

Designing Access and Core Switching Architectures with Meraki

cisco Live !

Enterprise Cloud managed switching

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Agenda

- 01 Intro
- 02 Cloud management with IOS XE
- 03 Streamlined Onboarding
- 04 Cloud Configuration
- 05 Platforms
- 06 IOS XE 17.18 Cloud switching
- 07 Designing Switching Cloud Architectures
- 08 Cloud Delivered Campus Fabric

More time underground than in data centers

- Ask me about potash
- Saskatoon, Saskatchewan – Canada
- 20+ years building networks
- CCIE R/S #50782

Nico Darrow

- Maker/Hacker/Geek
 - Robotics Lover
 - Maker and Chronic Tinkerer
 - Python Geek
- 15 year Cisco veteran
 - CCIE W #38552

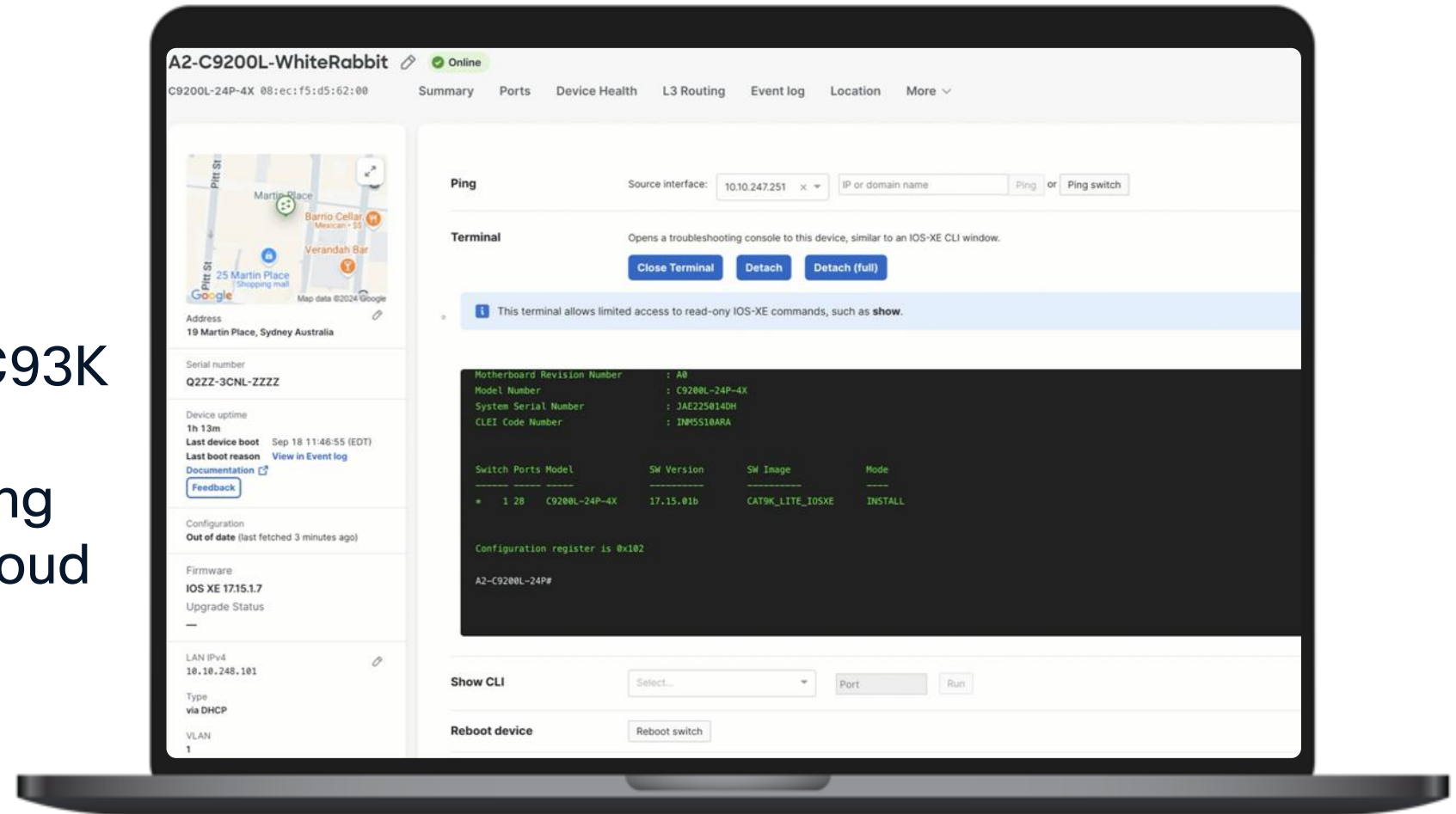


Cloud management with IOS XE

We've been busy on cloud enablement

IOS XE:

- Cloud CLI
- Support for all C92K,C93K
- Support for 9500H
- Streamlined Onboarding
- Config on device or cloud



Introducing a secure Cloud CLI terminal, directly in dashboard

Access an embedded cloud-hosted CLI terminal within the Meraki dashboard without the need for VPN or jump host

Support for common CLI commands to uncover network issues effecting network devices

Leverage existing and familiar skillsets while ensuring your teams maintain access to detailed device data with CLI

The screenshot displays the Meraki dashboard interface for a device named 'ACCESS-2'. The top navigation bar includes tabs for 'Switches', 'Ports', 'Cloud CLI' (which is selected), 'Device Health', 'L3 Routing', 'Event log', 'Location', and 'Tools'. Below the navigation bar, the device's location is shown on a map of São Paulo, Brazil, with the address 'Av. Nações Unidas, 12901 - Torre O...'. The device's serial number is 'FJC281410NK' and its cloud ID is 'OSKA-P84L-TONZ'. The device's uptime is '106d 15h 34m' and it was last booted on 'Apr 9 16:32:43 (C...'. The configuration is 'Up to date (last fetched 37 minutes ago)'. The firmware is 'IOS XE 17.15.3'. The LAN IPv4 address is '10.103.64.12'. The interface is 'Vlan1' and the public IP is '64.100.12.2'. The 'Cloud CLI' tab is active, showing a 'CLI terminal' section with a 'Capture session' checkbox and buttons for 'Close terminal' and 'Detach terminal'. Below this, a terminal window displays the following text: 'Welcome to the interactive CLI IOS XE terminal. You are in Read-only Mode. Establishing connection to your device. Please wait... Connection established successfully.' A blue box highlights the 'Terminal' section, which states: 'Opens a troubleshooting console to this device, similar to an IOS-XE CLI window.' Below this, there are 'Close Terminal' and 'Detach' buttons. A blue information box states: 'This terminal allows limited access to read-only IOS-XE commands, such as **show**.' The terminal window shows the command 'WW_CORE_9300X#show ip route bgp' and its output, which includes a list of codes for various routing protocols and a gateway of last resort.

Terminal

Opens a troubleshooting console to this device, similar to an IOS-XE CLI window.

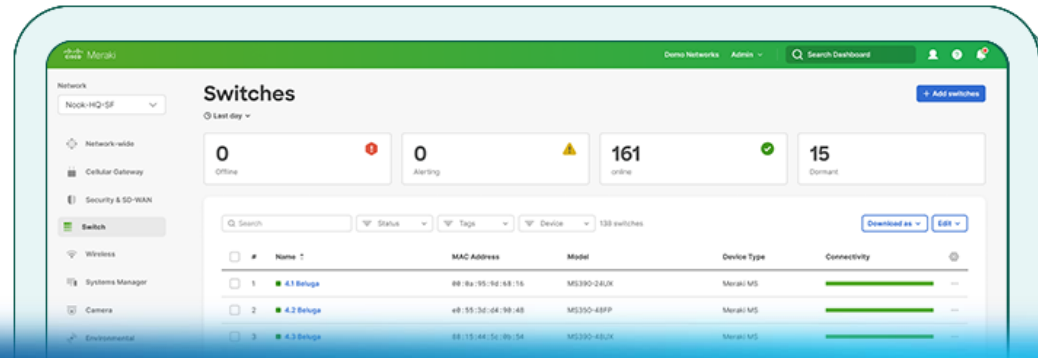
Close Terminal Detach

This terminal allows limited access to read-only IOS-XE commands, such as **show**.

```
WW_CORE_9300X#show ip route bgp
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
       & - replicated local route overrides by connected

Gateway of last resort is 10.10.254.2 to network 0.0.0.0
```

Now supporting 9200L



IOS XE 17.15 - AVAILABLE NOW



C9300L



C9300



C9300X



C9200L

NEW

Building on simplified cloud management with IOS XE

IOS XE 17.18 - BETA



One unified OS for cloud and on-prem



Options for migration or Day 0 cloud management



Cloud simplicity with advanced IOS XE features

Industry Leading Enterprise Switching Portfolio



Unified Cloud Platform

✓ C9200CX

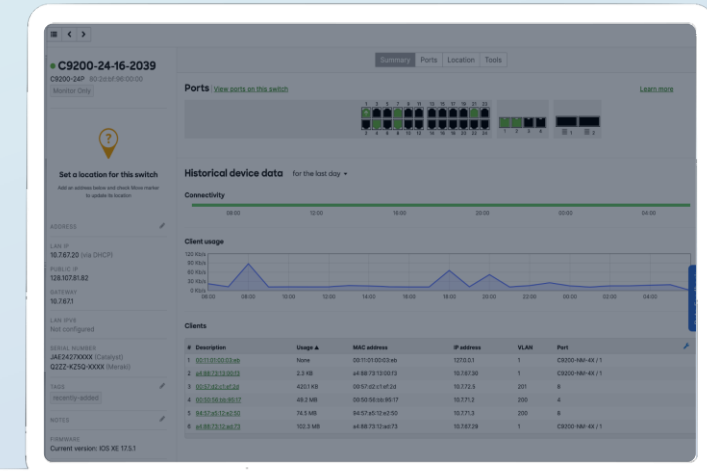
✓ C9500H

✓ C9350 Smart Switches

✓ C9200/L

✓ C9300/L/X/LM

✓ C9610 Smart Switches*



Cisco Meraki Dashboard

*Support for C9610 available in subsequent release

Catalyst 9200

Migration and Out of Box



Catalyst 9300

Migration and Out of Box



Cisco C9350

Out of Box Experience



Catalyst 9500

Migration Only



Cloud Management

Our Portfolio

Cloud Management for Catalyst and
Cisco C9000 Smart Switches

*Cloud management capabilities for C9610 available in subsequent release

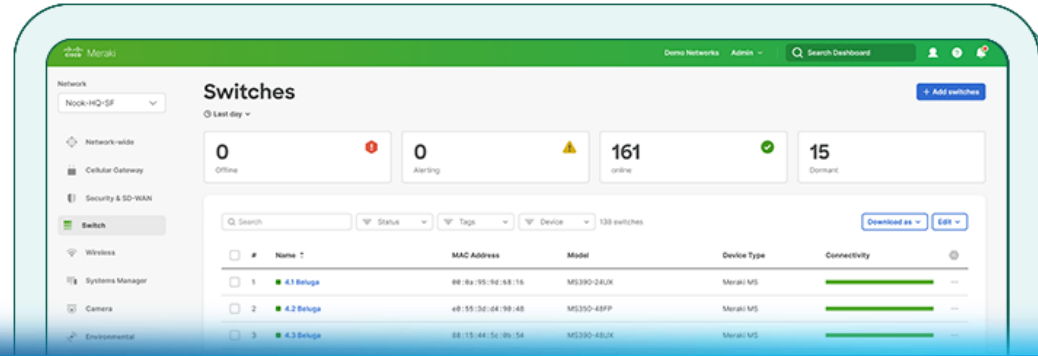
Platforms

Unlocking the Portfolio



C9610*

Preview: Modular Platform
support coming soon
*Targeting
late 2025/early 2026*



Preview: Extend secure
connectivity to rugged
outdoor networks
Targeting Q1CY2026



IE3500

IOS XE 17.15 - AVAILABLE NOW



C9300L



C9300



C9300X



C9200L

NEW

IOS XE 17.18



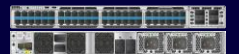
C9500



C9200/CX



C9300LM



C9350

Every C9200 and C9300 model,
with more on the way

Streamlined Onboarding

Available Now

It starts with a streamlined onboarding process

Users can quickly onboard new devices to the network, choose their operating mode, and begin cloud management without any additional applications.

Add devices to network



Select network

2

Configure IOS-XE
devices

3

Summary

Device management and configuration source

C9500H refers to C9500-48Y4C, C9500-24Y4C, C9500-32C, C9500-32QC

C9200/C9300/C9500H ⓘ devices

☐ Cloud configuration ⓘ

Configuration is sourced from the Meraki Dashboard.

☐ Device configuration ⓘ

Configuration remains local to the device.

Device configuration credentials

Please provide the [level 15 configuration access credentials](#) ⓘ so the Meraki dashboard can make necessary configuration changes to these devices.

Username

Password

Streamlined Onboarding

```
WW_CORE_9300(config)# service meraki connect

Switch 1 has been successfully registered
Meraki MAC: AABBCDDDEEFF
Cloud ID: QXXX-XXXX-YYYY

*May  7 00:16:03.519: %MERAKI-5-SWITCH_REGISTER_SUCCESS: Switch 1 has been successfully registered.
*May  7 00:16:03.519: %MERAKI-5-MAC_ADDR: Meraki MAC: AABBCDDDEEFF
*May  7 00:16:03.519: %MERAKI-5-CLOUD_ID: Cloud ID: QXXX-XXXX-YYYY

Device Registration Status:
-----
Switch          Serial
Num   PID      Number      Cloud ID      Mac Address    Migration
-----
1     C9300-24UX  XXYQCCXXC   QXXX-XXXX-YYYY aabb.ccdd.eeff Registered    C9K-C [Monitoring]
```

Cloud Management App-less Onboarding

- Automated Registration and Nextunnel creation (service meraki connect)
- Simply claim the Cloud ID and add to a network

```
Service meraki connect: enable

Meraki Tunnel Config
-----
Fetch State:
Fetch Fail:
Last Fetch(UTC):
Next Fetch(UTC):
Config Server:
Primary:      usw.nt.meraki.com
Secondary:    use.nt.meraki.com
Client IPv6 Addr:  FD0A:9B09:1F7:1:9A18:88FF:FE00:CC00
Network Name:  .Corrin - switch

Meraki Tunnel State
-----
Primary:      Up
Secondary:    Up
Primary Last Change(UTC):  2024-05-29 23:34:02
Secondary Last Change(UTC): 2024-05-29 23:34:02
Client Last Restart(UTC):  2024-05-29 23:33:56

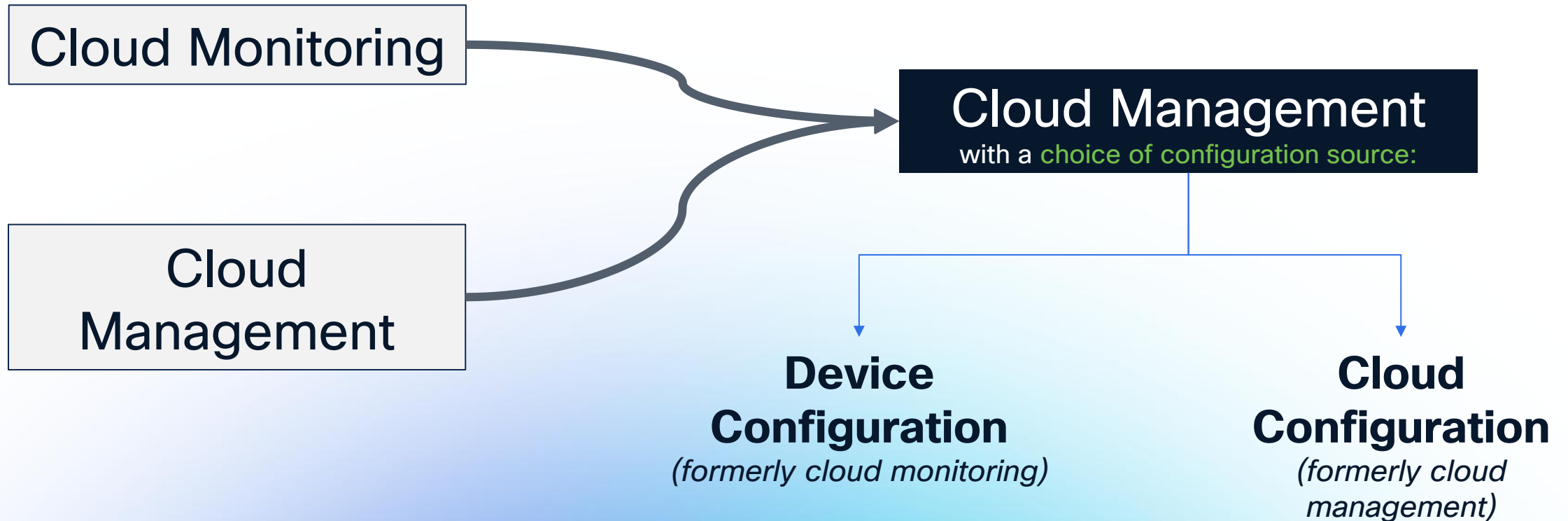
Meraki Tunnel Interface
-----
Status:      Enable
Rx Packets:  795767
Tx Packets:  600246
Rx Errors:    0
Tx Errors:    0
Rx Drop Packets:  0
Tx Drop Packets:  0

Meraki Device Registration
-----
url:      https://catalyst.meraki.com/nodes/register
```

Connection State
(show meraki connect)

Prior to IOS XE 17.15

IOS XE 17.15+



Streamlined Onboarding

Choose Your Configuration Source When Onboarding

Add devices to network



Device management and configuration source

C9200/C9300 devices

- ☐ Cloud configuration
Configuration is sourced from the Meraki Dashboard.
- ☒ Device configuration **Beta**
Configuration remains local to the device.

Device configuration credentials

Please provide the [level 15 configuration access credentials](#) so the Meraki dashboard can make necessary configuration changes to these devices.

Username

Password

 [Show](#)

IOS-XE enable password (optional)

 [Show](#)

☒ I accept the [Terms and Conditions](#)

[Cancel](#)

[Back](#)

[Next](#)

Cloud Configuration

Existing configuration removed
Reload with full cloud configurations synced to
IOS XE

Device Configuration

Enter switch local credentials
Dashboard connection and telemetry IOS XE
configurations provisioned by Dashboard

Maintain operational flexibility with cloud management

Configuration Source: Cloud



UNLOCK FULL CLOUD SIMPLICITY

Configurations are performed in the cloud and managed using the dashboard UI

Configuration Source: Device



RETAIN ADVANCED CONTROL

Configurations are managed via traditional methods and performed local to the device

FLEXIBLE OPTIONS FOR MANAGING YOUR DEVICES FROM THE CLOUD

Configuration Source: Cloud

The full cloud experience with management and configurations performed in the cloud

- Cloud CLI Support for read-only 'show' commands for advanced troubleshooting
- Leverage the intuitive user interface to build configurations that are performed directly from the Meraki cloud at scale.

The screenshot shows the 'Add devices to network' wizard in the Meraki dashboard. It consists of three steps: 1. Select network (completed), 2. Configure IOS-XE devices (current step), and 3. Summary. Under the heading 'Device management and configuration source', there are two radio button options for 'C9200/C9300 devices'. The first option, 'Cloud configuration', is selected and highlighted with a blue border; its description is 'Configuration is sourced from the Meraki Dashboard.' The second option, 'Device configuration', is marked as 'Beta' and has the description 'Configuration remains local to the device.' At the bottom of the wizard, there are 'Cancel', 'Back', and 'Next' buttons.

Add devices to network

1 Select network 2 Configure IOS-XE devices 3 Summary

Device management and configuration source

C9200/C9300 devices

☒ Cloud configuration
Configuration is sourced from the Meraki Dashboard.

☐ Device configuration **Beta**
Configuration remains local to the device.

Cancel Back Next

[Full List of Supported Models Here](#)

Configuration Source: Device

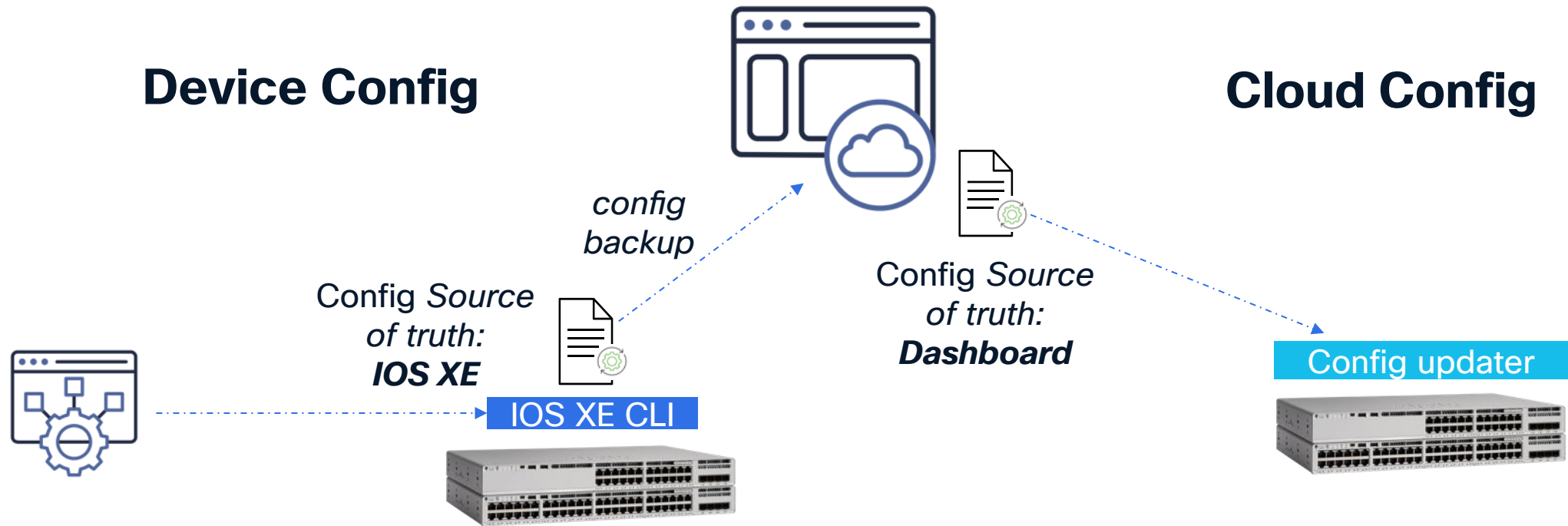
Cloud scale visibility with localized configurations and the full IOS XE feature set

- Non-destructive onboarding preserves configurations, which are managed and performed local to the device via traditional methods.
- Cloud CLI support for show and config commands in dashboard
- Configuration back up in the cloud.

The screenshot shows a web interface titled "Add devices to network". At the top, there is a progress bar with three steps: 1. Select network (marked with a checkmark), 2. Configure IOS-XE devices (highlighted in blue), and 3. Summary. Below the progress bar, the section "Device management and configuration source" is visible. Under the sub-header "C9200/C9300 devices", there are two radio button options. The first is "Cloud configuration" with the description "Configuration is sourced from the Meraki Dashboard." The second is "Device configuration" with a "Beta" label and the description "Configuration remains local to the device." The "Device configuration" option is selected and highlighted with a blue border. At the bottom of the form, there are three buttons: "Cancel", "Back", and "Next".

