



The bridge to possible

# Accelerating the Benefits of Routed Optical Networking with Crosswork Automation

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# 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 until February 24, 2023.

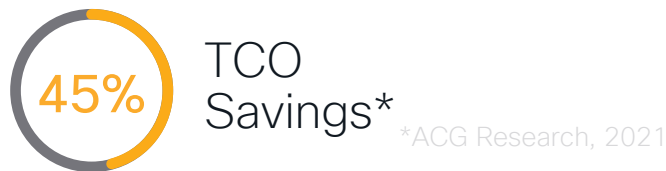




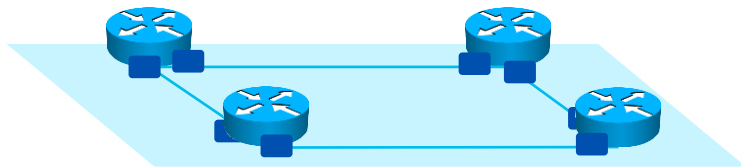
# Agenda

- The benefit of Routed Optical Networking
- Crosswork Automation Stack
- How Automation accelerates RON benefits

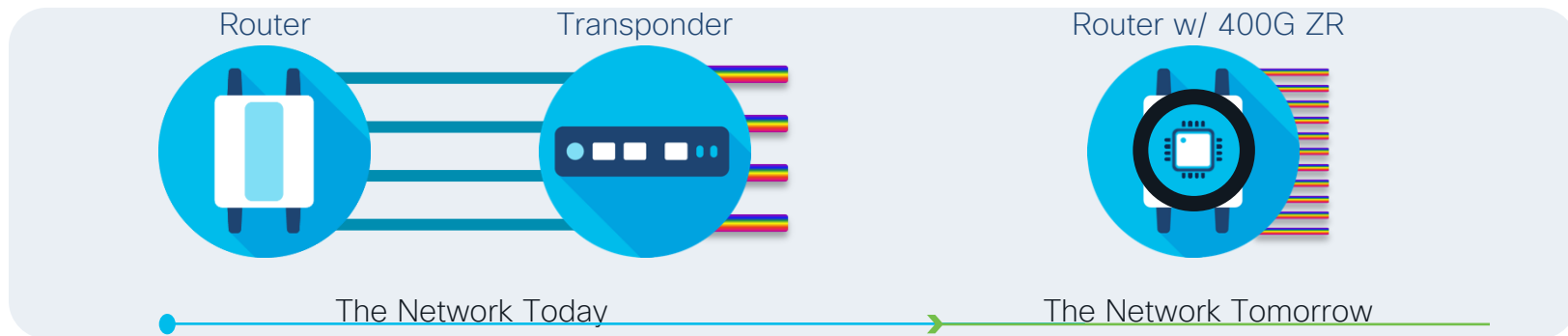
# The benefits of Routed Optical Networking



\*ACG Research, 2021

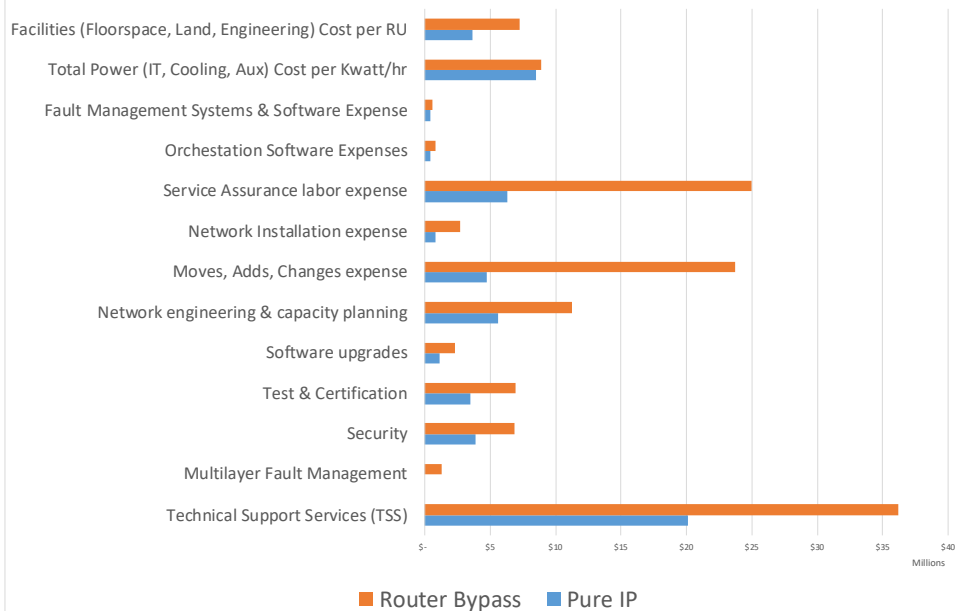


- **Agility** in capacity planning and service delivery
- **Simplicity** with Interoperability and standardization
- **Efficiency** with differentiated service delivery



# The details of the savings

5 Year Cumulative OPEX Breakdown



## Hardware related savings



Space and power savings. The “green” network

## Automatin related savings



Shorter Time-to-Market for services



Service assurance cost savings

Source: ACG Research

# Crosswork Automation





# Automation vision

Automate processes by bringing together visibility, insights and actions in a closed loop



