

# 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).

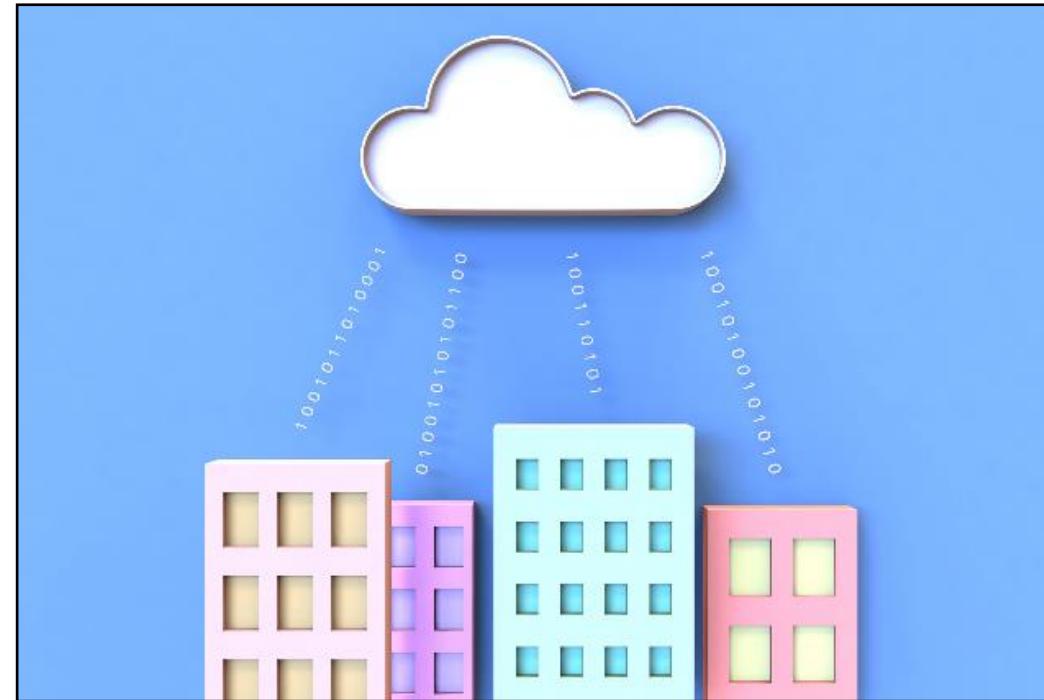
# Part 1: What is Cloud Computing?

# What is Cloud Computing?



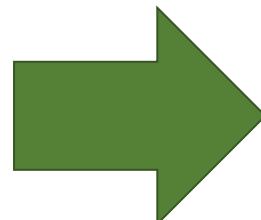
# What is Cloud Computing?

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**.

A screenshot of a terminal window with a dark blue background and light blue text. The text consists of binary code, showing several lines of 1s and 0s. The window has a standard OS X-style title bar at the top.

