



# Backbone-Enterprise Designs

ACE Team

# Enterprise Architectures





# Enterprise Architectures

- Enterprise Architecture 1: Region to Region
- Enterprise Architecture 2: Colo Extension
- Enterprise Architecture 3: SD-WAN
- Enterprise Architecture 4: Hybrid Connectivity
- Enterprise Architecture 5: Managed Service Provider (MSP)
- Enterprise Architecture 6: Mergers and Acquisitions

# Enterprise Architecture 1

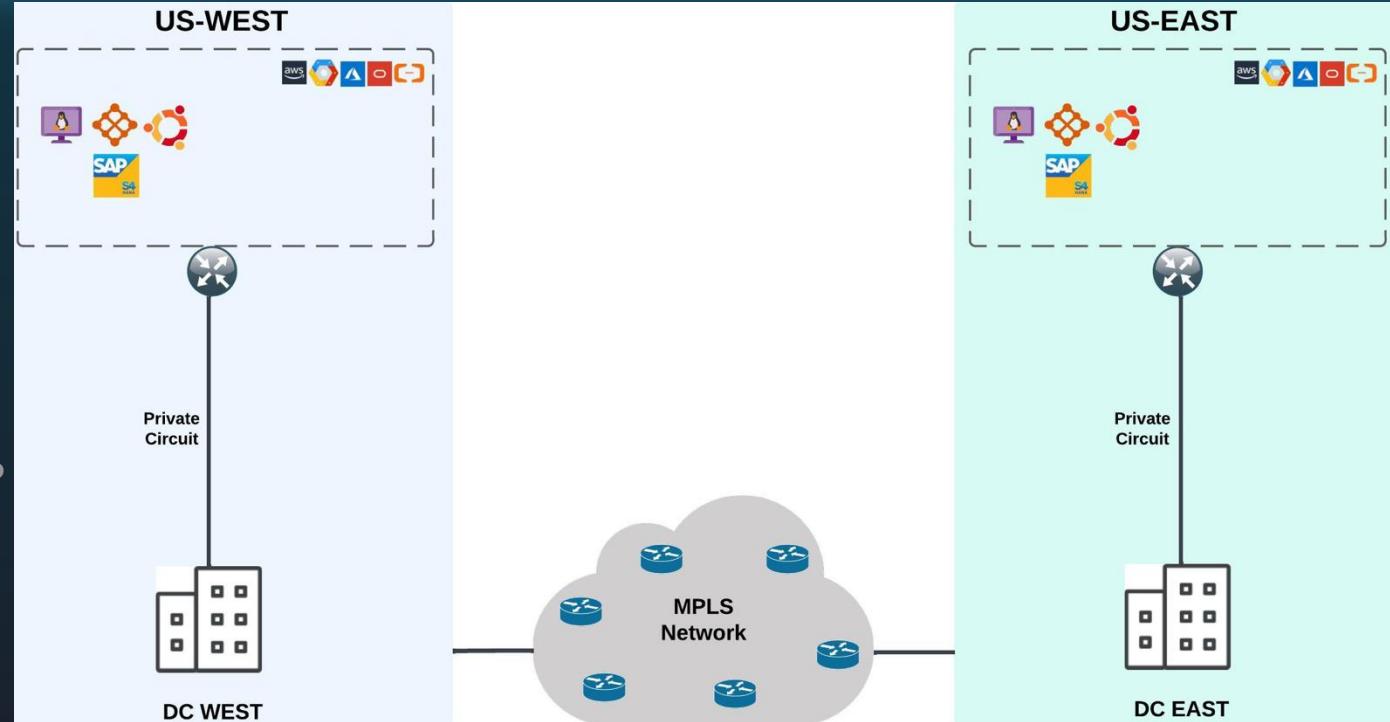
## Region to Region



# Architecture 1 – Region-to-Region Communication

## Suboptimal and Complex Architecture

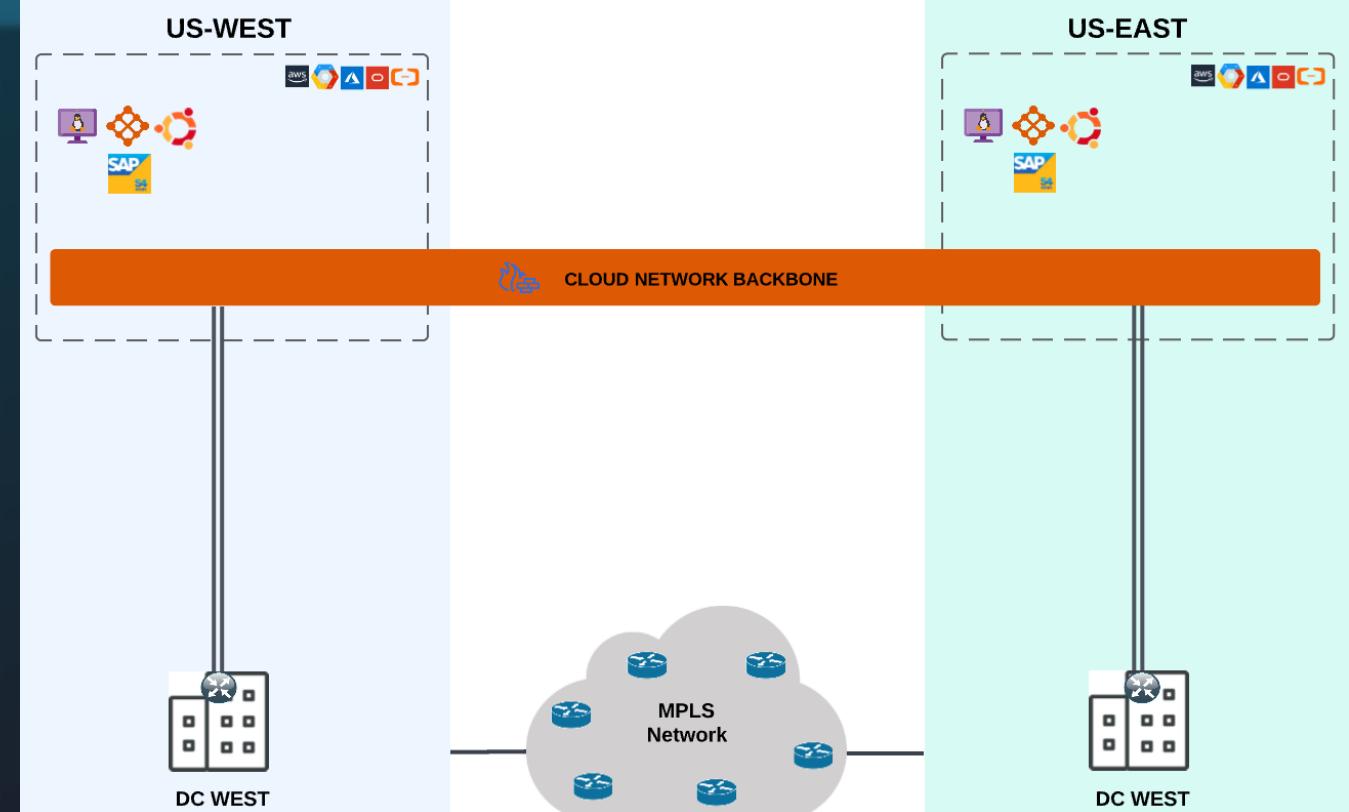
- Inter-region applications experience significant latency
- L7 Service Inspection
- Organizational Boundaries Dependence
  - Network team responsible for the hybrid connectivity (on-ramp)
  - Cloud team responsible for the cloud transit architecture
  - Changes made by either team are not visible to the other team
- Expensive to deploy and maintain high-capacity MPLS and CSP private circuits
- Absence of real-time and historical analytics of cloud network increases MTTR



# Architecture 1 – Region-to-Region Communication

## Aviatrix Cloud Backbone

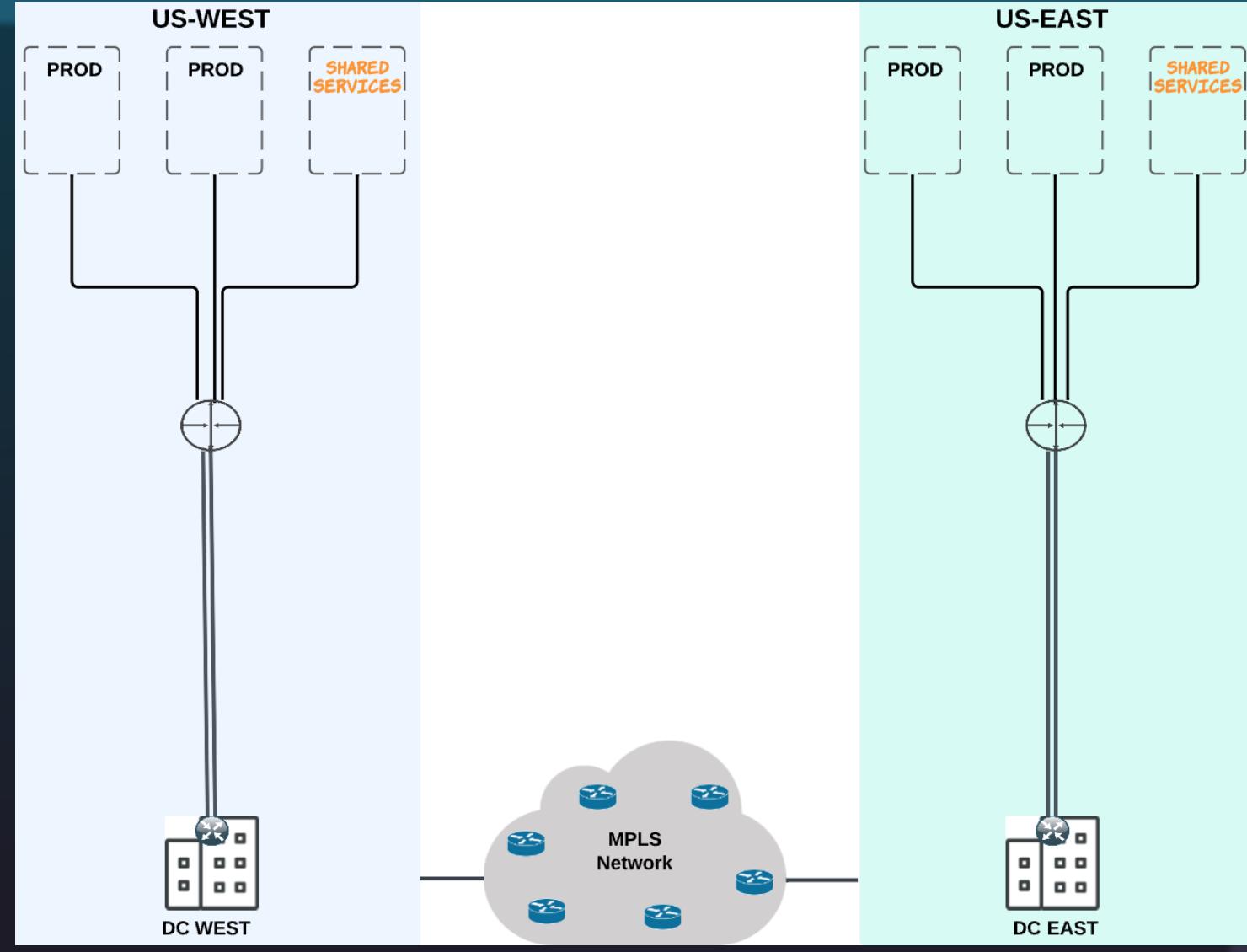
- High-Performance Encrypted Cloud Backbone that eliminates latency challenges
- Full control, independent and traffic engineering capable solution where application data stays within the enterprise network boundary
- Cost-effective enterprise cloud network backbone solution
  - Reduce private WAN circuits usage
  - Eliminate use of expensive native visibility services
  - No need to involve developers to stitch many visibility and troubleshooting tools
- Enterprise-class embedded telemetry, network visibility and troubleshooting tools



# Architecture 1 – Region-to-Region Communication

## How to Get Started

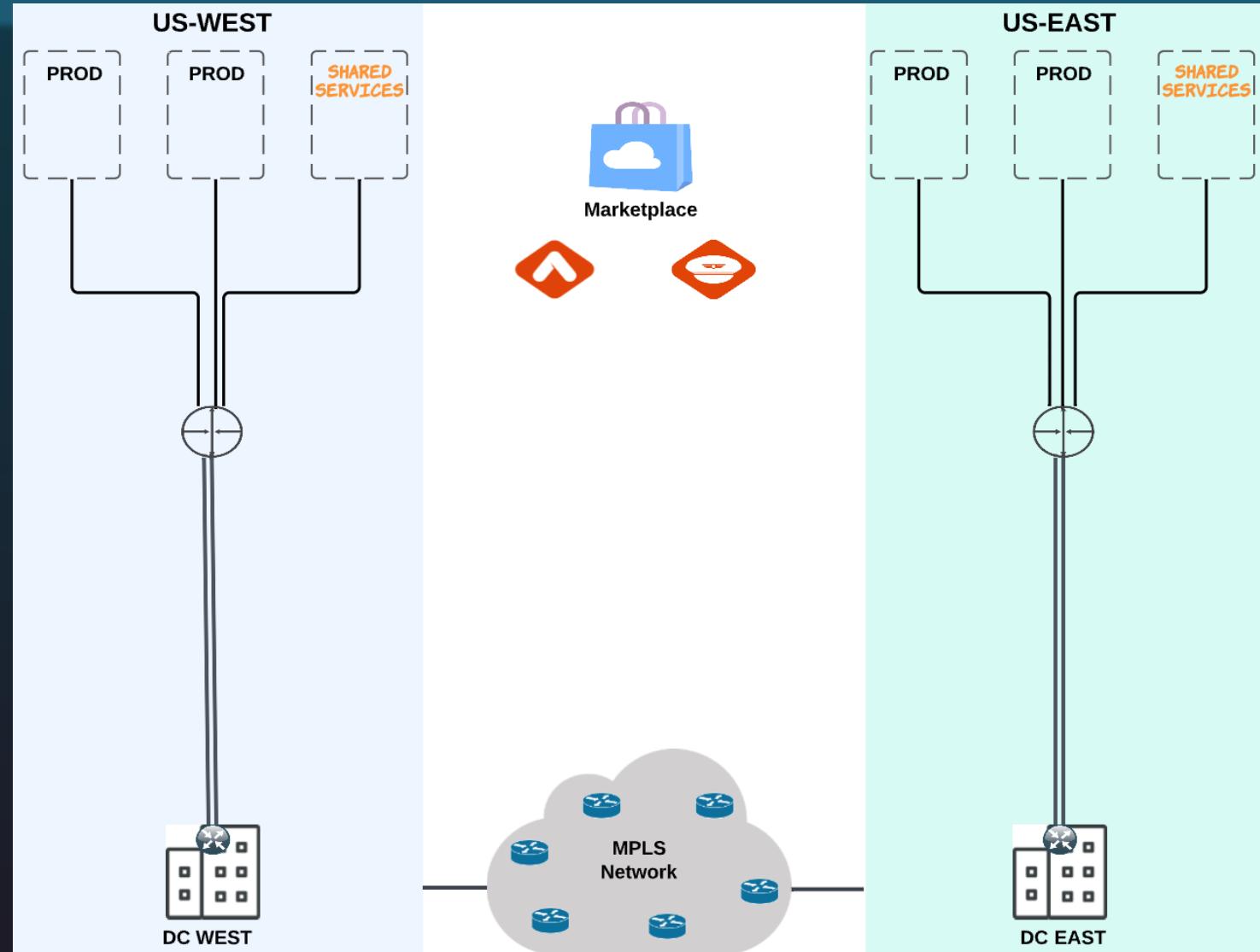
- Zoomed-in Existing Architecture



# Architecture 1 – Region-to-Region Communication

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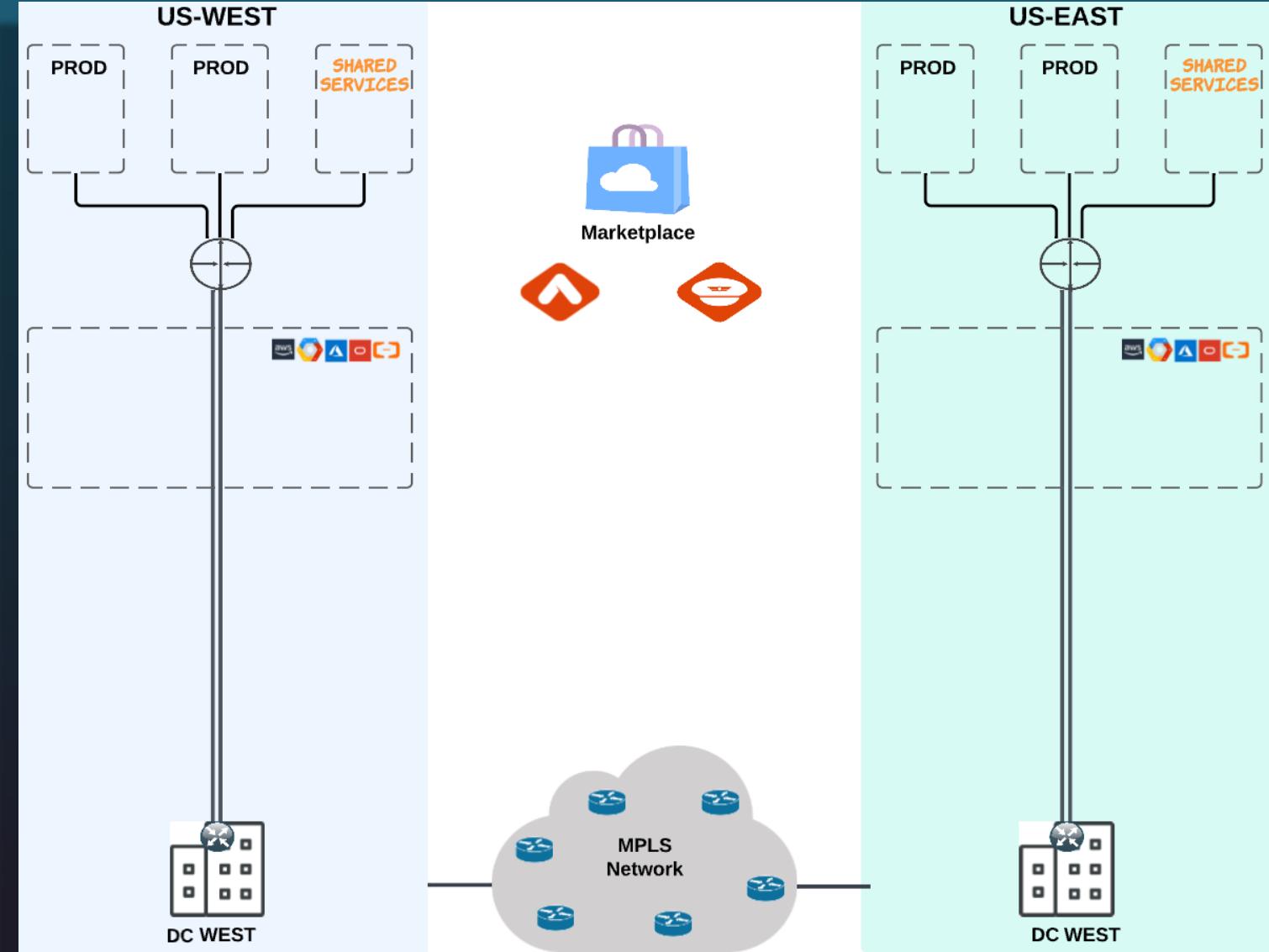
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# Architecture 1 – Region-to-Region Communication

