Introduction to AWS

Εθνικό Μετσόβιο Πολυτεχνείο
28 Μαΐου 2025

Νικηφόρος Μποτής (nbotis@amazon.com)

Sr. Solutions Architect, Δημόσιος Τομέας Ελλάδος/Κύπρου/Μάλτας

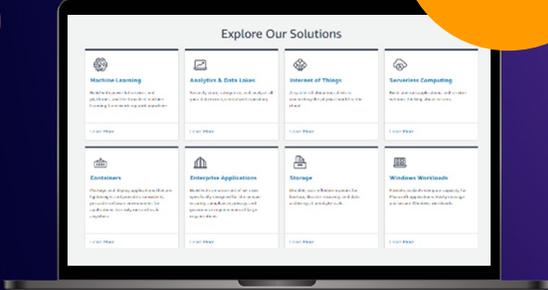| 1994	Founded
1995	Amazon.com
1998	Added CDs & DVDs
2006	Amazon Web Services
2007	Kindle/Prime
2011	Video
2012	Groceries
2014	Alexa/Echo
2015	Bookstores
2017	Amazon Go
2019	Prime Air – Drone Delivery
2023	Kuiper – LOE Satellite

Innovations from Amazon

E-commerce
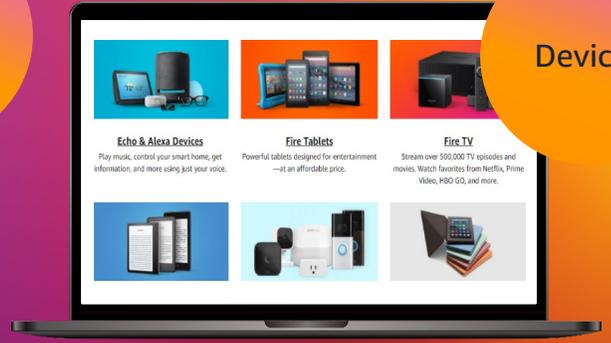
Streaming content

Consumables

AWS

Just Walk Out

Amazon One

Robotics

Scout

Kuiper

Devices

Amazon's Secret Recipe of Innovation

$$f(\text{innovation}) = (\text{org} * \text{arch})^{(\text{mechanisms} * \text{culture})}$$

Amazon's Secret Recipe of Innovation

Mechanisms
- Press Release
- FAQ
- Visuals

Culture
- Leadership Principles
- Hire builders
- Accept failure

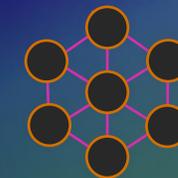$$f(\text{innovation}) = (\text{org} * \text{arch})^{(\text{mechanisms} * \text{culture})}$$

Innovation
- Customer obsession
- Invent on behalf of customers
- Long-term thinking

