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The bridge to possible

# Multilayer, Multivendor Automation with Cisco's Hierarchical Controller!

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PSOSPG-2009



#CiscoLive

# 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
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- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until June 17, 2022.



<https://ciscolive.ciscoevents.com/ciscolivebot/#PSOSPG-2009>

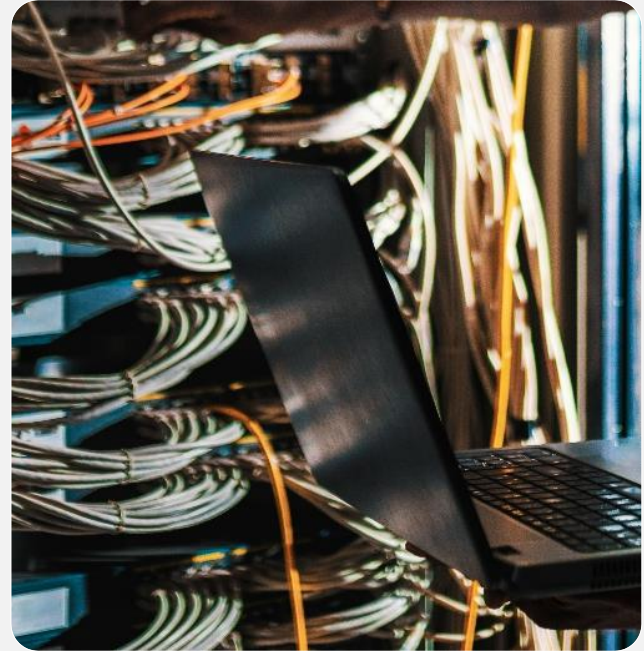


# Agenda

- Introduction
- Why do we need a Hierarchical controller?
- Introducing Crosswork HCO
- How does this fit with the industry?
- Differentiation
- Conclusion

# Why the need for hierarchical control?

- All service providers networks are complex
  - Multilayer
  - Multidomain
  - Multivendor
- Demands on the network are ever increasing
  - 5G services
  - On-demand expectations
  - Rapid data growth
  - Architecture shifts



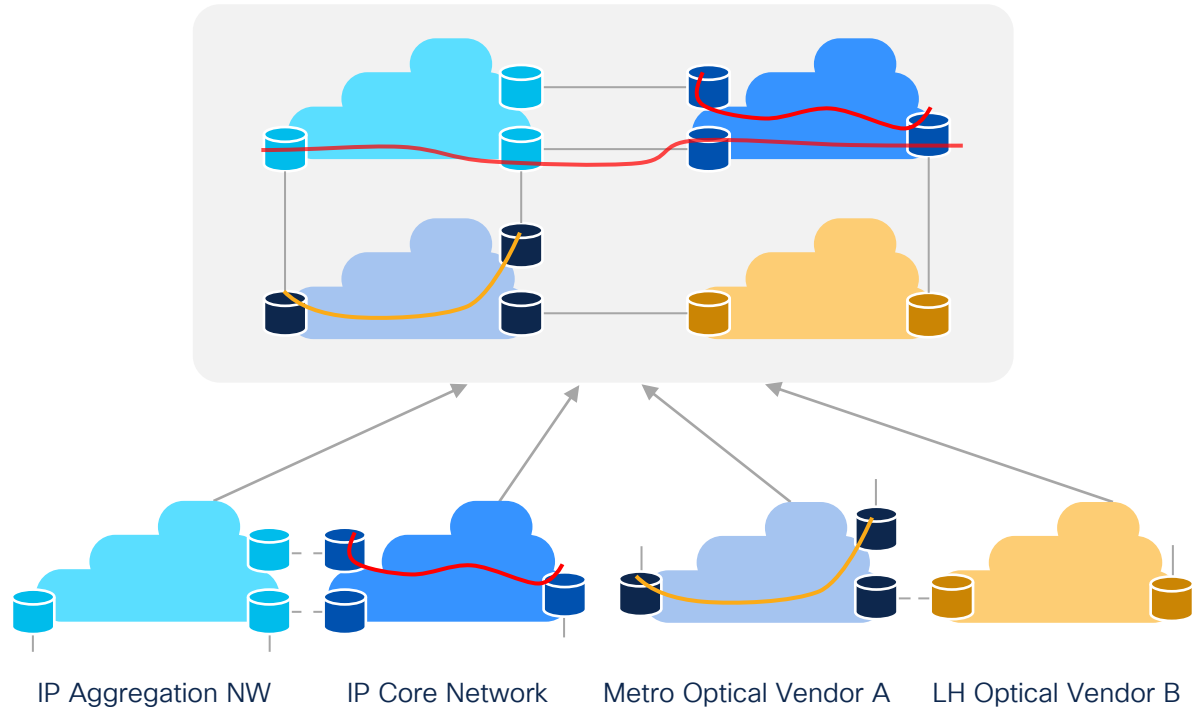
# Bring order out of chaos!

