

CISCO *Live!*

Let's go



The bridge to possible

Closed Loop Automation in SDWAN via ThousandEyes

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CISCO *Live!*

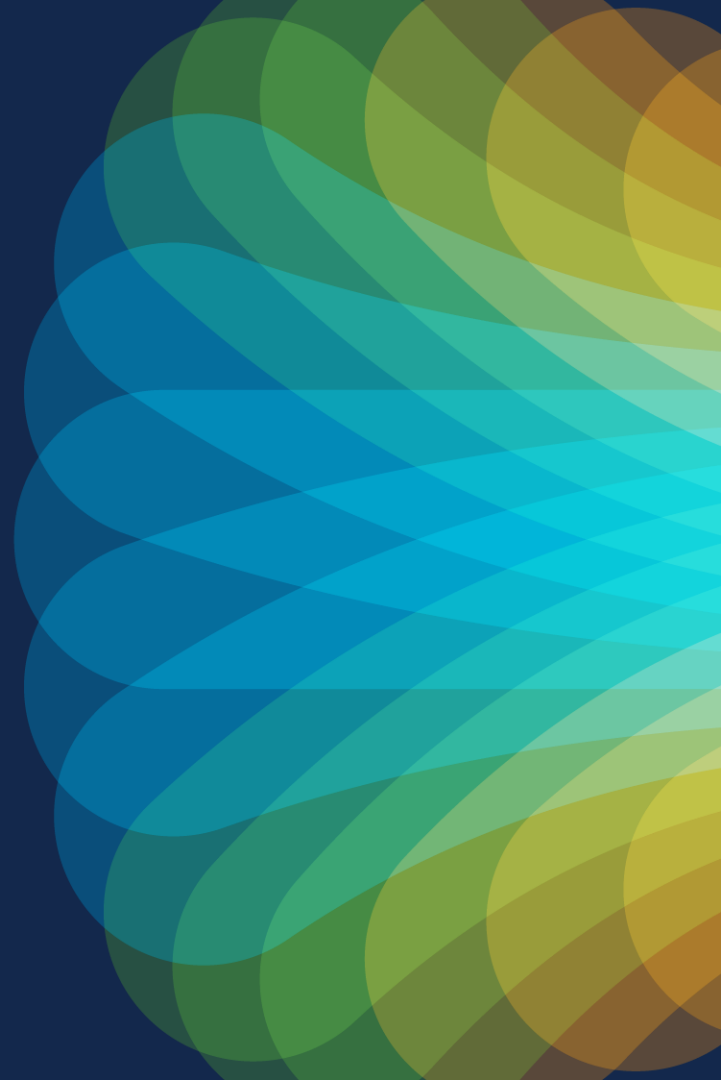
DEVNET-1608

Agenda

- A Bird's-Eye View of
 - Cisco SD-WAN
 - ThousandEyes
- ThousandEyes WAN Insights
- Bringing it all Together



Cisco SD-WAN



Session Objective :

This Session Focuses on :

- Brief Overview of Cisco SDWAN & ThousandEyes WAN Insights.
- The session covers closed loop automation via SDWAN Analytics Predictive Path recommendations (powered by ThousandEyes WAN Insights).

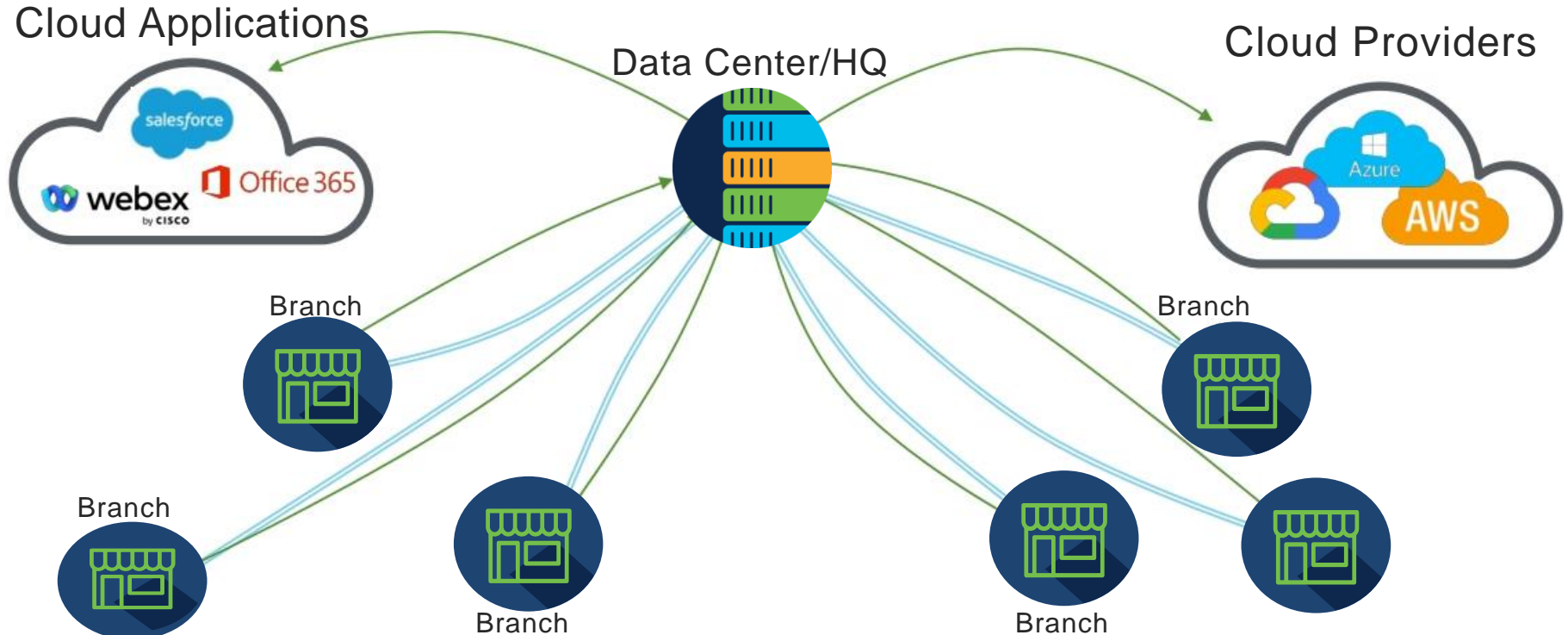
By the end, I hope everyone in this room gets a better understanding of the steppingstone for transforming SDWAN into a predictive model.