## Visibility

Verify and monitor customer experience



## Insights

Correlate data, identify trends and patterns



## Action

Automate processes to drive agility

# Cisco Crosswork™ automation portfolio



Visibility



Insights



Action

## Hierarchical Controller (HCO)

Cross-domain routed optical controller

## Crosswork Network Controller (CNC)

Multi-vendor IP controller

## Cisco Optical Network Controller (CONC)

Multi-vendor IP controller

## Network Services Orchestrator (NSO)

Intent-based network automation

## Evolved Programmable Network Manager (EPNM)

Element lifecycle management

## WAN Automation Engine (WAE)

Network design and planning

## Network Insights

Analysis of network and routing data

## Traffic Analysis

Analysis/optimization of traffic

## Trust Insights

Monitor device integrity & security posture

## Accedian Skylight (Partner)

Service assurance

## Vitria VIA AIOps (Partner)

Service assurance



# RON Automation

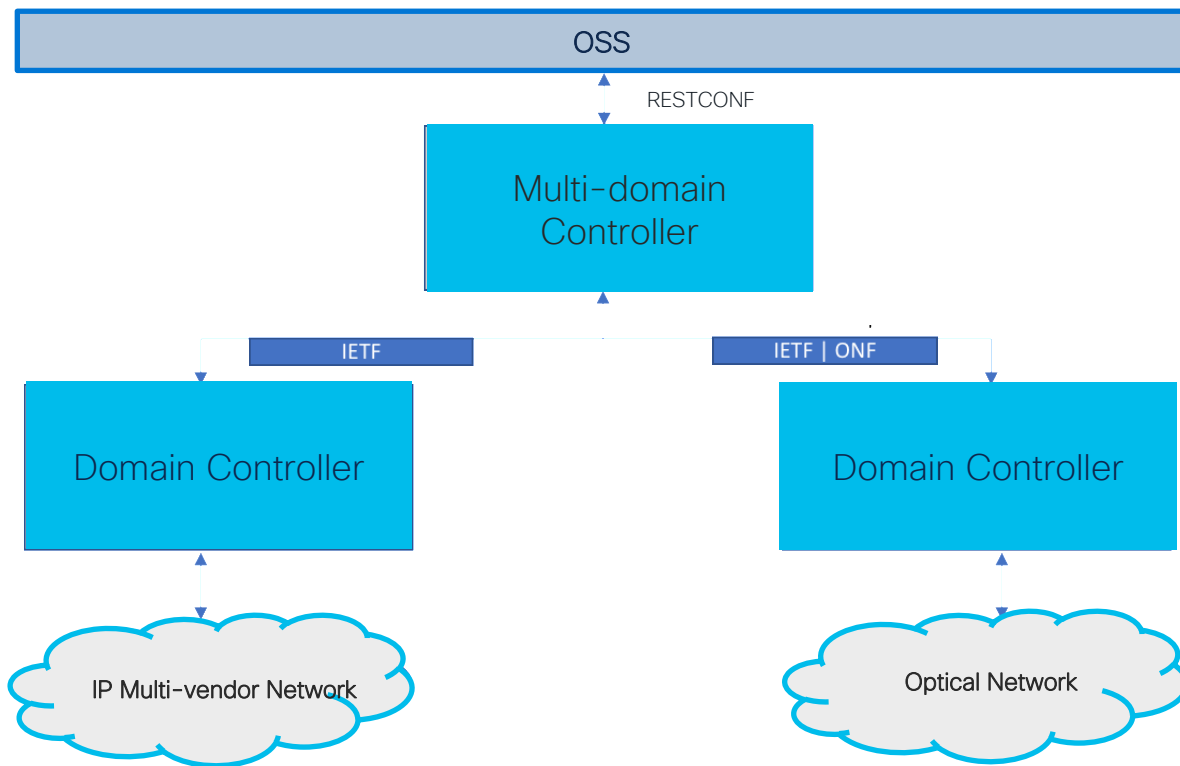
simple ingredients for RON



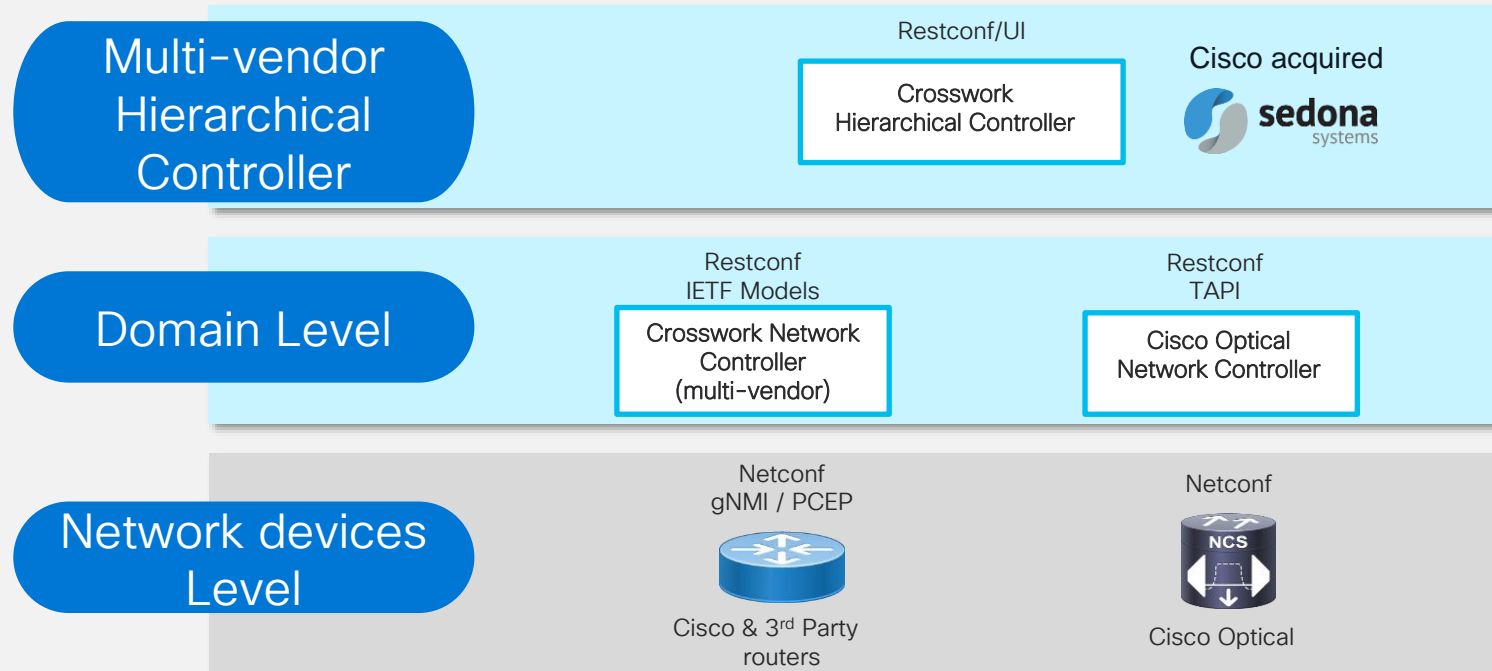
# Multilayer Multidomain Standard Automation Architecture

