
AWS
re:Invent
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HYB311

How to simplify your hybrid cloud migration strategy with AWS

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Agenda

Why migrate to the cloud?

Application migration strategies

AWS hybrid cloud solutions for migration

Customer use cases

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Why migrate to the cloud?



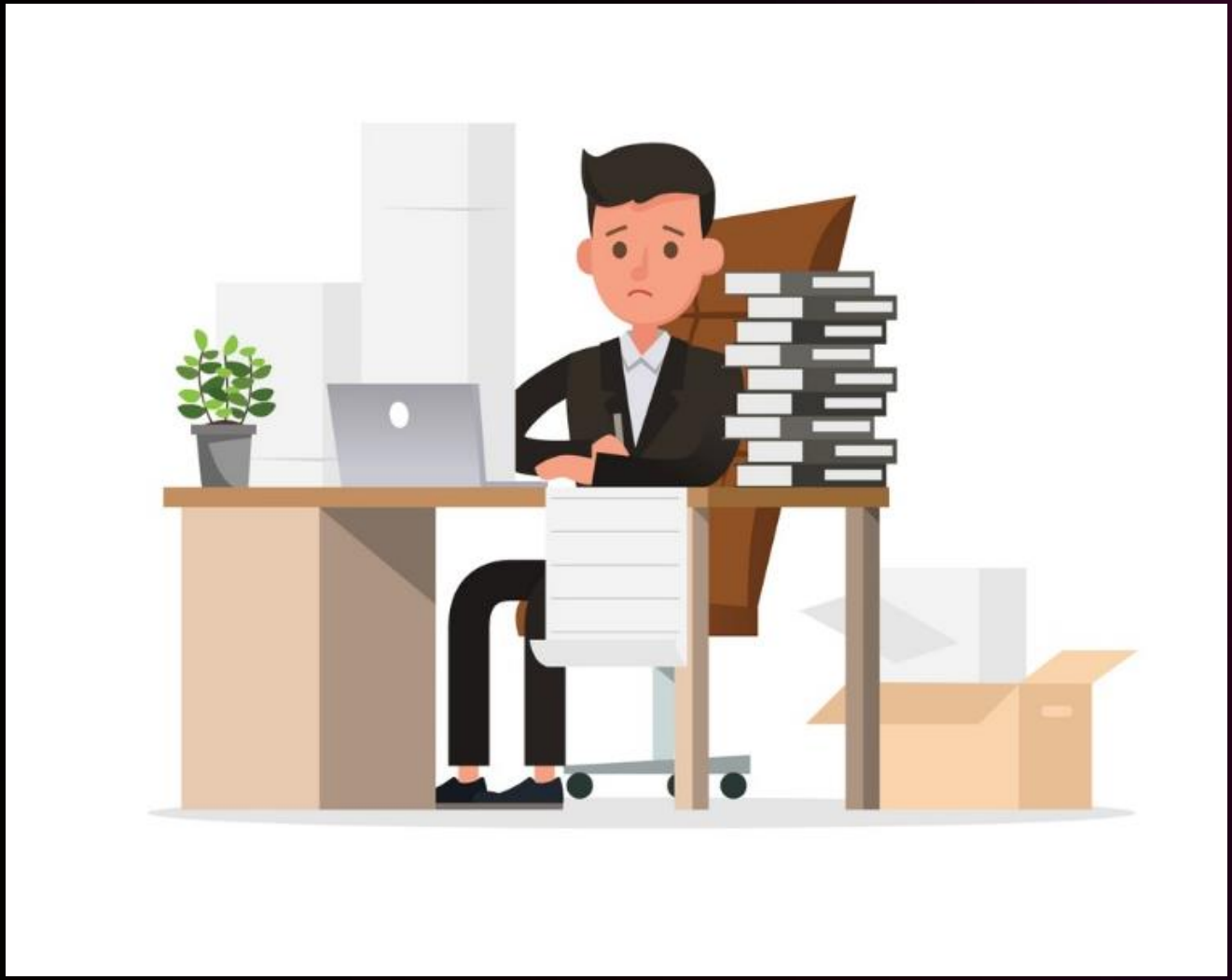
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Customers want simplification



