
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

HYB312

AWS Outposts: Bringing the AWS experience on premises

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Agenda

Hybrid Edge

AWS Outposts

First Abu Dhabi Bank

How we built Outposts

Sizing, ordering, and installation

Customer use cases

Questions

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Hybrid Edge

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Edge requirements



Low latency



Local data processing



Data residency



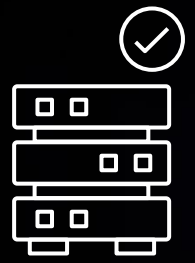
Migration and modernization

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AWS wherever you need it

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AWS extends the cloud to the edge



Reliable, secure, and high-performance infrastructure



Ownership model and operational consistency



Services and APIs



Tools for automation, deployments, and security controls



Pace of innovation

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AWS wherever you need it

REGIONS



METRO AREAS & TELCO NETWORKS



ON PREMISES



REMOTE & LIMITED CONNECTIVITY LOCATIONS



SMART DEVICES



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REGIONS



30 Geographical Regions

96 Availability Zones

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AWS Outposts

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AWS Outposts Family



Outposts rack

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



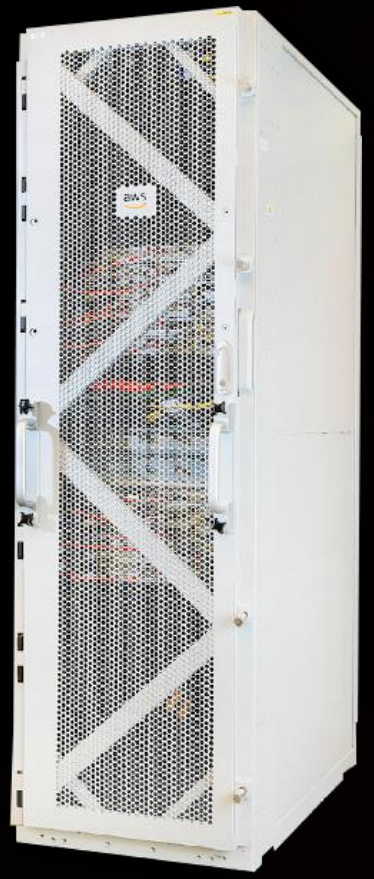
Outposts servers

Run Outposts in locations with limited space or smaller capacity requirements

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AWS Outposts rack

42U RACK
80 inches tall



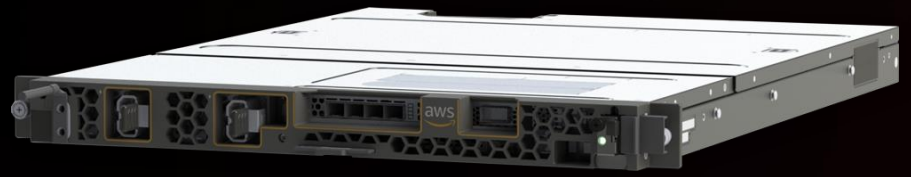
- Industry-standard 42U rack
- Fully assembled, ready to be rolled into final position
- Installed by AWS, simply plug into power and network
- Centralized redundant power conversion unit and a DC power distribution system
- Redundant active components including top-of-rack switches

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AWS Outposts servers

1U SINGLE SERVER

1 ¾ inches tall



2U SINGLE SERVER

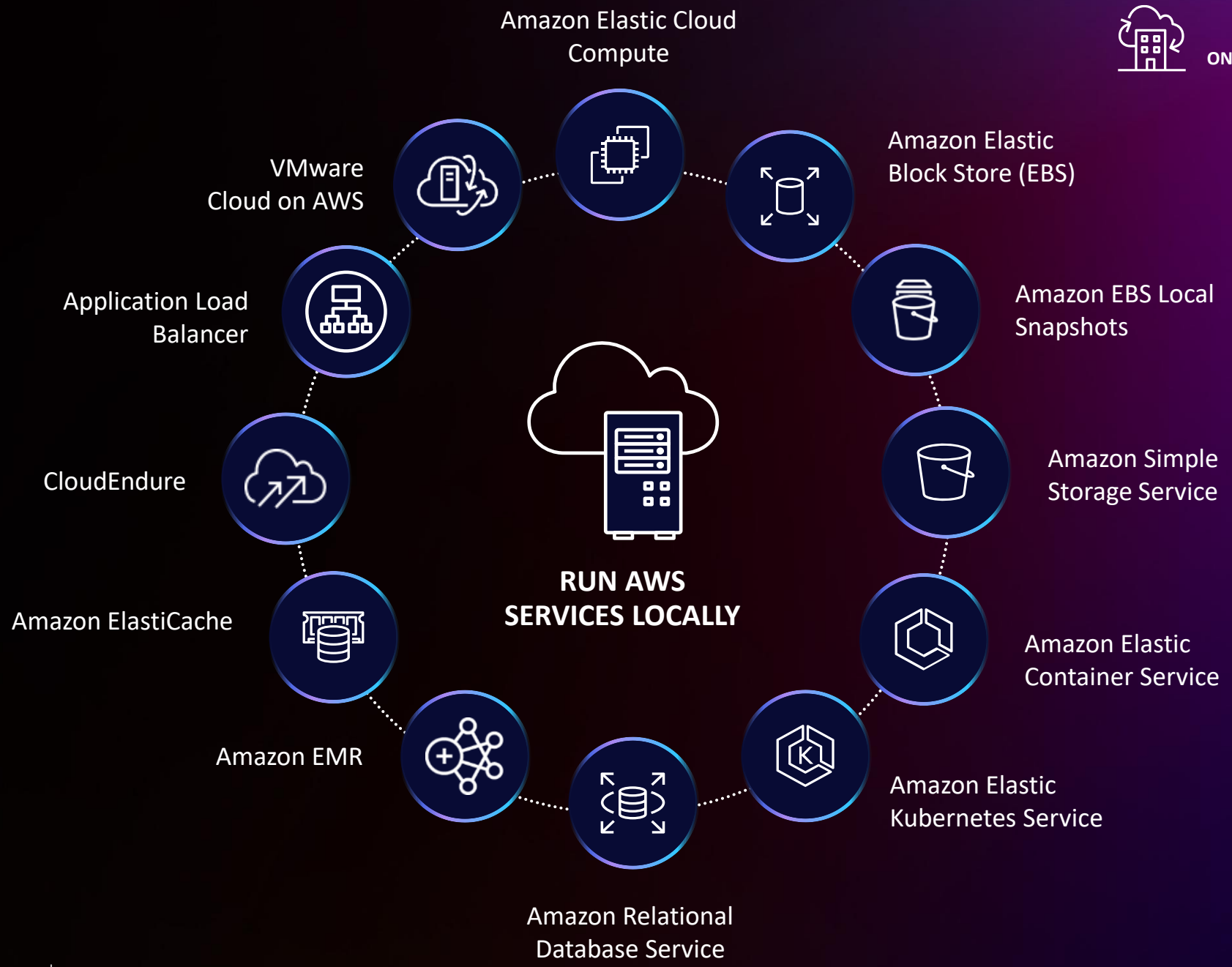
3 ½ inches tall



- 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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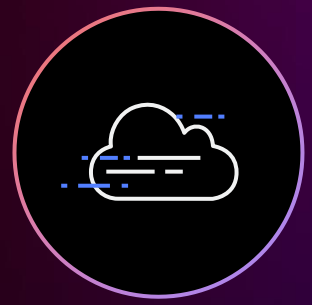
AWS Outposts supports mission-critical and business-critical workloads



