



The bridge to possible

Eliminate Congestion Surprises and Fire Drills Forever with Crosswork Cloud - Traffic Analysis as a Service

Cisco Knowledge Webinar

December 2, 2021

Today's Presenters



John Malzahn
Leader, Service Provider
Product Marketing



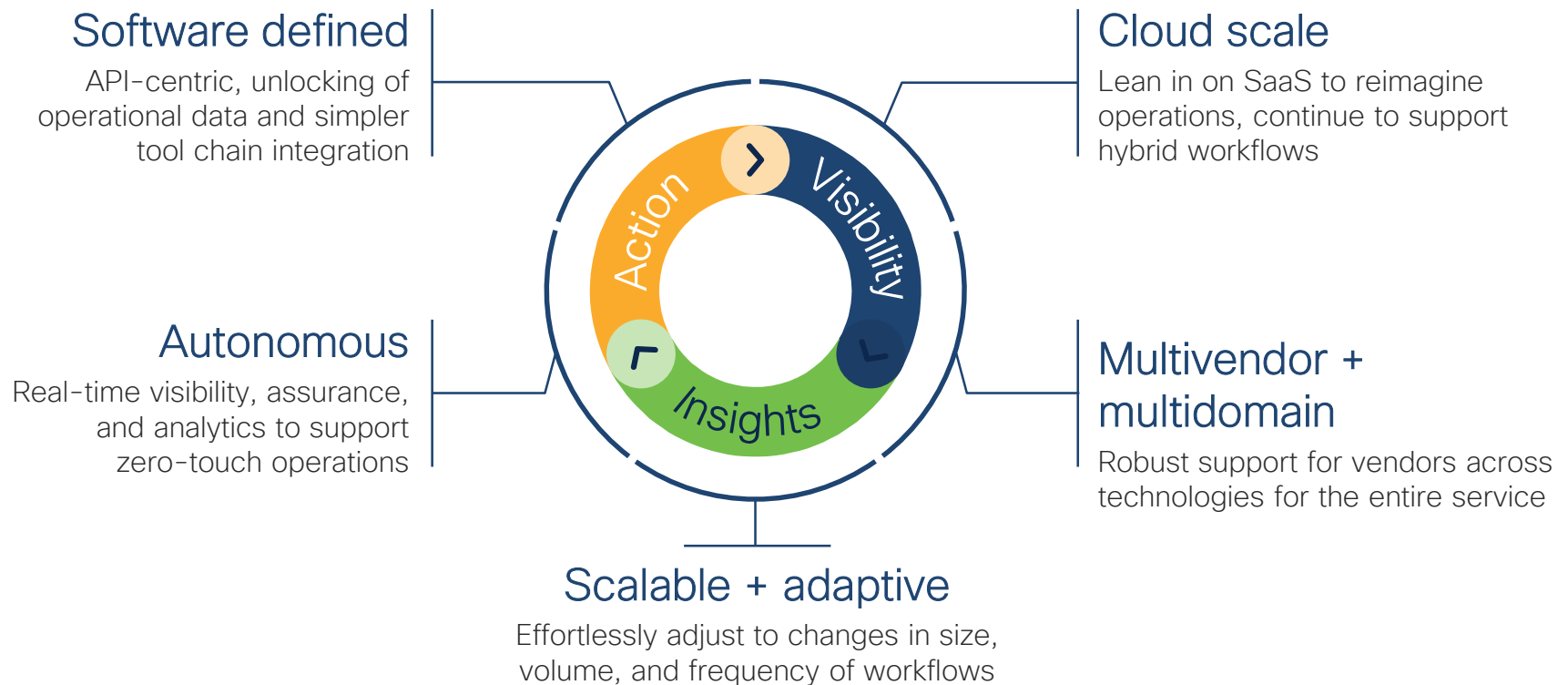
Martin Thygesan
Product Management
Leader, Crosswork
Cloud



Agenda

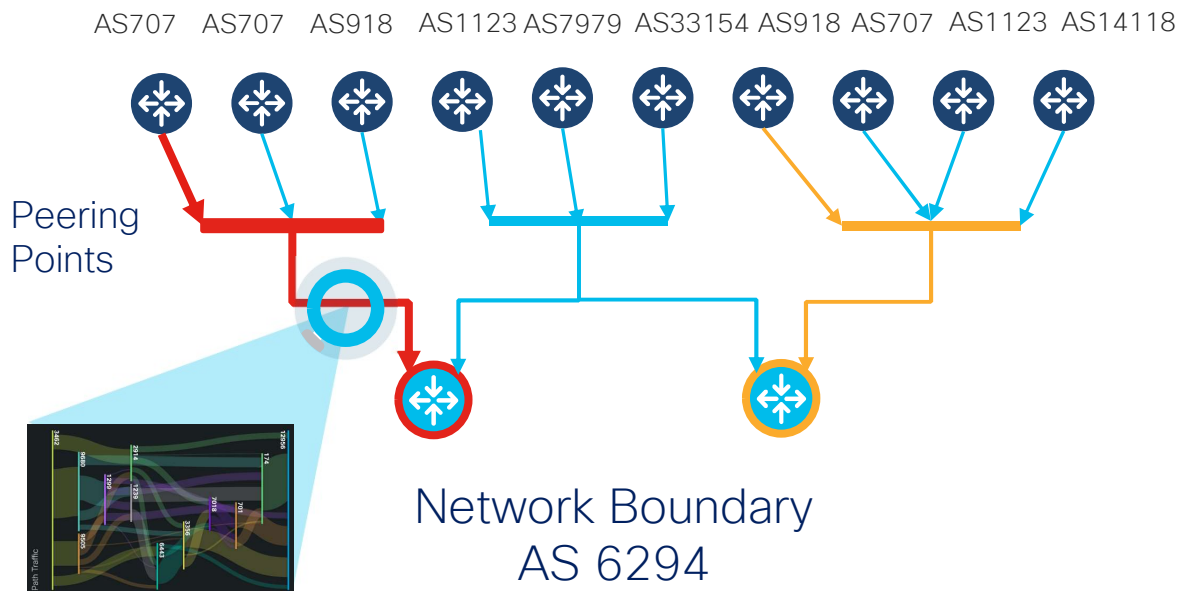
- Cloud as a Service Platform
- Route Analysis as-a-Service
- Traffic Analysis as-a-Service
- Cloud-to-Ground: Data Gateway
- What Next
- Conclusion

Crosswork Network Automation



Crosswork Cloud – Traffic Analysis

What's the challenge?