- **Abstracting the complexity accelerates:**
  - Innovation
  - Time to market
  - Mean time to repair
- **Simplifying control of a network makes sense!**
  - Segment domains for expertise
  - Abstract when bringing it together
  - Allow for flattening the architecture
  - Routed Optical Networking

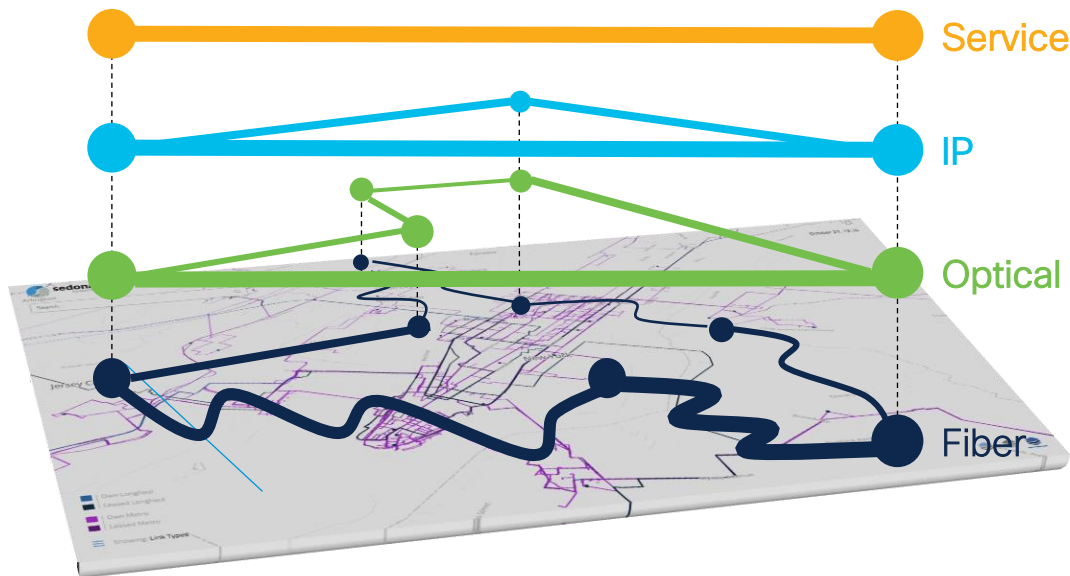


# We put the network puzzle together

- **Acquire** domain-specific network data
- **Fill in gaps** using sophisticated algorithms
- **Normalize** into network structure
- Understand how **layers** are connected to each other
- **Analyze** the network to identify issues
- **Visualize** it
- **Control** it



# Creating the ultimate network data source: Fiber-to-service visibility



## Complete

Multilayer, multivendor, and multidomain topology, traffic, and services (SDN and legacy)