Organization
- Two pizzas
- Full ownership
- Full accountability

Architecture
- Microservices
- Self-service tools
- Automation

The **most secure, extensive, and reliable** Global Cloud Infrastructure

Infrastructure allows customers to run workloads

Customers have the same access and capabilities no matter where you are

240+ fully featured services from data centers globally

The Everywhere Cloud

31 Wavelength Zones

114 Availability Zones

36 REGIONS

A Z

A Z

700+ Points of Presence

43 Local Zones

On-premises

Outposts & Private 5G

Internet of **Things**

IoT Greengrass & FreeRTOS

Rugged edge

Snow Family

The **next frontier**

Ground Station

Kuiper
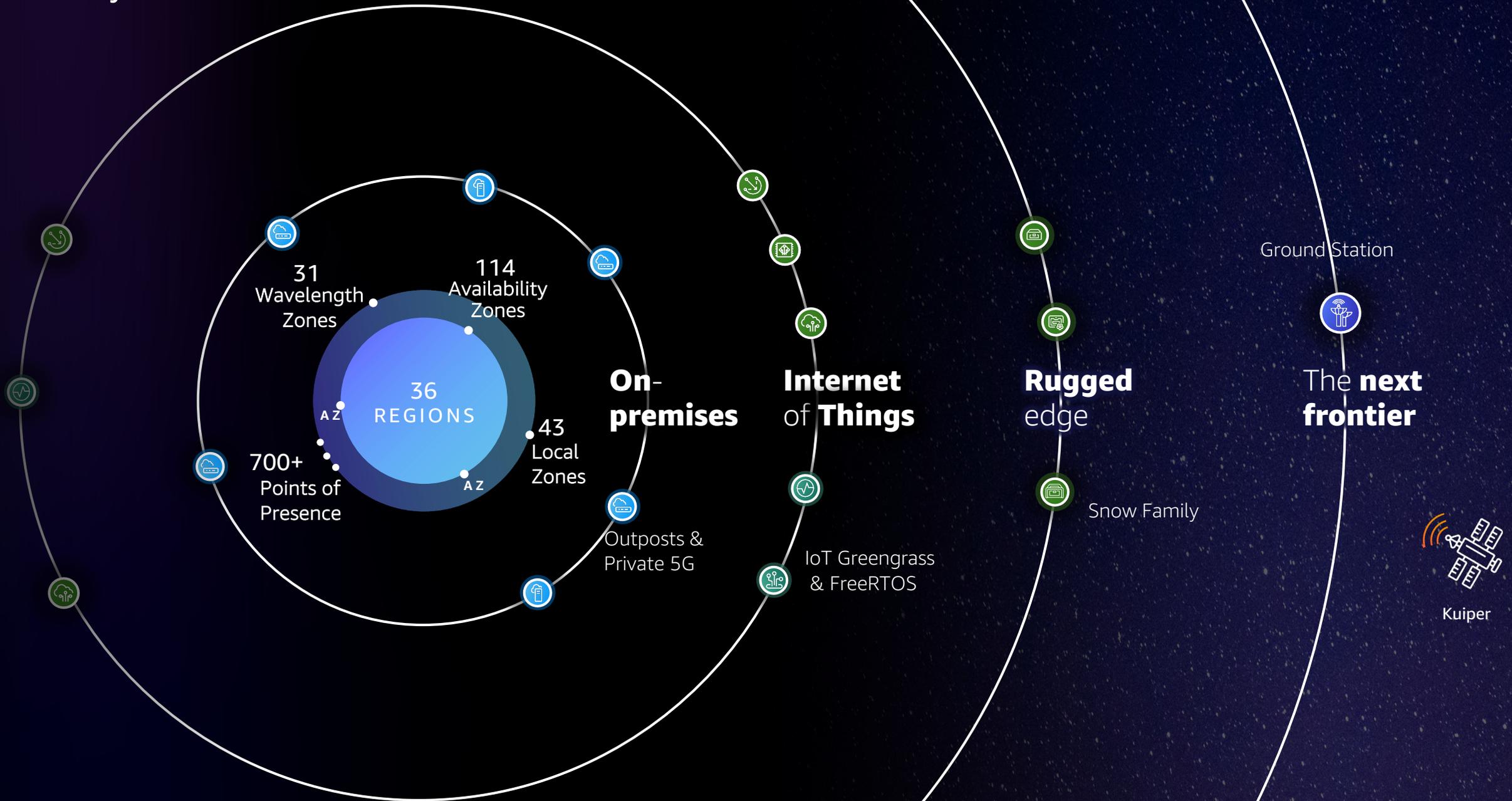
AWS Global Network

400 Gbps

Network backbone

5,000,000 km

Terrestrial fiber optic cable

Availability Zones design for resiliency

REGION

Distance ensures high availability

Low latency ensures real-time data replication

Availability Zone (AZ)
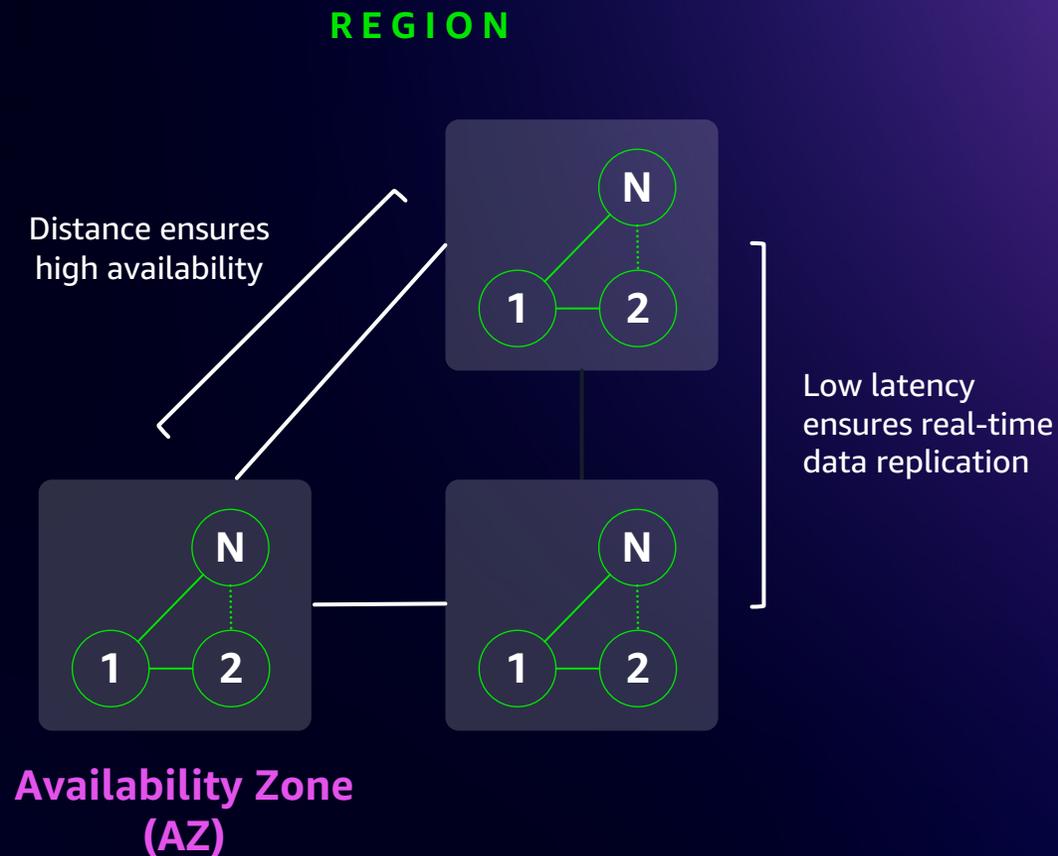
100K+ servers at scale

ISOLATED PARTITION

Fully isolated with one or more data centers

POWER

Highly available, fault tolerant, and scalable
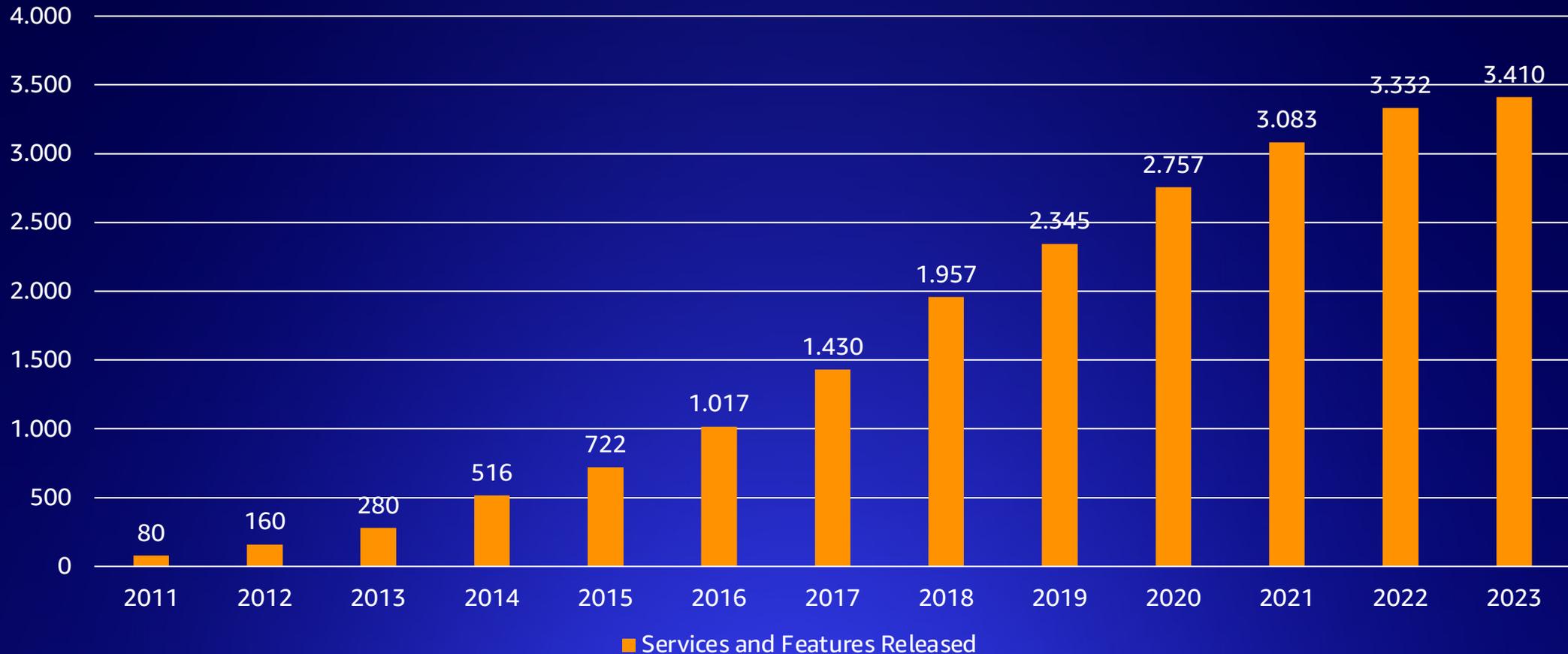
DISTANCE

Physically separated by a meaningful distance – all within 60 miles (100km) of each other

INTERCONNECTION

Data centers connected via fully redundant and isolated metro fiber

AWS Innovation Paces - 90% of features are requested from customers

new services / features release

#3410 in 2023, 65.57 new features launched per week

240+

SERVICES

Broad and Deep Functionality

TECHNICAL & BUSINESS SUPPORT

MARKETPLACE

ANALYTICS	DEV OPS	MOBILE SERVICES	IoT
MACHINE LEARNING	ENTERPRISE APPS	HYPRID ARCHITECTURE	MIGRATION
APP SERVICES			
INFRASTRUCTURE	CORE SERVICES	SECURITY & COMPLIANCE	MANAGEMENT TOOLS

AWS Can Help – Breadth and Depth of Services

ANALYTICS

ANALYTICS
- DATA EXCHANGE
- DATA LAKE
- DATA PIPELINES
- DATA WAREHOUSE
- ELASTICSEARCH

STREAMING
- ETL
- HADOOP/SPARK
- INTERACTIVE SQL QUERIES
- VISUALIZATIONS

AR + VR
- AR/VR EXPERIENCES

AWS COST MANAGEMENT
- ANALYZE AWS COSTS
- COST & USAGE BUDGETS
- COST & USAGE REPORTS
- RESERVED INSTANCES REPORTING

APPLICATION INTEGRATION
- EMAIL
- MESSAGE BROKER
- QUEUING & NOTIFICATIONS
- SEARCH
- TRANSCODING
- WORKFLOW

BUSINESS APPLICATIONS
- EMAIL & CALENDARING
- ONLINE MEETINGS
- SHARING & COLLABORATION
- UNIFIED COMMUNICATIONS
- VOICE-ENABLED WORKPLACE

BLOCKCHAIN
- BLOCKCHAIN TEMPLATES
- LEDGER DATABASE
- MANAGED BLOCKCHAIN

CUSTOMER ENGAGEMENT
- CONTACT CENTER
- TARGETING
- USER ENGAGEMENT ACROSS CHANNELS

COMPUTE

COMPUTE
- AUTO SCALING
- BATCH JOBS
- EVENT-DRIVEN SERVERLESS COMPUTING
- INSTANCE TYPES
- MANAGED VIRTUAL PRIVATE SERVERS
- MANAGED REPOSITORY FOR SERVERLESS APPS
- RUN & MANAGE WEB APPS
- SERVERLESS COMPUTE
- VIRTUAL SERVERS

CONTAINTERS
- CONTAINER SERVICE
- MANAGED KUBERNETES
- STORE & RETRIEVE DOCKER IMAGES

DATABASE

REALTIONAL DATABASES
- HIGH-PERFORMANCE RELATIONAL DATABASE BUILT FOR THE CLOUD
- MANAGED MARIADB
- MANAGED MYSQL
- MANAGED ORACLE
- MANAGED POSTGRESQL
- MANAGED SQL SERVER

PURPOSE-BUILT DATABASES
- DOCUMENT DATABASE
- GRAPH DATABASE
- IN-MEMORY CACHING
- KEY-VALUE STORE DATABASE
- LEDGER DATABASE
- TIME SERIES DATABASE

DEVELOPER TOOLS
- ANALYZE & DEBUG
- APPLICATION LIFECYCLE MANAGEMENT
- AUTHORING
- BUILD & TEST
- CONTAINERS
- DEVOPS RESOURCE MANAGEMENT
- ONE-CLICK APP DEVELOPMENT
- PATCHING
- PIPELINE ORCHESTRATION
- RESOURCE TEMPLATES
- TRIGGERS

END USER COMPUTING
- APP STREAMING
- DESKTOP COMPUTING
- MOBILE ACCESS
- STORAGE & COLLABORATION

HYBRID ARCHITECTURE
- AWS SERVICES ON PREMISES
- DATA INTEGRATION
- INTEGRATED DEVICES & EDGE SYSTEMS
- INTEGRATED IDENTITY & ACCESS
- INTEGRATED NETWORKING
- INTEGRATED RESOURCE & DEPLOYMENT MANAGEMENT
- VMWARE CLOUD ON AWS

