



Cisco Knowledge Network
Service Provider Webinar Series

Crosswork Health Insights and Change Automation

Closing The Loop

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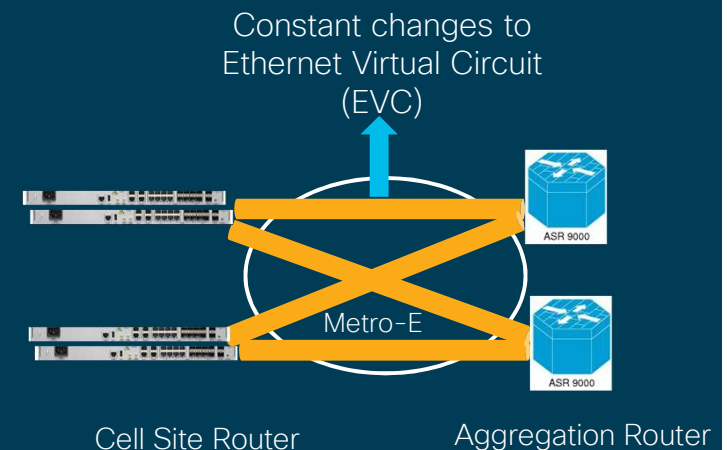
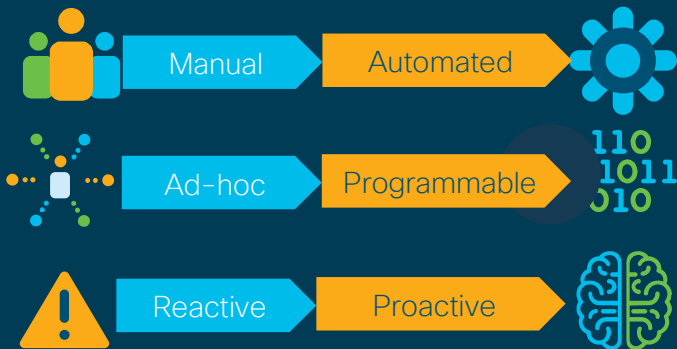
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“We’re spending over 100,000 labor hours annually on constant changes in our mobile backhaul network.”

*– VP Operations,
Maj T1 Service Provider*



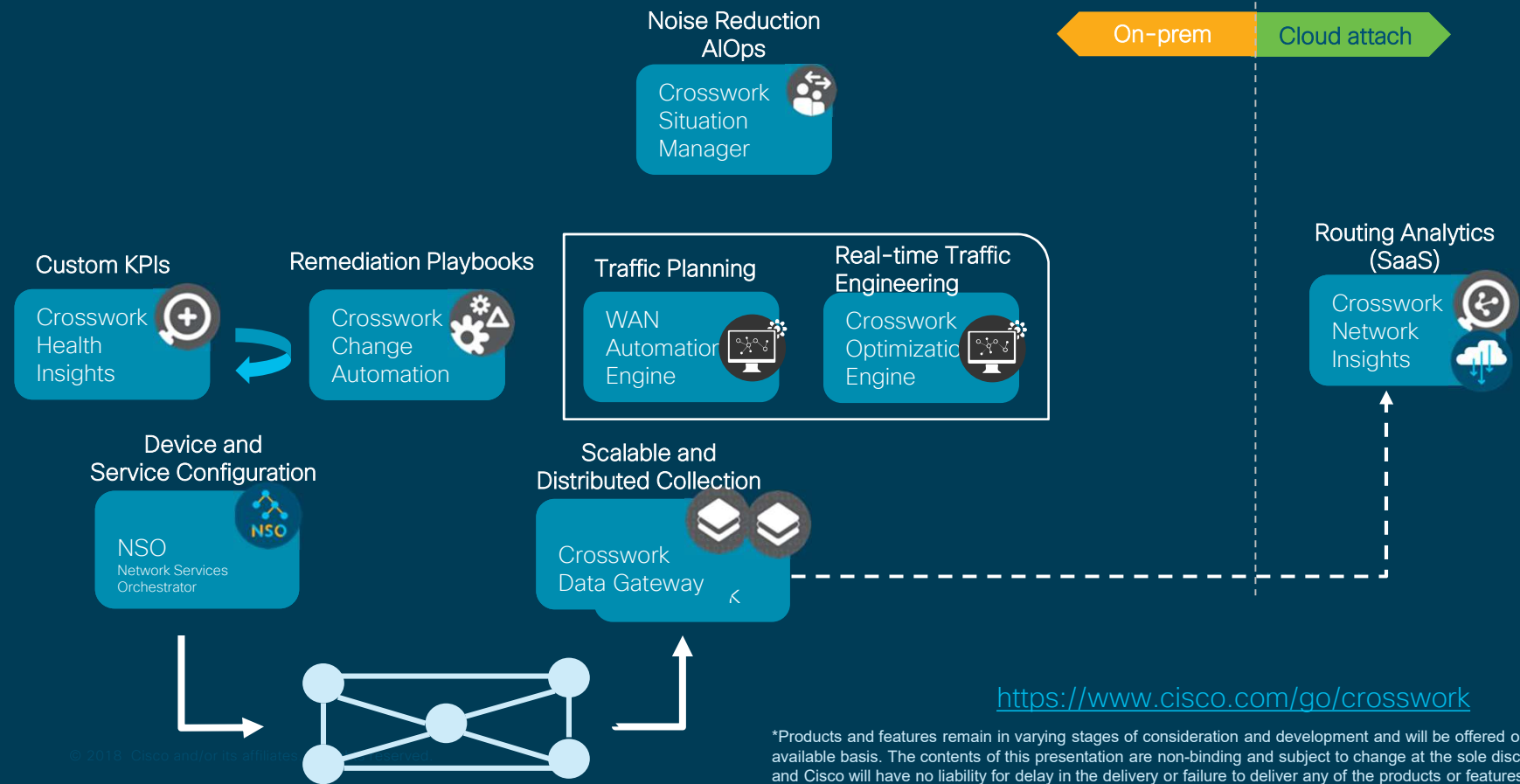
Crosswork Health Insights and Change Automation can help



