
AWS
re:Invent
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TLC304

# Coinventing connectivity with CSPs

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# Agenda

1. What the cloud brings to networks and connectivity
2. Connectivity services – AWS Direct Connect (precedence – launched in 2011), AWS Private 5G (2022), AWS Cloud WAN (2022)
3. Coinventing and jointly going-to-market with CSPs
4. Deployment examples and use cases

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# What cloud brings to networks and connectivity

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# ”Cloud-native” networks and connectivity



Very large scale



Elastic



Pay-as-you-go



High availability



Agile (DevOps)

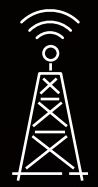


Automated



Highly secure

## Apply to network infrastructure



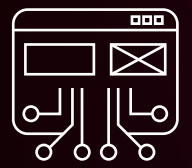
Mobile networks



Private networks



Cable broadband



Wired WAN

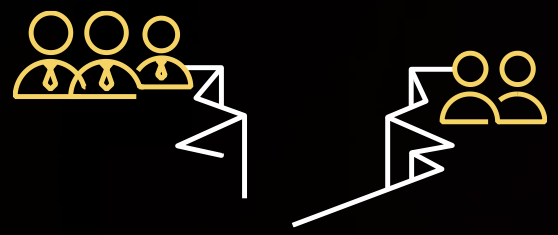


Backbone

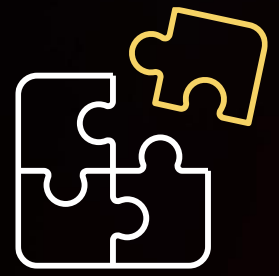
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# Evolution in cloud capabilities over the years



Skills gap
vs. need



Migration/
legacy applications



Prebuilt
solutions



Rise of managed
services

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AWS CONNECTIVITY OFFERINGS

# AWS Direct Connect

## (Announced in 2011)

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# Direct Connect

Dedicated connectivity to the AWS Cloud

Private, secure, reliable, and scalable

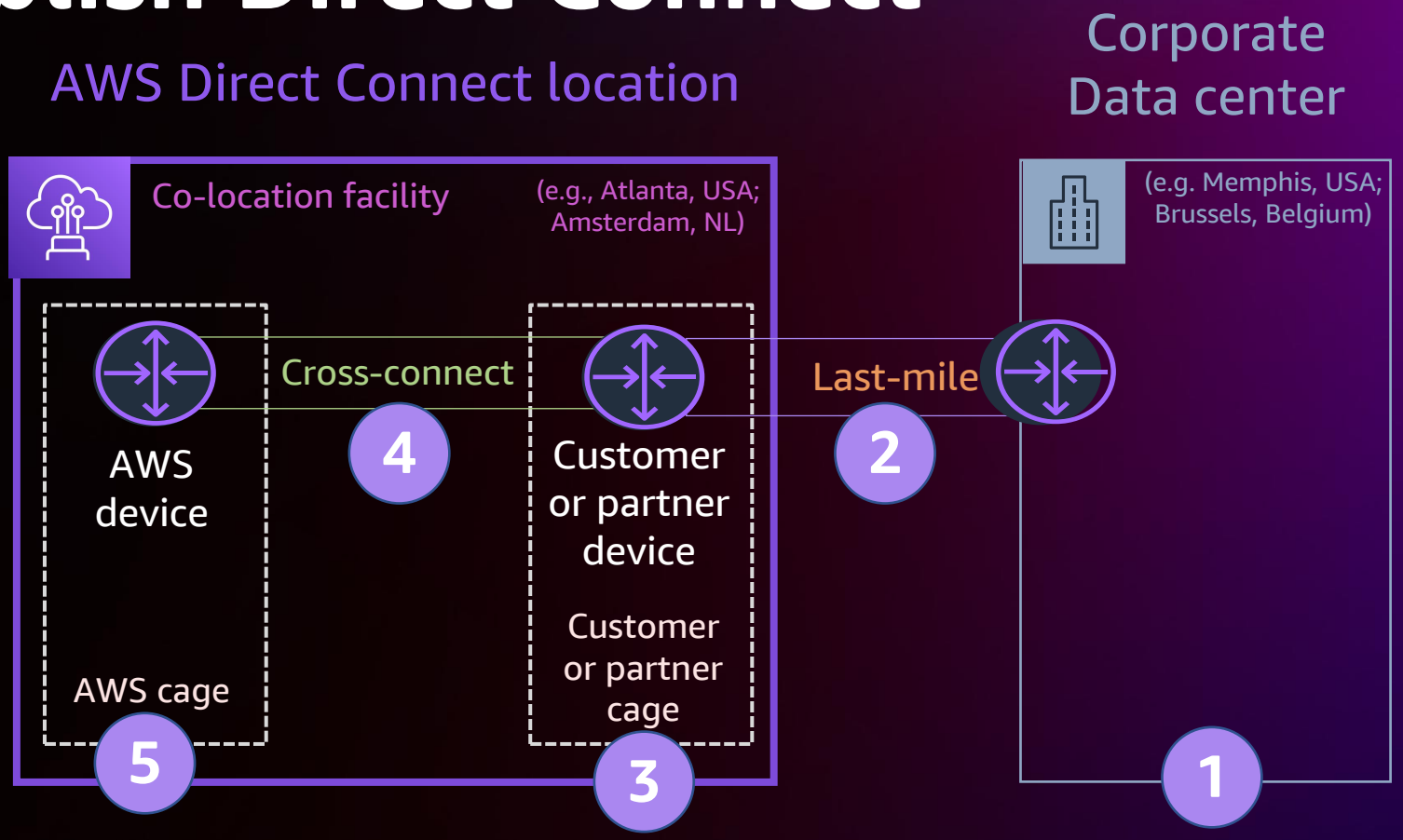
Lowers costs for private global interconnect

Supported by SLA



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# Ownership to establish Direct Connect