Session Non-Objective :

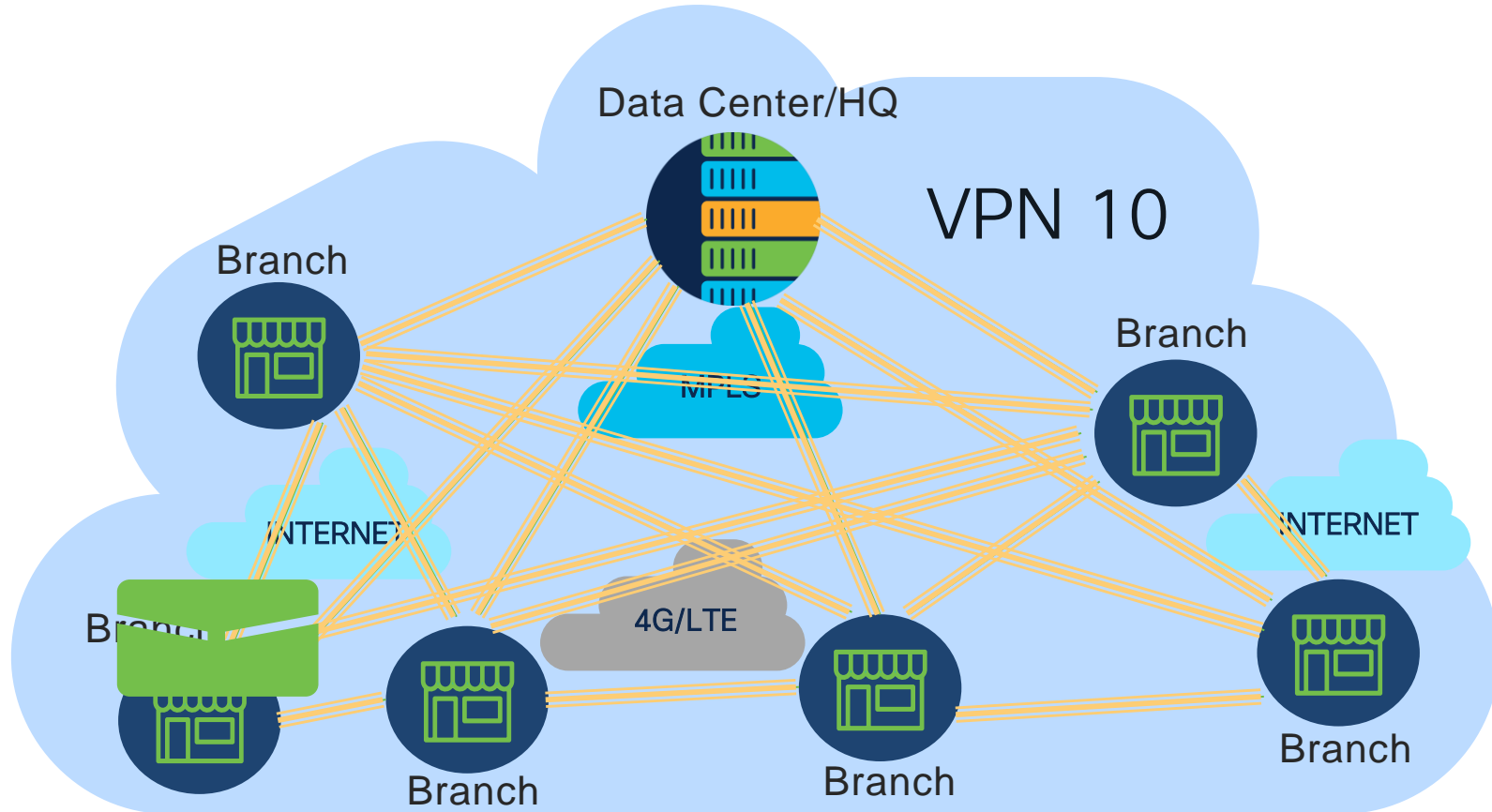
- We will not cover any of the installation aspects of these components.
- We will not focus on the Licensing.
- We will also not be covering the AI/ML models that are working in the backend to provide a Feedback loop.

