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Let's go

The bridge to possible

Meraki Wireless AIOps & Assurance

Optimizing Enterprise Wi-Fi at Scale

Richard Jang, Senior Product Manager

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BRKEWN-2014

Richard Jang

Senior Product Manager for Wireless AIOps & Assurance

Scan to add me on LinkedIn! ⟶
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Fields of Expertise

Wireless AIOps & Assurance for Meraki Cloud & Catalyst Center

Personal Life

Taiwanese American, Silicon Valley Native, San Jose State University

Hobbies

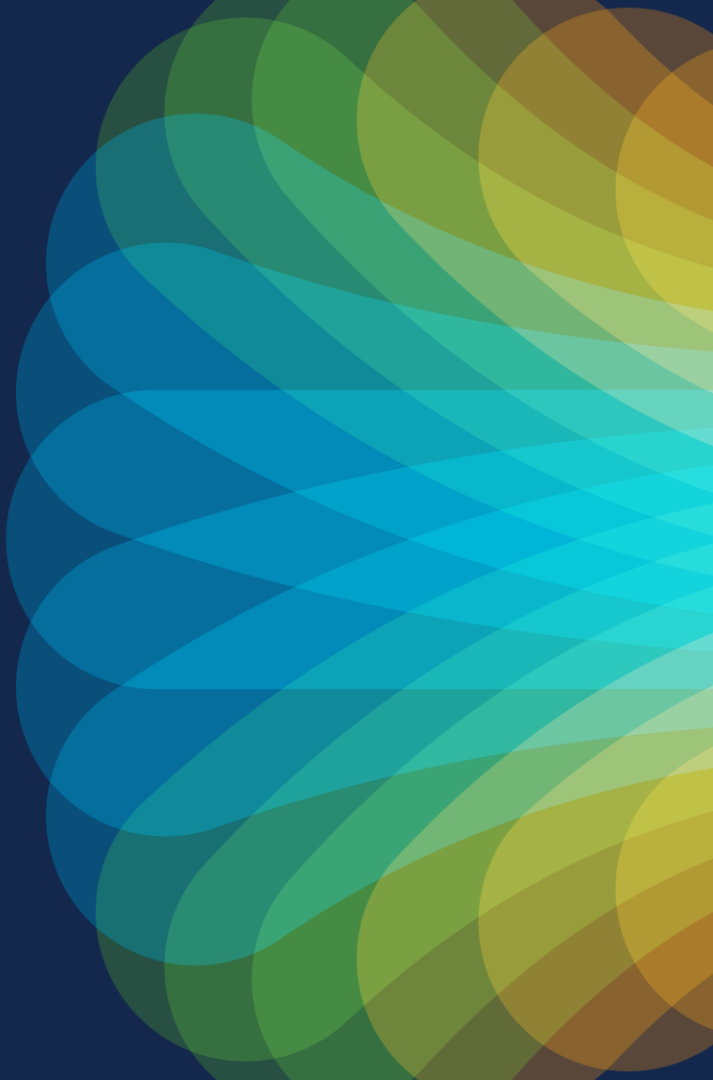
Drum Set Player, Calisthenics Enthusiast

Agenda

- Cisco Meraki – The Who, What, When, Why?
- Cisco Wireless (Meraki & Catalyst) Unification
- Wireless AIOps & Assurance
  - Focus Area and Vision
  - **Day 0**
    - AI-Enhanced RRM
  - **Day 1**
    - Assurance Overview
    - Wireless Overview
    - Roaming Analytics
    - AP Neighbor
  - **Day N**
    - Alert Dashboard & Hub
    - AI-Powered RCAs
- Conclusion

Cisco Meraki

The Who, What, When, Why



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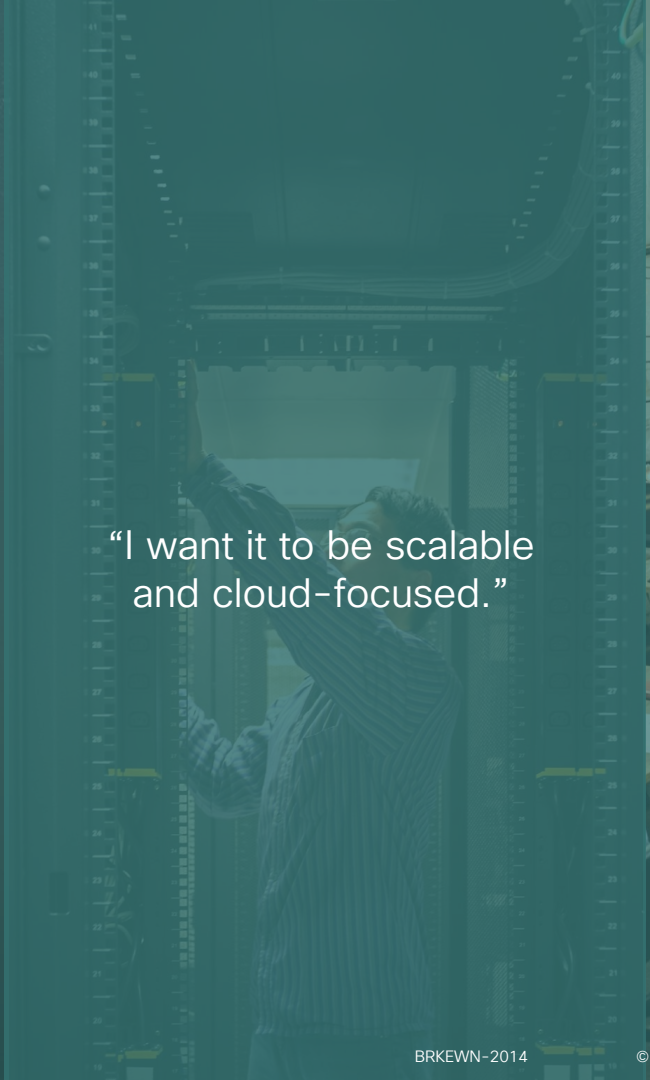
Meraki at a glance

2006

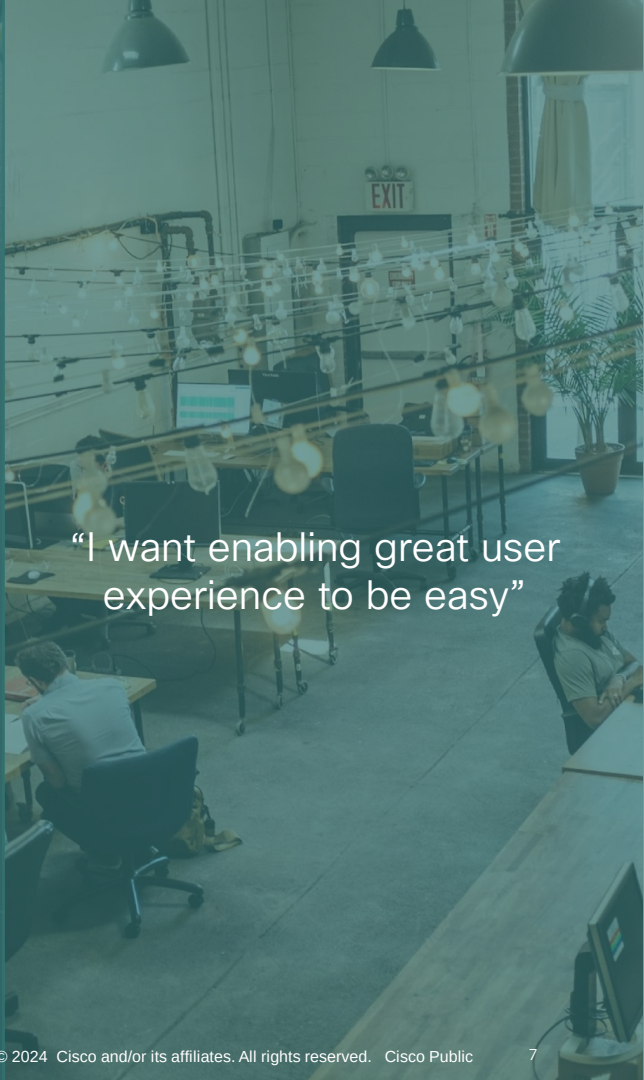
FOUNDED CLOUD NETWORKING

Connecting passionate people to their mission by simplifying the digital workplace.

“I want a simpler networking solution.”



“I want it to be scalable and cloud-focused.”



“I want enabling great user experience to be easy”

Meraki at a glance

2006 — FOUNDED CLOUD NETWORKING

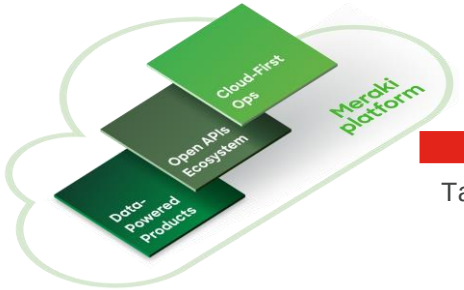
2012 — ACQUIRED BY CISCO

TODAY — 18+ YEARS DESIGNING SCALABLE & SECURE CLOUD ARCHITECTURE

Connecting passionate people to their mission by simplifying the digital workplace.

Cisco Meraki, Everything Network and IoT
Powered by AIOps & Assurance

Built-in solutions



API

Tailored solutions

CUSTOM BUILT

developer.cisco.com/meraki

TECH PARTNERS

meraki.com/marketplace


Wireless


Switching

Mobile Device Management


Security and SD-WAN


Cellular Gateways


Smart Cameras


Sensors

ACCESS

SECURITY AND IOT

18 years of helping customers and partners deliver exceptional User Experiences

750K+
Customers

99.99%
Cloud SLA

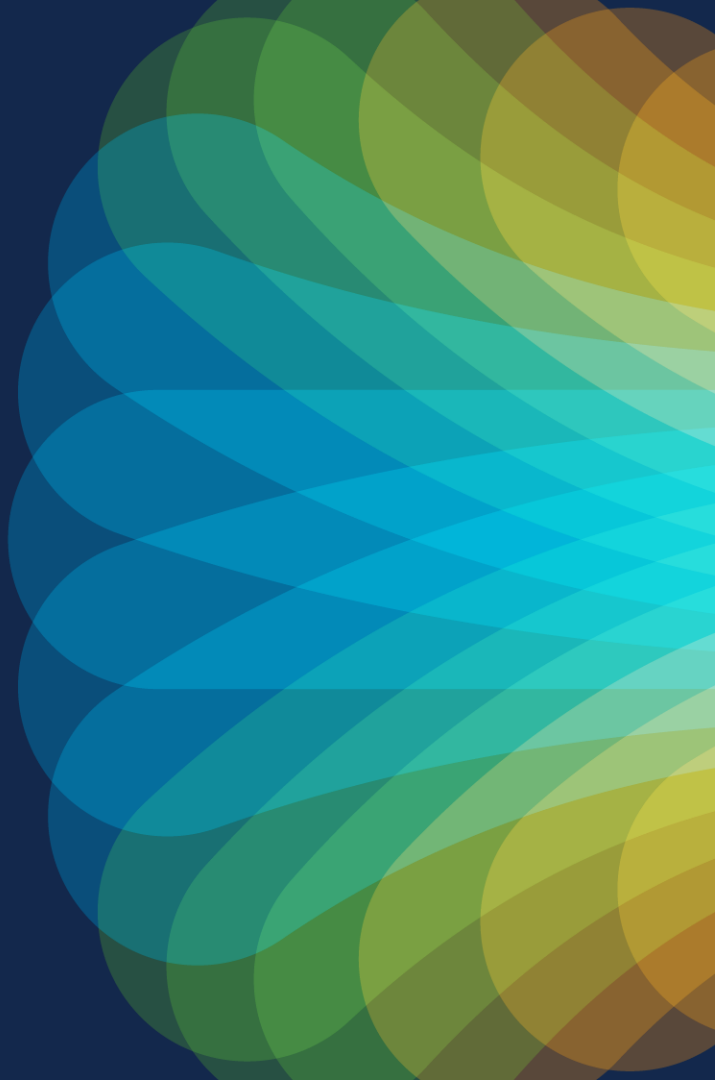
9.8+ MILLION	4.6+ MILLION	14+ MILLION	190+
Access Points	Customer networks	Meraki devices online	Countries in network

250+ Thousand	9+ BILLION	350+ MILLION	250+ MILLION
Meraki Devices for the Largest Customer	External API monthly calls	Daily end-user devices	Daily splash pages served

Born in the cloud, growing daily, and
Trusted Everywhere

Cisco Wireless Unification

The Best of Meraki & Catalyst



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Industry's best & broadest Wi-Fi 6E portfolio

9162

9164

9166D1

9136

9166I

MR57

9163E

Indoor Access Points

Outdoor Access Points

Management mode can be changed

Network Management

Meeting our customers where they are

On-prem with *Catalyst Center*

Use cases require on-prem delivery. DIY IT model

On-prem/Cloud with Catalyst *Cloud Monitoring*

Retain control on prem but use AIOps & Assurance in cloud to help run networks

Cloud with *Meraki*

Prefer cloud-enabled delivery for simplicity. SaaS IT model

Cisco Wireless Mission: Deliver simplified outcomes to **all customers**

Cloud Monitoring for Catalyst Wireless

On-premise functionality in the cloud | Deployed & monitored by you

Unified view of Cisco Wireless Infrastructure

Leverage Meraki AIOps & Assurance!