Business Outcomes

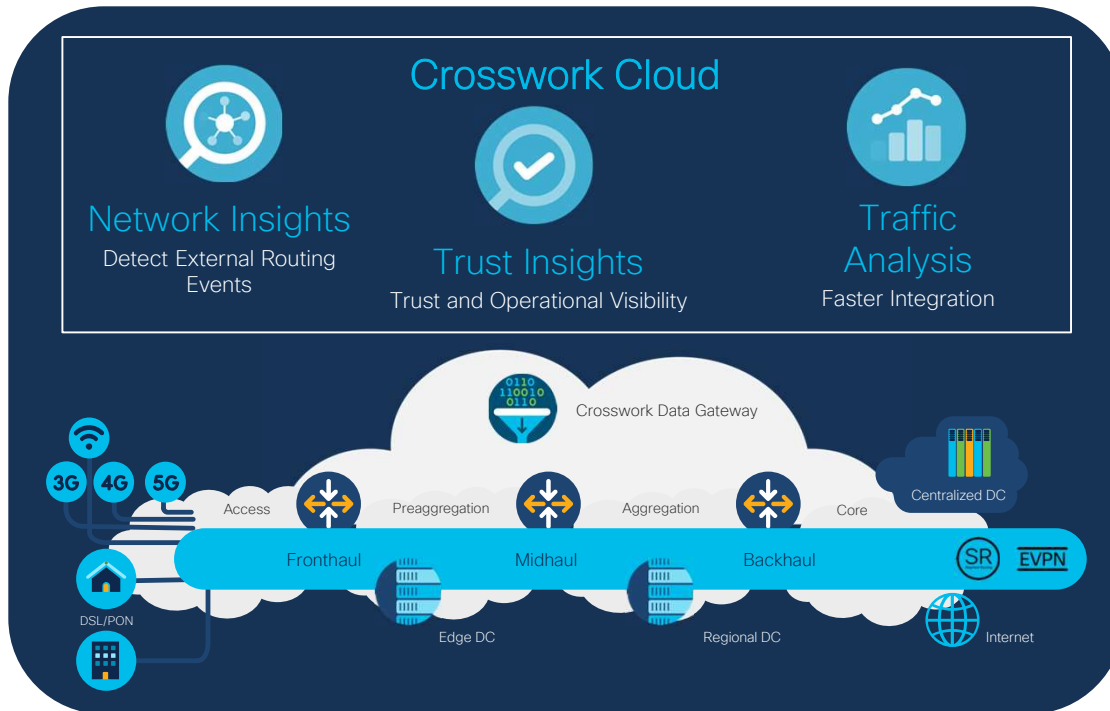
Improve Customer Experience
Peering recommendations to improve traffic
Identify hijacks & route leaks

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

Analytics and Automation in the Cloud

The Future of Network Operations



Advantages

- Immediate ROI
- Unified Operational Intelligence
- Low Insertion Costs
- Lowers Risk

Enhance Network Security with Crosswork Cloud



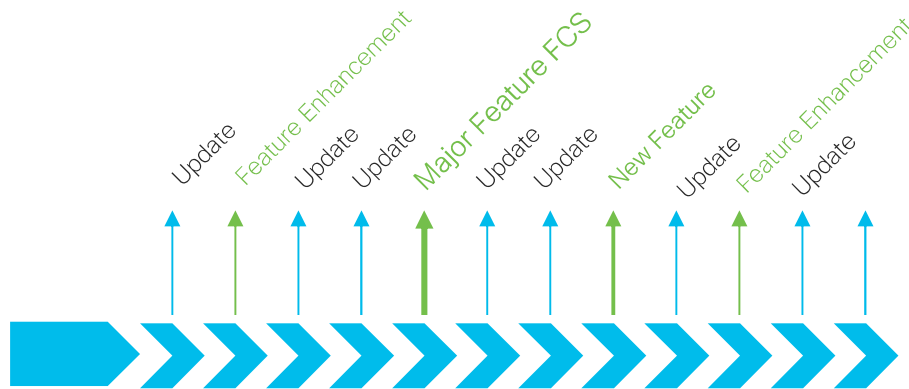
Cloud-enhanced operations

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



A new way to consume software as a service

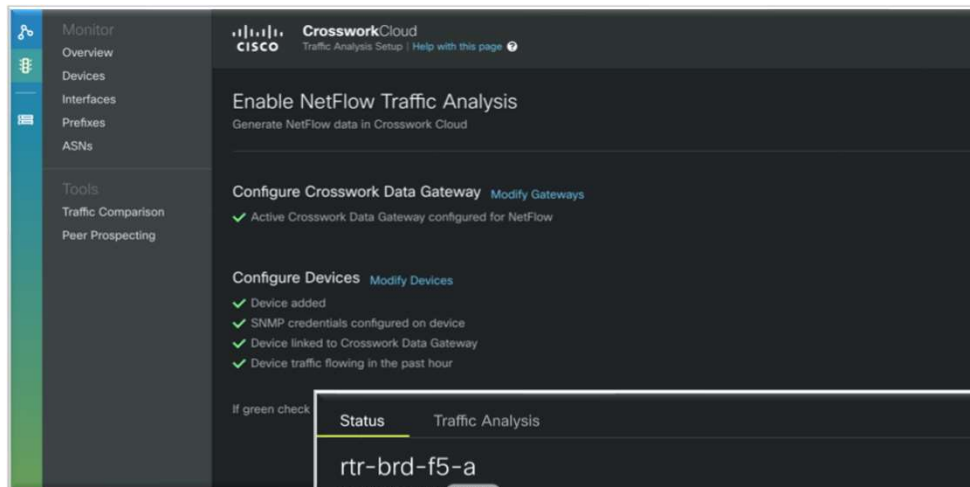


Continuous delivery of new features and software updates to the production cloud service.

No user testing or software maintenance required.

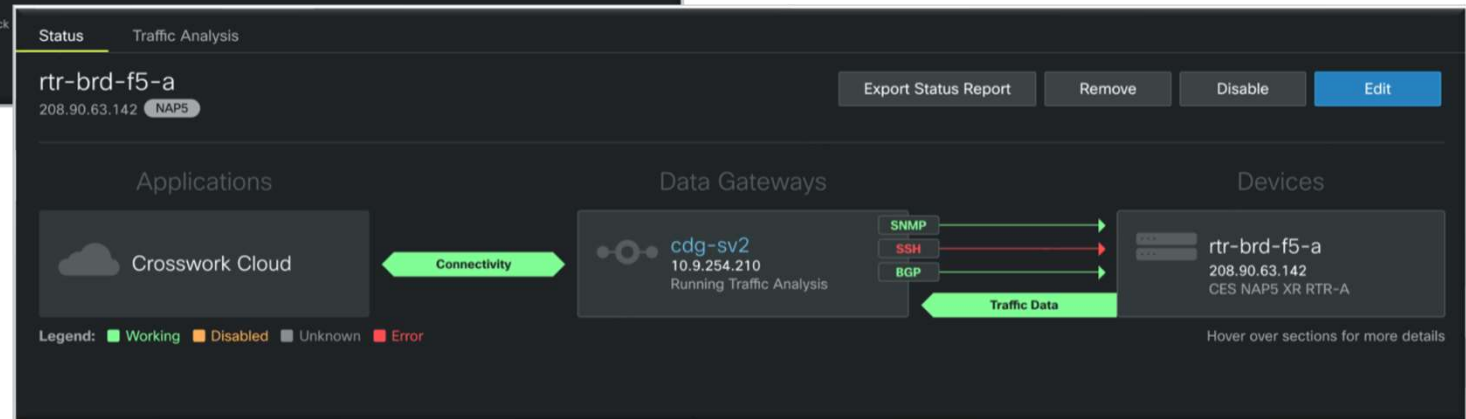
- Software delivered and maintained by Cisco
- Continuous (Weekly) delivery pipeline to production service
- Continuous pipeline for new features and fixes
- No customer action required for ongoing maintenance or upgrades

