



The bridge to possible

Multi Layer, Multi Vendor Automation with Cisco's Hierarchical Controller!

Cisco Knowledge Network

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Today's Presenters



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Agenda

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

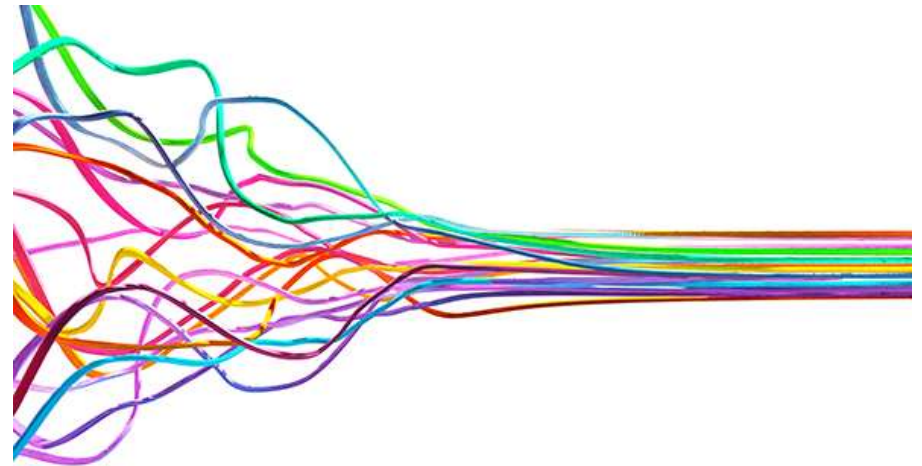
Why the need for hierarchical control?

- All service providers networks are complex
 - Multi Layer
 - Multi Domain
 - Multi Vendor
- Demands on the network are ever increasing
 - 5G services
 - On-demand expectations
 - Rapid data growth
 - Architecture shifts



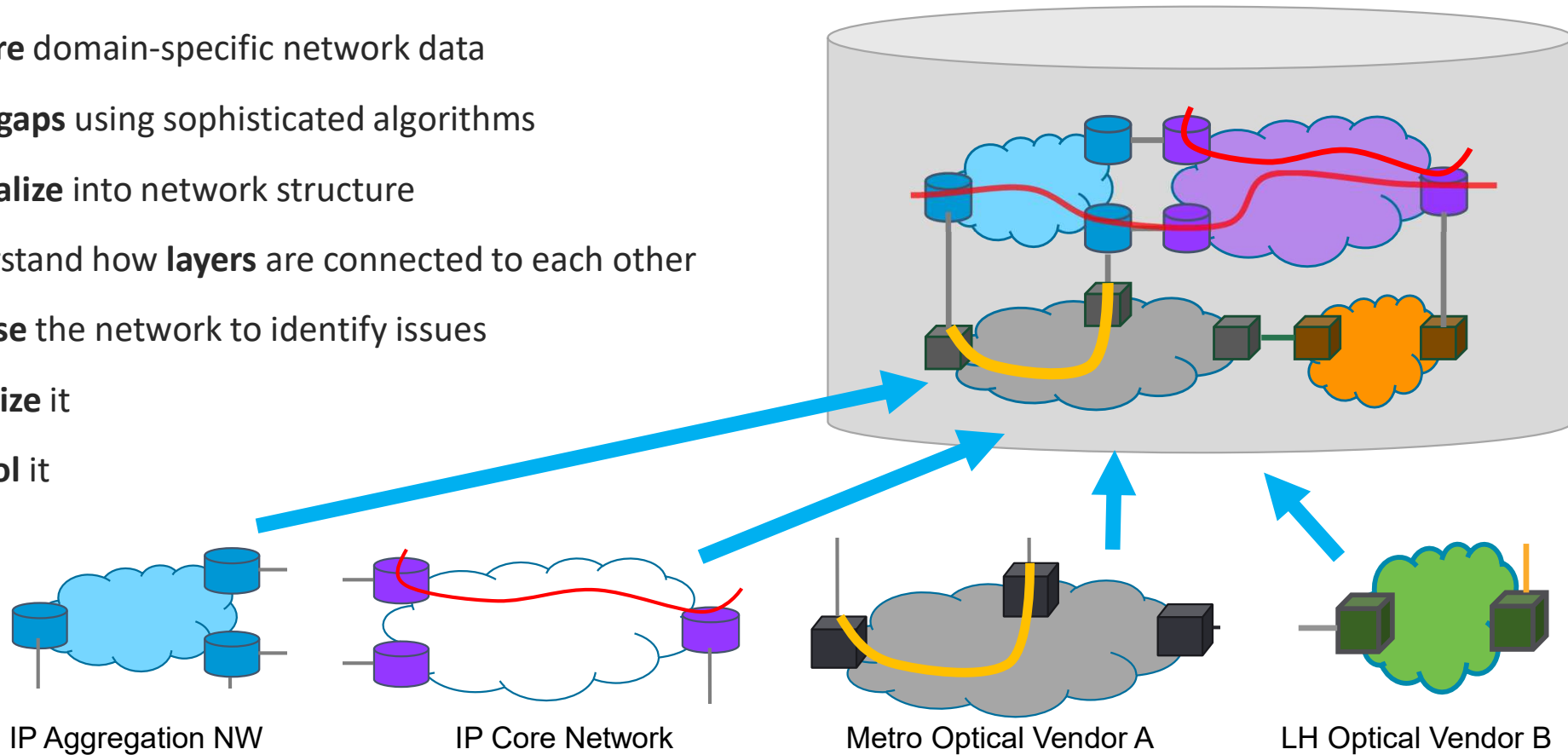
Bring order out of chaos!

