cisco

The bridge to possible

Modernizing the Secure WAN Edge
with the Meraki MX Platform's "software ASIC"

Chris Weber, Product Manager, MX
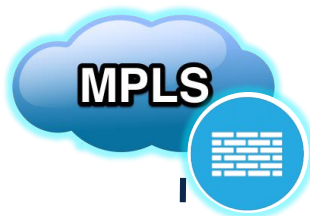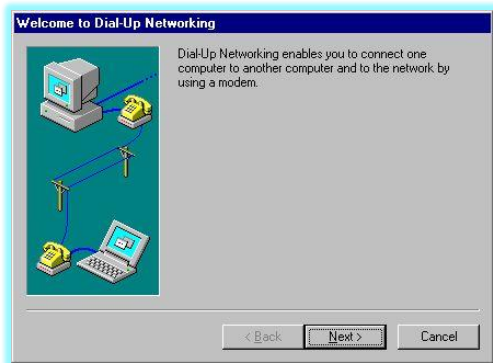Amrit Bansal, Engineering Manager, MX
BRKENT-2014

Cisco Live!

#CiscoLive

The 15 Year Phenomenon

Major transformations happen across most industries every 15 years…

The IT Industry has been no Exception

1990   2000   2010   2020   2030

MPLS

3

Agenda

- Secure WAN Edge Challenges

- Firmware-independent cloud-delivered upgrade architecture

- MX-OS Architecture Evolution and the "Software ASIC"

- Demo

- Q&A

What do you like about the Meraki MX?

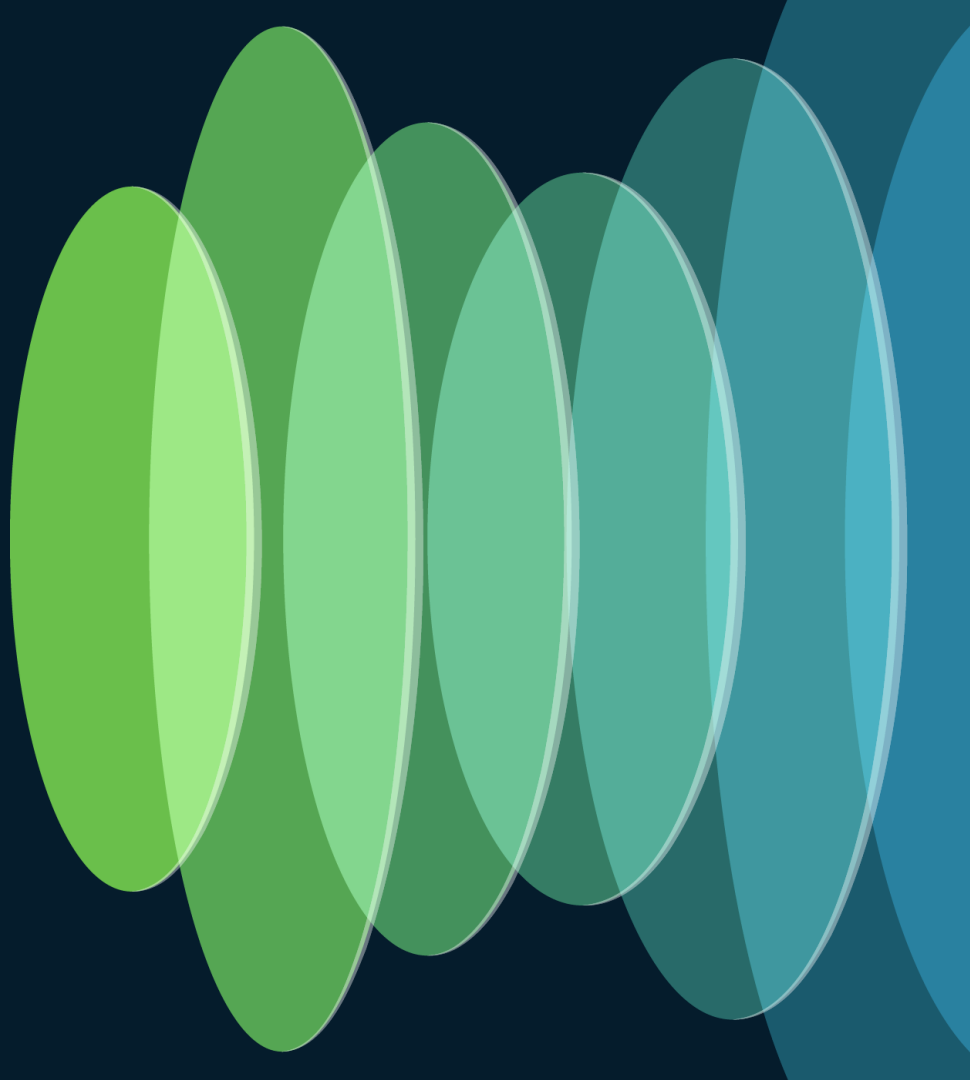ⓘ Start presenting to display the poll results on this slide.

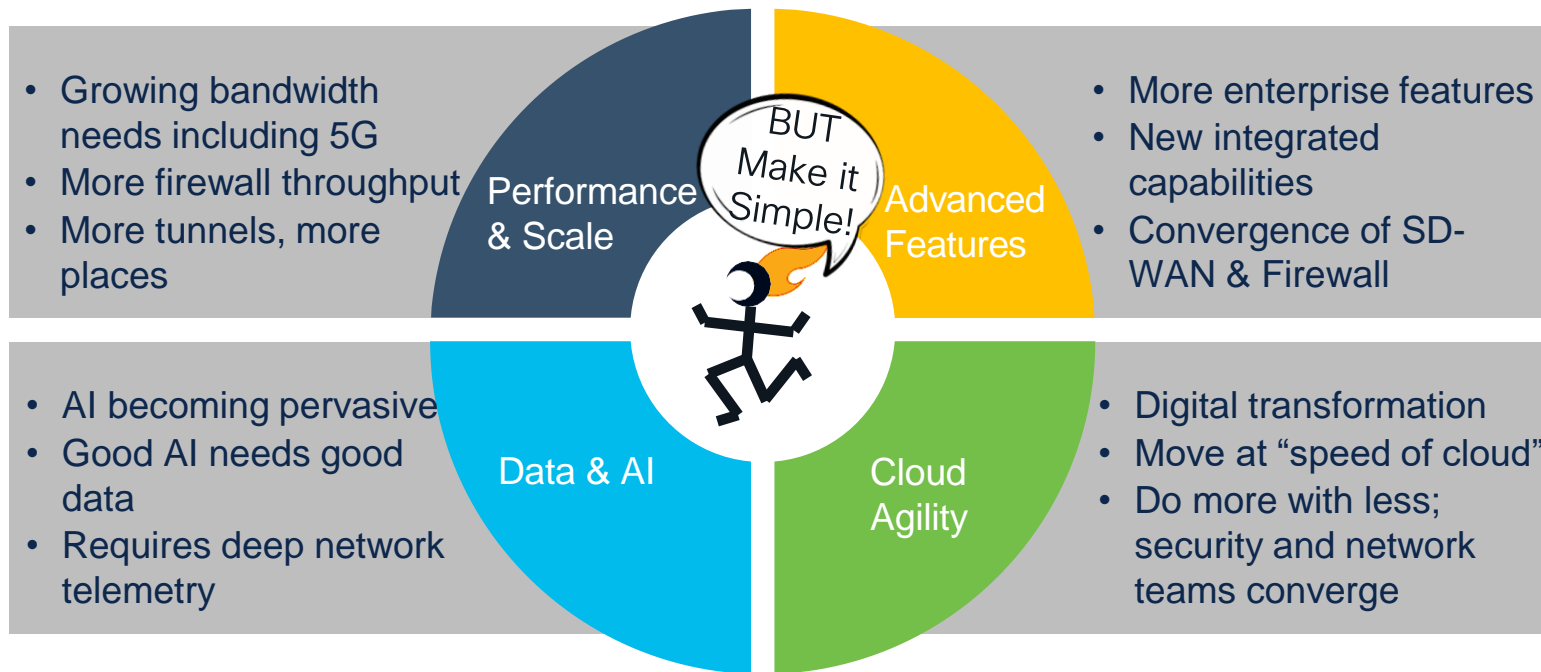# What are your biggest challenges with the Meraki MX today?

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

Modern Secure WAN Deployments

Defining the problems enterprises are facing and Why should you care?

CISCO Live!

Modern Enterprise Secure WAN Edge Challenges

Performance & Scale
- Growing bandwidth needs including 5G
- More firewall throughput
- More tunnels, more places

Advanced Features
- More enterprise features
- New integrated capabilities
- Convergence of SD-WAN & Firewall

Data & AI
- AI becoming pervasive
- Good AI needs good data
- Requires deep network telemetry

Cloud Agility
- Digital transformation
- Move at "speed of cloud"
- Do more with less; security and network teams converge

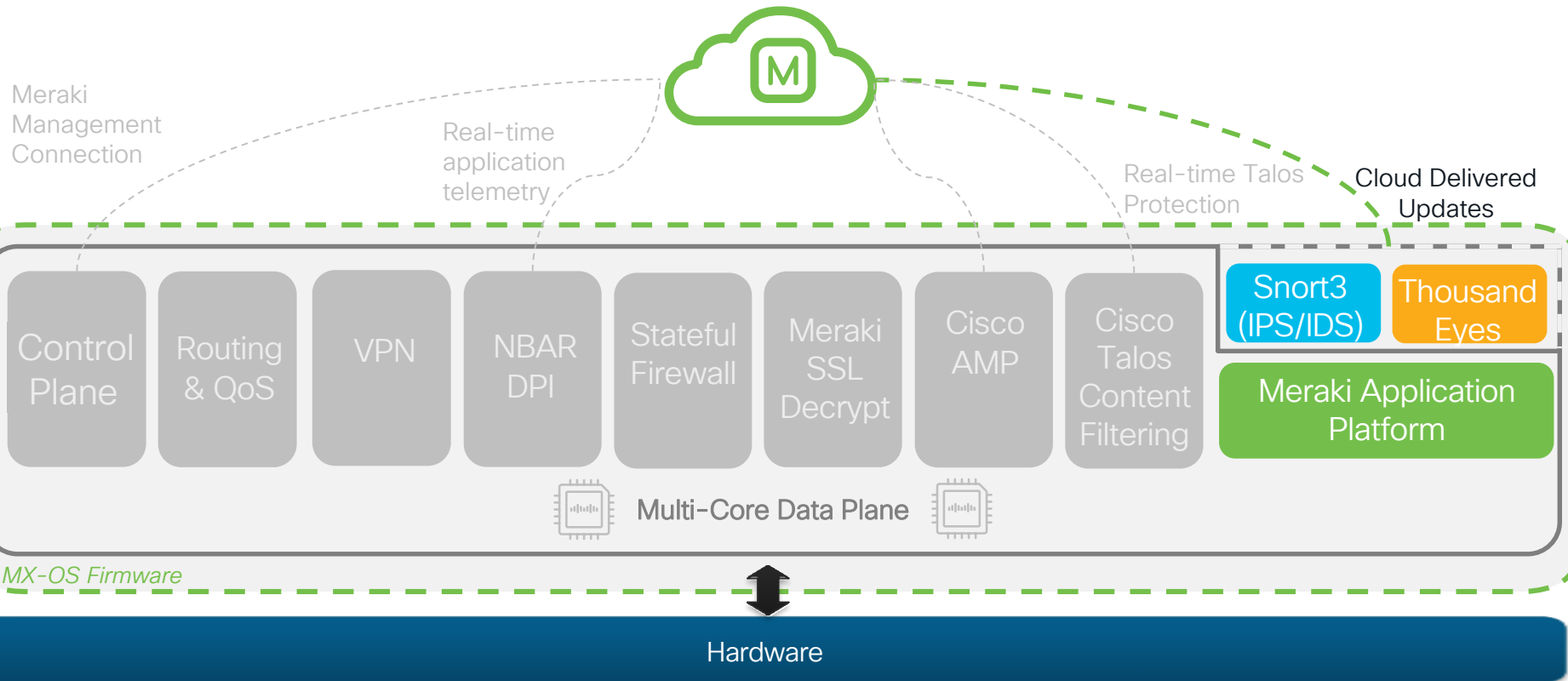BUT Make it Simple!

