



A CLOUD GURU



**AWS  
BUSINESS  
ESSENTIALS**

### Ideal for:

- ✓ Non-technical decision makers
- ✓ Executives
- ✓ Product Managers
- ✓ Program Managers

### This course will cover:

- ✓ The cloud and how it will help grow your business
- ✓ The basic economics of cloud computing
- ✓ How security and compliance work in the cloud
- ✓ An overview of the cloud migration process so you can make IT decisions that align with your business goals

**MARK NUNNIKHOVEN**

A CLOUD GURU

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# The First Question You Should Ask



Mark Nunnikhoven  
AWS Community Hero

# What is the cloud?

## What is Cloud Computing?

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.

How Does Cloud Computing Work?

**Definition**



**Benefits**



If you need light in a room, what do you do? You simply

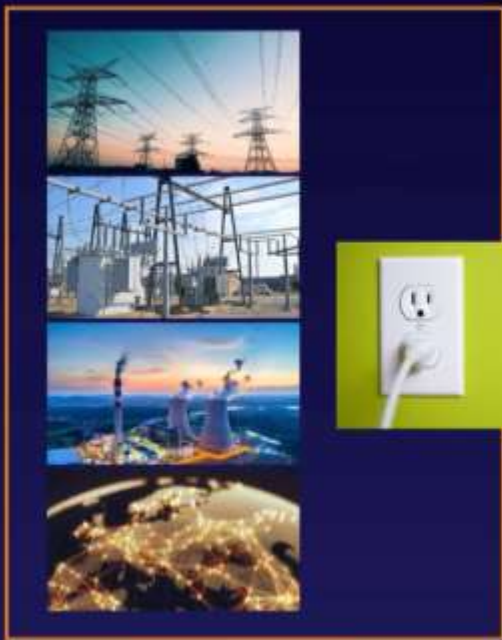


But there are a lot of things going on behind the scenes that make the plug simply work



*Electrical Grid*

This is the electrical grid or the network that abstracts away a lot of the things we should not be worrying about

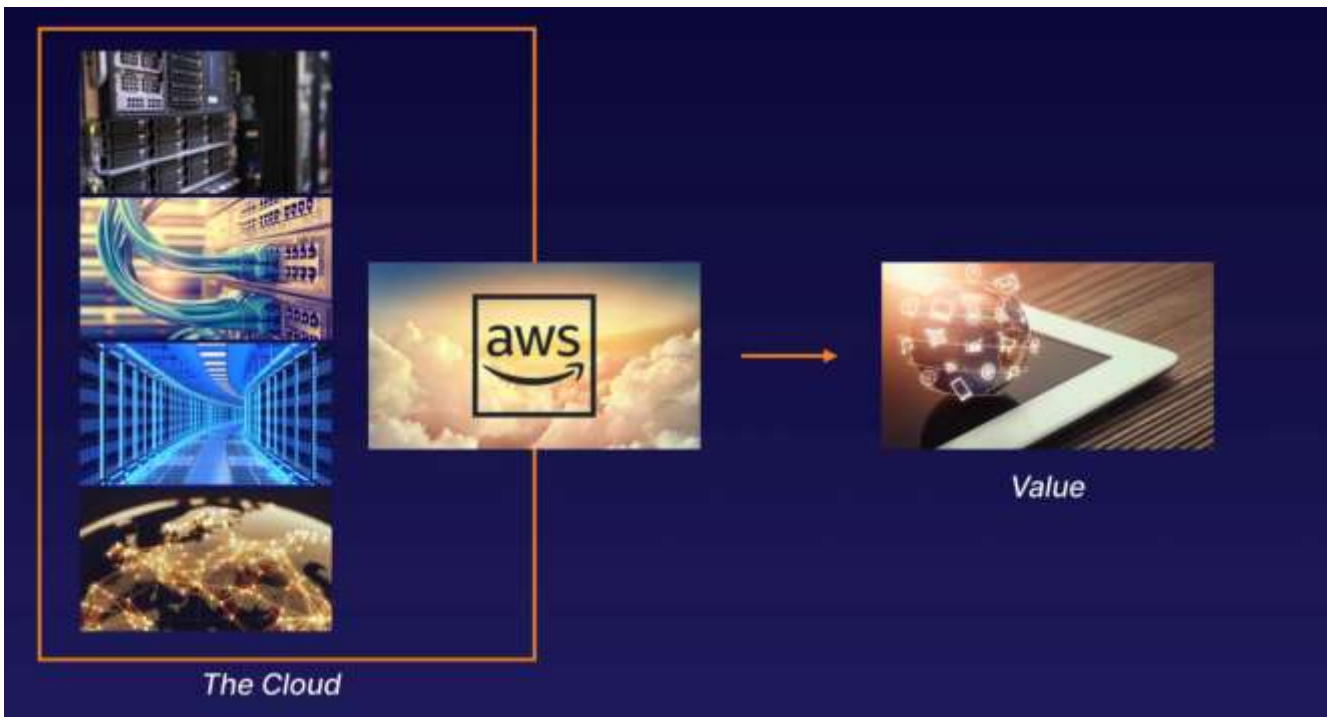


*Electrical Grid*



*Value*





We simply have an interface to plug into the network for different IT resources that we need





But AWS is not a one-size fits all, AWS has different technology stacks that we can use similar to having different plug ins

