



The Network and NOC

PNLNMS-1035



NOC Team

@Cisco *Live!* Europe Amsterdam

CISCO *Live!*

Agenda

- Introduction
- Data Centre
- NetApp
- Operations, Logistics & Deployment
- Internet Edge
- Inventory, Templating & Deployment Automation
- Wireless @ Cisco Live 2025
- Wayfinding
- Security and the SOC
- Services, Management, Alerting, and Stats
- Q&A



Data Centre

Anthony Jesani
Technical Solutions Engineer
PNLNMS-1035



The Team, Starring...

Joe
Clarke



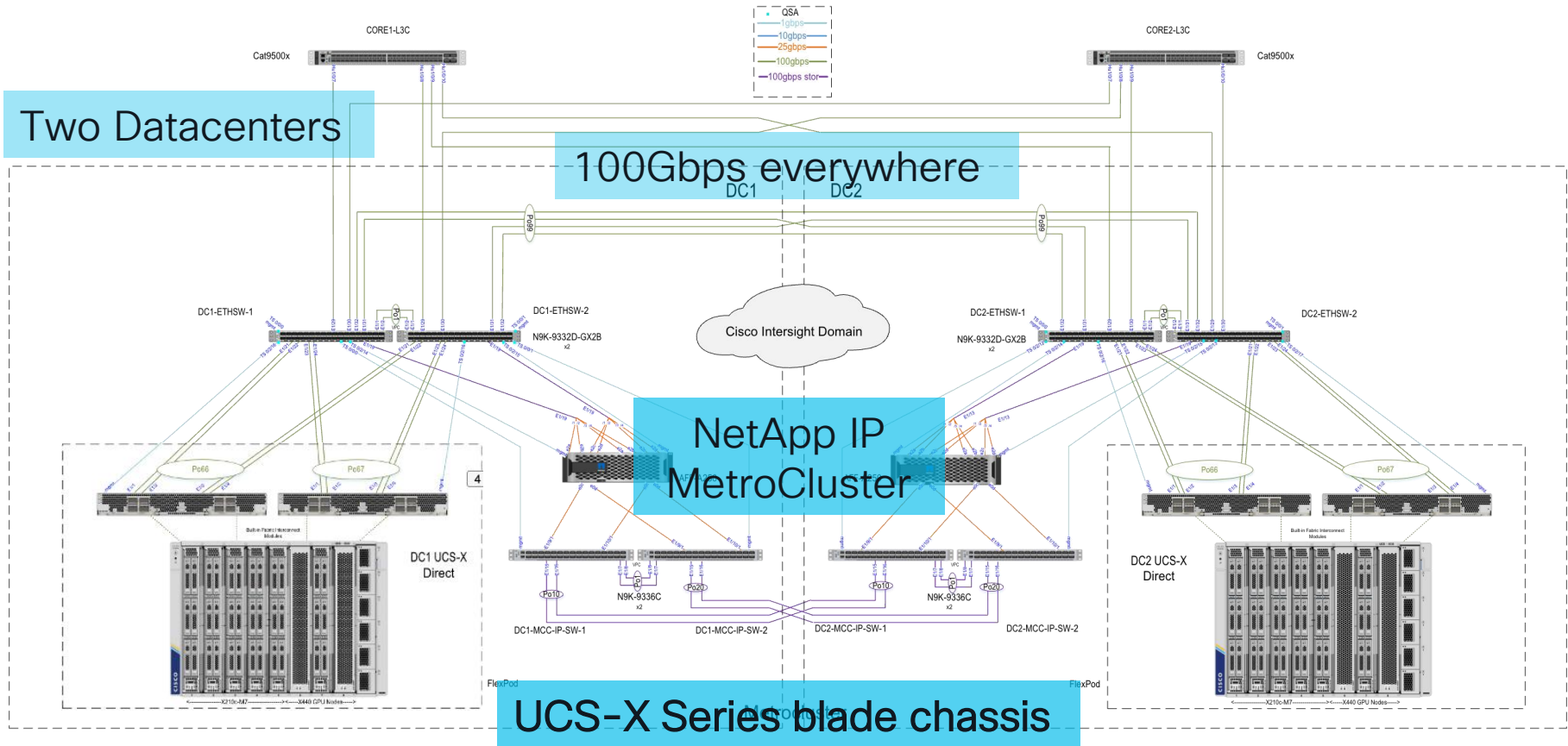
Jara
Osterfeld



Anthony
Jesani



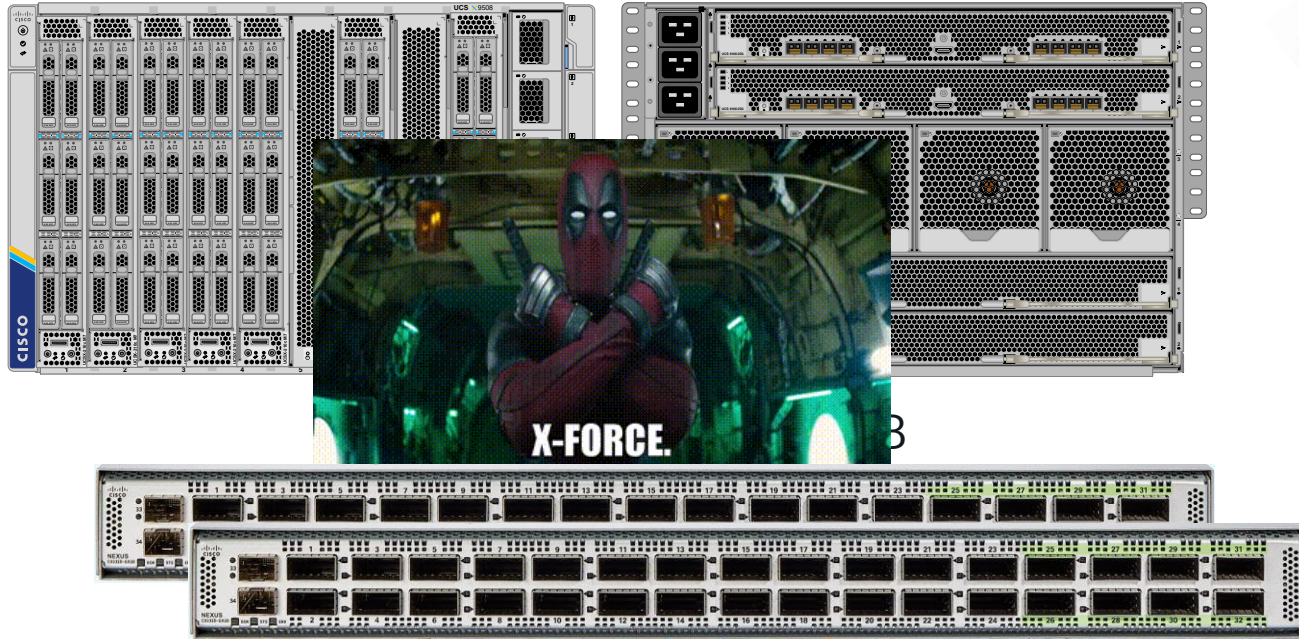
Data Centre Design



New HW

Nvidia L40S GPU

UCS-X Series Direct blade chassis



cisco Live!

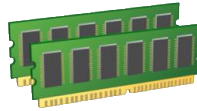
Data Centre – What's inside?

Last year

vCPU: 1088 @ 1.17 THz
(544 cores)

Memory: 12TB

Disk: 63TB



This year

vCPU: 1536 @ 1.7 THz
(768 cores)

Memory: 12TB

Disk: 72TB



With 25% less hosts!

8x GPU



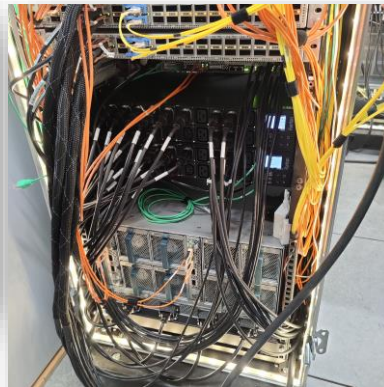
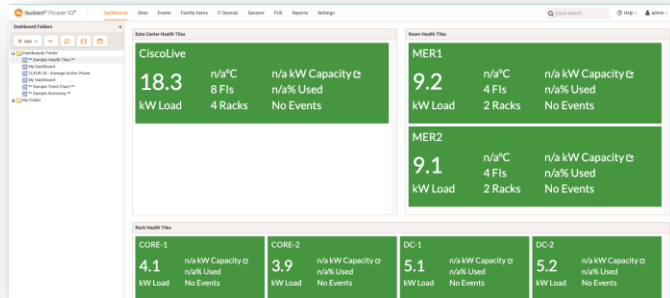
Virtual Machines: 80

Core and DC powered by Raritan® Sunbird®

A brand of legrand®

DCIM that's easy, fast, and complete

- 4x two Raritan PX3-5844R
- 19" 2RUs Rack PDUs
- (14) C13, (6) C19 outlets
- Sunbird's Power IQ® monitoring

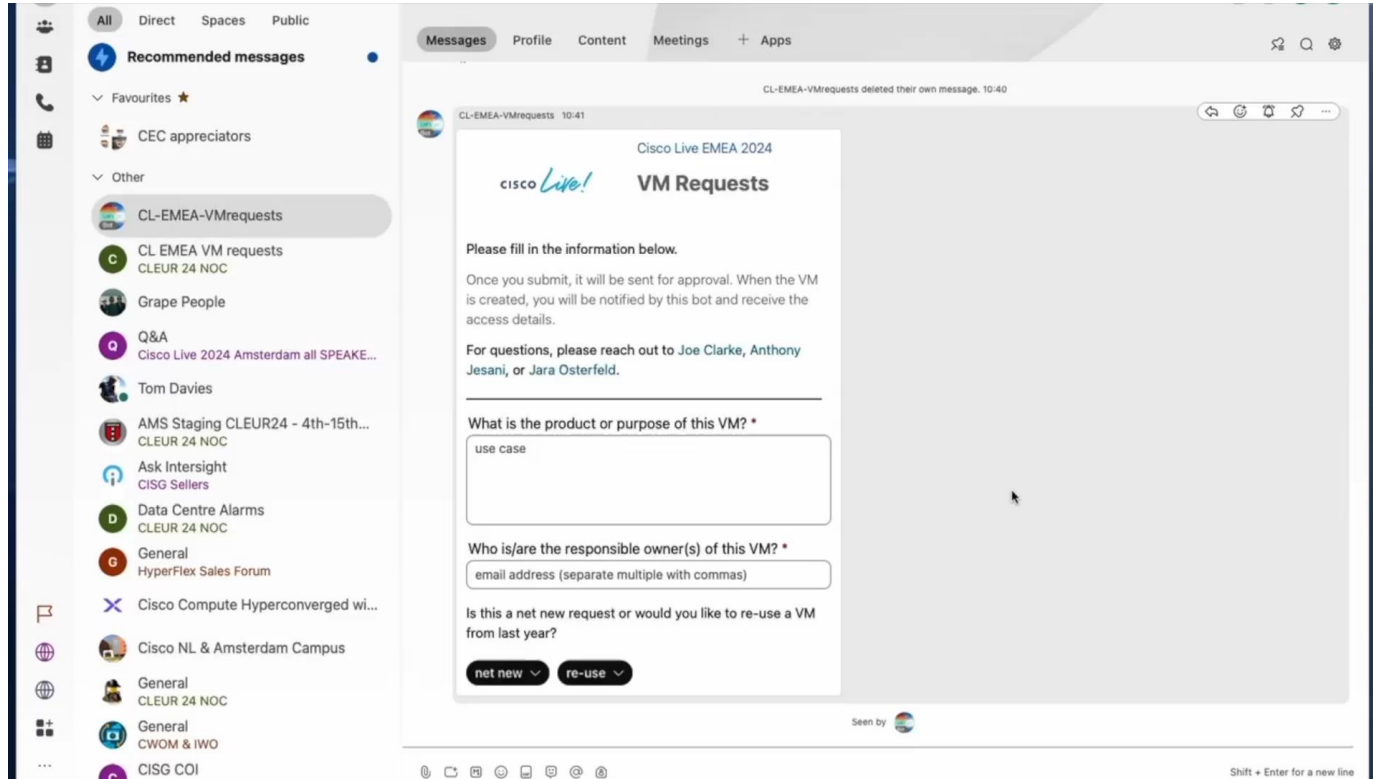


cisco Live!

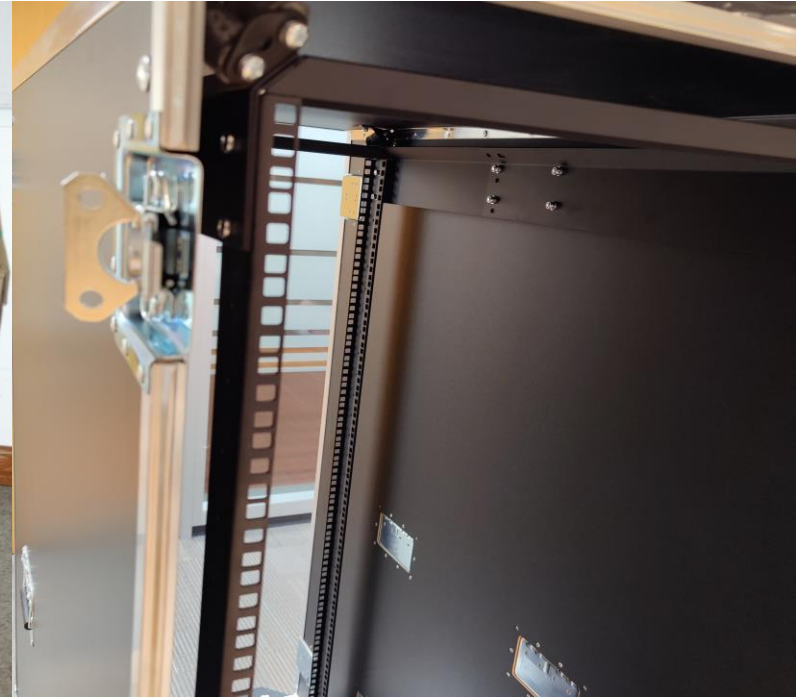
The Bot Strikes Back

A1 Primary Hostname				
	A	B	C	D
1	Primary Hostname	Operating System	Is OVA	Product / Purpose
2	cl-freebsd	freebsd13.1	FALSE	jump server, samplerator, syslog-ng, scripts
3	cl-jump-01	windows2019	FALSE	Jump host
4	cl-jump-02	windows2019	FALSE	Jump host
5	cl-jump-03	windows2019	FALSE	Jump host
6	cl-vcenter	other (OVA, custom OS, etc.)	TRUE	vCenter
7	dc1-ise	other (OVA, custom OS, etc.)	TRUE	ISE
8	dc1-ad	windows2019	FALSE	Active Directory
9	cl-cpnr-regional	other (OVA, custom OS, etc.)	TRUE	CPNR Regional
10	dc1-dns	other (OVA, custom OS, etc.)	TRUE	CPNR Auth DNS
11	dc1-dhcp	other (OVA, custom OS, etc.)	TRUE	CPNR CDNS/DHCP
12	dc1-umbrella	other (OVA, custom OS, etc.)	TRUE	Umbrella VA
13	cl-monitoring	freebsd13.1	FALSE	LibreNMS and Rancid
14	cl-netbox	freebsd13.1	FALSE	NetBox
15	cl-ntap-aiqum	linux	TRUE	Monitoring NetApp Cluster
16	cl-ntap-intassist	linux	TRUE	Monitoring FlexPod via Cisco Intersight

The Bot Strikes Back



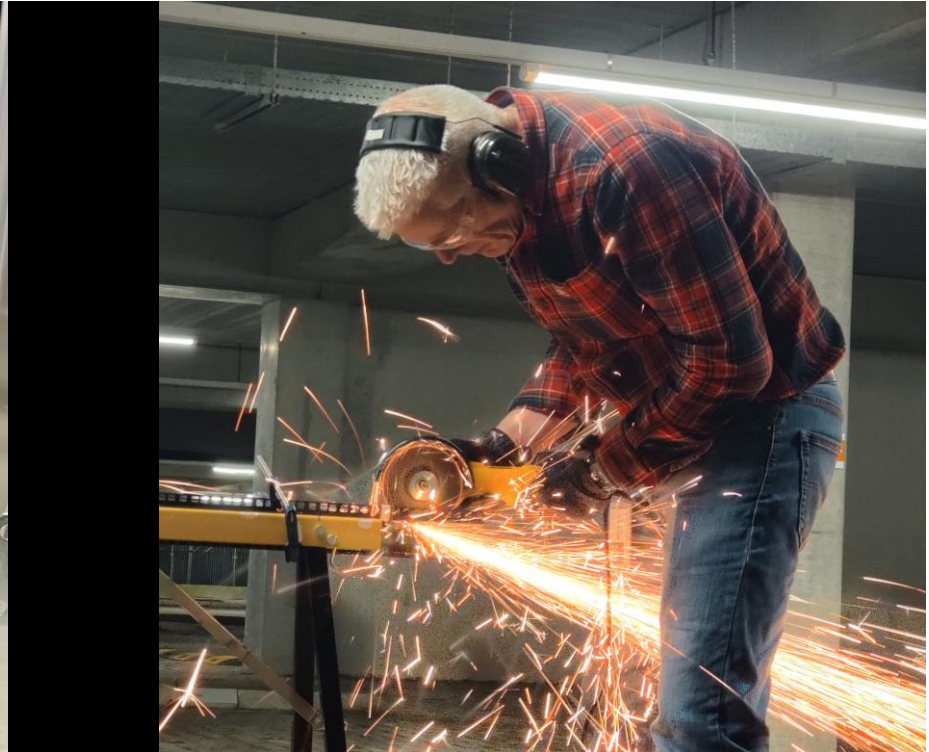
DO sweat the small stuff: Details matter



Hulp Help Hilfe 48 45 4C 50



Details matter





FlexPod Datacenter at NOC

Data Management Powered by NetApp

Abhinav Singh

Sr. Technical Marketing Engineer @NetApp

PNLNMS-1035

CISCO *Live!*

NetApp's Role in the NOC

- NetApp in Cisco Live NOC since 2014
- Official Storage Provider for Cisco Live EMEA & Cisco Live US
- Critical Apps hosted on NetApp Storage
- Support – Staging & Event

NetApp Team



Abhinav Singh



Bobby Oommen



Roney Daniel

What is New for NOC 2025

- Upgraded ONTAP software to 9.15.1P5
 - MetroCluster IP support for end-to-end encryption
 - Dynamic authorization to increase security of remote access to ONTAP
 - Performance metrics enhancements for the System Manager dashboard
- Upgraded cluster switches to NX-OS 10.3.4a.M
- ONTAP tools for VMware vSphere
- IPv6 for dual stack management

FlexPod Datacenter for AI



Model Provider



Hugging Face



Dev & Deployment Suite

NVIDIA AI Enterprise



Red Hat



Infrastructure

UCS Servers



NetApp Storage Controller



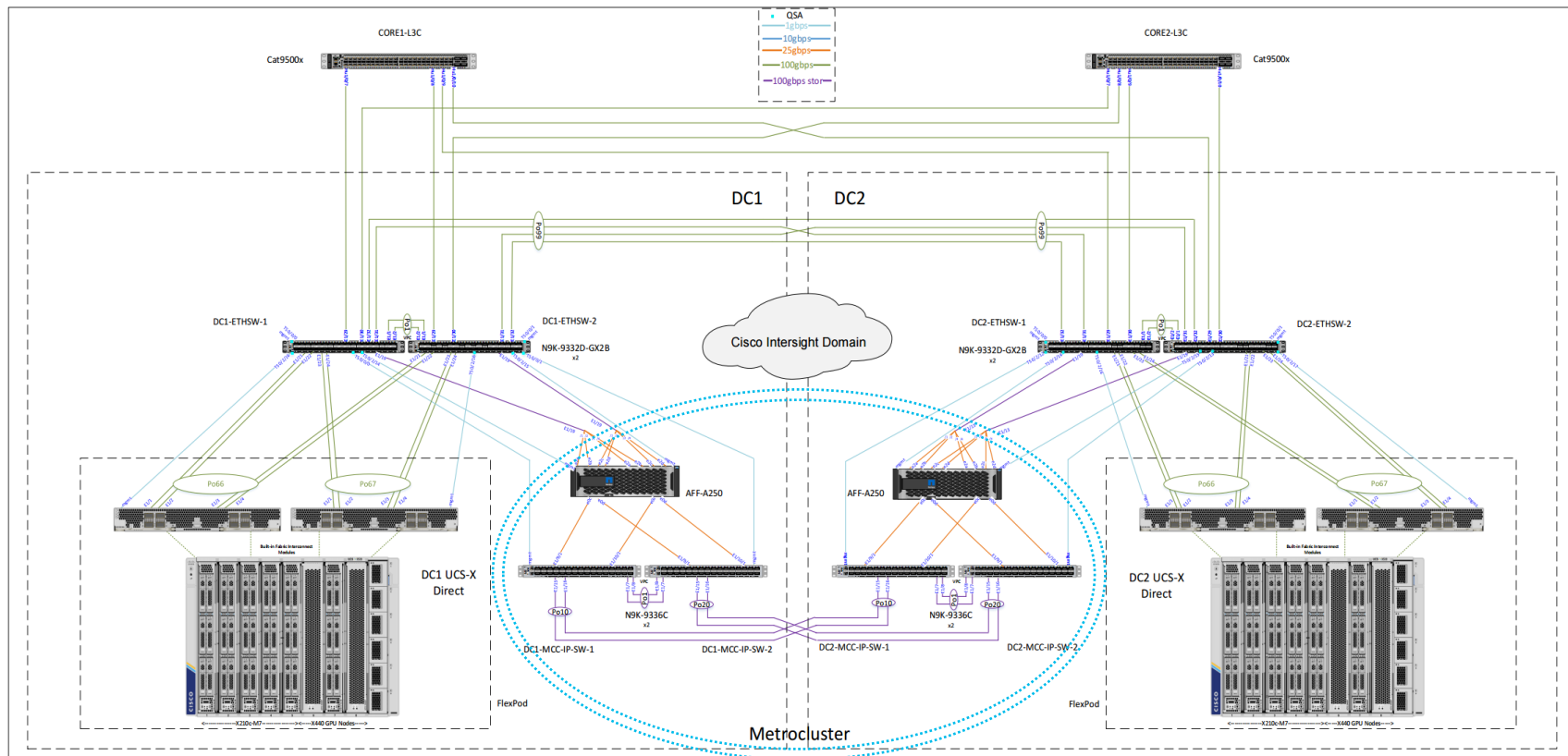
NVIDIA GPUs

FlexPod with MetroCluster

- Synchronous replication of data
- Zero RPO and near zero RTO
- Distance up to 700KM with MCIP
- Seamless integration with ONTAP features
 - Storage Efficiency
 - End-to-End Encryption
 - Application aware backups
- High Availability for Business Continuity
 - Protects against Controller failure
 - Network failure, Site Outage



MetroCluster – Network Topology



MetroCluster Check- Why did it fail...?