Cloud Agility

Firmware-Independent Cloud-Delivered Updates
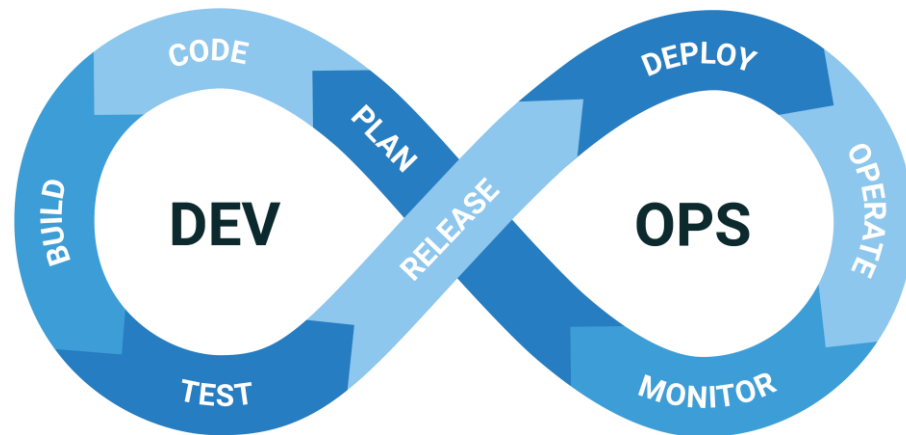
Meraki Application Platform

Key to autonomous updates to core services independent of firmware

Meraki Management Connection

Real-time application telemetry

Real-time Talos Protection

Cloud Delivered Updates

| Control Plane | Routing & QoS | VPN | NBAR DPI | Stateful Firewall | Meraki SSL Decrypt | Cisco AMP | Cisco Talos Content Filtering | Snort3 (IPS/IDS) | Thousand Eyes |

Meraki Application Platform

Multi-Core Data Plane
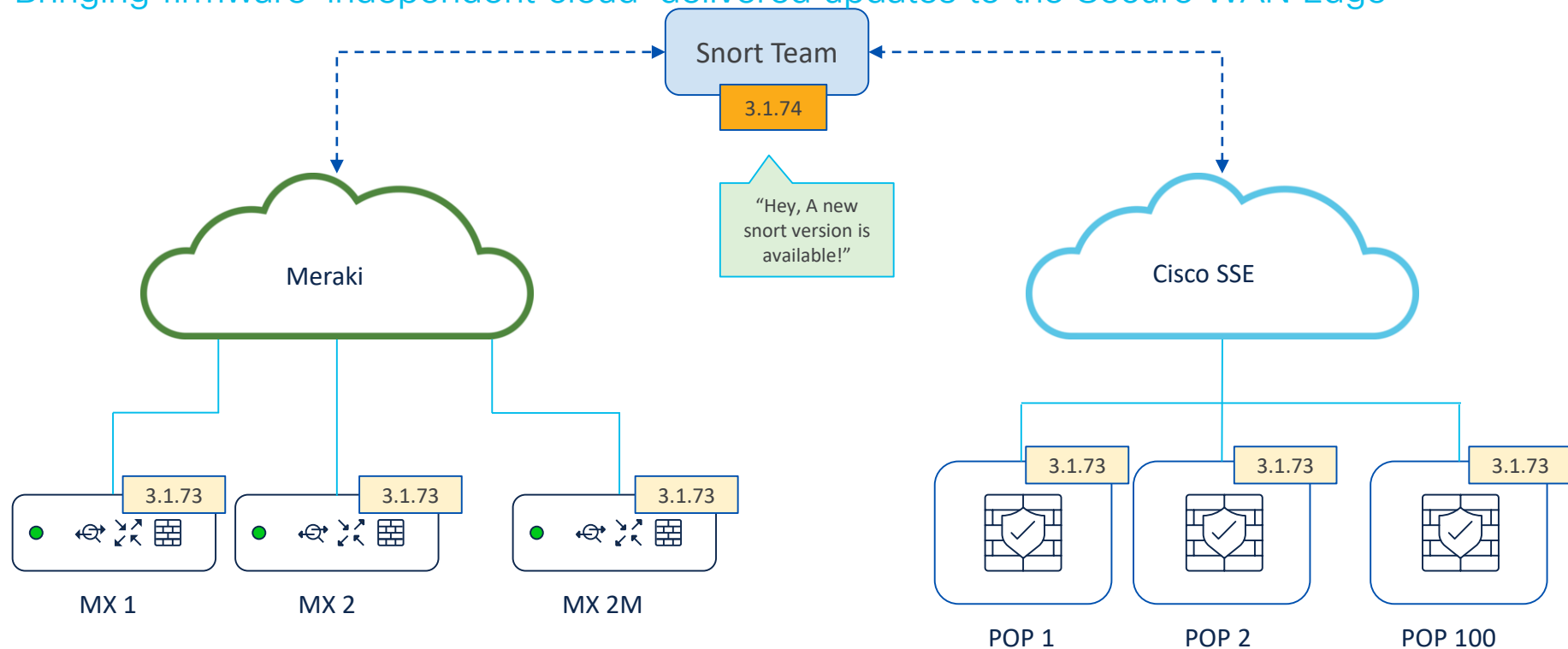
MX-OS Firmware

Hardware

Autonomous Updates

Bringing firmware-independent cloud-delivered updates to the Secure WAN Edge
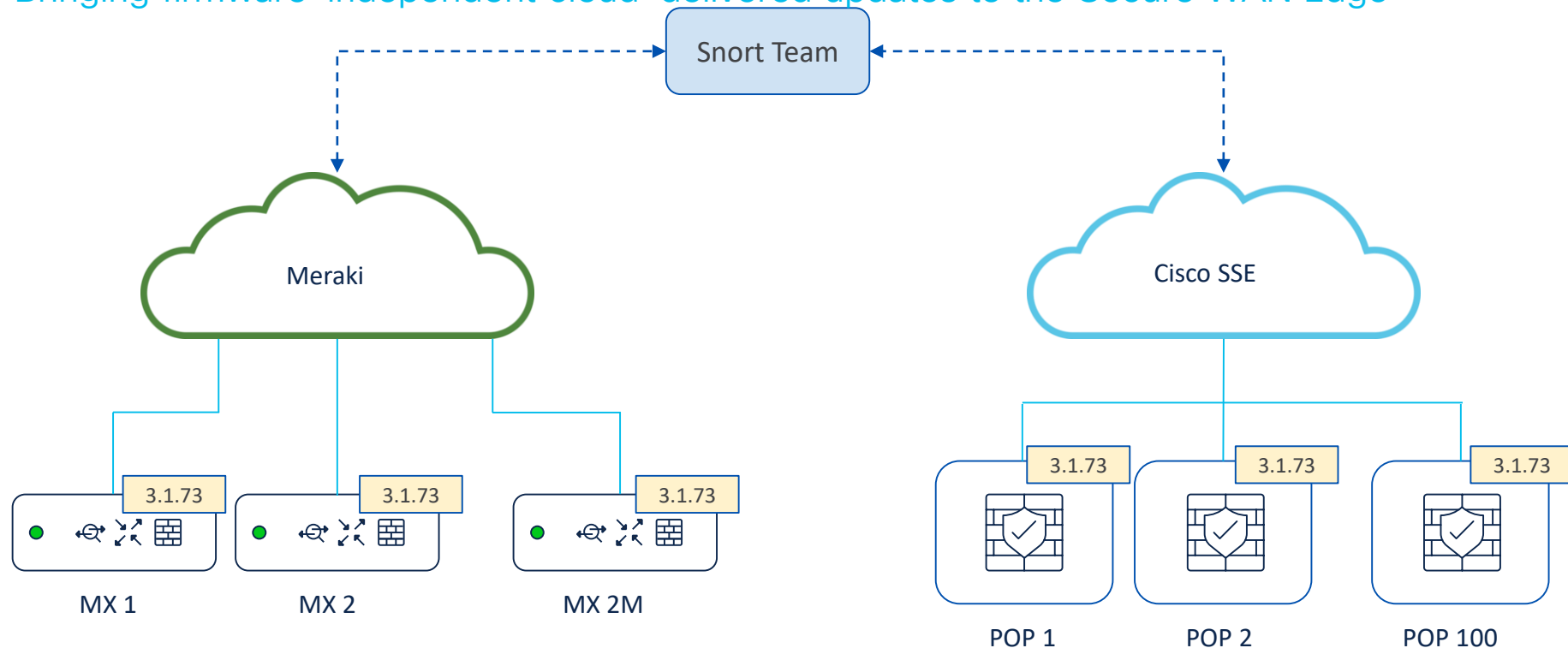
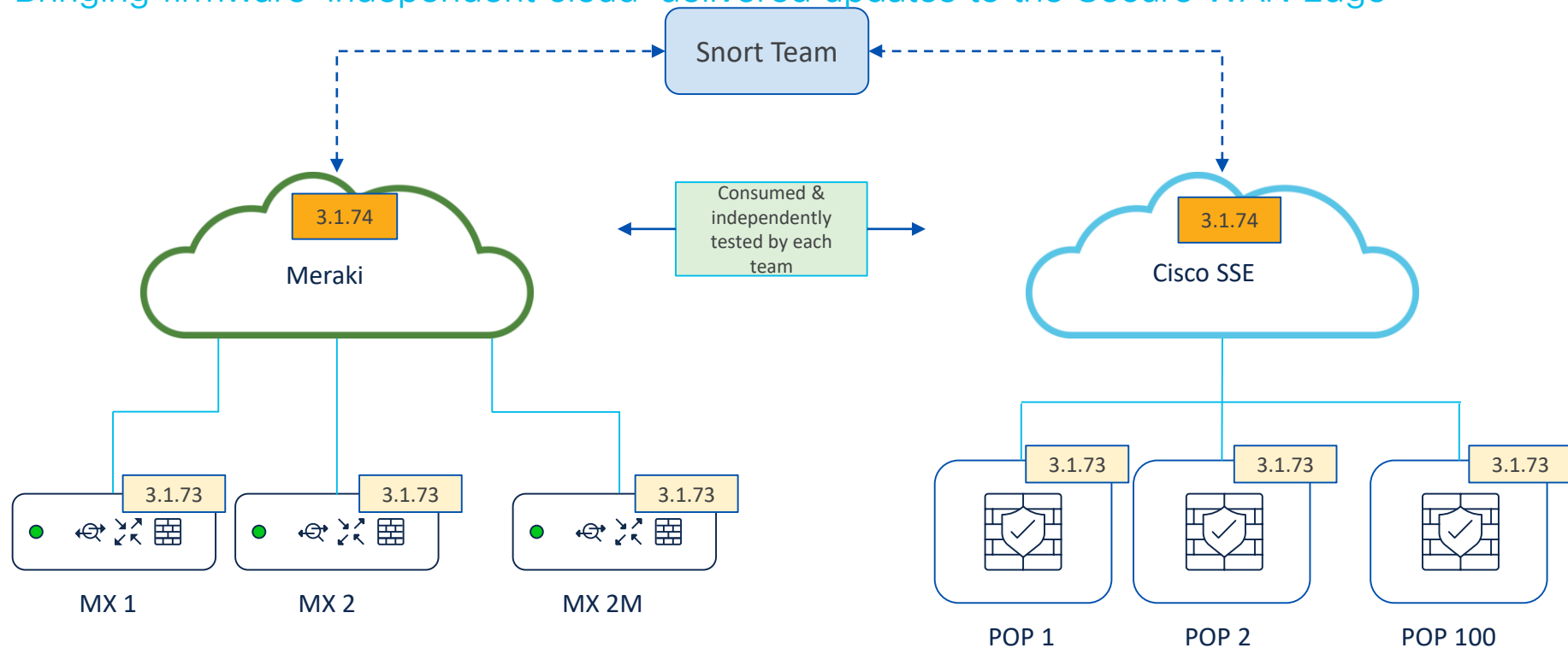Snort 3.1.73 running everywhere from WAN Edge to SSE