GAME TECH
- CROSS-PLATFORM 3D GAME ENGINE
- GAME SERVER HOSTING

INFRASTRUCTURE
- AVAILABILITY ZONES
- CUSTOM HARDWARE
- DATA CENTER INFRASTRUCTURE
- GLOBAL NETWORK BACKBONE
- POINTS OF PRESENCE
- POWER INFRASTRUCTURE
- REGIONS

INTERNET OF THINGS (IOT)
- RULES ENGINE
- DEVICE ANALYTICS
- DEVICE GATEWAY
- DEVICE SDK
- DEVICE SHADOWS
- EVENT DETECTION & RESPONSE
- LOCAL COMPUTE
- LOCAL DATA COLLECTION
- MANAGEMENT & SECURITY
- MICROCONTROLLER OPERATING SYSTEM
- REGISTRY
- VISUAL APPLICATIONS DEVELOPMENT

MACHINE LEARNING

ML FRAMEWORKS
- DEEP LEARNING AMIs & CONTAINERS
- HARDWARE ACCELERATION
- ML AT THE EDGE
- TENSORFLOW, PYTORCH, MXNET

AI SERVICES
- CHATBOTS
- ENTITY EXTRACTION
- FACE ANALYTICS
- FACE SEARCH
- FORECASTING
- IMAGE LABELING
- NATURAL LANGUAGE PROCESSING
- PERSONALIZATION & RECOMMENDATION
- SENTIMENT ANALYSIS
- SPEECH TRANSCRIPTION
- TEXT & DATA EXTRACTION
- TEXT TO SPEECH
- TRANSLATION
- VIDEO & IMAGE ANALYSIS
- CONTENT MODERATION

SAGEMAKER
- AUTOMATIC MODEL TUNING
- DATA LABELING
- HOSTED NOTEBOOKS
- ML MARKETPLACE
- MODEL HOSTING
- MODEL OPTIMIZATION
- MODEL TRAINING
- PRE-BUILT ALGORITHMS
- TOPIC MODELING
- DEEP LEARNING MODELS
- REINFORCEMENT LEARNING
- SPOT INSTANCES
- BATCH PREDICTIONS
- REAL-TIME PREDICTIONS

MANAGEMENT & GOVERNANCE
- ACTIVITY & API USAGE TRACKING
- CHATBOT
- CONFIGURATION TRACKING
- GOVERNANCE
- INVENTORY TRACKING
- LICENSE MANAGER
- MANAGE POLICIES
- MANAGE RESOURCES
- MONITORING
- PROVISIONING
- RESOURCE TEMPLATES
- SECURITY RECOMMENDATIONS
- SERVER MANAGEMENT
- SERVICE CATALOG
- SYSTEMS MANAGER

MARKETPLACE
- ANALYTICS
- DATA PRODUCTS
- DATABASES
- DEVOPS
- IOT
- MACHINE LEARNING
- NETWORKING
- OPERATING SYSTEMS
- SECURITY
- STORAGE

MEDIA SERVICES
- LIVE VIDEO TRANSPORT
- MEDIA STORAGE
- TRANSCODING
- VIDEO ORIGINATION & PACKAGING
- VIDEO PERSONALIZATION & MONETIZATION
- VIDEO PROCESSING & DELIVERY
- VIDEO STREAMING ANALYSIS

MIGRATION & TRANSFER
- APPLICATION MIGRATION
- DATABASE MIGRATION
- EXABYTE-SCALE MIGRATION
- ONLINE DATA TRANSFER
- SCHEMA CONVERSION
- SERVER MIGRATION
- TRANSFER FOR SFTP

MOBILE
- API GATEWAY
- DEVELOPMENT FRAMEWORK
- IDENTITY
- MOBILE ANALYTICS
- MOBILE APP TESTING
- SINGLE INTEGRATED CONSOLE
- SYNC
- TARGETED PUSH NOTIFICATIONS

NETWORKING & CONTENT DELIVERY
- APPLICATION DELIVERY
- DEDICATED NETWORK CONNECTION
- DOMAIN NAME SYSTEM
- LOAD BALANCING
- MONITOR APIS
- MONITOR MICROSERVICES
- NETWORK TOPOLOGY
- NETWORKING HUB
- PRIVATE CONNECTION TO APPS
- SCALE VPC & ACCOUNT CONNECTIONS
- SERVICE DISCOVERY
- VIRTUAL PRIVATE CLOUD

ROBOTICS

SATELLITE
- SATELLITE OPERATIONS

## SECURITY, IDENTITY, & COMPLIANCE
- ACCESS CONTROL
- ASSESSMENT & REPORTING
- CONFIGURATION COMPLIANCE
- DATA PROTECTION
- DDOS PROTECTION
- IDENTITY MANAGEMENT
- KEY MANAGEMENT & STORAGE
- MONITORING & LOGGING
- RESOURCE MANAGEMENT
- THREAT DETECTION
- WEB APPLICATION FIREWALL

STORAGE
- ARCHIVE STORAGE
- BACKUP & RESTORE
- BLOCK STORAGE
- DATA TRANSFER
- EDGE PROCESSING & COMPUTING
- FILE STORAGE
- HIGH-PERFORMANCE FILE SYSTEM
- HYBRID CLOUD STORAGE
- OBJECT STORAGE
- WINDOWS FILE SYSTEM

CUSTOMER ENABLEMENT
- ACCOUNT MANAGEMENT
- DASHBOARD PERSONALIZATION
- ENTERPRISE SUPPORT
- EXPERTS MARKETPLACE
- OPTIMIZATION GUIDANCE
- PARTNER ECOSYSTEMS
- PROFESSIONAL SERVICES
- SECURITY & BILLING REPORTS
- SOLUTIONS MANAGEMENT
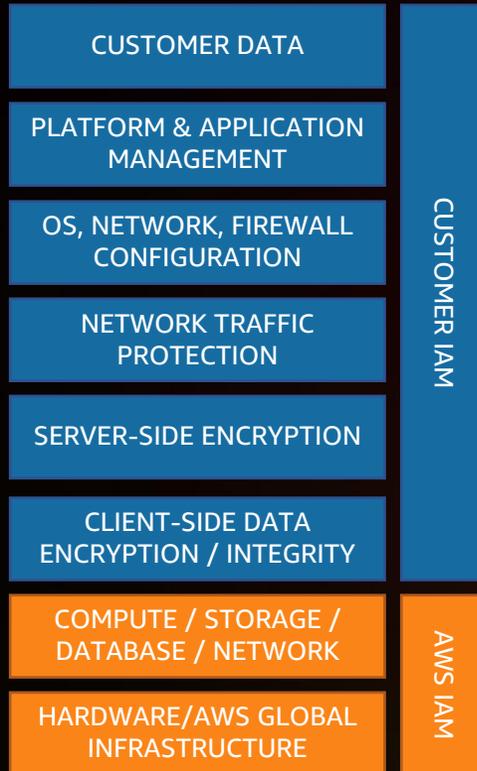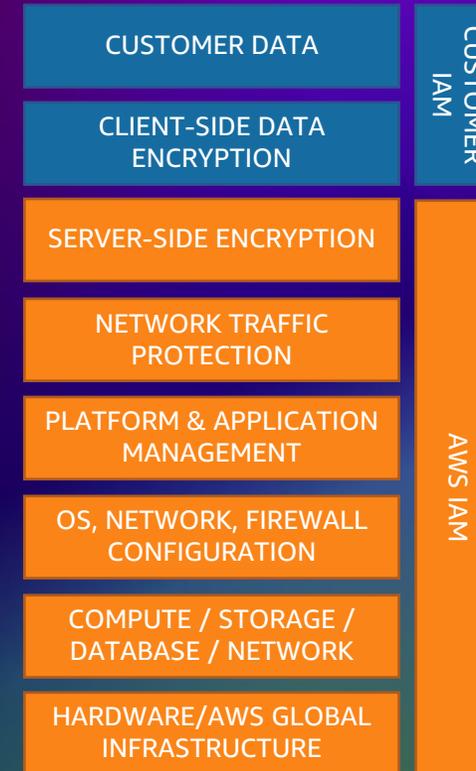- TRAINING & CERTIFICATION
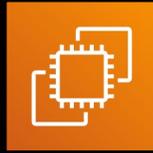
Amazon EC2

Amazon RDS

Amazon S3   **AWS KMS**   **Amazon DynamoDB**

More Customizable
+
More Customer Responsibility

Less Customizable
+
Less Customer Responsibility
+
More Best Practices built-in

INFRASTRUCTURE SERVICES

Amazon EC2	
CUSTOMER DATA	CUSTOMER IAM
PLATFORM & APPLICATION MANAGEMENT	
OS, NETWORK, FIREWALL CONFIGURATION	
NETWORK TRAFFIC PROTECTION	
SERVER-SIDE ENCRYPTION	
CLIENT-SIDE DATA ENCRYPTION / INTEGRITY	
COMPUTE / STORAGE / DATABASE / NETWORK	AWS IAM
HARDWARE/AWS GLOBAL INFRASTRUCTURE	