Alignment to Standards – IETF ACTN\*

\*RFC 8453 Framework for Abstraction and Control of TE Networks (ACTN)



# Cisco implementation aligned to Standards



# RON Automation

simple ingredients for RON



## Visualization

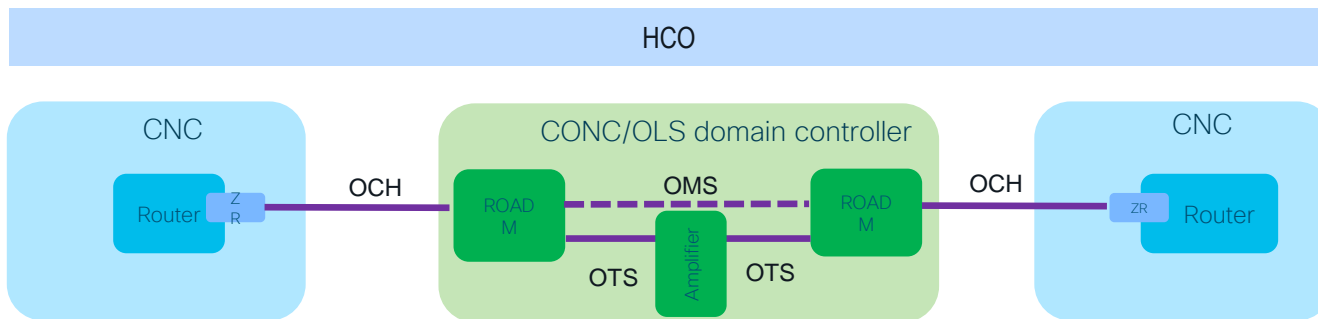
Visualize Optical IP Links

## Assurance

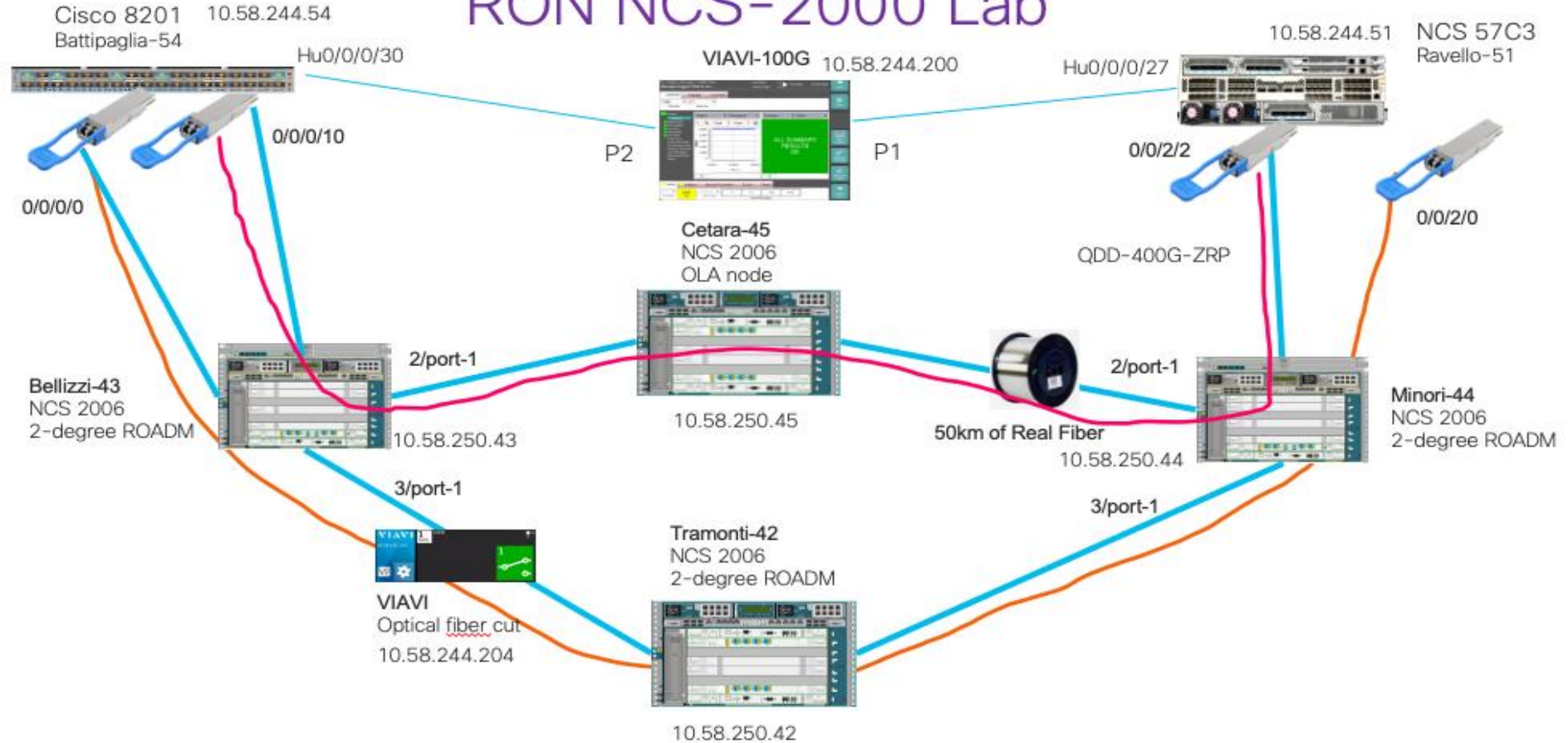
Optical KPI visualization and  
correlation  
Root Cause Analysis