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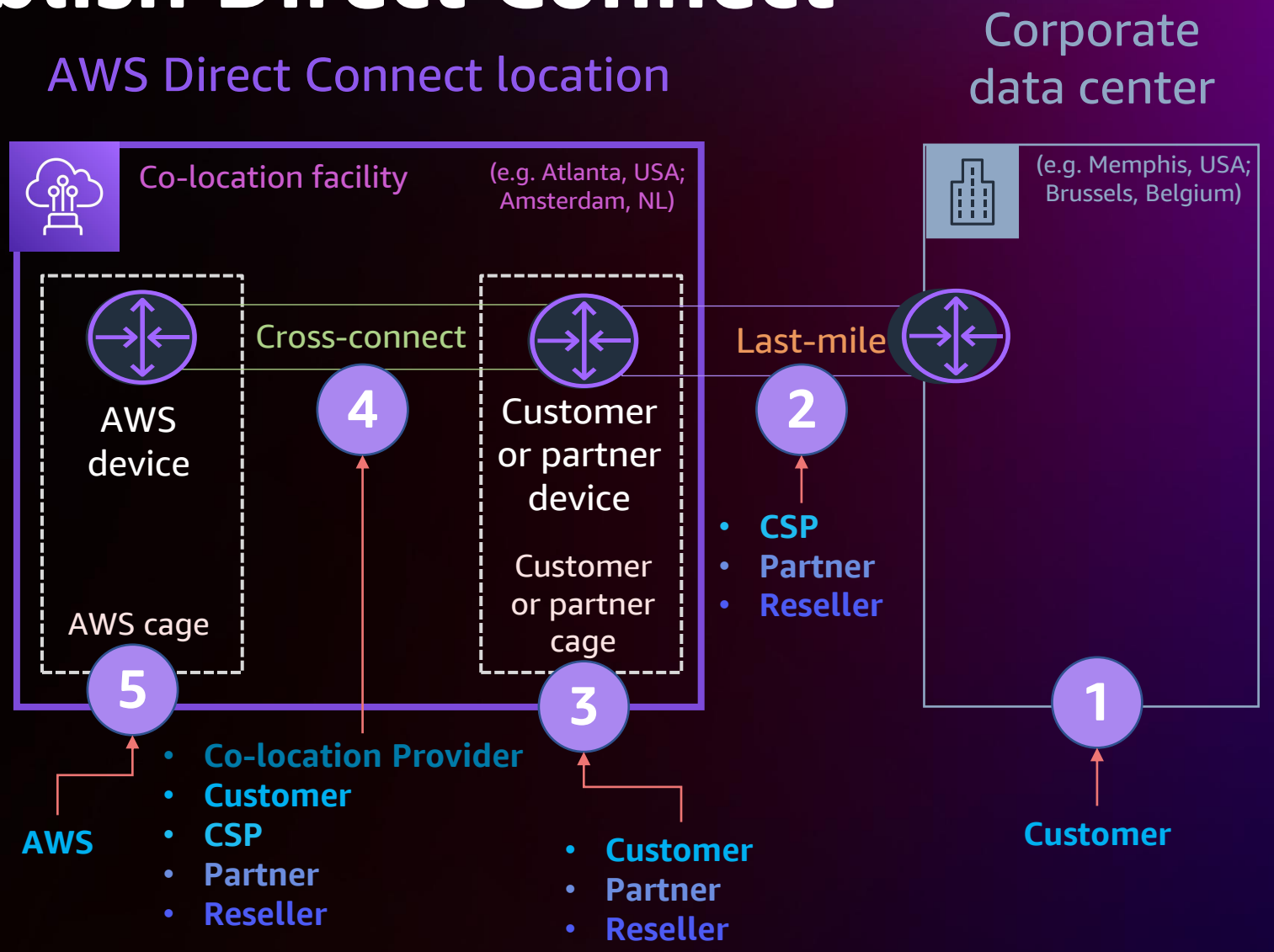
# Ownership to establish Direct Connect

**CSP:**
CSP that delivers connectivity (e.g., last-mile)

**Partner:**
CSP inducted into the AWS Partner Network (APN) with expertise in delivering Direct Connect (facilitates, does not resell) – aws.amazon.com/directconnect/partners

**Reseller:**
Specialized Partner authorized to resell Direct Connect

**Co-location provider:**
Owner of the co-location facility that houses the Direct Connect location




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# AWS Service Delivery Partners

## DIRECT CONNECT




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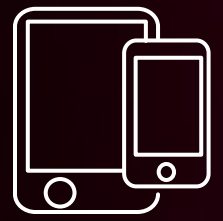
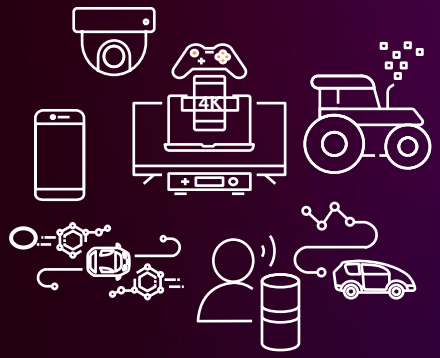
This is not a complete list. To view all AWS Partners for this category, visit the AWS Partner Solutions Finder. This list of partners is current as of November 27, 2022.

AWS CONNECTIVITY OFFERINGS (2022)

# AWS Private 5G

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# Evolution of mobile networks

| Generations | 1980s | 1990s | 2000s | 2010s | 2020s |
|---|---|---|---|---|---|
| | 1G | 2G | 3G | 4G | 5G |
| Devices |  |  |  |  |  |
| "Killer" use case |   |  |  | | |

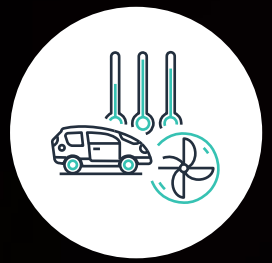
Connectivity → Data → Applications

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# Private networks: Use cases



Venues and stadiums



Smart energy management



Smart factories



Autonomous vehicles



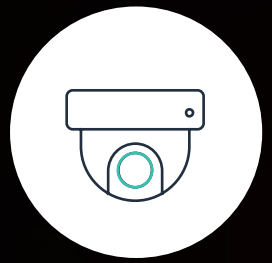
Surgical robotics



AR/VR augmented services



Public sector



Smart surveillance



Smart agriculture



Transportation



Smart traffic lights, road congestion



Smart devices

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# Two ways of building private networks on AWS



## Do it yourself (DIY)

### Multiple AWS services

Integrate multiple 5G components from AWS Partners and deploy a cloud-native 5G network