# 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

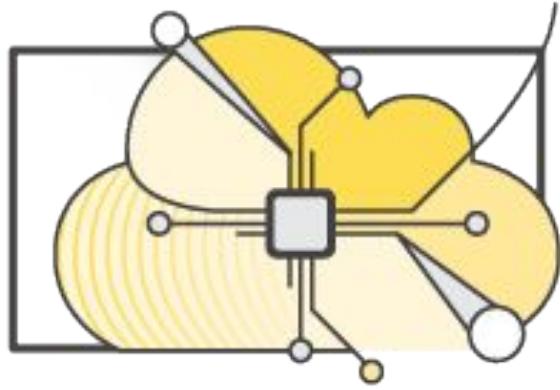
**PaaS**

Platform  
as a Service

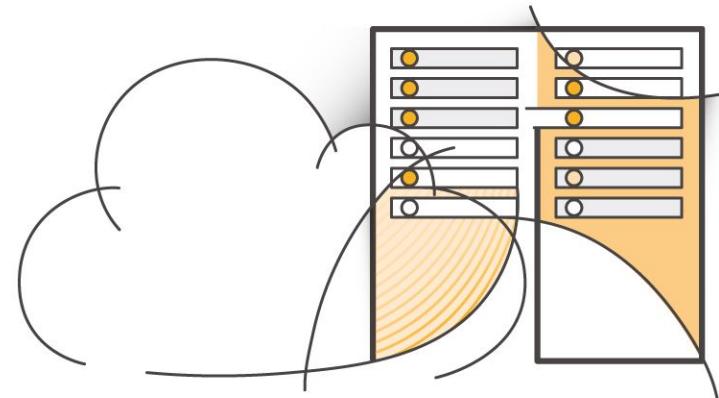
**SaaS**

Software  
as a Service

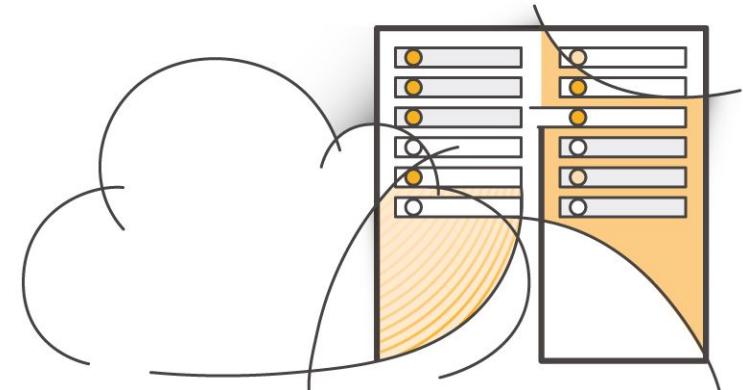
# Three Cloud Deployment Models



**All-In Cloud**



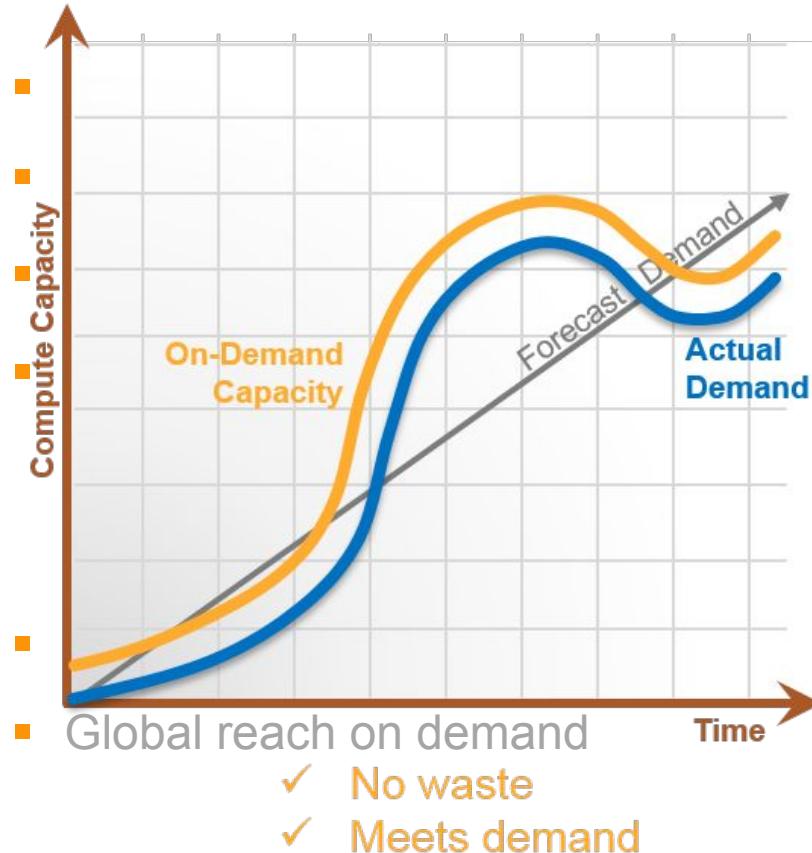
**Hybrid**



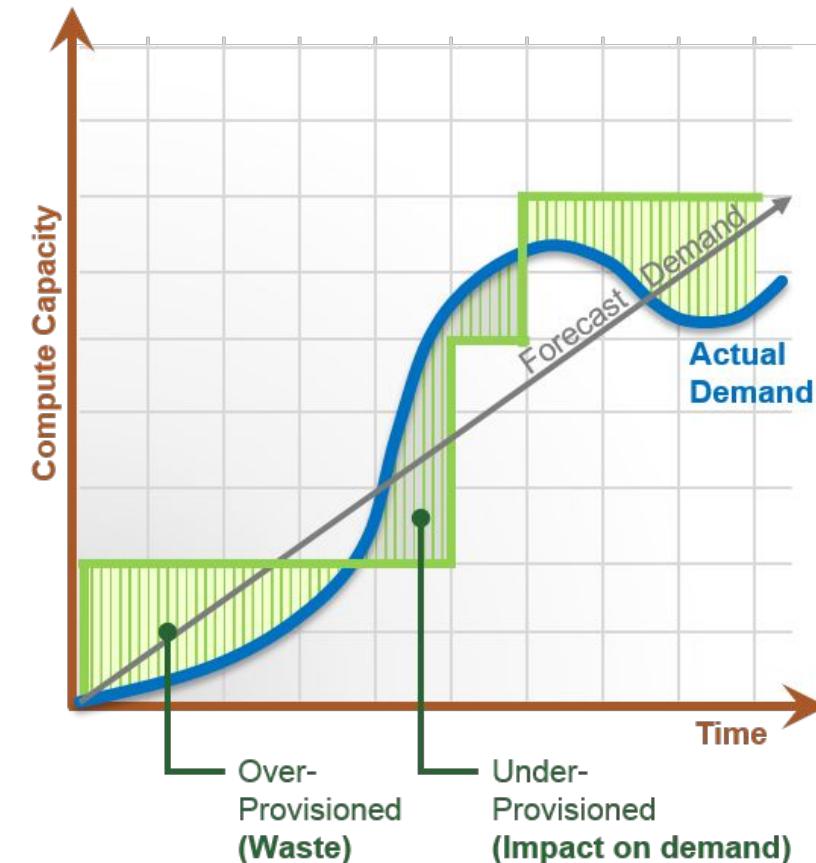
**Private Cloud  
(On-premises)**