## Current

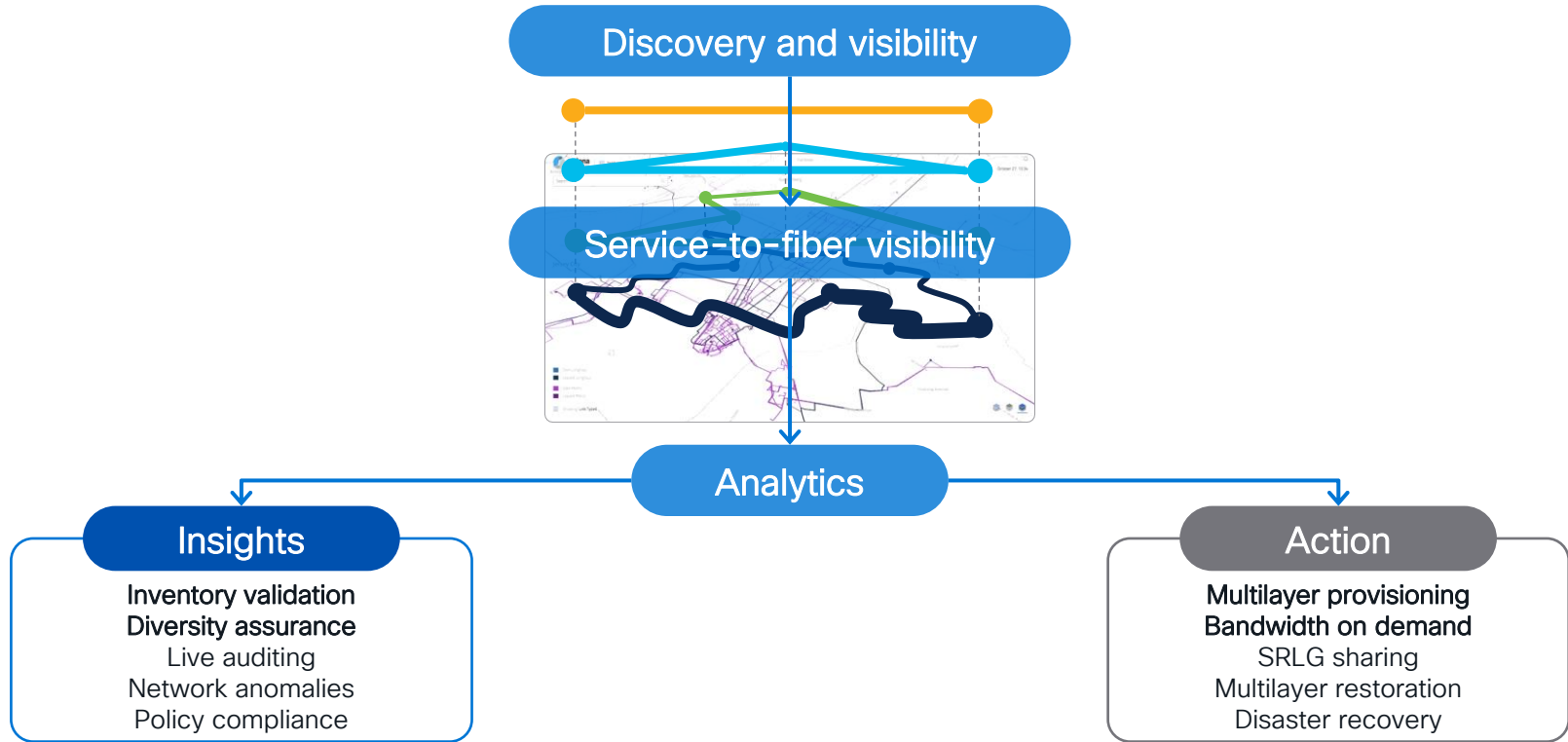
Automatically and ongoingly discovered – directly from the network

## Correlated

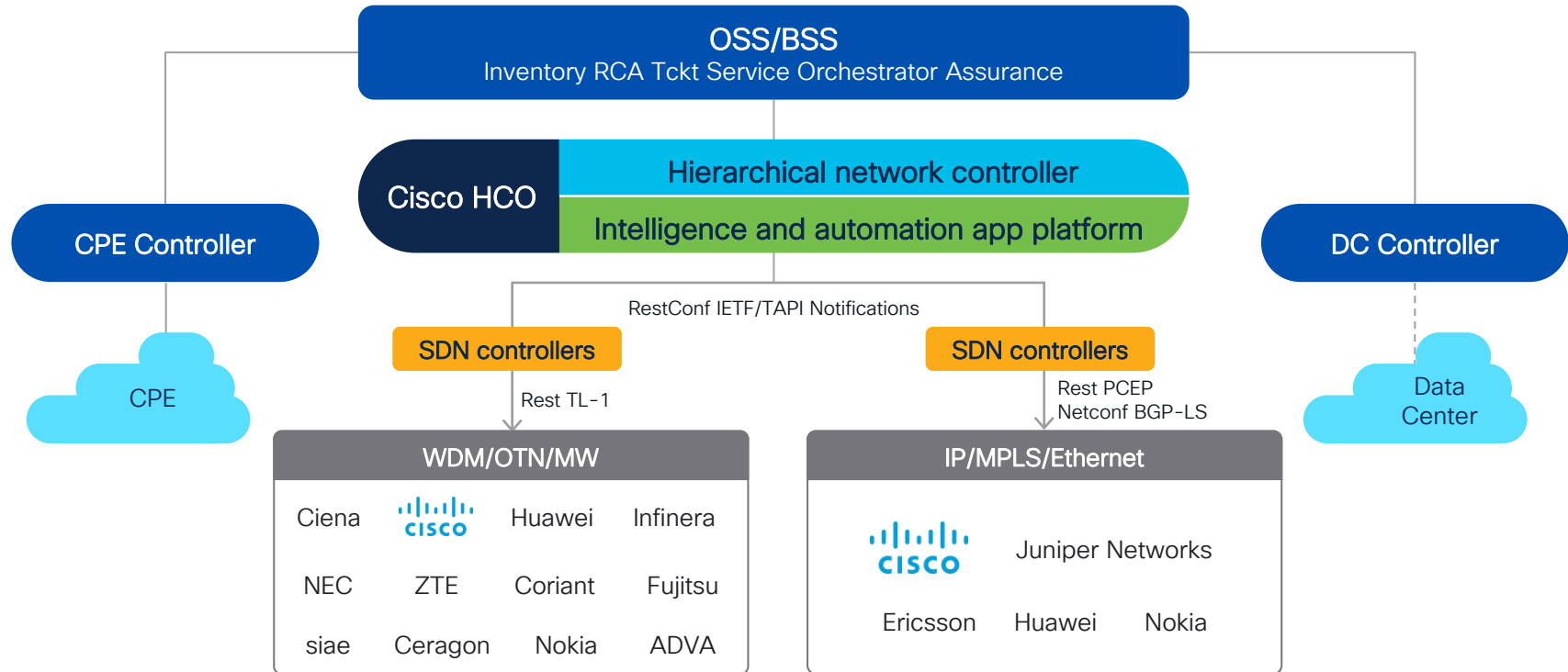
Dynamically deducing cross-domain connectivity



