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GO BEYOND

#CiscoLiveAPJC



Monitor Your Catalyst 9000 Switch and Wireless from Meraki Dashboard

Dennis Kim – Solution Engineer
BRKENS-2201



#CiscoLiveAPJC

Dennis Kim

Solution Engineer – Cisco



Fields of Expertise (4 Years at Cisco)

Enterprise Network Specialist, Generalist System Engineer



Hobbies

Coffee, Audiophile, Lift heavy things (Not Switches)

Cisco Webex App

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 November 15, 2024.



<https://ciscolive.ciscoevents.com/ciscolivebot/#BRKENS-2201>



Story time



Look at our network

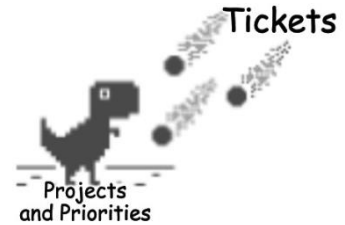
Drowning
Dennis



Lifeguard
looking at
wrong places



Dennis's
drowning
thoughts



To Meraki or to Catalyst.. That is the question

On-Premises Management

Do-it-Yourself
Operational Flexibility

High-Touch



Cisco
Catalyst
Center

Physical Appliance

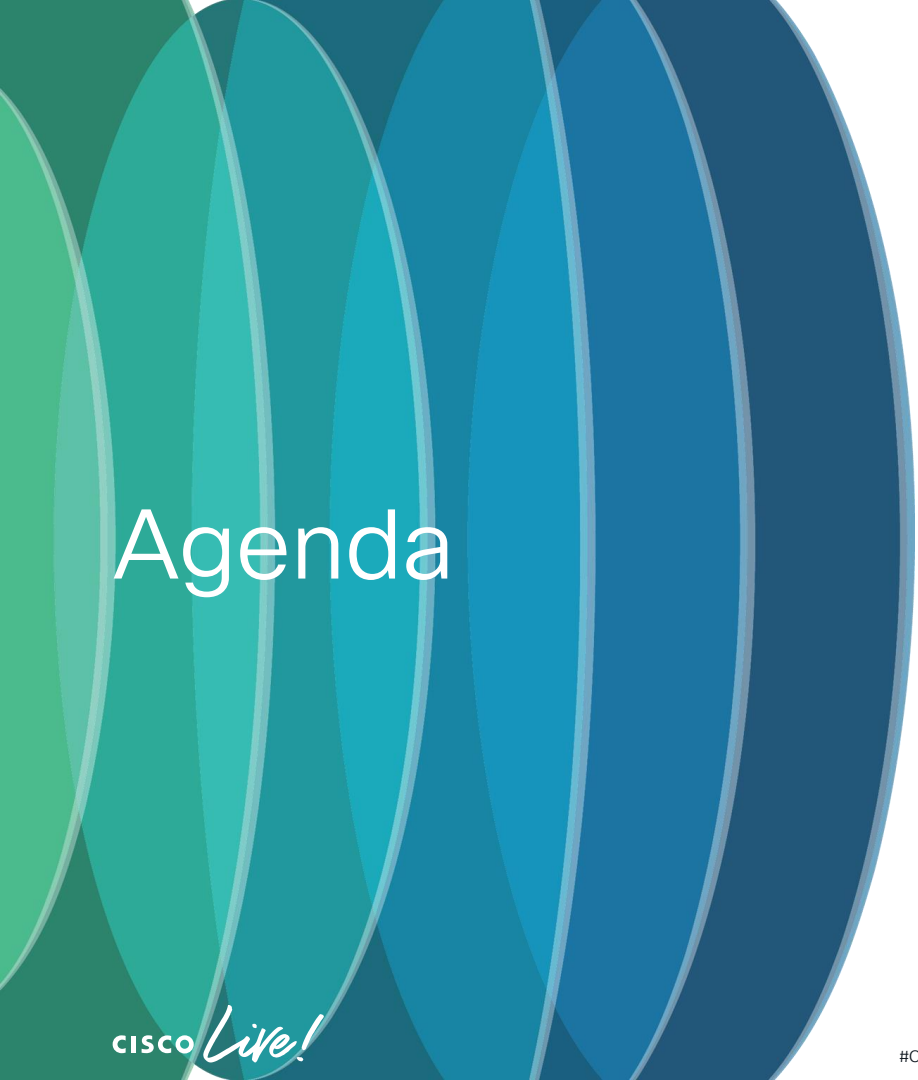
Virtual Appliance

Cloud Management

Cloud first IT Transformation
Operational Simplicity

Low-Touch

 Meraki



Agenda

Cloud Monitoring for Catalyst

- Meraki & Catalyst Unified
- Connecting to Meraki Dashboard
- Demo of the Dashboard

Your IT operation model, your way



Cloud Monitoring



Management:



CLI

Monitoring:



Meraki Dashboard

License:



DNA Subscription



Full Management



Management:



Meraki Dashboard

Monitoring:



Meraki Dashboard

License:



Meraki License



Converged Catalyst Infrastructure

Your IT operation model, your way



Cloud Monitoring



Management:



CLI

Monitoring:



Meraki Dashboard

License:



DNA Subscription



Converged Catalyst Infrastructure

Meraki Dashboard for Catalyst Operations

One Platform to Rule Them All



Reliability and Uptime

Health & Assurance

Troubleshooting

Platform Support



C9200
C9200L
C9200CX



C9300
C9300L
C9300X



C9500

IOS-XE 17.3.1 and later



C9800-L
C9800-40
C9800-80



CW9166 CW9163
CW9164 CW9162
C9136



C9130 C9117
C9124 C9115
C9120 C9105



AP4800 AP2800
AP3800 AP1562

IOS-XE 17.12.3 +
IOS-XE 17.15.1 +

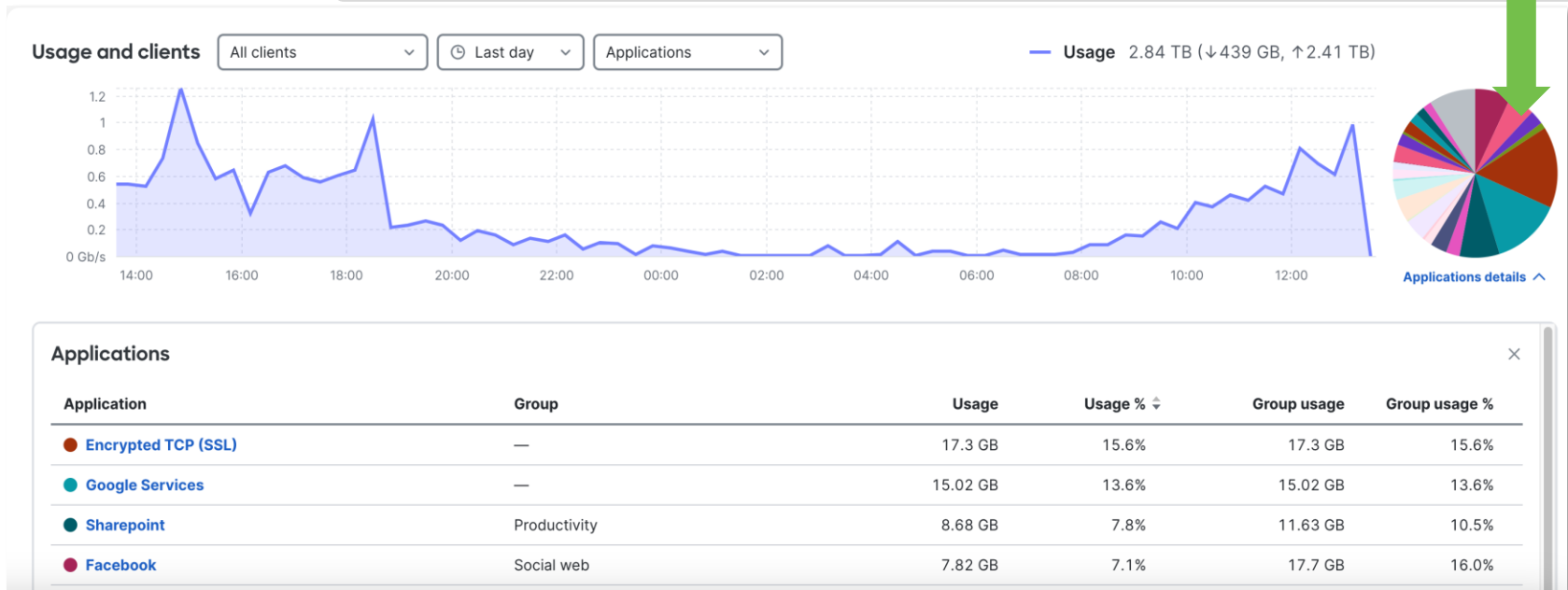
Cloud Monitoring Licensing for Cloud Monitoring