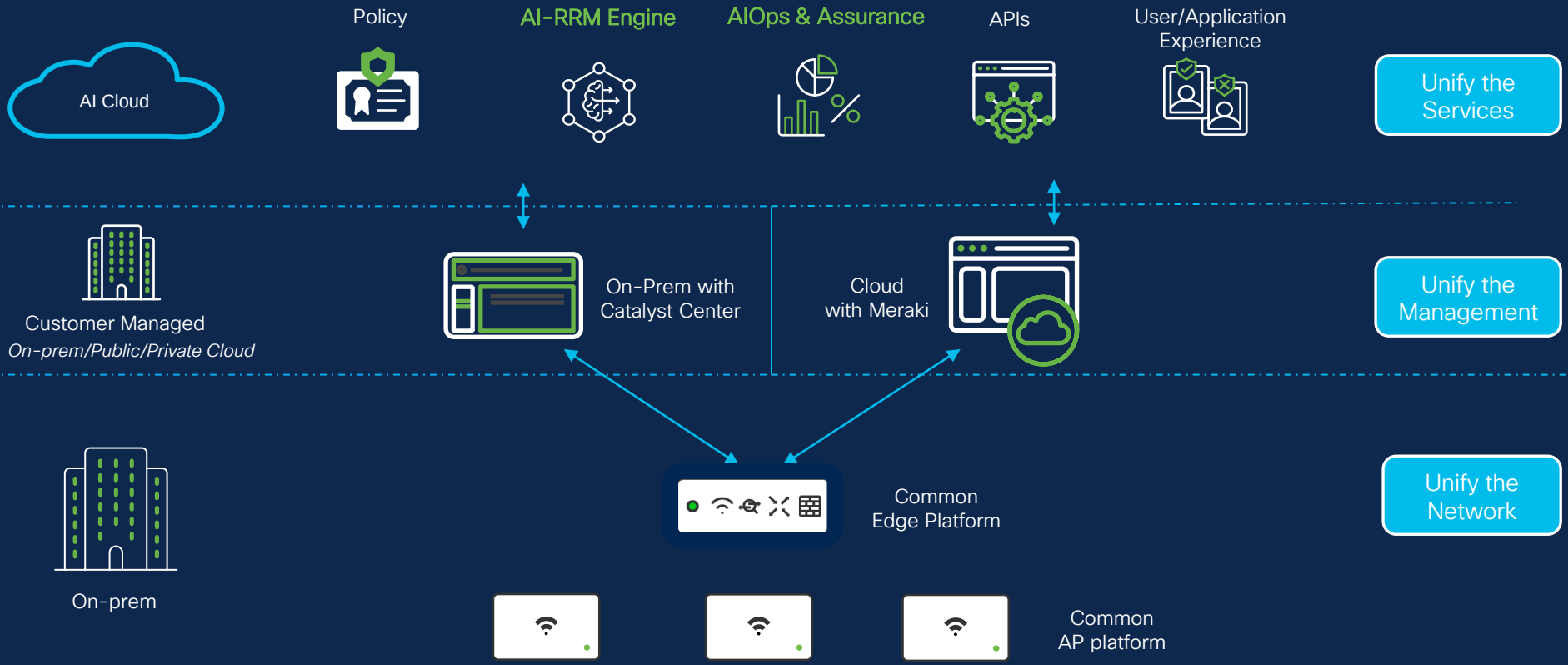
Network Client and Traffic Information

Licensing
DNA Essentials
DNA Advantage

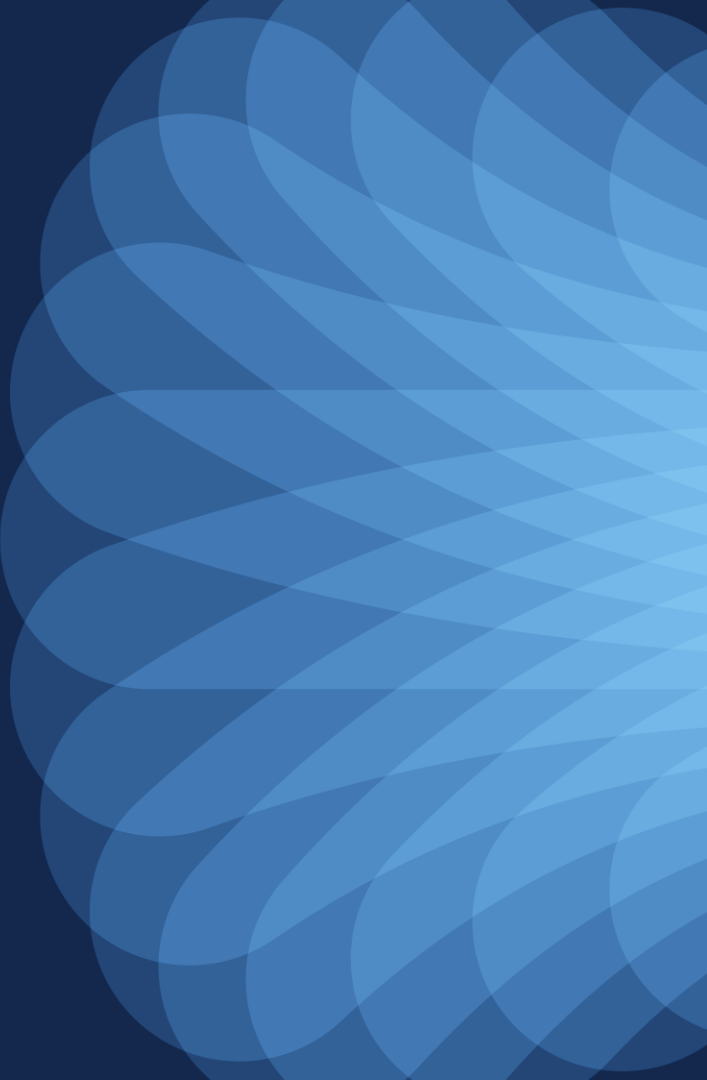
Wireless Models
WLC – 98xx
APs – 28xx, 38xx, 48xx,
C91xx, CW91xx

Learn more: BRKEWN-2097 Monitoring Catalyst Wireless with the Meraki Dashboard 7th Feb, 16:00

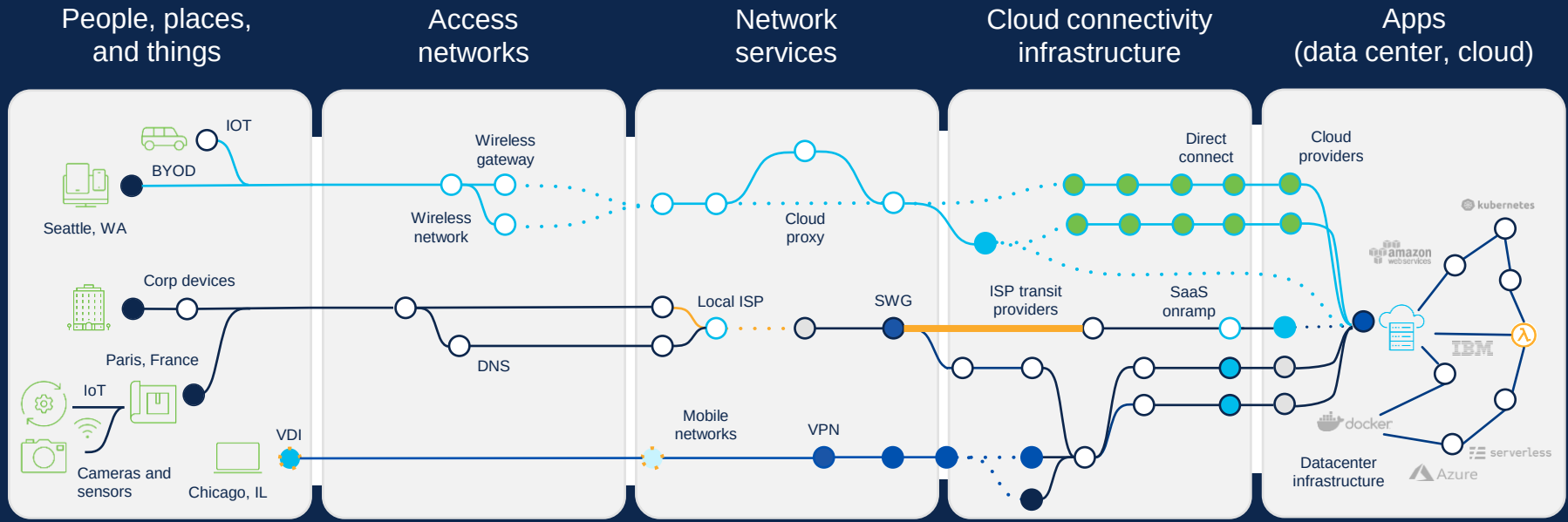
Cisco Wireless Strategy: Converged Experience



Wireless AIOps & Assurance



Networks are More Complex Than You Think



Cisco AIOps & Assurance Focus Areas and Vision

Network Devices
Network devices across wireless and wired domains are up and operational.

Infra Connectivity
Connections between network devices to the RF, LAN, WAN, and Services are available and optimal.

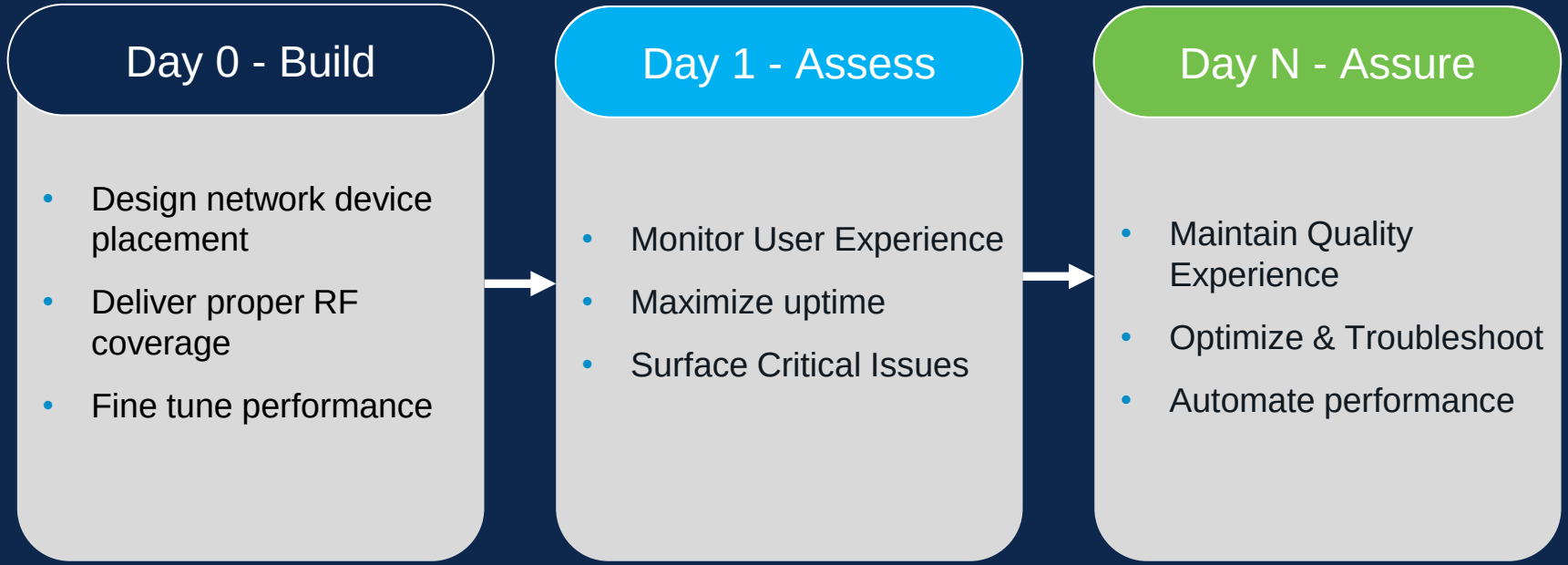
Client
Wireless & wired clients can leverage the network to access data reliably.

Applications
Users can utilize applications with sufficient performance when needed.

- AI-Driven Automation
- Full-Stack Optimization
- Proactive Issue Detection
- Auto Issue Remediation

Cisco AIOps & Assurance enables great user experiences!

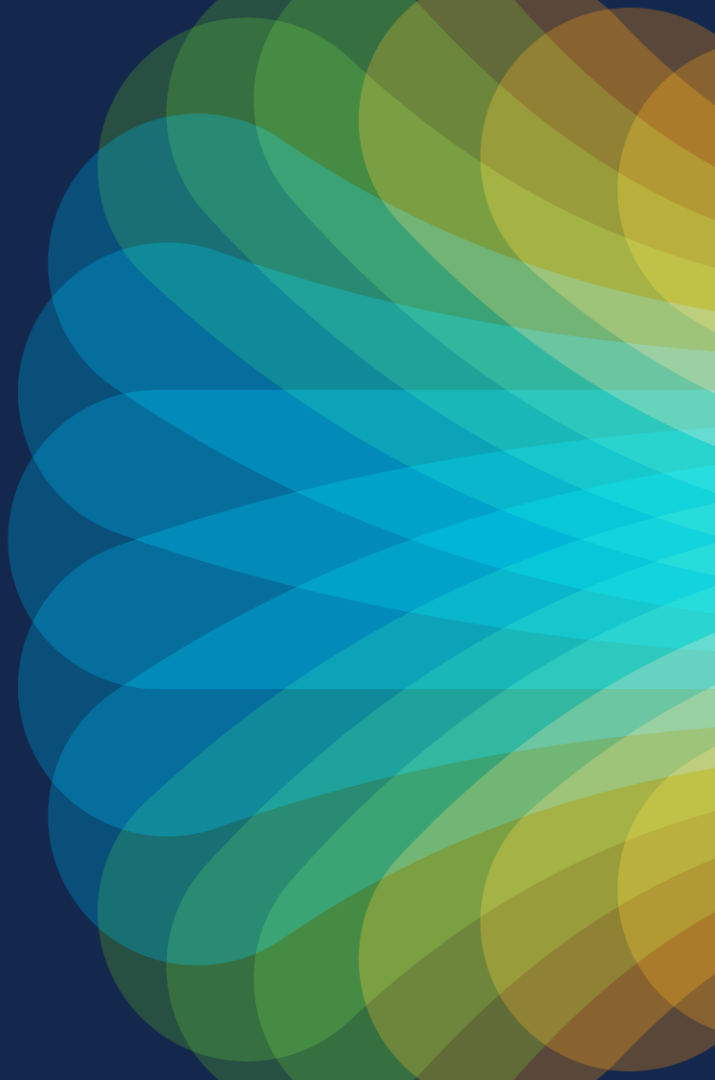
Simplify Network Management with AIOps & Assurance



Day 0

AI-Enhanced RRM

AI-Powered RF Optimizations for Meraki



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The Reality of Enterprise Wi-Fi

It’s Complicated!