Data Centre Alarms ☆

CLEUR 25 NOC

Messages People (10) Content Meetings +Apps

🔖 🔍 ⚙️

cleur2025-netapp-alerts @cisco.com 06-02-2025, 08:47

★ **NetApp Error Event:** mcc.check.failed: The MetroCluster (tm) check job has failed to complete all checks for the system in cluster cl-emea-noc-mcc-dc2.

Storage & Intersight

Visibility within Cisco Intersight – Hosts

← Virtualization

Hosts

Virtual Machines Datancenters Clusters Hosts Virtual Machine Templates Datastores Datastore Clusters

* All Hosts ⓘ FlexPod Host +

🔍 Search Filters 12 results Export

<input type="checkbox"/>	Name	Datcenter	Cluster	CPU Capacity	CPU Utilization	Memory Utilizat...	Memory Capa...	CPUs	⚡
<input type="checkbox"/>	🔌 dc1-esx-04.ci...	CiscoLive	FlexPod	140.80 GHz	2.7%	15.7%	1023.70 GiB	64	...
<input type="checkbox"/>	🔌 dc1-esx-05.ci...	CiscoLive	FlexPod	140.80 GHz	4.9%	14.7%	1023.70 GiB	64	...
<input type="checkbox"/>	🔌 dc1-esx-06.ci...	CiscoLive	FlexPod	140.80 GHz	15.1%	13.8%	1023.70 GiB	64	...
<input type="checkbox"/>	🔌 dc2-esx-03.ci...	CiscoLive	FlexPod	140.80 GHz	9.5%	19.4%	1023.70 GiB	64	...
<input type="checkbox"/>	🔌 dc2-esx-02.ci...	CiscoLive	FlexPod	140.80 GHz	5.7%	13.1%	1023.70 GiB	64	...
<input type="checkbox"/>	🔌 dc2-esx-01.ci...	CiscoLive	FlexPod	140.80 GHz	2.5%	16.5%	1023.70 GiB	64	...
<input type="checkbox"/>	🔌 dc2-esx-06.ci...	CiscoLive	FlexPod	140.80 GHz	5.3%	15.1%	1023.70 GiB	64	...
<input type="checkbox"/>	🔌 dc1-esx-03.ci...	CiscoLive	FlexPod	140.80 GHz	18.0%	39.2%	1023.70 GiB	64	...
<input type="checkbox"/>	🔌 dc2-esx-05.ci...	CiscoLive	FlexPod	140.80 GHz	8.1%	23.3%	1023.70 GiB	64	...
<input type="checkbox"/>	🔌 dc2-esx-04.ci...	CiscoLive	FlexPod	140.80 GHz	0.9%	8.8%	1023.70 GiB	64	...

Rows per page 10 < 1 2 >

Visibility within Cisco Intersight - Storage

← Storage
cl-emea-noc-mcc-dc1

General Inventory Checks

Sections

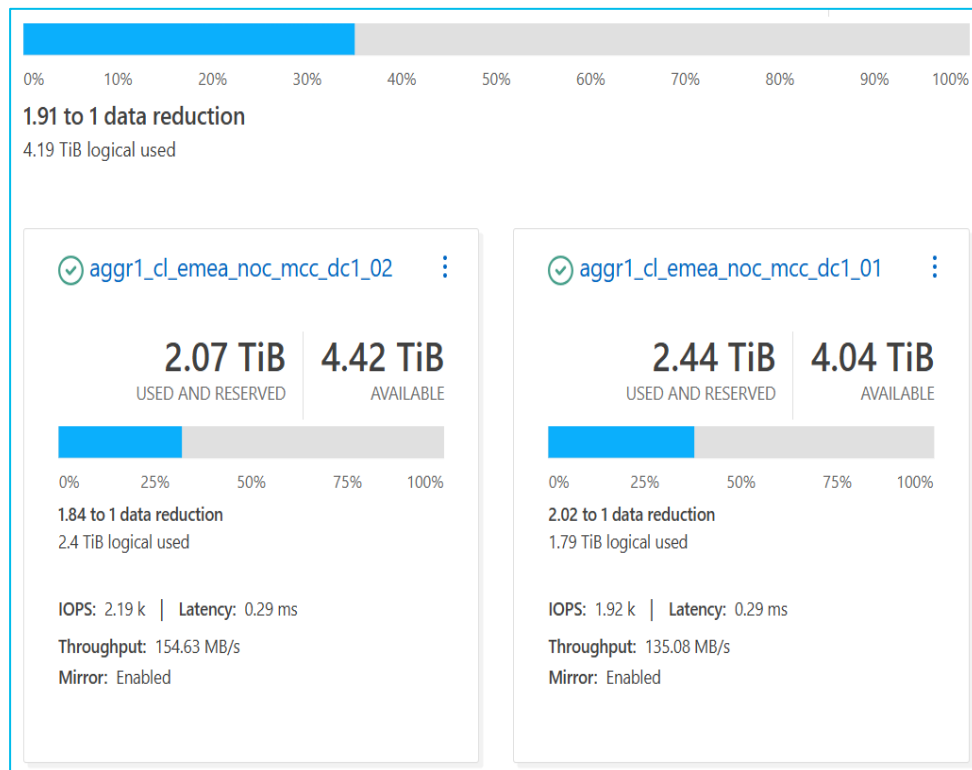
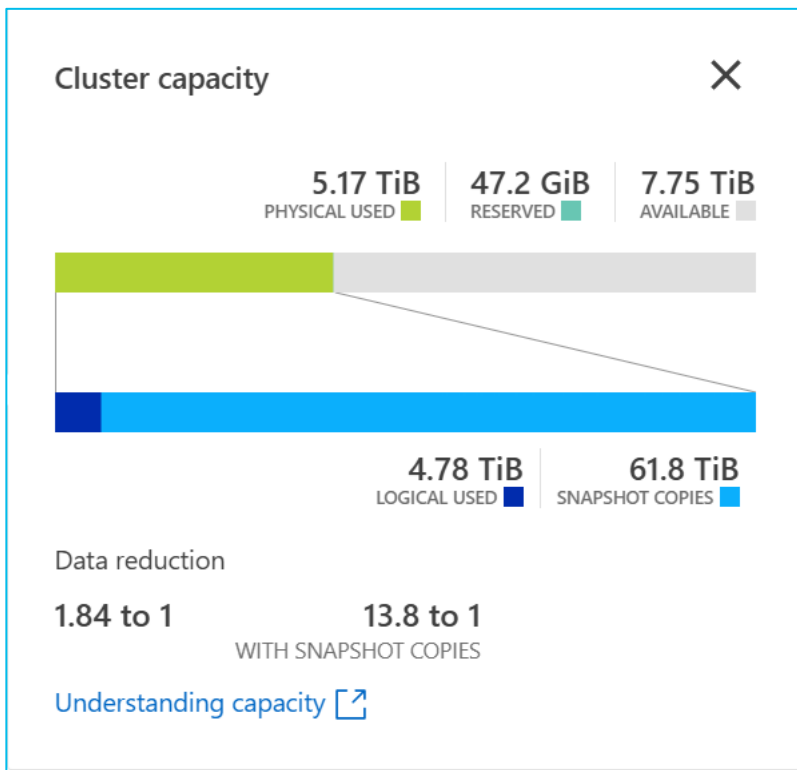
- Licenses
- HARDWARE**
 - Nodes
 - Disks
 - Ports
- NETWORK**
 - Network Interfaces
 - NTP Servers
- PROTECTION**
 - Relationships
 - Policies
- HOSTS

Network Interfaces

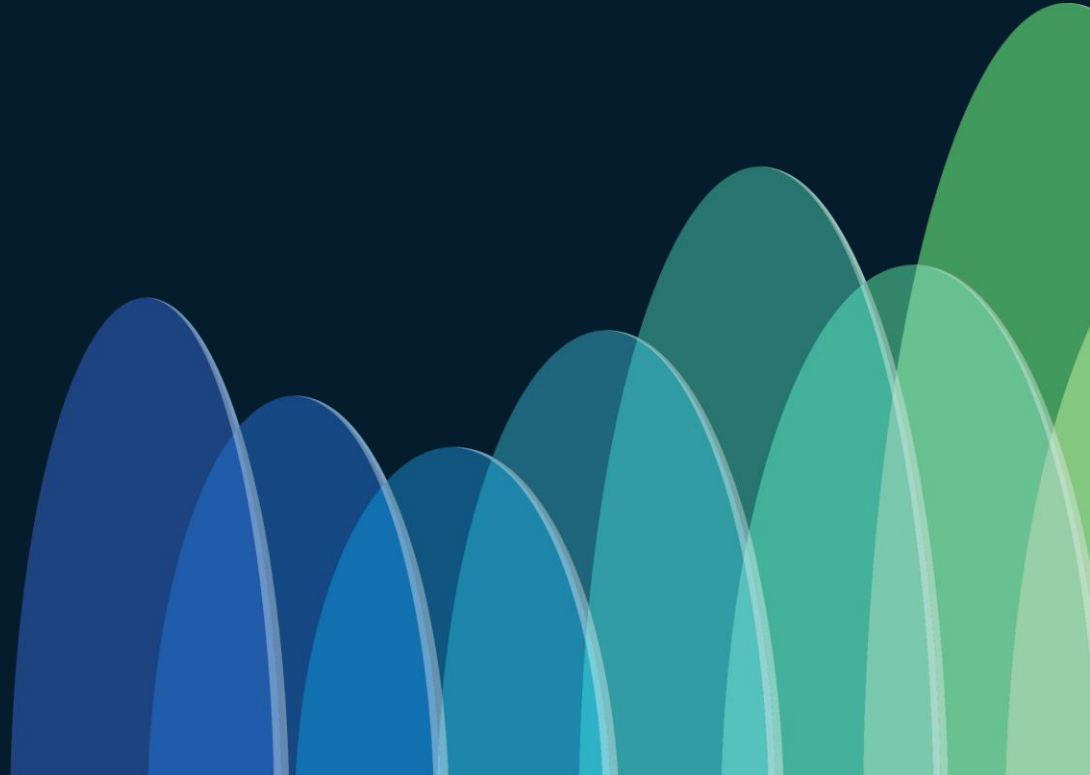
Q Search Filters 15 results Export

Name	Operati...	Admin ...	S...	IP...	IP Address	Ho...	Home ...	Is
cl-emea-noc-mcc-dc1-01_clus1	Up	Enabled		Cluster	169.254.244.2...	cl-emea-...	e0c	Y
cl-emea-dc1-node-2-ipv6-mgmt	Up	Enabled		Default	2a11:d940:2:7e...	cl-emea-...	e0M	Y
dc1_node_02_ic	Up	Enabled		Default	10.120.253.23	cl-emea-...	a0a-120	Y
cl-emea-noc-mcc-dc1-02_mgmt1	Up	Enabled		Default	10.126.245.121	cl-emea-...	e0M	Y
dc1_node_01_ic	Up	Enabled		Default	10.120.253.22	cl-emea-...	a0a-120	Y
cl-emea-dc1-node-1-ipv6-mgmt	Up	Enabled		Default	2a11:d940:2:7e...	cl-emea-...	e0M	Y
cl-emea-noc-mcc-dc1-02_clus1	Up	Enabled		Cluster	169.254.156.252	cl-emea-...	e0c	Y
cl-emea-noc-mcc-dc1-02_clus2	Up	Enabled		Cluster	169.254.248.26	cl-emea-...	e0d	Y
cluster_mgmt	Up	Enabled		Default	10.126.245.124	cl-emea-...	e0M	Y
cl-emea-noc-mcc-dc1-01_clus2	Up	Enabled		Cluster	169.254.14.138	cl-emea-...	e0d	Y

Storage Capacity & Efficiency




Tools



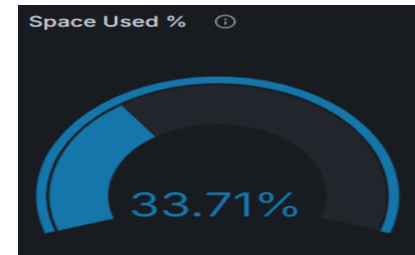
ONTAP tools for VMware vSphere

Hosts

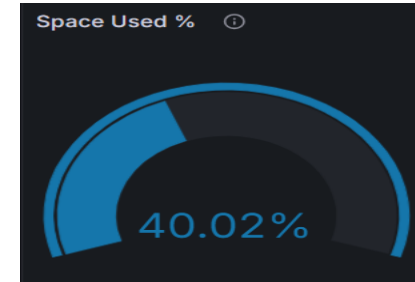
Select the hosts that you want to comply with NetApp recommended host settings.

<input type="checkbox"/>		ESXi Host ▼	NFS Compliance
<input type="checkbox"/>	<input checked="" type="checkbox"/>	dc1-esx-02.c... Version: 8.0.3 IP Address: 10.127.253.132	 Compliant VAAI patch compatible: Yes Current NFS Settings Net.TcpipHeapSize: 32 Net.TcpipHeapMaxSize: 1024 NFS.MaxVolumes: 256 NFS.MaxQueueDepth: 128 NFS.HeartBeatTimeout: 5 NFS.HeartBeatMaxFailures: 10 NFS.HeartBeatFrequency: 12 NFS4.1.MaxVolumes: 256 SunRPC.MaxConnPerIp: 128 nconnect enabled: No nconnect sessions: 0

Data Growth – ~1.67 TiB for 2025



Pre-Event



Post-Event

Next Year?

- MetroCluster controller refresh with latest system
- More capacity for Splunk, Cisco Catalyst Center , AI workloads
- Explore a Kubernetes based Chatbot for NOC
- Dedicated volumes for Splunk



Wired Core

Lionel Hercot
Technical Marketing Engineer / NOC Consistency Officer



The Team



Lionel
Hercot



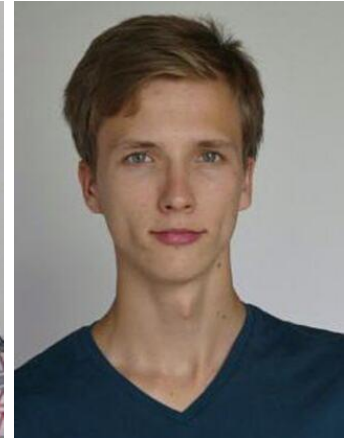
James
Botting



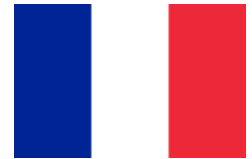
Andrew
Yourtchenko

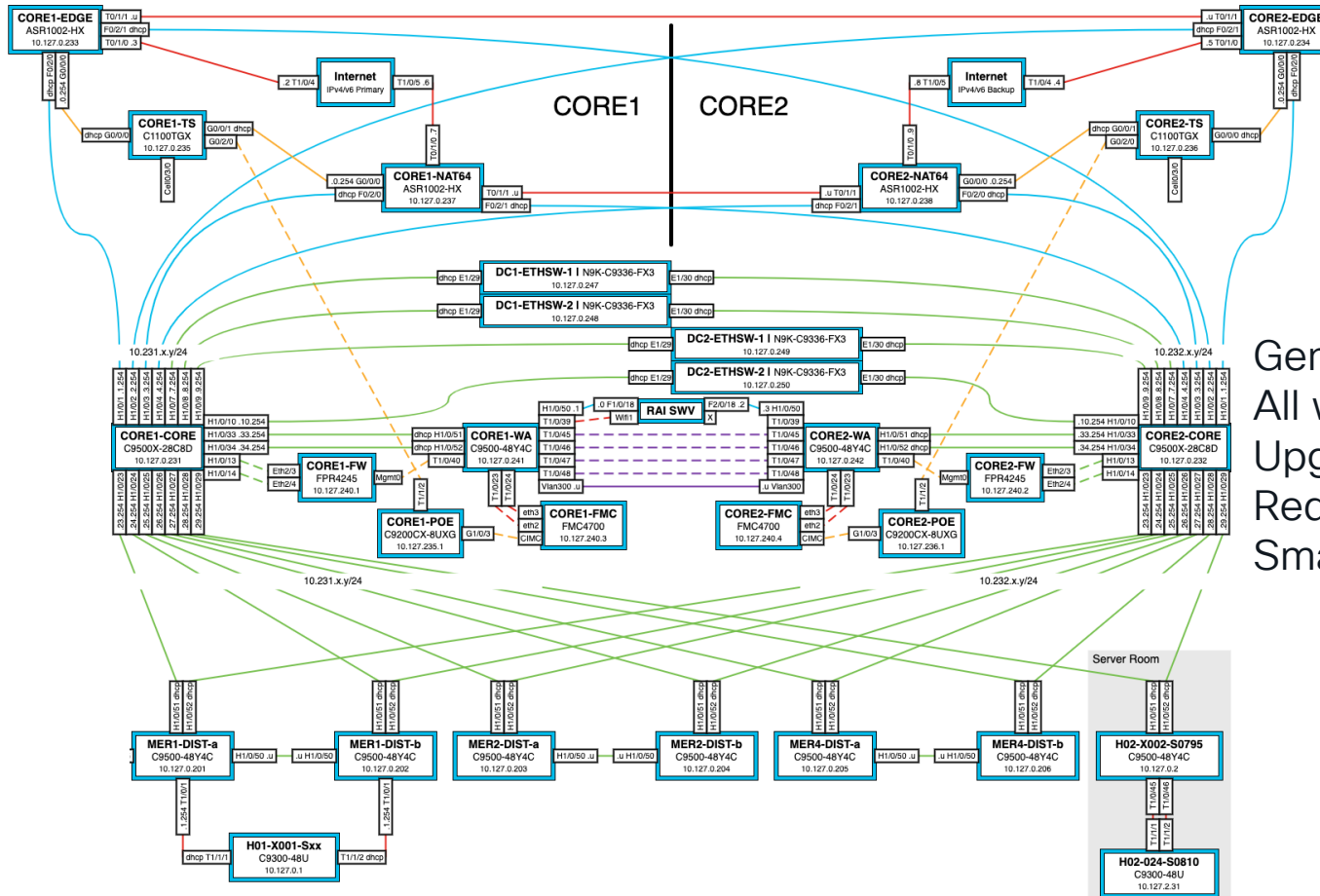


Martin Kriska



Ivan Ivanov





Generating Core Diagram
 All wired devices automated
 Upgrade IDS to 100G
 Reduce OSPF changes
 Smaller broadcast domains