DNA Essentials

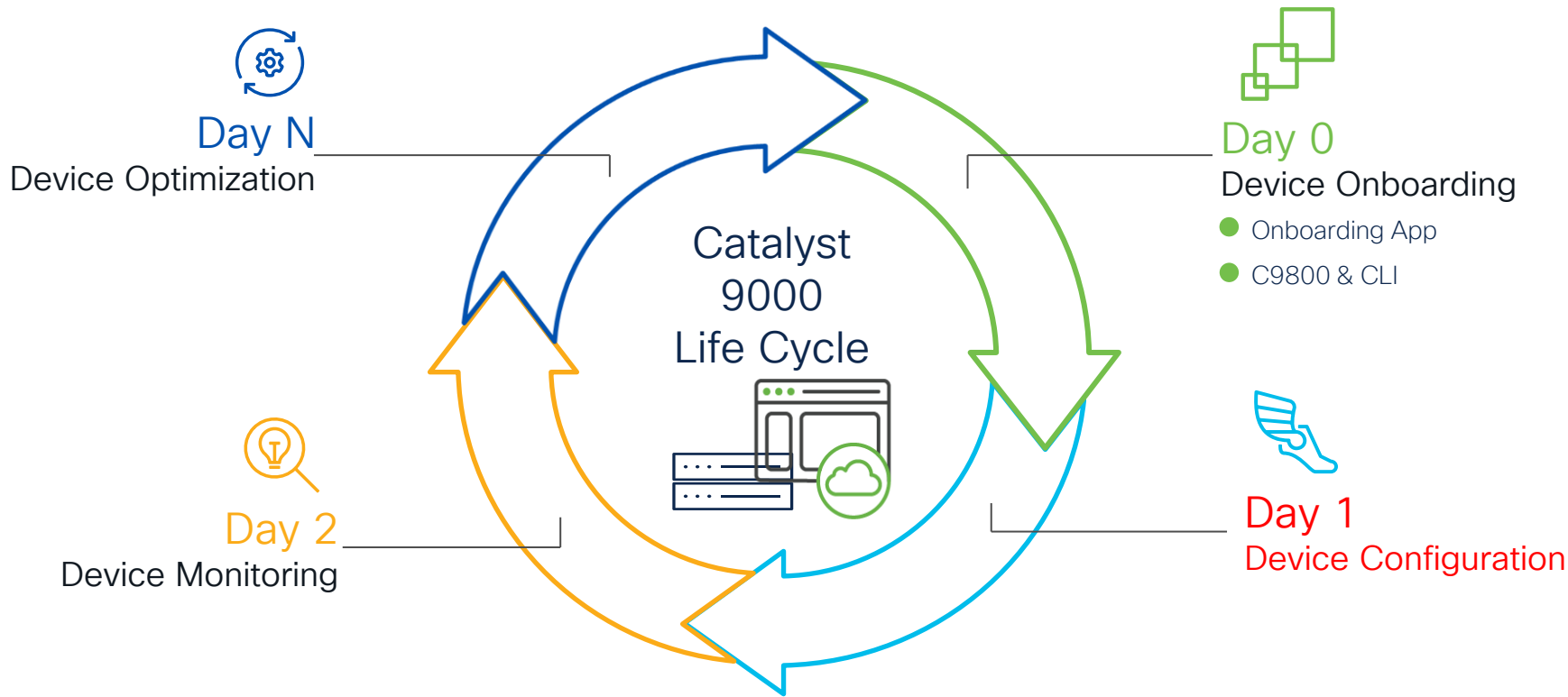
Full monitoring suite for Catalyst Switches, Controllers and Access Points

DNA Advantage

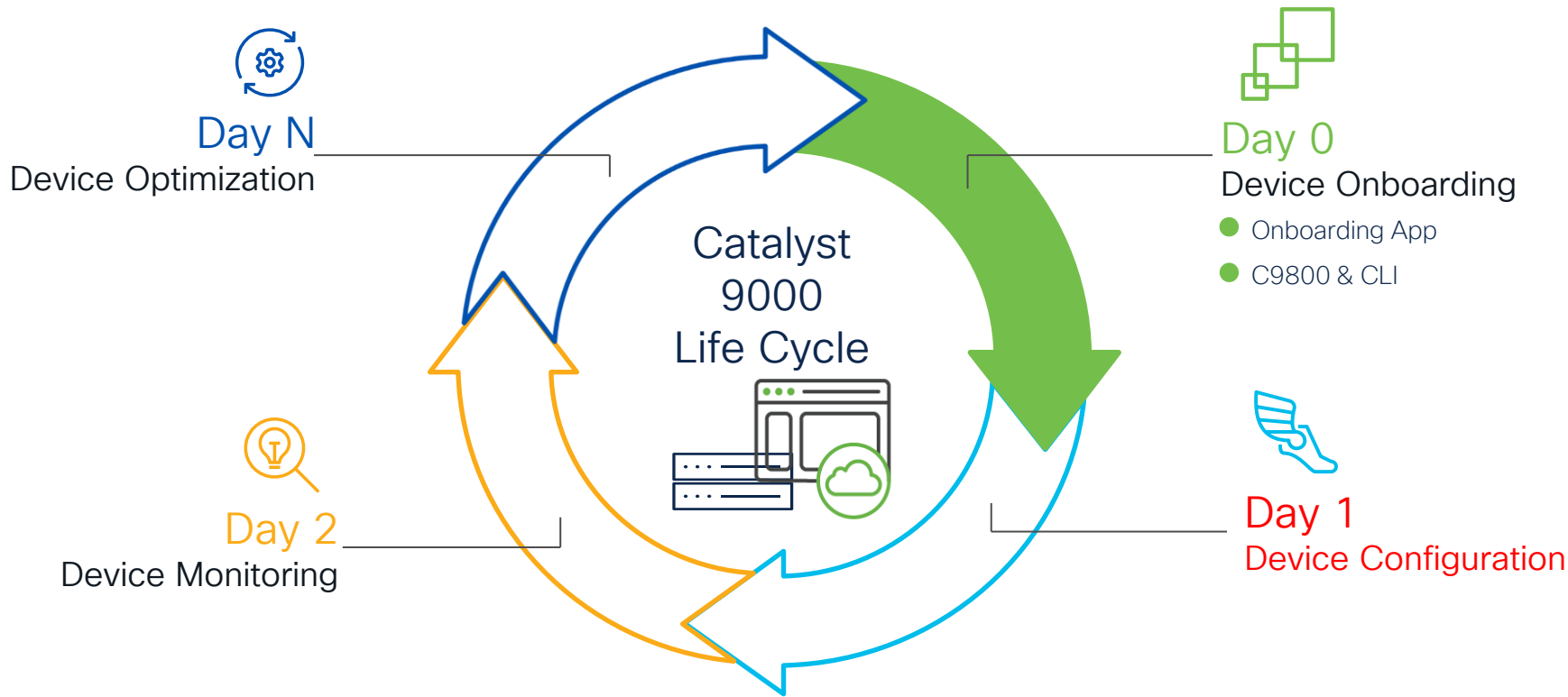
DNA Essentials capabilities + *Client Traffic Analytics provided by IOS XE NBAR*



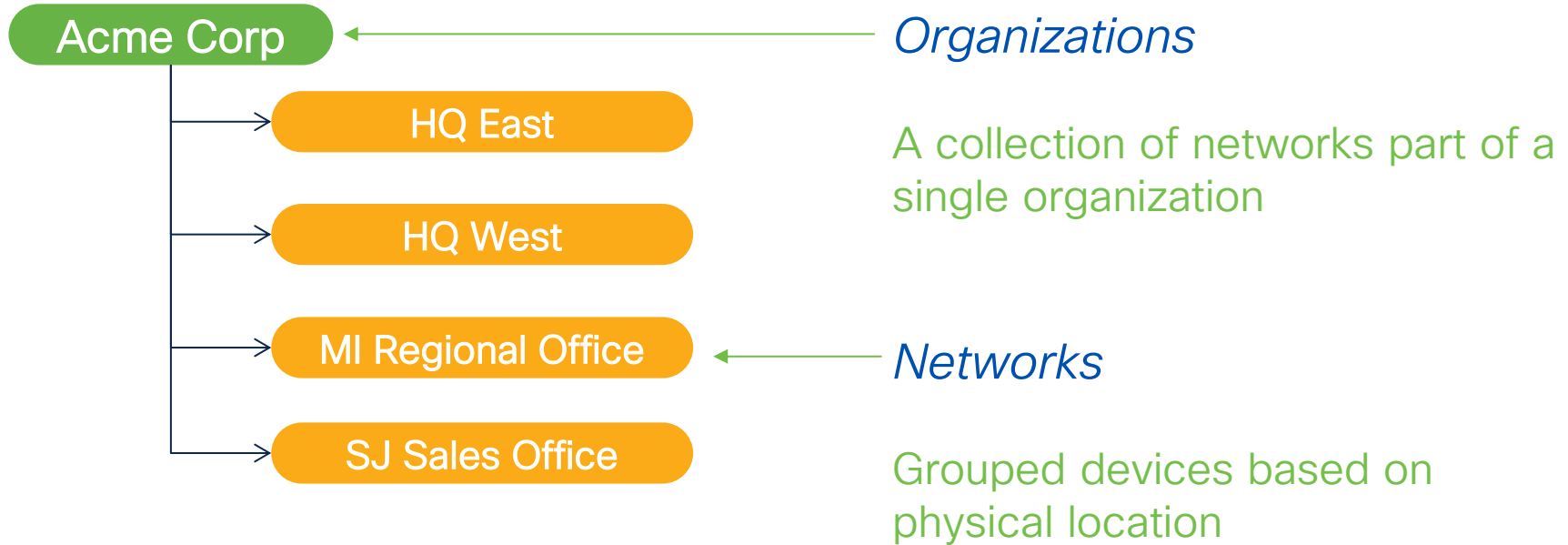
cisco Live!