Designed for Ease of Use and Supportability



Designed for fast time-to-value

- Self-Guided Deployment
- Built-in connectivity diagnostics



Crosswork Cloud: Operational Intelligence Platform

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

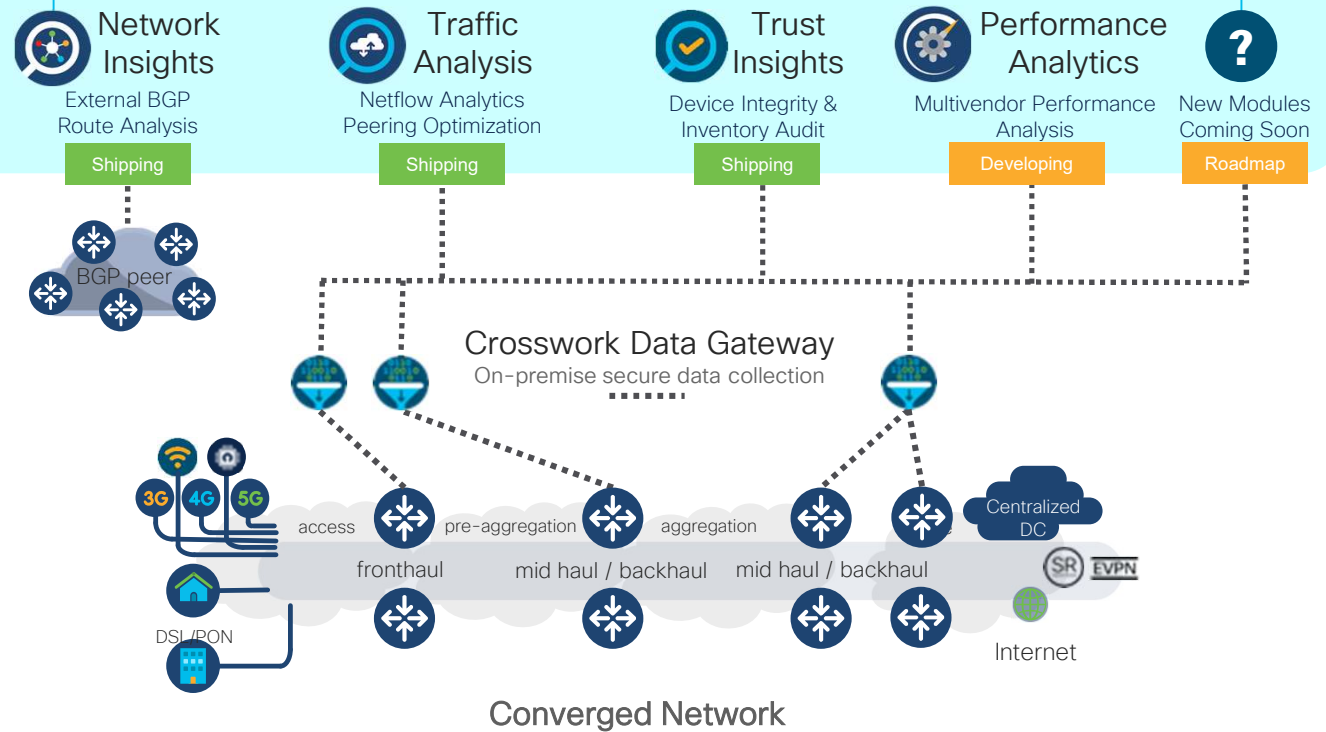
Operational Intelligence

- Multiplatform Routing and Traffic Analytics
- Multivendor
- Multidomain
- IOS Device Insights and Analytics

