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Next-Gen SD-WAN (Viptela) Deployment, Monitoring, and Troubleshooting

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BRKRST-2093

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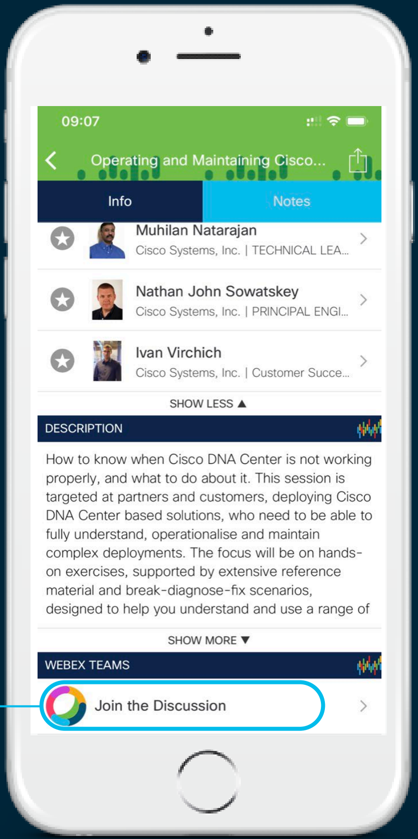

09:07

Operating and Maintaining Cisco...

Info | Notes

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Cisco Systems, Inc. | TECHNICAL LEA...

Nathan John Sowatskey
Cisco Systems, Inc. | PRINCIPAL ENGI...

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DESCRIPTION

How to know when Cisco DNA Center is not working properly, and what to do about it. This session is targeted at partners and customers, deploying Cisco DNA Center based solutions, who need to be able to fully understand, operationalise and maintain complex deployments. The focus will be on hands-on exercises, supported by extensive reference material and break-diagnose-fix scenarios, designed to help you understand and use a range of

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WEBEX TEAMS

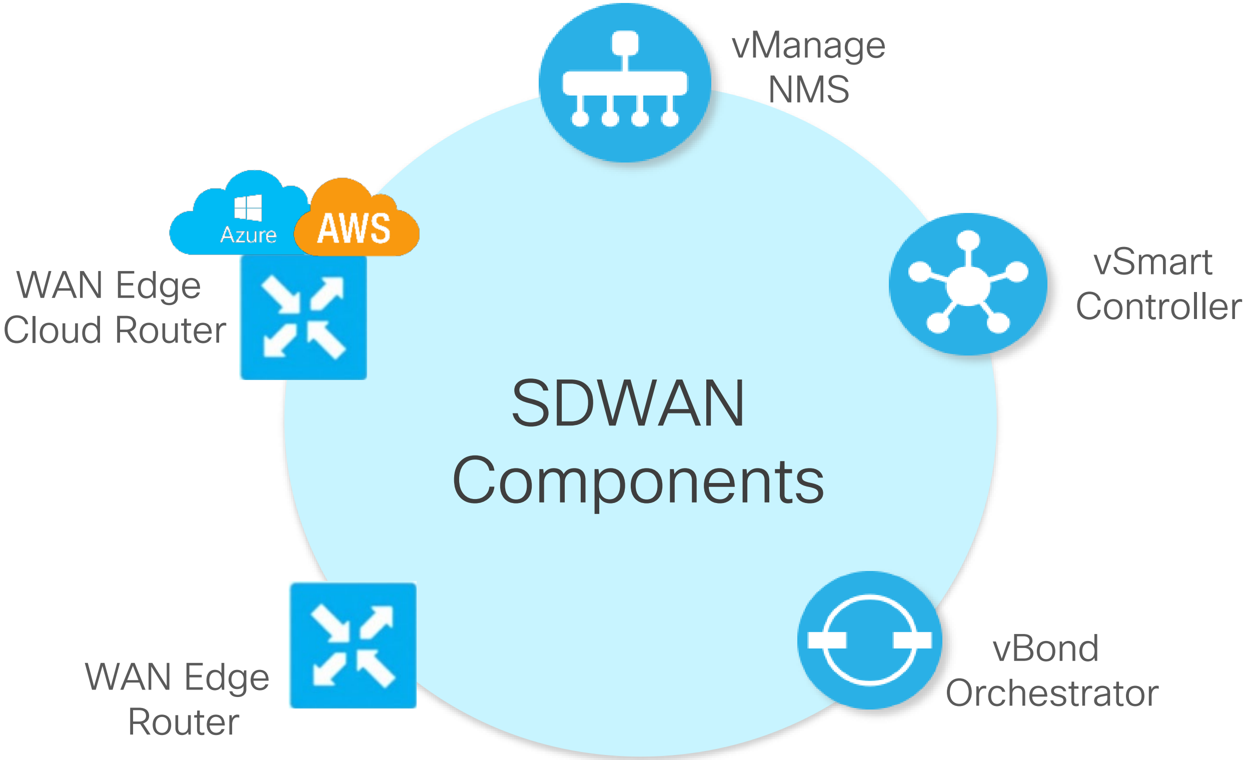
Join the Discussion

Agenda

- Introduction
- SD-WAN Solution Overview
- Bringup - Control & Data Plane Troubleshooting
- Setup - Application Policies in SD-WAN
- Deploy - Device & Configuration Management
- Monitor – vManage, APIs & Programmability
- Conclusion

