# Introduction to Hybrid Cloud on AWS

Tom Laszewski, AWS Enterprise Architecture Leader

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# Learning Objectives

- Understand Hybrid Cloud architecture use cases
- Understand AWS portfolio of capabilities to support Hybrid Cloud
- Understand AWS partnerships with VMWare, Microsoft and other key enterprise players

# Hybrid Cloud Strategy

**83%**

of workloads are virtualized today (IDC )

**60%**

of large enterprises run VMs in the public cloud (IDC)

**65%**

of organizations have a hybrid cloud strategy today (IDC *)

# What Do Customers Want in Hybrid?

Run workloads on-premises

Run workloads on the cloud

Tight integration


Without buying new hardware



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# Hybrid Cloud Use Cases

- Integrated Identity and Access
- Integrated Network
- Data Integration
- Integrated resources and deployment management
- Integrated Devices and Edge Systems
- Cloud Bursting
- Data center extension

# AWS Hybrid Cloud Solutions & Partners


VPC


IAM


Direct Connect


EC2


Storage Gateway

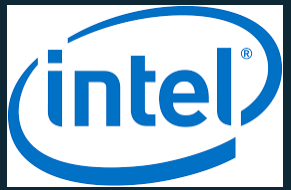

S3


Snowball


RDS


Systems Manager


OpsWorks



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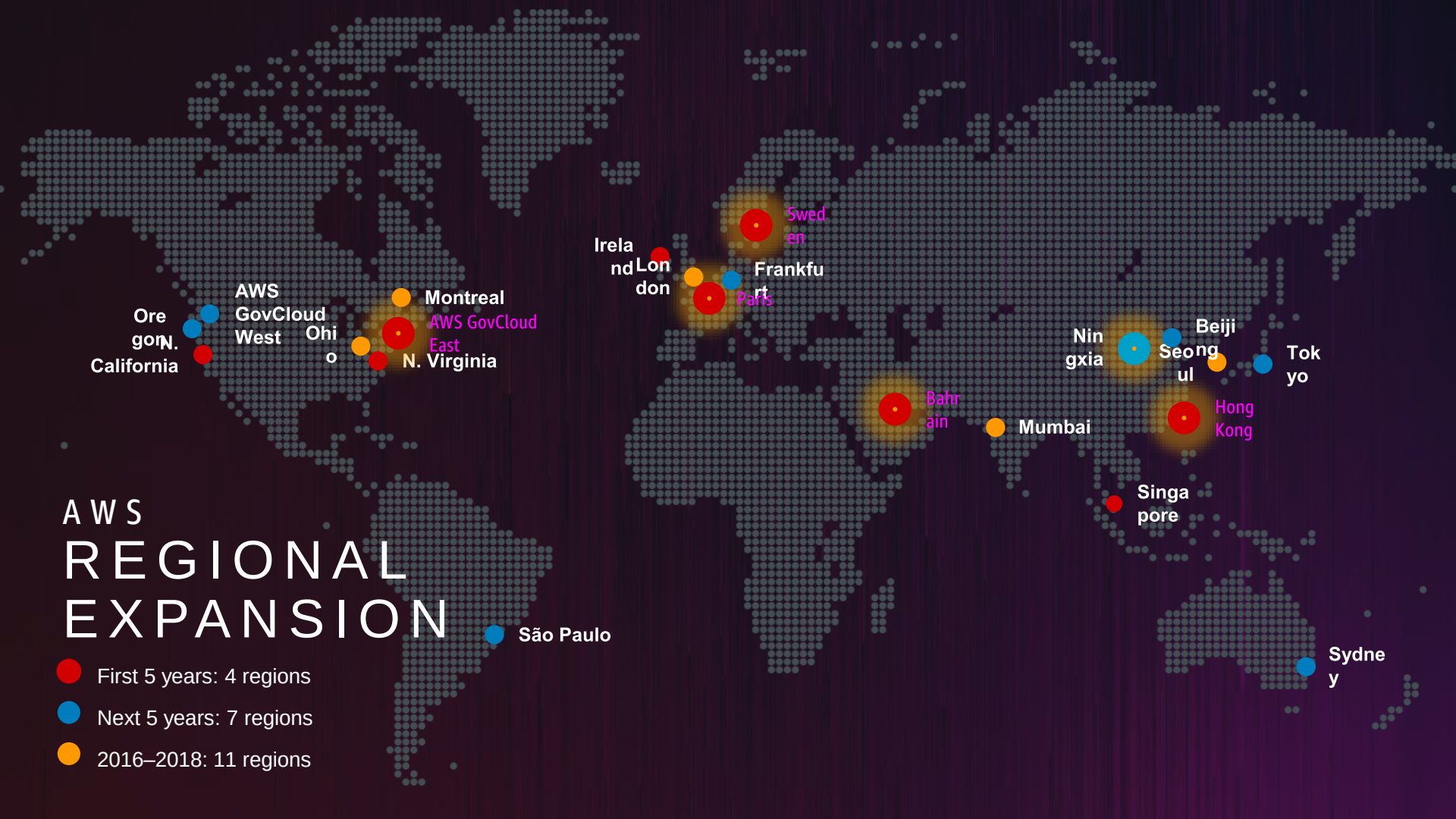
AWS
REGIONAL
EXPANSION
First 5 years: 4 regions
Next 5 years: 7 regions
2016–2018: 11 regions
Ore
gon
N.
California
AWS
GovCloud
West
Ohi
o
Montreal
AWS GovCloud
East
N. Virginia
São Paulo
Irela
nd
Lon
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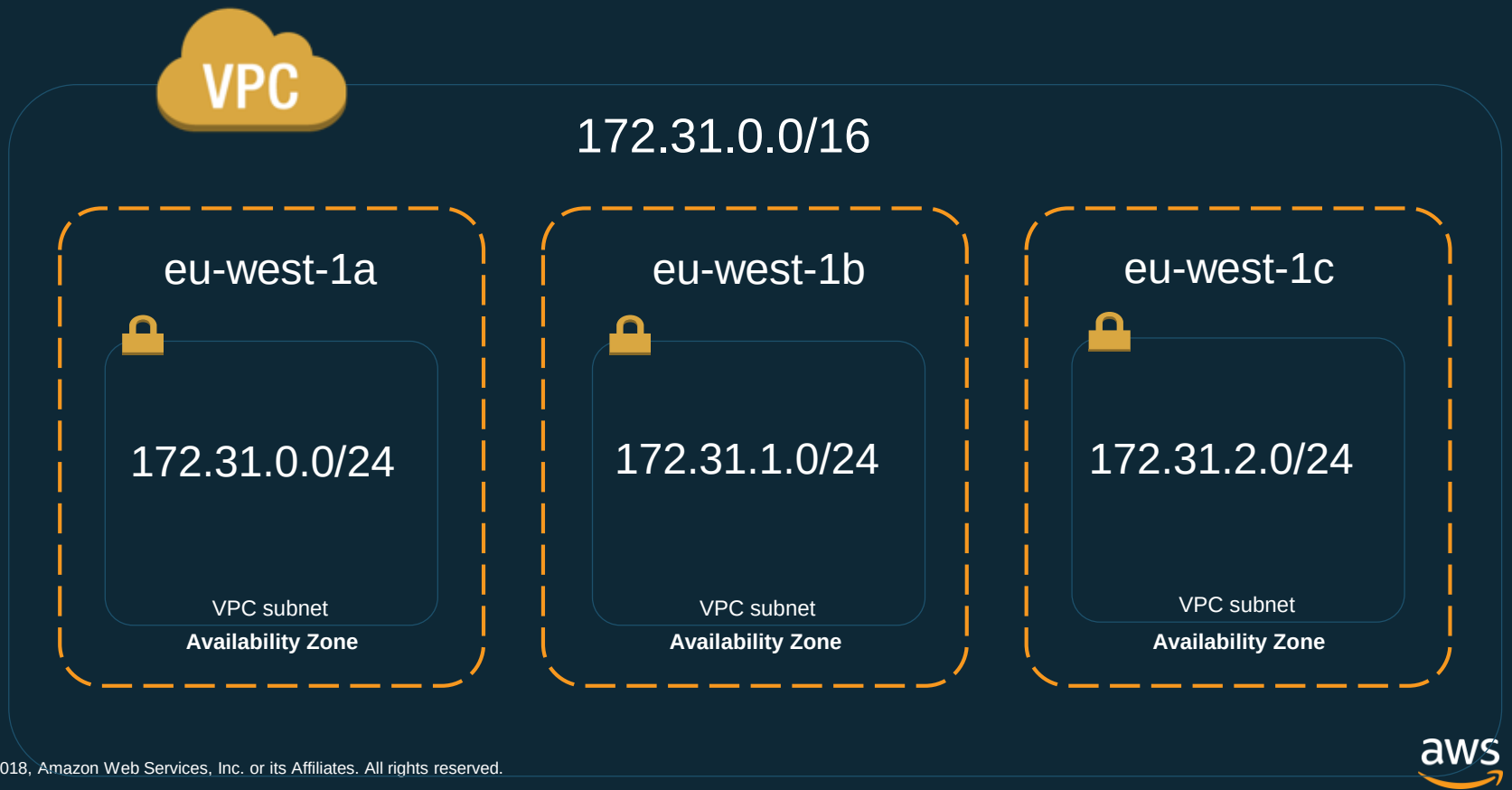
# The Foundation