CONTAINER SERVICES

Amazon RDS	
CUSTOMER DATA	CUSTOMER IAM
NETWORK TRAFFIC PROTECTION	
CLIENT-SIDE DATA ENCRYPTION	
FIREWALL CONFIGURATION	
PLATFORM & APPLICATION MANAGEMENT	AWS IAM
OS, NETWORK, FIREWALL CONFIGURATION	
COMPUTE / STORAGE / DATABASE / NETWORK	
HARDWARE/AWS GLOBAL INFRASTRUCTURE	

ABSTRACTED SERVICES

Amazon S3	
CUSTOMER DATA	CUSTOMER IAM
CLIENT-SIDE DATA ENCRYPTION	
SERVER-SIDE ENCRYPTION	AWS IAM
NETWORK TRAFFIC PROTECTION	
PLATFORM & APPLICATION MANAGEMENT	
OS, NETWORK, FIREWALL CONFIGURATION	
COMPUTE / STORAGE / DATABASE / NETWORK	
HARDWARE/AWS GLOBAL INFRASTRUCTURE	

aws

Shared Responsibility Model

Customer

Customer App / Content / Data

Platform, Applications, Identity & Access Management

Operating System, Network & Firewall Configuration

| Client-side Data Encryption | Server-side Data Encryption | Network Traffic Protection |

AWS

AWS Foundation Services

Compute | **Storage** | **Database** | **Networking**

AWS Global Infrastructure

Availability Zones

Regions

Edge Locations

Focus on Innovation
聚焦在
創新應用

AWS and Partners Provides a lot of tools/solutions to support customers

AWS 提供專業的工具
協助客戶

AWS World Wide Professional Teams (e.g. Support Engineers, Customer Incident Response Team)

AWS 全球專業的安全團隊

Shared Responsibility Model

AWS Well-Architected

Learn, measure, and build using architectural best practices

| AWS Architecture Center | This is My Architecture | AWS Answers | AWS Solutions | Case Studies | Cloud Security |

Security IN the Cloud

Managed by **customers**

AWS Cloud Compliance

Assurance programs for finance, healthcare, government and more.

I'd like information about Compliance in the Cloud »

| Compliance | Cloud Security | Assurance Programs | Resources | Latest News | Testimonials |

AWS Artifact

No cost, self-service portal for on-demand access to AWS' compliance reports.

Start for Free with AWS Artifact

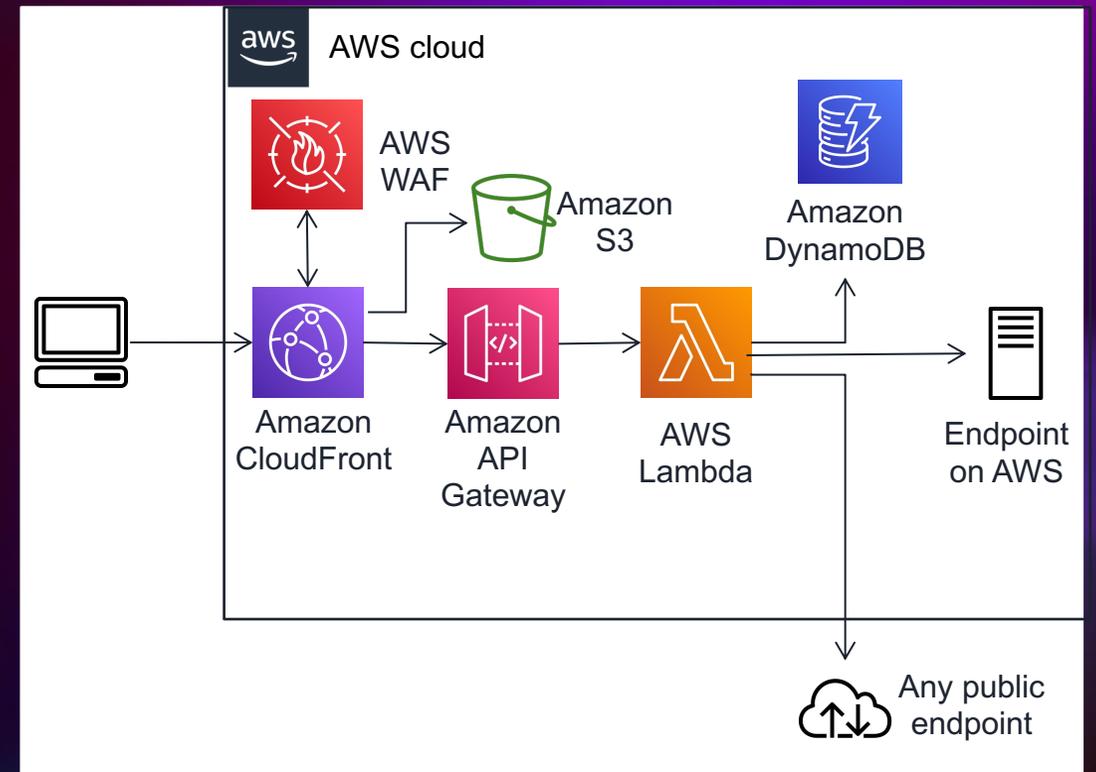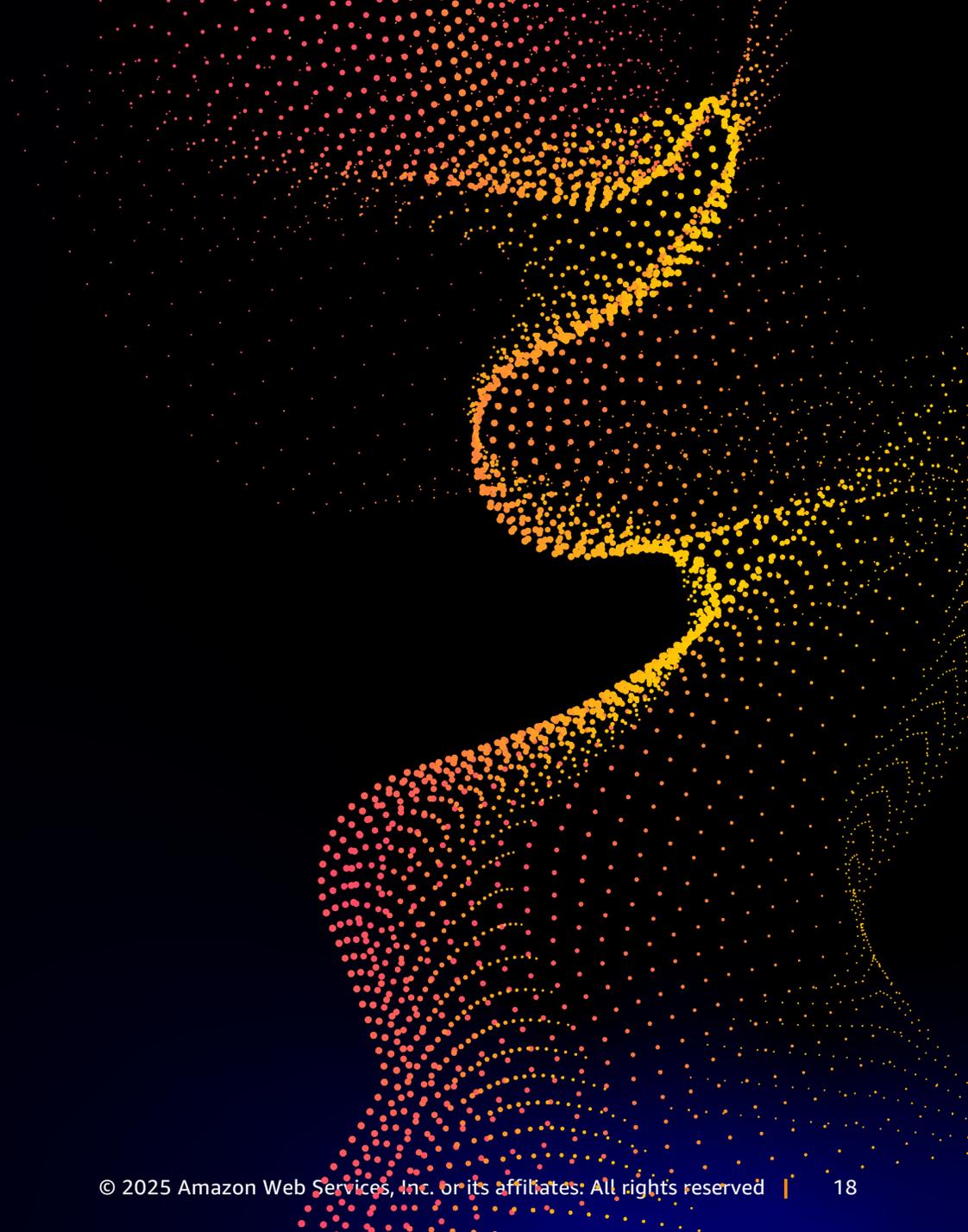| Artifact | Getting Started | FAQ | Documentation | Compliance | Security |