# All-In Cloud versus On-Premises

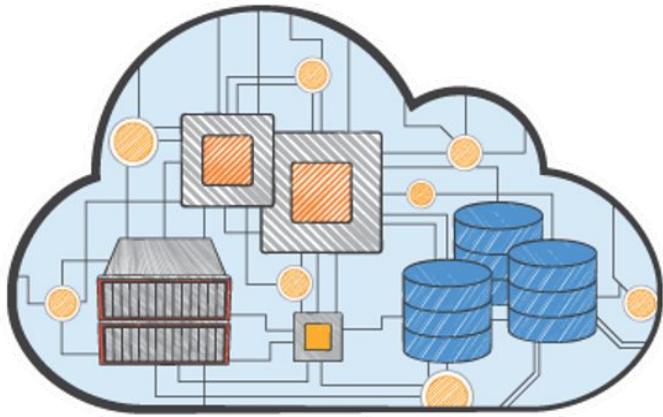
All-In Cloud



On-Premise



# 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

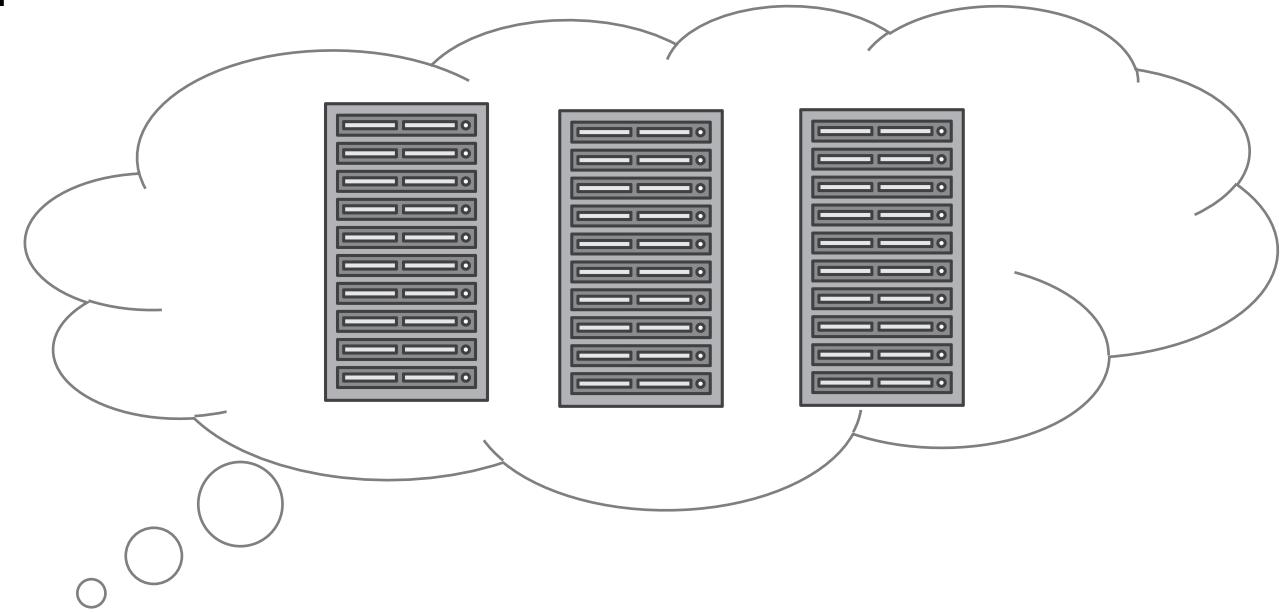
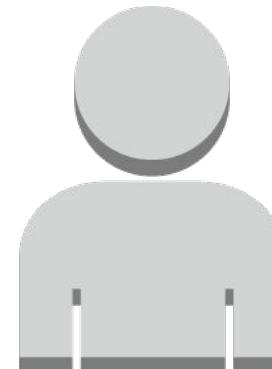
## On-Premises

- 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:

- Application Hosting
- Backup and Storage
- Content Delivery
- Websites
- Enterprise IT
- Databases