[Full List of Supported Models Here](#)

Configuration Source



Adopt cloud-managed networking as you evolve your IT operations to cloud

Full cloud-managed for efficient and scalable cloud network operations

Cloud Configuration

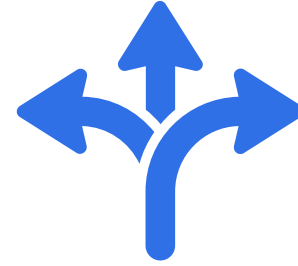
Cloud management with IOS XE

Architecture Advancements

Resilient connectivity to the Cloud

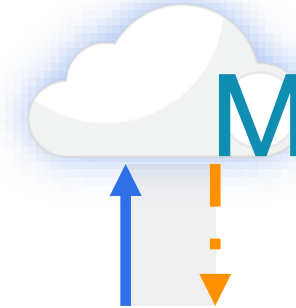
Uplink Auto Config (UAC)

Can I reach Dashboard?



Nextunnel

Connect to Dashboard



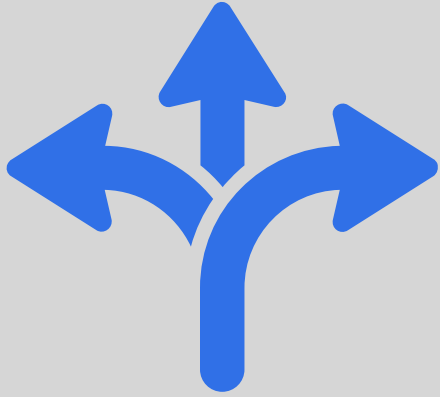
Config Updater

Apply and Synchronize Config, Safe config rollback



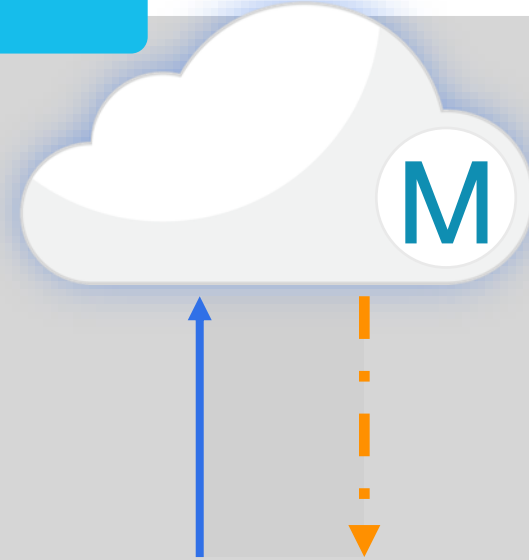
Resilient connectivity to the Cloud

IOS XE 17.15



Uplink Auto Config (UAC)

- Automated discovery for dashboard connectivity
- Automated failover / path discovery
- Tunable for primary interface
- Creates a ranked/scored interface list



Nextunnel

- Secure tunnel to Dashboard for configuration and telemetry

Uplink Auto Config

```
Rocky_and_Bullwinkle#show uac ?  
  active-vlan  Active vlans in network  
  uplink       Uplink Autoconfig Uplink info
```

show uac

- Which VLANs has UAC discovered?
- Which VLAN has the best score?
- Which SVI is being used to reach Meraki Dashboard?



Nextunnel

show meraki connect

- Has the switch fetched tunnel config
- Is the tunnel up?
- Are packets coming/going?

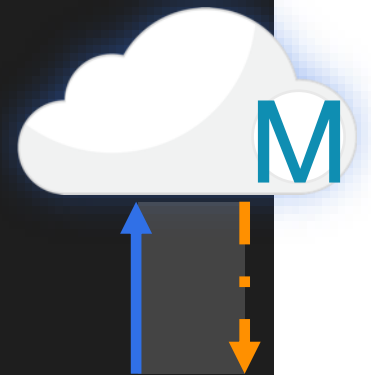
```
Rocky_and_Bullwinkle#sh meraki connect
Service meraki connect: enable

Meraki Tunnel Config
-----
Fetch State:                Config fetch succeeded
Fetch Fail:
Last Fetch(UTC):            2025-01-28 16:25:24
Next Fetch(UTC):            2025-01-28 17:28:58
Config Server:              cs46-2037.meraki.com
Primary:                    usw.nt.meraki.com
Secondary:                  use.nt.meraki.com
Client IPv6 Addr:           FD0A:9B09:1F7:1:2E3F:BFF:FE2B:9F80
Network Name:               Eh2 - switch

Meraki Tunnel State
-----
Primary:                    Up
Secondary:                  Up
Primary Last Change(UTC):   2025-01-23 19:17:42
Secondary Last Change(UTC): 2025-01-23 19:17:42
Client Last Restart(UTC):   2025-01-22 19:25:10

Meraki Tunnel Interface
-----
Status:                     Enable
Rx Packets:                  22355237
Tx Packets:                  35429584
Rx Errors:                   0
Tx Errors:                   0
Rx Drop Packets:             0
Tx Drop Packets:             0

Meraki Device Registration
-----
url:                         https://catalyst.meraki.com/nodes/register
```



Resilient connectivity to the Cloud

IOS XE 17.15



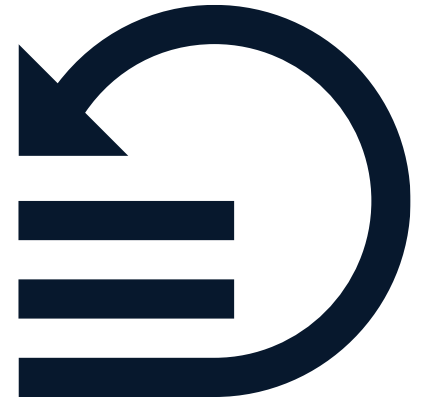
Config Updater

- Fetch and apply config from Dashboard
- Safe configuration rollback: 30 minute recovery mechanism for configuration error

Config Updater

show meraki config updater

- Can the switch fetch config?
- Can the switch upload the config?
- Does the switch need to upload config?



```
Rocky_and_Bullwinkle#sh meraki config updater
Config Updater
-----
Current state:                      Ready

Latest operation
-----
Upload running config

Get running config: Pass
  start time(UTC): 2025-01-29 22:22:15
  result time(UTC): 2025-01-29 22:22:33
  Running config location: /flash/meraki/config_updater/monitor/upload.config
Get presigned url: Not needed
  start time(UTC): 2025-01-29 22:22:33
  result time(UTC): 2025-01-29 22:22:36
  dashboard status code: 204
Upload config: Not started
```

Optimizations



**Management Interface
Architecture Change**



**Default Network
Module**

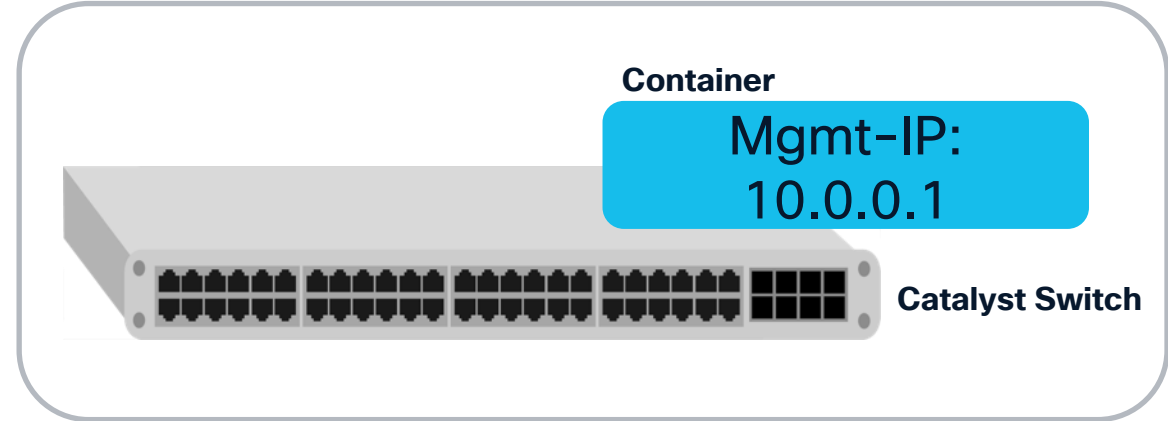


Command Runner

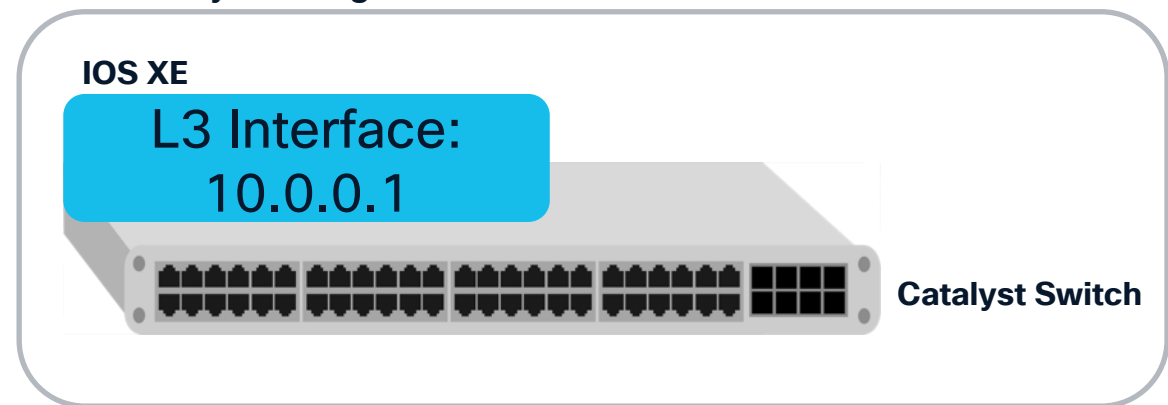
Management Interface Architecture Change

- The management interface is now an L3 Interface. Switches running CS firmware required a dedicated management IP address, now management is handled by **any L3 interface**
- All configuration for management connectivity and L3 interfaces is now available on the Routing & DHCP page.
- If a switch is L2 only, DHCP will work 👍 but enabling L3 requires first setting a static management IP

L2 Catalyst Management Behavior prior to IOS XE (<= CS17)



L2 Catalyst Management Behavior with IOS XE



Management Interface Architecture Change

Switch Summary page>

The screenshot shows the Cisco Meraki Switch Summary page. On the left, a sidebar has 'Switching' selected, with a sub-menu showing 'Monitor', 'Switches' (highlighted with a green checkmark), and 'Switch Ports'. The main content area displays the switch's IP configuration: 'LAN IPv4' with address '10.20.20.4', 'Type' as 'statically assigned', and 'VLAN' as '20'. A red callout bubble with the number '1' points to the edit icon (pencil) next to the IP address. A configuration modal is open on the right, titled 'IPv4 Type *'. It features a dropdown menu set to 'Static', with a red callout bubble '2' pointing to it. Below the dropdown is a yellow warning box with an exclamation mark icon and the text: 'Visit the **Routing & DHCP** page to configure your Uplink L3 Interface.' At the bottom right of the modal is a blue 'Save' button, with a red callout bubble '3' pointing to it.

1. Edit IP config
2. Change Type to Static
3. Redirect to Routing & DHCP page

Management Interface Architecture Change

VLAN

IP Toggle IPv4 Only IPv6 Only

 Choose the **Both** tab to configure both IPv4 and IPv6

IPv4

V4 Uplink ☒

Subnet

Interface IP

Default gateway

DNS server 1

DNS server 2

Uplink interfaces include DNS and Default Gateway settings

Easily move the uplink to a different interface

- Define the new gateway
- Confirm DNS

IPv4

V4 Uplink ☒

Subnet

Interface IP

Default gateway

DNS server 1

DNS server 2

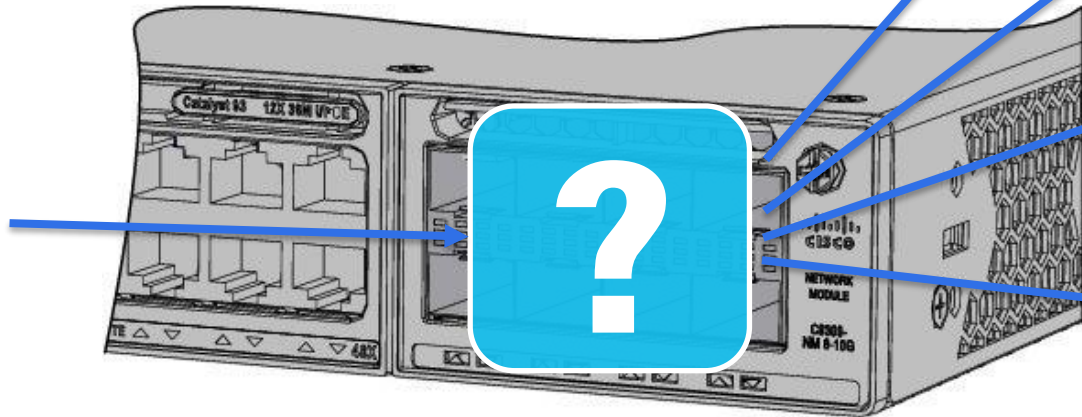
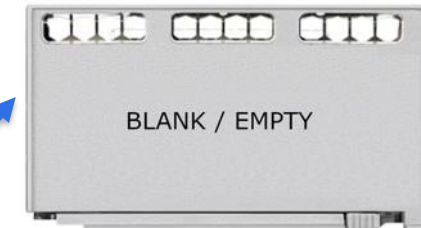
Multicast routing Disabled

Default Network Module

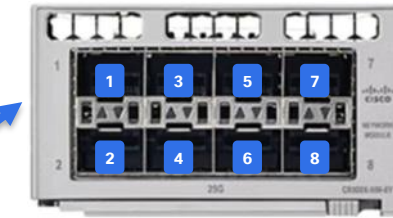
Simplification of Network Module Configuration

- When a module is not installed, configuration is now consolidated into 8 default ports which are mapped to the appropriate interfaces when a Network Module is installed.
- Prior to this architecture, every potential network module required unique config. A 48-port switch required configuring 98 ports to cover each possible module. We now have only 56 ports (48+8) which covers existing and future modules.

Pre-Configured
Default Ports

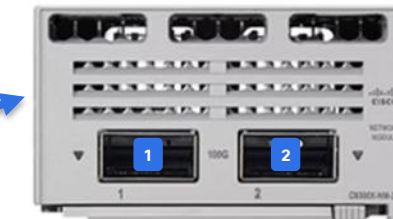


Unassigned



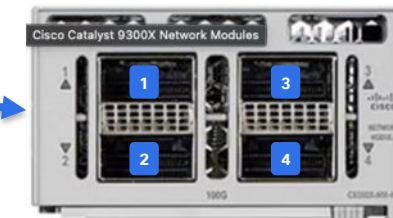
Unassigned

C9300X-NM-8Y



Unassigned

C9300X-NM-2C



Unassigned

C9300X-NM-4C

Default Network Module

The CS way:

- Which module is installed?
- Is any module installed?



C9300-NM-4G



C9300X-NM-8Y



C9300X-NM-2C

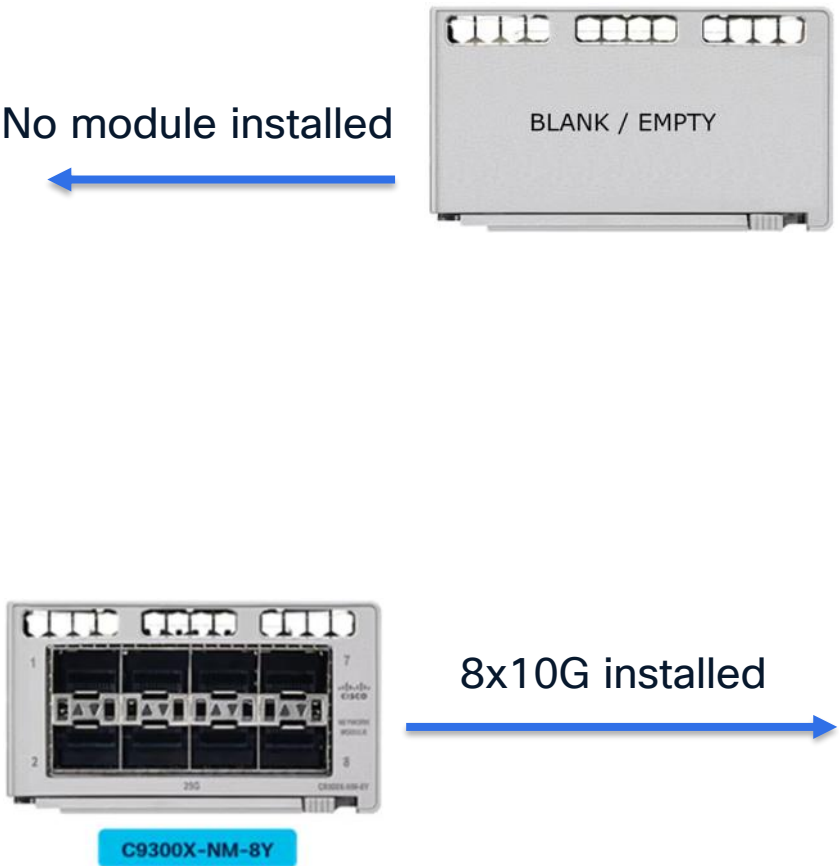
- ☐ [STACK-MS390-RR / 4×10G / 1 details](#)
- ☐ [STACK-MS390-RR / 4×10G / 2 details](#)
- ☐ [STACK-MS390-RR / 4×10G / 3 details](#)
- ☐ [STACK-MS390-RR / 4×10G / 4 details](#)
- ☐ [STACK-MS390-RR / 8×10G / 1 details](#)
- ☐ [STACK-MS390-RR / 8×10G / 2 details](#)
- ☐ [STACK-MS390-RR / 8×10G / 3 details](#)
- ☐ [STACK-MS390-RR / 8×10G / 4 details](#)
- ☐ [STACK-MS390-RR / 8×10G / 5 details](#)
- ☐ [STACK-MS390-RR / 8×10G / 6 details](#)
- ☐ [STACK-MS390-RR / 8×10G / 7 details](#)
- ☐ [STACK-MS390-RR / 8×10G / 8 details](#)
- ☐ [STACK-MS390-RR / 2×40G / 1 details](#)
- ☐ [STACK-MS390-RR / 2×40G / 2 details](#)

Default Network Module

The IOS XE 17.15.2+ way:

☐	Bullwinkle / DEFAULT / 1 details
☐	Bullwinkle / DEFAULT / 2 details
☐	Bullwinkle / DEFAULT / 3 details
☐	Bullwinkle / DEFAULT / 4 details
☐	Bullwinkle / DEFAULT / 5 details
☐	Bullwinkle / DEFAULT / 6 details
☐	Bullwinkle / DEFAULT / 7 details
☐	Bullwinkle / DEFAULT / 8 details

No module installed



8x10G installed

☐	Mr Peabody / 8×10G / 1 details
☐	Mr Peabody / 8×10G / 2 details
☐	Mr Peabody / 8×10G / 3 details
☐	Mr Peabody / 8×10G / 4 details
☐	Mr Peabody / 8×10G / 5 details
☐	Mr Peabody / 8×10G / 6 details
☐	Mr Peabody / 8×10G / 7 details
☐	Mr Peabody / 8×10G / 8 details

Show CLI / Command runner

Quick access to over 30 common CLI outputs

- Platform monitoring
- Device tracking
- Stacking details
- Dashboard connection status
- Etc...

Show CLI

Show Power Over Ethernet D... x ▾

Run

Outputs power over ethernet details

◦ Show Power Over Ethernet Details ↻

```
1 Rocky# show power inline
```

Module	Available (Watts)		Used (Watts)	Remaining (Watts)			
-----	-----		-----	-----			
1	595.0		0.0	595.0			
Interface	Admin	Oper	Power (Watts)	Device	Class	Max	

Tel1/0/1	auto	off	0.0	n/a	n/a	60.0	
Tel1/0/2	auto	off	0.0	n/a	n/a	60.0	
Tel1/0/3	auto	off	0.0	n/a	n/a	60.0	
Tel1/0/4	auto	off	0.0	n/a	n/a	60.0	
Tel1/0/5	auto	off	0.0	n/a	n/a	60.0	
Tel1/0/6	auto	off	0.0	n/a	n/a	60.0	
Tel1/0/7	auto	off	0.0	n/a	n/a	60.0	
Tel1/0/8	auto	off	0.0	n/a	n/a	60.0	
Tel1/0/9	auto	off	0.0	n/a	n/a	60.0	
Tel1/0/10	auto	off	0.0	n/a	n/a	60.0	
Tel1/0/11	auto	off	0.0	n/a	n/a	60.0	

Firmware Upgrade Status for IOS XE

✓ Upgrade complete. [Expand to show details](#)

✓ Upgrade scheduled — ✓ Firmware download — ✓ Firmware install — ✓ Firmware verification — ✓ Upgrade complete

Available soon

Drill down into each switch to view progression through each stage, with guidance on expected times, and success and failure states.

Supports CS to IOS XE and all IOS XE upgrades.

i Upgrade scheduled. [Collapse to hide the details](#)

✓ Upgrade scheduled

Switch upgrade to IOS XE 17.15.4 scheduled for Oct 05, 2025 10:23 ETC

○ Firmware download

Estimated time: up to 20 minutes

Switch will download the network firmware.

○ Firmware install

Estimated time: up to 40 minutes

Switch will install the network firmware and reboot using the new firmware version.

○ Firmware verification

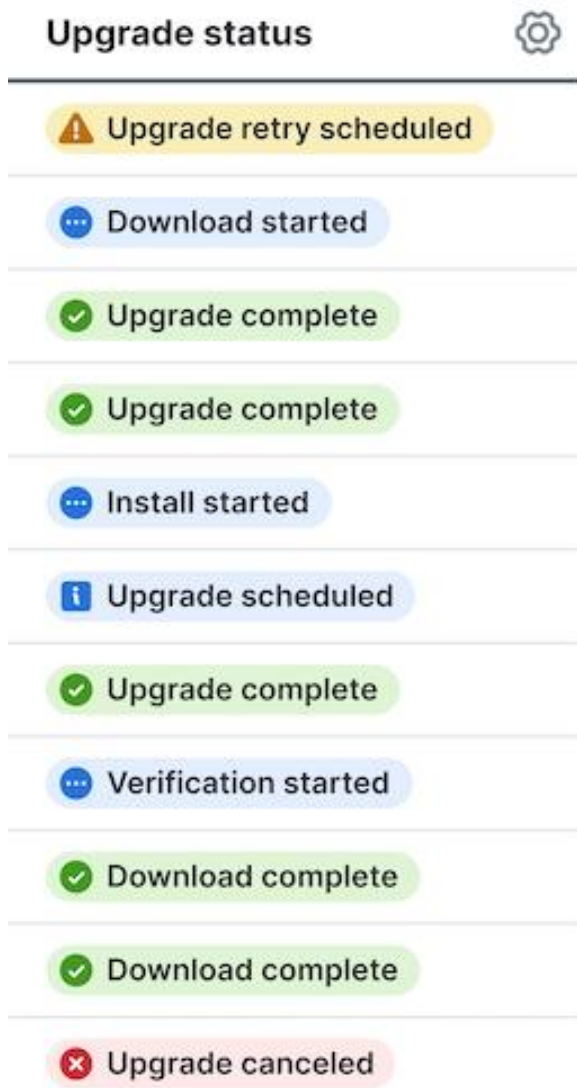
Estimated time: up to 5 minutes

Switch will verify that it has a stable connection with the Meraki cloud on the new firmware.

○ Upgrade complete

See [Documentation on firmware upgrades](#) ↗

Firmware Upgrade Status for IOS XE



Available soon

Monitor each stage of firmware upgrades for all switches in a single view:

- Download
- Installation
- Verification

Supports CS or IOS XE to IOS XE upgrades

IOS XE 17.18

Cloud switching

Combined with advanced features powered by IOS XE

What's New

IOS XE 17.18.1 (beta) brings advanced capabilities to the cloud through the introduction of advanced routing and high availability features. Additional cloud expansion features Bring greater value to enterprise customers through the introduction of simplified support for troubleshooting, monitoring, and configuration management tasks.