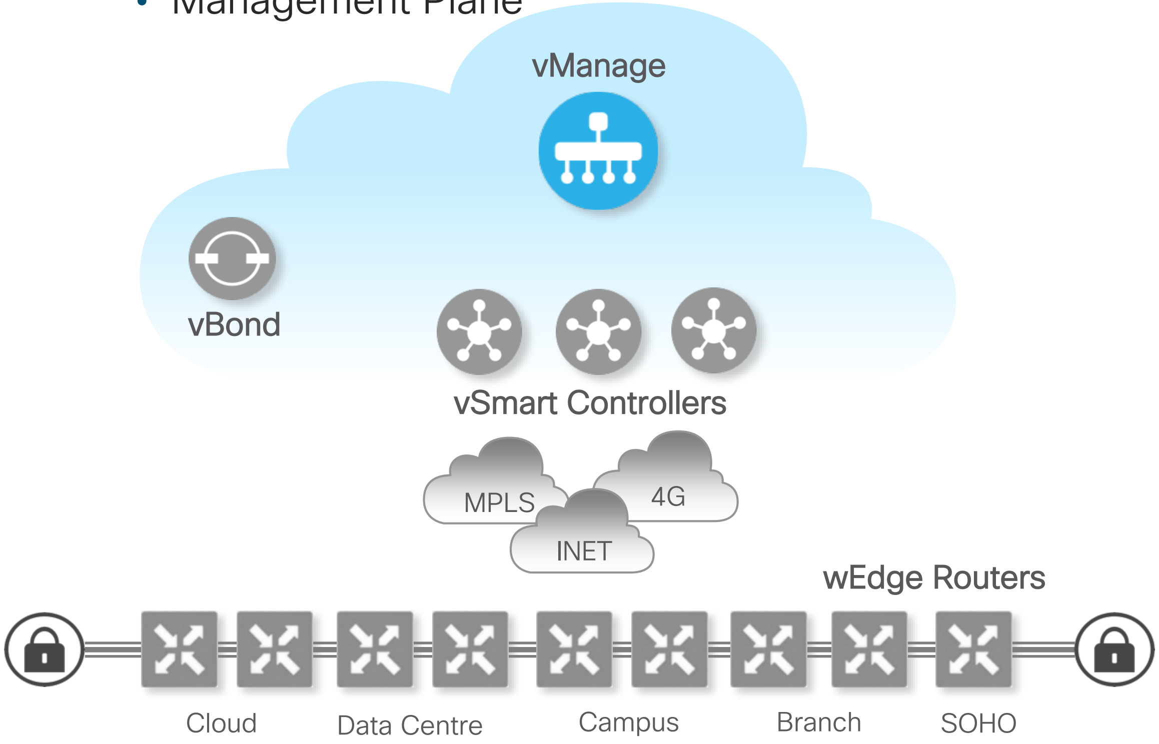
SD-WAN Solution Overview

SDWAN Components Overview



SDWAN Components Overview

- Management Plane



Management Plane

Cisco vManage

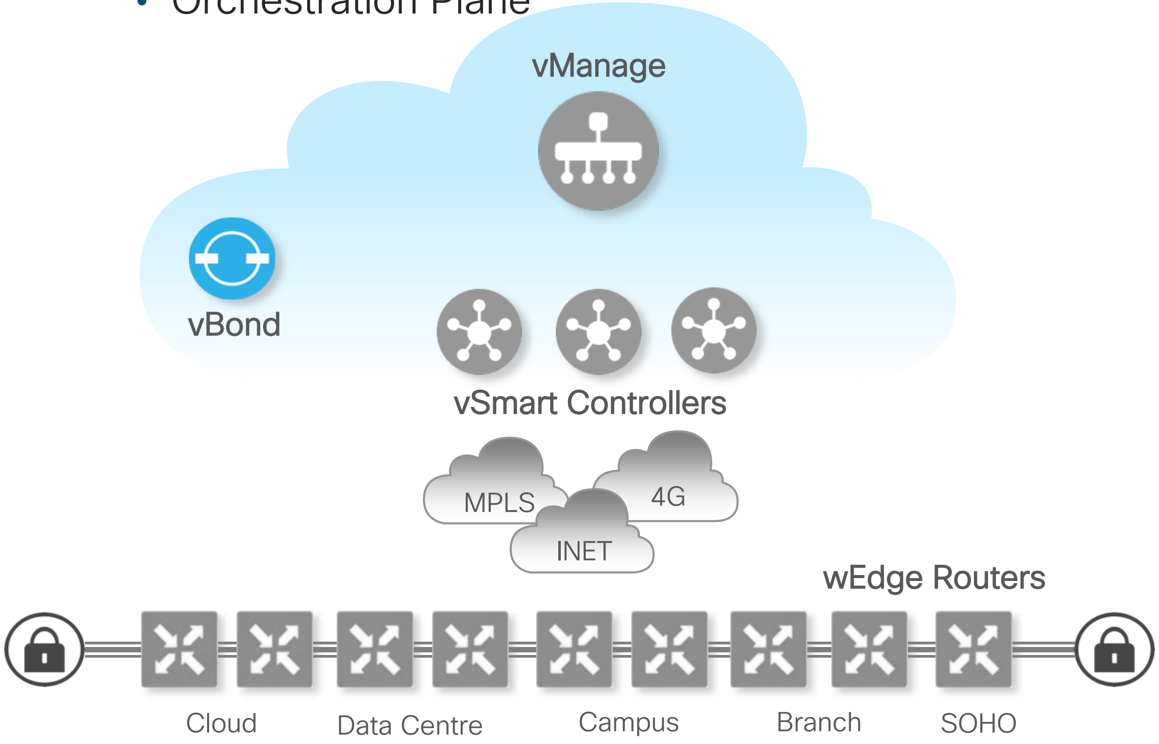
✓ Policies and Templates

✓ Troubleshooting and Monitoring

✓ Programmatic interfaces

SDWAN Components Overview

- Orchestration Plane



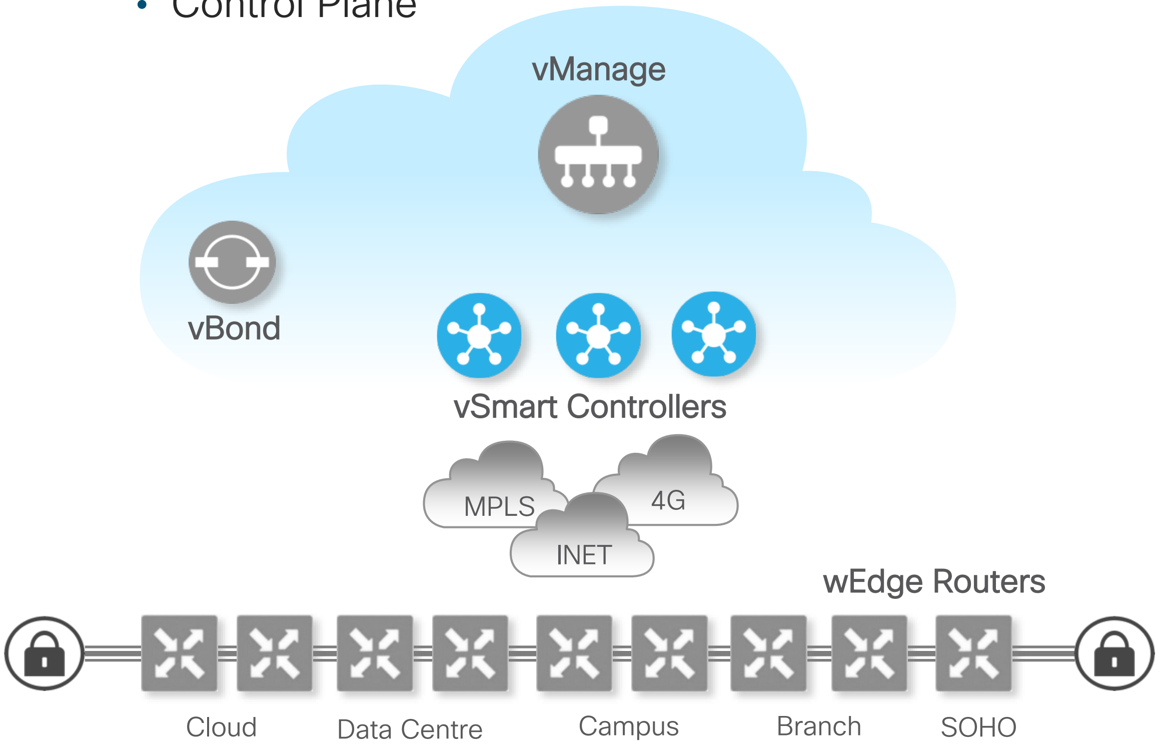
Orchestration Plane

Cisco vBond

- ✓ Orchestrates Connectivity
- ✓ First point of authentication
- ✓ Facilitates NAT traversal

SDWAN Components Overview

- Control Plane



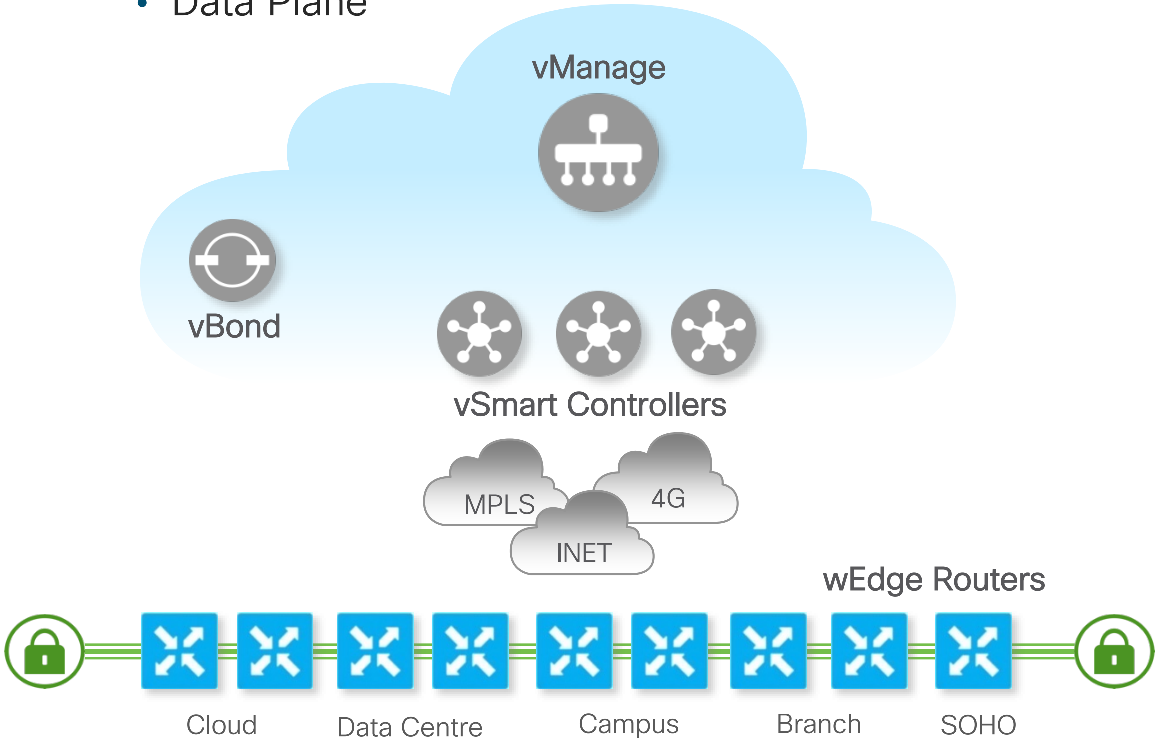
Control Plane

Cisco vSmart

- ✓ Handles overlay routing
- ✓ Facilitates encryption between vEdges
- ✓ Propagates policies for handling traffic