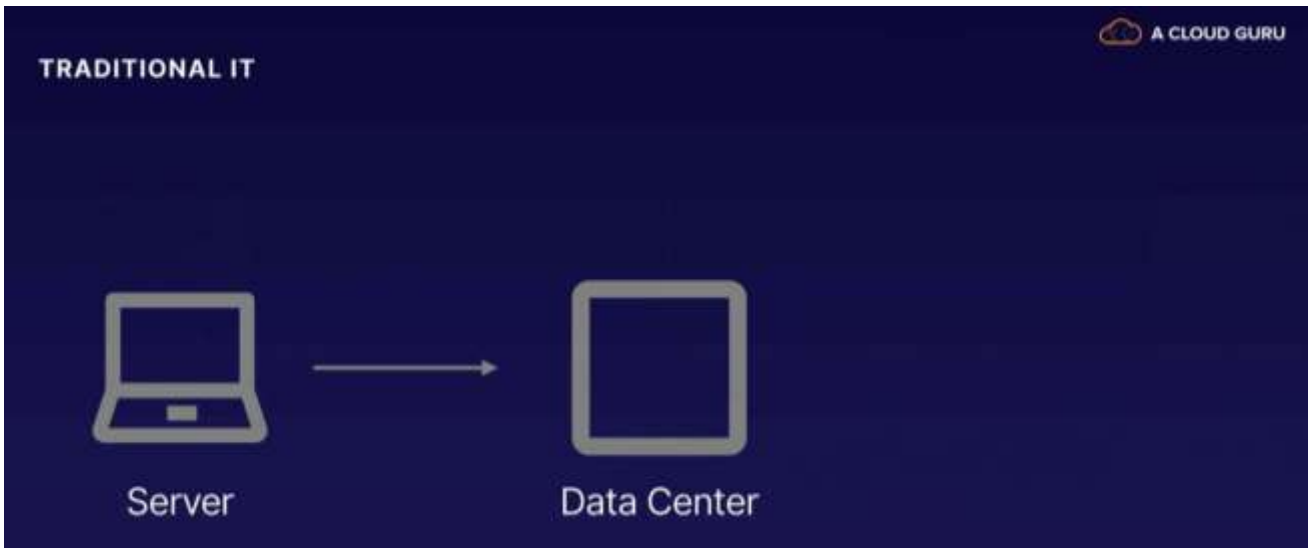


We can simply focus on the value we want to add to our customers or business







But let us see what used to happen in the past for traditional IT



**TRADITIONAL IT** A CLOUD GURU

 <b>Server</b>	 <b>Data Center</b>
<ul style="list-style-type: none"><li>- Do you have one?</li><li>- If no, is it in stock?</li><li>- Is it powerful enough?</li><li>- Is it configured?</li><li>- What's the maintenance plan?</li><li>- How long will it last?</li><li>- What's the warranty?</li><li>- ...</li></ul>	<ul style="list-style-type: none"><li>- Is there sufficient space?</li><li>- ...in the right area?</li><li>- Heat allowance?</li><li>- Power?</li><li>- Cooling?</li><li>- Enough addressable network?</li><li>- Backup space?</li><li>- ...</li></ul>

## TRADITIONAL IT



*Server*



*Data Center*

- Do you have one?

- If no, is it in stock?

- Is there sufficient space?

- Is it in the right area?

# ...1000s of questions later.

## TRADITIONAL IT



*Server*



*Data Center*



*Users*

## TRADITIONAL IT



*Data Center*

- Is the data centre physically close to our target users?
- Redundant routes available to the majority of target users?
- Enough bandwidth available?
- Can teams troubleshoot easily?

- ...



*Users*

- Can the users access our content?
- Is the user access consistent?
- Is the customer experience sufficient? Delightful?
- Is failover transparent to the user?

- ...



## TRADITIONAL IT



*Data Center*



*Users*

Is the data centre physically  
close to our target users?

Can the users access our  
content?

...1000s of questions later.



*The Cloud*



*Value*



**You focus on value.**



# What's different?



## The ticket system.



The old system relies on a ticketing system where you submit what you need and what for your partner to get back to you.



This is a technical contract where you make a request and get the system to get it for you. Consistently and fast.

## AWS Provides a Platform

- The AWS Cloud is a platform that you build on top of.
- This is a vastly different relationship compared to traditional IT deliver services and partners.



## Simple Efficiency

- Traditional IT becomes consistent, reliable.
- Traditional workloads can be "forklifted" and see a immediate and tangible benefit in the cloud.

## Possibilities

- New ways of working become possible.
- The cloud environment allows rapid innovation within the organization.



# The Four Benefits of the AWS Cloud



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## The AWS Cloud

- Is a platform that works like a vending machine for IT.
- Acts as a foundational layer for our business.
- Enables new innovations through modern IT delivery.



## FOUR BENEFITS OF CLOUD COMPUTING



Agility



Go Global



Elasticity



Cost Savings





## Agility

- Focus on business value, not managing infrastructure.
- Quickly access new technologies.
- Try out new ideas with minimal effort.

## Go Global

- Improve response time for users around the world.
- Increase application resilience with global deployments.
- Simplify disaster recovery plans.



## Elasticity

- Scale up and down as business requirements change.
- Automate provisioning entirely.
- Increase operational efficiency.

## Cost Savings

- Pay only for what you consume.
- No up-front costs.
- Leverage unprecedented economies of scale.



## What is Cloud Computing?

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.

How Does Cloud Computing Work?

**The cloud delivers IT resources via the internet with pay-as-you-go pricing.**

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# What is the cloud? Answered.



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# Traditional IT

VS

# The Cloud



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## What Agility Does For Your Business



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AWS Community Hero



### Agility

- Focus on business value, not managing infrastructure.
- Quickly access new technologies.
- Try out new ideas with minimal effort.



# Change direction quickly and easily.



## Traditional IT

- You own and build the foundation.
- Foundations are built to support specific services.
- Any service not supported requires time consuming and expensive changes to the foundation.



## IT Is Slow

15% of organizations need up to six months to incorporate changes to an application.

As per DORA's 2018, "State of DevOps" global survey. Worse, these 15% have a failure rate of 46-60% for each change.



# The AWS Cloud

- AWS is responsible for the foundation.
- Exposes many pre-built options and allows for customization.
- Pick and choose what's needed and start building!



**Provides an increase in speed.**

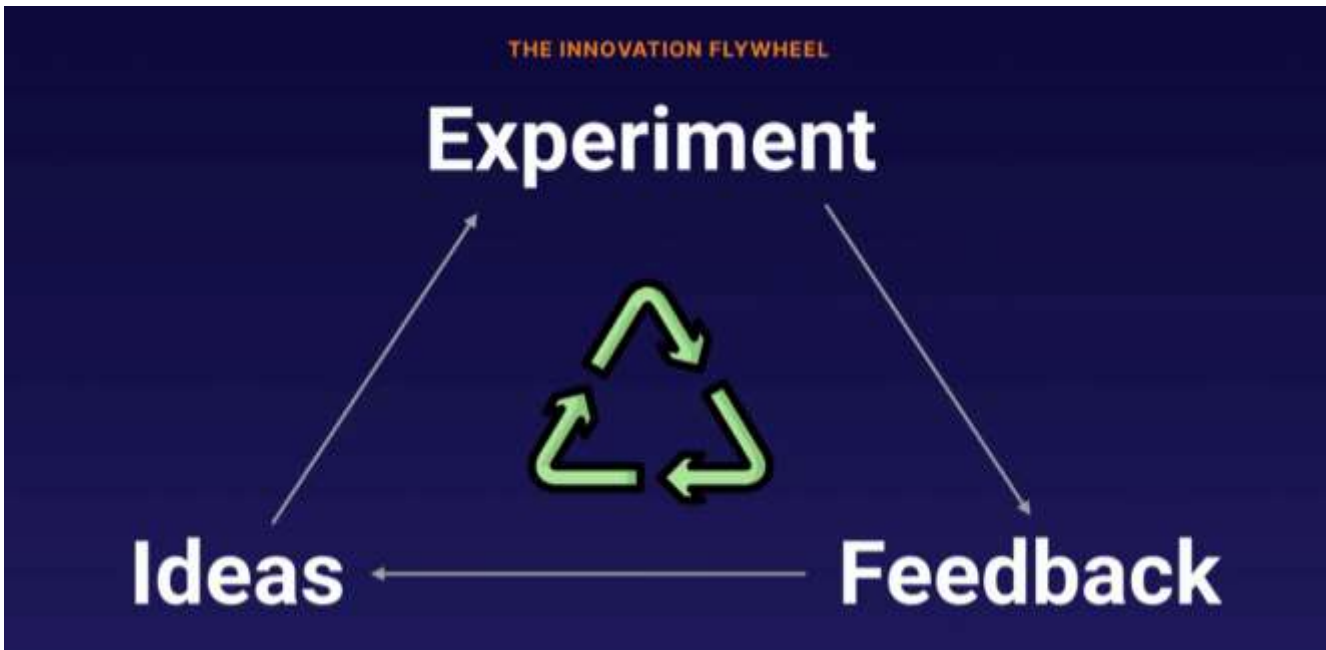


**Provides the tools for experiments.**





Is truly 'plug and play.'