## Managed service

### AWS Private 5G

Deploy, operate, and scale a private cellular network at an on-premises facility in days instead of months

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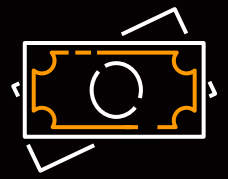
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# How it works



## AWS Private 5G

Deploy, manage, and scale your own private mobile network



## Order

From the console, specify the coverage and capacity requirements for your private network



## Install

AWS delivers your network hardware. Attach power and internet connectivity



## Activate

Open the console and acknowledge hardware receipt for automated network configuration. Insert SIM card into the devices to connect



## Manage

Operate and manage your mobile network and connected devices as any other AWS resource



## Scale

More easily adjust the network capacity and number of connected devices to match your business needs

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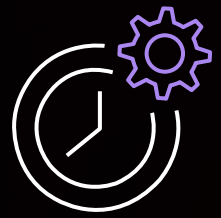
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# Value proposition

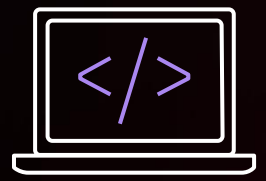
BRINGING THE CLOUD CONSUMPTION MODEL TO PRIVATE 5G NETWORKS



Hassle-free procurement using the AWS Management Console or APIs



Start as small as you want, validate your business requirement, and then scale up as needed



A pricing model where you only pay for the throughput capacity you need and not the number of devices you connect



Integrated with AWS Identity and Access Management (IAM) for operational consistency



Same pace of innovation as the cloud

aws

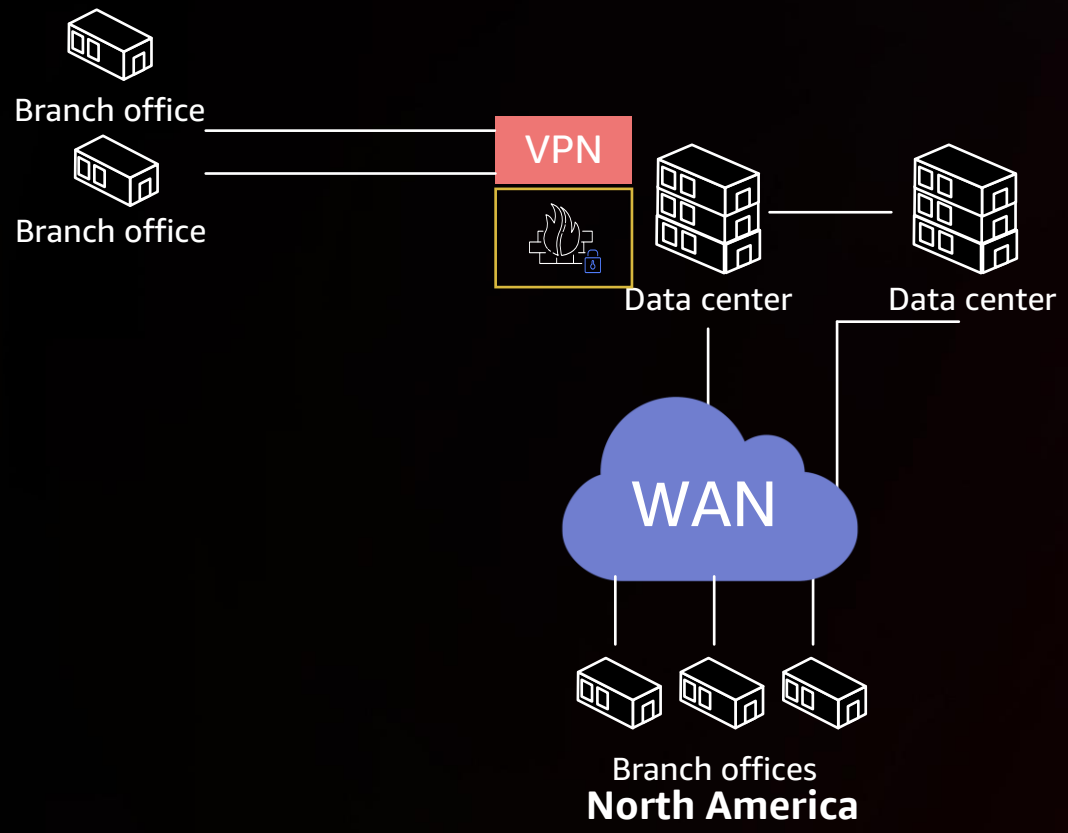
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AWS CONNECTIVITY OFFERINGS (2022)

# AWS Cloud WAN

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# WAN evolution: The traditional WAN



