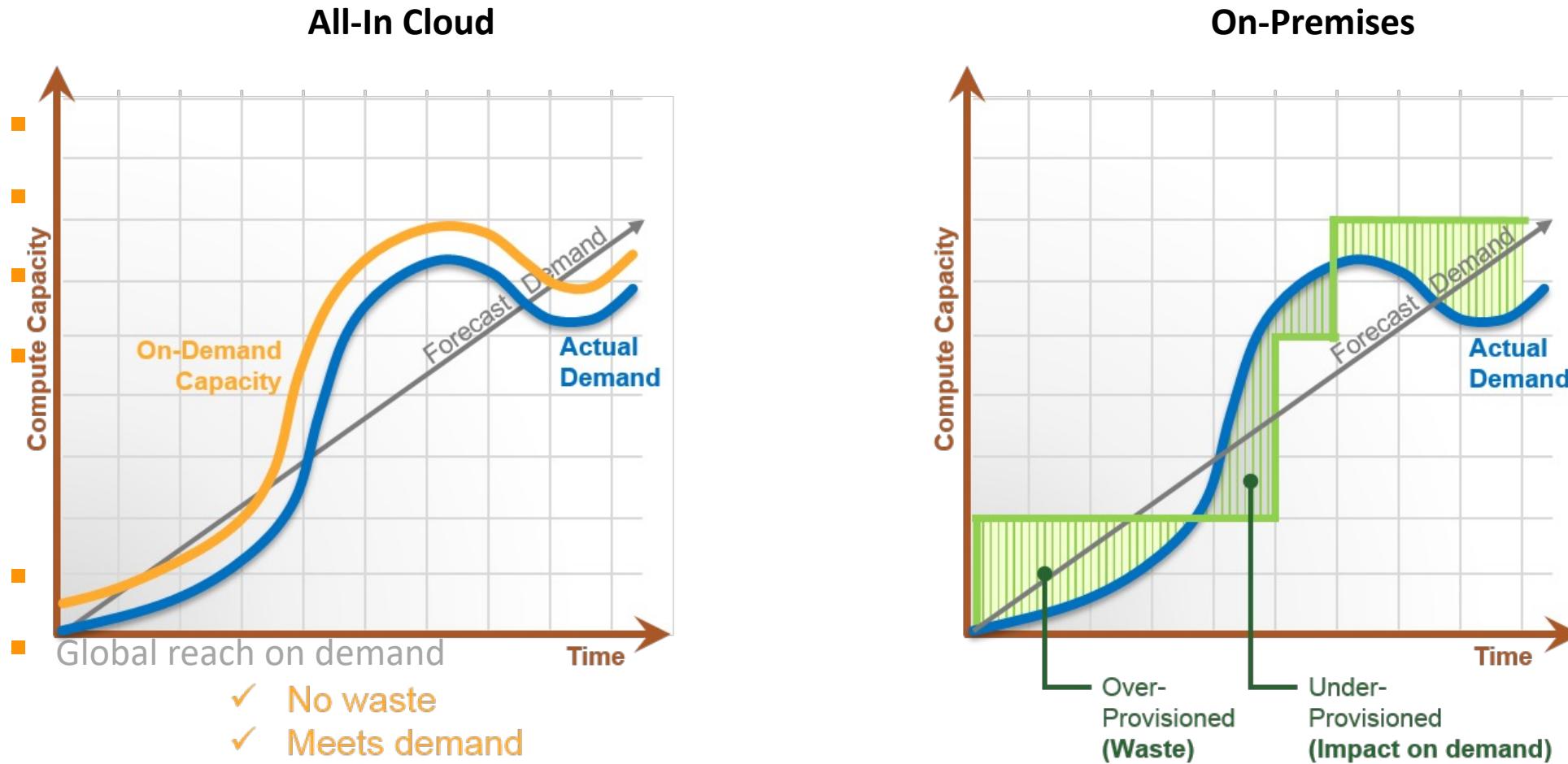


Hybrid

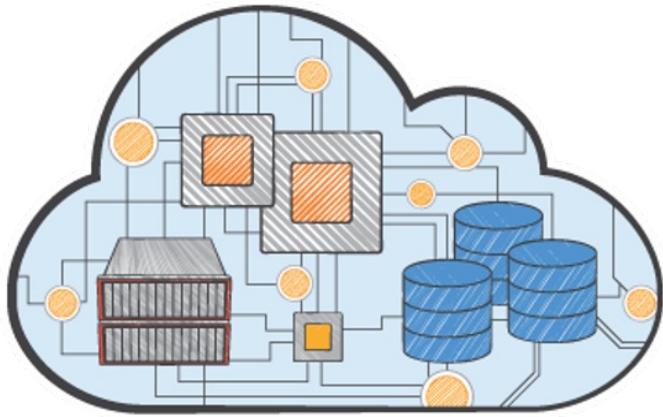


**Private Cloud
(On-premises)**

All-In Cloud versus On-Premises



All-In Cloud versus On-Premises



All-In Cloud

- No upfront investment
- Low ongoing costs
- Focus on innovation
- Flexible capacity
- Speed and agility
- Global reach on demand