- 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

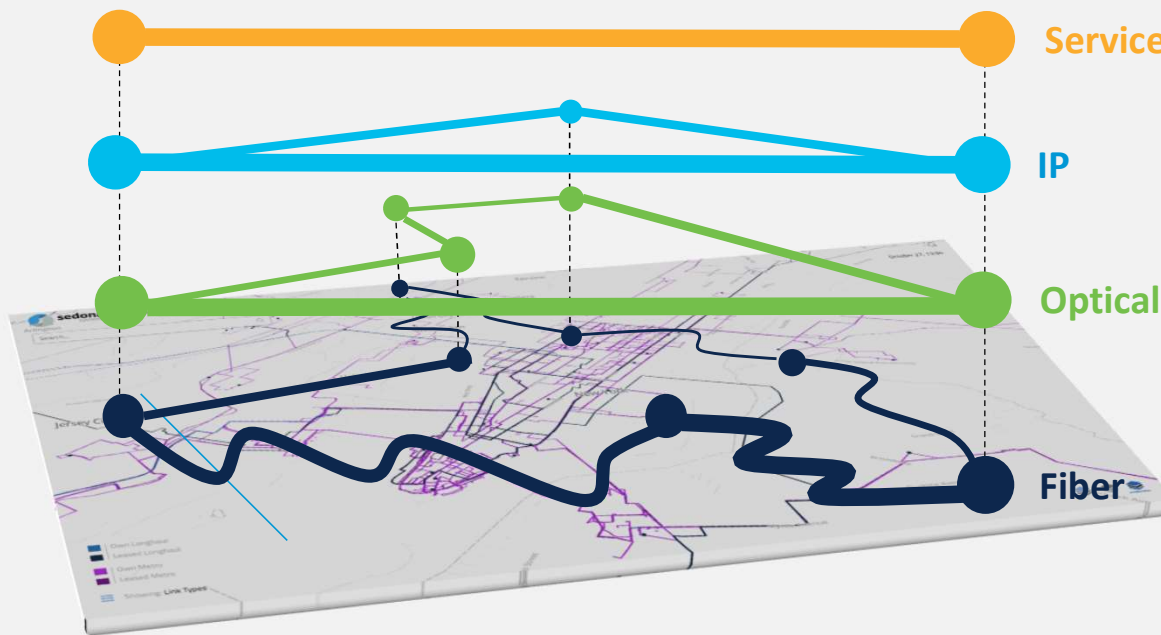


We Put the Network Puzzle Together

- **Acquire** domain-specific network data
- **Fill in gaps** using sophisticated algorithms
- **Normalize** into network structure
- Understand how **layers** are connected to each other
- **Analyse** 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)