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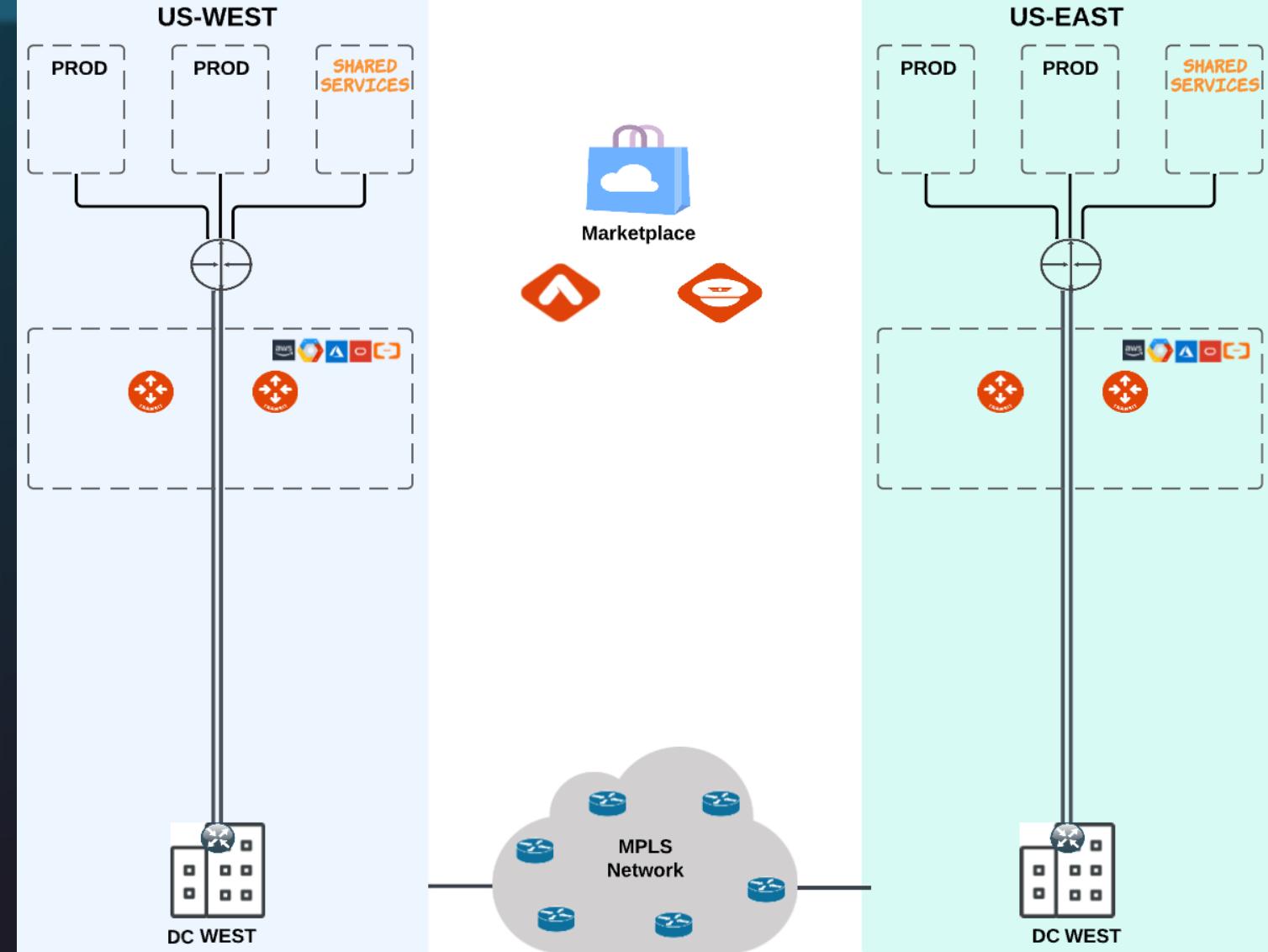
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  - Transit VPC/VNET/VCN



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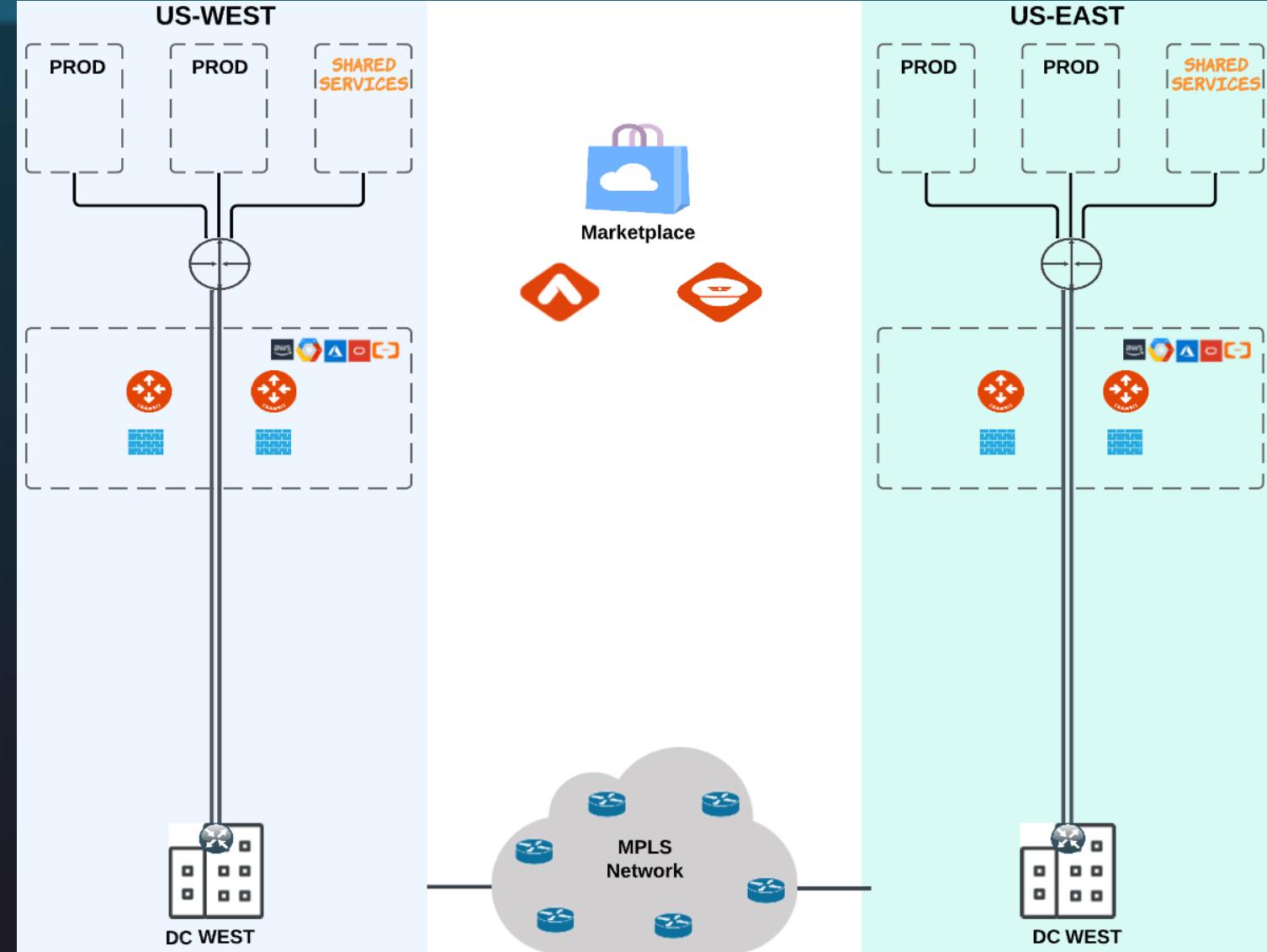
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  - Aviatrix Transit Gateways



# Architecture 1 – Region-to-Region Communication

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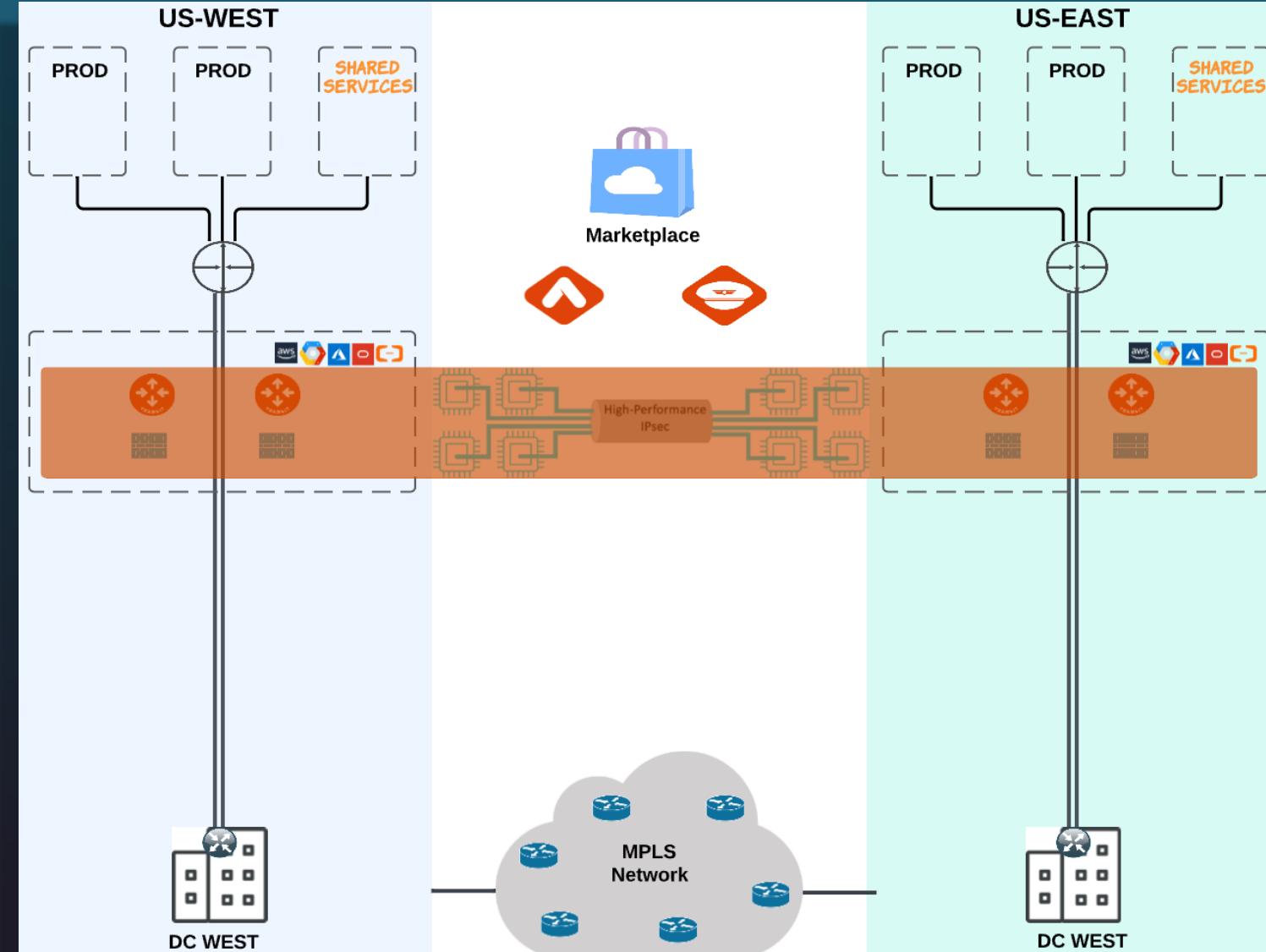
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  - NGFWs



# Architecture 1 – Region-to-Region Communication

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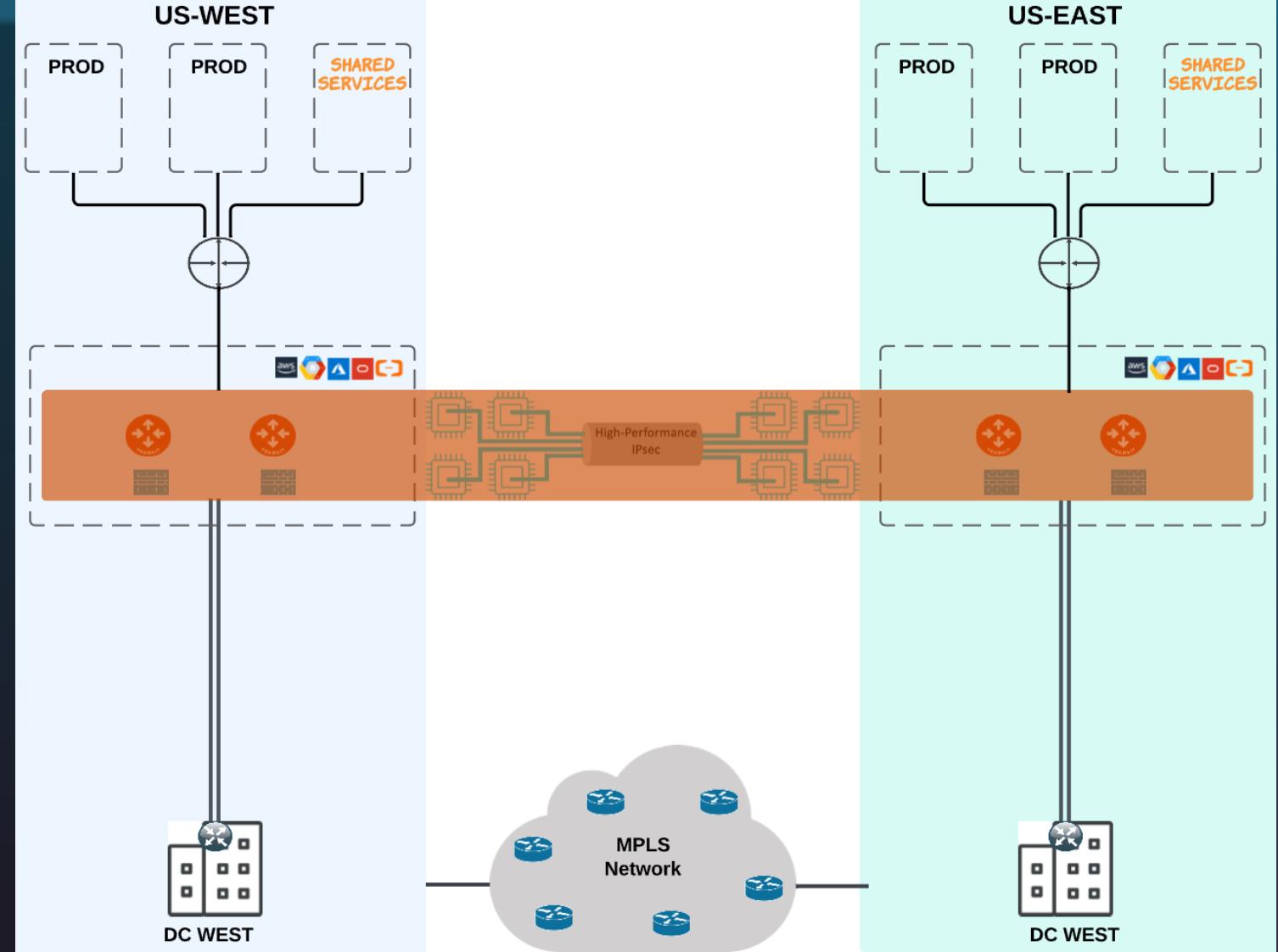
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  - Deploy Cloud Backbone