Expectation

Everything Just Works!

VS.

Reality

Without Fine Tuning:

- Flaky Connectivity
- Poor Performance
- Bad User Experience

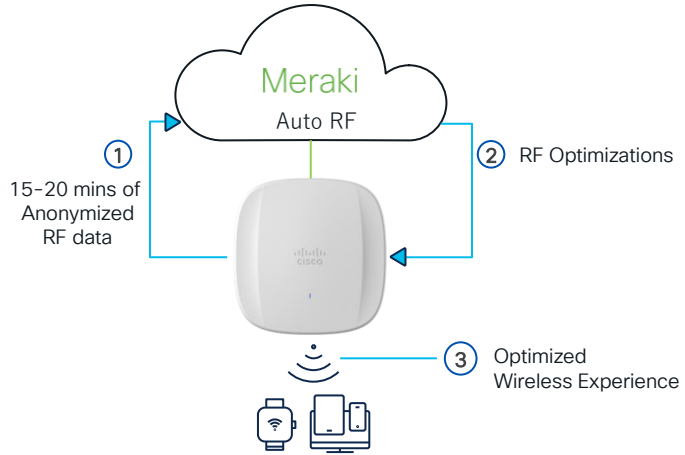
Meraki's Solution Optimizing Wi-Fi Starts with Auto RF

Auto RF is Cisco Meraki's radio resource management (**RRM**) solution that optimizes wireless configurations using 15-20 mins of RF data (**Snapshot-based**) to improve RF performance.

Supported RRM Services

- **Dynamic Channel Assignment (DCA)**
  Automate Channel Assignment
- **Dynamic Band Selection (DBS)**
  Automate Channel Width Assignment
- **Transmit Power Control (TPC)**
  Automate Radio Tx Power Assignment

Topology



Introducing AI-Enhanced RRM for Meraki

RF Optimization Designed for the Highest Density Networks

Reduce

Client Disruptions by 50%+
with AI Channel Planning

Minimize

RRM Changes by 70%+
with Busy Hour

Maximize

Performance and Efficiency
with Trend-Based RRM & FRA

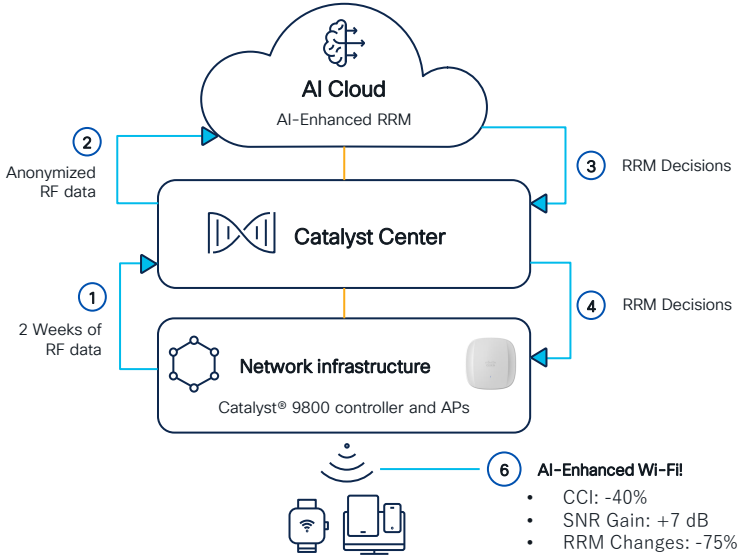
What is AI-Enhanced RRM?

AI-Enhanced RRM is Cisco Wireless's radio resource management (RRM) solution that optimizes wireless configs using **2 weeks** of RF data (Trend-Based RRM) to improve RF performance.

Supported RRM Services

- Dynamic Channel Assignment (DCA)
- Dynamic Band Selection (DBS)
- Transmit Power Control (TPC)
- Flexible Radio Assignment (FRA)

Topology

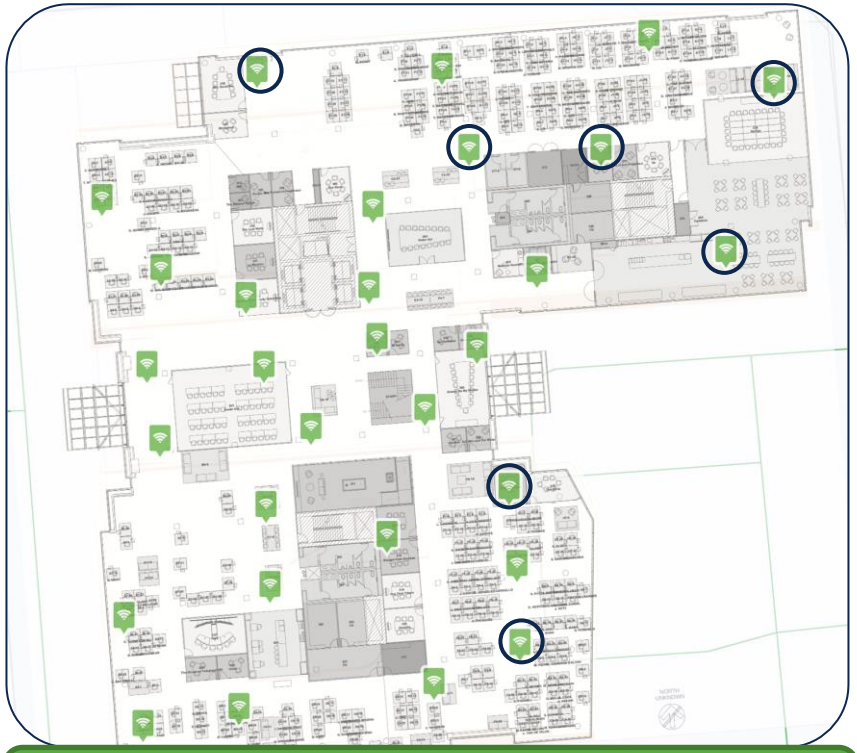


Available

Reduce

Client Disruptions by 50% with AI Channel Planning

Powered by
AI-Enhanced RRM



AI learns your wireless with 6+ weeks of data to prioritize channels with the best experience

How does AI Channel Planning work?

Step 1

Channels that face a DFS or channel jammed event with will be put on an **Avoid List** starting at severity 6.

Step 2

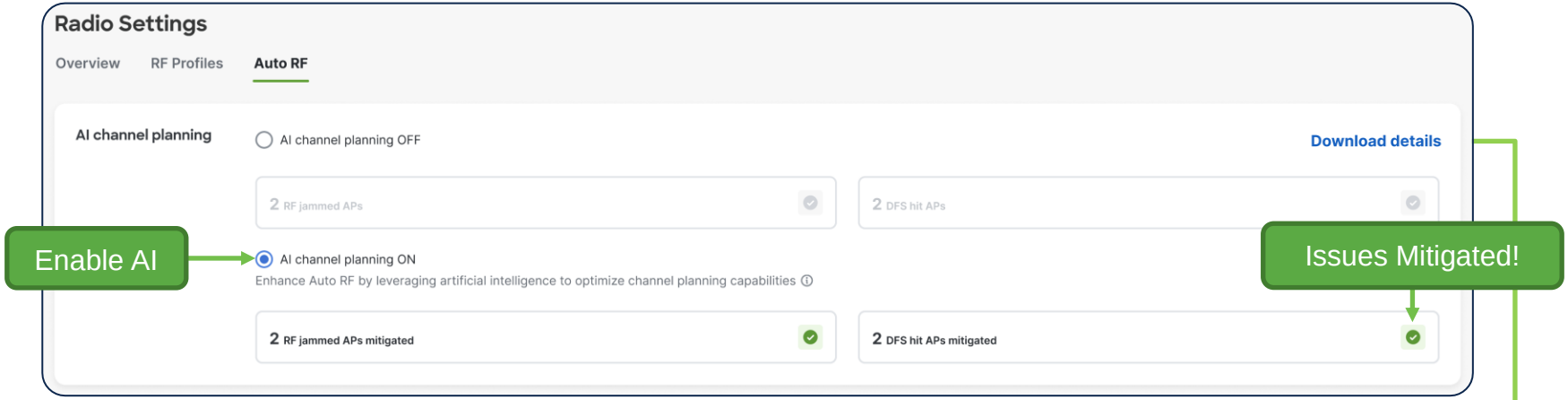
Channels on the **Avoid List** won't be selected by RRM; after the period, it'll be added to the **Monitor List** with the same severity.

Step 3

While a channel is in the **Monitor List** and an interference event occurs, it's moved back to the **Avoid List** with increased severity.

Severity Level	Channel Avoid List	Channel Monitor List
6	1 Day	1 hour
5	2 Days	2 hours
4	4 Days	3 hours
3	8 Days	4 hours
2	14 Days	5 hours
1	30 Days	6 hours

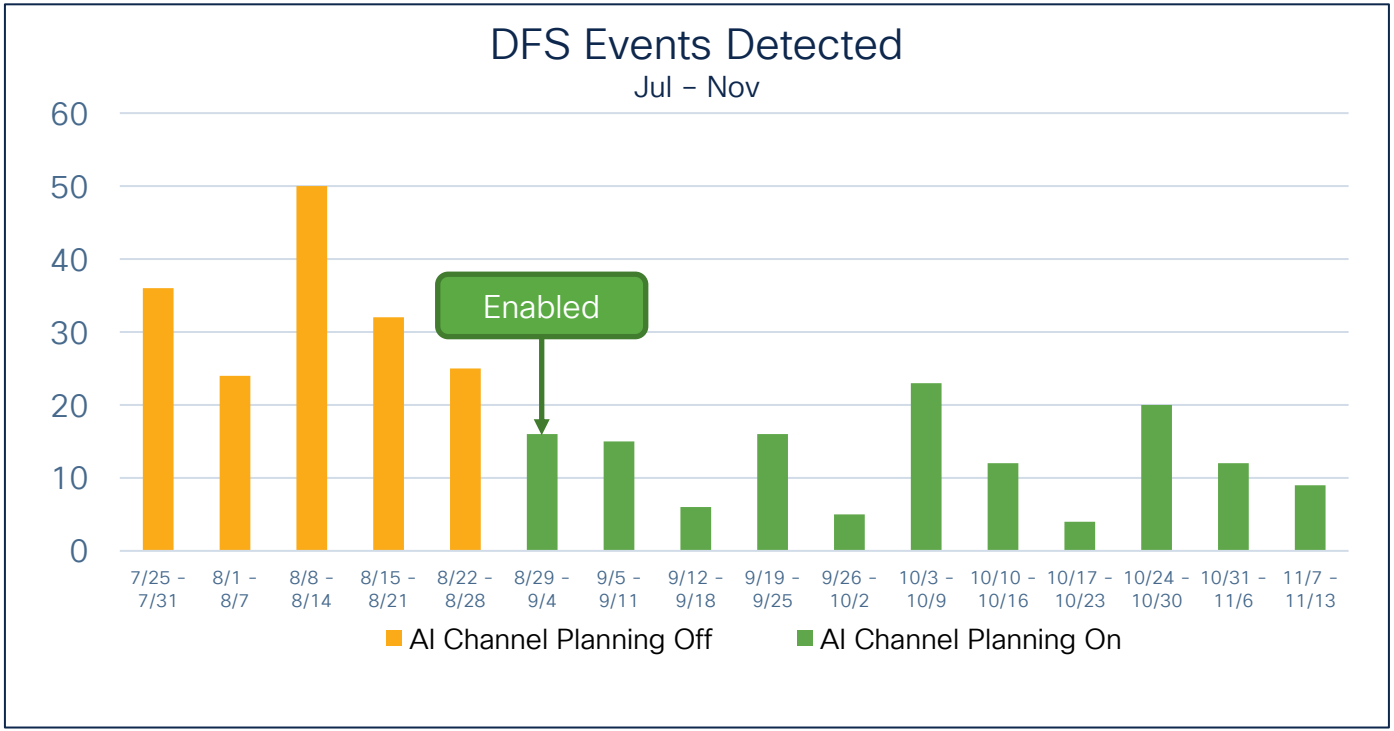
How to Enable AI Channel Planning



AP Name	Issue	Band (GHz)	Channel	AI Channel Planning Mitigation	Start Time	End Time
AP1	<None, Frequent DFS Hit, RF Jammed>	<2.4, 5, 6>	<Channel>	<Channel Avoided, Channel Monitored, Feature Disabled>	<Start Time>	<End Time>
AP1	RF Jammed	6	104	Channel Avoided	3/23/23 - 12:45 PM	3/25/23 - 12:45 PM
AP1	Frequent DFS Hit	5	108	Channel Monitored	3/23/23 - 5:45 PM	4/23/23 - 5:45 PM
AP2	RF Jammed	6	100	Channel Avoided	3/23/23 - 5:45 PM	3/27/23 - 5:45 PM
AP3	RF Jammed	6	100	Feature Disabled	N/A	N/A

Proof that AI Channel Planning Works!