Routing Table Increase

No SVI AutoState + 20% increase in L3 domains + 20% more VLANs =

```
%FMFP-3-OBJ_ACK_FROM_DP_STUCK: Switch 1 F0/0: fman_fp_image: AOM ack download to Data Plane is stuck for more than 1800 seconds for obj[14005] type[71] pending-ack Req-none Issued-create 'PREFIX 10.15.91.0/24 (Table id 0)'  
host = hal-x001-s0784 : source = sc4s : sourcetype = cisco:ios  
%FED_L3_ERRMSG-3-RSRC_ERR: Switch 1 F0/0: fed: Failed to allocate hardware resource for fib entry due to hardware resource exhaustion - rc:2054  
host = hal-x001-s0784 : source = sc4s : sourcetype = cisco:ios
```

Shutdown reserved SVIs to recover

i	Time	Event
>	2/8/25 10:52:56.000 AM	%FMFP-3-OBJ_ACK_FROM_DP_RESUME: Switch 1 F0/0: fman_fp_image: AOM ack of objects to Data Plane is back to normal host = hal-x001-s0784 : source = sc4s : sourcetype = cisco:ios

Monitor the usage





Internet Edge

James Botting
Core Network Team

CISCO *Live!*



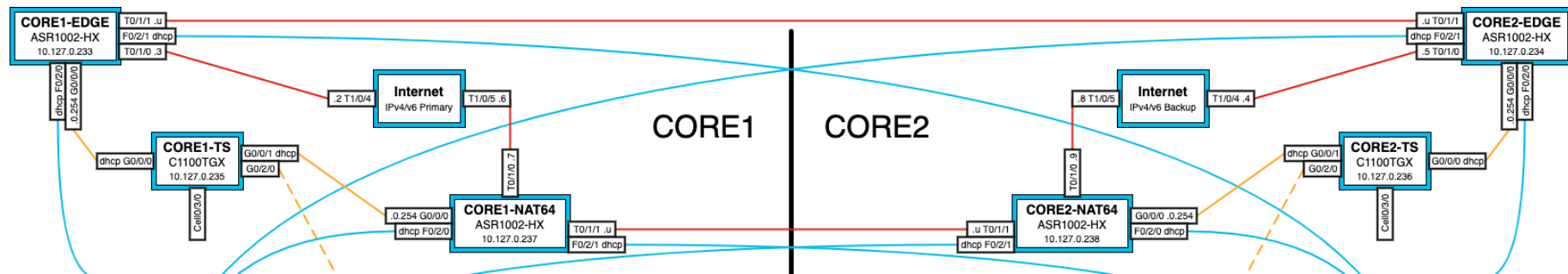
Objectives for 2025

- More IPv6!
- DDoS Mitigation Platform
- Move all config to our custom tooling platform

NAT64 Statistics

```
Total active translations: 124958 (0 static, 124958 dynamic; 124957 extended)
Sessions found: 16472522528
Sessions created: 186965222
Expired translations: 187000395
Global Stats:
  Packets translated (IPv4 -> IPv6)
    Stateless: 0
    Stateful: 9629223847
    nat46: 0
    MAP-T: 0
    MAP-E: 0
  Packets translated (IPv6 -> IPv4)
    Stateless: 0
    Stateful: 7027925427
    nat46: 0
    MAP-T: 0
    MAP-E: 0
```

Edge Design

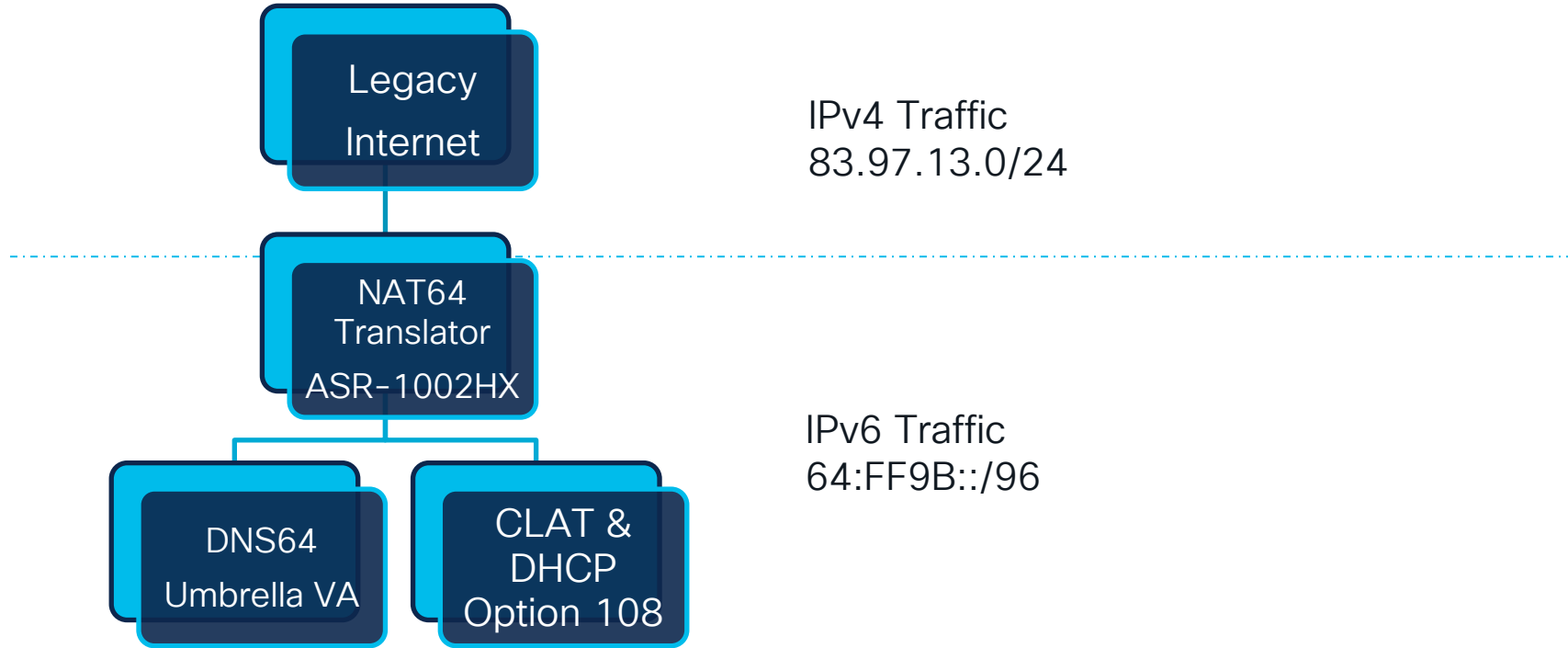


2x ASR 1002-HX for NAT44 and Native IPv6
2x ASR 1002-HX for NAT64 only
/26 of V4 public per NAT pool

Each unit BGP peered to Venue
1x 10Gb/s connectivity to Venue
2x 40Gb/s to core

NAT64 Design

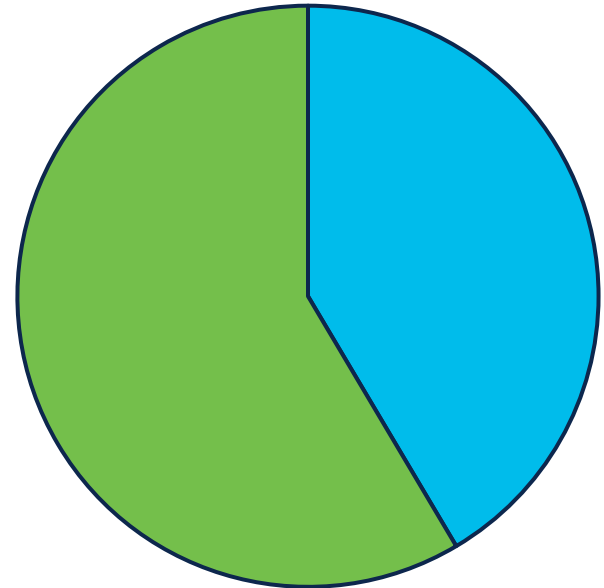
Aspiring for 100% IPv6 inside the network



Option 108 – IPv6 Mostly

I don't often do IPv6 Mostly, but when I do, I do it on main

- Clients supporting CLAT support Option 108. These devices get a pure IPv6 only operation in the network.
- Clients that don't understand 108 don't request it, get dual stack.
- We still catch some traffic with synthetic IPv6 AAAA records via NAT64 for those older clients

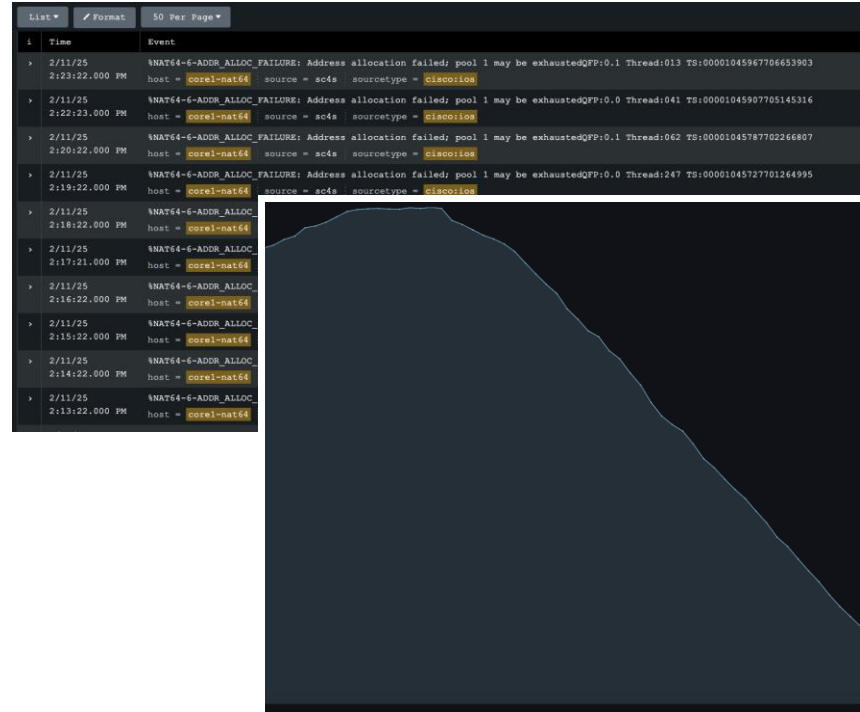


■ Supports 108 ■ Does not support 108

NAT64 More Popular than Expected

Segmenting your IPv4 space between NAT44 and NAT64 is tricky

- Didn't really know how popular NAT64 would be over NAT44 edge.
- Ultimately, not enough addresses in NAT64 pool and too many in NAT44
- Changed translation expiry timers to resolve, added more IP's out of hours.





Inventory, Templating & Deployment Automation

Andrew Yourtchenko
Principal Engineer
PNLNMS-1035



New acquisition: 400 Catalyst 9200 switches

300*C9200CX-12P-2X2G + 100*C9200CX-8UXG-2X



NetDevOps templates: git-driven, modular

- Network **DEV**-ops elements
 - Changes only during pre-staging
 - Include-only, part of templates
 - Use CPP to #include "file.inc"
 - (worked well, but ...)
- Network dev-**OPS** elements
 - Both pre-staging and showtime
 - Incremental during the event
 - ACLs
 - Last-minute config tweaks

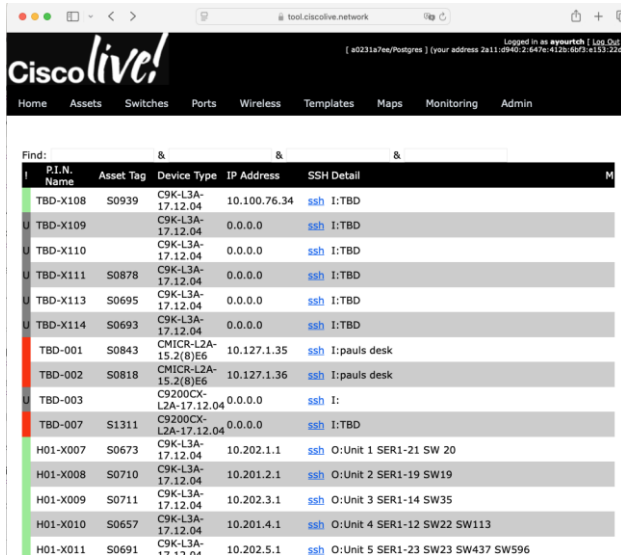
Nginx as git server, process the commit + post-commit hook to upload to github.com

IF REACHABLE

New: A.I. powered custom software development

- A = Andrew

- Rust backend + Vintage UI

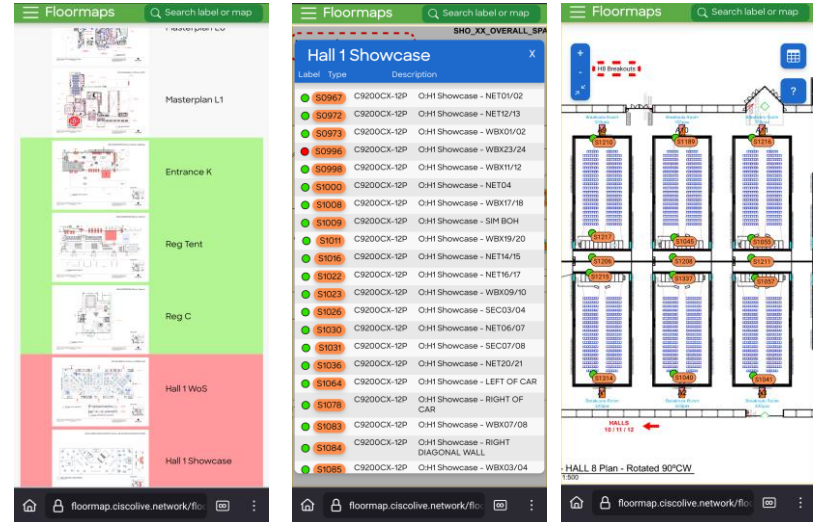


The screenshot shows the Cisco Live! web application interface. At the top, there's a navigation bar with links: Home, Assets, Switches, Ports, Wireless, Templates, Maps, Monitoring, Admin. Below the navigation bar, there's a search bar and a table of network assets. The table has columns: P.I.N. Name, Asset Tag, Device Type, IP Address, and SSH Detail. The table contains several rows of data, including assets like TBD-X108, TBD-X109, TBD-X110, etc.

P.I.N. Name	Asset Tag	Device Type	IP Address	SSH Detail
TBD-X108	S0939	C9K-L3A-17.12.04	10.100.76.34	ssh 1:TBD
TBD-X109		C9K-L3A-17.12.04	0.0.0.0	ssh 1:TBD
TBD-X110		C9K-L3A-17.12.04	0.0.0.0	ssh 1:TBD
TBD-X111	S0878	C9K-L3A-17.12.04	0.0.0.0	ssh 1:TBD
TBD-X113	S0695	C9K-L3A-17.12.04	0.0.0.0	ssh 1:TBD
TBD-X114	S0693	C9K-L3A-17.12.04	0.0.0.0	ssh 1:TBD
TBD-001	S0843	CMICR-L2A-15.2(8)E6	10.127.1.35	ssh 1:pauls desk
TBD-002	S0818	CMICR-L2A-15.2(8)E6	10.127.1.36	ssh 1:pauls desk
TBD-003		C9200CX-L2A-17.12.04	0.0.0.0	ssh 1:
TBD-007	S1311	C9200CX-L2A-17.12.04	0.0.0.0	ssh 1:TBD
H01-X007	S0673	C9K-L3A-17.12.04	10.202.1.1	ssh O:Unit 1 SER1-21 SW 20
H01-X008	S0710	C9K-L3A-17.12.04	10.201.2.1	ssh O:Unit 2 SER1-19 SW19
H01-X009	S0711	C9K-L3A-17.12.04	10.202.3.1	ssh O:Unit 3 SER1-14 SW35
H01-X010	S0657	C9K-L3A-17.12.04	10.201.4.1	ssh O:Unit 4 SER1-12 SW22 SW113
H01-X011	S0691	C9K-L3A-17.12.04	10.202.5.1	ssh O:Unit 5 SER1-23 SW23 SW437 SW596

- I = Ivan

- New Maps with Modern UI



Day 0..N bidirectional sync with Catalyst Center

- **Bespoke tooling**

- Wired Source of truth
- Lightweight maps for switches
 - Assign to Catalyst Center Hierarchy
 - Auto-sync WiFi maps from C.C.

- **Catalyst Center**

- Wireless Source of Truth
- End-to-end assurance

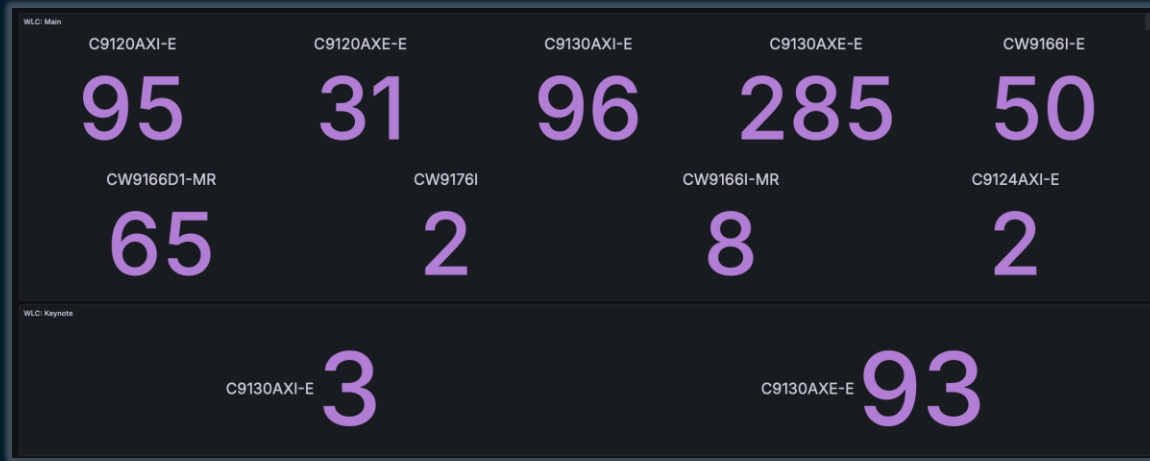


Wireless @ Cisco Live 2025

Christian Gauer, CSS
Michał Kowalik, Principal Architect
PNLNMS-1035



Infrastructure



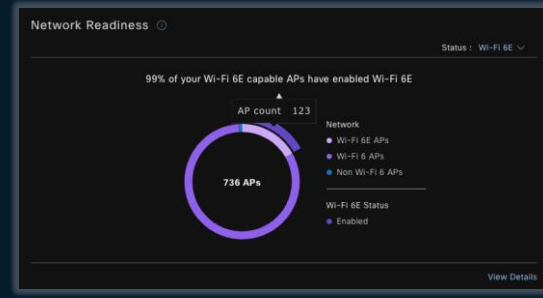
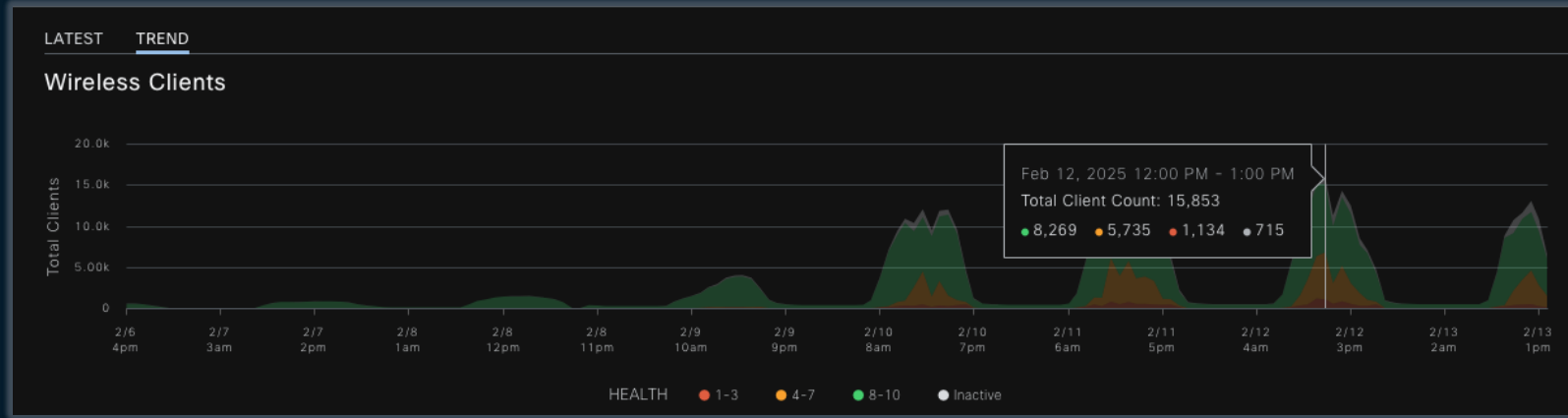
CISCO *Live!*