Enhanced availability, security, and compliance



Simplified management and scaling



Accelerated cloud migration

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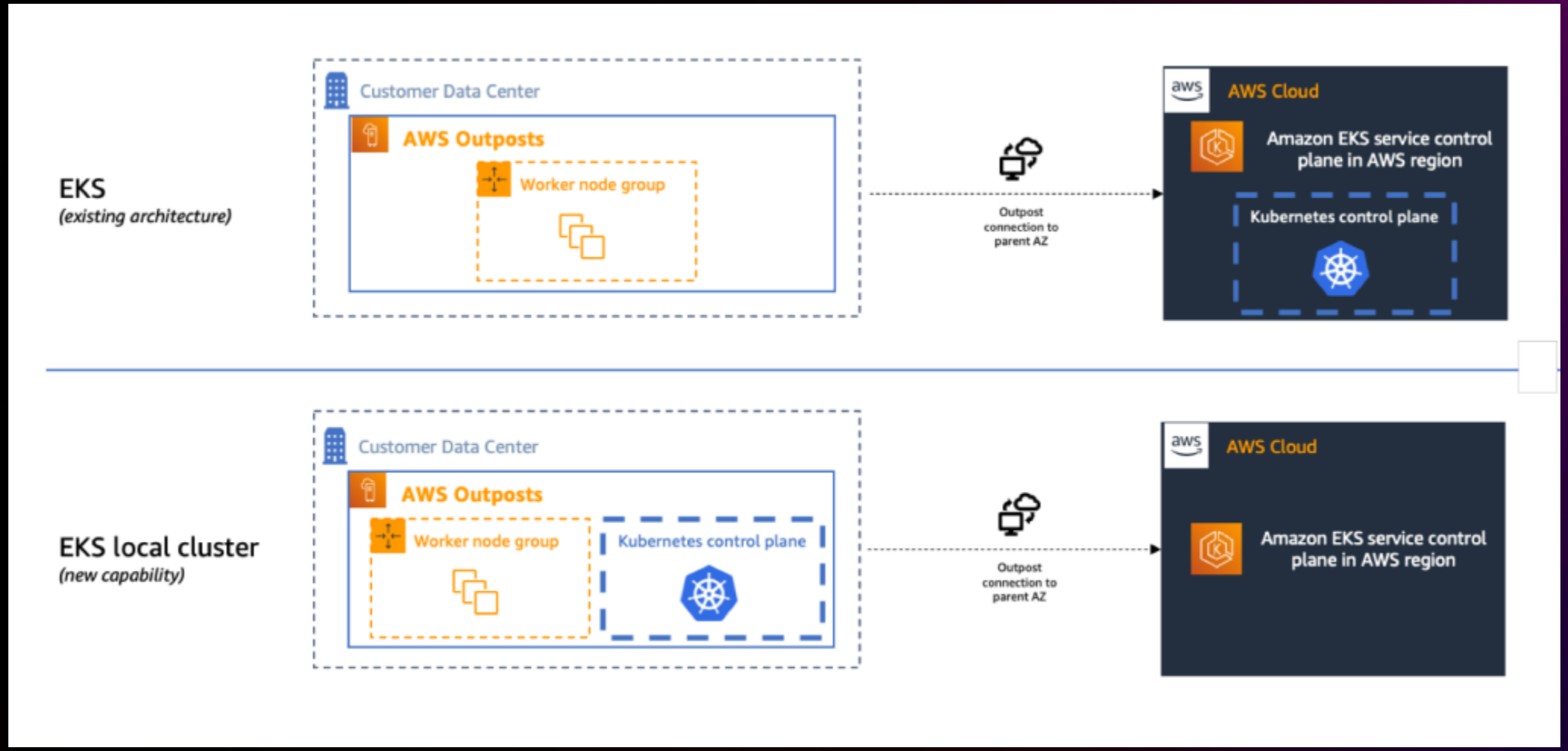
Enhanced availability, security, and compliance

- Host-level spread placement group for high availability
- Local gateway ingress routing for fine-grained network and security policies
- Local clusters for EKS on Outposts
- Multi-AZ for Amazon RDS on Outposts for highly available databases on premises
- S3 on Outposts support for object versioning
- FedRAMP authorized
- S3 on Outposts available in GovCloud Regions



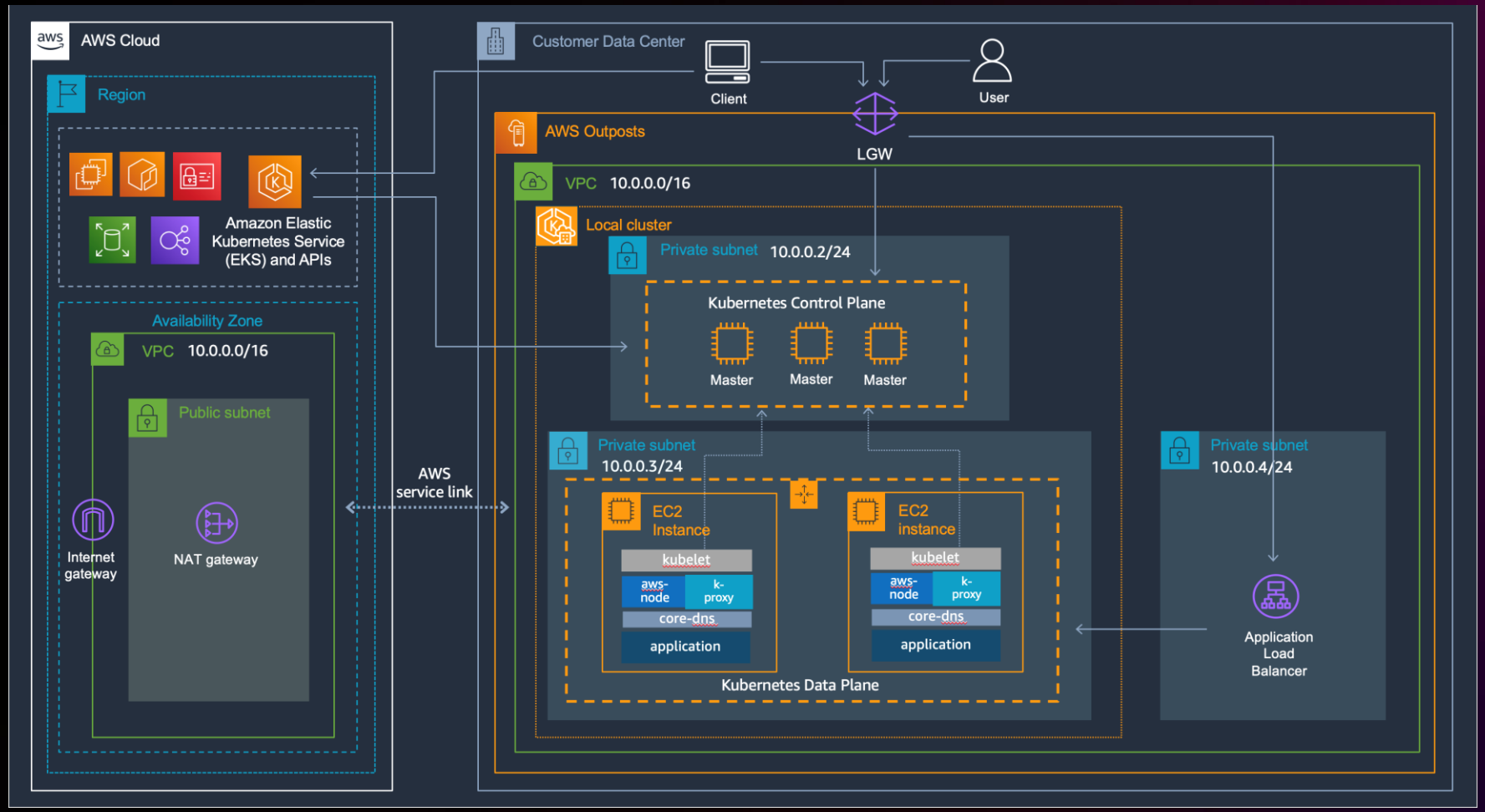
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Local clusters for Amazon EKS on AWS Outposts