# Architecture 1 – Region-to-Region Communication

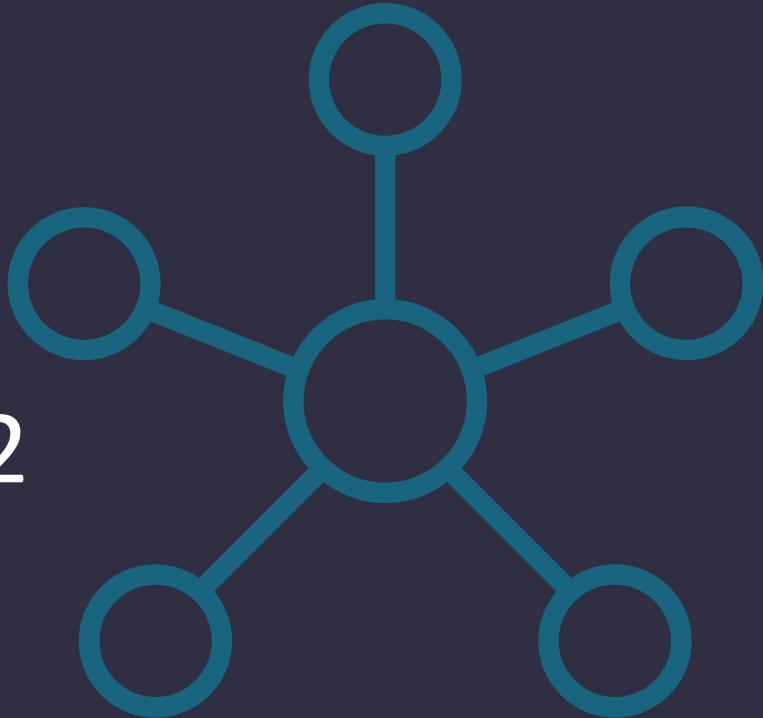
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  - NGFWs
  - Deploy Cloud Backbone
- Connect the native transit construct to the Cloud Backbone
- Switch the private circuits connectivity from the native transit construct to Cloud Backbone



# Enterprise Architecture 2

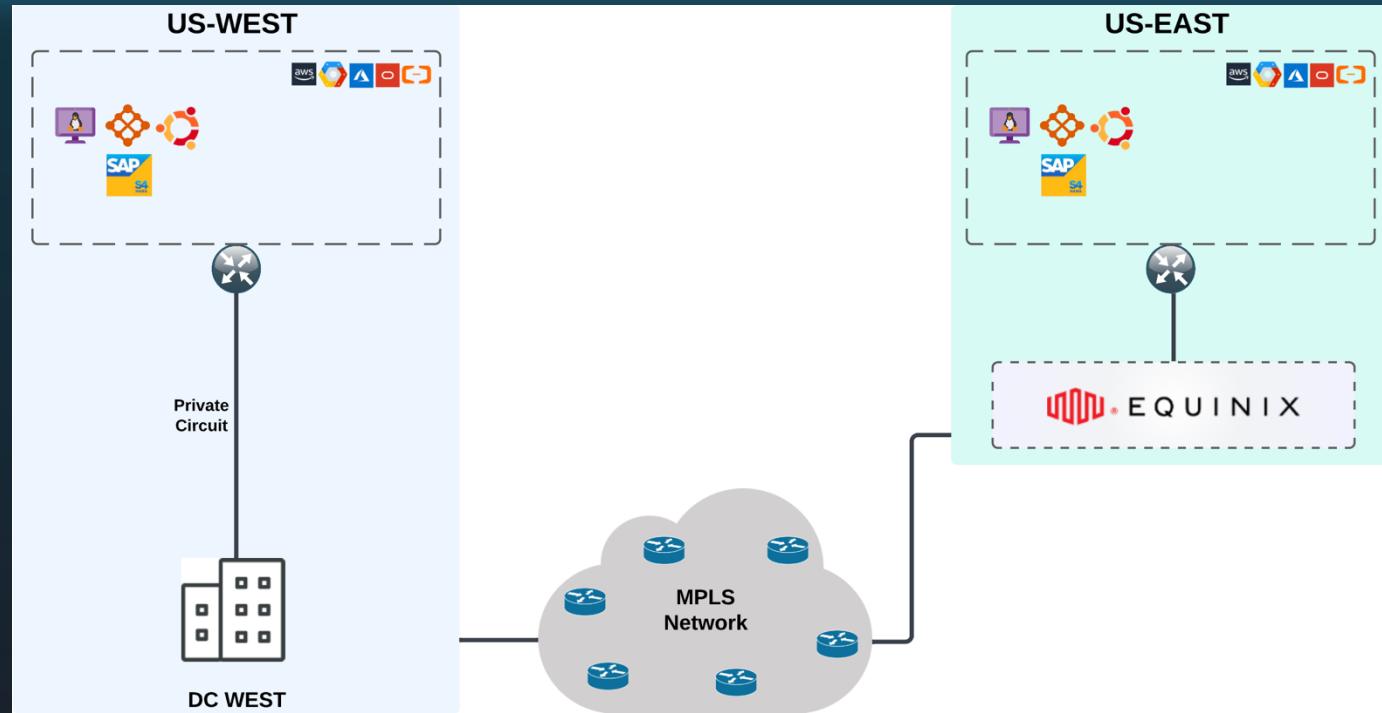
## Colo Extension



# Architecture 2 – CoLo Extension

## Inconsistent and Expensive

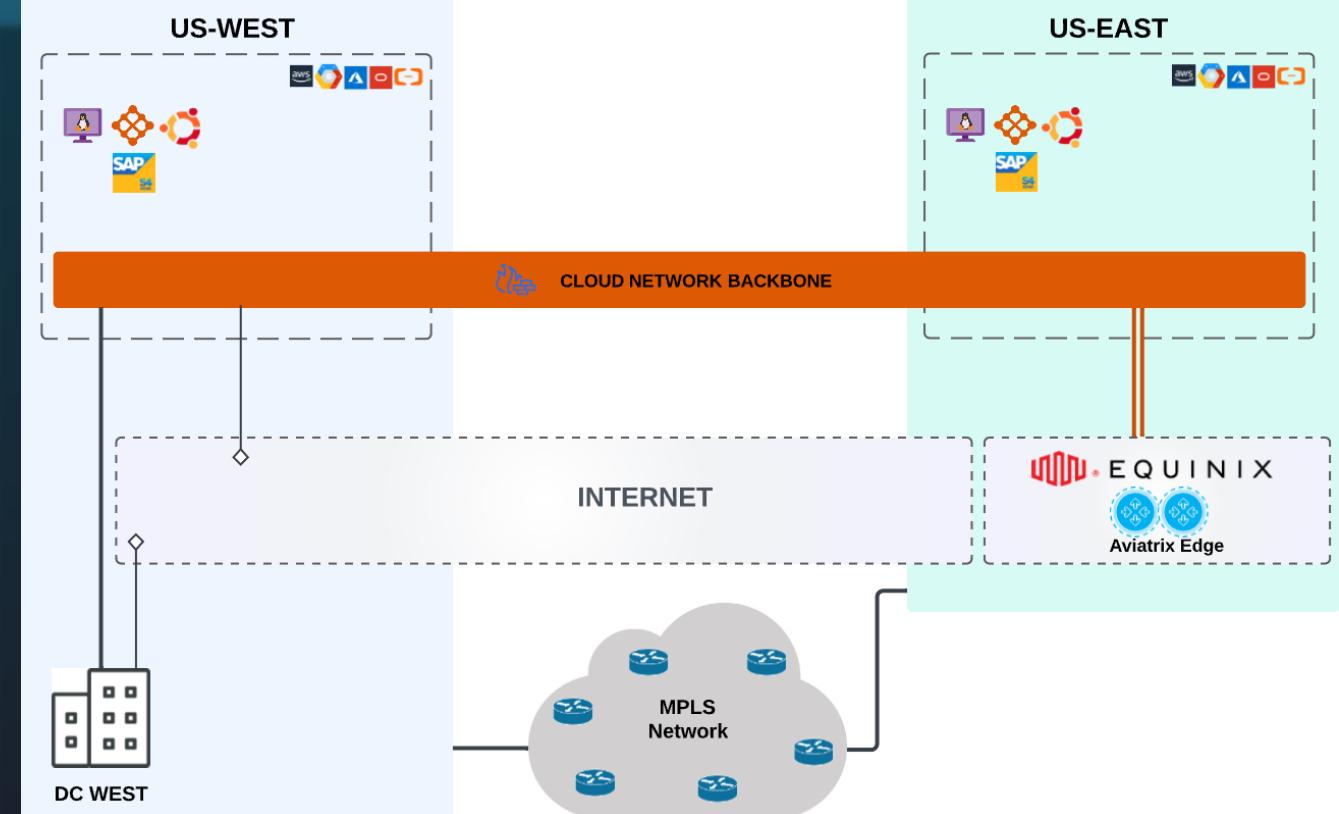
- Business growing in a new region
  - No plans to invest in the DC business
- DC, CoLo and Cloud region's application dependencies
- MPLS to connect Equinix with the DC
- Equinix provides connectivity to East region's applications
- Inter-region applications experience significant latency
- Expensive to deploy and maintain high-capacity MPLS and CSP private circuits



# Architecture 2 – CoLo Extension

## Aviatrix Cloud Backbone

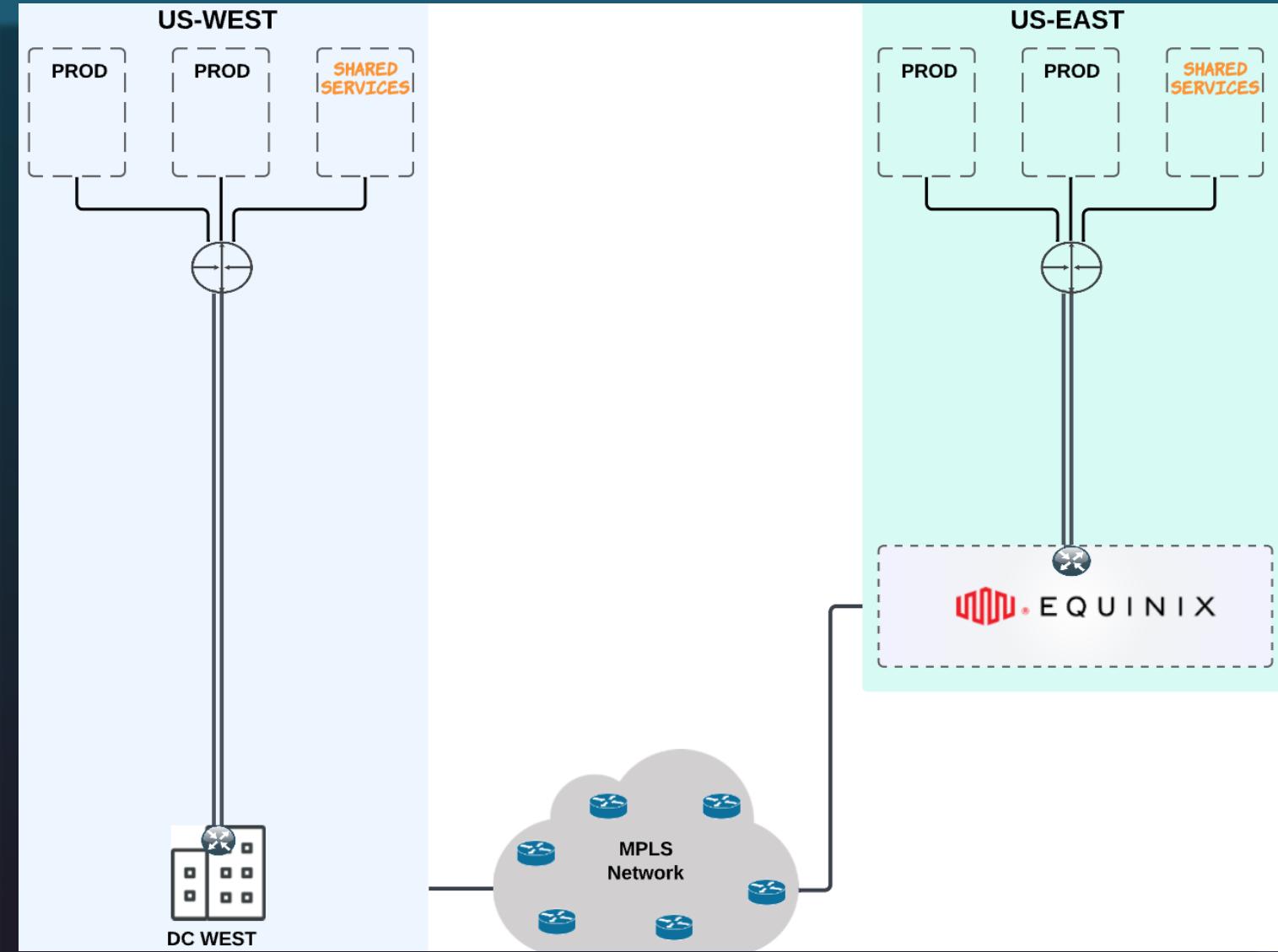
- Common repeatable architecture in the cloud and in the Equinix
- Leveraging CSP's and Equinix underlay to considerably reduce application latency
- No forced traffic backhauling
- Cost-effective enterprise cloud network backbone solution
  - Reduce private WAN circuits usage
  - Eliminate use of expensive native visibility services
  - No need to involve developers to stitch many visibility and troubleshooting tools
- Enterprise-class embedded telemetry, network visibility and troubleshooting tools



# Architecture 2 – CoLo Extension

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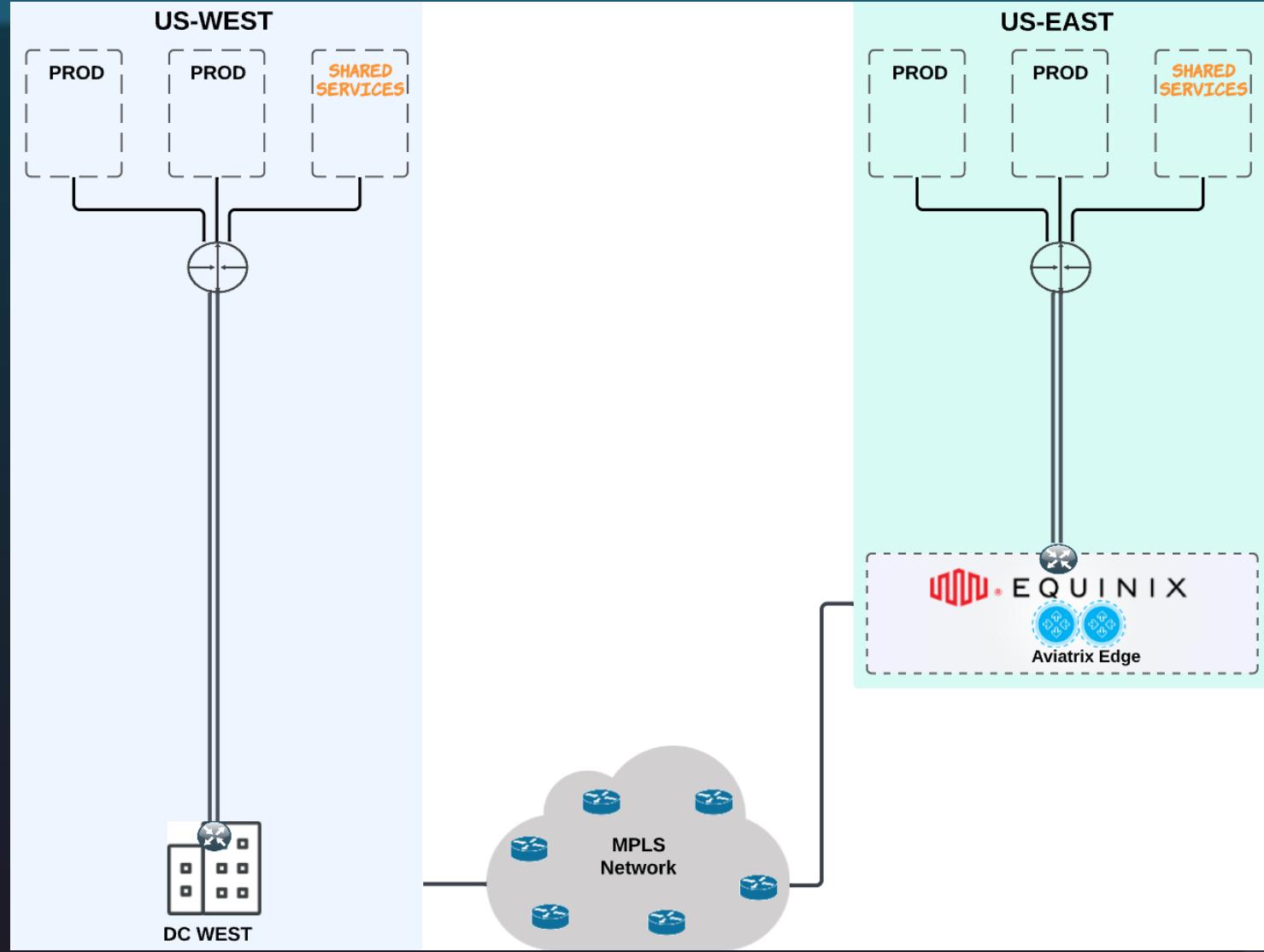
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# Architecture 2 – CoLo Extension