SDWAN Components Overview

- Data Plane



Data Plane

Physical/Virtual

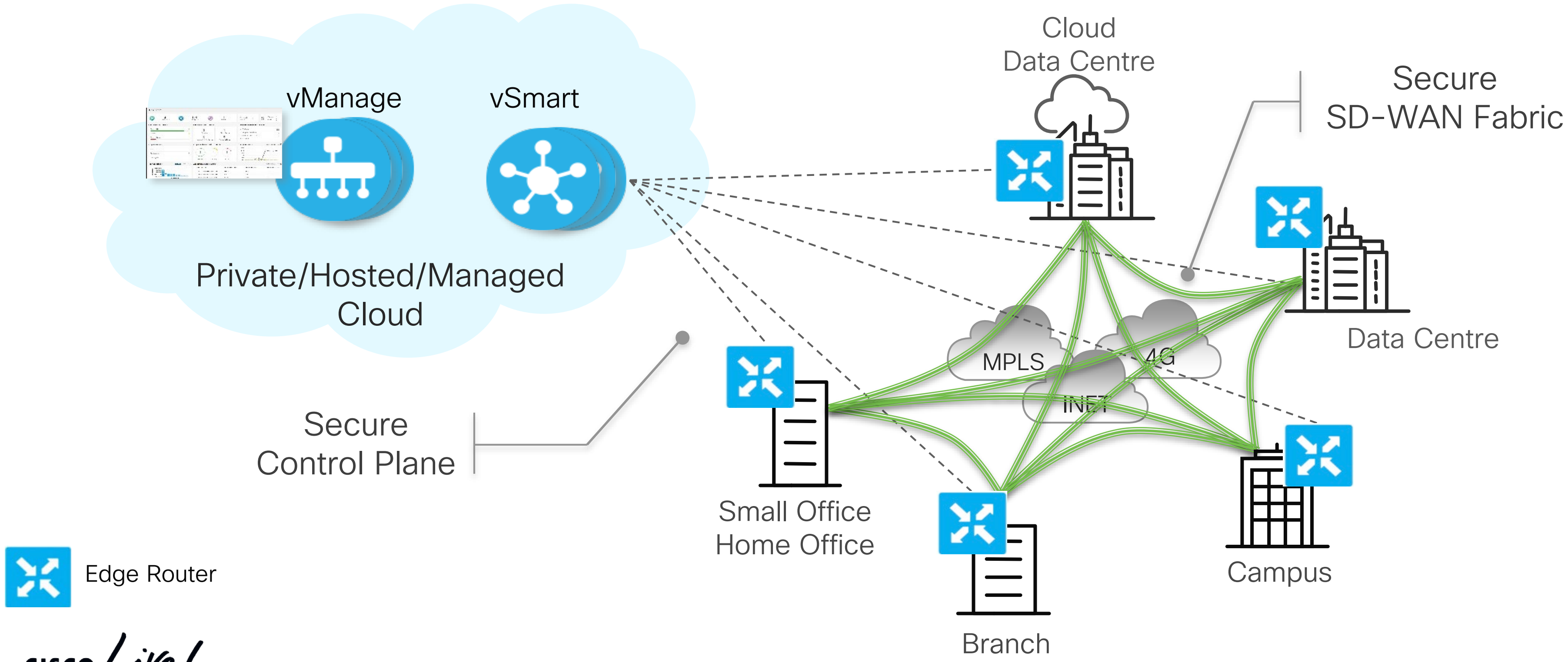
wEdge
Azure
AWS
vEdge Cloud

✓ WAN Edge router

✓ Secure data plane with other vEdge routers

✓ Implements data plane policies

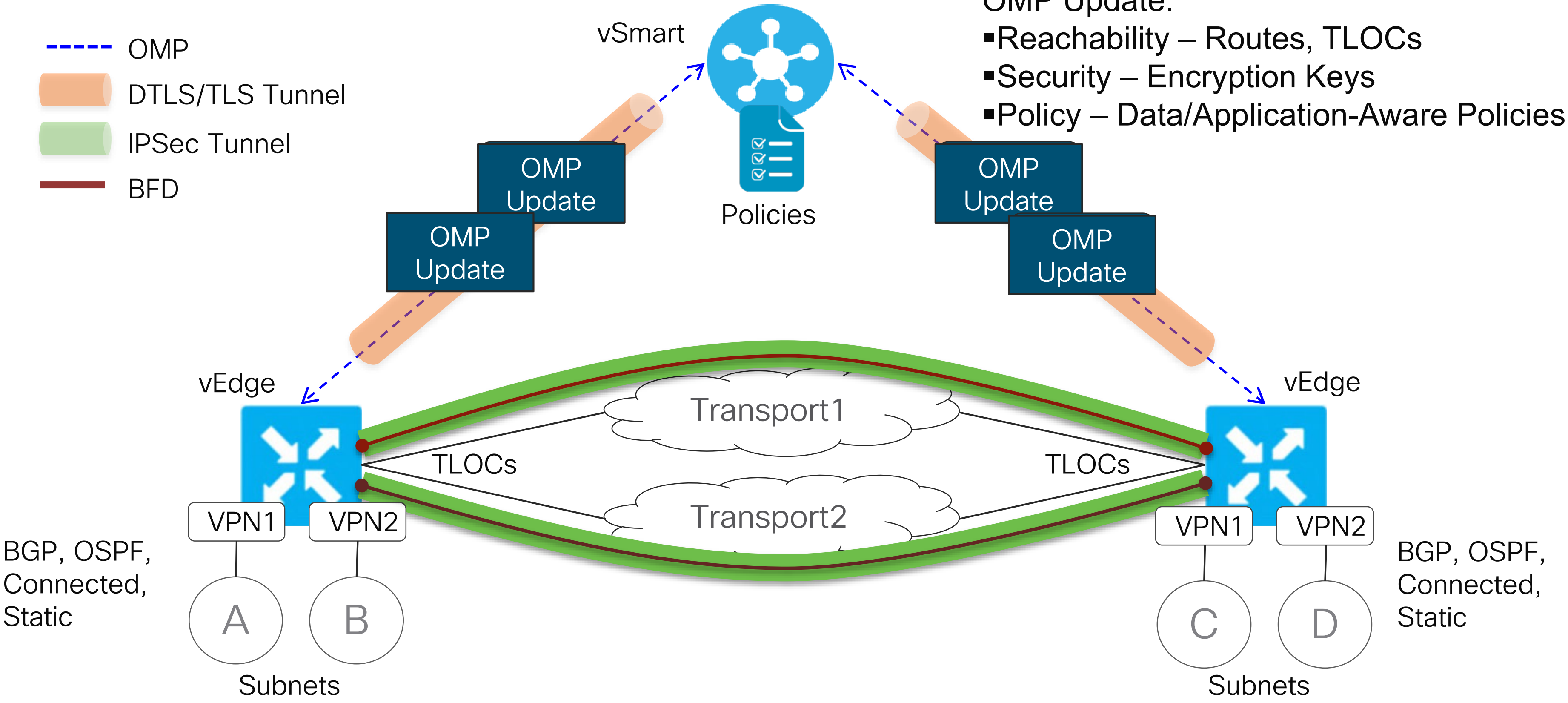
Delivering a Cloud-Ready architecture



SDWAN Fabric Terminology Review

- Overlay Management Protocol (OMP) – Control plane protocol distributing reachability, security and policies throughout the fabric
- Transport Locator (TLOC) – Transport attachment point and next hop route attribute
- Color – Control plane tag used for IPSec tunnel establishment logic
- Site ID – Unique per-site numeric identifier used in policy application
- System IP – Unique per-device (vEdge and controllers) IPv4 notation identifier. Also used as Router ID for BGP and OSPF.
- Organization Name – Overlay identifier common to all elements of the fabric
- VPN – Device-level and network-level segmentation.