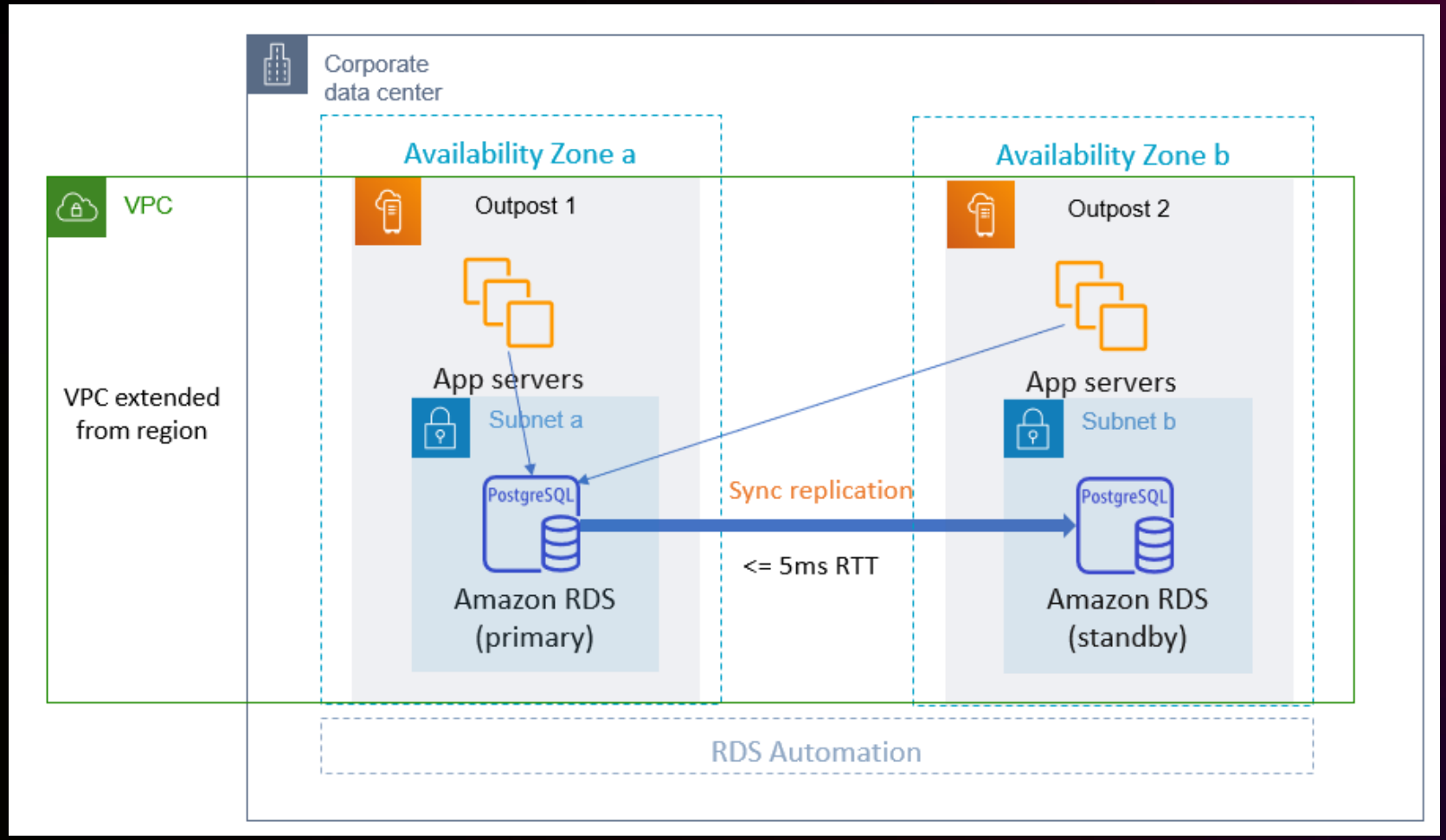
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Local clusters for Amazon EKS on AWS Outposts – Deep Dive



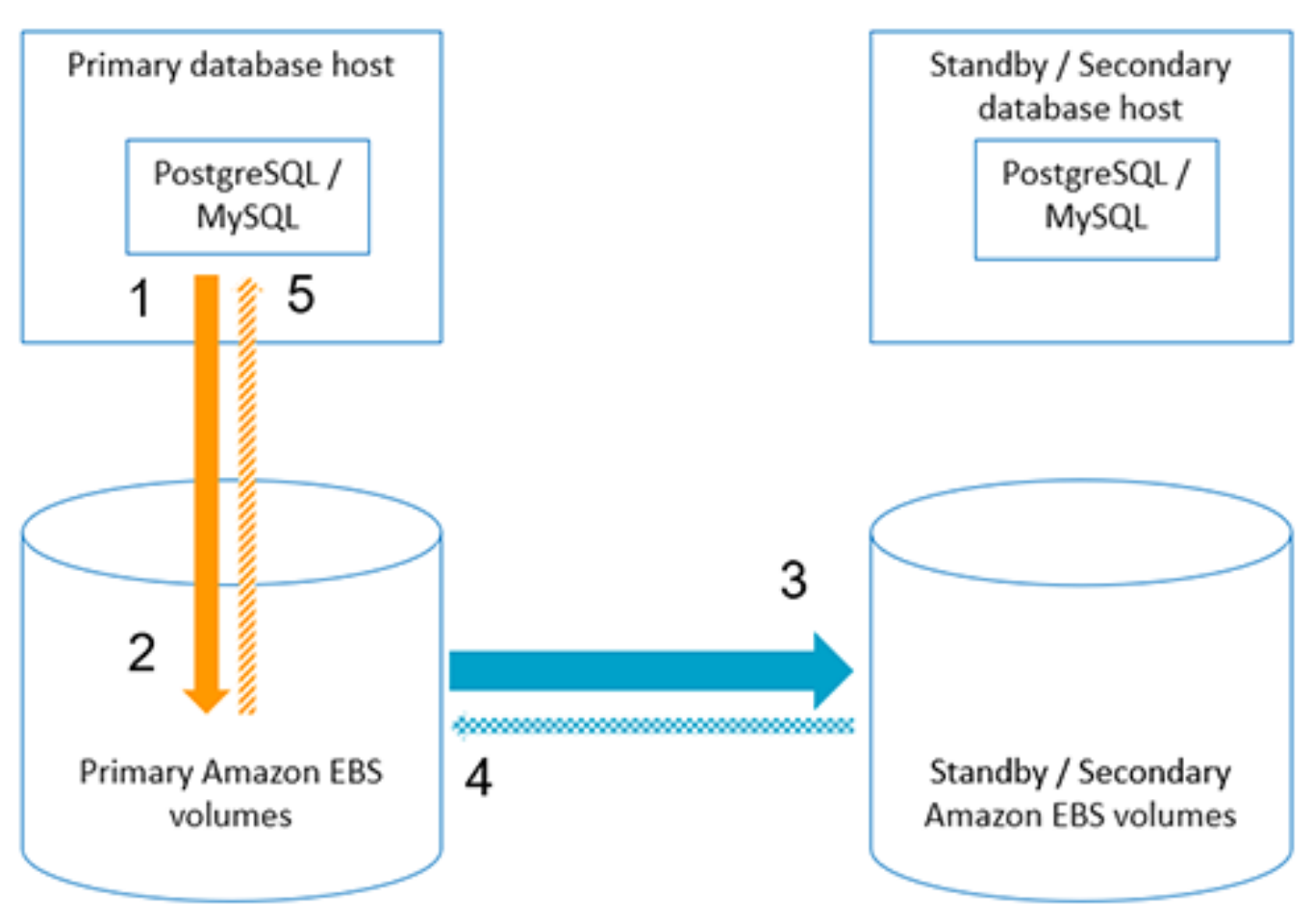
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Amazon RDS on AWS Outposts Multi-AZ deployment