This is a core part of modern application development for agile development for going faster



## KEY TERMS

**API** An Application Programming Interface is a set of actions that can be requested and fulfilled automatically by a user, code, or other tool.

For example, asking for a new server is one API call to AWS, specifically to the EC2:RunInstances endpoint.

You can put different tool on top of the AWS API

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# Why Going Global Changed The Game

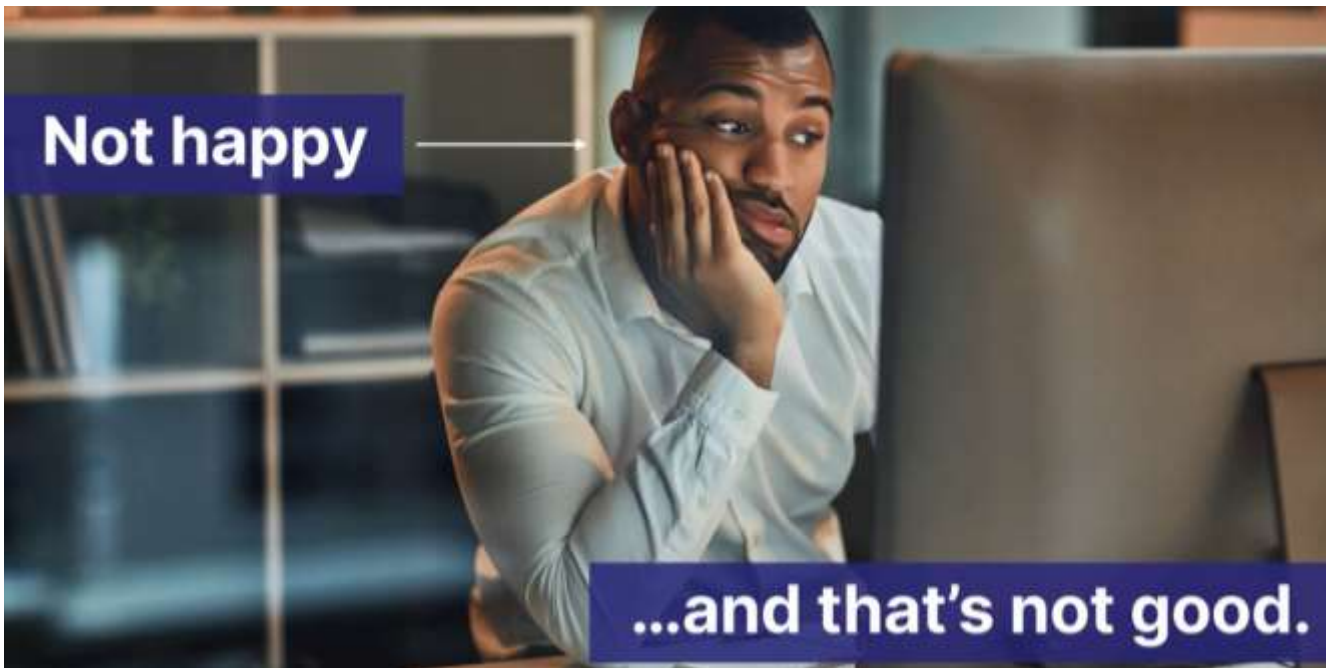


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## Go Global

- Improve response time for users around the world.
- Increase application resilience with global deployments.
- Simplify disaster recovery plans.





It affects how far an app responds to you due to its distance and packet travel



This is why you need to be thinking about going global and reducing response times for your app

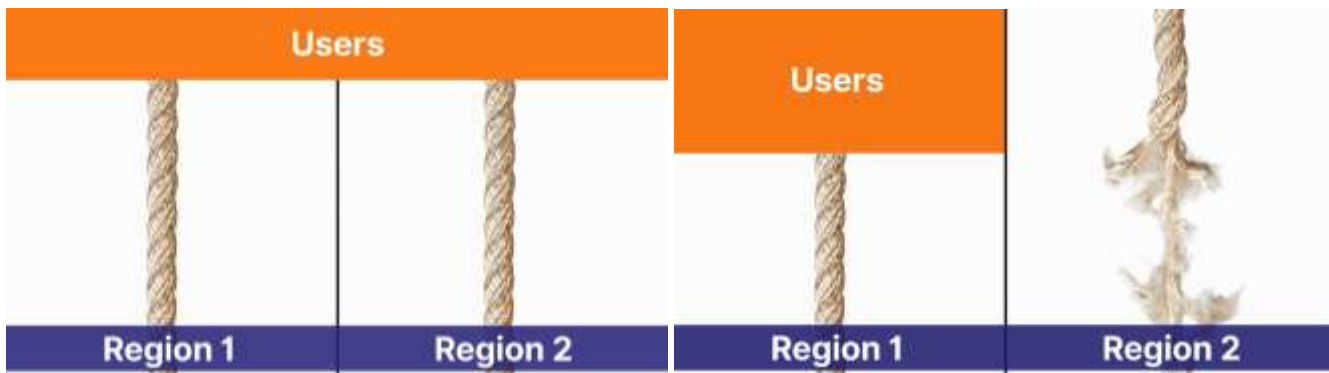
**Increase resilience by partitioning.**



**Recover from disasters quicker.**



This helps us reduce our failure blast radius for application resiliency



This is an active-active deployment that allows us to have smooth failovers when deployed globally



