

The background is a vibrant, abstract graphic. It features a central bright white light source from which numerous colorful rays emanate, creating a sunburst or starburst effect. The rays transition through a spectrum of colors including yellow, orange, red, and various shades of blue and green. Overlaid on this are several large, semi-transparent, wavy shapes in similar color tones, giving the overall image a sense of motion and energy.

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The bridge to possible

# Differentiate Your Services with Confidence

Automated Assurance Best Practices and Use Cases

Paola Arosio, SP Connectivity - Product Manager Leader

@arosio\_paola

PSOSPG-1141

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Webex spaces will be moderated by the speaker until June 9, 2023.

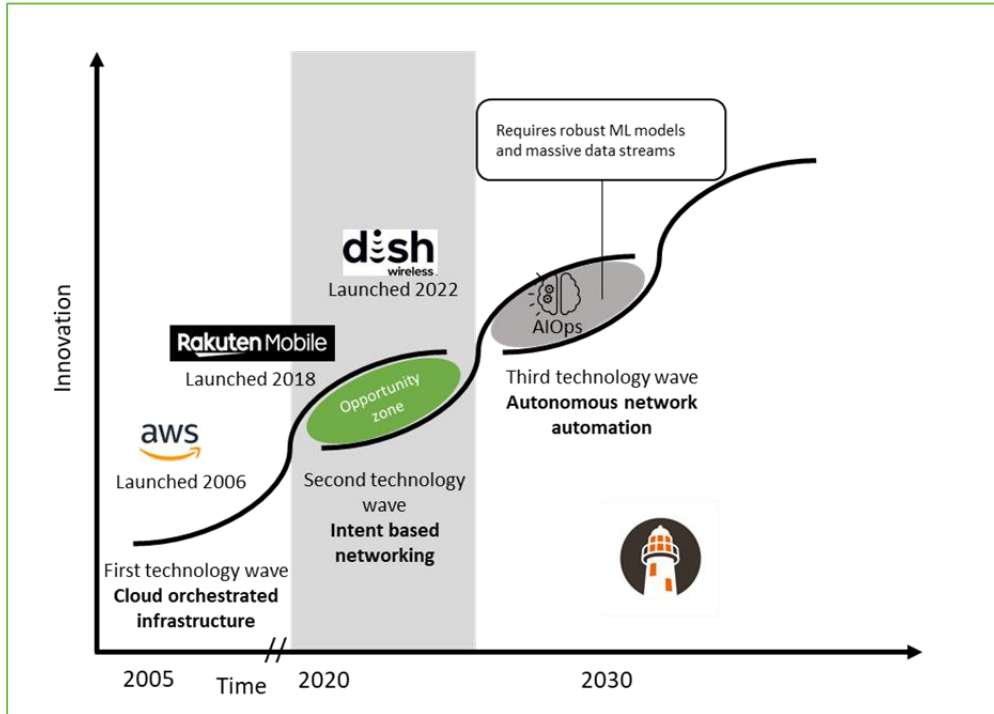


<https://ciscolive.ciscoevents.com/ciscolivebot/#PSOSPG-1141>

# Agenda

- Intent-Based Networking and Automation – Industry and Market Overview
- Cisco's Automated Assurance Strategy & Approach
- Crosswork Automated Assurance Use Cases
- Conclusion

# Automated Assurance in the Programmable Network



- Entering 2<sup>nd</sup> wave of Intent-based Networking
- Cloud & distributed network functions deliver increased scale but also complexity
- Independent technology silos will be replaced with closed loop automation (CLA)

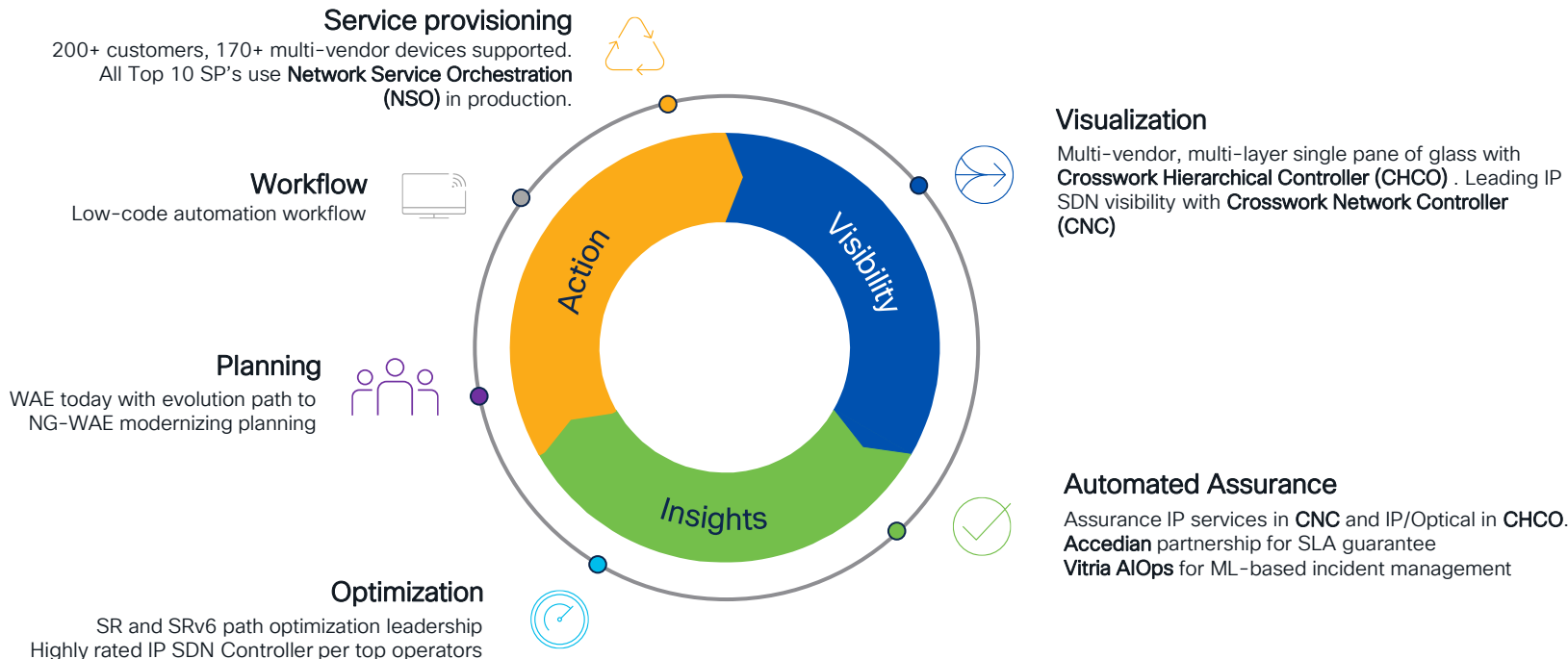
Source: White Paper by Appdore Research: ['Intent-based Networking: Automated Assurance Critical Success Factor'](#)