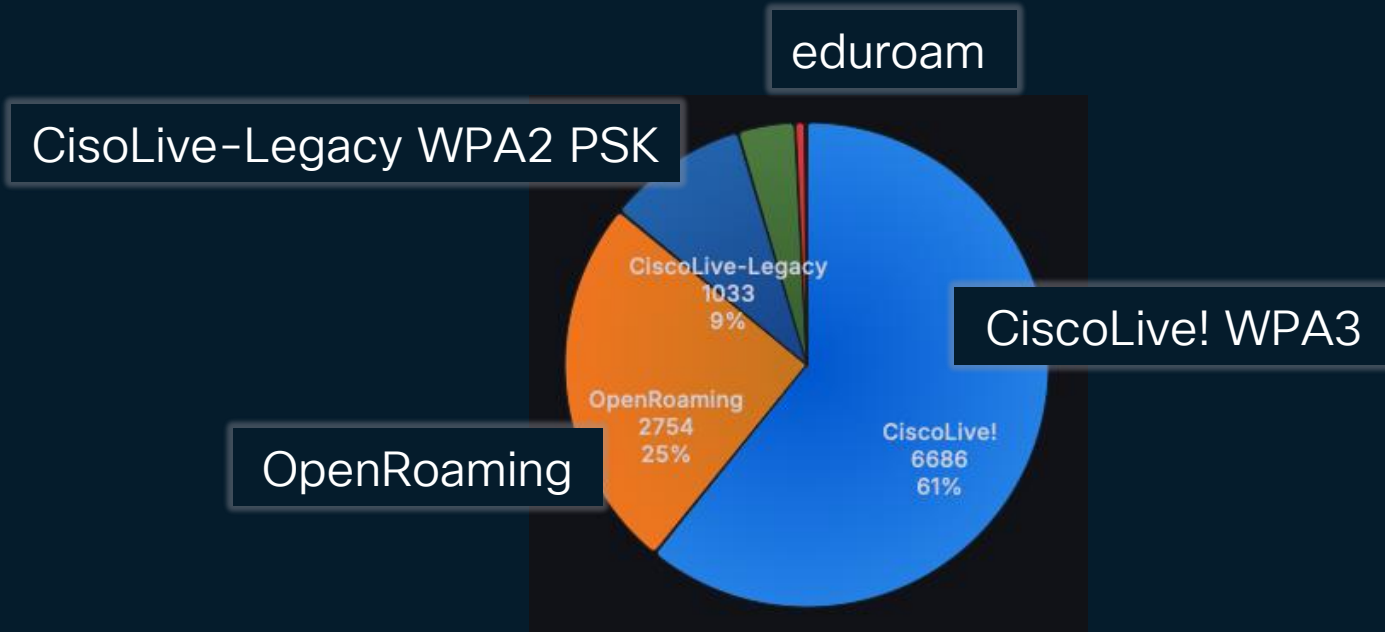
Wireless Campus Automation enabled

The screenshot displays the Cisco Catalyst Center interface for configuring a WLAN profile. The left sidebar shows the navigation menu with categories like DETAILS, SECURITY, FIELD NOTICES, CONFIGURATION, WLAN, RF, AP, and Security. The main content area is titled "Edit WLAN Profile: WLAN_PRFL_CiscoLive!". The "Layer 2" tab is selected, showing the "Configure Layer 2 Security policies for WLAN. WLANs with the same SSID must have unique Layer 2 security policies." section. The "Personal" tab is active, displaying the "WPA Parameters" and "WPA2/WPA3 Encryption" settings. The "WPA Parameters" section includes checkboxes for WPA, WPA2, WPA3, and WPA3 SAE. The "WPA2/WPA3 Encryption" section includes checkboxes for AES/CCMP128, GCMP128, CCMP256, and GCMP256. The "Auth Key Management" section includes checkboxes for SAE, FT, and SAE-EXT-KEY. The "SAE" checkbox is checked, and the "FT" checkbox is also checked. The "SAE-EXT-KEY" checkbox is unchecked. The "SAE Password Element" is set to "Both H2E H2P". The "PSK Type" is set to "Unencrypted". The "Max Retries" is set to 5. The "Anti Clogging Threshold" is set to 1500. The "Retransmit Timeout" is set to 400. The "PSK Format" is set to "ASCII".

Clients



Clients on SSIDs



Wireless Wonders: How to build your Wi-Fi 7 network

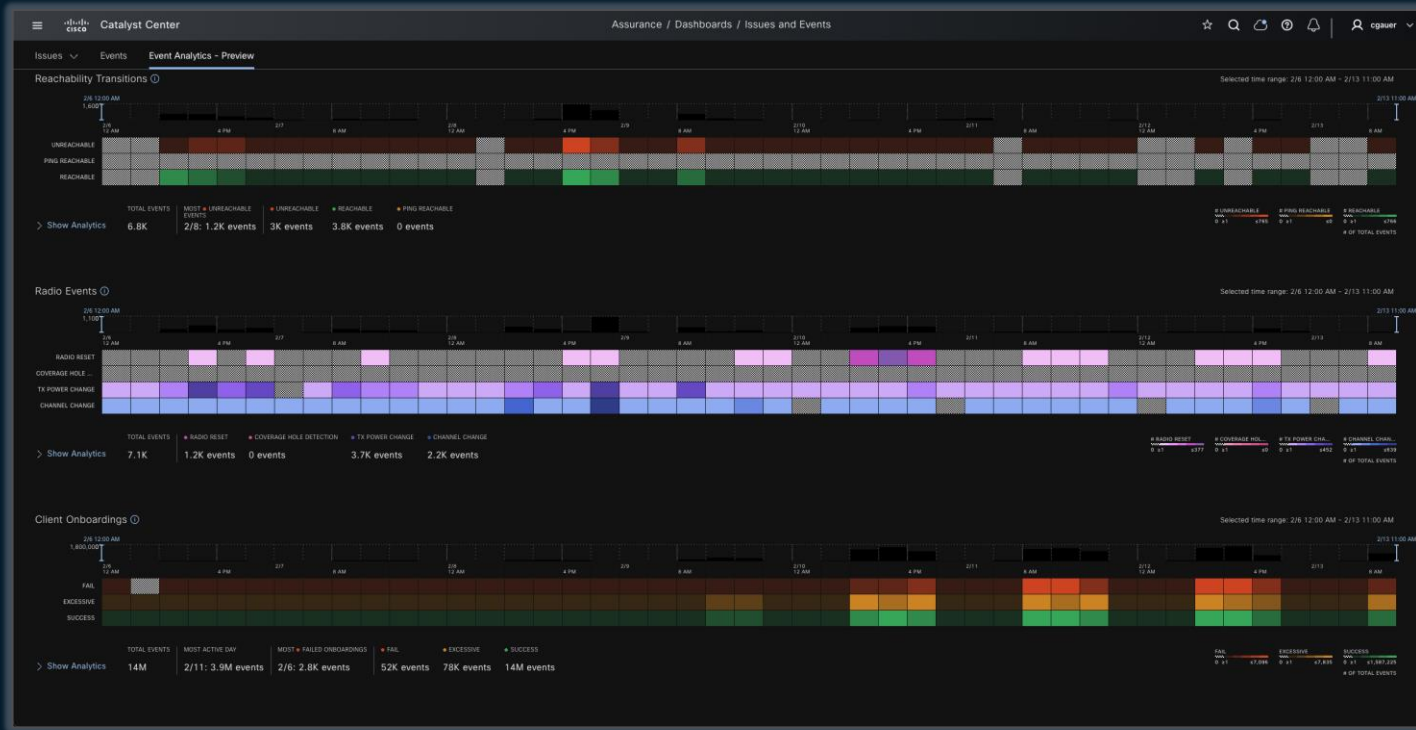


7 Ways to Fail as a Wireless Expert on Wi-Fi 7

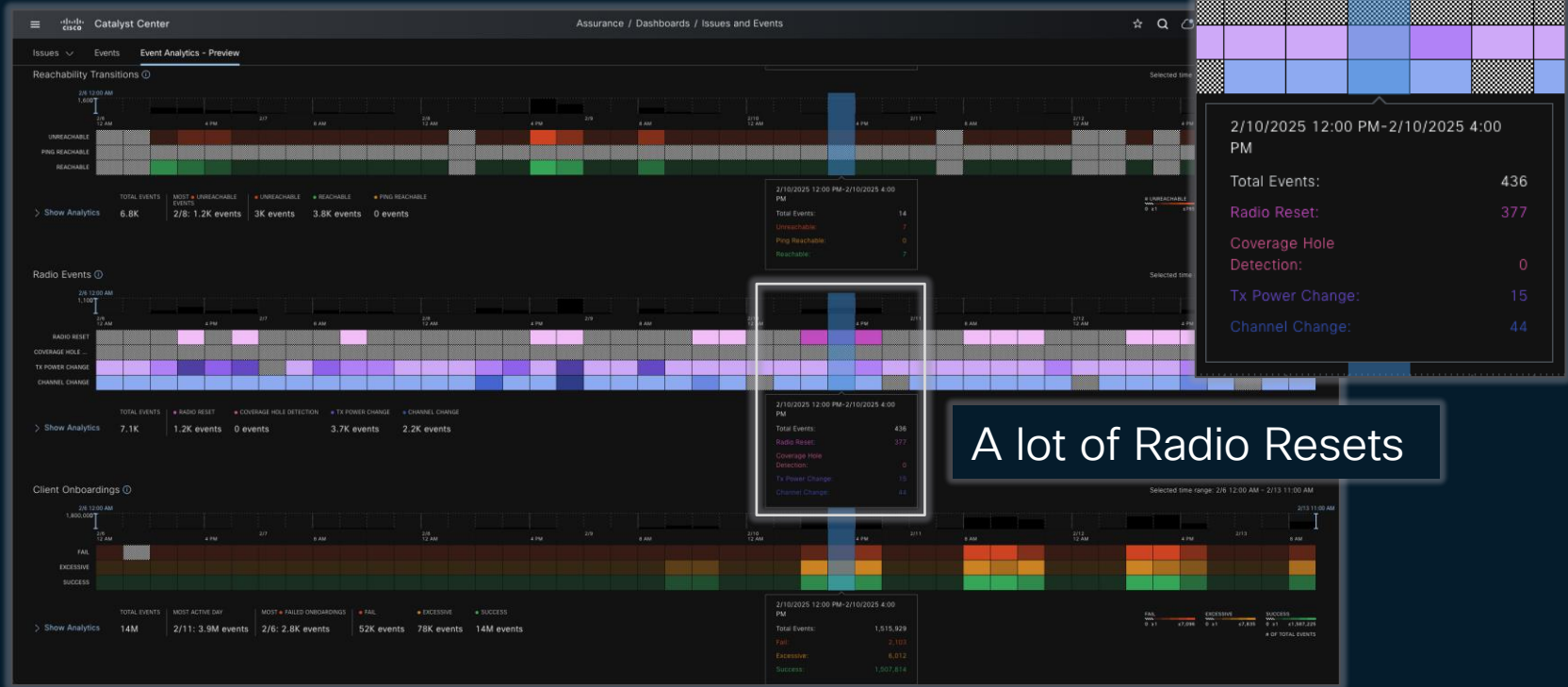
2



Catalyst Center Event Analytics

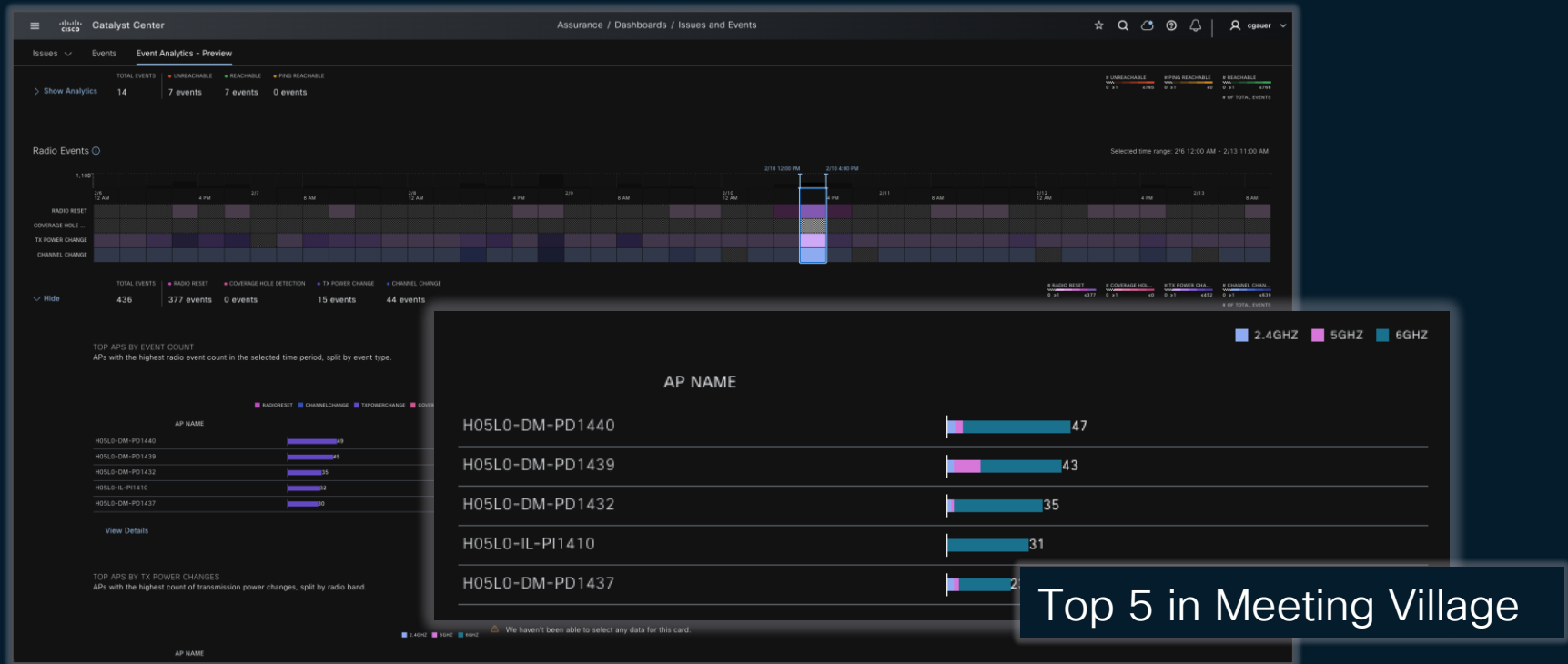


Catalyst Center Event Analytics



A lot of Radio Resets

Catalyst Center Event Analytics



Some more Wi-Fi details

- Michal

Keynote

61x 9104 (each dual 5GHz)

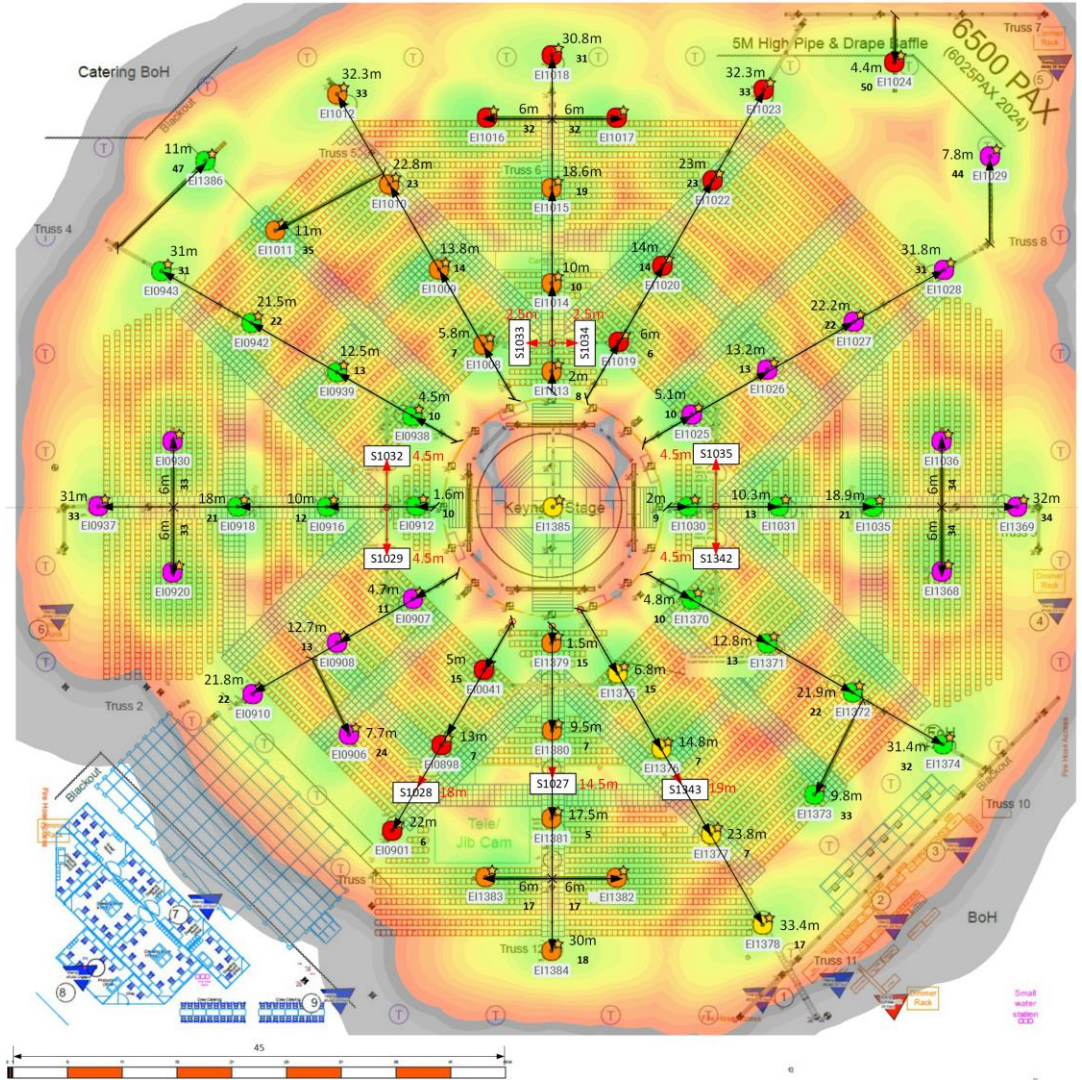
Mandatory 36Mbps / RxSop -76dBm

5300 clients during keynote

Channel	Power Level	Antenna PID
(100)	4/7 (11 dBm)	C-ANT9104=
(48)	1/5 (12 dBm)	C-ANT9104=
(136)	4/8 (12 dBm)	C-ANT9104=
(44)	1/5 (12 dBm)	C-ANT9104=
(136)	4/8 (12 dBm)	C-ANT9104=
(40)	1/5 (12 dBm)	C-ANT9104=
(124)	4/8 (12 dBm)	C-ANT9104=
(44)	1/5 (12 dBm)	C-ANT9104=
(128)	4/8 (12 dBm)	C-ANT9104=
(36)	1/5 (12 dBm)	C-ANT9104=
(100)	4/7 (11 dBm)	C-ANT9104=
(48)	1/5 (12 dBm)	C-ANT9104=
(116)	4/7 (11 dBm)	C-ANT9104=
(60)	1/5 (12 dBm)	C-ANT9104=
(140)	4/8 (12 dBm)	C-ANT9104=
(64)	1/5 (12 dBm)	C-ANT9104=
(136)	4/8 (12 dBm)	C-ANT9104=
(40)	1/5 (12 dBm)	C-ANT9104=

Tx power set via script

Visio for cable distances





Installation mastermind
- Maurijn

Live monitoring



Full Keynote
Installation time <1
day






Wi-Fi Police (rogue hunting)



Obvious



Less Obvious

BSSID	Network Name	Device Name	Signal	Min Basic Rate	Vendor	Band	Channel	Channel Width
6A:49:82:3F:A5:A0	Office	🔒	-42 dBm 	12 Mbps	 Cisco Meraki	5 GHz	48	40 MHz
6E:49:82:3F:A5:A0	TP-LINK_F0D6B4	🔒	-42 dBm 	12 Mbps	 Cisco Meraki	5 GHz	48	40 MHz



Level: Master



SSID	Band(s)	Purpose	Security
CiscoLive!	5 / 6GHz	Shiny new main SSID	WPA3 / SAE / FT+SAE
CiscoLive-Legacy	5GHz	Failsafe SSID	WPA2 / PSK
CiscoLive-WiFi7	5 / 6GHz	Do you have a client?	WPA3 / OWE
OpenRoaming	5 / 6GHz		WPA3 / 802.1X / FT+802.1X
eduroam	5 / 6GHz		WPA3 / 802.1X / FT+802.1X
CL-OPS	5 / 6GHz	Network staff	WPA3 / 802.1X / FT+802.1X

Inter-controller roaming

Dedicated WLCs:

- Hall 5 >> Meeting Village
 - 17.15.2 (Wi-Fi 7)
- Hall 12 >> Keynote
 - 17.12.4

Main WLC (9800-80):

- All other areas
 - 17.12.4




CISCO Live!