# On-Premises and AWS Comparison

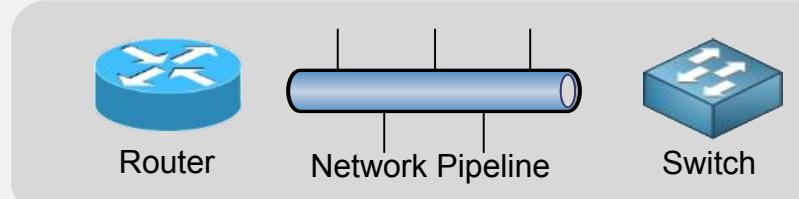


## On-Premises Infrastructure

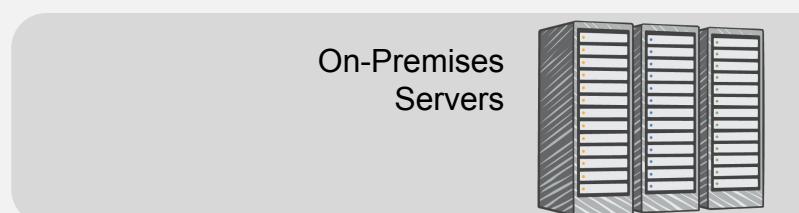


Security

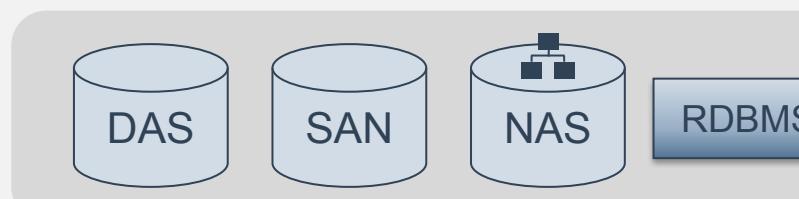
## Amazon Web Services



Networking



Servers



Storage and Database



# 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

# Summary

- 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



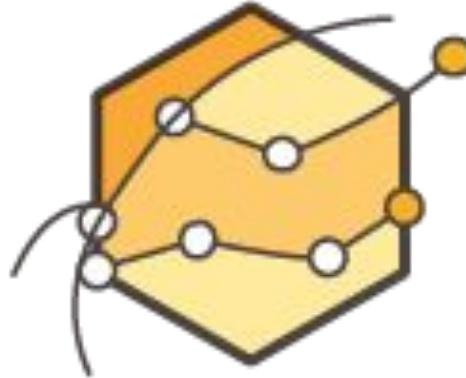
Benefit from **massive economies of scale**.

# 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.



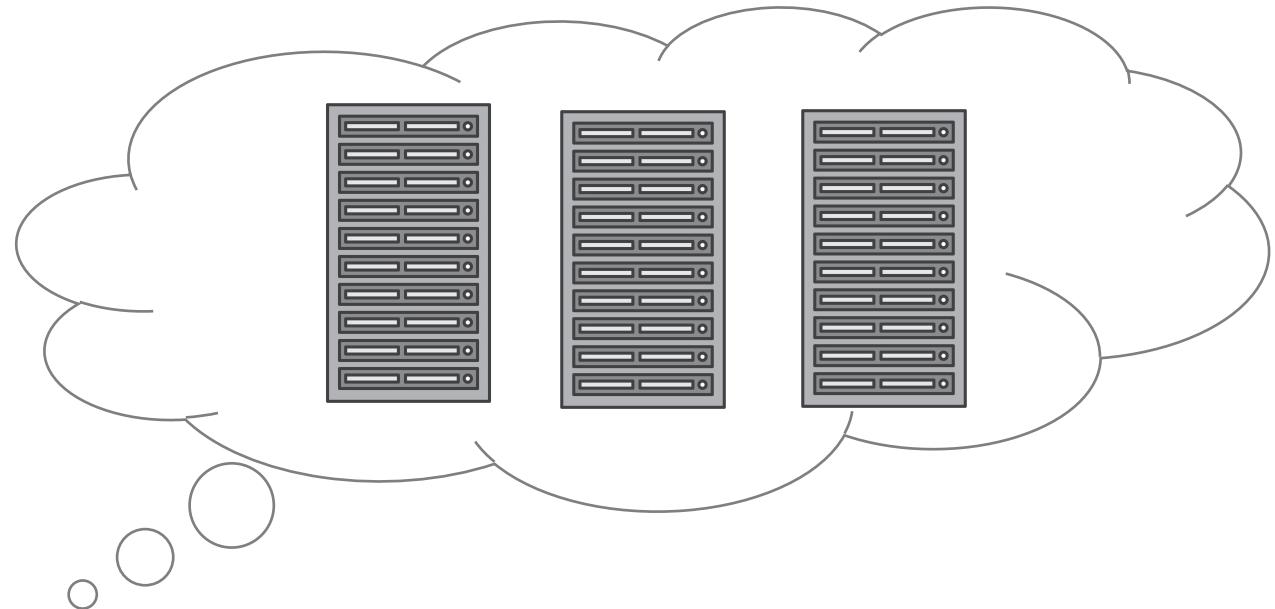
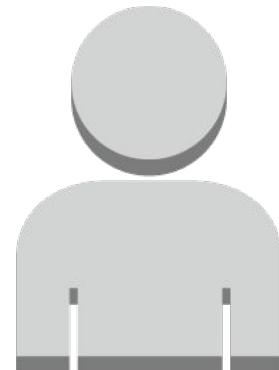
# Advantage #3: Capacity Planning



**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?



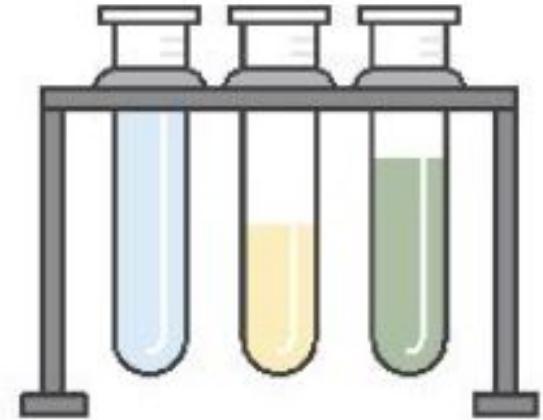
# Advantage #4: Speed and Agility



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.

