The bridge to possible

Interconnecting Cisco Catalyst SD-WAN and Cisco Meraki SD-WAN Fabrics

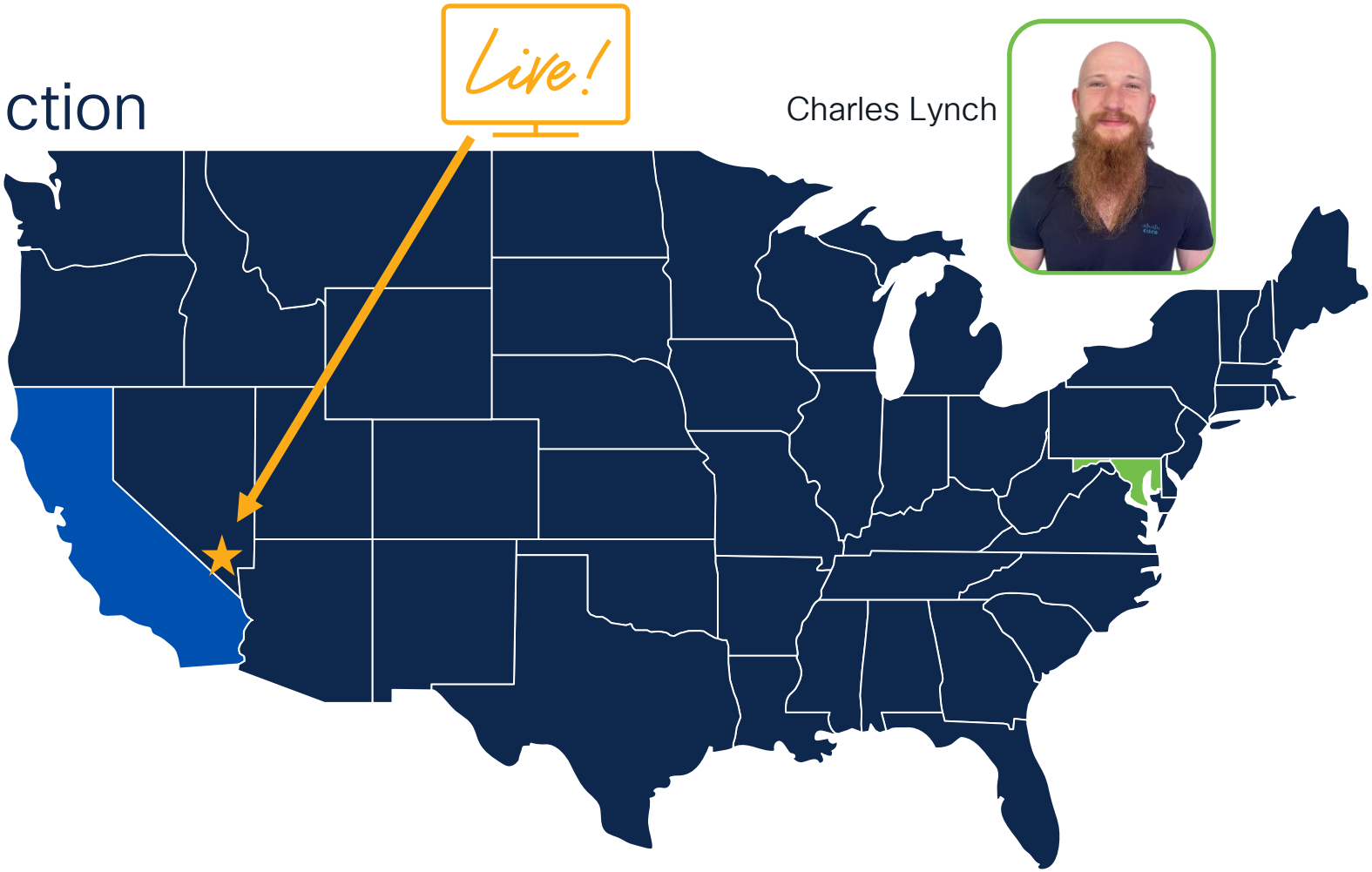
Charles Lynch, Technical Marketing Engineer, Meraki
Ashton Williams, Technical Marketing Engineer, Catalyst

BRKENT-2056

Agenda

- Introduction & Housekeeping
- Current Challenges
- The Solution
- A Future of Possibility
- Conclusion

Introduction



Ashton Williams

Charles Lynch

Cisco Webex App

https://ciscolive.ciscoevents.com/ciscolivebot/#BRKENT-2056

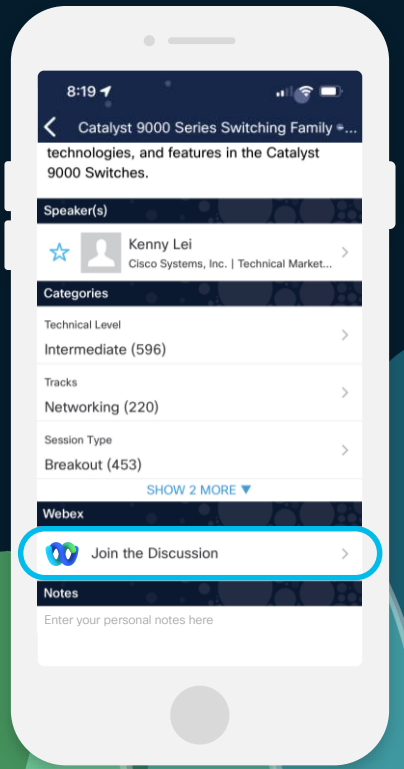
Questions?

Use Cisco Webex App to chat with the speaker after the session

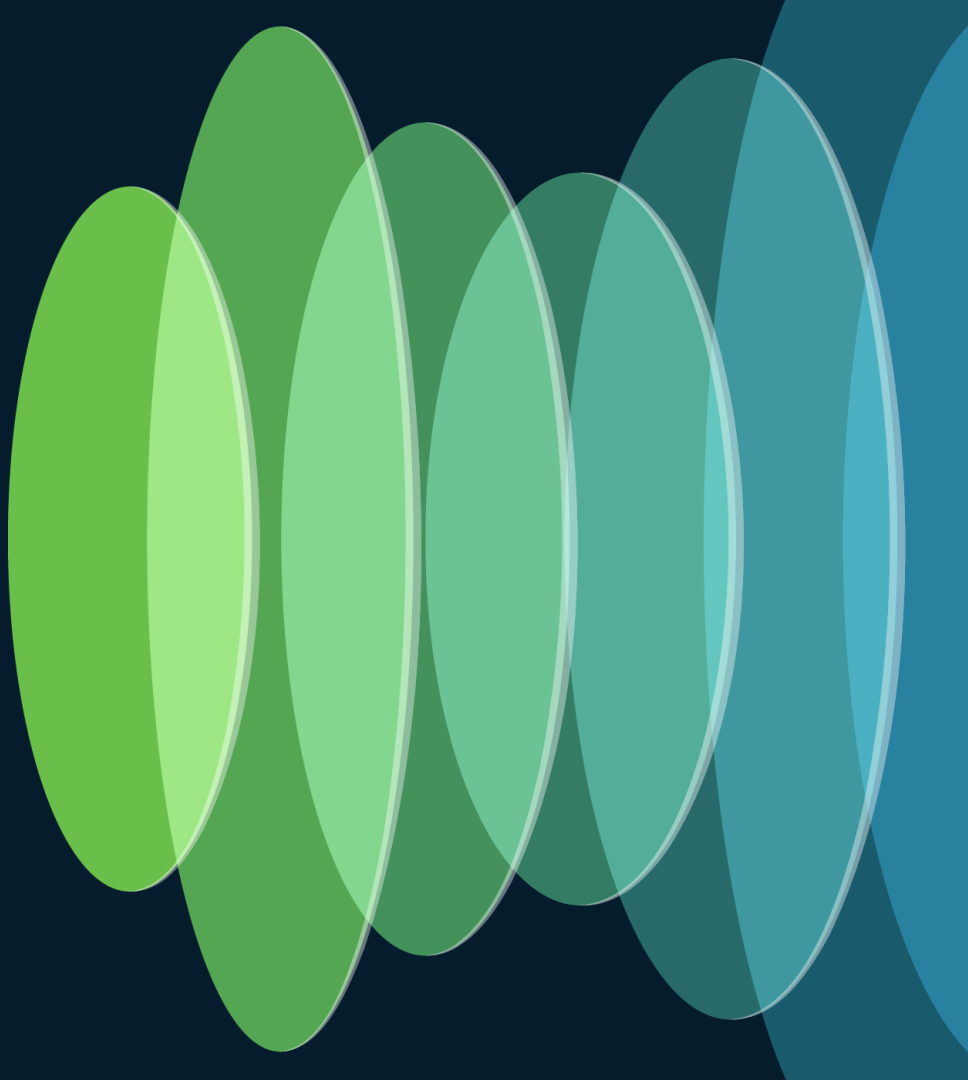
How

1. Find this session in the Cisco Live Mobile App
2. Click “Join the Discussion”
3. Install the Webex App or go directly to the Webex space
4. Enter messages/questions in the Webex space

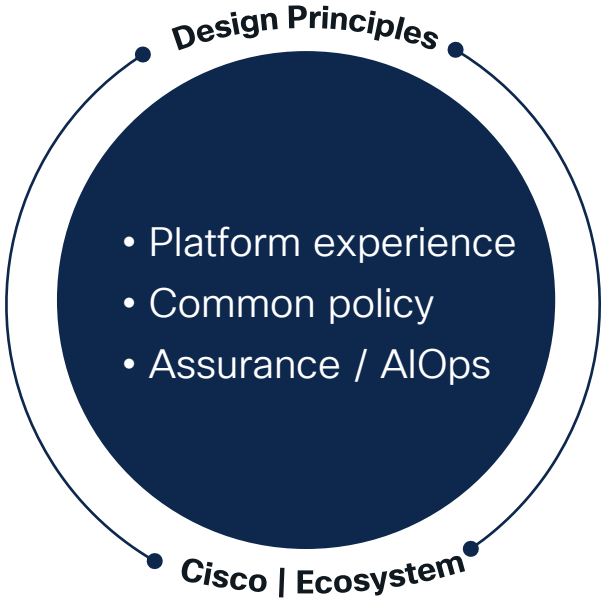
Webex spaces will be moderated by the speaker until June 7, 2024.



Current Challenges



Key design principles for **Campus and Branch**



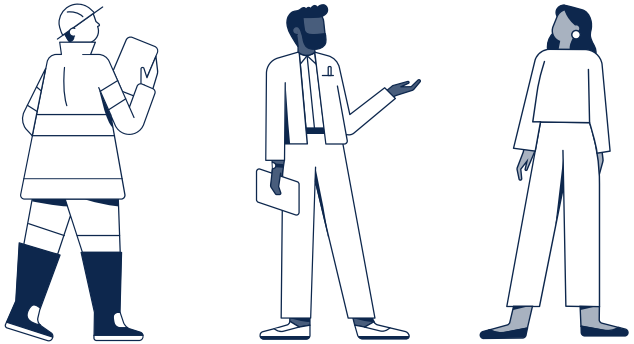
Digital Experience Assurance

Simplified, AI-Native Operations

End-to-End Secure Networking

A customer

grounded by a set of complex needs and business demands



Critical Infra

Heavy Regulation

Remote Workers

Multiple teams

PCI Compliant

100s of sites

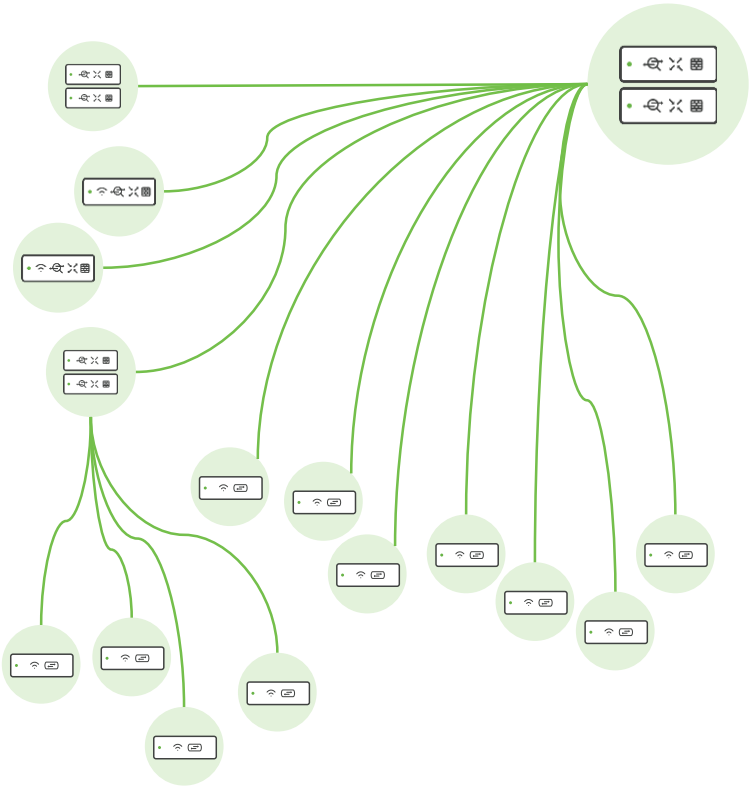
L2 / L3 Segment.