The Hardware Based WAN of Yesterday

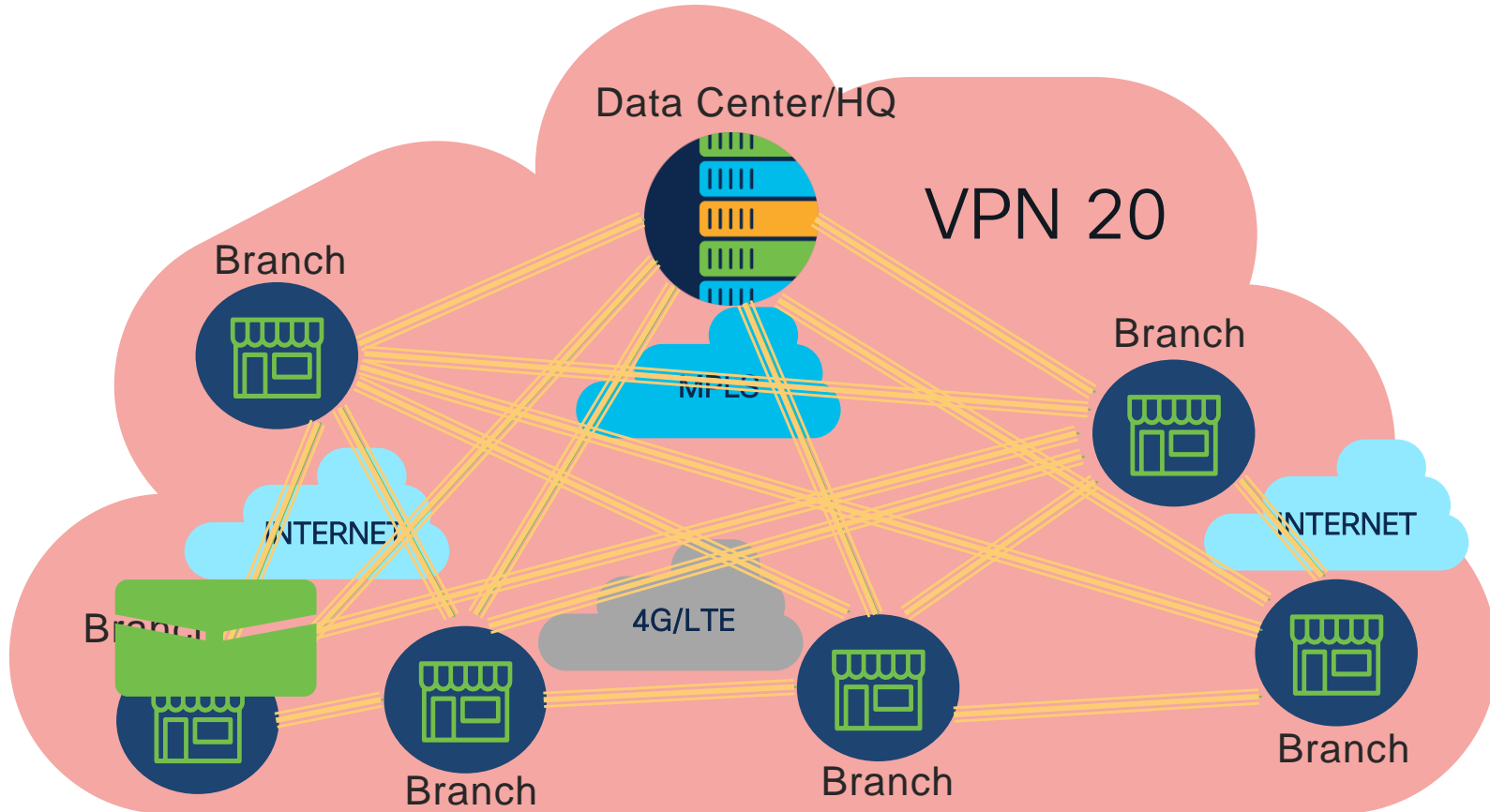
Doesn't Keep up with the Needs of Today



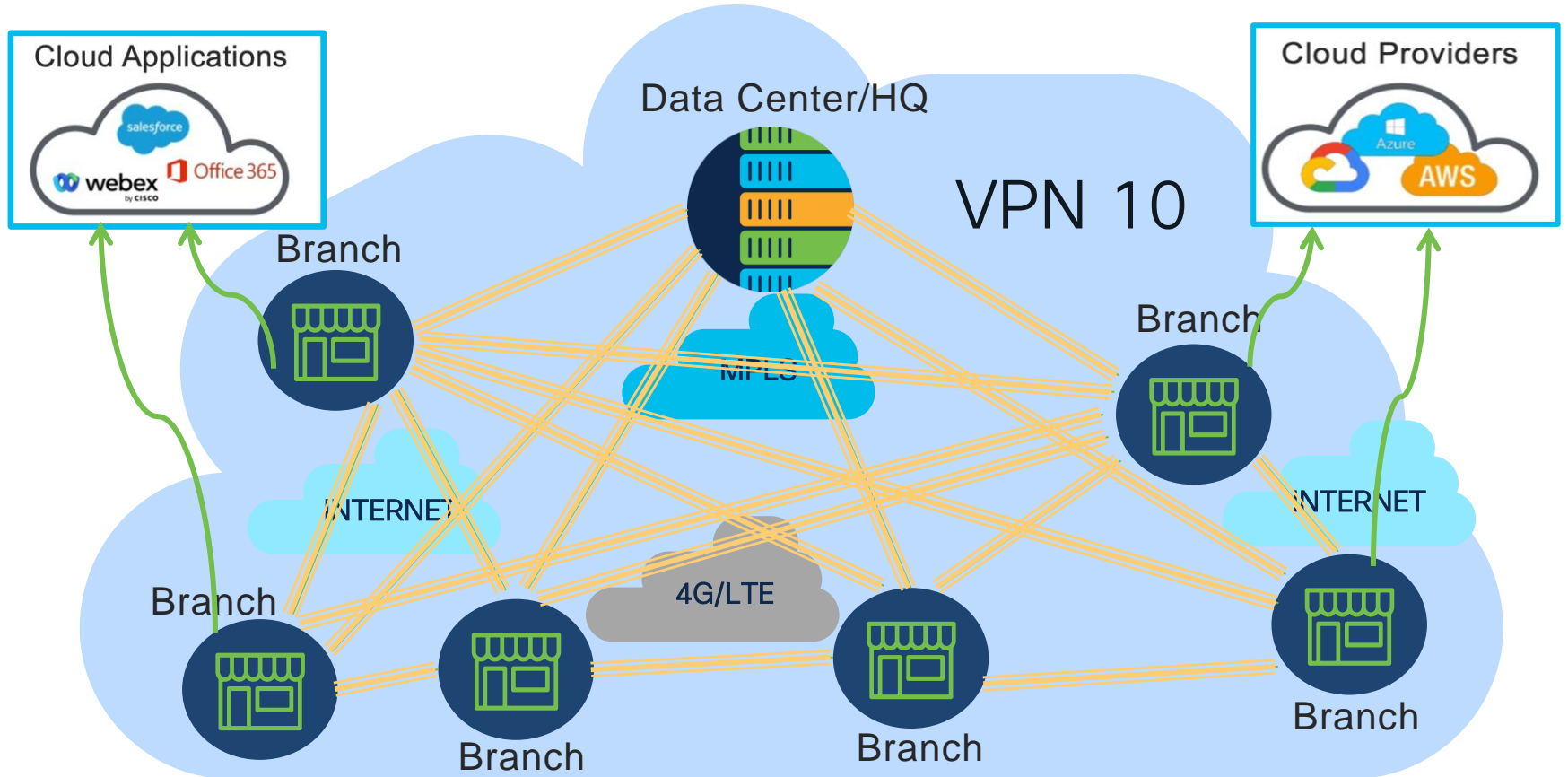
Cisco SD-WAN: Software Approach



Cisco SD-WAN: Software Approach



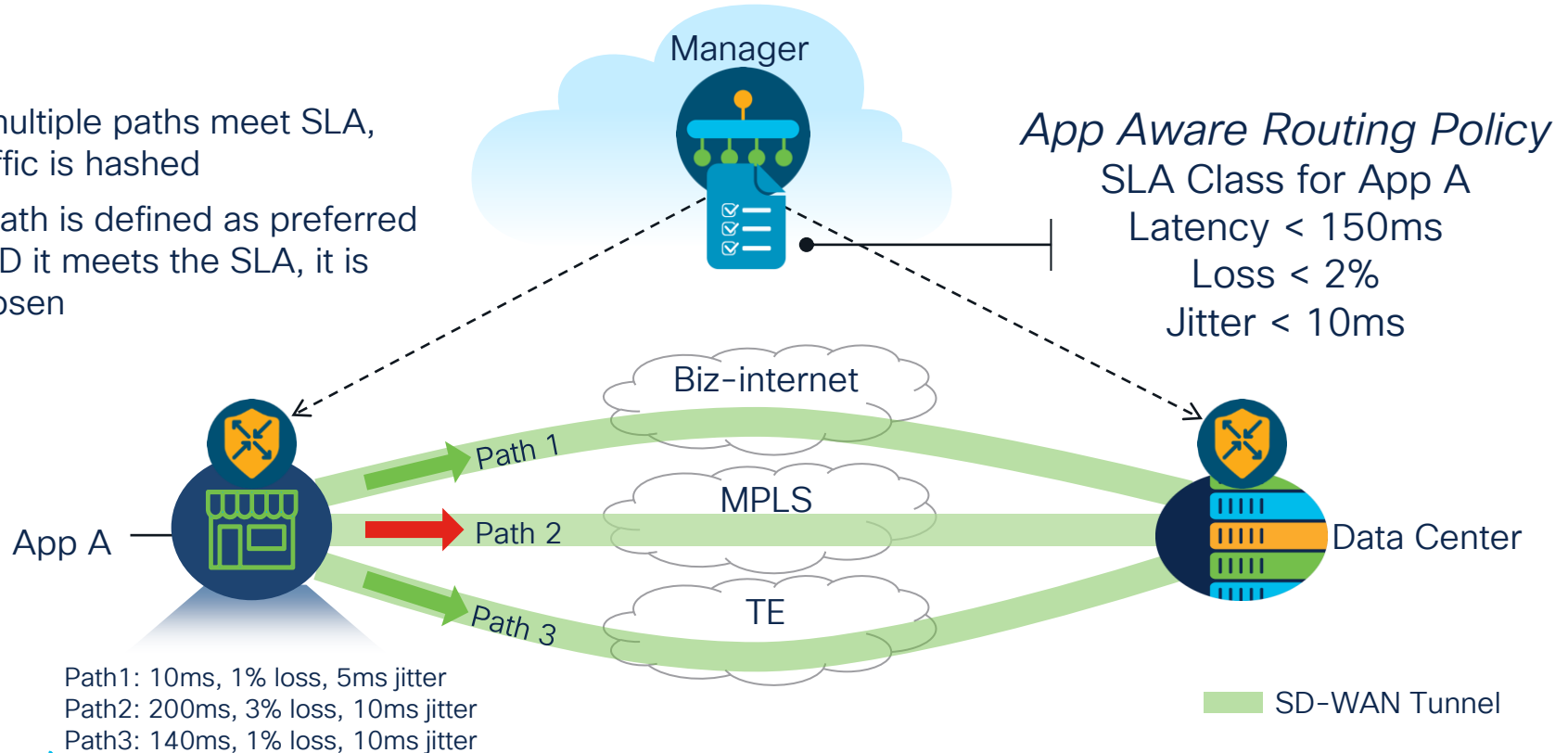
Cisco SD-WAN: Software Approach



Cisco SD-WAN: Software Approach

Application Aware Routing

- If multiple paths meet SLA, traffic is hashed
- If path is defined as preferred AND it meets the SLA, it is chosen