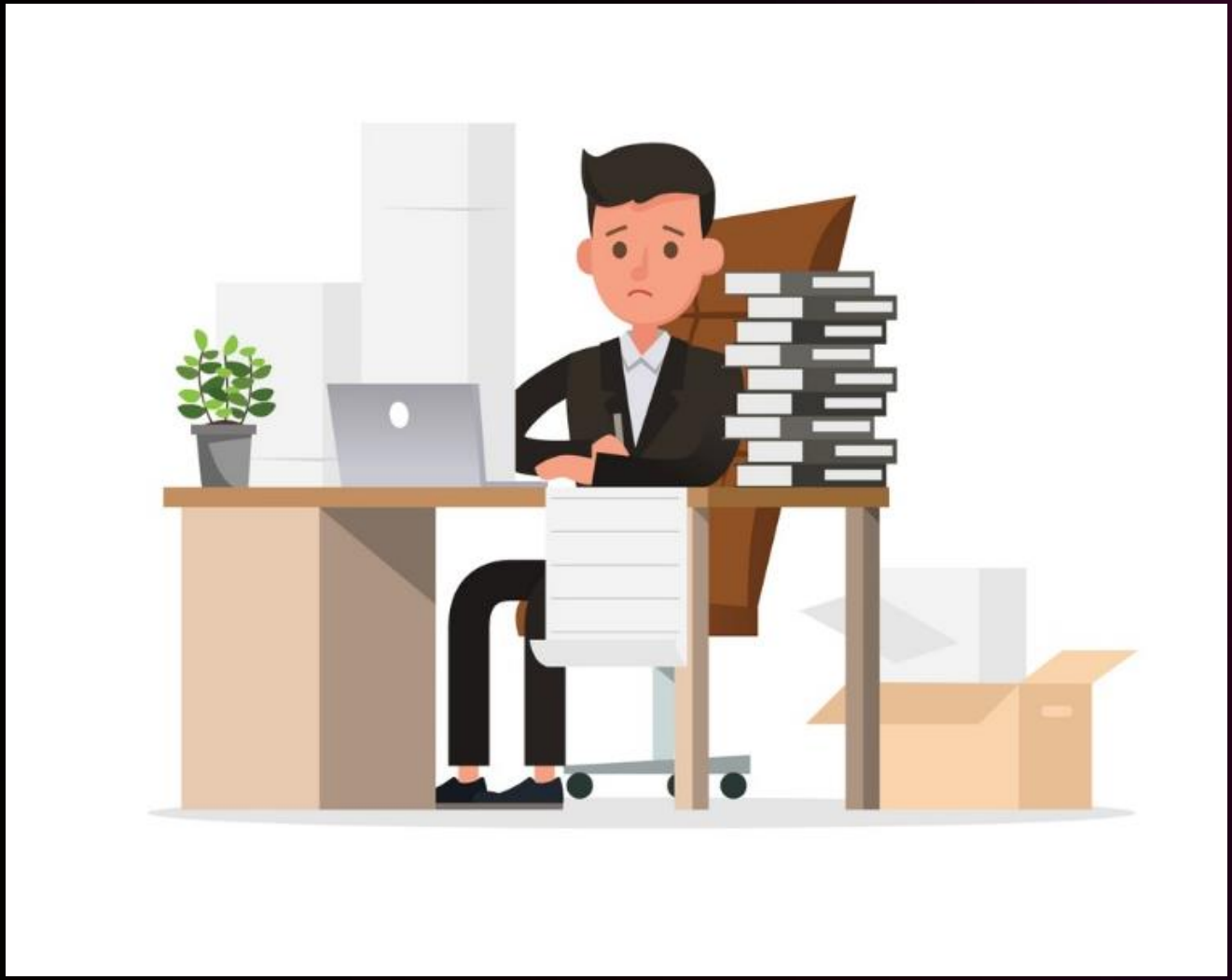
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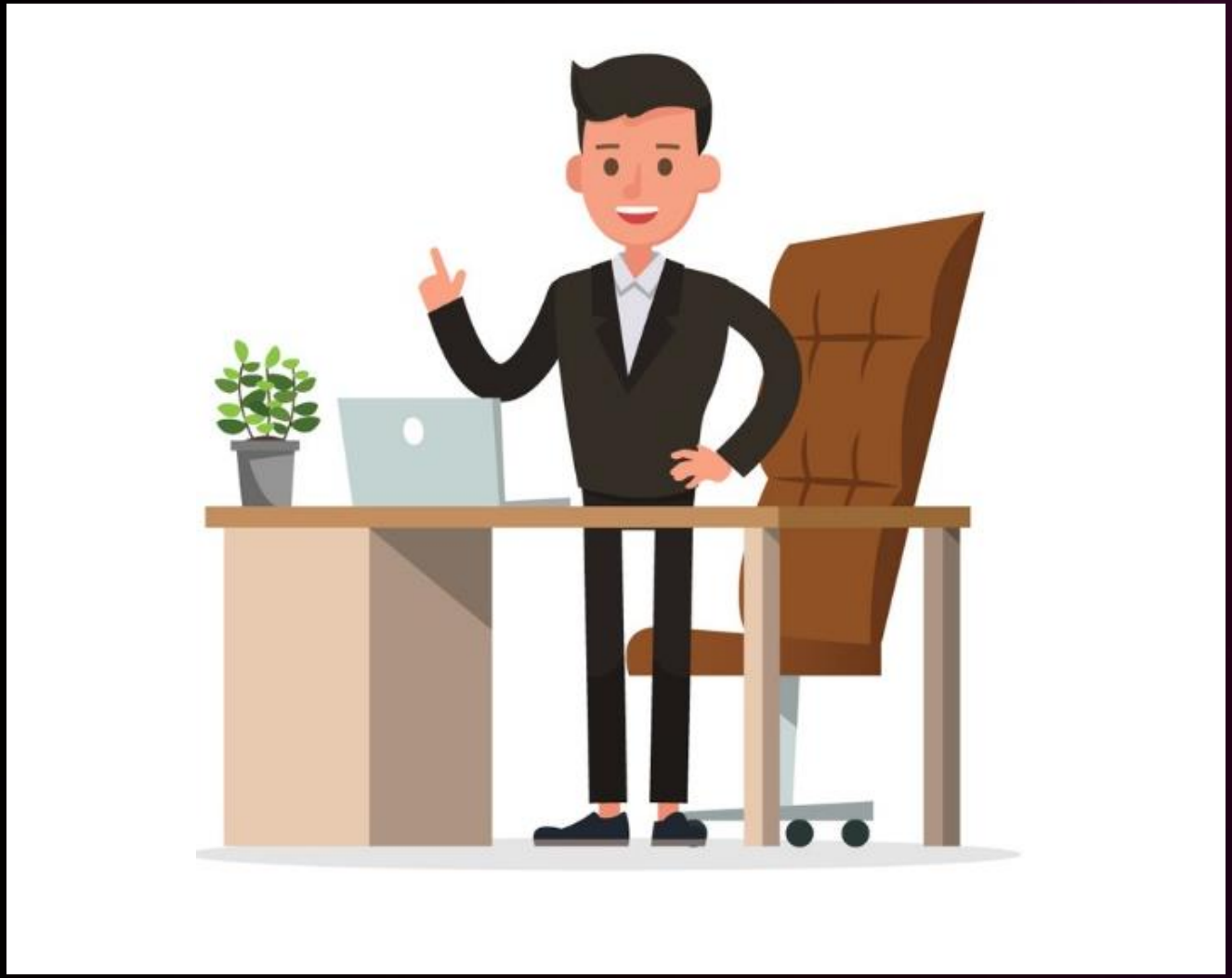
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Customers want simplification



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Benefits of the cloud



Enables rapid scalability



Reduces operational costs



Simplifies IT



Accelerates business innovation



Amplifies developer productivity

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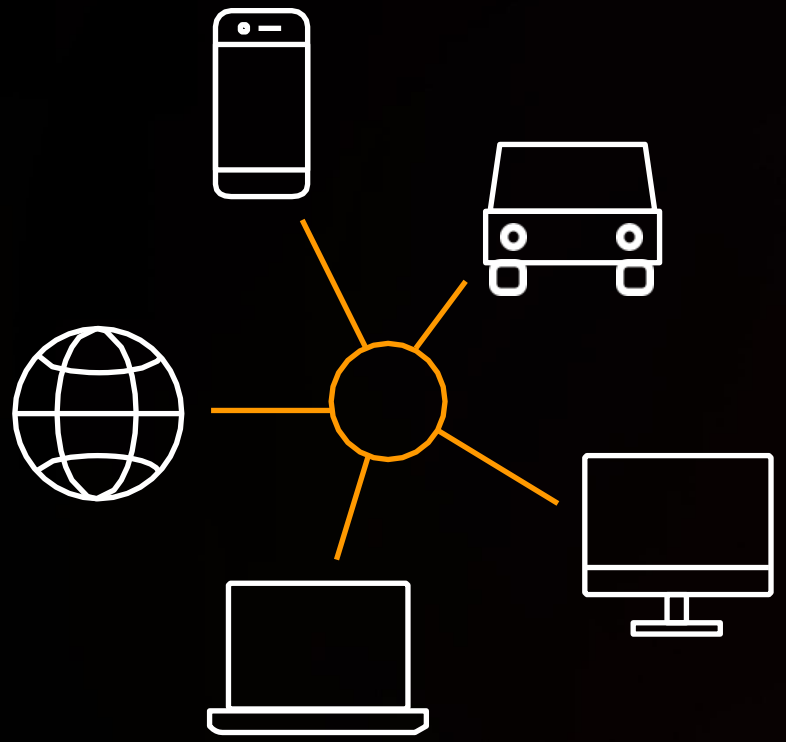
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Application migration strategies



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Choosing a migration strategy



1. **Rehost** by lifting and shifting

2. **Refactor**, retool, and replatform

3. **Retain** on premises

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Retain on premises

CUSTOMERS NEED TO RETAIN WORKLOADS ON PREMISES FOR A VARIETY OF REASONS



Complex legacy applications



Single-digit latency or local data processing requirements



Data residency requirements

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Retain on premises

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AWS hybrid cloud solutions for migration



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AWS Cloud migration solutions

FROM THE CLOUD TO THE EDGE

Global infrastructure



AWS Regions

Metro centers



AWS Local Zones

On premises



AWS Outposts

Far edge



AWS Snow Family

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Same experience from the cloud to the edge

CUSTOMERS WANT THE SAME INFRASTRUCTURE, SERVICES, APIS, AND TOOLS WHETHER IN THE CLOUD OR AT THE EDGE



Same reliable, secure, and high-performance infrastructure



Same ownership model and operational consistency



Same services and APIs



Same tools for automation, deployments, and security controls



Same pace of innovation as in the cloud

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Hybrid cloud customers



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Hybrid partners



This is not a complete list. To view all AWS Partners for this category, visit AWS Partner Solutions Finder. This list of partners is current as of November 3, 2022.