Agenda

- ✓ Understand how Health Insights and Change Automation support closed-loop remediation
- ✓ Understand how Health Insights and Change Automation fit within the Cisco Crosswork portfolio
- ✓ Understand how to think about closed-loop automation with Crosswork
- ✓ Understand the developer ecosystem around Crosswork Health Insights and Change Automation

Cisco SP Automation Portfolio*



<https://www.cisco.com/go/crosswork>

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What are Health Insights and Change Automation?*

To network operators, Crosswork Health Insights and Change Automation provide a **programmable remediation** system that supports **closed-loop operations** with configurable KPIs and **feedback-driven workflows**.



Programmable Remediation



Tie anomalies to Ansible playbooks

Closed-Loop



Observe, alert, remediate, observe

Configurable



Create your own KPIs and custom alerts

Feedback-driven



Ansible enhanced with telemetry

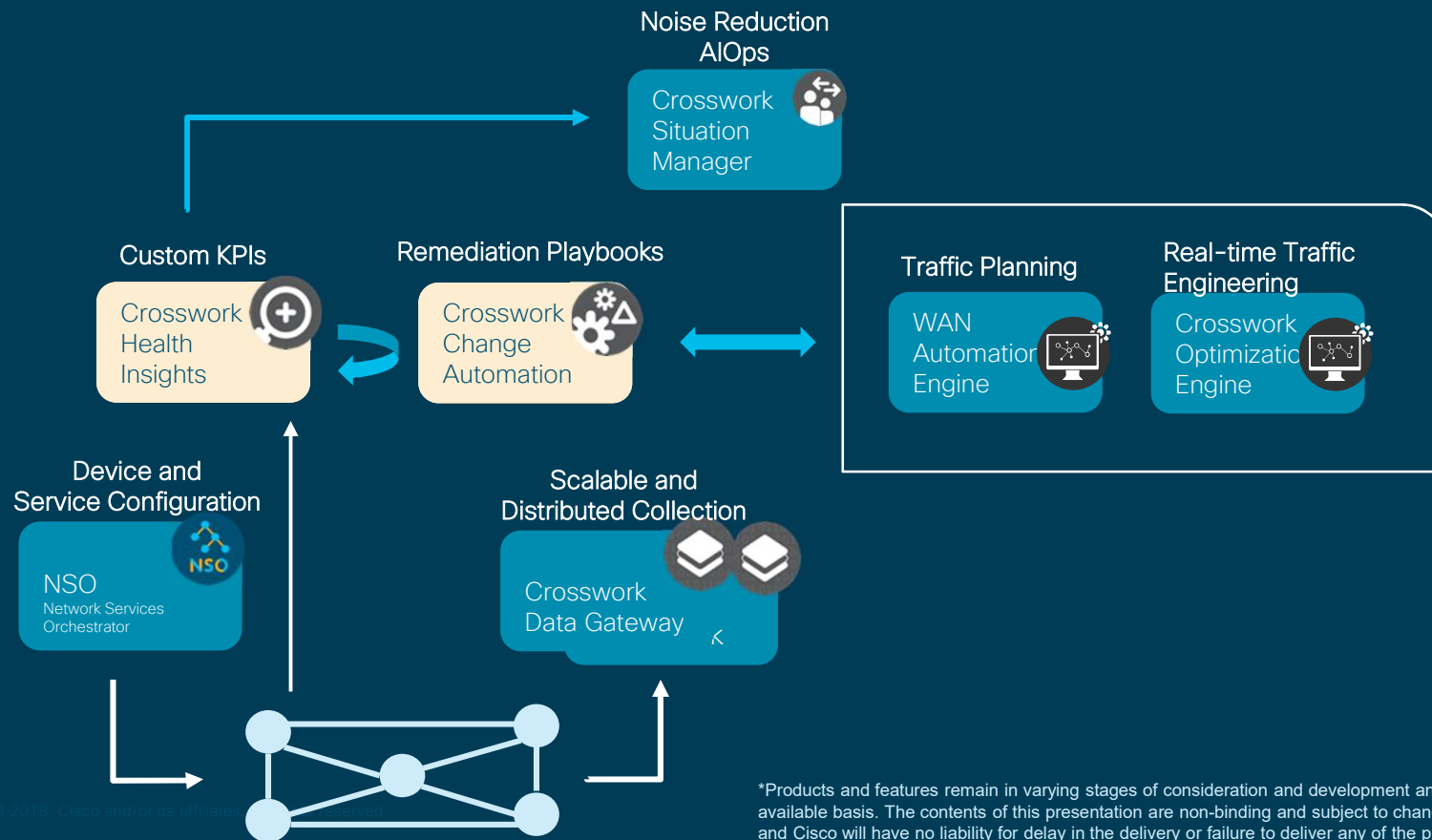
Built on the foundation of



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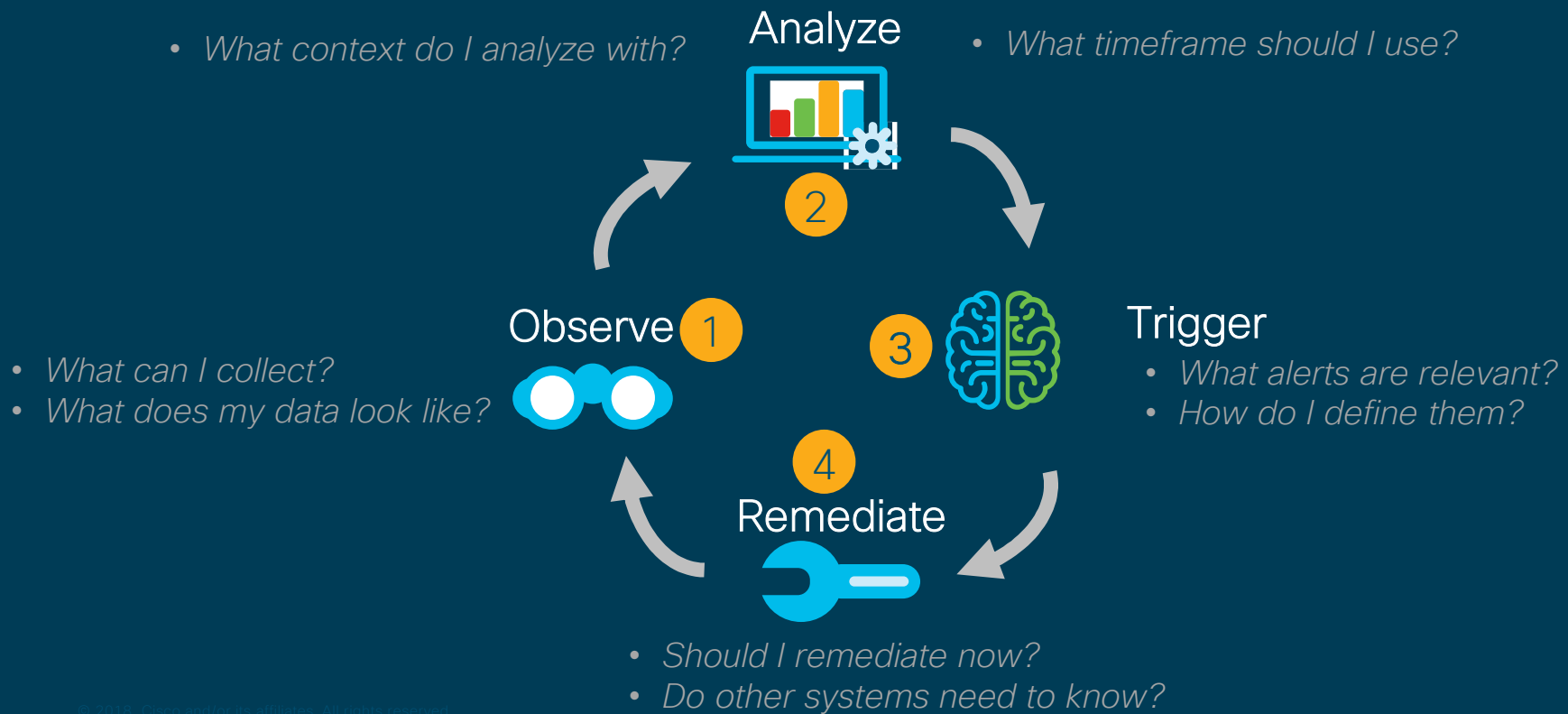
*Health Insights and Change Automation can also be sold and used separately