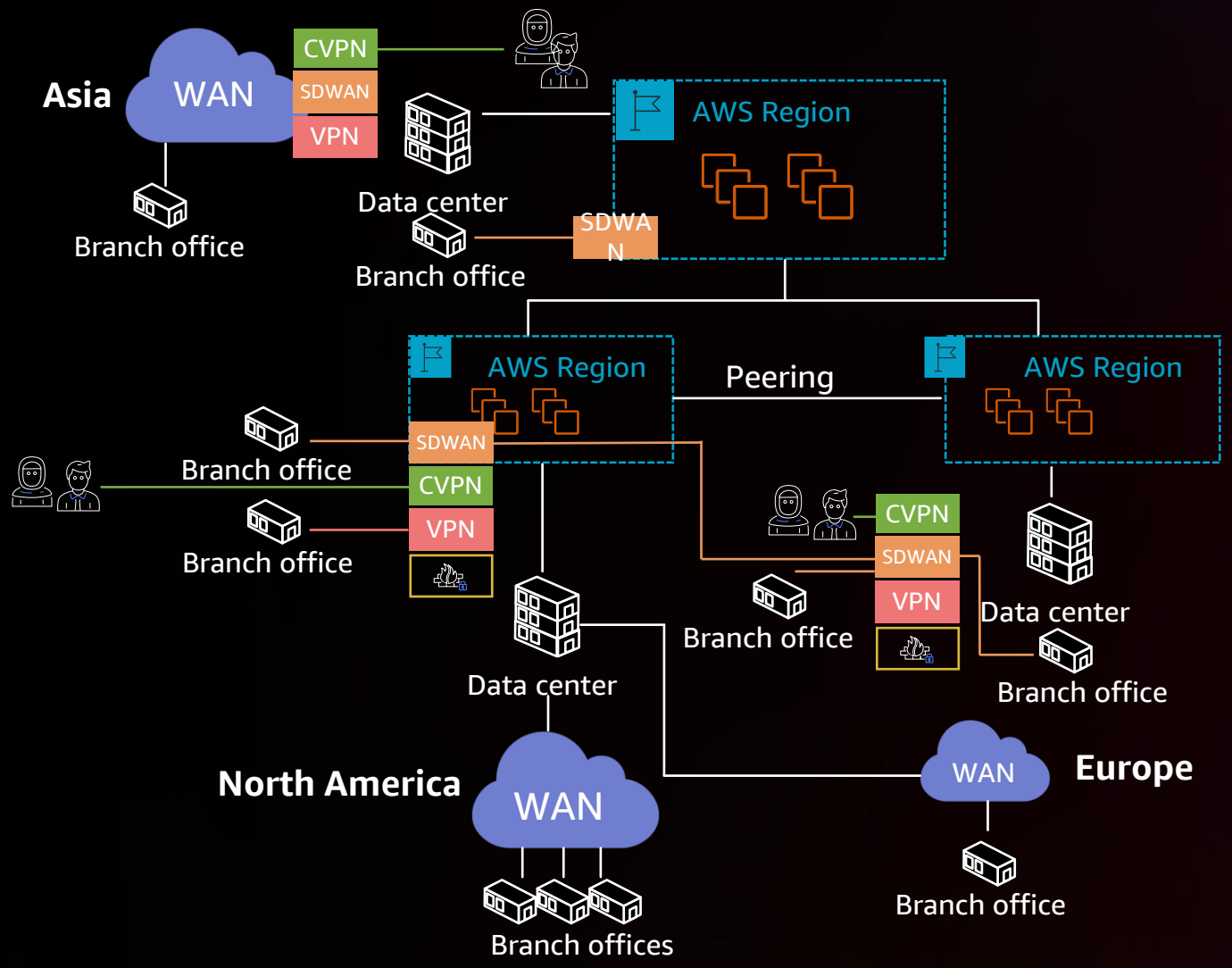

Traditional technology
- MPLS and VPN

Traffic
- User at sites
- Apps in data centers

Making changes
- New offices take months
- New geographies take even longer

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# WAN evolution: The modern WAN