# Cisco's Automated Assurance Strategy & Approach

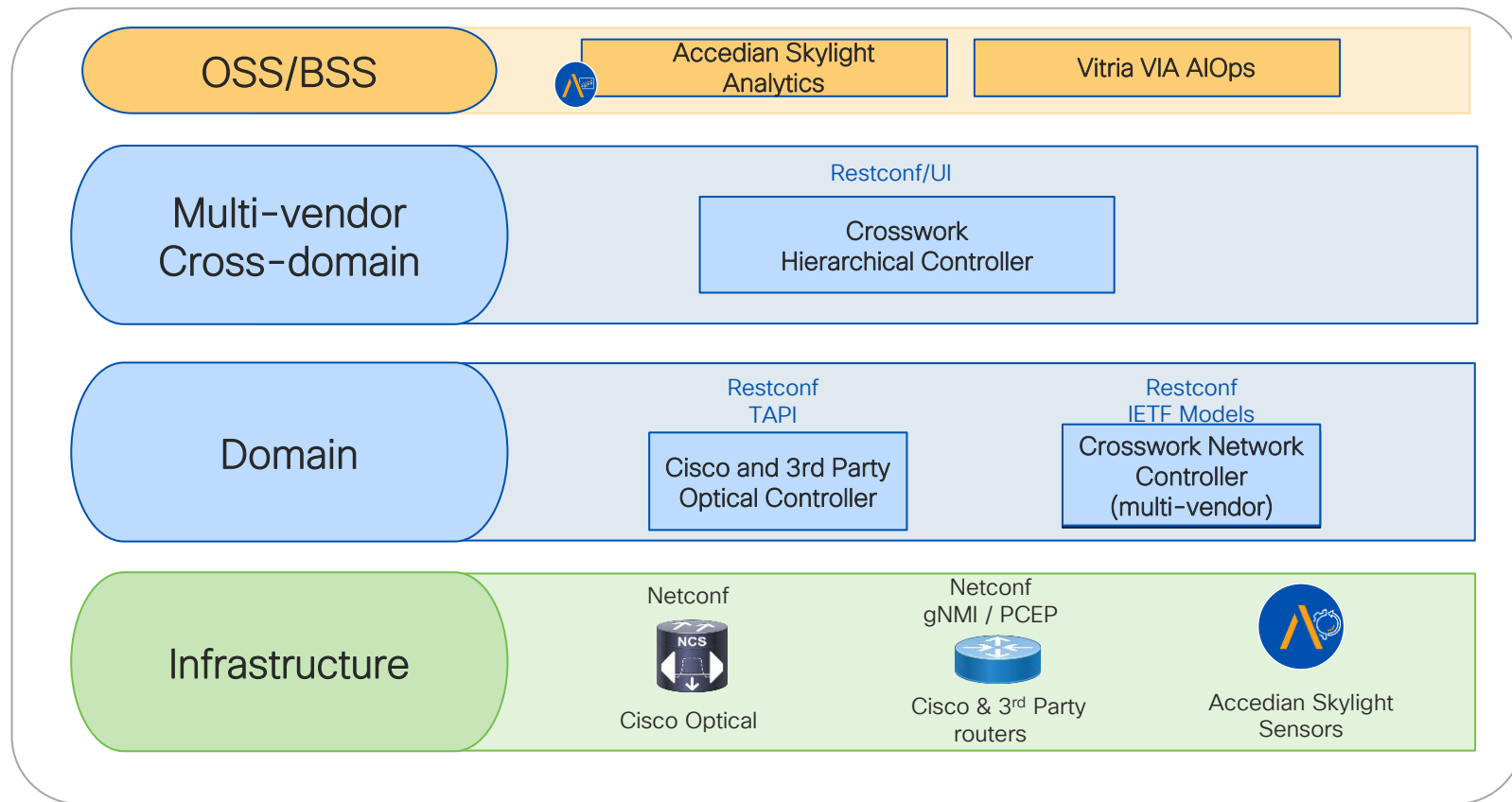


# Operationalizing Mass-Infrastructure Networks

Foundation for closed-loop automation and zero-touch networks

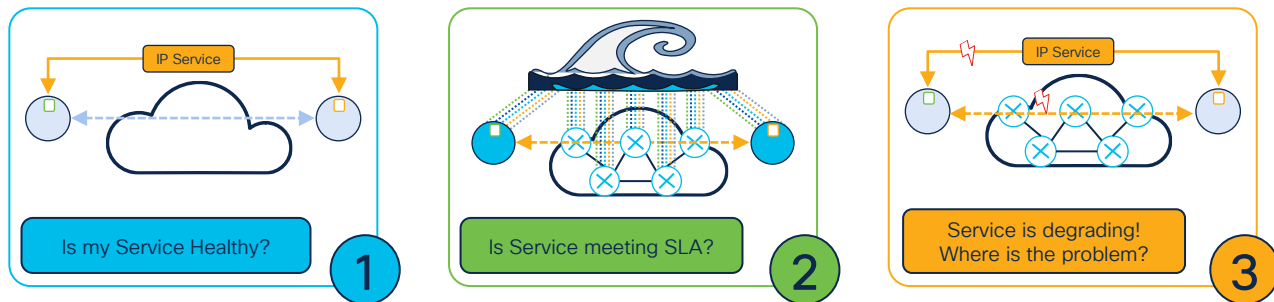


# Open SDN Architecture Aligned to Standards





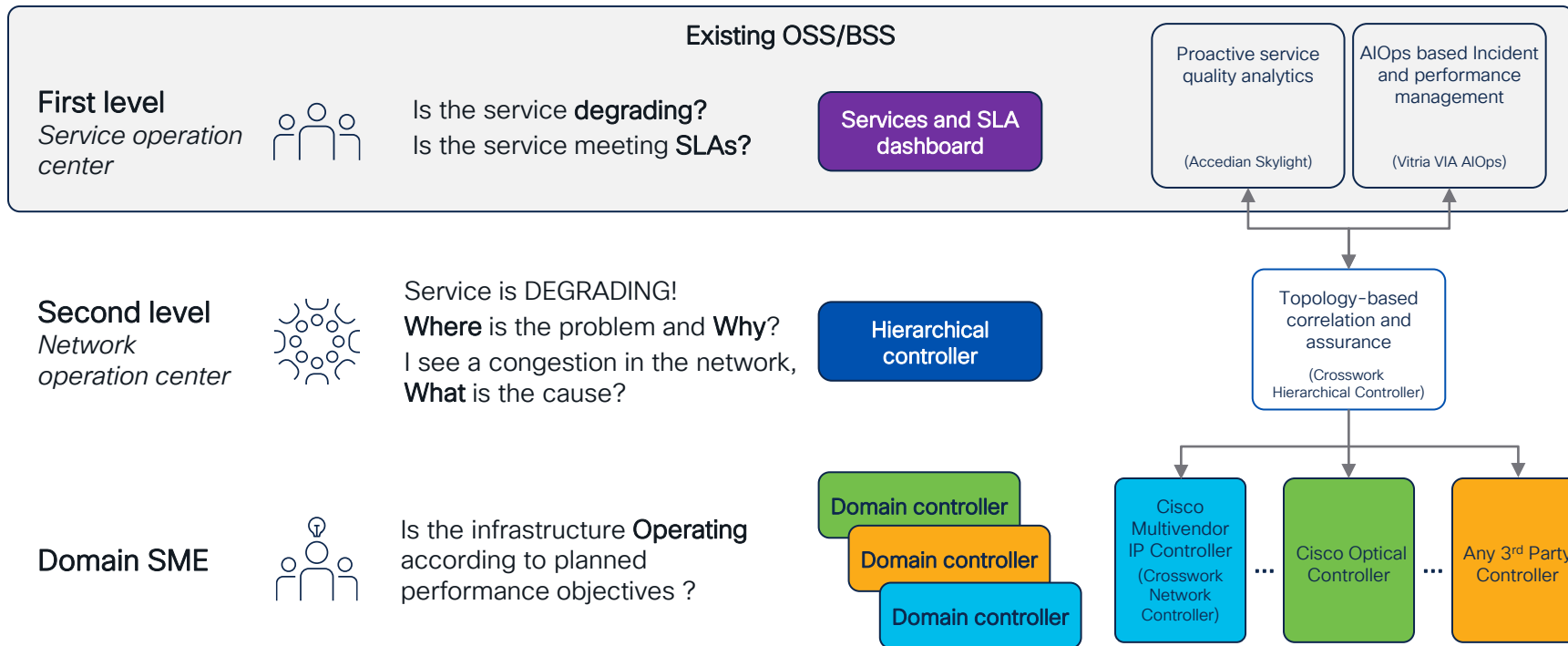
# A New Approach to Assurance



Challenge	Requirement	How
1 Visibility	End-to-end service visibility	Service centric operations
2 Insight	Bridge customer experience to network health	Dynamically tie Intent to telemetry
3 Action	Expedite MTTI/MTTK	Capture knowledge to automate troubleshooting

# Crosswork Automated Assurance Use Cases

*Know your Customer Personas: Role and Know-How its different*



# Crosswork Network Controller *Assurance Use Cases*

# Crosswork Network Controller (CNC)

Assure Each Layer Independently