Cloud CLI

Access an embedded cloud terminal within the Meraki dashboard.

Expanded Support

Support for new hardware models and expanded support for cloud features.

Advanced Routing

Advanced capabilities like BGP and VRF are now supported in the cloud dashboard

High Availability

In-Service Software Upgrades, Virtual Stacking for C9500, and more.

Beta: IOS XE 17.18.1

Cloud Managed Enterprise Switching on IOS XE 17.18

Enterprise Feature Development

Advanced Routing

Routed Ports

Loop-free Routed Access

VRF Lite

Scalable Macro Segmentation

BGP

Flexible, Open Dynamic Routing

High-Availability

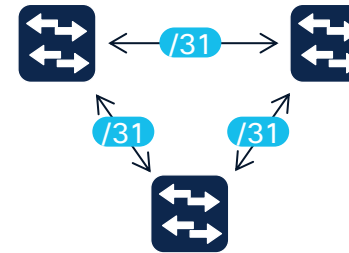
Rapid PVST+

Enhanced L2 Loop Prevention

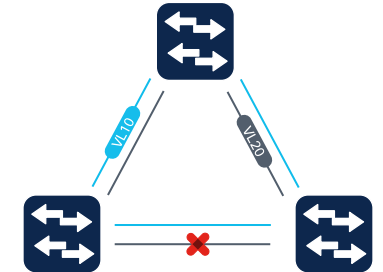
StackWise Virtual (SVL)
ISSU

Sub-second downtime
firmware upgrades

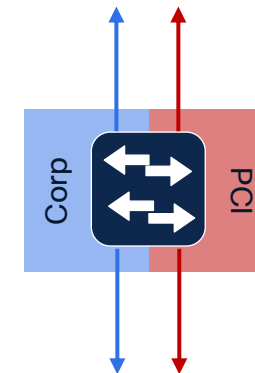
Routed Ports



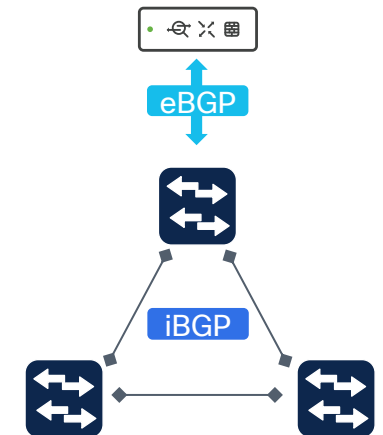
RPVST+



VRF Lite



BGP



Introducing VRF deployment from the cloud

Easily create isolated routing domains without additional hardware

Strengthen security with scalable macro-segmentation, limiting lateral movement of threats

Simplify network management by eliminating the need for ACLs on every SVI and reducing oversized route tables

Routing & DHCP

Switch or switch stack

Interface

Name

VRF

Subnet

IP

☐ Switch or switch stack

☐ Doug

☐ Rocky_and_Bullwinkle

☐ Bob

☐ Bob

☐ Doug

☐ Doug

80 VLAN

80 VLAN

Bob / 13

Bob / 14

0 Loop

20 VLAN

eighty

BLUE VLAN 80

Bobs routed port

Bobs 2nd routed port

0

Uplink Vlan 20

BLUE_VRF

BLUE_VRF

BLUE_VRF

BLUE_VRF

BLUE_VRF

Default

10.80.80.0/24

10.80.80.0/24

10.88.88.0/24

10.89.89.0/24

10.252.252.252/32

10.20.20.0/24

10.80.80.254

10.80.80.253

10.88.88.252

10.89.89.252

10.252.252.252

10.20.20.2

← VRF

Edit BLUE_VRF

Configuration details

VRF name *

BLUE_VRF

Description

IoT

Route distinguisher ⓘ

52:106

Route target ⓘ

Save changes

Cancel

VRF

0 VRFs with associated interfaces

0 VRFs without associated interfaces

Q Search

+ Add VRF

☐ Name

Description

Route distinguisher

Route target

Networks

☐ Default

—

—

—

—

☐ BLUE_VRF

IoT

52:106

—

—

☐ GREEN_VRF

PCI

52:108

—

—

☐ RED_VRF

Evil Printers and Fax Machines

52:107

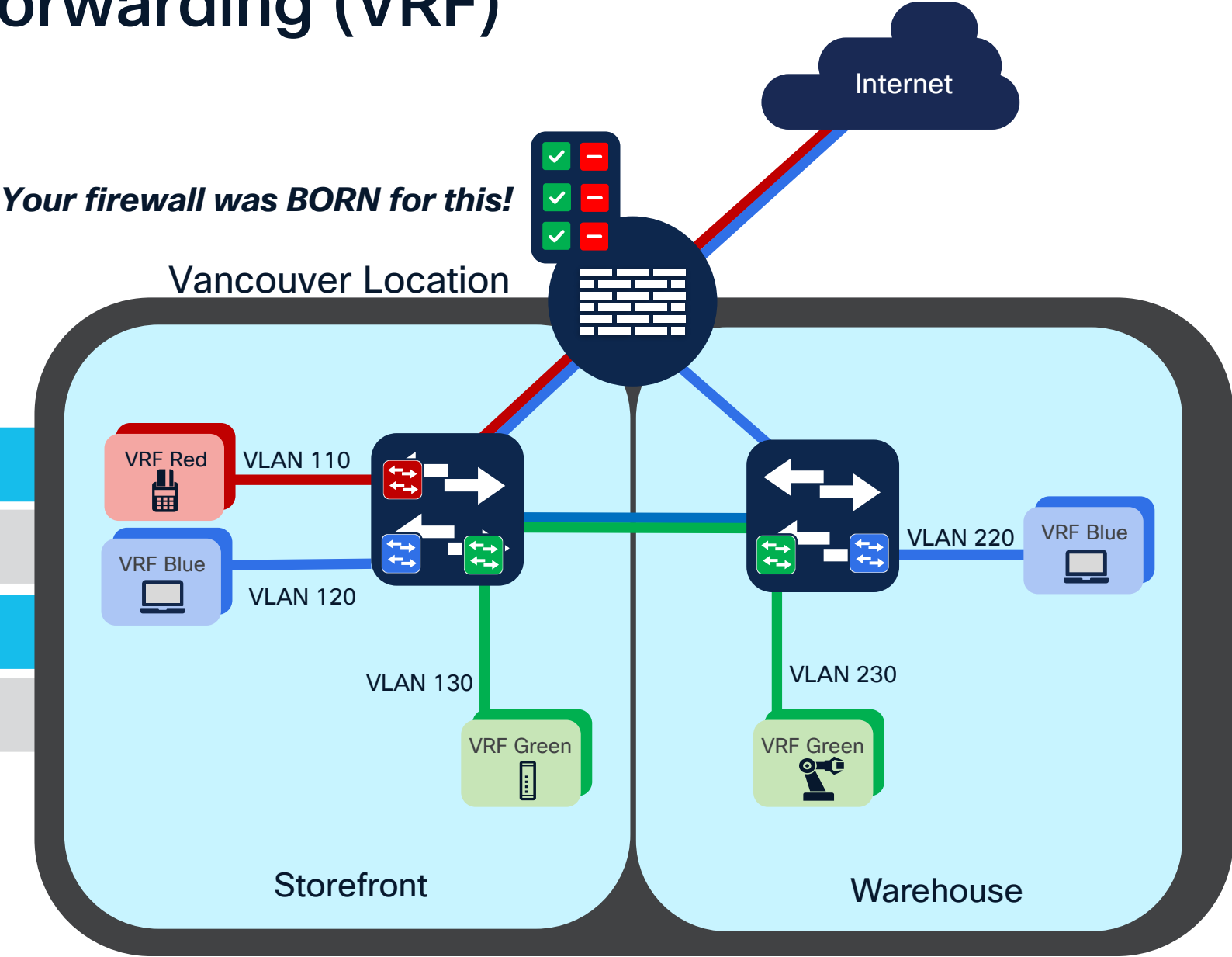
—

—

Beta: IOS XE 17.18.1

Virtual Routing and Forwarding (VRF)

- Macro-segmentation that scales
- Centralized ACLs
- Efficient route handling and forwarding
- A separate lane for management traffic



VRF Config

Organization > VRFs

VRF

0 VRFs with associated interfaces

0 VRFs without associated interfaces

Q Search

+ Add VRF

☐	Name	Description	Route distinguisher	Route target	Networks
☐	Default	—	—	—	—  
☐	BLUE_VRF	IoT	52:106	—	—  
☐	GREEN_VRF	PCI	52:108	—	—  
☐	RED_VRF	Evil Printers and Fax Machines	52:107	—	—  

- Create VRFs at an organization-level
- Assign a name, and Route Distinguisher *(future use)*

← VRF

Edit BLUE_VRF

Configuration details

VRF name *

BLUE_VRF

Description

IoT

Route distinguisher ⓘ

52:106

Route target ⓘ

Save changes

Cancel

VRF Config

Switching > Routing & DHCP

☐ Switch or switch stack	Interface	Name	VRF ↕	Subnet
☐ Doug	80 VLAN	eighty	BLUE_VRF	10.80.80.0/24
☐ Rocky_and_Bullwinkle	80 VLAN	BLUE VLAN 80	BLUE_VRF	10.80.80.0/24
☐ Bob	Bob / 13 Routed	Bobs routed port	BLUE_VRF	10.88.88.0/24
☐ Bob	Bob / 14 Routed	Bobs 2nd routed port	BLUE_VRF	10.89.89.0/24
☐ Doug	0 Loop	0	BLUE_VRF	10.252.252.252/32
☐ Doug	20 VLAN	Uplink Vlan 20	Default	10.20.20.0/24

- Assign interfaces to a VRF

← Routing & DHCP

Edit Interfaces

Interface editor

Interface mode

☐ VLAN

☒ Routed port

☐ Loopback

Switch or switch stack

Bob

▼

Switch ports

Bob / 9

▼

Name

Transit Network Routed Port

VRF

GREEN_VRF

▼

IP toggle

☒ IPv4 only

☐ IPv6 only

☐ Both

i

Select "Both" in IP Toggle to configure both IPv4 and IPv6

IPv4

Subnet

10.52.108.0/24

Interface IP

10.52.108.254

Introducing Routed Ports from the cloud

Reduce convergence time while simplifying network management

Routed peer to peer links including east/west and north/south traffic

Minimize VLAN ID consumption while joining separate networks

New port icon

Switch	VLAN	Name	Subnet	IP Address	MTU	Trunk	Server	Enabled
CAMPUS01-CORE	10	Corp-Data	172.16.10.0/24	172.16.10.254	False	False	Server	Enabled
CAMPUS01-CORE								
CAMPUS01-CORE								
CAMPUS01-CORE								
CAMPUS01-CORE								
CAMPUS01-CORE								
CAMPUS01-CORE								
CAMPUS01-CORE								
CAMPUS01-CORE								
CAMPUS01-CORE								

Update 1 Ports

Selected Switch / Port: 1 ^
Bob/13

Interface mode
☐ Switch port ☒ Routed port
☒ Navigate to configure routed port

Name
Transit Network

Tags
▼

Port status
☒ Enabled

Link negotiation
Auto negotiate ▼

EEE ⓘ ☐ Enabled

Port schedule
Unscheduled ▼

PoE ☒ Enabled

Port isolation ☐ Enabled

Cancel Update

Beta: IOS XE 17.18.1

Routed Ports

Routed peer to peer links
East/West and North/South

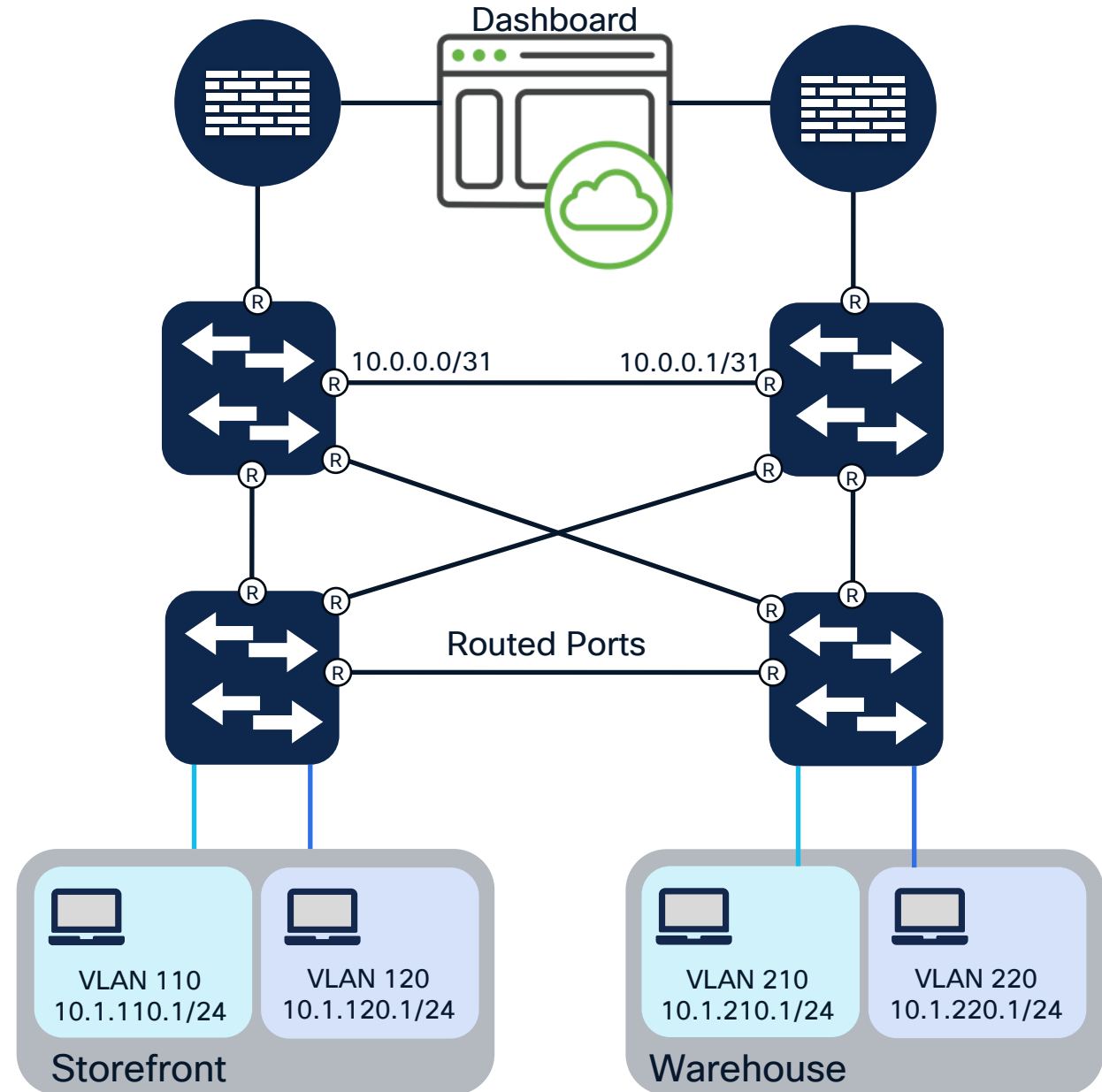
/31 Addressing

Reduced VLAN ID consumption

Faster Convergence

STP boundaries

Equal cost load balancing



Routed Port Config

Switching > Switches > Switch Summary

Update 1 Ports

Selected Switch / Port

Bob/13

Interface mode

☐ Switch port

☒ Routed port

☒ Navigate to configure routed port

Name

Transit Network

Tags

Port status

☒ Enabled

Link negotiation

Auto negotiate

EEE ⓘ

☐ Enabled

Port schedule

Unscheduled

PoE

☒ Enabled

Port isolation

☐ Enabled

Cancel

Update

Switching > Routing & DHCP

← Routing & DHCP

Edit Interfaces

Interface editor

Interface mode

☐ VLAN

☒ Routed port

☐ Loopback

Switch or switch stack

Bob

Switch ports

Bob / 9

Name

Transit Network Routed Port

VRF

GREEN_VRF

IP toggle

☒ IPv4 only

☐ IPv6 only

☐ Both

Select "Both" in IP Toggle to configure both IPv4 and IPv6

IPv4

Subnet

10.52.108.0/24

Interface IP

10.52.108.254

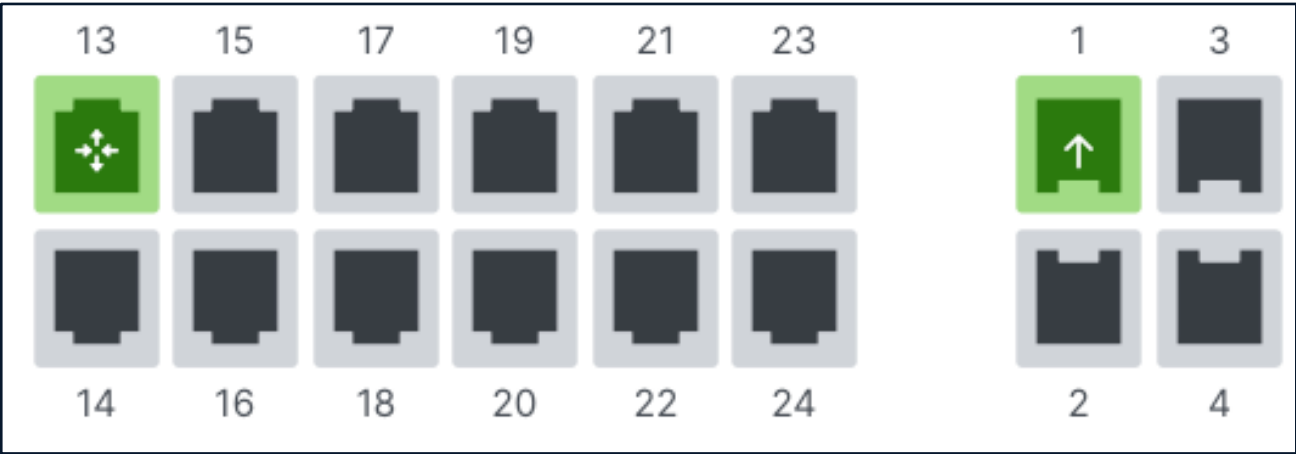
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BRKENS-1402

Routed Port Config

Switching > Routing & DHCP

Routing & DHCP		
Interfaces		
☐	Switch or switch stack	Interface
☐	C9300-Lab1	1 VLAN
☐	C9300-Lab1	C9300-Lab1 / 5 Routed
☐	C9300-Lab1	C9300-Lab1 / 1 Routed
☐	C9300-Lab1	C9300-Lab1 / 3 Routed
☐	C9300-Lab1	111 VLAN



Adorable new routed port icon ♥

New tags for routed ports
and VLAN Interfaces(SVIs)

Introducing **Border Gateway Protocol** from the cloud

Multiple configuration options including full stack dynamic routing (SD-WAN + LAN) and simplified iBGP/eBGP routing

Flexible configurations including per switch and peer-group templates, plus support for common policy objects

Support for full API programmability and open compatibility with third-party vendors

BGP Routing

General BGP Filters ASN

BGP Routers

Enable	Switch name	Model	ASN	Active peers	Advertised routes
☒	Bob	C9300-24UX	65500	0	1

Rows per page: 20 1-1 of 1

BGP Peer Groups

Supports either an IPv4 or IPv6 address.

#	Name	Description	Neighbors Count
1	WANGroup	WAN peer group	1

Peer Group Settings

Remote AS: 65234
Multihop: 255
Weight: 32768

Peers

Active: ☒

BGP Routing

General BGP Filters **ASN**

Autonomous System Numbers (ASN)

ASNs can only be deleted once BGP routers have been removed. [How to remove BGP routers.](#)

ASN	Description	BGP routers
65500		1

Rows per page: 10 1-1 of 1

Supported Hardware: C9500, C9300X, C9300, C9300L, C9300LM, C9200CX, MS390
Beta: IOS XE 17.18.1

BGP

Simple eBGP/iBGP

- Full stack meraki (MX + Catalyst)
- Vendor neutral peering

Large Campus Route-Reflector

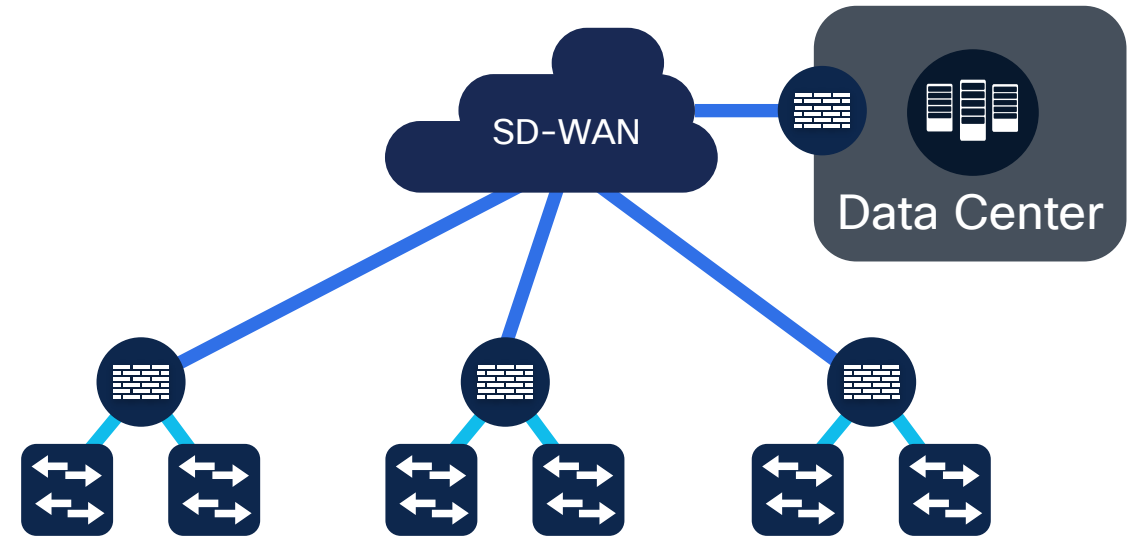
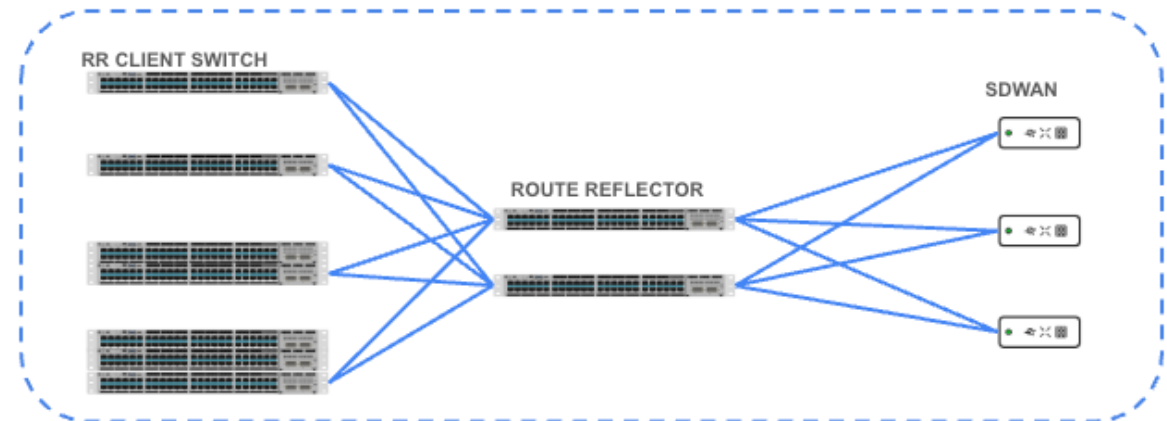
- iBGP peer route-reflector
- Loopback support
- Route filtering and AS-path control
- Traffic ECMP

Spin your own

- Per-switch configuration
- Peer-group templates
- Common policy objects

Requirements

- Firmware: IOS XE 17.18+
- HW: C9500, C9300X, C9300, C9300L, C9300LM



BGP Config

Switching > BGP Routing

Create an ASN

BGP Routing

GeneralBGP FiltersASN

Autonomous System Numbers (ASN)

+ Add ASN

⚠️

ASNs can only be deleted once BGP routers have been removed. [How to remove BGP routers.](#)

ASN	Description	BGP routers	
65500		1	<div><div></div><div></div></div>

Rows per page101-1 of 11

BGP Routing

GeneralBGP FiltersASN

Create a BGP Router

BGP Routers ⓘ

+ Add router

	Switch name	Model	ASN ⓘ	Active peers	Advertised routes
<div><div></div>Enable</div>	Bob	C9300-24UX	65500	0	1...