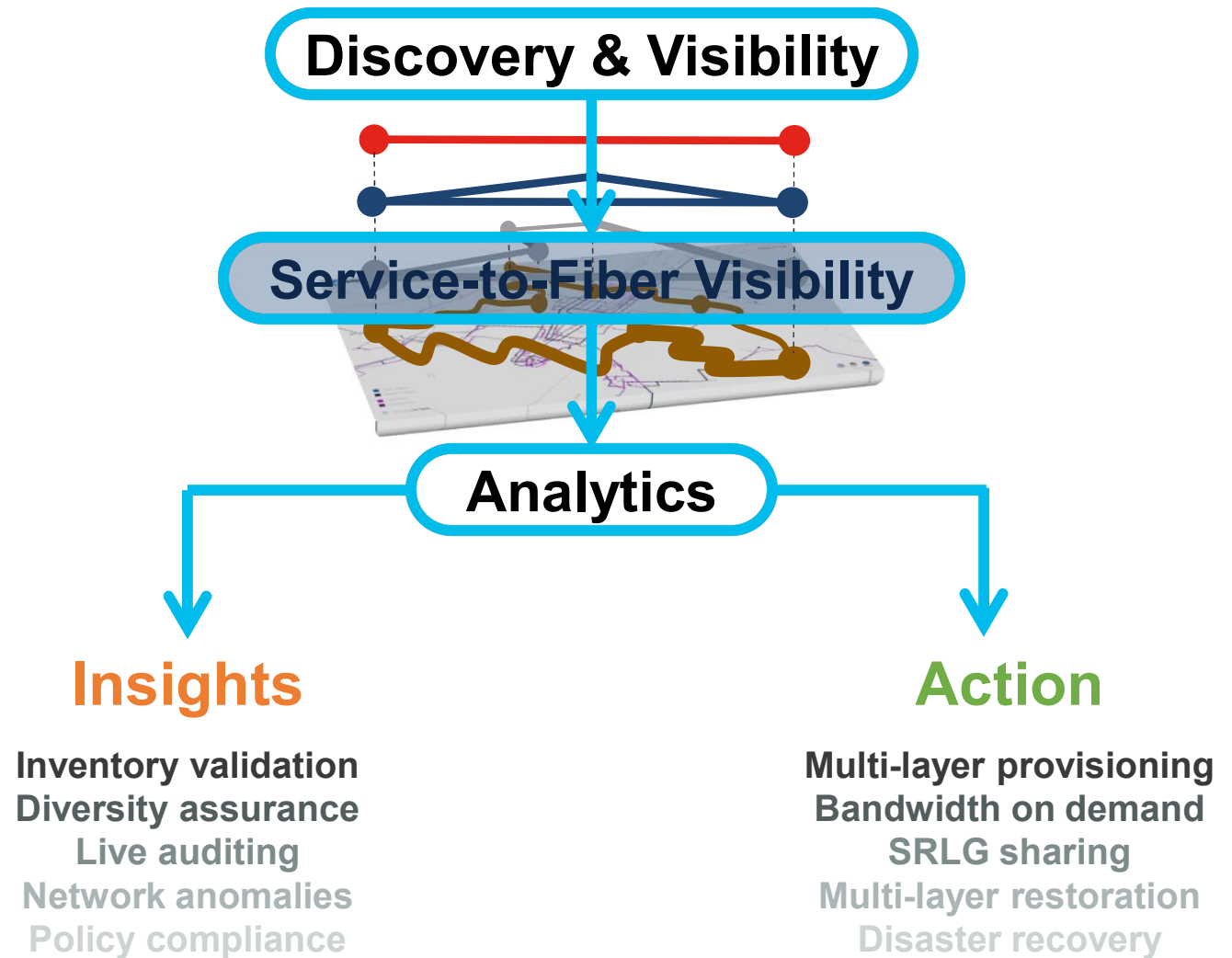
Current

automatically and ongoingly discovered – directly from the network

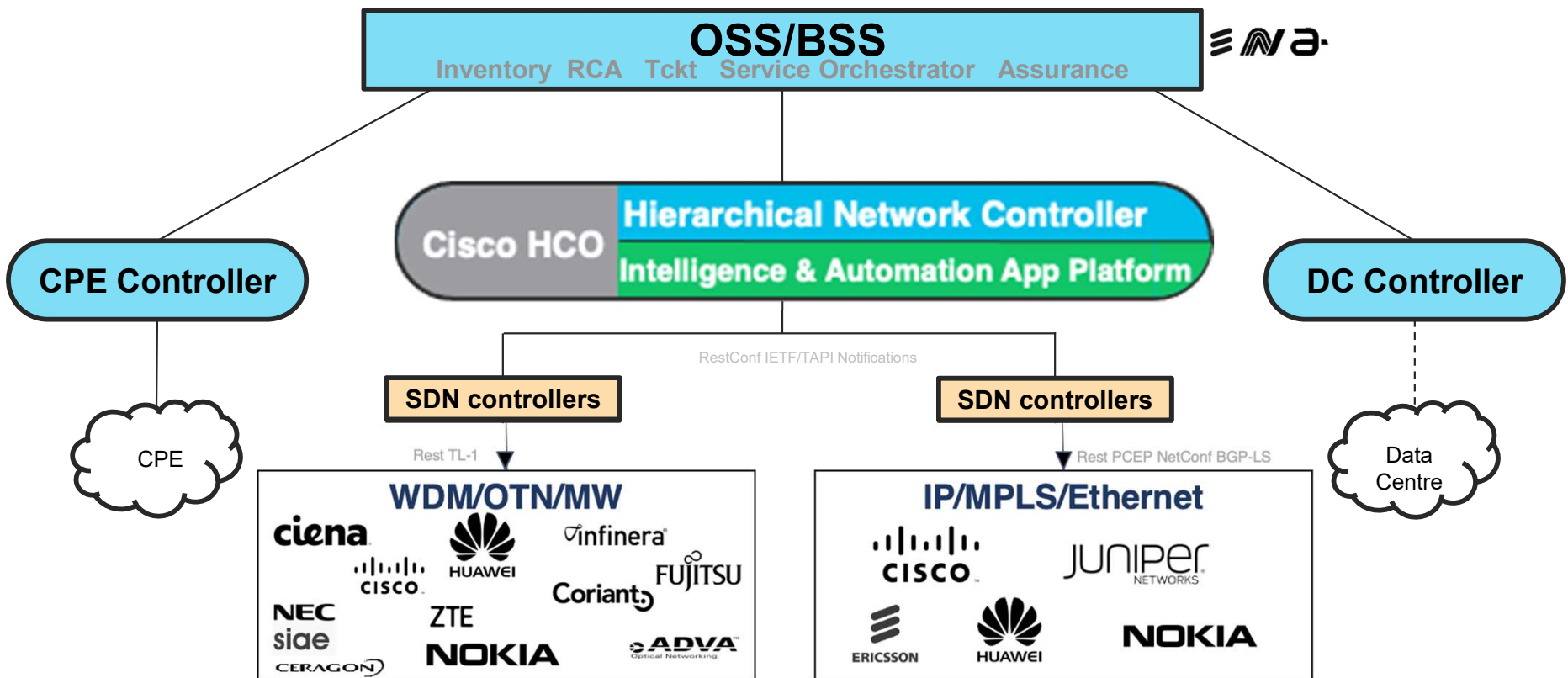