Cisco Vision: SD-WAN Analytics

Observability



Enhance visibility into network behavior and user experience with applications deployed on-prem or in cloud

Diagnostics



Expedite troubleshooting & reduce OpEx by offering actionable insights to help isolate problem areas

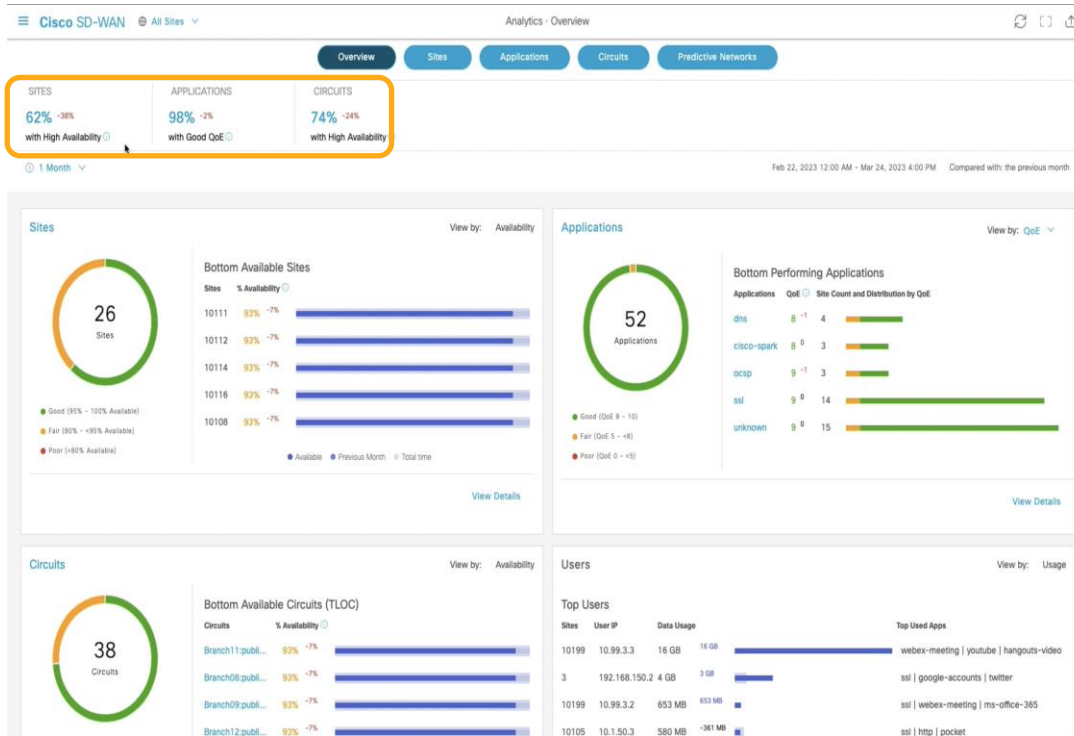
Predictive / Adaptive



Simplify operations/ automate networks through AI/ML/Big Data based predictive insights

Scalable, Cloud-first, Multi-domain Analytics Architecture

Overview Dashboard



Benefits

Quickly gain operational insights into overall applications and network

Highlights

- Snapshot view of your overall application experience and network health (sites, circuits)
- Identify top users across entire network
- Compare with previous time periods

SD-WAN Observability Tools



SDWAN Manager

- **NMS for deployment and configuration**
 - ✓ Design validation
- **Raw monitoring**
 - ✓ Tunnel, Interface, Site, QoS
- **Alert management**
 - ✓ Logs – alarms, events, audit
- **Troubleshooting**
 - ✓ Traceroute, speed test, ping
- **Deployment**
 - ✓ On-prem and Cloud-hosted



SDWAN Analytics

- **Path Recommendations powered by WAN Insights**
- **Aggregate perf analytics**
 - ✓ Application health
 - ✓ Top talkers
 - ✓ M365 CoR Telemetry
- **Historical trend analysis**
 - ✓ Application and network performance
- **Large scale deployments with a lot of SAIE(DPI) data**
- **Future – AI/ML based features**
- **Deployment**
 - ✓ SaaS service



ThousandEyes

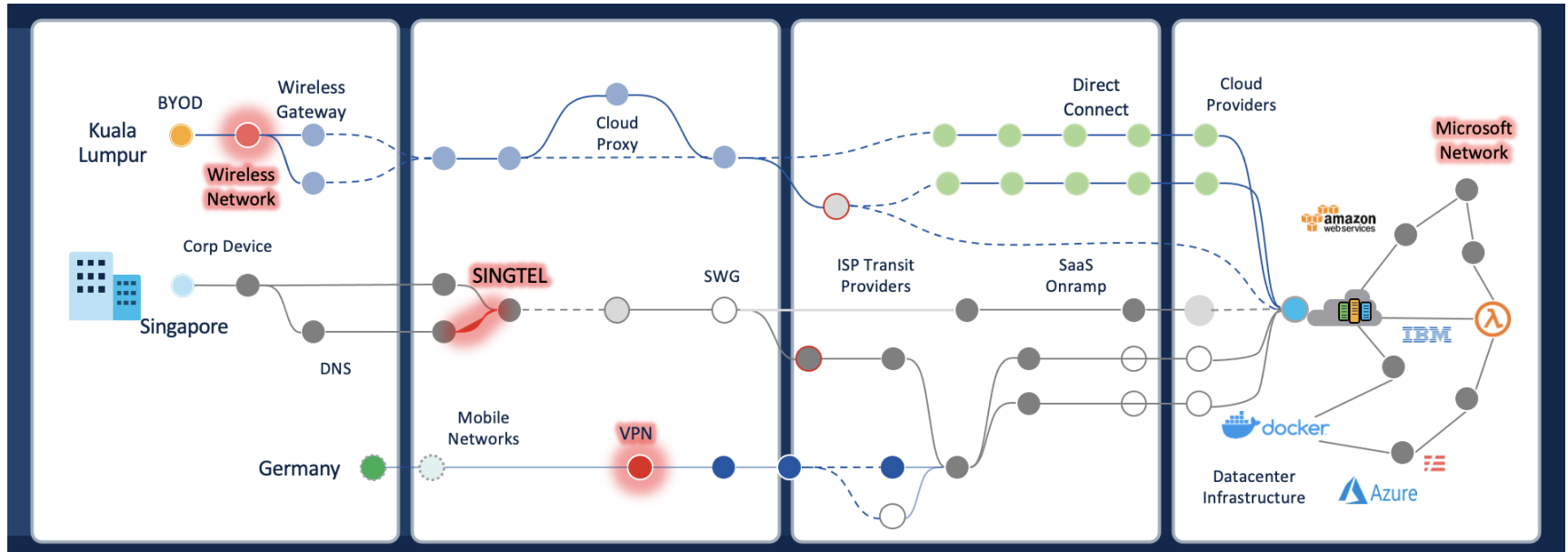
- **WAN Insights**
- **Underlay Path Visualization**
- **Monitoring**
 - ✓ Deep L7 App Analytics
 - ✓ Path visualization
- **Troubleshooting**
 - ✓ Identify path changes
- **Site Evaluation**
 - ✓ Before/After metrics
- **Deployment**
 - ✓ SaaS service
 - ✓ Agent deployed on edge

ThousandEyes

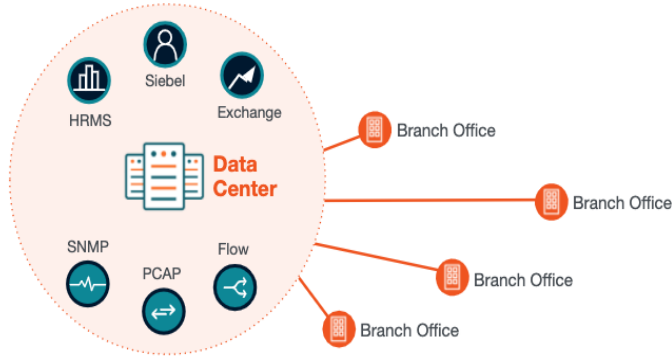


What Is ThousandEyes?