Partner Orgs

Rented Spaces

Cisco SD-WAN

A Meraki Fabric satisfies needs for:

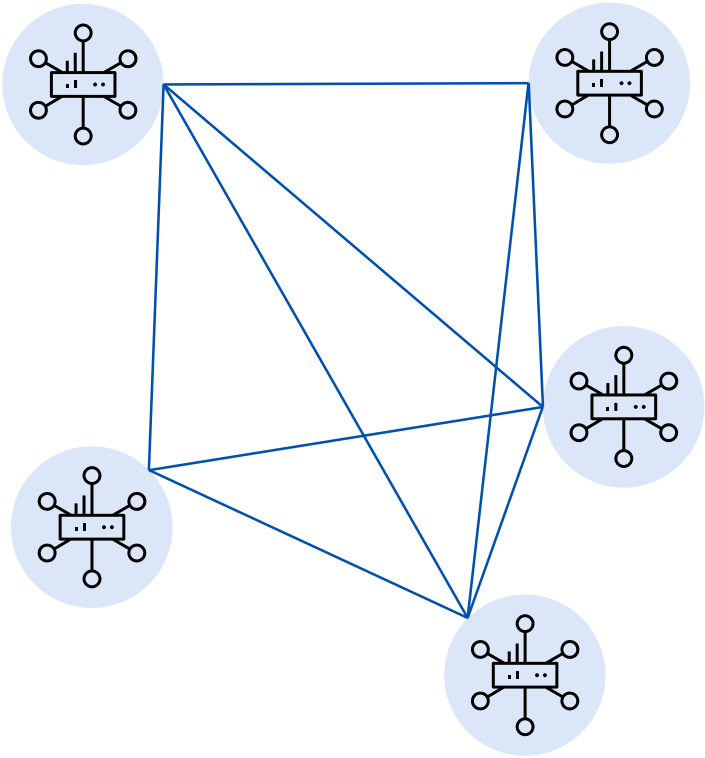


- Rapid Deployment
- Full Stack
- Remote Workforce
- Versatile SD-WAN
- Smaller Sites

Cisco SD-WAN

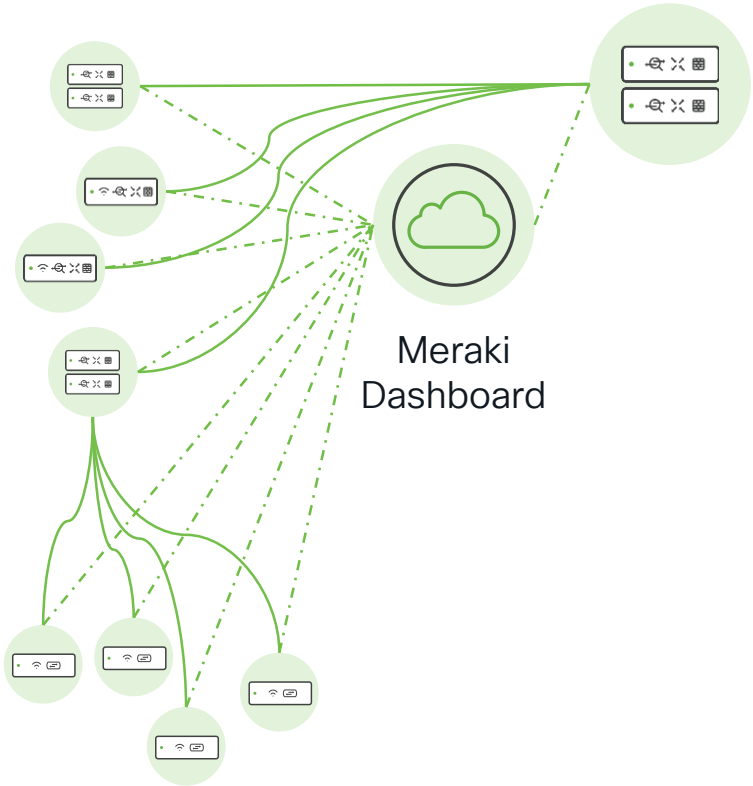
A Catalyst Fabric satisfies needs for:

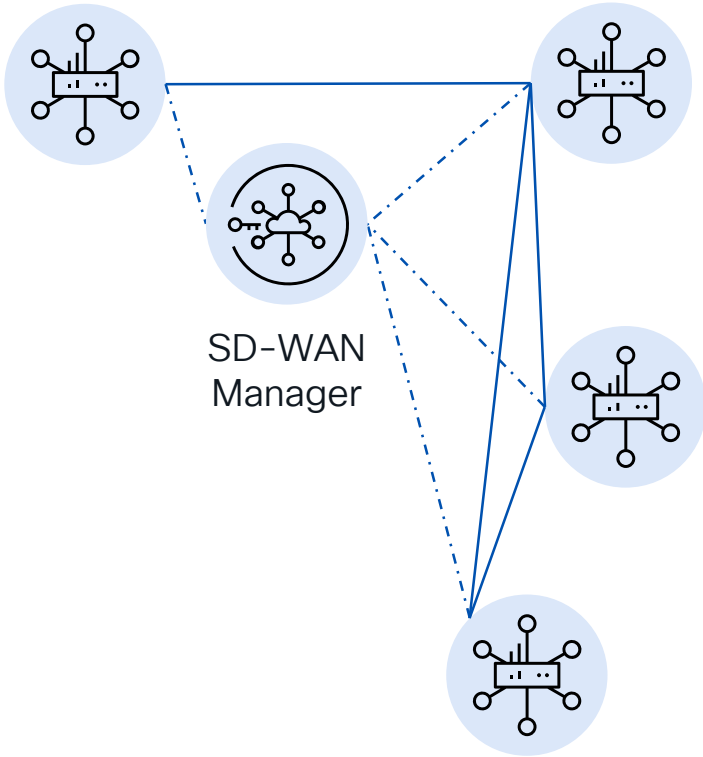
- Greater Scale
- Segmentation
- Increased Customization
- Granular Control
- Bandwidth Capabilities



Cisco SD-WAN

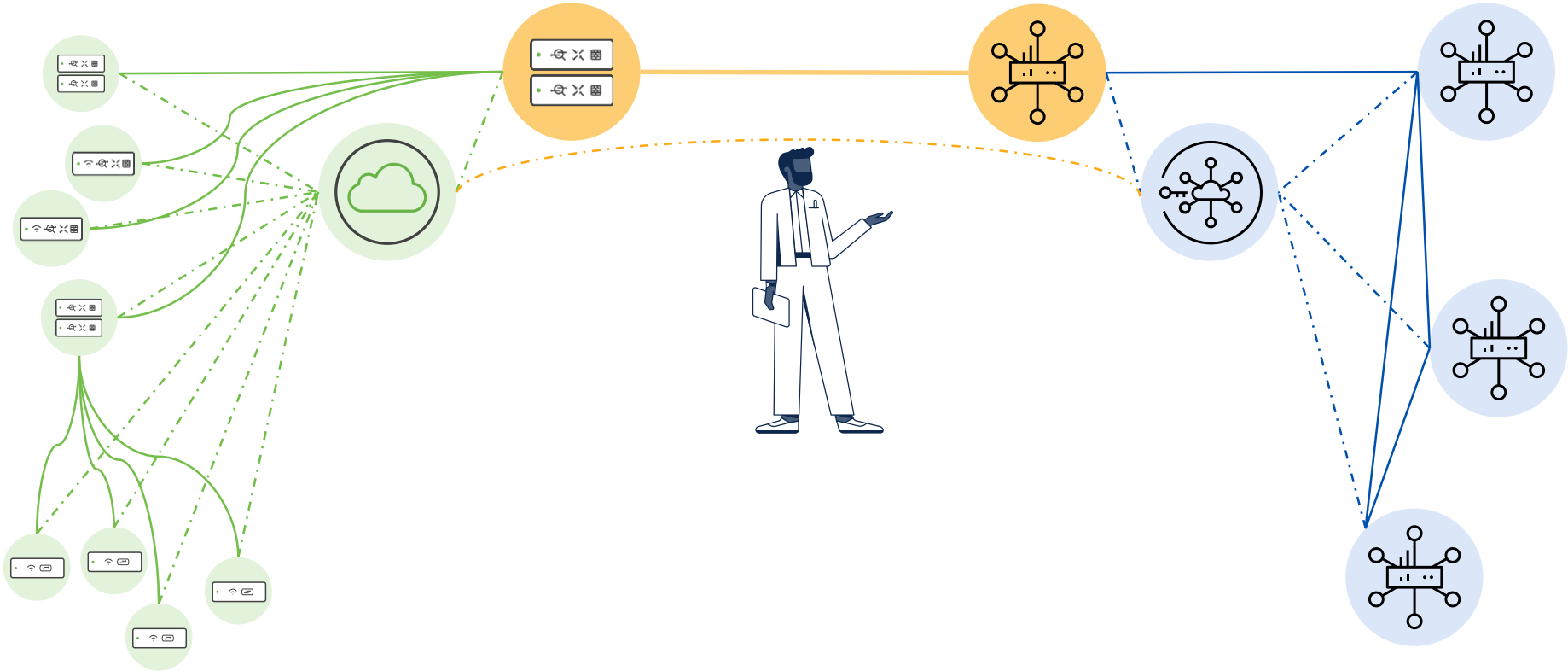
One operation driven by two solutions lacks efficiency and scale





Cisco SD-WAN

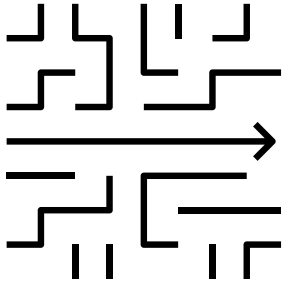
Joining fabrics is now a simplified experience



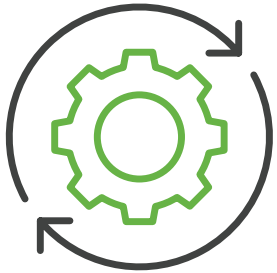
Current Challenges

Cisco SD-WAN meets the needs of a growing and demanding enterprise.

Simplicity



through



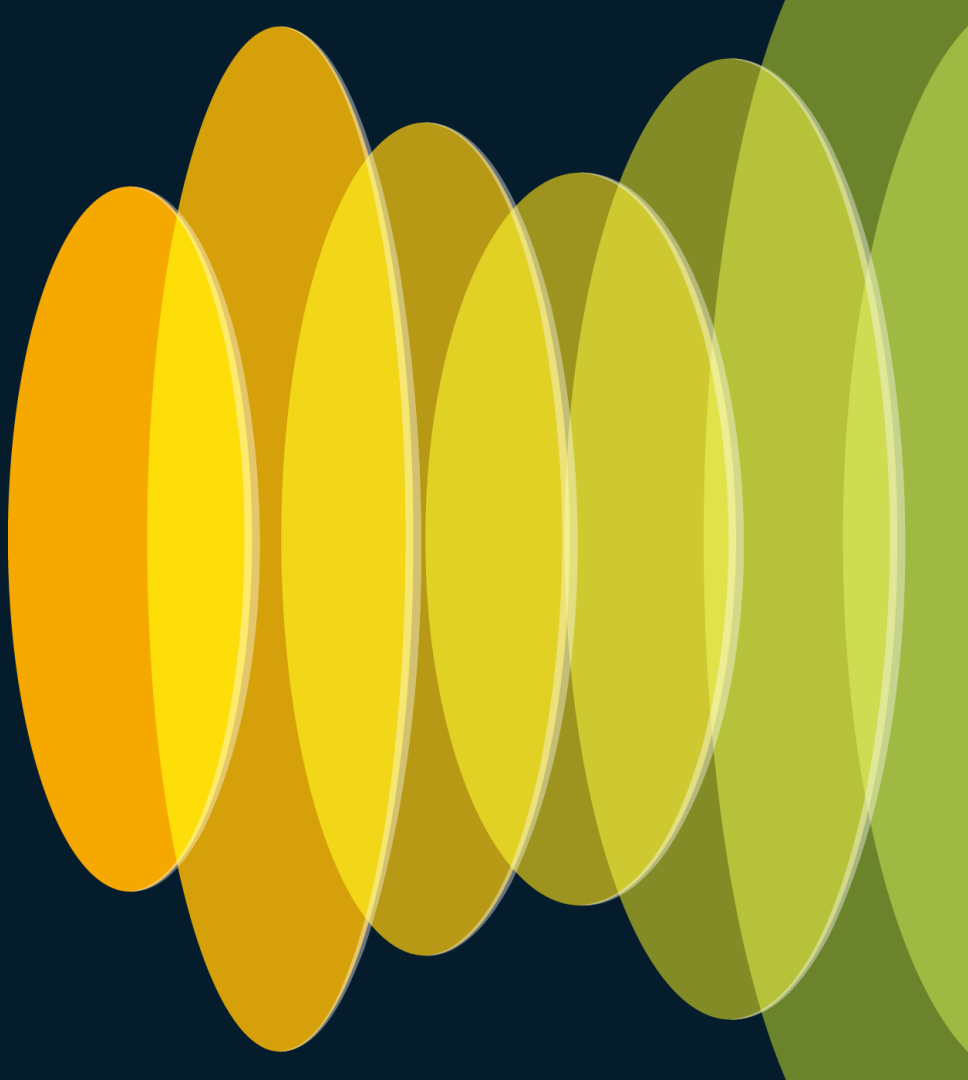
Automation

slido

What and how would you interconnect in your SD-WAN fabrics?