Onboarding Devices

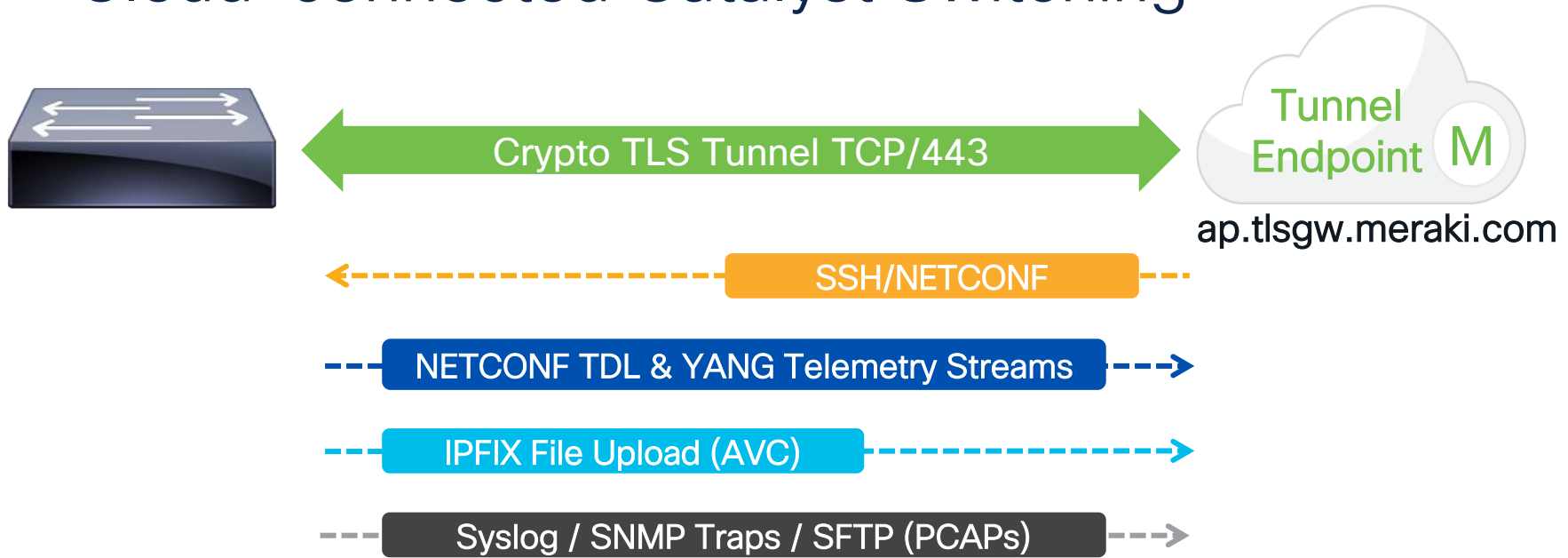


Dashboard Organizational Structure



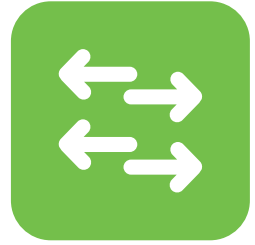
Catalyst Switching + Meraki Dashboard

Cloud-connected Catalyst Switching



Downloadable onboarding application to automate connection do dashboard

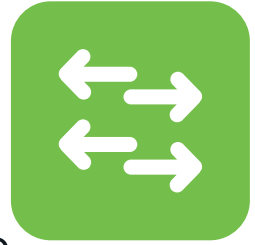
Other Pre-requisite



- Account at <https://dashboard.meraki.com>
- Dashboard API access is enabled
- Generate Dashboard API*
- Download onboarding application

*SAML log-in is not supported for API key creation

Pre-configuration 1



- Connectivity must be provided via a front-panel port, not the management interface
- Only a default VRF is supported
- Device must have loopback interface 1000 or 2000 available.
- Default route is in place
- Two unused VTY slots between 16 and 98 must be available. 4 is recommended

Pre-configuration 2



- DNS and DNS-Lookup are configured



```
ip name-server {}  
ip domain lookup
```

- SSH and Telnet are enabled

- Username defined and set to privilege 15



```
username {} privilege 15
```

- AAA



```
aaa new-model
```

- Reachability to **ap.tlsgw.meraki.com 443**

PC to Cloud reachability

A PC on which the Onboarding Application is installed must have reachability to the Dashboard on TCP port 443:



```
PC~% telnet api.meraki.com 443
Trying 209.206.59.168...
Connected to fra.proxy.k8s.ikarem.io.
Escape character is '^]'.
```

```
PC~% telnet meraki-cloud-monitoring-onboarding-app.s3.amazonaws.com 443
Trying 52.219.193.105...
Connected to s3-us-west-1-w.amazonaws.com.
Escape character is '^]'.
```

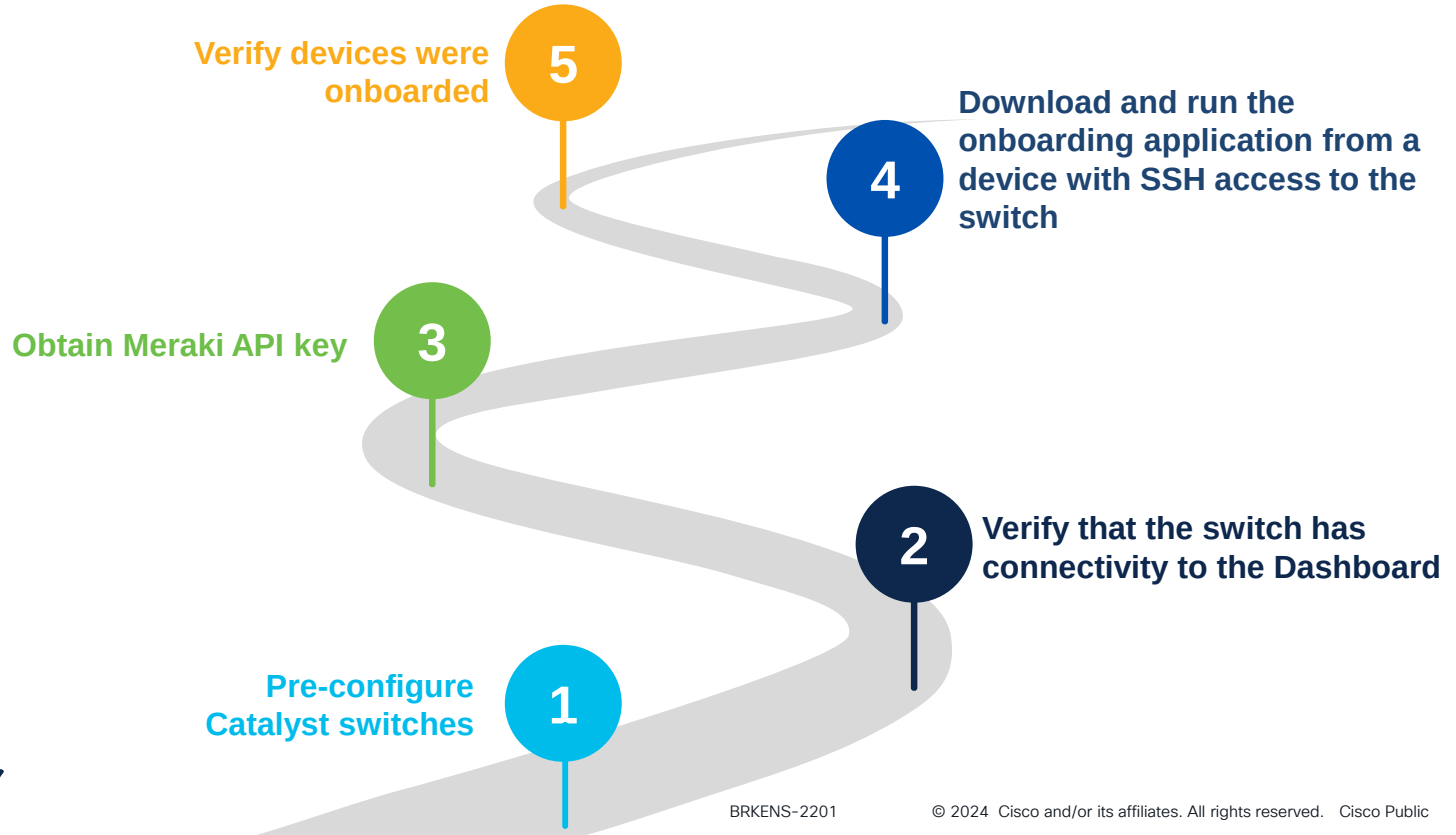
Downloading Onboarding Application



Available on

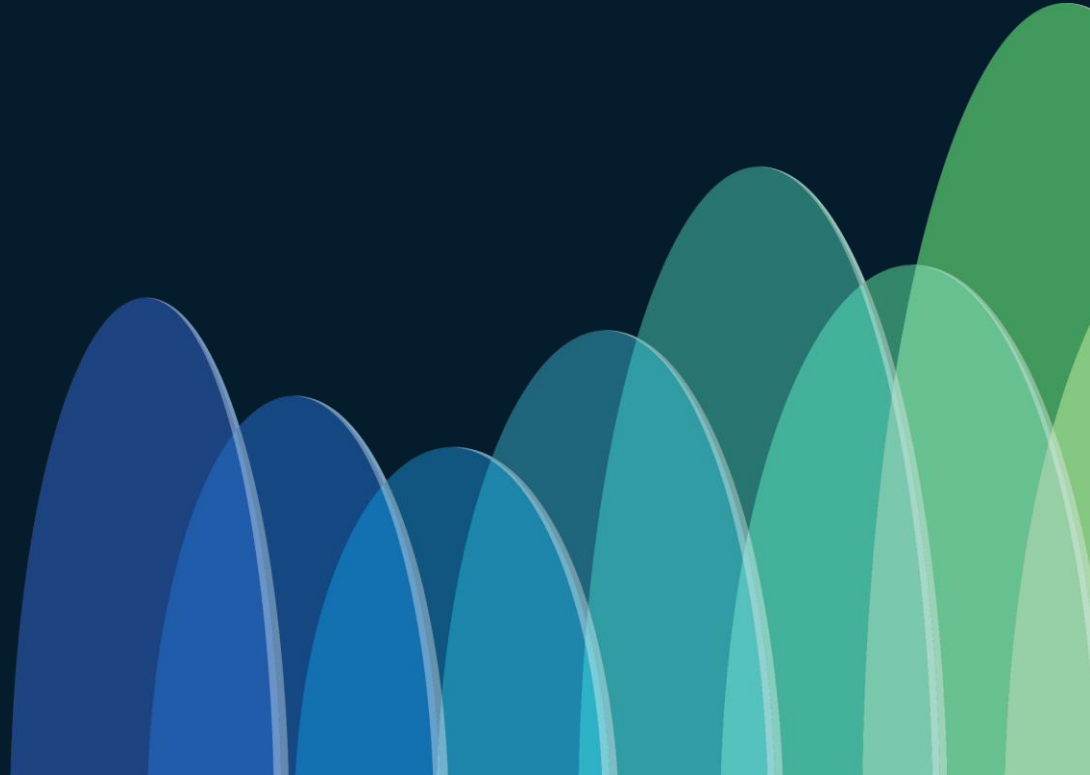
1. Windows
2. macOS
3. Linux

Onboarding Flow – User experience



Demo

CISCO *Live!*



Meraki

Search Dashboard

Network Demo Farm

Network-wide

Switching

Organization

Two-factor Authentication is not currently enabled on your Meraki Dashboard account. For an extra layer of security, we recommend [enabling it](#) at your earliest convenience.

Packet capture for monitored Catalyst switches now available! To find out more and enable packet capture in Dashboard for monitored Catalyst monitored switches, visit our [Early Access Program page](#).