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Cloud infrastructure: AWS Regions



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AWS Regions & Availability Zones

GLOBAL INFRASTRUCTURE



United States

GovCloud (U.S.):
U.S.-East (3), US-West (3)

U.S. West
Oregon (4), Northern California (3)

U.S. East
N. Virginia (6), Ohio (3)

Canada

Central (3)

South America

São Paulo (3)

Africa

Cape Town (3)

Europe

Frankfurt (3)
Ireland (3)
London (3)
Milan (3)
Paris (3)
Stockholm (3)

Middle East

Bahrain (3)
UAE (3)

Asia Pacific

Beijing (2)
Hong Kong (3)
Hyderabad (3)
Jakarta (3)
Mumbai (3)
Ningxia (3)
Osaka (3)
Seoul (4)
Singapore (3)
Tokyo (4)

Australia

Sydney (3)

Announced Regions: 8 Regions and 24 AZs in Australia, Canada, India, Israel, Australia, Switzerland, Spain, and Thailand

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Metro centers: AWS Local Zones



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AWS Local Zones



Meet latency, local data processing, and data residency requirements in more locations, without deploying self-managed infrastructure

- Integrated with Region services through the AWS backbone
- AWS deployed and operated infrastructure in metro centers
- Same AWS core services and developer experience
- Elastic, on-demand resources, with pay-as-you-go pricing

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AWS Local Zones

METRO CENTERS

North America

Atlanta
Boston
Chicago
Dallas
Denver
Houston
Kansas City
Las Vegas
Los Angeles
Miami
Minneapolis
New York City
Philadelphia
Phoenix
Portland
Seattle
Querétaro
Toronto
Vancouver

Europe and Africa

Hamburg
Warsaw
Amsterdam
Athens
Berlin
Brussels
Copenhagen
Helsinki
Johannesburg
Lisbon
Munich
Nairobi
Oslo
Prague
Vienna

Asia Pacific

Delhi
Taipei
Bangkok
Bengaluru
Chennai
Hanoi
Kolkata
Manila

Available
Announced

South America

Bogotá
Buenos Aires
Lima
Rio de Janeiro
Santiago

Australia and New Zealand

Auckland
Brisbane
Perth

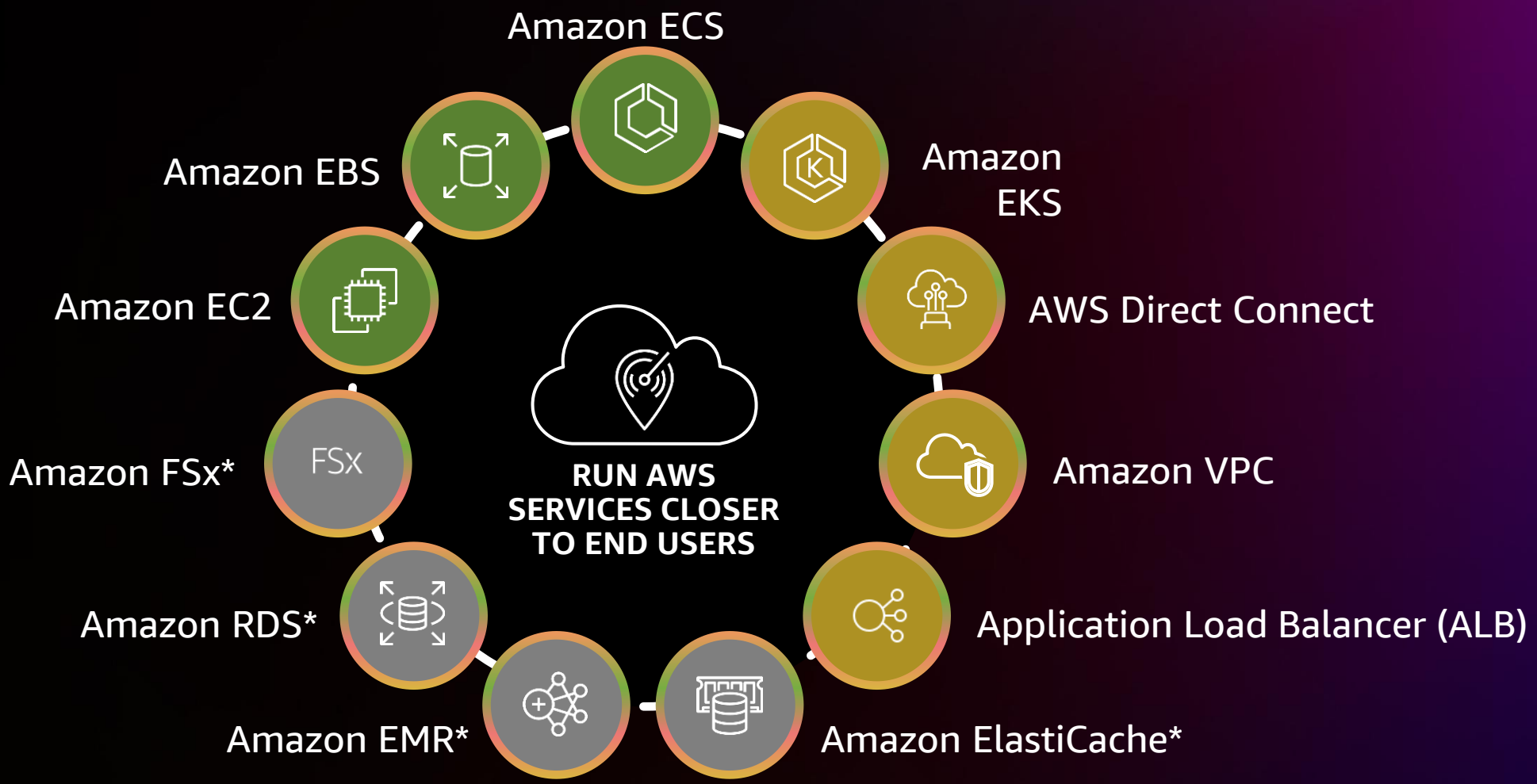
34 New AWS Local Zones generally available starting 2022

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Services on AWS Local Zones

METRO CENTERS



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** Some services only available in select Local Zones*