ⓘ Start presenting to display the poll results on this slide.

The Solution



The Solution

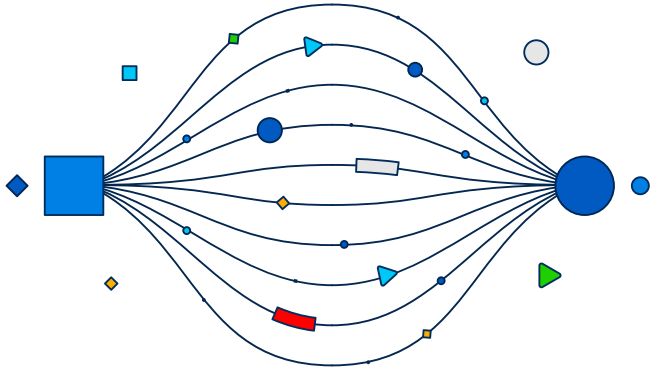
Cisco SD-WAN Interconnects

- A network-to-network interconnect (NNI)
- Leverages eBGP over IPsec for route propagation and data transmissions
- Highly available with redundancy at device and protocol levels
  - Redundant IPsec Tunnels
  - Redundant eBGP sessions
- Deployed by a seamless automated workflow from the Meraki dashboard

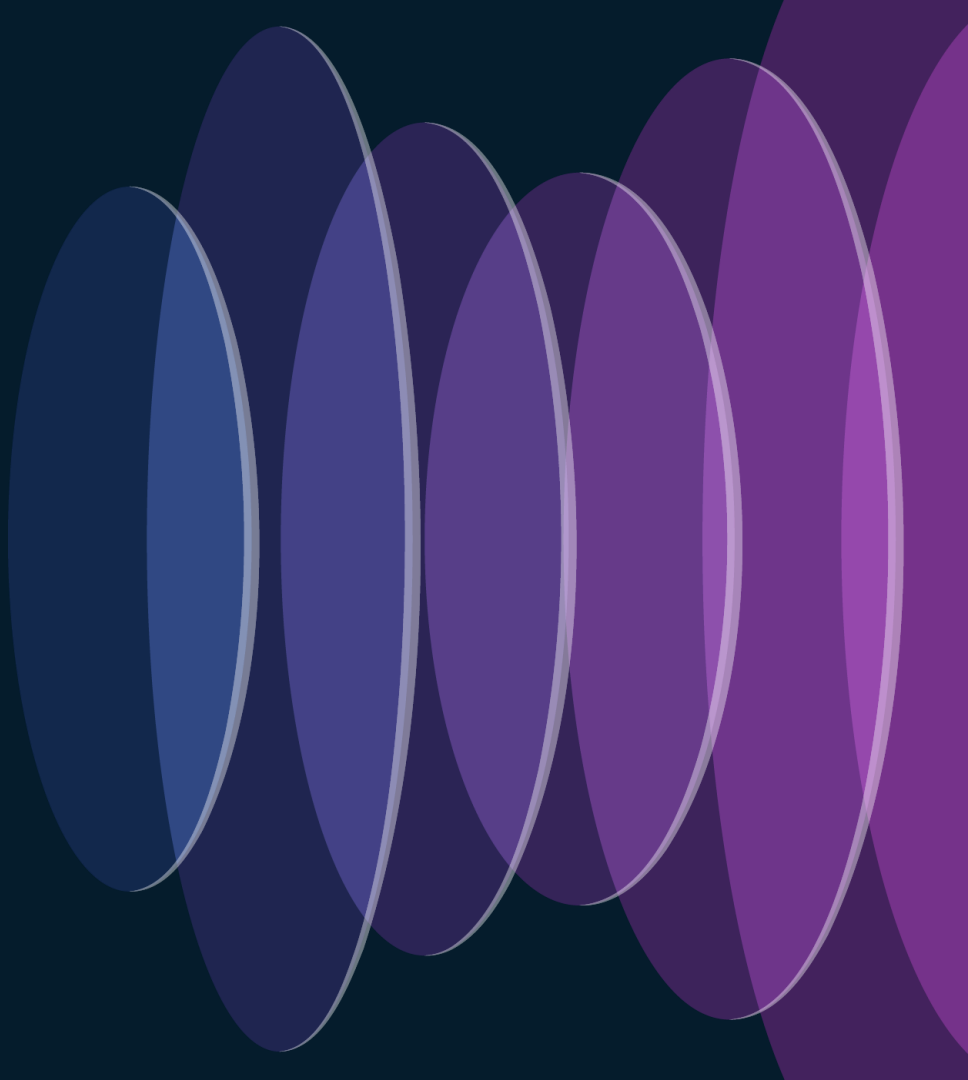
The Solution

An interconnect built with redundancy and configured through the power of automation.

- Meraki AutoVPN network interconnect with Cloud-delivered Catalyst SD-WAN (CDCS) Service VPN
- Dual-Collocated Devices
- eBGP over IPsec

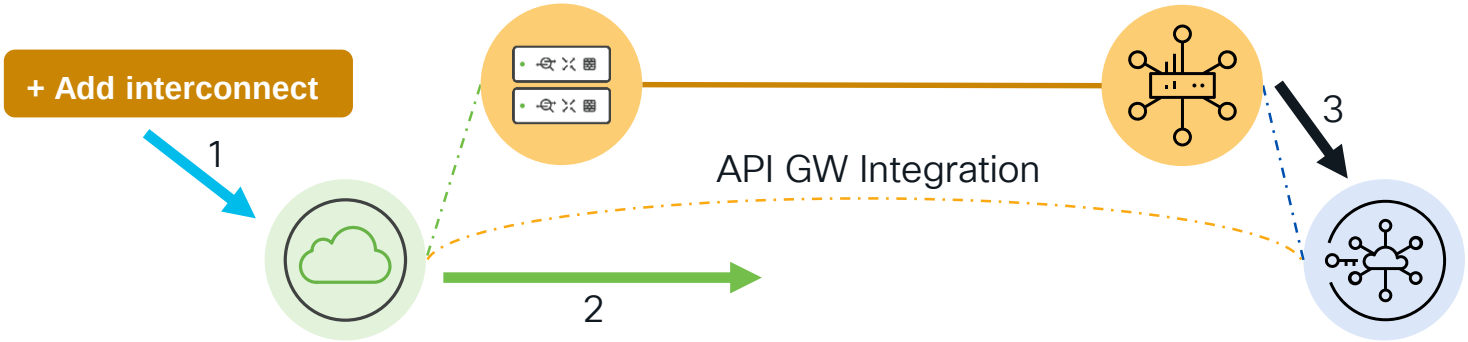


Automated Deployment Mechanisms



Automated Deployment Mechanism

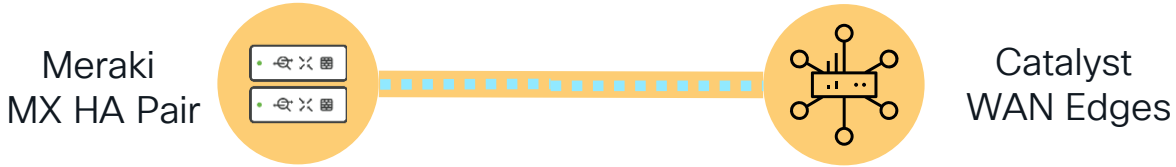
OAuth & Interconnect Configuration



1. User Input for Interconnect (Blue)
2. API Requests for Realtime Configuration & Monitoring (Green)
3. Passive Information Updates (Black)

Automated Deployment Mechanism

Configuration parcel management



IPsec: Create Tunnels
Primary Tunnel - 169.254.250.1/30
Secondary Tunnel - 169.254.250.5/30

BGP: Add Neighbors
Primary Neighbor - 169.254.250.2
Secondary Neighbor - 169.254.250.6

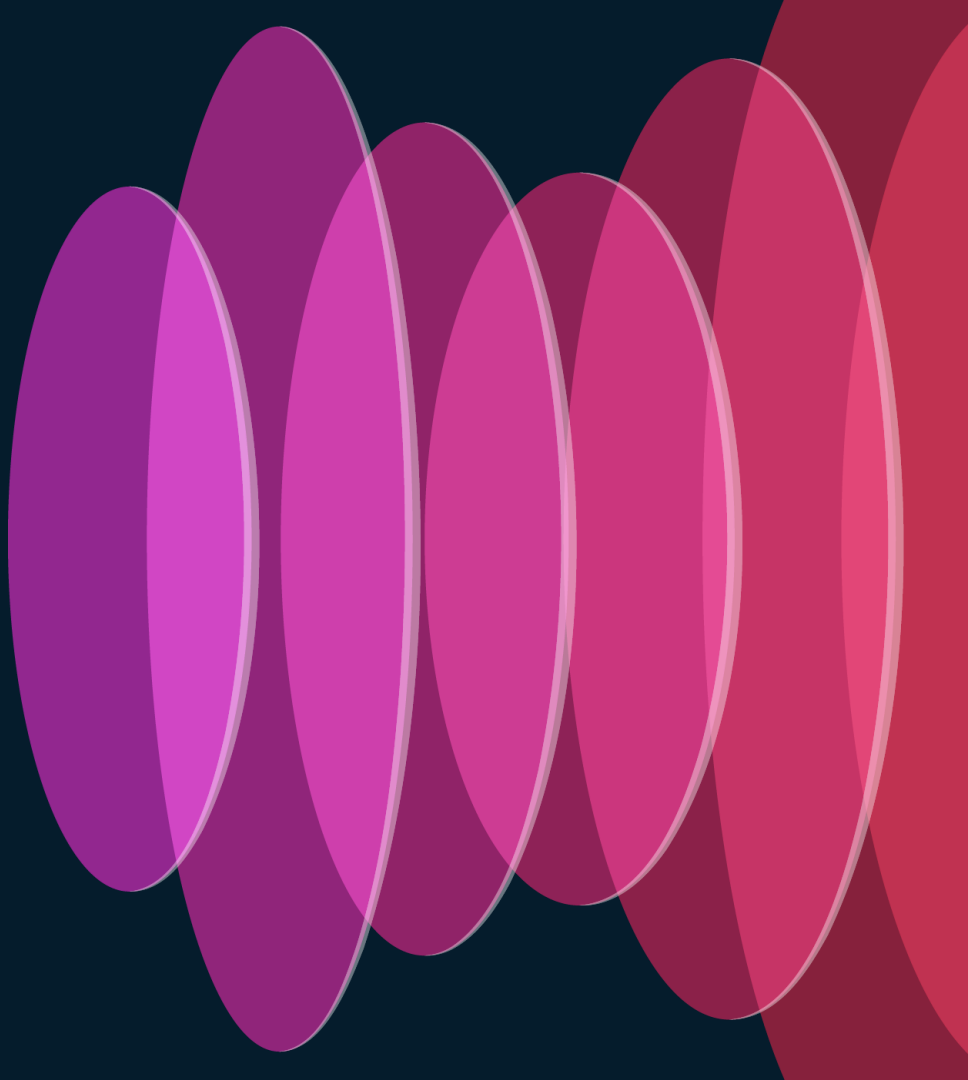
→ Primary Routes:
AS_PATH=61000 ; WEIGHT=20
→ Secondary Routes:
AS_PATH=61000 61000; WEIGHT=10