Integrated Collaboration tools

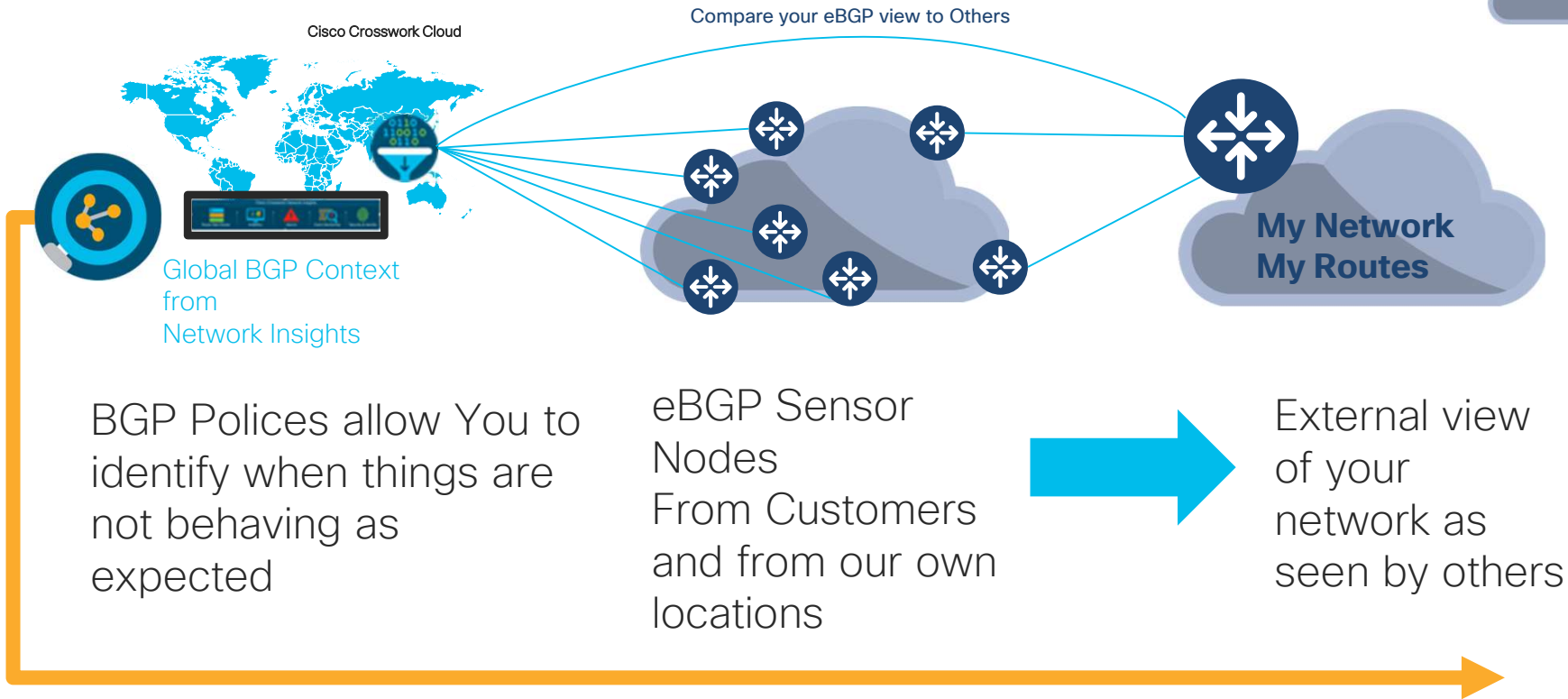


One Portal <https://crosswork.cisco.com>



Network Insights External BGP Analysis

External Route Analysis at Cloud Scale



Crosswork Network Insights – Route Analysis

- A cloud-based SaaS offer that provides routing analysis and edge BGP event detection

Customer Challenges:

Know what changed and when?

Know what routes your Routers are advertising and receiving

What is happening to my routes outside my network?

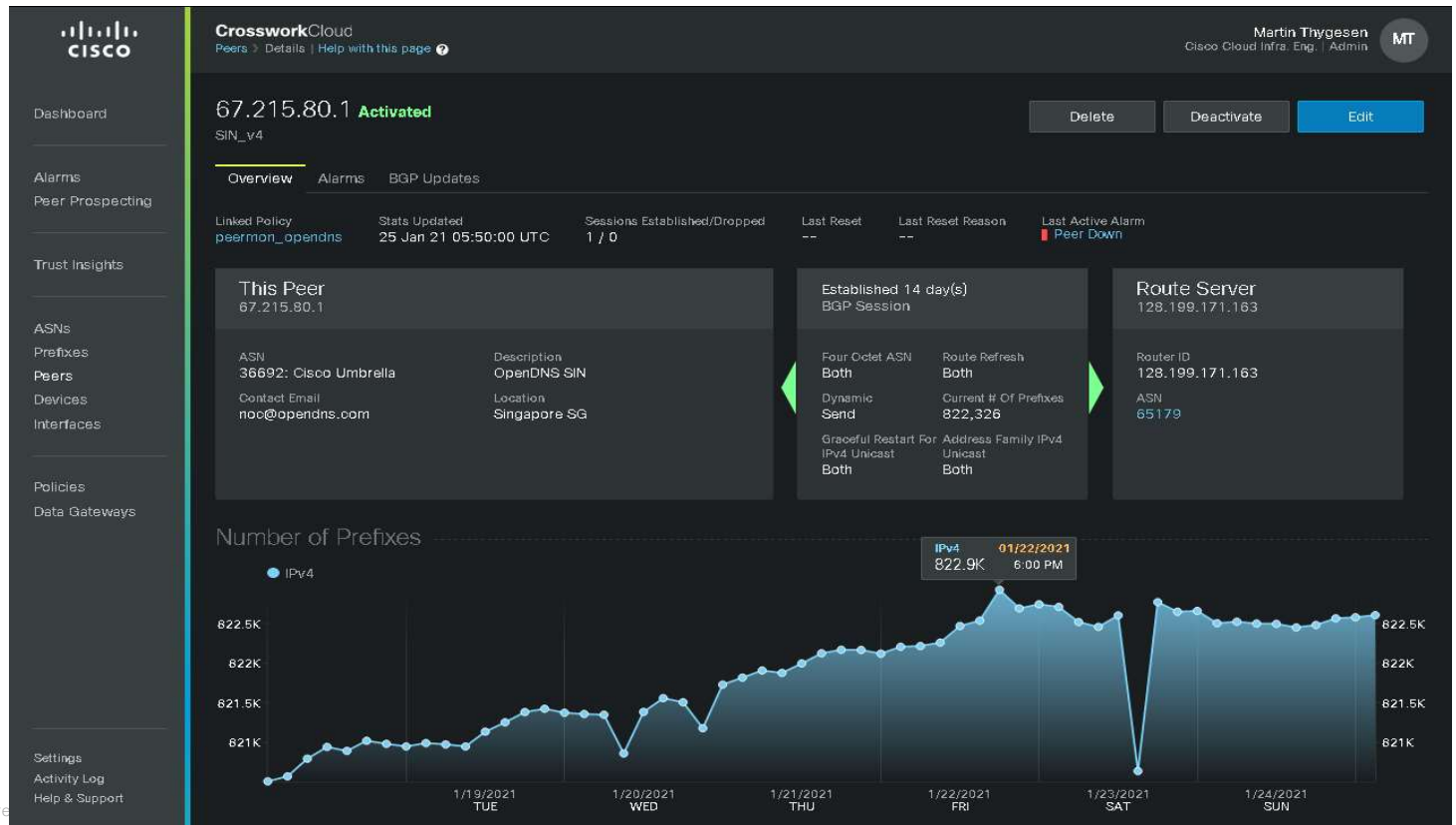
Check your Route Registration Data is up to date