## Slice health



Slice

Slice Health based on subtending transport service health

## Service health



VPN Service

IETF: Service Assurance for Intent Based Networking Architecture  
Data Plane Verification through probing

## Transport policy health



Transport

Policy verification with SR-PM: a TWAMP based tool

## Infrastructure health



Infrastructure

Element Management Functions (Device Inventory, Fault, Performance Metrics)  
Model Driven Telemetry



# Infrastructure Health

## Element Management Functions & Model Driven Telemetry

### Deep Inventory Visibility

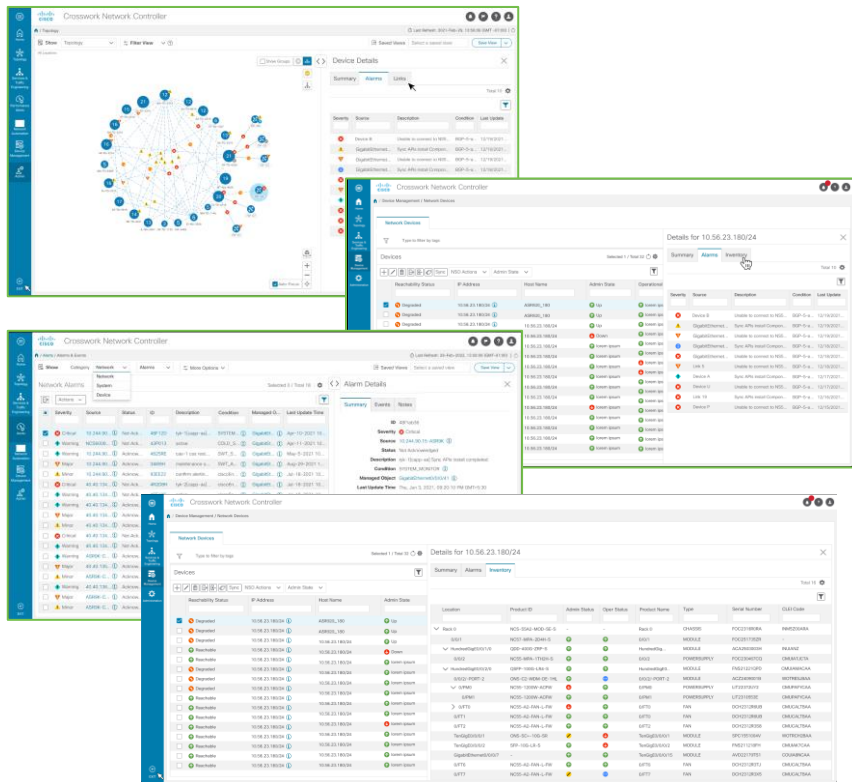
Clearly identify interface -> pluggable -> port -> line card. Complete topology information with detailed physical location of an interface.