Difficult decisions (1)

- Saturday, one day before opening
- **Issue**: Broken inter-controller roaming for some clients

SSID	Band(s)	Purpose	Security
CiscoLive!	5 / 6GHz	Shiny new main SSID	WPA3 / SAE / SAE+FT

- **Decision**: Redesign venue using only 2x WLCs...
- **Decision**: Keep Wi-Fi 7 >> Upgrade MAIN WLC to 17.15.2 
- Bedtime = 2:30am

Difficult decisions (2)

- Monday, first full day of the show
- **Issue**: Wi-Fi 7 MLO client interop Bug, causing 6GHz radios to crash

kernel: [*02/10/2025 09:29:34] #011 ++++ Radio Firmware Crashed ! ++++

- **Outcome**: Successful discovery of CSCwo03761 ...
- **Decision**: Disable 802.11be (no more Wi-Fi 7)

A few moments later ...

Difficult decisions (3)

- Tuesday...
- **Issue:** Probe response flood on 9176 5GHz radios
CSCwo08256
- **Decision:** Replace *all* 9176 APs with 9166 APs

Source	Protocol	Length	Info
Cisco_99:c9:ee	802.11	486	Probe Response, SN=2822, FN=0, Flags=...R...C, BI=100, SSID="eduroam"
Cisco_99:c9:ee	802.11	486	Probe Response, SN=2822, FN=0, Flags=...R...C, BI=100, SSID="eduroam"
Cisco_99:c9:ee	802.11	486	Probe Response, SN=2822, FN=0, Flags=...R...C, BI=100, SSID="eduroam"
Cisco_99:c9:ee	802.11	486	Probe Response, SN=2822, FN=0, Flags=...R...C, BI=100, SSID="eduroam"
Cisco_99:c9:ed	802.11	488	Probe Response, SN=2828, FN=0, Flags=...R...C, BI=100, SSID="CiscoLive!"
Cisco_99:c9:ed	802.11	488	Probe Response, SN=2828, FN=0, Flags=...R...C, BI=100, SSID="CiscoLive!"
Cisco_99:c9:ed	802.11	488	Probe Response, SN=2828, FN=0, Flags=...R...C, BI=100, SSID="CiscoLive!"
Cisco_99:c9:ed	802.11	488	Probe Response, SN=2828, FN=0, Flags=...R...C, BI=100, SSID="CiscoLive!"
Cisco_99:c9:ed	802.11	488	Probe Response, SN=2828, FN=0, Flags=...R...C, BI=100, SSID="CiscoLive!"
Cisco_99:c9:ed	802.11	488	Probe Response, SN=2828, FN=0, Flags=...R...C, BI=100, SSID="CiscoLive!"
Cisco_99:c9:ed	802.11	488	Probe Response, SN=2828, FN=0, Flags=...R...C, BI=100, SSID="CiscoLive!"
Cisco_99:c9:ed	802.11	488	Probe Response, SN=2828, FN=0, Flags=...R...C, BI=100, SSID="CiscoLive!"
Cisco_99:c9:ec	802.11	514	Probe Response, SN=2871, FN=0, Flags=...R...C, BI=100, SSID="OpenRoaming"
Cisco_99:c9:ec	802.11	514	Probe Response, SN=2871, FN=0, Flags=...R...C, BI=100, SSID="OpenRoaming"
Cisco_99:c9:ec	802.11	514	Probe Response, SN=2871, FN=0, Flags=...R...C, BI=100, SSID="OpenRoaming"
Cisco_99:c9:ec	802.11	514	Probe Response, SN=2871, FN=0, Flags=...R...C, BI=100, SSID="OpenRoaming"
Cisco_99:c9:ec	802.11	514	Probe Response, SN=2871, FN=0, Flags=...R...C, BI=100, SSID="OpenRoaming"
Cisco_99:c9:ec	802.11	514	Probe Response, SN=2871, FN=0, Flags=...R...C, BI=100, SSID="OpenRoaming"
Cisco_99:c9:ec	802.11	514	Probe Response, SN=2871, FN=0, Flags=...R...C, BI=100, SSID="OpenRoaming"
Cisco_99:c9:ef	802.11	537	Probe Response, SN=2817, FN=0, Flags=...R...C, BI=100, SSID="CL-OPS"
Cisco_99:c9:ef	802.11	537	Probe Response, SN=2817, FN=0, Flags=...R...C, BI=100, SSID="CL-OPS"
Cisco_99:c9:ef	802.11	537	Probe Response, SN=2817, FN=0, Flags=...R...C, BI=100, SSID="CL-OPS"
Cisco_99:c9:ef	802.11	537	Probe Response, SN=2817, FN=0, Flags=...R...C, BI=100, SSID="CL-OPS"
Cisco_99:c9:ef	802.11	537	Probe Response, SN=2817, FN=0, Flags=...R...C, BI=100, SSID="CL-OPS"
Cisco_99:c9:ef	802.11	537	Probe Response, SN=2817, FN=0, Flags=...R...C, BI=100, SSID="CL-OPS"
Cisco_99:c9:ef	802.11	537	Probe Response, SN=2817, FN=0, Flags=...R...C, BI=100, SSID="CL-OPS"
Cisco_99:c9:ef	802.11	537	Probe Response, SN=2817, FN=0, Flags=...R...C, BI=100, SSID="CL-OPS"



CiscoLive! **8651**

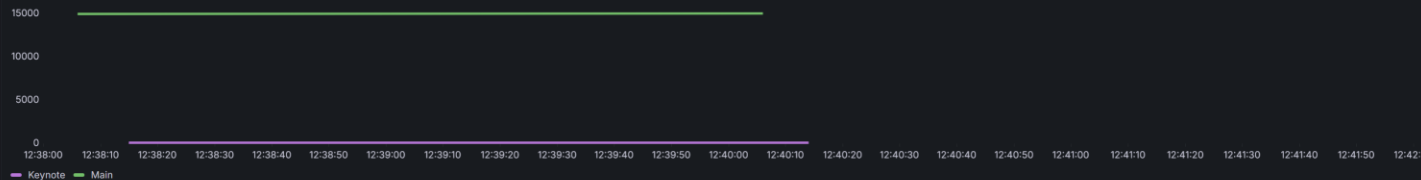
OpenRoaming **4770**

CiscoLive-Legacy **1040**

eduroam **535**

CL-OPS **63**

Total Wi-Fi Clients



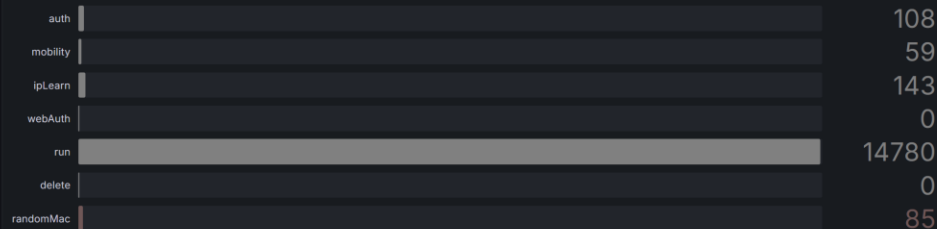
Total Wi-Fi Clients

15121

Clients / Band



Client States

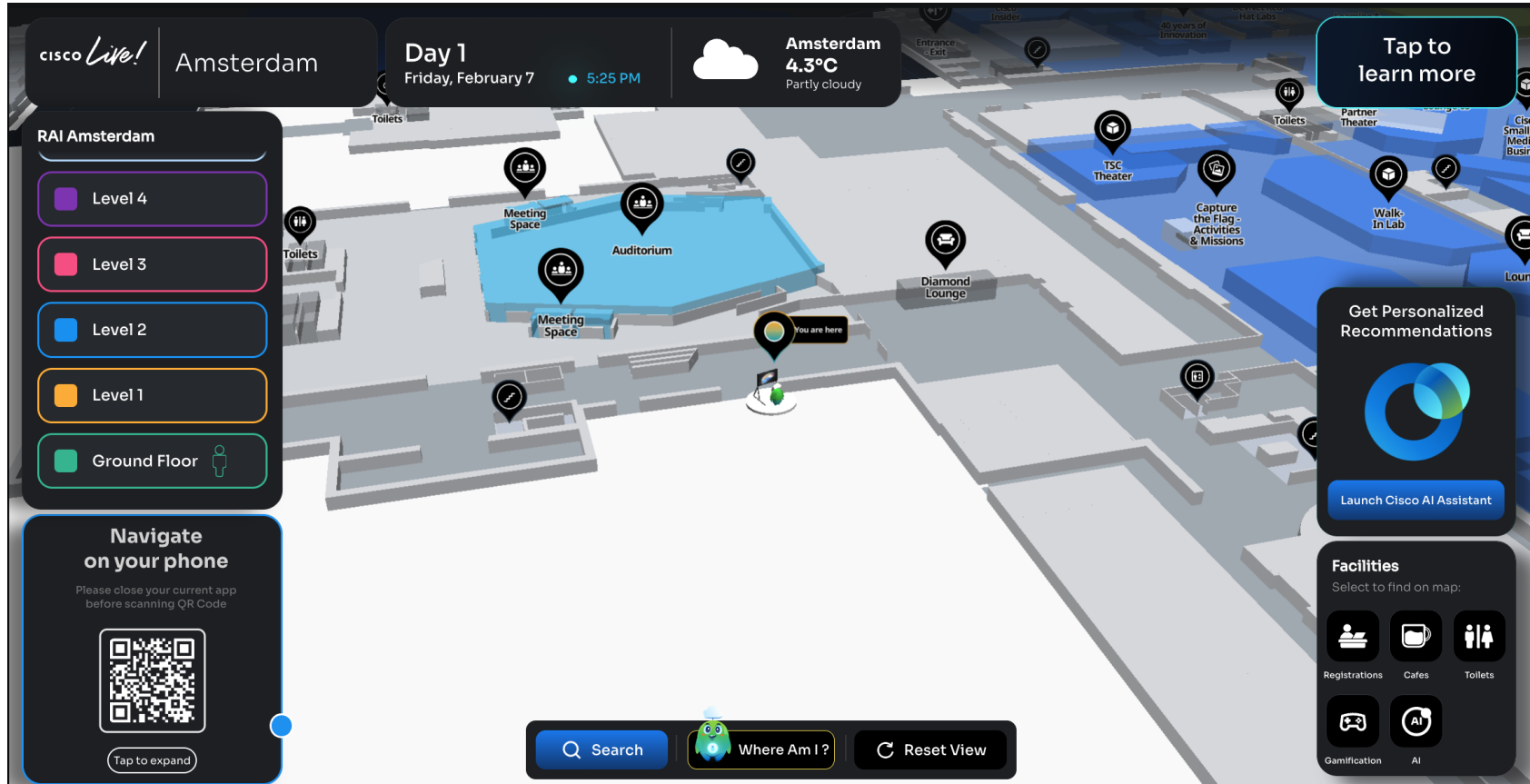


WayFinding

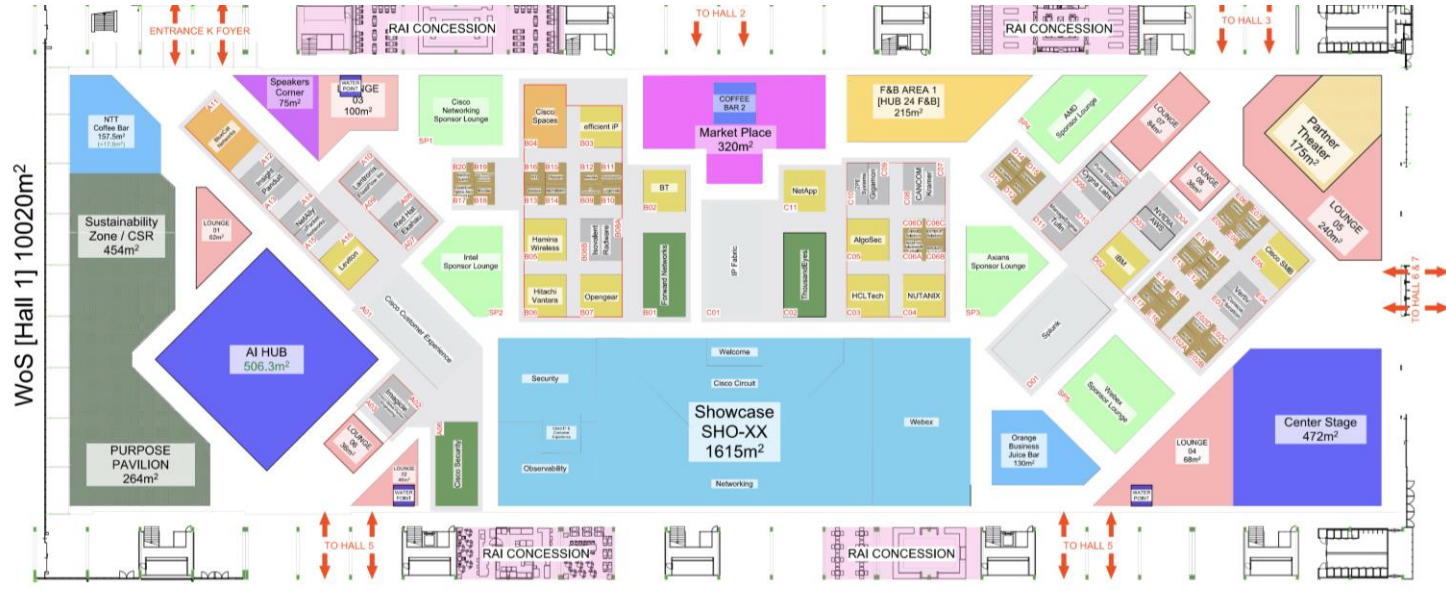
Sebastien Marchal
Technical Solutions Architect



Event.ciscospaces.io/clemea2025



But before that...



Versioning

...



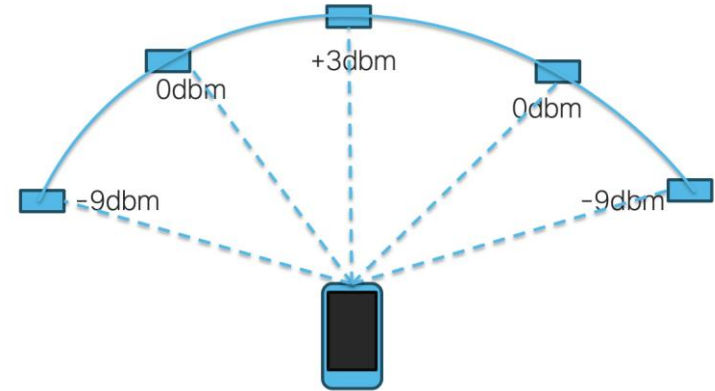
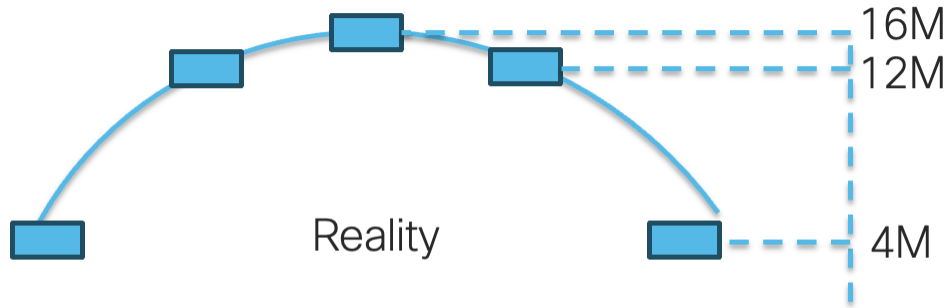
25CL_RAI_FLOORPLANS_V20tl_OP (1).pdf

January 27

Access Point BLE Mostly

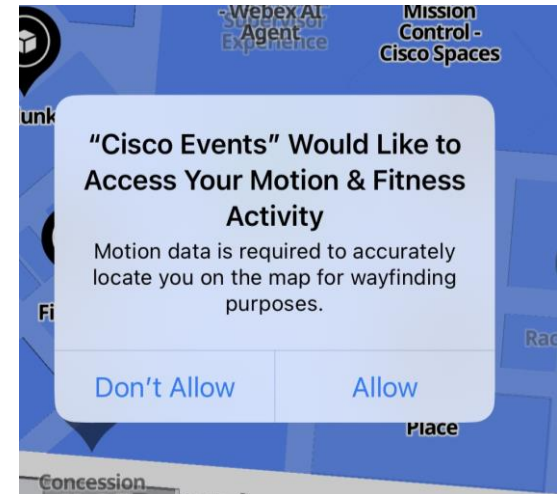
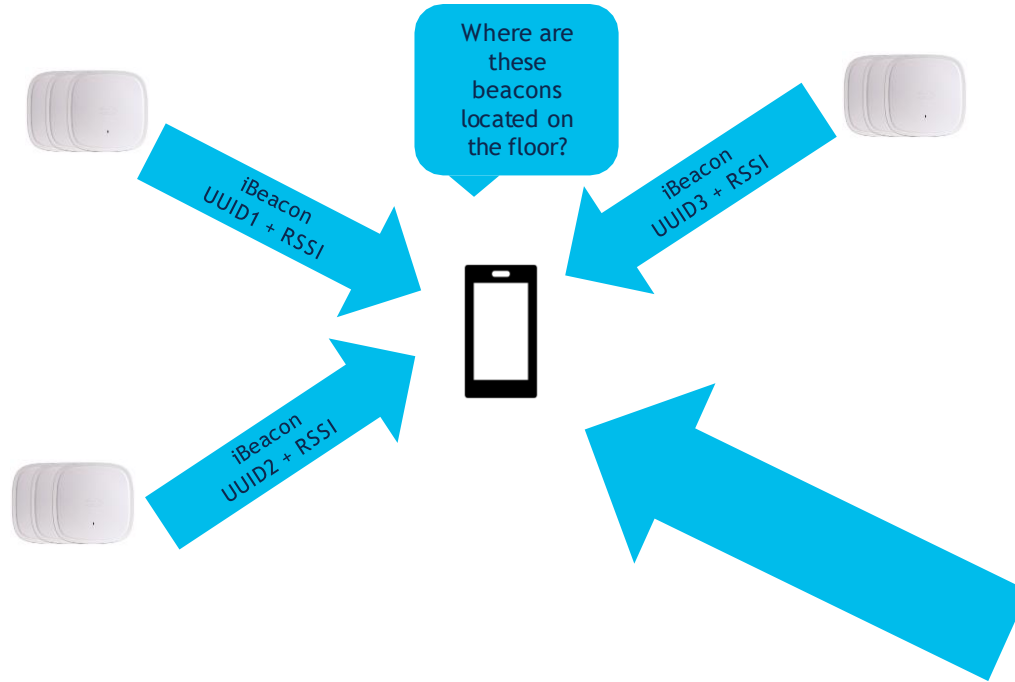
iBeacon Prefix (9 bytes)	UUID (16 bytes)	Major (2 bytes)	Minor (2 bytes)	Tx Power (1 byte)
-----------------------------	--------------------	--------------------	--------------------	----------------------

(a)