Rows per page201-1 of 11

Enable BGP per switch

BGP Config

Route Filtering

Add prefix-list

Name

Restrict Advised Prefixes

Description (optional)

Rules

+ Add rule

Sequence #	Action	Prefix	GE	LE	
10	Deny	10.100.0.0/16	23		
20	Deny	10.101.0.0/16	24		

Cancel

Add

Prefix-lists

Add AS-path access-list

Number

10

Description (optional)

Rules

+ Add rule

Action	Path	
Deny	65100 65101 65328	

AS-path access-lists

Peering Config

Local Networks

Enable	Subnet	Description	
☒	10.255.255.255/32	BobLoop	<div></div>
☒	10.20.0.0/16	20 Network	<div></div>

BGP Peer Groups

Supports either an IPv4 or IPv6 address.

#	Name	Description	Neighbors Count	
1	WANGroup	WAN peer group	1	<div></div>

Peer Group Settings

Remote AS

65234

Update Source

Loop0

Multihop

255

Authentication

Enabled

Weight

32768

Peers

Active	Peer	Description	
☒	52.105.10.23	WAN SP1	<div></div>

Advertise local networks
Create Peer Groups
Attach Peers

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BRKENS-1402

Introducing support for StackWise Virtual from the cloud

Simplify configuration management by presenting two physical switches as one logical entity

Lower the risk associated with a looped topology while reducing operational failure points

Maintain HA with support stateful switch failover (SSO) by ensuring minimal downtime during failures or maintenance

Create Stack

Stack name
Hourglass Twins

Name
☒ Ash Twin
☒ Ember Twin

Configure your StackWise Virtual pair

To successfully provision Catalyst 9500 switches as a StackWise Virtual pair, select switch ports below to set up SVL and DAD links.

 Please ensure you have **physically connected** the ports selected below before proceeding

Stack name
Hourglass Twins

Members
Ash Twin , Ember Twin

SVL links

Select between 2 and 8 ports on each switch to establish the SVL link. Note that any existing switch port config will be overwritten for ports selected here.

Ash Twin

1 x 2 x

⇌

Ember Twin

1 x 2 x

DAD link

Select 1 port to establish the DAD link. Note that any existing switch port config will be overwritten for the port selected here.

Ash Twin

3

⇌

Ember Twin

3

☒ I acknowledge that by clicking 'Configure' I have physically connected the ports selected for SVL and DAD links.

Cancel Configure

Beta: IOS XE 17.18.1

StackWise Virtual Setup

Create Stack

Stack name

Hourglass Twins

Q Search

Device type

2 results

	Name	Serial number	Model
☒	Ash Twin	Q2ZZ-6SH4-2458	C9500-24Y4C
☒	Ember Twin	Q2ZZ-A22Z-2HL3	C9500-24Y4C

Rows per page 30 1-2 of 2 < 1 >

Cancel Create

Configure your StackWise Virtual pair

To successfully provision Catalyst 9500 switches as a StackWise Virtual pair, select switch ports below to set up SVL and DAD links.

Please ensure you have **physically connected** the ports selected below before proceeding

Stack name Hourglass Twins

Members Ash Twin , Ember Twin

SVL links

Select between 2 and 8 ports on each switch to establish the SVL link. Note that any existing switch port config will be overwritten for ports selected here.

Ash Twin

Ember Twin

1 × 2 ×

1 × 2 ×

DAD link

Select 1 port to establish the DAD link. Note that any existing switch port config will be overwritten for the port selected here.

Ash Twin

Ember Twin

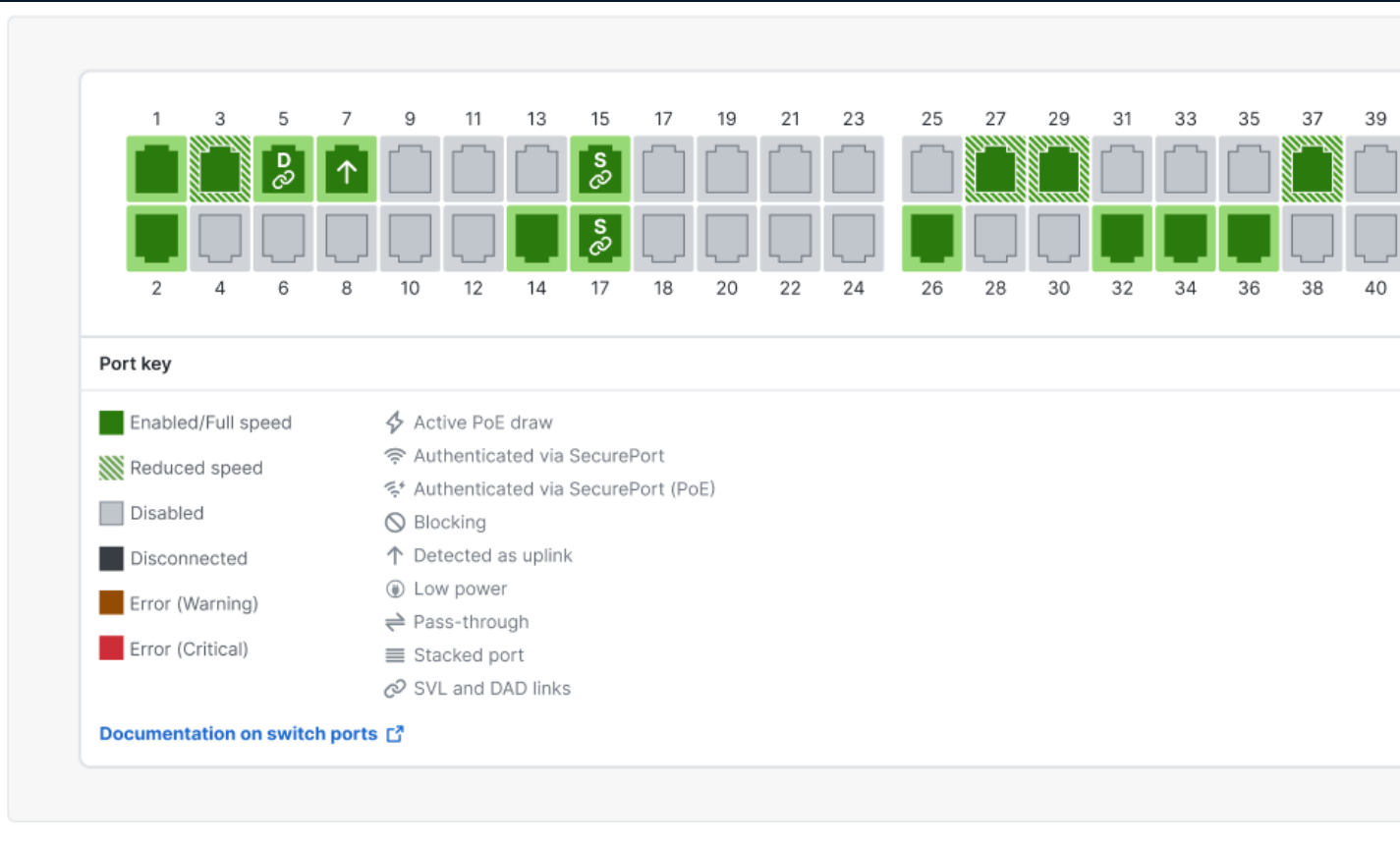
3

3

☒ I acknowledge that by clicking 'Configure' I have physically connected the ports selected for SVL and DAD links.

Cancel Configure

StackWise Virtual Config



StackWise Virtual Pair Provisioning

Monitor your new StackWise Virtual pair creation process.

Number of StackWise Virtual pairs being provisioned: 5

My SVL Stack

SVL domain configuration

Members [sfo12-4-1-sw-01-pdu](#), [sfo12-4-1-sw-01-pdu](#)

SVL links Port 1, Port 2

DAD links Port 5

Provisioning progress

1/4 SVL domain configuration

[Cancel provisioning](#) [Go to stack](#)

My SVL Stack 2

SVL and DAD link configuration

My SVL Stack 3

SVL and DAD link configuration

My SVL Stack 4

StackWise Virtual pair ready

Introducing In-Service Software Upgrades from the cloud

ISSU allows users to upgrade switch stacks while the network continues to forward packets

Minimize network disruptions and downtimes with simplified scheduling

Deploy new services and features faster with remote execution

The screenshot displays the Meraki management console interface. On the left is a navigation sidebar with categories like Global Overview, Organization (Meraki Launchpad), Network (Sao Paulo - Cloud Campus Fabric), Secure Connect, Network-wide, Assurance, Security & SD-WAN, Switching (highlighted), Wireless, Insight, Organization, Security (marked New), Automation, and Access Manager (marked New). The main content area is titled 'Staged upgrades' with tabs for 'Groups' and 'Sequence'. A modal dialog titled 'Schedule firmware change' is open, featuring a close button (X) in the top right. The dialog asks 'When should this firmware be installed?' and includes a note: 'Upgrade times may be staggered depending on the number of devices changing firmware.' It offers two options: 'Perform the upgrade now' (selected with a blue radio button) and 'Schedule the upgrade for:' (with an unselected radio button). The scheduling option includes a date field set to '03/28/2025', a time dropdown set to '11:00', and the text '(network local time)'. Below this, the 'ISSU' section explains that when enabled, the setting applies exclusively to eligible switches with StackWise Virtual pairs. The 'Attempt ISSU when available' checkbox is checked. At the bottom right of the dialog are 'Back' and 'Next' buttons.

Introducing Rapid Per-VLAN STP+ from the cloud

RPVST+ provides faster convergence to minimize downtime and ensure resilience in dynamic environments

Allows efficient load balancing across multiple different VLANs

Critical for maintaining stable L2 topologies in dense campus deployments

Switch settings

VLAN configuration

Management VLAN

STP configuration

☒ Enable Rapid Spanning Tree (RSTP)

STP bridge priority

Switches/Stacks	Bridge priority
Default	32768

[+ Set the bridge priority for another switch or stack](#)

Quality of service

#	VLAN	Protocol	Source port	Destination port	Trust incoming DSCP
---	------	----------	-------------	------------------	---------------------

STP configuration

STP configuration mode

☒ Enable Spanning Tree

Select Spanning Tree mode for Catalyst switches:

☐ Enable Multiple Spanning Tree (MST)

☒ Enable Rapid per-VLAN Spanning Tree (RPVST+)

i Operating network with a mix of RPVST+ and RSTP may cause unexpected issues, please refer to [Documentation](#) for best practices for operating mixed STP environments.

☐ Disable Spanning Tree

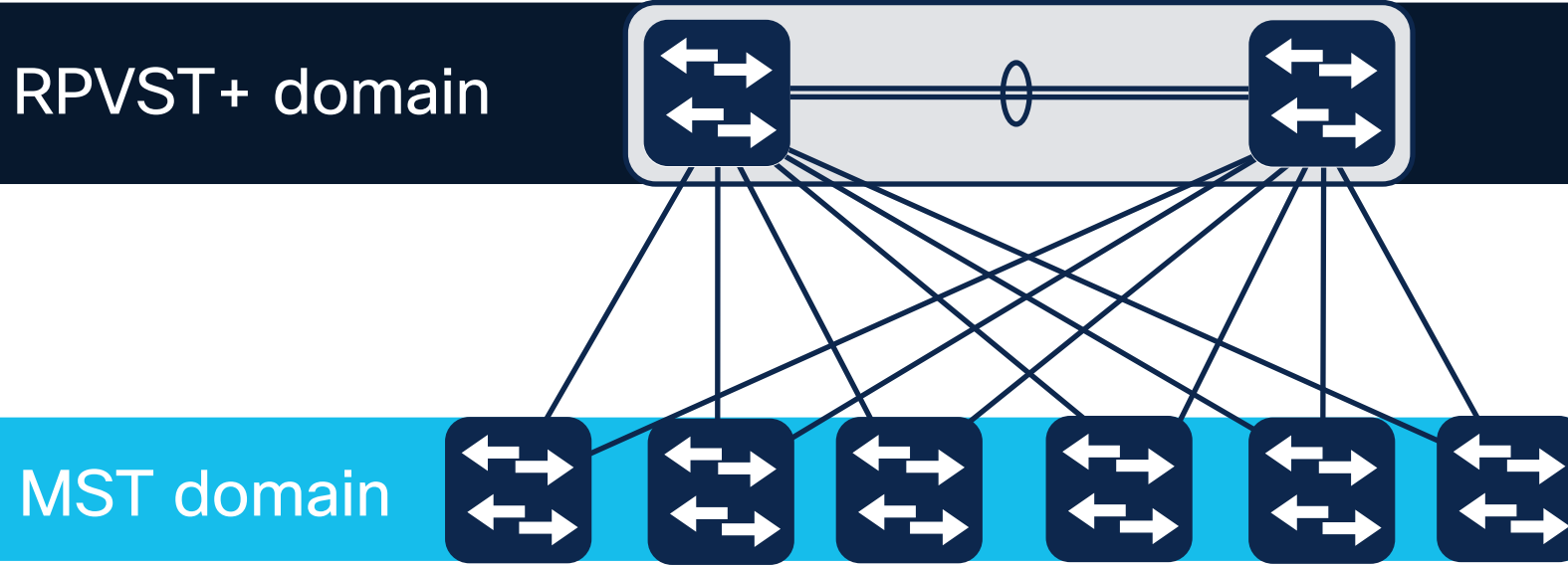
STP bridge priority

Switches/Stacks	Bridge priority	VLAN list	Actions
Default	32768		
Rocky_and_Bullwinkle	8192	1-4094	edit delete

[+ Set the bridge priority for another switch or stack](#)

Beta: IOS XE 17.18.1

Mixed Spanning-tree Versions



Rules of MST PVST+ interaction

- If the MST bridge is the root, this bridge must be the root for all VLANs
- If the PVST+ bridge is the root, this bridge must be the root for all VLANs (this includes the CST, which always runs on VLAN 1, regardless of the native VLAN, when the CST runs PVST+)
- The simulation fails and produces an error message if the MST bridge is the root for the CST, while the PVST+ bridge is the root for one or more other VLANs. A failed simulation puts the boundary port in root inconsistent mode.

REF: [*Understanding Multiple Spanning Tree Protocol \(802.1s\)*](#)

VLANs and PVST+ Instances

Time to use VLAN Database

Cloud-managed switches start with max supported active VLANs

- Catalyst 9300 = 1000
- Catalyst 9200 = 512

Catalyst switches can't run that many PVST+ instances

- Catalyst 9300 max 300 PVST instances
- Catalyst 9200 max 128 PVST instances
- Max 13000 STP Virtual ports*

VLAN profiles

Edit profile

Profile name

Building 12 VLANs

Iname

bldg12

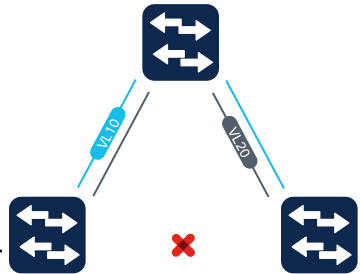
Active VLANs

1,4-8,10,20,30,33,80,100-102,106

The secret to a happy life is pruning unneeded VLANs

*STP virtual ports = trunks * active VLANs on trunk + number of non-trunk ports.

RPVST+ Config



Switching > Switch Settings

STP configuration

STP configuration mode

- ☒ Enable Spanning Tree
- Select Spanning Tree mode for Catalyst switches:
 - ☐ Enable Multiple Spanning Tree (MST)
 - ☒ Enable Rapid per-VLAN Spanning Tree (RPVST+)

i Operating network with a mix of RPVST+ and RSTP may cause unexpected issues, please refer to [Documentation](#) for best practices for operating mixed STP environments.

- ☐ Disable Spanning Tree

STP bridge priority ⓘ

Switches/Stacks	Bridge priority	VLAN list	Actions
Default	32768		
Rocky_and_Bullwinkle	8192	1-4094	

[+ Set the bridge priority for another switch or stack](#)

Set the STP mode for the entire network

Set bridge priorities per switch & VLAN

VRRP

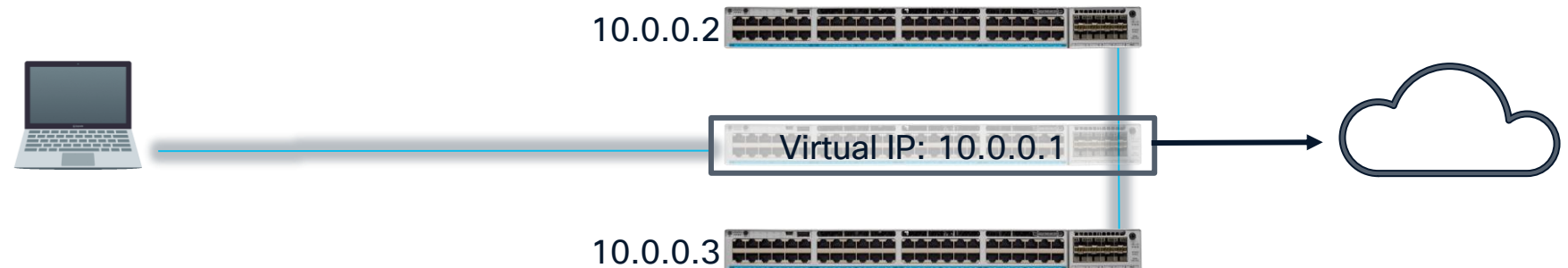
Flexible, interoperable HA

**Coming 17.18.2*

- 1 Create/Edit a Layer3 SVI on each switch
- 2 Enable "VRRP" for IPv4 or IPv6
- 3 Configure both switches with matching Group-ID and VIP
- 4 Assign Priority to control Active

High Availability (VRRP)	
☒	Enabled
Virtual IP	
10.0.40.1	
Priority	
Custom	
Custom priority	
155	
Group ID	
120	

- IPv4 and IPv6 Support
- Per-Interface Control
- Compatible with OSPF/BGP/VRF
- Standards-based compatibility



Additional **cloud** **features** now available on Catalyst 9000

Standardize and simplify configuration management by predefining port profiles with SmartPorts

Reduce time spent on PCAP analysis by remotely scheduling captures with Intelligent Capture

View statistics and receive alerts for critical system resources with Device Health support

View statistics relative to Device Uptime including time online, last boot, and last boot reason.

Support for Digital Optical Monitoring to enable real-time monitoring of fiber optic transceivers

SmartPorts

Profiles Automations

Q Search All 7 Results

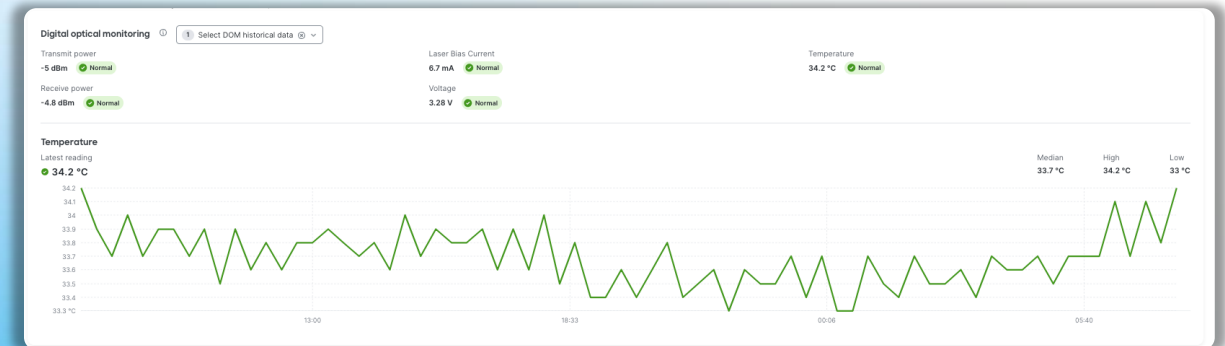
Profile name	Date created
Cameras	June 01, 2023 09:06 AM
Servers	August 02, 2023 12:08 PM
Printers	August 09, 2023 01:08 PM

Intelligent Capture For access points

New capture **Stored captures** Proactive PCAP Enablement

New in Dashboard: Proactive Packet capture enables automated packet capture upon any wireless connection failure. Click [here](#) to enable.

Time	Name	Access Points	User	Status	Source	Client	Packet Count	Step	Reason	Notes	File size	Analyze	Action
Jan 24, 04:55 PM	Cisco CE A_2025-01-24T16:54:31	Front Coffee House	Cisco Admin	Saved to cloud	Manual					Customer WiFi Issues 2	7.0 kB	View report	...
Jan 24, 04:52 PM	Cisco CE A_2025-01-24T16:52:02	Front Coffee House	Cisco Admin	Saved to cloud	Manual					Customer WiFi Issues	0.6 kB	View report	...