IPsec: Create Service VPN Tunnels
Primary Edge - 169.254.250.2/30
Secondary Edge - 169.254.250.6/30

BGP: Add Neighbors & Redistribute
Primary Neighbor - 169.254.250.1
Secondary Neighbor - 169.254.250.5
redistribute omp, connected
propagate-aspath

OMP: Auto-Translate BGP→OMP
AS_PATH → OMP Preference:
Enabled

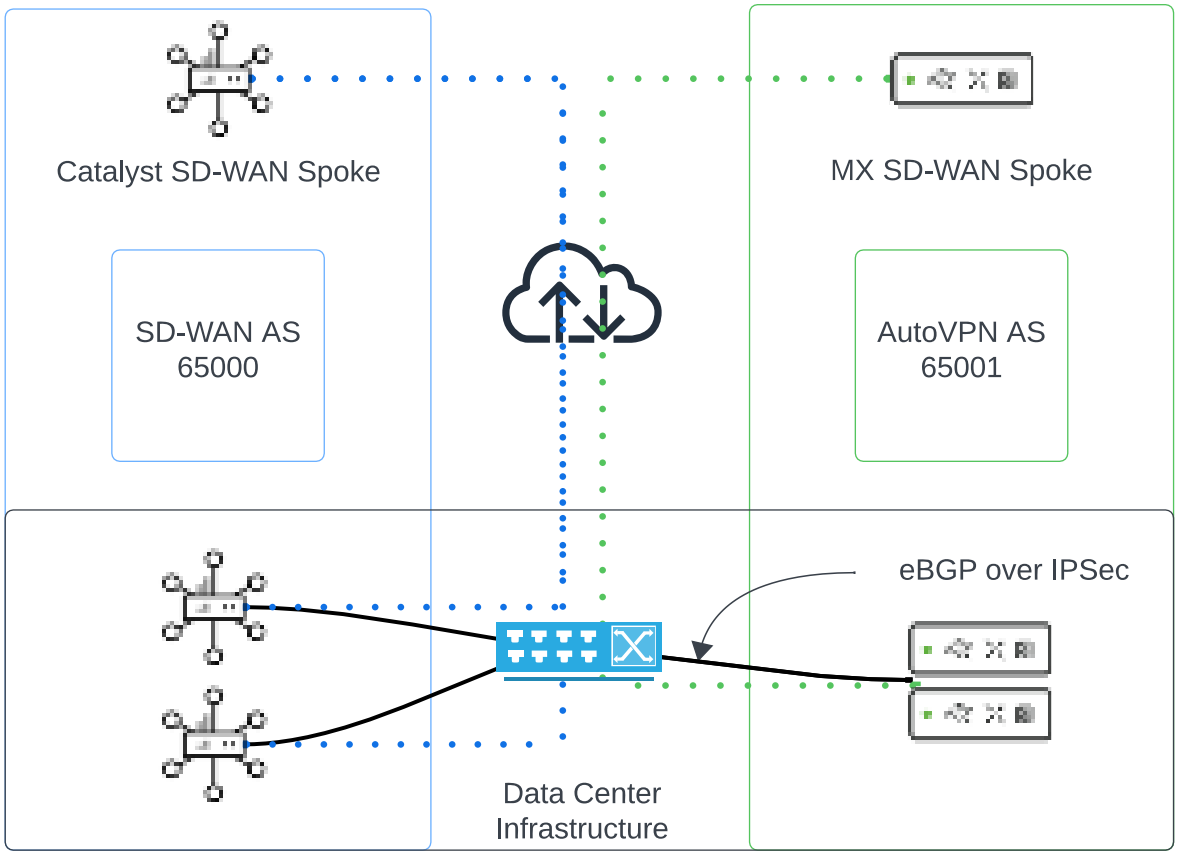
Network Architecture



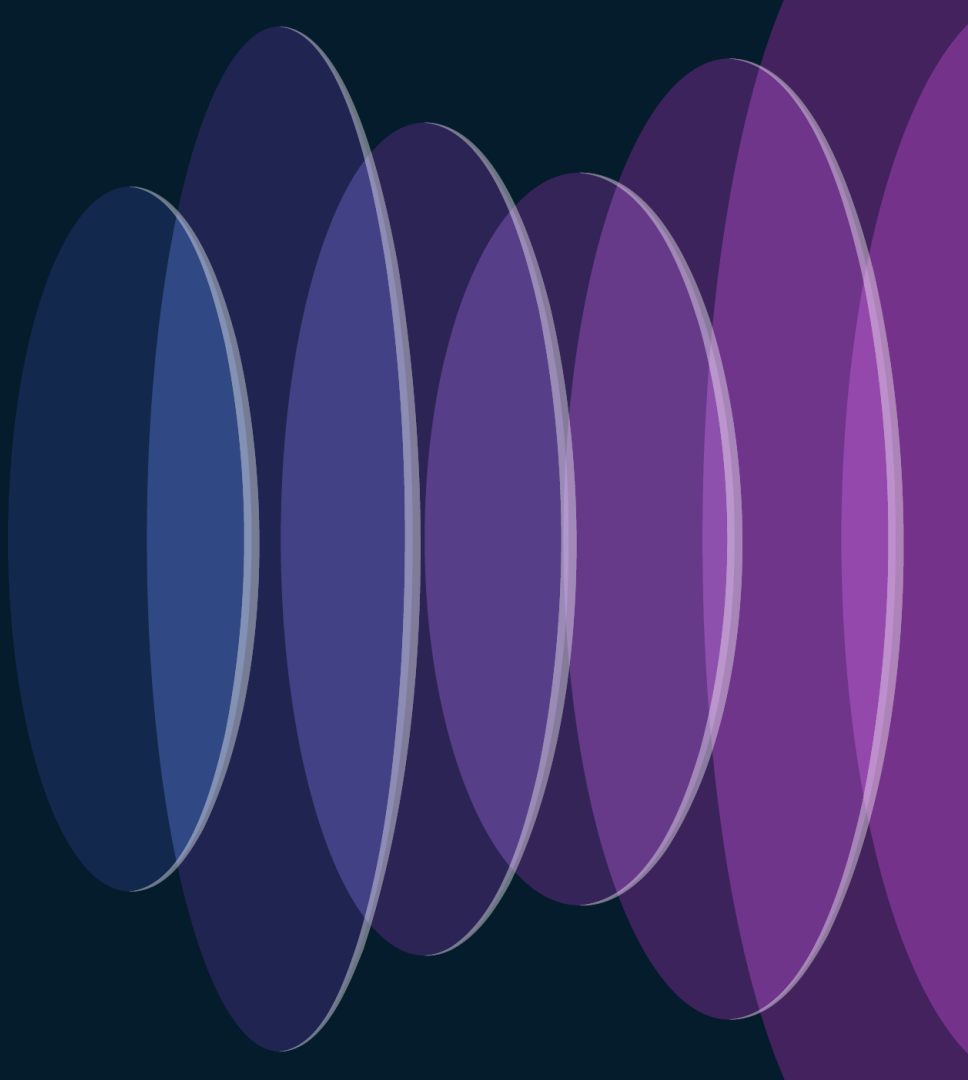
Network Architecture

Overview

- Joining Cisco Catalyst SD-WAN and Cisco Meraki SD-WAN
- eBGP over IPsec
- Hub to Hub Routing
- Collocated

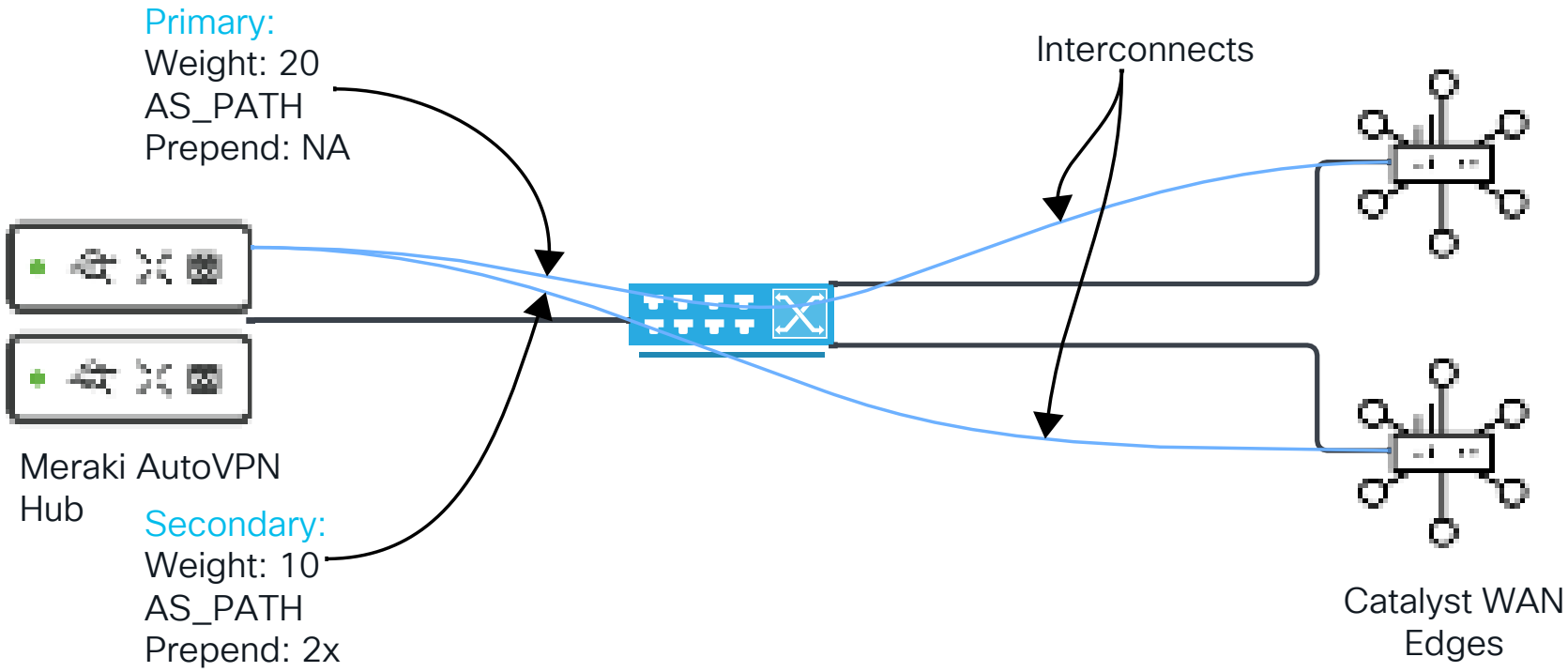


Dynamic Routing Behaviors



Routing Behaviors

Interconnect Default Routing Behavior



Routing Behaviors

Catalyst WAN Edge Routing Tables

- Primary and Secondary interconnects
- Deterministic routing with AS_PATH Attribute

AS_PATH

Primary Catalyst Edge

OUTPUT: show ip bgp vpnv4 vrf 1

```
 *>   10.106.106.0/24  10.0.0.1                  0 61000 i
 *>   10.249.1.0/24    10.0.0.1                  0 61000 i
 *>   192.168.121.0    10.0.0.1                  0 61000 i
```

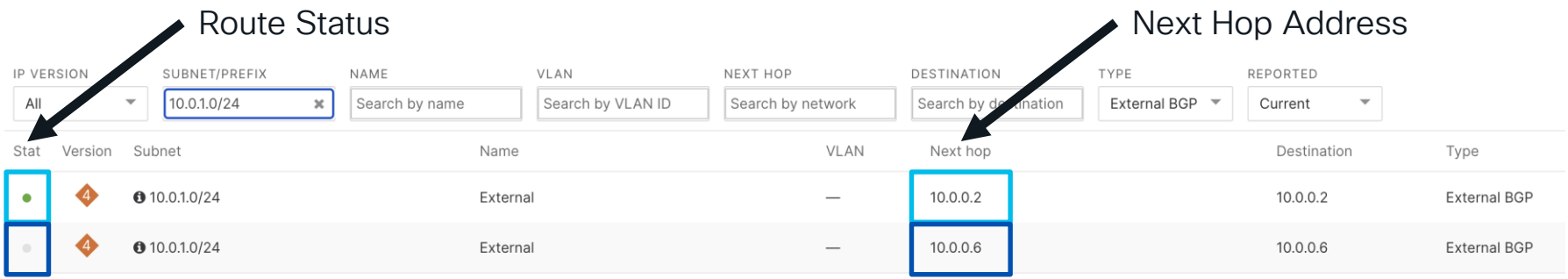
Secondary Catalyst Edge

OUTPUT: show ip bgp vpnv4 vrf 1

```
 *>   10.106.106.0/24  10.0.0.5                  0 61000 61000 i
 *>   10.249.1.0/24    10.0.0.5                  0 61000 61000 i
 *>   192.168.121.0    10.0.0.5                  0 61000 61000 i
```