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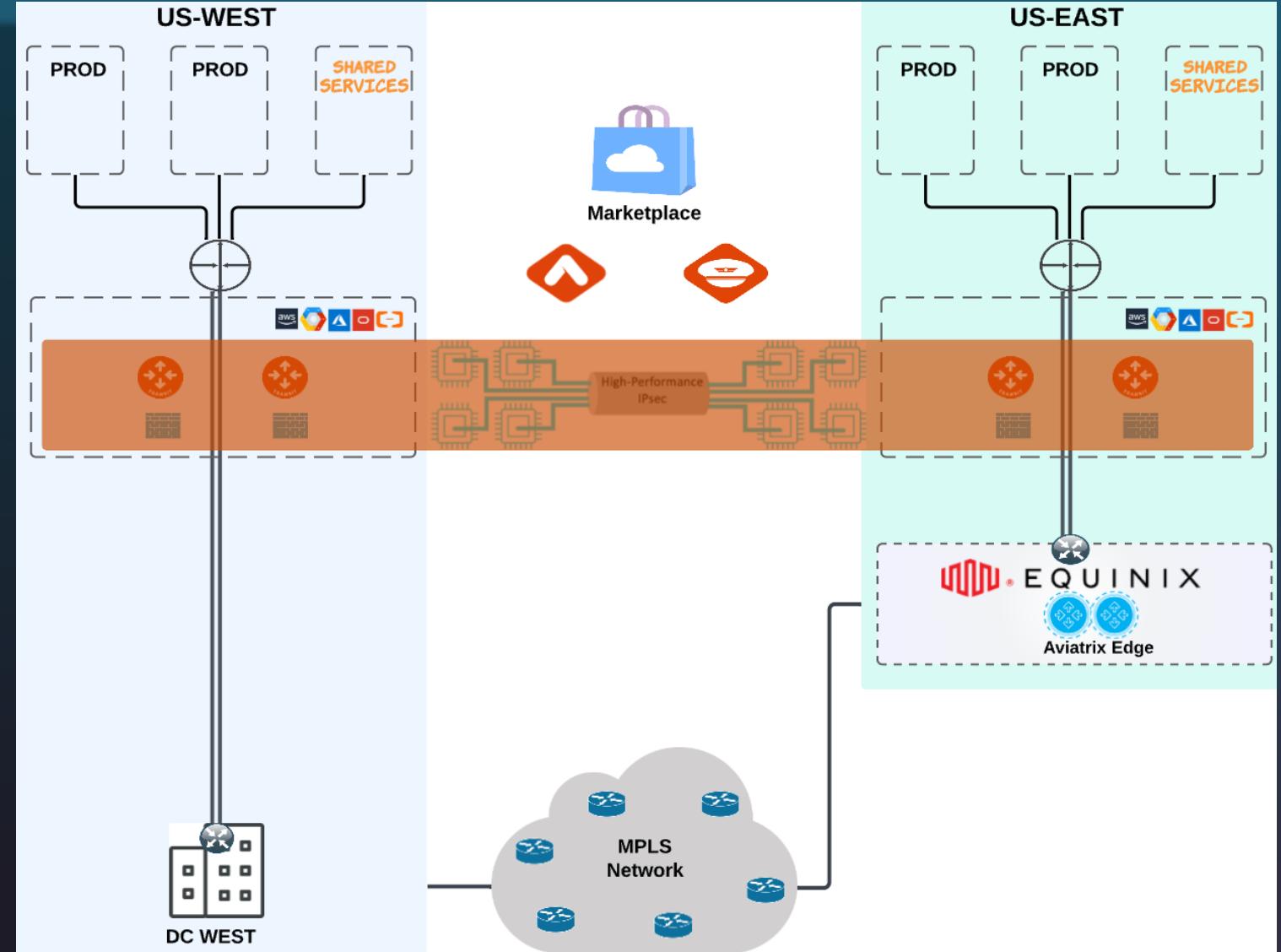
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- Deploy Aviatrix Edge from Equinix marketplace



# Architecture 2 – CoLo Extension

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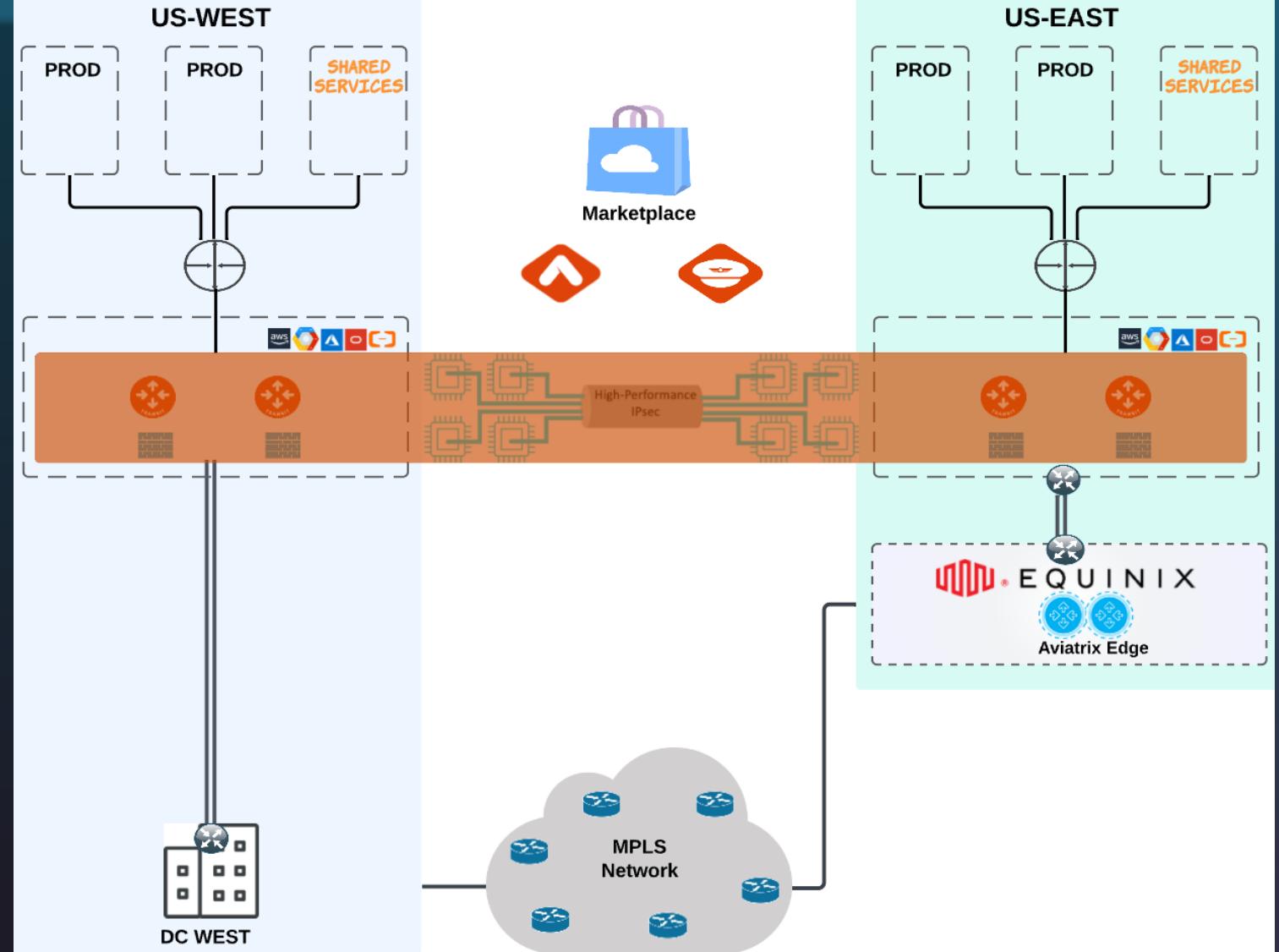
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  - Deploy NGFWs
  - Deploy Cloud Backbone



# Architecture 2 – CoLo Extension

## How to Get Started

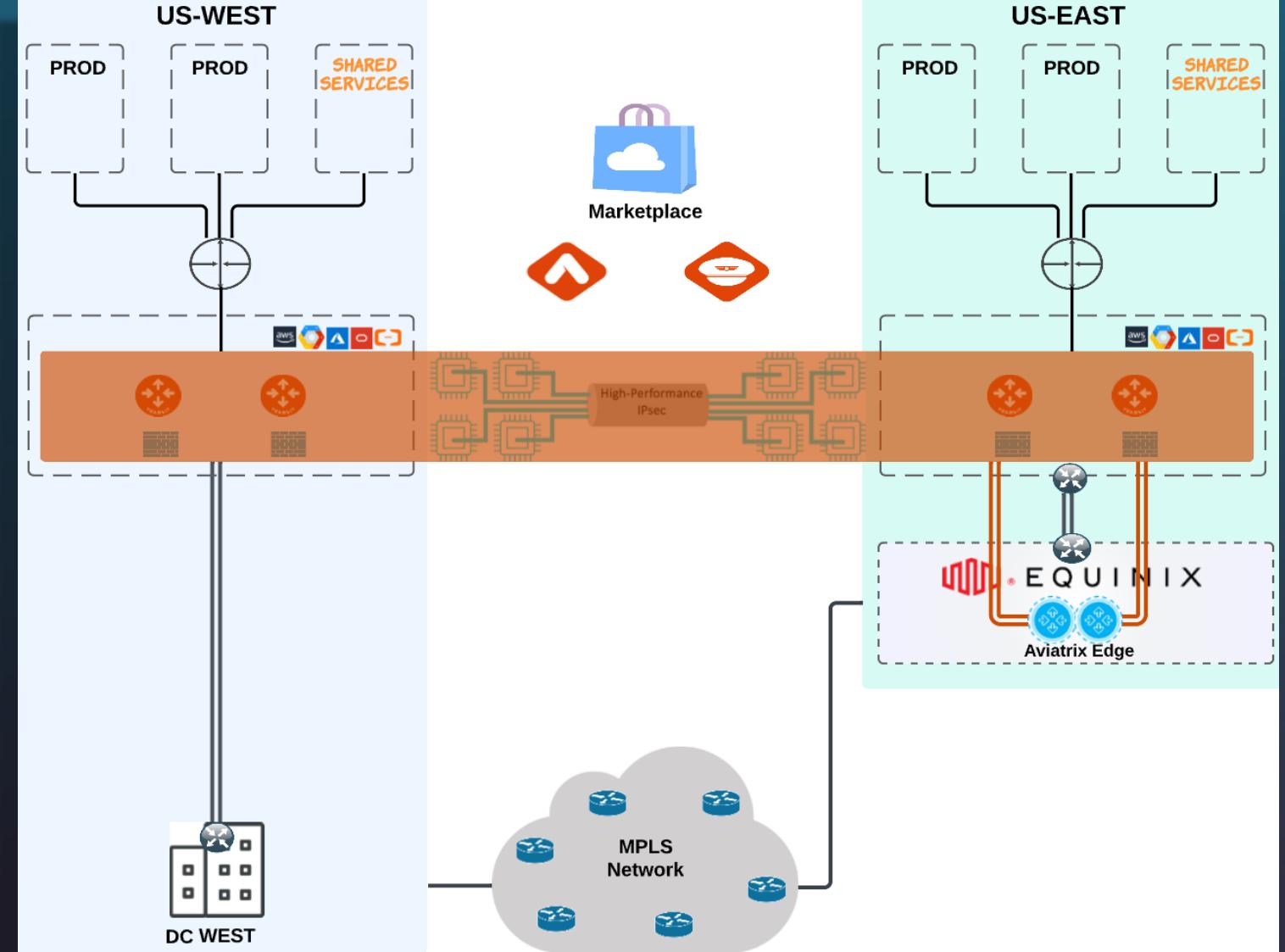
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  - Deploy NGFWs
  - Deploy Cloud Backbone
- Connect the native transit construct to the Cloud Backbone
- Create HPE connectivity between Equinix and Cloud Backbone using Aviatrix Edge



# Architecture 2 – CoLo Extension

## How to Get Started

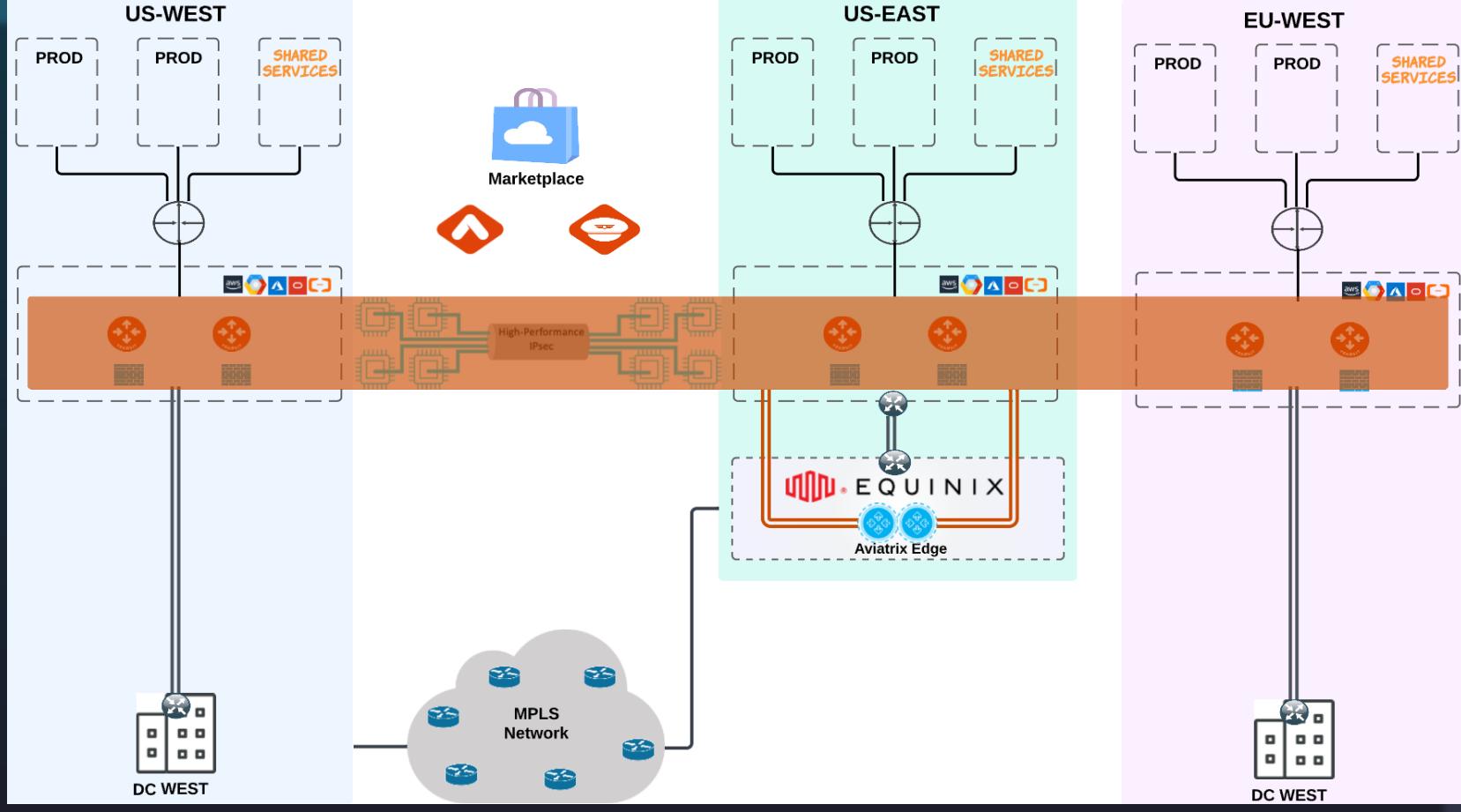
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  - Deploy NGFWs
  - Deploy Cloud Backbone
- Connect the native transit construct to the Cloud Backbone
- Create HPE connectivity between Equinix and Cloud Backbone using Aviatrix Edge
- Switch the private circuits connectivity from the native transit construct to Cloud Backbone



# Architecture 2 – CoLo Extension+

## How to Get Started

- Zoomed-in Existing Architecture
- Deploy Aviatrix Edge from Equinix marketplace
- Deploy Aviatrix Controller & CoPilot from CSP Marketplace
- Create the following from Aviatrix without changing anything in the existing architecture
  - Transit VPC/VNET/VCN
  - Aviatrix Transit GWs
  - Deploy NGFWs
  - Deploy Cloud Backbone
- Connect the native transit construct to the Cloud Backbone
- Create HPE connectivity between Equinix and Cloud Backbone using Aviatrix Edge
- Switch the private circuits connectivity from the native transit construct to Cloud Backbone
- Extend to any new region



