



**Coosa Valley**<sup>sm</sup>

TECHNOLOGIES

powered by



**Coosa Valley**<sup>sm</sup>  
ELECTRIC COOPERATIVE

# *Our Story*

*CVT Deployment and Management*

# How cooperatives began...

- u Co-ops started with the Rural Electrification Act of 1936 as part of the New Deal.
- u Coosa Valley Electric Cooperative was founded in 1939 in St. Clair County
- u What the REA did in the 30s is what's happening today with cooperatives providing quality internet to rural homes and businesses.

# How we started an ISP...

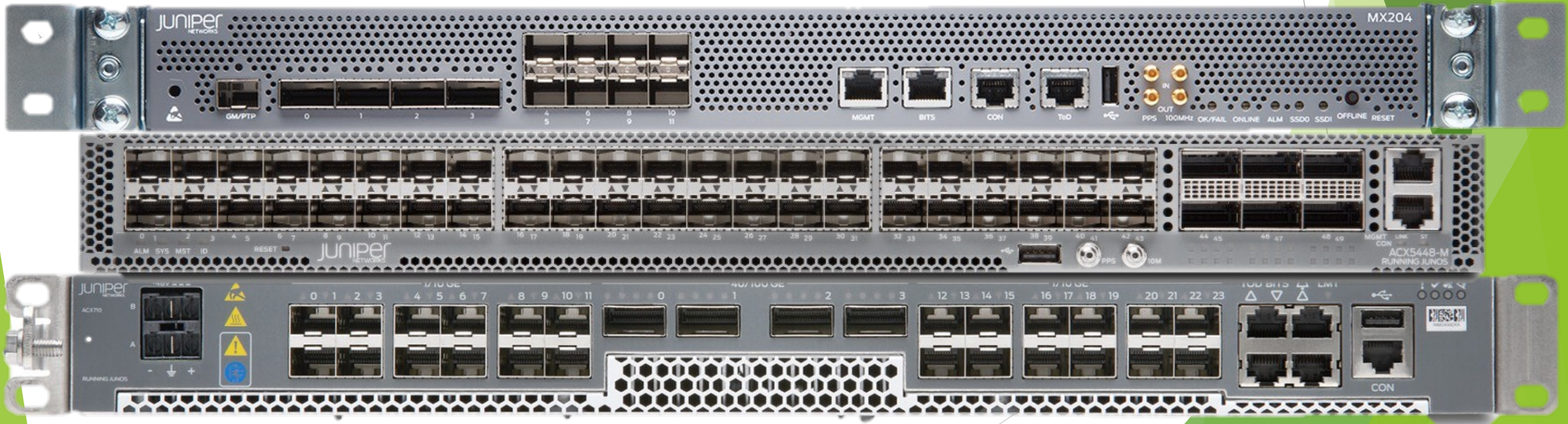
- u We completed our first feasibility studies in 2020.
- u At our September annual meeting, we had our largest turn-out ever amid COVID to overwhelmingly vote “yes” to our subsidiary: Coosa Valley Technologies.
- u With our consultants help, we decided to build an all ADSS 144 count backbone fiber network that can provide up to 8.5 Gbps to the home.

# Where we are today...

- u Of the 22 electric distribution cooperatives in the state, 8 are now in the ISP business.
- u Coosa Valley is just shy of 5,000 subscribers after turning up our first customer in February of 2022.
- u 7 ISP cooperatives, PowerSouth, and Alabama Power are all a part of the Alabama Fiber Network.

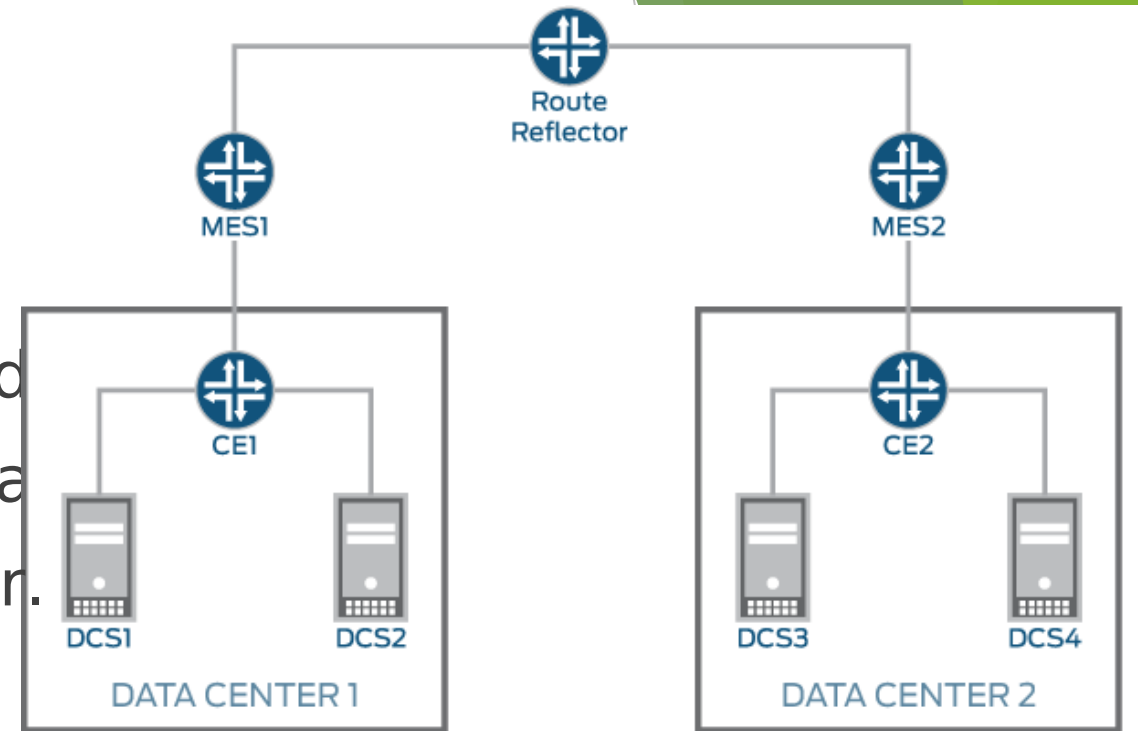
# What we use...