How do I know when key customer content networks are impacted and why



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



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

CrossworkCloud
Peers > Details | Help with this page

Martin Thygesen
Cisco Cloud Infra. Eng. | Admin

67.215.80.1 **Activated**
SIN_v4

Overview Alarms **BGP Updates**

Time Range
25 Jan 21 05:03 UTC - 25 Jan 21 06:03 UTC

Peer AS	Prefix	AS Path	Communities	Update Type	Last Updated
36692	185.175.100.0/24	36692 < 4637 < 47562	4637:500 4637:30024 4637:303f	Add	25 Jan 21 06:00:00 UTC
36692	103.94.12.0/22	36692 < 2914 < 6453 < 4536 < 131576	2914:420 2914:1405 2914:2406	Add	25 Jan 21 06:00:00 UTC
36692	99.194.200.0/22	36692 < 2914 < 3356 < 209 < 22561	2914:420 2914:1405 2914:2406	Add	25 Jan 21 05:59:58 UTC
36692	41.202.229.0/24	36692 < 3257 < 174 < 16637 < 20294 < 36991	3257:8029 3257:8856 3257:304f	Add	25 Jan 21 05:59:57 UTC
36692	177.124.99.0/24	36692 < 3257 < 3356 < 267469 < 28642 < 2...	3257:8784 3257:30147 3257:50f	Add	25 Jan 21 05:59:55 UTC
36692	192.206.204.0/24	36692 < 2914 < 3356 < 209 < 53853	2914:420 2914:1005 2914:2000	Add	25 Jan 21 05:59:47 UTC
36692	185.137.56.0/22	36692 < 2914 < 29119	2914:410 2914:1204 2914:2205	Add	25 Jan 21 05:59:45 UTC
36692	45.251.48.0/22	--	--	Delete	25 Jan 21 05:59:44 UTC
36692	67.201.98.0/24	36692 < 2914 < 701	2914:420 2914:1005 2914:2000	Add	25 Jan 21 05:59:42 UTC
36692	62.201.195.0/24	36692 < 2914 < 3356 < 44217	2914:420 2914:1405 2914:2406	Add	25 Jan 21 05:59:41 UTC
36692	130.137.81.0/24	36692 < 2914 < 174 < 16509	2914:420 2914:1005 2914:2000	Add	25 Jan 21 05:59:40 UTC
36692	103.161.104.0/24	36692 < 4637 < 6461 < 2914 < 10075 < 137...	4637:33052 4637:33314 4637:3f	Add	25 Jan 21 05:59:40 UTC
36692	68.142.0.0/19	36692 < 2914 < 174 < 11280	2914:420 2914:1005 2914:2000	Add	25 Jan 21 05:59:39 UTC

Viewing 1 - 14 of 114 Records

Demo

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Network Insights
External BGP Monitoring

Traffic Analysis

Netflow Analytics as a Service

Crosswork Traffic Analysis



CrossworkCloud
Traffic Analysis | Help with this page

Time: Last Week | Updated: 7:08 PM

Top To/From ASNs

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?

Device Overview

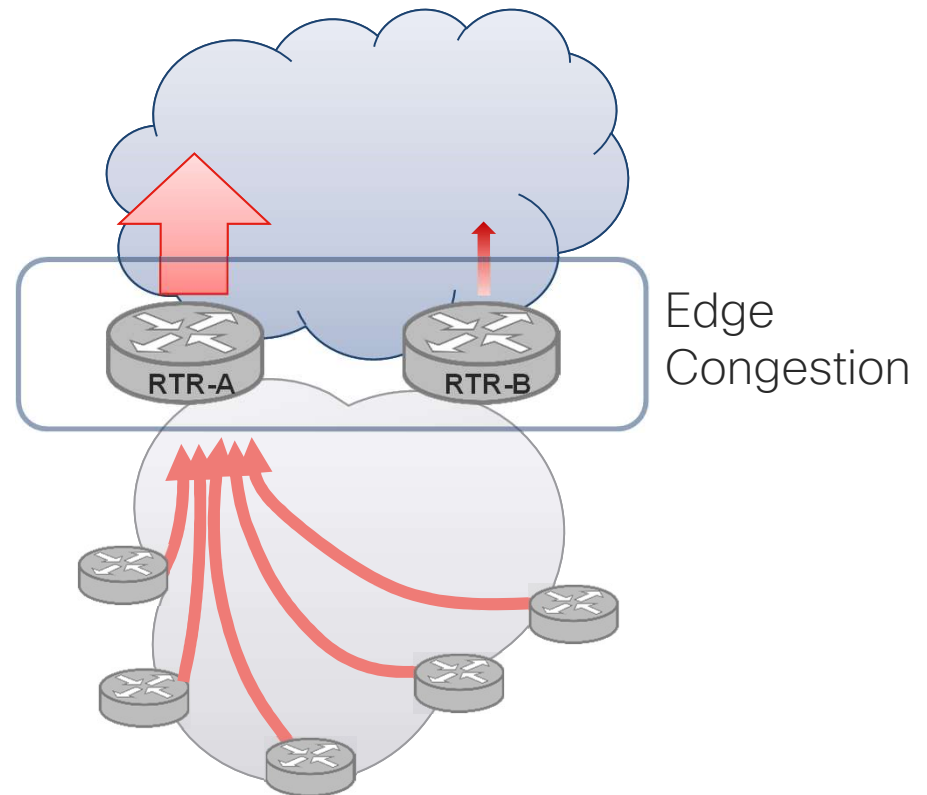
Device	Current	Max
rtr-brd-f5-a	1.1 Gbps	594.8 Mbps
rtr-brd-f5-b	12.8 bps	583.3 Mbps
rtr-peer-f4-1	236.6 Mbps	211.5 Mbps
rtr-brd-f4-a	21.7 Mbps	15 Mbps

Where is Traffic Analysis needed?



Network Edge Congestion occurs where two or more different networks interact

- Most network protocols will seek a common transit point
- This leads to under used assets and accelerated congestion
- This problem applies to Enterprise, Service Provider and Overlay Networks