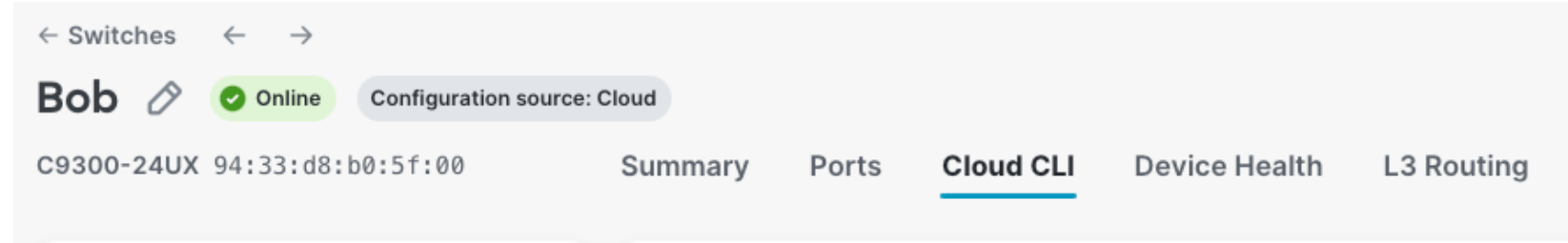
Beta: IOS XE 17.18.1

Cloud CLI

CLI configuration for cloud config switches*

Supported Features

- EIGRP
- BFD for OSPF or EIGRP
- Advanced QoS Policies
- PTP
- MACSec



In Dashboard or via API

Safety Features

- If NexTunnel goes down for ten minutes, config updater will roll back to the safe config
- Full system reset will restore safe config
- Review CLI configurations with config archive log

```
Welcome to the interactive CLI IOS XE terminal
Verifying your device configuration. Please wait...Done
You are in Configuration Mode
All configuration commands are logged as user brennan@ehframes.ca

Establishing connection to your device. Please wait...
Connection established successfully

Bob#config t
Enter configuration commands, one per line. End with CNTL/Z.
Bob(config)#ptp mode transparent
```

*Coming Q1 CY 2026, Supporting C9300/MS390 running 17.18+

Designing Switching Cloud Architectures

Enterprise Campus

Campus Core

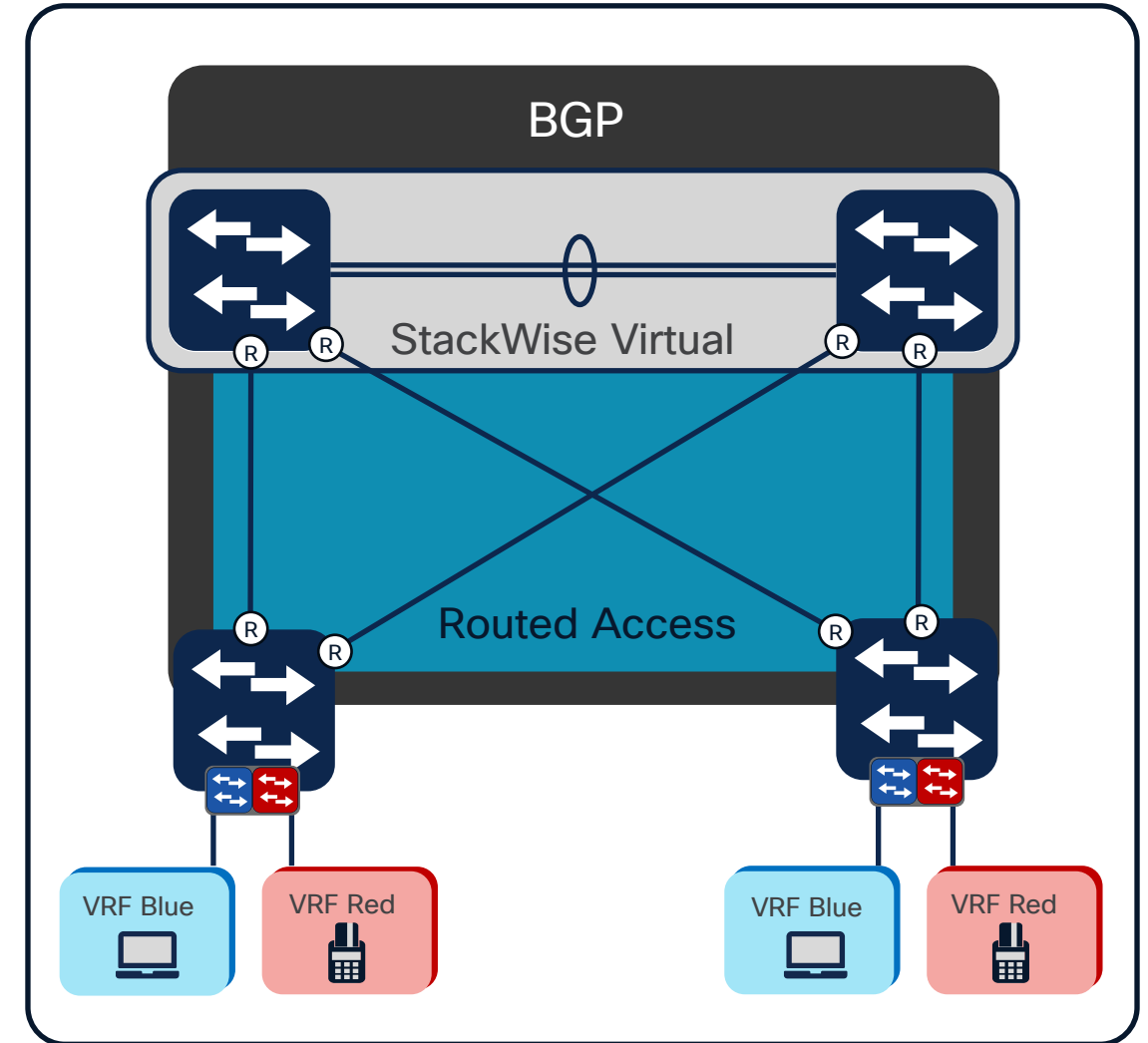
Low-latency, high-availability

Core-Access Interconnect

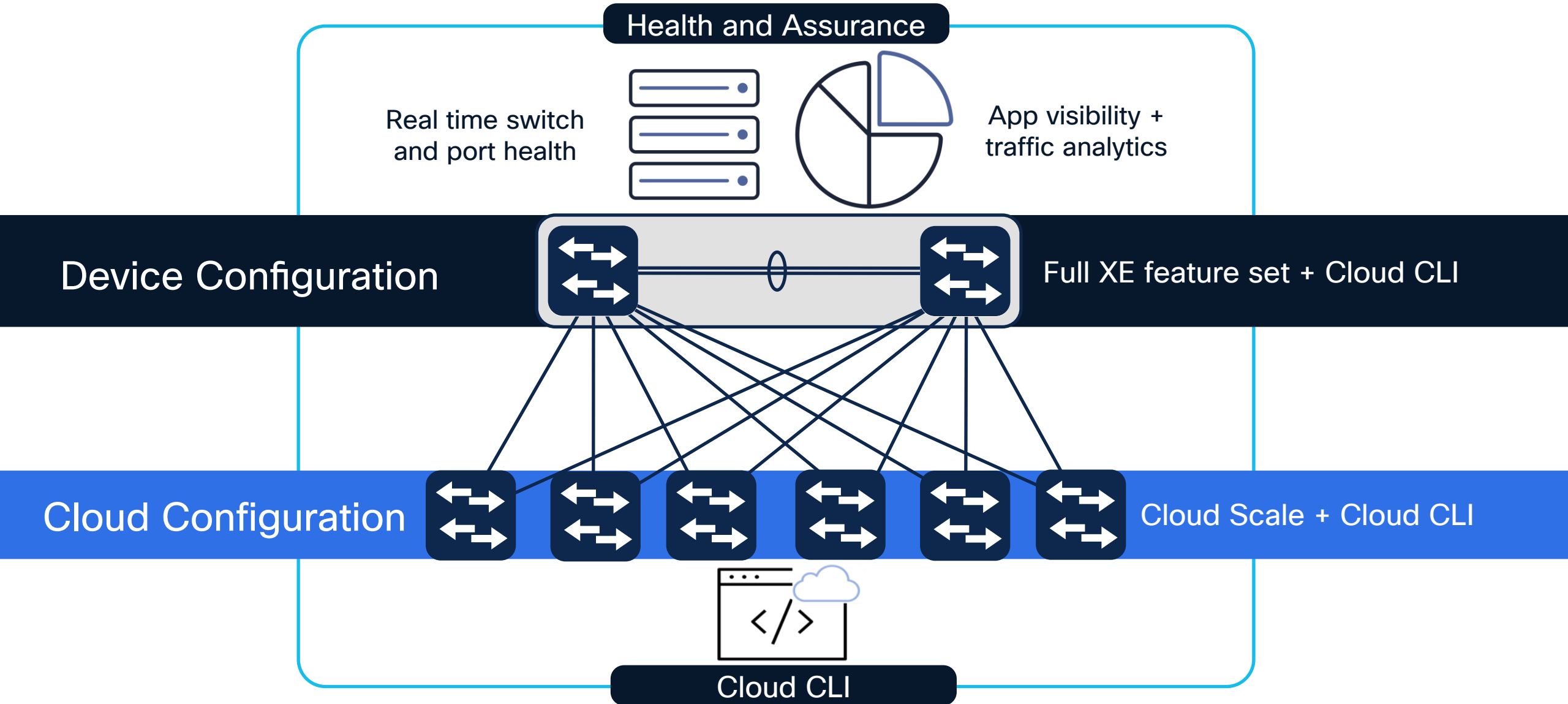
L3 routed access, limited STP
RPVST+ is still common

Campus Access

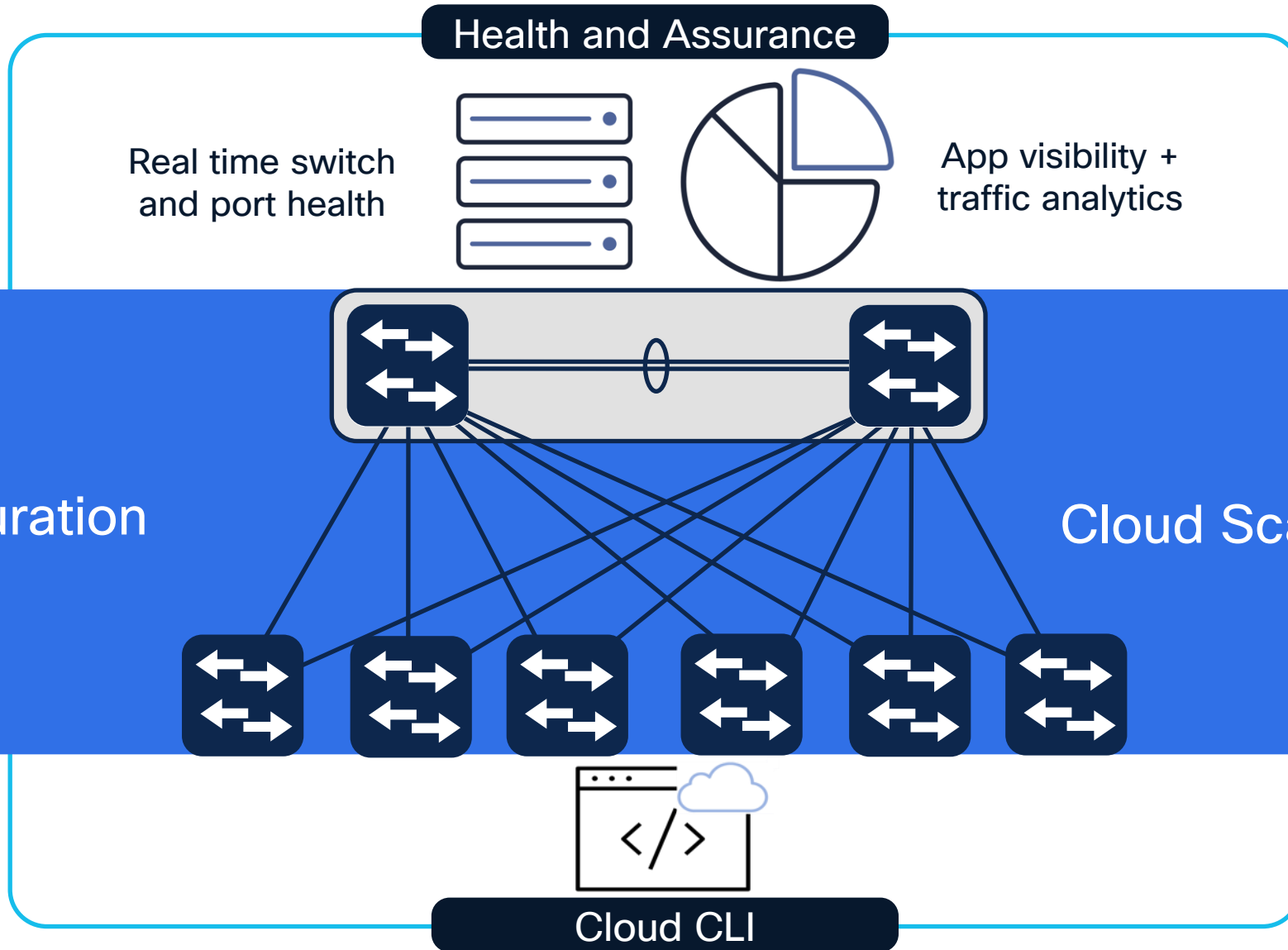
VRF segmented access layer
RPVST+ is common



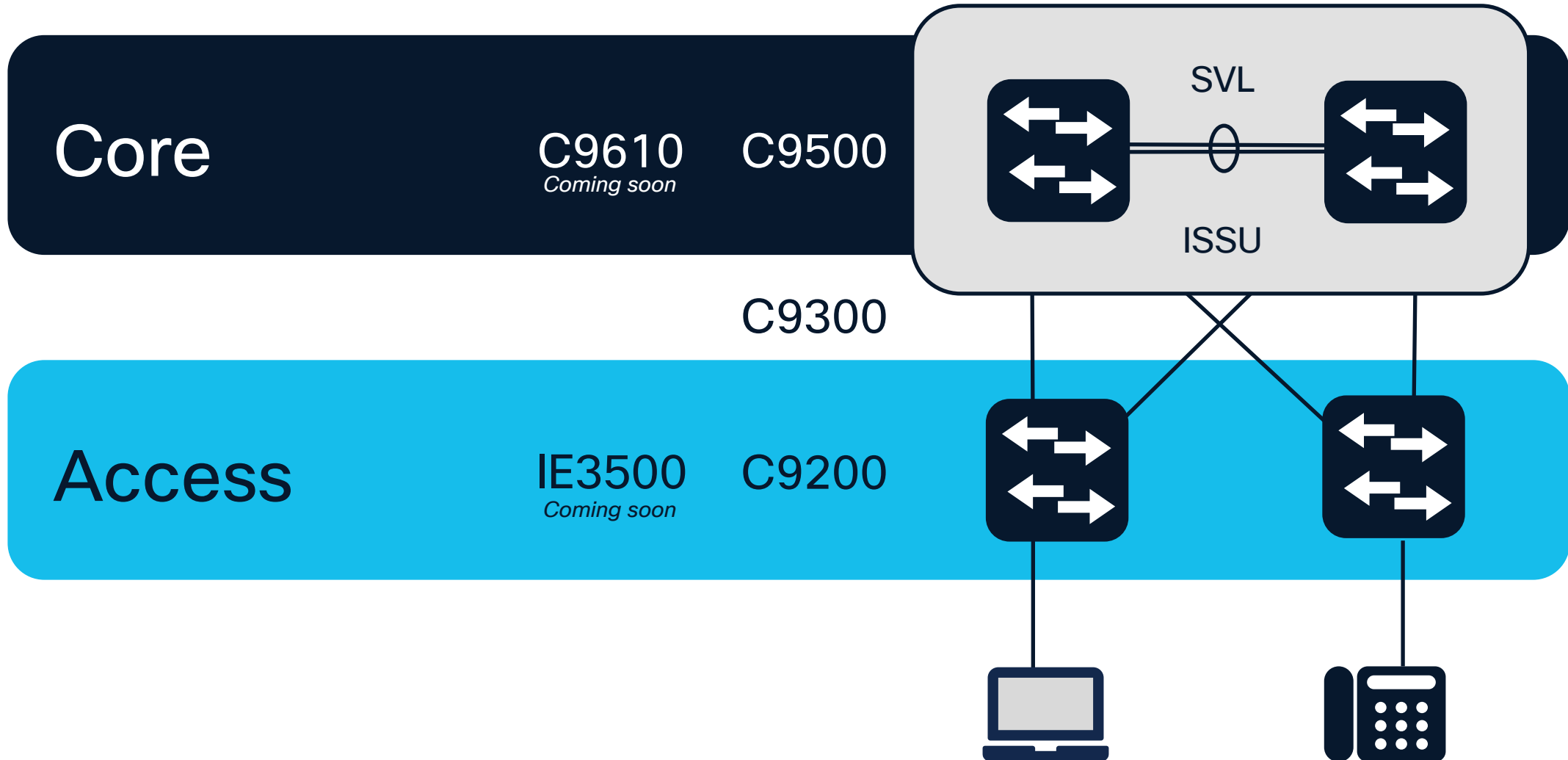
Choose Mixed Device and Cloud Config



Or Choose Full cloud config



Choose Cloud Supported Core and Access Platforms



Designing for the Multi-tier Enterprise

Advanced Routing

Routed Ports

Loop-free routed access

VRF Lite

Scalable macro segmentation

BGP

Flexible, open dynamic routing

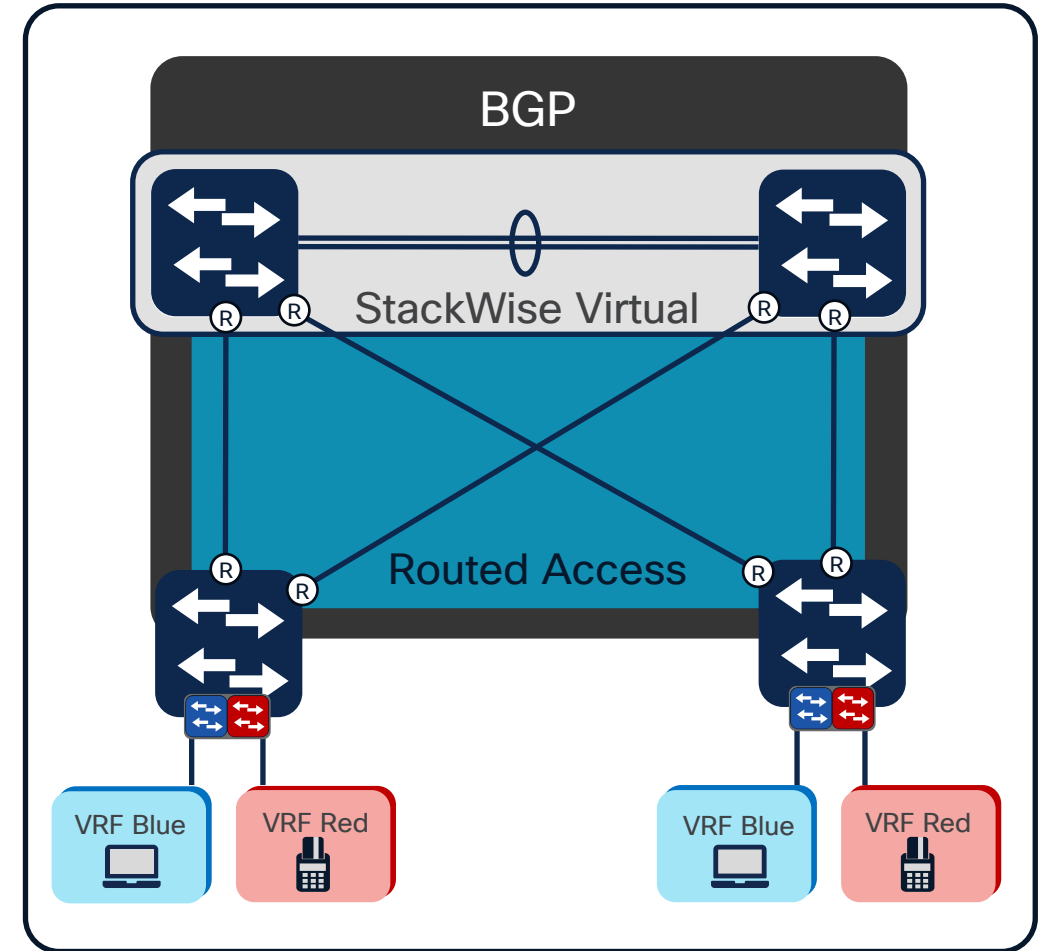
High-Availability

Rapid PVST+

Enhanced L2 loop prevention

StackWise Virtual (SVL)
ISSU

Sub-second downtime
firmware upgrades



Designing with Advanced L3

Use Routed Ports to

Leverage Layer 3:

- Limit spanning-tree issues
- Smaller broadcast domains
- Faster Convergence
- Fewer VLANs

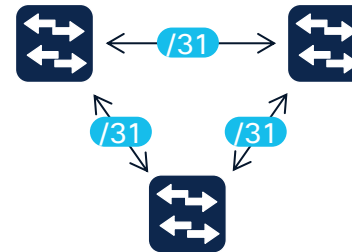
Use VRF for

- Simple Macro Segmentation
- Separate IT and OT

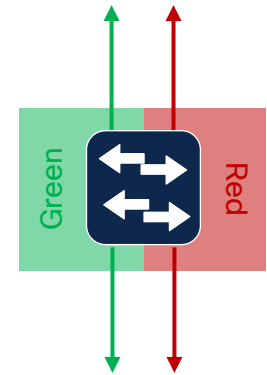
Use BGP for

- Highly Flexible Reachability
- Peering with edge firewall
- Large Campus Route Reflector

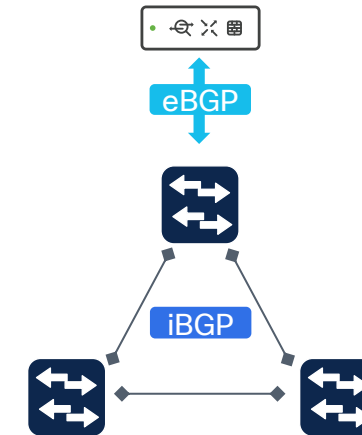
Routed Interfaces



VRF Lite



BGP



Designing for High Availability

Use Stackwise Virtual and ISSU

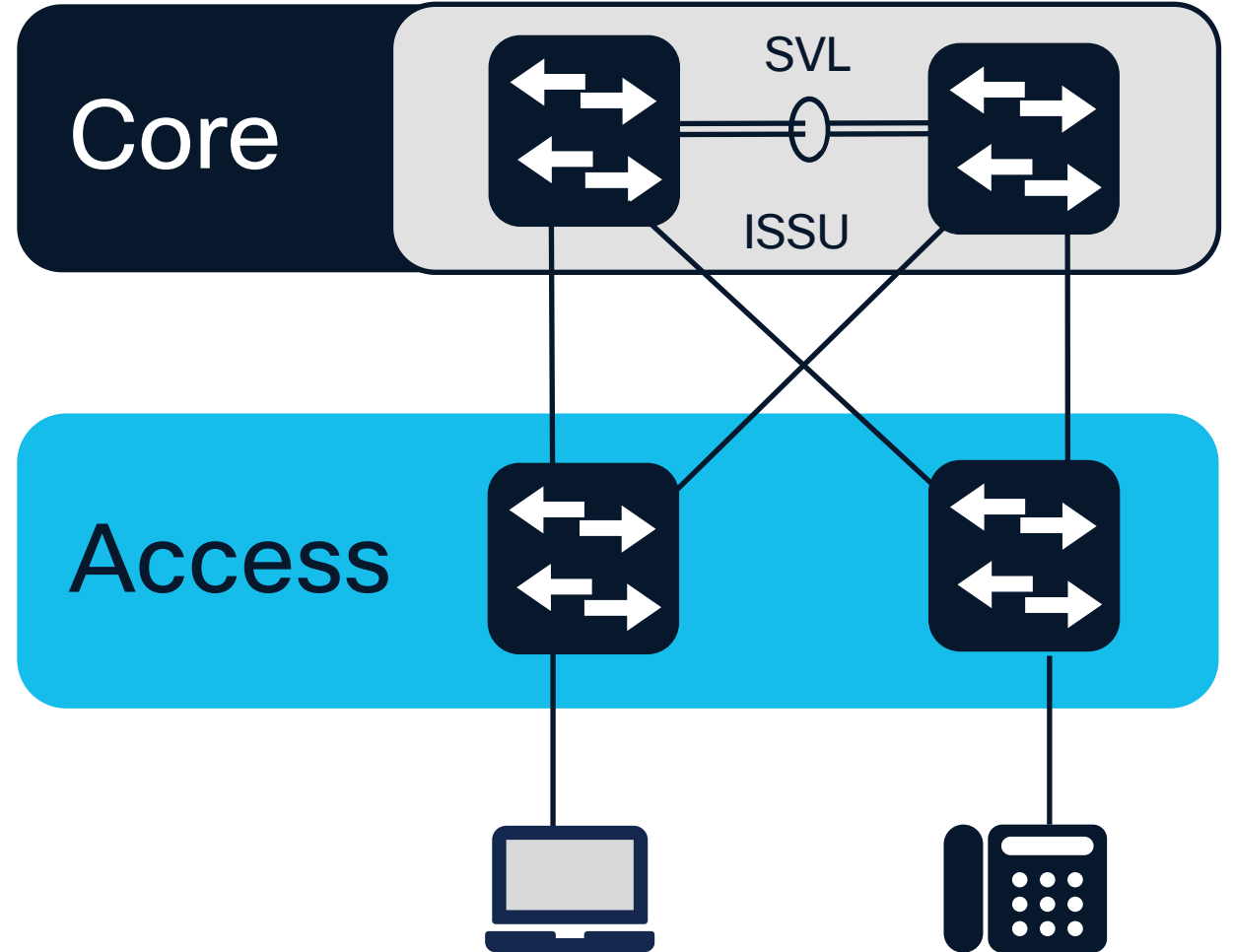
- To have sub-second downtime at the core when performing firmware upgrades