Building the overlay fabric

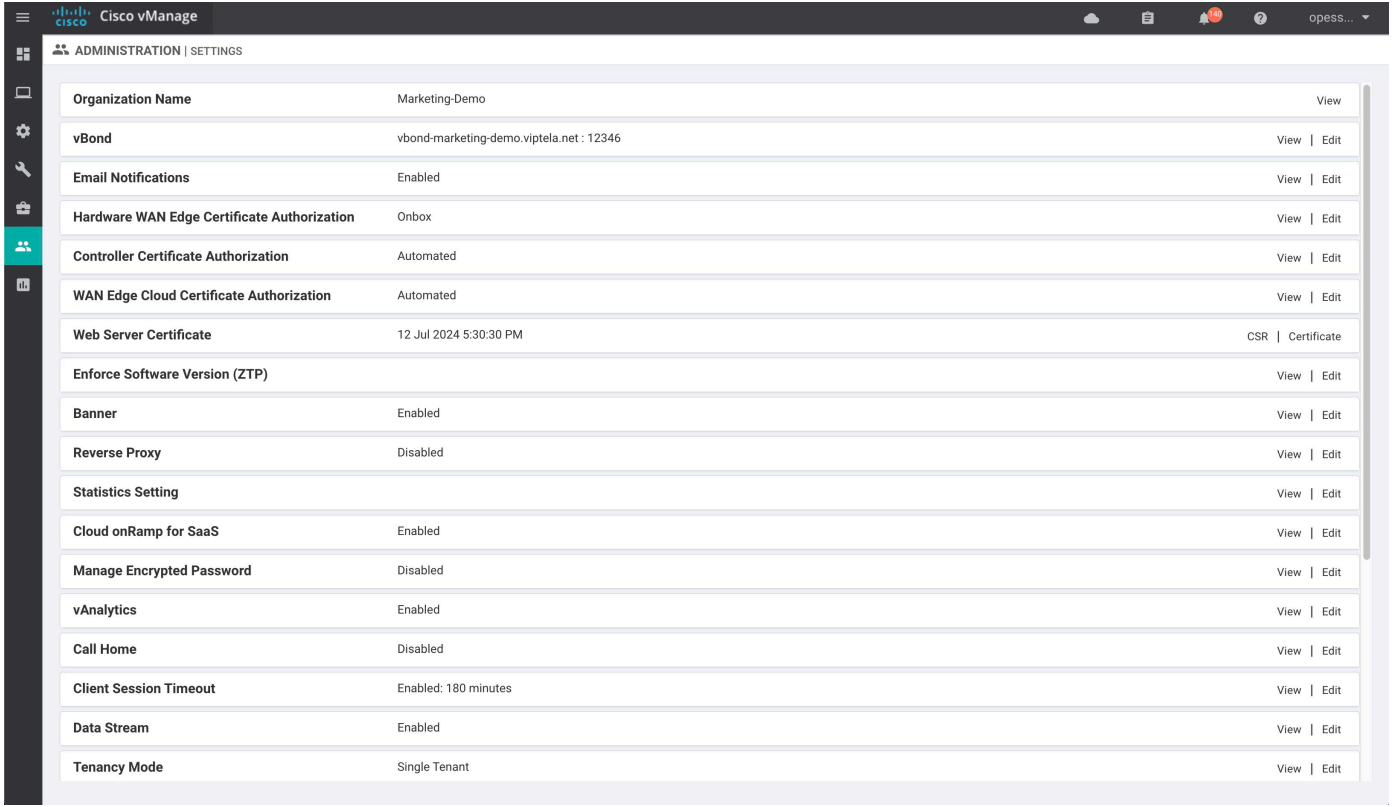


OMP Update:

- Reachability – Routes, TLOCs
- Security – Encryption Keys
- Policy – Data/Application-Aware Policies

Bringup - Control & Data Plane Troubleshooting

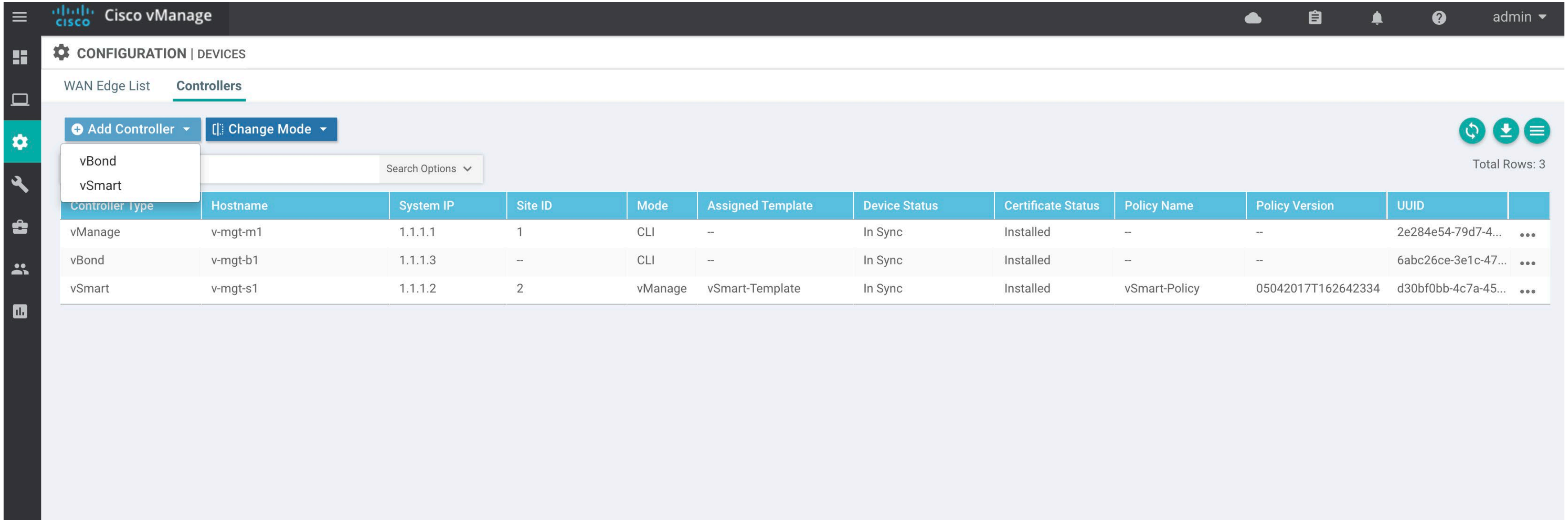
Configure administrative settings



ADMINISTRATION | SETTINGS

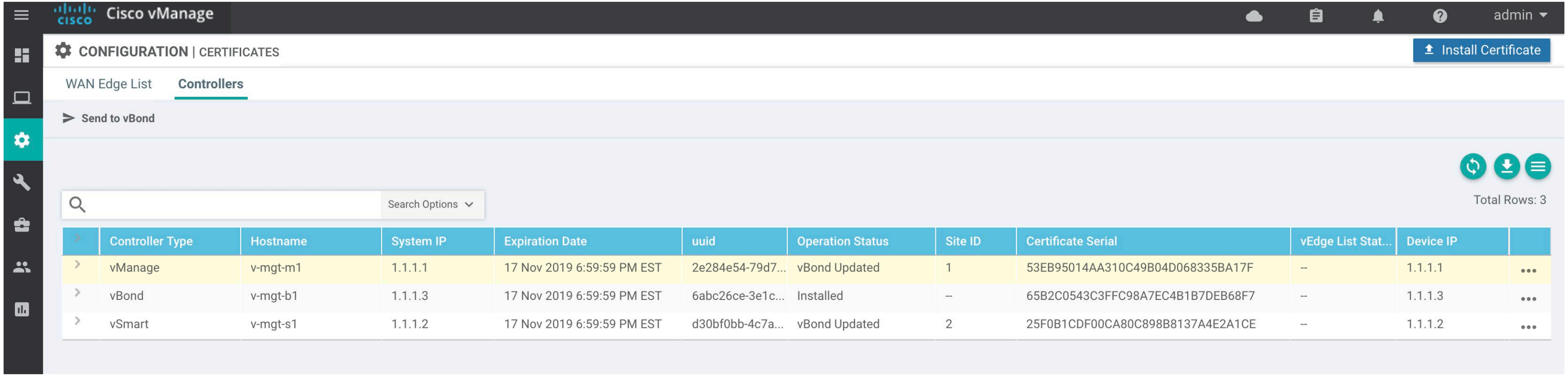
Organization Name	Marketing-Demo	View
vBond	vbond-marketing-demo.viptela.net : 12346	View | Edit
Email Notifications	Enabled	View | Edit
Hardware WAN Edge Certificate Authorization	Onbox	View | Edit
Controller Certificate Authorization	Automated	View | Edit
WAN Edge Cloud Certificate Authorization	Automated	View | Edit
Web Server Certificate	12 Jul 2024 5:30:30 PM	CSR | Certificate
Enforce Software Version (ZTP)		View | Edit
Banner	Enabled	View | Edit
Reverse Proxy	Disabled	View | Edit
Statistics Setting		View | Edit
Cloud onRamp for SaaS	Enabled	View | Edit
Manage Encrypted Password	Disabled	View | Edit
vAnalytics	Enabled	View | Edit
Call Home	Disabled	View | Edit
Client Session Timeout	Enabled: 180 minutes	View | Edit
Data Stream	Enabled	View | Edit
Tenancy Mode	Single Tenant	View | Edit