### Device Fault and Events

Align alarm/events to a single format that operator can sort and filter. Ability to overlay Alarm Status on topology

### Model Driven Telemetry

Real-Time update on operational and performance data. Selectively choose what to monitor.

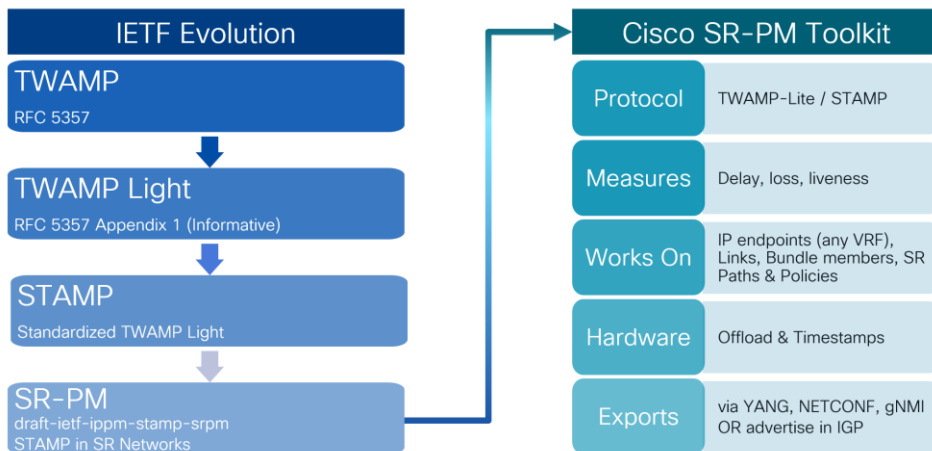




Transport

# Transport Health

## *Policy verification with SR Performance Monitoring*



SR-PM is a TWAMP based Toolkit

### Network as a Horizontal Controller

Measured link delay & loss flooded by IGP for SRTE computation and re-optimization

### End-to-End Empirical Test

Delay / Loss measurement + liveness of SR Policy (w/ ECMP) or IP endpoints

### Advanced Telemetry

Visibility to enable analytics using complete MDT and EDT KPI data (min / max / avg / variance)