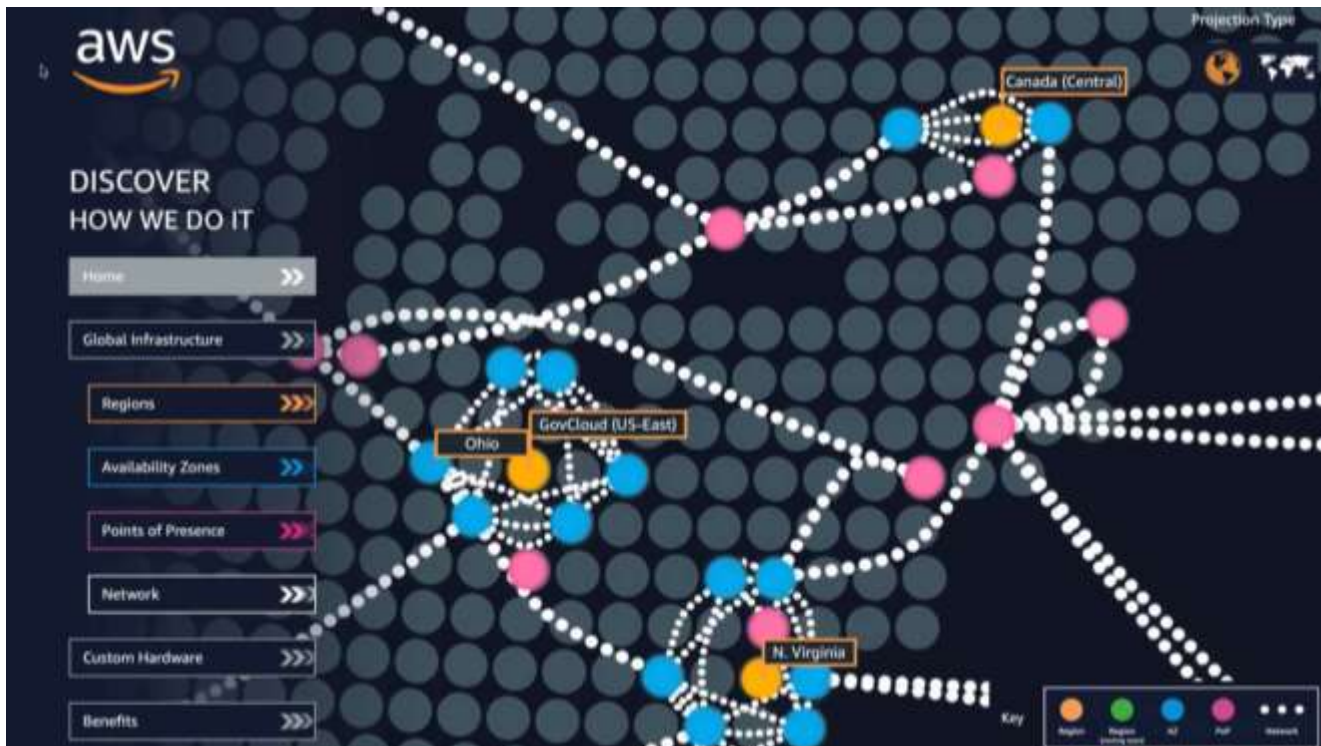
# AWS Global Infrastructure



The Most Extensive, Reliable and  
Secure Global Cloud Infrastructure  
Available

[SEE HOW WE DO IT >>>](#)

The Amazon Web Services (AWS) Global Infrastructure delivers a cloud infrastructure companies can depend on—no matter their size, changing needs, or challenges. The AWS Global Infrastructure is designed and built to deliver the most flexible, reliable, scalable, and secure cloud computing environment with the highest quality global



These are components of the AWS cloud using globally physically, distributed infrastructure components and services

#### KEY TERMS

### Region

A geographic area where AWS services are physically hosted from. Regions contain multiple availability zones (usually 3).

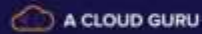
### Availability Zone

A set of data centers (usually 3) operating together to deliver fault-tolerant service to customers.

## Go Global

- Improve response time for users around the world.
- Increase application resilience with global deployments.
- Simplify disaster recovery plans.





# How Elasticity Transforms IT



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## Elasticity

- Scale up and down as business requirements change.
- Automate provisioning entirely.
- Increase operational efficiency.

**Scale to meet changing business demands.**







Using a capacity graph as above, demand and capacity are in lock step when using the AWS Cloud. Capacity can be automatically provisioned if needed



Provisioning is mostly automated in the AWS Cloud.



You only do an initial automated configuration of your AWS Cloud setup and things will automatically scale up in future



Automated provisioning works to scale up and scale down when needed in the AWS Cloud



#### KEY TERMS

## Auto Scaling

A feature of various AWS services to automatically scale capacity **up** and **down** as demand changes.



## Elasticity

- Scale up and down as business requirements change.
- Automate provisioning entirely.
- Increase operational efficiency.

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# How Pay-as-you-go Creates Opportunity



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AWS Community Hero



# Cost Savings

- Pay only for what you consume.
- No up-front costs.
- Leverage unprecedented economies of scale.



**Pricing is based on consumption.**



Traditional

AWS



OPTIMIZED SPEND



CAPACITY  
DEMAND



## Further Savings

- Variable or stable pricing models available
- Use more and save more with tiered pricing, volume discounts, and custom pricing

Variable pricing aligns more for variable workloads, there are tools in AWS to help you figure which pricing model to adopt

## No up-front costs.



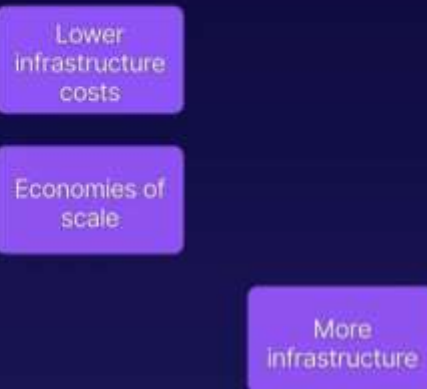
## CapEx to OpEx

- Replace heavy up-front cost with lower variable costs.
- Reduced barrier to entry.
- Investment tied directly to business needs.



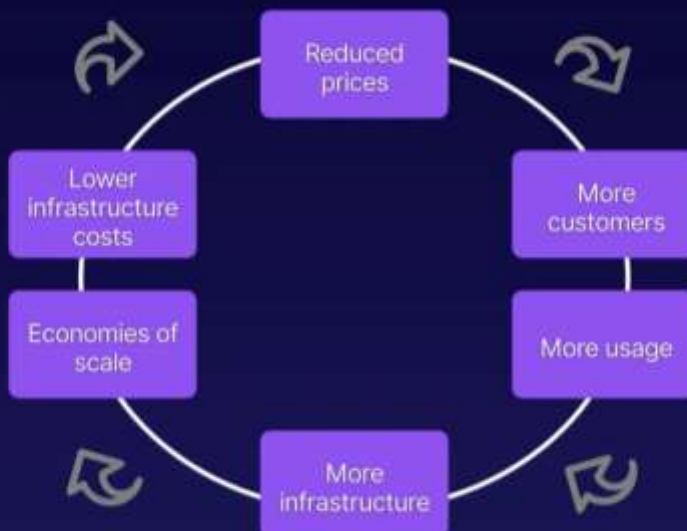
# Economies of scale.

## AWS MOTIVATIONS



AWS' per unit costs are lower than every other business and they pass those gains to their customers

## AWS MOTIVATIONS





#### KEY TERMS

### Consumption-based Pricing

Costs are linked 1:1 to usage. If you store 1 GB of data, you are billed for 1 GB of data.