# Enterprise Architecture 3

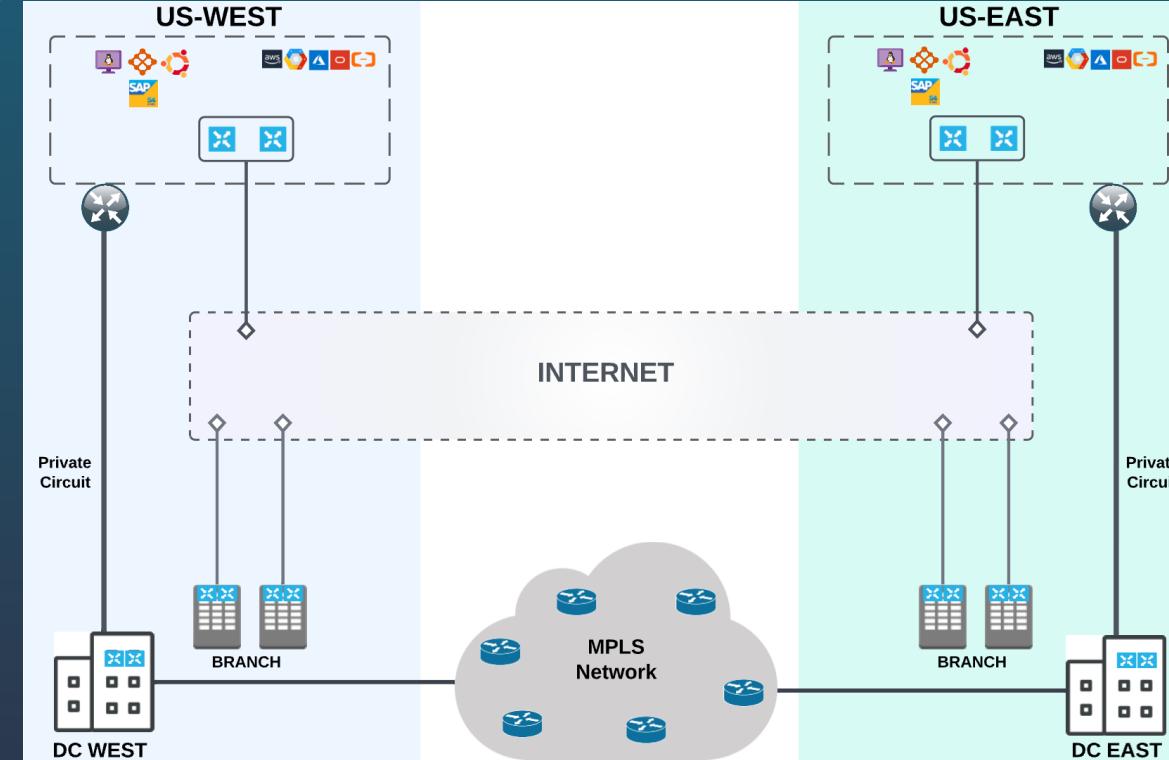
## SD-WAN



# Architecture 3 – SD-WAN

## Inefficient, Challenging and Low Performance Solution

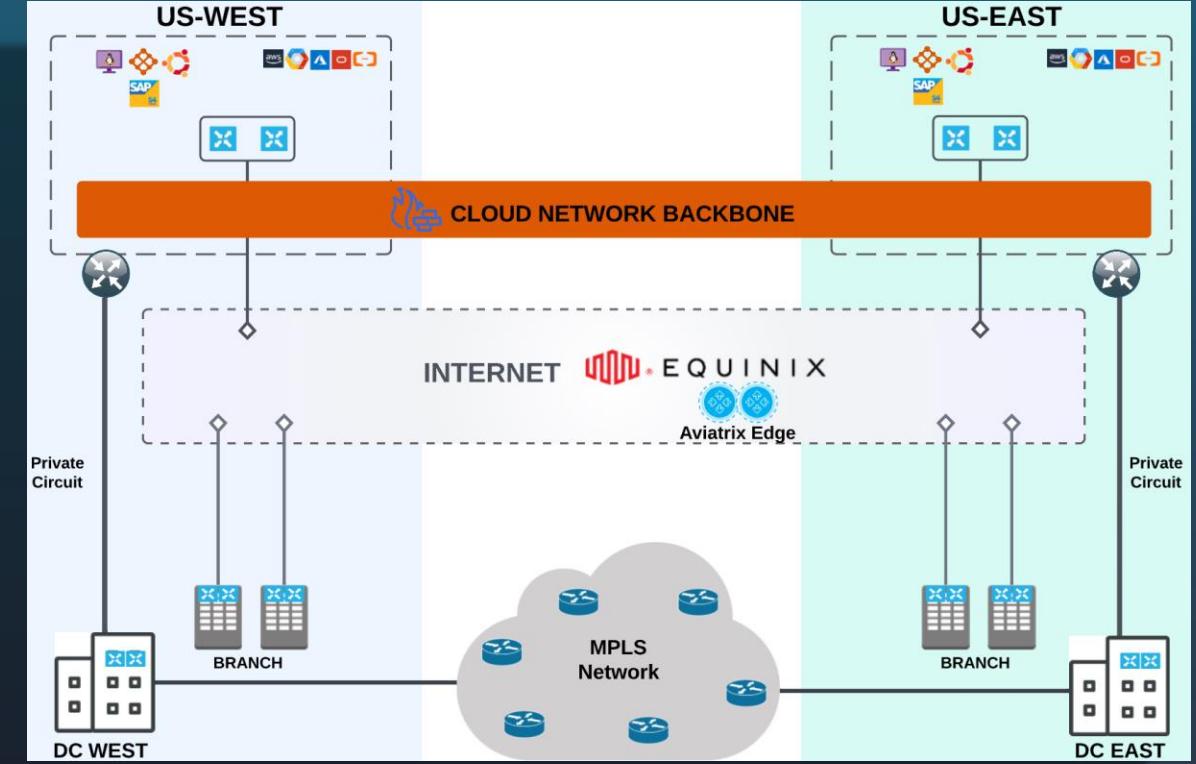
- Expensive solution for utilizing only the fundamental features of SD-WAN
- Difficult to manage and deploy hardware at each physical location
- Only understands on-prem environment
  - Cloud on-ramp solution
- SD-WAN hybrid connectivity solutions lacks high-performance encryption
- Runs into native construct's limitations
- Inefficient day2 operations due to many management stations (one per cloud and on-prem)



# Architecture 3 – SD-WAN

## Aviatrix Cloud Backbone

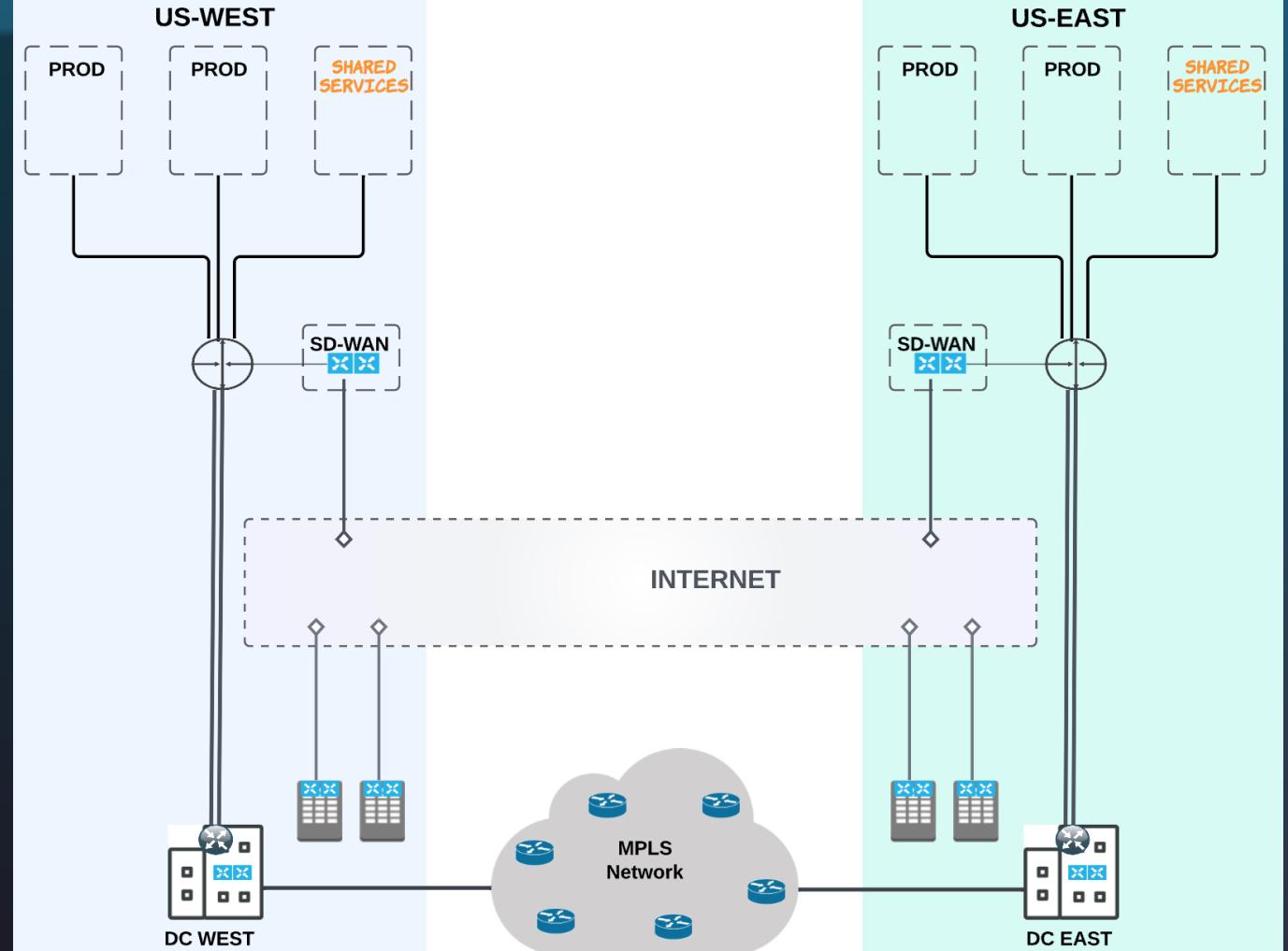
- High-Performance and extremely efficient architecture
- Programmable integration with SD-WAN
- Overcomes native CSP's limitations
- Multicloud native networking and security platform
- Enterprise-class embedded telemetry, network visibility and troubleshooting tools



# Architecture 3 – SD-WAN

## How to Get Started

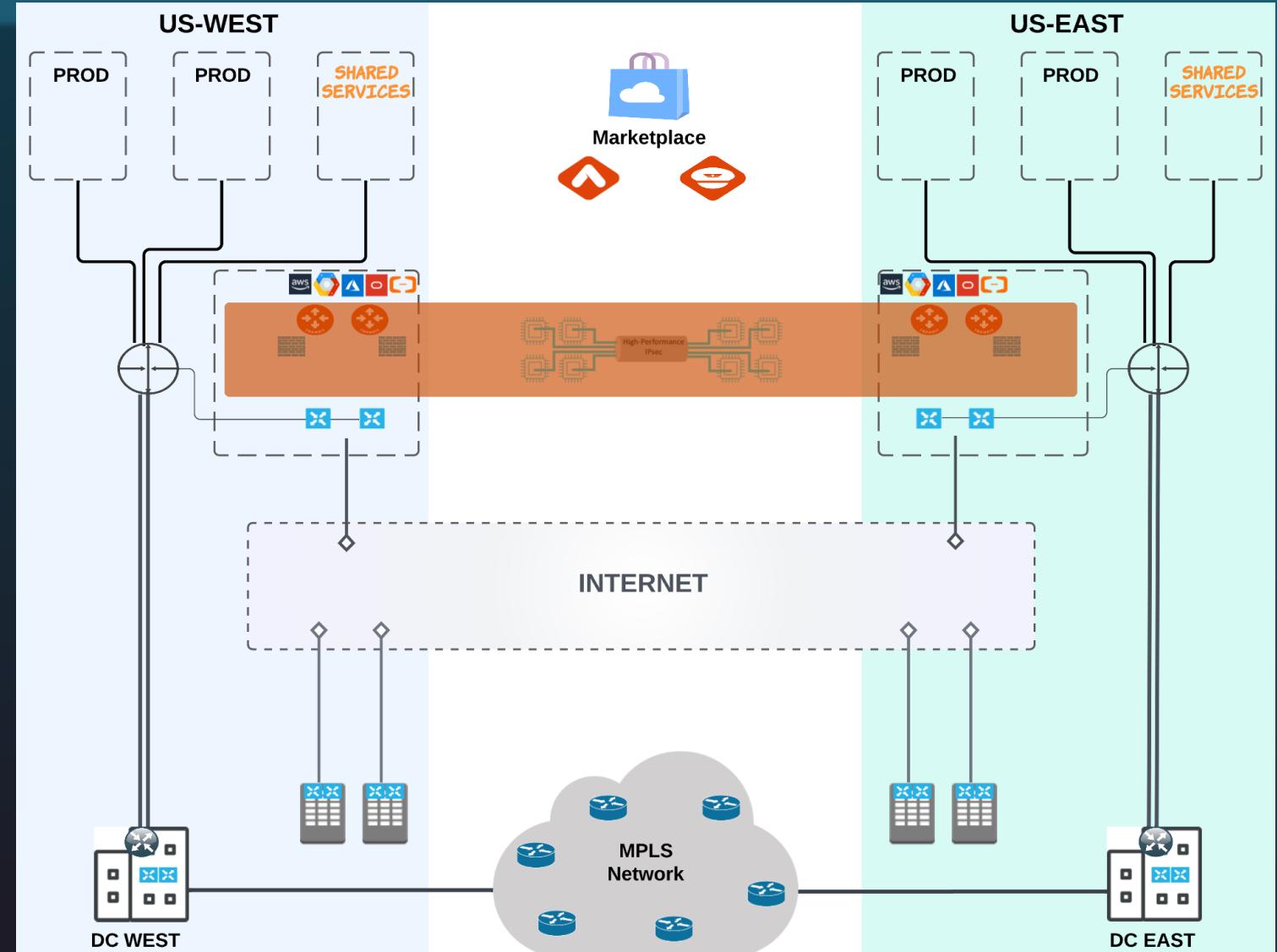
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# Architecture 3 – SD-WAN

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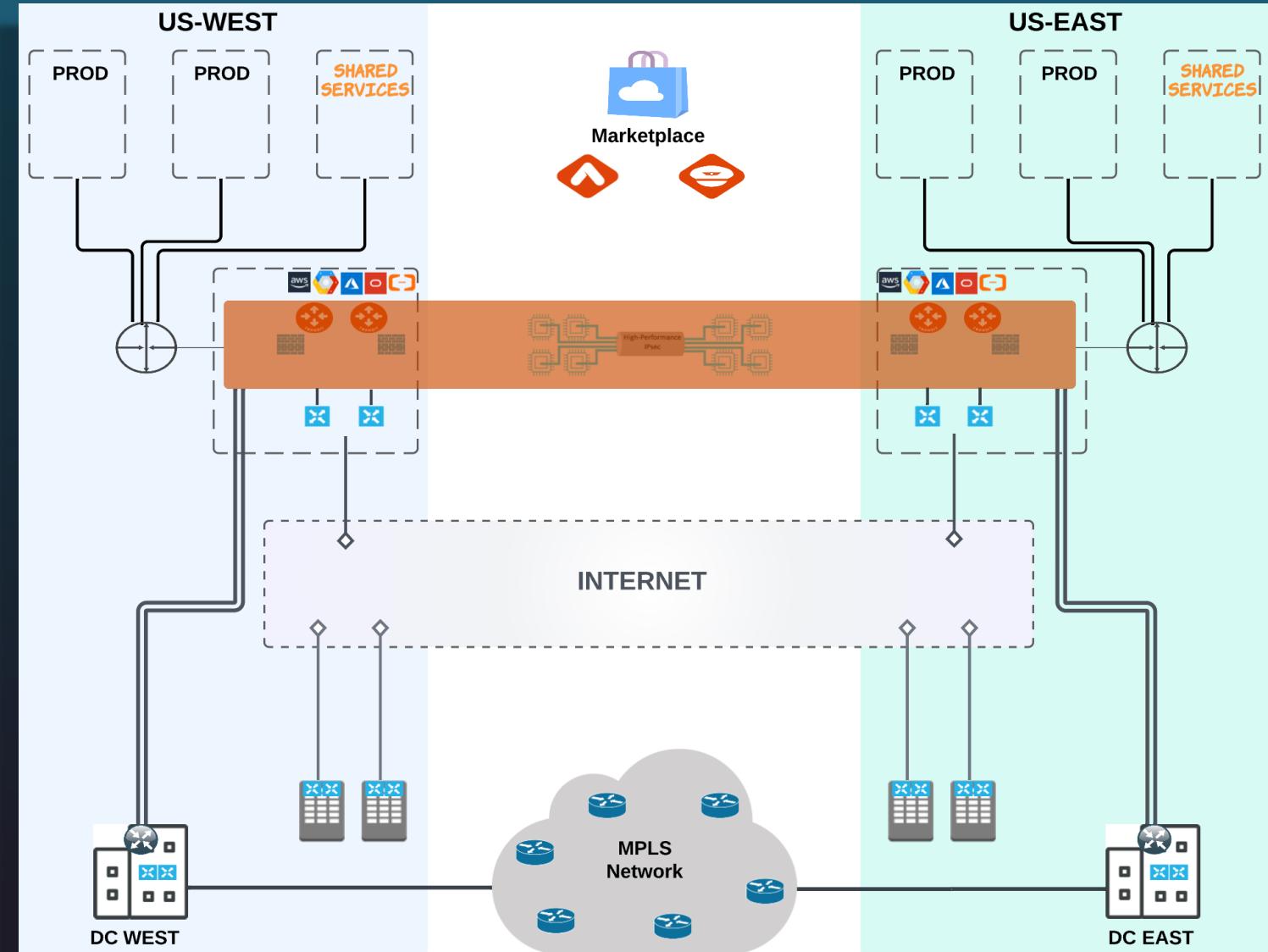
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  - Aviatrix Transit GWs
  - Deploy NGFWs
  - Deploy Cloud Backbone