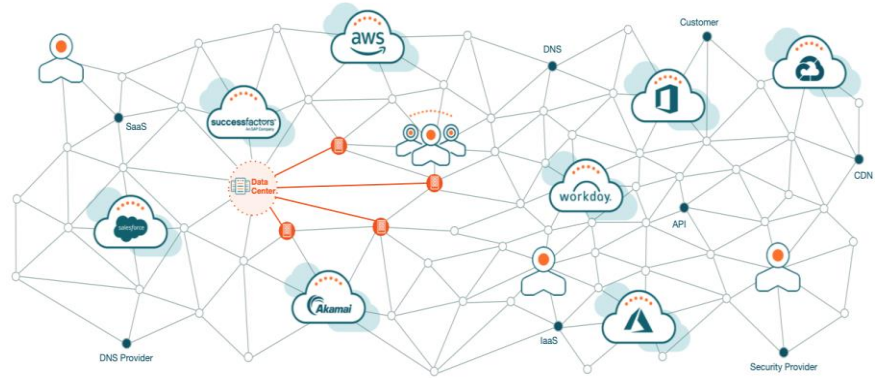
ThousandEyes allows you to visualize any network as if it was your own, quickly surface actionable insights, and collaborate and solve problems with your partners.



Why Does It Matter



THE WAY IT WAS



THE WAY IT IS

CLOUD is the new DataCenter

INTERNET is the new Network

SaaS is the new App Stack

Achieve extended visibility with Cisco SD-WAN and ThousandEyes

Cisco SD-WAN



Measures **point-to-point network** telemetry

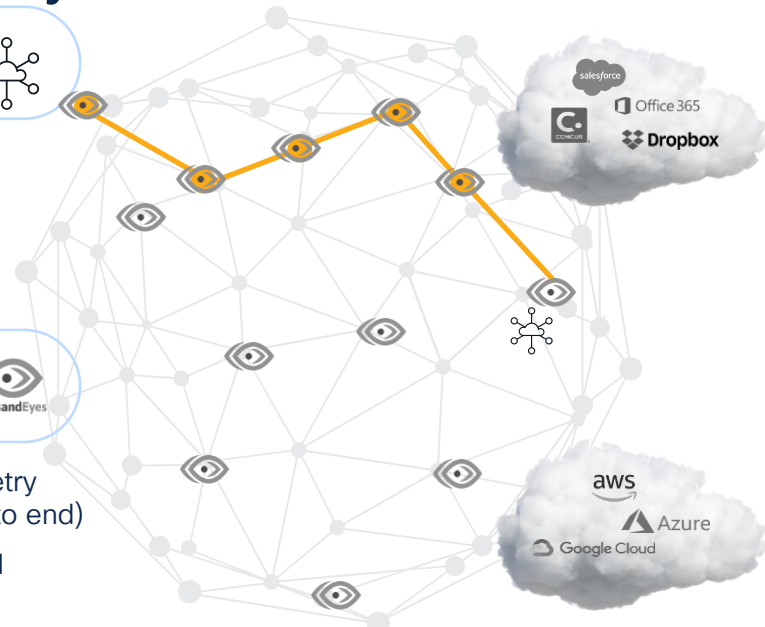
Enables automated routing based on network performance and availability

Cisco ThousandEyes



Measures **hop-by-hop network** telemetry and path (SD-WAN underlay and end to end)

Measures application performance and correlates with network insight



Cisco SD-WAN and ThousandEyes native integration

- Turn-key agent deployment
- Rapid MTTI/MTTR
- Actionable insights

Empowering IT to faster resolution

Evaluate persistently

Pinpoint evidence

Escalate accurately

ThousandEyes WAN Insights

A new world...

Highly dynamic multi-cloud world: applications move across Clouds, the new WAN is the Internet with a plethora of network access. Seamless integration with Home Office



Customers #1 priorities are
Application Experience and Security

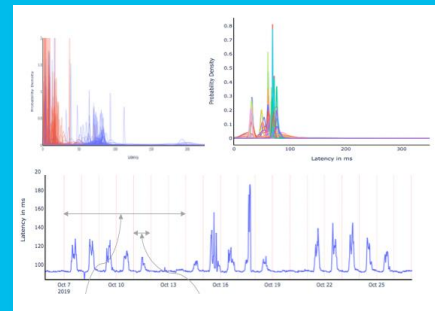


... With new challenges

Make the network application driven (not just networking centric)



Be Predictive,
not Reactive



Predictive network assurance for digital experience transformation

Forecasts conditions

Identifies expected issues based on predictive analysis

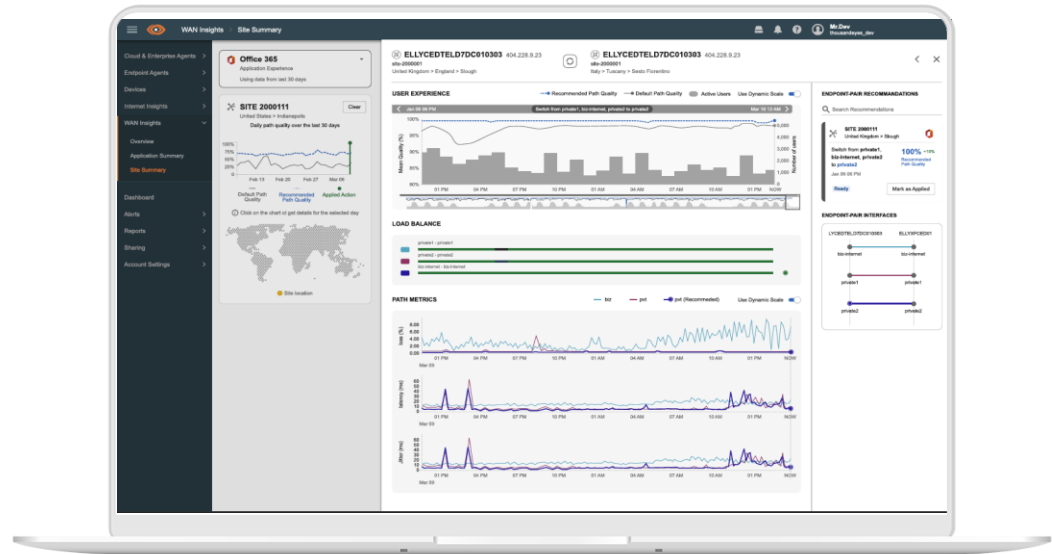
Recommends actions

Provides specific steps to improve application experience

Improves experience

Sustained improvement over a longer period of time - promotes continuous improvement.