### Tiered Pricing

Lower prices made available as a result of increased usage.

### Cost Savings

- Pay only for what you consume.
- No up-front costs.
- Leverage unprecedented economies of scale.



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## Adding the AWS Cloud to Your Current Deployment



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The AWS Cloud is not an all-or-nothing approach

## Bridging into the cloud as an extension.



You can start by building a bridge that extends your current deployments into the cloud as a starter.



## What You Have Works

- Existing investments are meeting customer needs.
- With an eye to the cloud, continuing to invest in traditional data centers and technologies no longer makes sense.

## Extend into the Cloud

- Add capacity in the cloud.
- Extend your network for seamless connectivity.
- Gradually start to leverage higher level AWS services.



Add more systems and capacity in the cloud instead. You can also extend your network into the cloud.



## Forklift Friendly

By using AWS as an extension of your existing network, it's easy to forklift applications into the cloud one at a time.

This may seem like a baby step into the cloud but for some organizations, this is a wonderful first step. It allows teams to come up to speed on what the AWS Cloud offers without having to disrupt the current level of operations.



## Migrating Everything to the AWS Cloud



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All in. ASAP.



## What You Have Is Outdated

- Existing investments are end-of-life or very close.
- Current infrastructure is preventing you from deploying the solutions that your business requires.
- Financial motivator to move to a new solution.



# Move to the Cloud

- Replicate existing infrastructure in the cloud.
- Minimal connections to current infrastructure as it is being retired.



This is about MOVING your entire systems into the AWS Cloud, you are not bridging or linking the old environment in this case.



## Forklift Express

Moving to AWS as quickly as possible often means creating a replica of your existing environment in the cloud.

As long as replicating your existing environment in the AWS Cloud is done as a temporary measure to avoid another challenge with your existing infrastructure. This can be a smart move. However, teams should apply the modern application development framework as soon as possible to get the most out of building in AWS.

You can then gradually change your application designs to be cloud-native once you are into the AWS Cloud.

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# Creating New Solutions in the AWS Cloud



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AWS Community Hero

# Starting “from now on...”

START —



## From This Day Forward...

- Any new project will be built cloud-native from the stated point in time.
- Current infrastructure is maintained with existing solutions and processes.
- Balances need for new solutions while continuing to meet business needs.

## Building New in the Cloud

- Logical way to transition to the cloud.
- AWS provides a suite of tools to help manage hybrid infrastructures.
- Challenges with teams over who gets to build with newer tools and with powerful new services.





## Old + New

Building all new projects in the AWS Cloud allows teams to gradually migrate workloads and skills.

This balanced approach moves at a reasonable pace for most organizations. As long as teams are aware of and prevent running a set of processes for the cloud and another set for the traditional environment, the business will see an overall benefit. Team perceptions need to be addressed up front to avoid conflicts.

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# How to Pick an Adoption Strategy



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AWS Community Hero



**No up-front costs.**

Regardless of which strategy you use, there are no upfront costs. There might also be situations with multiple mix of strategies in your company's cloud adoption