Use Staged Upgrades

- To roll incremental upgrades across a campus network:
 - Building by building
 - Floor by floor
 - Custom groupings

Use RPVST+ for

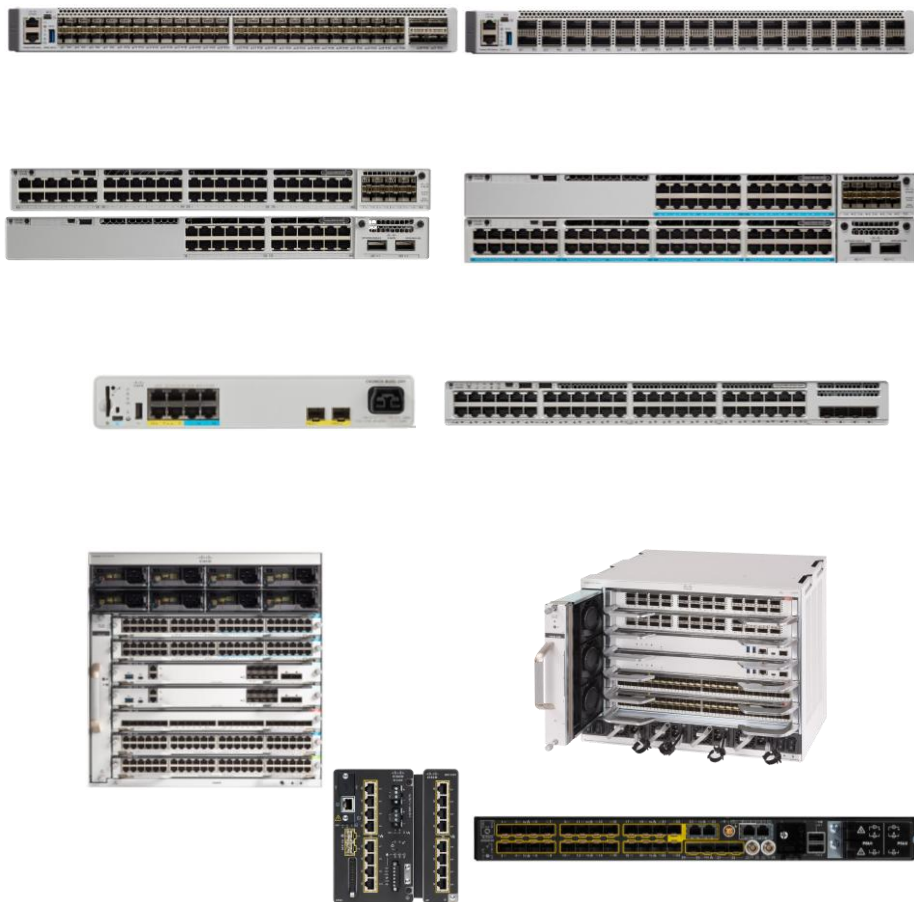
- Interoperability with all Catalyst based platforms
- Per-VLAN high availability



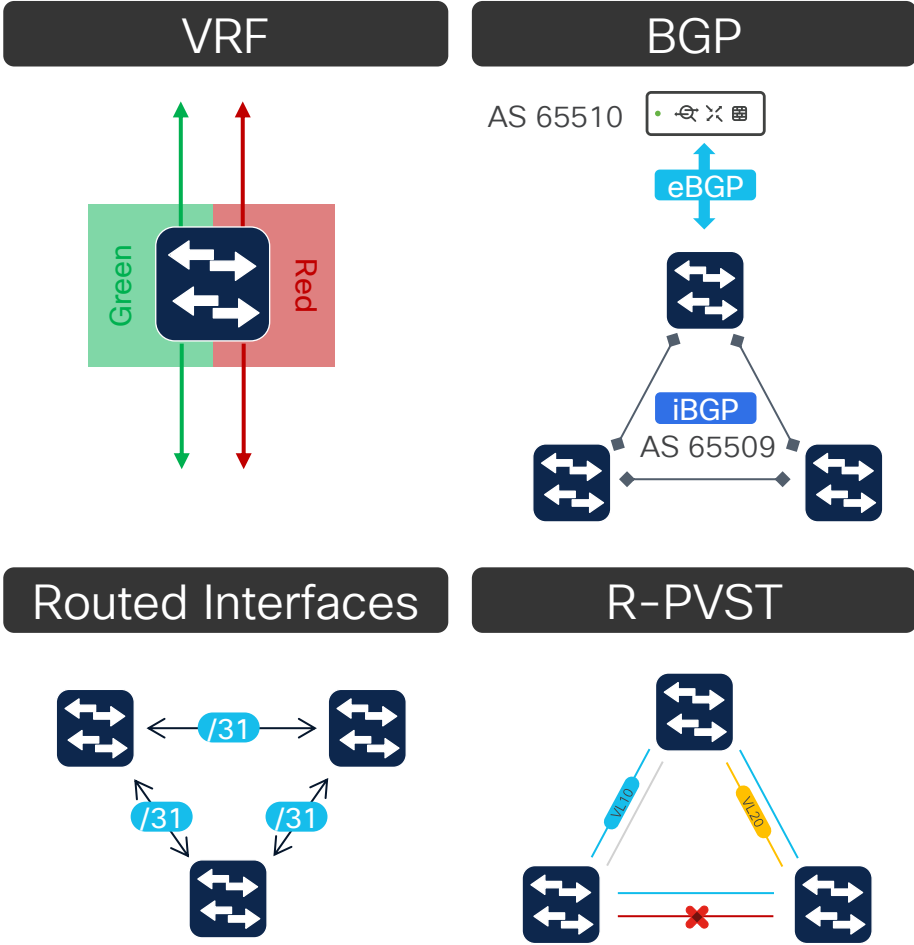
How do we maintain cloud simplicity at scale?

We have been accelerating feature development...

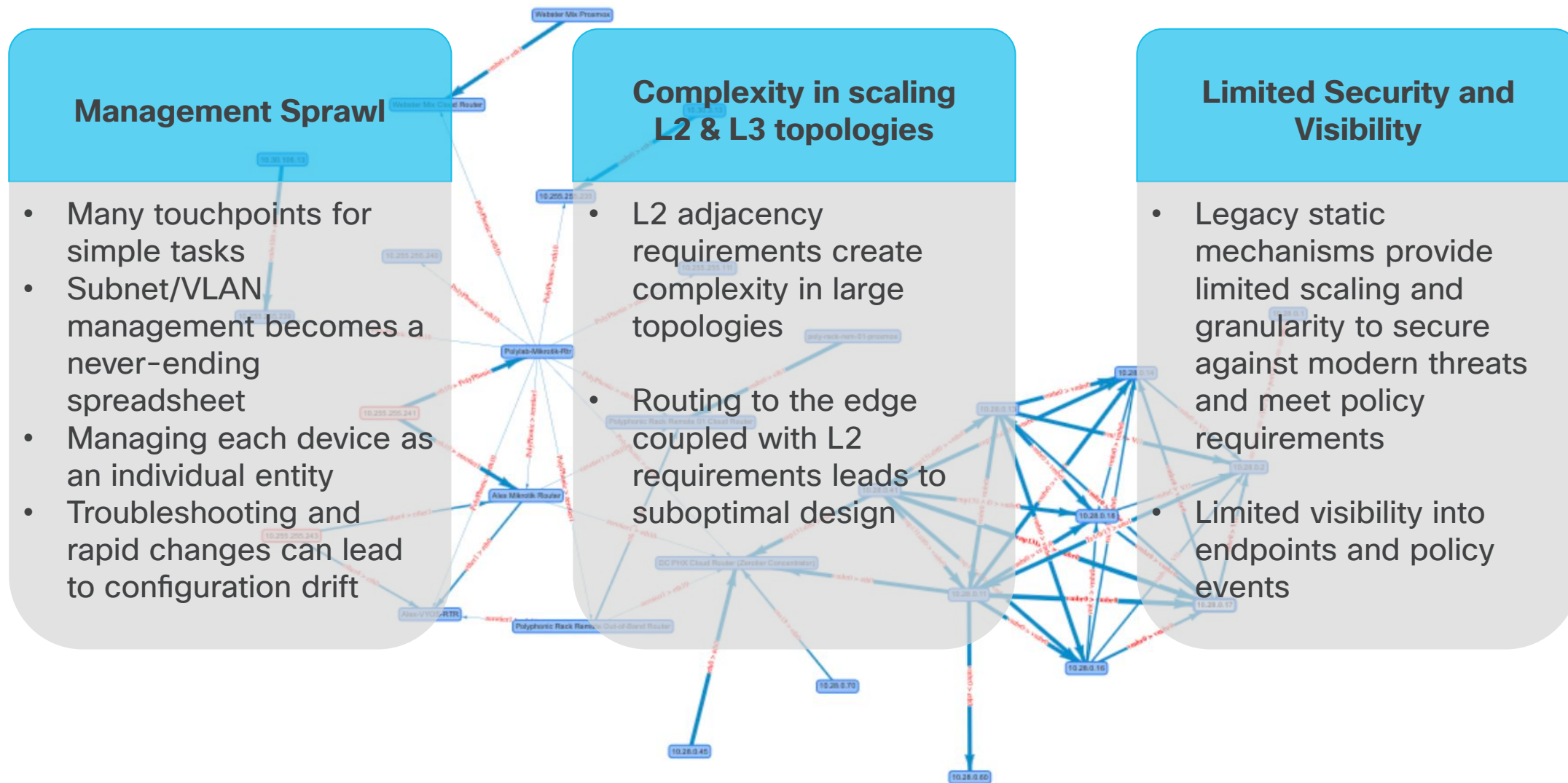
Platform Enablement



Enterprise Feature Development



The challenge with operating traditional networks

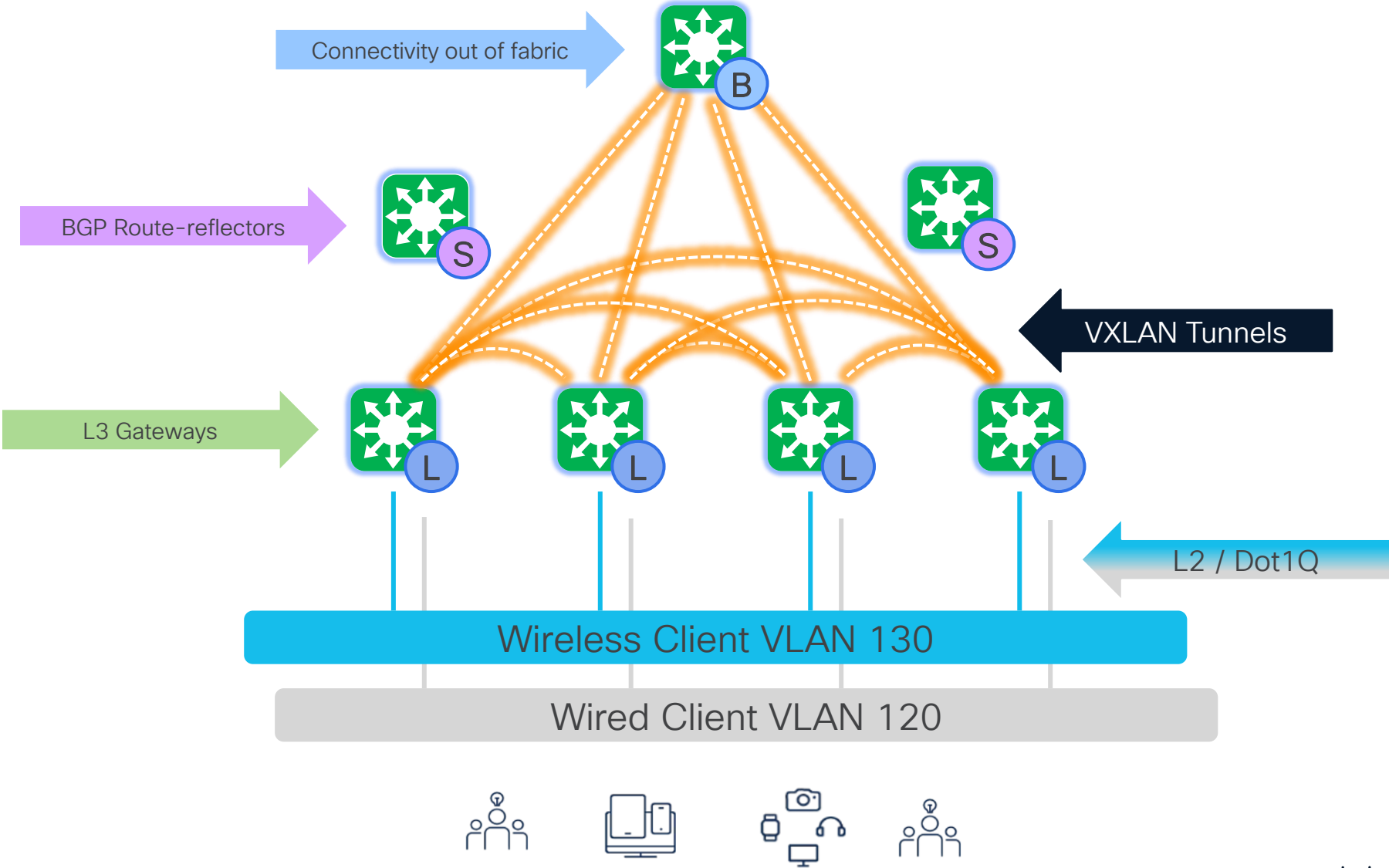


What if, instead of configuring devices...

We configure the network?

Introducing Cloud Fabric

- BGP Control Plane
- VXLAN overlay between fabric nodes
- Distributed anycast gateway for IP mobility
- Common L2 south of the anycast gateway



Cisco Cloud-Managed Campus Fabric

Multi-Network Cloud-Managed EVPN-VXLAN Fabric



Simplified management as a single logical entity



Focused on brownfield migration



Flexible deployment and staging



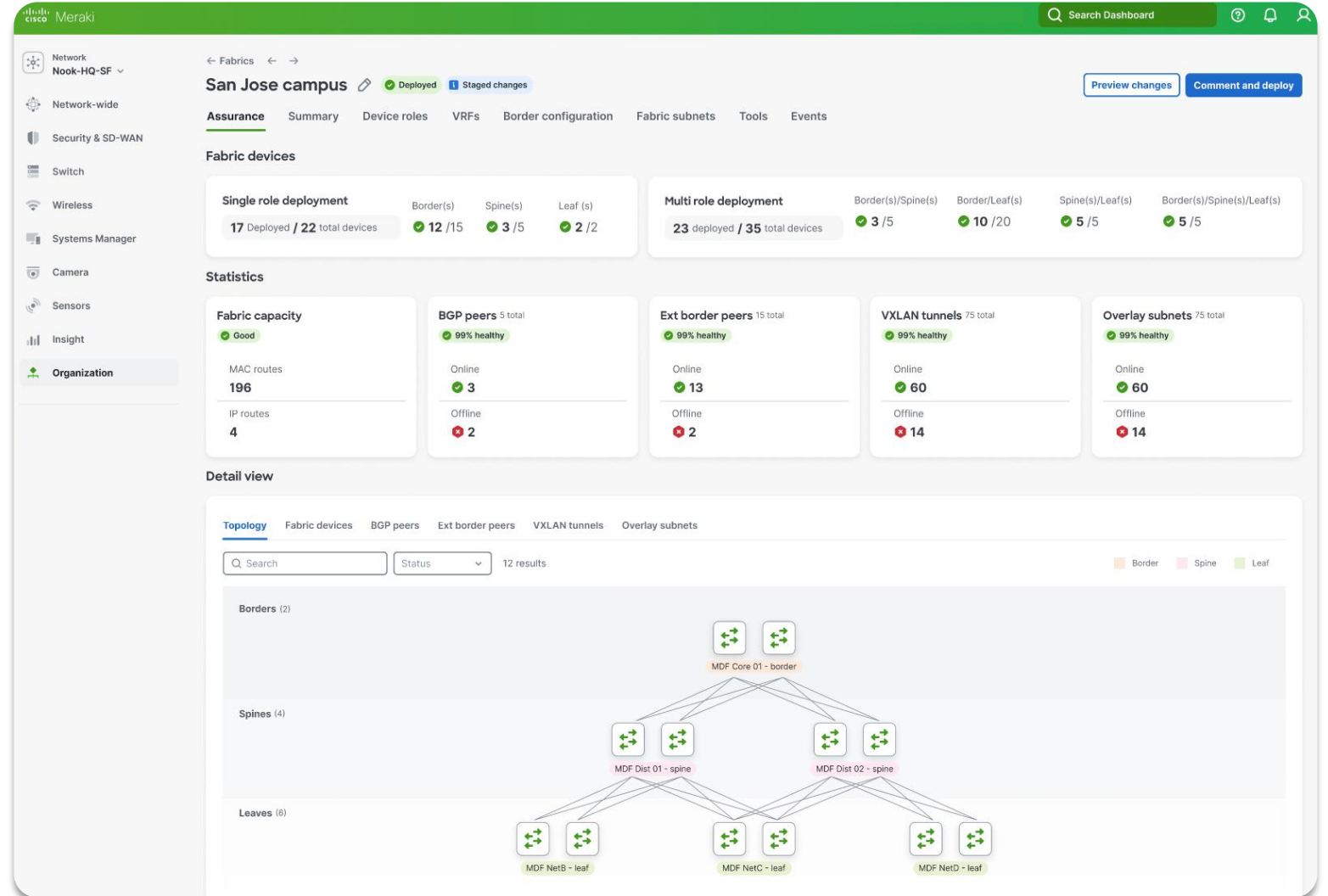
Securing the network with Adaptive Policy