Routing Behaviors

Meraki MX Route Table



Catalyst Edge 1

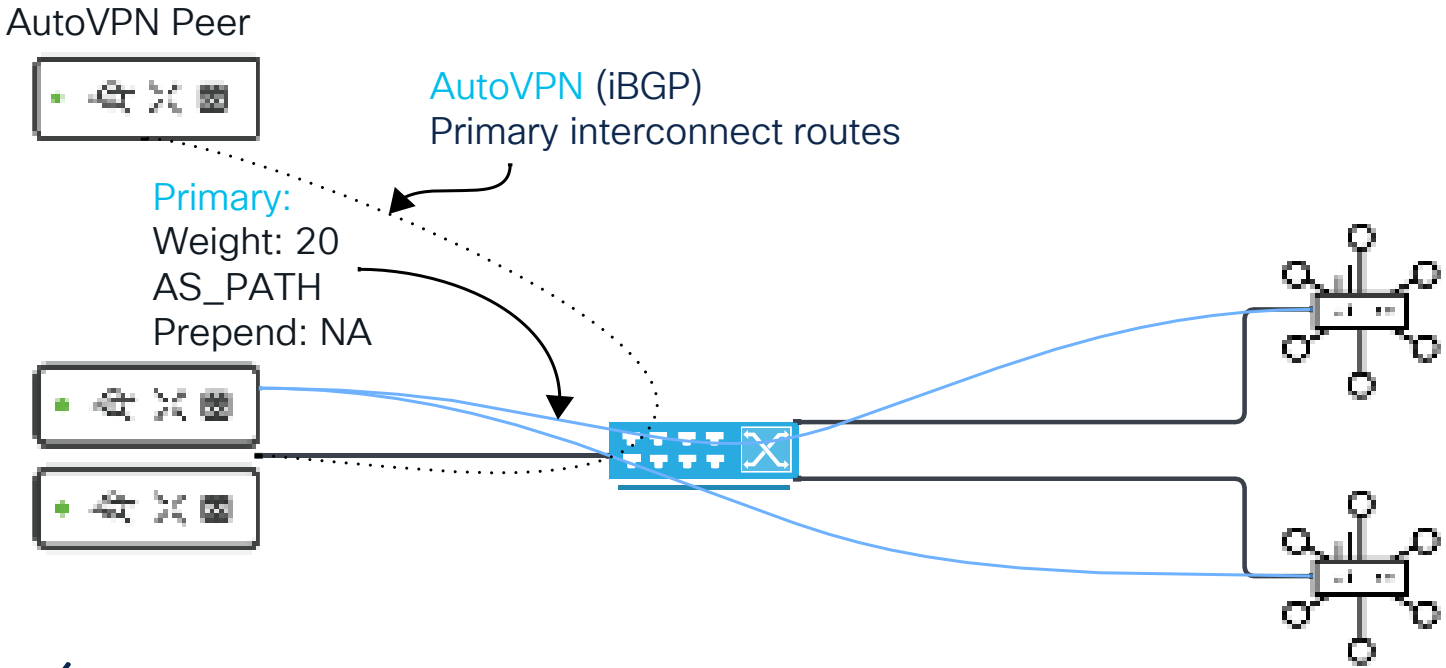
Status: ●
Next hop: 169.254.250.0/32
Weight: 20
Router ID: 169.254.250.2

Catalyst Edge 2

Status: ●
Next hop: 169.254.250.4/32
Weight: 10
Router ID: 169.254.250.6

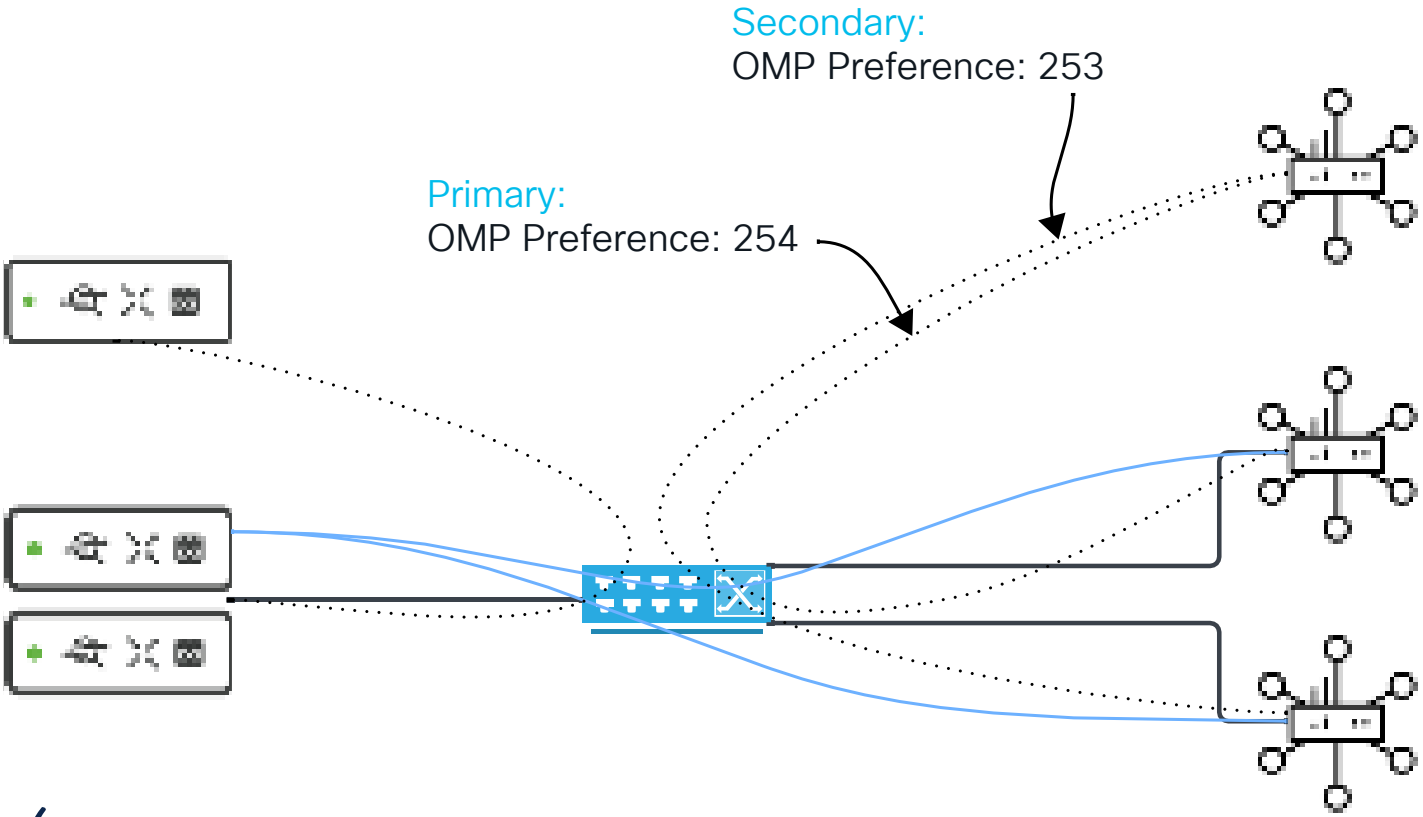
Routing Behaviors

MX SD-WAN Route Propagation



Routing Behaviors

Catalyst SD-WAN Route Propagation



Routing Behaviors

Catalyst SD-WAN Route Propagation

Auto-Translation BGP → OMP Logic

`Max OMP Route Preference [255] – BGP AS_PATH Length = Translated OMP Preference`

Interconnect Received AS-PATH Lengths

`Primary AS_PATH Length → "61000" = 1`
`Secondary AS_PATH Length → "61000 61000" = 2`

Interconnect Translated OMP Preferences

`Primary OMP Route Preference → 255 – 1 = 254`
`Secondary OMP Route Preference → 255 – 2 = 253`

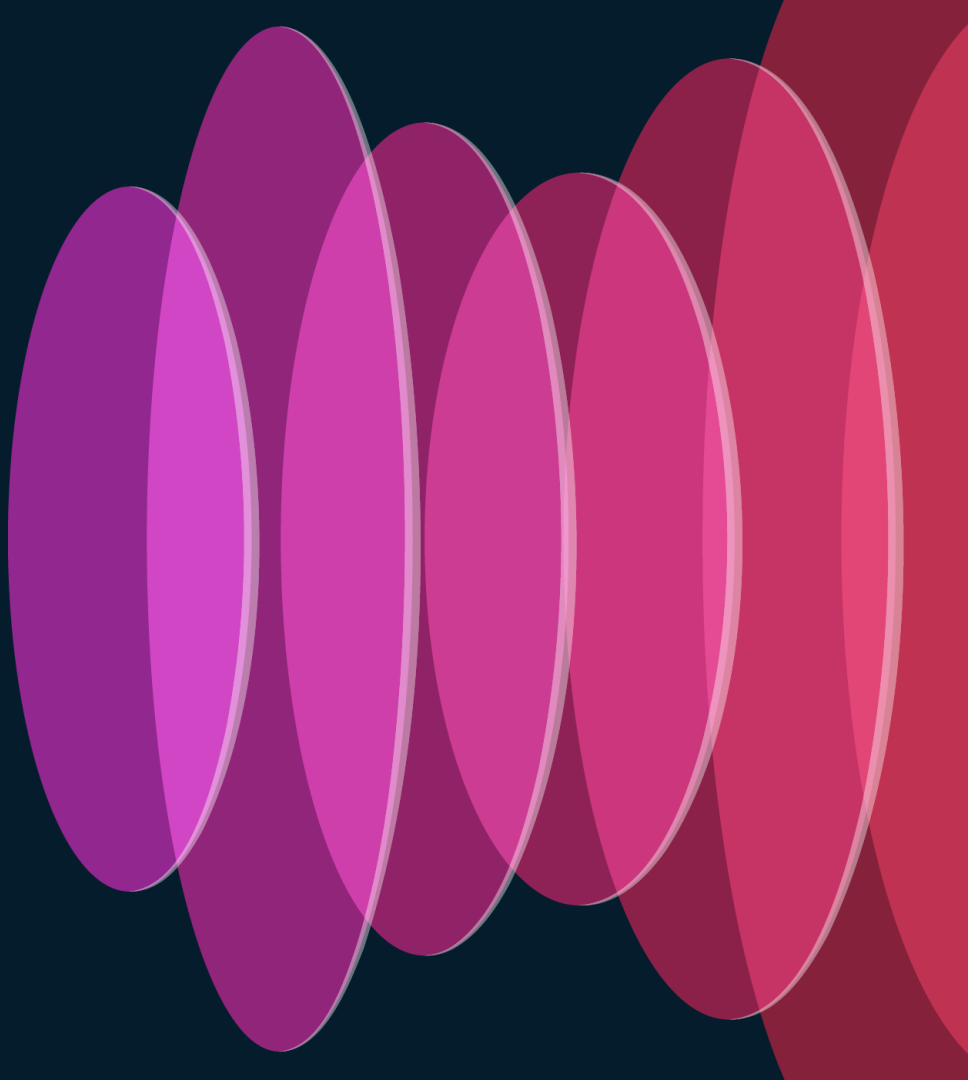
`OUTPUT: show sdwan omp routes` `[R = Resolved, I = Installed]`

Route Status

OMP Pref.