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Database write operation data flow



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Simplified management and scaling

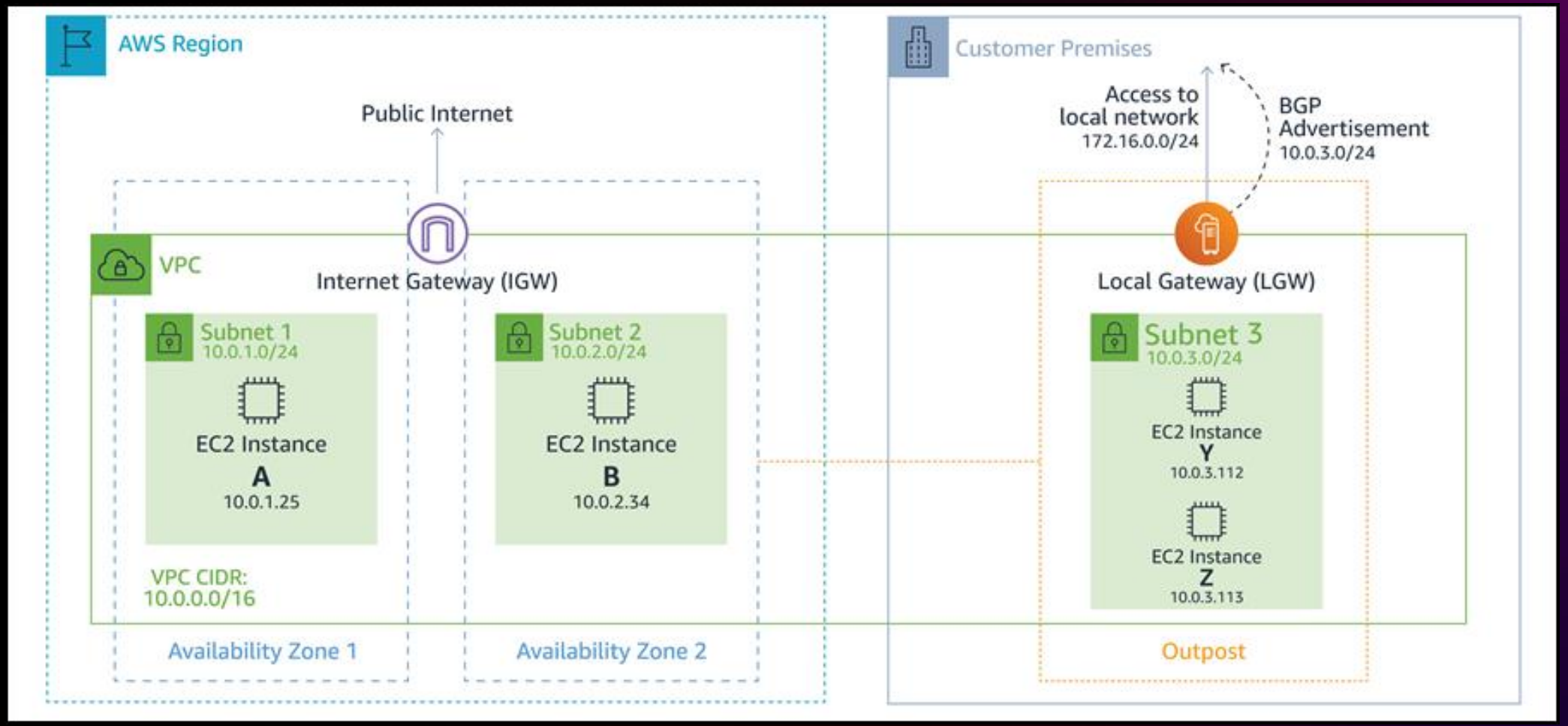
- Local gateway direct VPC routing for simplified IP address management
- Storage autoscaling for Amazon RDS on Outposts
- New S3 Lifecycle actions and filters to optimize storage management
- S3 on Outposts Access Point aliases to simplify application access to data
- S3 on Outposts presigned URLs for time-limited sharing of objects
- AWS PrivateLink for management of S3 buckets and access points



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Local gateway direct VPC routing



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Accelerated cloud migration

- EC2 Dedicated Hosts on Outposts
- Enterprise On-Ramp Support
- AWS Backup with AWS PrivateLink support for VMware workloads
- AWS Backup compliance management for VMware workloads
- AWS Backup for restoring virtual disks from protected copies of VMware VMs



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بنـــك أبـــوظبـــي الأول
FAB
First Abu Dhabi Bank

Innovating at First Abu Dhabi Bank while meeting data residency requirements

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Agenda

First Abu Dhabi Bank overview

Business opportunities that we wanted to capture

Architecture overview of Outposts at FAB

Practical example of Region-based and local services working together

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First Abu Dhabi Bank

- UAE’s largest bank and one of the world’s largest and safest institutions
- Diversified banking franchise with market-leading corporate, commercial, investment, private, and consumer banking business
- Headquartered in Abu Dhabi with global presence across 20 countries
- 3+ million customers in the UAE
- Total assets of over US$312 billion



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Transform user experience in banking



Business opportunities

- **Transform the user experience** for our customers while complying with **data residency** requirements
- Among others, enable customers to **open a fully functional bank account and receive a credit card** using their cell phones **in less than 10 minutes** in a completely self-service manner

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Build and deploy modern apps with AWS Outposts

بنـك أبـوظبـي الأول
FAB
First Abu Dhabi Bank



Solution

- Leveraged **AWS Outposts** to build and deploy modern containerized applications while storing and processing data within our data centers in the UAE
- **Multiple Outposts** located in Abu Dhabi and Dubai to meet business continuity requirements

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Faster time to market and increased developer/infra team productivity