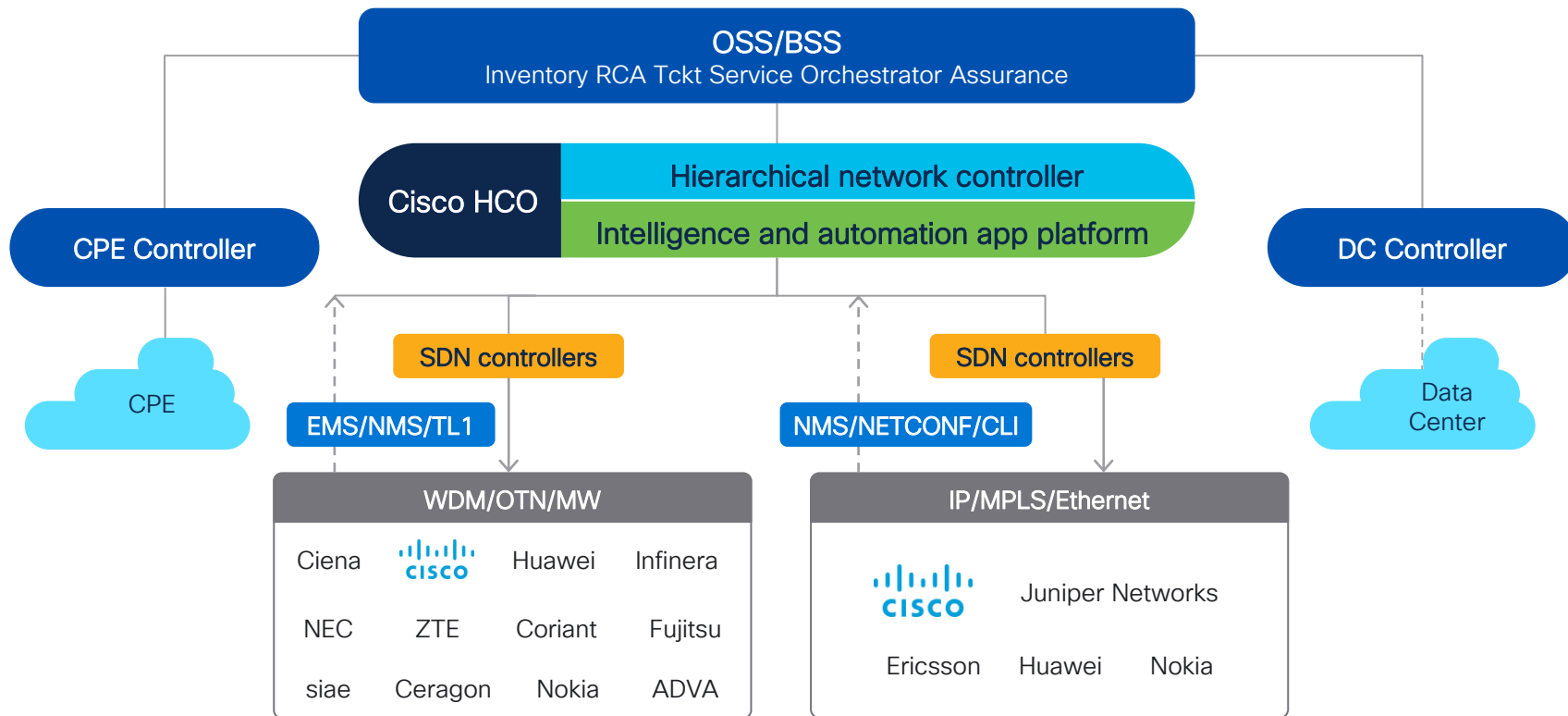
# We apply the data to transform network operation