- u Juniper MX204s for our full table edge routing
- u Juniper ACX 710s and 5448s for our MPLS/SR backbone
- u Adtran TA-5000s for XGS-PON to the home
- u Calix u4 and u6 for home RGs



# Ethernet VPN

- u Simple to implement and understand
- u Seems to be the new industry standard
- u Has flexibility that VPLS doesn't offer.

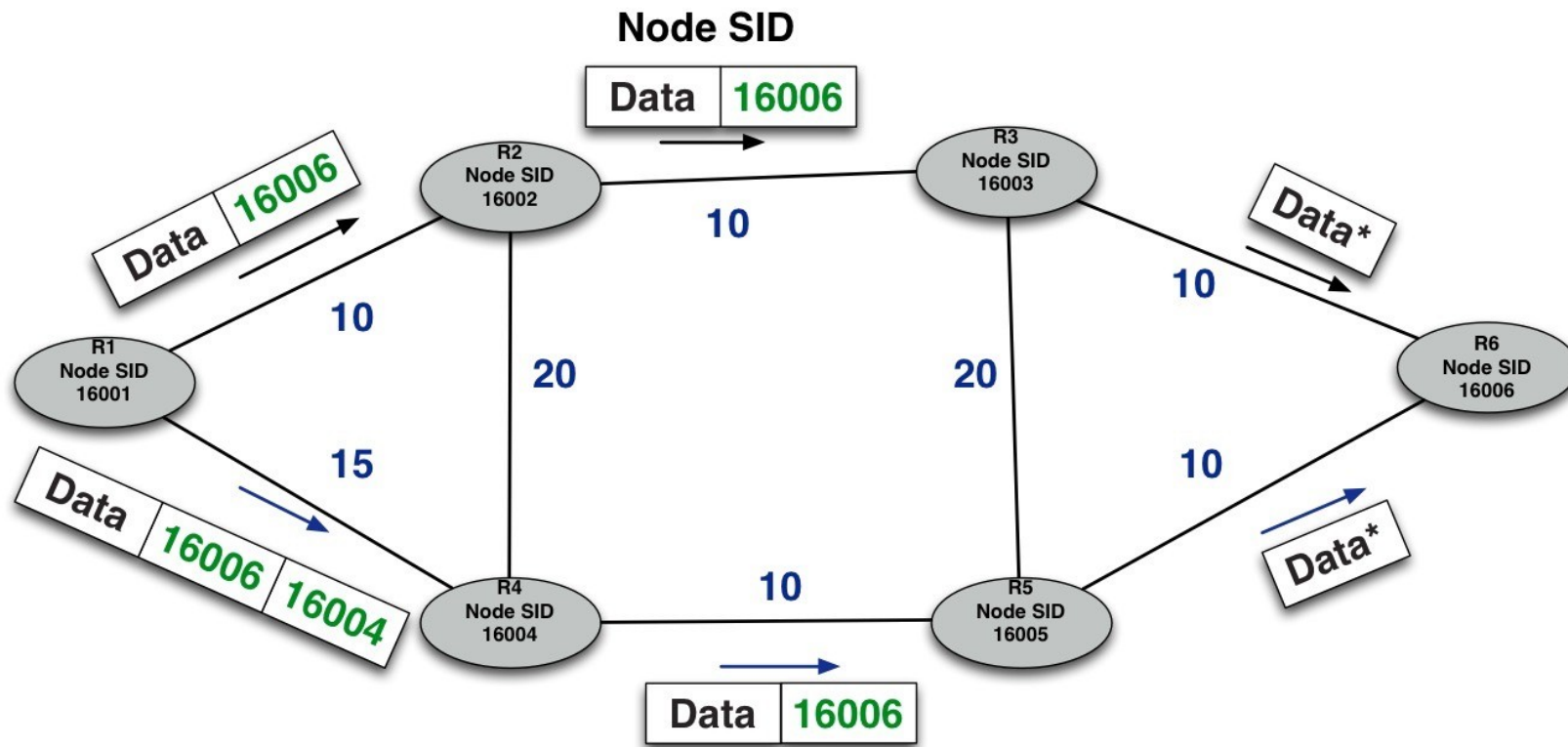


```
instance-type vrf;  
description "VRF TO MANAGE PON/TA5K";  
interface irb.99;  
route-distinguisher 10.50.11.1:99;  
vrf-target {  
    import target:1399268L:99;  
    export target:1399268L:99;  
}
```