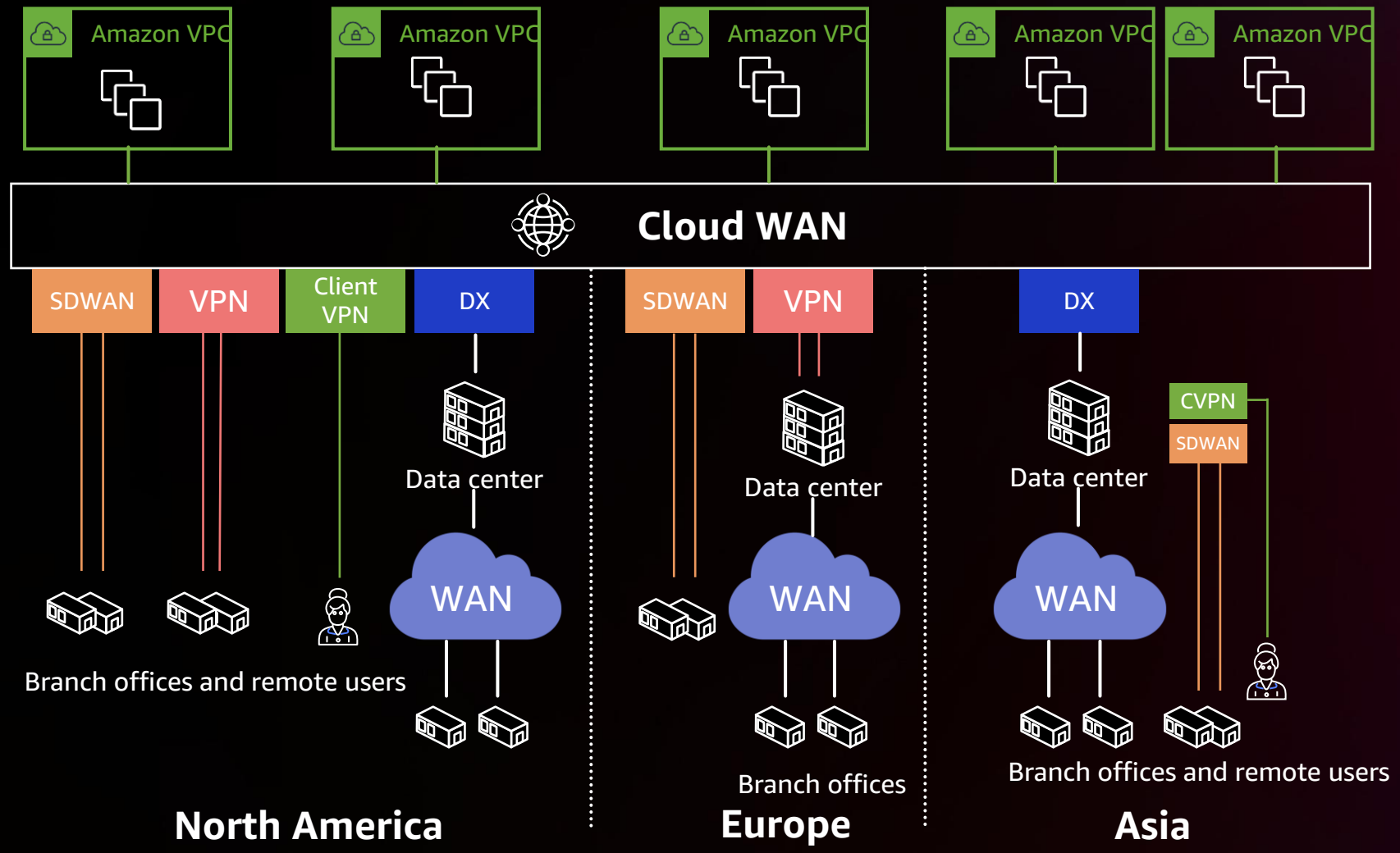

More technology
- SD-WAN, Cloud, Client VPN
- Increased security

Dynamic traffic
- Users everywhere
- Apps in the cloud

Making changes
- Go global in seconds
- Changing site requirements

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# AWS Cloud WAN




## Global

- Create connectivity across AWS Regions

## Managed

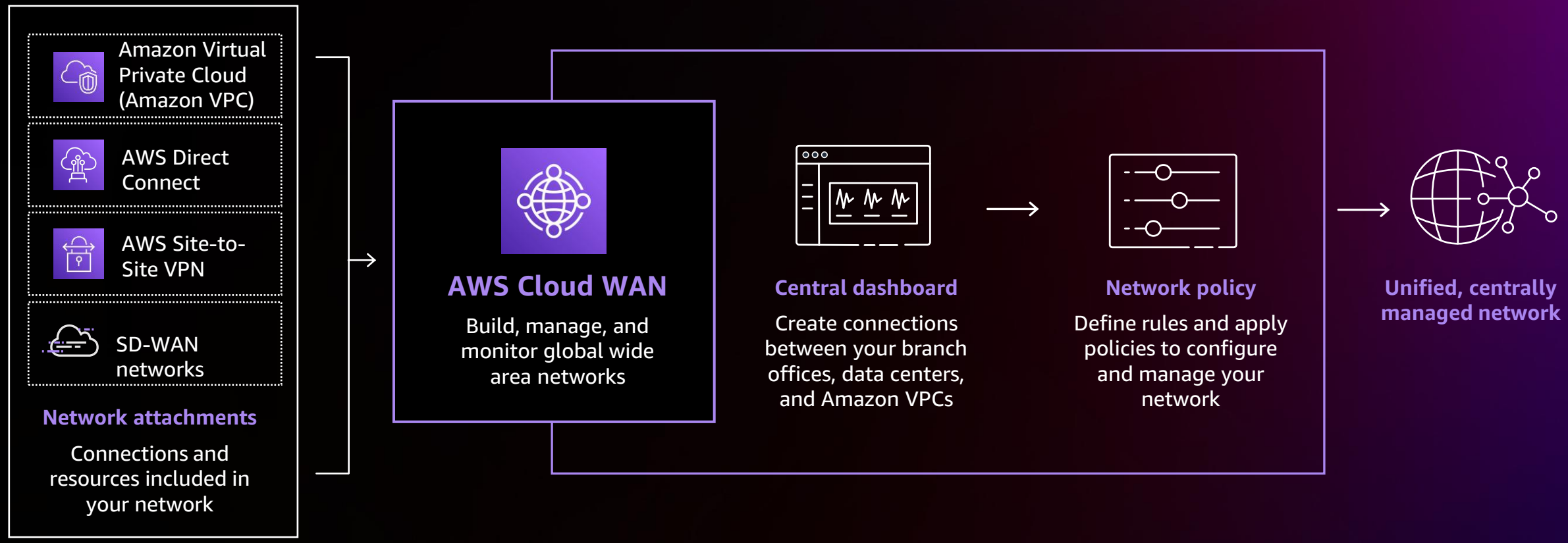
- Dynamic routing
- Built-in automation

## Attach your things

- VPCs
- VPNs
- SD-WAN
- Client VPN
- Firewalls

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# How it works: AWS Cloud WAN management




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# Value proposition



Available in public preview

1. Build global networks in minutes
2. Use the AWS global backbone
3. Simplify WAN networking
4. Segment traffic
5. Advanced visibility

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“Every new thing creates two new questions and two new opportunities.”

**Jeff Bezos**

Founder and Executive Chair of Amazon

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# Value chain and CSP opportunity

## Value chain revenue split

| 5% | 10% | 20% | 25% | 20% | 20% |
|---|---|---|---|---|---|
| HW devices | Connectivity services | Platforms and clouds | Applications and VAS SW | E2E integration services | Operations and managed service |
| • Embedded, ruggedized devices<br>• Modules<br>• Sensors, cameras<br>• AR glasses<br>• Smartphones, tablets | • 4G connectivity<br>• 5G connectivity<br>• Fixed connectivity<br>• Unlicensed connectivity | • IoT OM, Security<br>• MEC<br>• Cloud services (compute, storage, etc.)<br>• Data management | • Vertical specific applications<br>• Data management<br>• Data analytics<br>• Reporting/VAS | • E2E integration of solutions<br>• Testing and handover<br>• Project management | • Service provisioning<br>• Service assurance<br>• QoS, SLA management, and reporting |

Today's CSP scope (-15%)

Opportunity to go up the value chain

## Contribution margin

| 30% | 40% | 10% | 30-80%* | 40% | 40% |
|---|---|---|---|---|---|

Source: Analysis Mason, Forrester

*ISV reselling to in-house development spectrum

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# Coinventing with CSPs: AWS Private 5G

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# AWS Private 5G with CSPs

## Opportunities



- Licensed spectrum operations for AWS Private 5G
- RF planning/site deployment/ installation services to enterprises
- Ongoing maintenance and support services for AWS Private 5G
- Joint go-to-market to address enterprise private 5G market

## Benefits to the CSPs



- Monetize and increase utilization of spectrum
- Faster time to market for enterprise private 5G solutions
- Move up the value chain with managed services and applications built for private 5G solutions

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# Deploying private networks: Role of CSPs

**Discover, identify, and define use case**

- Identify target use case
- Define value proposition of using 5G
- Develop ISV partners to enable use case

**Architecture**

- Engineering for how solution will work
- Unified architecture across cloud and 5G network
- Security design for solution

Design feedback

**Functional validation/PoC**

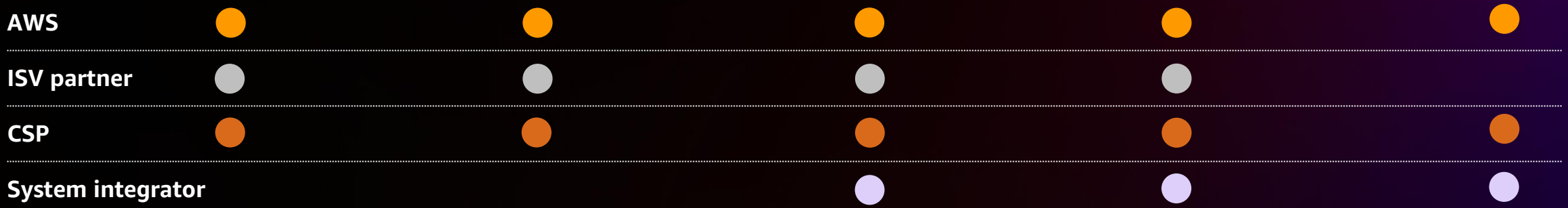
- Functional testing (w/simulators)
- Protocol conformance testing