Add controller devices



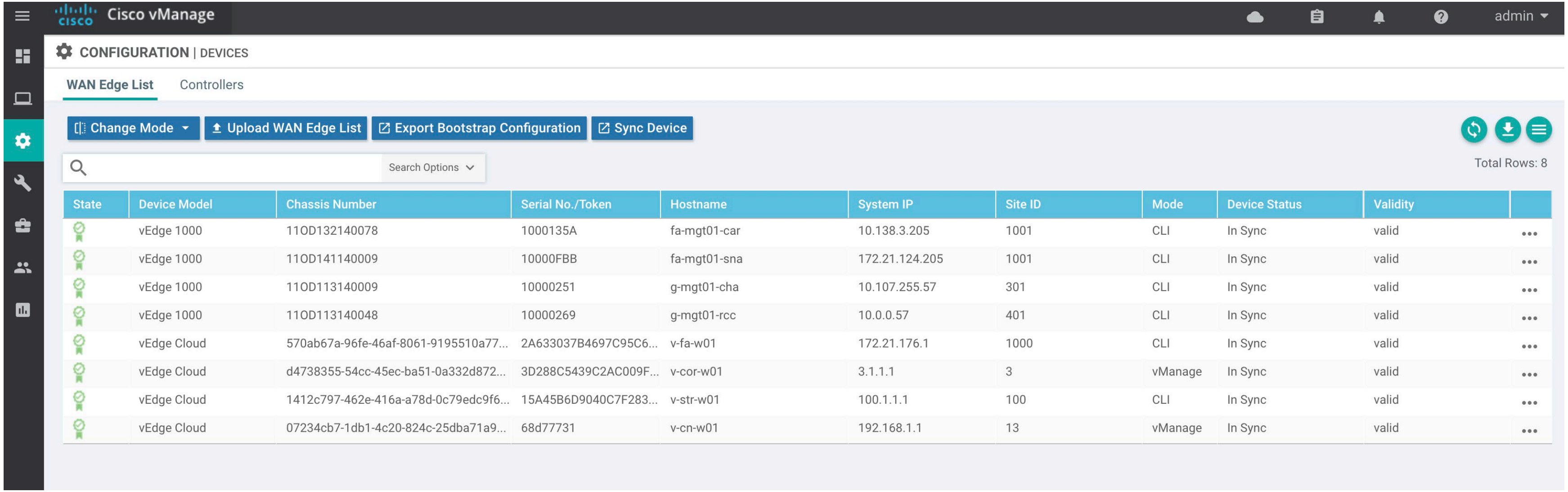
Controller Type	Hostname	System IP	Site ID	Mode	Assigned Template	Device Status	Certificate Status	Policy Name	Policy Version	UUID	
vManage	v-mgt-m1	1.1.1.1	1	CLI	--	In Sync	Installed	--	--	2e284e54-79d7-4...	•••
vBond	v-mgt-b1	1.1.1.3	--	CLI	--	In Sync	Installed	--	--	6abc26ce-3e1c-47...	•••
vSmart	v-mgt-s1	1.1.1.2	2	vManage	vSmart-Template	In Sync	Installed	vSmart-Policy	05042017T162642334	d30bf0bb-4c7a-45...	•••

Generate controller certificates



	Controller Type	Hostname	System IP	Expiration Date	uuid	Operation Status	Site ID	Certificate Serial	vEdge List Stat...	Device IP	
›	vManage	v-mgt-m1	1.1.1.1	17 Nov 2019 6:59:59 PM EST	2e284e54-79d7...	vBond Updated	1	53EB95014AA310C49B04D068335BA17F	--	1.1.1.1	•••
›	vBond	v-mgt-b1	1.1.1.3	17 Nov 2019 6:59:59 PM EST	6abc26ce-3e1c...	Installed	--	65B2C0543C3FFC98A7EC4B1B7DEB68F7	--	1.1.1.3	•••
›	vSmart	v-mgt-s1	1.1.1.2	17 Nov 2019 6:59:59 PM EST	d30bf0bb-4c7a...	vBond Updated	2	25F0B1CDF00CA80C898B8137A4E2A1CE	--	1.1.1.2	•••

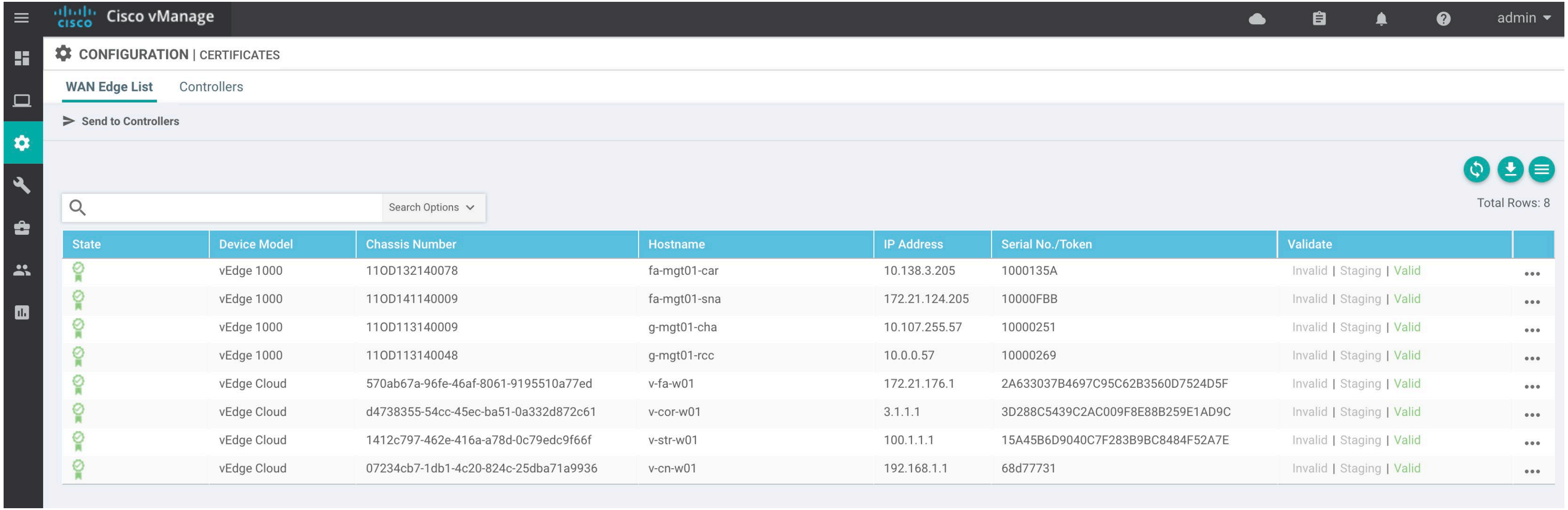
Add WAN Edge Devices



Total Rows: 8

State	Device Model	Chassis Number	Serial No./Token	Hostname	System IP	Site ID	Mode	Device Status	Validity	
✓	vEdge 1000	11OD132140078	1000135A	fa-mgt01-car	10.138.3.205	1001	CLI	In Sync	valid	•••
✓	vEdge 1000	11OD141140009	10000FBB	fa-mgt01-sna	172.21.124.205	1001	CLI	In Sync	valid	•••
✓	vEdge 1000	11OD113140009	10000251	g-mgt01-cha	10.107.255.57	301	CLI	In Sync	valid	•••
✓	vEdge 1000	11OD113140048	10000269	g-mgt01-rcc	10.0.0.57	401	CLI	In Sync	valid	•••
✓	vEdge Cloud	570ab67a-96fe-46af-8061-9195510a77...	2A633037B4697C95C6...	v-fa-w01	172.21.176.1	1000	CLI	In Sync	valid	•••
✓	vEdge Cloud	d4738355-54cc-45ec-ba51-0a332d872...	3D288C5439C2AC009F...	v-cor-w01	3.1.1.1	3	vManage	In Sync	valid	•••
✓	vEdge Cloud	1412c797-462e-416a-a78d-0c79edc9f6...	15A45B6D9040C7F283...	v-str-w01	100.1.1.1	100	CLI	In Sync	valid	•••
✓	vEdge Cloud	07234cb7-1db1-4c20-824c-25dba71a9...	68d77731	v-cn-w01	192.168.1.1	13	vManage	In Sync	valid	•••