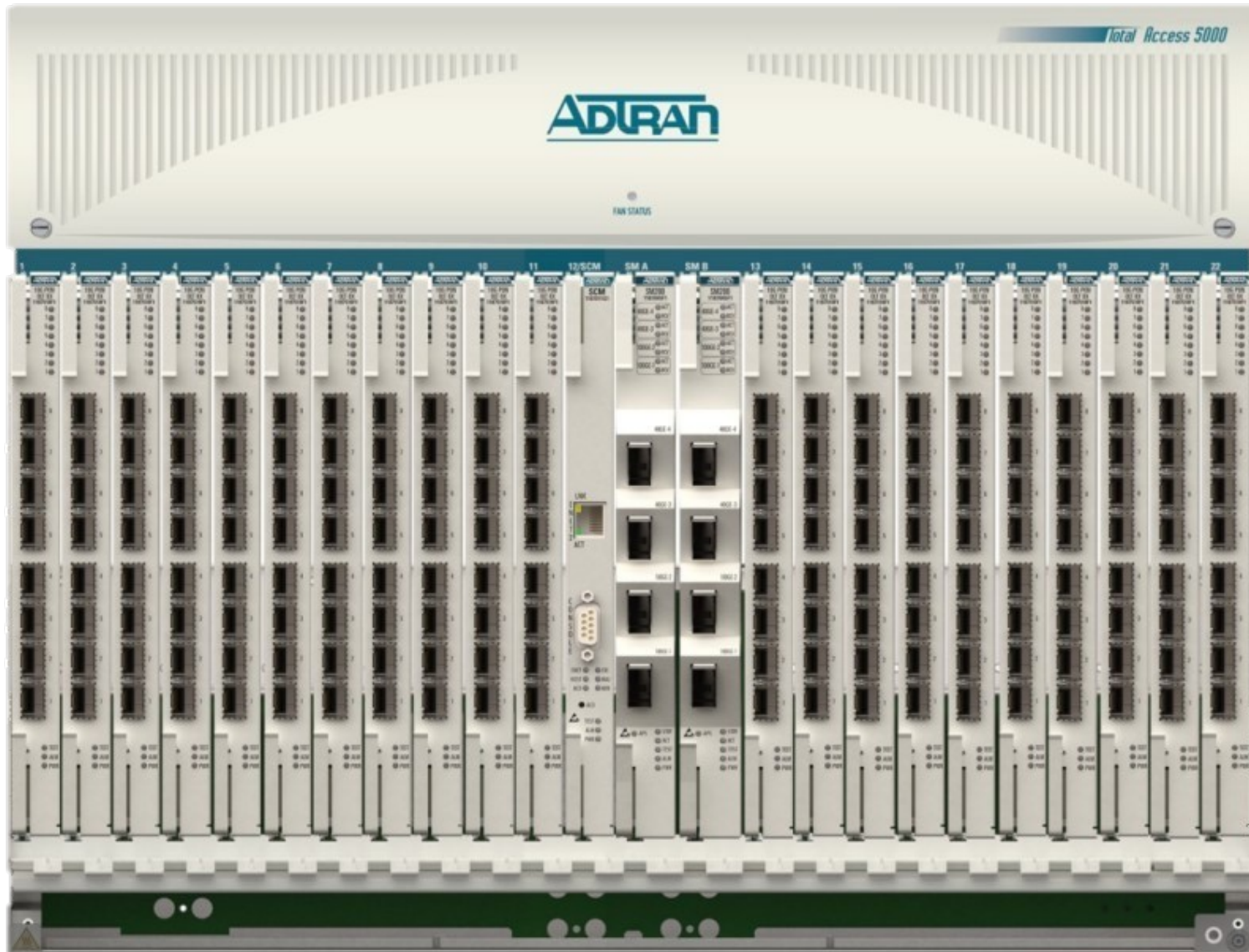
# Segment Routing MPLS

```
source-packet-routing {  
  srgb start-label 50000 index-range 5000;  
  node-segment ipv4-index 111;  
}
```

- u For a greenfield network, this has been easy for us to implement.
- u Drastically reduces troubleshooting issues with an MPLS network



# Adtran TA-5000 and ONT





# Mosaic Subscriber Insight

- u Provided by Adtran to help monitor PON network status.
- u Helps monitor our TA5000s, all ONTs on the system, and has helpful reports to make better business decisions with.

- Sweep
- Sweep Map
- ONT Status
- Capacity Planning
- Usage Heatmap
- Intelligence
- Services
- Settings
- Management

**ONT** **ONT Sweep** *Beta*

**ONT SUMMARY:**

- ONTs in service: 4930
- ONTs in warning state: 0
  - Known: 0
  - Orphaned: 0
- ONTs in severe state: 127
  - Known: 21
  - Orphaned: 106
- % ONTs in severe state: 2.58

[Show Counts by Site](#)

**SHOW ONT STATE:**

- OK state
- Warning state
- Severe state

Show in severe state for:

Any time

**SITE LOCATIONS:**

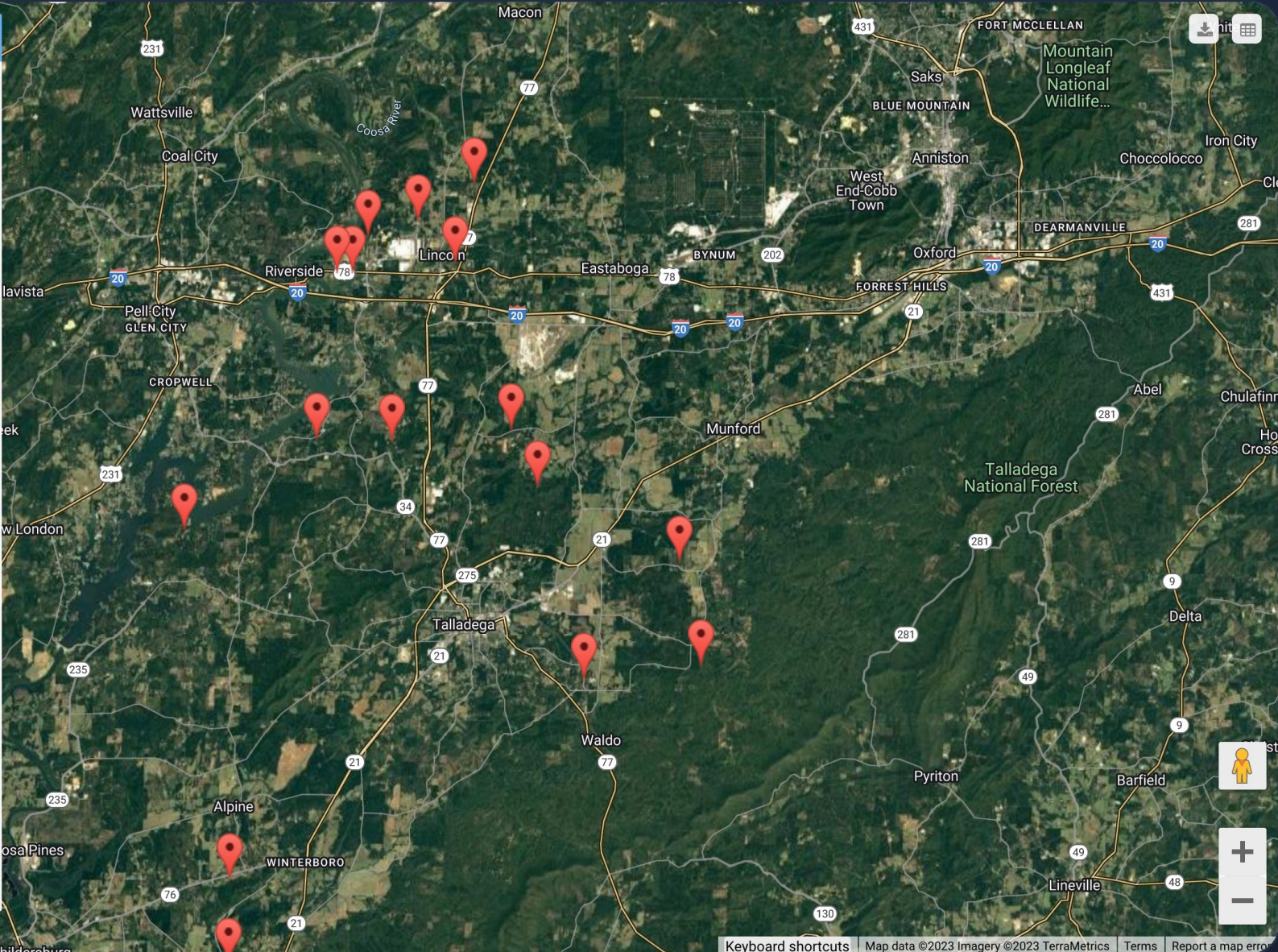
- Show Sites

[Show Advanced](#)

**ONT RE-POLL:**

Select Site

- Re-poll Alarms for Selected Site
- Re-poll ALL ONT Alarms



- 🔍 Sweep ^
- 📄 Sweep Map
- 📍 ONT Status
- 📊 Capacity Planning
- 🗺️ Usage Heatmap
- 🔍 Intelligence ∨
- » Services ∨
- » Settings ∨
- » Management ∨

TA-05 TA5K GPON	1/14	22.76%	5.23%	2.51%	0.07%	1.51%	0.07%	0.91%	0.04%	Sep 24, 2023 09:46 PM	NA	NA	Show Actions
CH-06 TA5K GPON	1/9	20.23%	16.28%	2.80%	0.04%	2.58%	0.09%	1.75%	0.02%	Sep 24, 2023 09:45 PM	30	0	Show Actions
SD-04 TA5K GPON	3/12	18.68%	7.22%	1.95%	0.11%	3.64%	0.11%	1.29%	0.07%	Sep 24, 2023 09:45 PM	13	0	Show Actions
HH-14 TA5K GPON	2/13	18.58%	16.34%	1.82%	0.16%	3.61%	0.20%	1.16%	0.12%	Sep 24, 2023 09:45 PM	28	1	Show Actions
OH-01 TA5K GPON	1/9	17.55%	9.64%	1.75%	0.05%	1.57%	0.05%	0.95%	0.01%	Sep 24, 2023 09:46 PM	18	0	Show Actions
HH-14 TA5K GPON	4/15	17.51%	16.37%	1.46%	0.16%	2.80%	0.79%	0.80%	0.11%	Sep 24, 2023 09:45 PM	19	1	Show Actions
GR-09 TA5K GPON	2/14	17.48%	2.26%	0.87%	0.06%	1.19%	0.03%	0.33%	0.02%	Sep 24, 2023 09:46 PM	9	0	Show Actions
CR-10 TA5K GPON	3/13	17.48%	1.25%	0.91%	0.02%	1.10%	0.04%	0.73%	0.01%	Sep 24, 2023 09:45 PM	11	0	Show Actions
CR-10 TA5K GPON	3/11	17.21%	2.46%	1.05%	0.02%	2.32%	0.04%	0.81%	0.01%	Sep 24, 2023 09:45 PM	13	0	Show Actions
OH-01 TA5K GPON	21/11	17.01%	15.38%	0.74%	0.15%	1.71%	0.06%	0.31%	0.02%	Sep 24, 2023 09:46 PM	18	0	Show Actions
HH-14										Sep 24, 2023			Show Actions