Keep up with the latest in Cloud Monitoring for Catalyst! You can now use the Meraki dashboard to perform IOS-XE image upgrades on monitored Catalyst switches. Enable this feature by visiting the [Early Access Program](#).

Switches

Last day

+ Add a switch

0 Offline

0 Alerting

1 Online

0 Dormant

Search

Status

Tags

Device type

1 result

Download

	Status	Name	MAC address	Connectivity (UTC-7)	Serial number	Local IP	Model	Firmware version	
☐	✓	Cloud_Managed	58:56:9f:6c:37:00		Q5TN-MX5A-RUDV	192.168.128.3	C9300X-24Y	CS 16.8	

Last login: 17 days ago from 2601:646:8983:9b60:4fb:f998:30a2:eec5 San Jose, CA

Current session started: 1 day ago

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[Privacy](#) - [Terms](#)

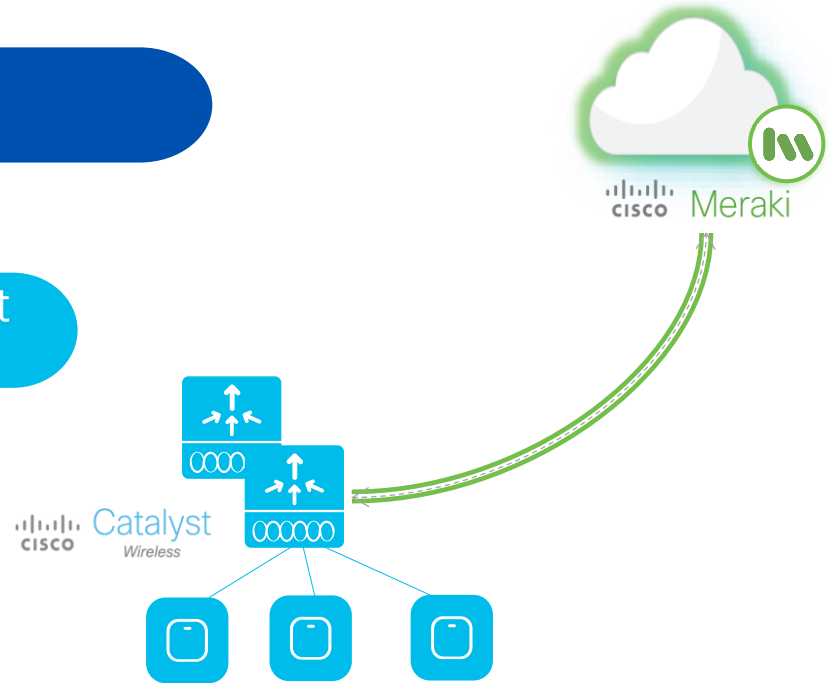
Catalyst Wireless + Meraki Dashboard

Meraki and Catalyst Unified

Native Meraki Tunnel on Catalyst Wireless Controllers and Switches*

Investigate root cause of network and client issues

Maximise network performance and uptime



Platform Support



C9200
C9200L
C9200CX



C9300
C9300L
C9300X



C9500

IOS-XE 17.3.1 and later



C9800-L
C9800-40
C9800-80



CW9166 CW9163
CW9164 CW9162
C9136



C9130 C9117
C9124 C9115
C9120 C9105



AP4800 AP2800
AP3800 AP1562

IOS-XE 17.12.3 +
IOS-XE 17.15.1 +

Catalyst Wireless + Meraki Dashboard

Cloud-native Catalyst Onboarding

1: Connect

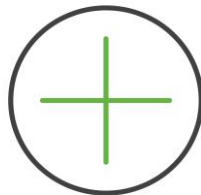
Quickly establish tunnel connection between Catalyst & Meraki



Connect supported Catalyst Device(s) to **Dashboard** with
One CLI command
or
One C9800 Web UI click

2: Claim & Add

Easily claim devices and add them to monitoring network(s)



Performed in *just a few clicks* via
Meraki dashboard UI
(claim device, add device to network)
or
Dashboard API

3: Provision

Configuration is automatically applied to enable service



Dashboard applies configuration to supported Catalyst device(s) for purpose of service enablement

Pre-requisite



- Account at <https://dashboard.meraki.com>
- Opt-in for Cloud Monitoring for Catalyst Wireless on C9800.
- C9800 must be running 17.12.3 OR 17.15.1+

Catalyst Wireless + Meraki Dashboard

Configuration Provisioning

Dashboard provisions C9800 with the required configs to enable monitoring

AAA

Access Control Lists

VTY Lines

SSH

Netconf

HTTP Secure Server

Telemetry Subscriptions

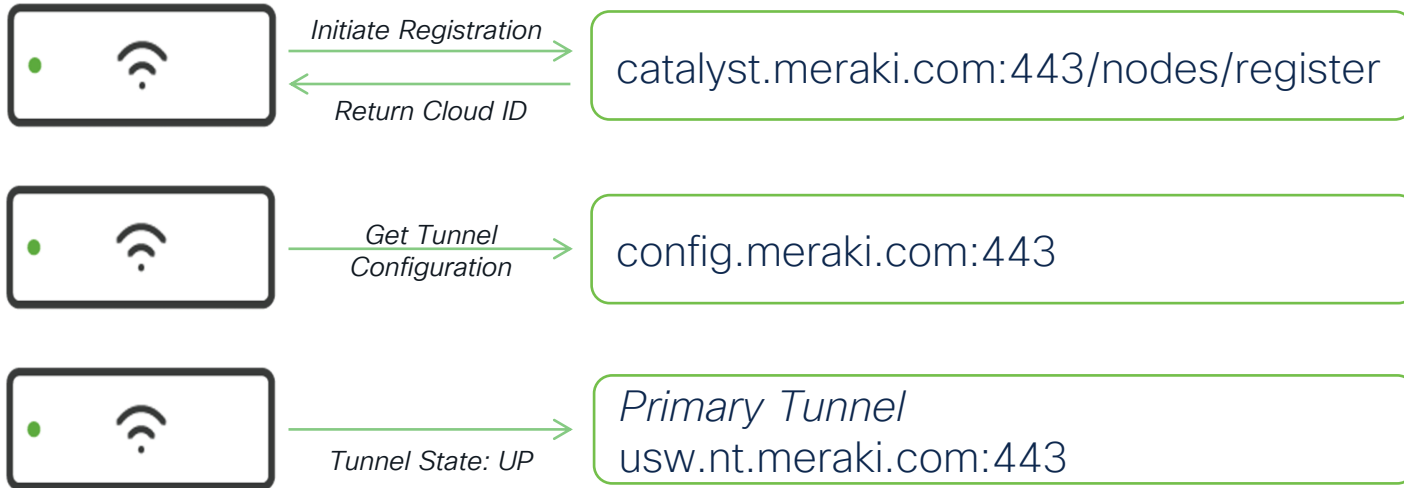
LLDP

https://documentation.meraki.com/Cloud_Monitoring_for_Catalyst/Onboarding/Cloud_Monitoring_Catalyst_9800_Dashboard_Provisioned_Configurations

Catalyst Wireless + Meraki Dashboard

Establish IOS XE Dashboard Registration + Meraki Tunnel

```
c9800-01(config)#service meraki connect  
service meraki connect has been enabled
```



Inventory - Meraki Dashboard

CMON-9800-L: Cisco C9800

← → ↺

https://10.13.1.10/webui/#/dashboard

☆

🔒

👤

📄

🔧

⚙️

🔍

🔄

📧 Feedback

🔗

🔗

🏠

Dashboard

📊

Monitoring

🔧

Configuration

⚙️

Administration

🔑

Licensing

🔧

Troubleshooting

Walk Me Through

Cisco Catalyst 9800-L Wireless Controller

17.12.20240311

Welcome admin

Last login 05/16/2024 20:48:37 ...

🏠

📶

⚠️

📄

⚙️

🔍

🔄

Search APs and Clients

📧 Feedback

🔗

🔗

Dashboard

Search Menu Items

Network

6 GHz 1

5 GHz 1

2.4 GHz 1

Wireless LANs

6 1

Access Points

2 0 0

Not Joined 0

Clients

Active 0

Excluded 0

Sleeping 0

Rogues

APs 81

Clients 42

Ad-Hoc 0

Interferers

6 GHz 0

5 GHz 0

2.4 GHz 0

Overview

Radios

Last Updated: 5/23/2024, 2:20:57 PM

🟢 Up

🔴 Down

Radio Role Hide

2 6 GHz

2 5 GHz

2 2.4 GHz

Top Access Points

Last Updated: 5/23/2024, 2:20:57 PM

Sort by: APs With Highest Client Count

Ad... Sta...	AP Name	AP MAC	Clients	Data Usage	Throughput
✓	AP-02-LAB	e438.7e43.7d...	0	13 GB	904 bps
✓	AP-01-LAB	e438.7e42.b0...	0	17 GB	424 bps

Top WLANs

Last Updated: 5/23/2024, 2:20:57 PM

Sort by: WLANs With Highest Client Co...

WLAN Name	ID	Clients	Data Usage
cloud-mon	1	0	2.3 MB

Client Device Types

Last Updated: 5/23/2024, 2:20:56 PM

System Information

Last Updated: 5/23/2024, 2:20:58 PM

Hostname: CMON-9800-L

Device Uptime: 2 weeks, 5 days, 23 hours, 56 minutes

System Time: 18:10:20.122 UTC Thu May 23 2024

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Access Point Onboarding

Set Up Your Wireless Devices

Complete these steps to ensure your wireless devices are properly onboarded to your Meraki network.



Organize your access points

Your APs must be assigned to a Dashboard network to properly view all monitoring data, including status and connectivity.

☒ **Single network**

Assign all your access points to a single network.