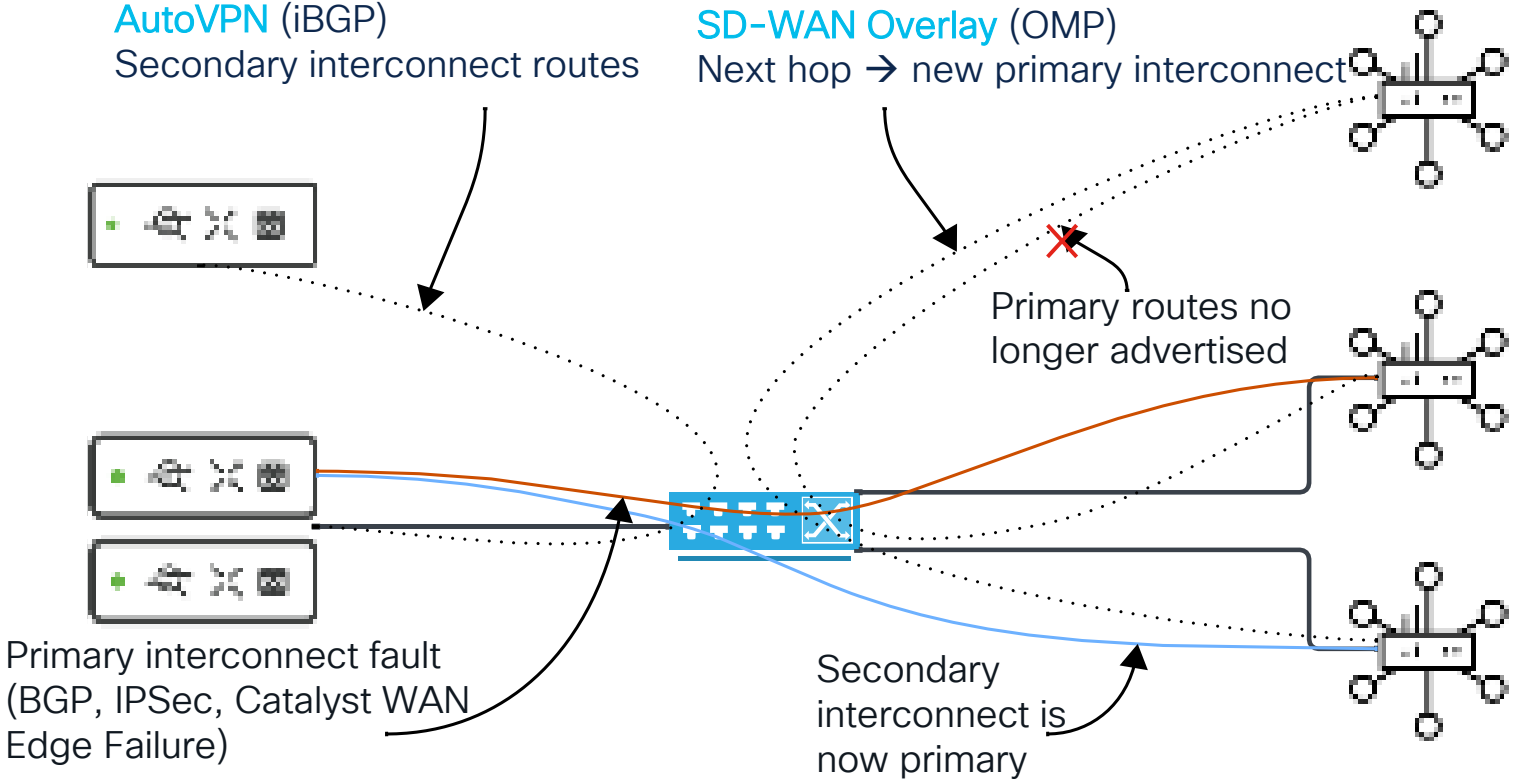
10.106.106.0/24	1.1.1.54	1	1009	R	installed	99.2.1.211	biz-internet	ipsec	253
	1.1.1.54	2	1008	C,I,R	installed	99.2.1.210	public-internet	ipsec	254
	1.1.1.150	1	1009	R	installed	99.2.1.211	biz-internet	ipsec	253
	1.1.1.150	2	1008	C,R	installed	99.2.1.210	public-internet	ipsec	254
10.249.1.0/24	1.1.1.54	1	1009	R	installed	99.2.1.211	biz-internet	ipsec	253
	1.1.1.54	2	1008	C,I,R	installed	99.2.1.210	public-internet	ipsec	254
	1.1.1.150	1	1009	R	installed	99.2.1.211	biz-internet	ipsec	253
	1.1.1.150	2	1008	C,R	installed	99.2.1.210	public-internet	ipsec	254
192.168.121.0/24	1.1.1.54	1	1009	R	installed	99.2.1.211	biz-internet	ipsec	253
	1.1.1.54	2	1008	C,I,R	installed	99.2.1.210	public-internet	ipsec	254
	1.1.1.150	1	1009	R	installed	99.2.1.211	biz-internet	ipsec	253
	1.1.1.150	2	1008	C,R	installed	99.2.1.210	public-internet	ipsec	254

Dynamic Recovery Behaviors



Recovery Behaviors

Primary Interconnect Failover Behavior

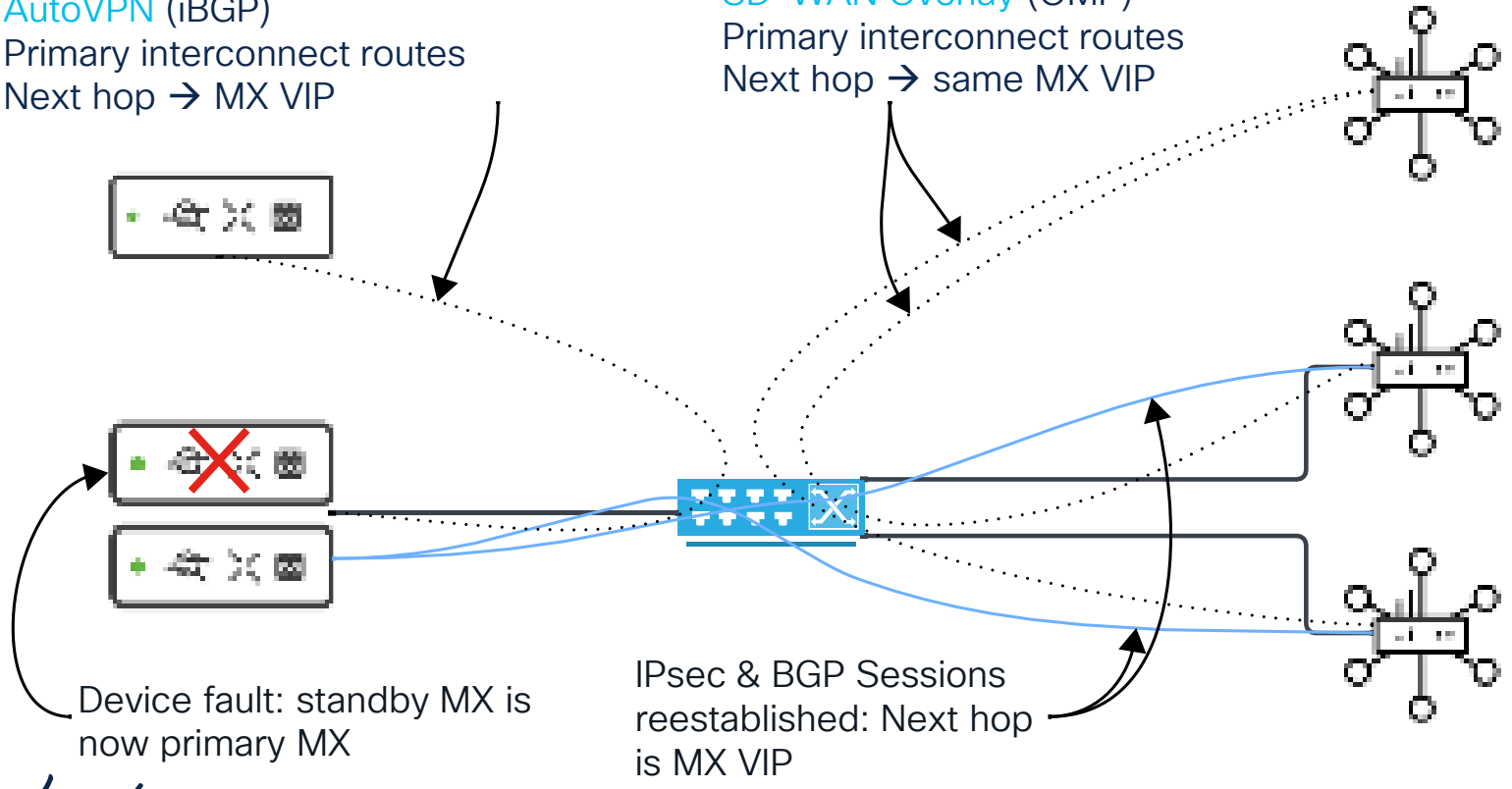


Recovery Behaviors

Primary Device Failover Behavior

AutoVPN (iBGP)
Primary interconnect routes
Next hop → MX VIP

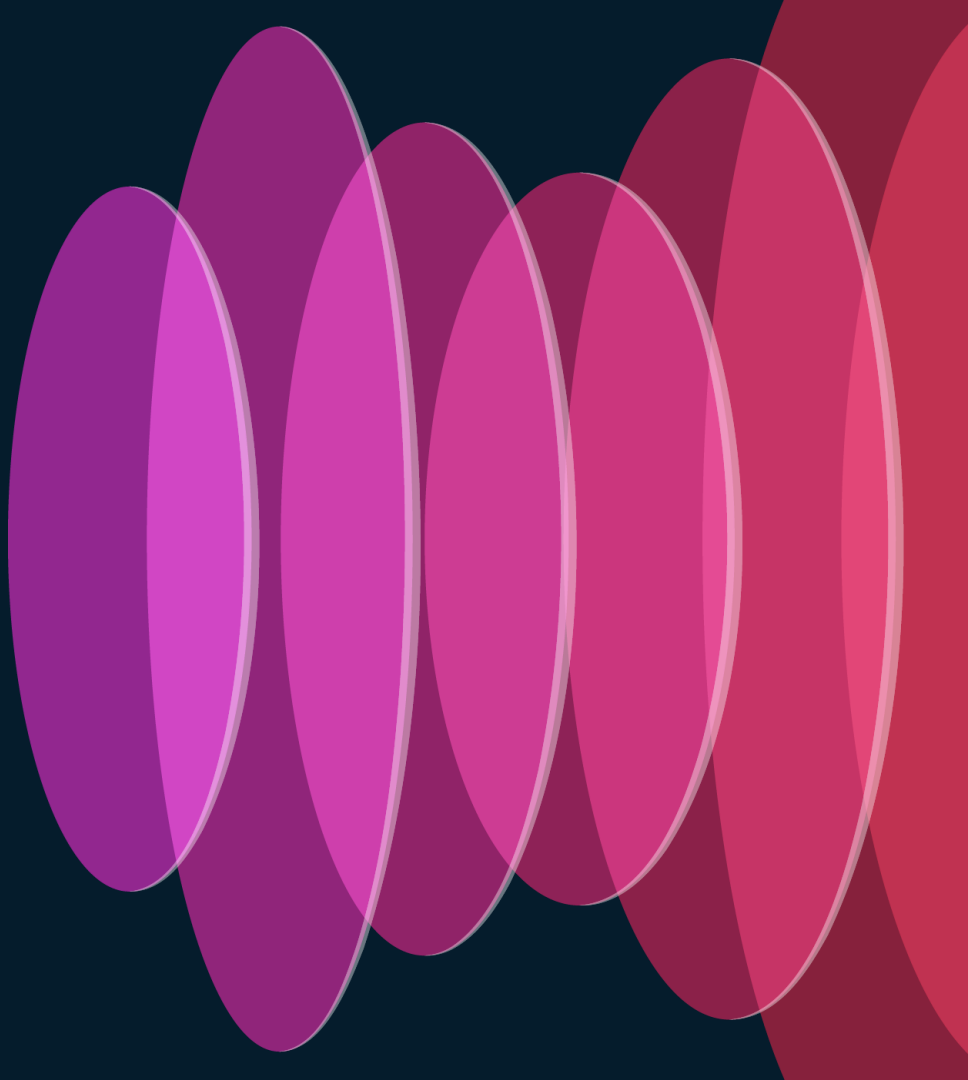
SD-WAN Overlay (OMP)
Primary interconnect routes
Next hop → same MX VIP