**Launch**

- Sales play development and training plan
- Pricing strategy/ GTM plan

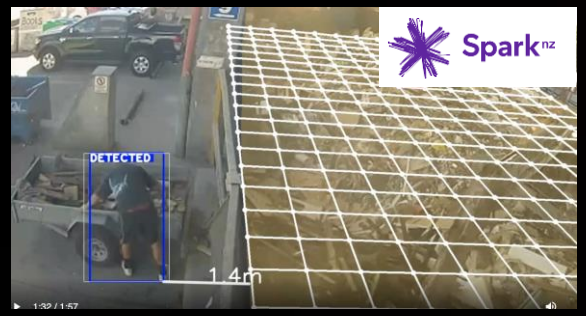
**Scale**

- Marketing to enable scaling
- Sales enablement
- Continuous improvement




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# Private 5G momentum




Waste management
TLC308




Hockey in-venue fan experience




On-site inspections in hazardous environments




Providing broadband access to underserved schools




Connecting rural areas




High-volume data collection and quality assurance




Modernize campus facilities




Real-time, AI-based video analytics solution

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# Coinventing with CSPs: AWS Cloud WAN

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# Benefits to CSPs



## Collaboration

CSPs can integrate value-added networking services, such as managed SD-WAN and Secure Access Service Edge (SASE)



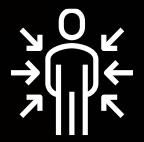
## Core network diversity

CSPs can provide core network diversity to their customers where required



## From branch to VPC network management

CSPs can expand their world-class networking management beyond branch locations into the cloud up to the VPC, becoming a one-stop shop for all their customers' networking needs



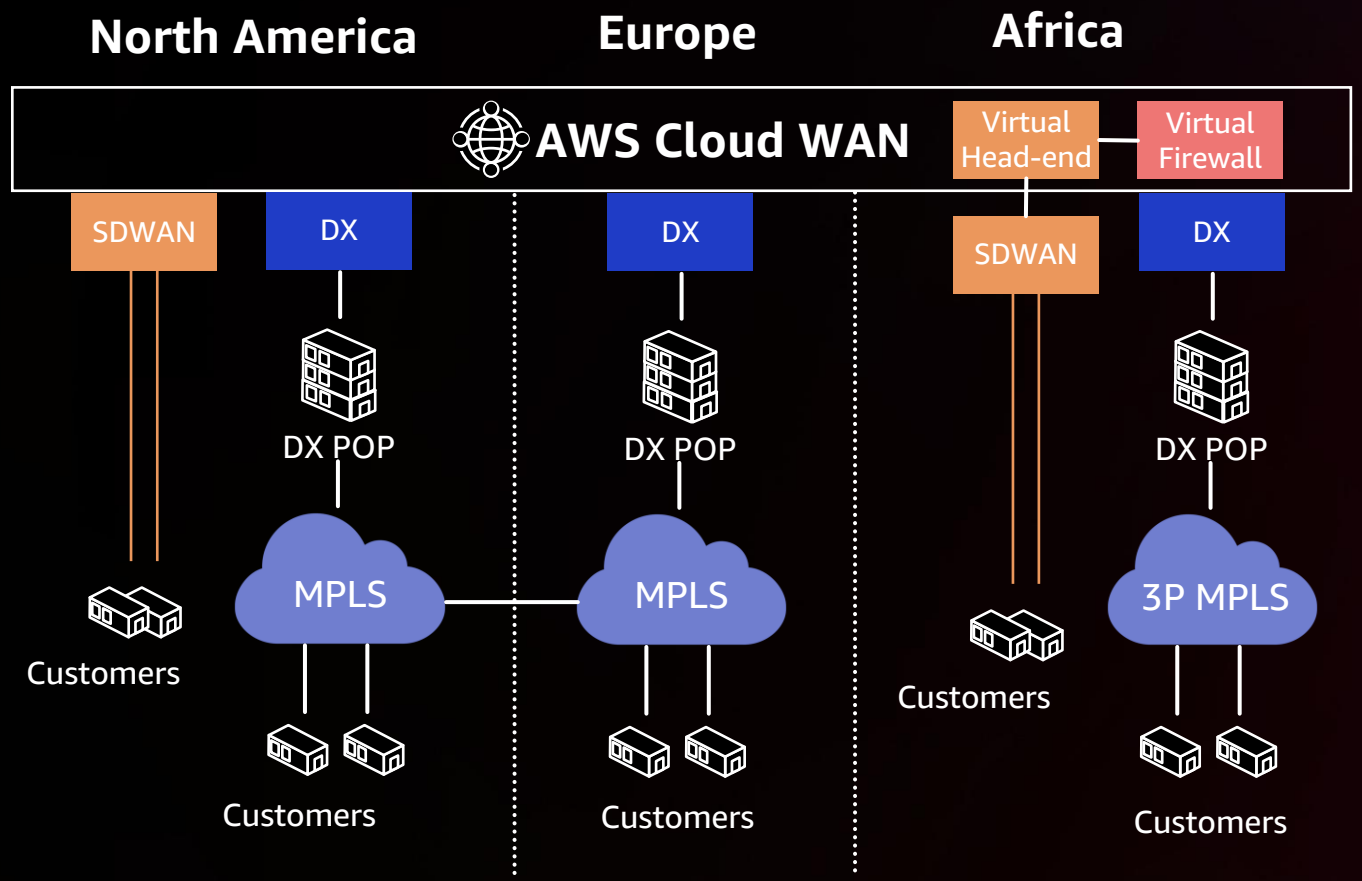
## Joint go-to-market

AWS and CSPs can jointly approach customers with an enhanced value proposition of connectivity and cloud, together