☒ **Existing network**

Choose network

☐ **New network**

☐ **Different networks (by site tag)**

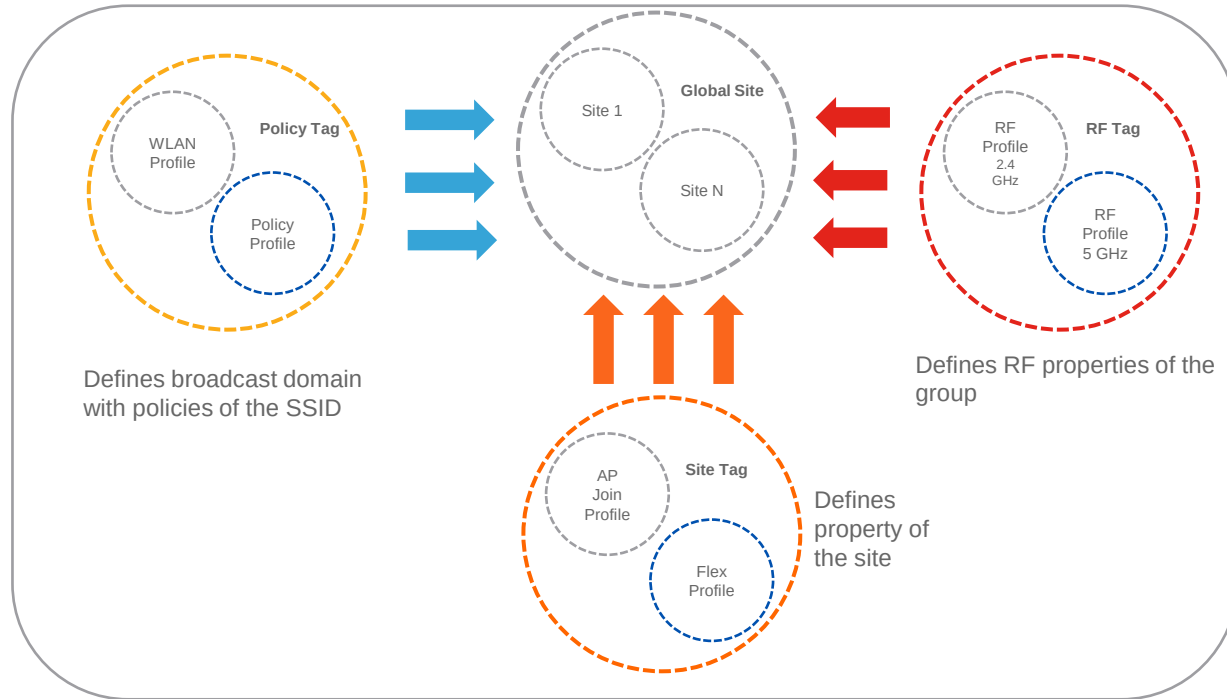
Organize by **site tag**. Dashboard will automatically detect and create new networks for your access points based on their site tag.

[Cancel](#)

[Back](#)

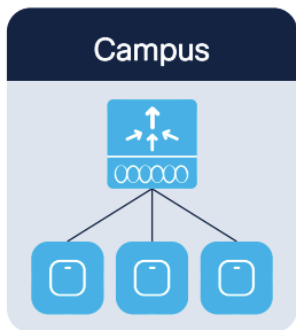
[Next](#)

Wireless Basic Configuration Model

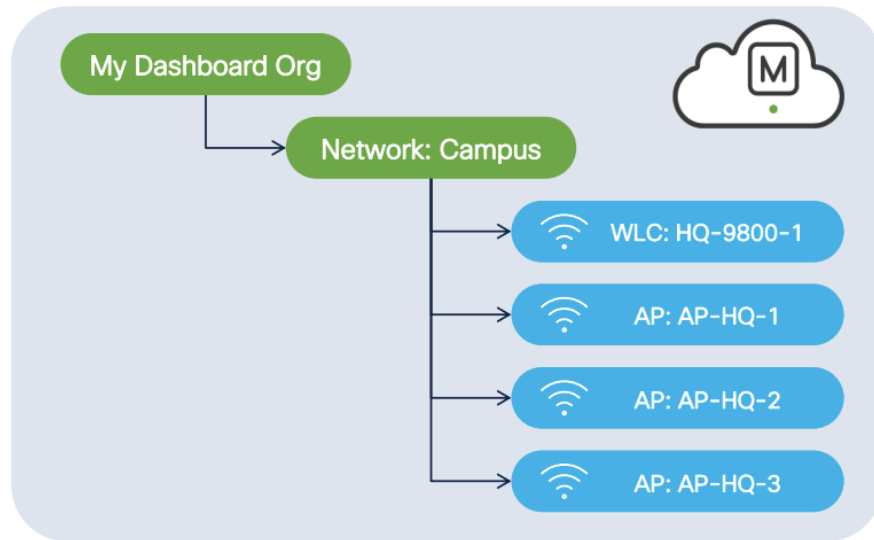


All In One Design

WLC deployed in the same location as Access Points

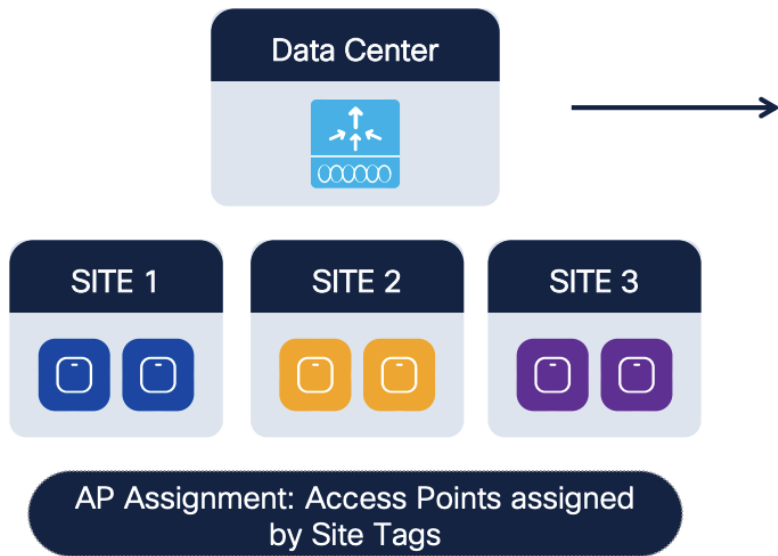
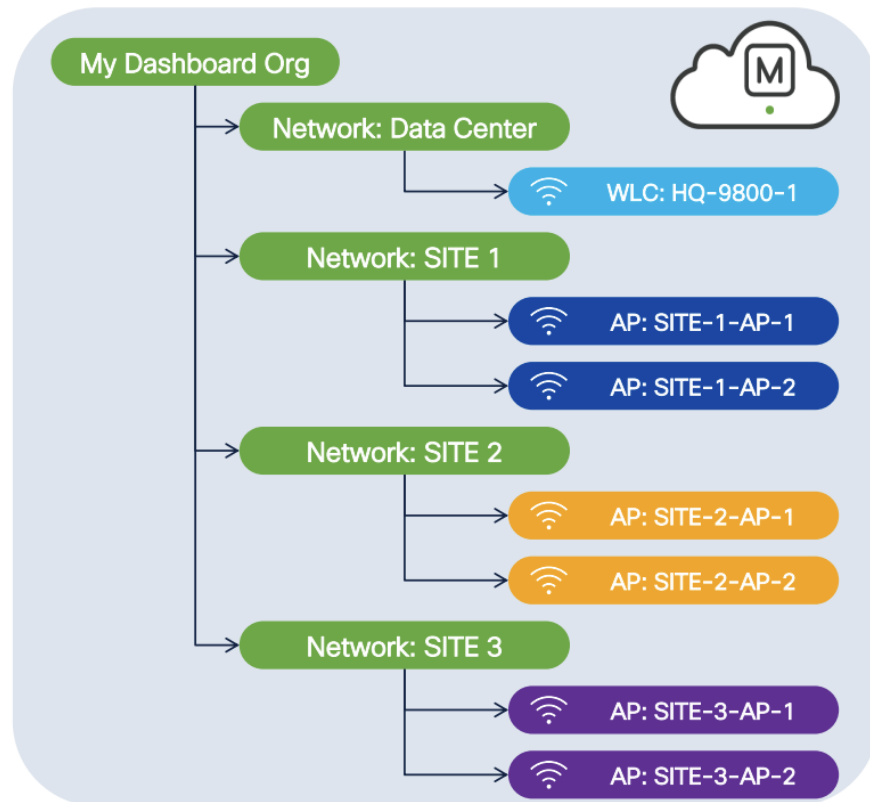


AP Assignment: All access points in the same network



Site-Based Design

WLC deployed in a central location for the Access Points



Site Based Design

Recommendation is to map C9800 Site Tags to Dashboard Networks

✓ All Access Points

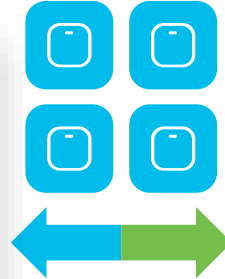
Total APs : 5

Misconfigured APs
Tag : 0 Country Code : 0 LSC Fallback : 0

Select an Action

AP Name ↑	AP Model	Policy Tag	Site Tag	RF Tag
AP-Bldg-14-HQ-01	CW9164I-B	CLUS-SSIDs	Building 14 HQ SSO	Building 14 HQ SSO RF TAG
AP-Bldg-14-HQ-02	C9115AXI-B	CLUS-SSIDs	Building 14 HQ SSO	Building 14 HQ SSO RF TAG