Cisco ThousandEyes WAN Insights



Use Case: Forecast, Recommend and Improve

ThousandEyes WAN Insights

Validates improvement

Recommends Actions

Forecasts Issues

Applies predictive models

Ingests performance data

Workforce digital experience

Improved user experience, by avoiding user degradation before it happens- Tune SD-WAN routing policies per site to avoid performance issues and measurably improve user experience.

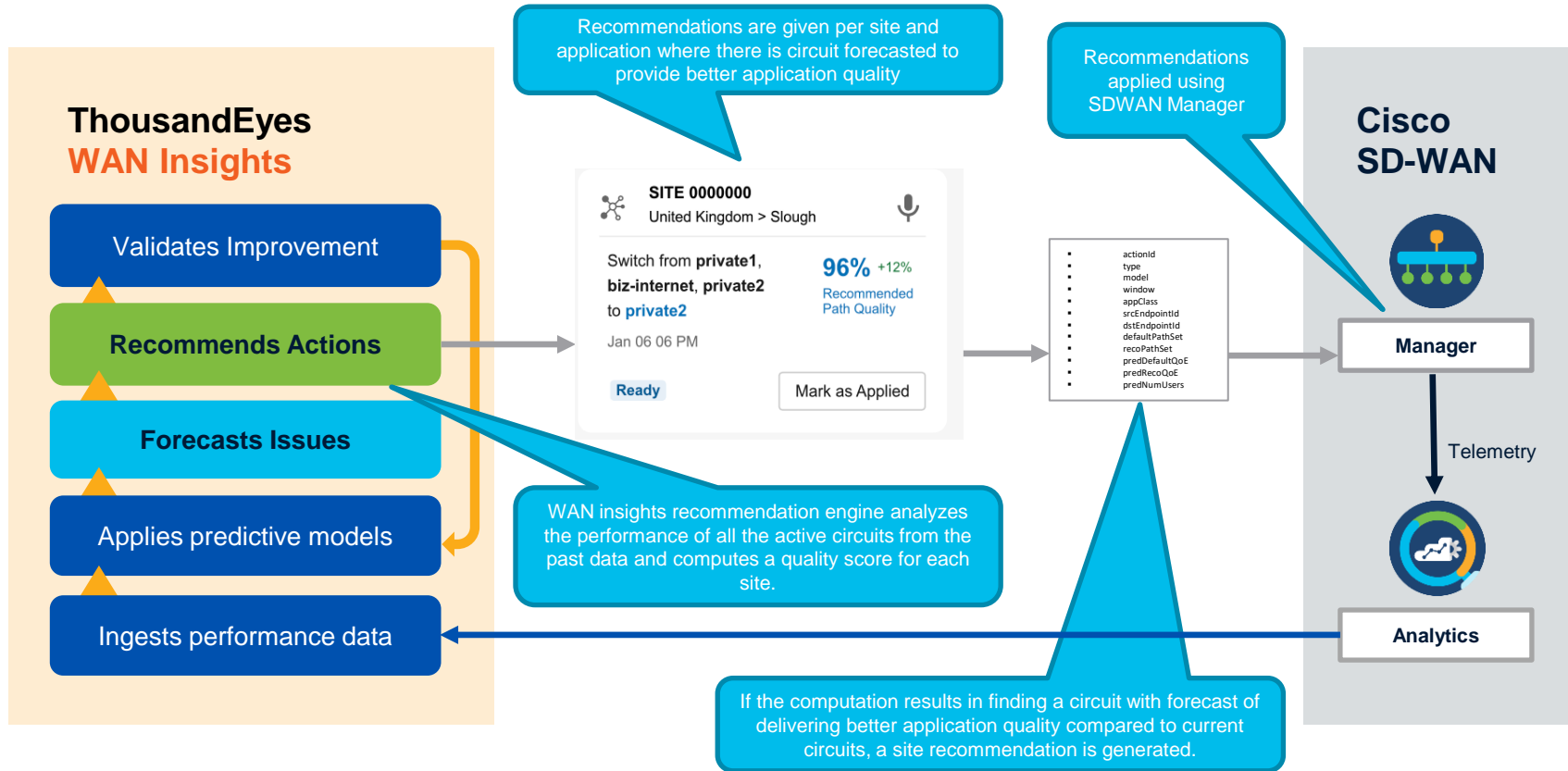
Policy Optimisation and Verification

Verification and validation that implemented policies meet business requirements for all locations.

Network Planning

Cross correlate with outage conditions to verify provider choices. Provide perpetual improvement cycle optimizing network and application performance over time

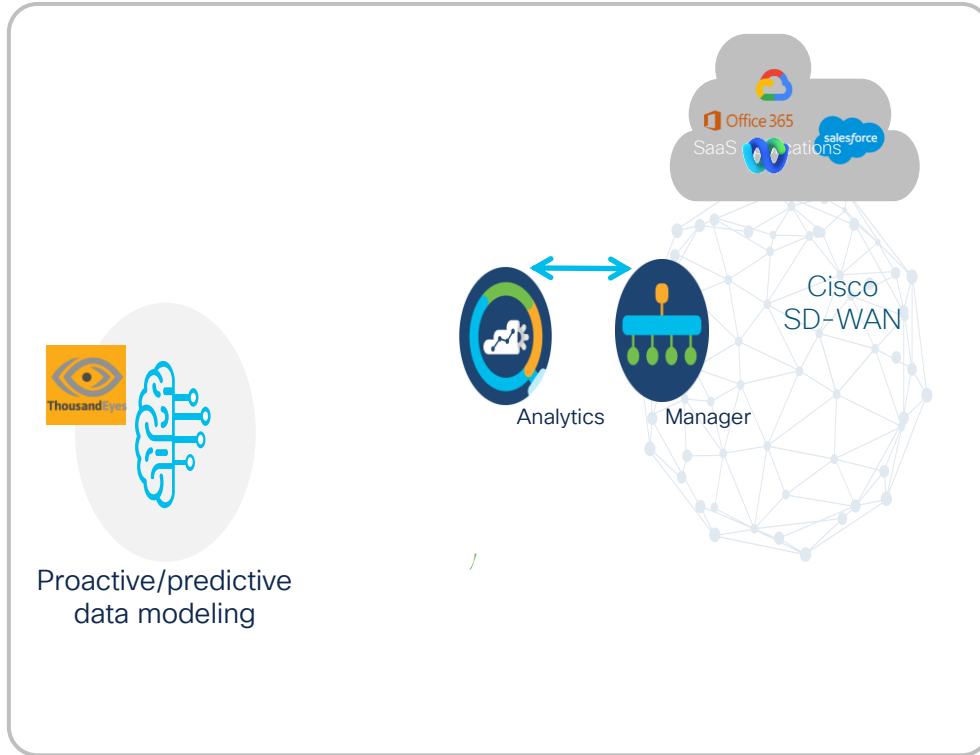
Understanding and Applying Recommendations