# Use case #1a - CHCO's role in the SDN architecture



# Use case #1b - Transition from legacy to SDN



# Use case - #2 - Routed optical networking

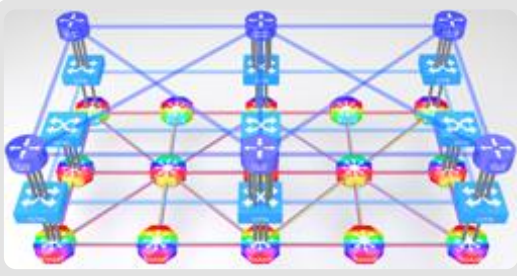
## Today's Architecture



Complex Operations  
Siloed Layers

IP  
NMS

Optical  
NMS



3 Control Planes  
IP/MPLS + GMPLS + WSON/SSON

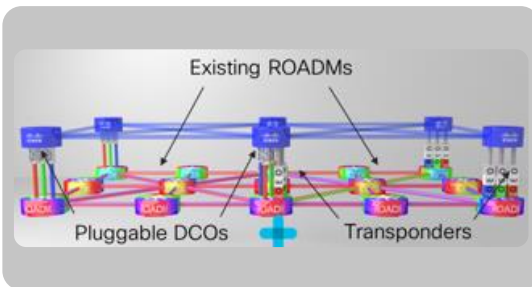


## Transitional Architecture: ZR-Enabled Network

Crosswork HCO  
Single Pane of Glass

IP SDN  
Controller (CNC)

Optical Controller  
(ONC/Existing)

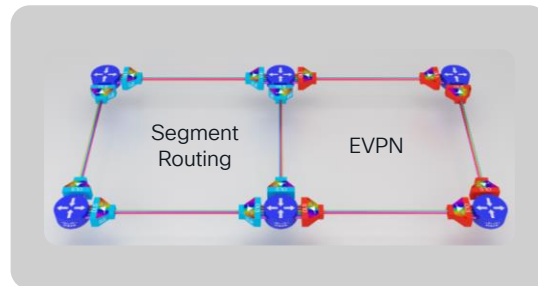


## Routed Optical Networking Architecture

Crosswork HCO  
Single Pane of Glass

IP SDN Controller  
(CNC)

Optical Controller  
(ONC/Existing)