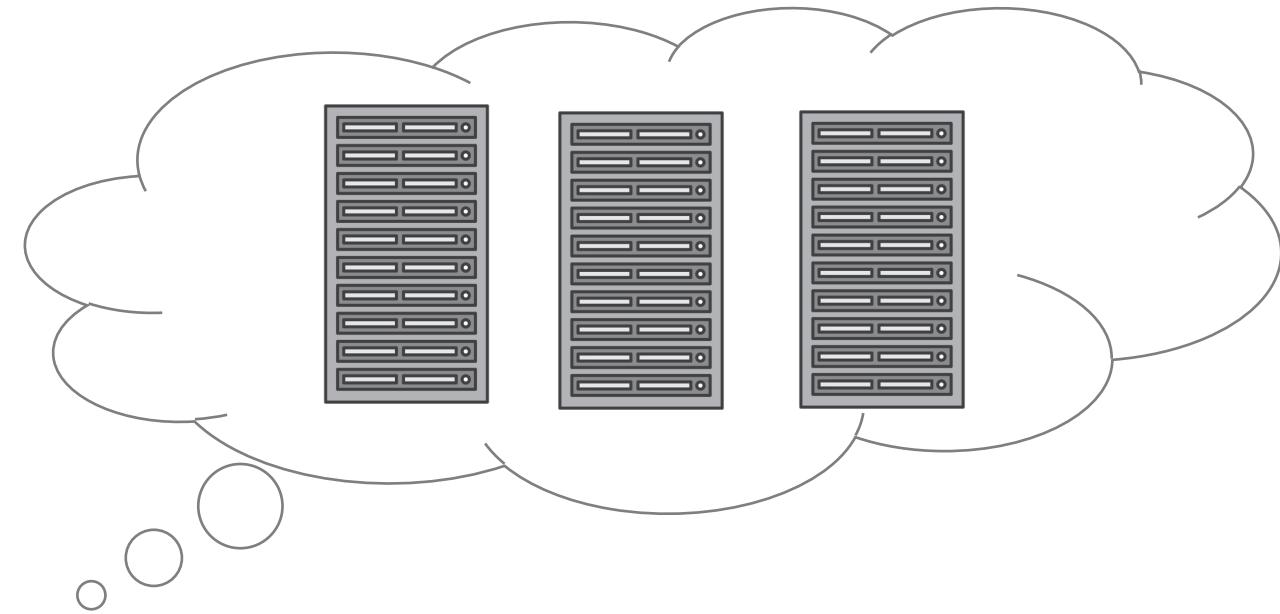
On-Premises

- Large initial purchase
- Labor, patches, and upgrade cycles
- Systems administration
- Fixed capacity
- Long procurement cycle and setup
- Limited geographic regions

What can you do in the cloud?

You can use a cloud computing platform for:

- 立方体图标 Application Hosting
- 立方体图标 Backup and Storage
- 立方体图标 Content Delivery
- 立方体图标 Websites
- 立方体图标 Enterprise IT
- 立方体图标 Databases



On-Premises and AWS Comparison



On-Premises Infrastructure



Firewalls



ACLs



Administrators



Amazon Web Services



Security Groups



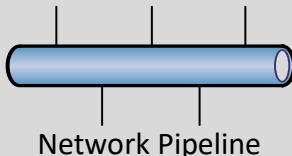
Network Access Control Lists



Identity Access Management



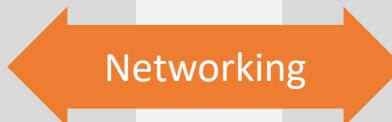
Router



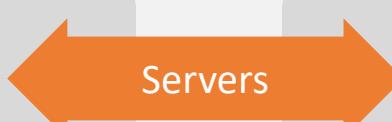
Network Pipeline



Switch



On-Premises Servers



Amazon Machine Image



Amazon EC2 Instances



DAS



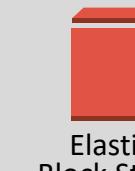
SAN



NAS



RDBMS



Elastic Block Store



Elastic File System



Amazon S3



Amazon RDS

Important Cloud Terminology

💡 **High Availability (Highly Available):**

- 💡 Accessible when you need it

💡 **Fault Tolerance (Fault Tolerant):**

- 💡 Ability to withstand a certain amount of failure and still remain functional

💡 **Scalability (Scalable):**

- 💡 Ability to easily grow in size, capacity, and/or scope when required
- 💡 Growth is (usually) based on demand