Autonomous Updates

Bringing firmware-independent cloud-delivered updates to the Secure WAN Edge
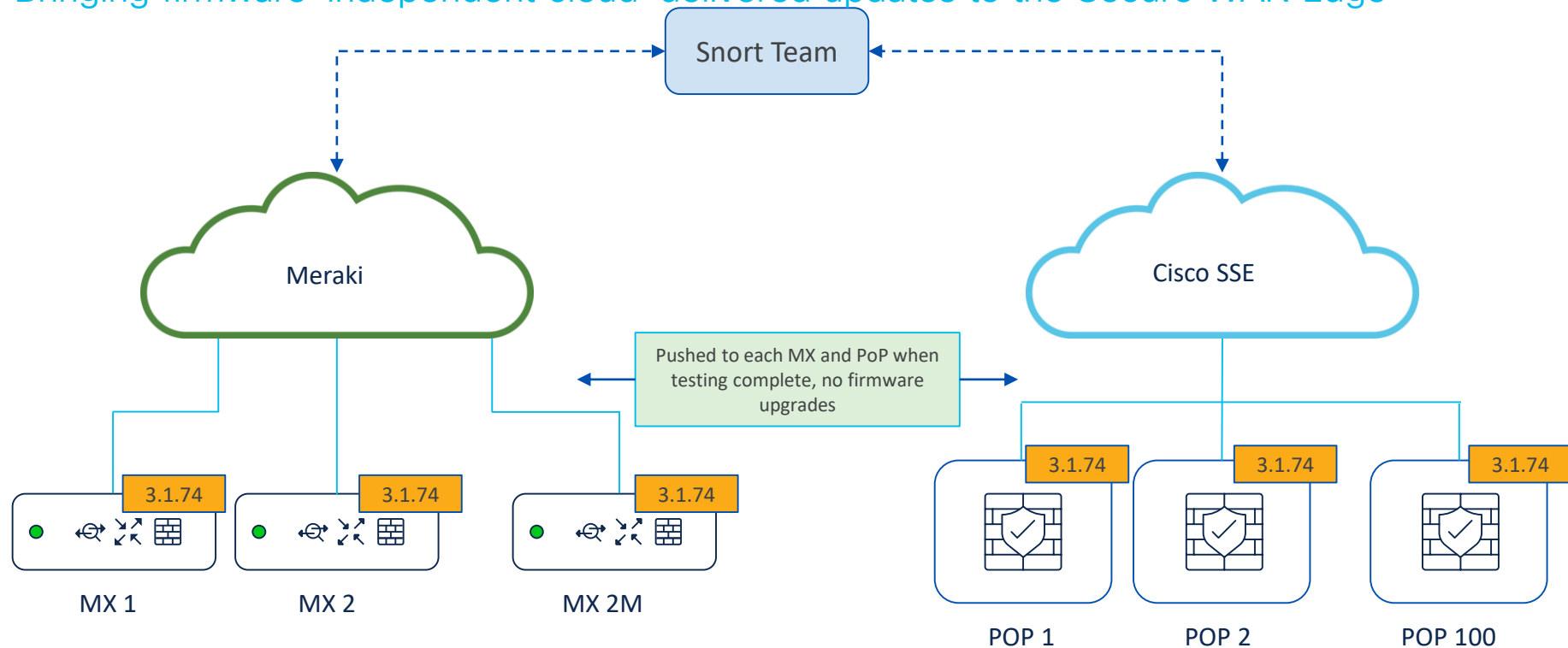
Autonomous Updates

Bringing firmware-independent cloud-delivered updates to the Secure WAN Edge

Autonomous Updates

Bringing firmware-independent cloud-delivered updates to the Secure WAN Edge

Snort Team

Meraki

Cisco SSE

Pushed to each MX and PoP when testing complete, no firmware upgrades

3.1.74

3.1.74

3.1.74

3.1.74

3.1.74

3.1.74

MX 1

MX 2

MX 2M

POP 1

POP 2

POP 100

Autonomous Updates

Bringing firmware-independent cloud-delivered updates to the Secure WAN Edge
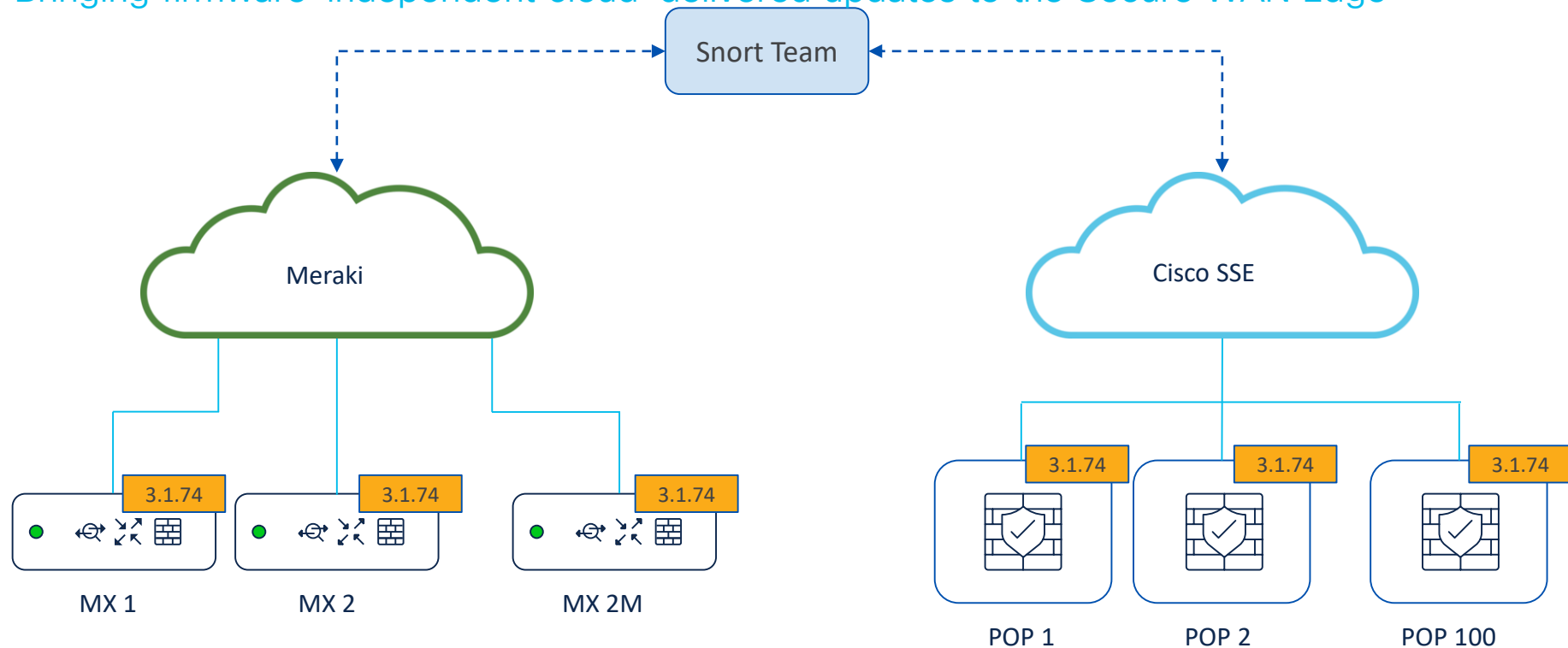
Consistent security delivered everywhere, as-a-service, at the speed of cloud

How many firmware upgrades have you done in the past 12-18 months?