## Provisioning

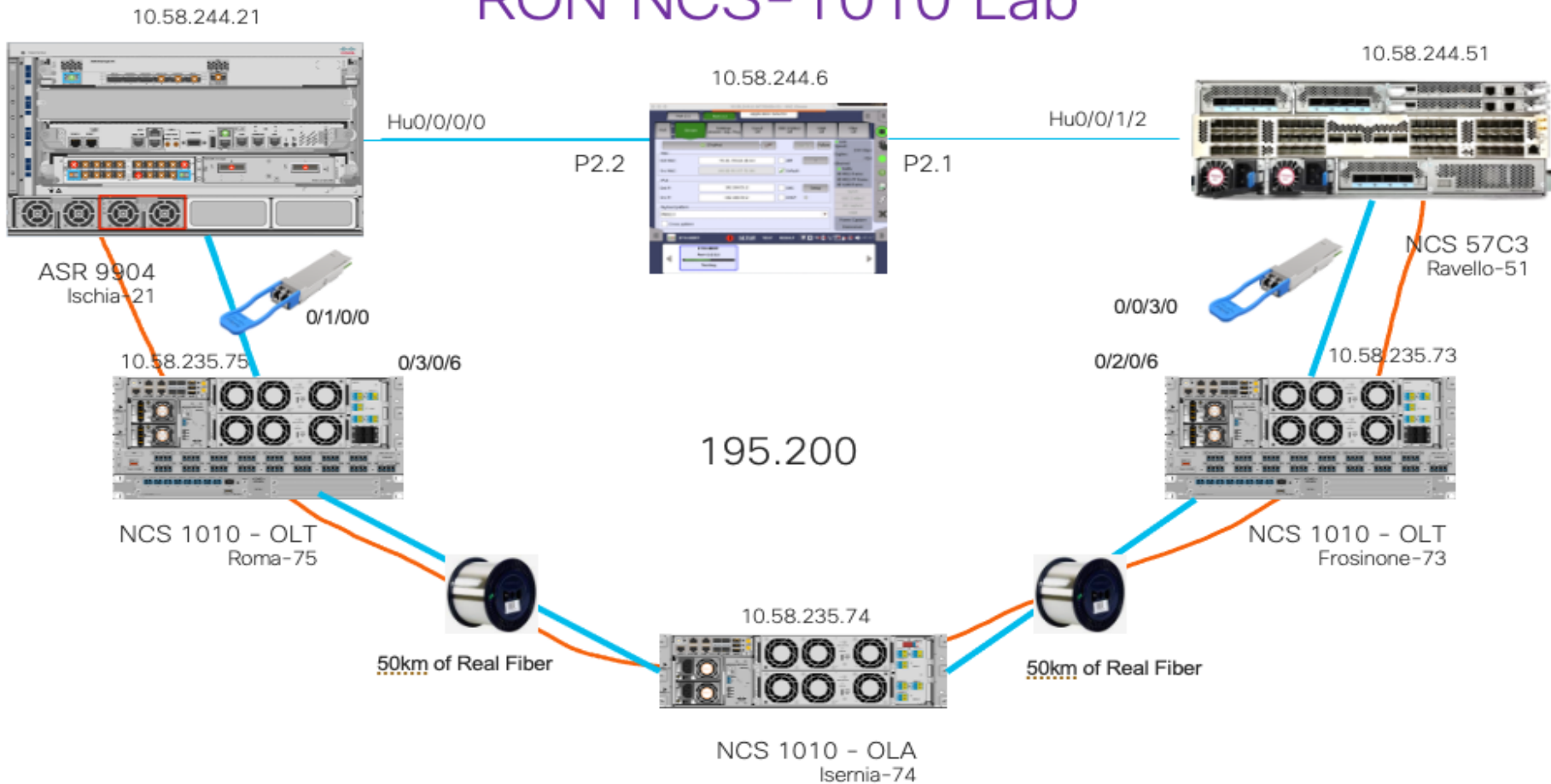
End to End creation of the  
Optical IP Link