Site Tag:
Building 14 HQ SSO



Organization
Cloud Monitoring TME
Catalyst

● AP-Bldg-14-HQ-01
CW9164I-B cc:9c:3ef1e3:70
Monitor Only

Network
Building 14 HQ SSO

Network-wide
Switching
Wireless
Organization

Cisco Building 14
Laney Rd
Google
Map data ©2023 Google

ADDRESS

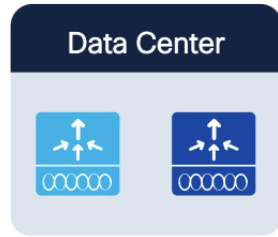
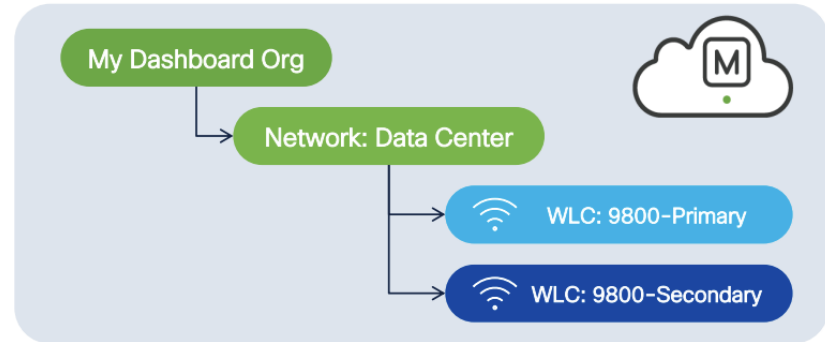
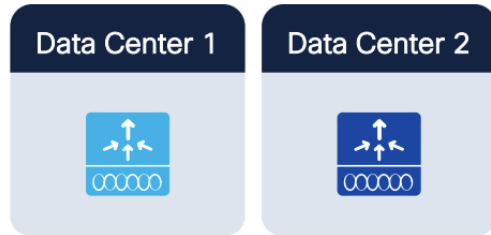
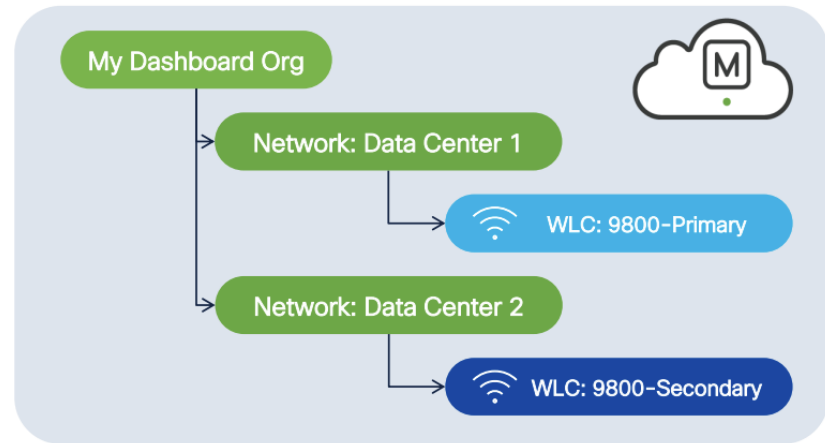
WIRELESS CONTROLLER
● C9800-L-B14-HQ-SSO

WIRELESS CONTROLLER TAGS
Site tag: Building 14 HQ SSO
Policy tag: CLUS-SSIDs
RF tag: Building 14 HQ SSO RF TAG

AP MODE
local-mode

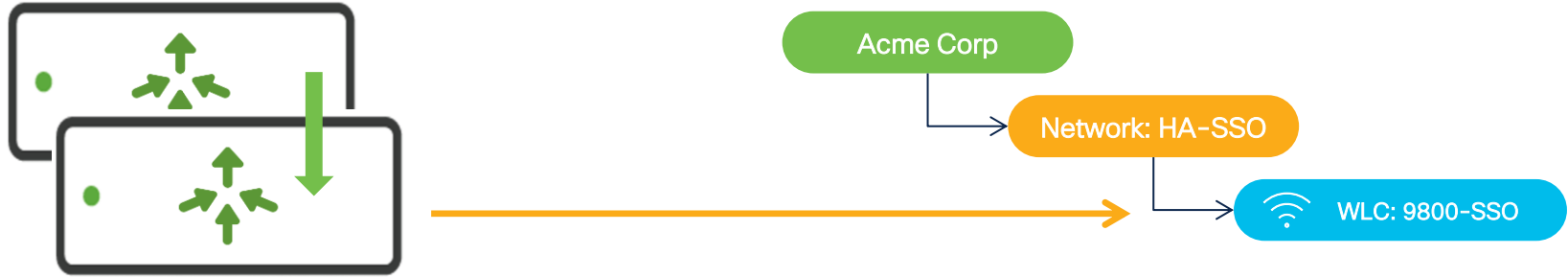
Meraki Network:
Building 14 HQ SSO

N+1 High Availability



Monitoring Wireless Controllers

Wireless controller redundancy



SSO pair is logically one Wireless Controller, represented as a single Wireless Controller in Dashboard

Catalyst Wireless + Meraki Dashboard

Verify Tunnel # show meraki connect

Verify Tunnel Configuration

Meraki Tunnel Config

```
-----
Fetch State:                Config fetch succeeded
Fetch Fail:
Last Fetch(UTC):            2024-01-31 17:19:43
Next Fetch(UTC):            2024-01-31 18:33:26
Config Server:              cs608-2037.meraki.com
Primary:                    usw.nt.meraki.com
Secondary:                  use.nt.meraki.com
Client IPv6 Addr:           FD0A:9B09:1F7:1:A45:D1FF:FE1B:8340
```

Verify Tunnel Interface

Meraki Tunnel Interface

```
-----
Status:                      Enable
Rx Packets:                   1054102
Tx Packets:                   899742
Rx Errors:                    0
Tx Errors:                    0
Rx Drop Packets:              0
Tx Drop Packets:              0
```

Verify Tunnel State

Meraki Tunnel State

```
-----
Primary:                      Up
Secondary:                    Up
Primary Last Change(UTC):     2024-01-30 23:29:23
Secondary Last Change(UTC):   2024-01-30 23:29:23
Client Last Restart(UTC):     2024-01-30 23:29:17
```

Summary of Wireless and Switch + Meraki Dashboard

Meraki + Catalyst Unified

Cloud-connected

Downloadable [onboarding application](#)

Claim/add supported Catalyst switches to monitoring within the onboarding application



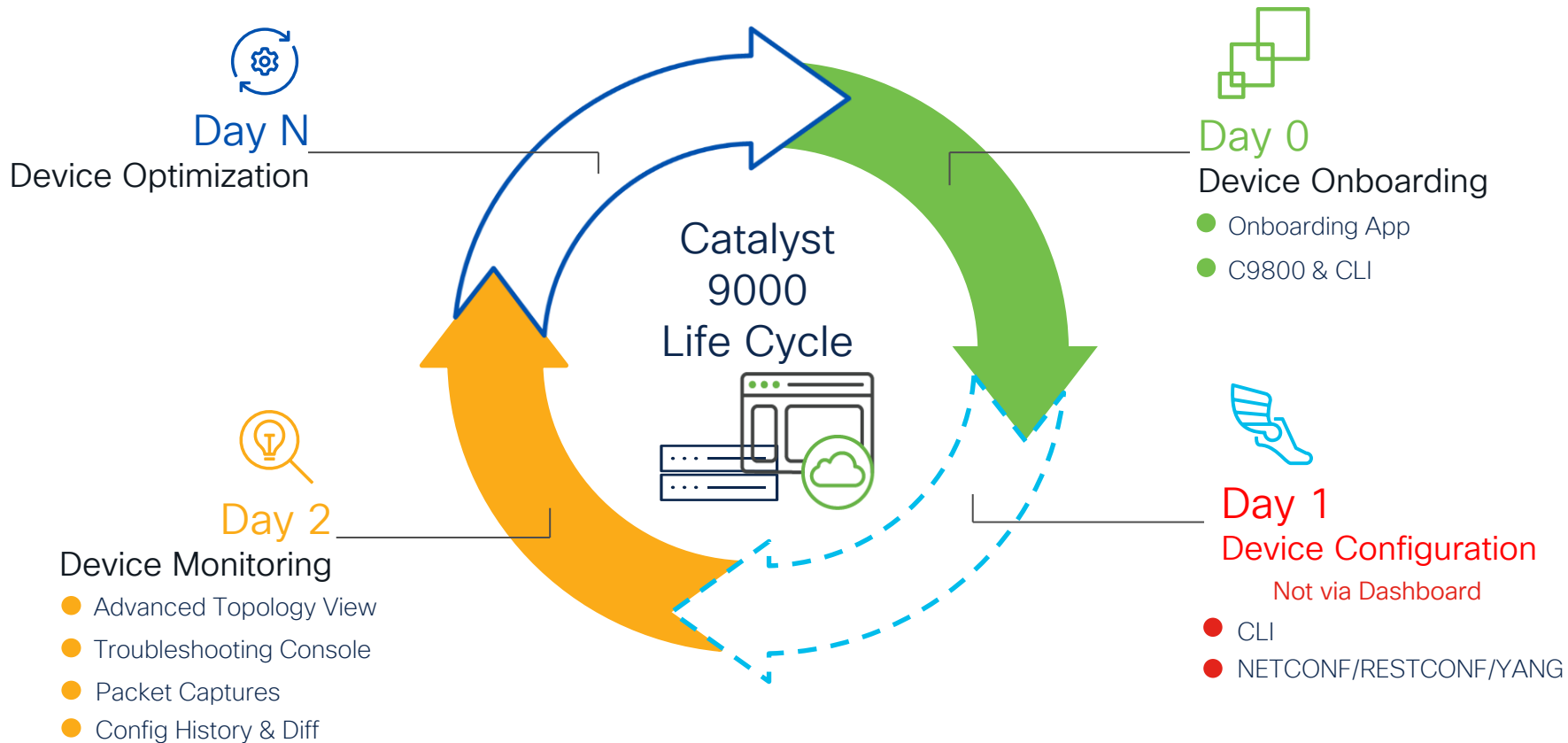
Cloud-native

Connect supported Catalyst Device(s) to Dashboard with
One CLI command
or
One C9800 Web UI click

Meraki dashboard-based claim/add device to network or API onboarding



Cloud Monitoring for Catalyst Dashboard



Switch Cloud Monitoring Capabilities



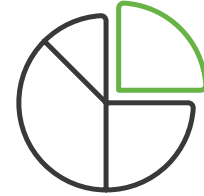
Centralized view of
the entire network



Software Image
Upgrade



Configuration
History



Packet Capture

Meraki

Search Dashboard

Network Demo Farm

Network-wide

Switching

Organization

Two-factor Authentication is not currently enabled on your Meraki Dashboard account. For an extra layer of security, we recommend [enabling it](#) at your earliest convenience.

Packet capture for monitored Catalyst switches now available! To find out more and enable packet capture in Dashboard for monitored Catalyst monitored switches, visit our [Early Access Program page](#).