Autonomous Updates

Ensuring the most up to date threat protection

5+

Firmware upgrades that customers didn't have to manage themselves in the last year

700,000+

Number of MX nodes running Snort3 and auto-updated from the cloud

1 Day

Time it takes to upgrade our entire MX fleet to a new version of Snort

February 2023

Performance increase

March 2023 — Memory tuning

June 2023 — Snort 3.1.28

October 2023 — Snort 3.1.65

February 2024 — Snort 3.1.74

April 2024 — Snort 3.1.82
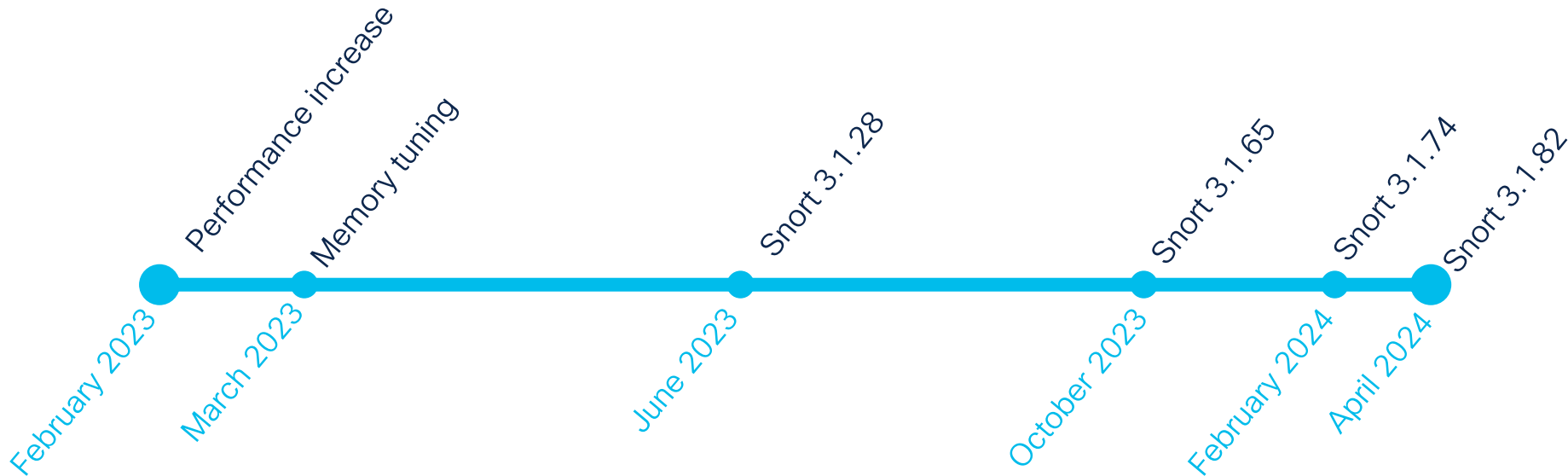
Next-Gen MX-OS

A Modern Architecture for Today's Secure WAN Edge

Single-Core
Dataplane

Multi-Core
Dataplane

Software ASIC
Dataplane
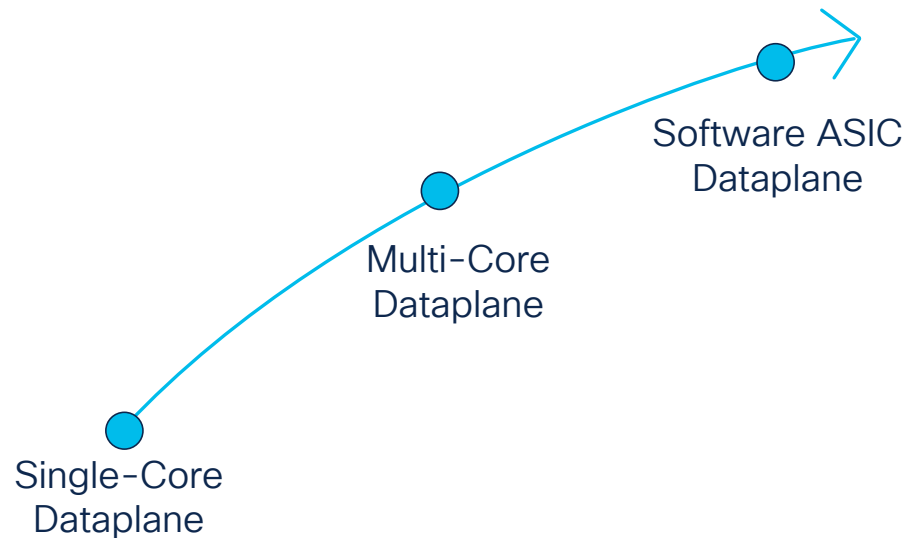
Where we were...

Single monolith MX-OS firmware

Meraki Cloud Connection

MX-OS Firmware

| Control Plane | Routing & QoS | Auto-VPN, IPSEC & L2TP | Traffic Classification | Stateful Firewall | SSL Decrypt | Cisco Advanced Malware Protection | Brightcloud Content Filtering | Snort2 (IDS/IPS) |

Single Core Dataplane

Hardware
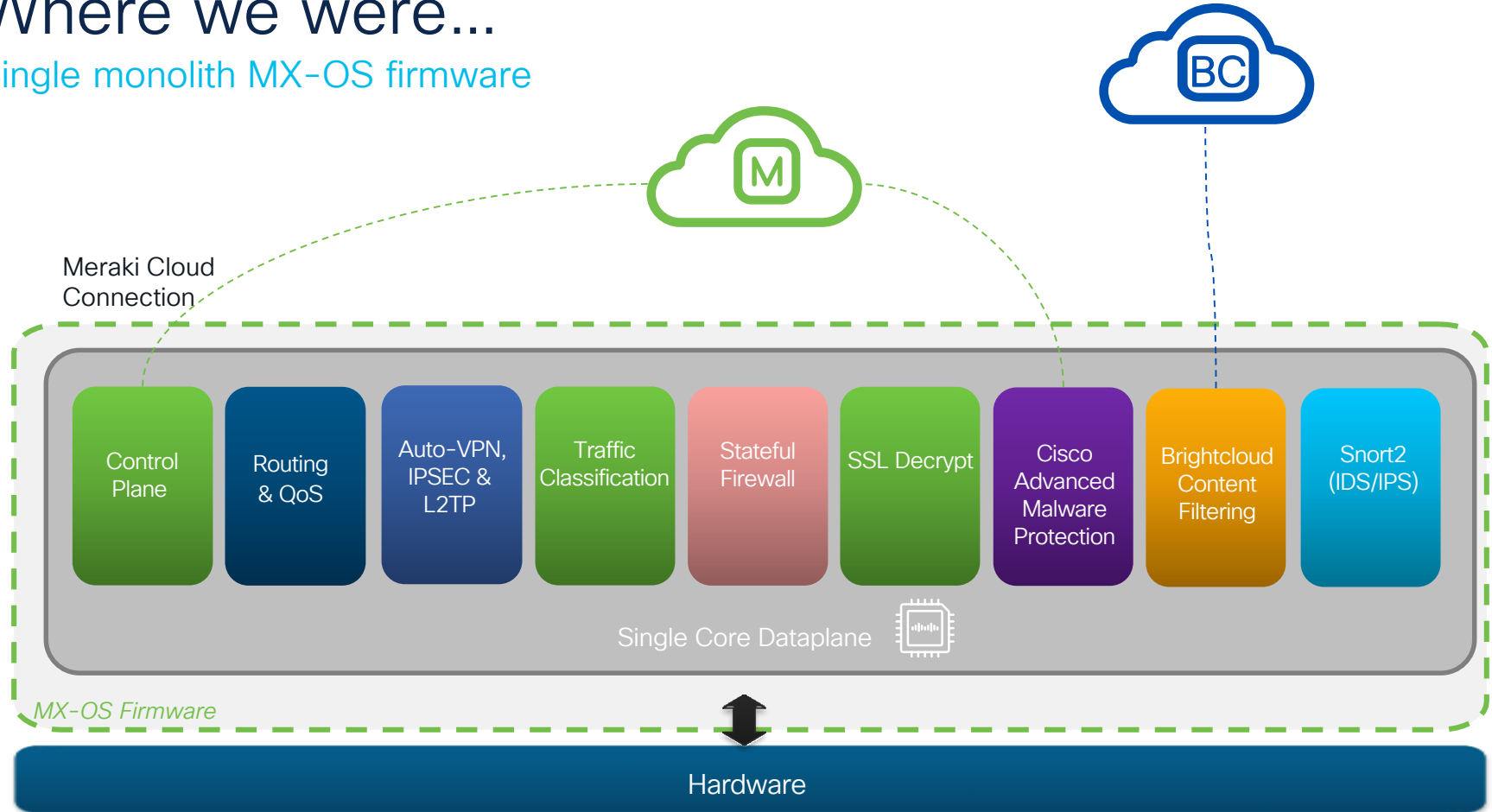
Where we are today

Multi-core dataplane with autonomous updates to core services

Meraki Cloud Connection

Real-time application telemetry

Real-time Talos Protection

CI/CD-Enabled Updates

| Control Plane | Routing & QoS | Auto-VPN, IPSEC, L2TP & Cisco AnyConnect | Cisco NBAR Traffic Classification | Stateful Firewall | Meraki SSL Decrypt | Cisco Advanced Malware Protection | Cisco Talos Content Filtering | Snort3 (IPS/IDS) | Thousand Eyes |

Meraki Application Platform

Multi-Core Data Plane

MX-OS Firmware

Hardware

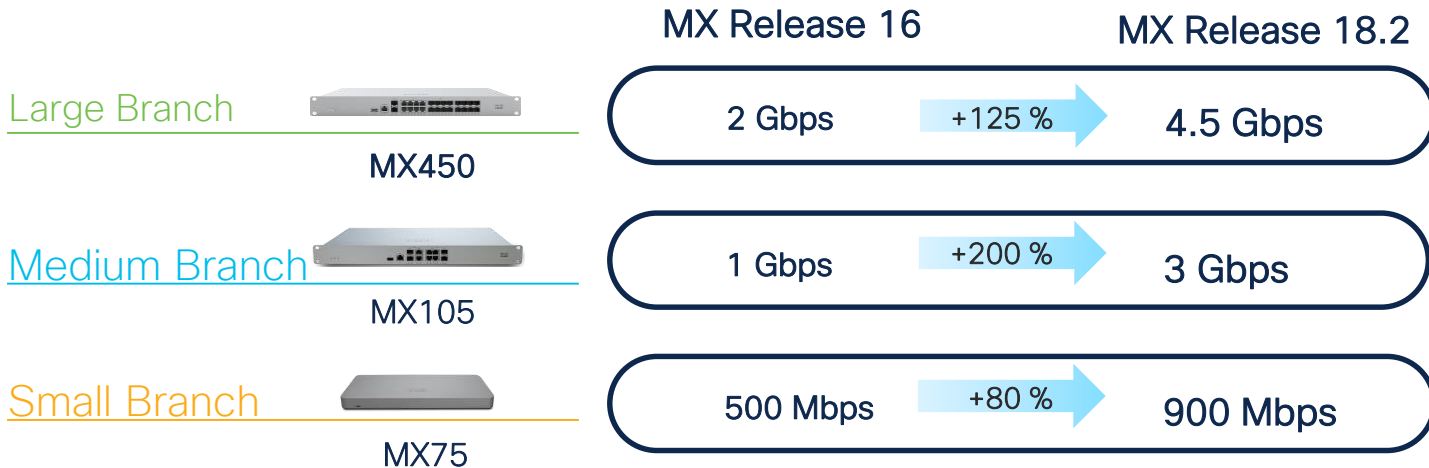# Latest Efficacy & Performance Enhancements