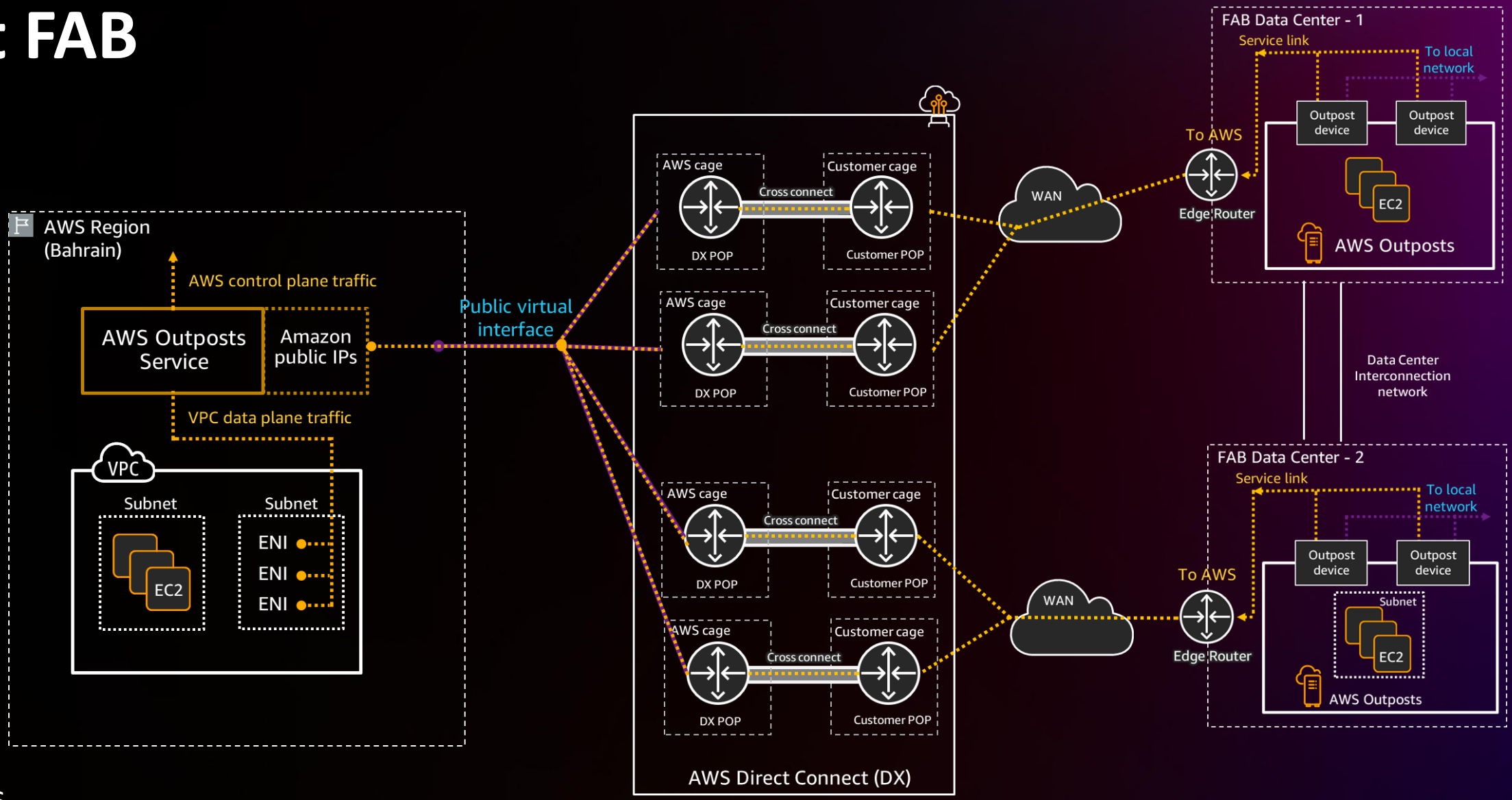


Business outcomes

- **Over 50%** faster time to market for the Outposts hosted applications
- **60%** increase in developer and infrastructure team productivity by leveraging the same infrastructure, services, APIs, and tools across the cloud and on-premises

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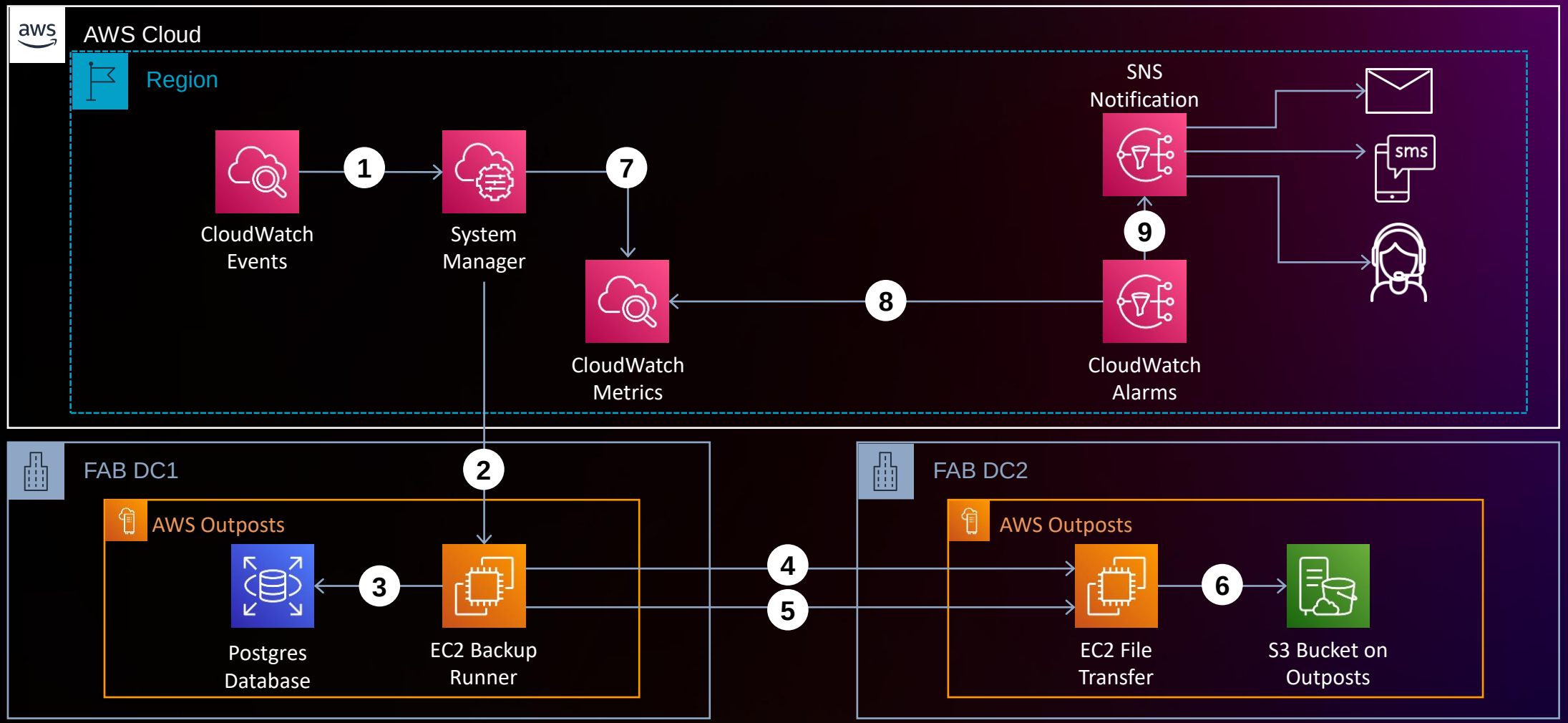
Architecture overview of AWS Outposts at FAB



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Region and local services working together

Problem Statement: Customer onboarding microservices use Amazon RDS on AWS Outposts. Even backup must remain within the UAE and meet recovery point objective (RPO) of 1 hour.



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Summary

- AWS Outposts has enabled First Abu Dhabi Bank to adopt modern containerized applications while complying with data residency requirements.
- FAB has built new apps such as self-service customer onboarding, multi-account management, and remote cheque deposit to transform our customers' experience.
- Outposts has enabled our engineers to become familiar with running production workloads on a consistent hybrid experience, which will help with our adoption of AWS UAE Region.
- FAB is using Amazon EKS, Amazon EC2, Amazon RDS, Application Load Balancer (ALB), Amazon S3, and Amazon ElastiCache on Outposts in combination with management services such as AWS Control Tower, AWS CloudFormation, Amazon CloudWatch and others from the Region. This combination enabled us to achieve over 50% faster time to market for the Outposts hosted applications.