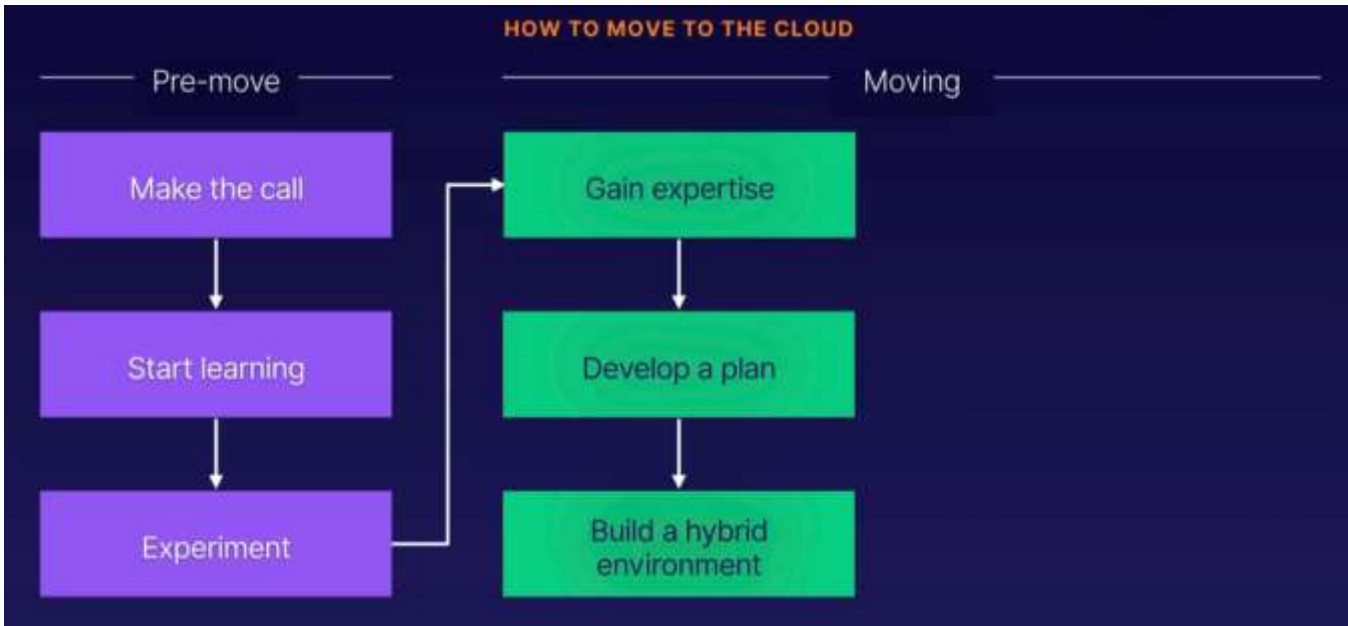




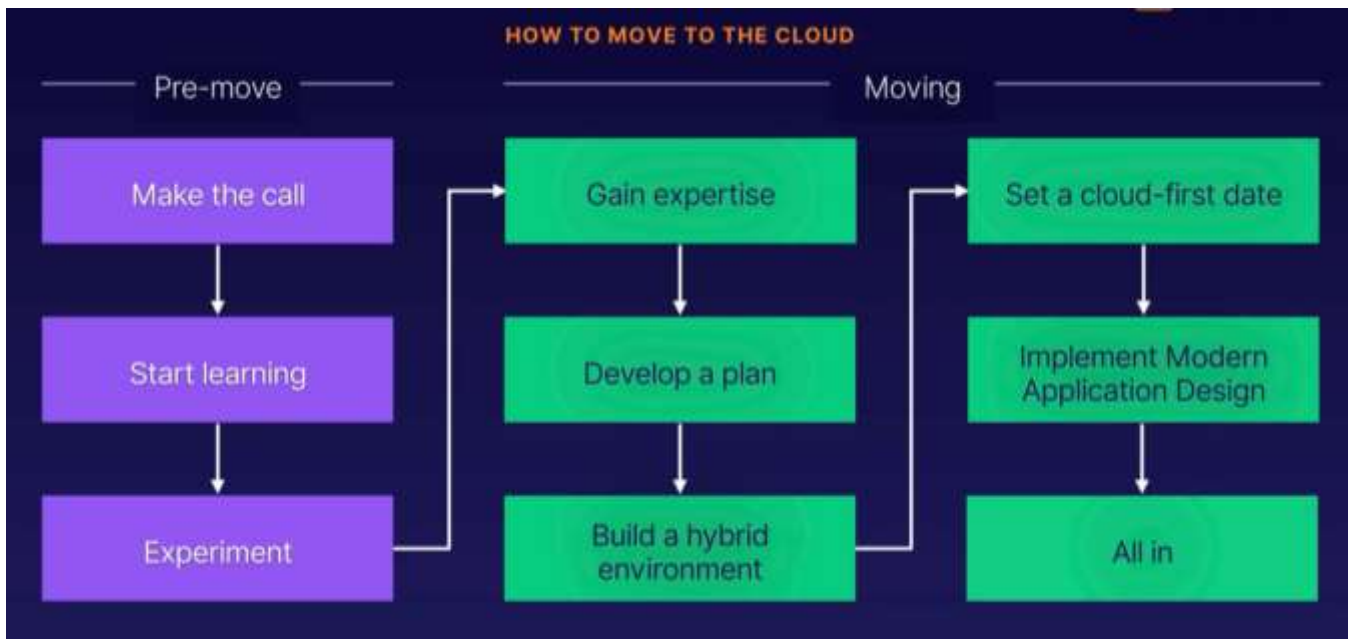
# Setting a Course

- Rarely do organizations use only one migration strategy.
- External factors and internal pressures change the pace of adoption in each organization.
- A blended approach is often the best. The Cloud Adoption Framework will help each organization find their specific balance.

AWS has the Cloud Adoption Framework to help you map out your stakeholders, solutions and give you a strategy to follow



Develop a plan is about using the cloud adoption framework from AWS



This involves refactoring, re-platforming and redesigning your old systems for the cloud.



Let us see how the cloud adoption framework can help you and your business move to the cloud.



Cultural, technology, skillset changes as you move into the cloud



## Build an Action Plan

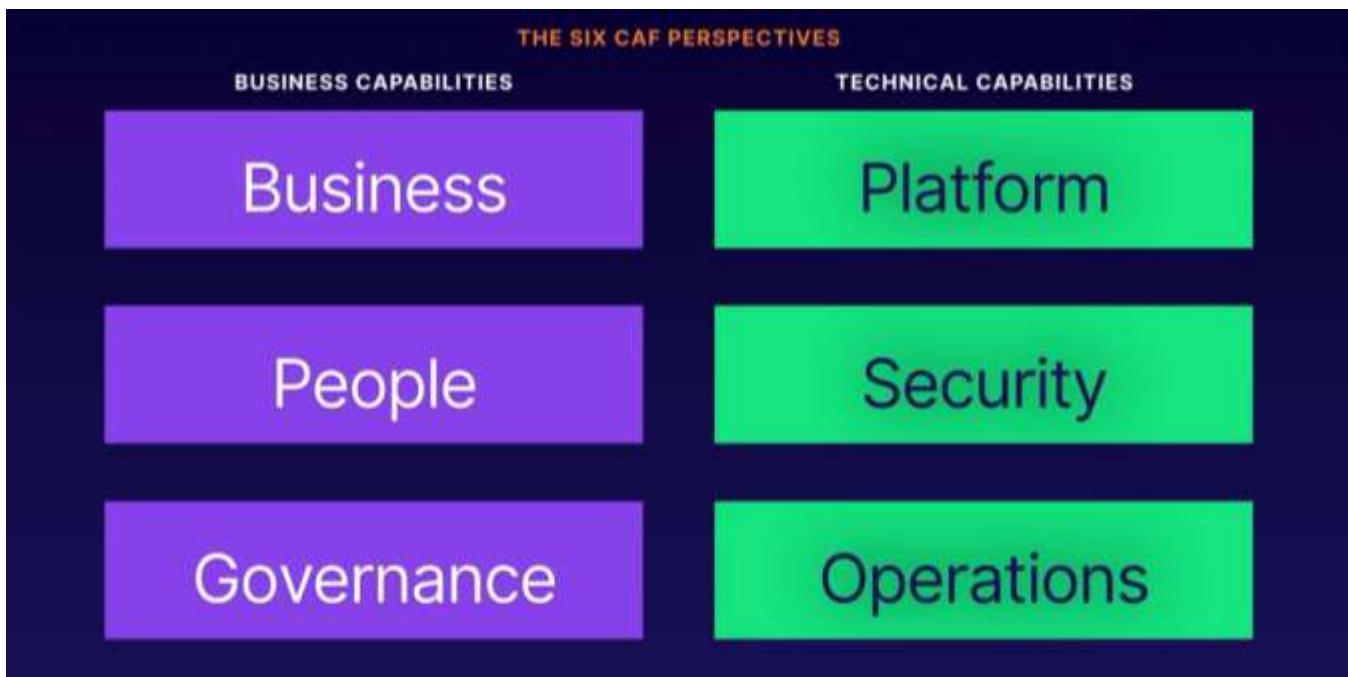
- Based on AWS' global experience.
- Breaks up the work into 6 perspectives.
- Helps define and clarify the scope of work.
- Focuses on desired outcomes.

This is a master document that will help you map out action steps to help you on your digital transformation cloud journey in a practical way. They involve 6 parts for the different parts that you need to focus on.



These are the softer/people side of the 6 parts and are mainly focused on process





The platform refers to the AWS Cloud, features and managed services being used within it.



## Action Plan

Everything in the framework leads to the construction of an action plan.

This plan provides clarity for teams within the organization as to how their roles and the technologies they use will change with cloud adoption.

The plan is a map for your cloud adoption journey.

A slide with a dark blue background. On the left, there is a circular inset image showing a hand holding a red pen over a collage of colorful sticky notes with various business-related terms like 'CREATIVITY', 'MARKETING', 'BIG PRO', 'IDEA', 'PRODUCT', 'VALUE', 'CONCEPTS', and 'TEAMWORK'. To the right of the image, the title 'Action Plan' is written in large white font. Below the title, there is a paragraph in orange text stating 'Everything in the framework leads to the construction of an action plan.' followed by two paragraphs in white text explaining the purpose and role of the action plan in cloud adoption.

This is a master document to provide clarity for teams within your organization on their role and how these might change as you move into the cloud.