💡 **Elasticity (Elastic):**

- 💡 Ability to grow (scale) when required and to reduce in size when resources are no longer needed

- Cloud computing is the on-demand delivery of IT resources online with pay-as-you-go pricing.
- Three models of cloud computing are:
 - Infrastructure as a Service (IaaS)
 - Platform as a Service (PaaS)
 - Software as a Service (SaaS)
- All-in cloud, hybrid, and private cloud are three cloud deployment models.
- Cloud services are available to replace traditional on-premises computing activities.

Part 2: Six Benefits of Cloud Computing

Advantage #1: Capex to Variable Expense



Trade **capital expense** for **variable expense**.

Capital Expense vs. Variable Expense



- **Capital expense (capex):** Funds used by a company to acquire, upgrade, and maintain physical assets such as property, industrial buildings, or equipment.

- **Variable expense:** A variable expense is an expense that is easily altered or avoided by the person bearing the cost.

Advantage #2: Economies of Scale



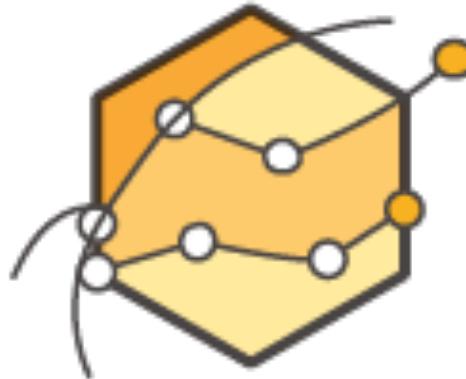
Benefit from **massive economies of scale**.

Economies of Scale

- Hardware solutions are **physical** and require:
 - Space
 - Staff
 - Physical security
- Significant cost to procure and house these resources.
- No purchasing power.
- Cloud providers leverage hundreds of thousands of customers to achieve economies of scale.



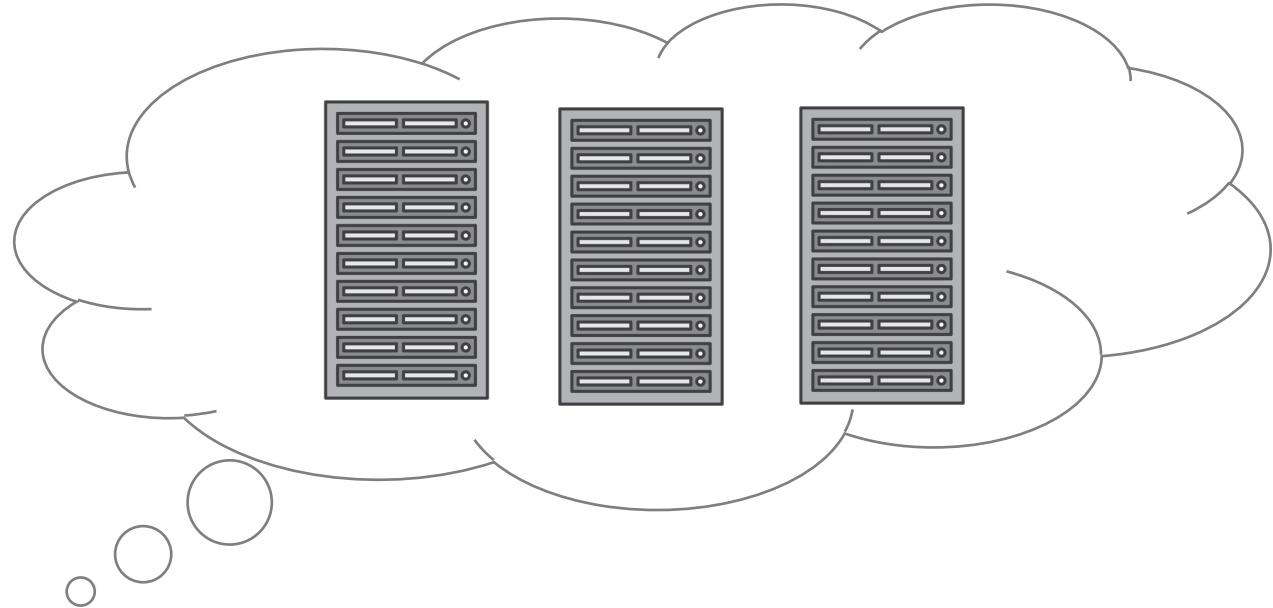
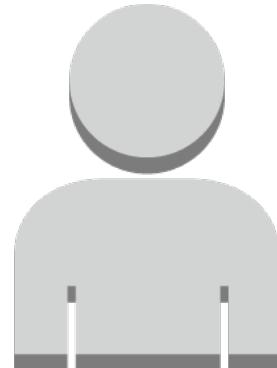
Advantage #3: Capacity Planning



Eliminate guessing on your capacity needs.