# Integrated Identity and Access
# Integrated Network

# Virtual Private Network – Extension of your data center

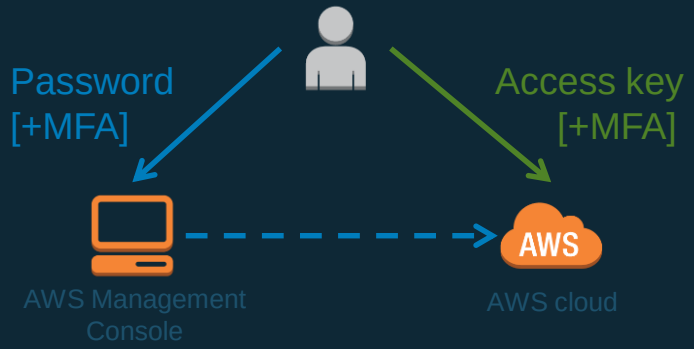


# IAM Identities

## Users and Groups

### IAM user

- Entity created in AWS to represent a person or service that uses it to interact with AWS

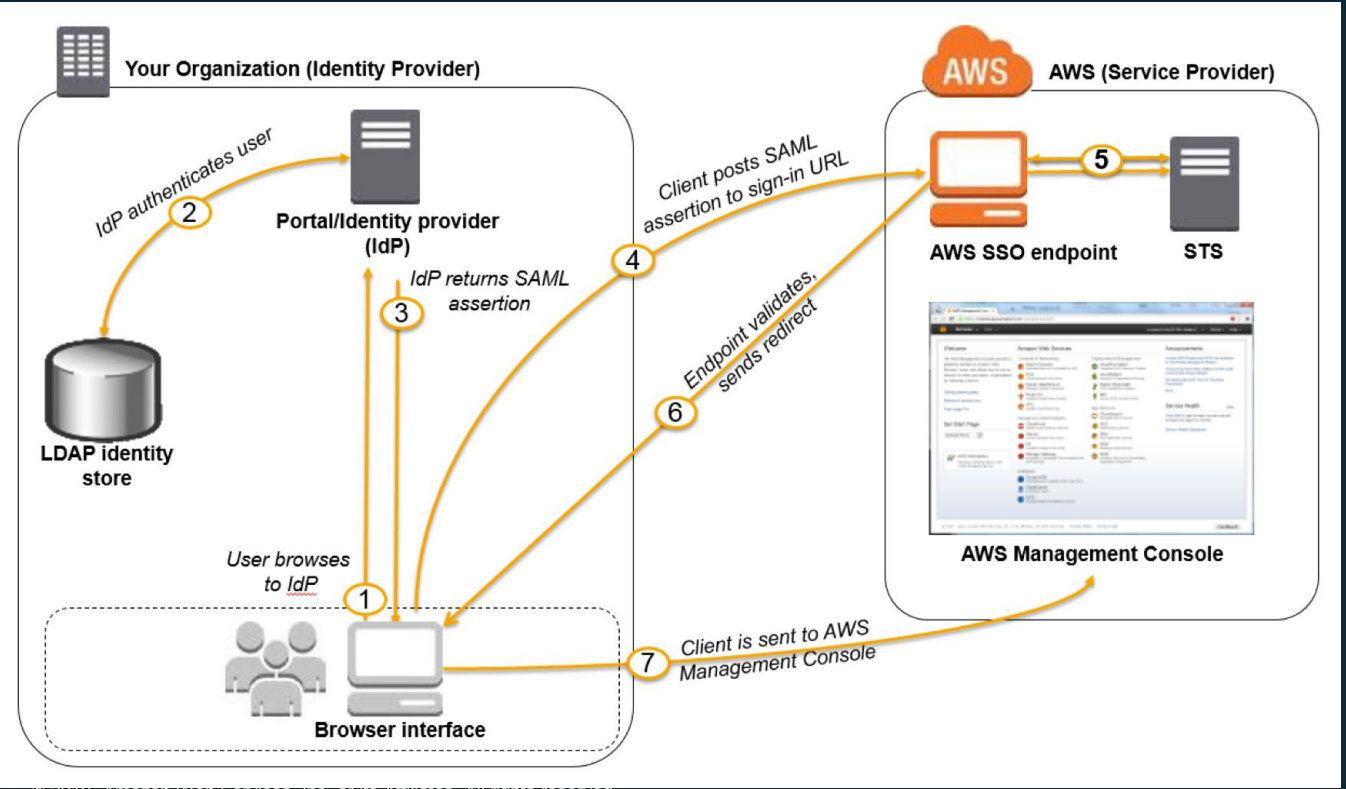



### IAM group

- Assign permissions to logical and functional grouping of your organization
- Bulk permissions management (*scalable*)
- Easy to change permissions as individuals change teams (*portable*)

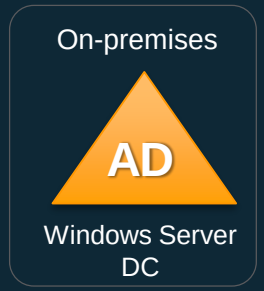
# IAM Identities

## Identity Federation – Example for SAML 2.0 (Web Console)



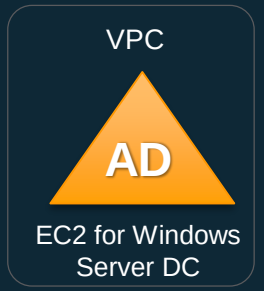

Other protocol supported: OpenID Connect

# Options for AD-aware Cloud Workloads



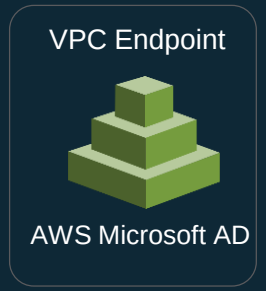