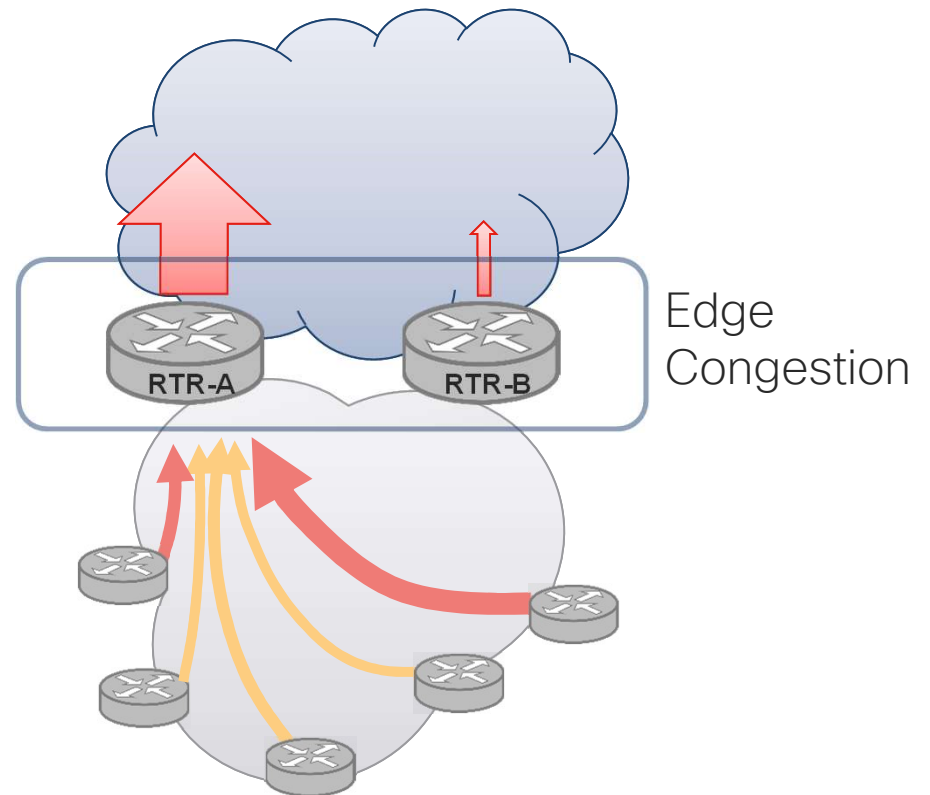




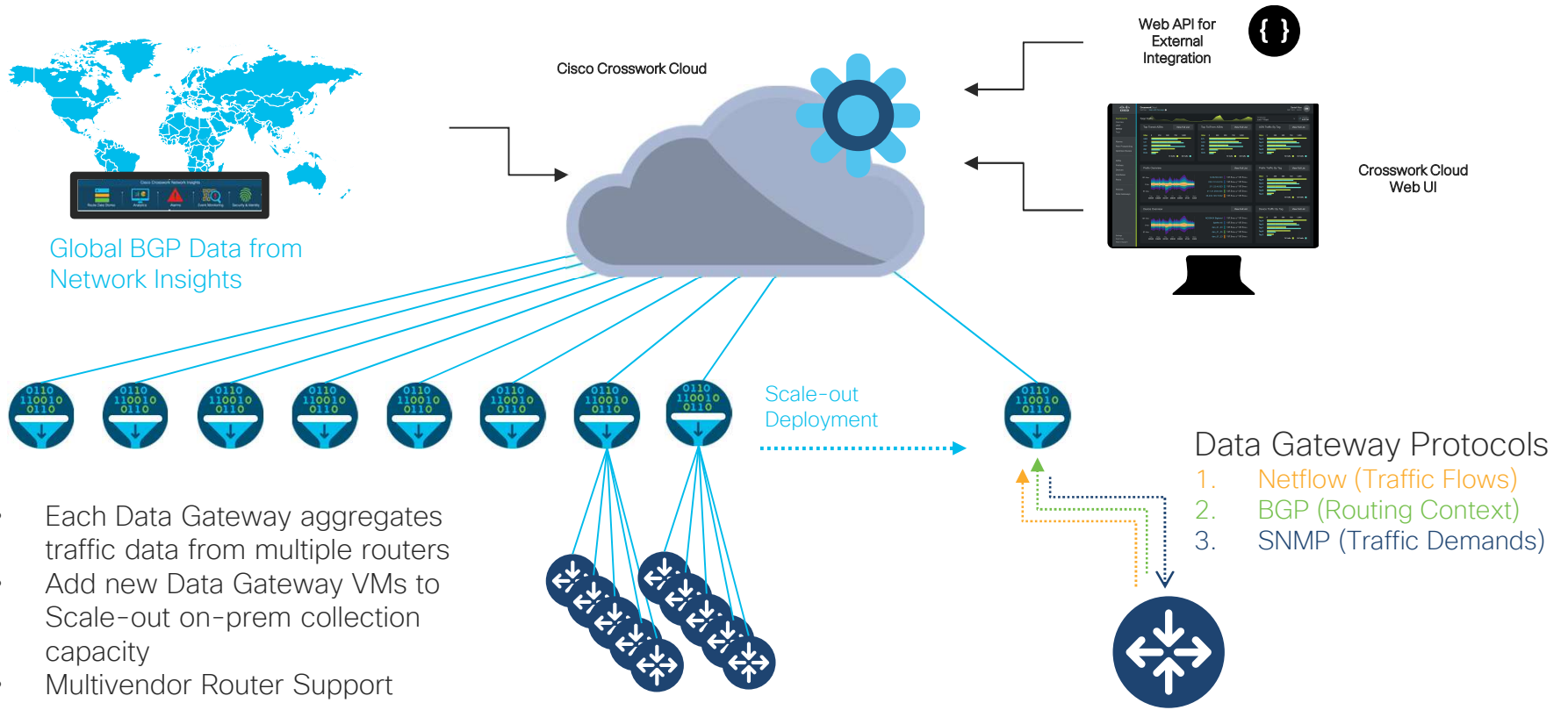
Where is Traffic Analysis needed?

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



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

Connecting Cisco's Cloud to your network

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



Cryptographically Secured Collection

Via Internet

Via AWS direct connect

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



Crosswork Traffic Analysis – Key use cases



Crosswork Cloud
Traffic Analytics

Traffic Matrix Visibility	Natively integrate with multiple vendor platforms to get a unified view of the traffic matrix
Top X Visibility	Automatically Identify Top X IP Routes which are consuming network capacity in different locations and directions.
Monitor Critical Flows	Search for Critical Networks using multiple methods – locate key services using ASN and IP Route Prefix information combined with WHOIS and IANA registration data.
Device Statistics	Congestion Awareness by identifying which Devices and Interfaces are congested, map device groups and interface functions to quickly locate opportunities to mitigate congestion.
Peering Prospects	Recommend who to Peer with by analyzing BGP path information and Top talkers to better understand opportunities to improve peering locations and ASN candidates.
Peering Engineering	Network Congestion for network boundaries is often the result of a poor distribution of traffic over edge devices. The cloud-enabled analytics continuously recommends routing changes to better influence flows through groups of edge devices.
Event Thresholds and Alarms	Cloud based event rules and alarms to detect when traffic event thresholds are identified and relay notifications to different endpoint types based on a policy workflow to trigger automated and manual actions.

Crosswork Data Gateway

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

The screenshot displays the Cisco CrossworkCloud interface for a device named NCS540-YY17-QA1 (IP: 172.24.96.133). The interface is divided into three main sections: Applications, Data Gateways, and Devices.

- Applications:** Shows 'Crosswork Cloud' with two green 'Connectivity' arrows pointing to the Data Gateways.
- Data Gateways:** Shows two gateways: 'prod-flow-cdg...' (IP: 172.24.96.155, Mode: Enabled, Running Traffic Analysis) and 'prod-edg-4' (IP: 172.24.96.156, Mode: Enabled, Running Trust Insights). The first gateway has protocols SNMP, SSH, and BGP. The second gateway has SSH.
- Devices:** Shows the device NCS540-YY17-... (IP: 172.24.96.133, Mode: Enabled). It receives 'Traffic Data' from the first gateway and sends 'Trust Data' to the second gateway.