98%

malware efficacy across
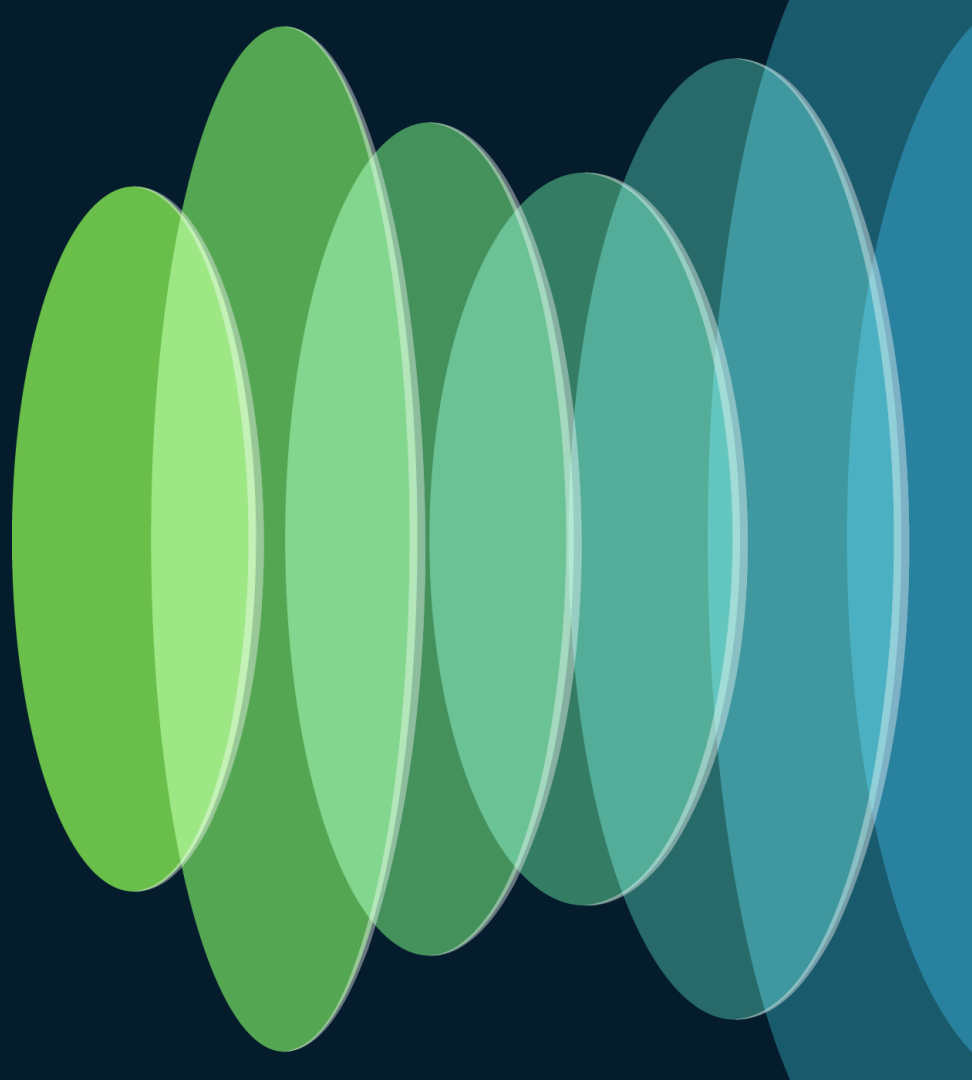11 real-world exploit categories

25%

Better malware efficacy compared
to the industry average of 73%

Miercom Detailed Report - https://miercom.com/cisco-security-and-sd-wan-efficacy-and-performance-evaluation-dr230809/

	MX Release 16		MX Release 18.2
Large Branch MX450	2 Gbps	+125 %	4.5 Gbps
Medium Branch MX105	1 Gbps	+200 %	3 Gbps
Small Branch MX75	500 Mbps	+80 %	900 Mbps

What's next?

CISCO Live!

"Software ASIC"
A new approach to achieve ASIC Performance

OXYMORON

Cisco Vector Packet Processing (VPP)

Industry's Fastest Software Dataplane Delivering Unparalleled Speeds

- <u>Fastest software dataplane:</u> Developed by Cisco and open sourced

- <u>Hardware ASIC killer:</u> achieving hardware ASIC performance in software, on general purpose CPU's

- <u>Industry Co-development:</u> Supported and contributed by many industry leaders like Intel, ARM, and Marvell

- <u>Highly trusted:</u> Powers some of the largest datacenters in the world, including Equinix and Alibaba Cloud

- <u>Cisco runs on VPP</u>: VPP now powers more and more Cisco platforms including Webex and our SSE/SASE solutions driving consistency across products

Next-Gen MX-OS

Accelerating Innovation in the Secure WAN Edge

What is it?

Carefully planned evolution to position Meraki
MX for the modern Secure WAN edge

Cisco Meraki

10+ years of successful feature development
with unmatched simplicity and Cloud Scale

CISCO
Next-Gen MX-OS

Cisco VPP

10+ years of successfully developing the
world's fastest software dataplane technology

Fundamental change in the industry

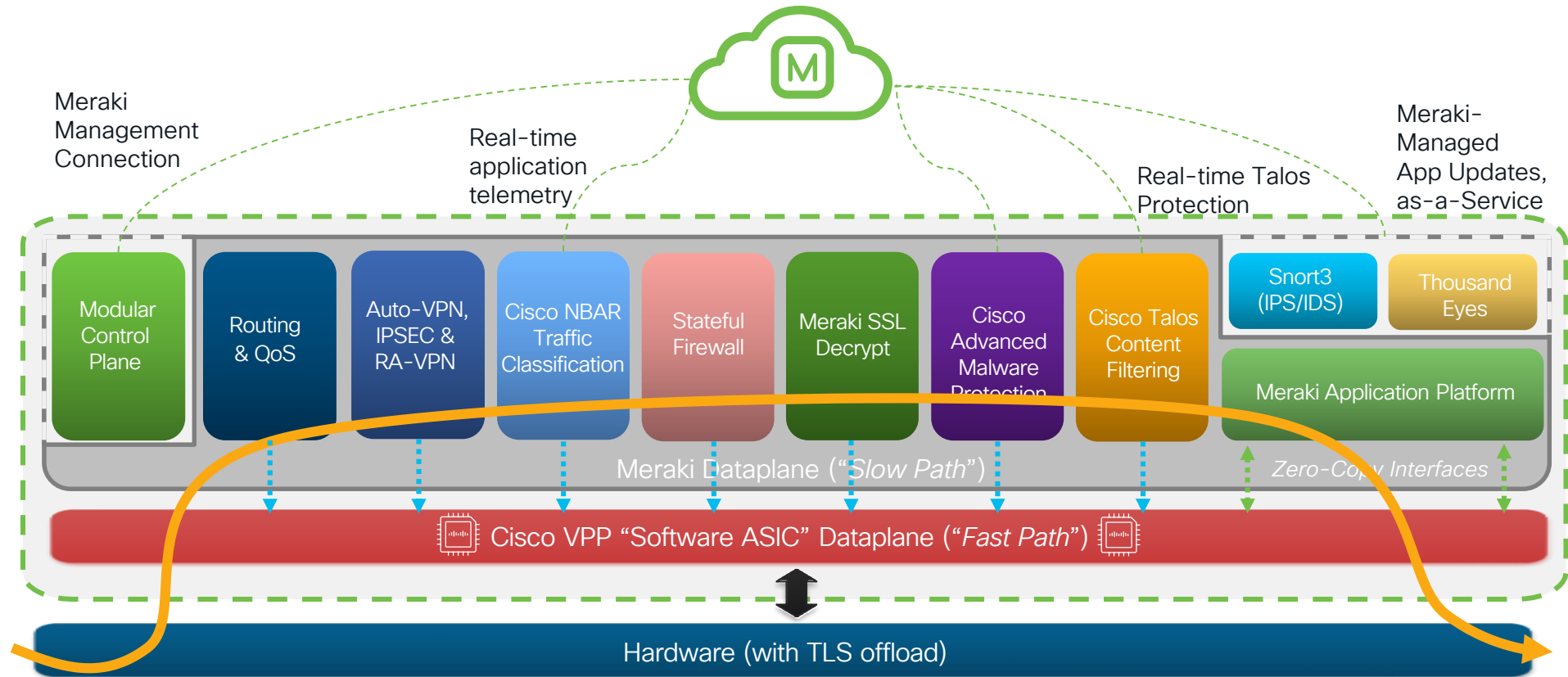Industry first "Software ASIC" architecture

Where we are going

"Software-ASIC" dataplane powered by Cisco VPP with a modular, modern architecture

Meraki Management Connection

Real-time application telemetry

Real-time Talos Protection

Meraki-Managed App Updates, as-a-Service

| Modular Control Plane | Routing & QoS | Auto-VPN, IPSEC & RA-VPN | Cisco NBAR Traffic Classification | Stateful Firewall | Meraki SSL Decrypt | Cisco Advanced Malware Protection | Cisco Talos Content Filtering | Snort3 (IPS/IDS) | Thousand Eyes |

Meraki Application Platform

Meraki Dataplane ("*Slow Path*")