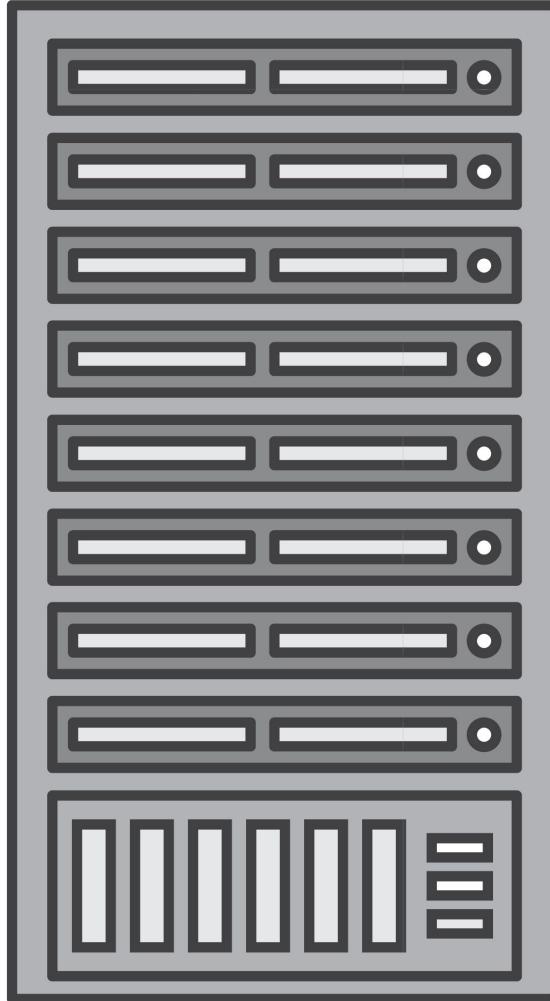


# Advantage #5: Spend Strategically



**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

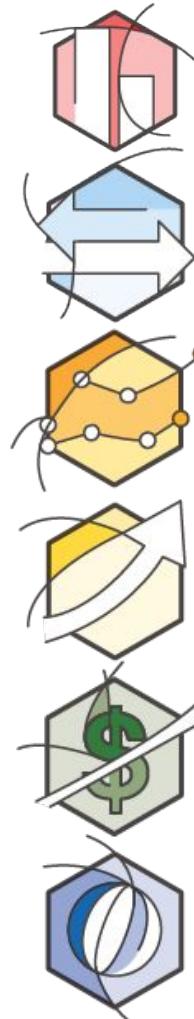
# Advantage #6: Ease of Deployment



**Go global** in minutes.

# Go Global in Minutes





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

Benefit from **massive economies of scale**.

**Eliminate guessing** on your capacity needs.

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

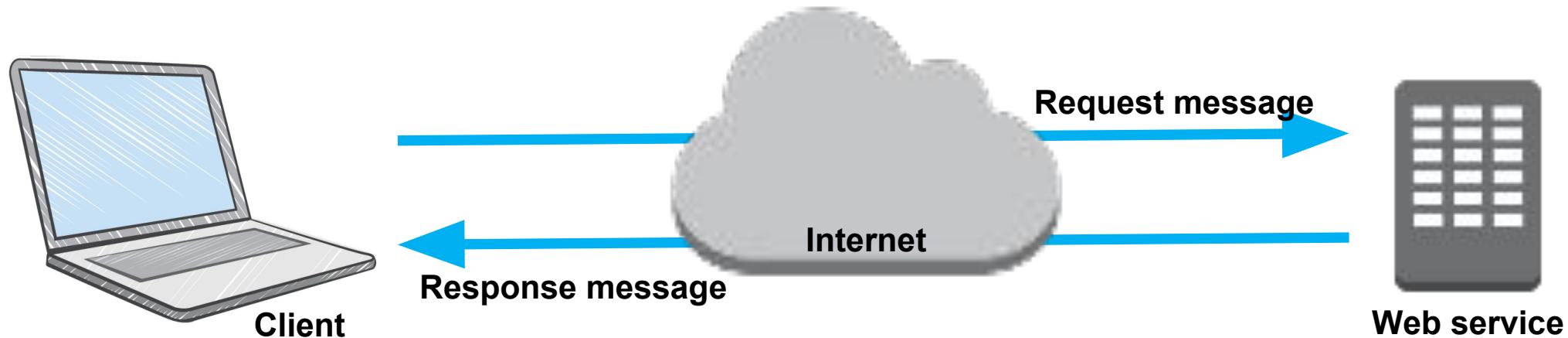
**Stop spending money** to run and maintain data centers.