Probing

# Service Health

## Data Plane Verification through probing

### Skylight Analytics



Micro  
Detail



Macro  
View



ML

### Skylight Sensors



Agent



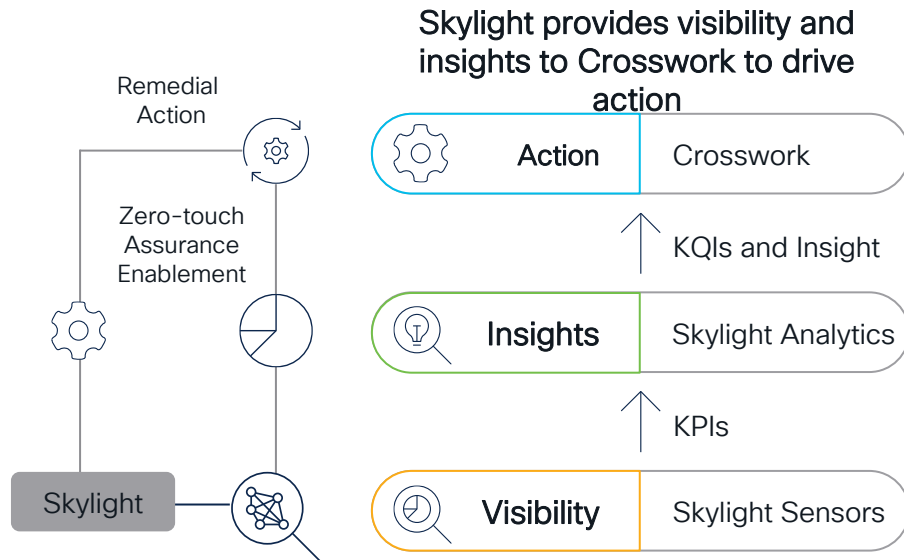
Control



Modules



SFP Compute





# Service Health

## IETF: Service Assurance for Intent based Networking Architecture

### Service Centric Approach

Start from the definition of the services and Tie Health across the layers

### Dynamically Tie Intent to Telemetry

Monitor only network component that can influence the service health state

### Automate Troubleshooting

Codify networking troubleshooting "Know-How" to automate

Intent-Based  
Network Provisioning



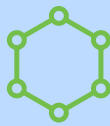
Intent-Based  
Network Assurance



End to End  
Probing



Transport  
Health



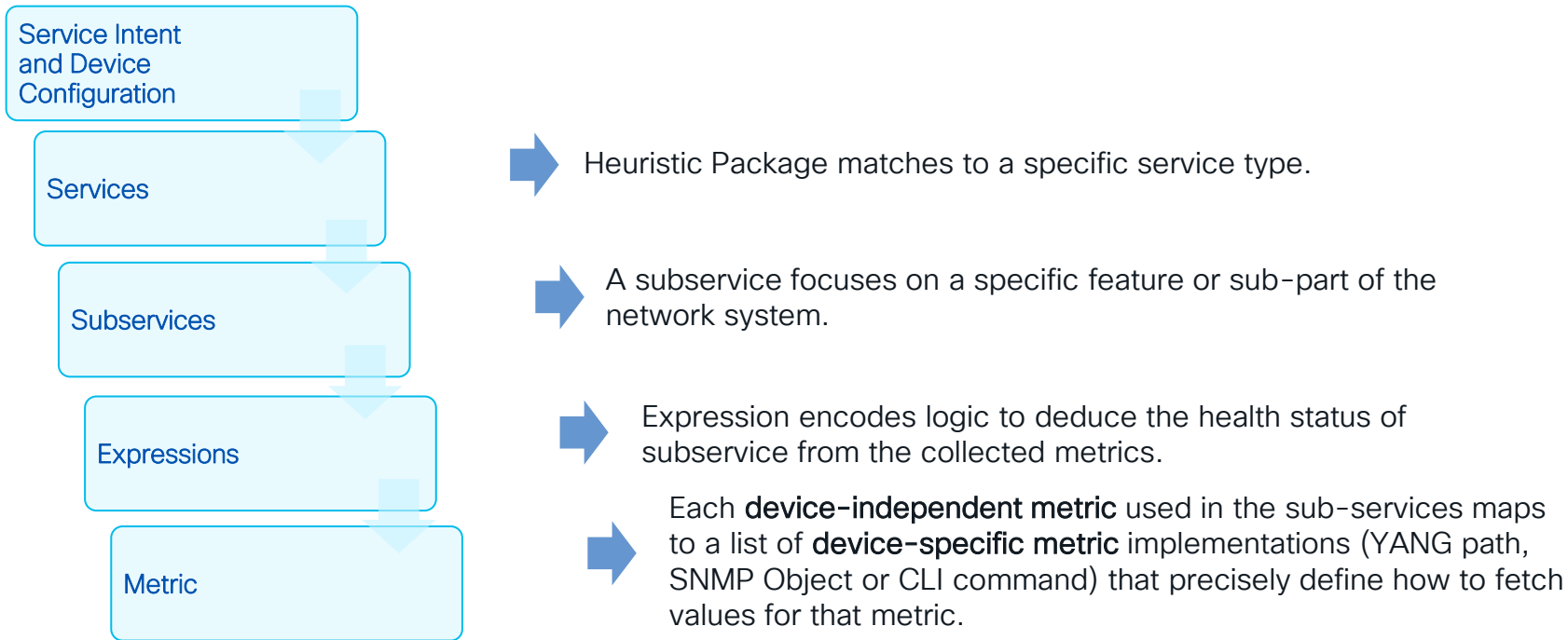
Infrastructure  
Health





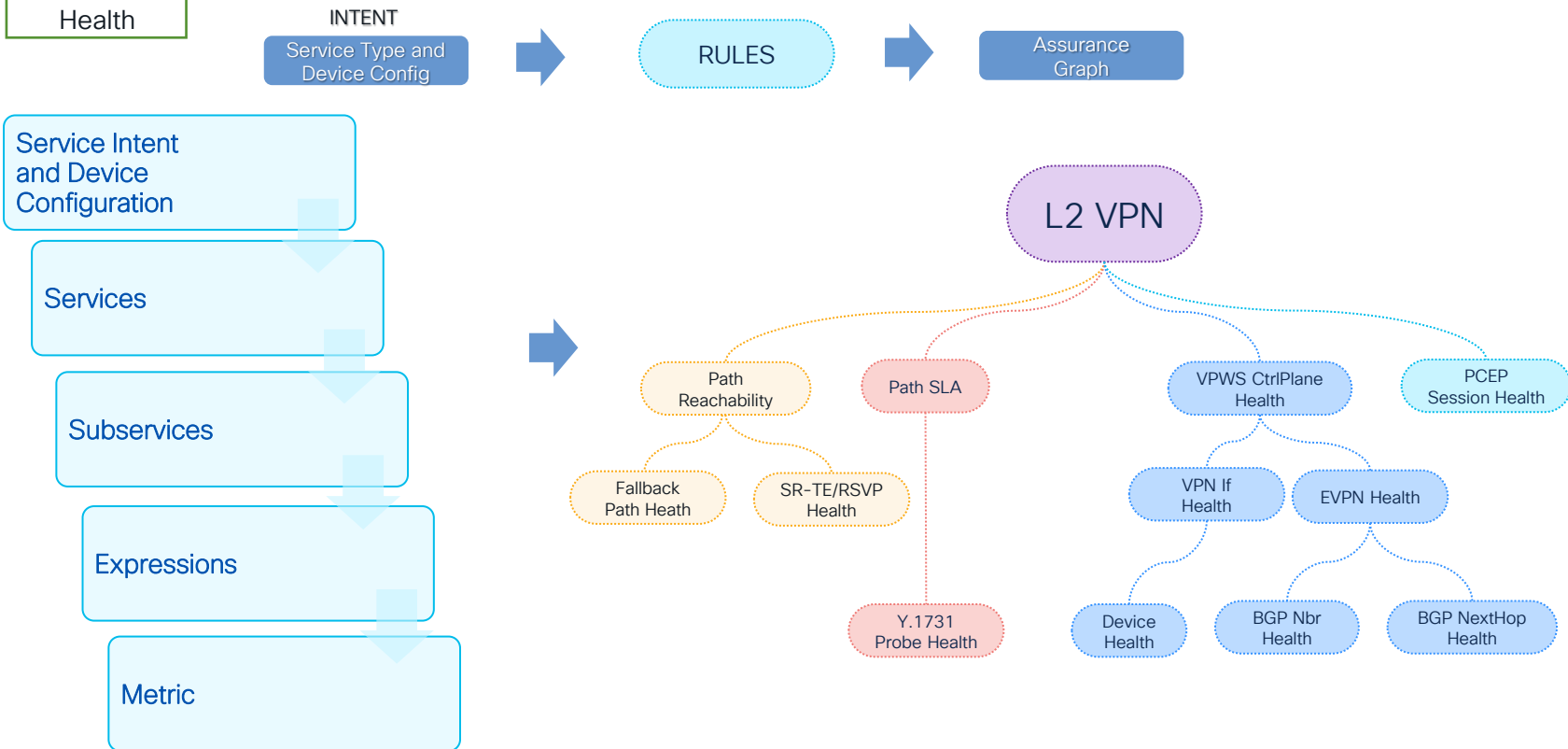
# Codify Know How

The **Heuristic Package** tie intent to telemetry





# From Heuristic Package to Assurance Graph



# Crosswork Hierarchical Controller

*Assurance Use  
Cases*





# Crosswork Hierarchical COntroller

## *Topology-based correlation and Assurance*

### Multi-layer

- Visualization of IP to optical topologies
- Multi-layer RCA, simulations to find SRLGs, failure impact
- ML PCE as API