**You manage**

1




**You manage**

2




**AWS manages**

3

AWS Directory Service
for Microsoft Active Directory
also known as AWS Managed Microsoft AD



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# Connectivity Options

**Public Internet**

- Public IPs
- Elastic IPs
- Internet data out pricing

**VPN**

- IPsec authentication and encryption
- Two main options
  - AWS Managed VPN
  - Software VPN (EC2)

**AWS Direct Connect**

- Launched in 2011
- Private connection
- Separate from the Internet
- Consistent network experience
- Connect through 67 locations
- Port speeds of 1 Gbps, 10 Gbps or sub-1 Gbps



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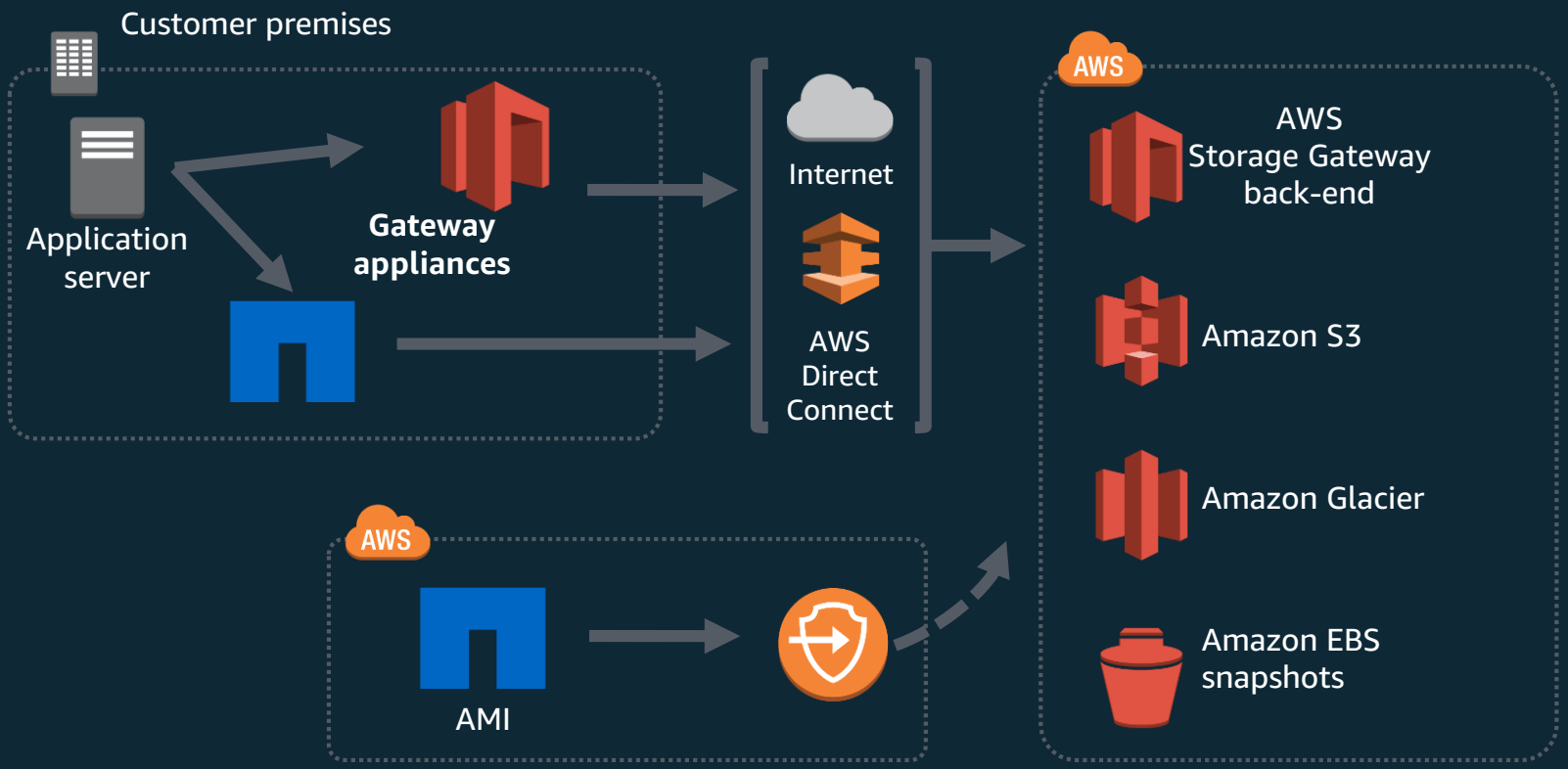
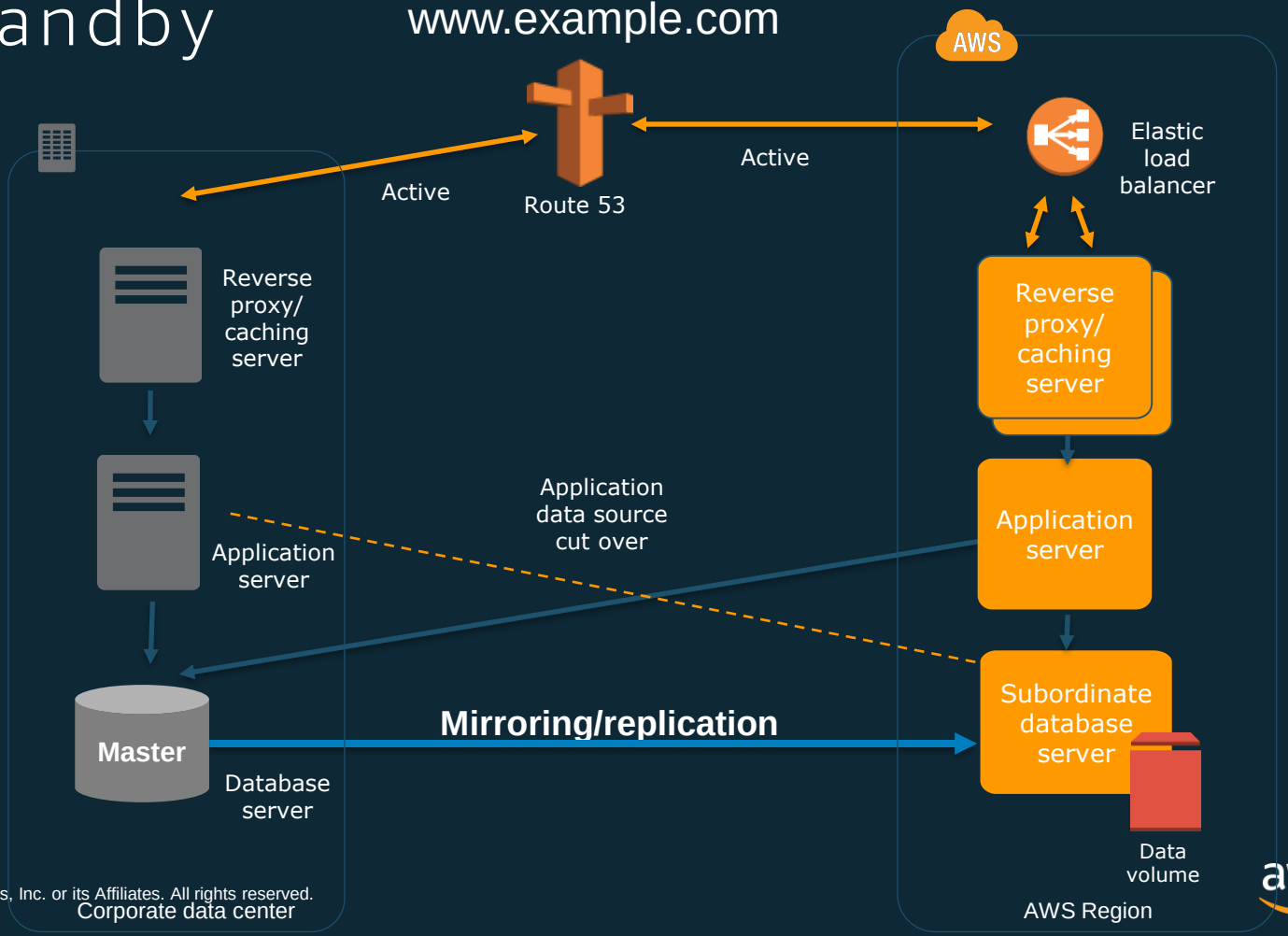
# Data Integration