Correlated

dynamically deducing cross-domain connectivity

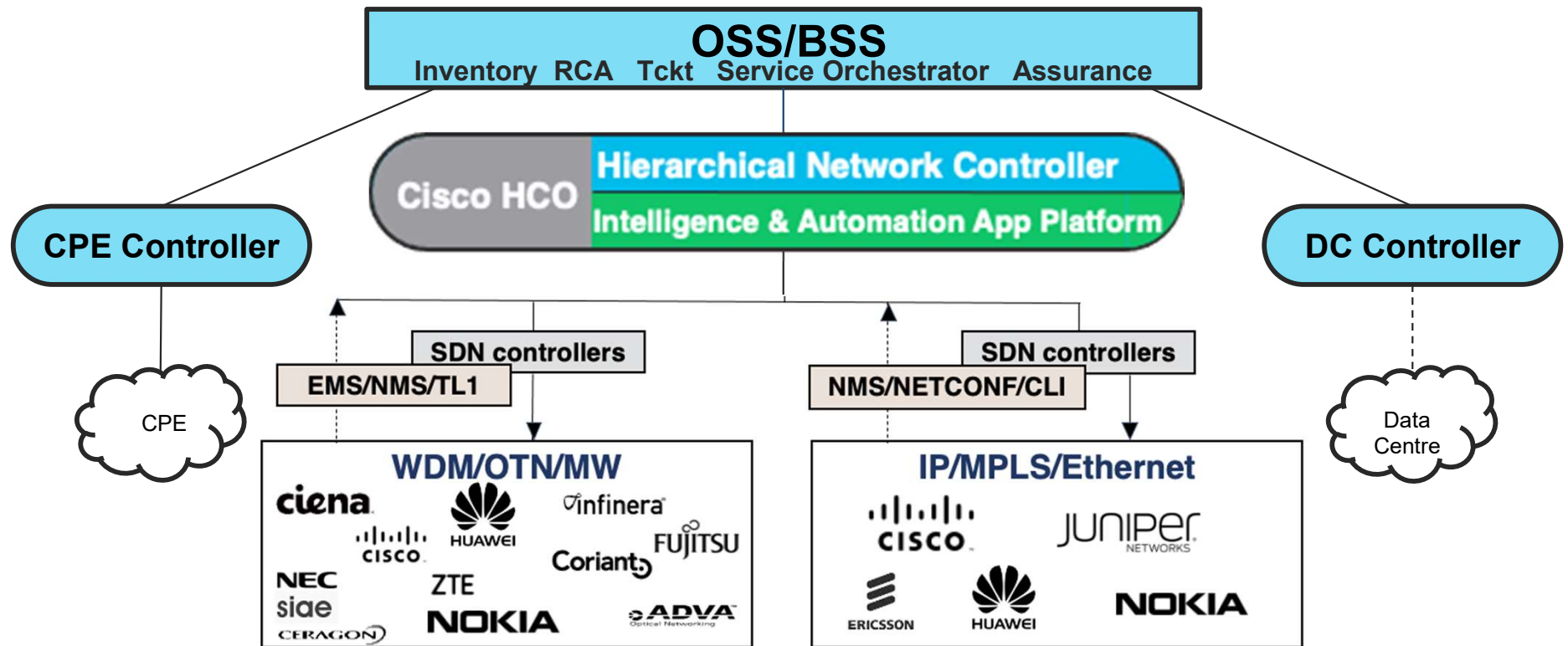
We Apply the Data to Transform Network Operation