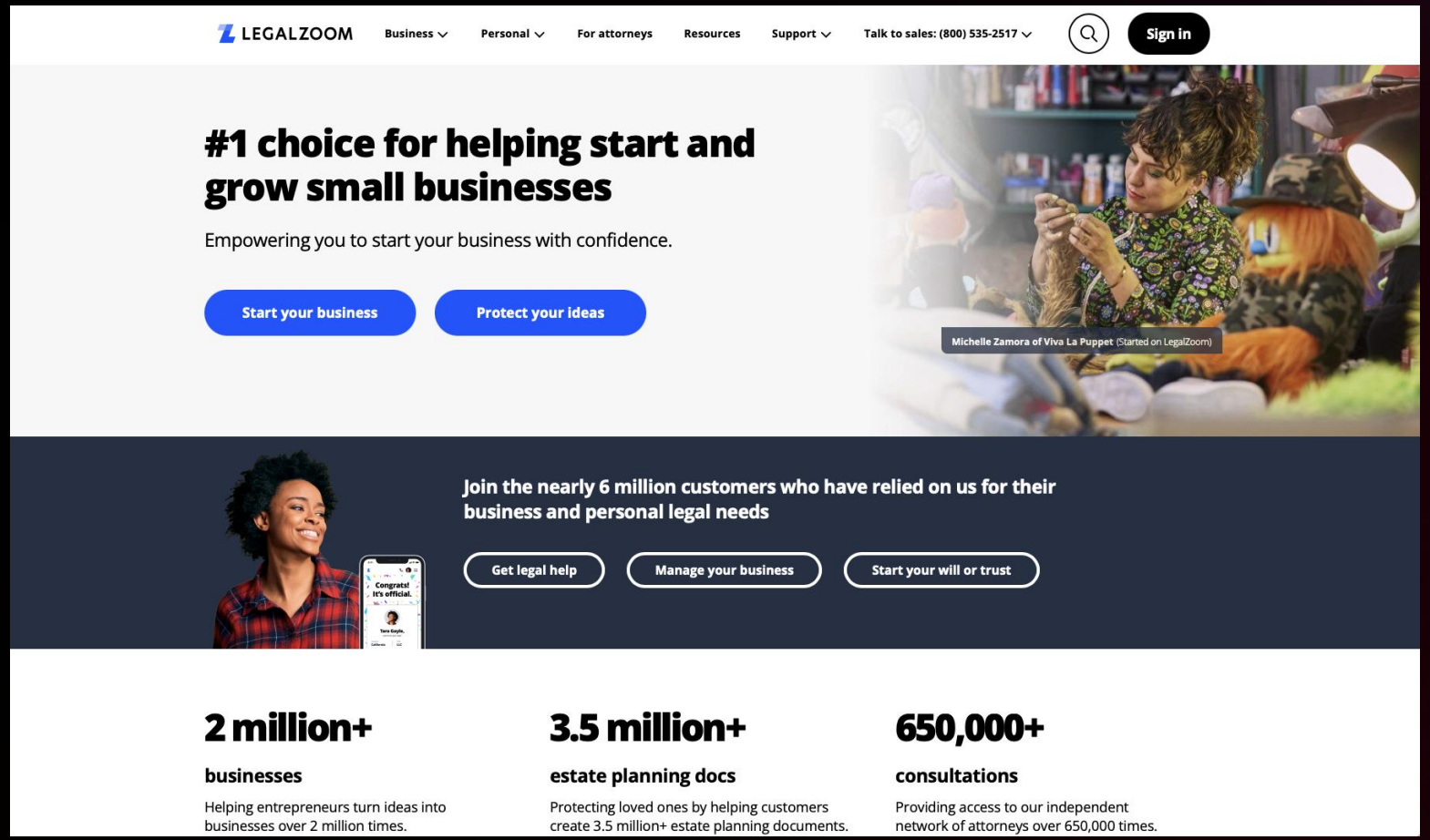


Jonathan Hutchins

Director of Engineering
LegalZoom

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About LegalZoom



- An industry leader in online small business formations
- A leading online platform for legal, compliance and tax solutions

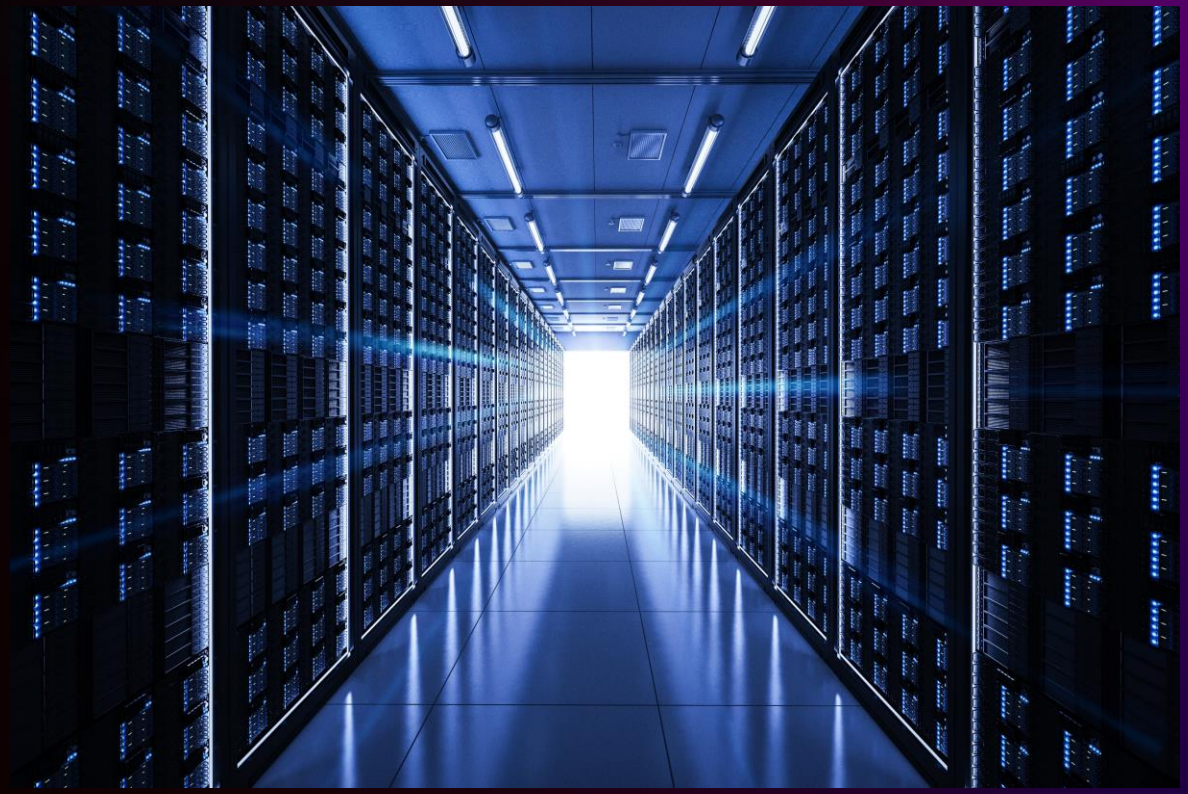
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Migrating to AWS Local Zones

FINDING THE BALANCE BETWEEN MODERNIZING AND LIFT AND SHIFT

Provocations for migrating:

- Rapid timeline: 2 years to move 2 data centers
- Modern microservice architecture capable of handling increased latency
- Legacy systems are tightly coupled; risk failure with latency variations



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LegalZoom existing technology stack

- 20-year-old fulfillment system in need of redesigning
- Several touch points along the fulfillment journey
- Requiring data manipulation
- Redesign needed to consider a local data center network
- Disaster recovery testing revealed latency sensitivity
- Highly complex system that would require a long time for a complete redesign
- **The solution…**

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LegalZoom migration to AWS Local Zones

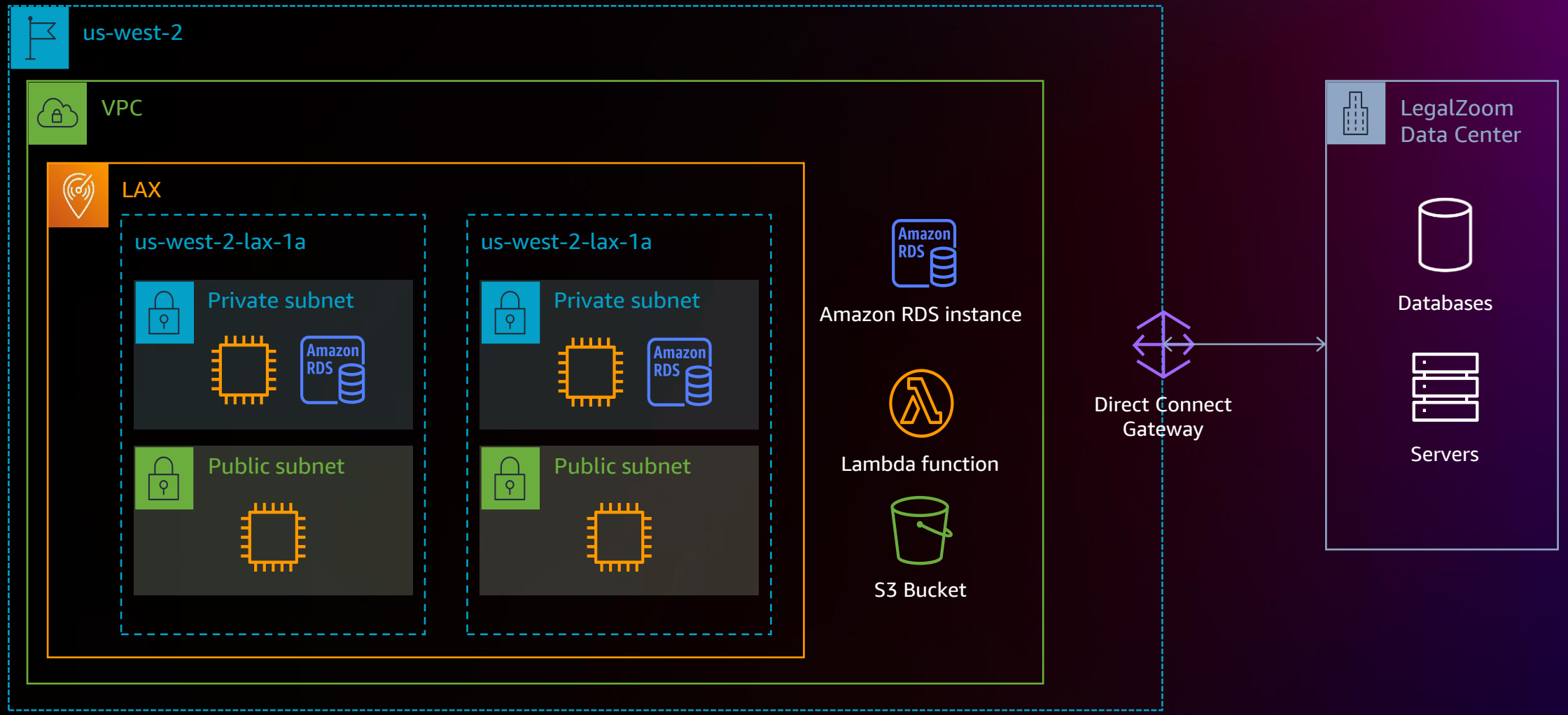
Using AWS Local Zones, we experienced:

- Minimal effort to provision a Local Zone
- Seamless migration: everything worked as soon as we set it up
- Running AWS services like Amazon EKS, Amazon EC2, Amazon RDS within the Local Zone
- Local Zones are bound to a nearby AWS Region, enabling you to extend your VPC from the Region to the Local Zone
- Additional resources can be also extended from the Region to the Local Zone

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LegalZoom AWS Local Zone Architecture



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LegalZoom Migration Takeaways

- As easy as using an Availability Zone in an AWS Region
- As reliable as a traditional region
- Enables innovation with AWS infrastructure, services, tools, and APIs
- Maintain < 5ms latency to our data center
- Services that are not yet locally supported in Local Zones can still be used in the Region
- Local Zones simplify our migration journey

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On premises: AWS Outposts

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AWS Outposts family

ON PREMISES

RUN AWS INFRASTRUCTURE AND SERVICES ON PREMISES

Outposts rack



Bring the same AWS APIs, services, and features to virtually any data center or co-location space

VMware Cloud on AWS Outposts



Deliver fully managed VMware Cloud on Outposts rack

Outposts servers



Run Outposts in locations with limited space or smaller capacity requirements

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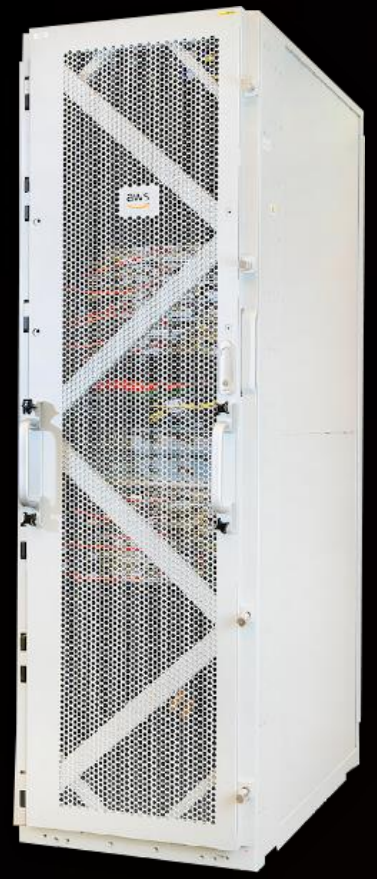
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AWS Outposts rack

ON PREMISES

RUN AWS OUTPOSTS ON-PREMISES

42U RACK
80 inches tall



- Industry-standard 42U rack
- Fully assembled, ready to be rolled into final position
- Installed by AWS, simply plug into power and network
- Centralized redundant power conversion unit and a DC power distribution system
- Redundant active components including top-of-rack switches

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Amazon EKS Local clusters on Outposts

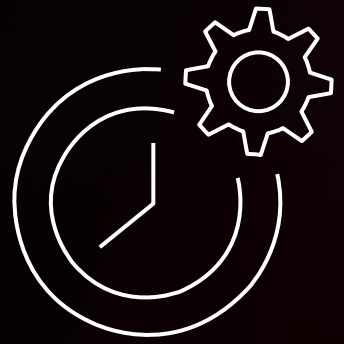
ON PREMISES

RUN YOUR ENTIRE AMAZON EKS KUBERNETES CLUSTERS ON AWS OUTPOSTS



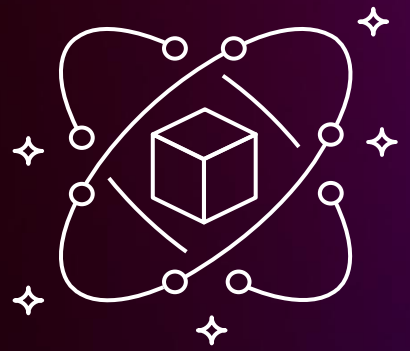
Highly Available

Stability and continued operations, even during temporary network disconnects



Consistent

Use familiar EKS APIs, console, and tools for a consistent hybrid Kubernetes experience



Fully Managed

Time-consuming Kubernetes operations fully managed by AWS

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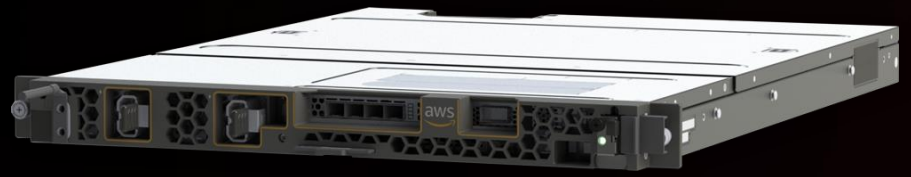
AWS Outposts servers

ON PREMISES

RUN AWS OUTPOSTS IN LOCATIONS WITH LIMITED SPACE OR CAPACITY REQUIREMENTS

1U SINGLE SERVER

1 ¾ inches tall



2U SINGLE SERVER

3 ½ inches tall



- 1U form factor with an AWS Graviton2 processor
- 2U form factor with an Intel processor
- Rack mountable
- Simple device installation
- Layer 2 connectivity to networks