Optimized L2 extension

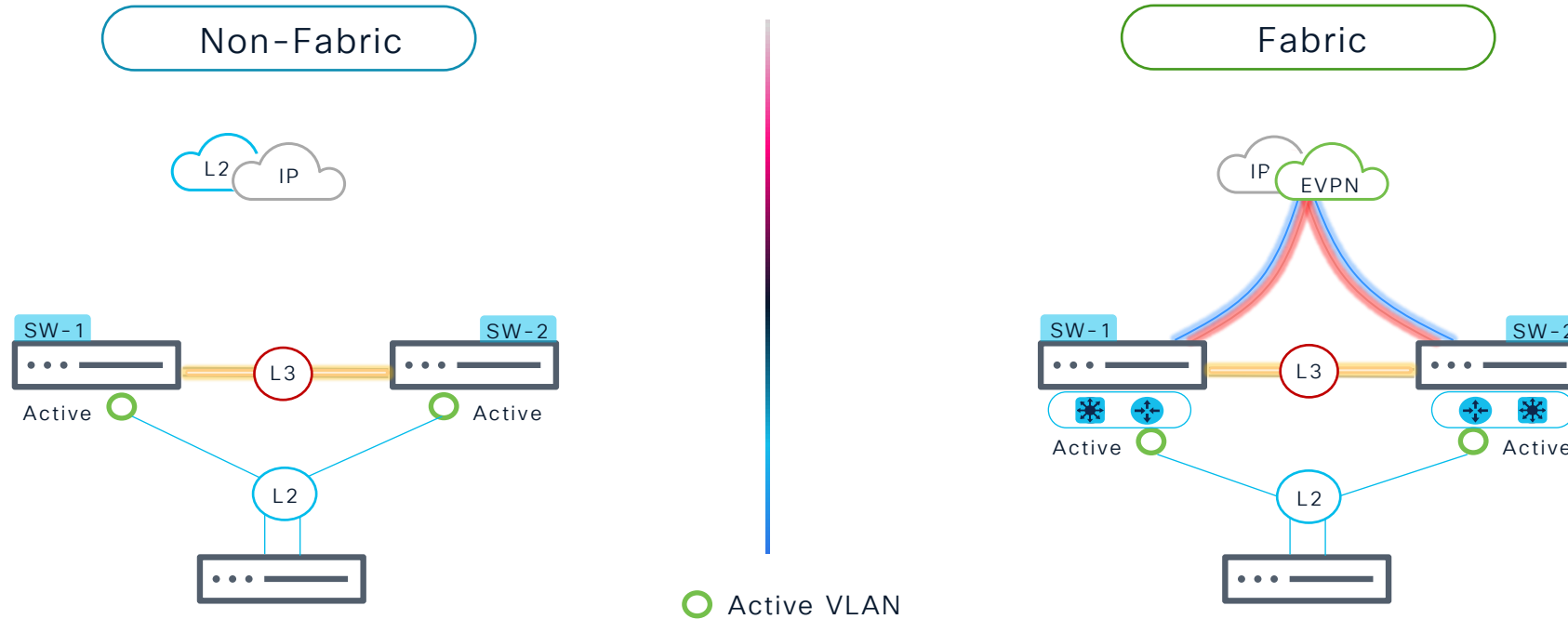


Day-2 Operational Assurance



EVPN-MH (Multihoming) for Fabric & Non-Fabric

Enable Active-Active redundancy for Firewall, WLC or Access layer



WLC HA



Firewall HA

2X performance, high availability and scale

for transition path from FHRP to EVPN Multihoming

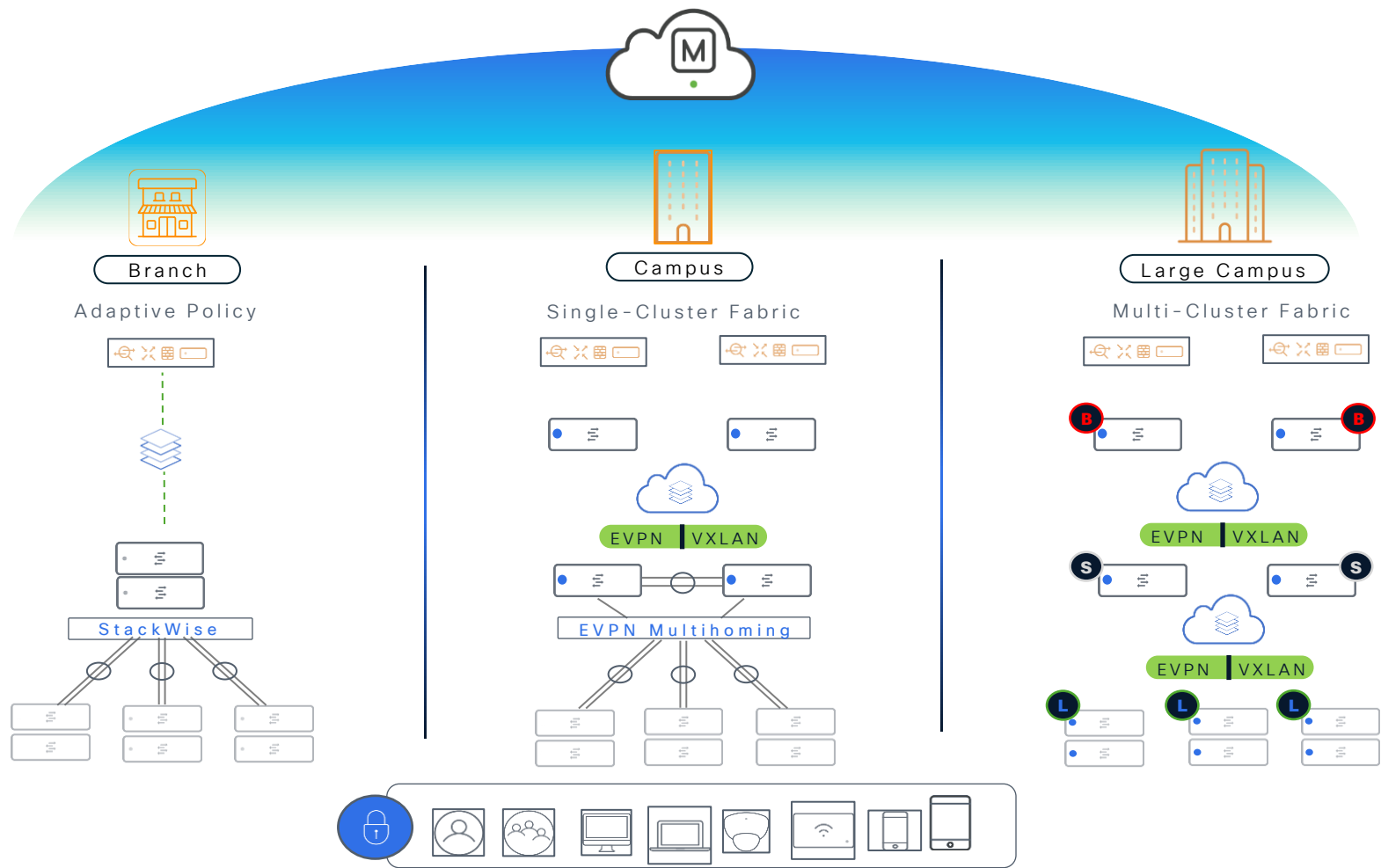
Flood free Access

L2 multipath solution for traditional IP / non-fabric networks

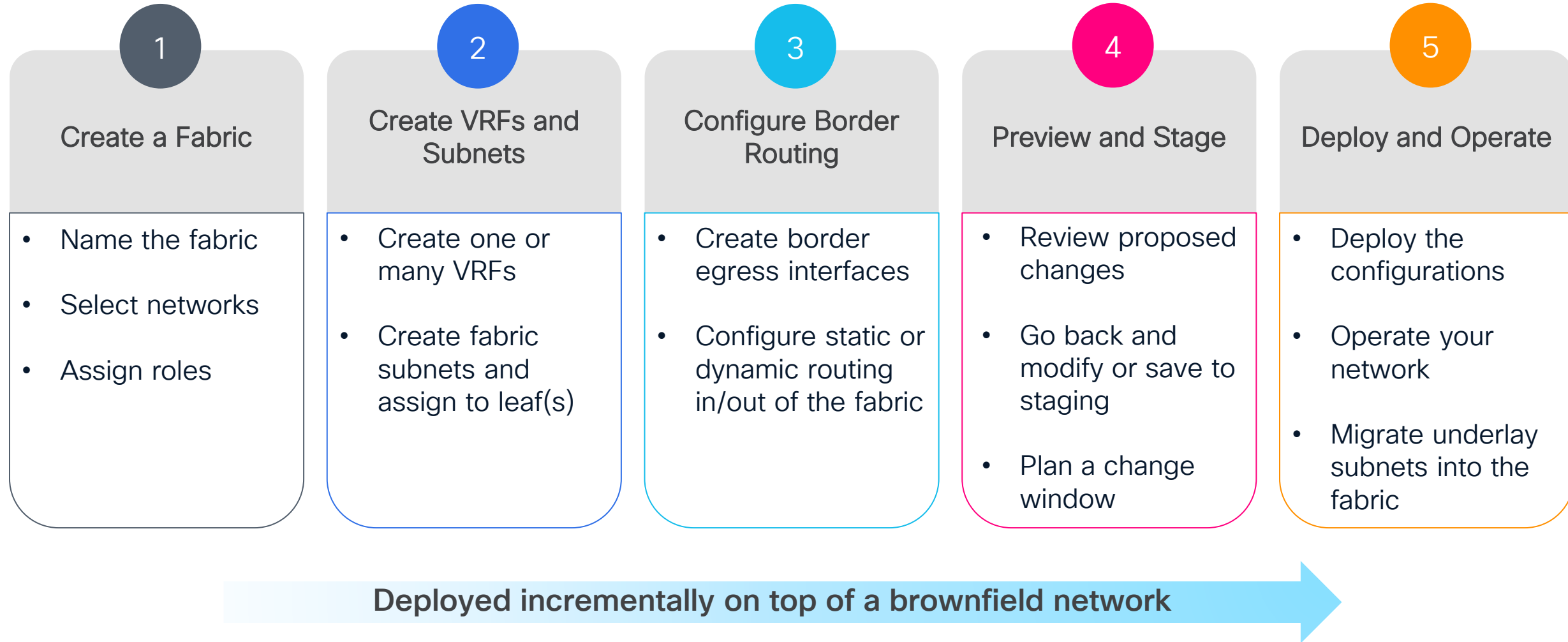
Extensive security

with Layer 3 segmentation and Layer 2 extension with EVPN fabric

Fabric Deployments Options



Simplified Deployment In 5-Steps



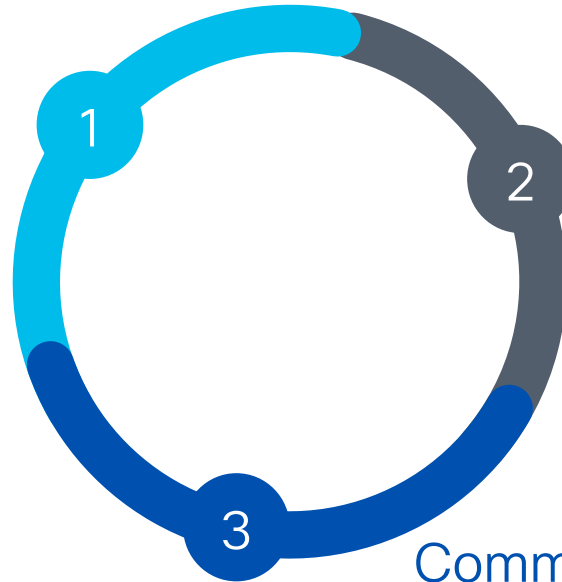
Controlling deployment with configuration staging

Stage first to
Reduce time spent
during change windows

- Allow more time for validating changes
- Reduce the window needed
- Track historical changes made

Update Configuration

- Add/Remove/Modify
 - fabric nodes
 - Subnets
 - VRFs
 - Border Configurations



Stage and Review

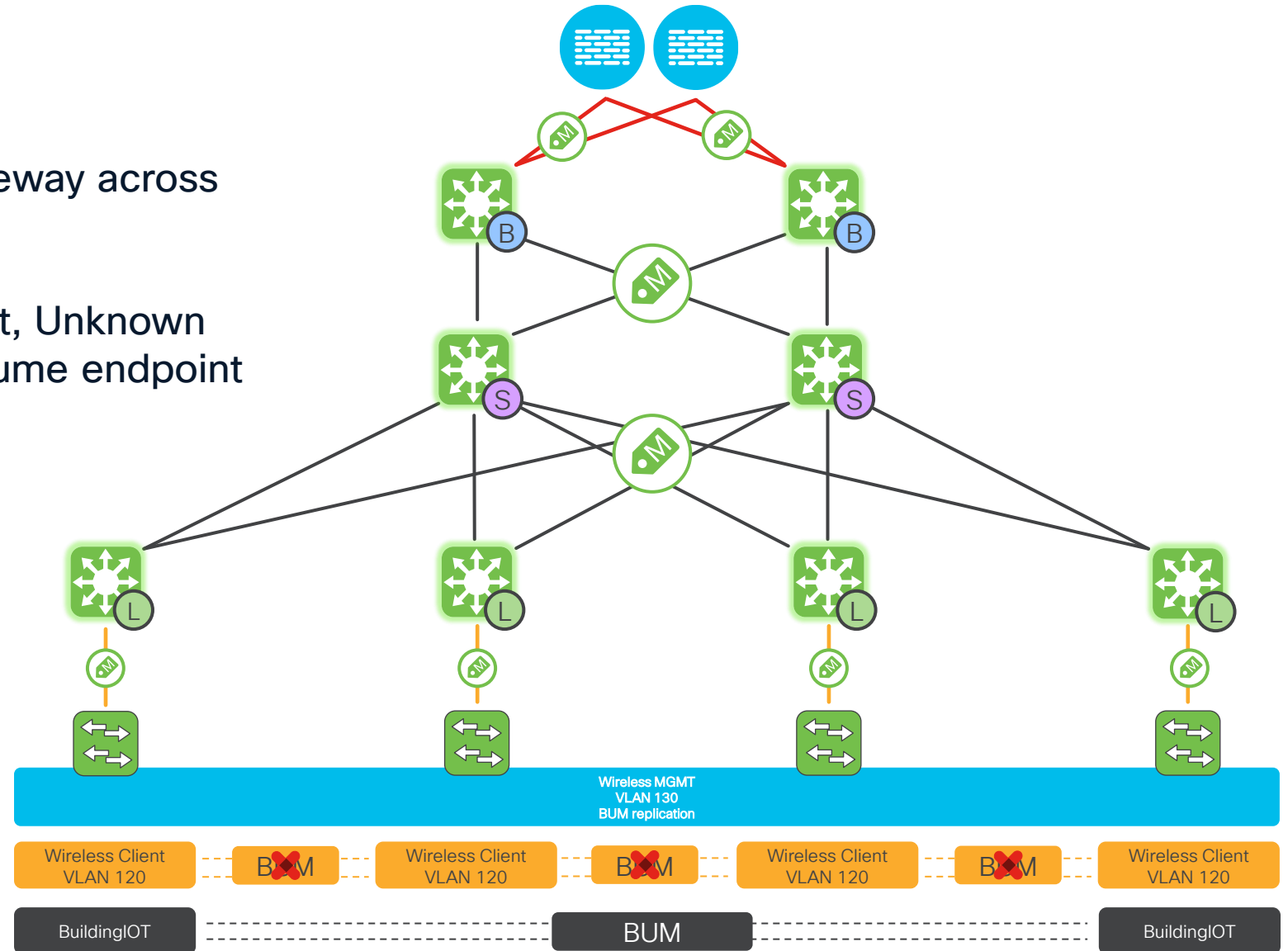
- Stage the configuration in advance
- Review with team
- Follow change control processes

Comment and Deploy

- Wait until planned change window
- Add any notes/comments
- Deploy the configuration to the fabric

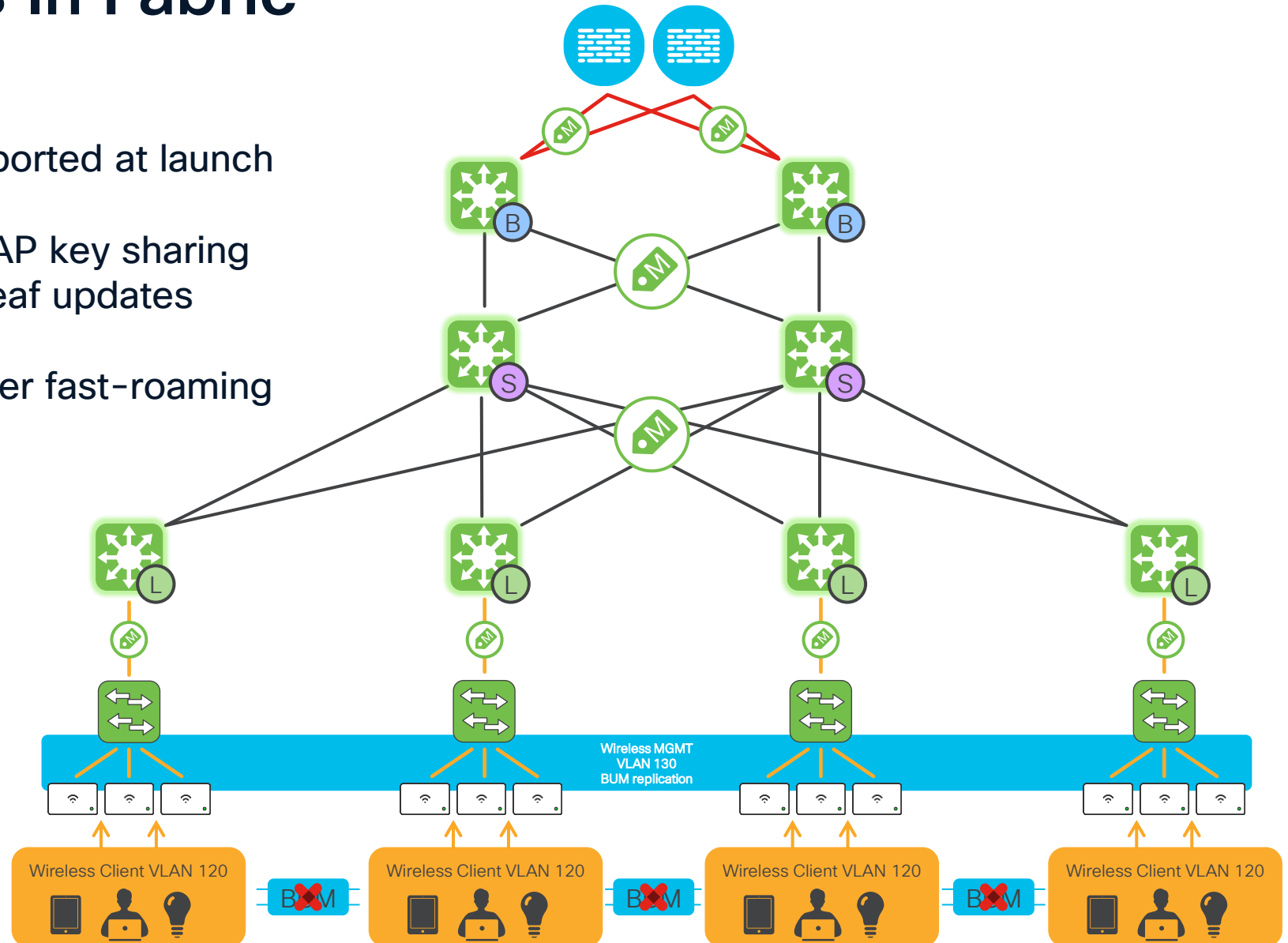
Efficient Scaling with Distributed Anycast Gateways (“DAG”)

- Deploy a subnet as an anycast gateway across all or a subset of leaves
- Suppress propagation of Broadcast, Unknown Unicast, and Multicast for high-volume endpoint subnets
- Fabric Subnet Types
 - Routed Subnet (Single Leaf)
 - DAG Routed (Distributed L3)
 - DAG Bridged (DAG + Bridged)



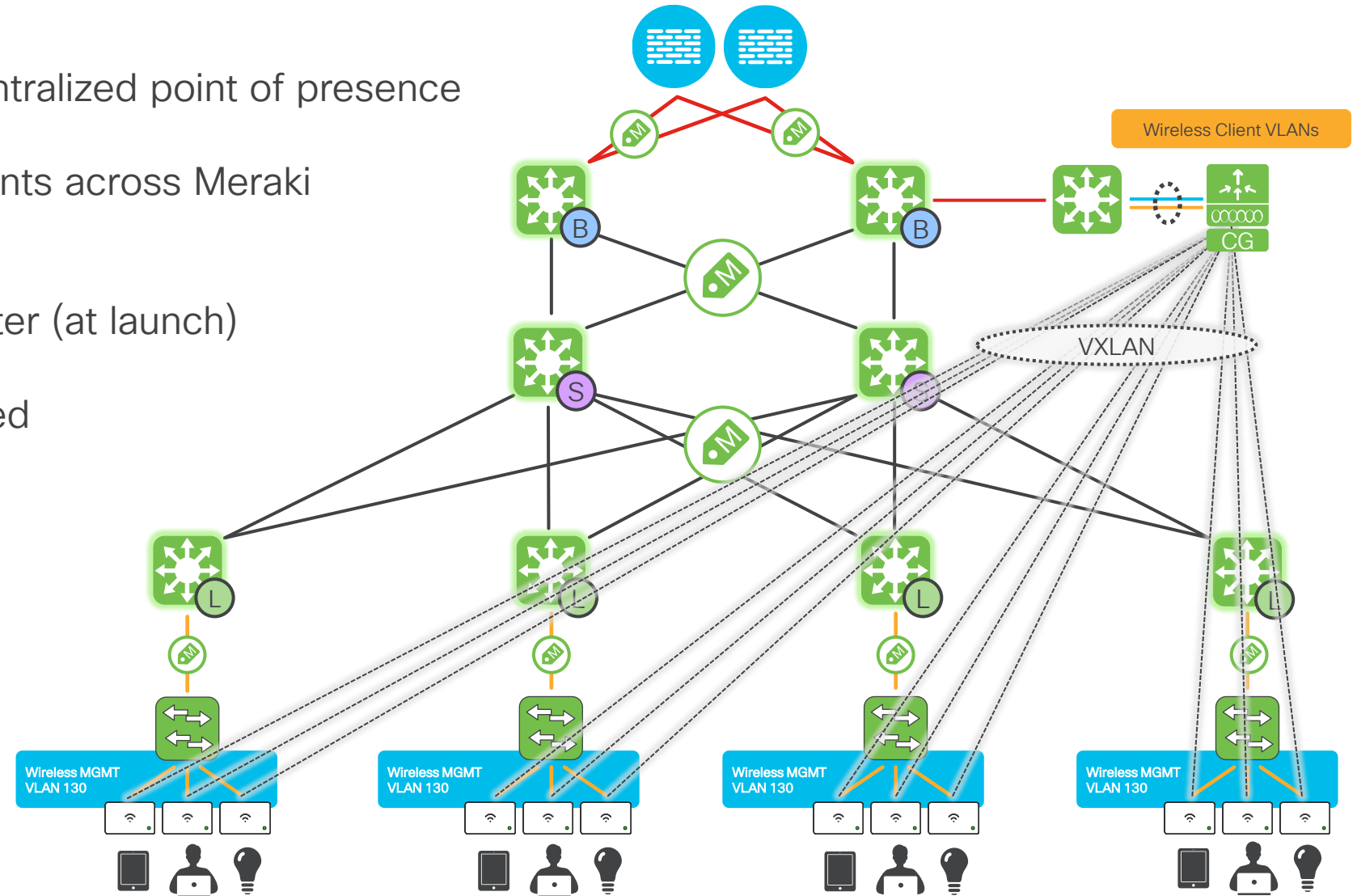
Distributed Wireless In Fabric

- L2 handoff (bridge mode) supported at launch
- Support for fast roaming with AP key sharing and magic ARP for proactive leaf updates
- Scaling up to 1k APs at MVP per fast-roaming domain (Meraki network)
- Adaptive Policy Supported (micro-segmentation)



Wireless Campus Gateway with Fabric

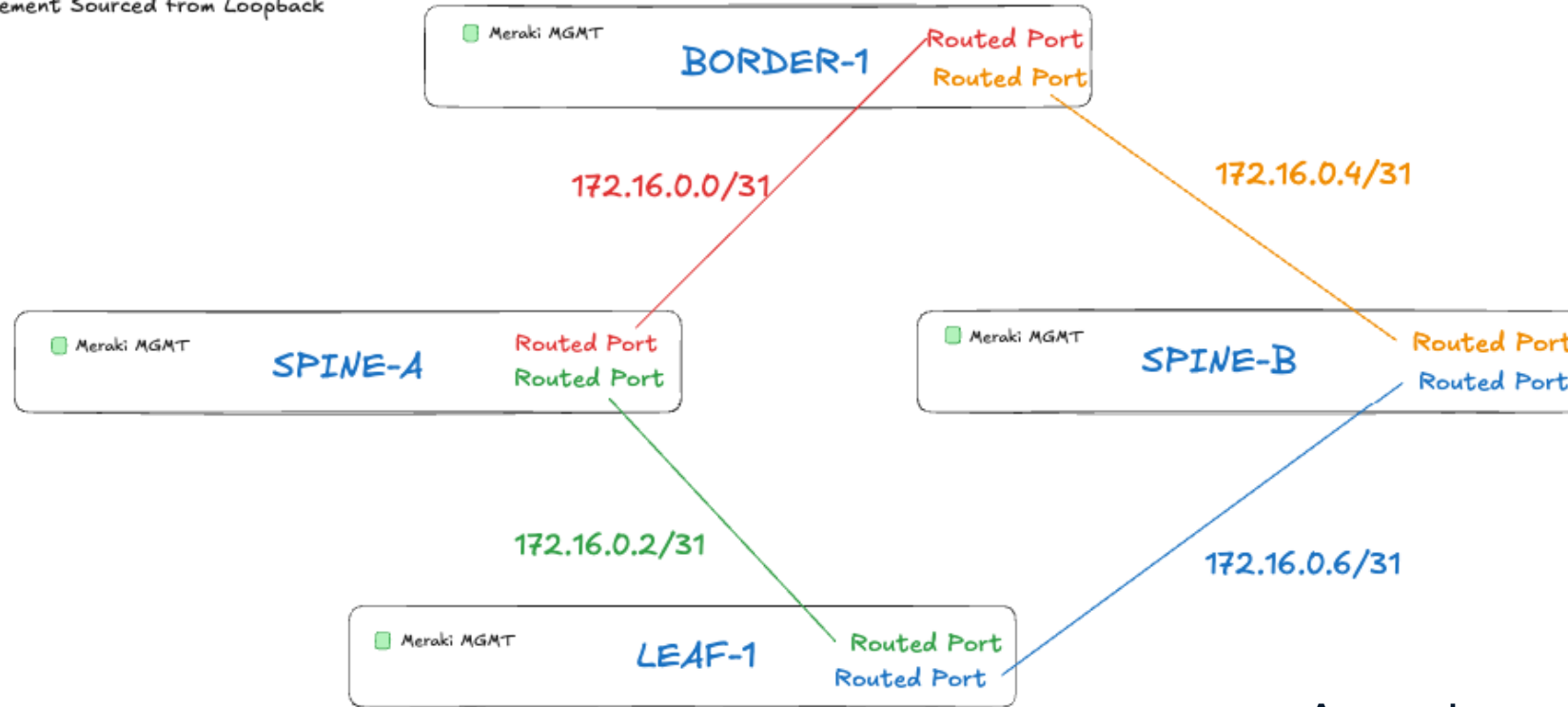
- Wireless overlay with centralized point of presence
- Fast roaming for 50k clients across Meraki networks
- Support 5k APs per cluster (at launch)
- Adaptive Policy Supported (micro-segmentation)
- Transits over fabric



Building the underlay

DIY Underlay Loop-Free Connectivity Design, solid foundation

No Layer-2, all layer3 connectivity, no Spanning Tree
Using non-routed underlay segments or ip-unumbered
Management Sourced from Loopback

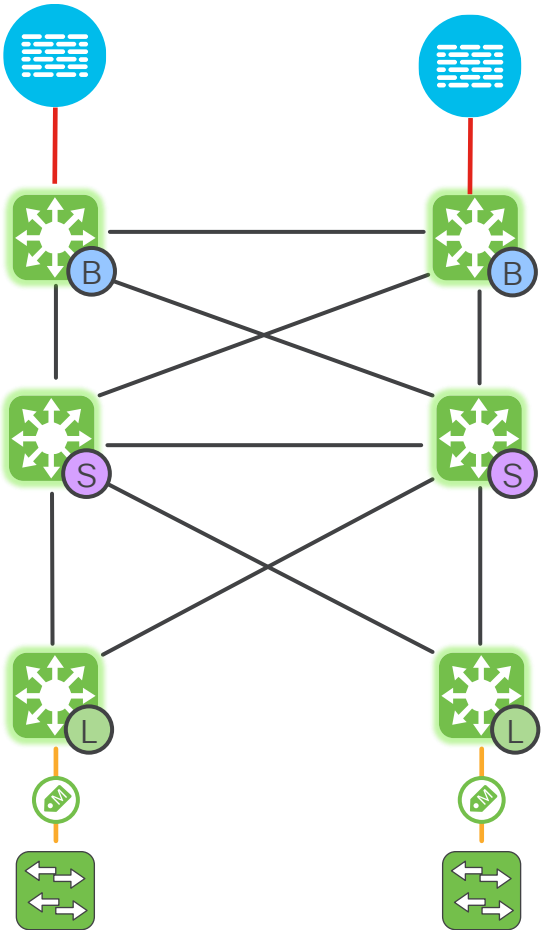


- A true loop-free layer3 underlay
- This is the way

Automatic Underlay Provisioning

Phase1 – Underlay Reservation

Resource	Base	Range
Fabric ID	1	1-8
VRF-ID	1	1-32
Core VLAN	965	1-32
Underlay VLAN	900	1-16
L2 VNI	10000	1-4094
L3 VNI	20000	1-32
Fabric Loopbacks	Loopback100	1
Core Vlan Loop	Loopback200	1-32
Anycast RP Loop	Loopback300	1-32
Route Distinguisher	$\$fabric_loopback_ip::\$score_vlan$	
Route Target	$\$asn_id::\$score_vlan$	
VXLAN Mcast Address	$239.1.\$fabric_id\vrf_id	239.1.1.1-239.1.8.32
Underlay Subnets	172.16.0.0/16	/24 pulled per subnet