Use Case #1a – Crosswork HCO's Role in the SDN Architecture



Use Case #1b - Transition from Legacy to SDN

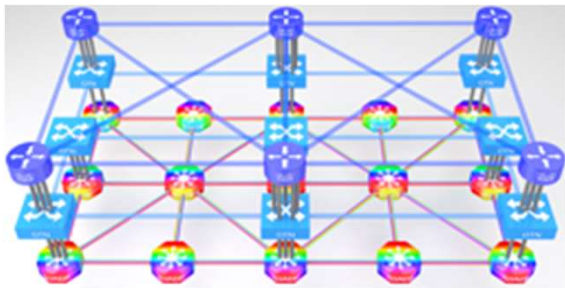


Use case - #2 – Routed Optical Networking

Today's Architecture



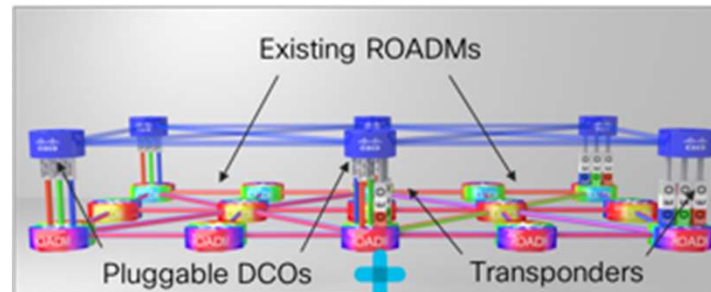
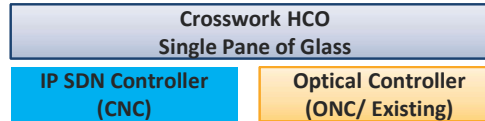
Complex Operations
Siloed Layers



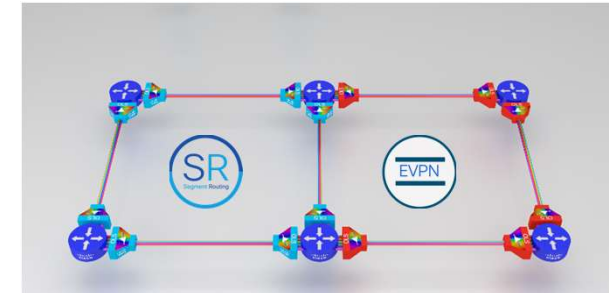
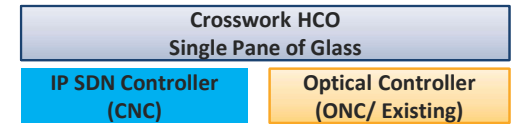
3 Control Planes
IP/MPLS+ GMPLS + WSON/SSON



Transitional Architecture:
ZR-Enabled Network



Routed Optical Networking
Architecture



Single Control Plane
Converged IP + Optical Architecture



Acacia

Transponder → Pluggable

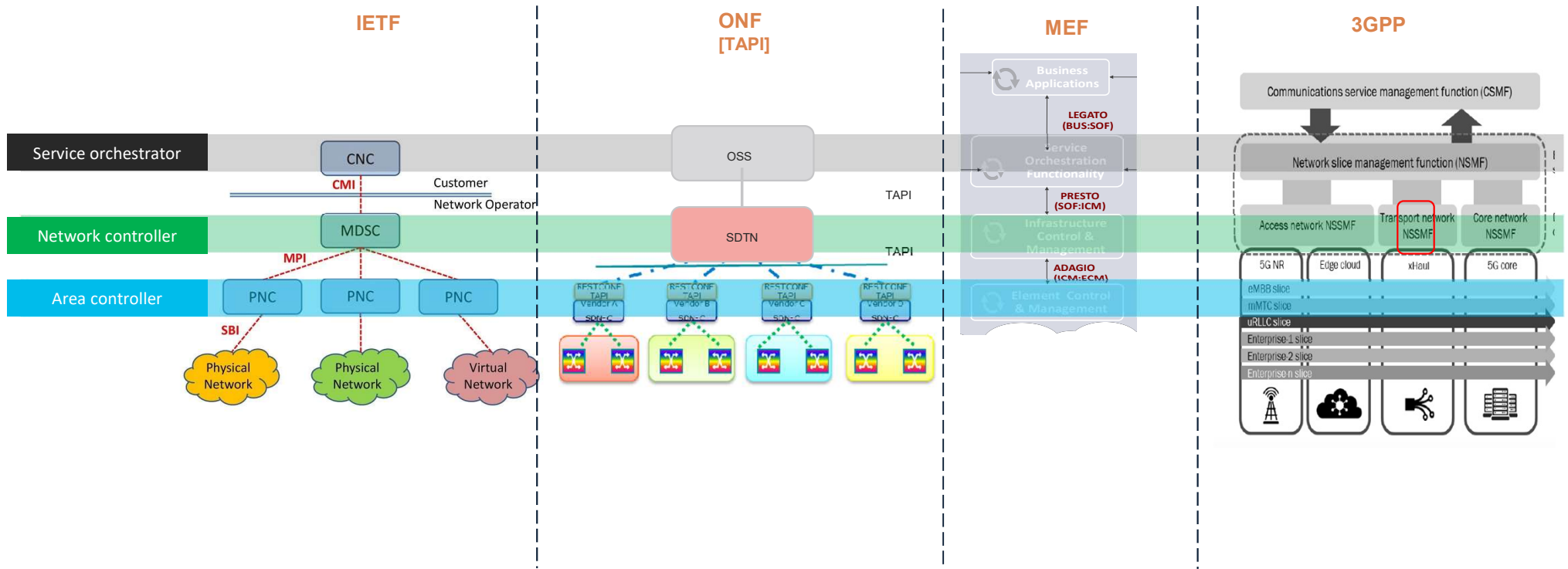


Massive Scalable
Silicon



Industry Automation:
Standardization

Aligned to standards





...As Well as by Major Telco Groups



- HCO is the interface between the OSS world and the network
- HCO has complete network visibility
- HCO closes the loop for network functions (remediation, optimization)
- HCO abstracts the network towards the OSS