Single Control Plane  
Converged IP + Optical Architecture



Acacia

Transponder → Pluggable



leaba

Massive Scalable Silicon



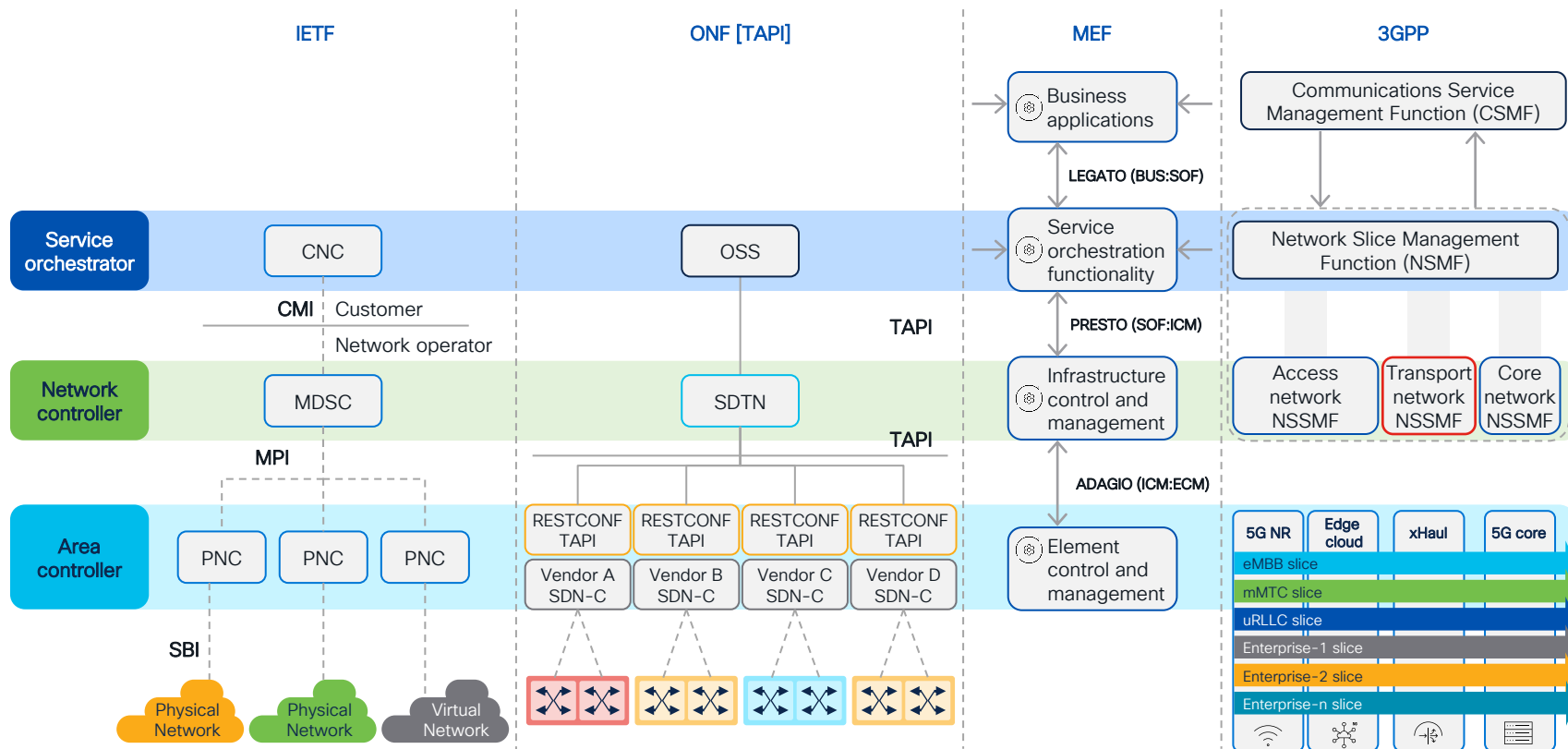
Crosswork  
Automation



sedona  
systems

Industry Automation: Standardization

# Aligned to standards

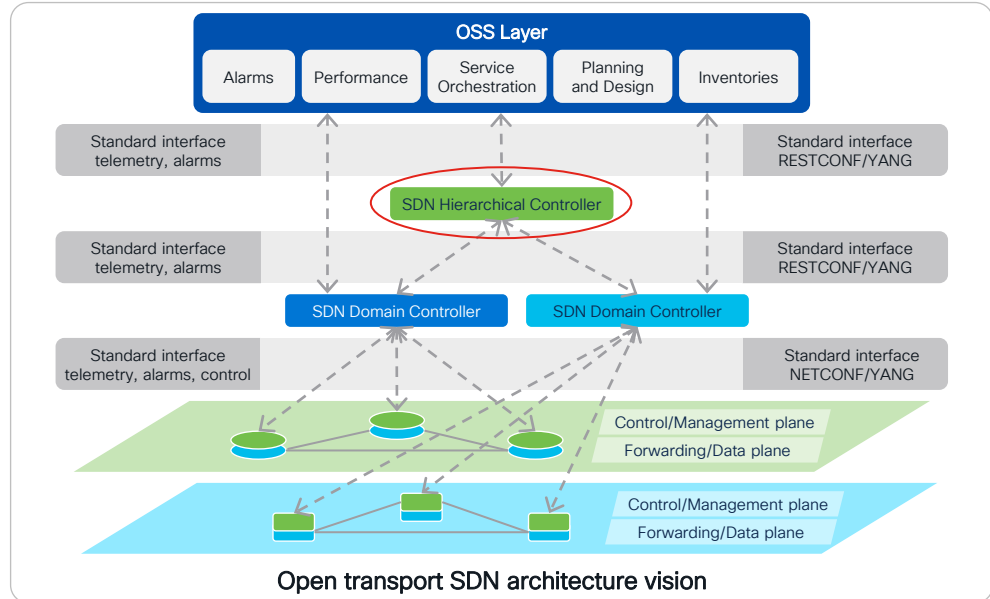


T-Mobile Telefónica TIM MTN  
Vodafone Turkcell Orange  
Telia Company China Mobile

## ...As well as by major telco groups

- Cisco Crosswork® HCO is the interface between the OSS world and the network.
- Crosswork HCO has complete network visibility.
- Crosswork HCO closes the loop for network functions (remediation, optimization).
- Crosswork HCO abstracts the network toward the OSS.

Telecom Infra Project Telefónica Vodafone MTN Orange Telia T-Mobile



[https://cdn.brandfolder.io/D8DI15S7/at/jh6nnbb6bjvn7w7t5jbgm5n/OpenTransportArchitecture-Whitepaper\\_TIP\\_Final.pdf](https://cdn.brandfolder.io/D8DI15S7/at/jh6nnbb6bjvn7w7t5jbgm5n/OpenTransportArchitecture-Whitepaper_TIP_Final.pdf)

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The screenshot shows the Google Cloud Network Explorer interface. At the top, the breadcrumb navigation is: My Drive - Google Drive > DUS > CR1.DUS > 10.40.0.21 > CR1.DUS:CR1.VAL:lsp\_0. Below this, there are tabs for Info, Connections, and Path. The Path tab is selected, showing a network path diagram. The path starts at LSP and goes through several hops: CR1.DUS (10.40.0.21), CR1.DUS (10.40.0.118), CR1.DUS (Tening@0/1/R/0), CR1.DUS (Tening@0/1/R/0), S01DU501 (1-5-100-2), S01DU501 (1-5-100-2), S01DU501 (1-6-1), S01DU501 (1-6-1), S01DU501 (1-6-1), S01DU501 (1-6-1), and finally S01DU501 (1-3-500).