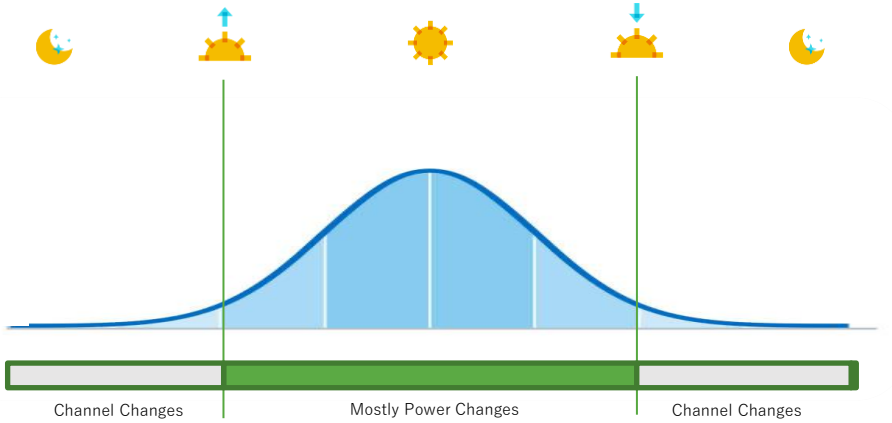
Reducing DFS Hits by ~50% on Customer Site with 135 APs



Available

Minimize

RRM Changes by 70% with Busy Hour

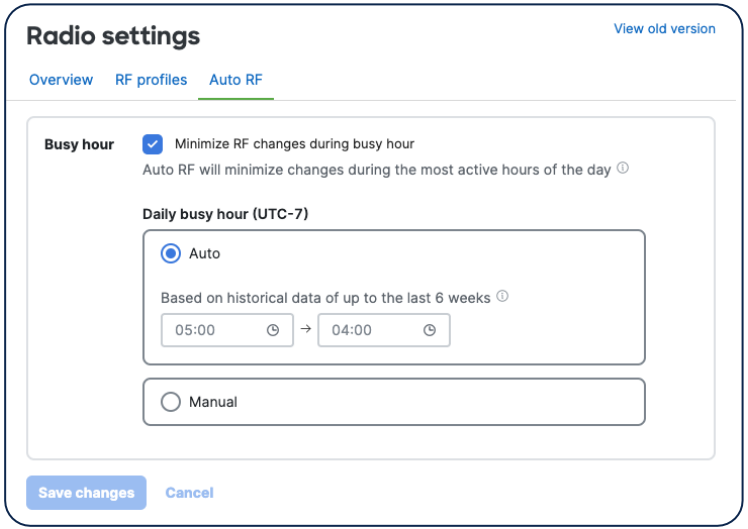


Promotes seamless connectivity for users by minimizing channel changes during peak hours.

Powered by
AI-Enhanced RRM

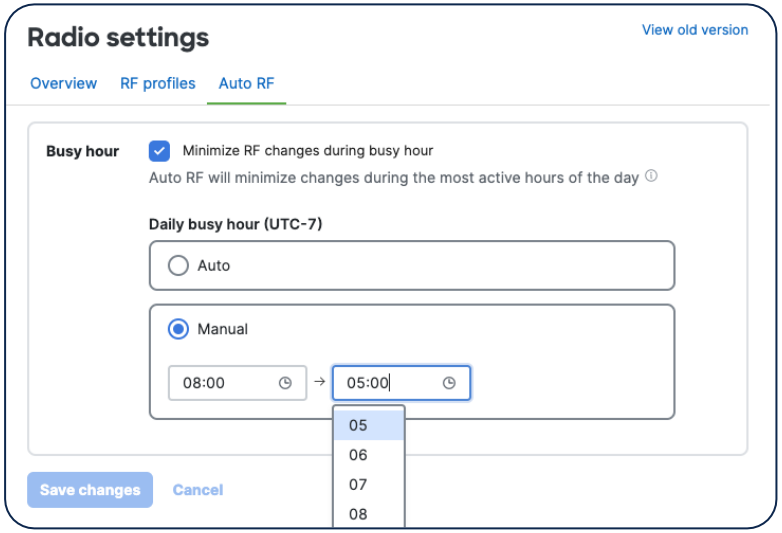
How To Enable Busy Hour

Two Choices, AI-Powered Simplicity or Control



Have AI decide for you with “Auto”

From 6 weeks of client count & traffic data



…or configure the time with “Manual”!

Cisco Customer ‘Room & Board’ User Experience Improved Thanks to AI Channel Planning and Busy Hour!

Channel Switch Changes Decrease

Tx Power Changes Decrease

Once we enabled both Busy Hour and AI Channel Planning, we observed a more stable channel state with far fewer changes among access points, in addition the radio power changes also became steadier.

In client experience this has translated to more efficient roaming, less sticky clients, and a decrease in undesirable client behavior like stationary clients floating between access points.

Mark Rodrigue

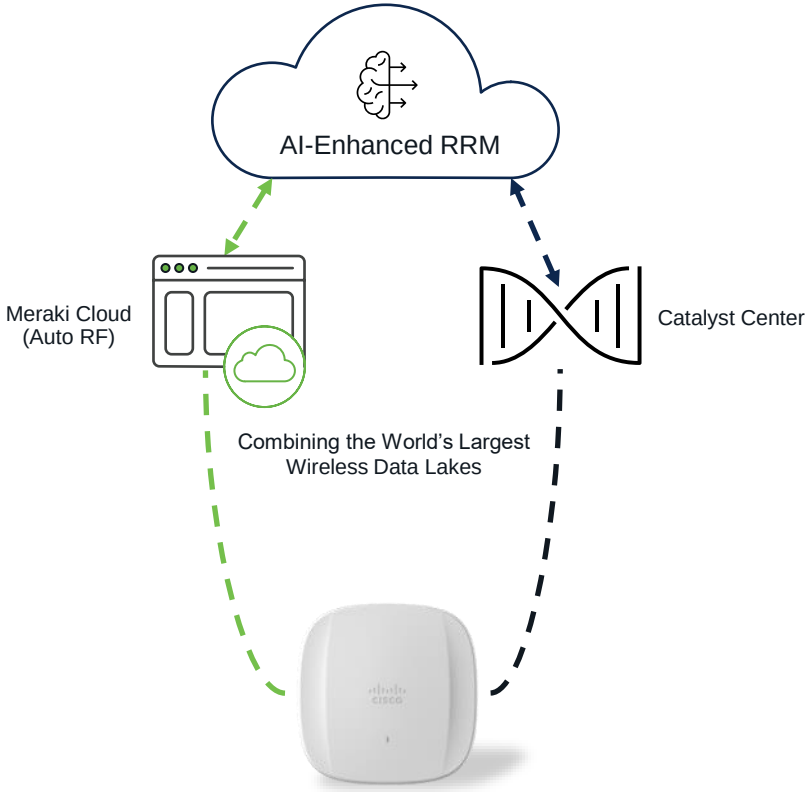
Senior Network Engineer, Room & Board

Private Beta

Maximize

Performance with Trend-Based RRM & FRA

Target GA Fall CY24



AI-Enhanced RRM Will Significantly Improve Meraki's Wi-Fi!

Trend-Based RRM

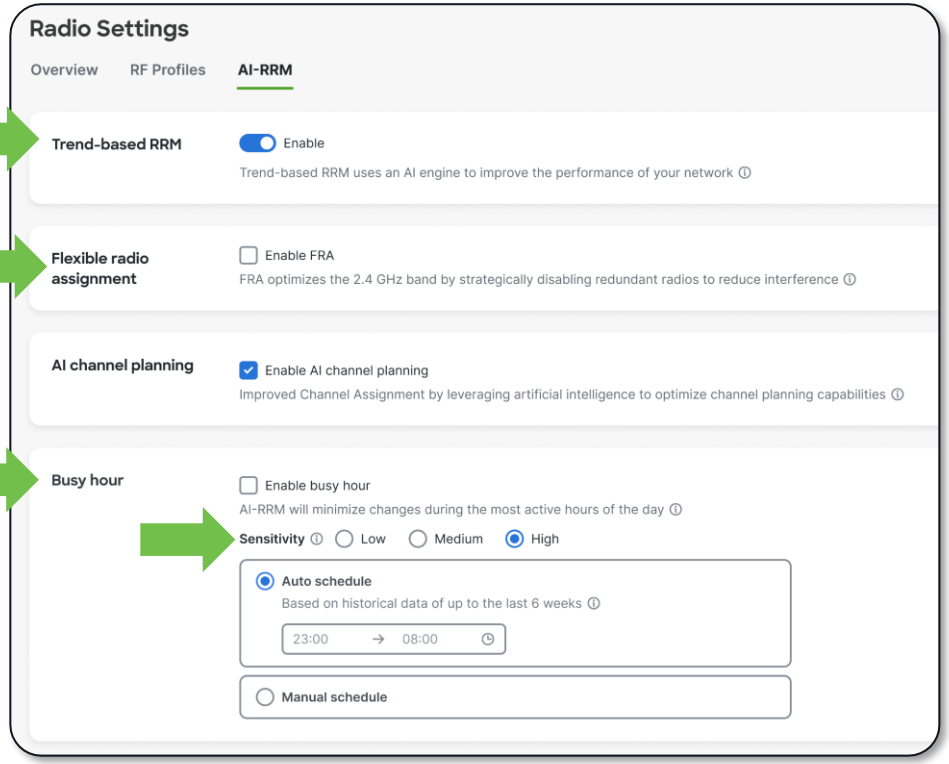
Optimize RF with 2 weeks of data enabling more sophisticated & efficient RRM optimization!

Flexible Radio Assignment

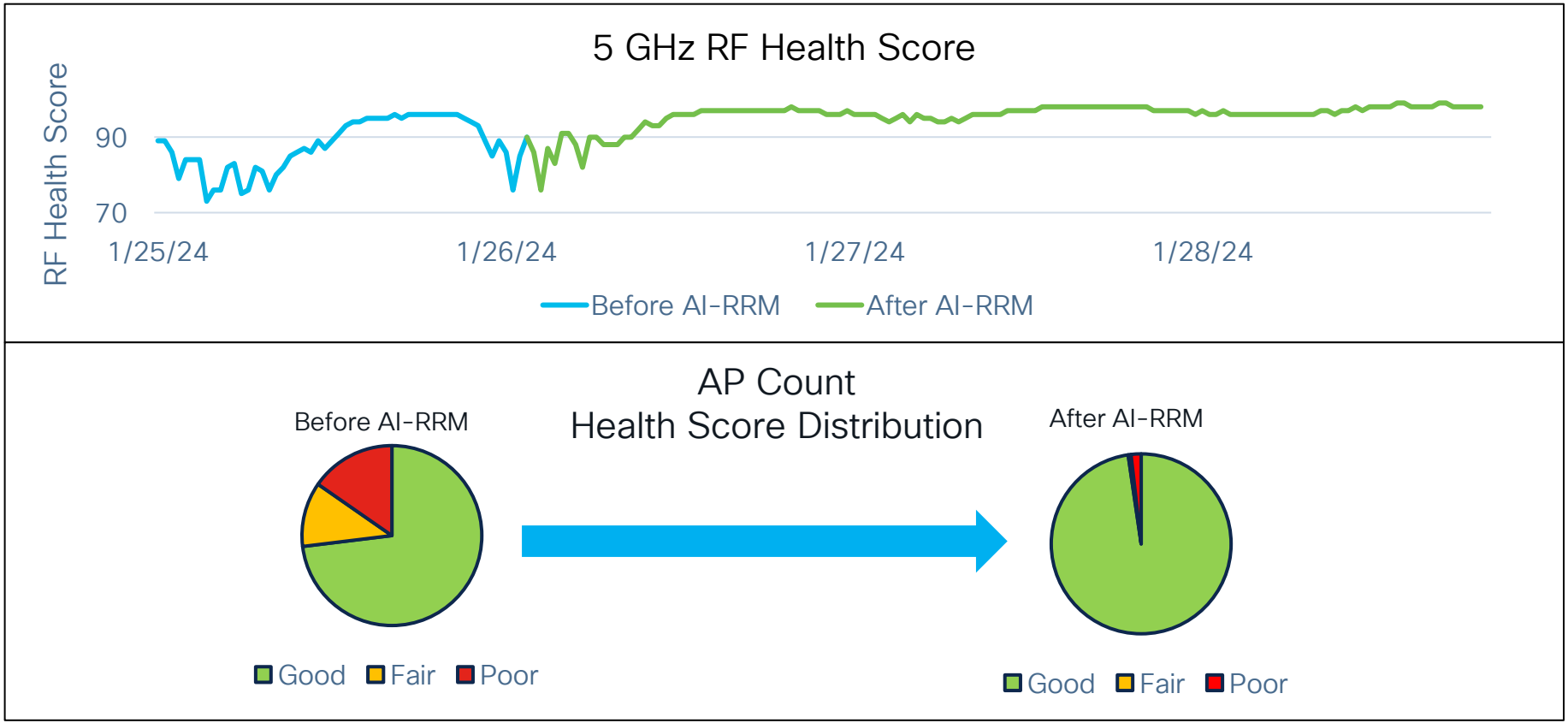
Place radios on the most optimal band/mode to minimize interference on 2.4 GHz at the touch of a button!