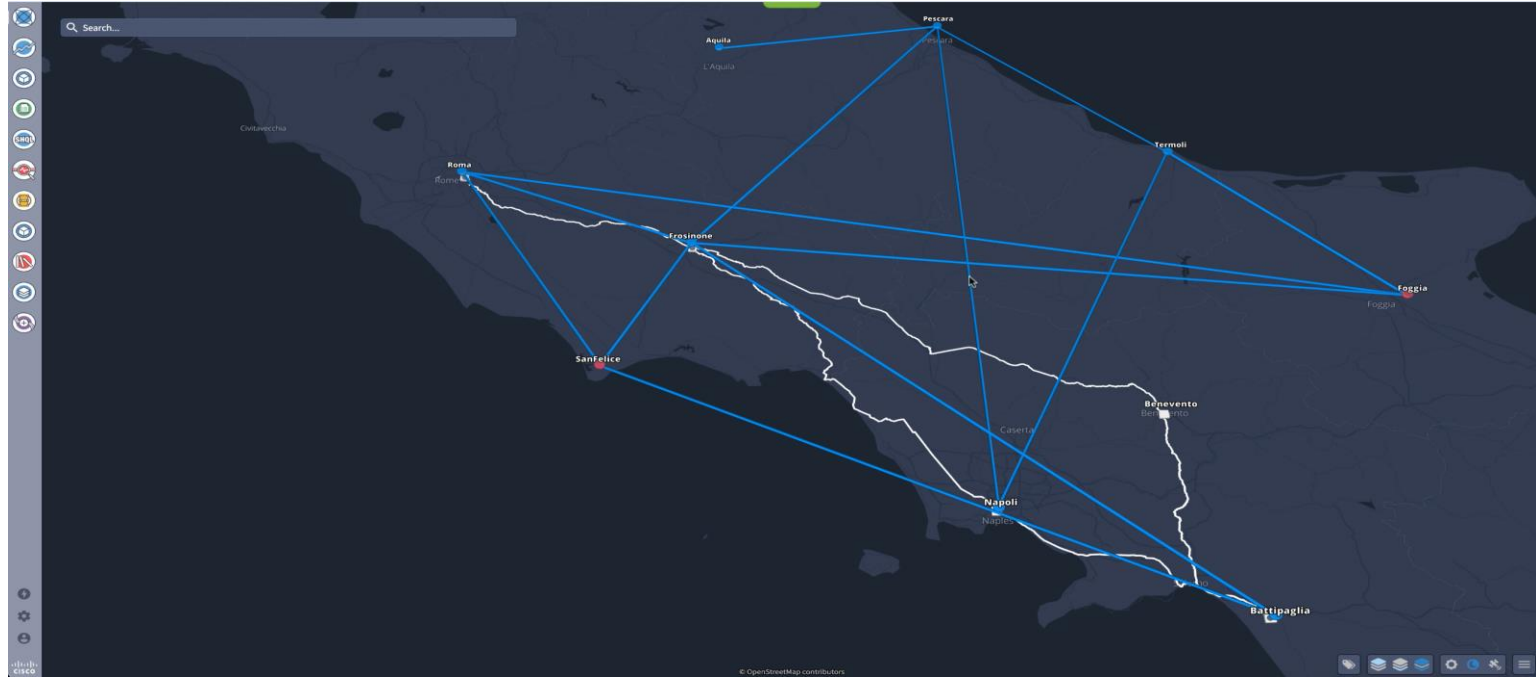
# RON NCS-2000 Lab



# RON NCS-1010 Lab



# Visualization of IP and Optical domains

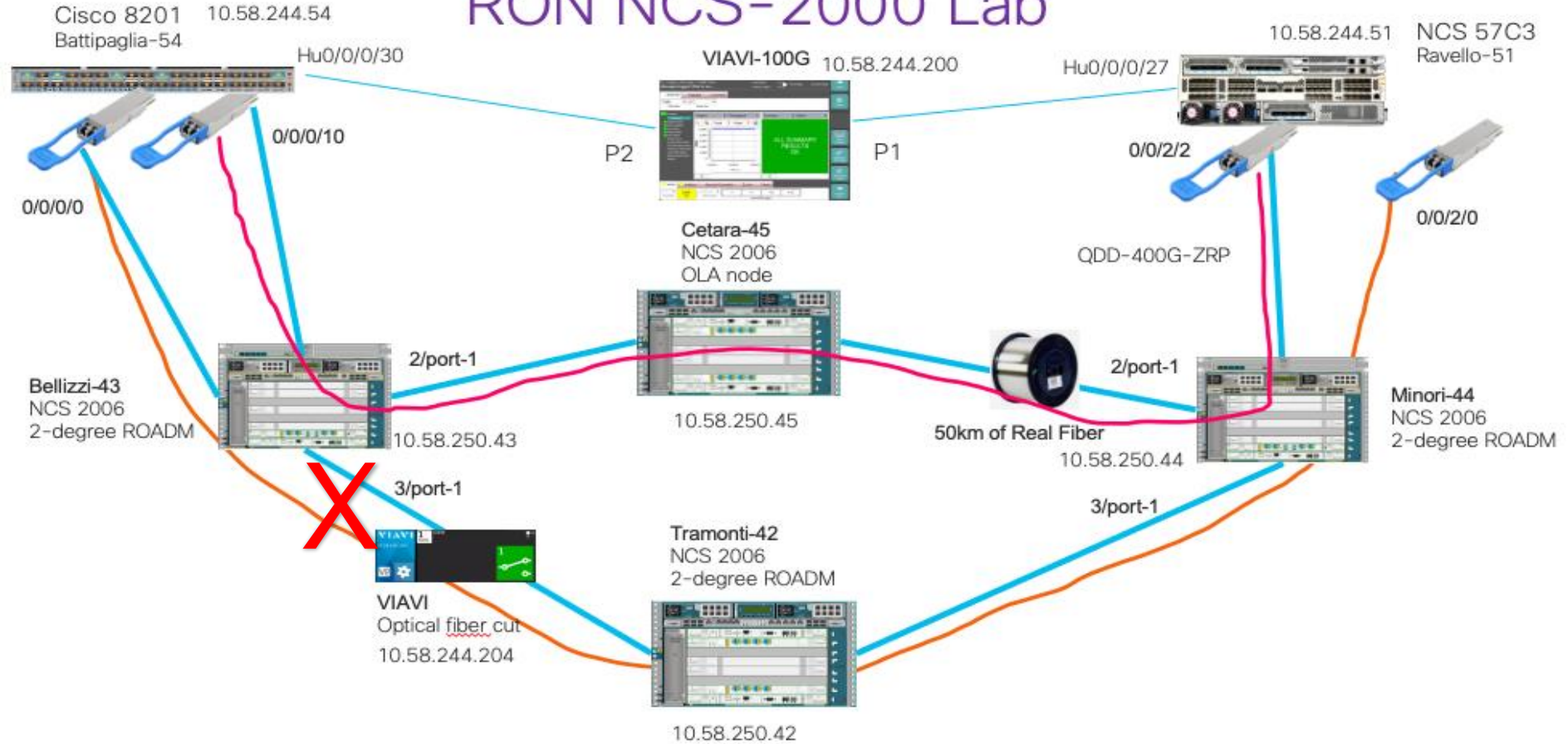


Visibility

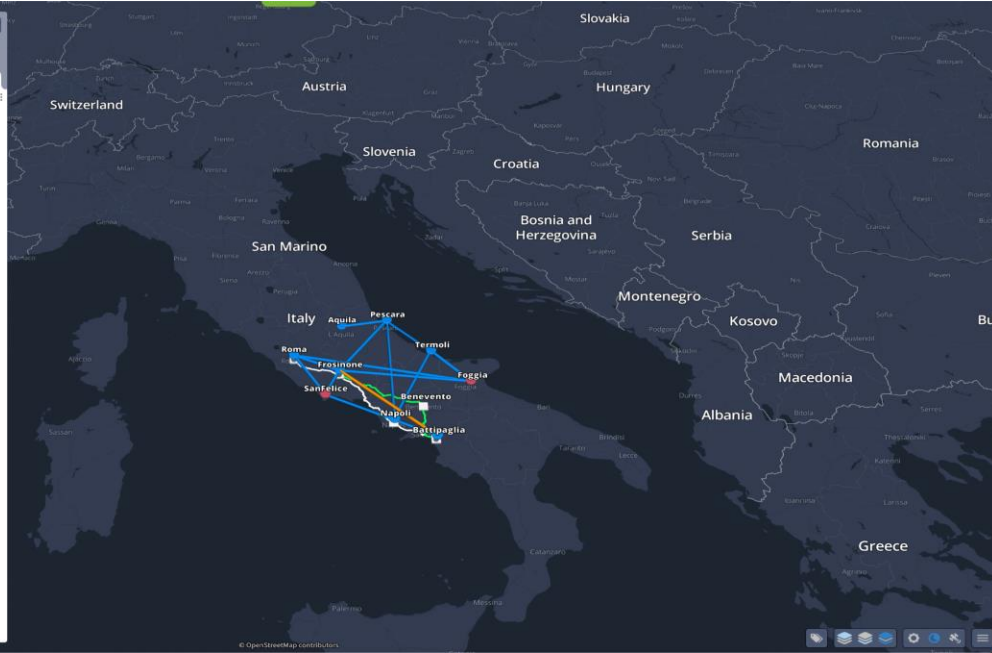
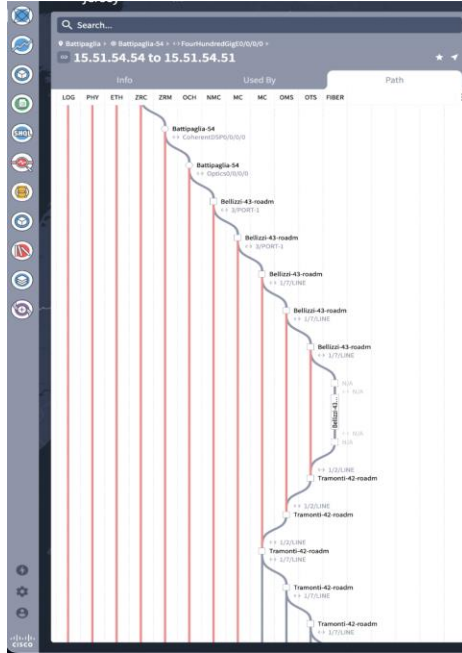
Verify and monitor customer experience



# RON NCS-2000 Lab



# Correlation of links and services for Root Cause Analysis



Insights

Correlate data, identify trends and patterns

# RCA calculation and display

Root Cause Analysis

Records fetched at: 10:37:46 01-29-2023 UTC

Filter By Impacted

1 OUT OF 10 ITEMS MATCHING FILTERS

Root Cause Resource Name	Root Cause Resource Type	Root Cause Tags	Affected Links	Affected Capacity (Gbps)	Time
Fiber-4	OTS		10	400.0	10:36:08 01-29-2023 UTC