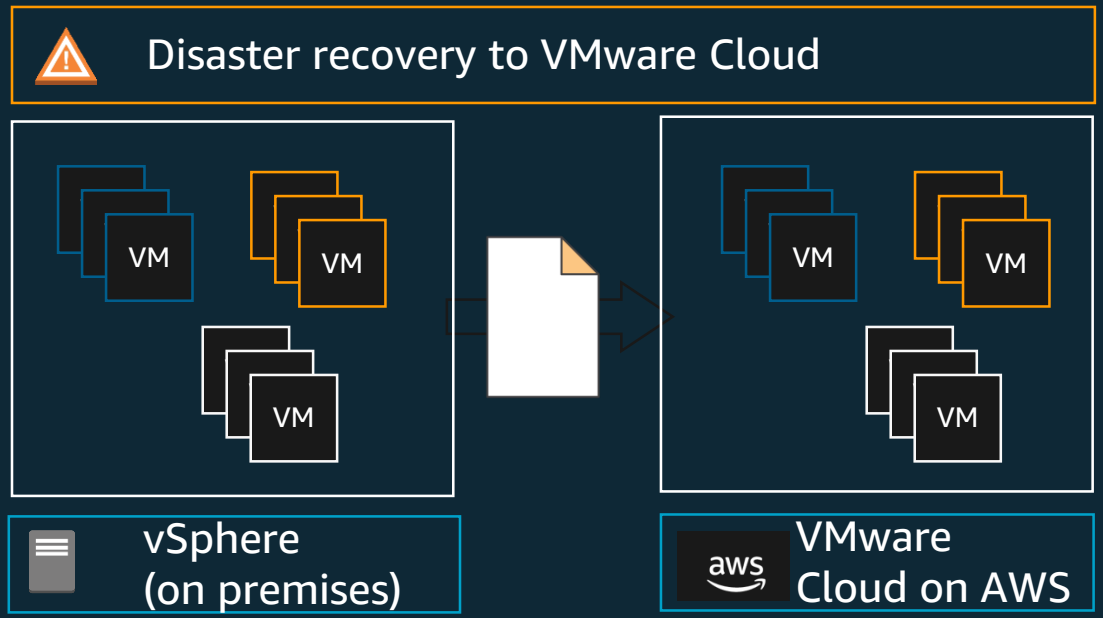
# Cold Standby – Cloud Gateways



# Hot Standby



# DR as a Service with Site Recovery Manager




## Overview of goals

Deliver as a service

Build on VMware established disaster recovery solutions

Provide application-centric DR runbook automation

Remove need for dedicated DR data center

Integrate deeply with the VMware Cloud on AWS services


scrippsnetworks interactive

## The Challenge

Needed a scalable and reliable DR solution

## The Solution

Pilot Light with Vmware Cloud on AWS

## Business Outcomes

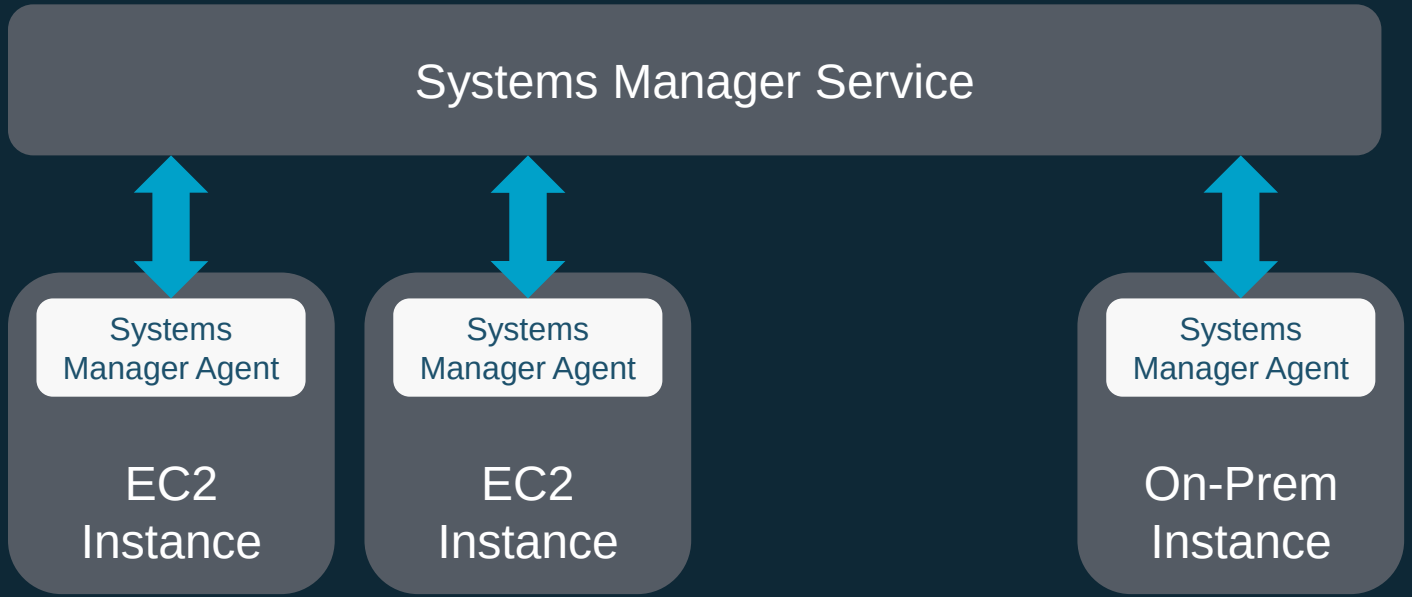
End-to-End DR from On-Prem to AWS

- Successful implement DR with multi-tier applications with SQL
- Achieve end-to-end failover time within **low RTO** with **no IP changes**

https://aws.amazon.com/partners/success/scripps-network-interactive/

# Integrated resources and deployment management

# AMAZON EC2 SYSTEMS MANAGER




Manage your Amazon EC2 and on-premises instances

# Deliver scalable, resilient applications with less work

AWS OpsWorks (Chef and Puppet)

Supports any application

Supports existing EC2 instances

Supports servers running in on-premises datacenters

Single platform to deploy and manage applications across hybrid architectures