Enhanced Busy Hour

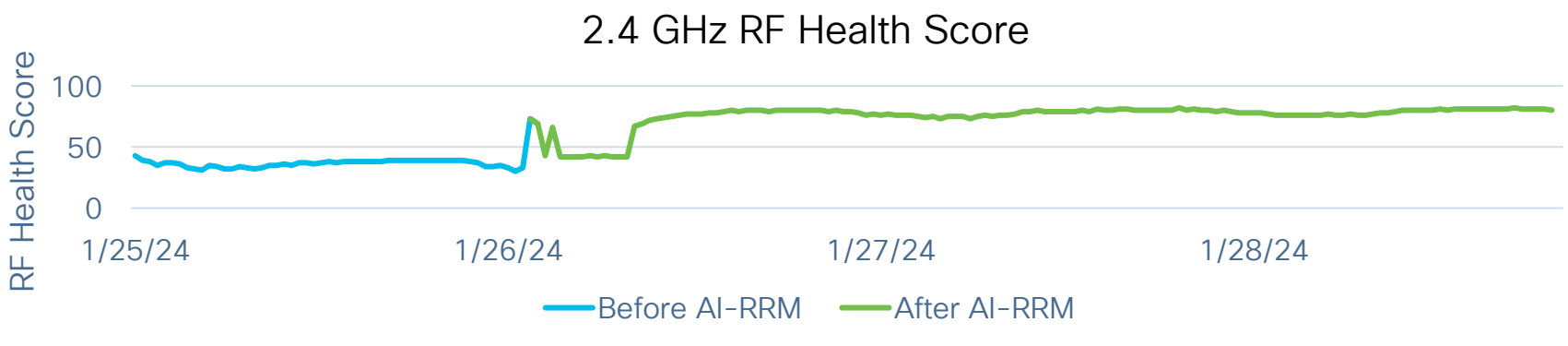
Optimizations are deferred until after the busy hour, using busy hour data, rather than just suppressed!

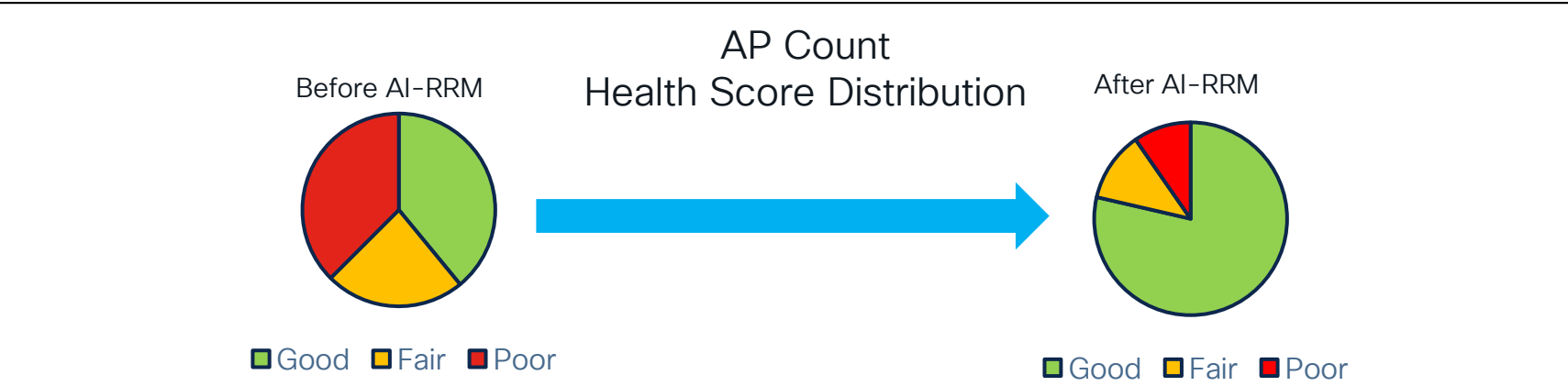


Trend-Based RRM Improved a Large Japanese University 5 GHz Network of 776 APs in Just Three Days!



Trend-Based RRM Improved a Large Japanese University 2.4 GHz Network of 776 APs in Just Three Days!





Day 1

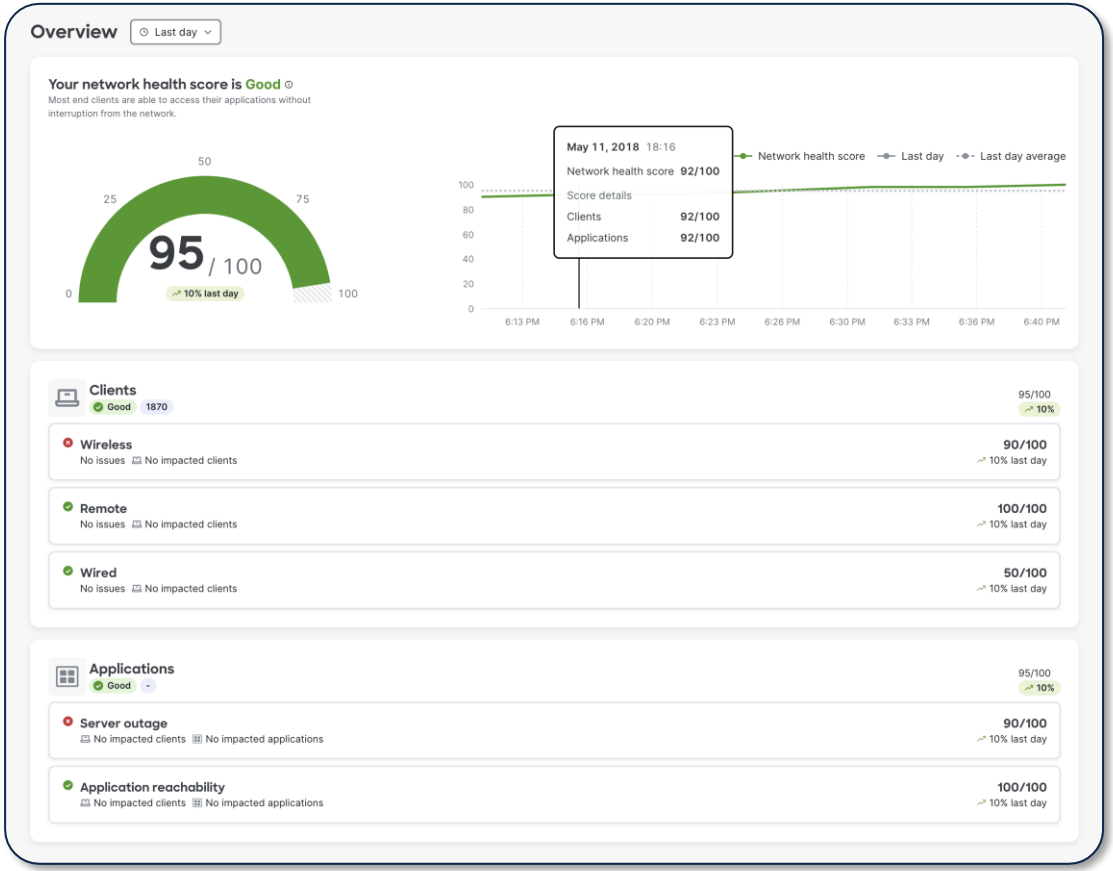
Assurance Overview

A View of All Things Networking

Private Beta

Assurance Overview Dashboard

- Full Stack Network Health
- Top-Down Scoring
- Client Impact Focus
- Before and After View



What Defines Network Health?

Are Wireless, Wired, or Remote Clients able to join the network and perform optimally?

Client Experience

Are network devices across the stacks such as APs, switches, routers, working as expected?

Network Devices

Are there issues over LAN, WAN, VPN, or RF and if yes what's are the impacting KPIs?

Infrastructure Connectivity

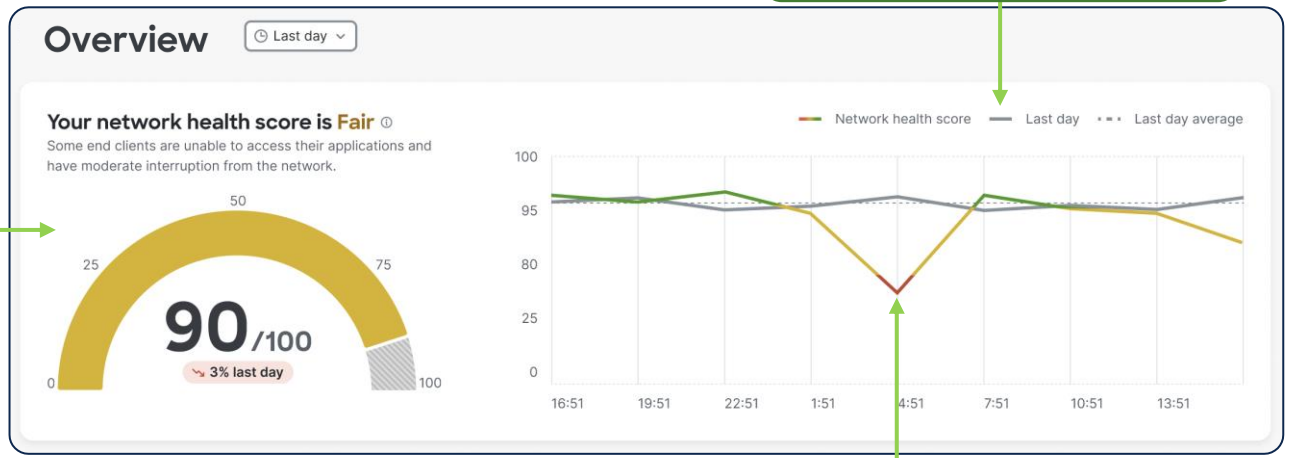
Can users access the applications and services they needs to be effective?

Applications

Assurance Overview Provides Full Network Visibility

Clients, Devices, Infra Connectivity, and Applications

Compare Today's Health with Yesterday!



Overall Network Score and Insights

Spot Network Degradation with the Network Health Trend

Sign up for the **Assurance Overview** Private Beta!

Scan QR Code

or Click Here!

Day 1

Wireless Experience Overview

Are Your Wireless Users Happy?

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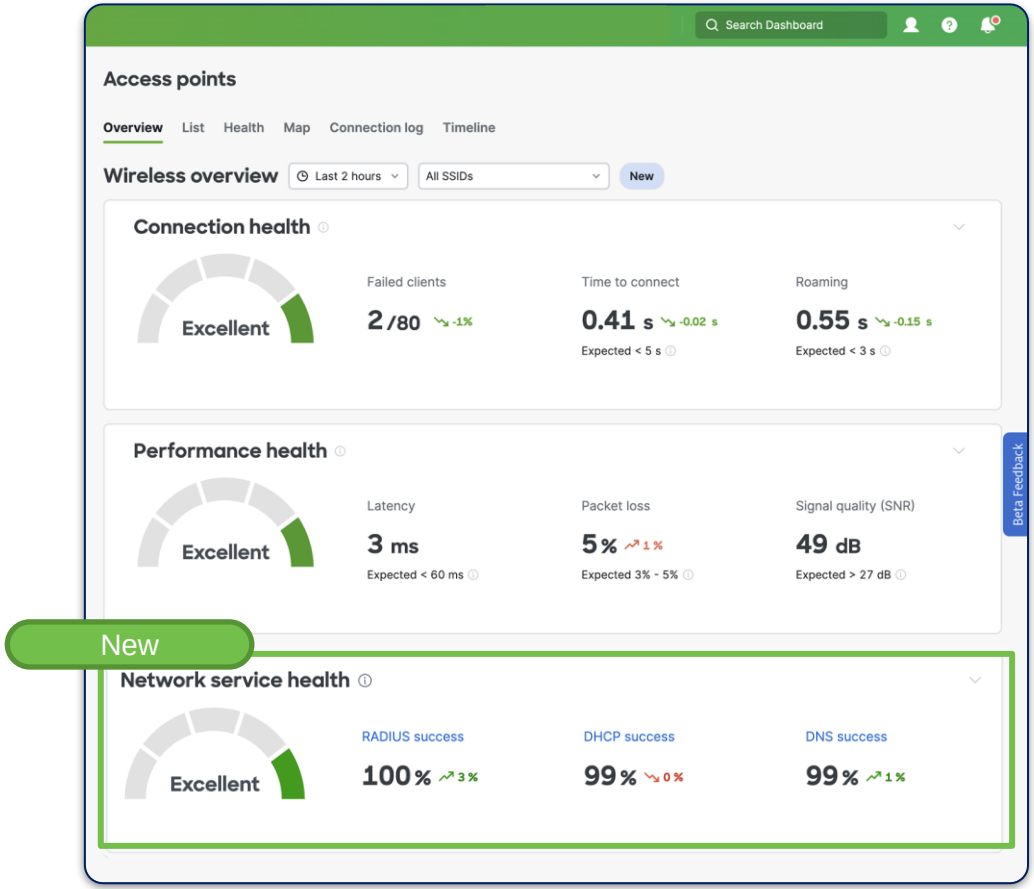
Available

Wireless Experience Overview

- Wireless Visibility
- Discoverable Drilldowns
- Client-Impact Focus

Wireless Experience Metrics will be integrated into Assurance Overview



What Defines Wireless **Connection Health?**

Discover the most vulnerable APs and clients

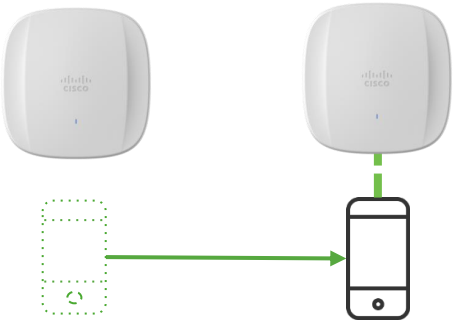
Are clients
failing to connect?

Failed Clients

Is the connection
experience too slow?

Time to Connect

Are clients
roaming effectively?