Device fault: standby MX is now primary MX

IPsec & BGP Sessions reestablished: Next hop is MX VIP

Interconnects at Scale



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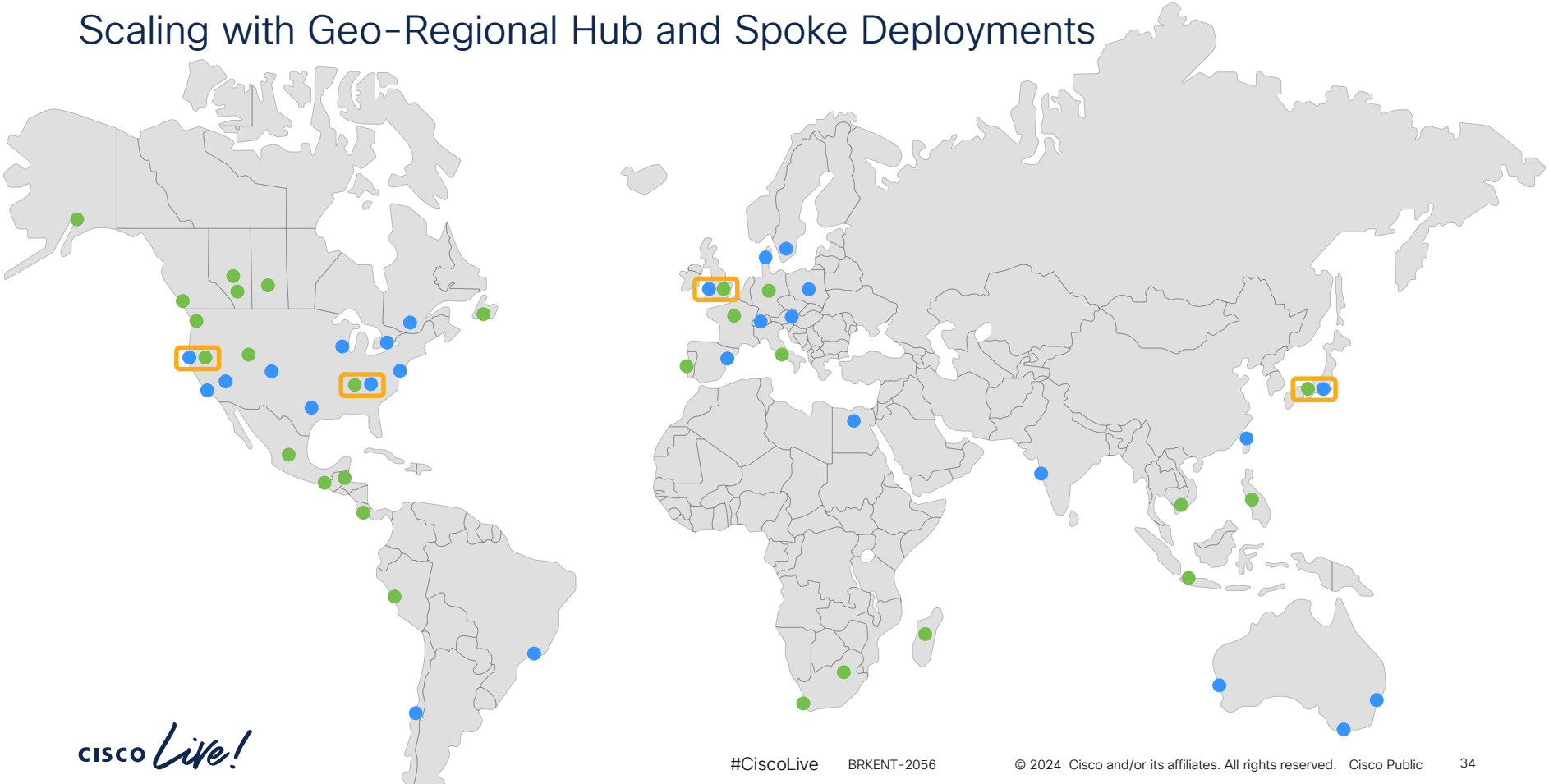
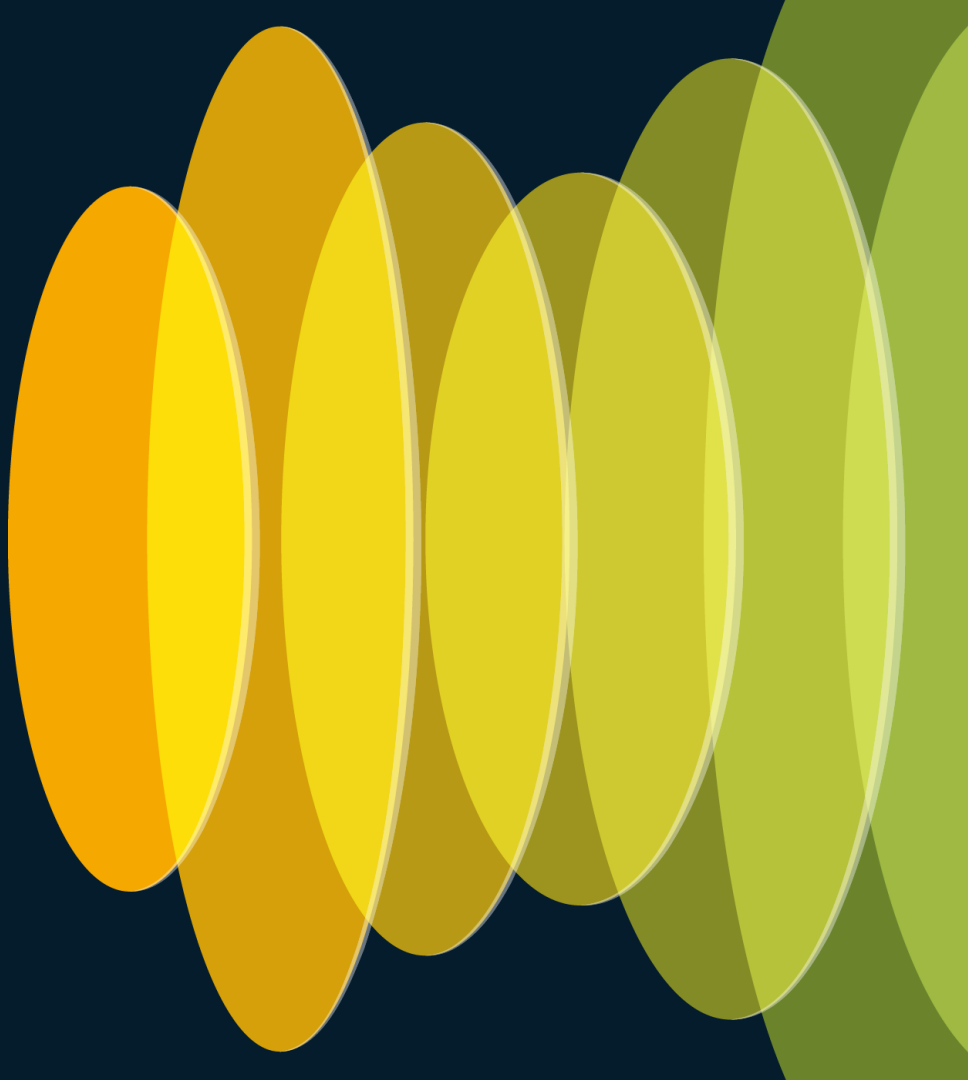
Interconnects at Scale

Scaling with Geo-Regional Hub and Spoke Deployments



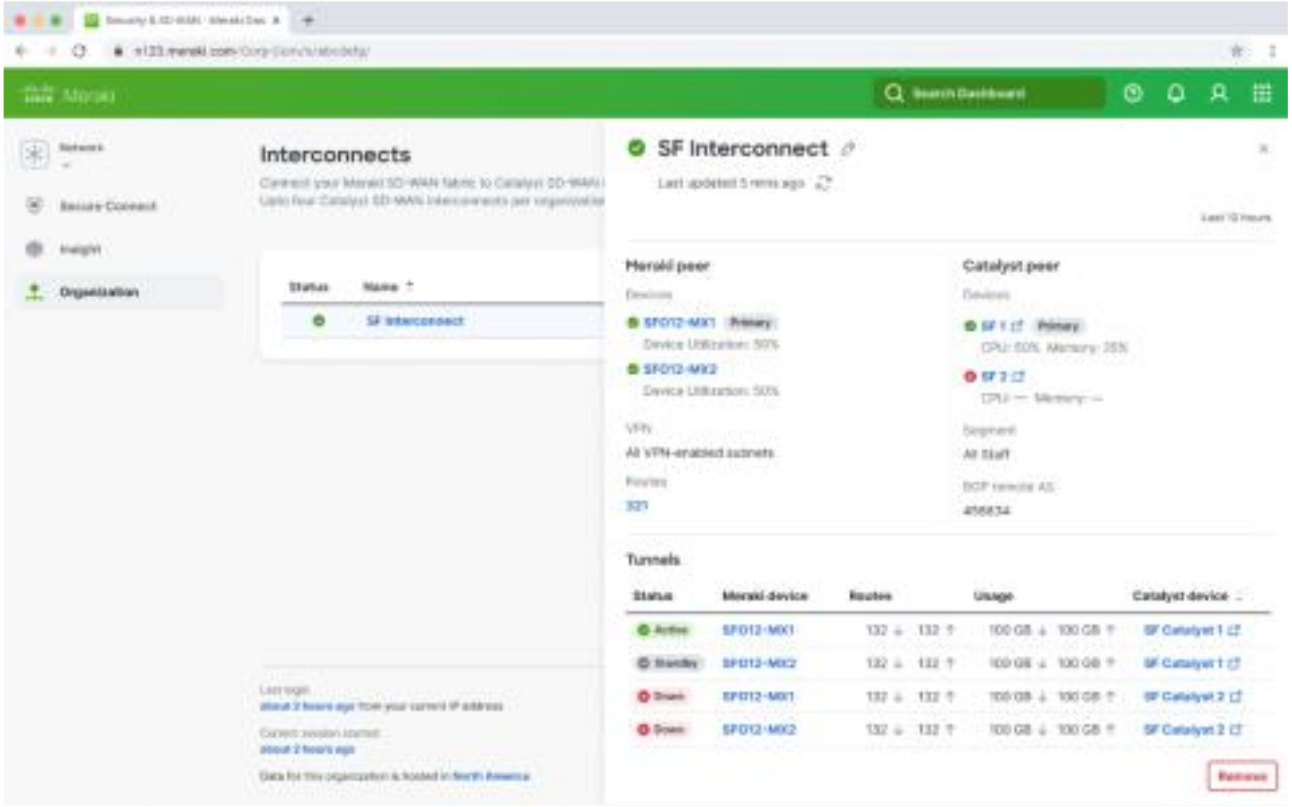
Dashboard Monitoring



Monitoring

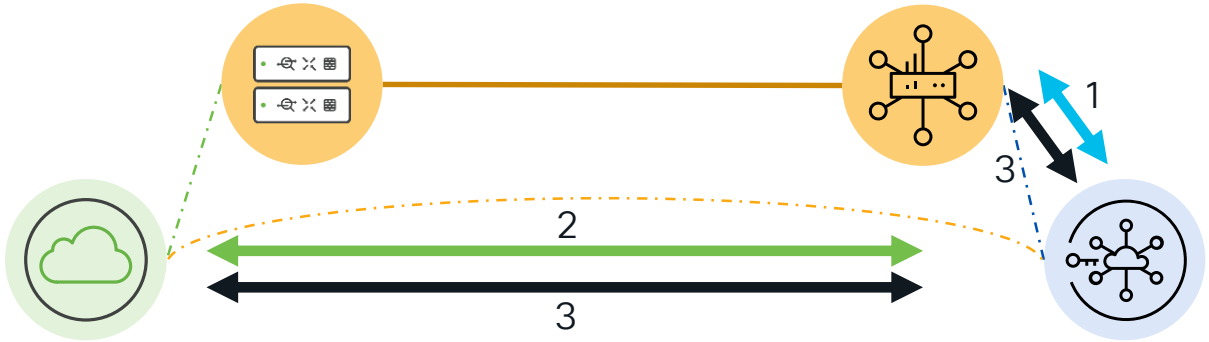
Cisco Meraki Dashboard

- Interconnect Health
  - eBGP Router statistics
  - IPsec VPN statistics
- Device health statistics
- Deep linking into the Catalyst SD-WAN Manager



Monitoring

Monitoring API Flow



1. Passive Information Updates (Blue)
2. Cisco Meraki Passive Information Polling (Green)
3. Realtime Information Updates (Black)