Control vEdge Whitelist



State	Device Model	Chassis Number	Hostname	IP Address	Serial No./Token	Validate	
✓	vEdge 1000	11OD132140078	fa-mgt01-car	10.138.3.205	1000135A	Invalid | Staging | Valid	•••
✓	vEdge 1000	11OD141140009	fa-mgt01-sna	172.21.124.205	10000FBB	Invalid | Staging | Valid	•••
✓	vEdge 1000	11OD113140009	g-mgt01-cha	10.107.255.57	10000251	Invalid | Staging | Valid	•••
✓	vEdge 1000	11OD113140048	g-mgt01-rcc	10.0.0.57	10000269	Invalid | Staging | Valid	•••
✓	vEdge Cloud	570ab67a-96fe-46af-8061-9195510a77ed	v-fa-w01	172.21.176.1	2A633037B4697C95C62B3560D7524D5F	Invalid | Staging | Valid	•••
✓	vEdge Cloud	d4738355-54cc-45ec-ba51-0a332d872c61	v-cor-w01	3.1.1.1	3D288C5439C2AC009F8E88B259E1AD9C	Invalid | Staging | Valid	•••
✓	vEdge Cloud	1412c797-462e-416a-a78d-0c79edc9f66f	v-str-w01	100.1.1.1	15A45B6D9040C7F283B9BC8484F52A7E	Invalid | Staging | Valid	•••
✓	vEdge Cloud	07234cb7-1db1-4c20-824c-25dba71a9936	v-cn-w01	192.168.1.1	68d77731	Invalid | Staging | Valid	•••

Failure Scenarios

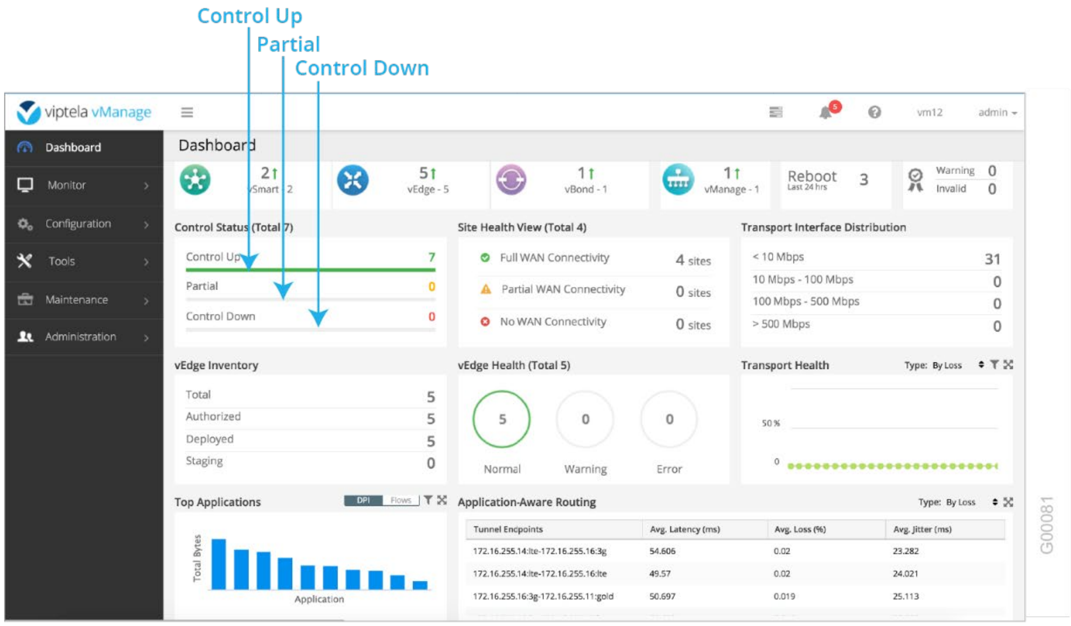
Connectivity Issues

- DTLS connection failure
- TLOC disabled
- Transient conditions

Certificate Issues

- Device(s) not added
- Certificate revoked/invalidated
- Certificate verification failures

Checking Control Connections



Control Up
Partial
Control Down

viptela vManage — vm12 — admin

Dashboard

2↑	vSmart - 2
5↑	vEdge - 5
1↑	vBond - 1
1↑	vManage - 1
Reboot Last 24 hrs	3
Warning	0
Invalid	0

Control Status (Total 7)

Control Up	7
Partial	0
Control Down	0

Site Health View (Total 4)

Full WAN Connectivity	4 sites
Partial WAN Connectivity	0 sites
No WAN Connectivity	0 sites

Transport Interface Distribution

< 10 Mbps	31
10 Mbps - 100 Mbps	0
100 Mbps - 500 Mbps	0
> 500 Mbps	0

vEdge Inventory

Total	5
Authorized	5
Deployed	5
Staging	0

vEdge Health (Total 5)

Normal	5
Warning	0
Error	0

Transport Health — Type: By Loss

Top Applications

Application-Aware Routing — Type: By Loss

Tunnel Endpoints	Avg. Latency (ms)	Avg. Loss (%)	Avg. Jitter (ms)
172.16.255.14:lte-172.16.255.16:3g	54.606	0.02	23.282
172.16.255.14:lte-172.16.255.16:lte	49.57	0.02	24.021
172.16.255.16:3g-172.16.255.11:gold	50.697	0.019	25.113

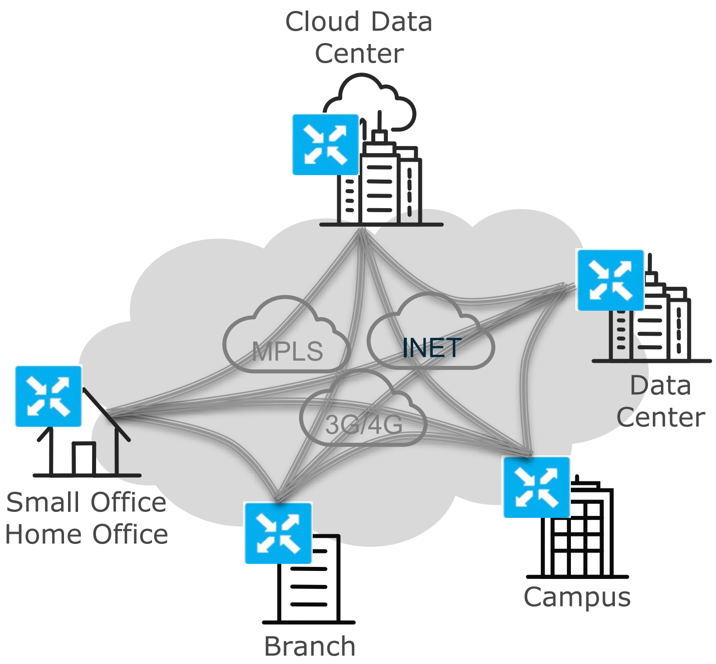
G00081

- ✓ **Control Up**: Total number of devices with the required number of operational control plane connections to a vSmart controller.
- ✓ **Partial**: Total number of devices with some, but not all, operational control plane connections to vSmart controllers.
- ✓ **Control Down**: Total number of devices with no control plane connection to a vSmart controller.

cisco Live!