**Go global** in minutes.

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

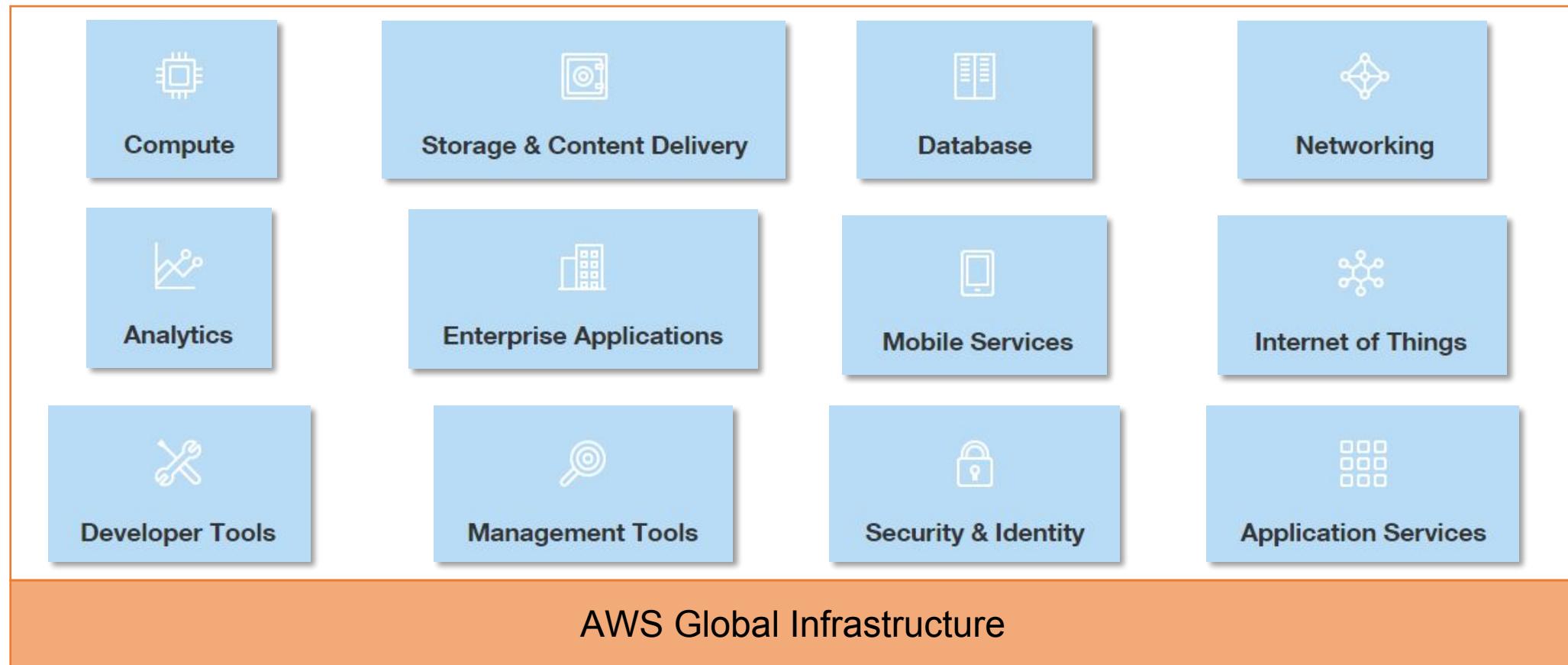
# What are Web Services?

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**.

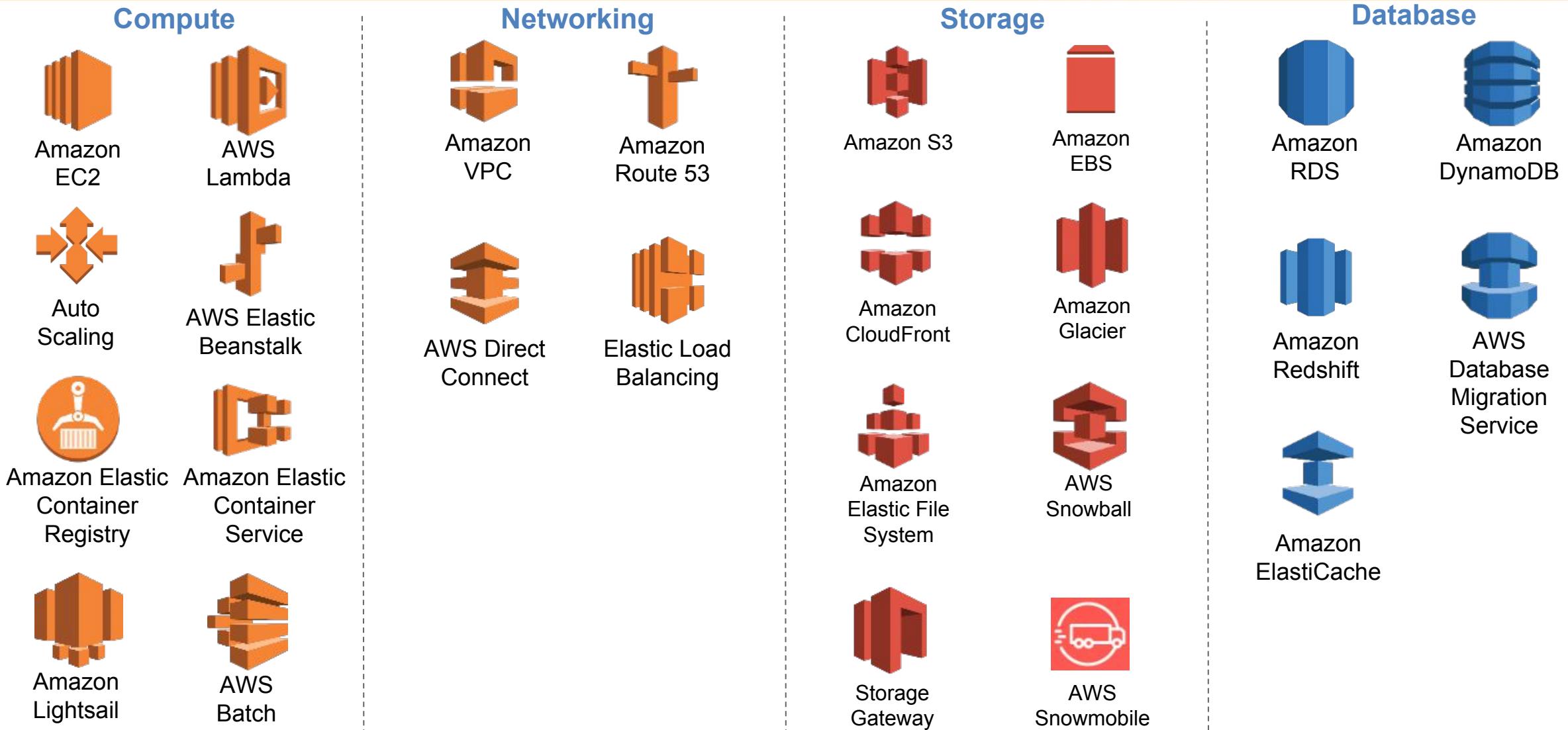


# What is AWS?

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



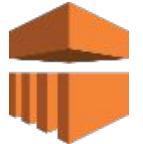
# AWS by Category: Core Services



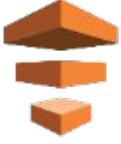
# AWS by Category: Foundational Services