### RON

- Visualization of ZR+ links across IP and OLS domains + ZR-OLS link validation
- ZR link assurance based on IP traffic and optical span monitoring + TCAs
- Provision new ZR link over OLS + new PLE over IP and OTN gears

### Multi-domain optical

- Visualization of all optical layers across multiple domains/vendors
- Service assurance based on multi-layer root-cause + optical perf monitoring
- Provision new E-Line and OTN line across domains (over MPLS-TP, OTN)

### Multi-domain IP

- Visualization of TE tunnels/policies over IP topologies and domains
- Assurance based on RCA + traffic and OAM PM and prediction + simulations
- Provision new VPNs across domains using NSO engine

# Partner Engagement *Assurance Use Cases*



Probing

# Skylight Sensors

## Data Plane Verification through probing

### Skylight Analytics



Micro  
Detail



Macro  
View



ML

### Skylight Sensors



Agent



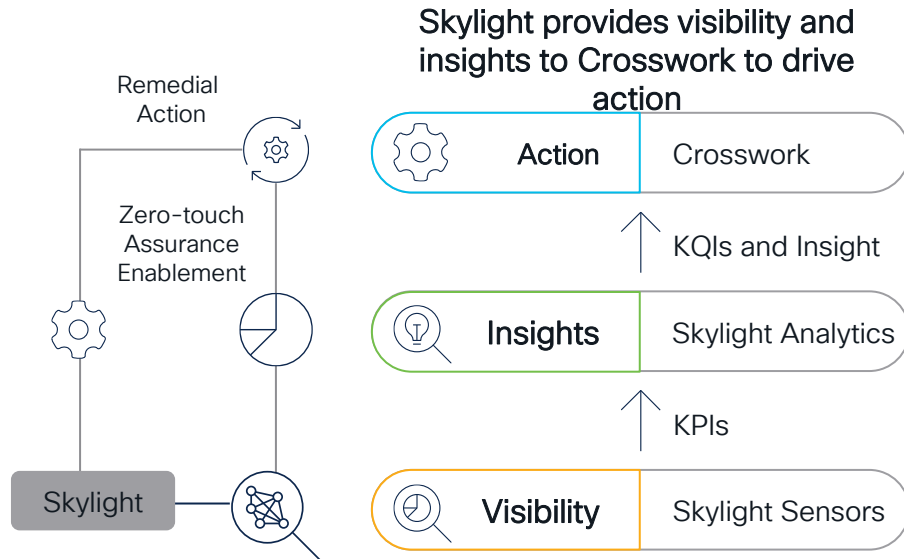
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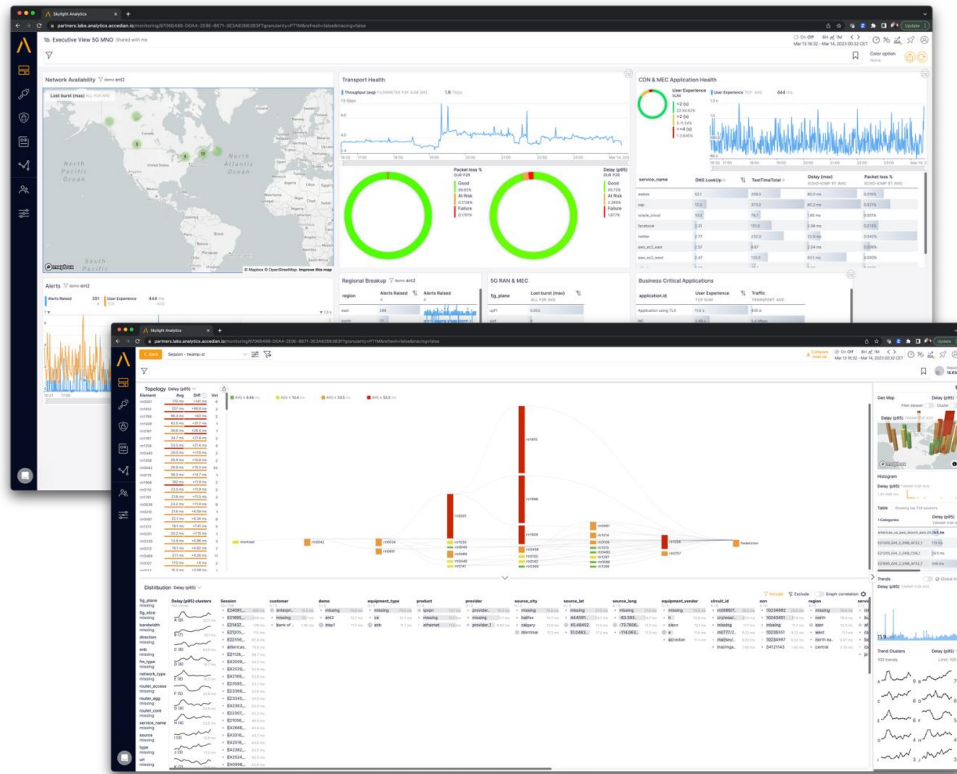


# Skylight Analytics

## Proactive Service Quality Analytics

### Skylight Analytics

- Visibility across transport network domains
- Visibility across multi network layers
- Multi-vendor integration
- Service provider scale and adaptability
- Cloud native software-based solution
- Data granularity & accuracy
- Ability to detect performance issues aligned with next-generation service assurance requirements





# Vitria VIA AIOps

## AI Ops Based Incident and Performance Management

### Skylight Analytics

- Ingests asynchronous events and time series metrics from the infrastructure, application and network
- Signals from the source or monitoring tools are correlated and analyzed to determine root cause
- Actions are prescribed with definition of the services and customers that are impacted



Accelerates the time to detect and resolve service-impacting events across service domains