Security OF the Cloud

Managed by **AWS**

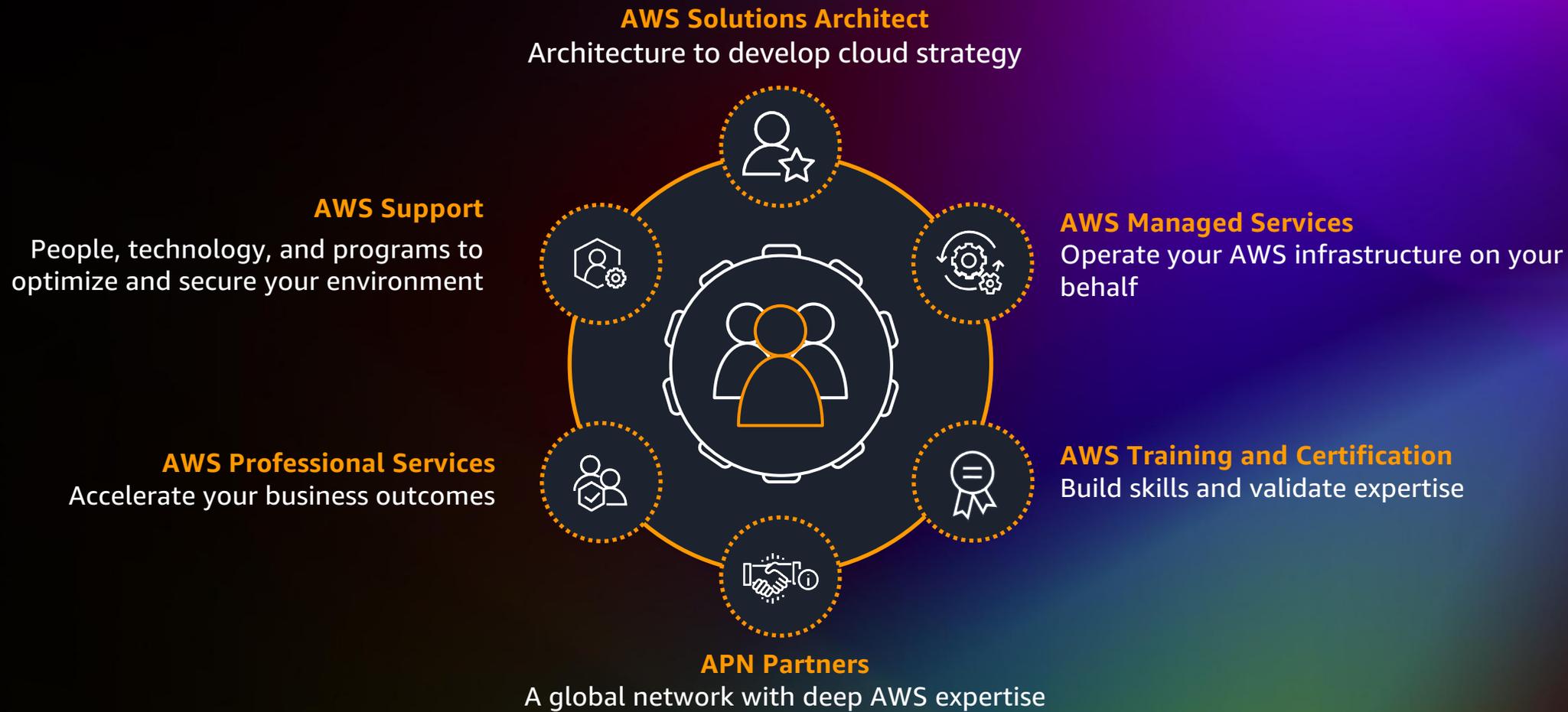# Three tier web application
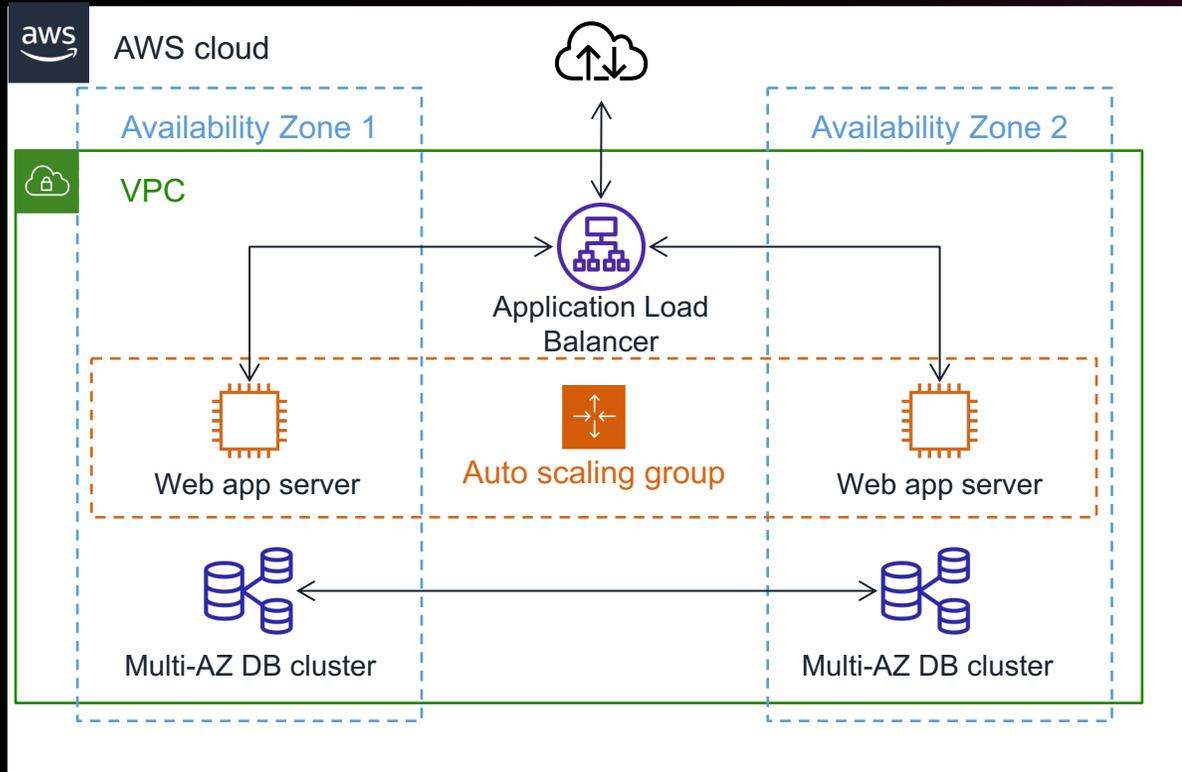
Serverless web application

Top 1 Question from Customers:

How Can We Start?

Support from Local Teams
Migrate and build faster in the cloud

AWS Solutions Architect
Architecture to develop cloud strategy

AWS Support
People, technology, and programs to optimize and secure your environment

AWS Managed Services
Operate your AWS infrastructure on your behalf

AWS Professional Services
Accelerate your business outcomes

AWS Training and Certification
Build skills and validate expertise

APN Partners
A global network with deep AWS expertise

Learn by Role

Build cloud skills to advance your career

| Solutions Architect | Cloud Practitioner | Developer | DevOps Engineer | Machine Learning | Operations |

Learn by Solution

Build cloud skills to solve real-world problems

Advanced Networking   Data Analytics   Databases   AWS for Games   Machine Learning   Media Services   Security   Serverless   Storage

https://aws.amazon.com/training/learn-about/?nc2=sb_tr_la

Ευχαριστώ!

Νικηφόρος Μποτής (nbotis@amazon.com)

Sr. Solutions Architect, Δημόσιος Τομέας Ελλάδος/Κύπρου/Μάλτας

AI chat applications at work

AMAZON Q is
YOUR AWS
EXPERT

AMAZON Q
IN AMAZON QUICKSIGHT

AMAZON Q is
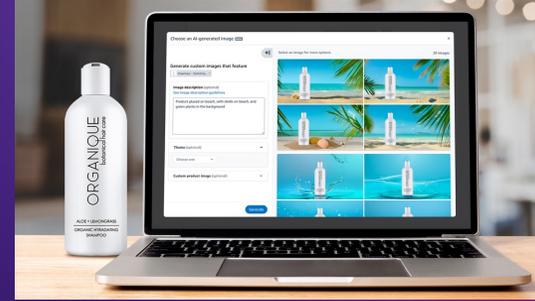**YOUR BUSINESS EXPERT**

AMAZON Q
IN AMAZON CONNECT

Amazon Q

8 ways Amazon is using generative AI to make life easier

A more conversational Alexa with generative AI

Generative AI improves product listings

Generative AI creates more engaging advertisements

Customers can pay with their palm

Enjoy review highlights with generative AI

Generative AI helps predict the blitz on 'Thursday Night Football'

Amazon Go - eliminate checkout lines

Generative AI makes prescriptions easier to read

Swami Sivasubramanian in · Following
VP, AI and Data
1mo · Edited · 🌐

With the general availability of Amazon Q, I wanted to give you the backstory on how we brought Q Apps to customers (hint: it started with our employees) and highlight some of the new capabilities that our customers are excited about.