300ms vs 5sec last year
34 Beacon for transition zone

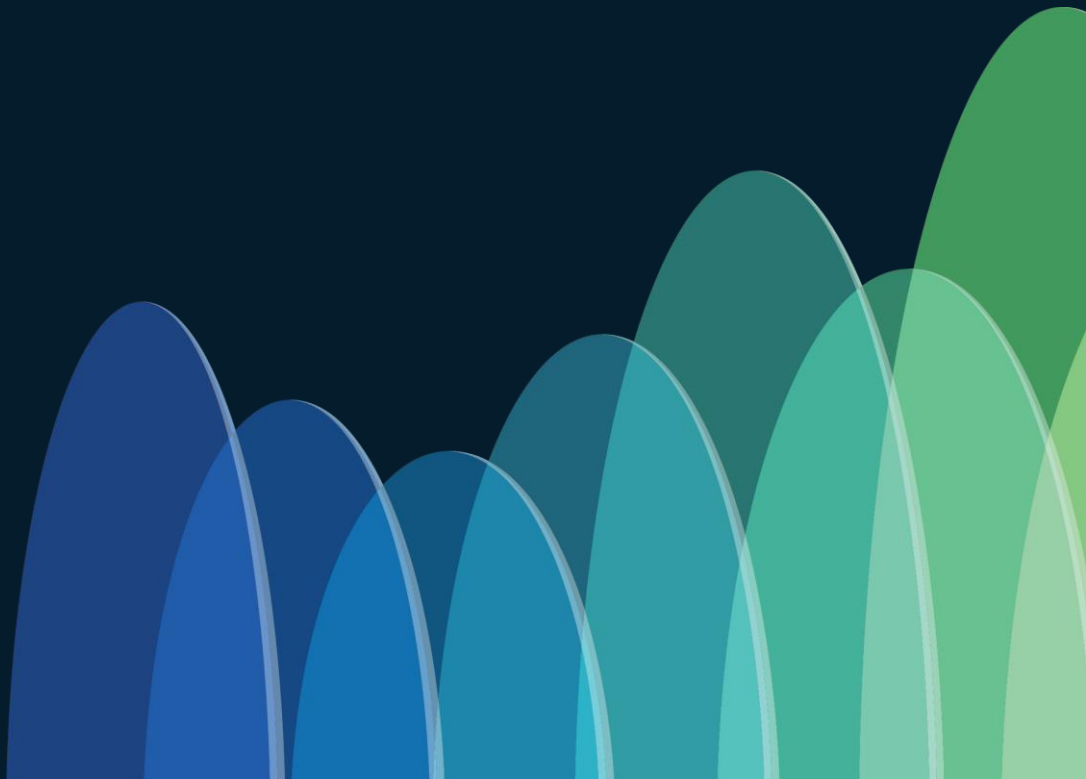
Client Computed Location with BLE Beacons



Security and the SOC

Luke Hebditch

CISCO *Live!*



The Team

- Luke Hebditch
 - Solutions Engineer, SSE
- Dave Tomkinson
 - Security Consulting Engineer
- Mark Bremner
 - Senior Security Consultant



Aims of the SOC

- Primary objective: maintain availability
- Close monitoring of the management networks and data centre
- Attendee and lab networks a secondary focus as considered as a guest network
- Work closely with the NOC team and vendors to ensure security best practice being followed

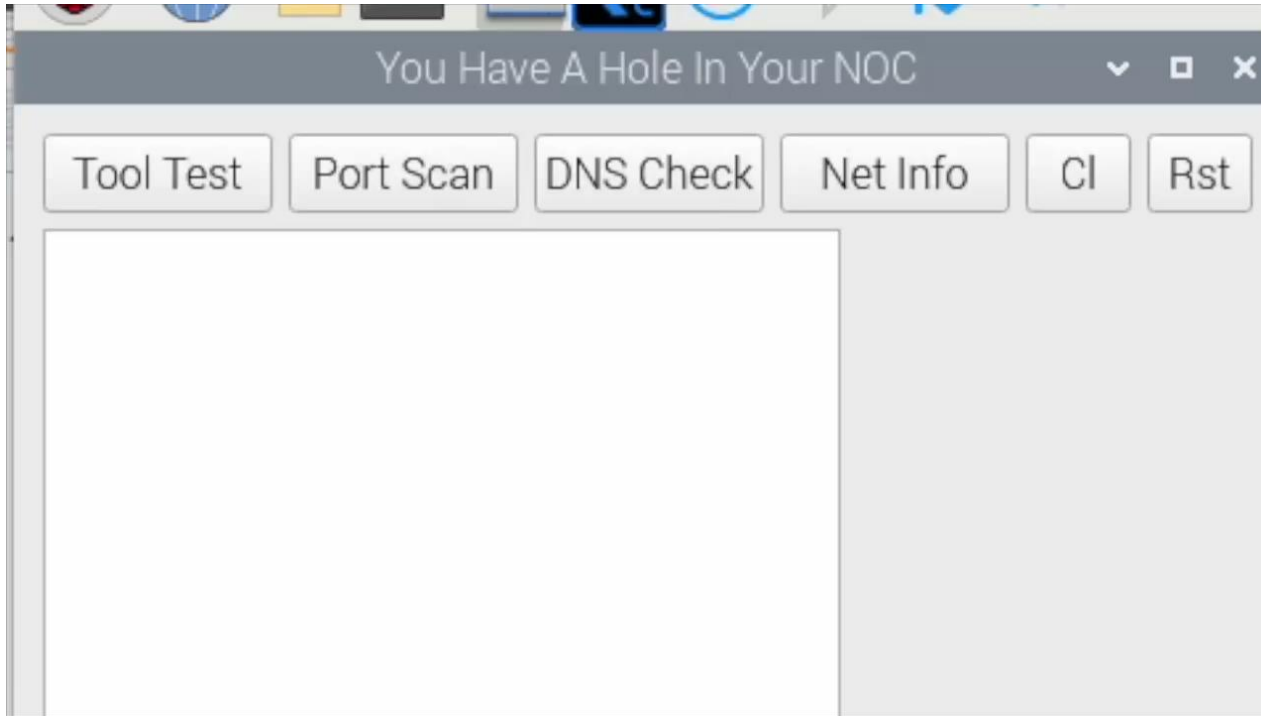
Key focus areas this year

- Starting to automate SOC processes
- Adjust security tooling to consider the wider use of IPv6 across the network
- Credential testing
 - Checking default credentials are NOT in use
 - Validation that important break-glass account passwords had been rotated

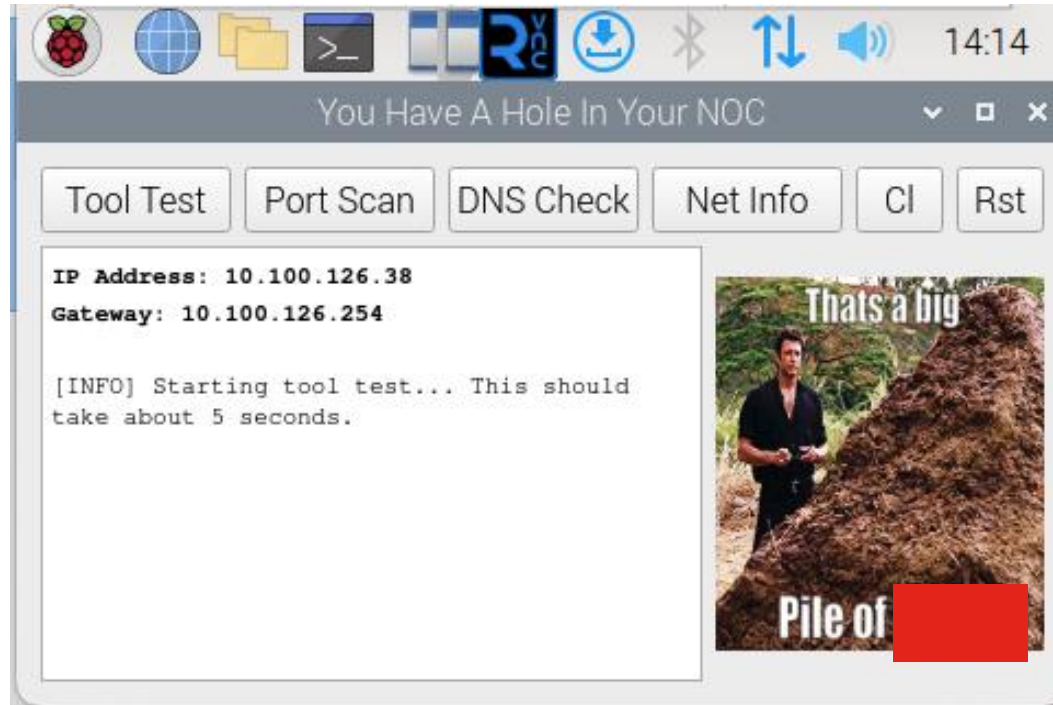
Technologies utilised

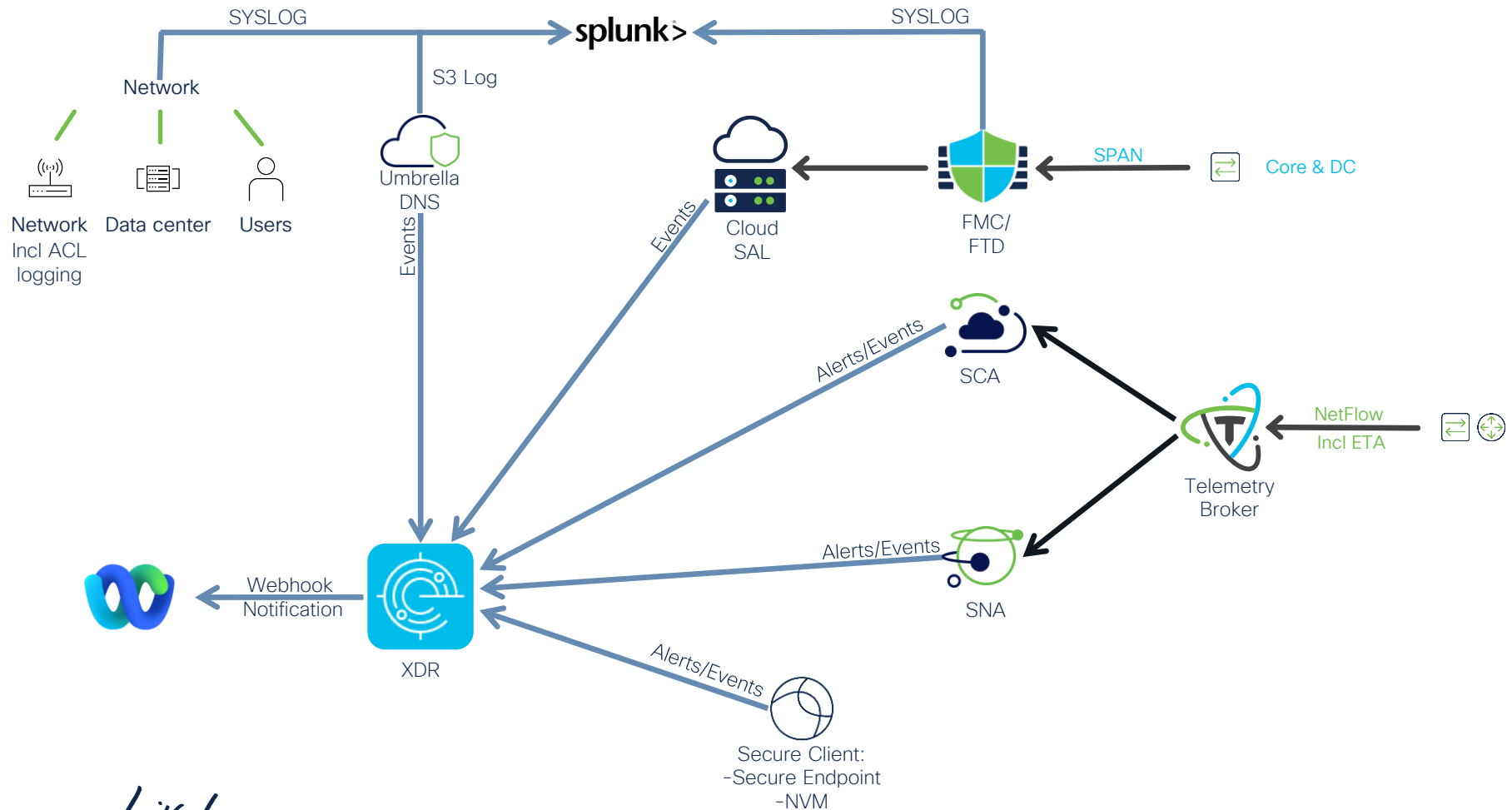
- Umbrella DNS
- Cisco XDR
- Secure Network Analytics
- Secure Cloud Analytics (including NVM)
- Secure Endpoint (incl Orbital)
- Encrypted Traffic Analytics
- Splunk Enterprise & Splunk Enterprise Security
- Radware Cloud DDOS (provided by the RAI)
- Firepower 4245's as IDS Sensors (SPAN of all traffic from the core & DC switches)
- Firepower Management Centre 4700's (in HA)
- SAL (Security Analytics and Logging)
- Bloodhound AD tool
- Nessus Professional
- Kali (with its various tools)
- Nuclei
- Burp suite

You have a hole in your NOC



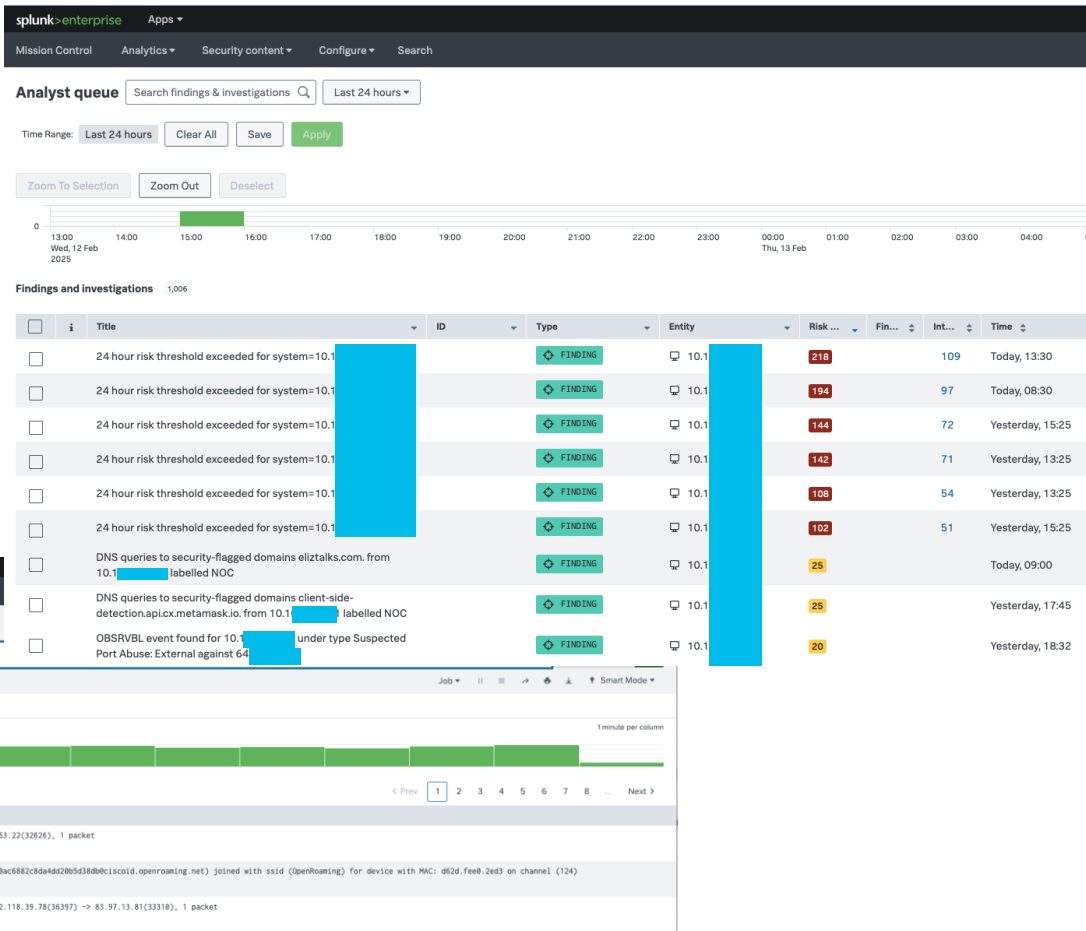
You have a hole in your NOC





Splunk

- Increased use of Splunk across the NOC team
- First use of Splunk ES



Next year?

- Discussion across the NOC team on potential extra enforcement points
- Extension of use of Splunk Enterprise Security



Services, Management, Alerting, and Stats

Joe Clarke
Distinguished Engineer



Our Mission Control

Actual
DAYLIGHT!



SOC
Dashboard
with Cisco
XDR and SNA

Wireless
metrics via
Grafana and
Cat Center

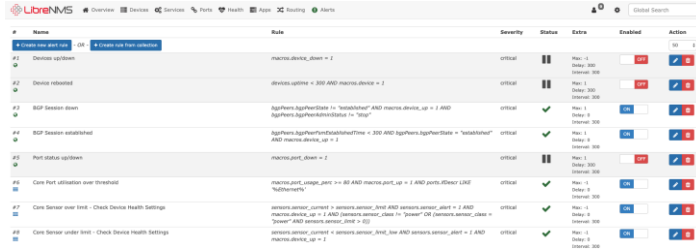
LibreNMS
for custom
alerting

Grafana
dashboards
for core
health stats

NetApp and
Intersight
dashboards

Multicast
streams
featuring one
Big Buck Bunny

Alerts Made Possible By...



#	Name	Rule	Severity	Status	Extra	Enabled	Action
#1	Device up/down	macro:device_updown = 2	critical	II	Max: 1 Delay: 300 Interval: 300	on	on
#2	Device rebooted	devices:uptime < 300 AND macros:device_up = 1	critical	II	Max: 1 Delay: 300 Interval: 300	on	on
#3	BGP Session down	AggPhen:AggPhenState != "established" AND macros:device_up = 1 AND AggPhen:AggPhenEstablishTime > 300	critical	III	Max: 1 Delay: 300 Interval: 300	on	on
#4	BGP Session established	AggPhen:AggPhenEstablishTime < 300 AND AggPhen:AggPhenState = "established" AND macros:device_up = 1	critical	III	Max: 1 Delay: 300 Interval: 300	on	on
#5	Port status up/down	macro:port_updown = 2	critical	II	Max: 1 Delay: 300 Interval: 300	on	on
#6	Core Port utilization over threshold	macro:port_utilize_port >= 80 AND macro:port_up = 1 AND ports:filter:120 "filtermarks"	critical	III	Max: 1 Delay: 300 Interval: 300	on	on
#7	Core Sensor near limit - Check Device Health Settings	sensors:sensor_current < sensors:sensor_limit AND sensors:sensor_prev < 2 AND macros:device_up = 1 AND sensors:sensor_name != "power" OR (sensors:sensor_name = "power" AND sensors:sensor_prev > 95)	critical	III	Max: 1 Delay: 300 Interval: 300	on	on
#8	Core Sensor under limit - Check Device Health Settings	sensors:sensor_current < sensors:sensor_limit AND sensors:sensor_prev < 2 AND macros:device_up = 1	critical	III	Max: 1 Delay: 300 Interval: 300	on	on



cisco Live!