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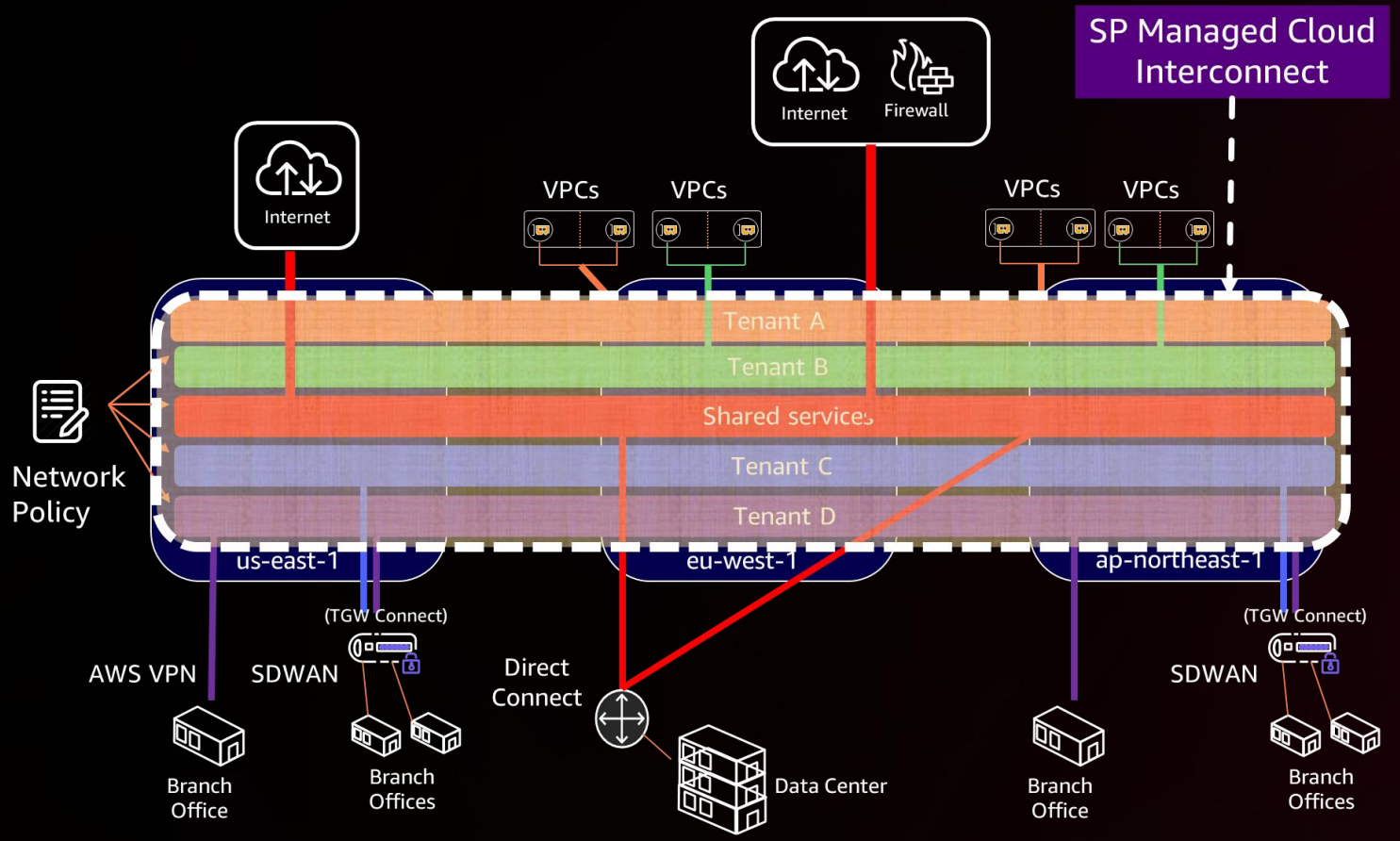
# Extending AWS Cloud WAN: Virtual PoP




- Use AWS PoPs to host network functions
- Use AWS Cloud WAN for services insertion

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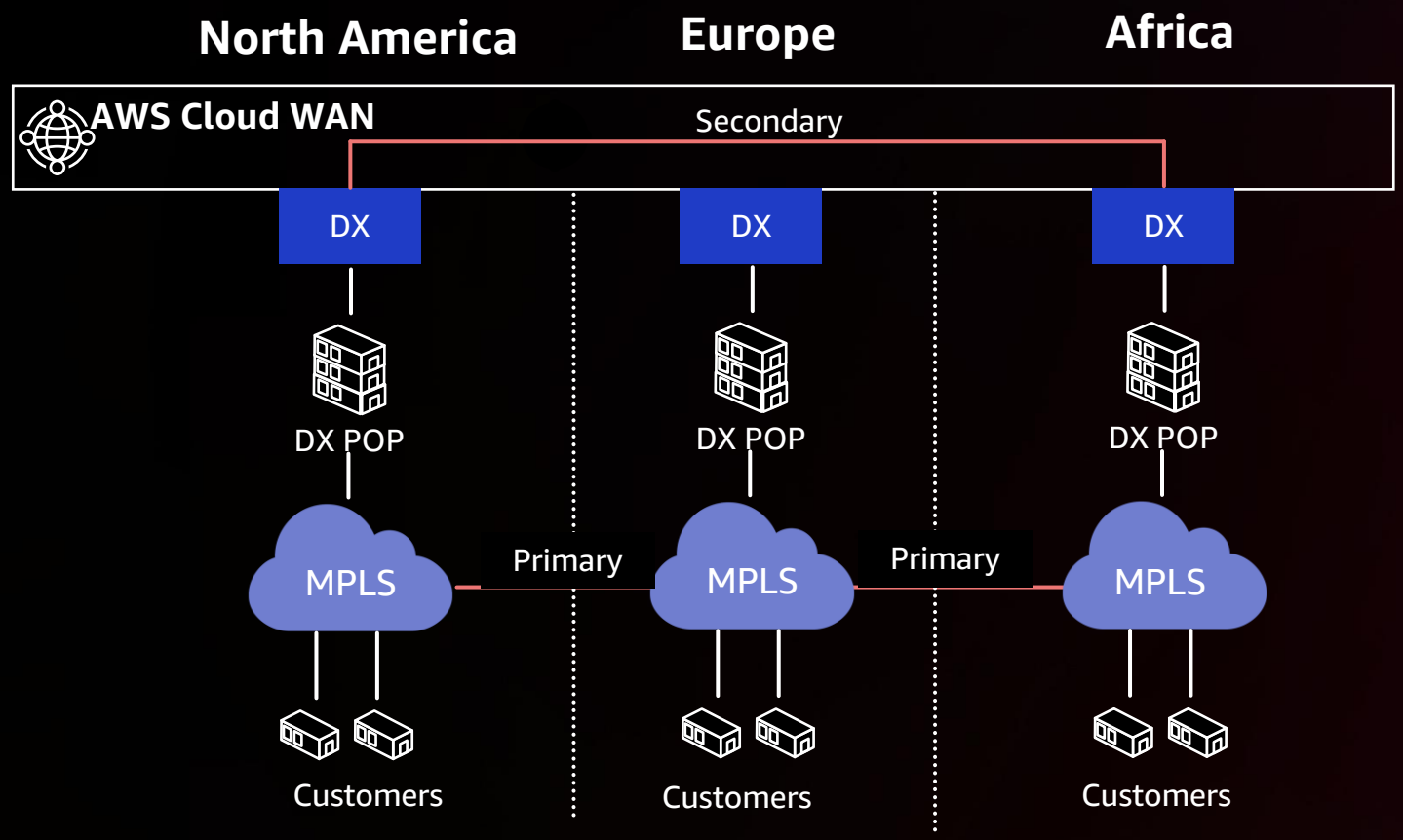
# Extending AWS Cloud WAN: Managed cloud interconnect