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# Microservices on AWS using Kubernetes

**Kubernetes is an open-source system for automating deployment, scaling, and management of containerized applications.**

Hybrid cloud compatible

Highly available

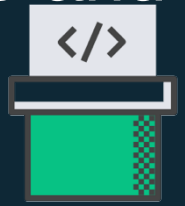
Automated upgrades and patches

Integrated with AWS Services

CloudTrail, CloudWatch, ELB, IAM, VPC, PrivateLink

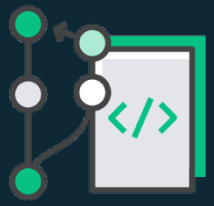
# DevOps – Build on AWS and deploy on premise

**Software Release Steps:**



**AWS** CodePipeline

Source | Build | Test | Production



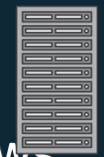
**AWS** CodeCommit

**AWS** CodeBuild

Third Party Tooling

**AWS** CodeDeploy

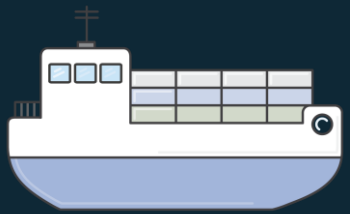
EC2



On-Prem

# Integrated Devices and Edge Systems

# Snowball Edge use cases



**Offline Staging**

**IoT**

**Local Tiering and Compute**

**Local Transformation**



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# Moving to the Edge

Things

**Devices**
Sense & Act

AWS Greengrass

Amazon FreeRTOS

**Cloud**
Storage & Compute

AWS IoT Core

AWS IoT Device Defender

AWS IoT Device Management

**Intelligence**
Insights & Logic → Action

AWS IoT Analytics



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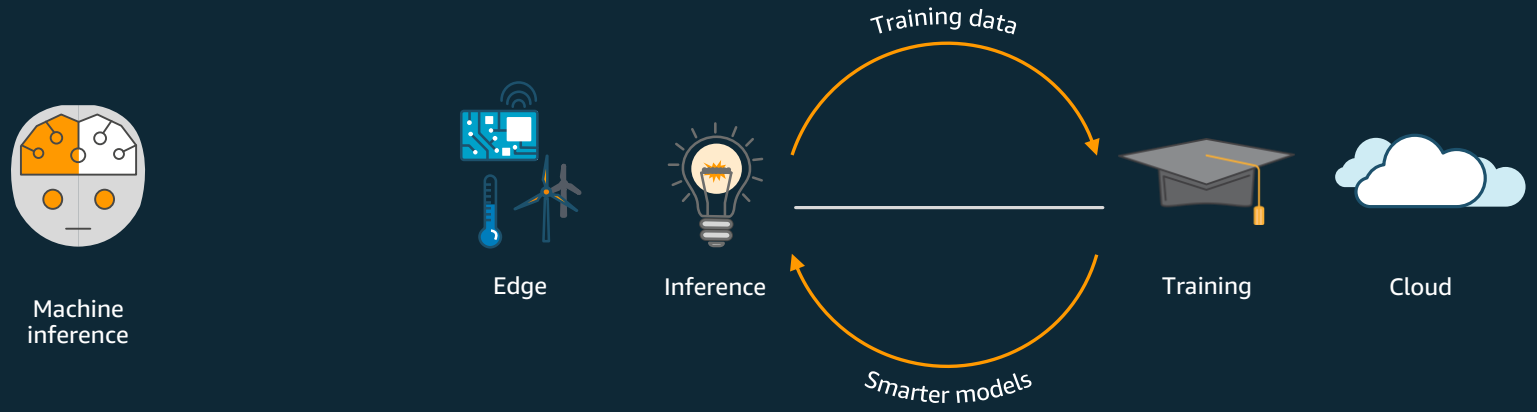
# AWS Greengrass ML Inference