Change Automation and Health Insights in the Cisco SP Automation Portfolio*







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A Framework for Closed Loop Automation



Example Use-Cases*

Use-Case	Health Insights			+ Change Automation
	Observe 	Analyze 	Trigger 	Remediate 
EVC rebalancing NetOps	EVC bandwidth	Bandwidth only or rebalance required?	Bandwidth < est. subscriber threshold b/w	Increase EVC bandwidth (w/ rebalance)
Queue-depth triggered traffic steering NetArch NetOps	QoS queue depth	Alternate path computation	Queue depth > X	Steer traffic to alternate path
BNG address pool refresh NetOps	DHCP address pool	Ability to grow pool?	Pool < Y	Increase address pool
Link flapping NetOps	Link Status	Redundancy exists	Flaps > 30 times in a minute	Shut down port
Traffic blackhole alerts SecOps NetOps	PCR for device	Other alerts?	PCR out of bounds	Alert forwarding
LAG imbalance NetOps	LAG balance ratio	Policy warrants re-hash	LBR out of spec	Run alternate hashing
Management plane compliance checks SecOps NetOps	Monitor open port(s) – e.g telnet	Policy dictates port access should be disabled	Ports remain open beyond stipulated window	Turn off port(s)

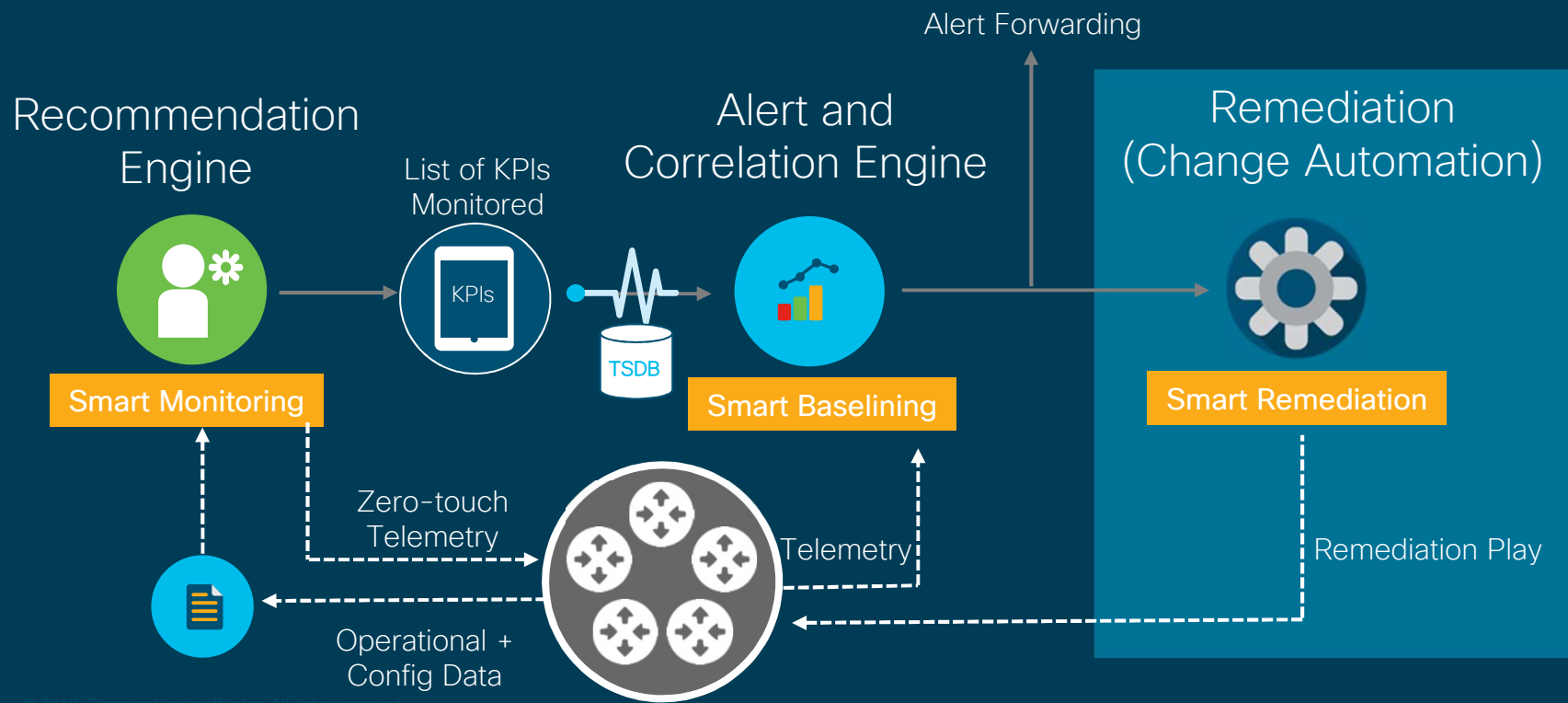
*In varying stages of development

Health Insights

Make Your Data Actionable



Health Insights: Make Your Data Actionable



Health Insights – Augmenting “Closed-loop”

✓ Flexible triggers with context agnostic filtering

Select Sensor Paths Select a module from the left.

Filter Modules

Module
Cisco-IOS-XR-controller-otu-oper
Cisco-IOS-XR-crypto-macsec-mka-oper
Cisco-IOS-XR-crypto-macsec-secy-oper
Cisco-IOS-XR-crypto-sam-oper
Cisco-IOS-XR-crypto-ssh-oper
Cisco-IOS-XR-dnx-driver-oper
Cisco-IOS-XR-dnx-netflow-oper
Cisco-IOS-XR-dnx-port-mapper-oper
Cisco-IOS-XR-drivers-media-eth-oper
Cisco-IOS-XR-dwdm-ui-oper

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✓ Dampening and Hysteresis



✓ Custom Remediation Workflow

Change Automation Home / Playbook List

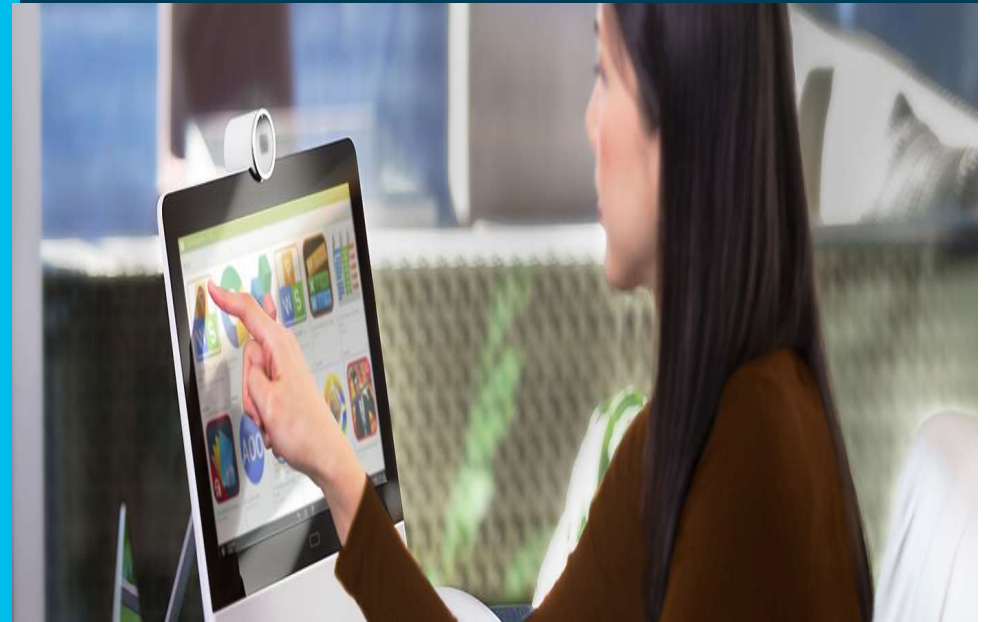
Playbooks

🗑️ ⬇️ ⬆️

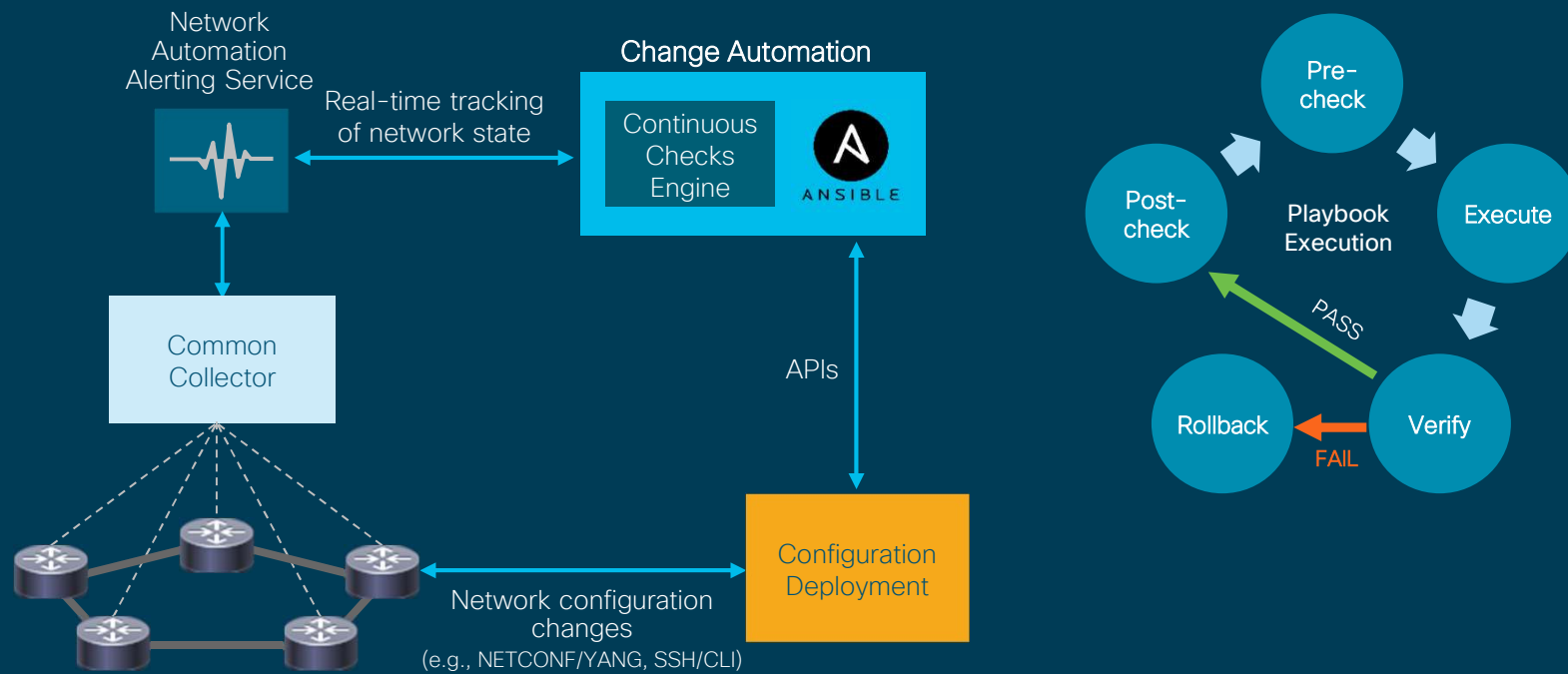
<input type="checkbox"/>	Name
<input type="checkbox"/>	Delete bgp neighbors on a router
<input type="checkbox"/>	IGP Interface Cost in out
<input type="checkbox"/>	Install an optional package or a SMU
<input type="checkbox"/>	Interface State change
<input type="checkbox"/>	Modify TE Tunnel Configuration
<input type="checkbox"/>	Node Cost Out/In
<input type="checkbox"/>	Node State Snapshot
<input type="checkbox"/>	Prefix Set ADD
<input type="checkbox"/>	Prefix Set Delete
<input type="checkbox"/>	Prefix Set Rename
<input type="checkbox"/>	Remove interface from Bundle Ether and delete bundle-ether
<input type="checkbox"/>	Run arbitrary show command(s) on IOS XR/XE device(s)
<input type="checkbox"/>	TE Tunnel Configuration
<input type="checkbox"/>	Uninstall an optional package or a SMU

Change Automation

Codify Your Workflows

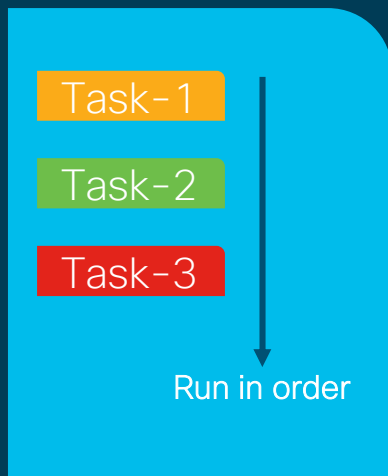


Change Automation: Codify Your Workflows



Change Automation = Ansible++

Ansible Plays

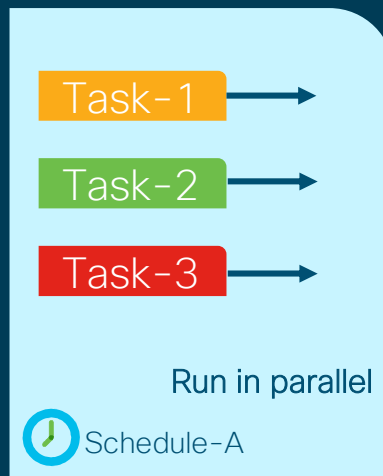


Dry-run
Check-mode

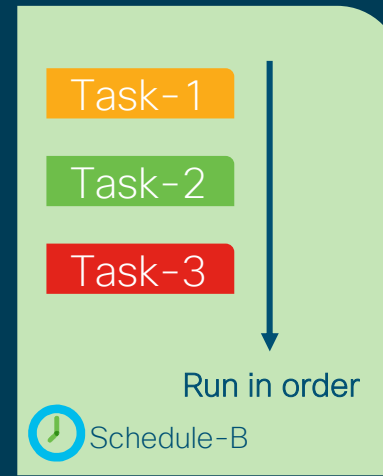
Rollback
Ansible native

Change Automation Plays

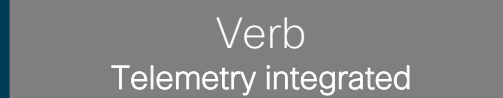
Continuous and
Pre-check



Maintenance and
Post-check



Change Automation Task



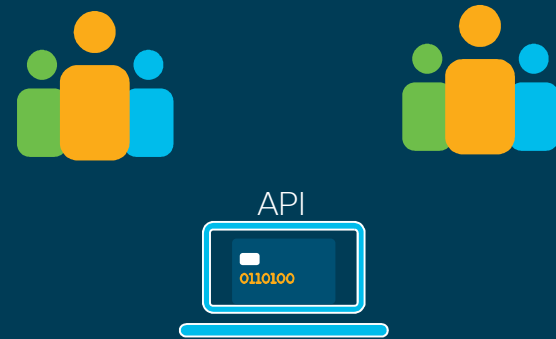
Single-step



Dry-run
Check-mode
+
NSO dry-run

Rollback
NSO based


Developer Ecosystem



Devnet Landing Page

Overview

What Is Cisco Crosswork?

What Is Cisco Crosswork?

Transforming Mass Scale Network Operations

Technical Overview

Getting Started

API Reference

Network Change Automation Service

Resources

DevNet Developer Support [↗](#)

SP360: Service Provider Blog [↗](#)

Cisco dCloud Crosswork Demos [↗](#)

What Is Cisco Crosswork?

Cisco Crosswork is a microservices platform that brings together streaming telemetry, big data, and model-driven application programming interfaces (APIs) to redefine service provider network operations. Cisco Crosswork offers a platform for customers and partners to collaborate and build an application ecosystem around on-box innovation.

The Cisco Crosswork product suite is a highly scalable and efficient operations automation framework. It enables service providers to quickly deploy intent-driven, closed-loop operations.

Transforming Mass Scale Network Operations

Plan, implement, operate, monitor and optimize your Service Provider Network Automation and gain the mass awareness, augmented intelligence and proactive control for data driven, outcome based network automation. Transform your network with:



Health Insights



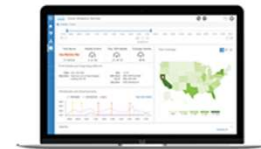
Network Change Automation



Data Gateway



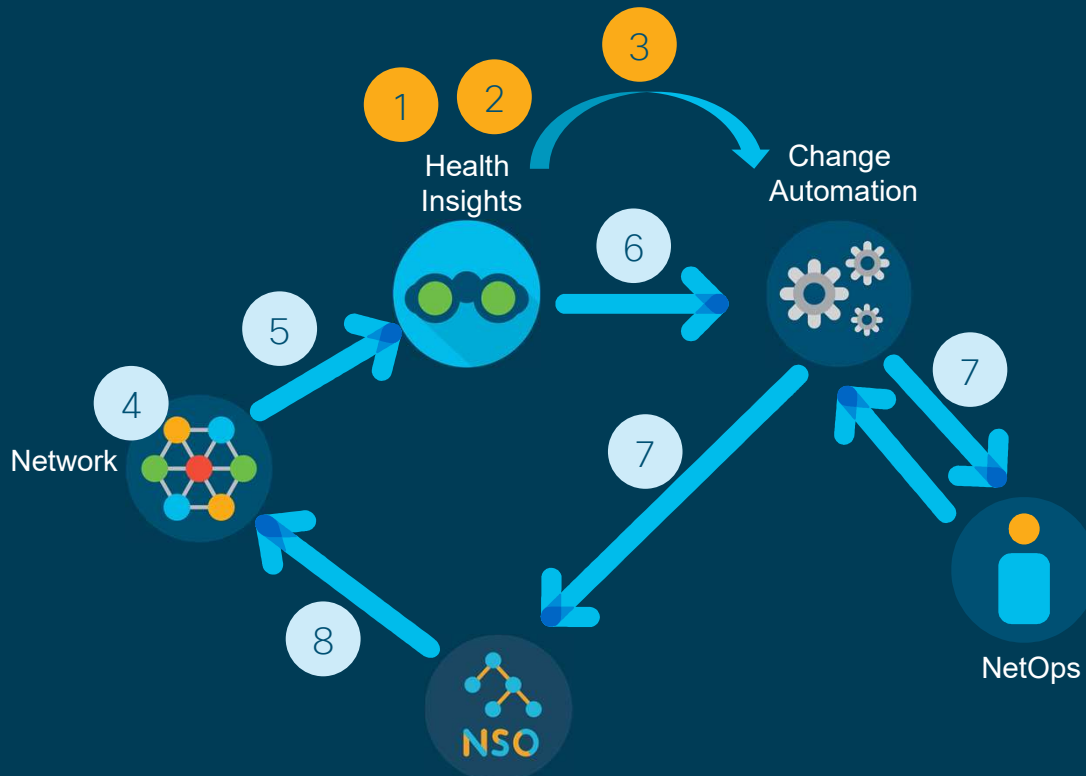
Situation Manager



Network Insights

Putting It Together

Demo Workflow



1. Select KPI
2. Set Alert Thresholds
3. Link Playbook
4. Force exception (link flap)
5. Exception Detected
6. Health Insights determines proper response and associated playbook
7. Playbook could be fully automated or also have manual steps
8. NSO pushes changes back to network

Additional Information

<https://www.cisco.com/go/crosswork>

Cisco Crosswork Network Automation



Transforming Mass Scale Network Operations

Plan, design, implement, operate, and optimize your service provider network with Cisco Crosswork Network Automation. Cisco Crosswork is designed to help service providers gain the mass awareness, augmented intelligence, and proactive control for a comprehensive data-driven, intent-based automated network.

▶ Watch the transformation (2 min)

▶ See the value of closed-loop network automation (60 sec)