Internally, we have something called LLM playground, where employees can experiment with different models. The playground has been wildly popular among Amazon users both in technical and non-technical roles. One of the things we noticed was non-developers started 1/building apps for functionality, 2/using those apps, and 3/sharing them with each other. Employees took this even further and maintained internal "how-to" guides for these apps on our internal Amazon portals/wikis. For instance, data center engineering and operations teams built an app—using natural language—to read equipment manuals and help debug when they are repairing equipment. What they wanted from us was to elevate apps from being a first class concept to having the ability to build on top of their business data (with built-in security and access controls) so that everyone could build an app right from Q Business and then publish their apps to broader App catalog. Interestingly, this was a pattern we started seeing from many of our external customers as well who wanted to use GenAI to push beyond getting insights. This led to Q Apps (available in preview).

Amazon Q Apps to customers (hint: it started with our employees)

Internally, we have something called **LLM playground**, where employees can experiment with different models.

The playground has been wildly popular among Amazon users both in technical and non-technical roles. One of the things we noticed was non-developers started **1/building apps for functionality, 2/using those apps, and 3/sharing them with each other.**

For instance, data center engineering and operations teams built an app—using natural language—to read equipment manuals and help debug when they are repairing equipment.

Amazon Q Apps to customers (hint: it started with our employees)

→ Buttom Up

Internally, we have something called **LLM playground**, where employees can experiment with different models.

→ Playground & Experiment

The playground has been wildly popular among Amazon users both in technical and non-technical roles. One of the things we noticed was non-developers started **1/building apps for functionality, 2/using those apps, and 3/sharing them with each other.**

→ Break silos between tech and non-tech.
Buidling, using, and sharing

For instance, data center engineering and operations teams built an app—using natural language—to read equipment manuals and help debug when they are repairing equipment.

→ Create values & new skills

Top 5 Question from Customers:

What's the benefits of Cloud?

Benefits of Cloud

Operational Resilience

Data Residency and Compliance

Breadth and Depth of Services

Low Network Latency

Samsung migrates 1.1 billion users across three continents from Oracle to Amazon Aurora with AWS Database Migration Service

SAMSUNG

60 ms latency
or less for 90% of the time

44%
reduced monthly database costs

"The scalability of Amazon Aurora is the best benefit – especially if we focus on the cost."

Salva Jung
Principal Architect and Engineering Manager

Customers realized an **88% ROI**
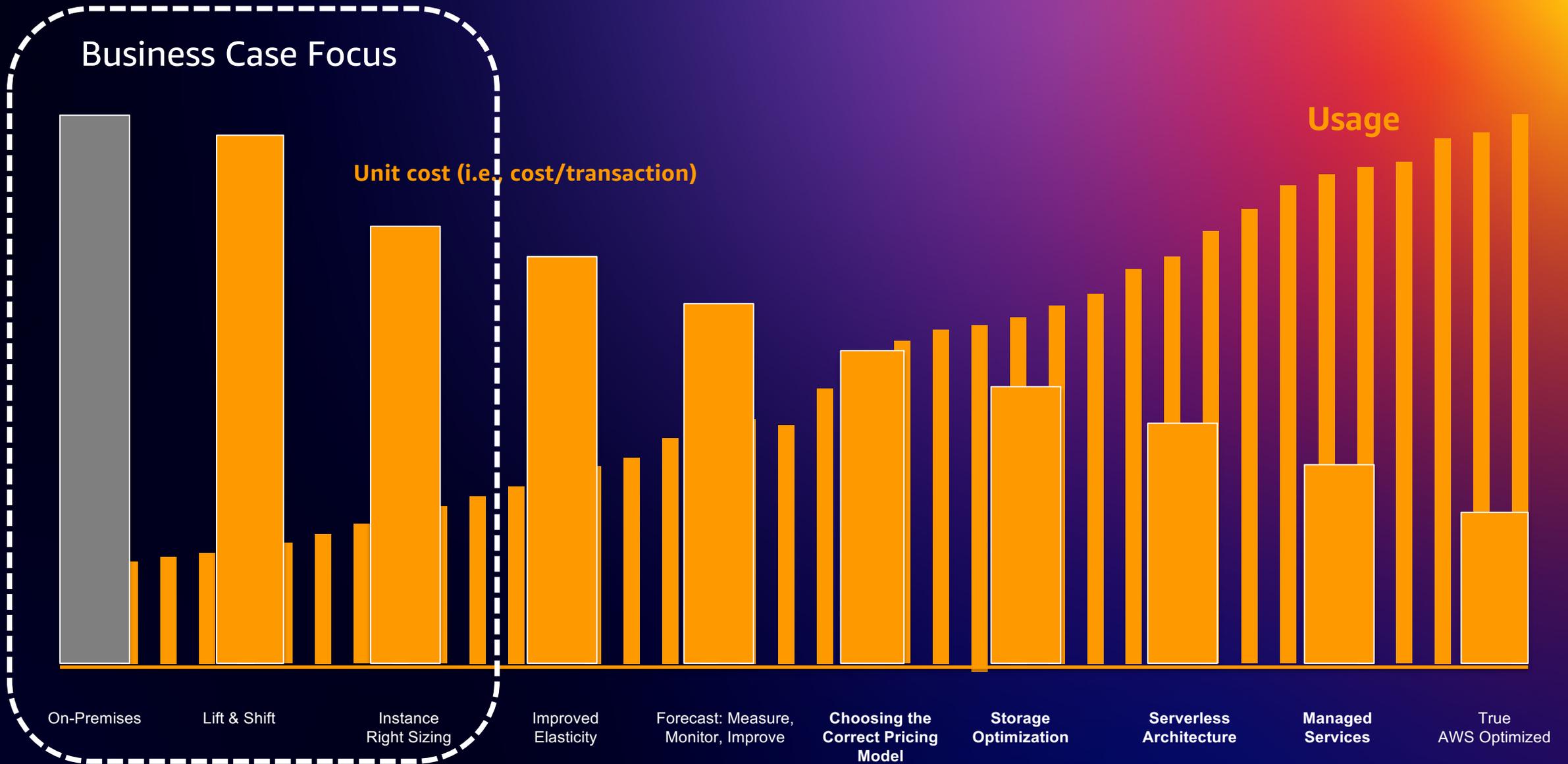
79% Improved speed-to-market

10% Reduced cost of legacy application maintenance
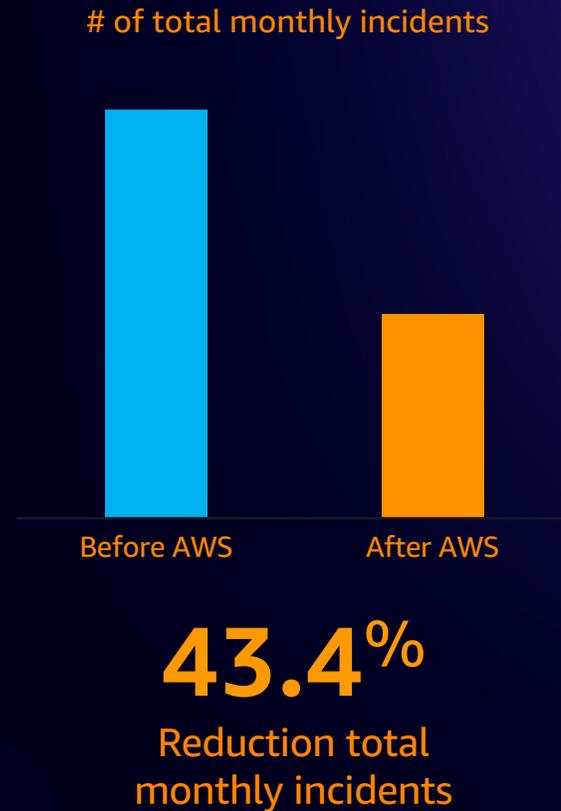
6% Reduced cost of new application maintenance

5% Accelerated customer onboarding

FORRESTER®

Cloud Economics

Business Case Focus

Unit cost (i.e. cost/transaction)

Usage

On-Premises | Lift & Shift | Instance Right Sizing | Improved Elasticity | Forecast: Measure, Monitor, Improve | **Choosing the Correct Pricing Model** | **Storage Optimization** | **Serverless Architecture** | **Managed Services** | True AWS Optimized

AWS customers reduce monthly incidents

of total monthly incidents

Before AWS   After AWS

43.4%
Reduction total
monthly incidents

- High infrastructure availability and durability; multi-Availability Zone fail over

- Automatic configuration and resource management; centrally manage users and credentials

- 36.1% drop in security incidents.