## Run Machine Learning at the edge




Use AWS Greengrass console to transfer models to your devices

# Customer Success Story

## Connects Growers, Data & Machines

**Using the AWS cloud, John Deere can help farmers take action on real-time developments on their farms, plant more efficiently, and improve the yield of their crops.**

**Patrick Pinkston**
VP, Information Solutions, John Deere


manufactures agricultural, construction, and forestry machinery, diesel engines, drivetrains used in heavy equipment, and lawn care equipment.

- **John Deere's mission:** connect people, technology, and insights to advance agriculture in a sustainable fashion.
- Uses AWS to stream, analyze, store, and share data collected by 200,000 telematics-enabled machines
- Provides growers with timely and accurate data for optimal growing conditions.

John Deere: Video Case Study: http://aws.amazon.com/solutions/case-studies/john-deere/

# Cloud Bursting

# EC2 Spot is legit

Spare capacity at scale

# Customer Success Story


## Physical Server Rental

- Limited by Power / Cooling Capacity
- 24 to 48 Hour Setup time
- Over spec to be safe
- Hard to return

## Cloud Bursting

- Unlimited capacity
- 10 min setup time
- Pay for what you use
- Flexible Machine Specs
- Automated Termination
- Leverage SPOT Instances for Inexpensive Compute usage

https://youtu.be/ThS9JZDCG_8



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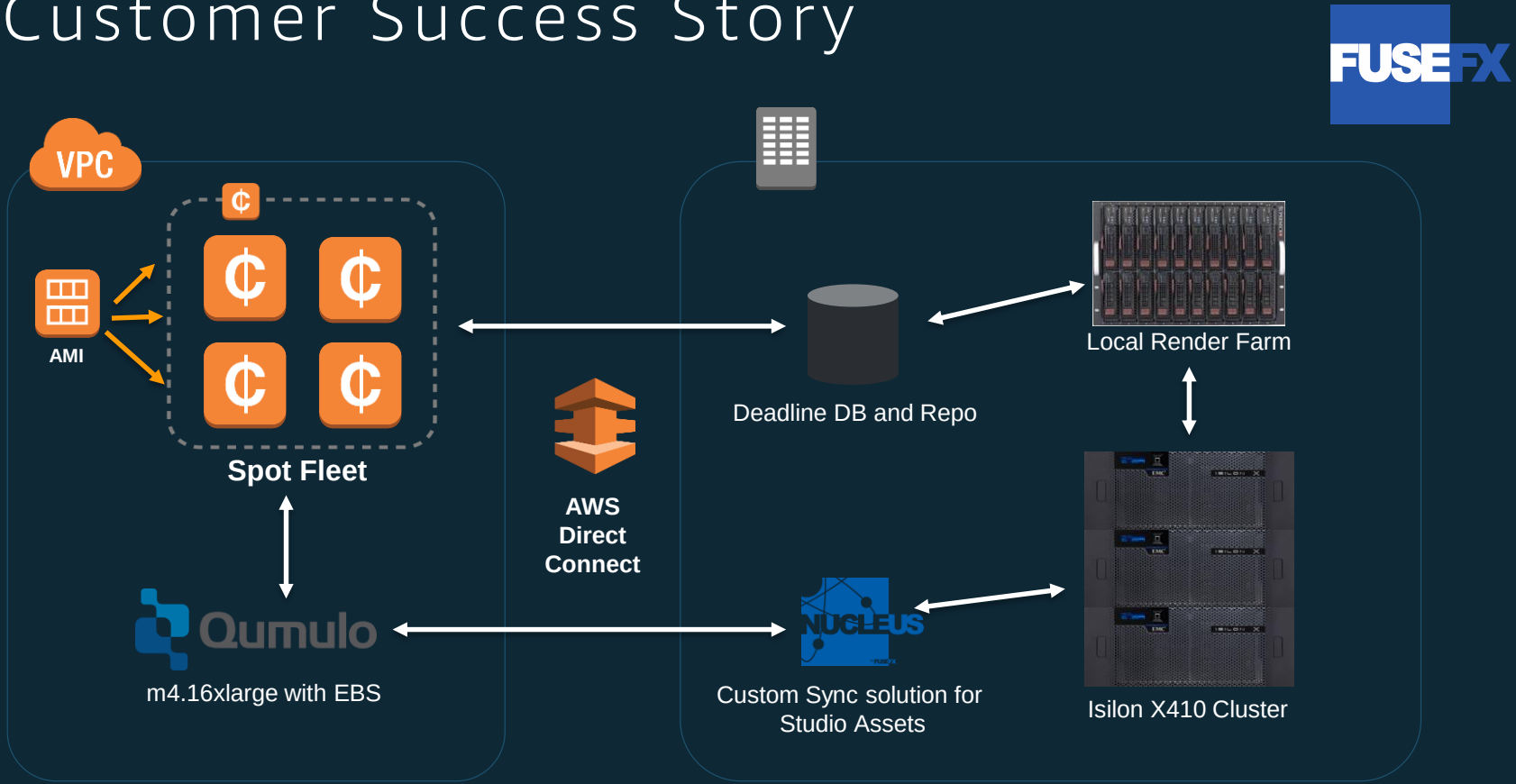
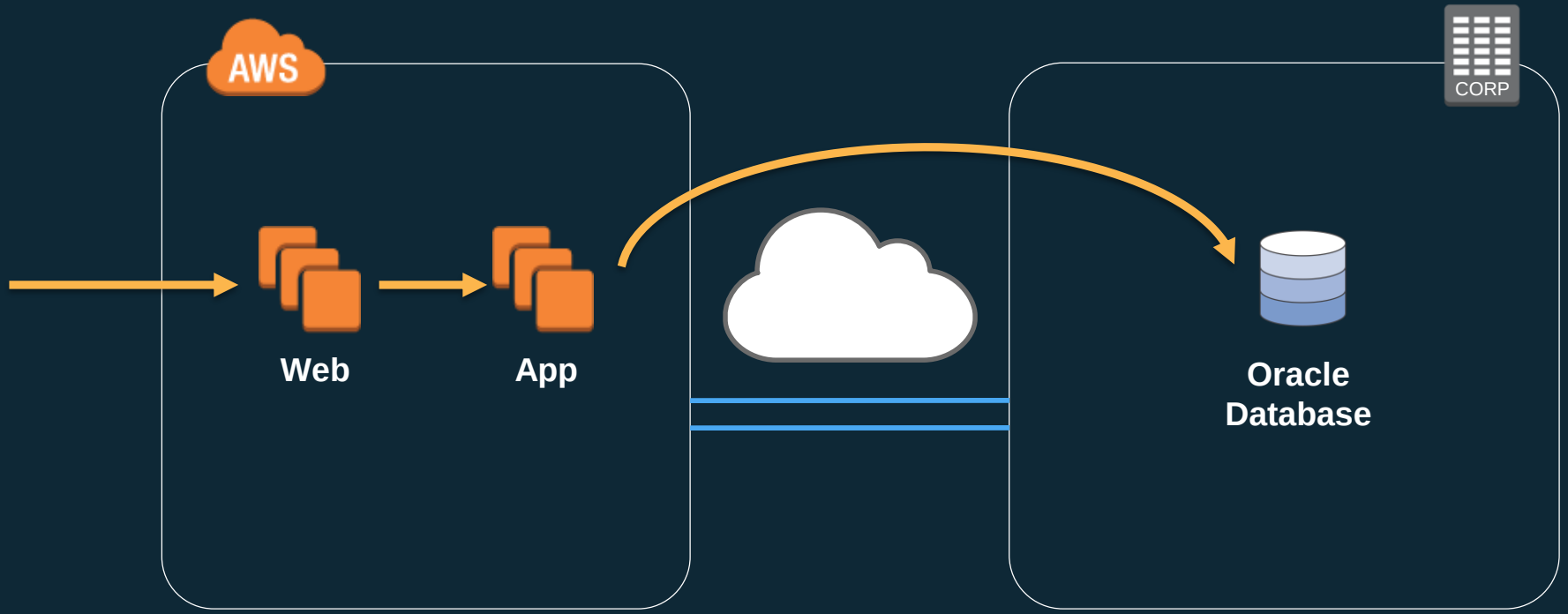
# Customer Success Story