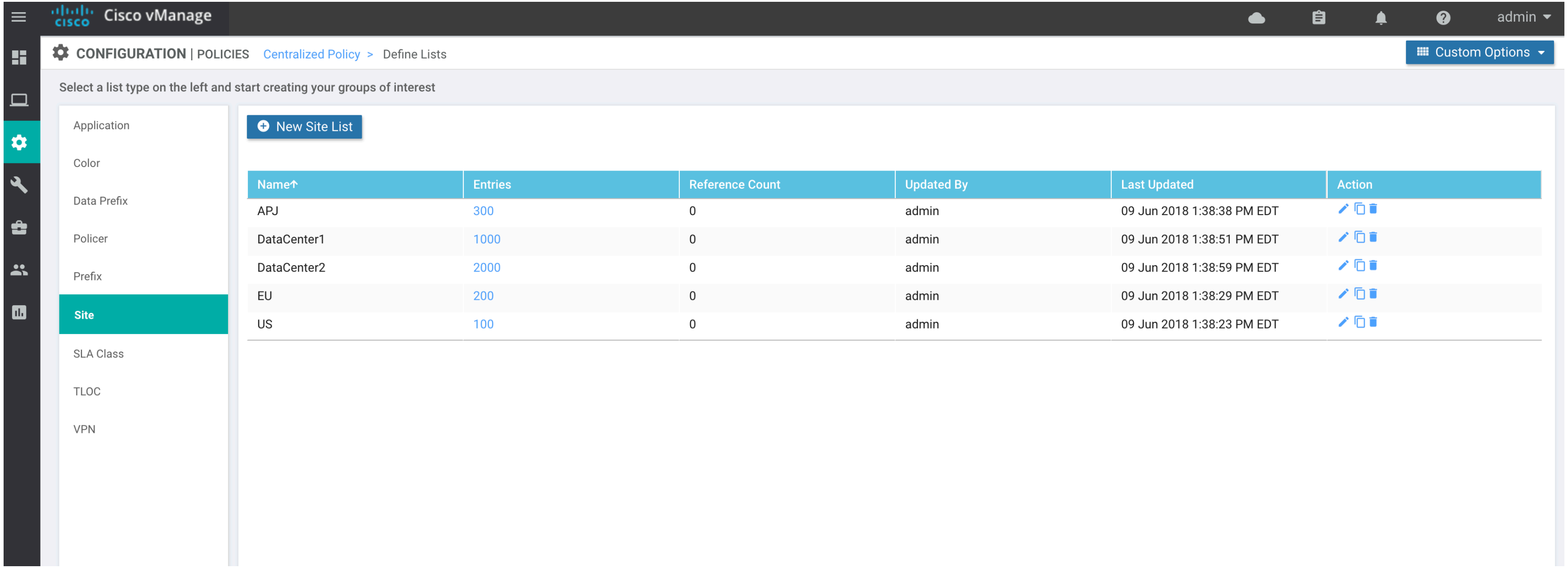
Setup - Application Policies in SD-WAN

Default Overlay Behavior



- Full Mesh IPSEC Overlay
- Equal Cost Multipath Data Forwarding
- Basic Tunnel Health Monitoring

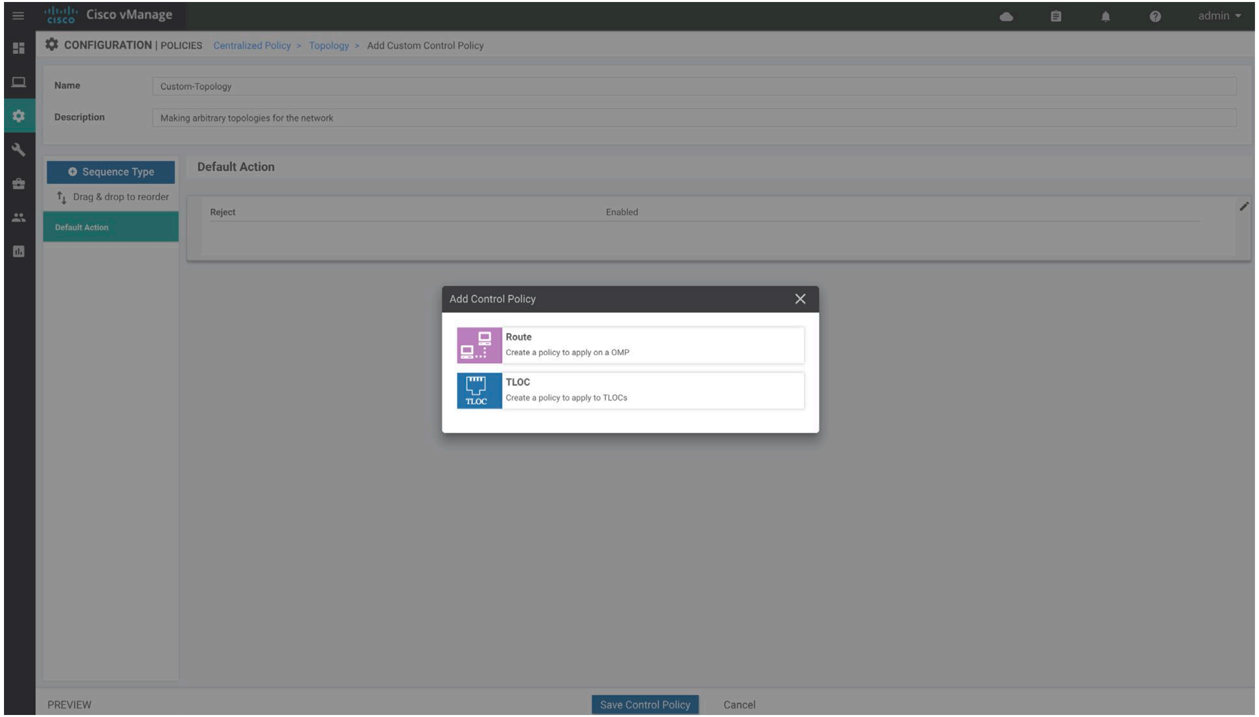
Defining the objects



Select a list type on the left and start creating your groups of interest

Name↑	Entries	Reference Count	Updated By	Last Updated	Action
APJ	300	0	admin	09 Jun 2018 1:38:38 PM EDT	
DataCenter1	1000	0	admin	09 Jun 2018 1:38:51 PM EDT	
DataCenter2	2000	0	admin	09 Jun 2018 1:38:59 PM EDT	
EU	200	0	admin	09 Jun 2018 1:38:29 PM EDT	
US	100	0	admin	09 Jun 2018 1:38:23 PM EDT	