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How it works

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AWS Outposts rack

42U rack

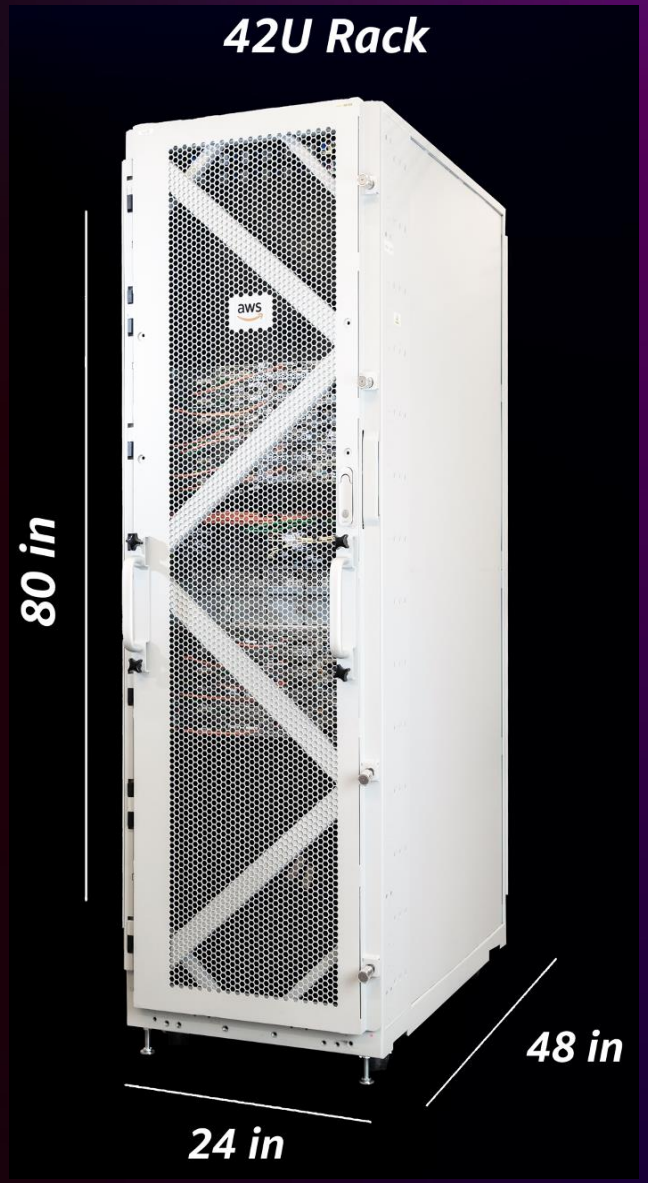
Same AWS control plane

Same Nitro hardware

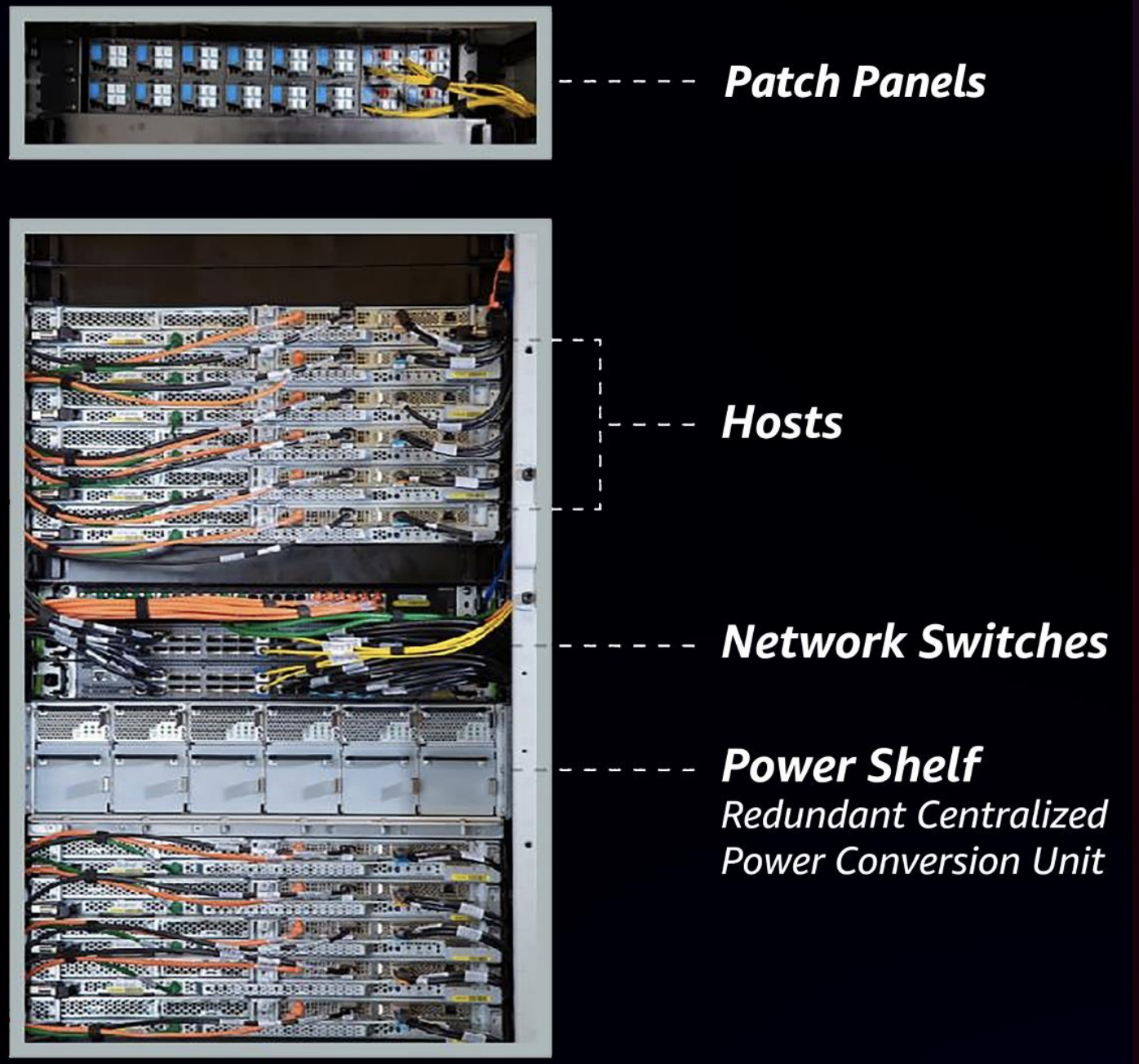
Same Nitro software

Same updates and maintenance

To give you the same AWS experience!



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Patch Panels
Hosts
Network Switches
Power Shelf
Redundant Centralized
Power Conversion Unit

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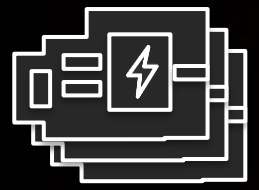
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AWS Nitro System

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AWS Nitro System

Nitro cards



VPC networking

Amazon Elastic Block Store (Amazon EBS)

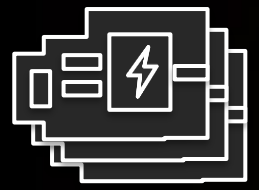
Instance storage

System controller

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AWS Nitro System

Nitro cards



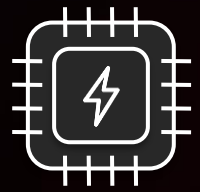
VPC networking

Amazon Elastic Block Store (Amazon EBS)

Instance storage

System controller

Nitro Security Chip



Integrated into motherboard

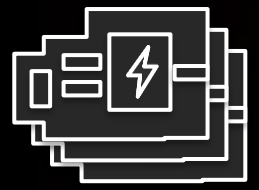
Protects hardware resources

Hardware root of trust

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AWS Nitro System

Nitro cards



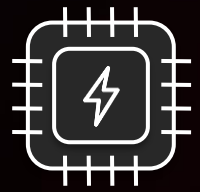
VPC networking

Amazon Elastic Block Store (Amazon EBS)