AI Ops Based

# Incident Pipeline: From Noise to Action

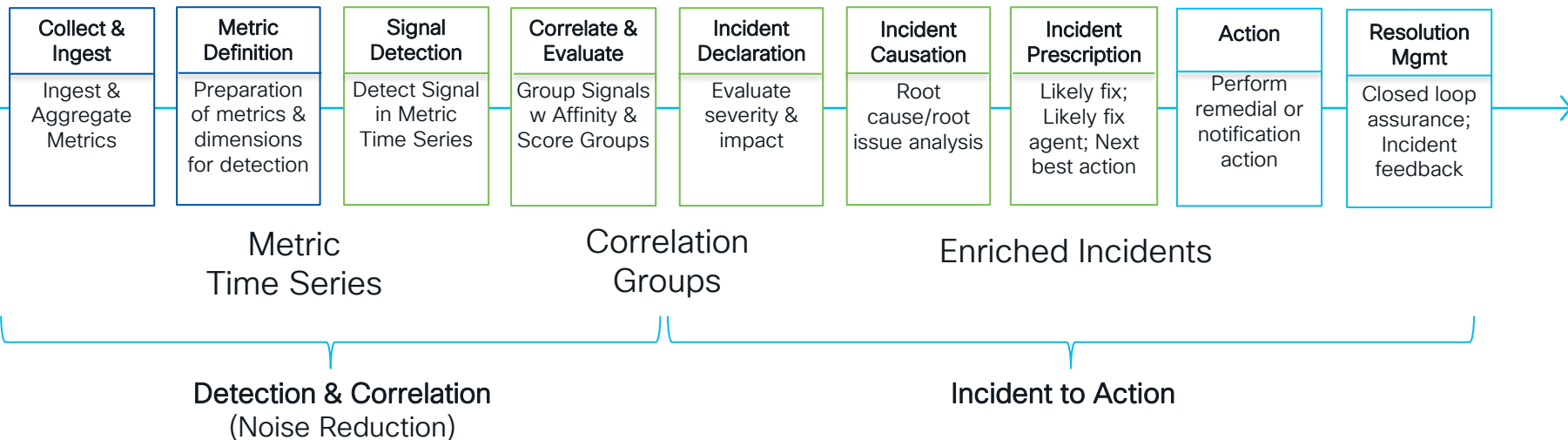
Observe → Analyze → Act

Raw Events &  
Measures

Signals &  
Severities

Incidents

Actions



# Conclusion



# Crosswork Automated Assurance Use Cases

## *Assurance Capabilities at each layer*

### Business Outcome

- Reduction in time-to-detect service issues and remediation
- Improved user experience and operator productivity



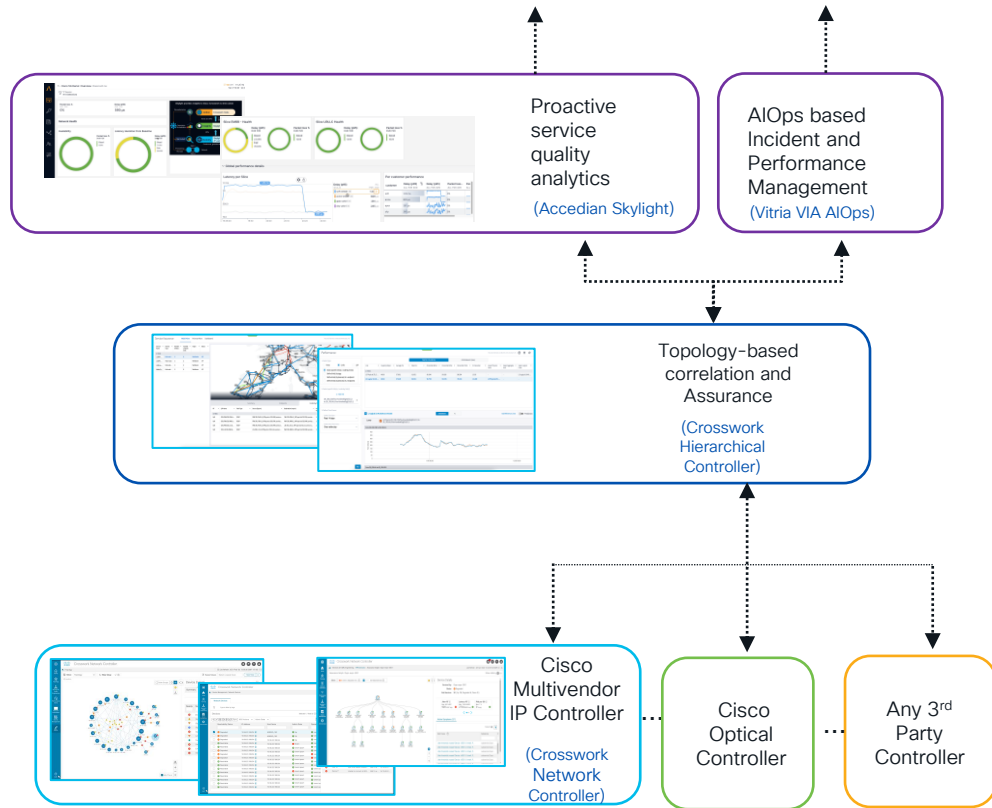
**Visibility:** Expedite troubleshooting by providing deep visibility



**Insights:** True Service Impact by combining empirical data plane verification with infrastructure health status in a single view