Value of the Cloud

Cost savings (TCO)	Staff productivity	Operational resilience	Business agility	Sustainability
What is it? Infrastructure cost savings/ avoidance from moving to the cloud	**What is it?** Efficiency improvement by function on a task-by-task basis	**What is it?** Benefit of improving SLAs and reducing unplanned outage	**What is it?** Deploying new features/ applications faster and reducing errors	**What is it?** Minimizing environmental impact of operations
20% reduction in IT infrastructure costs as a percentage of revenue	**66% increase** in VMs managed per server admin	**69% reduction** in unplanned downtime	**43% reduction** in time-to-market for new application features	**88% reduction** in workload carbon footprint

Tactical impact ⟶ Strategic impact

Safeguarding Ukraine's data to preserve its present and build its future

Challenge

In February 2022, the Russian government invaded Ukrainian territory and the Ukrainian government had an urgent need to safeguard critical data essential for government operation and its citizens' wellbeing by migrating data to cloud

Solution

The AWS Disaster Response and AWS Public Sector teams collaborated with the Ukrainian government to create Project Sunflower, which used AWS Snowball Edge devices to migrate critical government and commercial data to the cloud; the Snow team collaborated with the Project Sunflower team to make Snowball devices readily available for use by the WWPS SA team for the data migration

Result

- Snowball Edge successfully migrated PBs of critical government data into the AWS Cloud from Ukraine locations

- Enabled Ukrainian government and public to have access to critical data despite being in a war

"We used to assume that this is just how it is in war – everything gets destroyed and you have to rebuild from nothing. But by migrating to the safety and security of the cloud, the government and its citizen services prevail."

Liam Maxwell, Director of Government Transformation, WWPS

AWS Snowball Edge Compute

Availability Zones design for resiliency

AVAILABILITY ZONE A

AVAILABILITY ZONE B

AVAILABILITY ZONE C

Utilization varies up to less than 50%

Workload requirement: Immediate failover

Running in two zones you need to reserve enough spare capacity to rapidly switch the load for resilience

Availability Zones design for resiliency
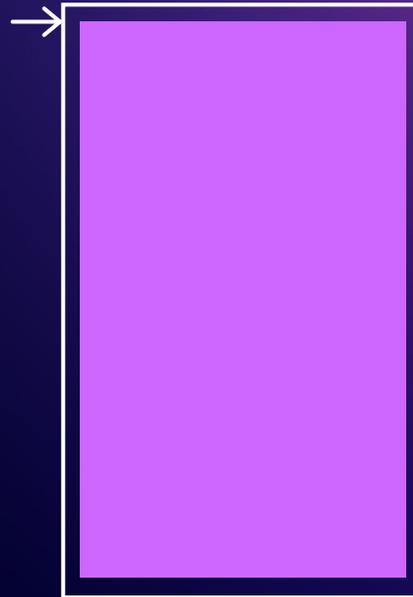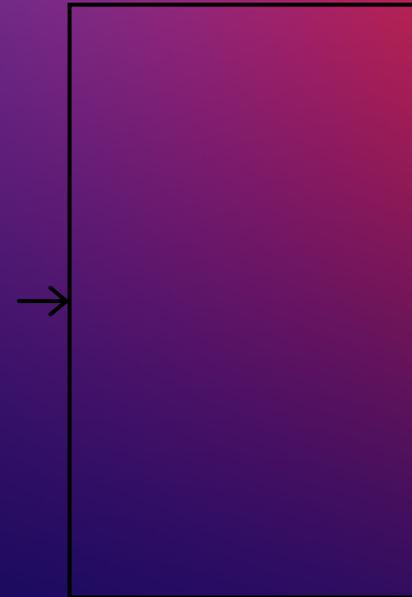
AVAILABILITY ZONE
A

AVAILABILITY ZONE
B

AVAILABILITY ZONE
C

Reserved capacity is sufficient to run workload in one zone

Workload requirement: Immediate failover

Running in two zones you need to reserve enough spare capacity to rapidly switch the load for resilience
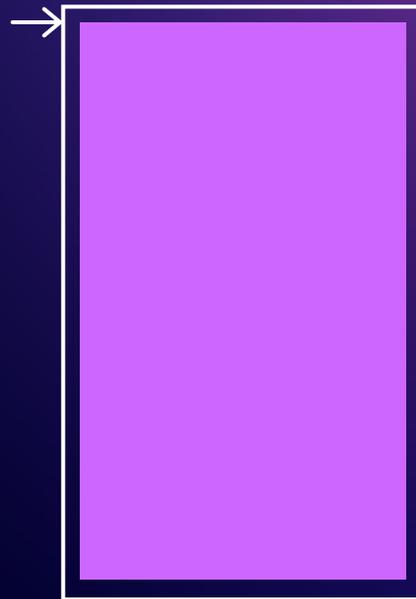
Availability Zones design for resiliency

**AVAILABILITY ZONE
A**

**AVAILABILITY ZONE
B**

**AVAILABILITY ZONE
C**

**Utilization varies up
to less than 2/3**

**Workload
requirement:
Immediate
failover**

Running in three zones you need less reserved capacity to switch the load
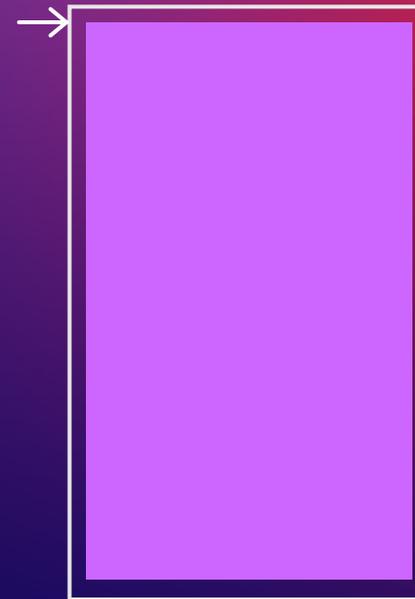
Availability Zones design for resiliency

AVAILABILITY ZONE A

AVAILABILITY ZONE B

AVAILABILITY ZONE C

Reserved capacity is sufficient to run workload in two zones

Workload requirement: Immediate failover

Split the extra load over two zones;
higher average utilization, lower cost and lower impact

There are many different business drivers

Digital transformation

Agility and staff productivity

Improved operational resilience, scalability, and **security**

Cost reduction

Going global quickly, M&A

IoT and AI/ML

Data center consolidation

Outsourcing changes EOL HW/SW

Moderna - Hybrid Reference Cases

moderna™
messenger therapeutics

"AWS Storage Gateway lets us easily integrate data files from analytical instruments . . . and the transparent S3 storage lets us easily connect our cloud-based applications and leverage the powerful storage capabilities of S3. **With the AWS File Gateway, we can now unleash the full power of AWS on our instrument data**."

Dave Johnson, PhD
Director of Informatics

Problem

Made a strategic decision to leverage AWS for processing and analyzing scientific data