Instance storage

System controller

Nitro Security Chip

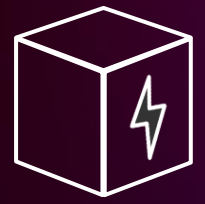


Integrated into motherboard

Protects hardware resources

Hardware root of trust

Nitro Hypervisor



Lightweight hypervisor

Memory and CPU allocation

Bare metal-like performance

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Nitro security key

All data is encrypted at rest and in transit in Nitro

Key material is wrapped to external key stored in removable device

Destroying the device is equivalent to destroying the data



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Bringing it all together

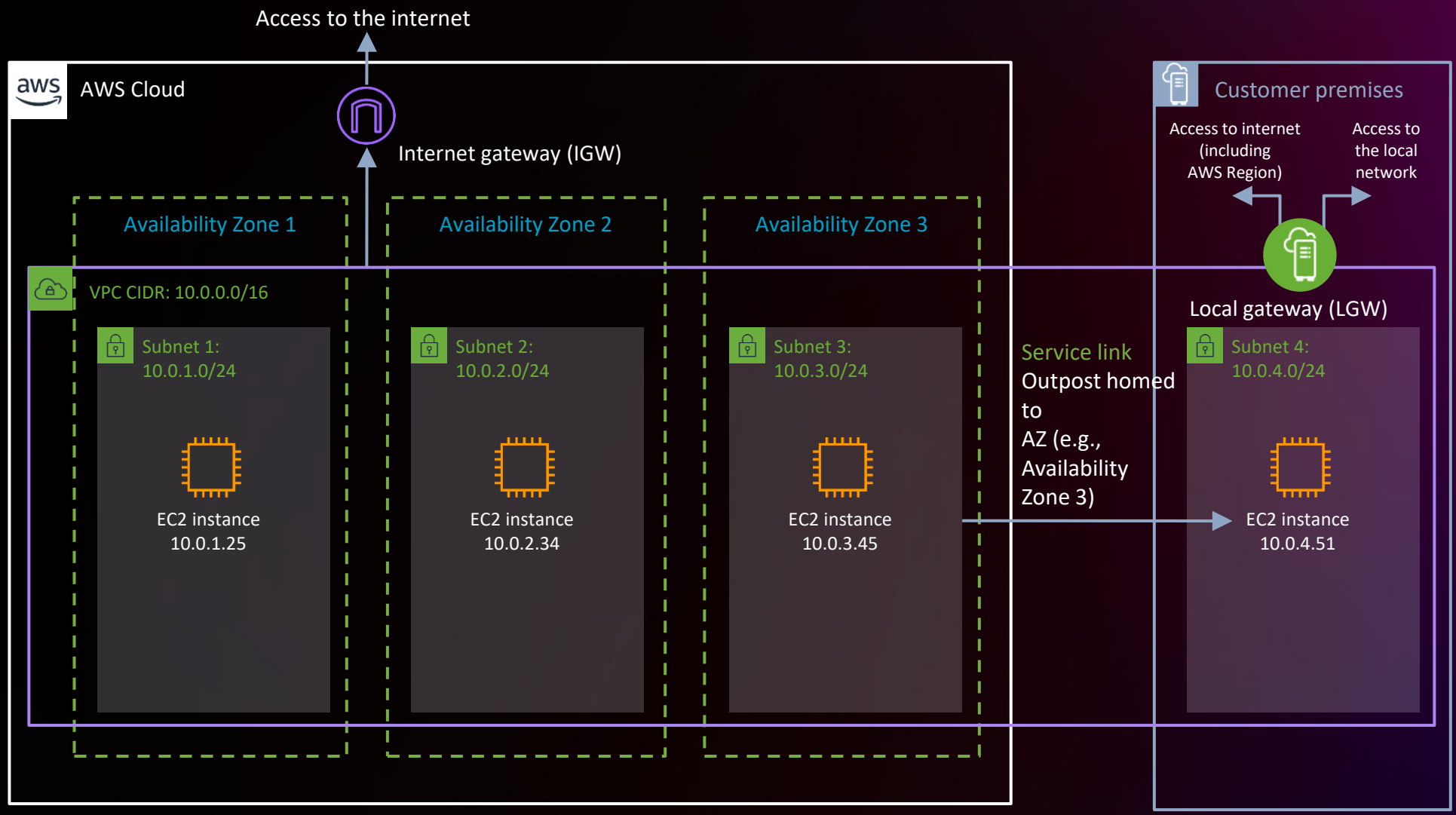
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How AWS Outposts racks work



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Networking with AWS Outposts racks



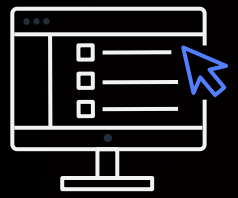
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Ordering and installation

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Ordering

Create a site



Location

Power requirements

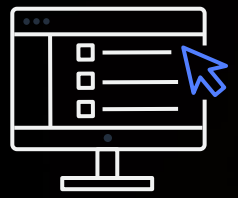
Network configuration

Weight requirements

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Ordering

Create a site



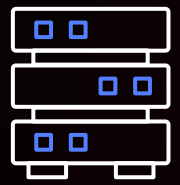
Location

Power requirements

Network configuration

Weight requirements

Select an Outpost



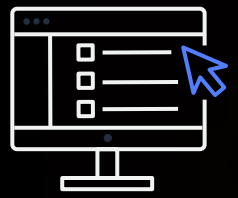
Configurations with predefined Nitro instances available