## Analytics



Amazon  
EMR



AWS Data  
Pipeline



Amazon  
Elasticsearch



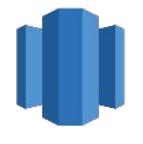
Amazon  
Kinesis



Amazon  
Machine Learning



Amazon  
Quicksight



Amazon  
Redshift



Amazon  
Athena

## Enterprise Apps



Amazon  
WorkSpaces



Amazon  
WorkMail



Amazon  
WorkDocs

## Mobile Services



AWS  
Mobile Hub



Amazon  
Cognito



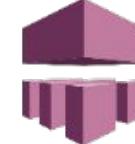
Amazon  
Mobile  
Analytics



Amazon  
Pinpoint



Amazon  
SNS



AWS  
Device Farm



AWS  
Mobile  
SDKs

## Internet of Things



AWS IoT



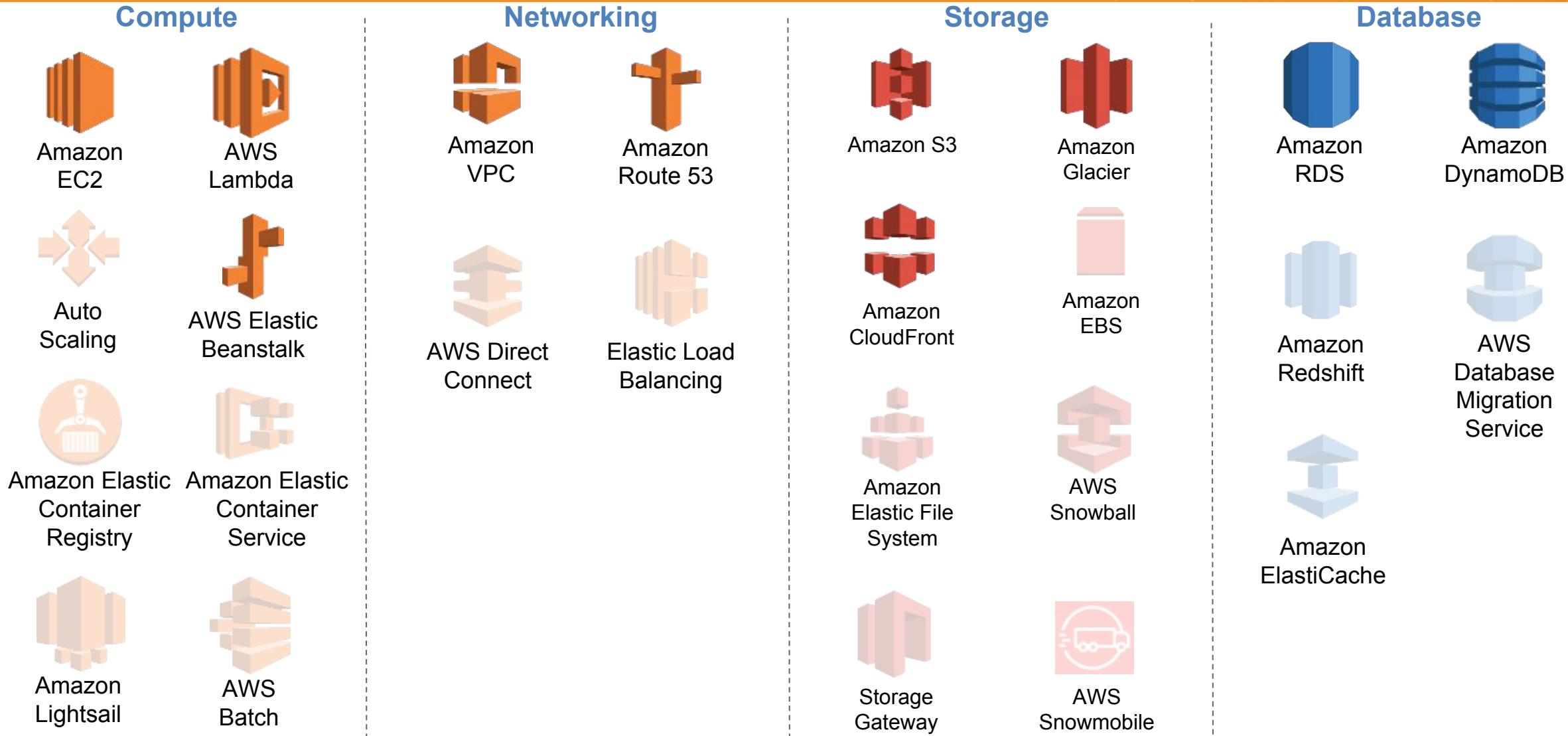
AWS  
Greengrass

# AWS by Category: Developer and Operations Services



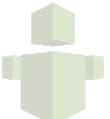
Developer Tools	Management Tools	Security & Identity	App Services
AWS CodeCommit	AWS CodeDeploy	AWS Identity and Access Management	Amazon API Gateway
AWS CodePipeline	AWS CodeBuild	Amazon Inspector	Amazon CloudSearch
AWS X-Ray	AWS OpsWorks	AWS Key Management Service	Amazon SES
	AWS Trusted Advisor	AWS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