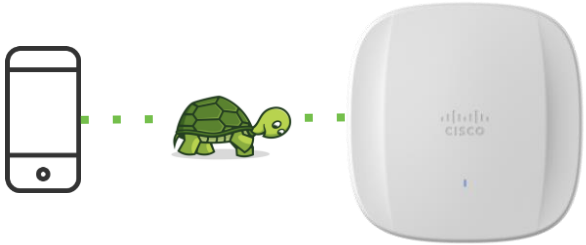


Roaming

What Defines Wireless **Performance Health?**

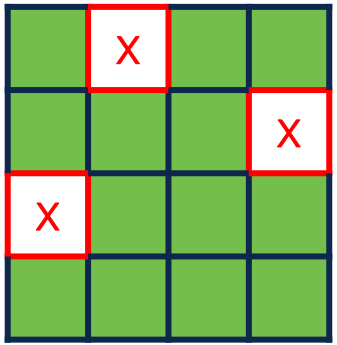
Understand slow Wi-Fi and poor application quality

Can I **transmit when I need to?**



Latency

Did my **data arrive successfully?**



Packet Loss

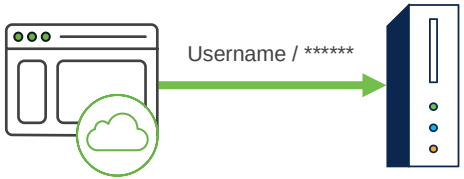
Do I have a **strong RF link?**

Signal Quality

What Defines Network Service Health?

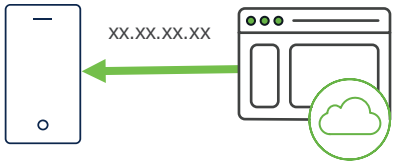
Understand slow Wi-Fi and poor application quality

Can I authenticate into my network?



Radius

Can I join my network quickly?



DHCP

Can I access internet reliably?

DNS

How are Health Scores Calculated?

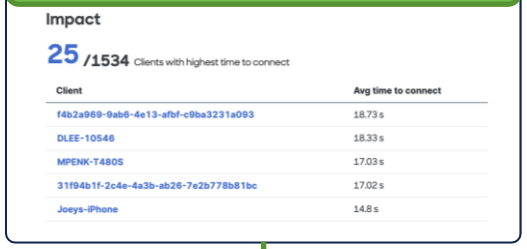
Health Score = (Client Impact KPI1 + Client Impact KPI2 + Client Impact KPI3) / 3

Client Impact KPIs of **Connection Health**

Failed Clients

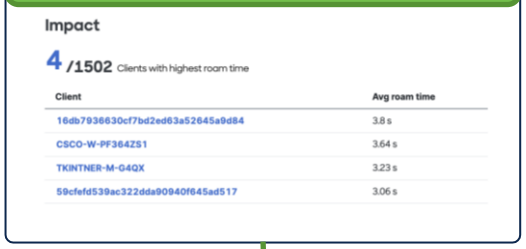
(**1.4% of Clients** Failed to Connect

Time to Connect



+ **1.6% of Client** Took >5s to Connect

Roaming



+ **0.2% Client** of Took >3s to Roam) / 3

= 1.06%

Failed %	Category
80% - 100%	Bad
60 - 80%	Poor
40% - 60%	Fair
20% - 40%	Good
0 - 20%	Excellent

Day 1

Roaming Analytics
Understand Complex Client Behavior

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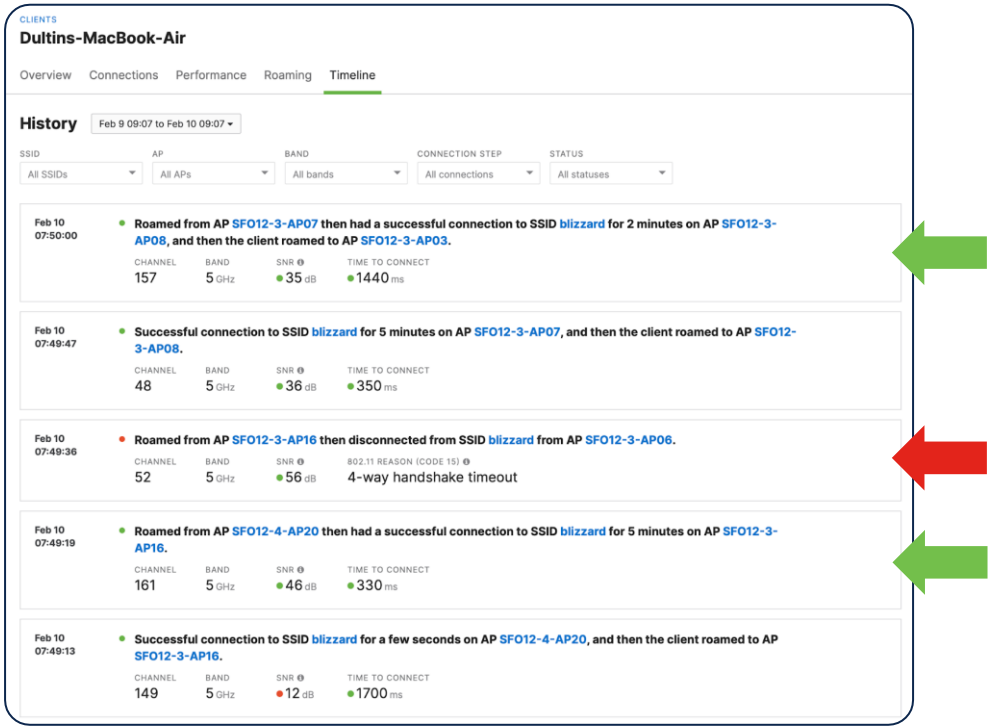
Understanding Client Roaming is Challenging!
Here's 3 objective reasons why...

Roaming is a client's decision, not the network's...

Visualizing roaming through a timeline is tedious.

Deriving roam patterns is needed for triaging but is challenging.



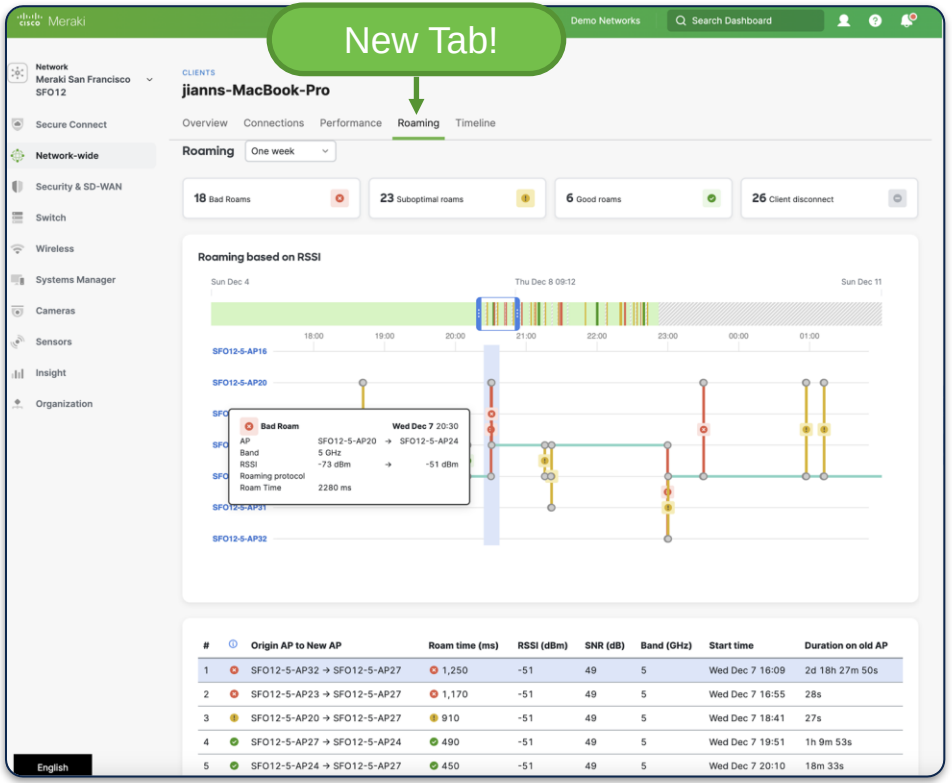
Available

Roaming Analytics

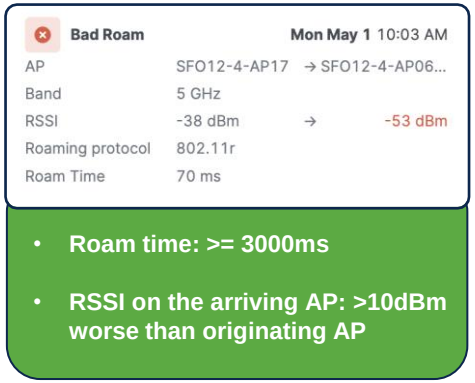
Client Roaming Made Easy

- Intuitive roaming visualization with detailed events for easy triaging.
- Categorized Roaming Event: Bad, Suboptimal, Good, Ping-Pong.
- 1-hour to 2 min visualization view.

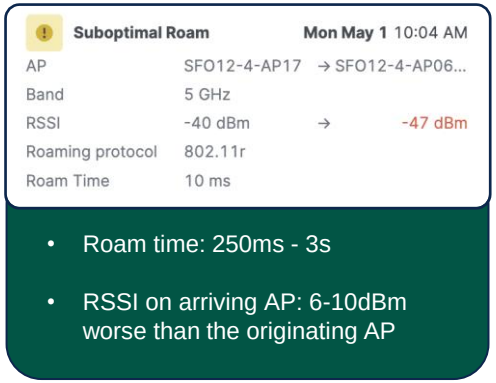
Roaming Analytics will be launchable from the Assurance Hub!



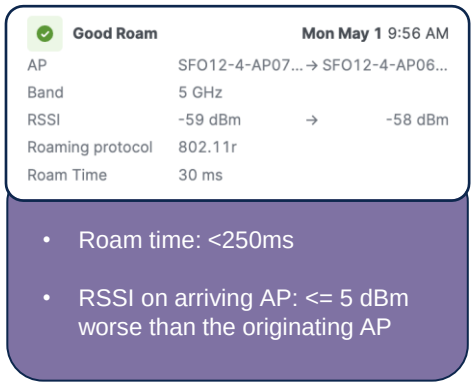
Roaming Event Definitions



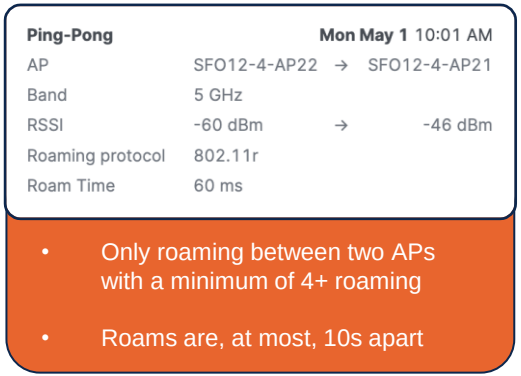
- **Roam time: >= 3000ms**
- **RSSI on the arriving AP: >10dBm worse than originating AP**



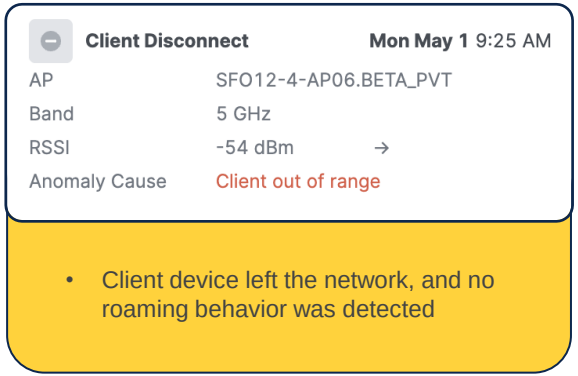
- Roam time: 250ms - 3s
- RSSI on arriving AP: 6-10dBm worse than the originating AP



- Roam time: <250ms
- RSSI on arriving AP: <= 5 dBm worse than the originating AP



- Only roaming between two APs with a minimum of 4+ roaming
- Roams are, at most, 10s apart

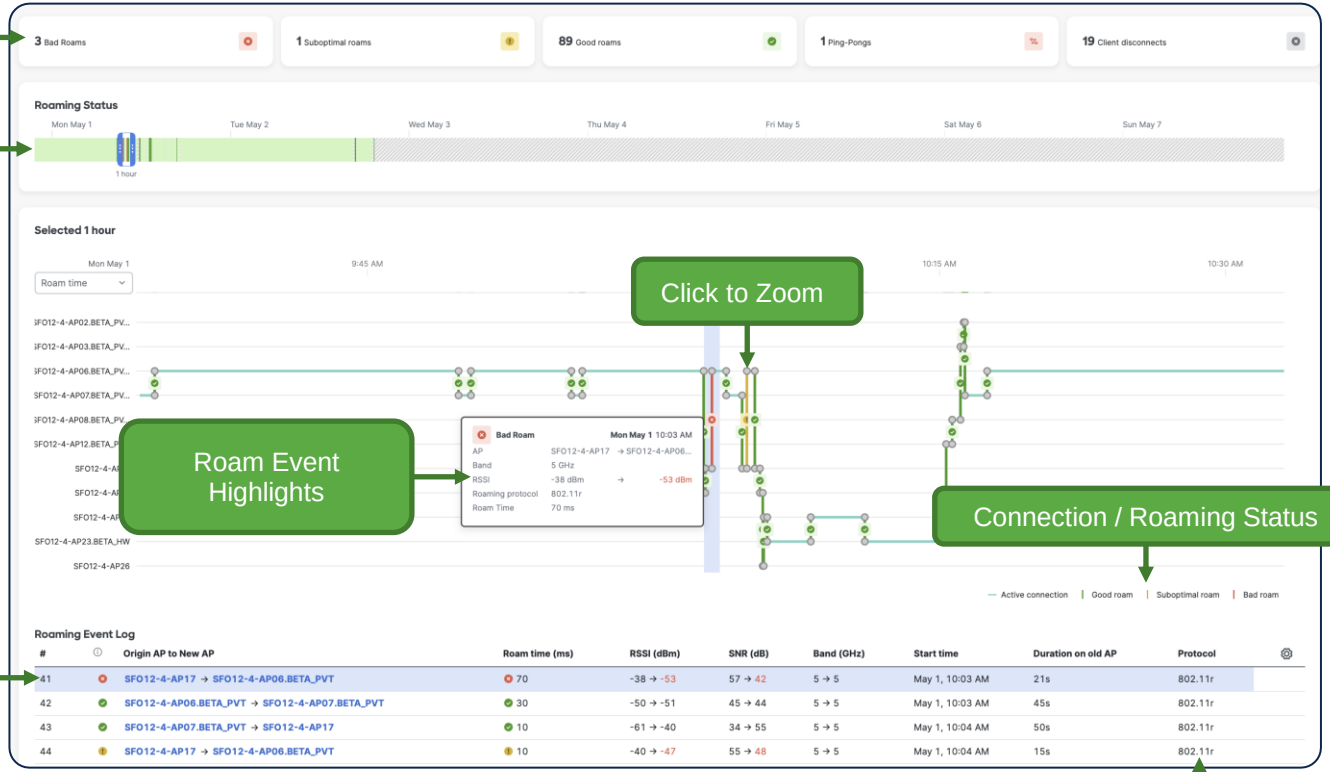


- Client device left the network, and no roaming behavior was detected

Visualize Client **Roaming** Over The Past One Hour!