[illegible]

Network-based Inventory							
Sedona Systems							
Network-based Inventory							
Name	Bandwidth (Gbps)	Distance (Km)	Node A	Port A	Node B	Port B	
9883 ITEMS							
<ETH> CISLCUT-0023-CISLCU...	10	N/A	CISLCUT-0023	<ETH> CISLCUT-0023-CISLCU...	STLMAGAH15	<ETH> STLMAGAH15-STLMAGAH...	
<ETH> DALDBX10101206177AB...	10	N/A	DALDBX10101206177AB	<ETH> DALDBX10101206177AB...	DALGB0202010202177BA	<ETH> DALGB0202010202177BA...	
<ETH> H0UJVB03021609177AA...	10	N/A	H0UJVB03021609177AA	<ETH> H0UJVB03021609177AA...	H0URQ07080000Q22977AB	<ETH> H0URQ07080000Q22977AB...	
<ETH> B5T02K01114405177BA...	10	N/A	B5T02K01114405177BA	<ETH> B5T02K01114405177BA...	B5T03C001012040177BA	<ETH> B5T03C001012040177BA...	
<ETH> C1NYNY007-0077-C1NYNY...	10	N/A	C1NYNY0077	<ETH> C1NYNY0077-C1NYNY...	C1PHL0PA-0063	<ETH> C1PHL0PA-0063-C1PHLDP...	
<ETH> LS407UM11000102177BF...	10	N/A	LS407UM11000102177BF	<ETH> LS407UM11000102177BF...	LSA00B05150705177BF	<ETH> LSA00B05150705177BF...	

# Hierarchical Controller values

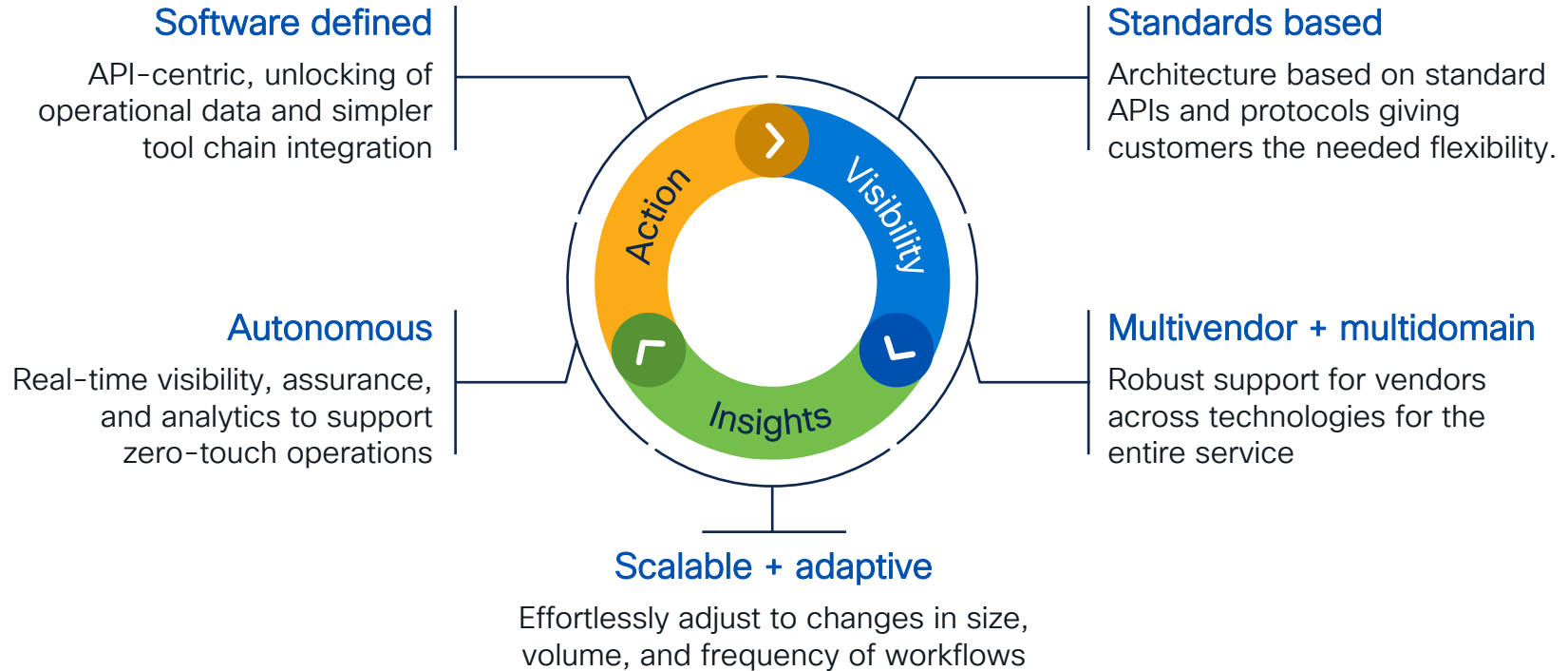
- Create single point of control for entire transport network
  - Network as a platform
- Enable new architectures and capabilities
  - Routed optical networking
  - 5G
  - On-demand services
- Digital twin of complex multivendor network
- Rationalize interlayer dependencies



A decorative graphic on the right side of the slide, consisting of numerous circles of various sizes and colors (blue, teal, green, orange, red, yellow) arranged in a cluster that tapers towards the right edge. The background is a solid dark blue.