# Core Services: The Basics



# Core Services: The Basics



Management Tools		Security & Identity		
	Amazon CloudWatch		AWS CloudFormation	
	AWS CloudTrail		AWS Config	
	AWS OpsWorks		AWS Service Catalog	
	AWS Trusted Advisor			
				
				
				
				

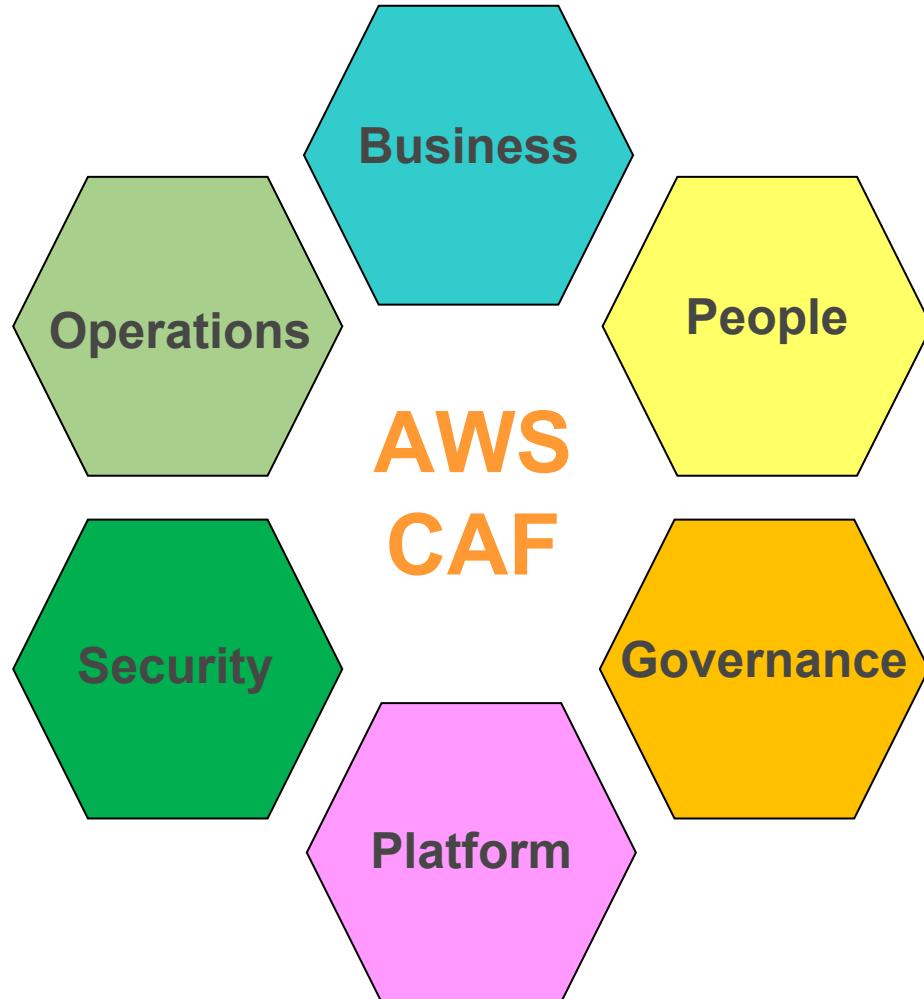
# Access to AWS Services

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



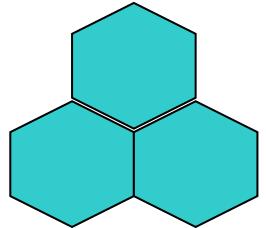
# Part 4: The AWS Cloud Adoption Framework

# AWS Cloud Adoption Framework (CAF)



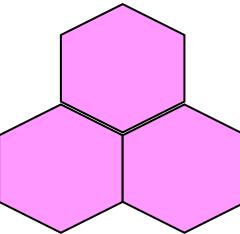
- Perspectives in planning, creating, managing, and supporting a modern IT service
- Guidelines for establishing, developing, and running AWS environments
- Structure for business and IT teams to work together

# Six Core Perspectives



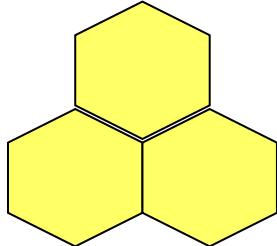
## Business Perspective

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



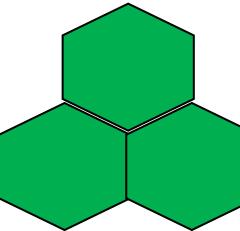
## Platform Perspective

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



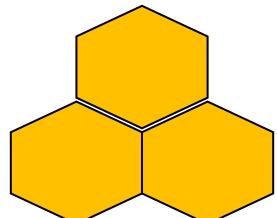
## People Perspective

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



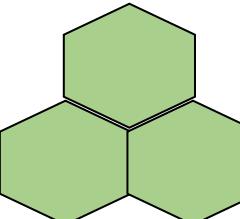
## Security Perspective

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**