Zero-Copy Interfaces

Cisco VPP "Software ASIC" Dataplane ("*Fast Path*")
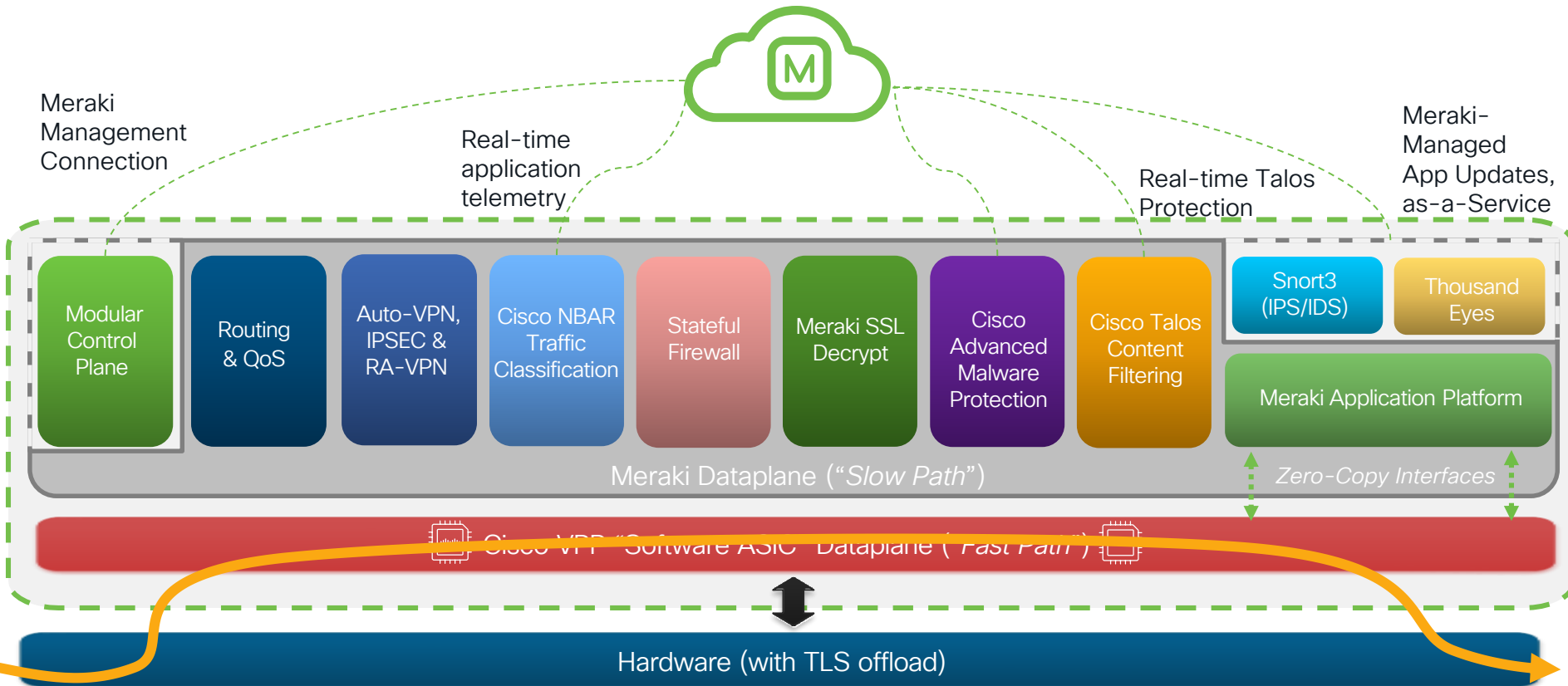
Next-gen MX-OS Firmware

Hardware (with TLS offload)

Life of a Flow – First Packet Policy Decision Making

Dual acceleration model with "Software-ASIC" and hardware crypto

Meraki Management Connection
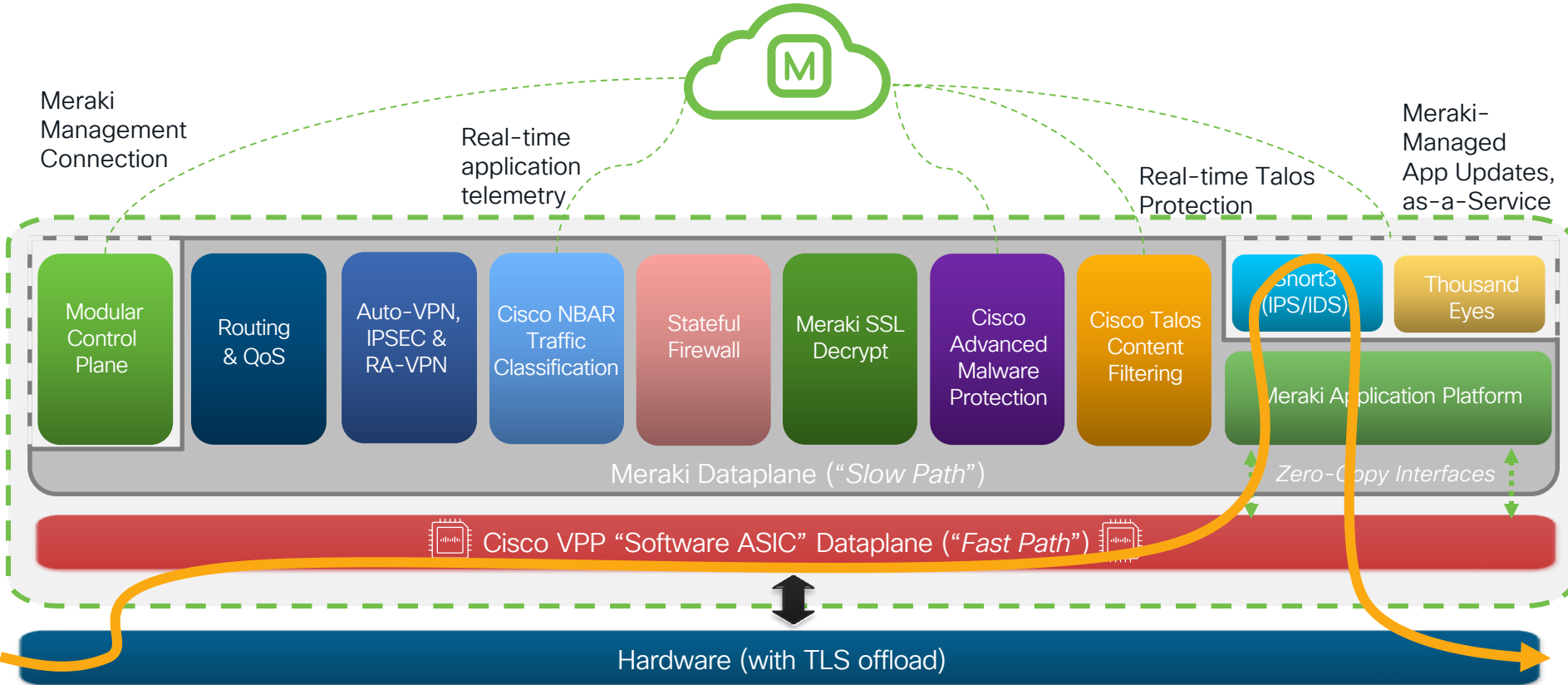
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Meraki Application Platform

Meraki Dataplane ("*Slow Path*") *Zero-Copy Interfaces*

Cisco VPP "Software ASIC" Dataplane ("*Fast Path*")

Hardware (with TLS offload)

Life of a Flow – Remainder of Flow (no IPS)

Dual acceleration model with "Software-ASIC" and hardware crypto

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Meraki Application Platform

Meraki Dataplane ("*Slow Path*")

Zero-Copy Interfaces

Cisco VPP "Software ASIC" Dataplane ("*Fast Path*")

Hardware (with TLS offload)

Ensuring Quality Through Extensive Automated Testing

Catching bugs and performance regressions as they happen

Fully automated testing

a. Unit and Functionality of new features

b. Every line of code is tested before it is committed

$f(x)$ ### Conformance testing

a. RFC conformance testing

b. Ensure features work per the RFC spec

Use case driven testing

a. Uni-dimensional: data, control, management

b. Multi-dimensional tests: use case driven

Performance tests

a. Data plane throughput and latency

b. Trending of data plane throughput limits

Regressions identified early!
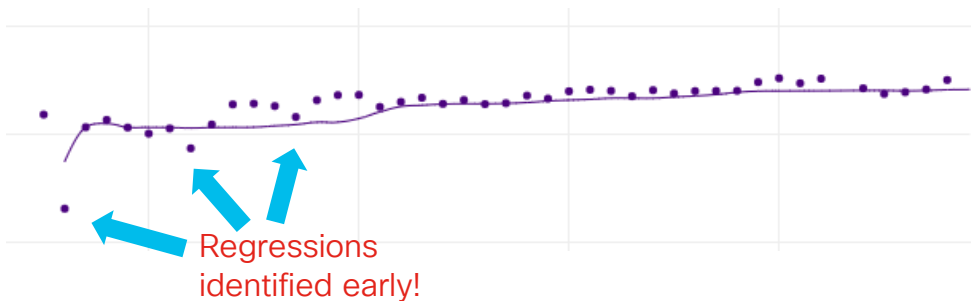
AI-Ready Cloud-Native Platform

"Without data, you're just another person with an opinion."
— W. Edwards Deming

Meraki MX is Cisco's Largest NGFW & SD-WAN Deployment

Trusted by organizations in 231 out of 238 countries around the world
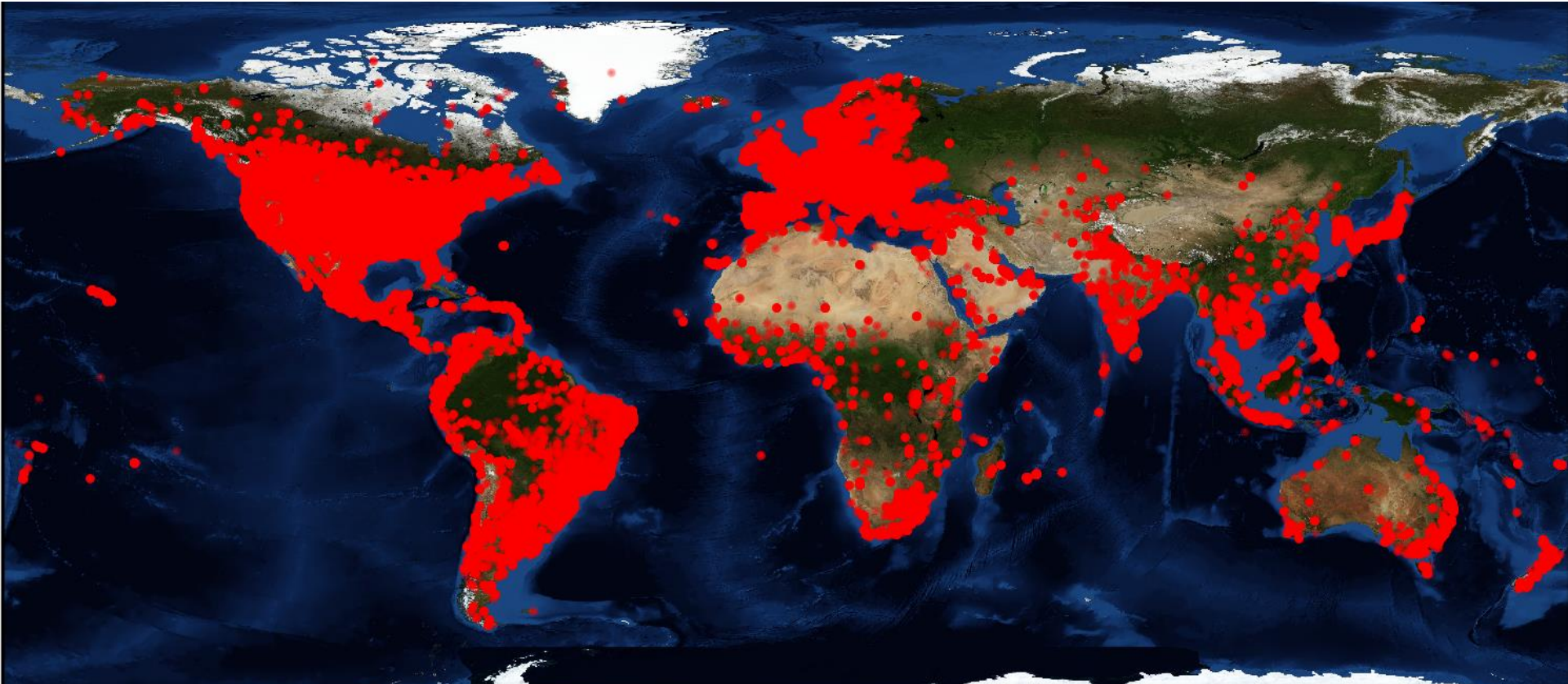
✅ 2M+ MX Deployments   ✅ 40,000+ SD-WAN Customers   ✅ Trusted by 100+ Fortune 500's