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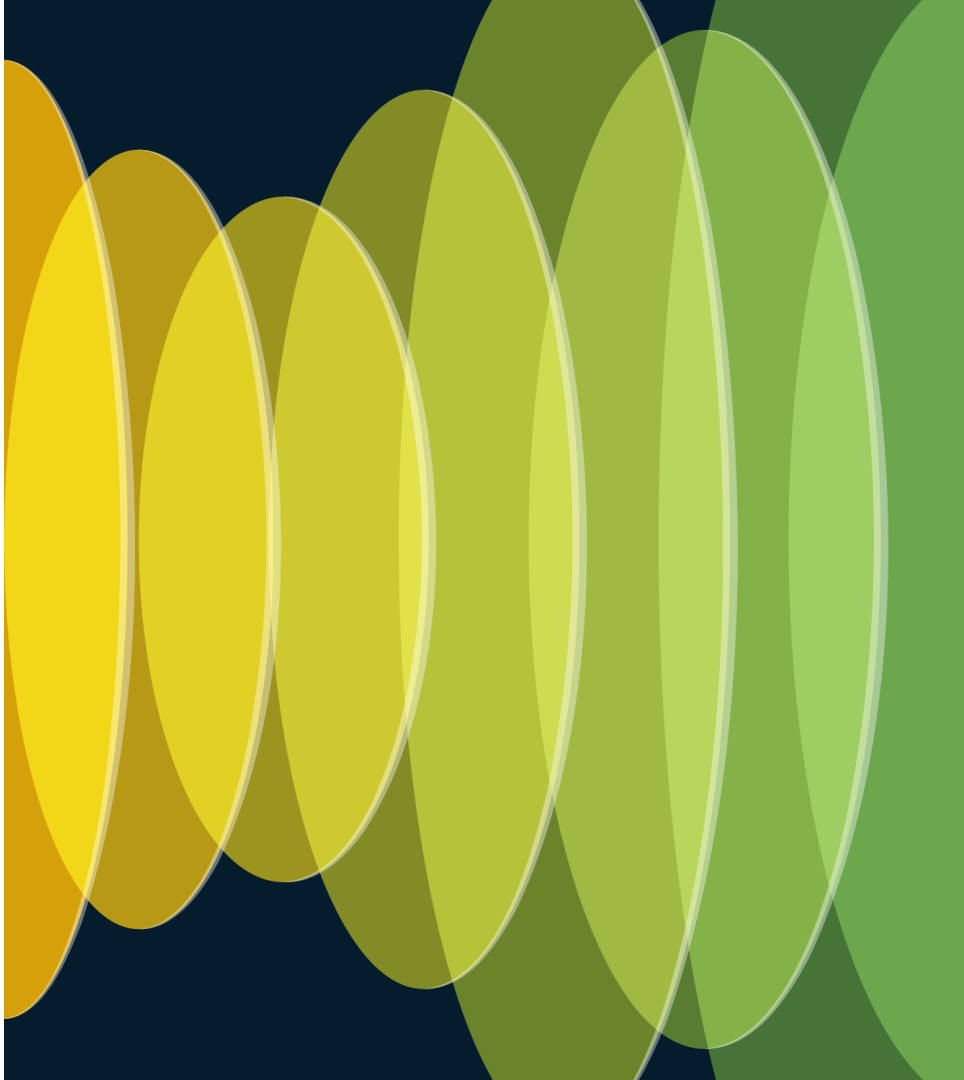
What other information would you want to know about the interconnect? Why?

ⓘ Start presenting to display the poll results on this slide.

Demo



Network
BR1 - CPH06
Network-wide
Security & SD-WAN
Insight
Organization

CPH06-MX67-TME-LAB

MX67 98:18:88:ca:30:01

ADDRESS
Lautrupsgade 7, 7th floor 2100
Copenhagen O

WARM SPARE
Configure warm spare

WAN
217.116.223.166 Active

HOSTNAME
sdwandemo-cph06-wired-jtcpmjmvjm.dynamic-m.com

SERIAL NUMBER
Q2FY-B85N-FVAH

TAGS

NOTES

FIRMWARE
Up to date
Current version: MX 18.107.2
Open source licenses

CONFIG
Up to date

Summary | Uplink | DHCP | IPv6 Prefixes | Location | Tools

Ports

Historical device data for the last day

Connectivity

Network usage

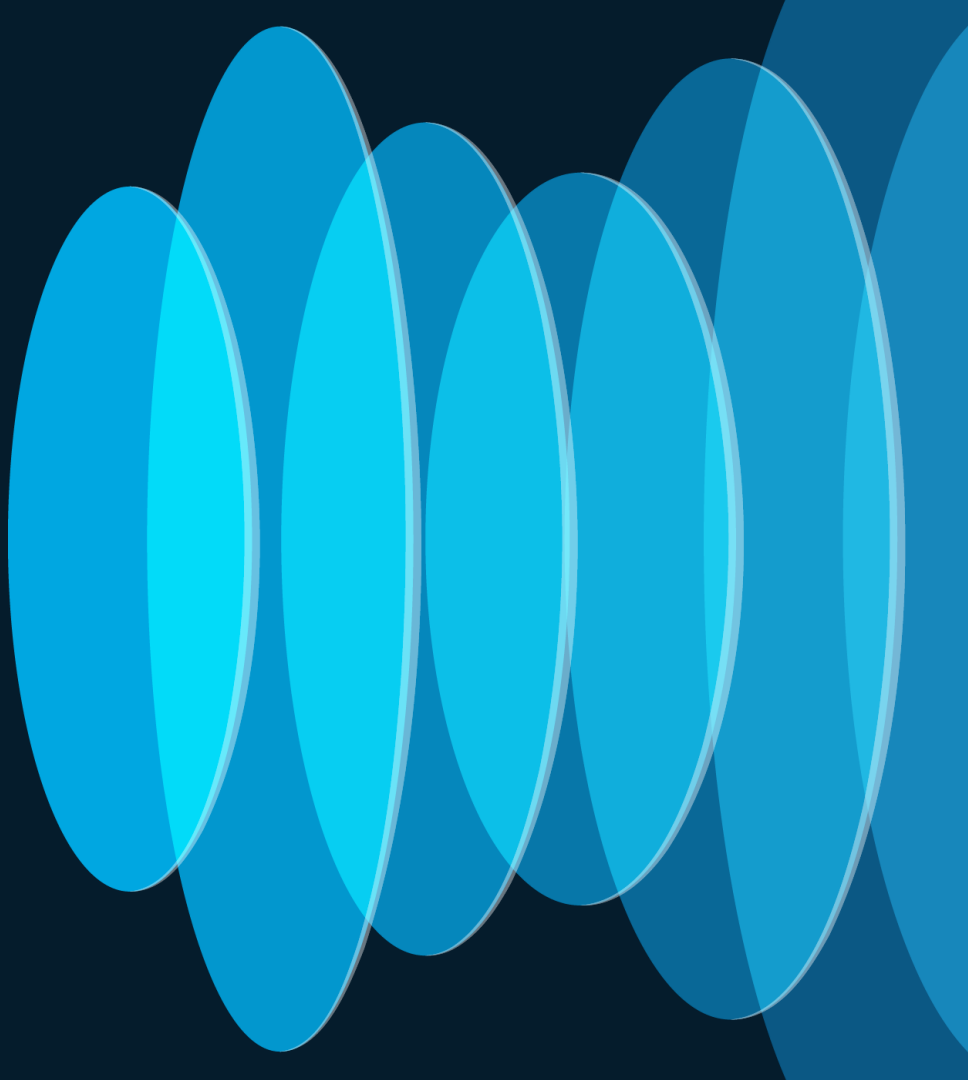
English

The Solution

An automated and highly available solution which can dynamically recover from a variety of failure scenarios

- Delivered via automation
  - API-driven approach
- Highly redundant
  - Dual IPsec Tunnels
  - Multihomed eBGP
- Monitoring Flexibility
  - Use either the Meraki Dashboard or Catalyst SD-WAN Manager

A Future of Possibility



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In terms of interoperability, what would you like to see next from Meraki and Catalyst SD-WAN?

ⓘ Start presenting to display the poll results on this slide.

Where to Next?

Join the SD-WAN Interconnects Beta!

Reach out to your account team to onboard for beta access

Influence the future of Cisco Networking

Interested in providing more feedback about the future of Cisco SD-WAN? Sign up to participate in user experience research studies: bit.ly/ciscouxr

Complete the form before 11:59pm PST on Monday, June 17, 2024 for a chance to win an iPad Pro, iPad Air, or Airpods Pro.

Conclusion

Complete Your Session Evaluations

Complete a minimum of 4 session surveys and the Overall Event Survey to be entered in a drawing to **win 1 of 5 full conference passes** to Cisco Live 2025.

Earn 100 points per survey completed and compete on the Cisco Live Challenge leaderboard.

Level up and earn **exclusive prizes!**

Complete your surveys in the **Cisco Live mobile app.**

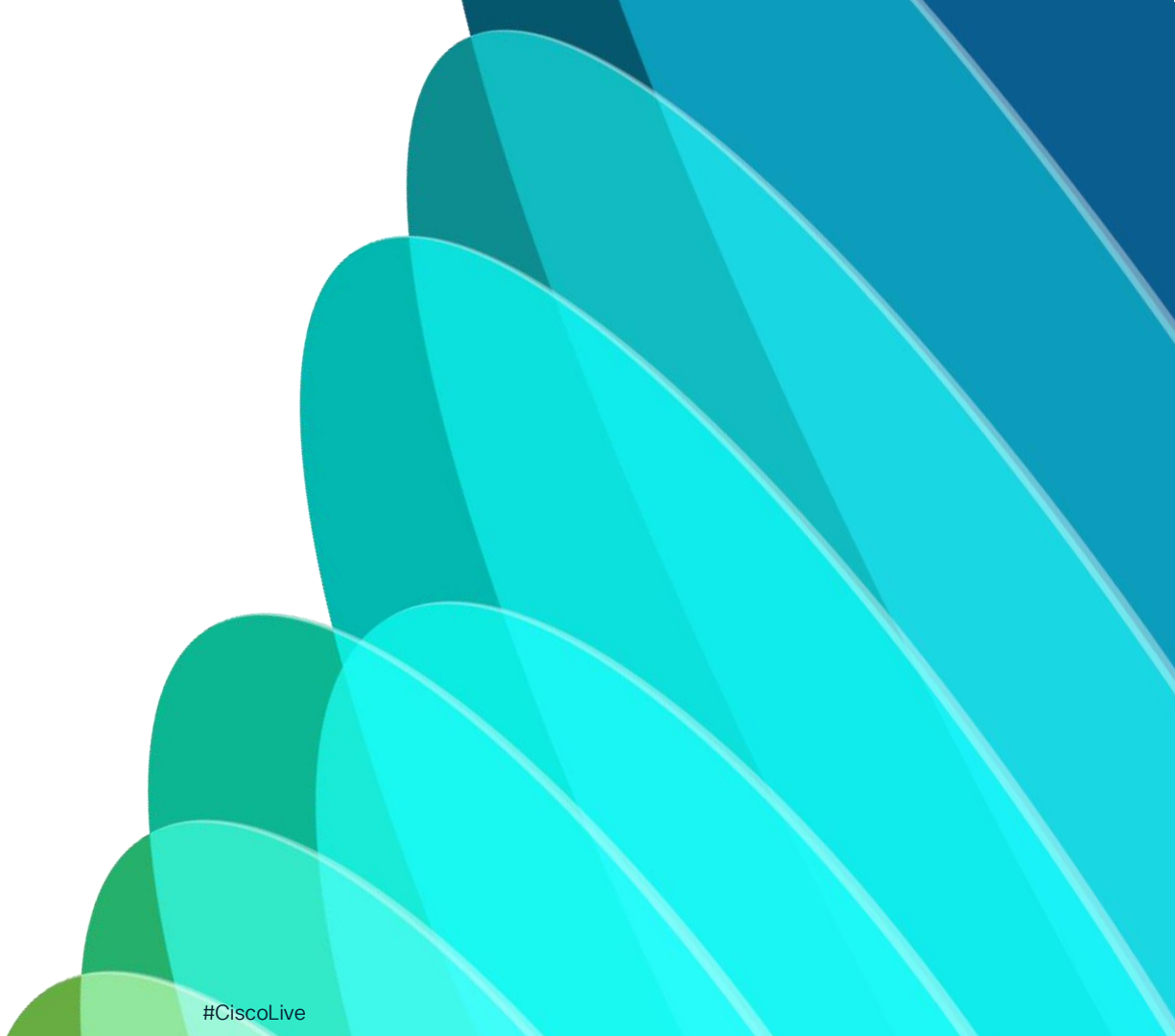
Continue your education

- Beta signup: Reach out to your account team
- Book your one-on-one Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand

Contact me at:
Charles – LinkedIn @Charles_p_lynch
Ashton – LinkedIn @ashtonseth

The bridge to possible

Thank you



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