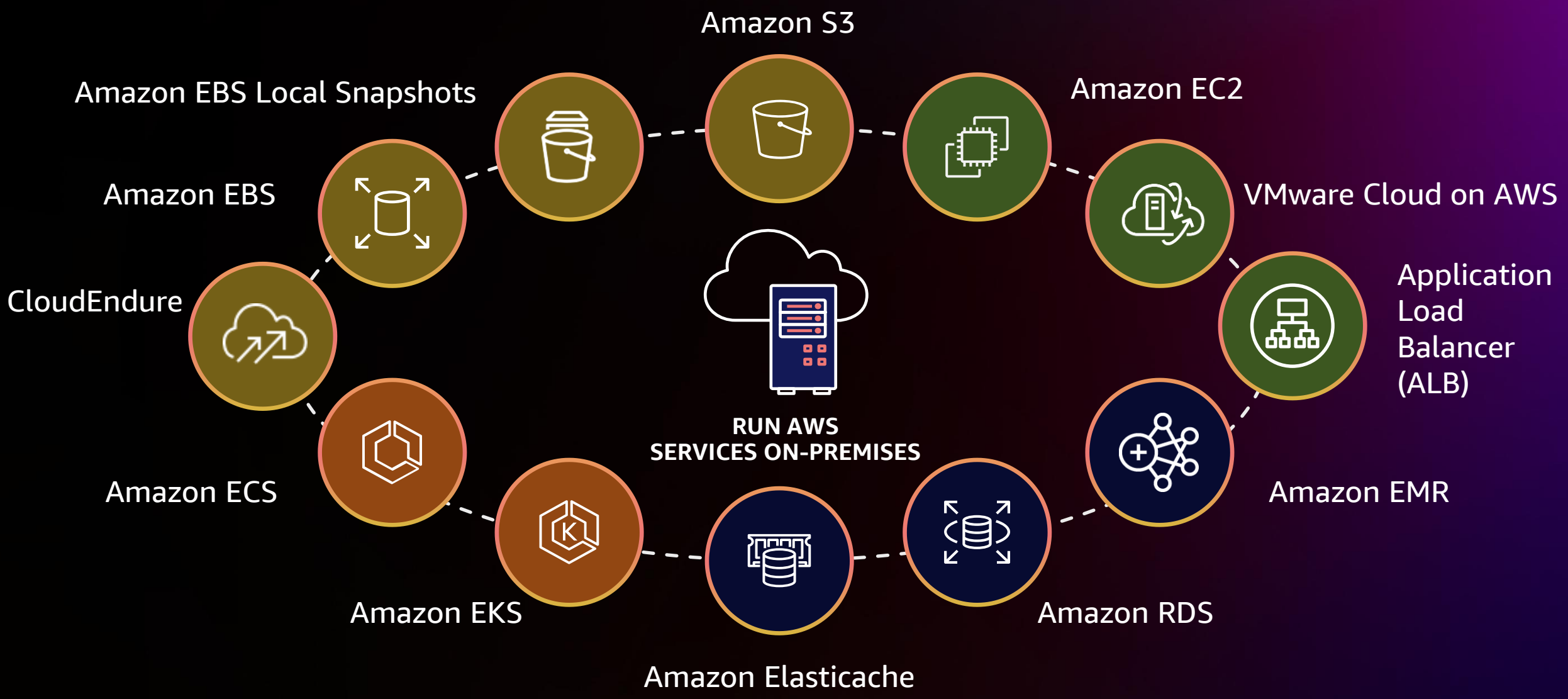
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AWS Outposts



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Services on AWS Outposts rack



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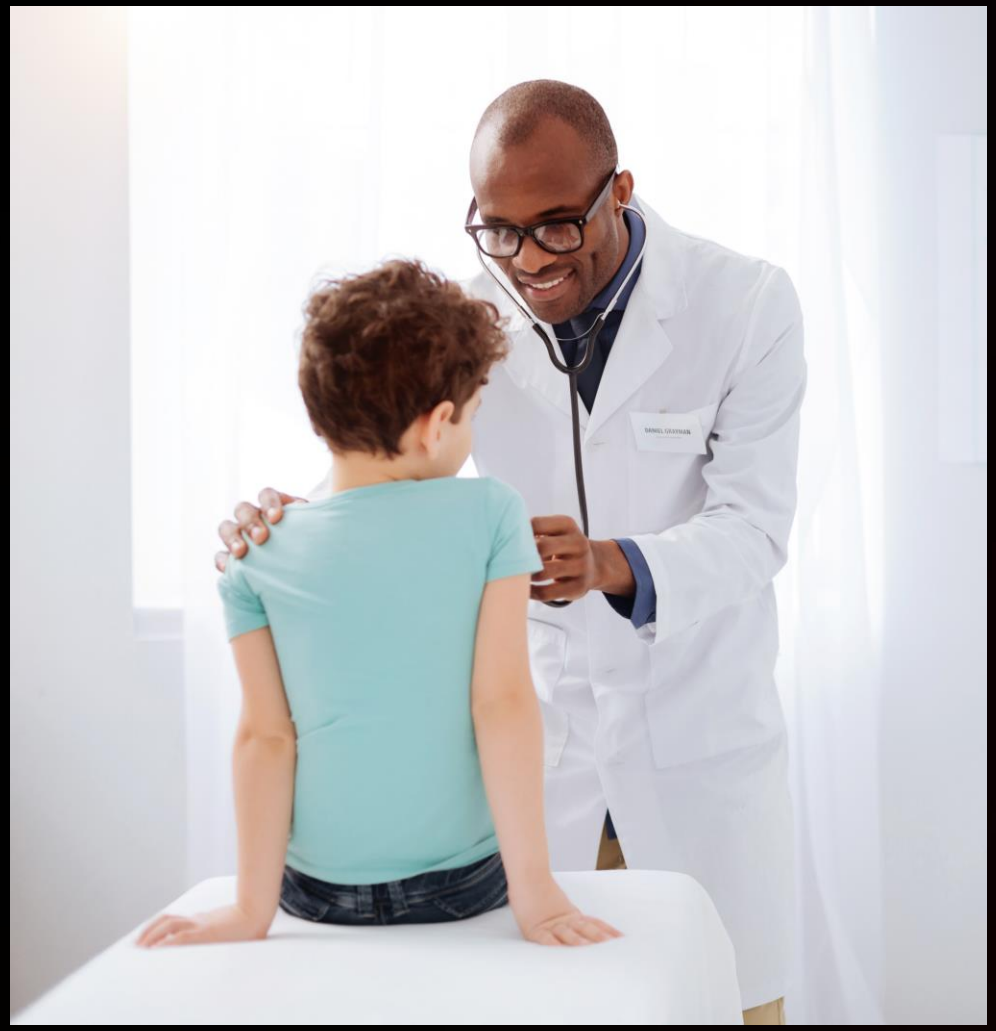
Anusha Dharmalingam

Senior Architect
athenahealth

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About athenahealth



- athenahealth creates innovative healthcare technology that connects clinicians, patients, payers, and partners.
- Our electronic health record, revenue cycle management, and patient engagement tools allow anytime, anywhere access, driving better financial outcomes for our customers and enabling our provider customers to deliver better quality care.

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athenahealth existing technology stack

- Business knowledge built over 25 years of domain expertise
- Perl based application on Apache web server with legacy relational database
- Multi tenancy
- Dedicated web server deployment and database instance/schema to scale effectively
- Tightly coupled code base causing maintainability and operational challenges
- Legacy data structures and table schema
- Modernization journey to AWS began a few years back

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athenahealth modernization strategy

- Strangler fig pattern in decomposing monolith to microservices
- Success with new peripheral services layered on top of existing services
- 80% of AWS footprint are Containerized workloads deployed on Amazon ECS
- With use of database services such as Amazon RDS for PostgreSQL, Amazon OpenSearch Service, and Amazon DynamoDB
- API, queuing, and event-based patterns for cross communication between services using Amazon EventBridge, Amazon Managed Streaming for Apache Kafka (Amazon MSK), and Amazon Simple Queue Service (Amazon SQS)
- Data from monolith is pushed to data lake on Amazon S3

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Migration challenges and solutions

Challenges

- Refactoring legacy code is hard and time-consuming
- High latency when accessing on-premises database for functionality in the cloud
- Developer challenges to keep switching between languages and infrastructure