# Architecture 3 – SD-WAN

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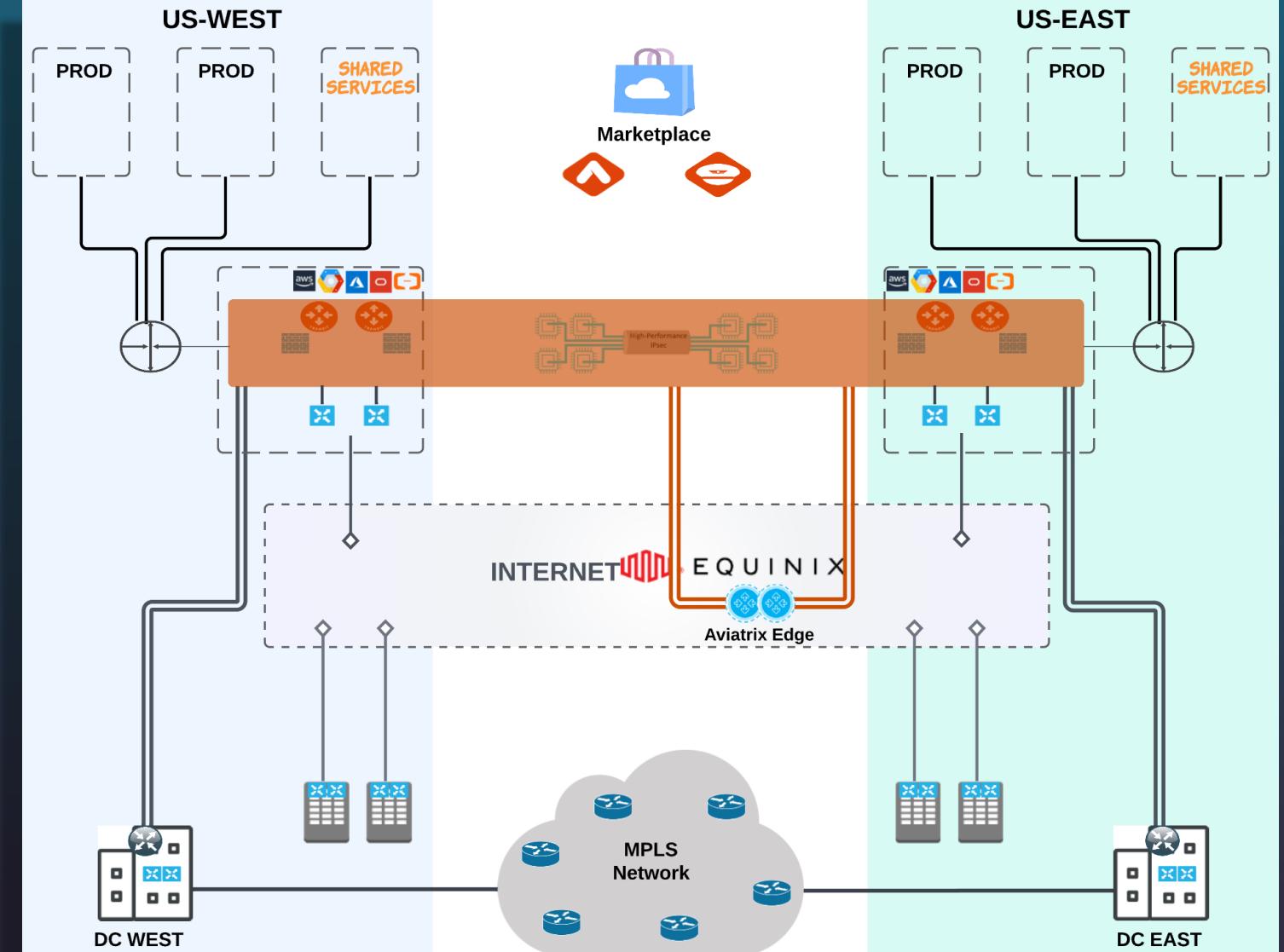
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  - Aviatrix Transit GWs
  - Deploy NGFWs
  - Deploy Cloud Backbone
- Build BGP adjacencies between Cloud Backbone and SD-WAN headend
- Switch native transit connection from SD-WAN to Cloud Backbone (BGP)
- Terminate private hybrid connectivity on Cloud Backbone



# Architecture 3 – SD-WAN (Equinix Extension)

## How to Get Started

- Zoomed-in Existing Architecture
- Deploy Aviatrix Controller & CoPilot from CSP Marketplace
- Create the following from Aviatrix without changing anything in the existing architecture
  - Transit VPC/VNET/VCN
  - Aviatrix Transit GWs
  - Deploy NGFWs
  - Deploy Cloud Backbone
- Build BGP adjacencies between Cloud Backbone and SD-WAN headend
- Switch native transit connection from SD-WAN to Cloud Backbone (BGP)
- Terminate private hybrid connectivity on Cloud Backbone
- Extend to Equinix



# Enterprise Architecture 4

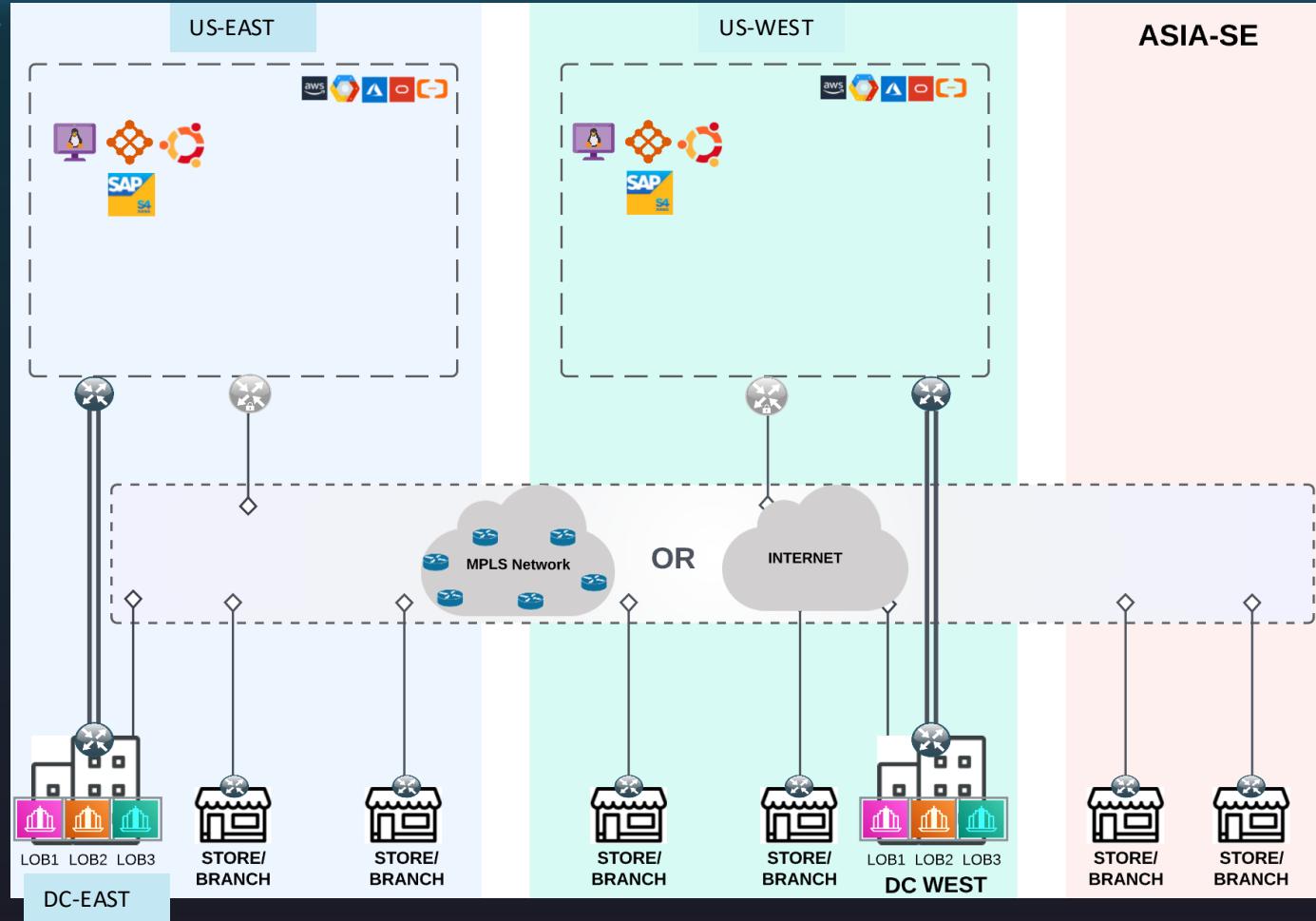
## Hybrid Connectivity



# Architecture 4 – Hybrid Connectivity

## Insecure, Inefficient & Lacks Programmability

- Native and 3<sup>rd</sup> party hybrid connectivity solutions lacks Zero Trust Architecture
  - Complex and expensive to achieve segregation between Lines of Businesses (LOBs)
  - Provides either low-performance encryption capabilities or let the traffic pass through unencrypted
  - NextGen FW service insertion
- Cloud-to-OnPrem application latency challenges (remote regions where no applications were deployed)
- Programmability challenges
- Organizational Boundaries Dependence
  - Network team responsible for the hybrid connectivity (on-ramp)
  - Cloud team responsible for the cloud transit architecture
  - Changes made by either team are not visible to the other team
- Expensive to deploy and maintain high-capacity MPLS and CSP private circuits

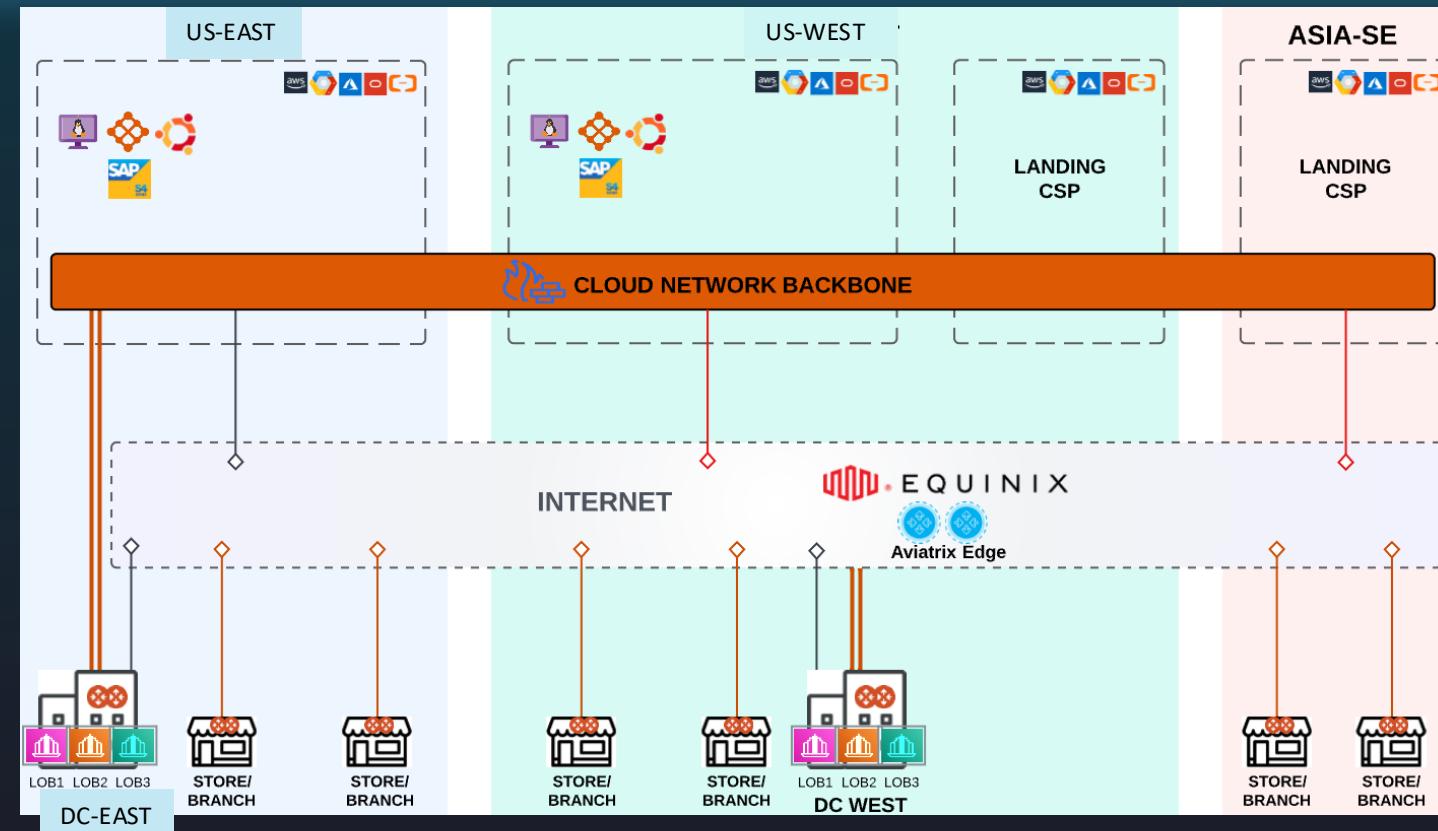


# Architecture 4 – Hybrid Connectivity



## Aviatrix Cloud Network Backbone

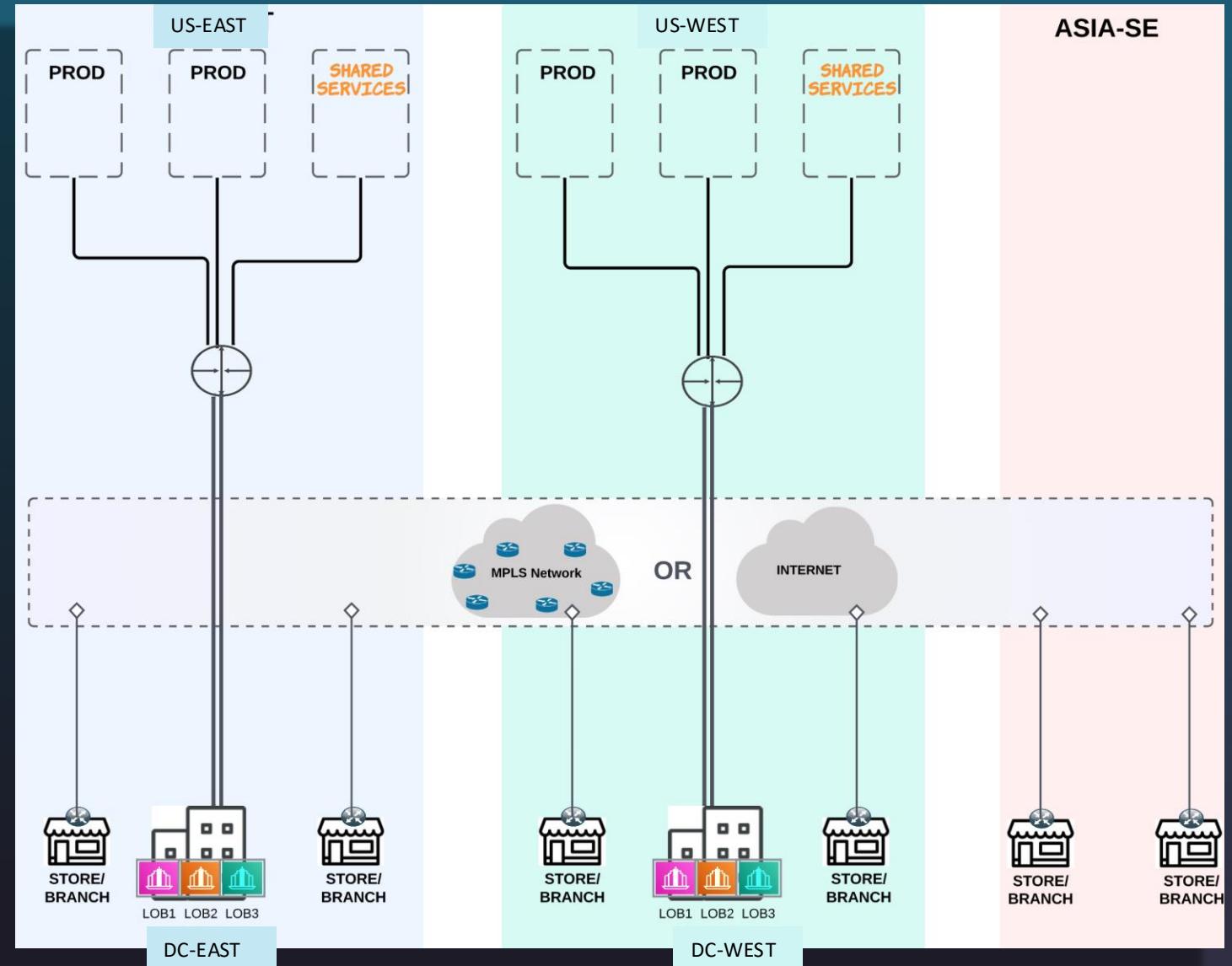
- Zero Trust policy-based security architecture
    - High-performance encrypted inter-region and multicloud connectivity
    - LOBs applications segmentation
    - NexGen FW service in the cloud (No hair-pinning)
  - Highly flexible cloud-out solution
    - Utilize landing CSP without deploying applications to overcome latency challenges
  - Programmable multicloud and on-prem deployment
    - No need to involve developers to stitch many visibility and troubleshooting tools
  - Zero Touch Provisioning
  - Cost-effective enterprise cloud network backbone solution
    - Reduce private WAN circuits usage
    - Eliminate use of expensive native visibility services
  - Unified management-plane for multicloud and on-prem