Guessing about Capacity

- 💡 What are the potential maximum peaks in usage?
- 💡 Is there enough resource capacity at peak?
- 💡 Is the amount of storage sufficient?



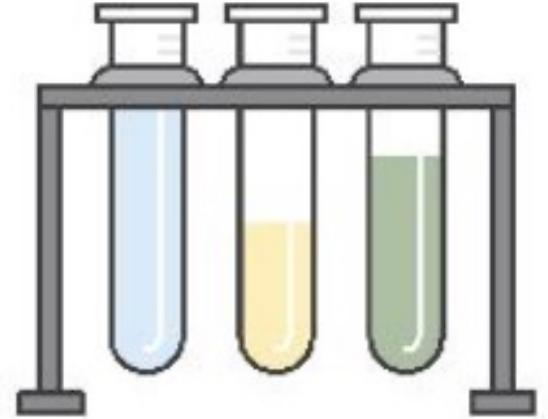
Advantage #4: Speed and Agility



Increase **speed** and **agility**.

Increase Speed and Agility

- Rapid availability of new resources
 - Provision resources in minutes, not weeks.
- Increase Innovation
 - Quick, low cost experimentation.
 - Leverage pre-fabricated functionality without requiring in-house expertise. (i.e., data warehousing, analytics)
- Increase experimentation
 - Explore new avenues of business with minimal risk and expense.
 - Test with different configurations.

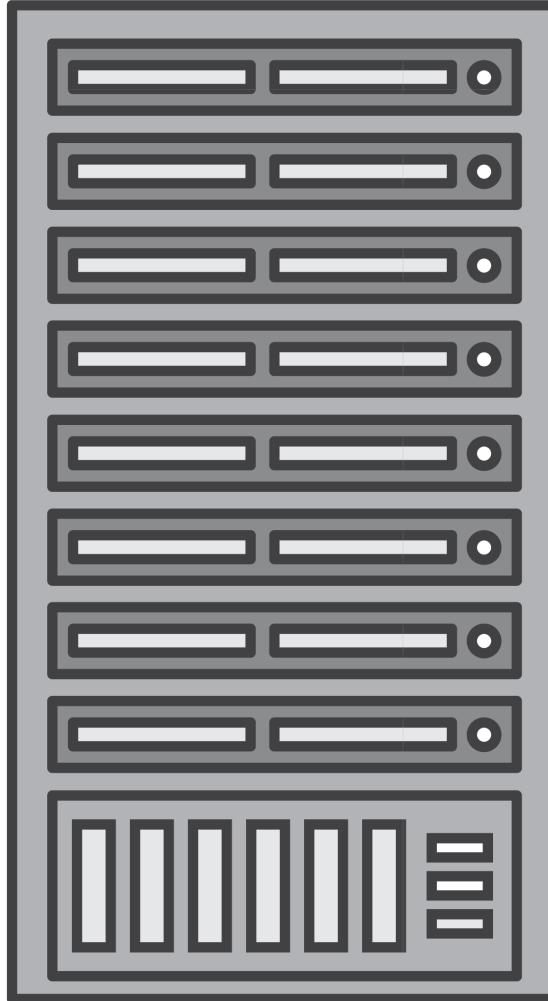


Advantage #5: Spend Strategically



Stop spending money on running and maintaining data centers.

Stop Spending Money on Data Centers



- Focus on customers
- Focus on projects that differentiate the business
- Delegate the racking, stacking and powering of servers to the cloud provider

Advantage #6: Ease of Deployment

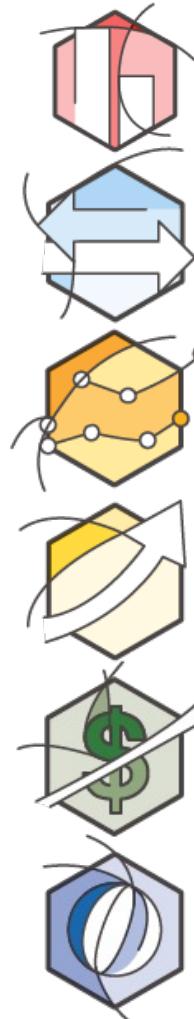


Go global in minutes.