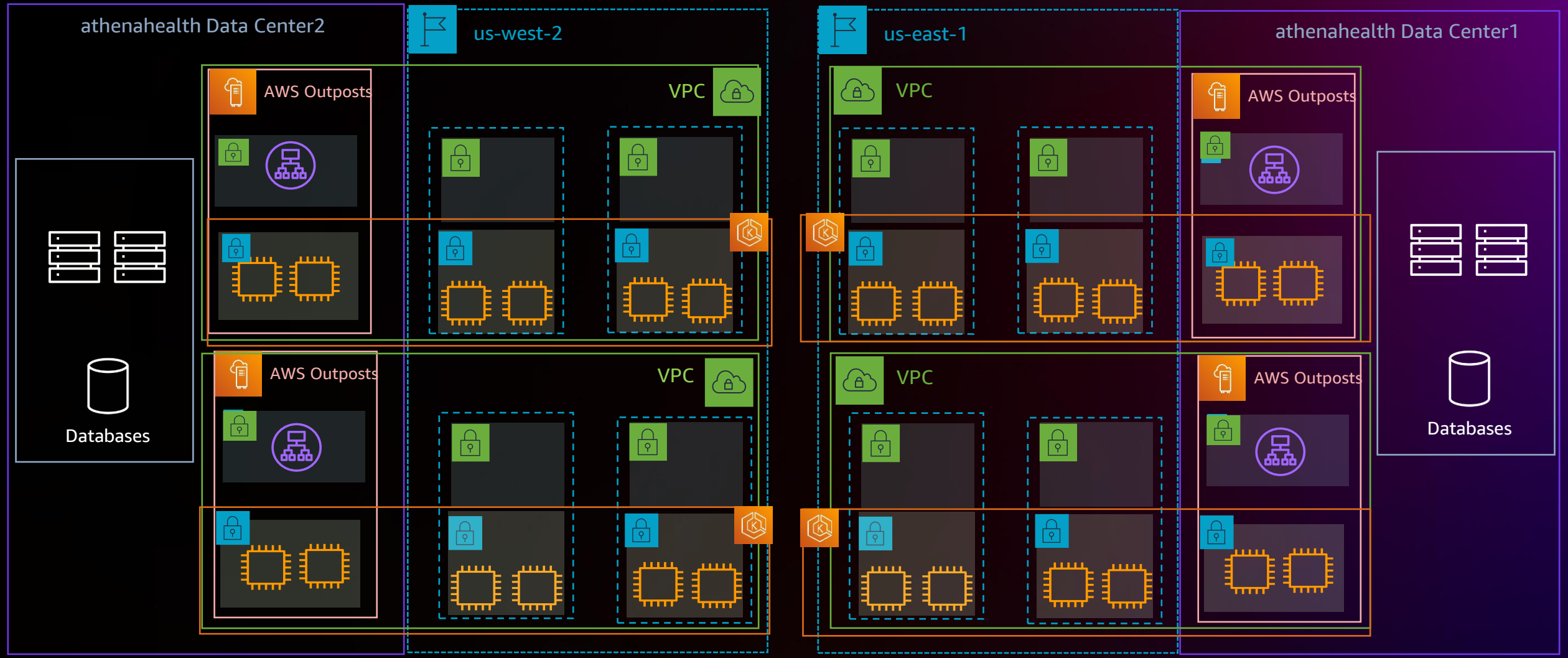
Solutions

- AWS Outposts provides containerized infrastructure with minimal latency
- Simplified deployment; build once and deploy on Outposts or migrate easily to AWS Region
- Developer skills aligned to one language stack and one deployment mode

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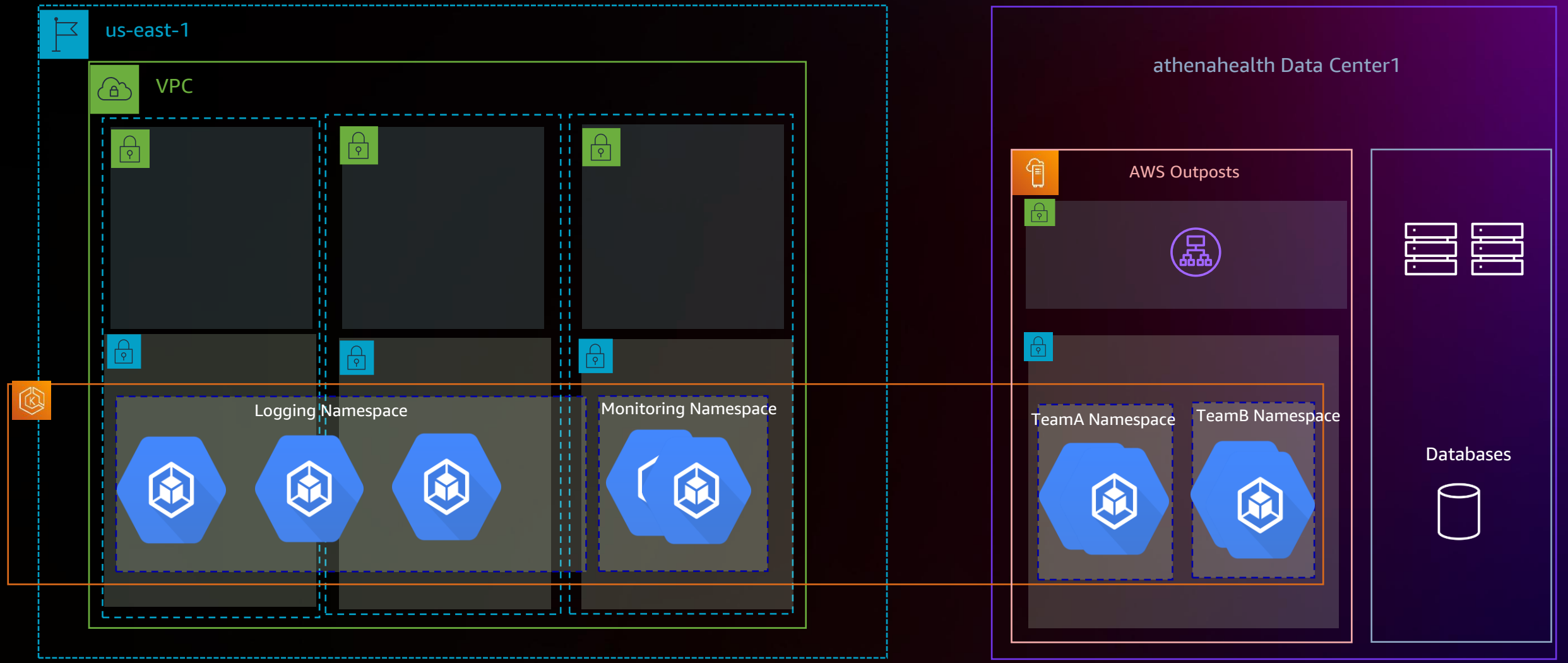
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AWS Outposts at athenahealth