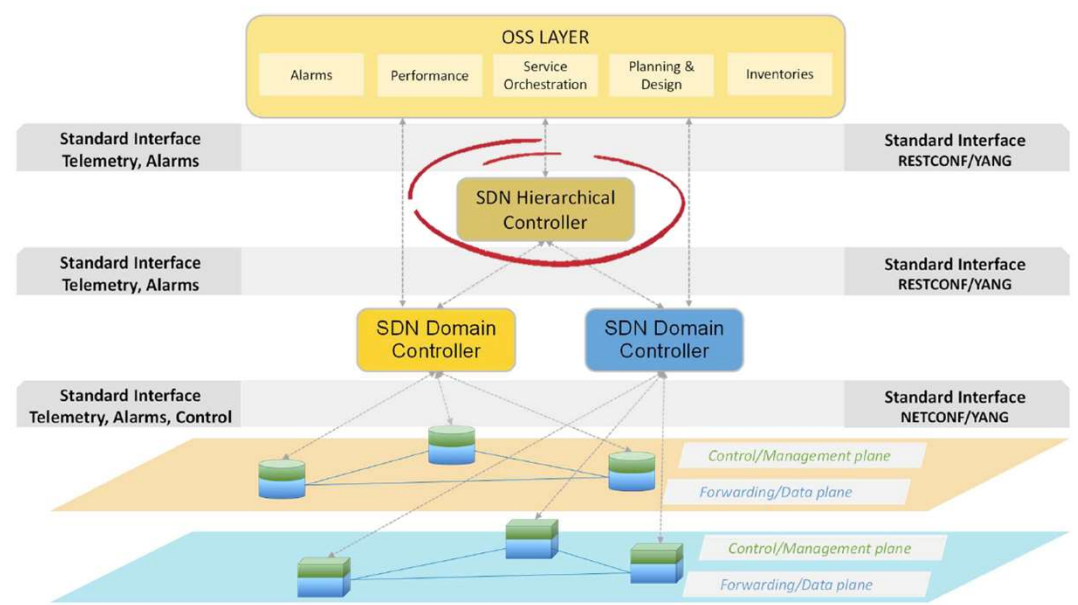
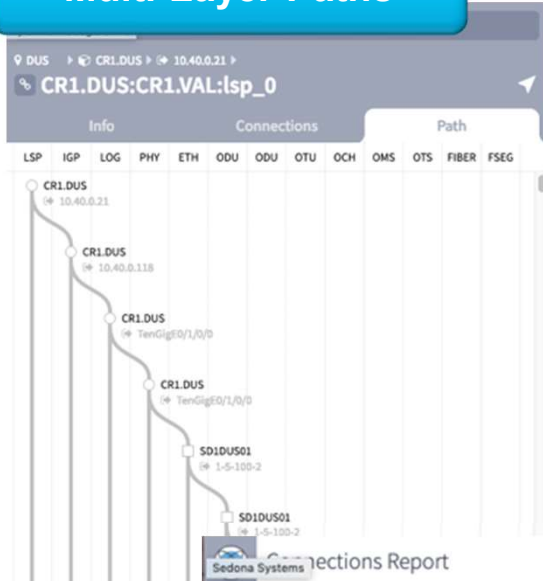


Figure 1: Open Transport SDN Architecture Vision

https://cdn.brandfolder.io/D8DI15S7/at/jh6nnbb6bjvn7w7t5jbgm5n/OpenTransportArchitecture-Whitepaper_TIP_Final.pdf

Cisco Hierarchical Controller Core Functions

Multi-Layer Paths



Service to Fiber Topology



Network based inventory

Name	Bandwidth (GBps)	Distance (Km)	Node A	Port A
9582 ITEMS				
<ETH> CISLLCUT-0023-CISLLCU...	10	N/A	CISLLCUT-0023	<ETH> CISLLCUT-0023-CISLLCU...
<ETH> DALDBX1010112061T7AB-...	10	N/A	DALDBX1010112061T7AB	<ETH> DALG80Z020102021T7BA...
<ETH> HOU0JVB030216091T7AA-...	10	N/A	HOU0JVB030216091T7AA	<ETH> HOU0RQJ08000M229T7AB...
<ETH> BST022K01114A051T7BA-...	10	N/A	BST022K01114A051T7BA	<ETH> BST03C0010128041T7BA...
<ETH> CINYKNY-0077-CINYKN...	10	N/A	CINYKNY-0077	<ETH> CIPHLDPA-0063-CIPHLDP...
<ETH> LSA07UM110001021T7BF-...	10	N/A	LSA07UM110001021T7BF	<ETH> LSA080B051507051T7BF...