# Architecture 4 – Hybrid Connectivity

## How to Get Started

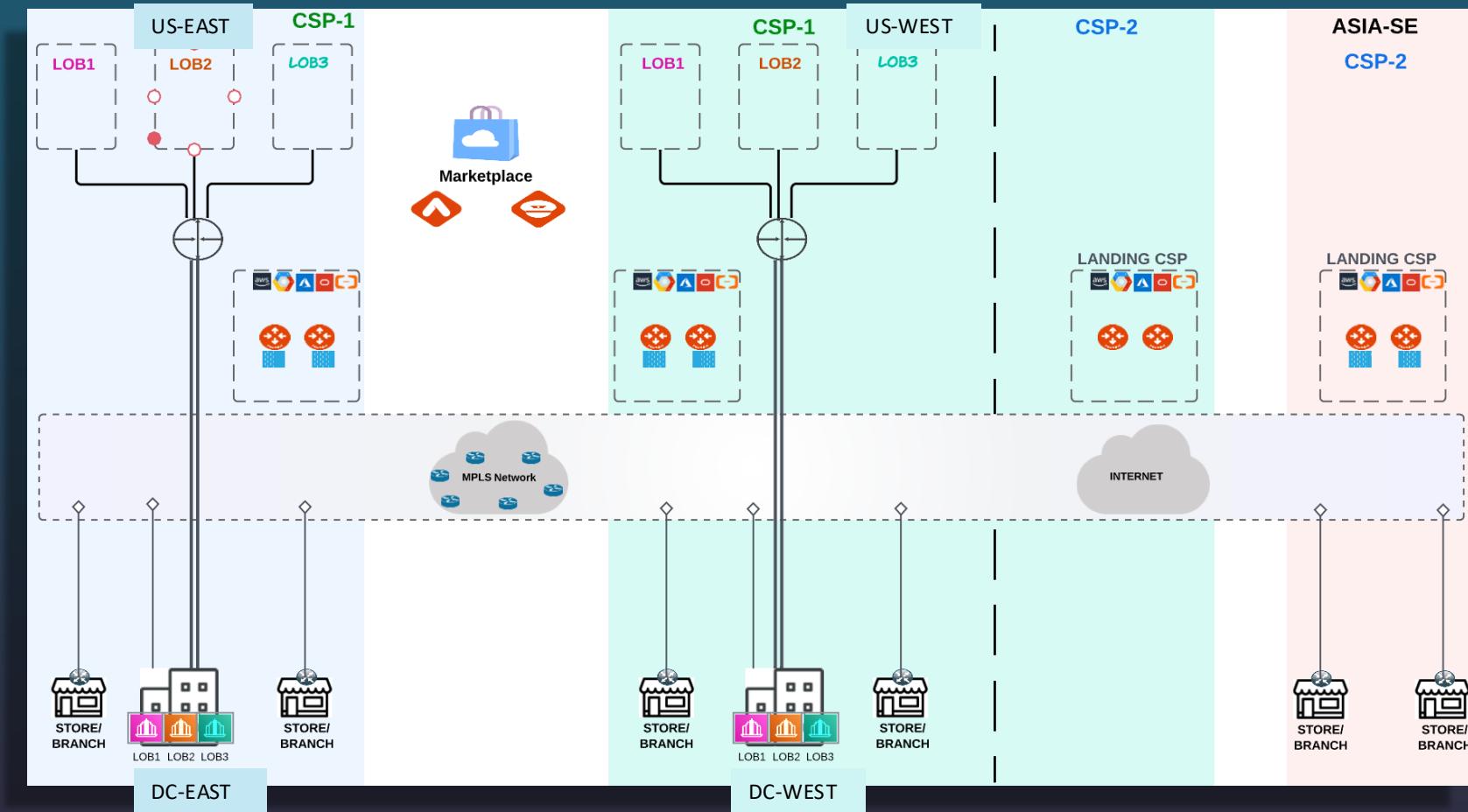
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# Architecture 4 – Hybrid Connectivity

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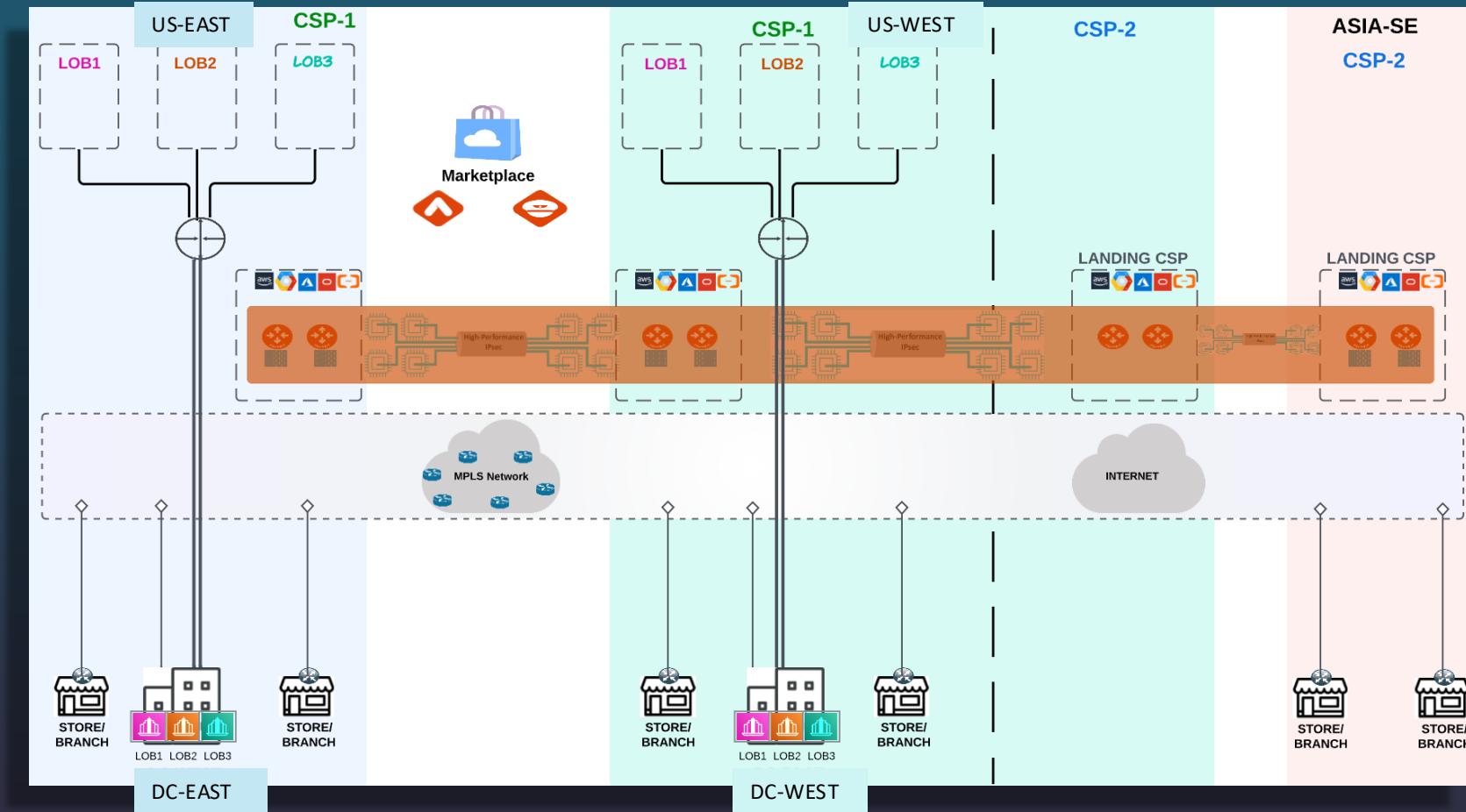
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  - Deploy NGFWs



# Architecture 4 – Hybrid Connectivity

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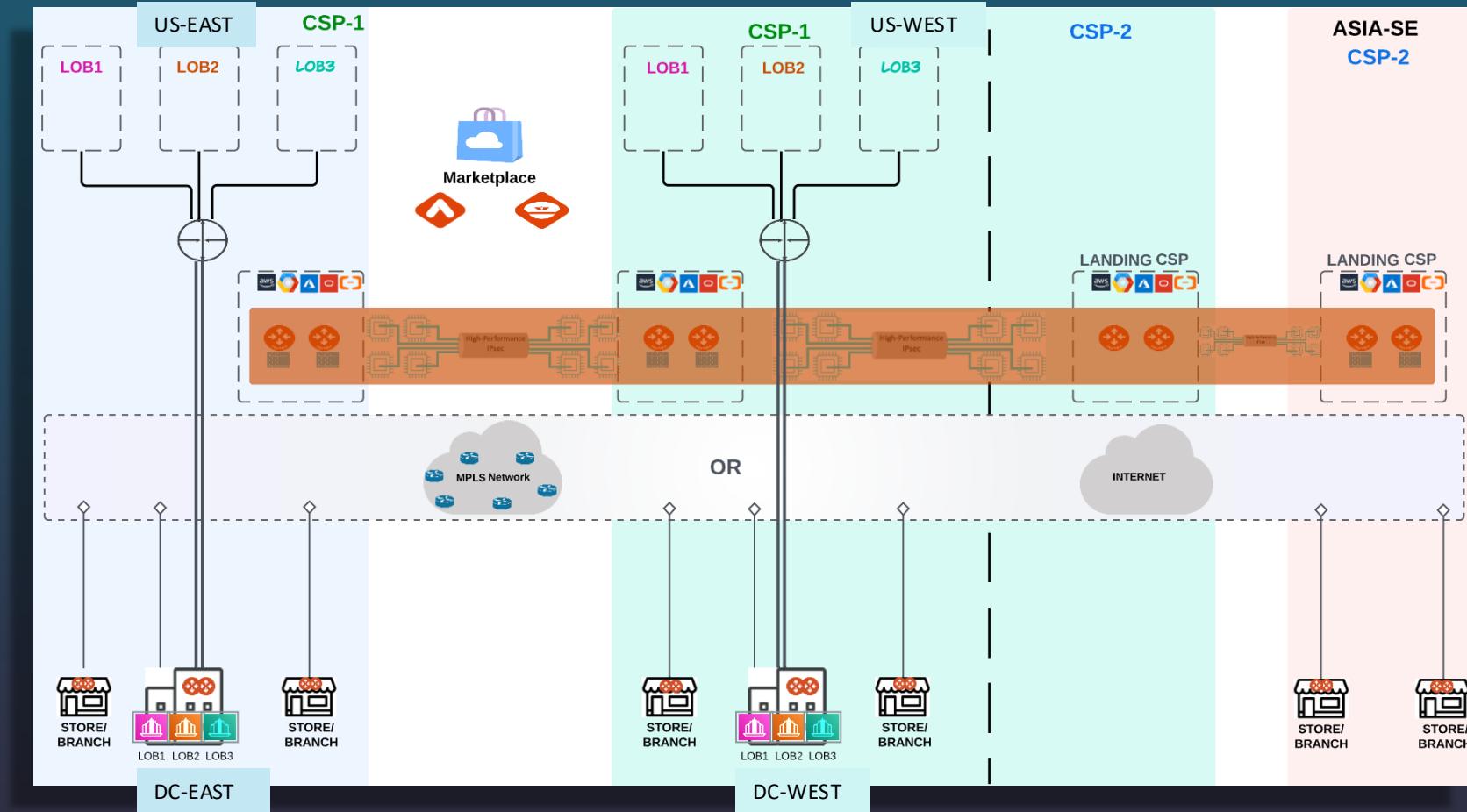
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  - Deploy NGFWs except CSP-2 (landing CSP)
  - Deploy Cloud Backbone



# Architecture 4 – Hybrid Connectivity

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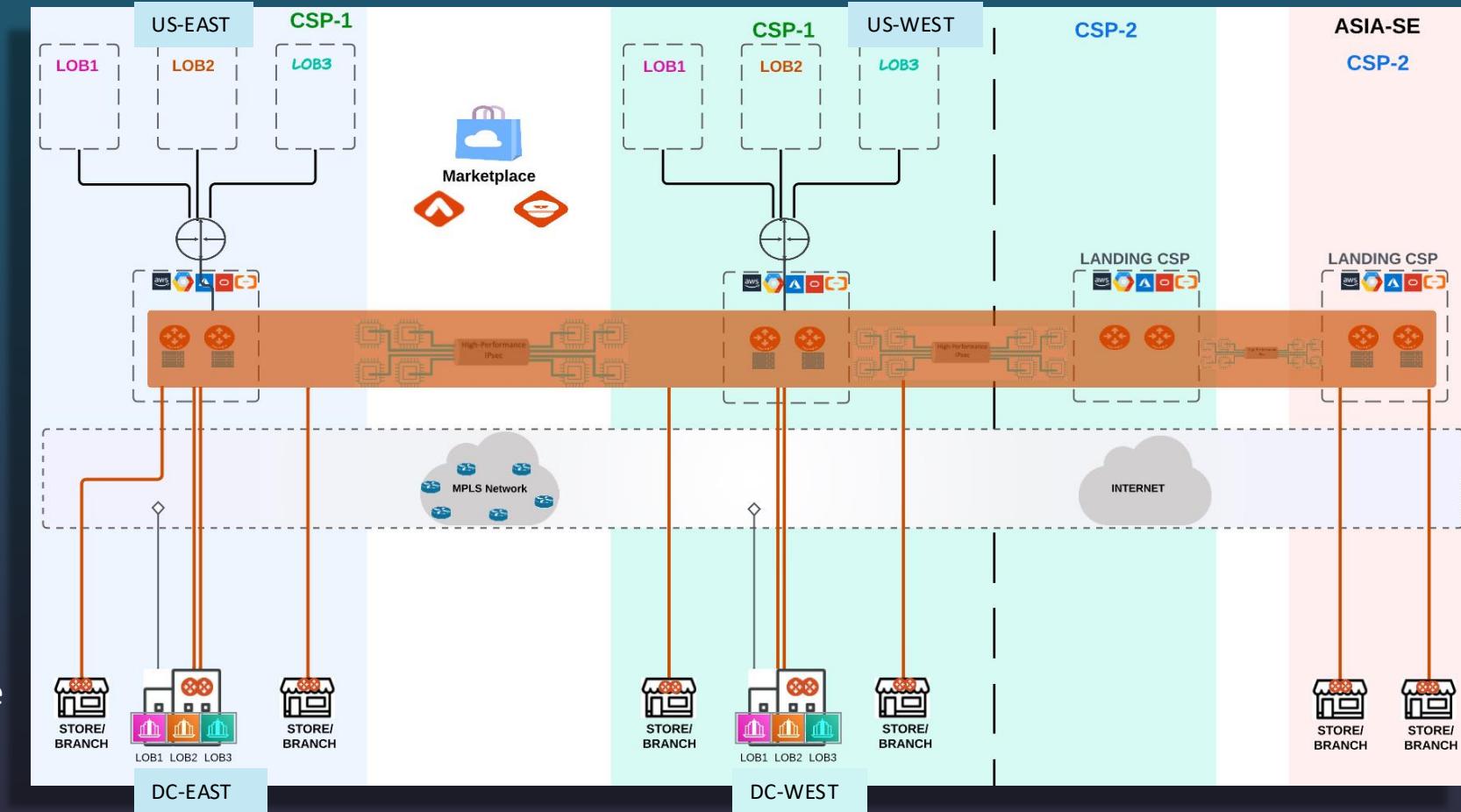
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  - Deploy Cloud Backbone
- Deploy Aviatrix Edge in the DC and branches