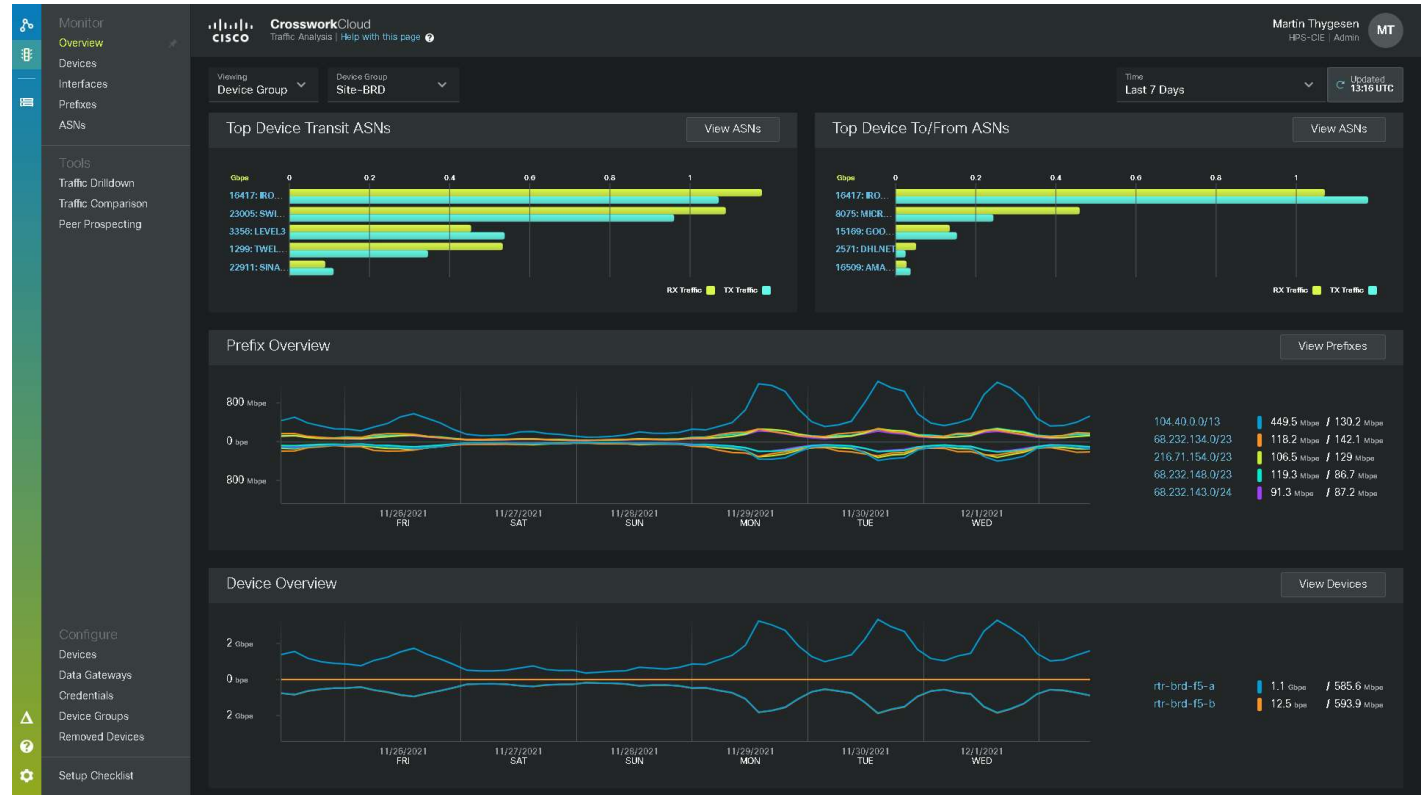
A legend at the bottom indicates: Working (green), Disabled (orange), Unknown (grey), Error (red). A tooltip for the device shows: Last Dossier Status: OK, Last Successful Dossier: 24 Jan 21 19:47:02 UTC, Next Scheduled Collection: 25 Jan 21 08:14:43 UTC.



Crosswork Traffic Analysis – Top-down Traffic Patterns

Aggregate Traffic

- Provide a unified view of traffic flow into/out of and transit through your network
- Classify flows across routers by source/dest ASN and IP prefix
- Support for IPv4 and IPv6