Contact us for new configurations

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Ordering

Create a site



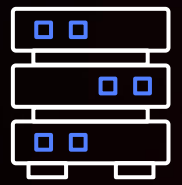
Location

Power requirements

Network configuration

Weight requirements

Select an Outpost



Configurations with predefined Nitro instances available

Contact us for new configurations

Deliver and install



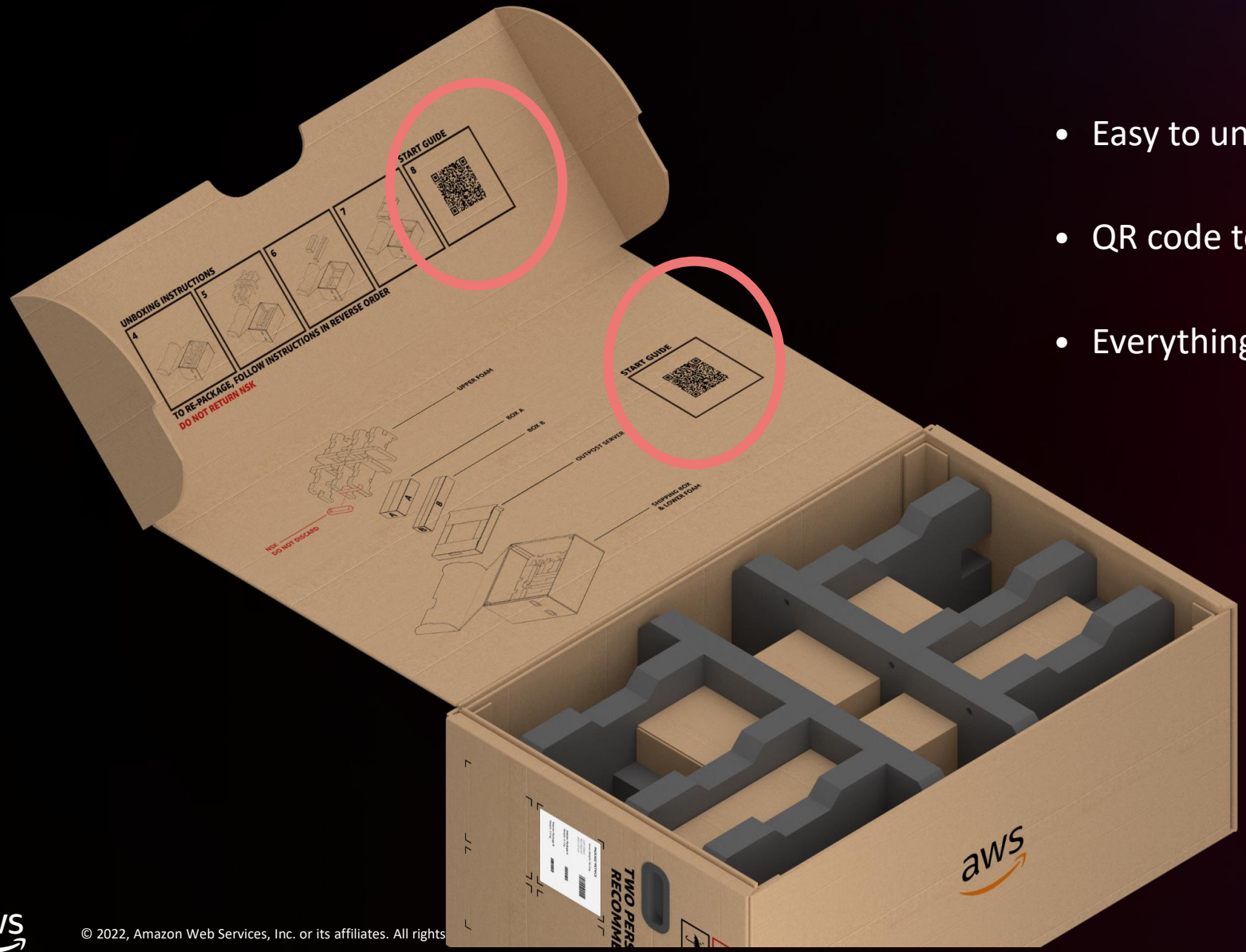
Outpost delivered to you

Plug it into power

Provision and configure

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1U/2U servers delivery



- Easy to unpack
- QR code to step-by-step video tutorials
- Everything you need included in the box

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Customer use cases

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Nasdaq

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

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Inmarsat has migrated over 90% of infrastructure to AWS, but certain business-critical applications had to remain on-premises for low-latency access to local operational systems

Running the entire business-critical billing system on AWS Outposts with Amazon EC2 and Amazon EBS

Keep latency down at 1.2 milliseconds against a goal of under 2 milliseconds. Easily maintain the same security stance, auditing, monitoring, reporting, and cost efficiency as in the cloud

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athenahealth

athenahealth wanted to modernize application features that have strong dependency an on-premises legacy database

Expedited migration by containerizing application features with Amazon EKS on Outposts while maintaining low-latency access to the legacy database

Simplified deployment model and improved developer productivity—developers can now write once and deploy on Outposts or migrate easily to an AWS Region

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Amazon Fulfillment Center

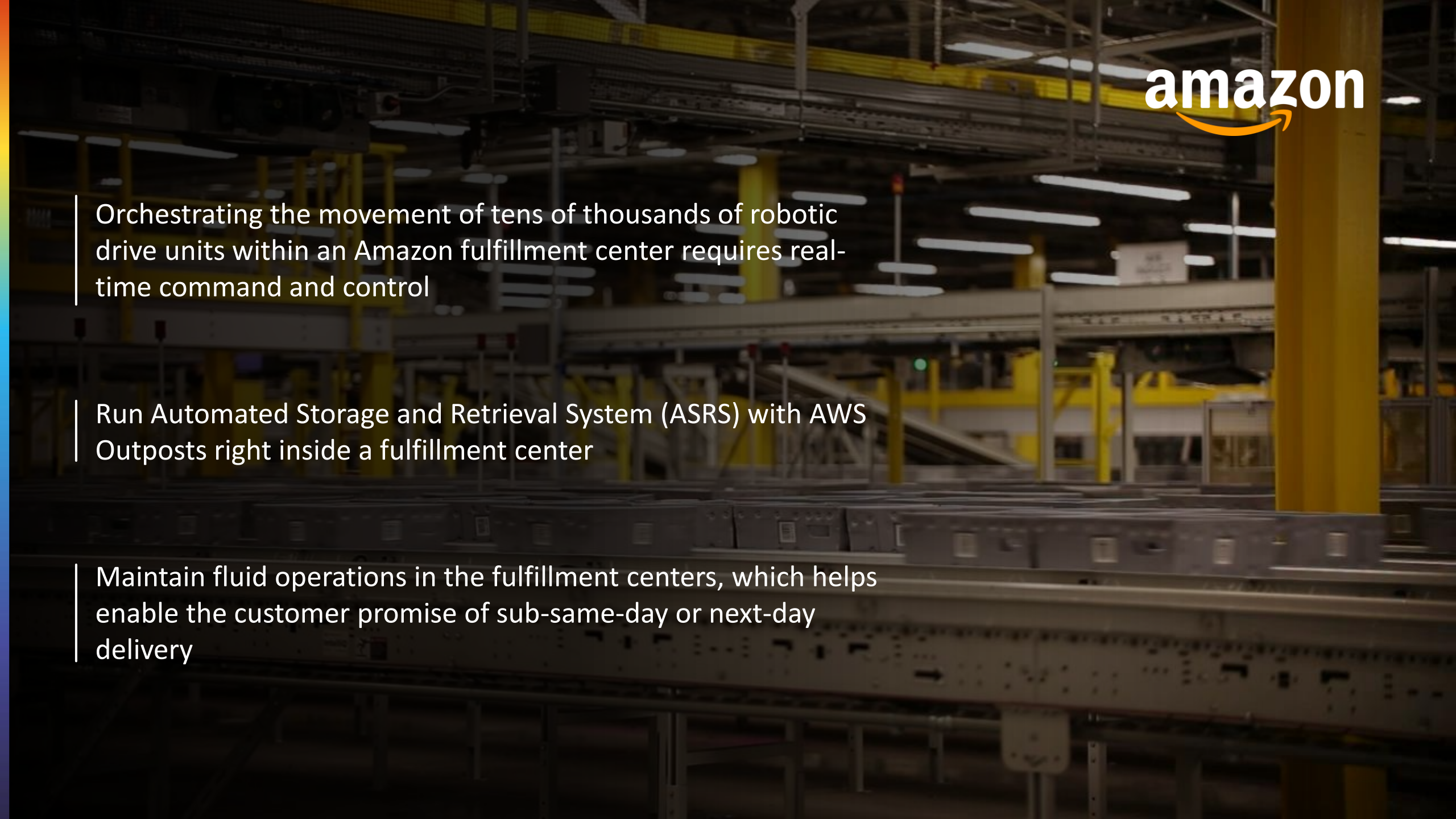
Mayur Nemade, Principal SDE, Amazon Robotics

Garry Galinsky, Principal Solution Architect, AWS

Sophie Pagalday, Sr. Product Marketing Manager, AWS

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- Orchestrating the movement of tens of thousands of robotic drive units within an Amazon fulfillment center requires real-time command and control

- Run Automated Storage and Retrieval System (ASRS) with AWS Outposts right inside a fulfillment center

- Maintain fluid operations in the fulfillment centers, which helps enable the customer promise of sub-same-day or next-day delivery



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Free Throw Analyzer

AWS Village (Booth #1335)

Venetian | Level 2 | Expo Hall





AI Quality Control at Scale

EBC Lounge

Venetian | Level 4



Free Kick Challenge

Industry Tent – Sports

Outside Caesars Plaza

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Thank you!

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