Keep up with the latest in Cloud Monitoring for Catalyst! You can now use the Meraki dashboard to perform IOS-XE image upgrades on monitored Catalyst switches. Enable this feature by visiting the [Early Access Program](#).

Switches

Last day

+ Add a switch

0 Offline

0 Alerting

2 Online

0 Dormant

Q Search

Status

Tags

Device type

2 results

Download

	Status	Name	MAC address	Connectivity (UTC-7)	Serial number	Local IP	Model	Firmware version	
☐	✓	Cloud_Monitored	c4:b2:39:7a:f6:80		Q2ZZ-4NJS-VCGE	128.107.251.118	C9300L-24UXG-2Q	IOS XE 17.9.5	
☐	✓	Cloud_Managed	58:56:9f:6c:37:00		Q5TN-MX5A-RUDV	192.168.128.3	C9300X-24Y	CS 17.1.1	

Last login: 9 days ago from your current IP address

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[Privacy](#) - [Terms](#)

Wireless Cloud Monitoring Capabilities

Wireless controller operations

- Live AP and client counts
- HA SSO health
- Performance health

Access point operations

- Live clients and radio utilization
- Performance health
- Alerts
- Client Visibility

Roadmap

- Packet Capture
- Software Upgrade

Monitoring Wireless Controllers Demo

The screenshot displays the Meraki dashboard interface for monitoring wireless controllers. The top navigation bar includes the Cisco Meraki logo and a search bar. A sidebar on the left provides navigation options: Global Overview, Organization (TME Cloud Monitoring), Network Cloud Monitoring Demo, Network-wide, Wireless, and Organization.

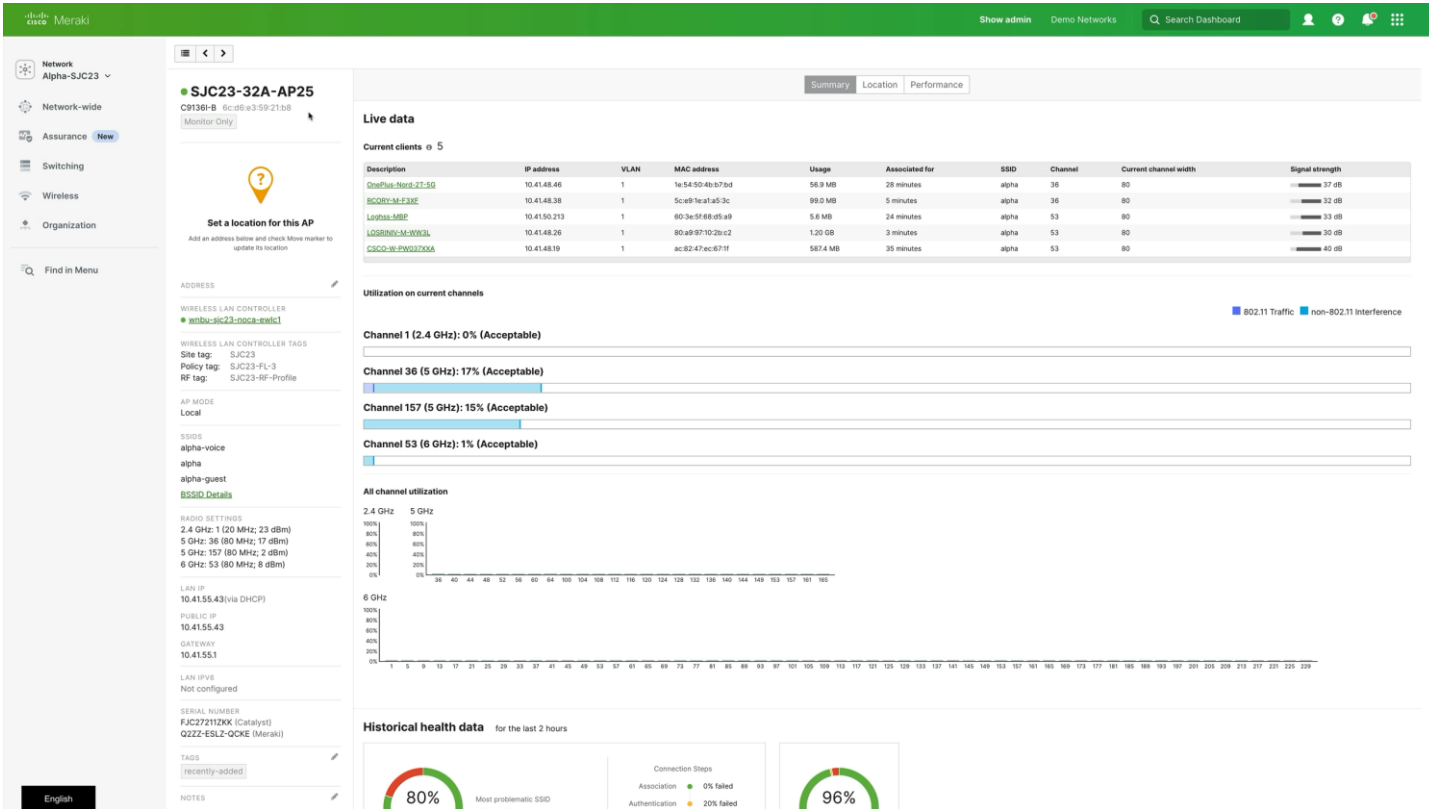
The main content area is titled "Wireless LAN controllers" and shows the configuration for a specific controller, "C9800-L-C-SSO", which is marked as "Online". Below the controller name, there are tabs for "Summary", "Ports", "Redundancy", and "APs".

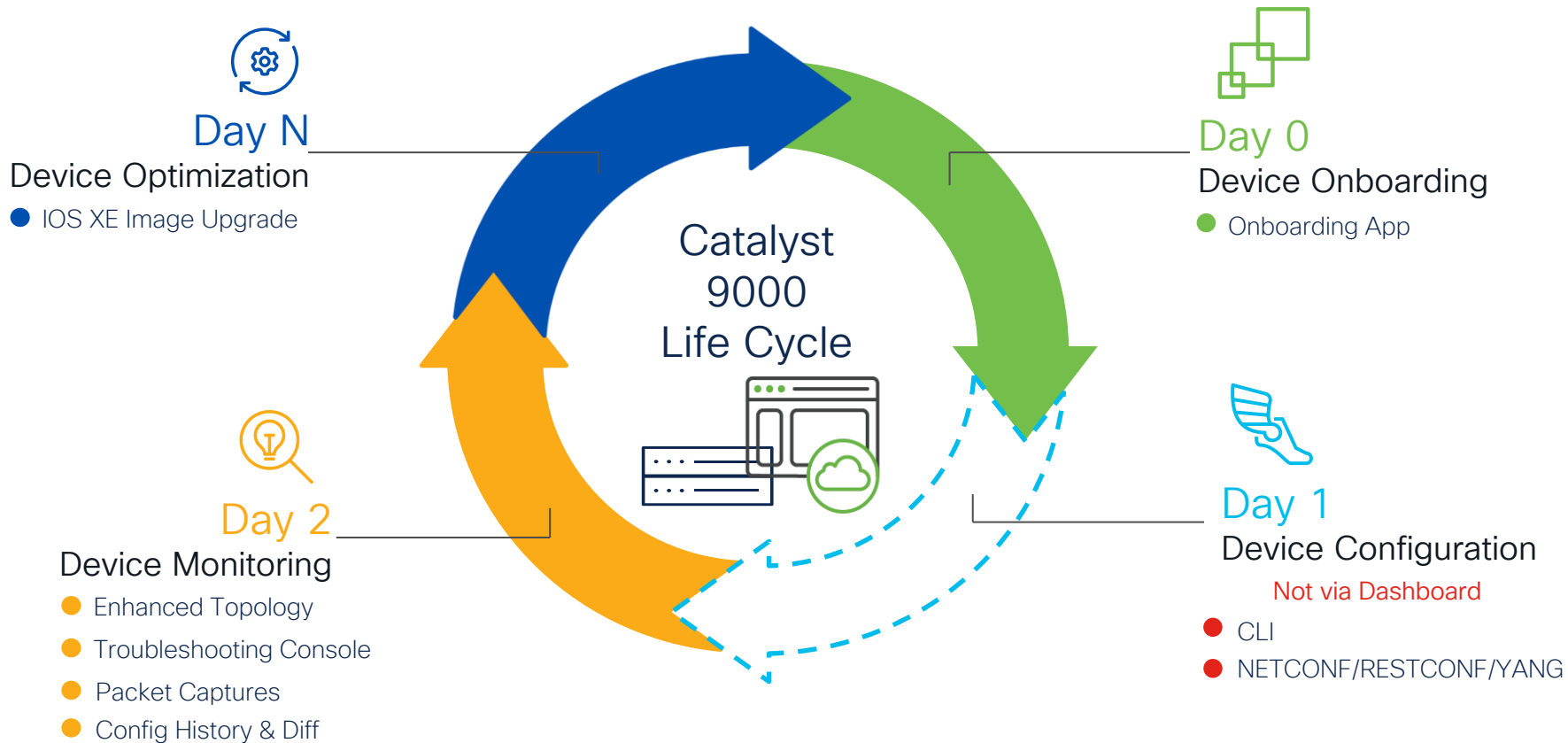
The "Summary" tab is active, displaying a "Set a location for this wireless LAN controller" section with a map icon and a text input field for the address. Below this, a list of configuration parameters is shown:

- HA/Redundancy: SSO
- LAN IP: 10.27.0.5
- Type: statically assigned
- Link aggregate: *
- Public IP: 173.36.255.2
- Gateway: 10.27.0.1
- DNS: 10.10.105.7
- LAN IPv6: *
- Serial number: [redacted]