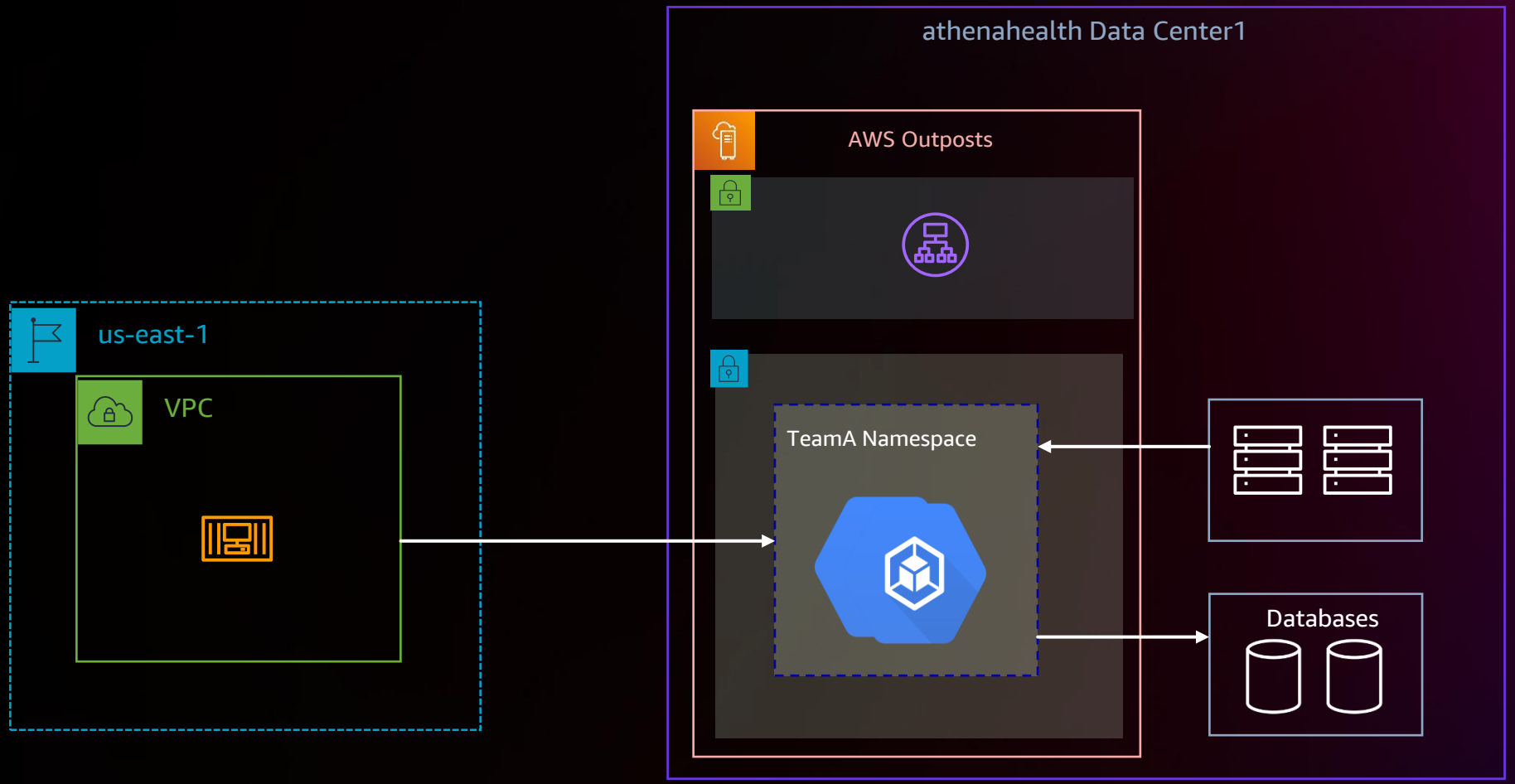
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Amazon EKS on AWS Outposts



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Amazon EKS on AWS Outposts



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Continued hybrid cloud journey

- Continue different architectural patterns of accessing data from Outposts
- Continue refactoring features from monolith
- Experiment with AWS Local Zones for less latency and improved elasticity while managing cost
- Build Kubernetes containers that can be deployed anywhere

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Far edge: AWS Snow Family

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Far edge: AWS Snow Family

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AWS Snowcone

FAR EDGE

PHYSICAL DEVICES TO AGGREGATE AND PROCESS DATA AT THE FAR EDGE



- Ultra-portable device
- 8 TBs storage
- 2 CPUs worth of compute
- 4.5 pounds
- Purpose-built for use outside of a traditional data center

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AWS Snowball

FAR EDGE

PHYSICAL DEVICES TO AGGREGATE AND PROCESS DATA AT THE FAR EDGE



Compute Optimized & Storage Optimized

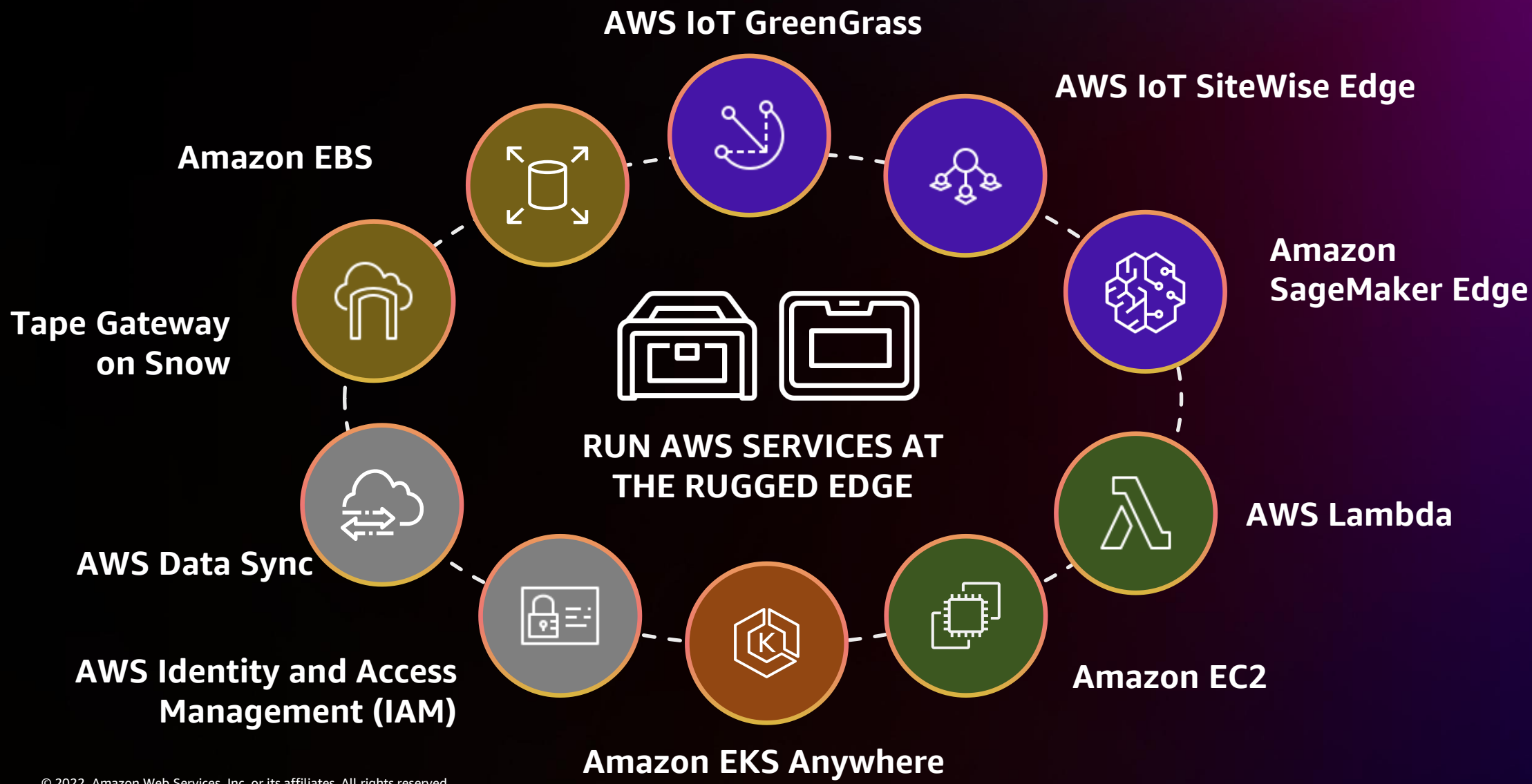
- Built to extend the cloud to the furthest corners of the world
- Ingest large amounts of data
- Distribute out large amounts of data to far edge
- Fit for portable use outside a data center
- Cluster for high availability

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Services on AWS Snow Family

FAR EDGE



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Workplace hero, Diego



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Thank you!

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