- Sweep
- Intelligence
- Services
- Subscribers
- Wired Broadband
- Mass Operation
- Settings
- Management

```

Remote Id Format: default
Remote Id Output: 003963_RESI_1G_ETH1
Vendor-Specific Enterprise Number: 664
Vendor-Specific Data-string:
IGMP:
Processing: disabled
Mode: block
Priority: 5
Version: 2
Last Member Query Count: 2
Last Member Query Interval: 1000
Host IP Address (Upstream): 0.0.0.0
Router IP Address (Downstream): 0.0.0.0
Maximum Multicast Bandwidth (kbps): unlimited
Maximum Multicast Groups: unlimited

```

Protocol	Relay-Agent	Remote-ID	Circuit-ID/ Interface-ID	Loop- Characteristics	Vendor- Specific
DHCPv4	inserted	not inserted	inserted	not inserted	not inserted
DHCPv6	inserted	not inserted	inserted	not inserted	not inserted
PPPoE	not inserted	na	na	na	na

MAC Address	IP Address	State
B8:94:70:97:3E:B4 (Calix Inc.)	104.151.250.102	DHCP Ack

MAC Address	IPv6 Address	State
B8:94:70:97:3E:B4 (Calix Inc.)	FE80::BA94:70FF:FE97:3EB4	IPv6 LinkL
B8:94:70:97:3E:B4 (Calix Inc.)	::	DHCP6 Sol

MAC Address	IPv6 Delegated Prefix	State
B8:94:70:97:3E:B4 (Calix Inc.)	::/0	DHCP6 Sol

Show Status (Basic) Show Status

# Calix u4 and u6



# Operations

System Groups Profiles Configuration Files Software Images **Workflows** Performance Testing

New Workflow

Name ▲	Description ▾	Current State ▾	Start Time ▾	End Time ▾		
Change Support Credentials to all Gigaspire	Change Support Credentials to all Gigaspire	● Complete	10/21/2022 09:51:06 AM	10/21/2022 09:53:19 AM		
GigaSpire u6.1 (GS4220E) workflow - WAP		● In progress	08/03/2022 11:32:38 AM	N/A		
MIGRATION - GigaSpire u4 (GS2028E) workflow - RG		● In progress	07/13/2022 12:51:38 PM	N/A		
MIGRATION - GigaSpire u4(GS2028E) workflow - WAP		● In progress	07/13/2022 01:15:33 PM	N/A		
MIGRATION - GigaSpire u6.1 (GS4220E) workflow - RG		● In progress	07/13/2022 12:41:18 PM	N/A		
MIGRATION - GigaSpire u6.2 (GS4227E) workflow - RG		● In progress	07/13/2022 12:35:53 PM	N/A		
MIGRATION - GigaSpire u6.2 (GS4227E) workflow - WAP		● In progress	07/13/2022 12:37:23 PM	N/A		
Technician SSID		● Complete	05/24/2023 01:00:43 AM	05/25/2023 01:03:43 AM		
Upgrade U4	3.14.23	● Complete	03/14/2023 01:00:00 AM	03/14/2023 02:06:10 AM		
Upgrade U6.1	3.14.23	● Complete	03/14/2023 01:00:00 AM	03/14/2023 01:25:11 AM		

Overview

0 Issue(s)

0 Warning

Service

- ↓ Down

- ↑ Up

System

RG -GS2028E

Wi-Fi

2 SSIDs

Devices

4 Connected

GS2028E  
**CXNK012C0173**  
 Residential Gateway

System

LAN Ports

Security

[Reboot](#) [Connect via IPv4](#) [...](#)

Residential Gateway - CXNK012C0173

Connection	Online
Uptime	19d 7h 03m 51s
Last Inform Time	09/24/2023, 10:05:31 PM
Software Version	23.1.0.0.85
Manufacturer	Calix
Model	GS2028E
FSAN/Serial Number	CXNK012C0173
Hardware Serial Number	422304079920
Registration ID	-
IP Address	104.151.248.180
Subnet Mask	255.255.255.128
Default Gateway	104.151.248.129
MAC Address	04:bc:9f:85:a1:b6
STUN Binding	-
Inform Interval	86400 seconds
System Temperature	141.8 °F / 61 °C
WAN Access Type	CopperEthernet

DHCP Server

DHCP Server	ON
Host Name	router
Domain Name	home
System IP Address	192.168.1.1
Beginning IP Address	192.168.1.100
Ending IP Address	192.168.1.249
Subnet Mask	255.255.255.0
DHCP Lease Time	0 Days, 12 Hours, 0 minutes
Primary DNS Server	N/A
Secondary DNS Server	N/A