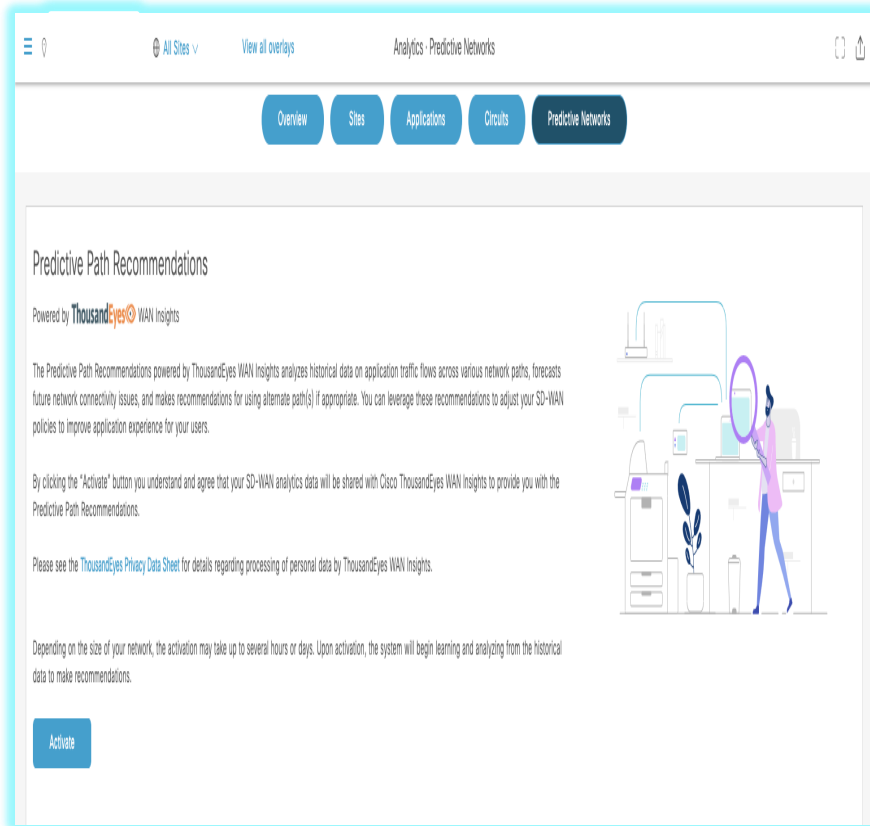
Bringing it all
Together



Cisco Analytics and ThousandEyes WAN insights



Prerequisites



The screenshot shows the Cisco SD-WAN Predictive Networks interface. At the top, there is a navigation bar with 'All Sites', 'View all overlays', and 'Analytics - Predictive Networks'. Below this is a menu with buttons for 'Overview', 'Sites', 'Applications', 'Circuits', and 'Predictive Networks'. The main content area is titled 'Predictive Path Recommendations' and is powered by ThousandEyes WAN Insights. It contains several paragraphs of text explaining the feature and an 'Activate' button. An illustration of a person in a lab coat looking at a screen is also present.

Predictive Path Recommendations

Powered by **ThousandEyes** WAN Insights

The Predictive Path Recommendations powered by ThousandEyes WAN Insights analyzes historical data on application traffic flows across various network paths, forecasts future network connectivity issues, and makes recommendations for using alternate path(s) if appropriate. You can leverage these recommendations to adjust your SD-WAN policies to improve application experience for your users.

By clicking the "Activate" button you understand and agree that your SD-WAN analytics data will be shared with Cisco ThousandEyes WAN Insights to provide you with the Predictive Path Recommendations.

Please see the [ThousandEyes Privacy Data Sheet](#) for details regarding processing of personal data by ThousandEyes WAN Insights.

Depending on the size of your network, the activation may take up to several hours or days. Upon activation, the system will begin learning and analyzing from the historical data to make recommendations.

[Activate](#)

- SD-WAN DNA Advantage or higher license is required.
- Active Analytics instance in the US or EU region
- SD-WAN Manager 20.3 or newer
- Enable DPI/SAIE in SD-WAN Manager (DPI for 20.7.x earlier, SAIE for 20.8.x up)
- Closed Loop Automation support starts from 20.12.x, 17.12.x releases.
- Application traffic over SD-WAN tunnels
- If customers use DIA, Cloud On Ramp SaaS needs to be enabled
- For onboarding Apps, AAR needs to be pre-configured in SD-WAN Manager

Predictive Path Recommendations

Activate Predictive Networks

☰ 📍 All Sites ▾ View all overlays Analytics · Predictive Networks 🗄️ ⬆️

Overview Sites Applications Circuits **Predictive Networks**

Predictive Path Recommendations


Powered by **ThousandEyes** WAN Insights

The Predictive Path Recommendations powered by ThousandEyes WAN Insights analyzes historical data on application traffic flows across various network paths, forecasts future network connectivity issues, and makes recommendations for using alternate path(s) if appropriate. You can leverage these recommendations to adjust your SD-WAN policies to improve application experience for your users.

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Activate ← Activate Predictive Path Recommendations

Let's see it in action ...

Cisco Catalyst SD-WAN | Select Resource Group | All Sites | Monitor · Overview

Overview | Devices | Tunnels | Applications | Security | VPN | Logs | Multicloud

Overview 🔍

CONTROLLERS			WAN EDGES	CERTIFICATE STATUS	LICENSING	REBOOT
1	1	1	9	0	0	0
Validator	Controller	Manager	Reachable	Warning	Assigned 11 Unassigned	Last 24 hrs

Site Health

Fair Performing Sites

7 Sites

Site	Usage (GB)
New York	~10
Dallas	~5
Azure-Central-US	~2
San Jose	~1
Seattle	~1

Legend: Good (Green), Fair (Orange), Poor (Red)

View Details

Tunnel Health

82 Tunnels

Legend: Good (Green), Fair (Orange), Poor (Red)

WAN Edge Health

CPU Load (%) | Fair Devices

Application Health

Notifications

- Predictive Networks (5)
 - San Jose (3)
 - Seattle (2)
- Device (1)
 - BR2-Seattle (52)

View All

Predictive Path Recommendations

Powered by ThousandEyes WAN Insights

Recommendation Summary ⓘ

All Recommendations

Office365_apps

Recommendation: Ready

Path Quality

Current Path:	77.6%
Recommended Path:	77.6% +0.00%

Impacted Clients: 2

[View Details](#)

Webex_apps

Recommendation: Ready

Path Quality

Current Path:	100.0%
Recommended Path:	99.9% -0.04%

Impacted Clients: 0

[View Details](#)

Voice_Apps

Recommendation: Ready

Path Quality

Current Path:	62.2%
Recommended Path:	83.3% +21.15%

Impacted Clients: 0

[View Details](#)

Salesforce_apps

None

Path Quality

Current Path:	--
Recommended Path:	--

Impacted Clients: --

[View Details](#)

Recommended Actions

View - Sort by Gain % ▾



🔍 Search site, location

Voice_Apps

Site 9
United States - Seattle

Switch from *private1*, *mpls* to *mpls*

Jun 16, 2023 07:30 AM

Path Quality

Current Path:	70.0%
Recommended Path:	96.5% +26.50%

Impacted Clients: 0

[View Details](#) | [Apply](#)

Webex_apps

Site 9
United States - Seattle

Switch from *private1*, *mpls* to *private1*

Nov 17, 2023 07:30 AM

Path Quality

Current Path:	98.9%
Recommended Path:	99.9% +1.02%

Impacted Clients: 0

[View Details](#) | [Apply](#)

Recommendation Summary

All Recommendations

Office365_apps Recommendation: Ready Path Quality Current Path: 7 Recommended Path: 7 Impacted Clients: 2 View Details	Webex_apps Recommendation: Ready Path Quality	Voice_Apps Recommendation: Ready Path Quality	Salesforce_apps None Path Quality
---	--	--	--

Recommended Actions [View · Sort by Gain %](#)

Search site, location

Webex_apps
Site 9
United States - Seattle
Switch from private1, mpls to private1
Nov 17, 2023 07:30 AM

Path Quality
Current Path: 98.9%
Recommended Path: 99.9% **+1.02%**
Impacted Clients: 0

[View Details](#) | [Apply](#)

Voice_Apps
Site 9
United States -
Switch from private1, mpls
Jun 16, 2023 07:30 AM

Path Quality
Current Path:
Recommended Path:
Impacted Clients:

[View Details](#) | [Apply](#)

Apply Predictive Path Recommendations

Confirm the selected predictive path recommendations below before proceeding to preview and deployment of active policy.