**Affected Links**  
Root Cause: Fiber-4

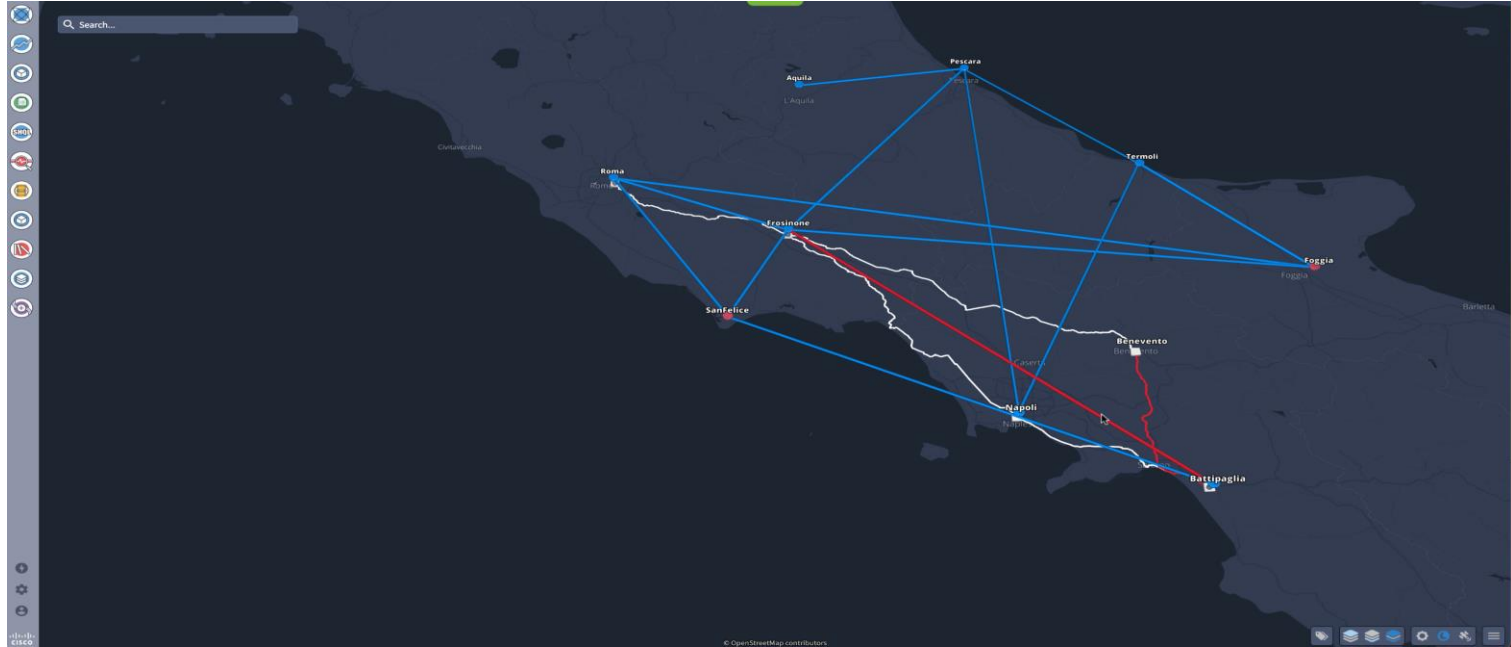
Link Name	Link Description	Link Type	Link Tags	Link Speed (Gbps)	Impact Type
10 ITEMS					
15.51.54.54 to 15.51.54.51		L3 Logical	Links ROR Links	0.0	Link down
FourHundredGigE0/0/0/0 to FourHundredGigE0/0/2/0		L3 Physical		400.0	Link down
FourHundredGigE0/0/0/0 to FourHundredGigE0/0/2/0	FourHundredGigE0/0/0/0 to FourHundredGigE0/0/2/0	Ethernet		0.0	Link down
CoherentDSP0/0/0/0 to CoherentDSP0/0/2/0	CoherentDSP0/0/0/0 to CoherentDSP0/0/2/0	ZR Channel		0.0	Link down
CoherentDSP0/0/0/0 to CoherentDSP0/0/2/0	CoherentDSP0/0/0/0 to CoherentDSP0/0/2/0	ZR Media		0.0	Link down
Optics0/0/0/0 to Optics0/0/2/0	Optics0/0/0/0 to Optics0/0/2/0	OCH		0.0	Link down
Minori_44_roadm_Bellizzi_43_roadm_1197867_otsmc	NMC: 3/PORT-1 to 3/PORT-1	NMC		0.0	Link down
Minori_44_roadm_Bellizzi_43_roadm_1197867_mc	MC: 3/PORT-1 to 3/PORT-1	MC		0.0	Link down
OMS-10002	MC: 1/7/LINE to 1/2/LINE	MC		0.0	Link down
1/7/LINE-1/2/LINE	OMS: 1/7/LINE to 1/2/LINE	OMS		0.0	Link down



Insights

Correlate data, identify trends and patterns

# RCA results graphically displayed



Insights

Correlate data, identify trends and patterns

# Link Manager App

The screenshot displays the Link Manager App interface. At the top, there's a header with 'Link Manager' and a 'Cross Links' tab. Below the header, there's a '+ Add Cross Link' button and a 'Validate All Manual Links' button. The main area contains a table with columns: Link Name, Description, Type, Provider, Device A / Port A, Device B / Port B, Status, Method, and Last Change. The table lists three items, including manual cross-links and a link kept in HCO. Below the table, there's a 'Summary' section with tabs for 'Summary', 'Evidence', and 'History'. The 'Summary' tab is active, showing details for a specific link, including its name, device ports, time added, method, last change, and description. At the bottom, there are 'Validate Link' and 'Delete Link' buttons.

Link Name	Description	Type	Provider	Device A / Port A	Device B / Port B	Status	Method	Last Change
Manual Cross Link Optics0/0/2/0 to 0/1/0/6	my-xlink-1	NMC	Manual	ron-ncs57c3-1 / Optics0/0/2/0	ron2_olt1-roadm / 0/1/0/6	Unknown	N/A	2022-11-08 13:32:49 IST
Manual Cross Link Optics0/0/0/0 to 0/3/0/6	x-link-2	NMC	Manual	ron-ncs5504-1 / Optics0/0/0/0	ron2_olt2-roadm / 0/3/0/6	Validated By Shut No ...	Shut no shut	2023-01-24 14:17:38 IST
Optics0/0/0/20 / 1/CHAN 51 (192.350)	this link description is kept in HCO	NMC	Manual	ron-poc-8201-1 / Optics0/0/0/20	ron-poc-ols-1-roadm / 1/CHAN 5...	Unknown	N/A	2023-01-25 16:31:25 IST

LINK NAME	DEVICE A / PORT A	DEVICE B / PORT B
Manual Cross Link Optics0/0/2/0 to 0/1/0/6	ron-ncs57c3-1/Optics0/0/2/0	ron2_olt1-roadm/0/1/0/6