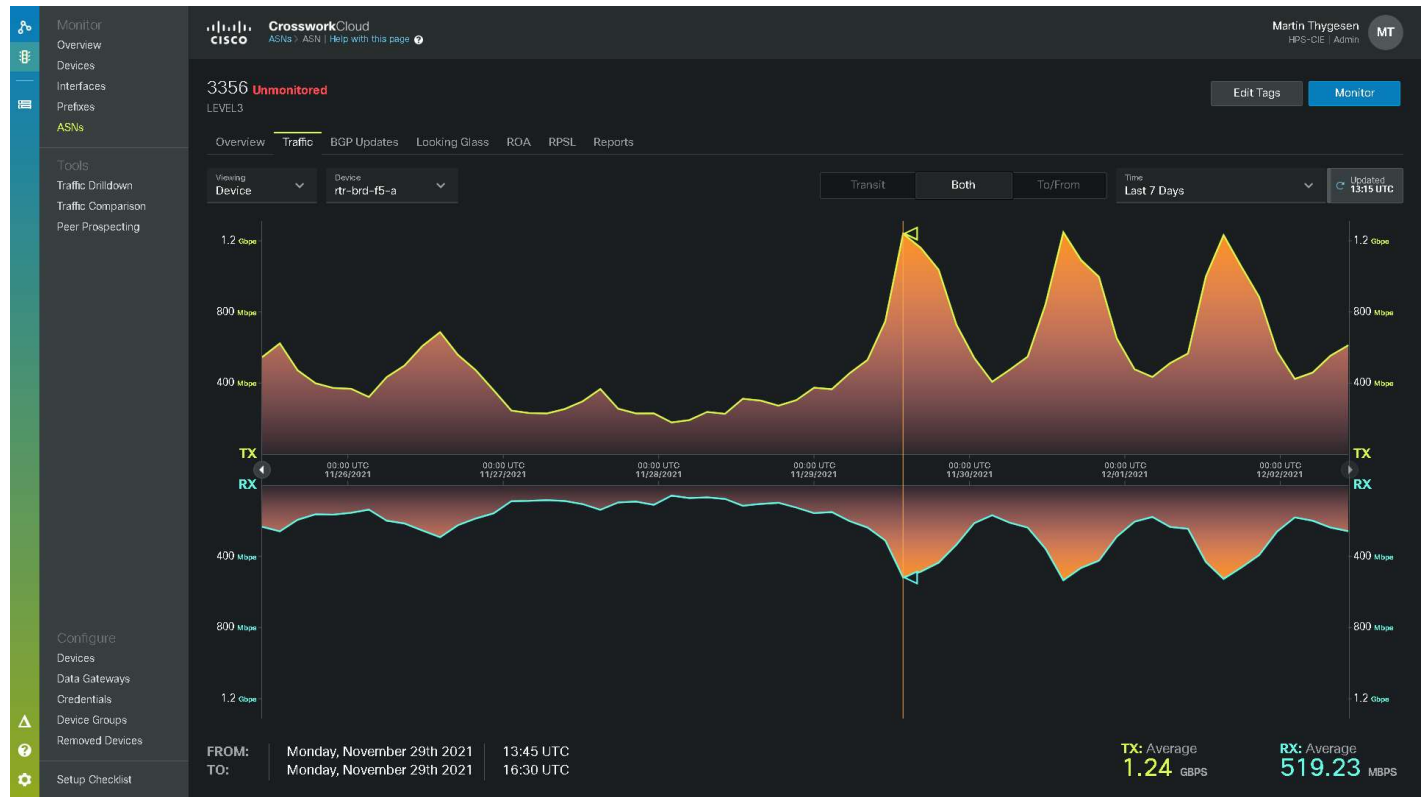




Crosswork Traffic Analysis - ASN and Prefix Analysis

ASN and Prefix Traffic Analysis

Provide a view of sample based Traffic information to or from a specific ASN or IP Prefix (route)





Crosswork Traffic Analysis - Peering Prospects

Peering Prospect Recommendation

Provide Analysis & Recommendation of Top Talkers that I should peer with to provide a better customer experience.

1 Transit ASN's have common paths vs just remote Top Talkers where the traffic is unique to the remote network. Here Top Talkers excludes connected ASN Peers.

The screenshot shows the CrossworkCloud interface for Peering Prospects. The table lists various ASNs with their respective traffic statistics and actions.

Pro...	Name	RX	TX	Total	Action	
8075	Microsoft	526.9 Mbps	210.9 Mbps	737.8 Mbps	IGNORE	1
701	Verizon	351.4 Mbps	253.7 Mbps	605.1 Mbps	IGNORE	2
3356	Lumen AS 3356	212.7 Mbps	252.3 Mbps	465 Mbps	IGNORE	3
7018	AT&T US - 7018	100.6 Mbps	53.6 Mbps	154.2 Mbps	IGNORE	4
16509	Amazon.com	69.7 Mbps	65.2 Mbps	134.9 Mbps	IGNORE	5
6461	Zayo (Abovenet Communications Inc.)	40.6 Mbps	51.5 Mbps	92.2 Mbps	IGNORE	6
2571	DHLNET	59.3 Mbps	26.4 Mbps	85.7 Mbps	IGNORE	7
14618	AMAZON-AES	32.2 Mbps	36.4 Mbps	68.6 Mbps	IGNORE	8
2914	NTT Global IP Network	26.2 Mbps	26.7 Mbps	52.9 Mbps	IGNORE	9
30337	DELOITTE-US-ASN	31.7 Mbps	8.5 Mbps	40.2 Mbps	IGNORE	10
6830	Liberty Global	27.2 Mbps	12.3 Mbps	39.5 Mbps	IGNORE	11
7029	Windstream Communications	12.6 Mbps	21.4 Mbps	34 Mbps	IGNORE	12
30031	MIMECAST-US	9.5 Mbps	21.6 Mbps	31.1 Mbps	IGNORE	13
3257	GTT Communications (AS3257)	11.1 Mbps	17.3 Mbps	28.3 Mbps	IGNORE	14

Demo

Traffic Analysis
Netflow Analytics as a
Service

Crosswork Traffic Analysis

What are our Traffic Analysis Use Cases?

MPLS & IP Core		
Top Talkers	Detailed review of IP Prefix top talkers per Device/IGP	Shipping
Peering Recommendation	Recommends new peering ASN's based on top talkers not directly connected	Shipping
Netflow Proxy	Leverages CDG to forward replicated Netflow to other Netflow listeners	Shipping
Flow Automation API	Traffic Analysis Flow API, Devices, Interfaces, Prefixes, ASN, etc..	Shipping
Peering Optimization Egress	Recommends Route changes to influence egress traffic balancing	CY21 - Q3
Peering Optimization Ingress	Recommends Route changes to influence ingress traffic balancing	CY21 - Q3
Netflow Proxy Resample	Leverages CDG to downscale replicated Netflow to other Netflow listeners	CY21 - Q3
Per Route Traffic Alarms	Provides notification when traffic for a specific IP Route exceeds a threshold	CY21 - Q4
Per Device Traffic Alarms	Provides notification when traffic for a specific Router exceeds a threshold	CY21 - Q4
Device Group Alarms	Provides traffic alarms collective across a group of Routers based on thresholds	CY21 - Q4
DDoS integration	BGP Flowspec Route & Traffic validation checks	Roadmap
Integration COE/CNC	Recommend IGP/ASN entry / exit changes based on device traffic thresholds	Roadmap

How do I get started?



CrossworkCloud



CrossworkCloud

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

[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.

Network Insights
Network and BGP analysis to monitor routing health by monitoring for route leaks and anomalies.

[Watch Video](#) [Find Out More](#)

Health and security

Trust Insights
Gain operational visibility to preserve the trustworthiness of your network infrastructure.

[Watch Video](#) [Find Out More](#)

For more information on Cisco's Automation Portfolio please visit cisco.com/go/crosswork

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Cisco Crosswork Network Automation

Modernize network operations

Crosswork Network Automation increases visibility of your infrastructure, providing valuable insights so you can take proactive actions. The end result: simplified network operations, faster service delivery, and improved experiences for your end customers.

[Watch overview \(3:10\)](#)

Benefits | Products | Partners | Customer Success Stories | Resources | Support

[Contact Cisco](#)

Simplify network automation

Crosswork Network Automation is a closed-loop, outcome-driven software suite used to deliver efficient mass-scale network operations across the services lifecycle. This is a scalable solution for operators of all-sized networks to accelerate mean-time-to-value by monetizing agile new services and minimizing mean-time-to-remediation to proactively prevent customer impacting issues.

Economic benefits from Crosswork Network Automation

Metric	Value
Faster time to service	85%
OpEx savings	55%
TCO savings	46%

Cloud enhanced operations

Crosswork Cloud is a powerful addition to any network operations using always-on, always-up-to date, SaaS-based services to help improve routing health, increase network visibility, maintain trustworthy infrastructure, and generate network traffic insights.

[Why operate in the cloud?](#) | [Try Network Insights for free](#)

Icon	Feature	Description
	Network Insights	Network routing analysis to maintain routing health by monitoring for route leaks and hijacks.
	Traffic Analysis	Visualize, analyze, and optimize network traffic at distributed peering points to improve
	Trust Insights	Gain operational visibility to preserve the trustworthiness of your network infrastructure.

Questions?





The bridge to possible