AI Ready Cloud Native Platform

AI-Powered Network & Security Observability

Thousand Eyes · NBAR · SSL Decrypt · Talos · Snort3

Unified VPP Flow-Table
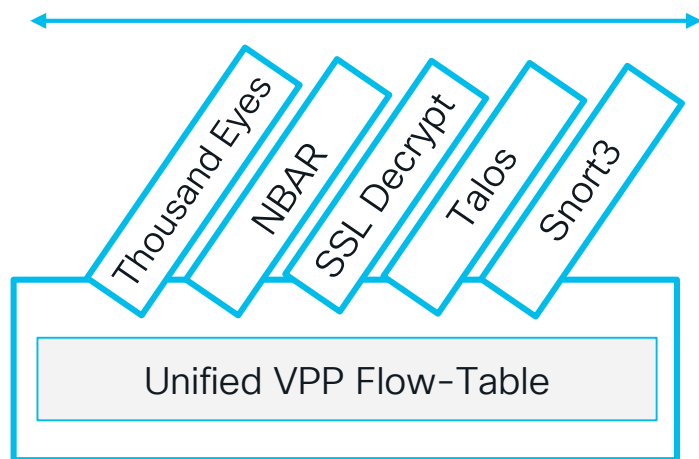
16 Trillion Flows: MX platforms observe 16 trillion flows of traffic per week. That's a lot of data!!

Unified Flow Table: Single source of truth on all flow decisions across all features

Cloud Native Logging: Full flow logging to the Cisco networking and security cloud platforms empowering AIOps

Driving AIOps Through Rich Network Data
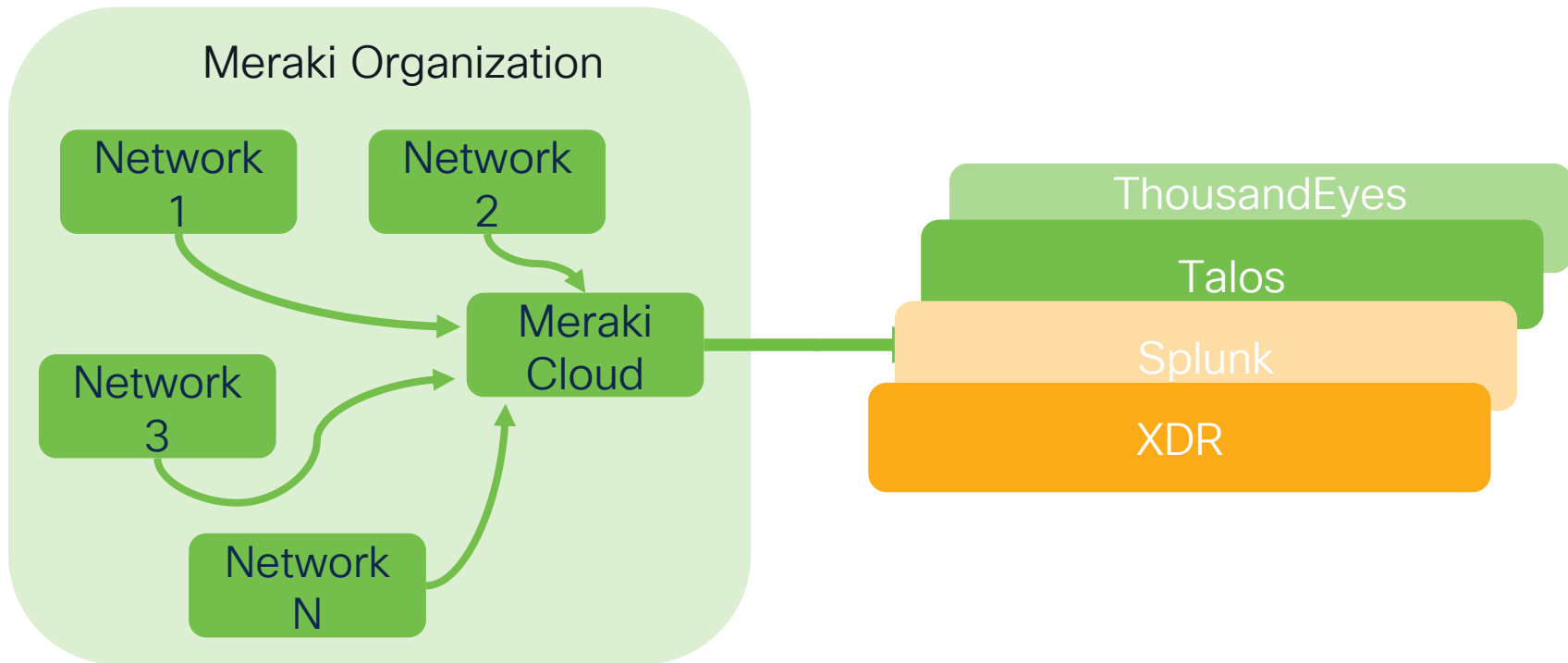
Start leveraging Next-Gen MX-OS TODAY!
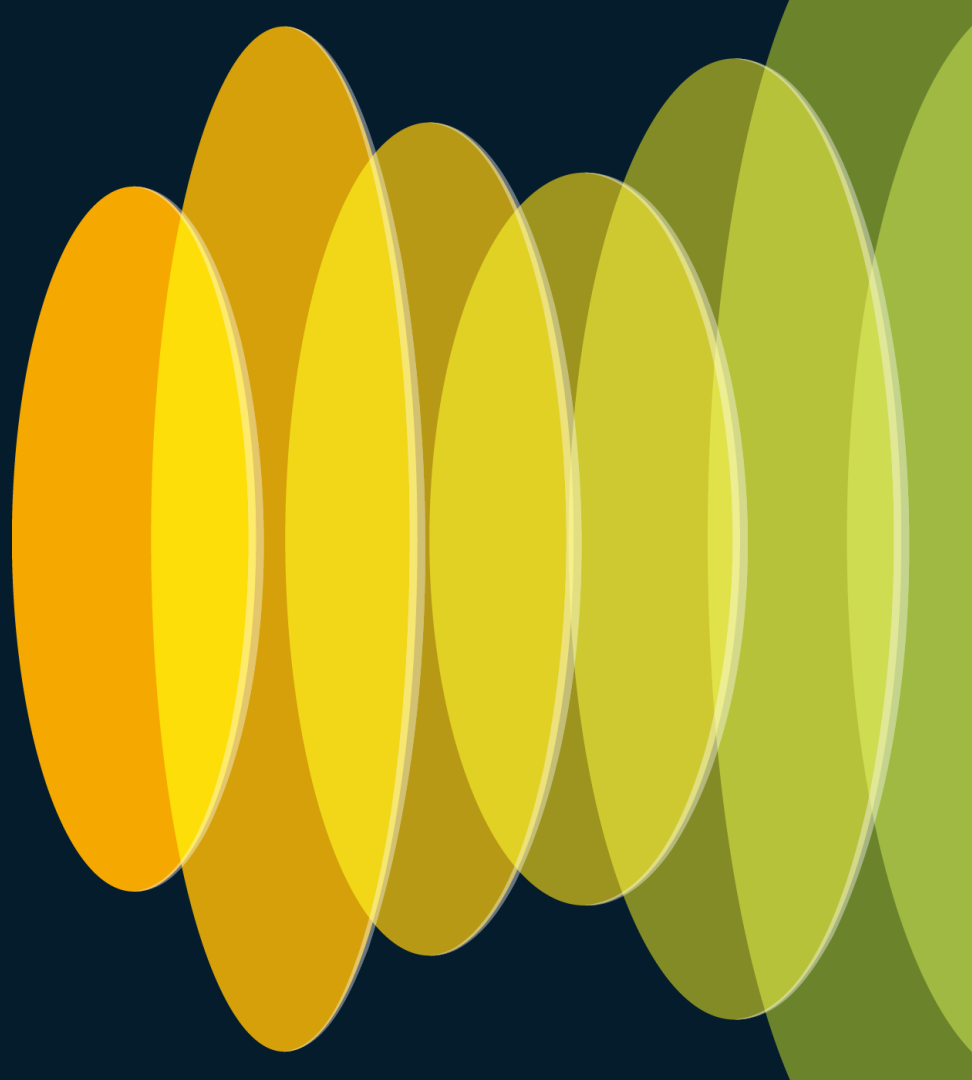
vMX-XL for AWS