- Single or multiple tenants
- Network isolation and policy for automation using AWS Cloud WAN
- Routing owned by CSP via MPLS, SDWAN, VPN, or AWS backbone

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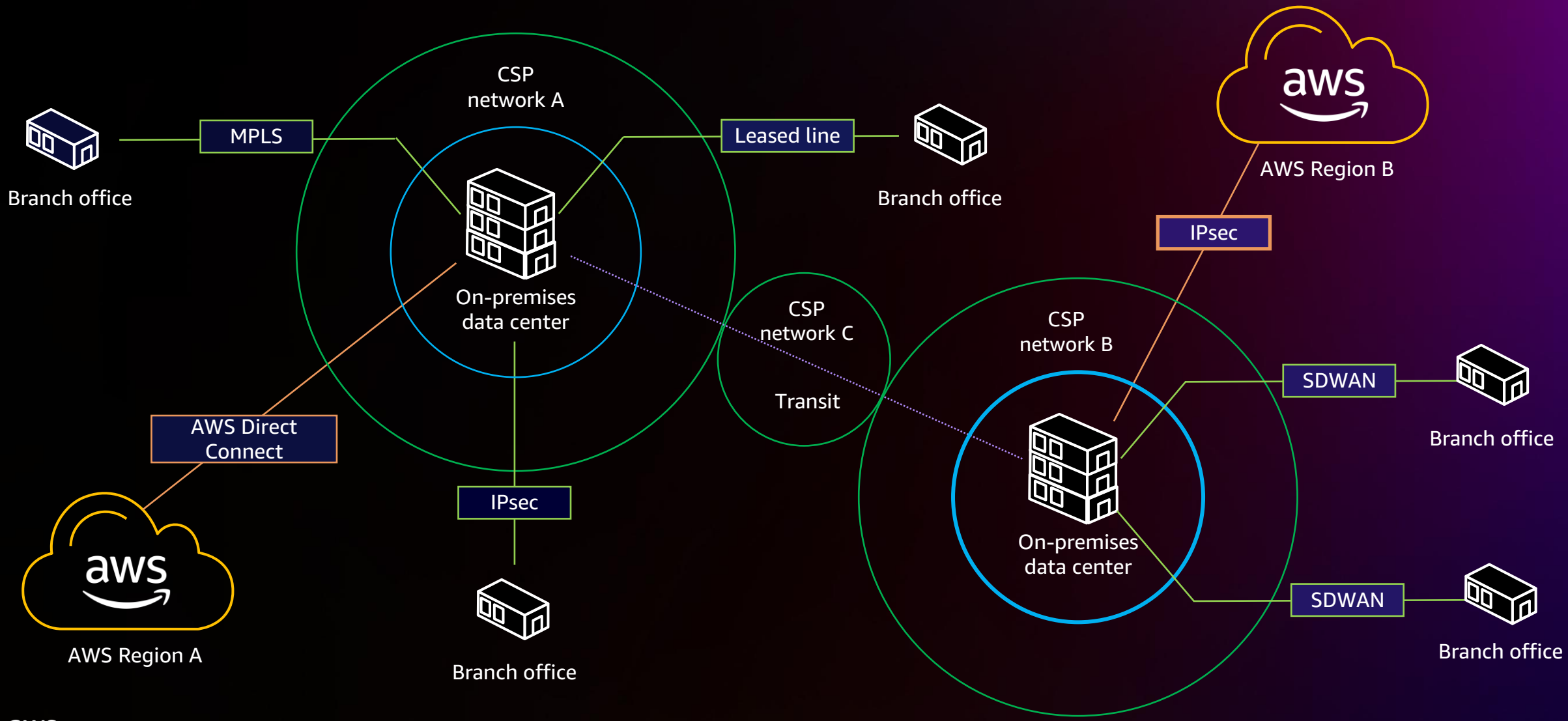
# Extending AWS Cloud WAN: CSP network augmentation




- Use AWS backbone for CSP network augmentation
- Use AWS Cloud WAN as a middle-mile

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# Bringing it together: A modern global network




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# AWS Cloud WAN Partners

**CSP**

ANY COMMUNICATION SERVICE PROVIDER

**Systems integrators**

accenture
Deloitte.
DXC TECHNOLOGY
kyndryl

**SD-WAN and security**

aviatrix
alkira
cisco
interCloud
ubyon
FORTINET
aruba a Hewlett Packard Enterprise company
vmware
paloalto NETWORKS
prosimo

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# Summary

- Cloud is a key enabler to building CSP networks and connectivity services
- AWS has launched AWS Private 5G and AWS Cloud WAN services for enterprises
- We are actively evolving and enhancing these services in partnership with CSPs
- The cloud-CSP partnership will yield more efficient ways of offering traditional services and new services

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# Thank you!

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