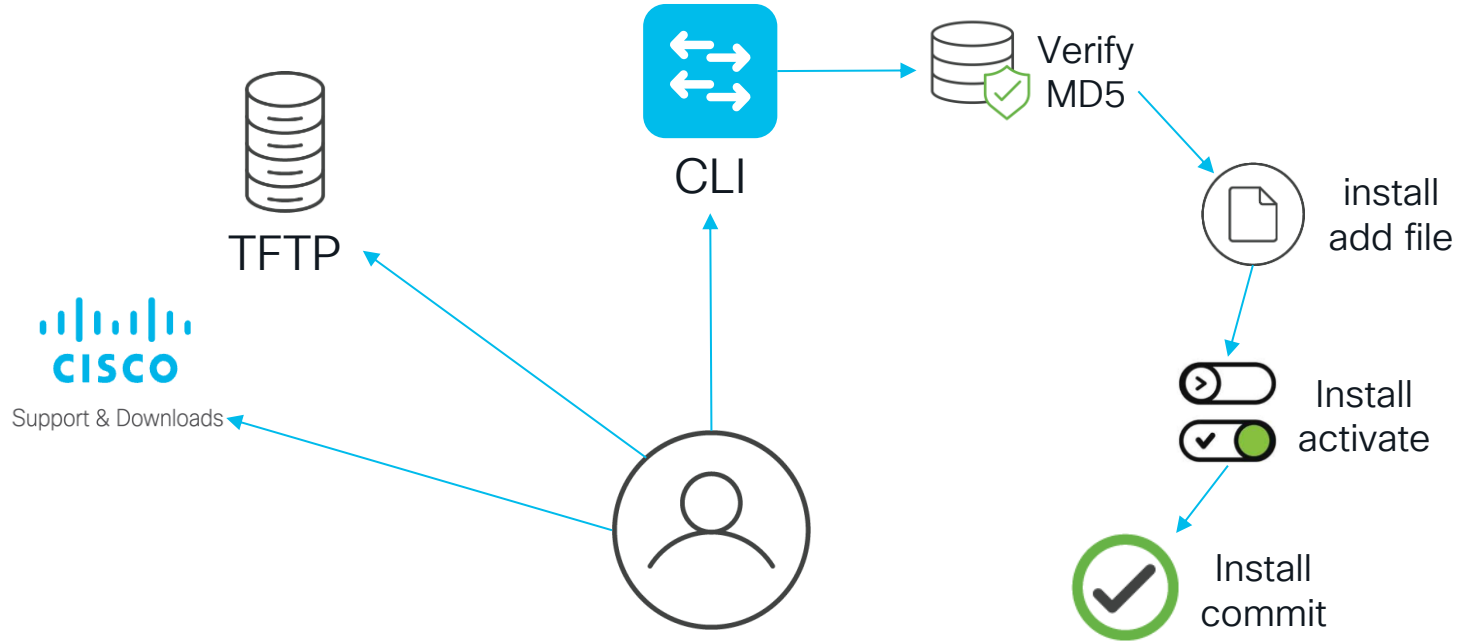
Below the configuration list, there is a "Live Data" section showing "Access Points 19 total" and "Clients 1 total", both with "All Online" status. A "Historical Data" section shows a "Connectivity" graph with a green bar indicating 100% connectivity over the last 2 hours. The graph shows a timeline from 13:36 to 15:16. Below the graph, a "Clients" table is visible, showing a single client entry.

Monitoring Access Points Demo





IOS-XE Software Image Upgrades



IT teams still spend lots of time keeping the network up to date!

Meraki

Search Dashboard

Network

Demo Farm

Network-wide

Switching

Organization

Keep up with the latest in Cloud Monitoring for Catalyst! You can now use the Meraki dashboard to perform IOS-XE image upgrades on monitored Catalyst switches. Enable this feature by visiting the [Early Access Program](#).

Cloud_Monitored

C9300L-24UXG-2Q c4:b2:39:7a:f6:80

Monitor Only

?

Set a location for this switch

Add an address below and check Move marker to update its location

ADDRESS

LAN IP

128.107.251.118 (statically assigned)

PUBLIC IP

128.107.251.118

GATEWAY

128.107.251.65

DNS

128.107.251.83

171.70.168.183

LAN IPV6

Not configured

TERMINAL

Launch Terminal

SERIAL NUMBER

FOC2350L3P6 (Catalyst)

Q2ZZ-4NJS-VCGE (Meraki)

TAGS

recently-added

NOTES

FIRMWARE

Summary

Ports

Location

Tools 1

Config history

Ping

IP or domain name

Ping

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`.

Base Ethernet MAC Address : c4:b2:39:7a:f6:80

Motherboard Assembly Number : 73-19172-06

Motherboard Serial Number : FOC23470AVR

Model Revision Number : A0

Motherboard Revision Number : A0

Model Number : C9300L-24UXG-2Q

System Serial Number : FOC2350L3P6

CLEI Code Number : INMBP00BRA

Switch Ports Model SW Version SW Image Mode

* 1 35 C9300L-24UXG-2Q 17.09.04a CAT9K_IOSXE INSTALL

Cloud_Monitored# |

Cycle port

Warning: PoE powered devices will be temporarily powered down.

Ports (ie. 1-5,7,11,20-23)

Cycle ports

Help Center

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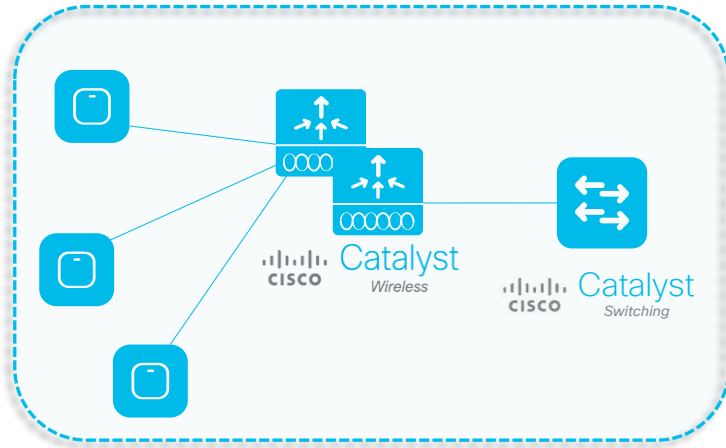
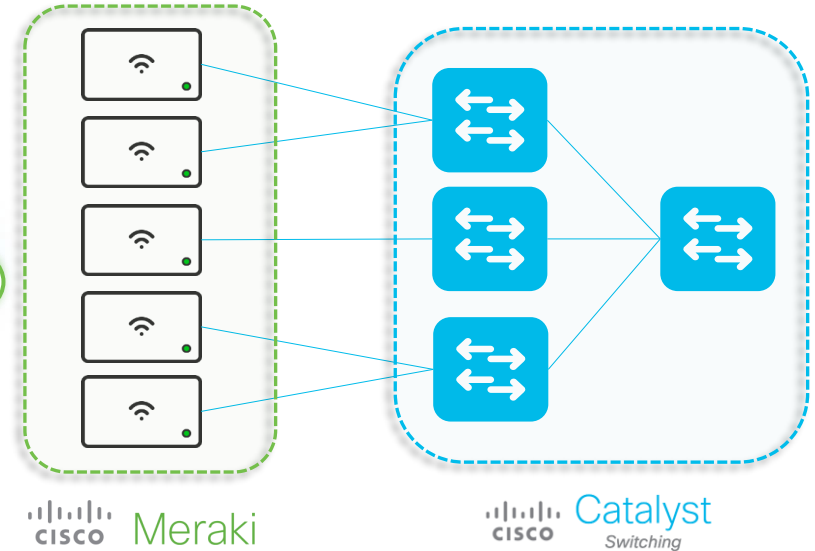
BRKENS-1601

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Architecture Use Cases

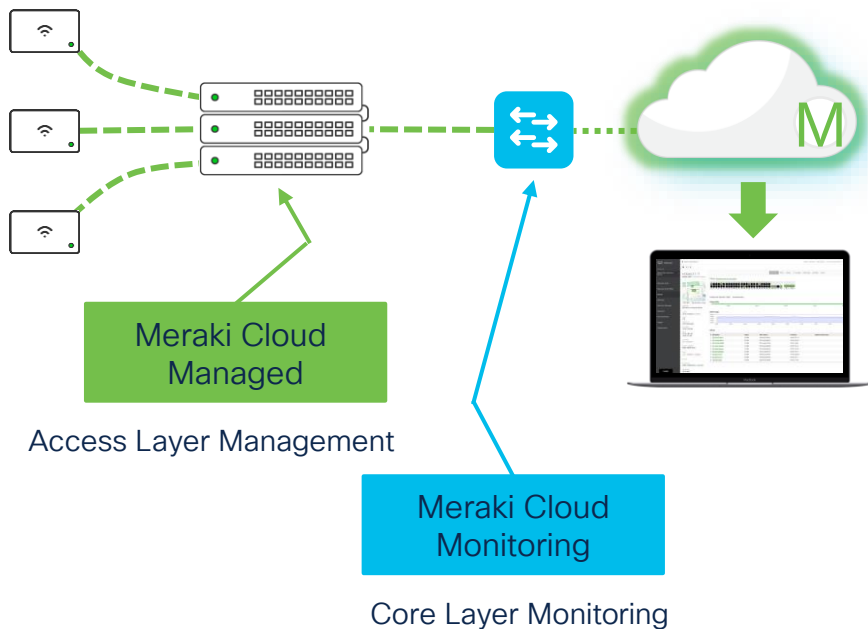
One Platform to Rule Them All



Cloud Monitored Catalyst
Wireless Controllers + Access
Points + Switches

Cloud Managed Wireless + Cloud
Monitored Switching

Embracing Hybrid Tiered Architecture with Meraki



Leverage agile cloud operations with Rich Catalyst features

– Meraki Dashboard feature:

- Image Upgrades, Config backup/diff, Device/Client Health
- Cloud-enabled troubleshooting: Packet Captures, 'show' commands in CLI terminal, Ping/Traceroute
- Sustainability options: Power consumption visibility

– Enhanced IOS XE feature set

- StackWise Virtual, QoS etc.

Keynote Deep Dives

Wednesday
10:30am – 11:30am



Experiences Amplified:
How AI Can Fuel Better Employee and Customer Experiences

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Smart, Secure, Seamless:
Transforming Experiences with Next-Generation Networking

Level 2
Room 204



Harness a Bold New Era:
Transform Data Centre and Service Provider Connectivity

Level 2
Room 203



Securing User to Application and Everything in Between

Level 2
Melbourne Room 2



Unlocking Digital Resilience through Unified Observability

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Thank you

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