A new cloud-based VPN Concentrator which delivers unprecedented throughput

10+ Gbps VPN Throughput

10x increase over

current gen maximum

10,000 VPN Tunnels

10x increase over current

generation maximum

Concentrator Mode

First release will support

Concentrator mode only

New VPP based OS architecture

A new 'Software ASIC' driven architecture

which is highly performant and scalable

Next-Gen High End - MX650

A new hardware-based VPN Concentrator which delivers unprecedented throughput

25 Gbps VPN Throughput

2.5x increase over

current gen maximum

16 Gbps IPS Throughput

up to 4x increase over

current generation maximum

Concentrator Mode

First release will support

Concentrator mode only

targets, subject to change

New VPP based OS architecture

A new 'Software ASIC' driven architecture

which is highly performant and scalable

Show me the proof!
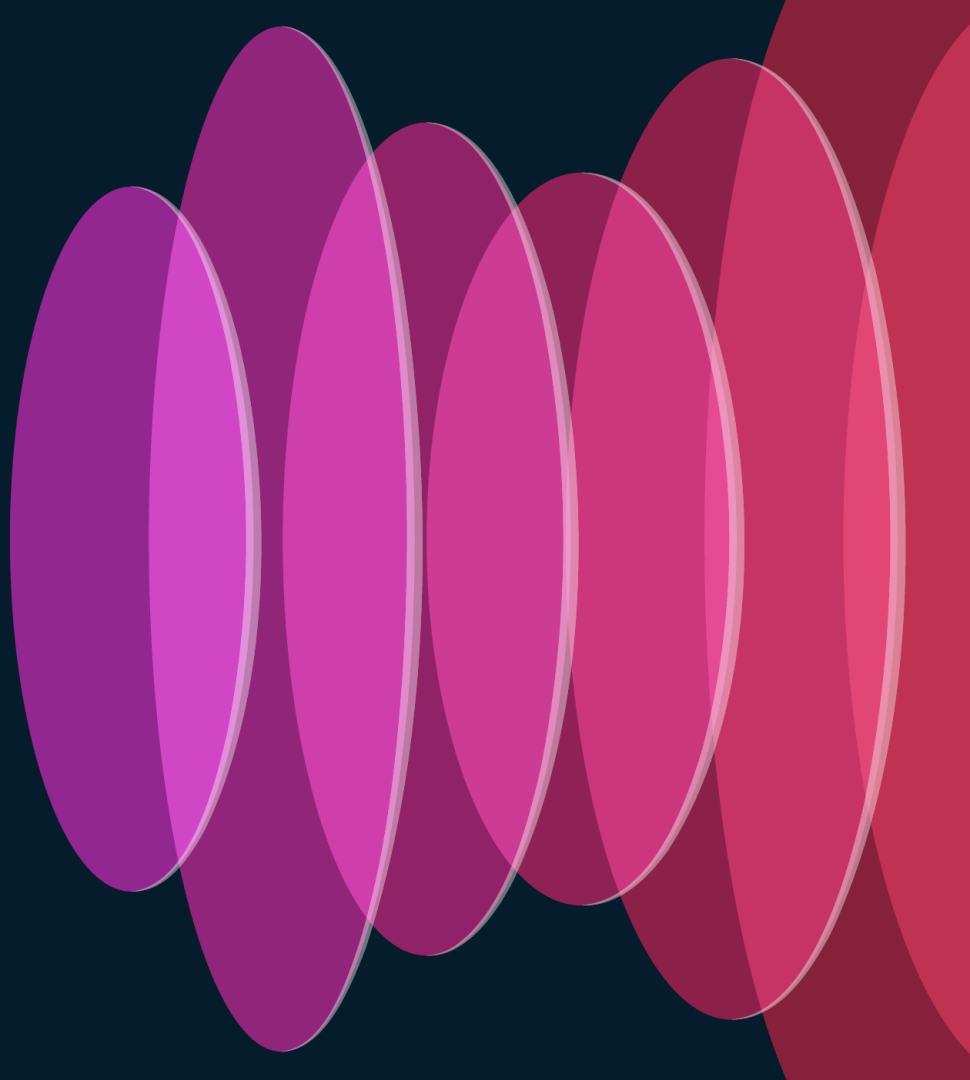
Next-Gen MX-OS Demo Topology
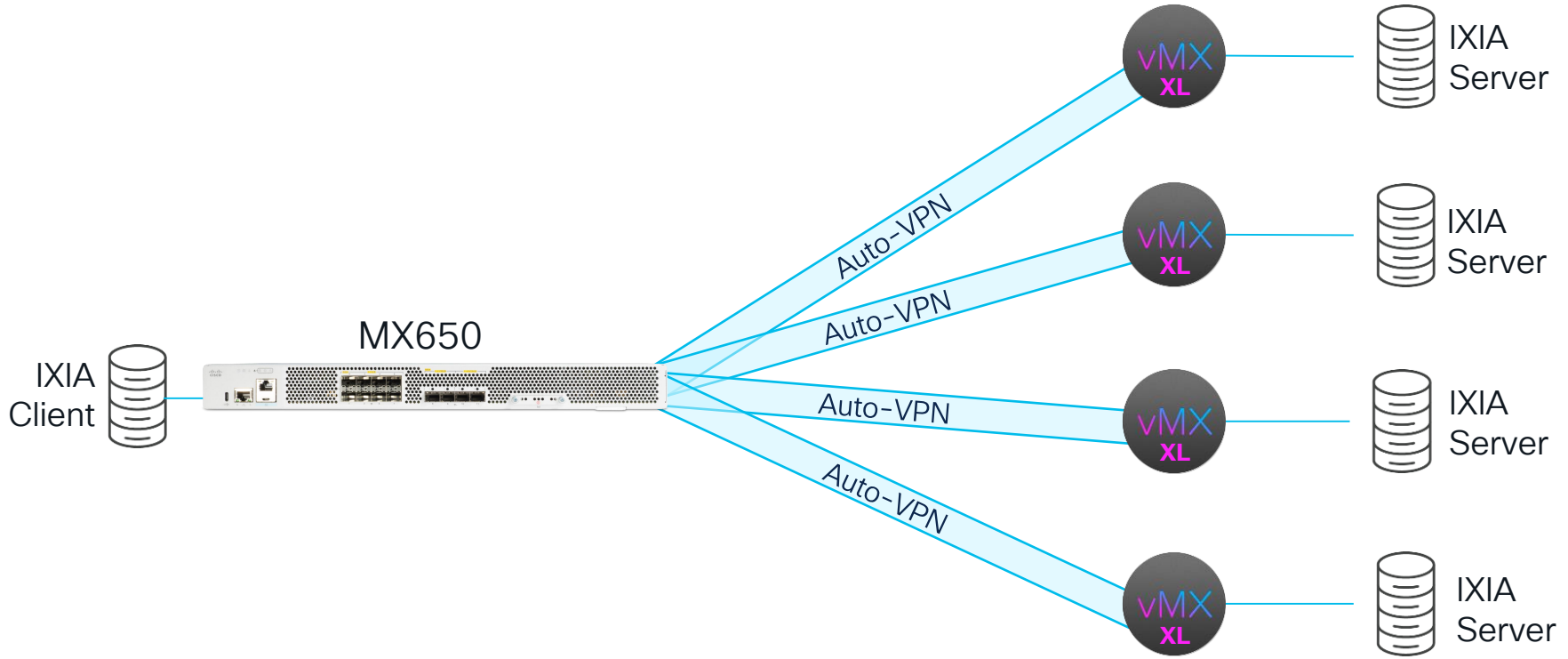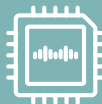
Next-Gen MX-OS in action!
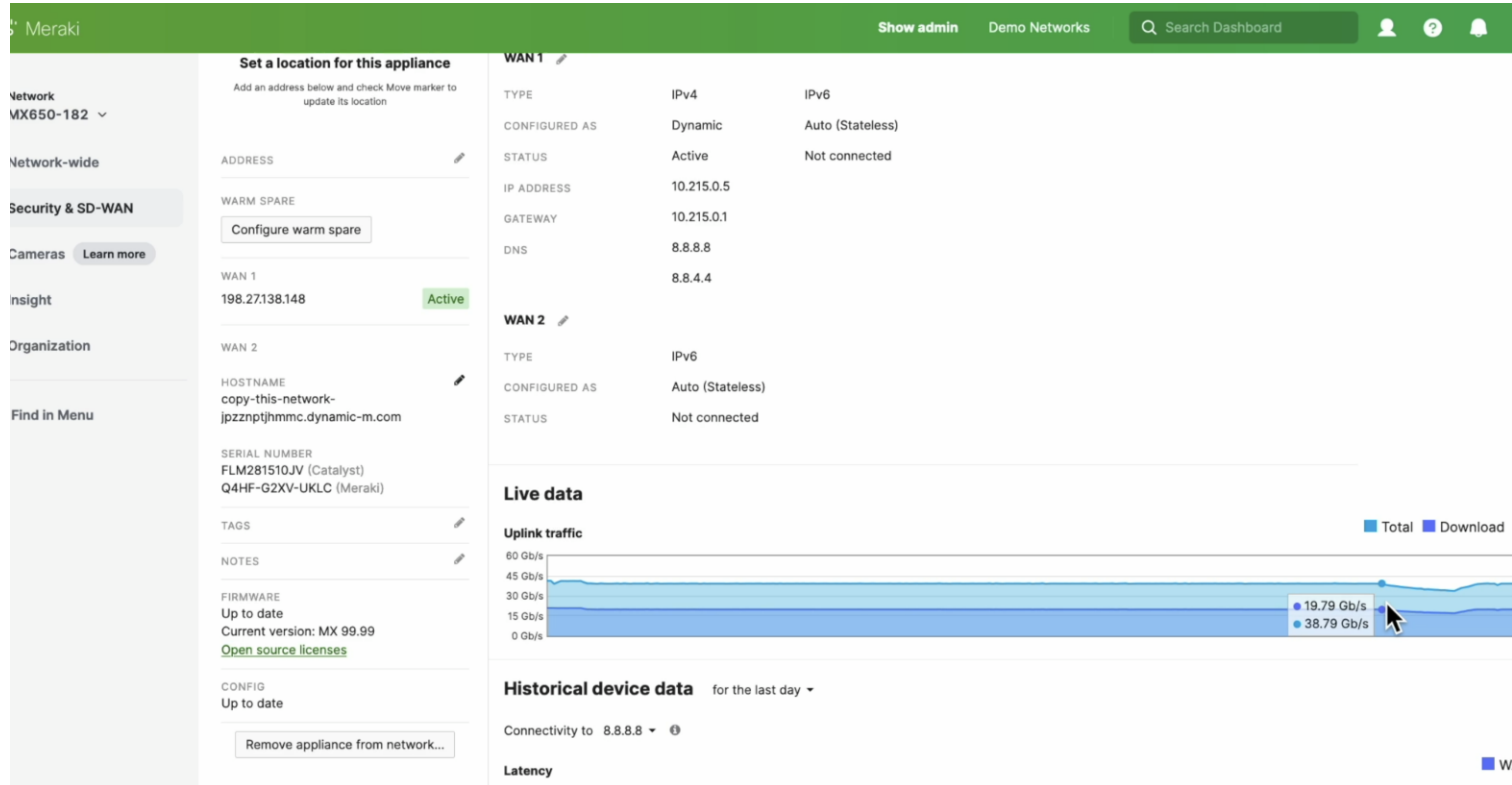
Takeaways

Unifying the best of Cisco Networking, Security and Dataplane for the modern Secure WAN Edge

Enabling a new era of features, agility and innovation

ASIC-Level Performance & Scale, in software, to maintain low price points

Try out the vMX-XL and sign up for the MX650 beta to unlock all new levels of performance and scale today!

Complete Your Session Evaluations

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

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

Level up and earn **exclusive prizes!**

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

Continue your education

- Visit the Cisco Showcase for related demos

- Book your one-on-one Meet the Engineer meeting

- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs

- Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand
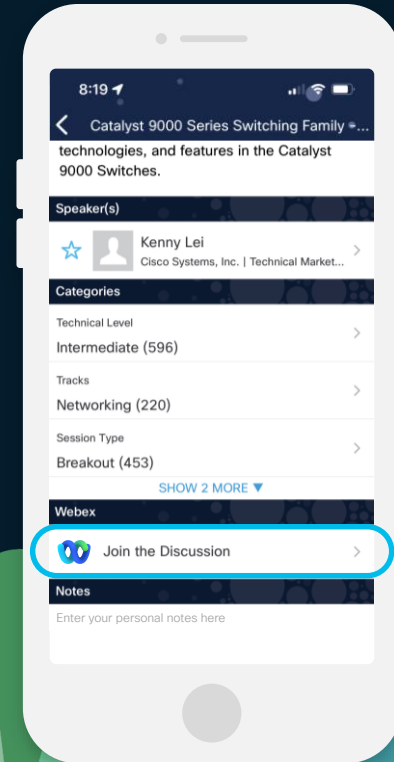
Cisco Webex App

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 June 7, 2024.

Thank you