Rich Suite of Applications

Root Cause Analysis

Root Cause

579 OUT OF 1104 ITEMS MATCHING FILTERS

LUN1FWY30-101-14-3 TO L3VWNU1Y15-101-514-14-12-3

FRK02-Y30-101-8-7-11 TO MRSI01-Y15-101-514-14-14-11

MCOI01-Y30-101-13-12-9 TO MRSI03-Y30-101-13-12-9

AMSN20-Y30-101-14

CHTN06-Y30-005

Network Vulnerability

Affected elements

- L3 VPN (392)
- LSP (34)
- IGP (1)
- L3 Logical (14)
- L3 Aggregat (2)

Service Assurance

VPNs Dashboard

Service Name	Service Type	Num. Of Sites	Num. Of Down Sites	Origin
WEIU-09	Any to any	3	1	Network
WEIU-10	Any to any	18	2	Network
WEIU-11	Any to any	11	4	Network
WEIU-12	Other	49	5	Network
WEIU-13	Any to any	2	0	Network
WEIU-14	Any to any	6	2	Network
WEIU-15	Any to any	11	1	Network
WEIU-16	Any to any	29	8	Network
WEIU-17	Any to any	22	4	Network
WEIU-18	Any to any	6	0	Network
WEIU-19	Other	2	0	Network
WEIU-20	Any to any	2	0	Network
WEIU-21	Any to any	2	0	Network
WEIU-22	Any to any	14	9	Network