**Actions:** Codified Assurance Intent and Network “Know-How” enable to automate troubleshooting step.



# Fill out your session surveys!



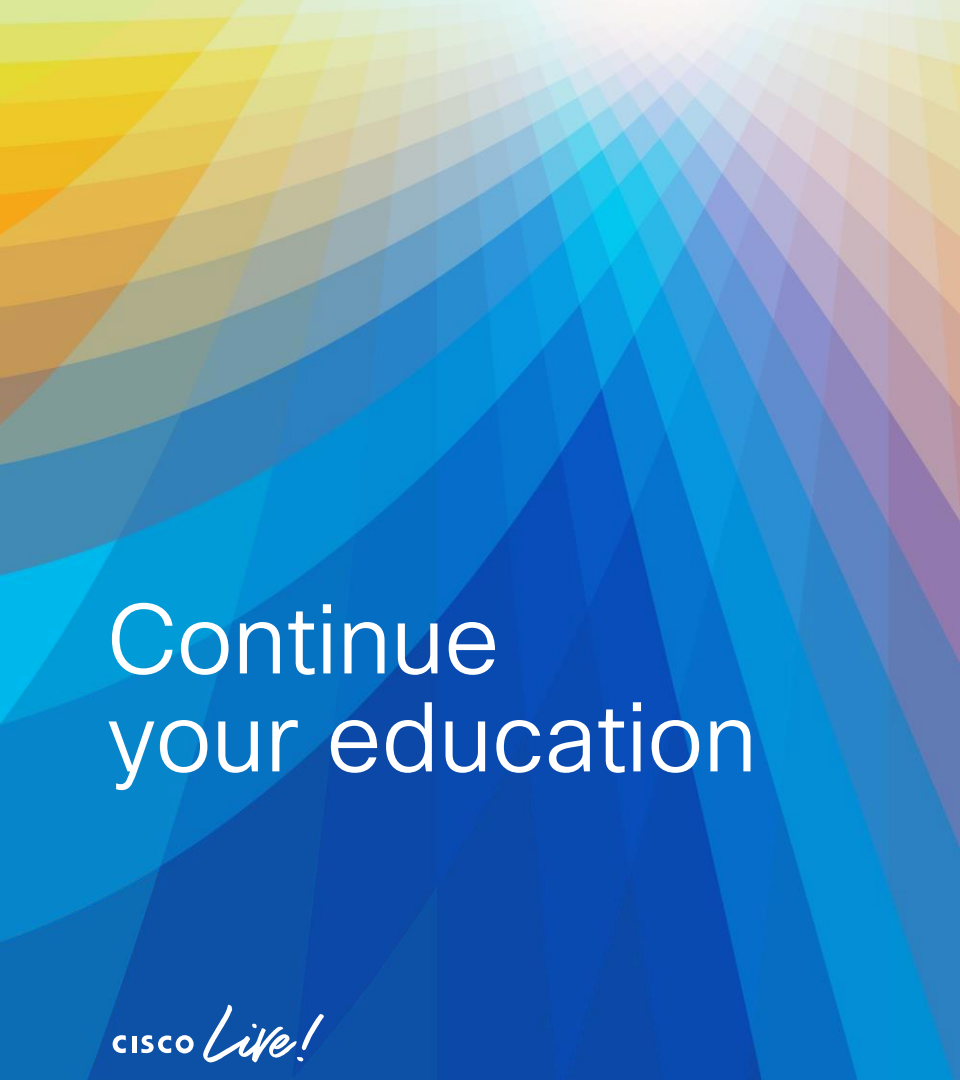
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# Continue your education



- 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](https://www.CiscoLive.com/on-demand)

# 'Share Your Experience'

Win prizes by participating in hands on activities about API quality and insights while working with Crosswork Automation & Data Center products.



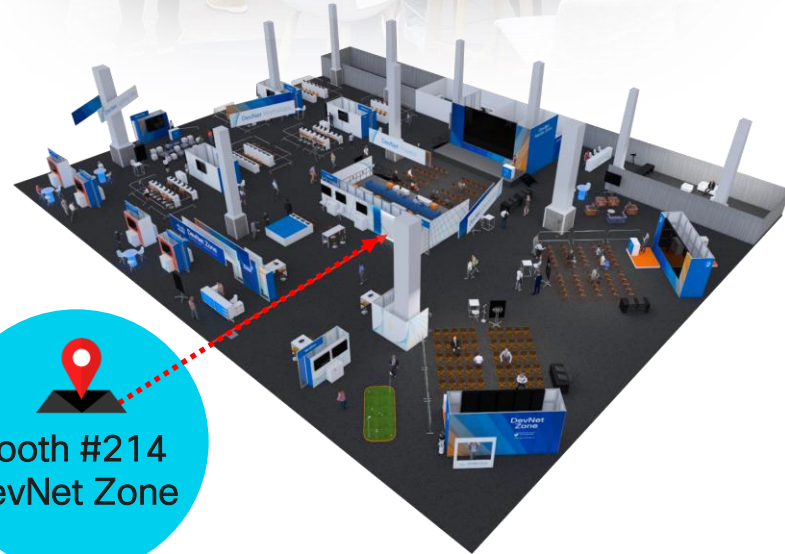
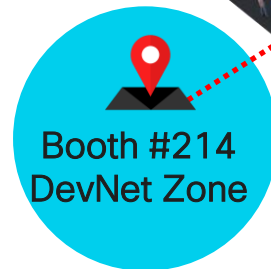
CNC



ACI



NDFC





The bridge to possible

# Thank you

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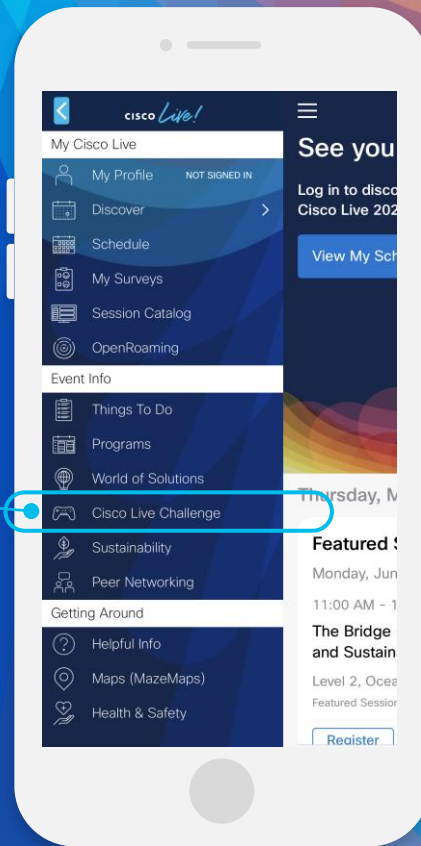
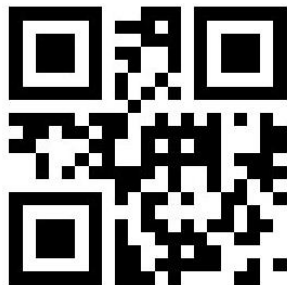


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