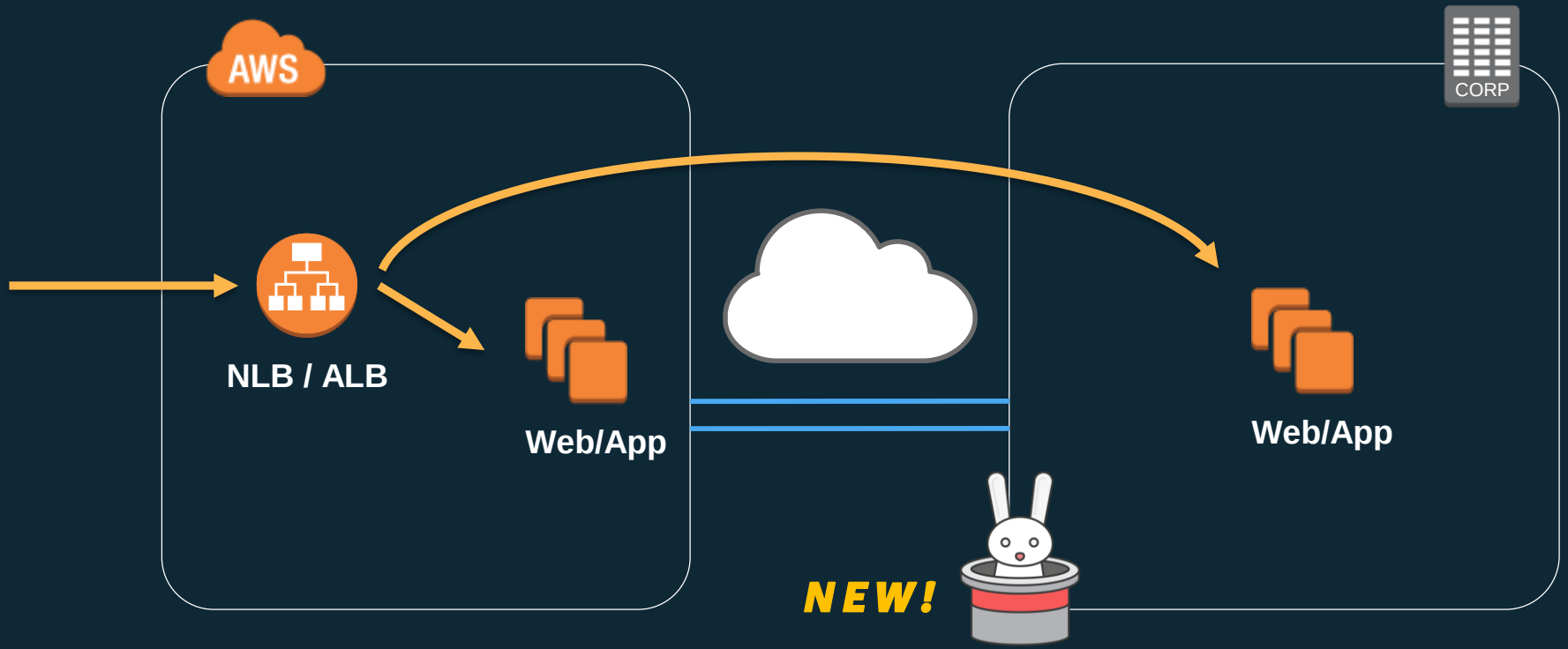


# Data center extension

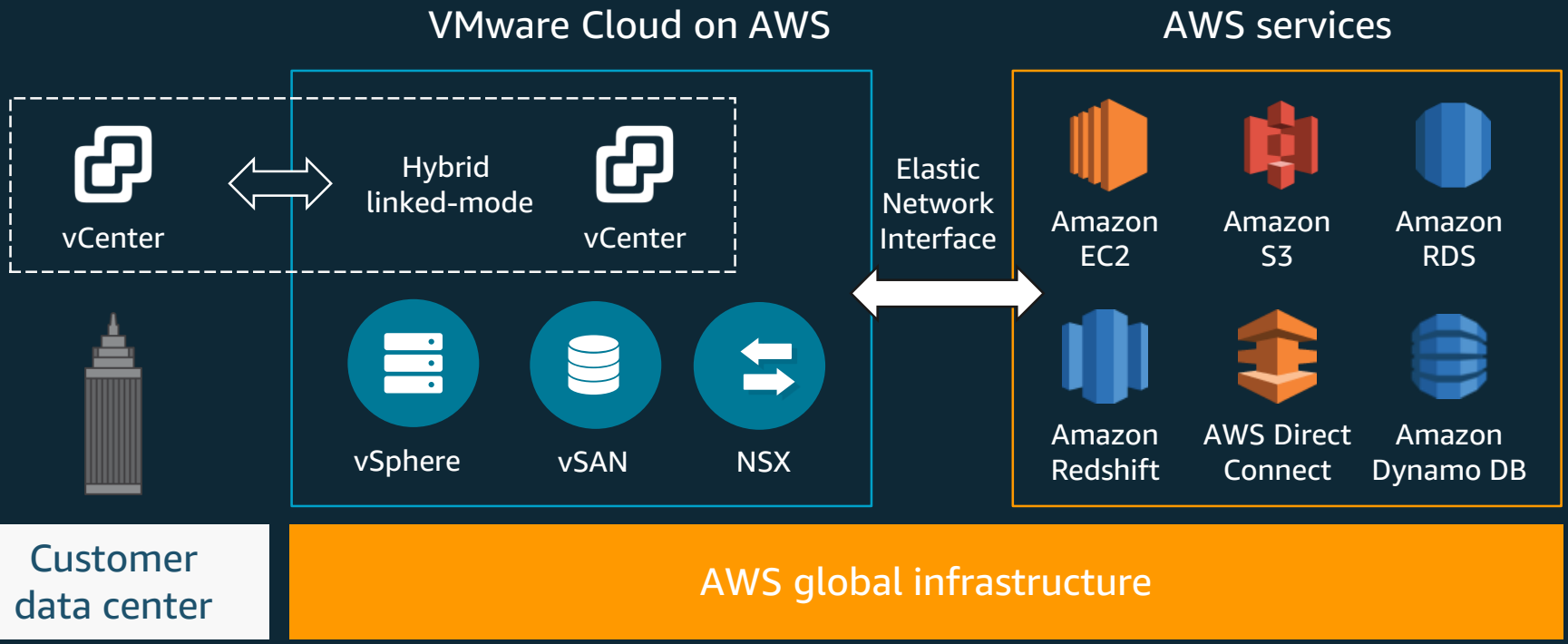
# Hybrid connectivity—split architecture



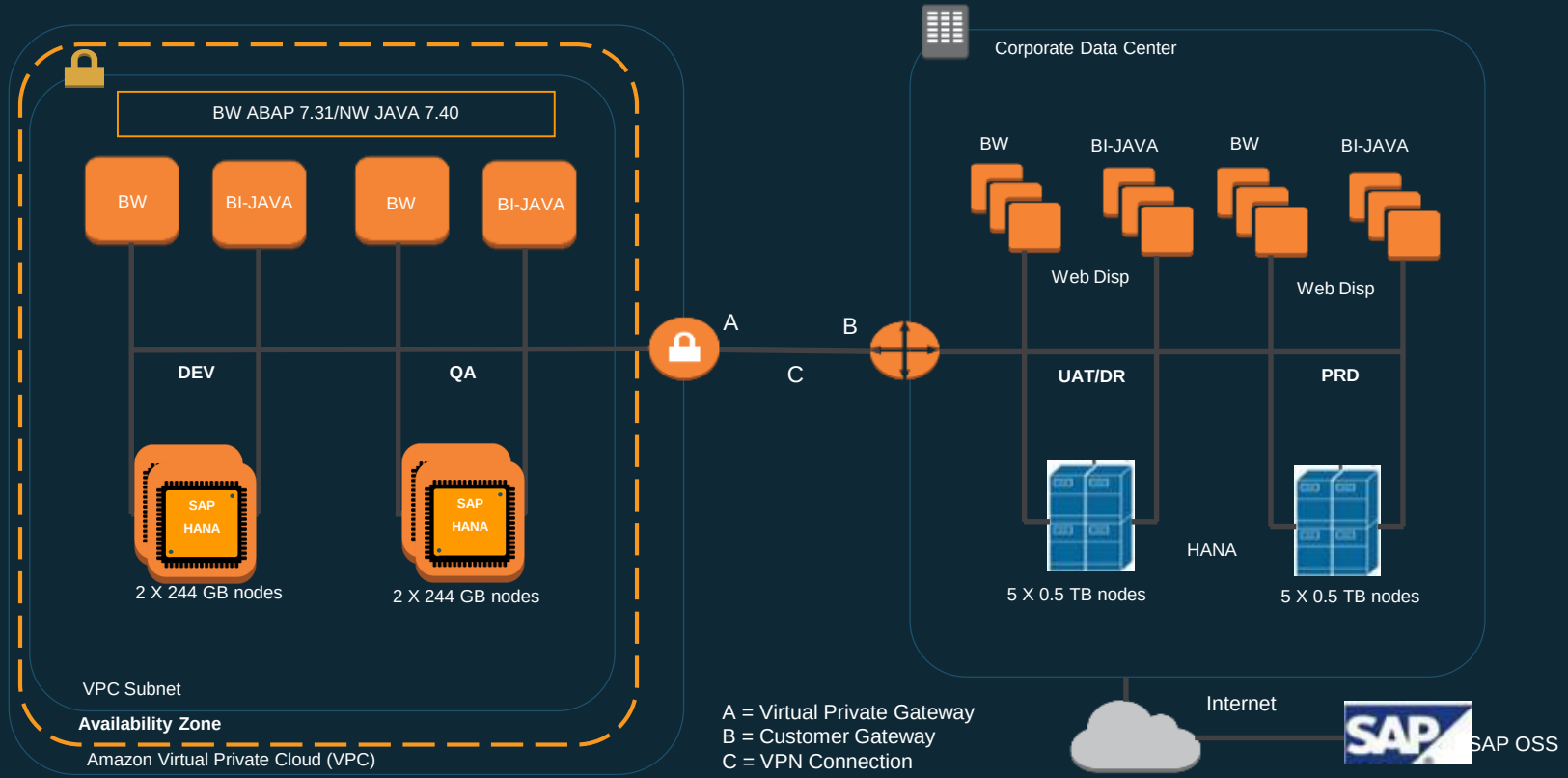
# Hybrid connectivity—split architecture (2)



# VMware Cloud on AWS



# Kellogg's—SAP HANA hybrid deployment






https://aws.amazon.com/sap/solutions/saphana/

# Thank You!

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https://aws.amazon.com/architecture/well-architected/

https://aws.amazon.com/migration-acceleration-program/