LibreNMS on cl-monitoring

Alert for device h01-066-s0688 - Access/IDF Power State Critical

Device name: h01-066-s0688.ciscolive.network

Timestamp: 2023-02-10 08:38:56

Rule: Access/IDF Power State Critical

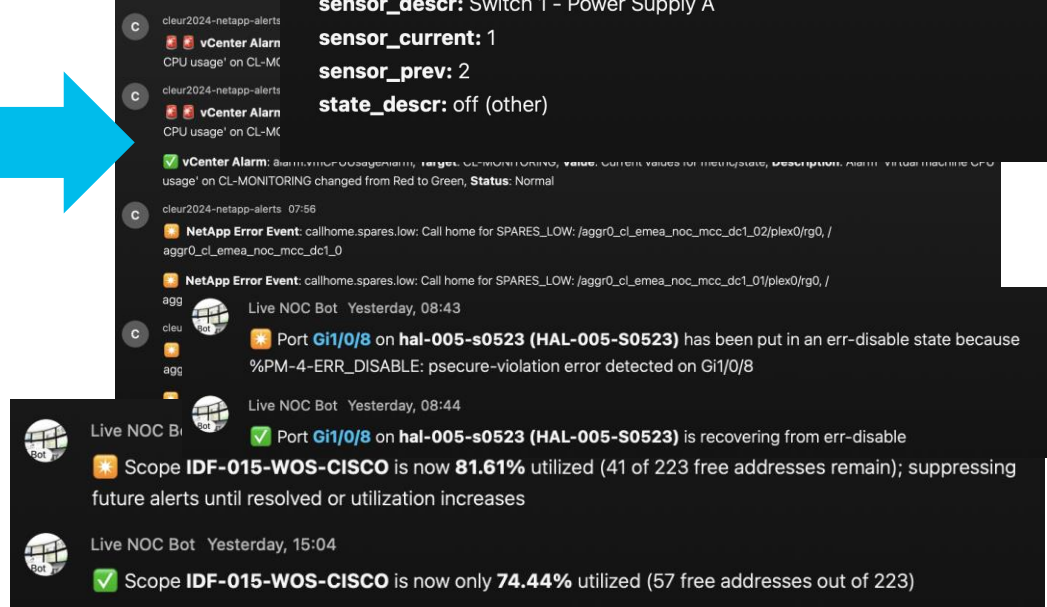
sensor_class: state

sensor_descr: Switch 1 - Power Supply A

sensor_prev: 1

sensor_current: 2

state_descr: off (other)



cleur2024-netapp-alerts

vCenter Alarm
CPU usage' on CL-MK

cleur2024-netapp-alerts

vCenter Alarm
CPU usage' on CL-MK

vCenter Alarm: ~~Switch 1 - Power Supply A~~ **sensor_class:** state, **sensor_descr:** Switch 1 - Power Supply A, **sensor_prev:** 1, **sensor_current:** 2, **state_descr:** off (other). **Status:** Normal

cleur2024-netapp-alerts 07:56

NetApp Error Event: callhome.spares.low: Call home for SPARES_LOW: /aggr0_cl_emea_noc_mcc_dc1_02/plex0/r0, /aggr0_cl_emea_noc_mcc_dc1_0

NetApp Error Event: callhome.spares.low: Call home for SPARES_LOW: /aggr0_cl_emea_noc_mcc_dc1_01/plex0/r0, /aggr0_cl_emea_noc_mcc_dc1_0

agg Live NOC Bot Yesterday, 08:43

cleu **Port Gi1/0/8 on hal-005-s0523 (HAL-005-S0523)** has been put in an err-disable state because %PM-4-ERR_DISABLE: psecure-violation error detected on Gi1/0/8

agg Live NOC Bot Yesterday, 08:44

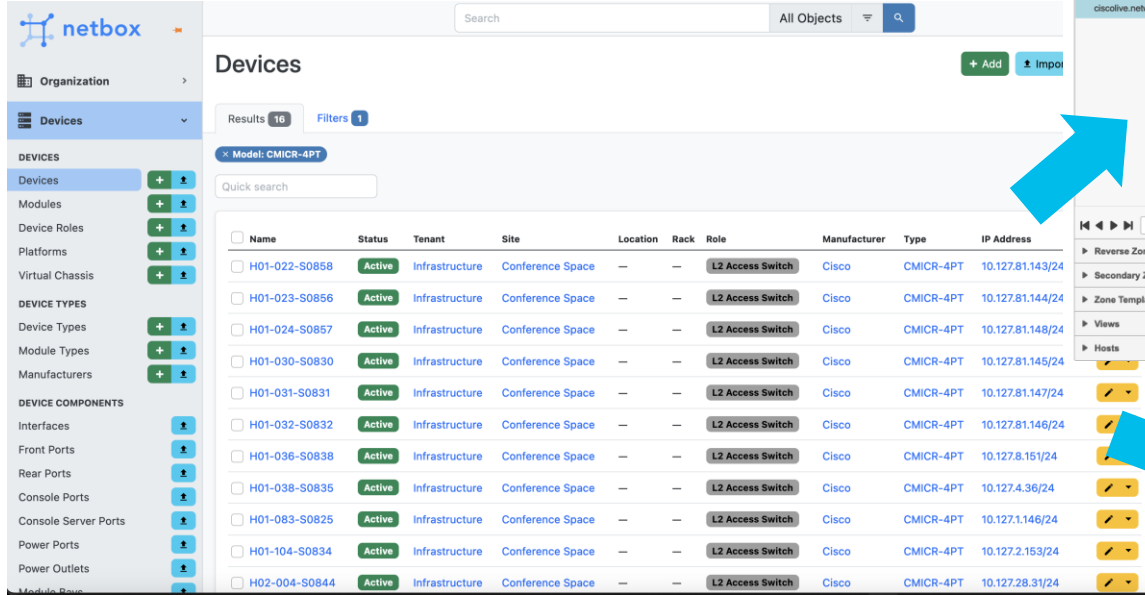
Live NOC Bot **Port Gi1/0/8 on hal-005-s0523 (HAL-005-S0523)** is recovering from err-disable

Scope IDF-015-WOS-CISCO is now **81.61%** utilized (41 of 223 free addresses remain); suppressing future alerts until resolved or utilization increases

Live NOC Bot Yesterday, 15:04

Scope IDF-015-WOS-CISCO is now only **74.44%** utilized (57 free addresses out of 223)

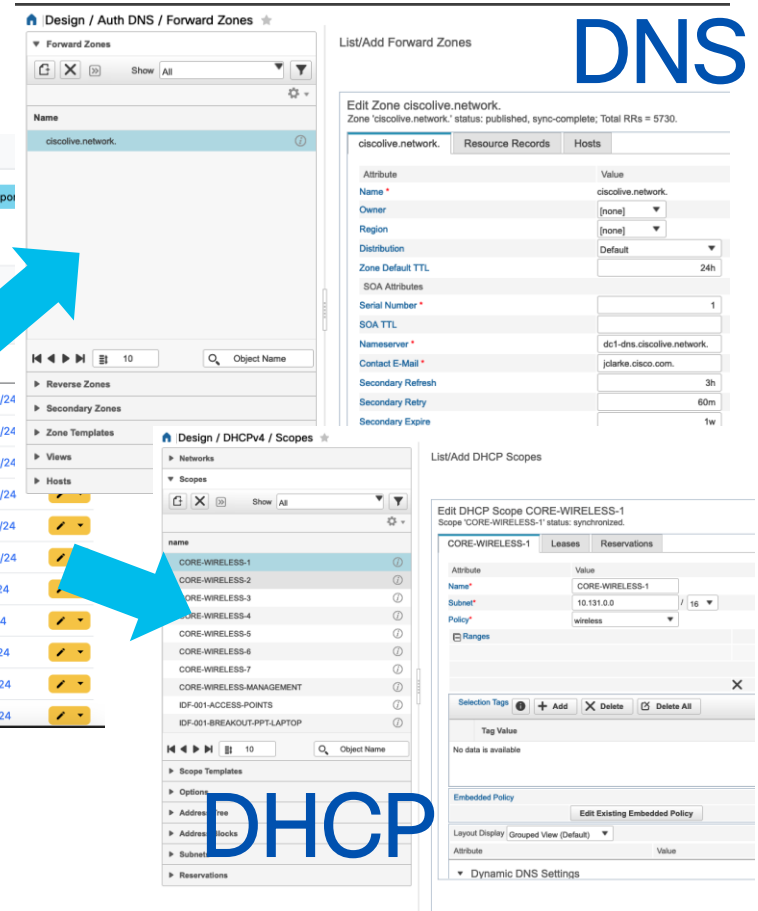
Be True To Your Network



The NetBox interface shows the 'Devices' page. On the left, a sidebar contains navigation links for Organization, Devices, Modules, Device Roles, Platforms, Virtual Chassis, Device Types, Module Types, Manufacturers, Device Components, Interfaces, Front Ports, Rear Ports, Console Ports, Console Server Ports, Power Ports, and Power Outlets. The main content area displays a table of devices with columns for Name, Status, Tenant, Site, Location, Rack, Role, Manufacturer, Type, and IP Address. A filter for 'Model: CMICR-4PT' is applied, resulting in 16 items. The table lists 16 CMICR-4PT access switches from Cisco, all with an 'Active' status, located in 'Conference Space' across various racks. A blue arrow points from the 'Forward Zones' panel on the right towards the 'DHCPv4 / Scopes' panel.

Name	Status	Tenant	Site	Location	Rack	Role	Manufacturer	Type	IP Address
H01-022-S0858	Active	Infrastructure	Conference Space	—	—	L2 Access Switch	Cisco	CMICR-4PT	10.127.81.143/24
H01-023-S0856	Active	Infrastructure	Conference Space	—	—	L2 Access Switch	Cisco	CMICR-4PT	10.127.81.144/24
H01-024-S0857	Active	Infrastructure	Conference Space	—	—	L2 Access Switch	Cisco	CMICR-4PT	10.127.81.148/24
H01-030-S0830	Active	Infrastructure	Conference Space	—	—	L2 Access Switch	Cisco	CMICR-4PT	10.127.81.145/24
H01-031-S0831	Active	Infrastructure	Conference Space	—	—	L2 Access Switch	Cisco	CMICR-4PT	10.127.81.147/24
H01-032-S0832	Active	Infrastructure	Conference Space	—	—	L2 Access Switch	Cisco	CMICR-4PT	10.127.81.146/24
H01-036-S0838	Active	Infrastructure	Conference Space	—	—	L2 Access Switch	Cisco	CMICR-4PT	10.127.8.151/24
H01-038-S0835	Active	Infrastructure	Conference Space	—	—	L2 Access Switch	Cisco	CMICR-4PT	10.127.4.36/24
H01-083-S0825	Active	Infrastructure	Conference Space	—	—	L2 Access Switch	Cisco	CMICR-4PT	10.127.1.146/24
H01-104-S0834	Active	Infrastructure	Conference Space	—	—	L2 Access Switch	Cisco	CMICR-4PT	10.127.2.153/24
H02-004-S0844	Active	Infrastructure	Conference Space	—	—	L2 Access Switch	Cisco	CMICR-4PT	10.127.28.31/24

DNS



The NetBox interface shows the 'Design / Auth DNS / Forward Zones' panel. The 'Forward Zones' list contains 'ciscolive.network'. A blue arrow points from the 'Forward Zones' panel to the 'DHCPv4 / Scopes' panel. The 'DHCPv4 / Scopes' panel shows a list of scopes, including 'CORE-WIRELESS-1'. A blue arrow points from the 'CORE-WIRELESS-1' scope to the 'Edit DHCP Scope CORE-WIRELESS-1' panel. The 'Edit DHCP Scope' panel shows configuration for 'CORE-WIRELESS-1', including Name, Subnet (10.131.0.0 / 16), Policy (wireless), and Dynamic DNS Settings.

Design / Auth DNS / Forward Zones

Forward Zones

Name: ciscolive.network

Reverse Zones

Secondary Zones

Zone Templates

Views

Hosts

Design / DHCPv4 / Scopes

Networks

Scopes

name: CORE-WIRELESS-1

CORE-WIRELESS-2

CORE-WIRELESS-3

CORE-WIRELESS-4

CORE-WIRELESS-5

CORE-WIRELESS-6

CORE-WIRELESS-7

CORE-WIRELESS-MANAGEMENT

IDF-001-ACCESS-POINTS

IDF-001-BREAKOUT-PPT-LAPTOP

Scope Templates

Options

Address

Address

Subnet

Reservations

Edit DHCP Scope CORE-WIRELESS-1

Scope 'CORE-WIRELESS-1' status: synchronized.

CORE-WIRELESS-1

Leases

Reservations

Attribute: Value

Name: CORE-WIRELESS-1

Subnet: 10.131.0.0 / 16

Policy: wireless

Ranges

Selection Tags

Tag Value

No data is available

Embedded Policy

Edit Existing Embedded Policy

Layout Display: Grouped View (Default)

Attribute: Value

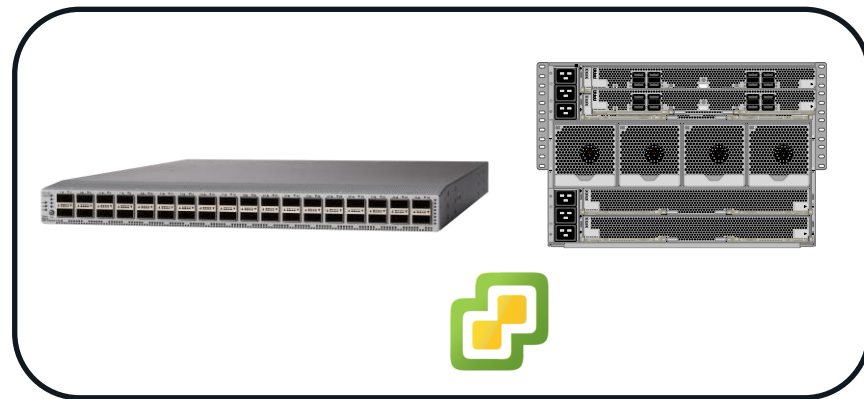
Dynamic DNS Settings

DHCP

CiscoLive As A [NSO] Service

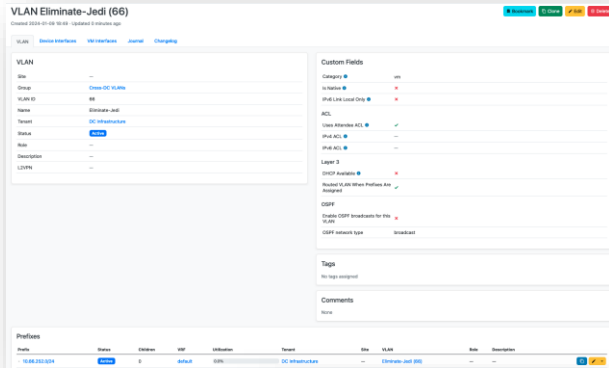


The Tool



```
ncs#config
ncs(config)#ciscolive Amsterdam 2025
```

Automation!



```
interface Vlan66
description Eliminate-Jedi
no shutdown
mtu 9216
ip flow monitor CL-ipv4-nb input
ipv6 flow monitor CL-ipv6-nb input
no ip redirects
ip address 10.100.252.247/24
ipv6 address 2a11:d940:2:64fc::f7/64
ipv6 nd ra dns server 2a11:d940:2:64fd::6 86400 sequence 0
ipv6 nd ra dns server 2a11:d940:2:64fe::6 86400 sequence 1
ipv6 nd ra dns search-list ciscolive.network 86400 sequence 0
no ipv6 redirects
ip ospf network point-to-point
ip router ospf 1 area 0.0.0.0
ospfv3 network point-to-point
ipv6 router ospfv3 1 area 0.0.0.0
no ip arp gratuitous hsrp duplicate
hsrp version 2
hsrp 1
authentication md5 key-chain HSRP_KEY
preempt
priority 105
timers 1 3
ip 10.100.252.254
hsrp 2 ipv6
authentication md5 key-chain HSRP_KEY
preempt
priority 105
timers 1 3
ip 2a11:d940:2:64fc::fe
ip dhcp relay address 10.100.253.9
ip dhcp relay address 10.100.254.9
```

Switch Config

```
device dcl-ethsw-1 {
    config {
        vlan {
            vlan-list 66 {
                name Eliminate-Jedi;
            }
        }
        interface {
            Vlan 66 {
                description Eliminate-Jedi;
                ip {
                    access-group in {
                        name IPV4-ACL-COMMON-VLAN;
                    }
                    address {
                        ipaddr 10.66.252.247/24;
                    }
                    arp {
                        gratuitous {
                            hsrp {
                                duplicate false;
                            }
                        }
                    }
                }
            }
        }
    }
}
```

Git-powered Auditing

Rancid spots config changes

```
diff --git a/configs/core1
index b993f17..eabd64e 100644
--- a/configs/core1-wa
@@ -1387,9 +1387,9 @@ interface Vlan135
no ip unreachable
ip access-group IPV4-ALLDENY in
standby version 2
- standby 2 ipv6 2A05:F8C0:2:87FF::FE/64
- standby 2 preempt
- standby 2 mac-address 0005.73a0.2222
+ standby 1 ipv6 2A0
+ standby 1 preempt
+ standby 1 mac-
```

Python monitors routing changes

```
diff --git a/config
index 5e36371..dd
--- a/configs/co
@@ -1428,10 +1428
no ip unreachable
ip access-group
standby version
- standby 2 ipv6
- standby 2 prio
- standby 2 pree
- standby 2 mac-
+ standby 1 ipv6
+ standby 1 prio
+ standby 1 pree
+ standby 1 mac-
load-interval 3
ipv6 address 2A
ipv6 enable

1 --- ipv6_route-CORE2-EDGE.prev 2020-01-31 09:55:17.680617000
2 +++ ipv6_route-CORE2-EDGE.curr 2020-01-31 10:00:24.610541000
3 @@ -1,5 +1,5 @@
4 show ipv6 route
5 -IPv6 Routing Table - default - 811 entries
6 +IPv6 Routing Table - default - 810 entries
7 Codes: C - Connected, L - Local, S - Static, U - Per-user St
8 B - BGP, R - RIP, H - NHRP, I1 - ISIS L1
9 I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary,
10 @@ -3618,11 +3618,6 @@
11 via FE80::10:128:1:2, TenGigabitEthernet0/1/0
12 via FE80::10:128:1:28, TenGigabitEthernet0/1/4
13 0 2A05:F8C0:2:7F00::20/128
14 - [110/30]
15 - via FE80::10:128:1:28, TenGigabitEthernet0/1/4
16 - via FE80::10:128:1:6, TenGigabitEthernet0/1/1
17 - via FE80::10:128:1:2, TenGigabitEthernet0/1/0
18 -0 2A05:F8C0:2:7F00::21/128
19 [110/30]
20 via FE80::10:128:1:28, TenGigabitEthernet0/1/4
21 via FE80::10:128:1:6, TenGigabitEthernet0/1/1
```

Gogs and git record the history

The screenshot displays a Gogs web interface for a repository named 'CiscoLive / routing-tables'. It shows a commit by 'RANCID daemon user' with 4 changed files (8 additions, 8 deletions). Below, a commit by 'Joe Clarke' is shown with 1 changed file (1 addition, 18 deletions). The file 'ip_route-CORE1-EDGE.txt' is highlighted, showing a diff of IPv6 routing table entries. The diff indicates changes in the routing table, such as the removal of certain routes and the addition of new ones, with line numbers 13 through 3074 visible.

You 08/02/2025, 16:23

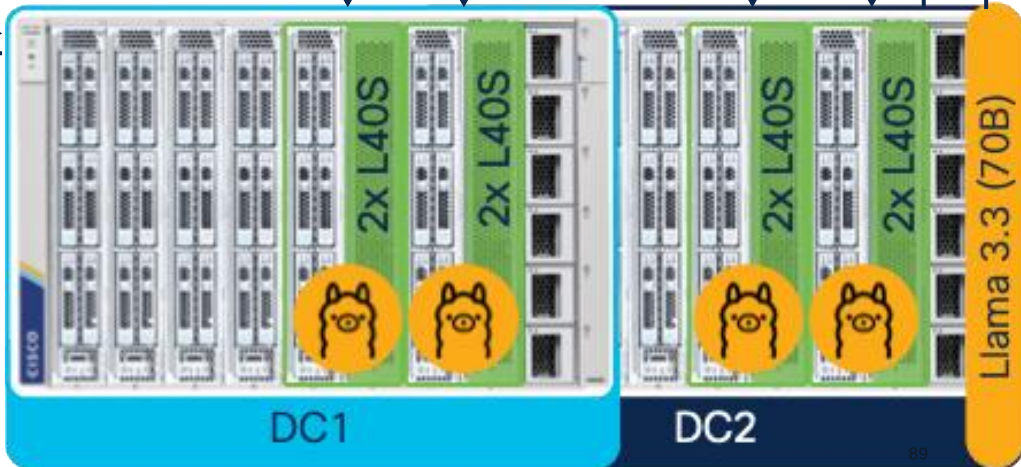
Live tell me about 10.100.240.47 in a form of a poem please

Call these
informati

Sure, here you go:
“poem poem poem”



webex
by CISCO



Live NOC Bot 08/02/2025, 16:23

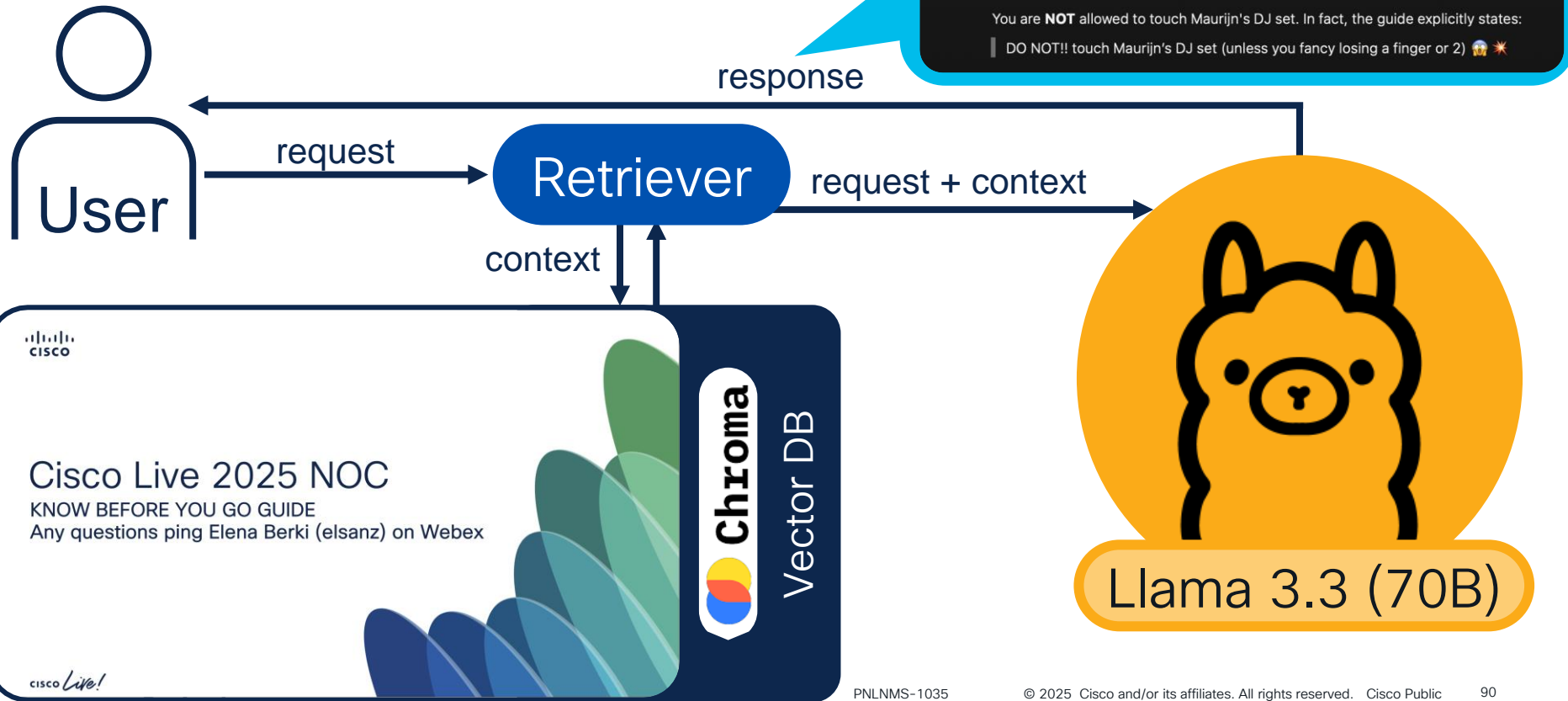
Hey, Jara! Let ChatNOC work on that for you...