#### KEY TERMS

**Action plan** The output of an organization working through the Cloud Adoption Framework.

**Perspective** An area of focus for culture and technology within the framework with defined stakeholders.

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# The Well-Architected Framework



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AWS Community Hero



The Well-Architected Framework is all about how to make good technology choices when building in the AWS Cloud



## Make the Right Trade-off

- Framework helps you evaluate pros and cons of the choices you make while building.
- Intended to help you apply technical best practices.
- Goal is resilient, applications that deliver business value.

## Core Principles

- Scale up and down as required.
- Automated systems ensure consistency and reliability.
- Test at scale for accuracy.
- Adapt the architecture as needed to meet new challenges.
- Drive decisions through data.
- Use "game days" to practice operations and validate architectural choices.



### THE FIVE PILLARS



Operational  
Excellence



Cost  
Optimization



Reliability



Performance  
Efficiency



Security





## Deliver Value

The framework is a tool to help constantly adjust your workload to best meet your business requirements.

Your business needs are constantly changing. The technology available in the AWS Cloud is too.

The Well-Architected Framework provides the tools your technical teams need to help make the best decisions to deliver your desired outcomes.

### KEY TERMS

**Pillar** A core area of practice and focus when building in the AWS Cloud.

**Lens** Resources (typically a whitepaper) that highlight how the Well-Architected Framework works when applied to a specific use case.

There are 5 Pillars or major concerns and 3 Lenses as whitepapers in the Well Architected Framework.

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# Modern Application Development Framework



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AWS Community Hero



## Changing how you build solutions.

These are a set of ideas on how to modernize existing applications



## Applications Change

- There is no right design, just a series of improvements.
- Modern Application Design as a practice helps guide those improvements.
- Helps you take traditional applications to cloud-native.

## Innovation

- A "flywheel" of ideas > experimentation > feedback.
- This framework helps you modernize applications over time.
- Applications need to balance new features with "hidden" work to ensure continued performance and sustainability.



#### MODERN APPLICATIONS ARE...

Secure

Modular

Resilient

Automated

Elastic

Interoperable

These attributes define flexibility for a modern application

#### FOUR PATHS TO MODERN APPLICATIONS

## REWARDING WAYS FORWARD

There are four pathways in modern application development. These pathways are not mutually exclusive and teams often find themselves using all four at various points on their cloud journey.

### Re-host

"Forklift" lift and shift as-is from the data center. No substantial changes made.

### Re-platform

"Forklift" from the data centre with small modifications.

### Re-factor

Break up monolith applications.  
Restructure into a more modern design

### Re-invent

Serverless, microservices, and awesomeness. Cloud-native applications taking advantage of the AWS Cloud

#### KEY TERMS

## Innovation Flywheel

The repeated process of having an idea, performing a small experiment, and then gathering feedback. As the team gets more experienced with this process they get faster and faster at innovating and responding to customer needs.



# The AWS Partner Network



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**Getting help from the experts.**



## Proven Expertise

- From technology products, services, or consulting expertise, the AWS Partner Network (APN) is a great place to start looking for qualified help.
- 5 levels of partners: registered, select, advanced, premier, and MSP/competency.
- Each level requires a higher commitment from the partner.

# Marketplace

- A digital catalog of AWS Partner solutions.
- Quickly launch offers with a few clicks.
- Pay for third-party services directly on your AWS bill, greatly simplifying procurement.



# Competencies

- Validation by AWS that a partner has met specific goals around a speciality.
- Helps you filter through the AWS Marketplace and available vendors.
- Wide range of categories from DevOps to education to security.



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# Calculating Total Cost of Non-Ownership



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Am I seeing value?





## TCO

- Total cost of ownership is an estimate of the financial cost of all aspects (direct and indirect) of running a solution.
- When applied to IT, the goal is to calculate the cost of power, cooling, maintenance, connectivity, etc. in addition to initial costs so you can compare approaches.

## Cheaper In the Cloud?

- Building in the AWS Cloud is a more efficient use of your budget, not necessarily a less expensive one
- AWS removes almost all of the maintenance and infrastructure costs.
- Total cost of ownership comparisons are the only fair way to compare.



## It's Complicated

- Paying for actual usage better aligns IT with business value.
- Keeping track of usage and billing is difficult and can be a full time job.
- This is a subject you should be paying attention to constantly.



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# AWS Cost Control

Drive down your cloud costs. Learn how to be cost effective when using AWS services, design for cost, get free AWS credits and much more.

[START THIS COURSE →](#)

BT - ABOUT THE COURSE

23

TOTAL LESSONS

4.5

HOURS OF VIDEO

## AWS Cost Control by Paul Wakeford

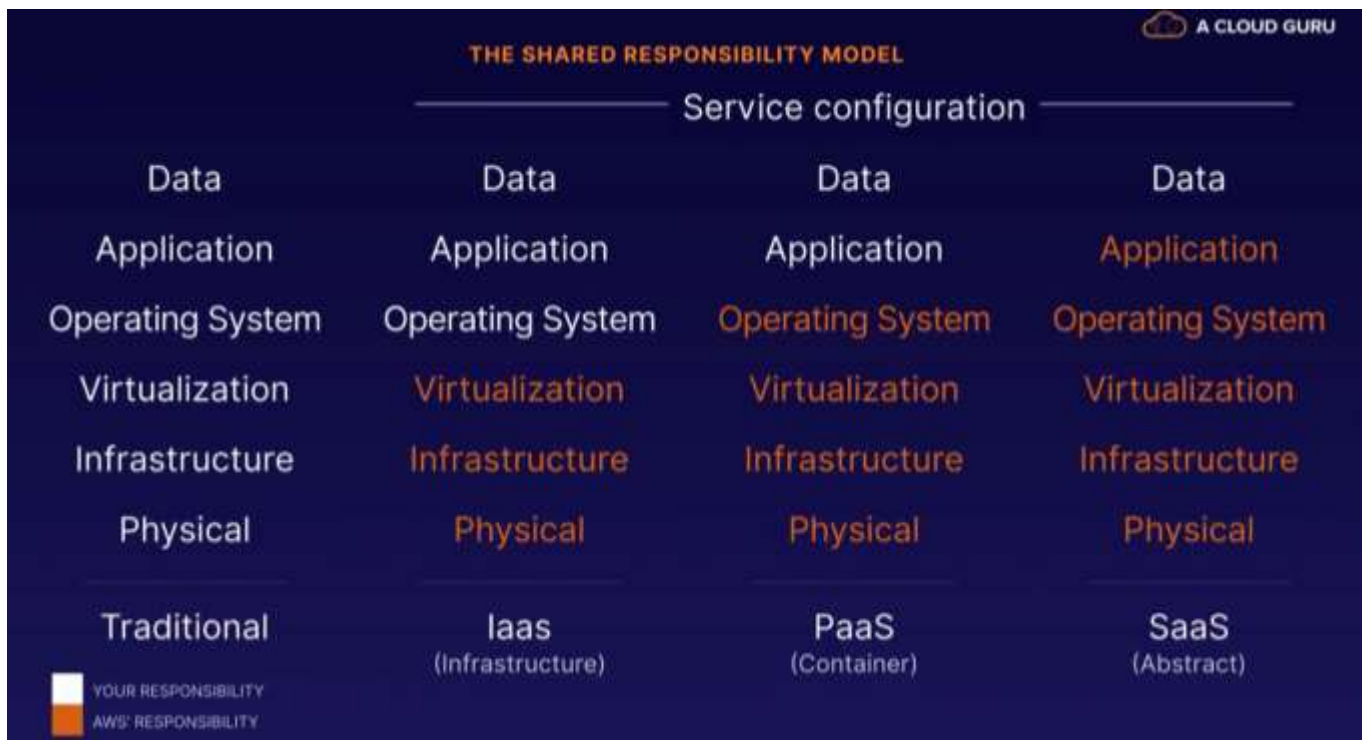
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# How Everything Works in the AWS Cloud