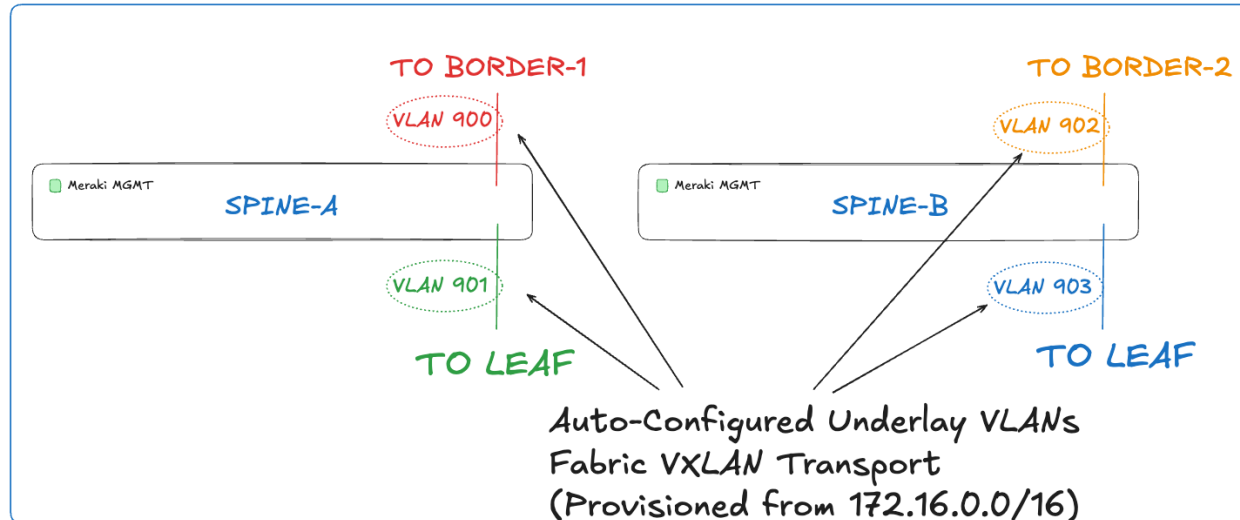
Underlay Subnet Provisioning

Phase1 – Underlay Vlan Mapping

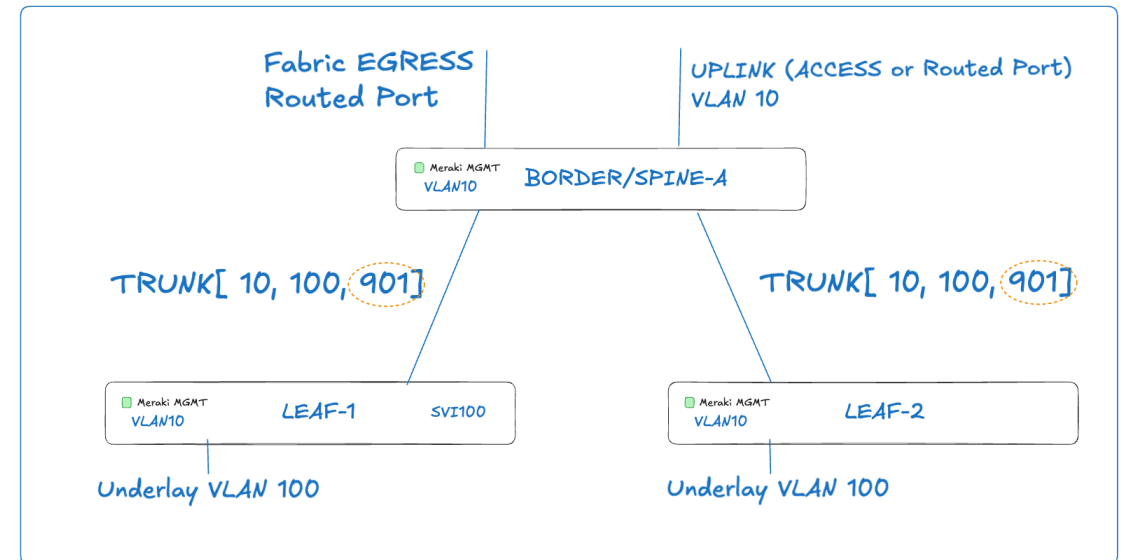
- VLAN 900-903 reserved for underlay
 - Border-Spine uses EVEN vlans (900,902)
 - Spine-Leaf uses ODD vlans(901,903)

Underlay vlan-id	non-routed subnet	Description
900	172.16.0.0/24	SPINE-A -> BORDER
901	172.16.1.0/24	SPINE-A -> LEAF
902	172.16.2.0/24	SPINE-B -> BORDER
903	172.16.3.0/24	SPINE-B -> LEAF

Fabric 2-Spine Node Configuration



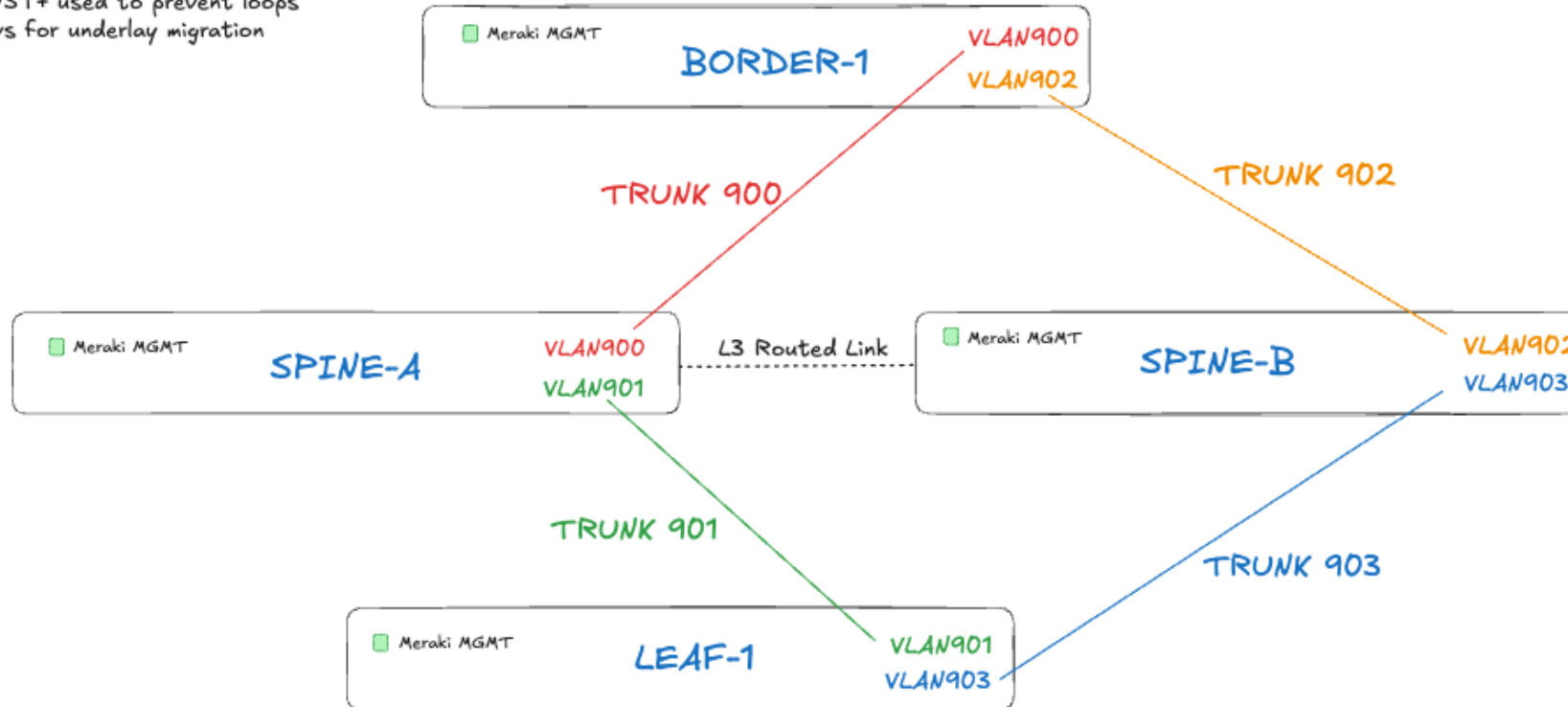
More Common example



Building a Loop-Free Fabric

Transitioning from brownfield to a loop-free Fabric design

No Layer-2 Vlans propagated
Routed-Port used for uplink connectivity
R-PVST+ used to prevent loops
Allows for underlay migration



- Making it easy to use existing network and migrate networks over time

- Multi-instance RPVST+ used to prevent loops
- Underlay migration automation prunes trunks
- Routed Port UAC fallback to SVI

Effortless Underlay Migration

- Take your **existing subnets** and migrate them into the fabric **at your own pace**
- **Control** subnet **deployment** and **availability** as part of the migration workflow
- **Post-migration** pruning and **optimization** of the underlay

The screenshot displays the Cisco Underlay Migration interface. At the top, the 'Migrate underlay subnets' section has a 'Yes' radio button selected, indicated by a red arrow. Below this is a table listing subnets for migration.

Interface	VRF	VLAN	Subnet IPv4	Subnet IPv6	Current switch
☒ BuildingCtrl-IOT	global	100	10.10.100.0/24	2001::10:39:0:1/64	MDF Dist 01
☐ Printers_NetC	global	176	10.10.176.0/20	2001::10:39:0:1/64	MDF NetC - Leaf
☐ Wireless-IOT	global	20	10.10.100.0/24	2001::10:39:0:1/64	MDF NetC - Leaf
☐ Wireless-Employee	global	40	10.10.40.0/24	2001::10:39:0:1/64	MDF NetC - Leaf
☐ Wired-Employee	global	30	10.10.30.0/24	2001::10:39:0:1/64	MDF NetC - Leaf

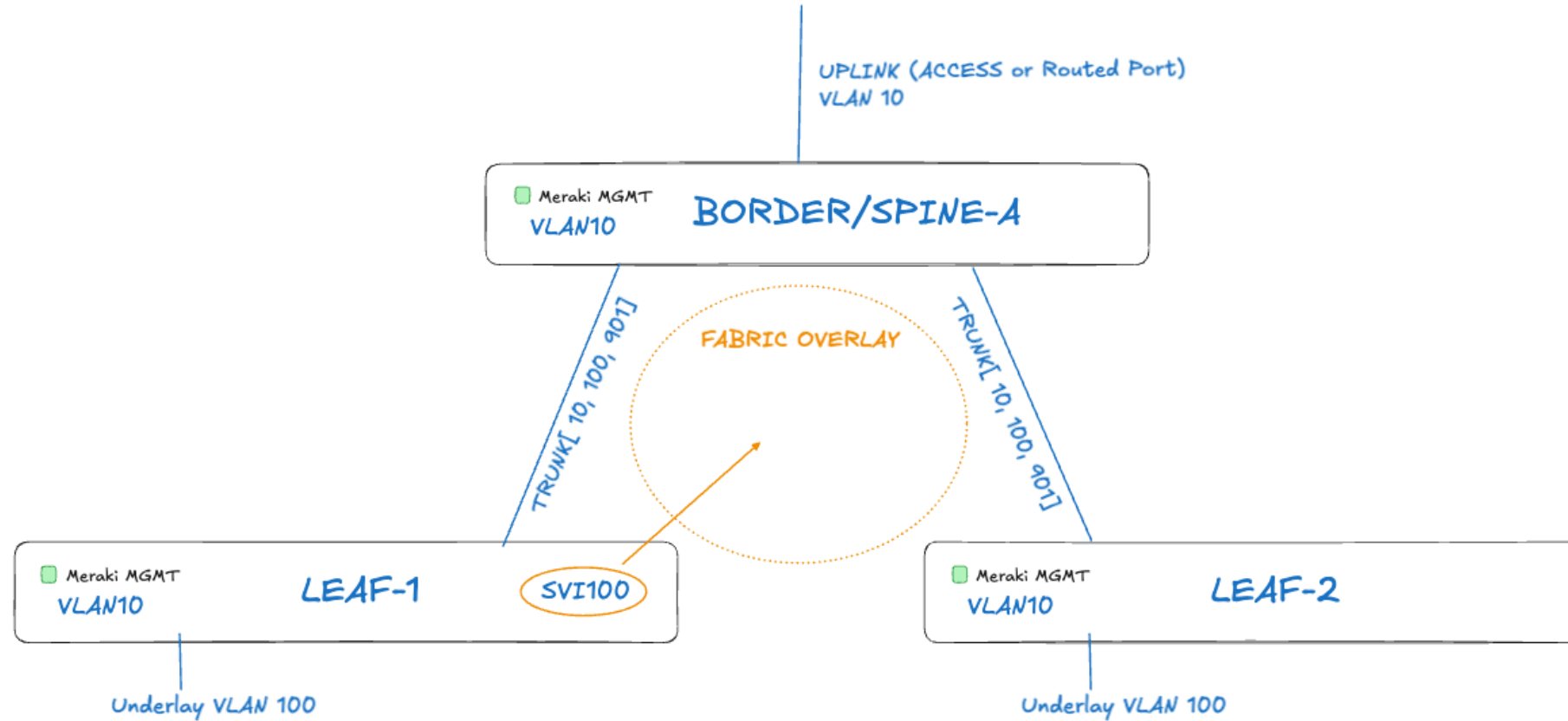
Below the table is the 'Subnet details' section. It contains various configuration fields for the selected subnet (BuildingCtrl-IOT). At the bottom of this section, the 'Anycast gateway' checkbox is checked, indicated by a red arrow.

Subnet details configuration:

- Subnet name: BuildingCtrl-IOT
- VLAN name: Guest
- VLAN ID: 100
- VNI ID: (empty)
- IPv4 configuration:
 - Subnet: 10.10.100.0/24
 - Gateway: 10.10.100.1
 - DHCP server IPs: 10.10.0.10, 10.10.0.11
- IPv6 configuration:
 - Subnet: 2001::10:39:0:0/64
 - Gateway: 2001::10:39:0:1
 - IPv6 EUI64: Disabled
 - DHCPv6 server IPs: 2001:10:10:0::10, 2001:10:10:0::11
- VRF: Default (fabric)
- Anycast gateway: ☒ Enable
- Broadcast replication: ☐ Enable

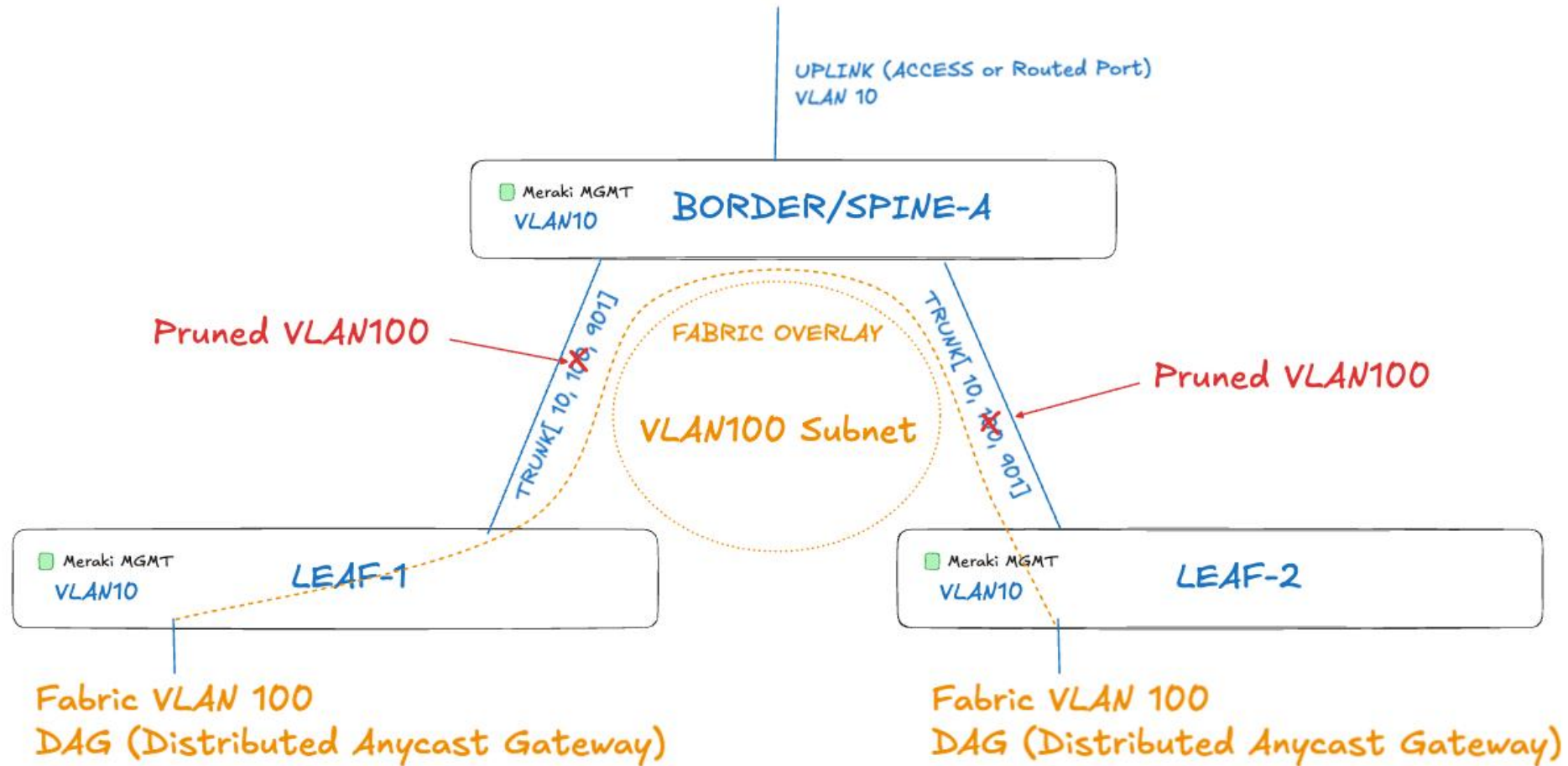
Migrating Underlay

Brownfield Migration Example – Pre-Migration



Migrating Underlay

Brownfield Migration Example – Post-Migration



Alot more to come....

Cloud Fabric Limited Availability (Dec '25)

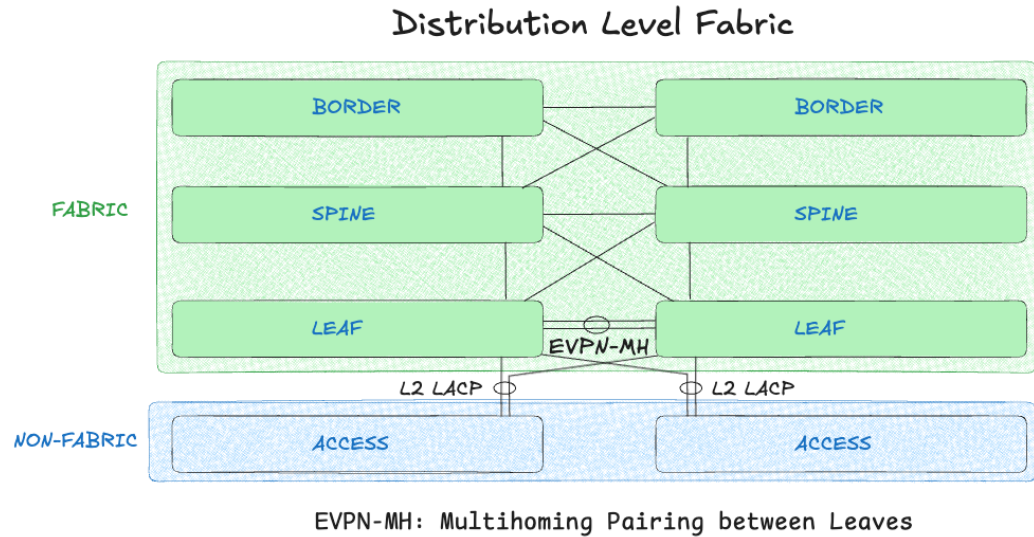
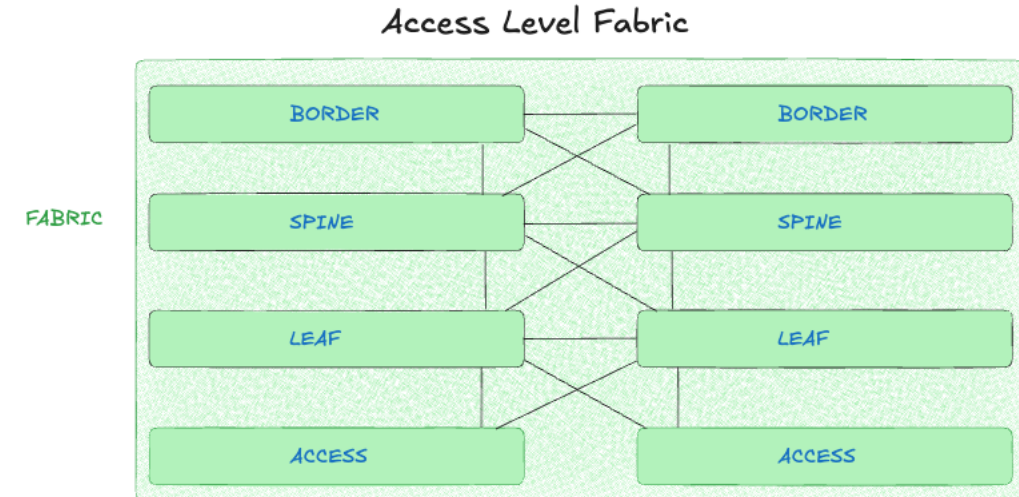
- Distribution Level Fabric
 - Fabric begins at the Distribution/Core
 - Multicast/Broadcast limited to Leaf
- Scale (1k Aps, 10k clients, 4 Leafs, 384 Switches, 300 Subnets)

Cloud Fabric – Phase 1 (March '26)

- EVPN-MH Multihoming
- Brownfield subnet migration

Cloud Fabric – Phase 2 (Sept '26)

- Access Level Fabric
 - Pure-Layer 3 underlay
 - Fully Flood-free Routed Access
- Tenant Routed Multicast and MSDP
- Multi-Cluster support for scale
- Topology-based Fabric Automation and Assurance
- Increased scale -> 100K clients
- AI-driven day2 operations

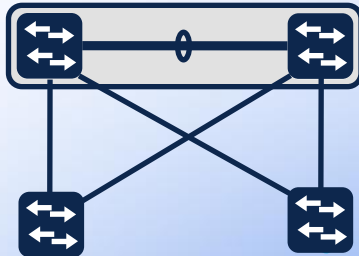


Is cloud ready for you?



Cloud manage your Catalyst

Check out the Cloud CLI



Look to the core in 17.18

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Thank you

CISCO Live !



QnA