Hello josterfe 🐷

I've gathered some information about the IP address 10.100.240.47 in a poetic form for you:

```
1 The IP address 10.100.240.47 so fine,  
2 Is leased to a MacBookPro, a device divine.  
3 Its MAC address is 5e:04:b8:4b:bc:1b,  
4 Connected to the IDF-240-NOC-MANAGEMENT scope with glee.  
5  
6 It's associated with the SSID CL-OPS,  
7 On the access point CONL0-IM-PI1416, no need to mope.  
8 The client details show a user jclarke,  
9 With an IP address and MAC address that perfectly embark.  
10  
11 The device is running macOS 15.3,  
12 A wireless connection with a health score of 10, you see.  
13 It's located in CLEUR 2025/Congress/Congress-L0,  
14 A place where connections are made, don't you know!  
15  
16 So there you have it, josterfe,  
17 Information about the IP address, all in a poetic retrieve 🌈  
18 From **CPNR** and **Netbox**,  
19 And **ISE** and **Cat Center**, all data to perceive.
```

LLM + RAG = KBYG Bot



From regex ...



```
824 m = re.findall(r"\b([0-9]+\.[0-9]+\.[0-9]+\.[0-9]+)\b", txt)
825 if not found_hit and len(m) > 0:
826     found_hit = True
827     for hit in m:
828         res = check_for_lease(hit)
829         # pires = get_from_pi(ip=hit)
830         nbres = get_from_netbox(pnb, ip=hit)
831         cmxres = None
832         dnacres = None
833 >         if res is not None:--
836         if res is not None:
837             reserved = ""
838 >         if "is-reserved" in res and res["is-reserved"]:-
840 >         if re.search(r"available", res["state"]):-
865         else:
866             port_info = res["relay-info"]["port"]
867 >         if port_info != "N/A":-
874
875         spark.post_to_spark(
876             C.WEBEX_TEAM,
877             SPARK_ROOM,
878             "{_} is leased by a client with name **{0}** and MAC **{1}** in scope **{2}** (state: **{3}**) and is connected to switch **{4}** on port {5} in VLAN **{6}**{7}.".format(
879                 hit,
880                 res["name"],
881                 res["mac"],
882                 res["scope"],
883                 res["state"],
884                 res["relay-info"]["switch"],
885                 port_info,
886                 res["relay-info"]["vlan"],
887                 reserved,
888             ),
889         )
```

DHCP Queries ☆

CLEUR 24 NOC



Meet

Messages

People (13)

Content

Meetings

+ Apps



Martin Kriska 01/02/2024, 22:37

Live 10.100.76.31



Live NOC Bot 01/02/2024, 22:37

Hey, Martin. Working on that for you...

10.100.76.31 is leased by a client with name **SEP40CE242BEBB5** and MAC **40:ce:24:2b:eb:b5** in scope **IDF-076-NOC-MANAGEMENT** (state: **leased**) and is connected to switch **H02-015-S0151** on port **GigabitEthernet1/0/4** in VLAN **100**.



DHCP Queries ☆

Messages

People (18)

Content

Meetings

+ Apps

You 08/02/2025, 16:23

Live tell me about 10.100.240.47 in a form of a poem please

Live NOC Bot 08/02/2025, 16:23

Hey, Jara! Let **ChatNOC** work on that for you...

Hello josterfe 🖐️

I've gathered some information about the IP address **10.100.240.47** in a poetic form for you:

```

1 The IP address 10.100.240.47 so fine,
2 Is leased to a MacBookPro, a device divine.
3 Its MAC address is 5e:04:b8:4b:bc:1b,
4 Connected to the IDF-240-NOC-MANAGEMENT scope with glee.
5
6 It's associated with the SSID CL-OPS,
7 On the access point CONL0-IM-PI1416, no need to mope.
8 The client details show a user jclarke,
9 With an IP address and MAC address that perfectly embark.
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11 The device is running macOS 15.3,
12 A wireless connection with a health score of 10, you see.
13 It's located in CLEUR 2025/Congress/Congress-L0,
14 A place where connections are made, don't you know!
15
16 So there you have it, josterfe,
17 Information about the IP address, all in a poetic retrieval
18 From **CPNR** and **Netbox**,
19 And **ISE** and **Cat Center**, all data to perceive.

```


NOC AI - Powered By UCS X Direct and Nvidia L40S GPUs

Total GPU Utilization



Total GPU Power Usage

870 w

GPU Utilization



GPU Power Usage



GPU Utilization Over Time



Jara Osterfeld 10:23

Live tell me about 10.100.240.47 in a form of a poem please

Live NOC Bot 10:23

Hey, Jara! Let ChatNOC work on that for you...

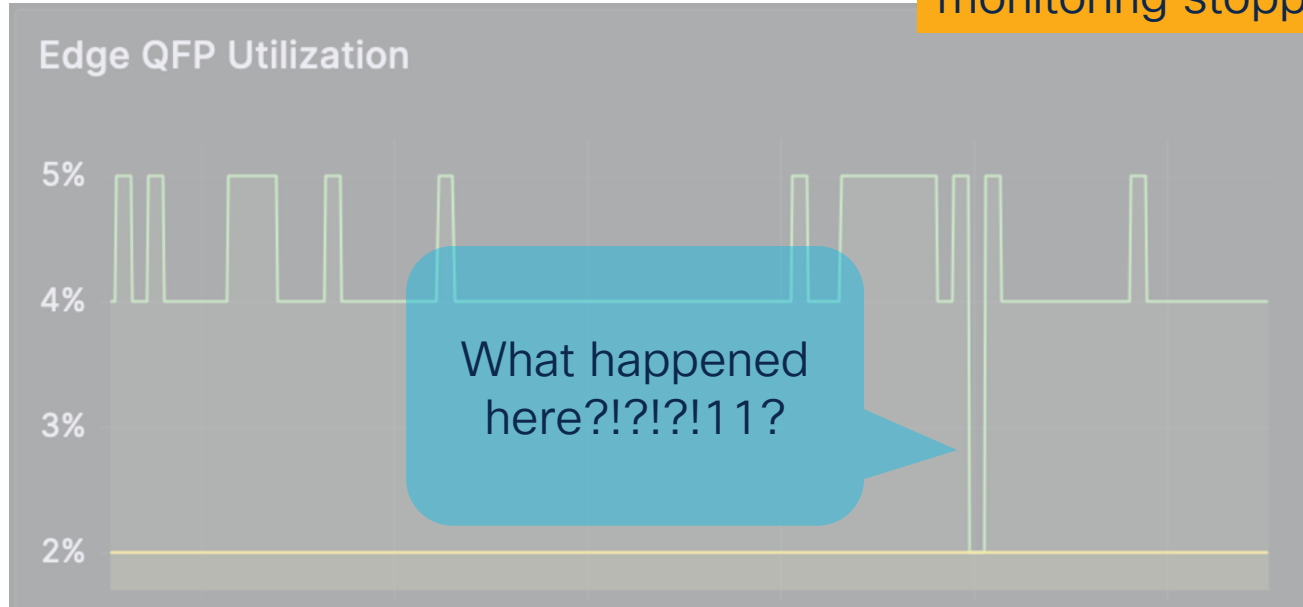
Hello josterfe 🍌

I've gathered some information about the IP address 10.100.240.47 in a poetic form for you:

- 1 The IP address 10.100.240.47 so fine,
- 2 Is leased to a MacBookPro, a device divine.
- 3 Its MAC address is 5e:04:b8:14:b1:1b,
- 4 Connected to the IDF-240-NOC-MANAGEMENT scope with glee.
- 5
- 6 It's associated with the SSID CI-OPS,
- 7 On the access point COMLO-IN-PI1416, no need to mope.
- 8 The client details show a user jclarke,
- 9 With an IP address and MAC address that perfectly embark.
- 10
- 11 The device is running macOS 15.3,
- 12 A wireless connection with a health score of 10, you see.
- 13 It's located in CLEUR 2025/Congress/Congress-L0,
- 14 A place where connections are made, don't you know!
- 15
- 16 So there you have it, josterfe,
- 17 Information about the IP address, all in a poetic retrieve 📖
- 18 From **CPMR** and **Mathbox**,
- 19 And **ISE** and **Cal Center**, all data to perceive.

Learning From Last Year

MySQL filled up the disk;
monitoring stopped



This Year...

Main **Advanced**

Rule name: Space on filesystem is >= 95% in use

Import from ▾

AND OR + Add rule + Add group

↑↓ storage.storage_deleted ▾ equal ▾ ✕ Delete

0

↑↓ storage.storage_descr ▾ begins with ▾ ✕ Delete

/

↑↓ storage.storage_perc ▾ greater or equal ▾ 95 ✕ Delete

↑↓ storage.storage_descr ▾ doesn't contain ▾ ✕ Delete

.

Severity: Critical ▾

Max alerts: 1 Delay: 0 Interval: 5m

Mute alerts: ☐ OFF Invert rule match: ☐ OFF

Recovery alerts: ☒ ON Acknowledgement alerts: ☒ ON

Match devices, groups and locations list: ✕ DC Servers ✕ DC VMs ✕ NetApp Devices All devices except in list: ☐ OFF

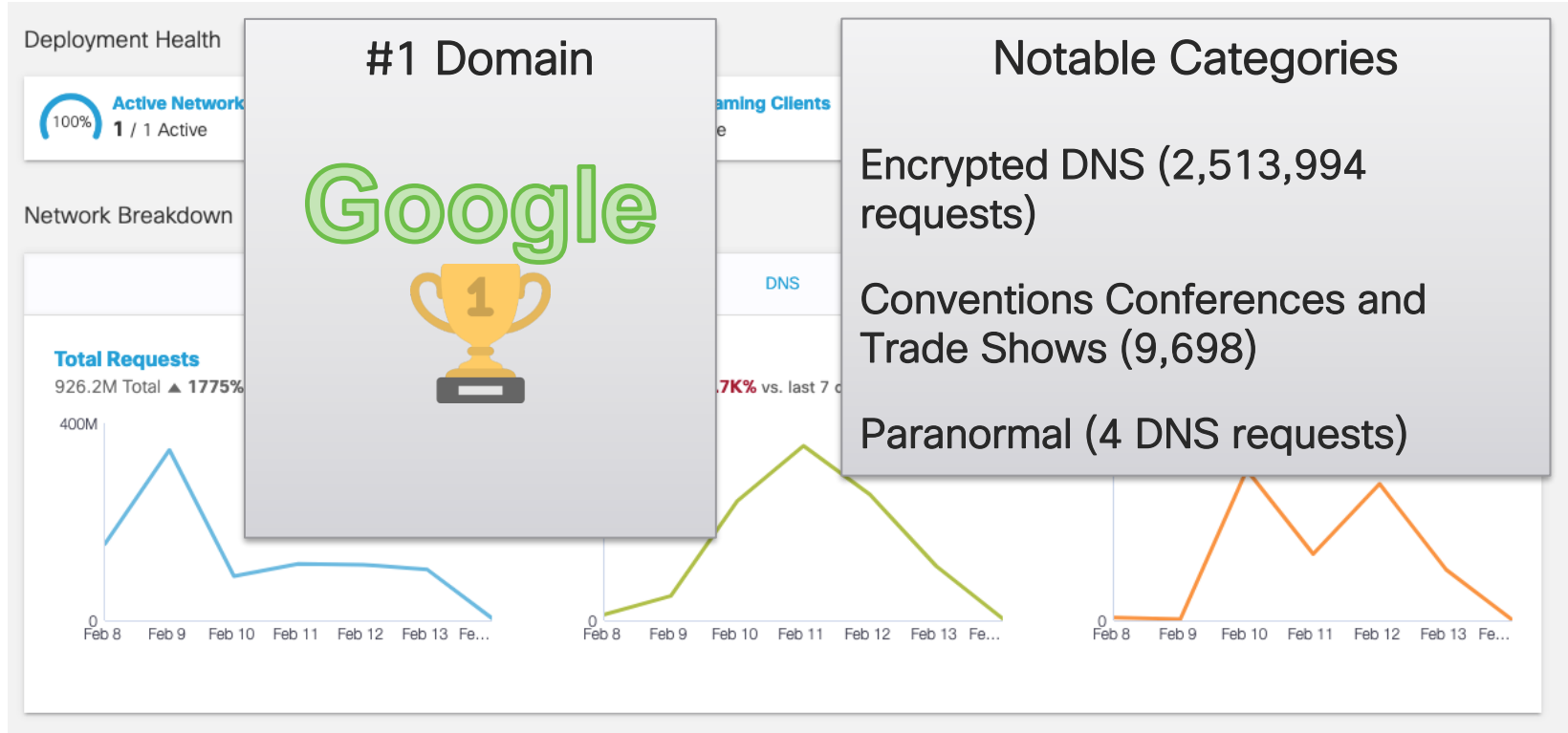
Transports: ✕ Ciscospark: Data Centre Alarms ✕ Syslog: FreeBSD Syslog

Procedure URL:

What We Want To Do Next Time

- Dump all our architecture docs and notes into a RAG for the AI
 - Allow attendees to talk to our AI bot (get those GPUs cranking!)
- Use our GenAI to document the automation and code we have (we like writing the code, not the docs)
- Allow exhibitors to change their own ports using a bot – maybe
- Lower disk alert threshold

DNS Stats By Umbrella



The New Year of IPv6

Total IPv4 Volume

35.01 TB

Total IPv6 Volume

44.2%

2024

30.96 TB

Total IPv4 Volume

26.20 TB

Total IPv6 Volume

45.18 TB

Percent of Total Internet Traffic That Is IPv6

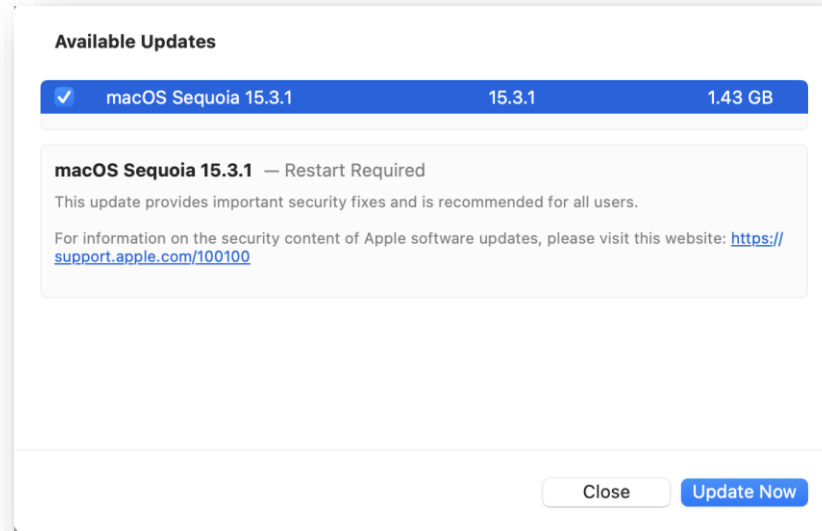
63.3%! 51.5%

Clients That Give Back

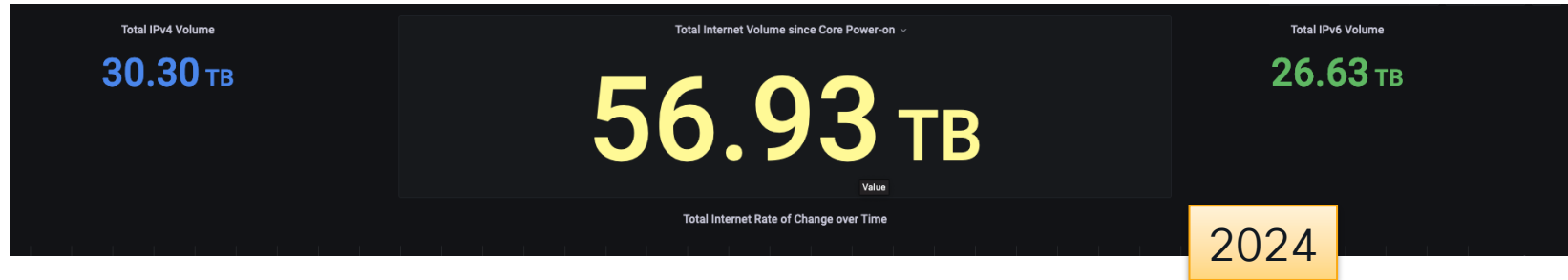


Thank You...

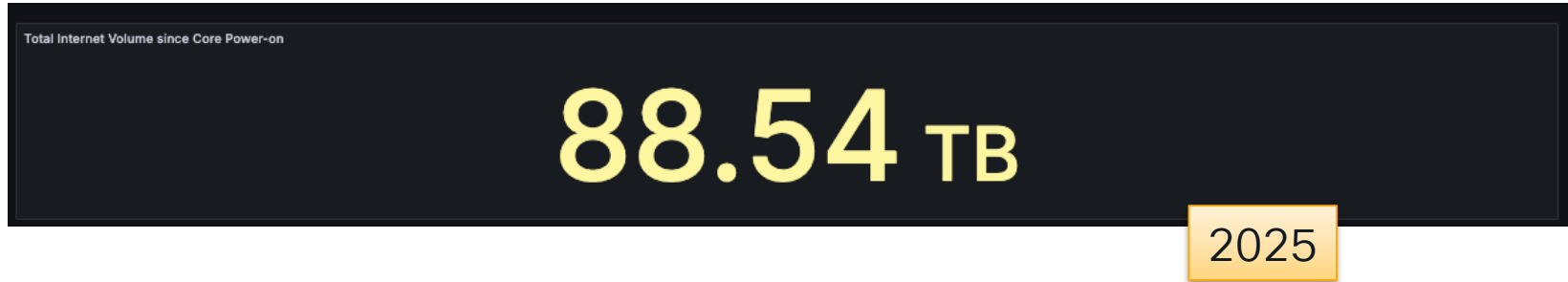
...Apple!



Total Traffic To The Internet...



Total Traffic To The Internet...







Thank you



CISCO *Live!*

GO BEYOND

The background of the slide is white. On the right side, there is a series of overlapping, teardrop-shaped elements in various shades of blue, ranging from a light sky blue to a deep navy blue. These shapes are layered to create a sense of depth and movement, extending from the top right towards the center of the frame.