Roaming Statuses

Event Timeline



Roam Event Highlights

Connection / Roaming Status

Correlating Roam Event Details

Protocols: OKC, SKC, 802.11r, etc.

Day 1

AP Neighbors

Advanced Radio Frequency Visualization

cisco Live!

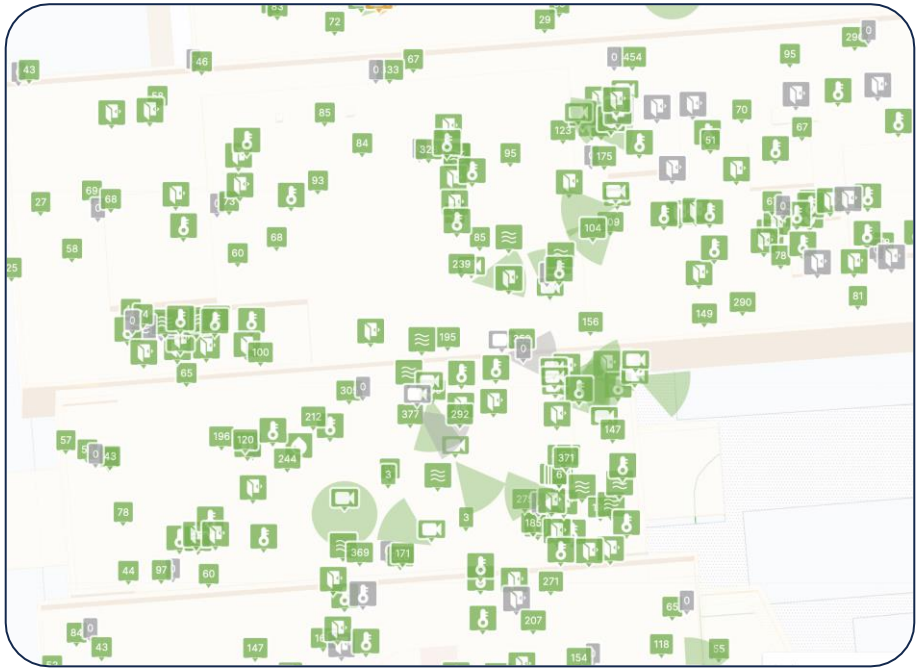
Troubleshooting Wi-Fi RF is Challenging!

Don’t believe me? Ask yourselves these questions…

RF is invisible, how do you troubleshoot it?

How do you root cause the impact of nearby interference?

Do you have a holistic view of the RF landscape?

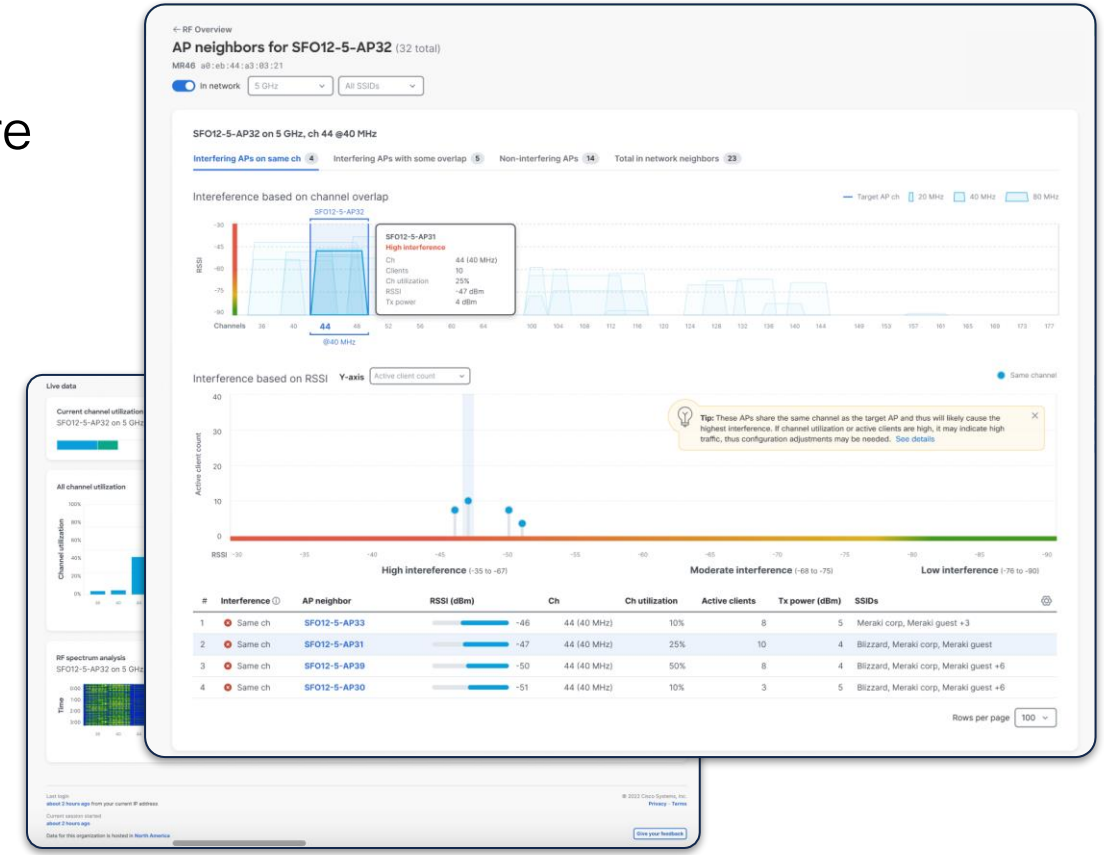


Early Access

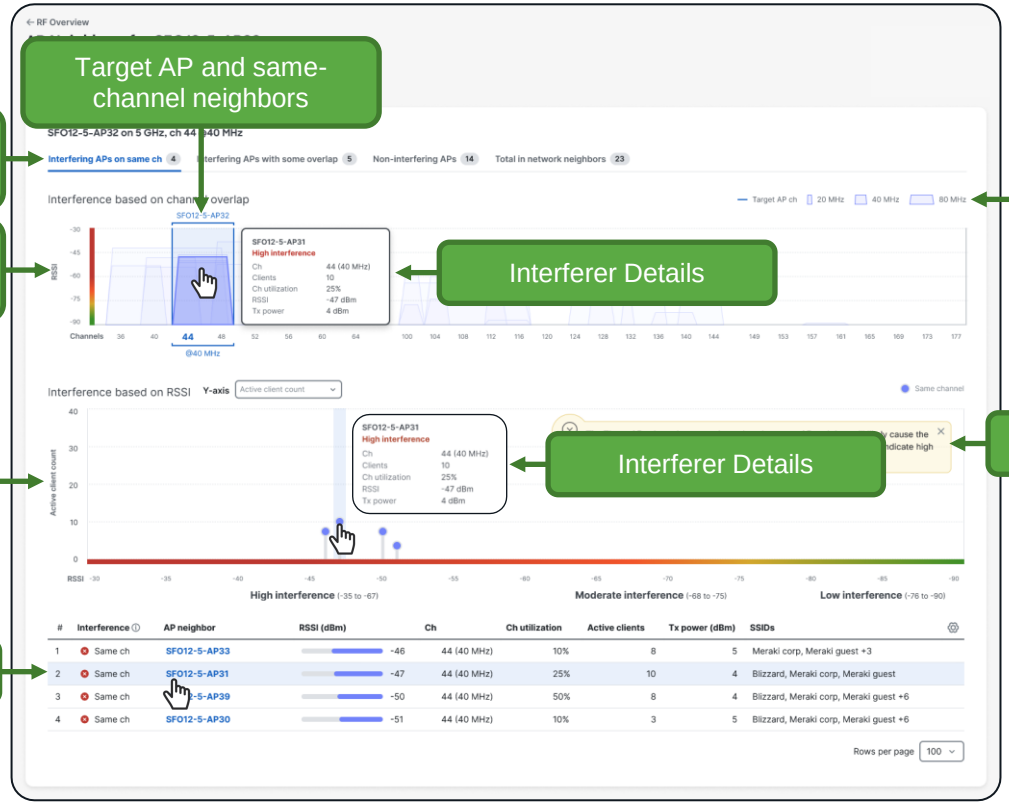
AP Neighbors

Visualize RF Like Never Before

- RF neighbors through the eyes of an AP.
- Understand interference and client impact.
- Takes learning to optimize the wireless experience for users.



Visualize Same-Channel and Width AP Interference with AP Neighbors



Day N

Proactive Alerts

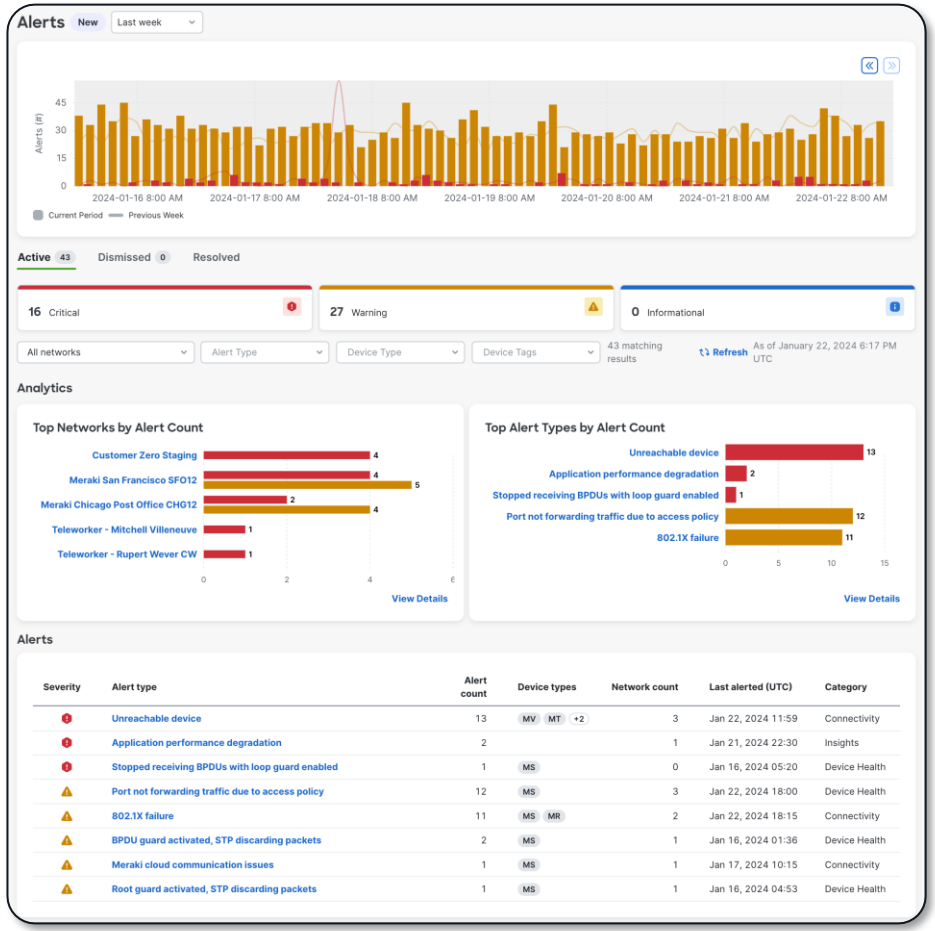
Triaging Made Easy

cisco Live!