# Architecture 4 – Hybrid Connectivity

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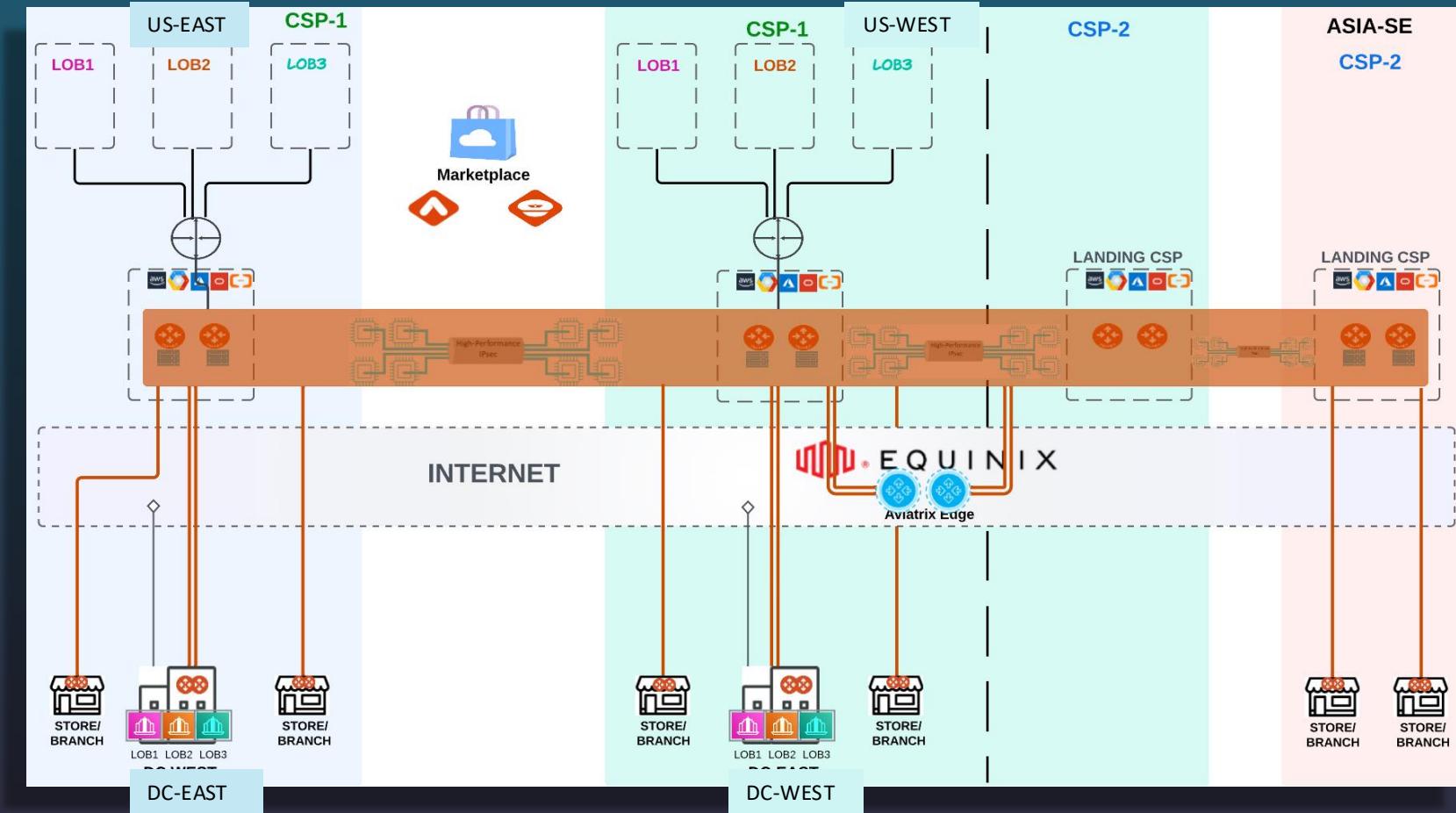
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  - Deploy NGFWs except CSP-2 (landing CSP)
  - Deploy Cloud Backbone
- Deploy Aviatrix Edge in the DC and branches
- Connect the native transit construct to the Cloud Backbone
- Switch the private circuits connectivity from the native transit construct to Cloud Backbone
- Connect branches with the Cloud Backbone using Aviatrix Edge



# Architecture 4 – Hybrid Connectivity (Equinix Extension)

## How to Get Started

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  - Deploy Cloud Backbone
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- Connect the native transit construct to the Cloud Backbone
- Switch the private circuits connectivity from the native transit construct to Cloud Backbone
- Connect branches with the Cloud Backbone using Aviatrix Edge
- Create HPE connectivity between Equinix and Cloud Backbone using Aviatrix Edge



# Enterprise Architecture 5 MSPs





# Architecture 5 – Managed Service Providers (MSPs)

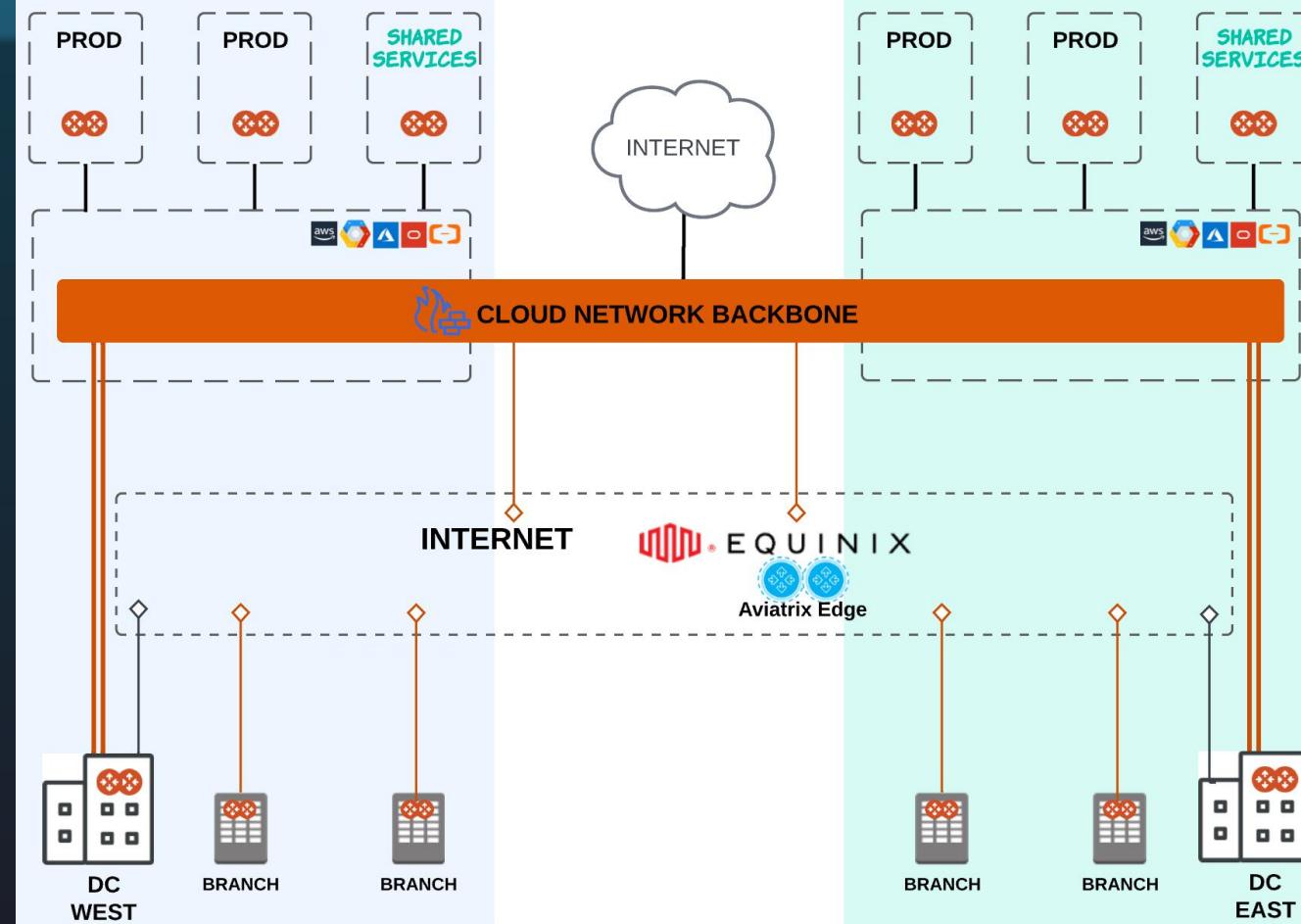
## Challenges:

- Slow Digital Transformation
- Locked-in with hardware vendors
  - Challenges in modernization of the solution
  - Solution lacks advanced cloud networking and security infrastructure
- Skills gap challenges
- Customers pushback not to invest in dying technologies
- Hardware staging and deployment delays
- Difficult to maintain multitenancy and segmentation between end-customers and Lines of Businesses (LOBs)
- Inefficient day2 operations due to many management stations (one per cloud and on-prem)

# Architecture 5 – Managed Service Providers (MSPs)

## Aviatrix Multicloud Network Architecture

- Cutting-edge secure and programmable private cloud network backbone
- Accelerated Digital Transformation
- Multitenancy capable enterprise cloud networking and security solution
- Unified management-plane for multicloud and on-prem



# Enterprise Architecture 6

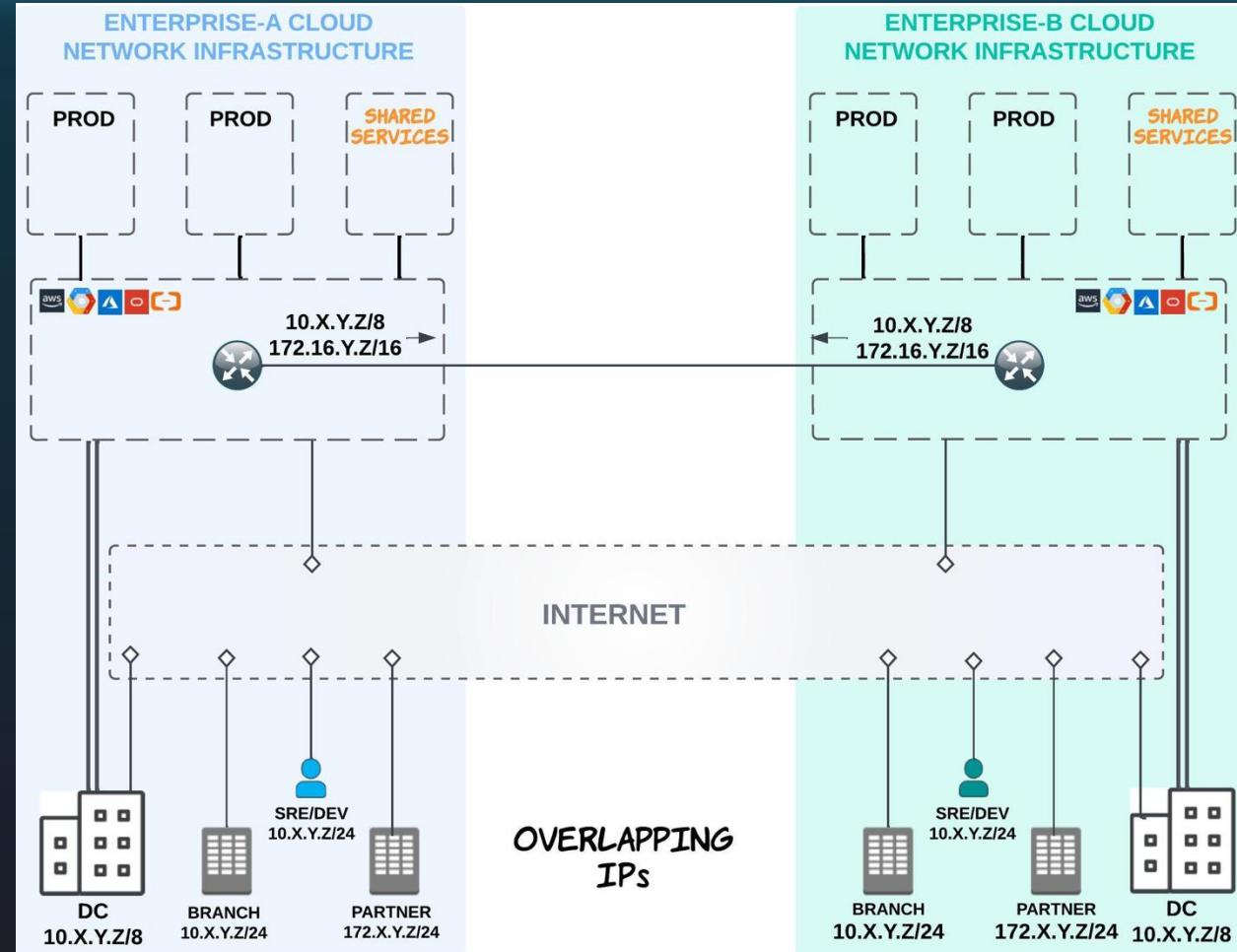
## M&As



# Architecture 6 – Mergers and Acquisitions

## Challenges:

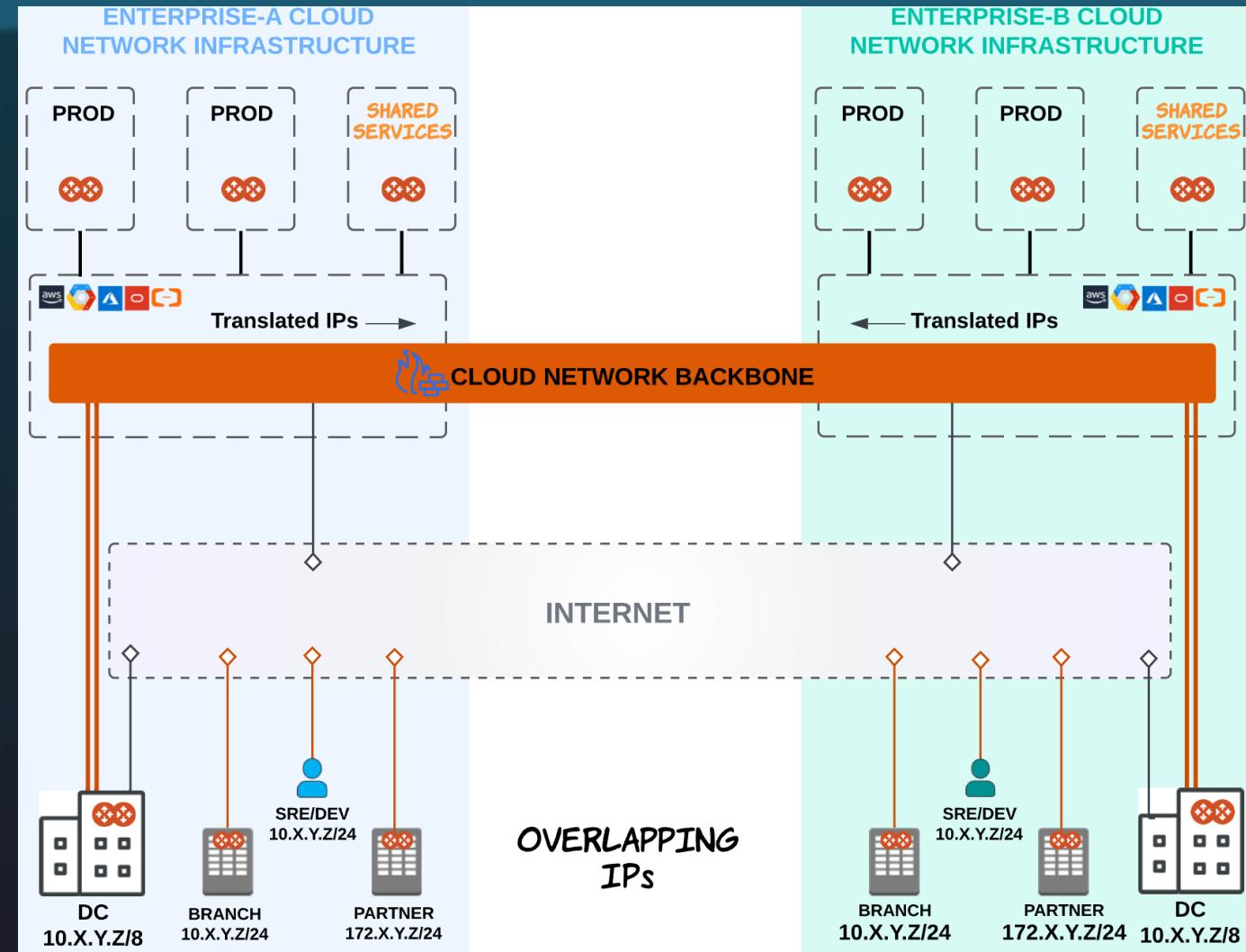
- Difficult to learn a new language and its native constructs (acquired enterprise could be in a different CSP)
- Different Security and Compliance Standards
- Different or no Cloud Network Architecture
- Overlapping IPs with:
  - DCs/Branches/Sites
  - Partners



# Architecture 6 – Mergers and Acquisitions

## Aviatrix Multicloud Network Architecture

- Common Repeatable Multicloud Network Architecture
- Consistent Security and Compliance Standards
- Overlapping IPs Solution at the Edge





Time for lab!



## Welcome to ACE Cloud Backbone #



### Aviatrix Certified Engineer Multicloud Network Backbone Specialty

The Aviatrix Certified Engineer Multicloud Network Backbone Specialty training is designed to help network administrators, engineers, architects and technology leaders adopt a clear approach to improve legacy designs and use the cloud service provider (CSP) underlay network to build a cloud network backbone.

This Lab Guide will guide you through the different scenarios of how to build and manage multicloud backbone and hybrid connectivity.

During this hands-on lab, you will experience the following:

- Understanding of enterprise's existing brownfield architecture
- Walkthrough enterprise's multicloud architecture with Aviatrix Cloud Backbone and ensure connectivity between the applications
- Verification of Aviatrix Edge deployment
- Verification of secure backbone deployment and operation
- Troubleshooting and Visibility

<https://docs.aviatrixlab.com/ace-backbone/docs/home.html>