 Mark Nunnikhoven  
AWS Community Hero

## Working together to deliver business value.



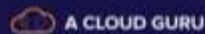


There are 6 main areas where something has to be done every day. In a traditional environment, your business is responsible for all the 6 parts. Moving into AWS Cloud and using the infrastructure services allow you to delegate 3 parts to AWS to make good choices and you will make good choices too. In SaaS e.g. S3, you only worry about the Data.



## Verify AWS' Work

- You are also responsible for verifying that AWS is fulfilling their part of the Shared Responsibility Model.
- Third-party compliance framework validation provides proof that they are.



## Who Owns The Data?



Mark Nunnikhoven  
AWS Community Hero

**Your data is always under your control.**



## Information

Given Name	John
City	Spokane
City	
Durati	

**CONFIDENTIAL**

## Privacy Policy

- AWS has a crystal-clear privacy policy: your data is yours.
- You "...maintain full control of your content and responsibility for configuring access..."
- "You choose how your content is secured" which aligns with the Shared Responsibility Model.



## Where Is My Data?

- You choose the AWS Region where your data is stored.
- Data will not be moved out of the region without your explicit consent except as legally required.
- AWS does provide tools to easily replicate data across regions that are entirely at your disposal.



## Easy Encryption

- Encryption puts your data under lock and key.
- AWS provides a number of services and features to encrypt your data in transit and at rest.
- The critical aspect of encryption is managing the keys. AWS helps here as well but it is still your responsibility.

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## How Secure is the AWS Cloud?



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AWS Community Hero

# Security is relative.



## The Goal

- Cybersecurity is often misunderstood.
- There is no such thing as "secure". It's not a binary state.
- The goal is very simple: to make sure whatever you've built works as intended...and only as intended.

## In and of the Cloud

- Security **OF** the cloud refers to all of the security controls, processes, and effort that AWS puts into the services they offer.
- Security **IN** the cloud refers to the work you have to do to secure your builds.
- This breakdown aligns directly with the Shared Responsibility Model.





**Passport**

## Who Is This?

- Identity is a critical security concept.
- Users and systems need to be identified (authenticated) and granted specific permissions (authorized).
- The AWS Cloud service IAM – Identity and Access Management – is woven into every other service in the AWS Cloud, making it easy to maintain a strong identity practice.

## Easier in the Cloud

- Security can be challenging but the shared responsibility model shows why it is easier in the cloud: you delegate at least half of the daily work to AWS.
- Sharing responsibility helps you address the cybersecurity skills gap.
- Building on world-class foundations reduces the likelihood of mistakes though misconfigurations continue to be a challenge.



You need to focus on your service configurations, including the roles and responsibilities assigned to your users and services.

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# The AWS Cloud. Summarized.



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AWS Community Hero





**The AWS Cloud is massive.**

**Working together to deliver business value.**



**Your data is always under your control.**



## FOUR BENEFITS OF CLOUD COMPUTING



Agility



Go Global



Elasticity



Cost Savings

## Traditional IT

vs

## The Cloud



Agile

Global

Elastic

Pay-as-you-go

**The cloud delivers IT resources via the internet with pay-as-you-go pricing.**



# AWS Terms You Need to Know



Mark Nunnikhoven  
AWS Community Hero



## The AWS Cloud

The collection of constantly evolving services that make up the AWS platform.

## API

An Application Programming Interface is a set of actions that can be requested and fulfilled automatically by a user, code, or other tool.

For example, asking for a new server is one API call to AWS, specifically to the EC2:RunInstances endpoint.

## Region

A geographic area where AWS services are physically hosted from. Regions contain multiple availability zones (usually 3).

## Availability Zone

A set of data centers (usually 3) operating together to deliver fault-tolerant service to customers.



## **Auto Scaling**

A feature of various AWS services to automatically scale capacity **up** and **down** as demand changes.

## **Consumption-based Pricing**

Costs are linked 1:1 to usage. If you store 1 GB of data, you are billed for 1 GB of data.

## **Tiered Pricing**

Lower prices made available as a result of increased usage.

### **KEY TERMS—CLOUD ADOPTION FRAMEWORK**

## **Action Plan**

The output of an organization working through the Cloud Adoption Framework.

## **Perspective**

An area of focus for culture and technology within the framework with defined stakeholders.

### **KEY TERMS—WELL-ARCHITECTED FRAMEWORK**

## **Pillar**

An core area of practice and focus when building in the AWS Cloud.

## **Lens**

Resources (typically a whitepaper) that highlight how the Well-Architected Framework works when applied to a specific use case.

## Innovation Flywheel

The repeated process of having an idea, performing a small experiment, and then gathering feedback. As the team gets more experienced with this process they get faster and faster at innovating and responding to customer needs.



## Amazon EC2

A service that provides servers (known as “instances”) on demand. Instances can be configured with a variety of different performance profiles.



## Amazon VPC

A Virtual Private Cloud provides an isolated network for your AWS assets. Referred to simply as a VPC, this service allows you to logically group your workloads.

An account can host multiple VPCs.



## Amazon S3

The Amazon Simple Storage Service (see what they did there?) was the first ever generally available AWS service.

It allows you to store files in a collection called a “bucket”. Its ease of use and low cost have made it the go-to for cloud storage.



## Amazon DynamoDB

A “NoSQL” database service that allows unprecedented scale. NoSQL means it breaks away from traditional database structures.

This enables some high performance applications that were previously extremely difficult to engineer.



## AWS IAM

The Identity and Access Management service is the cornerstone for security in the AWS Cloud.

It helps you confirm the identity of users and services (authentication) and set what they are allowed to do (authorization).



## Serverless

An architecture for solutions that only uses SaaS-level services to create a customized solution.

These solutions are truly cloud-native and allow developers to focus almost entirely on delivering business value.





## AWS Lambda

A service that allows you to run your code without worrying about the operating system or any of the typical underlying layers.

AWS Lambda functions are often used to connect other AWS services together like glue.

Next Course to take:

