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ALL IN

The bridge to possible

Eliminate Congestion Surprises and Fire Drills Forever with Crosswork Cloud

Traffic Analysis as a Service

Dan Backman, Principal Engineer, MIG Architecture

BRKSPG-2250

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with the speaker after the session

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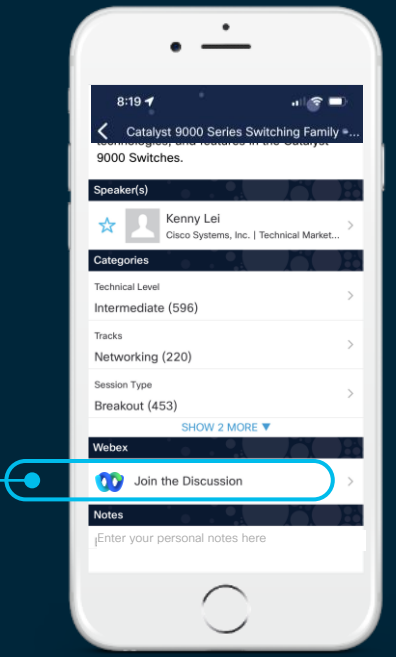

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Agenda

- Cloud as a new services platform
- Network Insights BGP monitoring
- Traffic Analysis as-a-Service
- Cloud-to-Ground: Data Gateway
- Trust Insights and XR Operational Intelligence
- Conclusion

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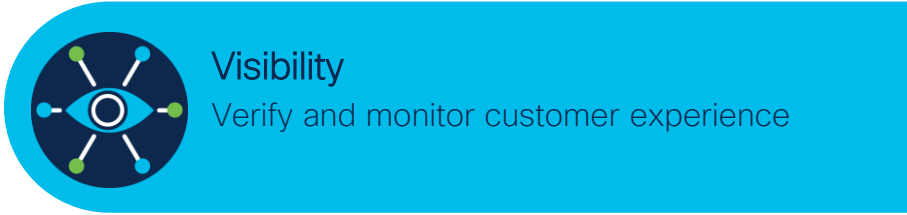
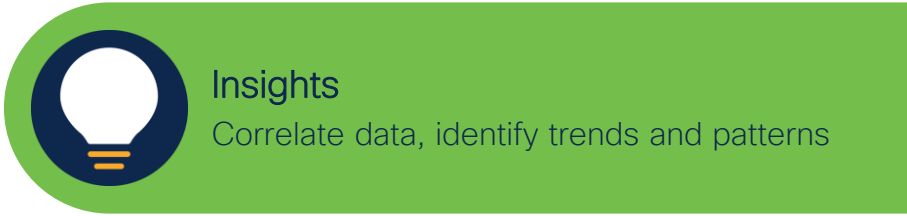
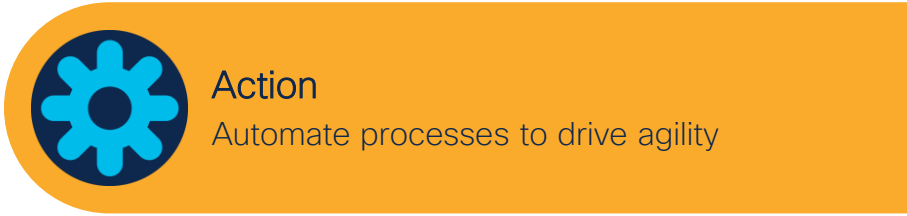
Automation vision

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







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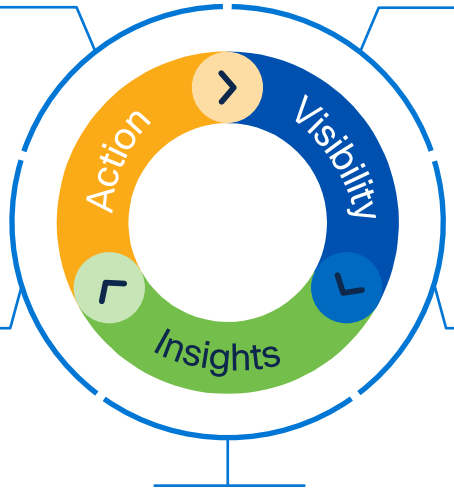
Tenets of Cisco Crosswork Automation

Software defined

API-centric, unlocking of operational data and simpler tool chain integration

Standards-based

Architecture based on standard APIs and protocols giving customers the needed flexibility.



Autonomous

Real-time visibility, assurance, and analytics to support zero-touch operations

Multivendor + multidomain

Robust support for vendors across technologies for the entire service

Scalable + adaptive

Effortlessly adjust to changes in size, volume, and frequency of workflows

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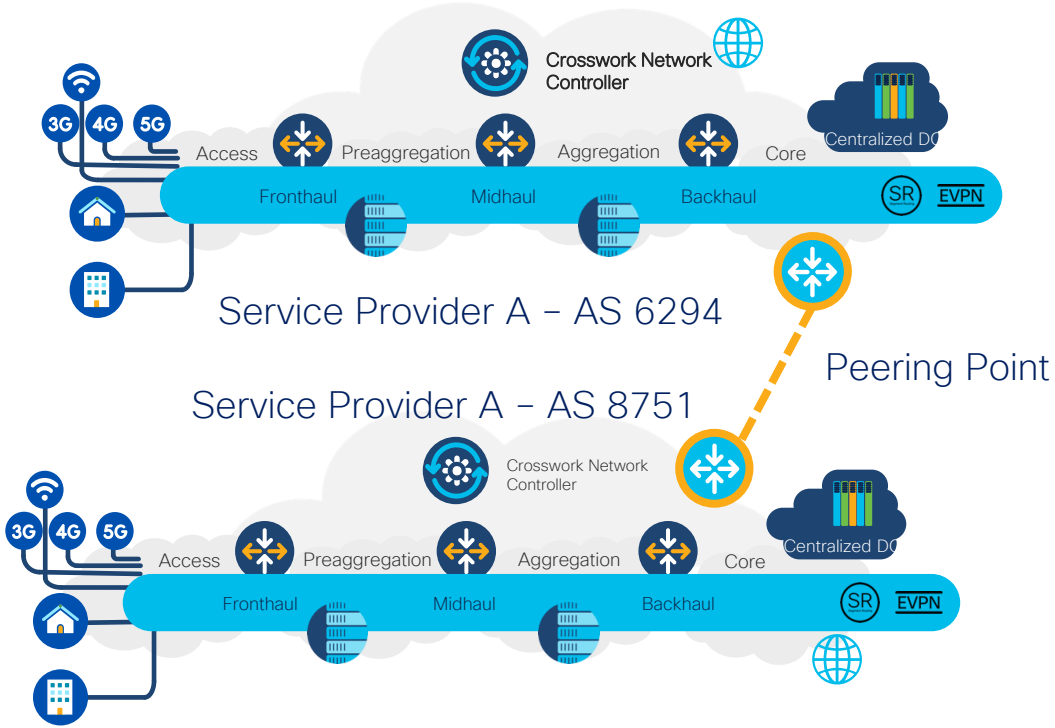
Crosswork Cloud – Traffic Analysis

- What's the challenge?



Business Outcomes

Improve Customer Experience
Peering recommendations to improve traffic
Identify hijacks & route leaks

Increase Provider Profitability
Dashboard of my top talkers
Identify remediations before issues occur

Operational Simplicity
Analytics translation into automatable actions
Visibility of network that's easy to understand

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Operational Intelligence as a Service

- **Cloud SaaS:** Always-On, Immediate Time-to-Value, Always Advancing
- No software to deploy and maintain
- Cloud Scale and scale-out CDG for on-prem support
- Reduced Operational Cost and Seamless Scalability

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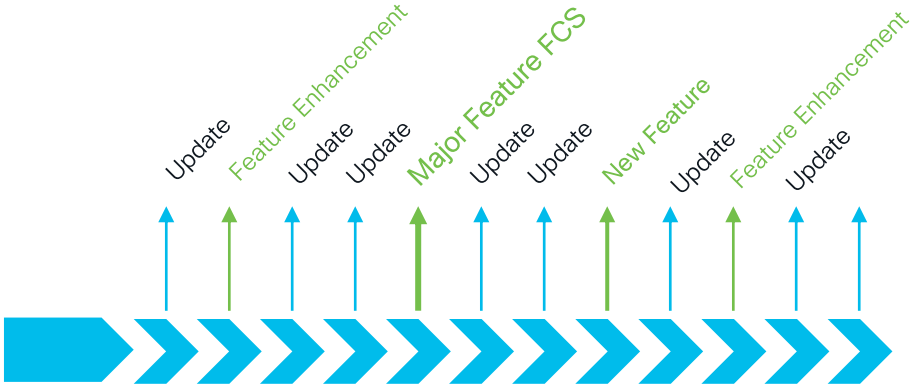
A new way to consume software as a service



Continuous delivery of new features and software updates to the production cloud service.

No user testing or software maintenance required.

- Software delivered and maintained by Cisco
- Continuous (Weekly) delivery pipeline to production service
- Continuous pipeline for new features and fixes
- No customer action required for ongoing maintenance or upgrades

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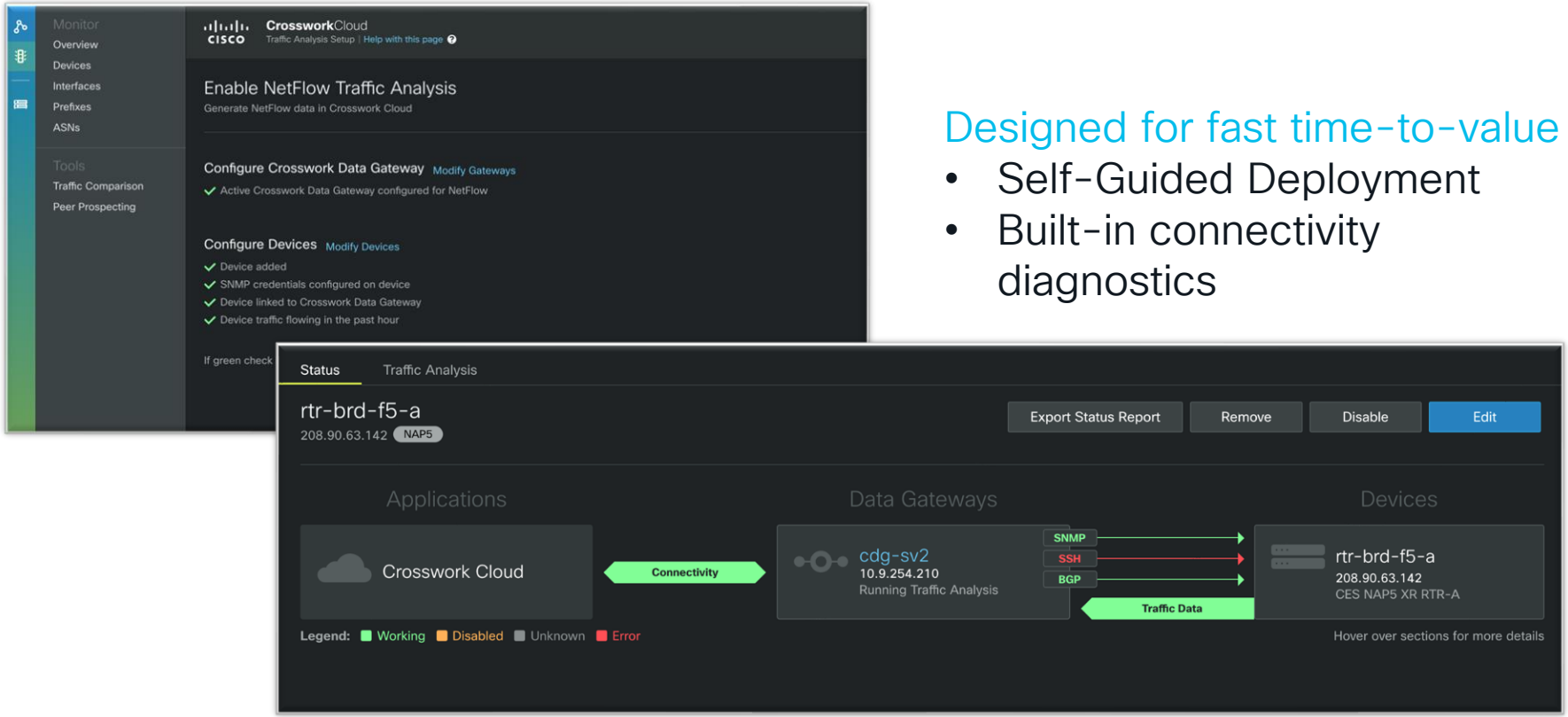
Designed for Ease of Use and Supportability



Designed for fast time-to-value

- Self-Guided Deployment
- Built-in connectivity diagnostics

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ABCs of Crosswork Cloud: AS monitoring, Border Netflow Analytics, Compliance

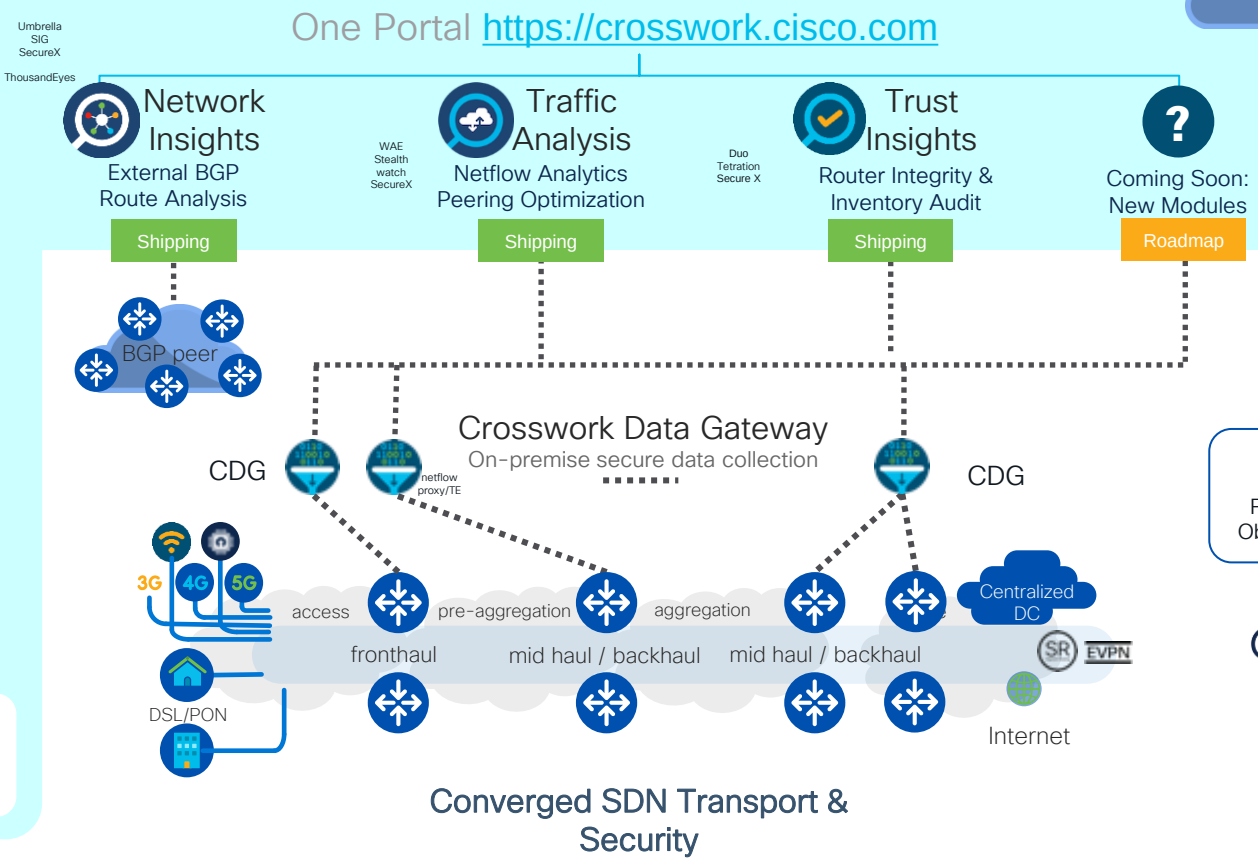
Key Points

- SaaS Delivered
- Immediate Deployment
- Always up-to-date
- Minimal Support OpEx
- Weekly Updates
- Dynamic Scalable Workloads
- Continuous New Features
- Task & Process Automation
- Focus on Analytics
- Give Answers not Questions

Operational Intelligence

- Multivendor & Multidomain
- Multiplatform Traffic Analytics
- Network security focused
- IOS XR7 device posturing
- REST API integration

Integrated Collaboration tools



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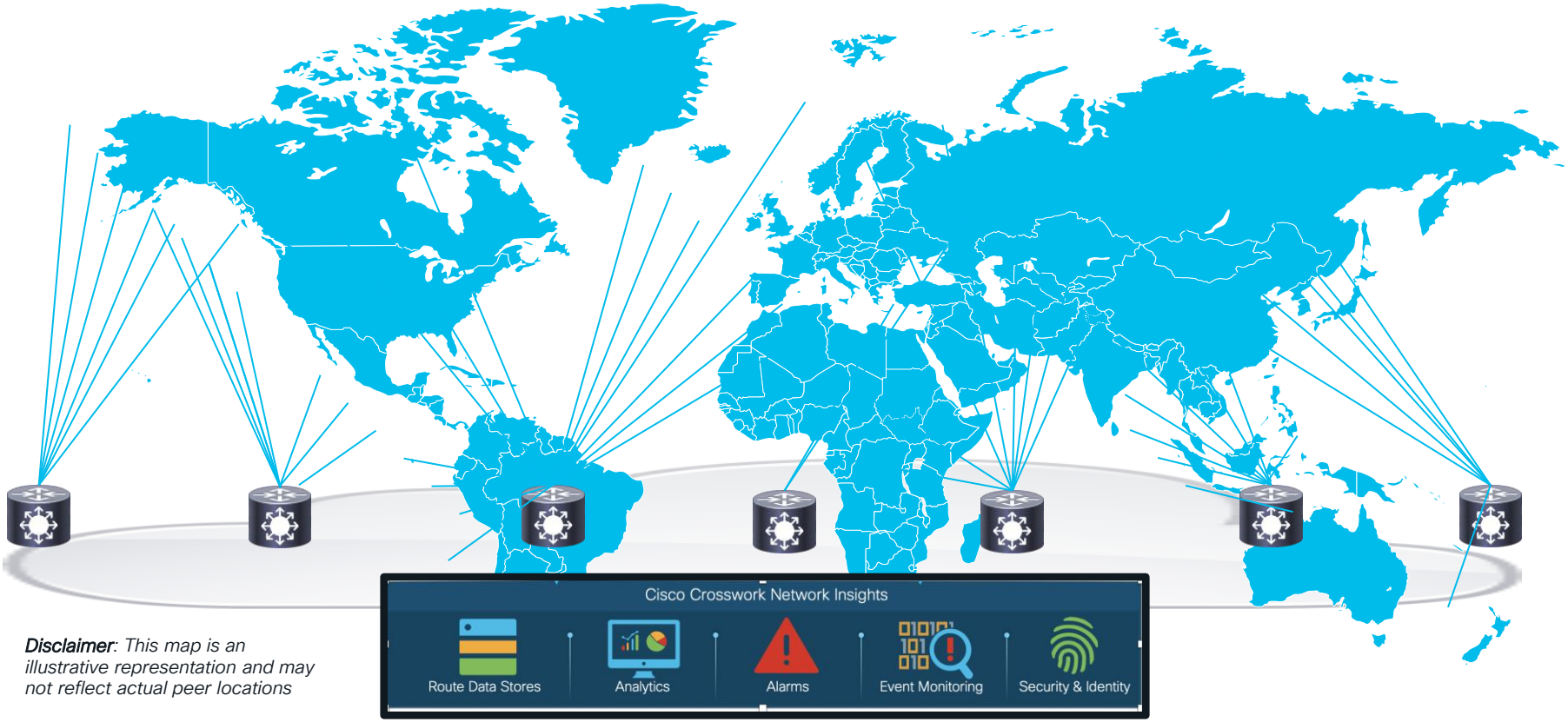
Network Insights External BGP Analysis

Network Insights monitors hundreds of peers world-wide



***Disclaimer**: This map is an illustrative representation and may not reflect actual peer locations*

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Using Network Insights

- (Always-On) Continuous monitoring and alerting for your BGP advertisements
  - Define policies to automatically alert on unexpected changes or anomalies
  - Detect common BGP issues: route leaks, prefix hijack events, withdrawls

- (Right now) Global BGP Looking Glass
  - Global view of how your BGP advertisements are received
  - Consolidated view of all global looking-glasses

- (History) BGP Update Log (Global BGP History)
  - Forensic view of all observed BGP updates with history

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Crosswork Network Insights – Route Analysis

Unlimited Peer Route Tracking

Peer Alarms

A large routing sensor network

Correlate BGP with other events

Free Access

Paid monitoring options

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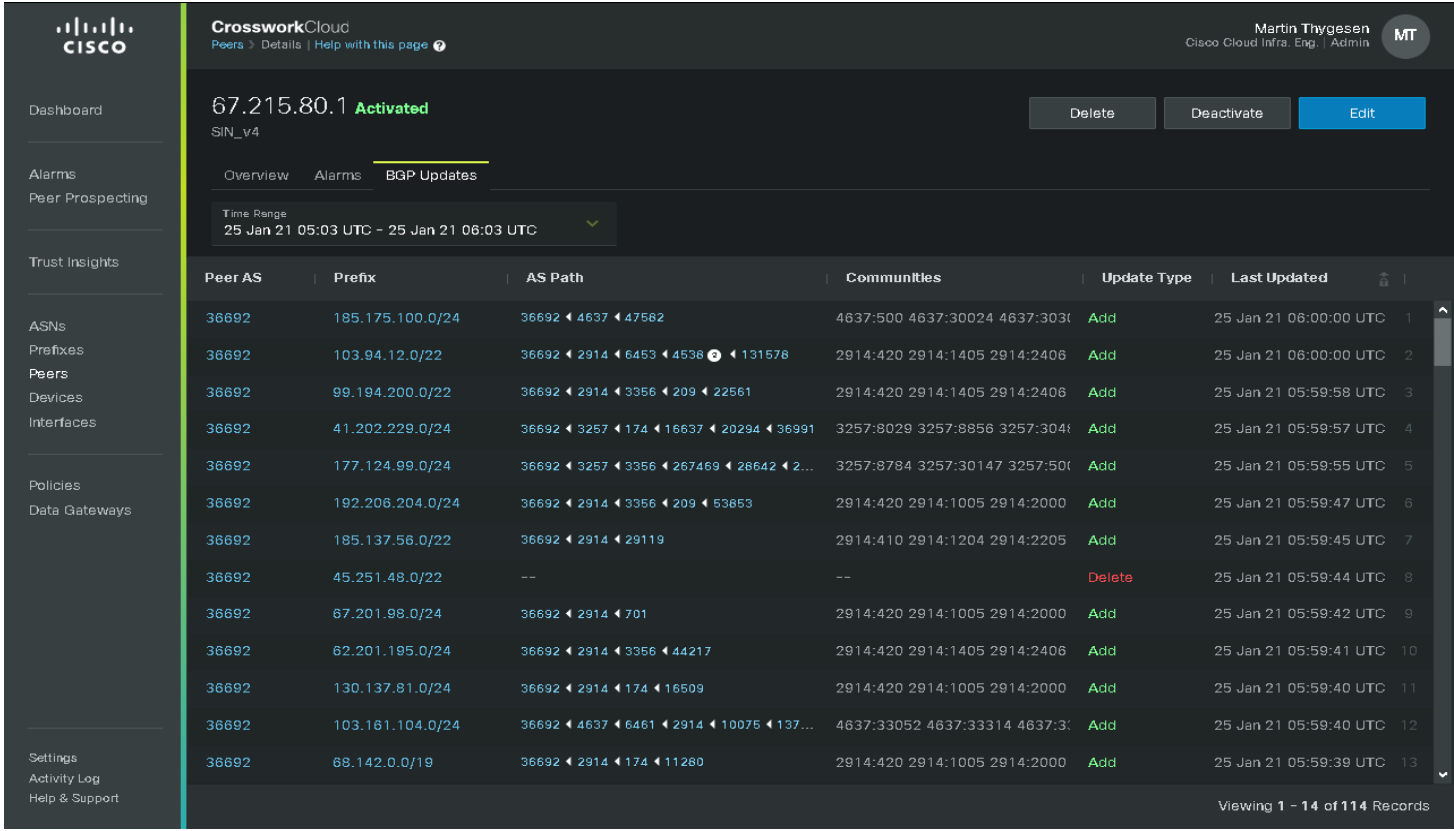
Crosswork Network Insights – Route Analysis

3 months of Route Updates history

Peer ID Information kept private

No cost views of what your routers are advertising



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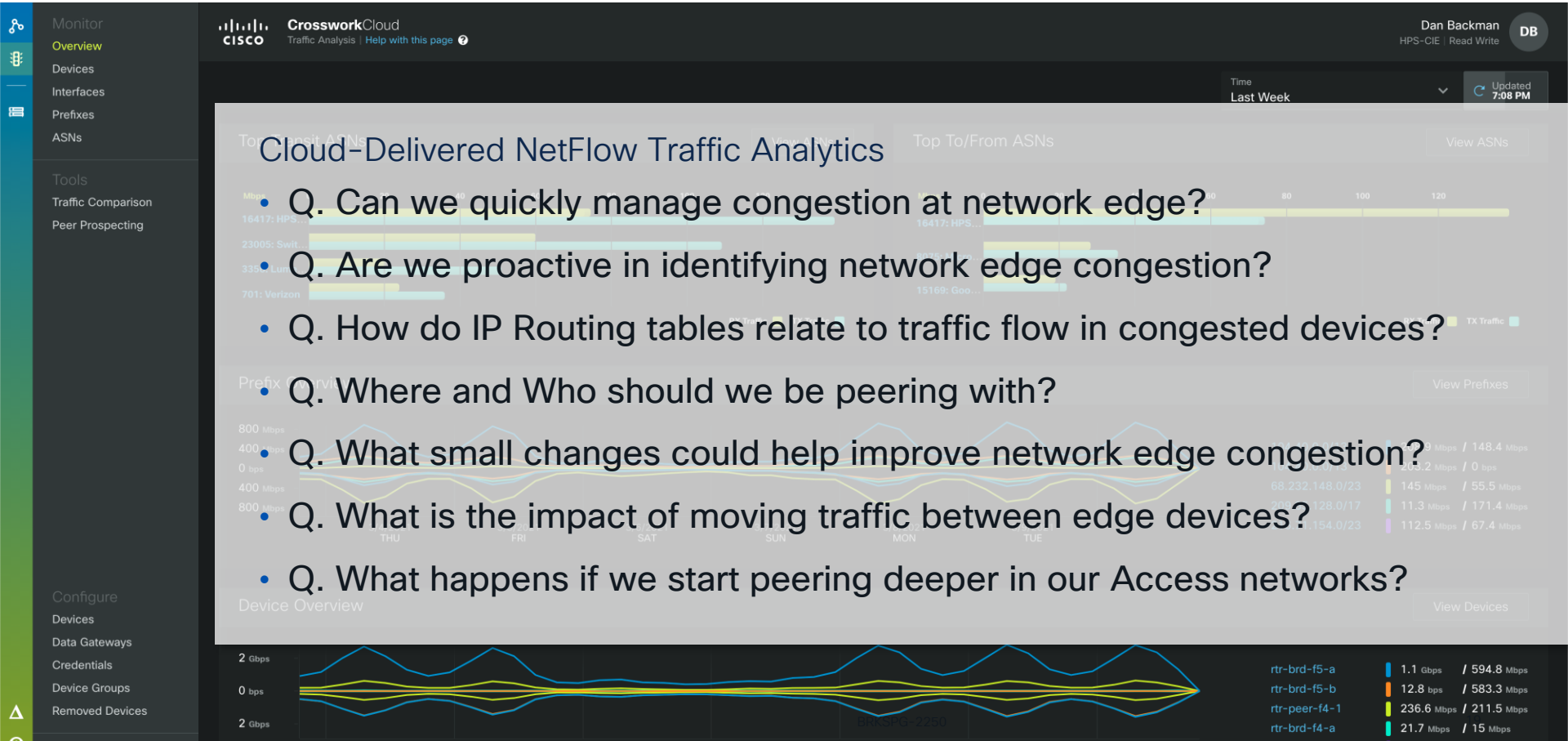
Demo

Network Insights

External BGP Monitoring

Traffic Analysis

Crosswork Traffic Analysis



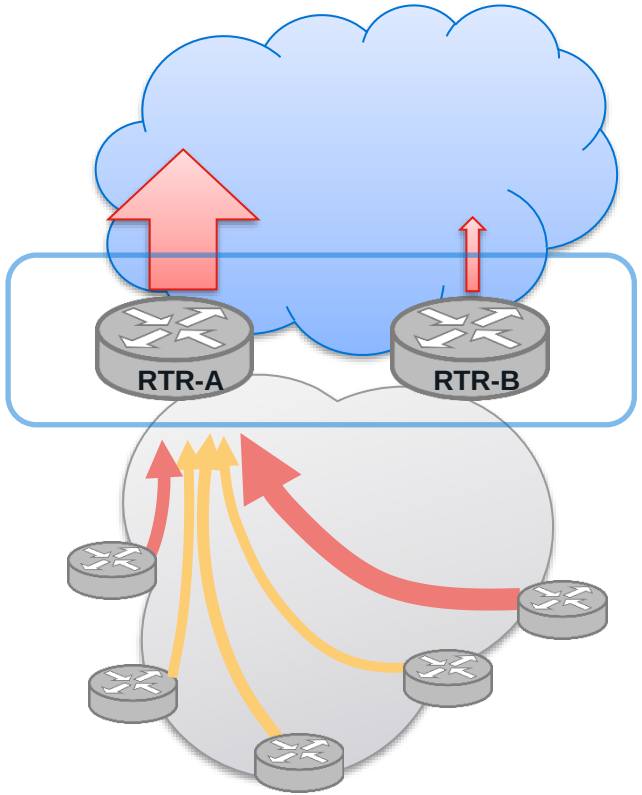
Cloud-Delivered NetFlow Traffic Analytics

- Q. Can we quickly manage congestion at network edge?
- Q. Are we proactive in identifying network edge congestion?
- Q. How do IP Routing tables relate to traffic flow in congested devices?
- Q. Where and Who should we be peering with?
- Q. What small changes could help improve network edge congestion?
- Q. What is the impact of moving traffic between edge devices?
- Q. What happens if we start peering deeper in our Access networks?

Where is Traffic Analysis needed

When Edge Congestion occurs, Operators need to understand the root cause and what actions they can take.

- Network Operators control Routing not Application Protocols
- Protocol Information tells us what the traffic is, but Routing is the key to making changes.
- Network Operators need to understand the source of flows and the size in order to quickly identify what actions can be taken



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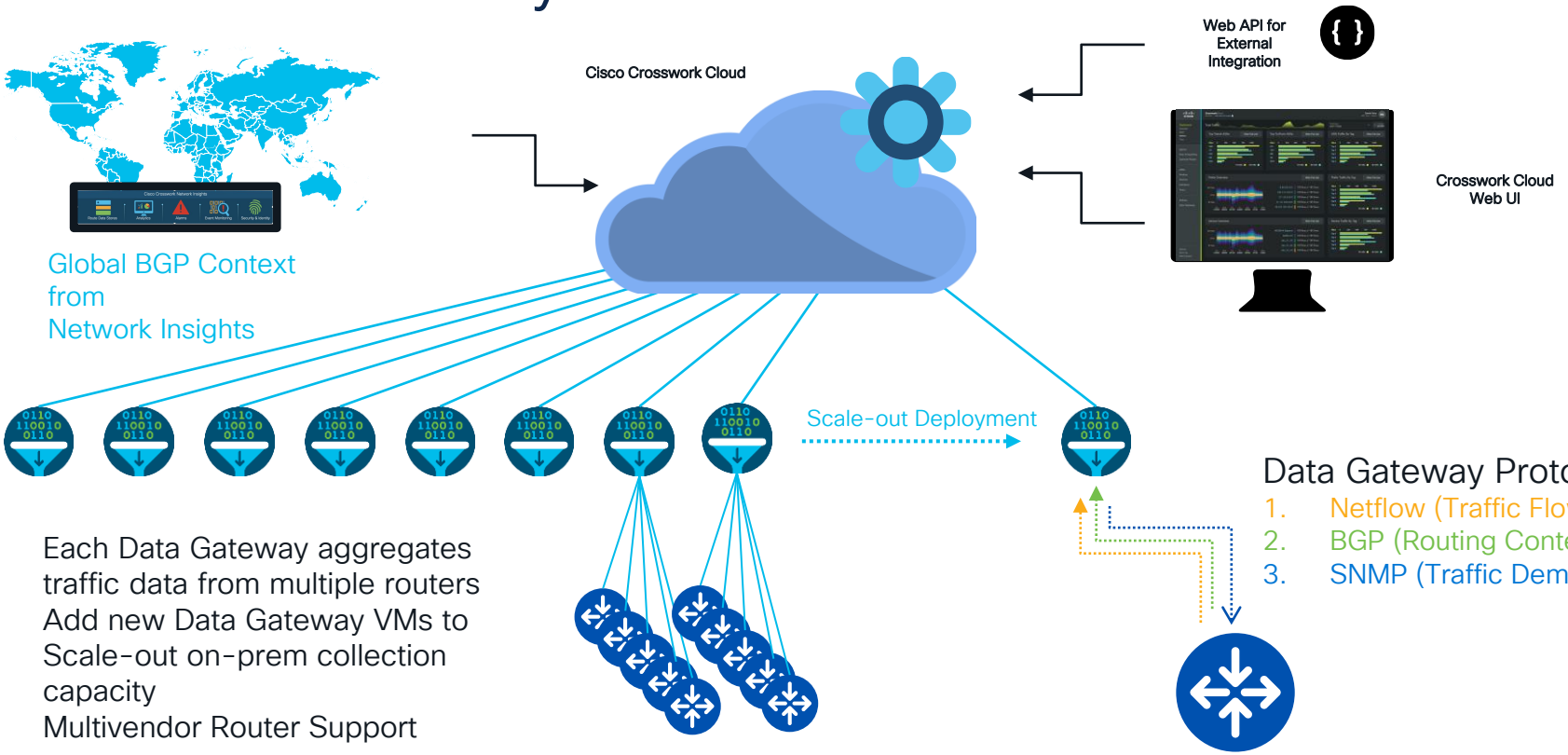
How Traffic Analysis Works



- Each Data Gateway aggregates traffic data from multiple routers
- Add new Data Gateway VMs to Scale-out on-prem collection capacity
- Multivendor Router Support

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Traffic Analysis - ASN and Prefix Analysis

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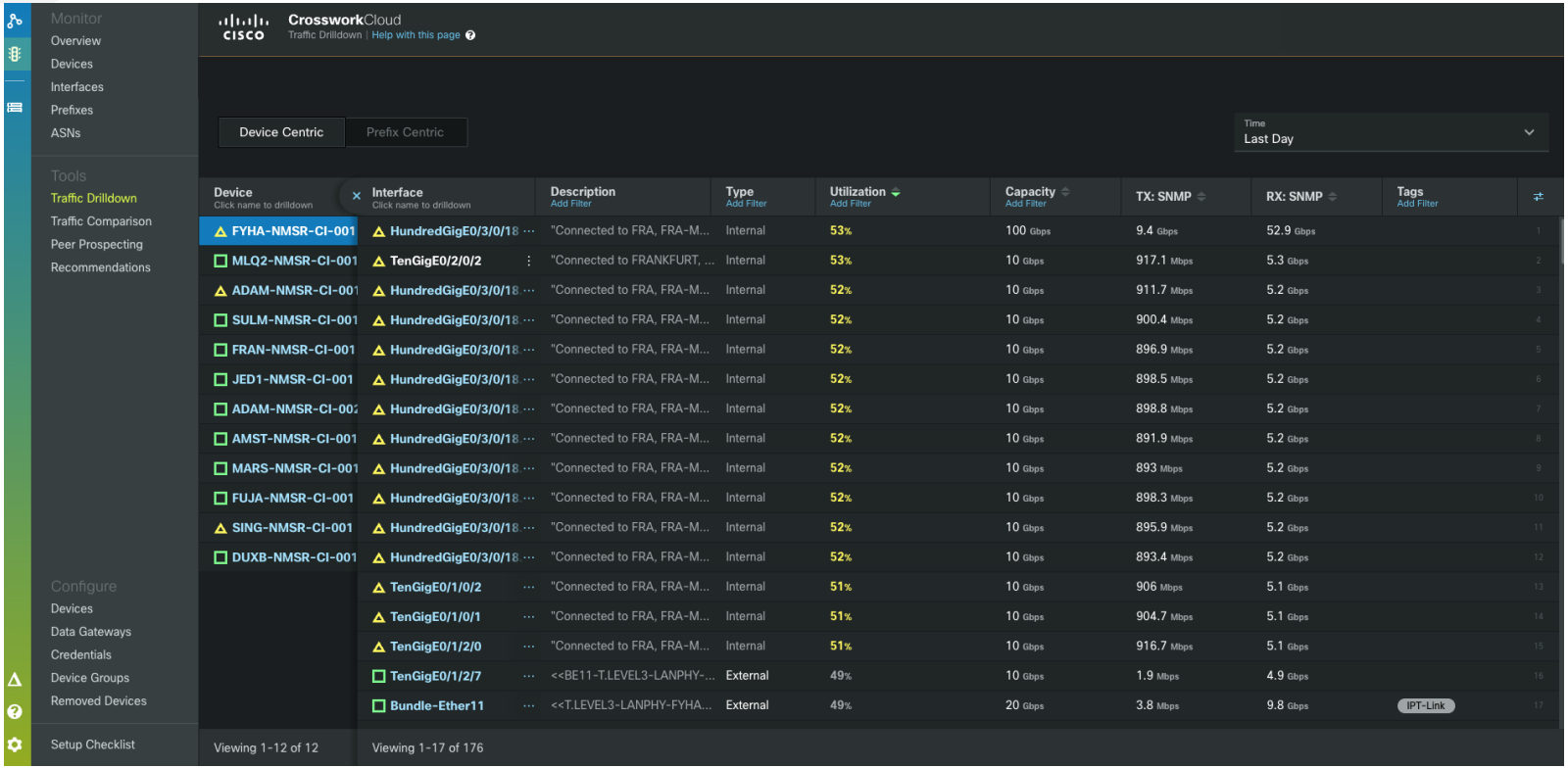
Traffic Analysis – Traffic Drilldown



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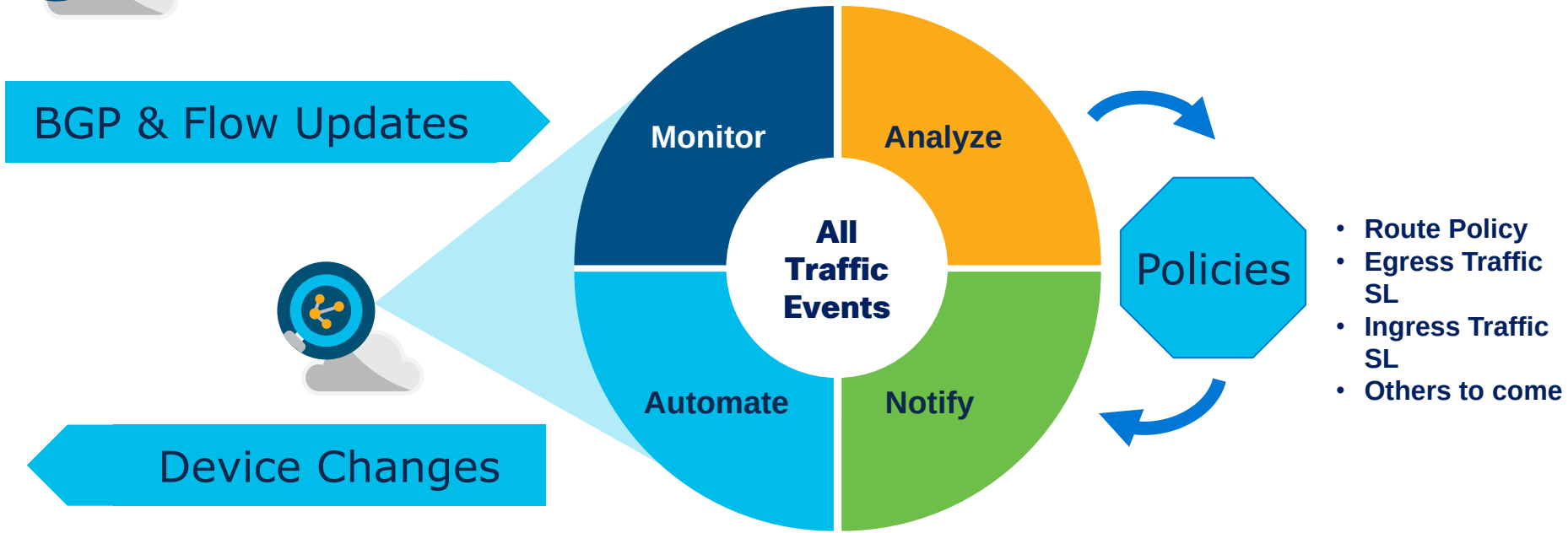
From Analysis to Intent based Automation



- Route Policy
- Egress Traffic SL
- Ingress Traffic SL
- Others to come

Intent is expressed as "What should be "
Policies = Intent, they trigger notification actions
Actions can be Manual or Automated based on business value

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Cloud Benefits: **Data Sharing via Cloud API**

Collaboration

- Cloud service allows shared access between departments within your network (opt-in with vendors or partners) with no additional infrastructure

Cloud-based API access

- Crosswork Cloud can become a data provider for other operational systems
- Common point of integration for API access to inventory data
- Simple integration to external cloud services and SIEM systems

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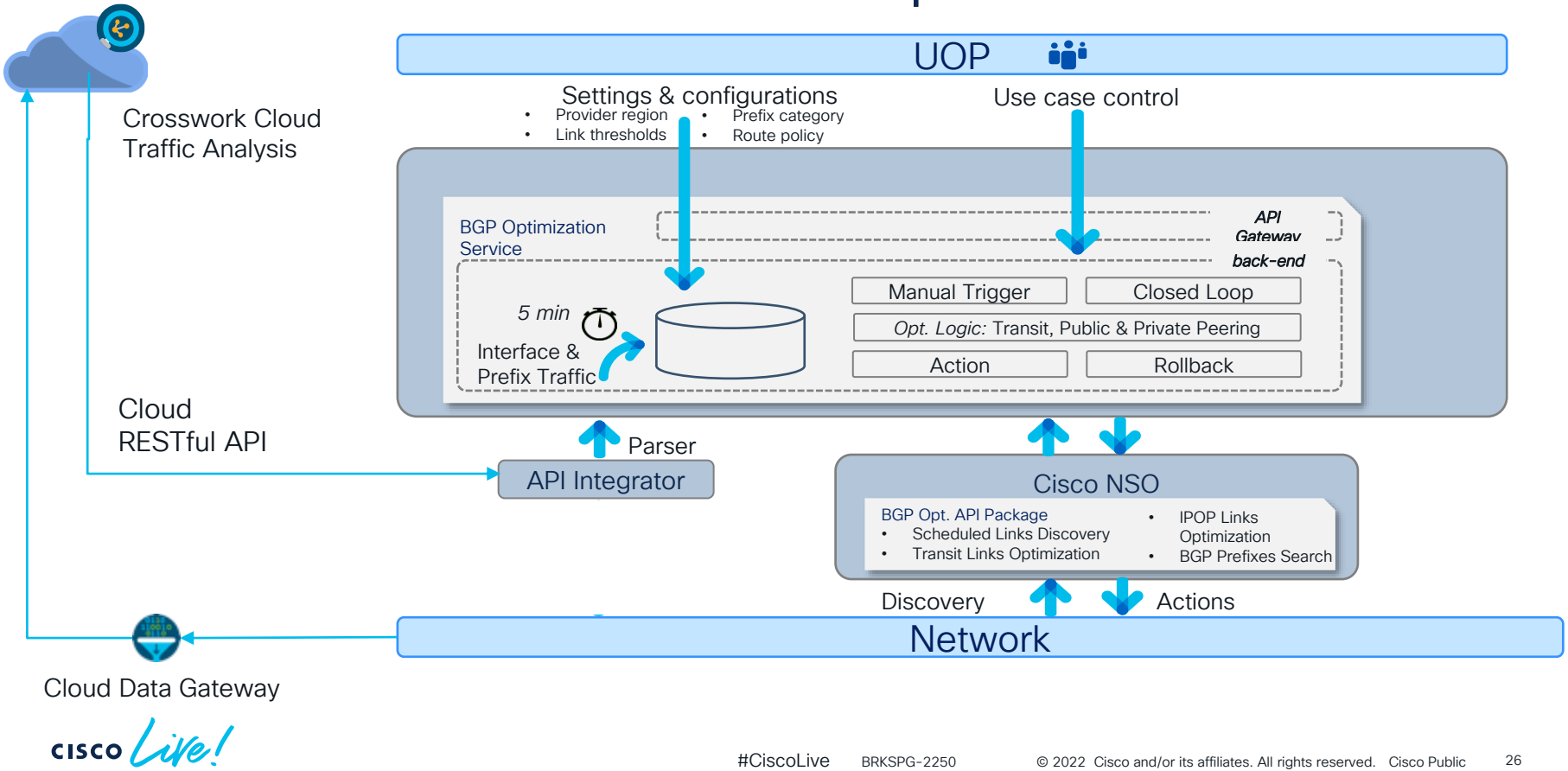
API: SPIS Automated BGP Optimization



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Demo

Traffic Analysis

Netflow Analytics as a Service

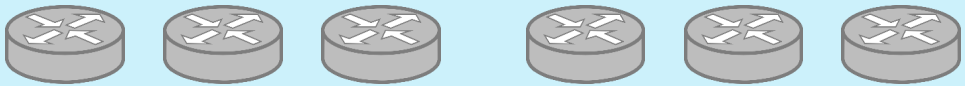
Data Gateway Cloud-to-Ground Connectivity

Connecting Crosswork Cloud to your network

Cisco's Cloud is hosted by Cisco in a secure environment

You need a secure way to connect these two
You need an operationally simple and reliable method to deploy this secure layer
You need a solution that can scale to whatever your network demands are today *and* tomorrow

You have devices in your secure network



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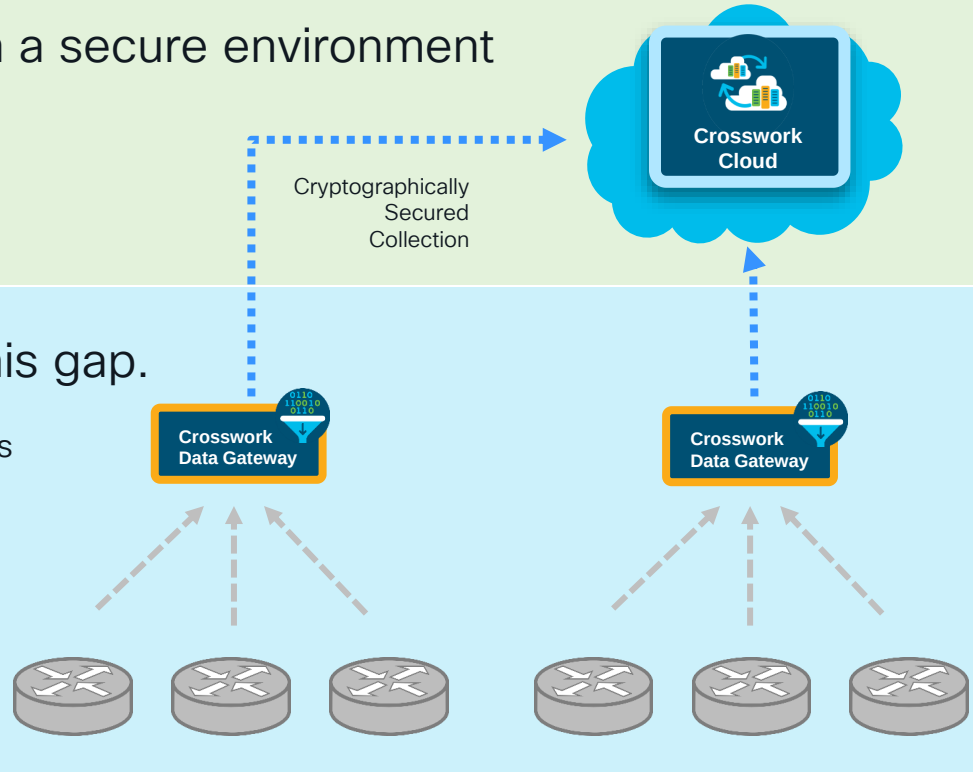
Connecting Cisco's Cloud to your network

Cisco's Cloud is hosted by Cisco in a secure environment



Crosswork Data Gateway bridges this gap.

- **Secure connectivity** to Crosswork Cloud
- **Simple and repeatable** deployment model with VMs
- **Scales** as you grow with a horizontal design
- Deploys **on premise** in your secure network

You have devices in your secure network

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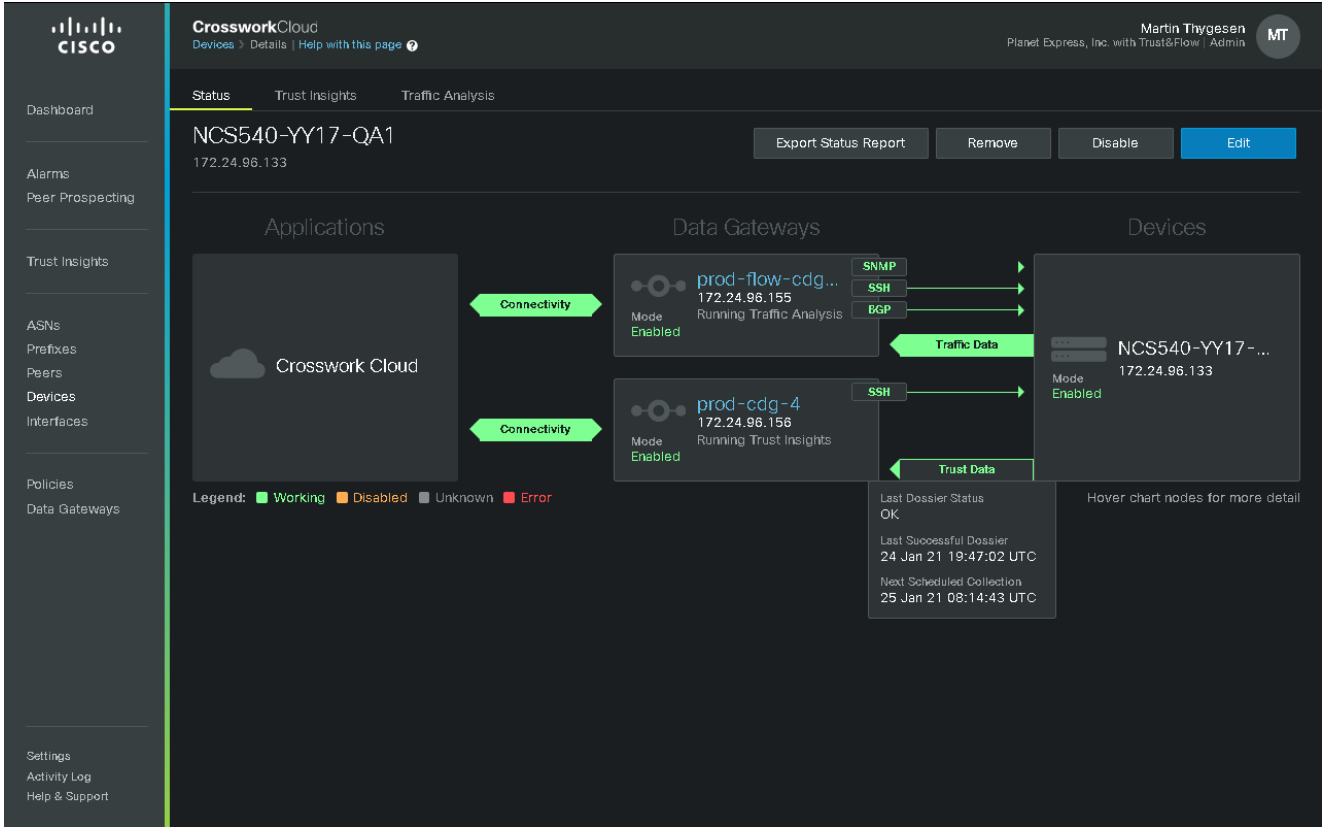
Crosswork Data Gateway

- Visibility of connection state
- Clear linkage between protocol collection and devices
- Platform health, resource management & reporting



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Trust Insights: XR Inventory and Integrity

Crosswork Trust Insights

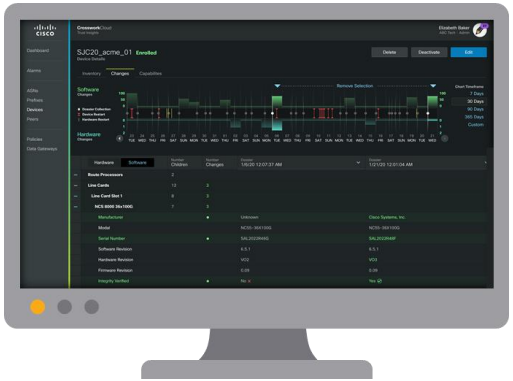
- Cloud-enabled IOS XR 7

Security Capabilities and Software Reporting

- Trust in the network operating system with image signing and secure boot infrastructure
- Trust at runtime with run time defense, encrypted transport, DDoS protection

Trustworthiness Report and Audit

- Visualize and report on the trustworthiness of network infrastructure
- Operation simplicity that provides a source of truth with your infrastructure (hardware, software, runtime)



Forensic Analysis

- Track changes in infrastructure over time
- Cryptographic and verifiable proof of what happened in the past

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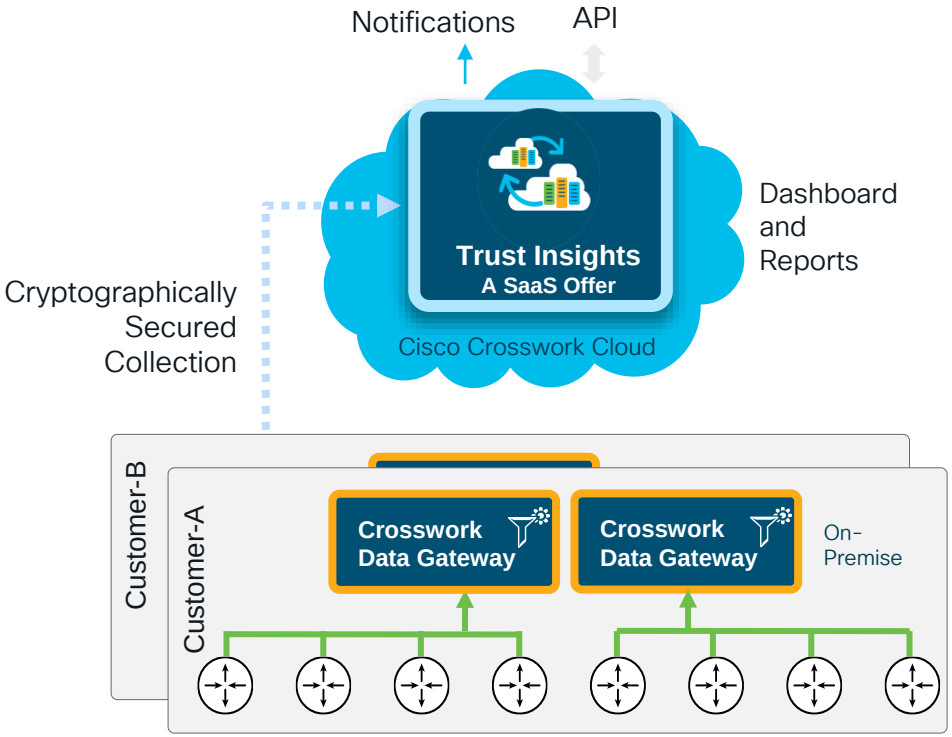
Crosswork Trust Insights Architecture



- On-Premises Data Gateway collects signed trust dossier from IOS XR Routers
- Dossier is human-readable
- Utilizes up-to-date feed of Known-Good-Values (KGV) from IOS XR Build and Regression
- Constantly evolving analytics of hardware and software fingerprints in Cloud Service

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Dashboard
Alarms
Trust Insights
ASNs
Prefixes
Peers
Devices
Policies
Data Gateways
Settings
Activity Log
Help & Support

Status | Trust Insights

NCS8001-Spitfire

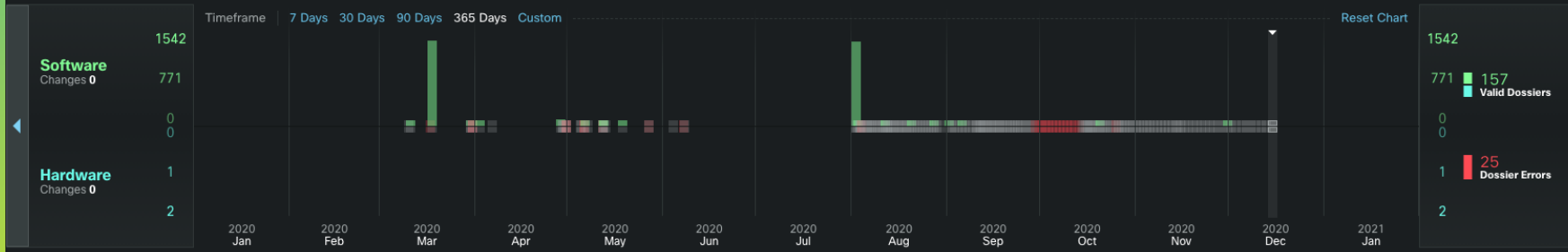
172.27.150.118 SJC20

Collect Dossier | Remove | Disable | Edit

Platform | Inventory | Changes | Capabilities

Model	Location	OS Version	Uptime	Last Successful Dossier	Last Dossier Status	Description
NCS_8000	SJC20	7.0.12	7 weeks, 1 day, 6 hours, 40 minutes	27 day(s) ago	OK	--

Use The Chart Below To Modify Select
12/15/2020 12:20:58 P



Hardware | Software

Quick Search

Package Name	Category	Known Cisco Release	Architecture	Release	Version	Built Time	Hashes Seen
cisco-grub	Os Base	RPM 7.0.12	corei7_64	0.29	1.0	3/9/2020 7:34:48 AM	Details
base-files	Os Base	RPM 7.0.12	wrlsdk_x86	89.7	3.0.14	3/9/2020 7:29:01 AM	Details
kernel-image-bzimage-4.8.28-wr9	Os Base	RPM 7.0.12	wrlsdk_x86	0.169	4.8.28	3/9/2020 7:29:01 AM	Details
kernel-module-br-netfilter	Os Base	RPM 7.0.12	wrlsdk_x86	0.169	4.8.28	3/9/2020 7:29:01 AM	Details
kernel-module-bridge	Os Base	RPM 7.0.12	wrlsdk_x86	0.169	4.8.28	3/9/2020 7:29:01 AM	Details
kernel-module-cdc-eem	Os Base	RPM 7.0.12	wrlsdk_x86	0.169	4.8.28	3/9/2020 7:29:01 AM	Details
kernel-module-cisco-fpga-qspi	Os Base	RPM 7.0.12	wrlsdk_x86	0.65	1.0	3/9/2020 7:29:01 AM	Details

Monitor
Overview
Devices

Tools
Device Comparison
Find Package
Find Hardware
Find Files

Configure
Devices
Data Gateways
Credentials
Known Good Files

Find Files

Locate files by entering a hash, file and path, or search by device.

Find By Hash | Find By Device

Device Type: ASR 9000v

Mismatch: Include | Exclude — Runtime

Add Filter

Device Name	Path	Node	Device Model	OS Version	Tags	Mismatch Status
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003						Runtime
XRv9K-003	/bin/cp.coreutils	0/RP0/CPU0	ASR 9000v	7.2.1.31I	SJC	Runtime

File Signature Analysis : bash

Historical details and other devices where the file appears.

History | Seen Elsewhere

Path: /bin
Package Name: host
KGV Release: 7.2.1
Package Version: --

Device	Node	KGV Hash	Ondisk Hash	Running Hash	Dossier Collec...
XRv9K-003	0/0/CPU0	63330895728ee92eea	--	04eb5c647a20c5b0	1/12/2021 11:18:01...
XRv9K-003	0/RP0/CPU0	63330895728ee92eea	--	04eb5c647a20c5b0	1/12/2021 11:18:01...
XRv9K-004	0/0/CPU0	63330895728ee92eea	--	04eb5c647a20c5b0	1/12/2021 11:18:01...
XRv9K-004	0/RP0/CPU0	63330895728ee92eea	--	04eb5c647a20c5b0	1/12/2021 11:18:01...

Viewing 1-4 of 8

Close

Operational Intelligence as a Service

- Always-On, Automated KGV Feeds, Up-to-Date Analytics
- No software to deploy and maintain
- Instant Integration, Continuous Improvement
- Reduced Operational Cost and Seamless Scalability

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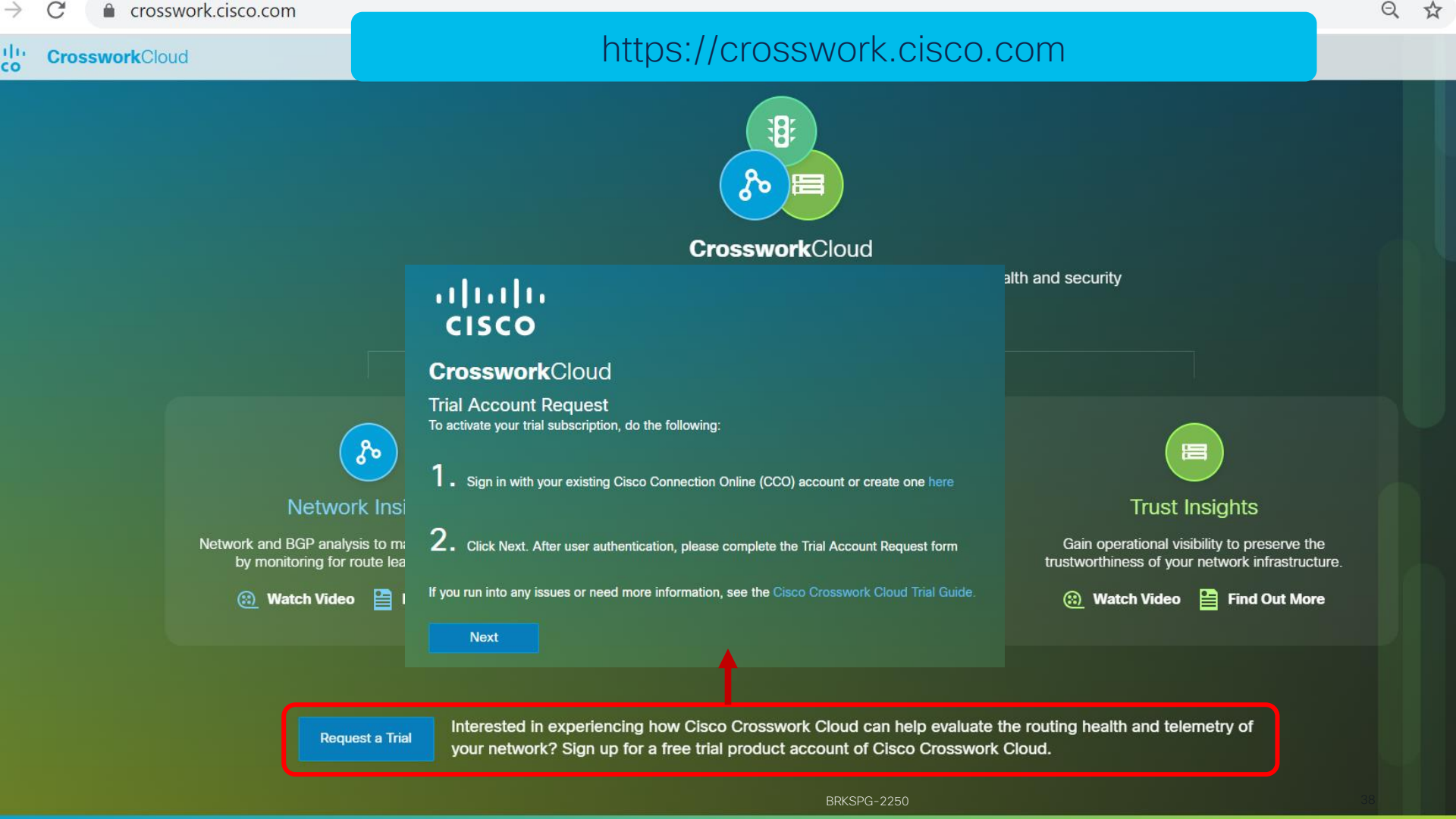
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CISCO
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Trial Account Request
To activate your trial subscription, do the following:
1. Sign in with your existing Cisco Connection Online (CCO) account or create one here
2. Click Next. After user authentication, please complete the Trial Account Request form
If you run into any issues or need more information, see the Cisco Crosswork Cloud Trial Guide.
Next
Network Insi
Network and BGP analysis to ma
by monitoring for route lea
Watch Video
Trust Insights
Gain operational visibility to preserve the
trustworthiness of your network infrastructure.
Watch Video
Find Out More
Request a Trial
Interested in experiencing how Cisco Crosswork Cloud can help evaluate the routing health and telemetry of your network? Sign up for a free trial product account of Cisco Crosswork Cloud.

Crosswork gives you a comprehensive toolkit

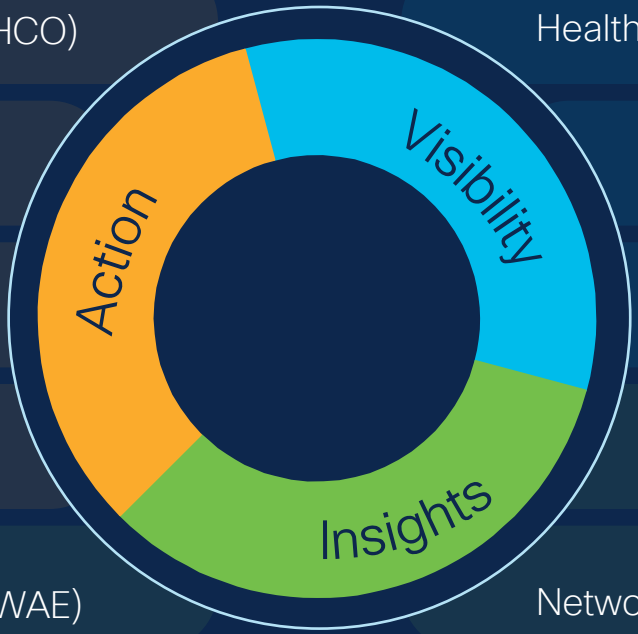
Hierarchical controller (HCO)

Network controller (CNC)

Infrastructure automation (NSO)

Element management (EPNM)

Network Planning (WAE)



Health insights

Service assurance

Discovery (EPNM)

Traffic analysis

Network Insights

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- These points help you get on the leaderboard and increase your chances of winning daily and grand prizes.

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