# In action (Demo)

# Tenets of Cisco Crosswork<sup>®</sup> automation



[cisco.com/go/hco](https://cisco.com/go/hco)

A banner for the Cisco Crosswork Hierarchical Controller. The top navigation bar includes the Cisco logo, links for Products and Services, Solutions, Support, Learn, and Partners, and buttons for Explore Cisco and Search. Below the navigation bar, a blue bar contains the text "Simplify hybridization, it's now Crosswork Hierarchical Controller" and a "Learn more" button. The main content area has a dark blue background with the title "Cisco Crosswork Hierarchical Controller" in large white text. Below the title, a paragraph states: "Cisco Crosswork Hierarchical Controller simplifies network operations of complex multilayer and multivendor infrastructure." To the right of the text is a screenshot of the controller's interface, showing a network topology diagram with nodes and links, and a sidebar with various configuration options. At the bottom, there is a "Watch video (4:09)" button. The footer contains links for Benefits, Industry Stories, Resources, and Support, along with a Partner Help button.

Crosswork Hierarchical Controller empowers operations with speed to orchestrate services and automate assurance across a converged network. Immediately see improved economics to operate multilayer, multivendor networks with 85% increased speed to deliver services and 62% savings in total cost of ownership.



Control multivendor IP, optical, and microwave equipment to create consistent services across your network infrastructure.



Orchestrate and troubleshoot transport services across any combination of packet, optical, and microwave domains.



visualization of the transport network, services and associated SLAs.

[Read solutions overview](#)

Read Analysys Mason's view on the essential need for automation and orchestration in converged SDN transport networks.

[Read report](#)

# Questions?



# Technical Session Surveys

- Attendees who fill out a minimum of four session surveys and the overall event survey will get Cisco Live branded socks!
- Attendees will also earn 100 points in the Cisco Live Game for every survey completed.
- These points help you get on the leaderboard and increase your chances of winning daily and grand prizes.



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IT learning hub that guides teams and learners toward their goals

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Accelerated curriculum of product, technology, and certification courses



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### Cisco Certifications and Specialist Certifications

Award-winning certification program empowers students and IT Professionals to advance their technical careers

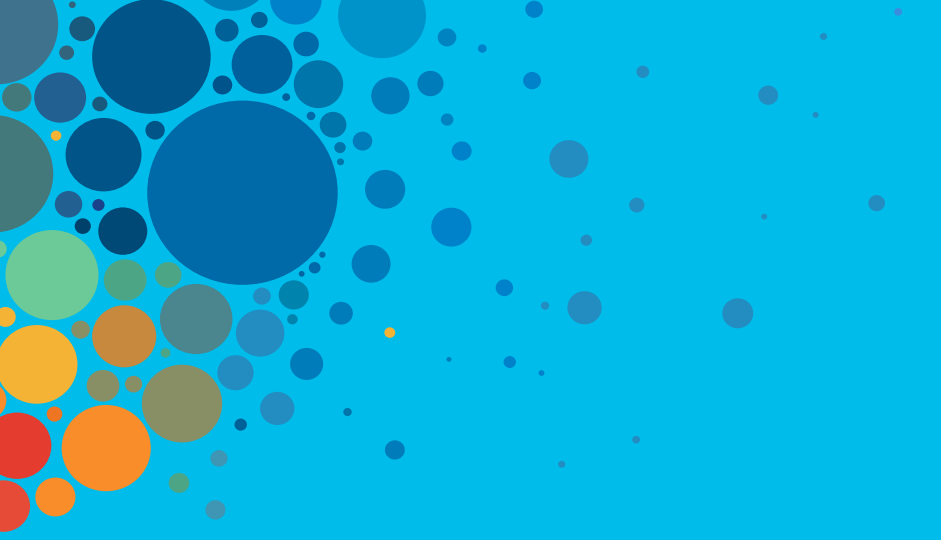
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180-day certification prep program with learning and support

### Cisco Continuing Education Program

Recertification training options for Cisco certified individuals

Here at the event? Visit us at **The Learning and Certifications lounge at the World of Solutions**



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The bridge to possible

# Thank you

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