Accelerate moving scientific data that is generated on premises to the cloud

Solution

Deploy multiple Storage Gateway appliances to copy scientific data to Amazon S3

Process and analyze 100s of TBs of data in Amazon S3
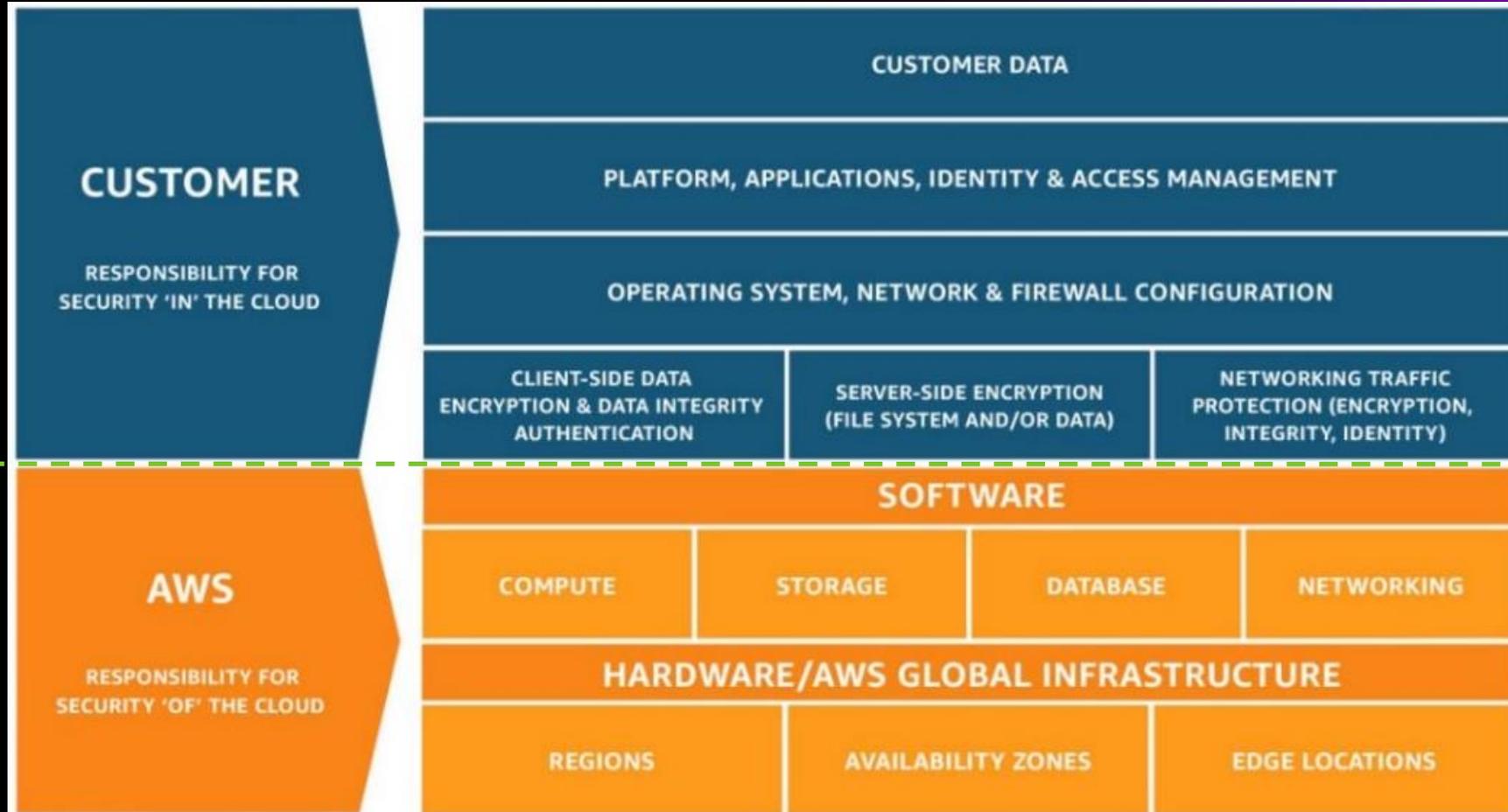
Outcome

On-premises scientific instruments get low-latency access to cloud storage

Lower cost and simplicity

Automation of data management

AWS Shared Responsibility Model

CUSTOMER

RESPONSIBILITY FOR SECURITY 'IN' THE CLOUD

CUSTOMER DATA

PLATFORM, APPLICATIONS, IDENTITY & ACCESS MANAGEMENT

OPERATING SYSTEM, NETWORK & FIREWALL CONFIGURATION

| CLIENT-SIDE DATA ENCRYPTION & DATA INTEGRITY AUTHENTICATION | SERVER-SIDE ENCRYPTION (FILE SYSTEM AND/OR DATA) | NETWORKING TRAFFIC PROTECTION (ENCRYPTION, INTEGRITY, IDENTITY) |

AWS

RESPONSIBILITY FOR SECURITY 'OF' THE CLOUD

SOFTWARE

| COMPUTE | STORAGE | DATABASE | NETWORKING |

HARDWARE/AWS GLOBAL INFRASTRUCTURE

| REGIONS | AVAILABILITY ZONES | EDGE LOCATIONS |

Security **IN** the Cloud

Managed by **customers**

Security **OF** the Cloud

Managed by **AWS**

Supporting resources

AWS Well-Architected

Learn, measure, and build using architectural best practices

AWS Architecture Center | This is My Architecture | AWS Answers | AWS Solutions | Case Studies | Cloud Security

Security **IN** the Cloud

Managed by **customers**

AWS Cloud Compliance

Assurance programs for finance, healthcare, government and more.

I'd like information about Compliance in the Cloud »

Compliance | Cloud Security | Assurance Programs | Resources | Latest News | Testimonials

AWS Artifact

No cost, self-service portal for on-demand access to AWS' compliance reports.

Start for Free with AWS Artifact

Artifact | Getting Started | FAQ | Documentation | Compliance | Security

Security **OF** the Cloud

Managed by **AWS**

PROBLEM

Sought to revolutionize the drug discovery process and bring drugs to market faster to help patients as soon as possible

SOLUTION

Using digital applications and machine learning built on AWS, Moderna developed a new mRNA COVID-19 vaccine with unprecedented speed. AI algorithms enable drug development from rapid experimentation cycles to help design mRNA and DNA sequences to the automation of quality control analyses, saving countless hours of manual review to improvements across production processes and logistics.

IMPACT

Designed and shipped the first clinical batch for its coronavirus vaccine in just 42 days.

Allowed company to rapidly expand into other infectious disease targets and modalities like oncology and autoimmune disease – using the flexible, programmable nature of mRNA, powered by machine learning,

moderna®

"We can be far more secure in the cloud and achieve a higher level of assurance at a much lower cost, in terms of effort and dollars invested. We determined that security in AWS is superior to our on-premises data center across several dimensions, including patching, encryption, auditing and logging, entitlements, and compliance."

—John Brady
CISO, FINRA

FINRA

Nasdaq wanted to migrate their mission-critical equities and options markets to the cloud to prepare for the future. It requires the underlying infrastructure to be hyper-scalable, ultra-resilient, and highly performant

Deploying North American markets on a co-designed edge compute solution using AWS Outposts

End-to-end order-to-trade process occurs in low double-digit microseconds with a 10% performance improvement in network latency, creating a cloud migration blueprint for 130+ markets infrastructure customers

Moderna - Hybrid Reference Cases

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AWS region design

AWS Regions are comprised of multiple AZs for high availability, high scalability, and high fault tolerance. Applications and data are replicated in real time and consistent in the different AZs.

AWS Availability Zone (AZ)

AWS Region
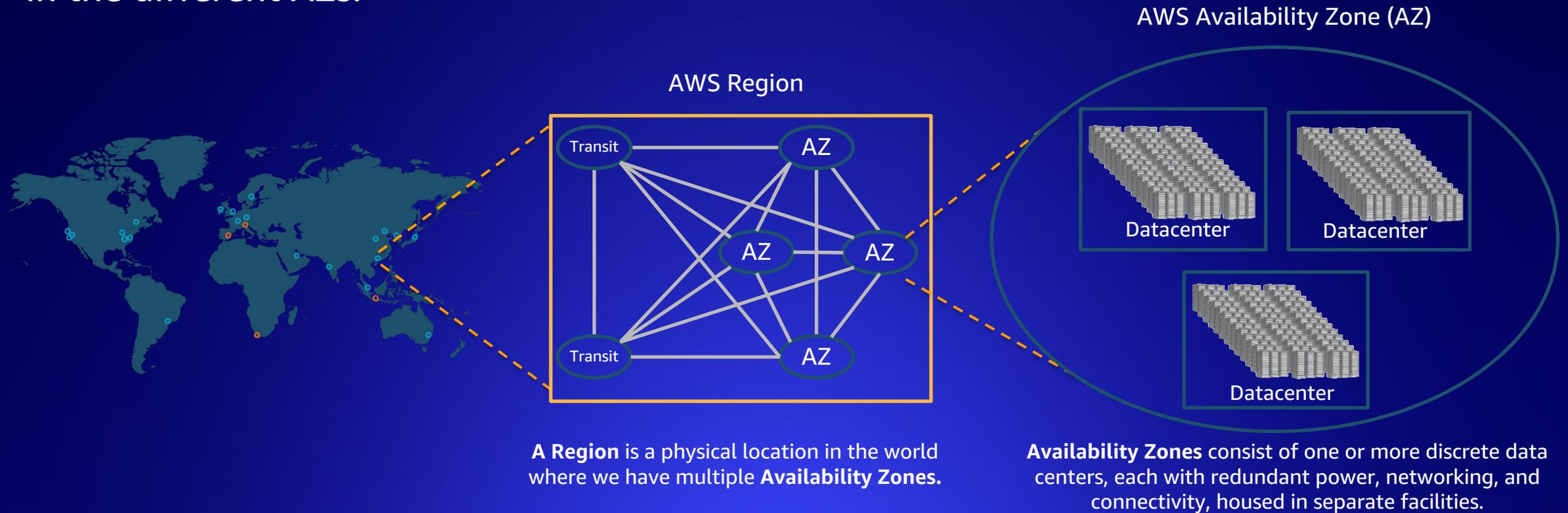
A Region is a physical location in the world where we have multiple **Availability Zones.**

Availability Zones consist of one or more discrete data centers, each with redundant power, networking, and connectivity, housed in separate facilities.