Go Global in Minutes



Region & Number of AZs



Trade **capital expense** for **variable expense**.

Benefit from **massive economies of scale**.

Eliminate guessing on your capacity needs.

Increase **speed** and **agility**.

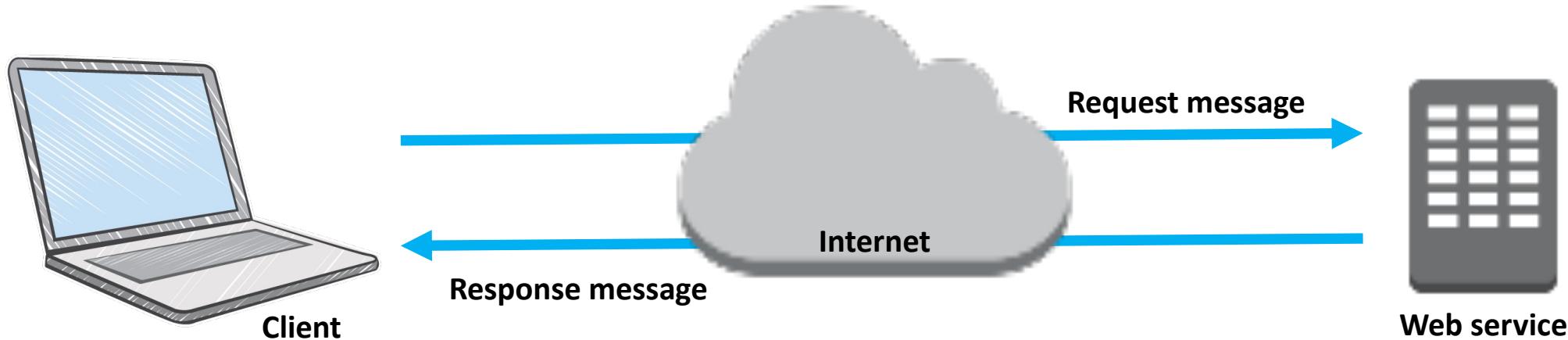
Stop spending money to run and maintain data centers.

Go global in minutes.

Part 3: What is Amazon Web Services (AWS)?

What are Web Services?

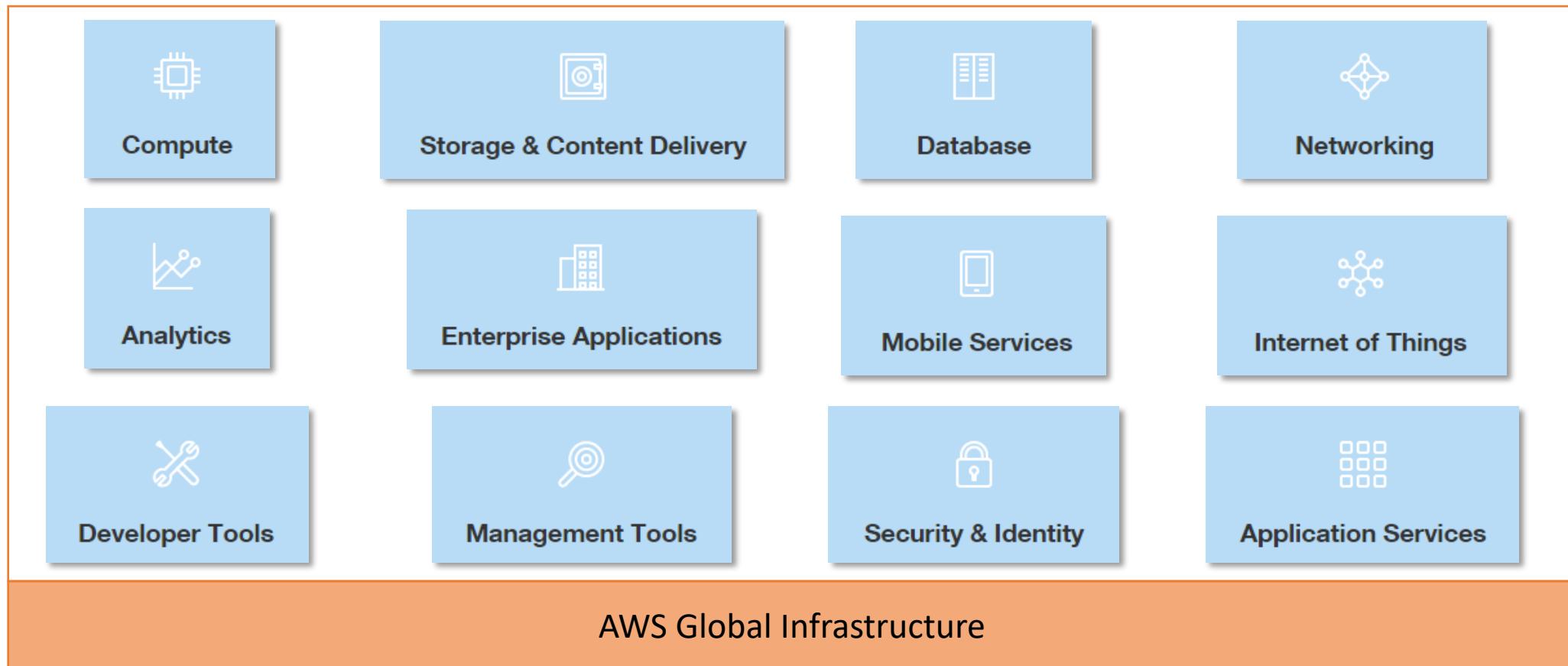
A **web service** is any piece of software that makes itself available over the internet and uses a **standardized format** (XML or JSON) for the request and the response of an **API interaction**.



What is AWS?



AWS is a **secure cloud platform** with **more than 165 different services** that include solutions for:



AWS by Category: Core Services



Compute



Amazon
EC2



AWS
Lambda



Auto
Scaling



AWS Elastic
Beanstalk



Amazon Elastic
Container
Registry



Amazon Elastic
Container Service



Amazon
Lightsail



AWS
Batch

Networking



Amazon
VPC



Amazon
Route 53



AWS Direct
Connect

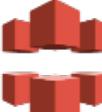


Elastic Load
Balancing

Storage



Amazon S3



Amazon
CloudFront



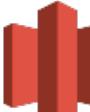
Amazon Elastic
File System



Storage
Gateway



Amazon
EBS



Amazon
Glacier



AWS
Snowball



AWS
Snowmobile

Database



Amazon
RDS



Amazon
Redshift



Amazon
ElastiCache



Amazon
DynamoDB



AWS
Database
Migration
Service

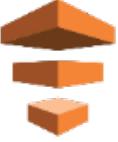
AWS by Category: Foundational Services



Analytics



Amazon
EMR



AWS Data
Pipeline



Amazon
Elasticsearch



Amazon
Machine Learning



Amazon
Quicksight



Amazon
Redshift



Amazon
Athena

Enterprise Apps



Amazon
WorkSpaces



Amazon
WorkMail



Amazon
WorkDocs

Mobile Services



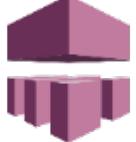
AWS
Mobile Hub



Amazon
SNS



Amazon
Cognito



AWS
Device Farm



Amazon
Mobile
Analytics



AWS
Mobile
SDKs



Amazon
Pinpoint

Internet of Things



AWS IoT



AWS Greengrass

AWS by Category: Developer and Operations Services



Developer Tools	Management Tools	Security & Identity	App Services
AWS CodeCommit	AWS CodeDeploy	AWS Identity and Access Management	Amazon API Gateway
AWS CodePipeline	AWS CloudTrail	Amazon Inspector	Amazon AppStream
AWS X-Ray	AWS OpsWorks	AWS Key Management Service	Amazon CloudSearch
	AWS Trusted Advisor	AWS Organizations	Amazon Elastic Transcoder
		AWS Certificate Manager	Amazon SES
			Amazon SNS
			Amazon SQS
			Amazon SWF

Core Services: The Basics



Compute



Amazon
EC2



AWS
Lambda



Auto
Scaling



AWS
Elastic
Beanstalk



Amazon
Elastic
Container
Registry



Amazon
Elastic
Container Service



Amazon
Lightsail



AWS
Batch

Networking



Amazon
VPC



Amazon
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AWS Direct
Connect

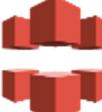


Elastic Load
Balancing

Storage



Amazon S3



Amazon
CloudFront



Amazon
Elastic
File System



Storage
Gateway



Amazon
Glacier



Amazon
EBS



AWS
Snowball



AWS
Snowmobile

Database



Amazon
RDS



Amazon
Redshift



Amazon
ElastiCache

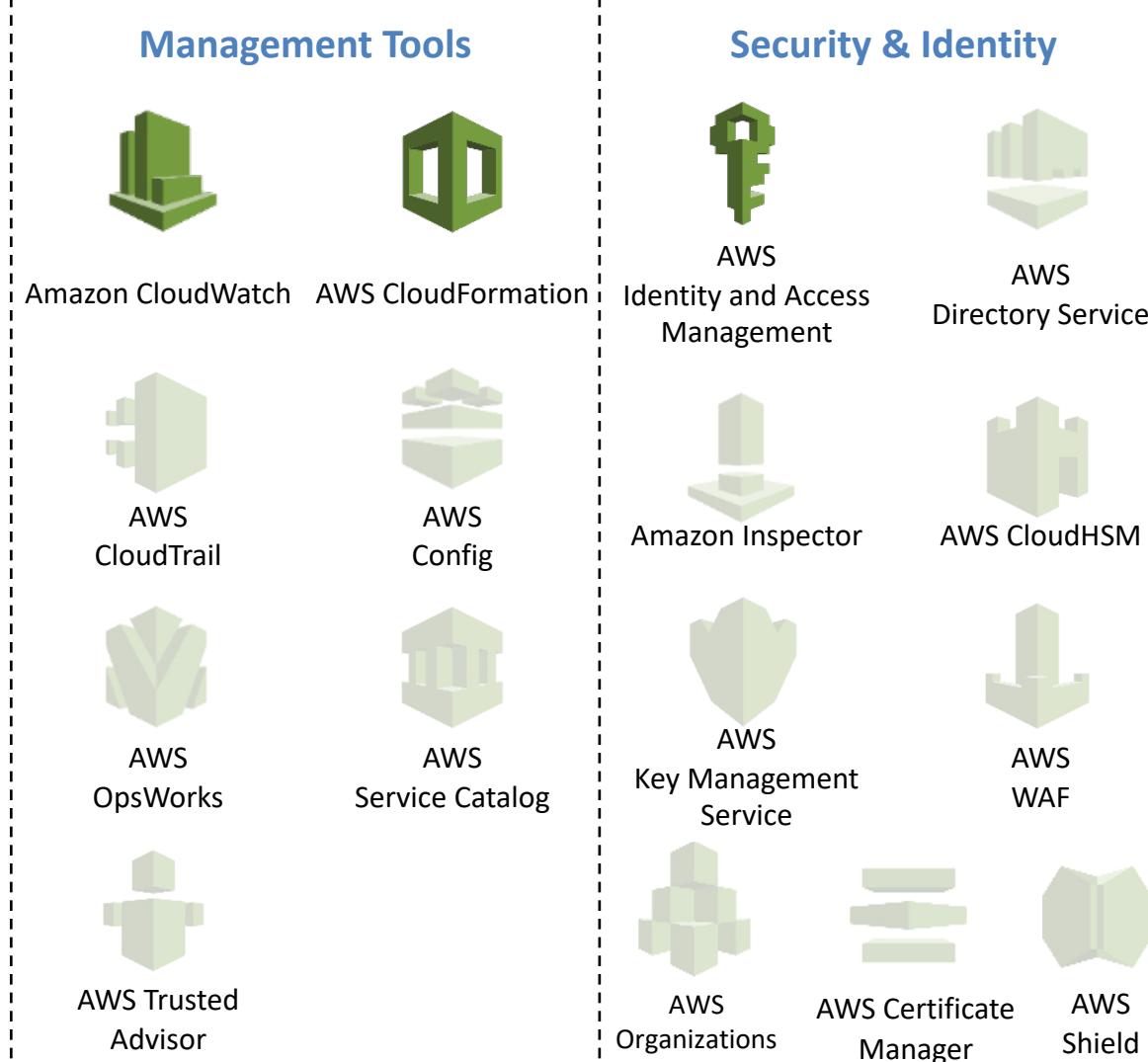


Amazon
DynamoDB



AWS
Database
Migration
Service

Core Services: The Basics



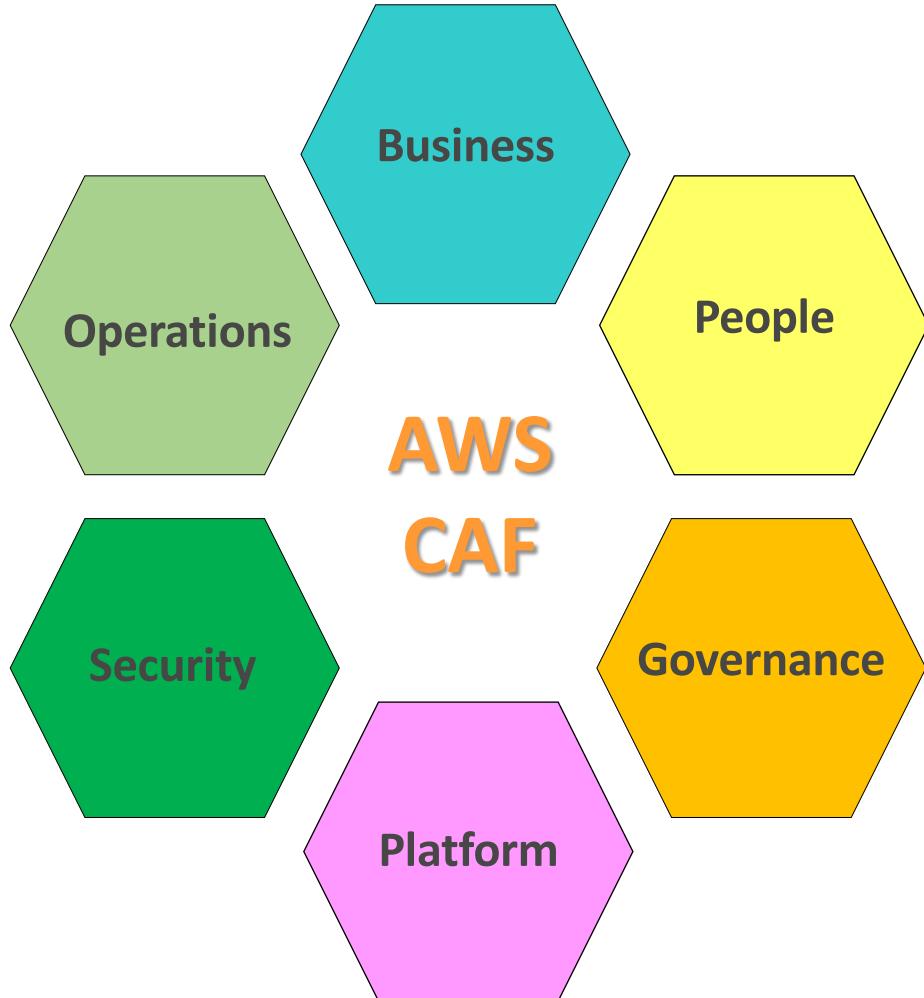
Access to AWS Services

- AWS Management Console
 - Access on the go with AWS Console Mobile App
- AWS Command Line Interface (AWS CLI)
- Software Development Kits (SDK)



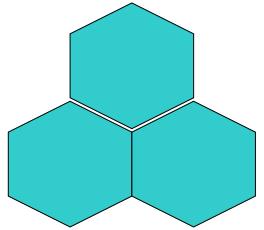
Part 4: The AWS Cloud Adoption Framework

AWS Cloud Adoption Framework (CAF)



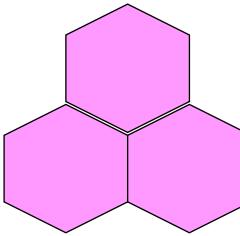
- Perspectives in planning, creating, managing, and supporting a modern IT service
- Guidelines for establishing, developing, and running AWS environments
- Structure for business and IT teams to work together

Six Core Perspectives



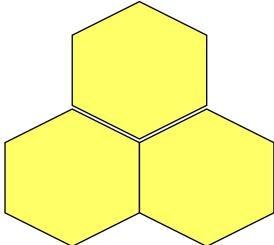
Business Perspective

How will your architectural approaches align **technical delivery to business imperatives?**



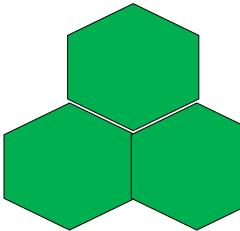
Platform Perspective

What patterns, guidance, and tools are necessary to optimize your use of **technology services** on AWS?



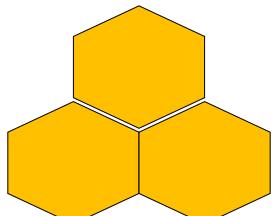
People Perspective

What **skills** are needed in order to adopt the AWS cloud platform? Examples include guiding processes of role descriptions, training, certification, and mentoring.



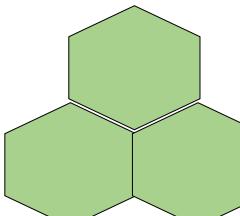
Security Perspective

How will you define and implement the required levels of security, governance, and risk management to **achieve compliance?**



Governance Perspective

How to update the staff skills and **organizational processes** necessary to ensure business governance in the cloud, and manage and measure cloud investments to evaluate business outcomes?



Operations Perspective

How will you provide process, guidance, and tools for optimum **operational service management** of the AWS environment?

- Defined cloud computing and alternative implementation models
- Described the advantages of cloud computing
- Explored AWS services
- Discussed the AWS CAF

To finish this module:

- Complete:  **Knowledge Assessment**

Up Next: Section 1.0.2 – Cloud Economics

Review Pricing Fundamentals
Understand Total Cost of Ownership



Thanks for participating!

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