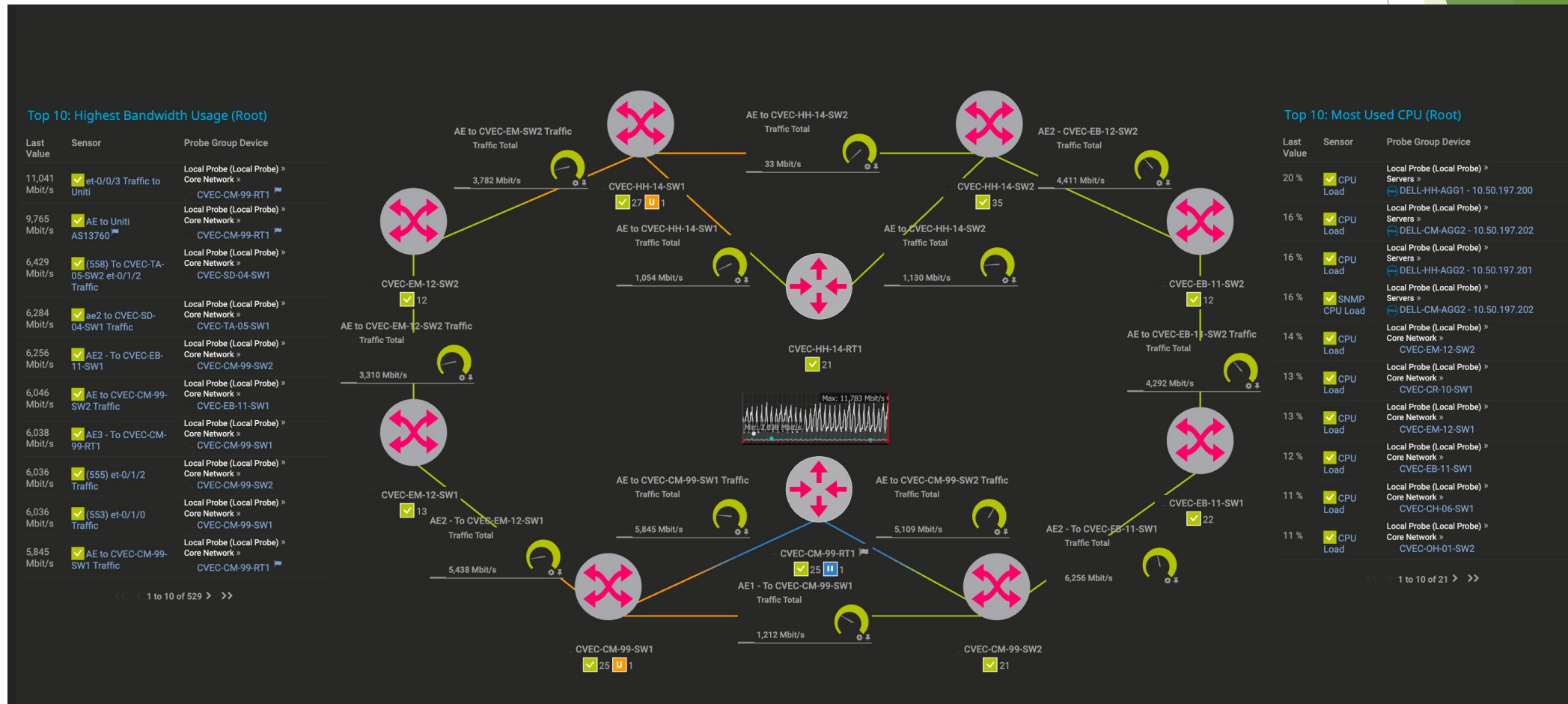
IPv6 LAN

RA Service	Server
DHCPv6 Service	Server
DHCPv6 Mode	Both
IPv6 DNS Type	Default



# PRTG

- u Has gotten the job done for monitoring our network.
- u Fairly easy to implement, takes a lot of tweaking to get the desired results.





- Coosa Valley Technologies (wallen) (896)
  - Root ! 1 W 1 ✓ 866 || 1 U 27
    - Local Probe ! 1 W 1 ✓ 864 || 1 U 27
      - Core Network ! 1 ✓ 385 || 1 U 21
        - CVEC-CM-99-RT1 ✓ 25 || 1
        - CVEC-HH-14-RT1 ✓ 21
        - CVEC-TA-05-RT1 ✓ 22
        - CVEC-CH-06-SW1 ! 1 ✓ 12 U 4
        - CVEC-CH-06-SW2 ✓ 16
        - CVEC-CM-99-SW1 ✓ 25 U 1
        - CVEC-CM-99-SW2 ✓ 21
        - CVEC-CR-10-SW1 ✓ 11 U 2
        - CVEC-CR-10-SW2 ✓ 8 U 4
        - CVEC-EB-11-SW1 ✓ 22
        - CVEC-EB-11-SW2 ✓ 12
        - CVEC-EM-12-SW1 ✓ 13
        - CVEC-EM-12-SW2 ✓ 12
        - CVEC-GR-09-SW1 ✓ 12
        - CVEC-GR-09-SW2 ✓ 12
        - CVEC-HH-14-SW1 ✓ 27 U 1
        - CVEC-HH-14-SW2 ✓ 35
        - CVEC-OH-01-SW1 ✓ 11 U 2
        - CVEC-OH-01-SW2 ✓ 6 U 6
        - CVEC-SD-04-SW1 ✓ 16
        - CVEC-SD-04-SW2 ✓ 14 U 1
        - CVEC-TA-05-SW1 ✓ 21
        - CVEC-TA-05-SW2 ✓ 11
      - Servers W 1 ✓ 181 U 1
      - Access Network ✓ 275 U 5