Site	Application	Current Path	Recommended Path	% Gain
9	Voice_Apps	private1, mpls	mpls	26.50%

[Cancel](#) [Proceed to Apply](#)

Custom Options

Centralized Policy

Localized Policy

Search

Add Policy Add Default AAR & QoS

Total Rows: 4

Name	Description
office-365-policy	office-365-policy
Corporate-Policy	Corporate Policy Demo
SD-AVC	SD-AVC
Custom-SaaS-Central-Policy	Custom-SaaS-Central-Policy

Last Updated
18 Oct 2020 9:46:51 PM IST
24 Oct 2023 12:23:38 AM IST
10 Aug 2021 2:44:30 AM IST
06 Aug 2021 9:10:55 PM IST

Activate Policy

Policy will be applied to the reachable vSmarts:
1.1.1.3

Activate
Cancel

Local Configuration		New Configuration	
250	sla-class Business-Critical preferred-color privatel	249	sla-class Business-Critical preferred-color privatel
251	!	250	!
252	!	251	!
253	sequence 61	252	sequence 61
254	match	253	match
255	source-ip 0.0.0.0/0	254	source-ip 0.0.0.0/0
256	app-list Voice_Apps	255	app-list Voice_Apps
257	!	256	!
258	action	257	action
259	sla-class Voice preferred-color mpls privatel	258	sla-class Voice preferred-color mpls
260	!	259	!
261	!	260	!
262	sequence 71	261	sequence 71
263	match	262	match
264	source-ip 0.0.0.0/0	263	source-ip 0.0.0.0/0
265	cloud-saas-app-list Google_Apps	264	cloud-saas-app-list Google_Apps
266	!	265	!
267	action	266	action
268	count Google_Apps_ctr_887245420	267	count Google_Apps_ctr_-256287335
269	cloud-saas	268	cloud-saas
270	!	269	!
271	!	270	!
272	!	271	!

Activate

Cancel

Key Takeaways

Key Takeaways

- Overview of SDWAN & ThousandEyes.
- ThousandEyes WAN Insight
 - Predictive network assurance for digital experience transformation
- Cisco SD-WAN - brings it all together..
 - Prerequisites
 - Walk through of the closed loop automation.



Automated recommendations & policy change
at the click of a button 😊

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Get access to an exclusive learning module filled with digital learning opportunities on topics including **Cisco Networking** and more.

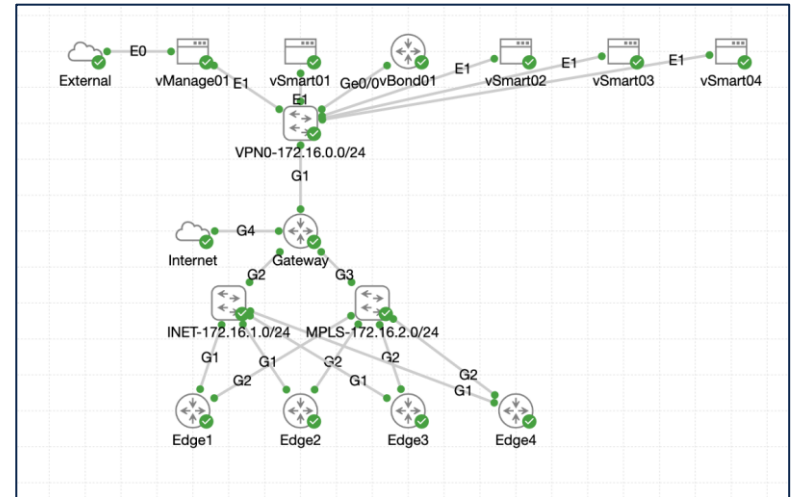
Scan QR Code to get started.



SD-WAN Lab Tool for Cisco Modeling Lab (CML)

Virtual SD-WAN Fabric automatically created in 15 minutes

- No need to install [CML](#) – existing dCloud [CML Sandbox](#) can be used
- SD-WAN Lab Tool is a python-based script for Day 0 and Day 1 automation
- Currently Cisco-internal only
- Considering opening to public GitHub



Call to Action:

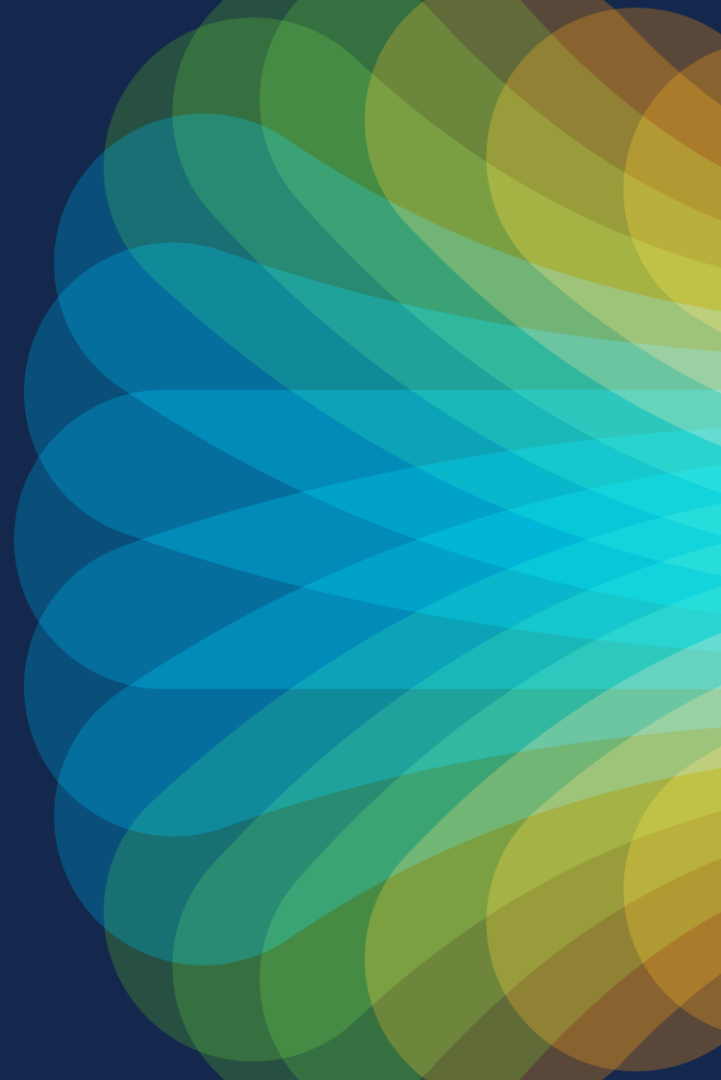
- Contact cml-sdwan-lab-tool@cisco.com if you want to participate as early adopter / contributor!



The bridge to possible

Thank you

CISCO *Live!*



The Cisco Live! logo features the word "CISCO" in a bold, black, sans-serif font, followed by "Live!" in a black, cursive script font. The background of the entire image is a vibrant, multi-colored abstract pattern of overlapping, wavy bands in shades of red, orange, yellow, green, and blue, creating a sense of motion and energy.

CISCO *Live!*

Let's go