Network Vulnerability Details

UKLONHDSA:RUNKSNHS

Name: UKLONHDSA:RUNKSNHS

Layer: LSP

LSP Technology: MPLS

Setup Priority: 0

Role: Regular

Operational Status: Unknown

Protection Status: Unknown

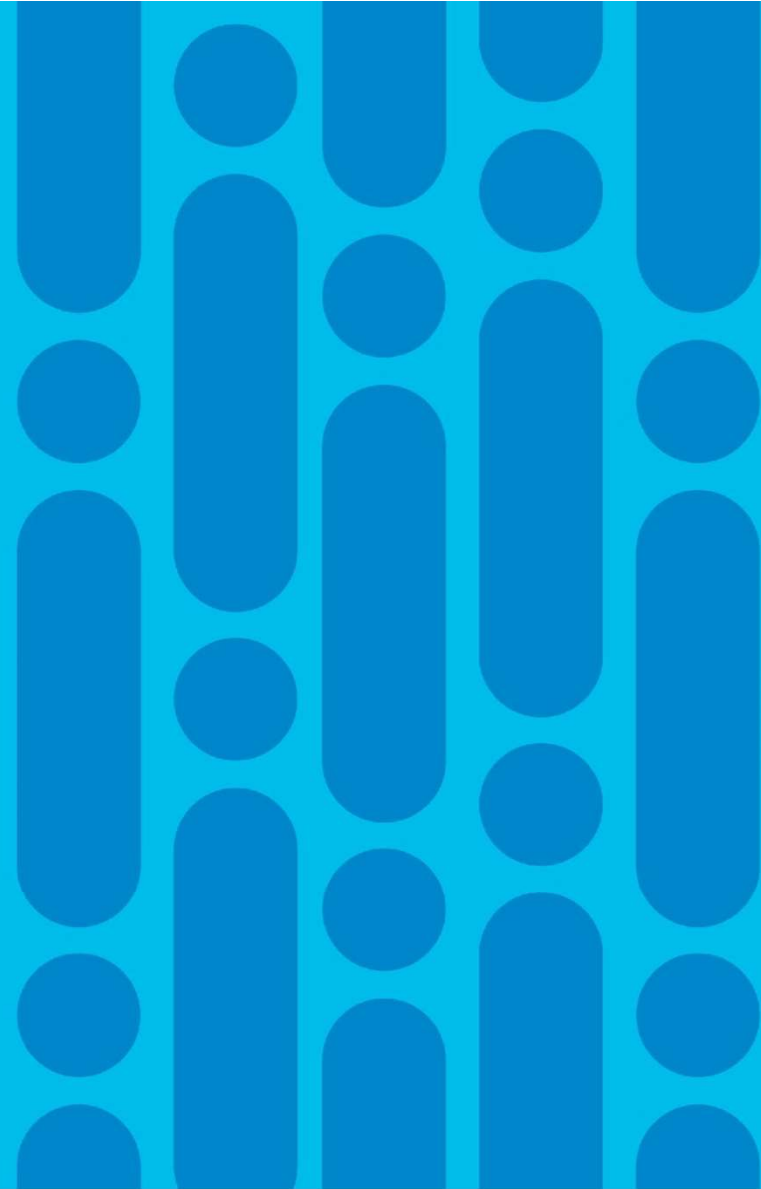
Path Group Type: Single Path

Port B: 94.35.208.51/24

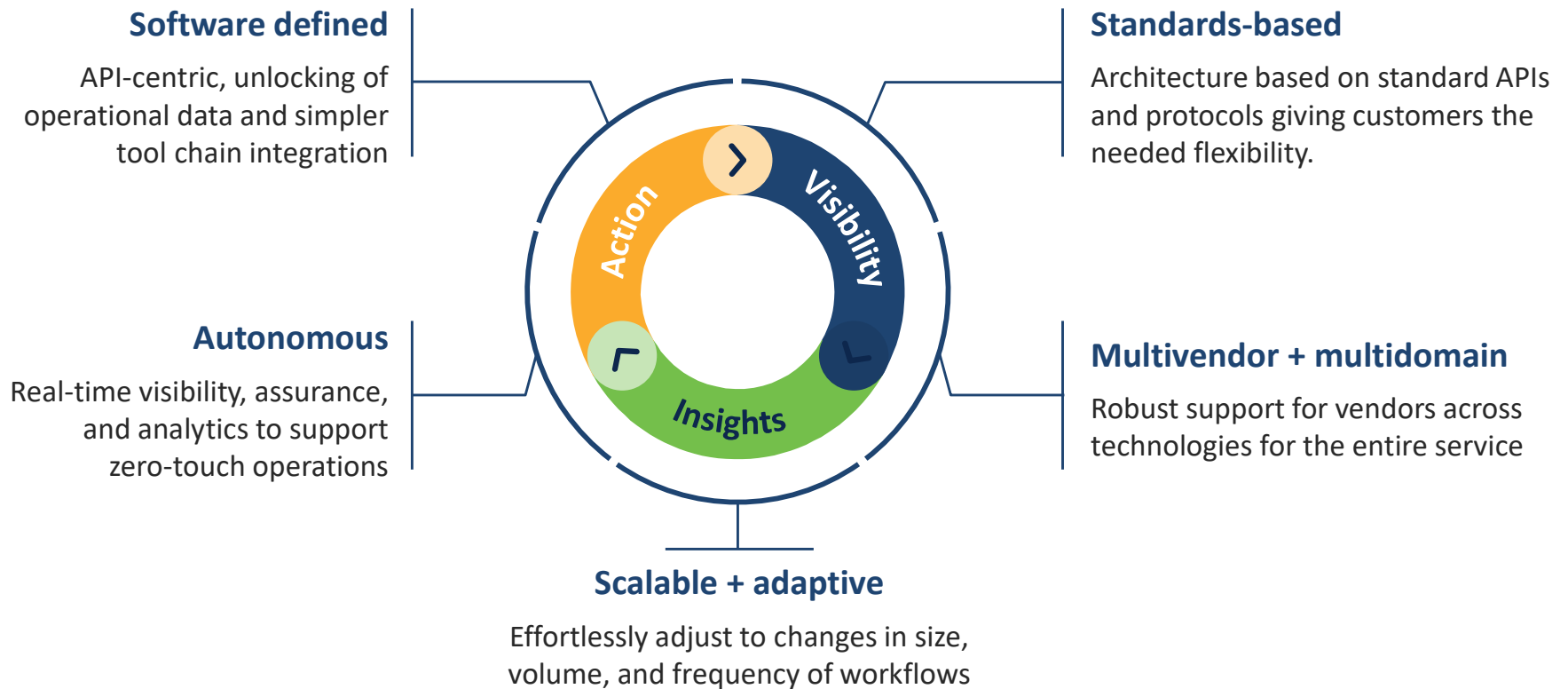
Hierarchical Controller Values

- Create single point of control for entire transport network
 - Network As A Platform
- Enable new architectures & capabilities –
 - Routed Optical Networking
 - 5G
 - On demand services
- Digital twin of complex multi vendor network
- Rationalize interlayer dependencies

In Action (Demo)



Tenets of Cisco Crosswork Automation





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June 12-16

For more information on Cisco's Crosswork Automation portfolio, please visit

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Cisco Crosswork Hierarchical Controller

Cisco Crosswork Hierarchical Controller simplifies network operations of complex multilayer and multivendor infrastructure.

Watch video (4:09)

Benefits Industry Stories Resources Support Partner Help

End-to-end service orchestration and assurance

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 82% savings in total cost of ownership.

- Multivendor support and control**
Control multivendor IP, optical, and microwave equipment to create consistent services across your network infrastructure.
- Multidomain and multilayer abstraction and control**
Orchestrate and troubleshoot transport services across any combination of packet, optical, and microwave domains.
- Single view for operations**
Simplify operations with a complete real-time visualization of the transport network, services, and associated SLAs.

Read solutions overview

Analysys Mason: Role of Automation in Converged SDN Transport

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

Read report

Category	Percentage
Reduce time to market	74%
Reduce operational complexity	64%
Reduce time to launch new services	48%
Reduce time to provision services	42%
Reduce network maintenance	32%
Reduce cost	28%
Reduce risk	23%
Reduce time to recover from outages	18%
Reduce time to resolve issues	14%
Reduce time to test new services	8%
Reduce time to test new equipment	8%

Questions?





The bridge to possible