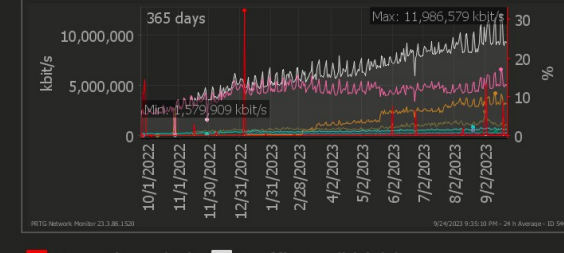
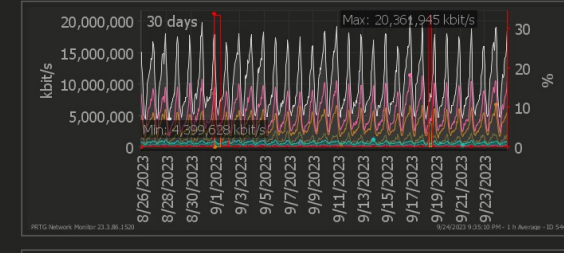
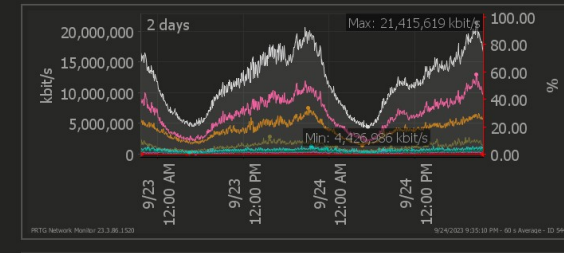
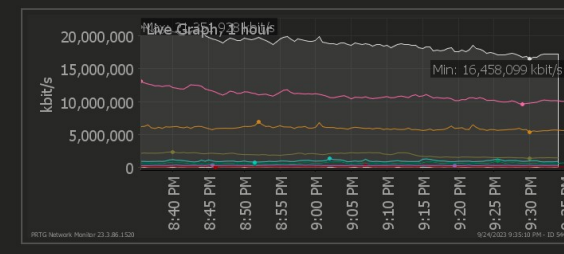
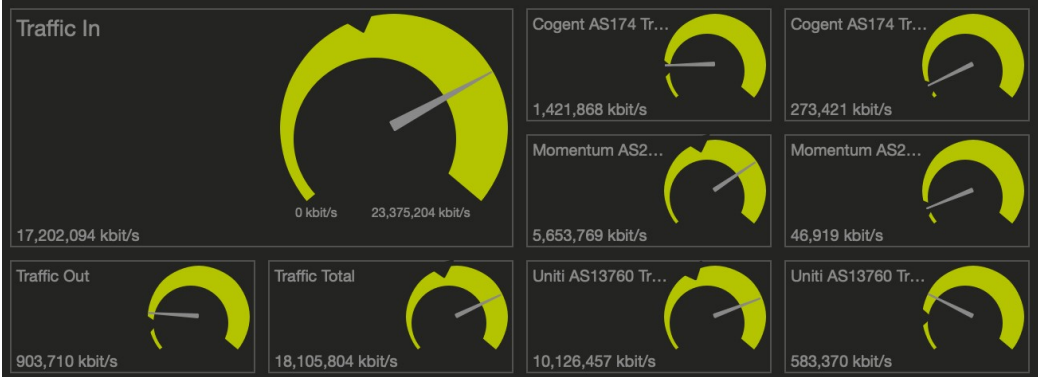
Local Probe > Core Network > CVEC-CM-99-RT1

✓ Sensor Network Total DIA Usage 🚩★★★★★

Last Message  
OK

- Overview
- Graphs
- Historic Data
- Log
- Settings
- Notification Triggers
- Comments
- History

Last Scan 19 s	Last Up 19 s	Last Down 253 d	Uptime 0.0000%	Downtime 100.0000%	Sensor Type Sensor Factory	Interval 30 s	ID 5449
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Channel	ID	Last Value	Minimum	Maximum
Cogent AS174 Traff...	5	1,421,868 kbit/s	0 kbit/s	9,607,042 kbit/s
Cogent AS174 Traff...	8	273,421 kbit/s	0 kbit/s	5,108,151 kbit/s
Downtime	-4			
Momentum AS2564...	6	5,653,769 kbit/s	0 kbit/s	7,907,695 kbit/s
Momentum AS2564...	9	46,919 kbit/s	0 kbit/s	680,009 kbit/s
Traffic In	1	17,202,094 kbit/s	0 kbit/s	23,375,204 kbit/s
Traffic Out	2	903,710 kbit/s	0 kbit/s	5,395,912 kbit/s
Traffic Total	3	18,105,804 kbit/s	0 kbit/s	24,186,561 kbit/s
Uniti AS13760 Traff...	4	10,126,457 kbit/s	0 kbit/s	13,218,319 kbit/s
Uniti AS13760 Traff...	7	583,370 kbit/s	0 kbit/s	2,283,341 kbit/s

■ Downtime (%)
 ■ Traffic In (kbit/s)
 ■ Traffic Out (kbit/s)
 ■ Uniti AS13760 Traffic In (kbit/s)