TIME ADDED	SOURCE	STATUS
N/A	Manual	Unknown

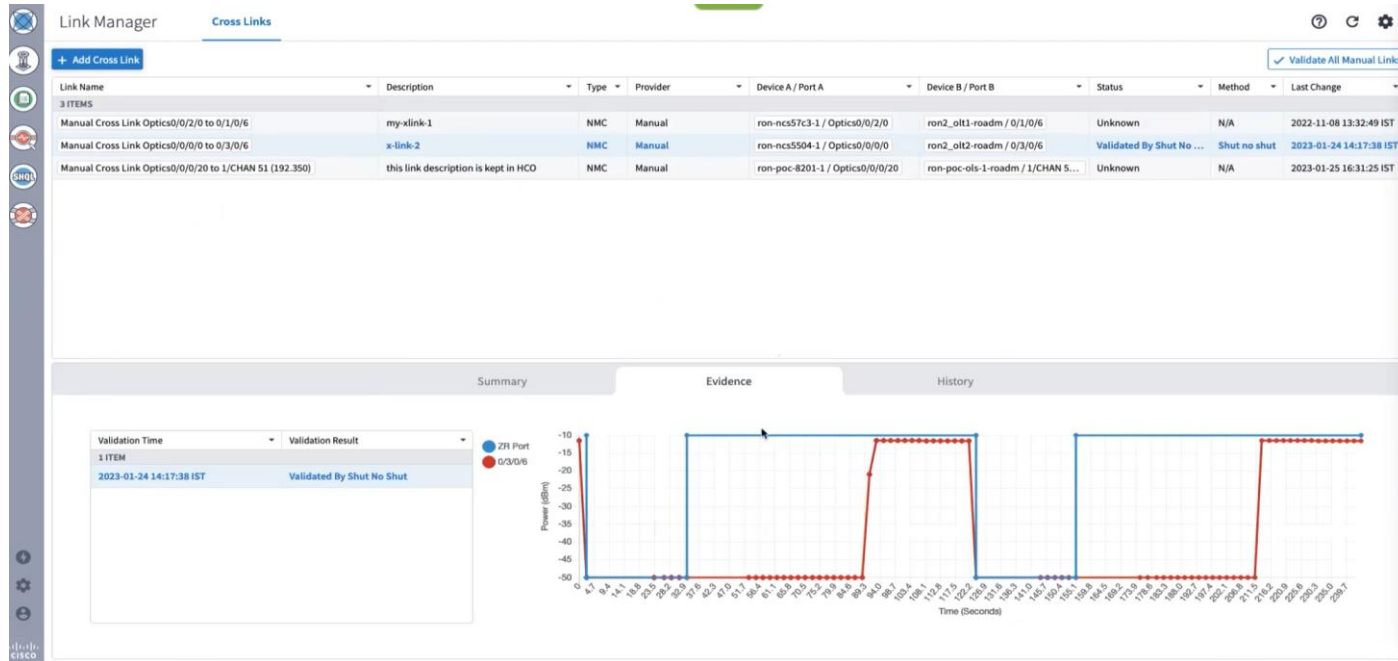
METHOD	LAST CHANGE	DESCRIPTION
N/A	N/A	my-xlink-1



Action

Automate processes to drive agility

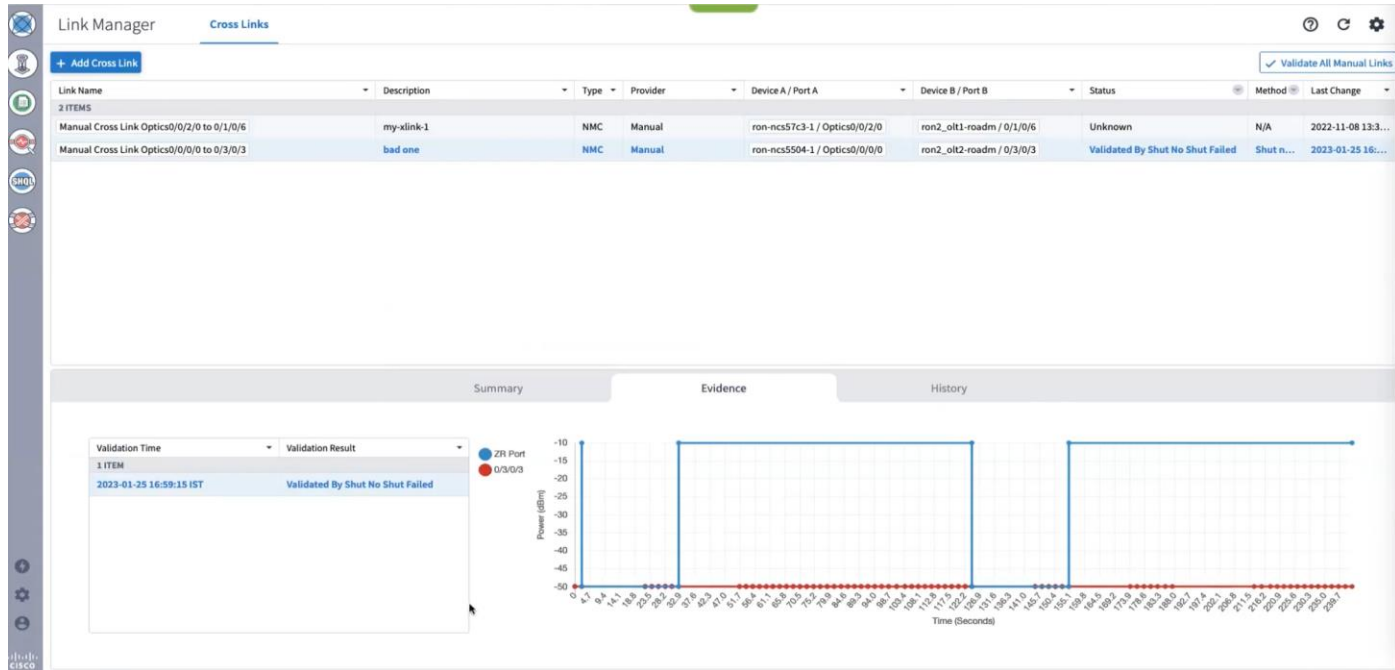
# Link Manager App – positive validation of X-Link



Action

Automate processes to drive agility

# Link Manager App – Negative validation of X-Link



Action

Automate processes to drive agility

# Key Takeaways



- RON makes the network more sustainable
- Understand automation for RON
- HCO boosts the RON benefits



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- All surveys can be taken in the Cisco Events Mobile App or by logging in to the Session Catalog and clicking the "Attendee Dashboard" at <https://www.ciscolive.com/emea/learn/sessions/session-catalog.html>



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The bridge to possible

# Thank you

CISCO *Live!*

CISCO *Live!*

ALL IN