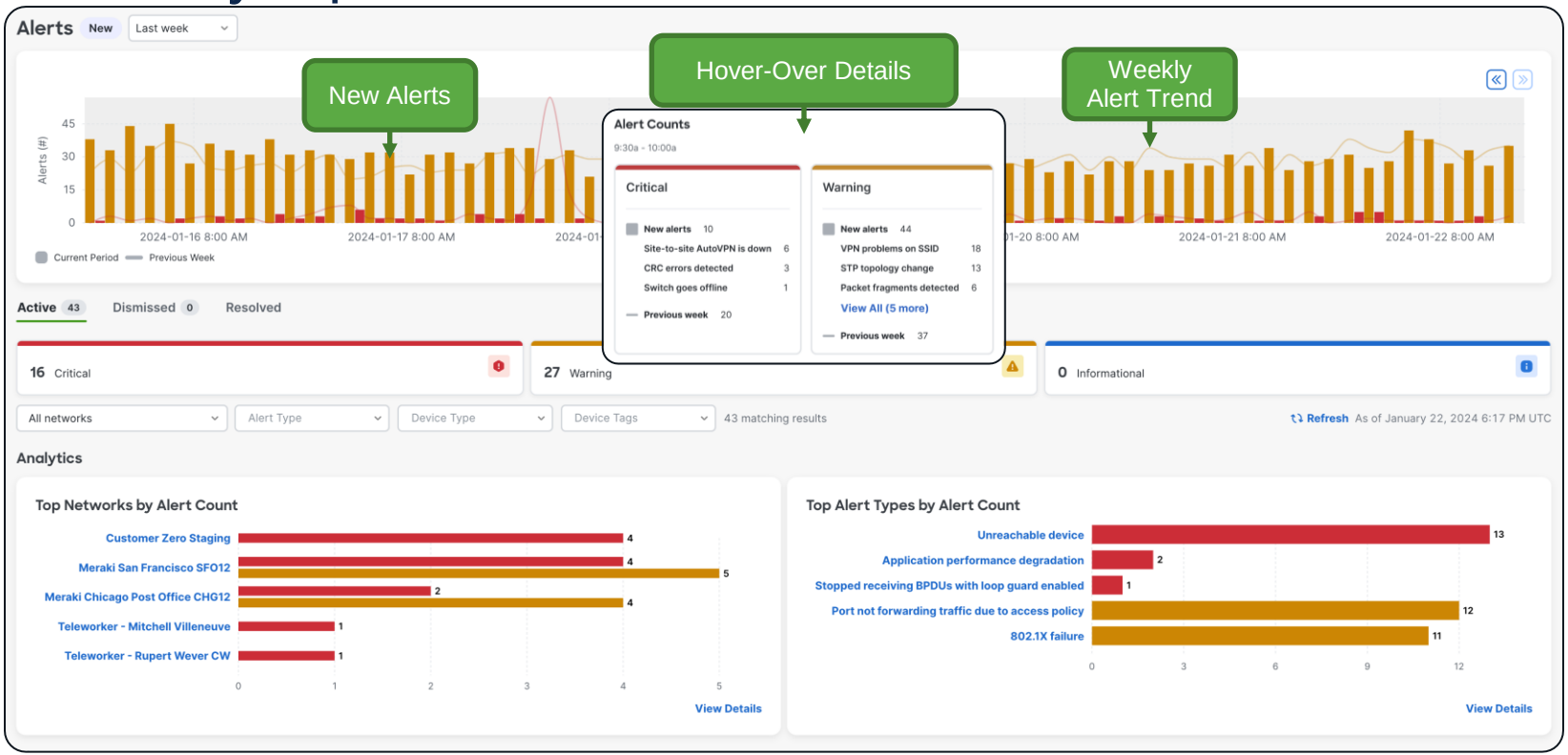
Available

New Org Alerts Page

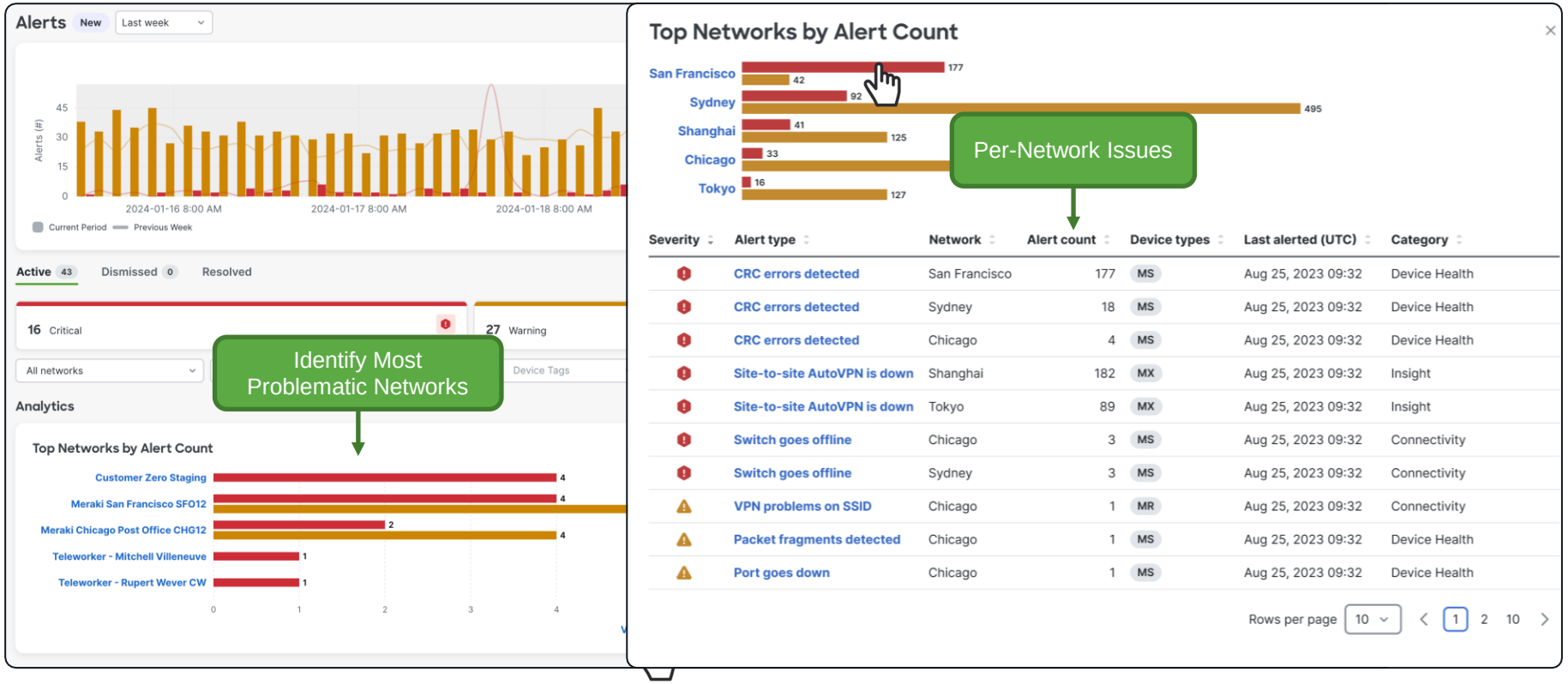
- Enhanced with Trends and Analytics!
- Centrally managed alerts
- Scale operations with device navigation, filters, and dismissals



Alert Page's Trend View Enables Identification of Anomaly Spikes Over 6 Month!



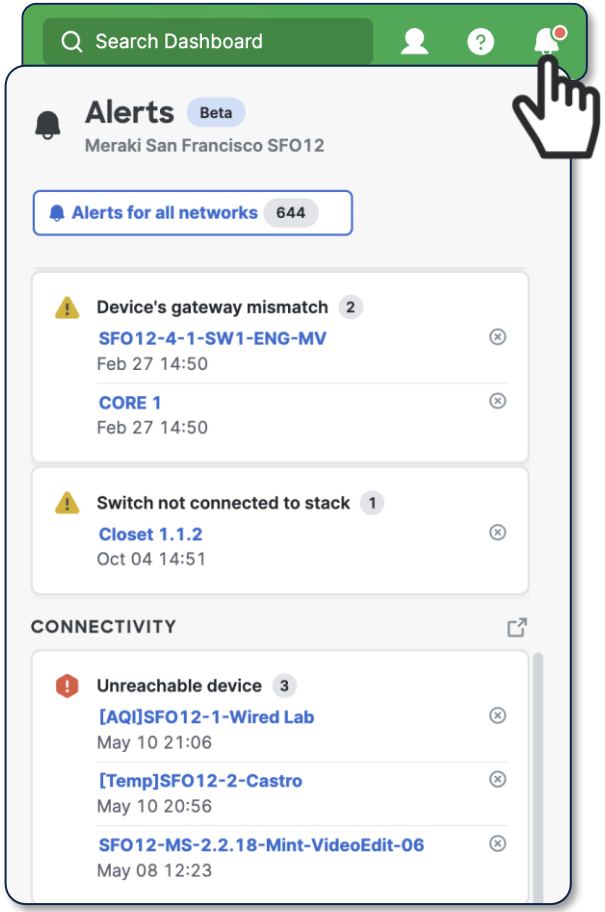
Alert Page Analytics Tells You Which Network you Need to Prioritize Fixing First!



Available

Network-Level Alert Hub

- Alerts are always 1 click
- Quickly navigate to problematic device
- Inline links to step-by-step troubleshooting



Day N

Root Cause Analysis

Issue Remediation Made Easy

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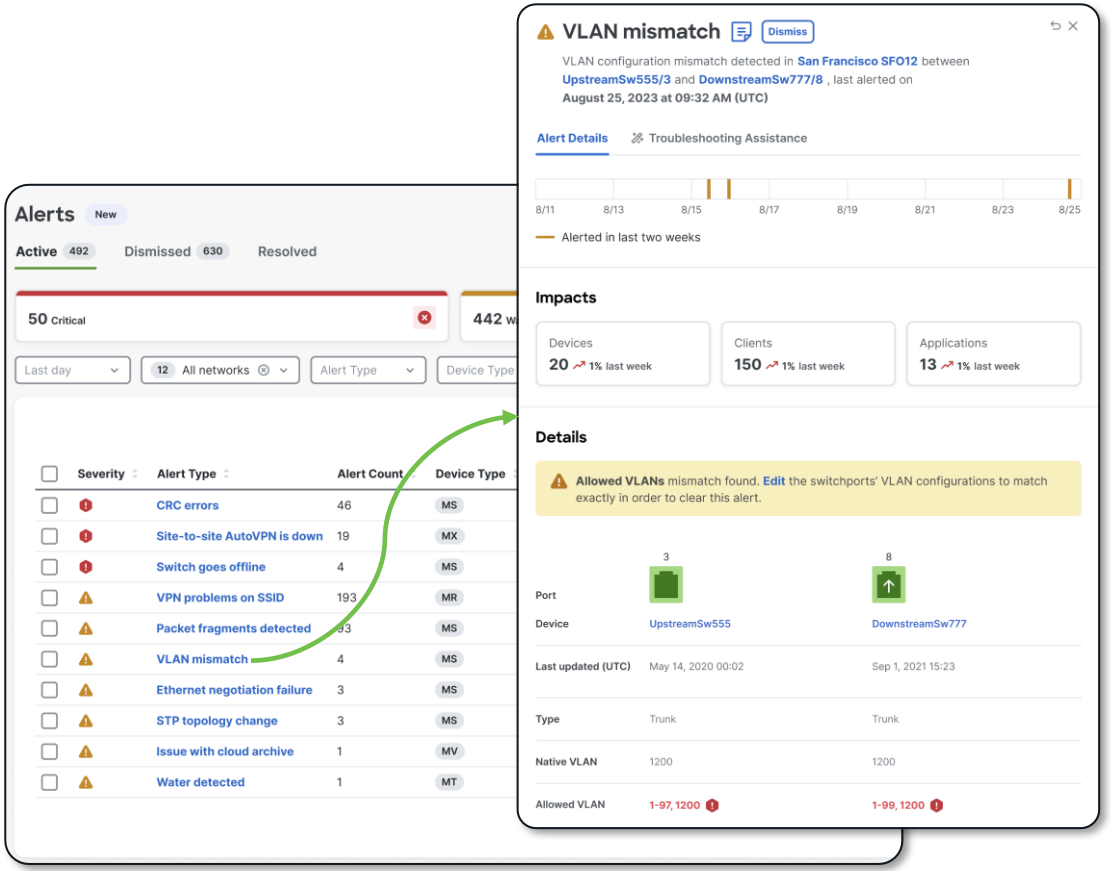
In Progress

New Alert RCA Workflow

- Significantly more insights into the root cause of issues than before
- Guided Workflow towards issue resolution
- Supports: Switch CRC errors, VLAN Mismatch, today but will be expand to all platforms



Meraki AIOps & Assurance is a Powerful AI-driven solution that'll allow you to Optimize Your Enterprise Wi-Fi at Scale!

AI-Enhanced RRM for Meraki:

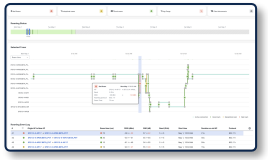
- Busy Hour (Available)
- AI Channel Planning (Available)
- Trend-Based RRM (Private Beta)
- Enhanced Busy Hour (Private Beta)
- FRA (In Progress)

Assurance Overview:

- Clients (Private Beta)
- Applications (Private Beta)
- Network Devices (In Progress)
- Infra Connectivity (In Progress)

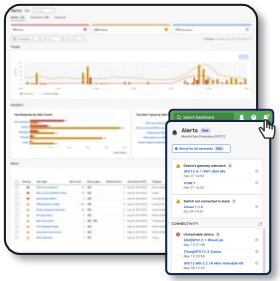
Wireless Overview:

- Connection Health (Available)
- Performance Health (Available)
- Network Service Health (Available)
- Networks Like Yours (Available)
- Smart Threshold (Available)



Roaming Analytics: (Available)

AP Neighbors: (Early Access)



Alerts and RCAs:

- New Org-Level Alerts (Available)
- Alert Hub (Available)
- New Alert RCA (Private Beta)
- MR Timeline RCA (Available)


cisco
The bridge to possible
Thank you
cisco Live!


cisco Live!
Let's go