- Root ! 1 W 1 ✓ 866 || 1 U 27
- Local Probe ! 1 W 1 ✓ 864 || 1 U 27
- Core Network ! 1 ✓ 385 || 1 U 21
- CVEC-CM-99-RT1 ✓ 25 || 1

✓ Network Total DIA Usage 15,625,757 kbit/s	✓ AE to Uniti AS13760 8,726 Mbit/s
✓ AE to CVEC-CM-99-SW1 Tr... 5,062 Mbit/s	✓ AE to CVEC-CM-99-SW2 T... 4,232 Mbit/s
✓ BGP Status 458,934 routes	✓ CM-RT1 NetFlow v9 2,138 Mbit/s
✓ CPU Load 1 %	✓ Junos Health: CB 0 Running
✓ Junos Health: Fan Tray 0 Fa... Running	✓ Junos Health: Fan Tray 0 Fa... Running
✓ Junos Health: Fan Tray 1 Fa... Running	✓ Junos Health: Fan Tray 1 Fa... Running
✓ Junos Health: Fan Tray 2 Fa... Running	✓ Junos Health: Fan Tray 2 Fa... Running
✓ Junos Health: FPC: MPC @ ... Running	✓ Junos Health: PEM 0 Running
✓ Junos Health: PEM 1 Running	✓ Junos Health: PIC: 4XQSFP... Running
✓ Junos Health: PIC: 8XSFP... Running	✓ Junos Health: Routing Engine Running
✓ Ping 0 msec	✓ To CVEC-CM-99-SW1 et-0... 5,075 Mbit/s
✓ To CVEC-CM-99-SW2 et-0... 4,204 Mbit/s	✓ Uptime 242 d
xe-0/1/0 Traffic to Uniti -	✓ et-0/0/3 Traffic to Uniti 9,144 Mbit/s

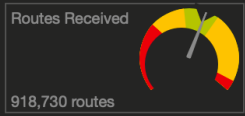
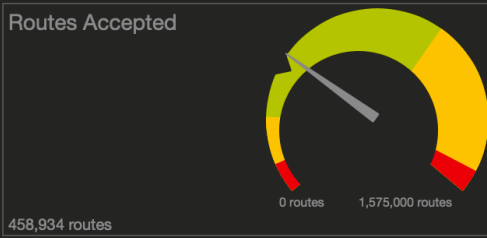
- > CVEC-HH-14-RT1 ✓ 21
- > CVEC-TA-05-RT1 ✓ 22
- > CVEC-CH-06-SW1 ! 1 ✓ 12 U 4
- > CVEC-CH-06-SW2 ✓ 16
- > CVEC-CM-99-SW1 ✓ 25 U 1
- > CVEC-CM-99-SW2 ✓ 21
- > CVEC-CR-10-SW1 ✓ 11 U 2

✓ Sensor BGP Status ★★★★★

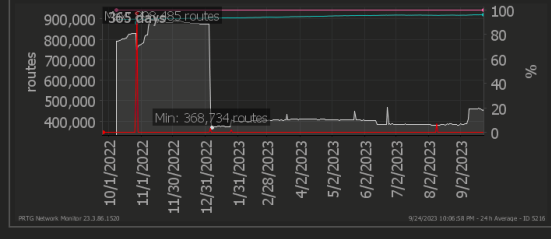
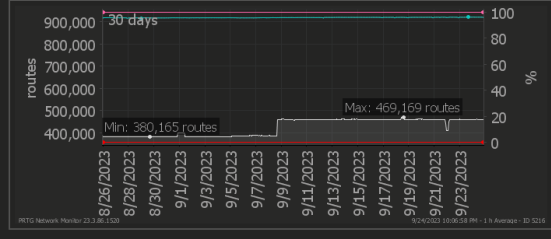
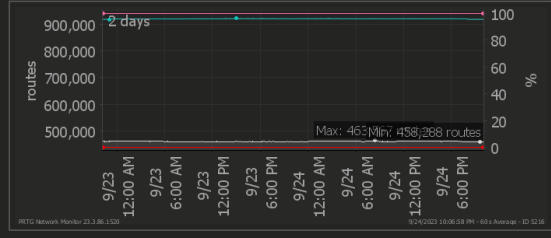
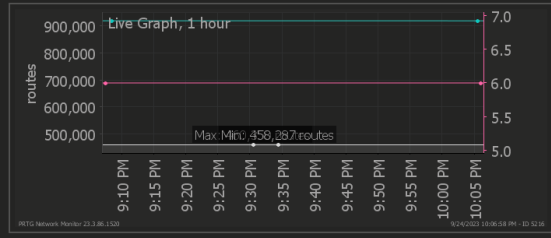
Last Message  
OK

- Overview
- Graphs
- Historic Data
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- Notification Triggers
- Comments
- History

Last Scan <b>6 s</b>	Last Up <b>6 s</b>	Last Down <b>46 d</b>	Uptime <b>99.5954%</b>	Downtime <b>0.4046%</b>	Sensor Type <b>SNMP Custom Advanced</b>	Interval <b>30 s</b>	ID <b>5216</b>
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Channel	ID	Last Value	Minimum	Maximum
BGP State	4	Established	Established	Established
Downtime	-4			
Routes Accepted	2	458,934 routes	0 routes	901,245 routes
Routes Received	3	918,730 routes	1 routes	922,272 routes



■ Downtime (%) 
 ■ Routes Accepted (routes) 
 ■ Routes Received (routes) 
 ■ BGP State



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*Questions? Comments?  
Suggestions?*