Building the topology



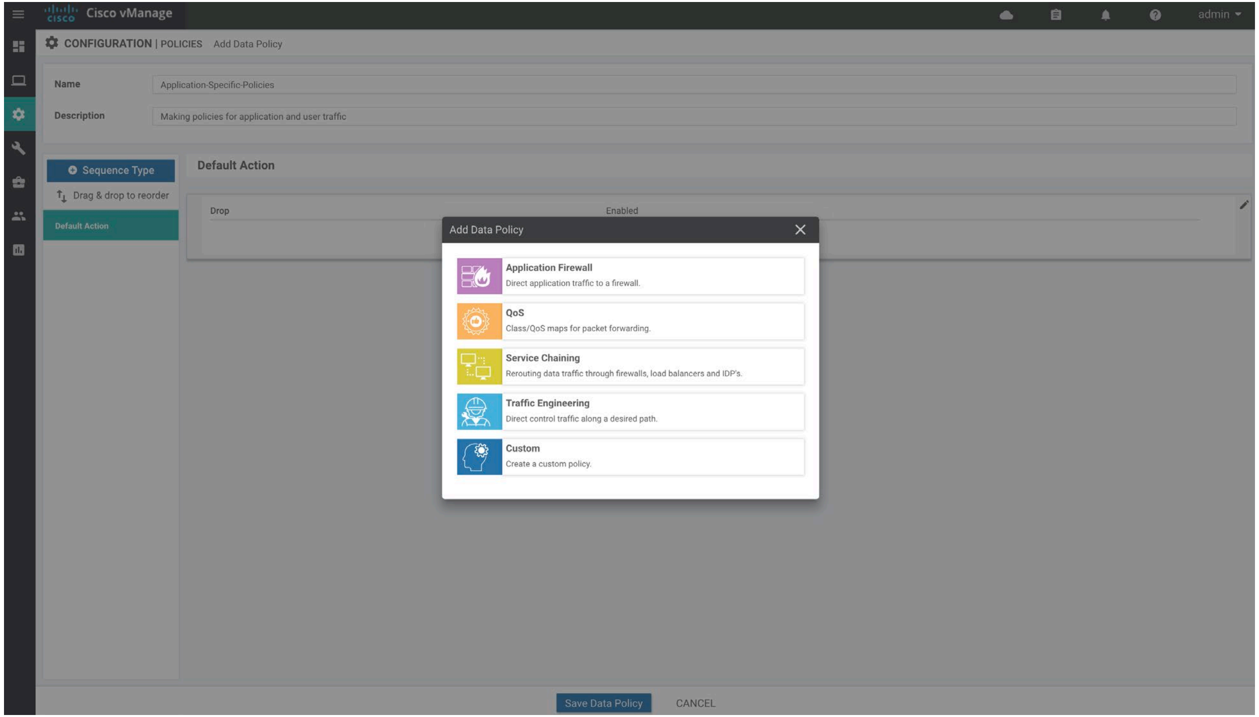
Name: Custom-Topology

Description: Making arbitrary topologies for the network

Route: Create a policy to apply on a OMP

TLOC: Create a policy to apply to TLOCs

Defining the treatment of applications



Cisco vManage

CONFIGURATION | POLICIES Add Data Policy

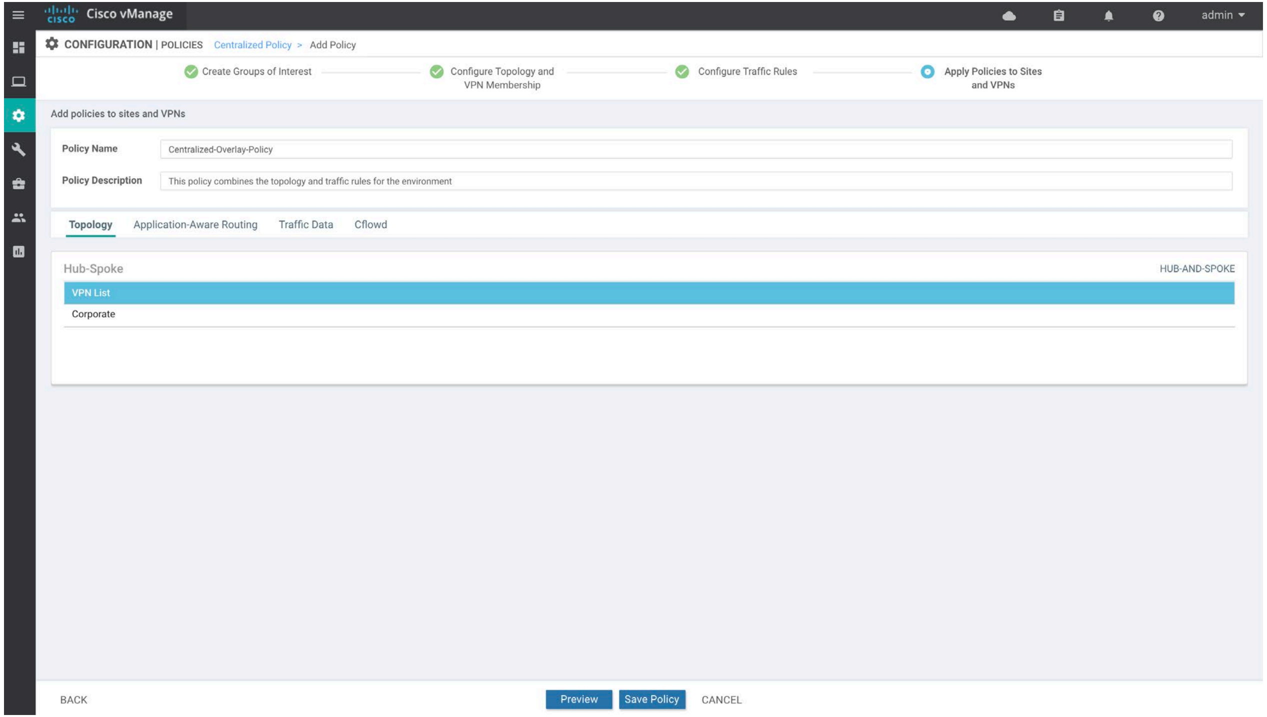
Name: Application-Specific-Policies

Description: Making policies for application and user traffic

Add Data Policy

- **Application Firewall** Direct application traffic to a firewall.
- **QoS** Class/QoS maps for packet forwarding.
- **Service Chaining** Rerouting data traffic through firewalls, load balancers and IDP's.
- **Traffic Engineering** Direct control traffic along a desired path.
- **Custom** Create a custom policy.

Activating the policies



Cisco vManage

CONFIGURATION | POLICIES Centralized Policy > Add Policy

✓ Create Groups of Interest — ✓ Configure Topology and VPN Membership — ✓ Configure Traffic Rules — ● Apply Policies to Sites and VPNs

Add policies to sites and VPNs

Policy Name: Centralized-Overlay-Policy

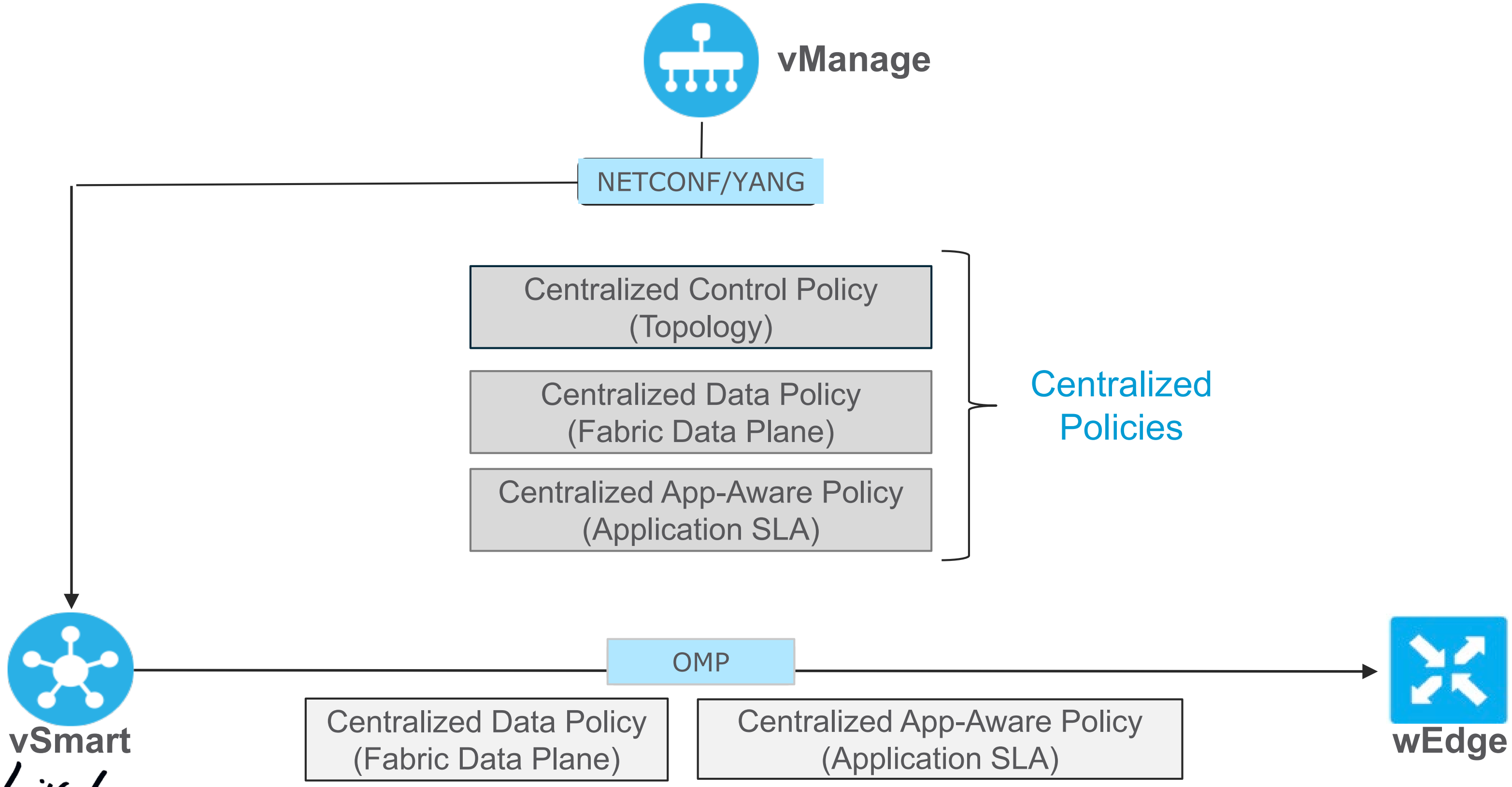
Policy Description: This policy combines the topology and traffic rules for the environment

Topology | Application-Aware Routing | Traffic Data | Cflowd

Hub-Spoke HUB-AND-SPOKE

VPN List
Corporate

Policy Framework
Centralized and Localized Policies



vManage

NETCONF/YANG

Centralized Control Policy (Topology)

Centralized Data Policy (Fabric Data Plane)

Centralized App-Aware Policy (Application SLA)

Centralized Policies

vSmart

OMP

Centralized Data Policy (Fabric Data Plane)

Centralized App-Aware Policy (Application SLA)

wEdge

Failure Scenarios

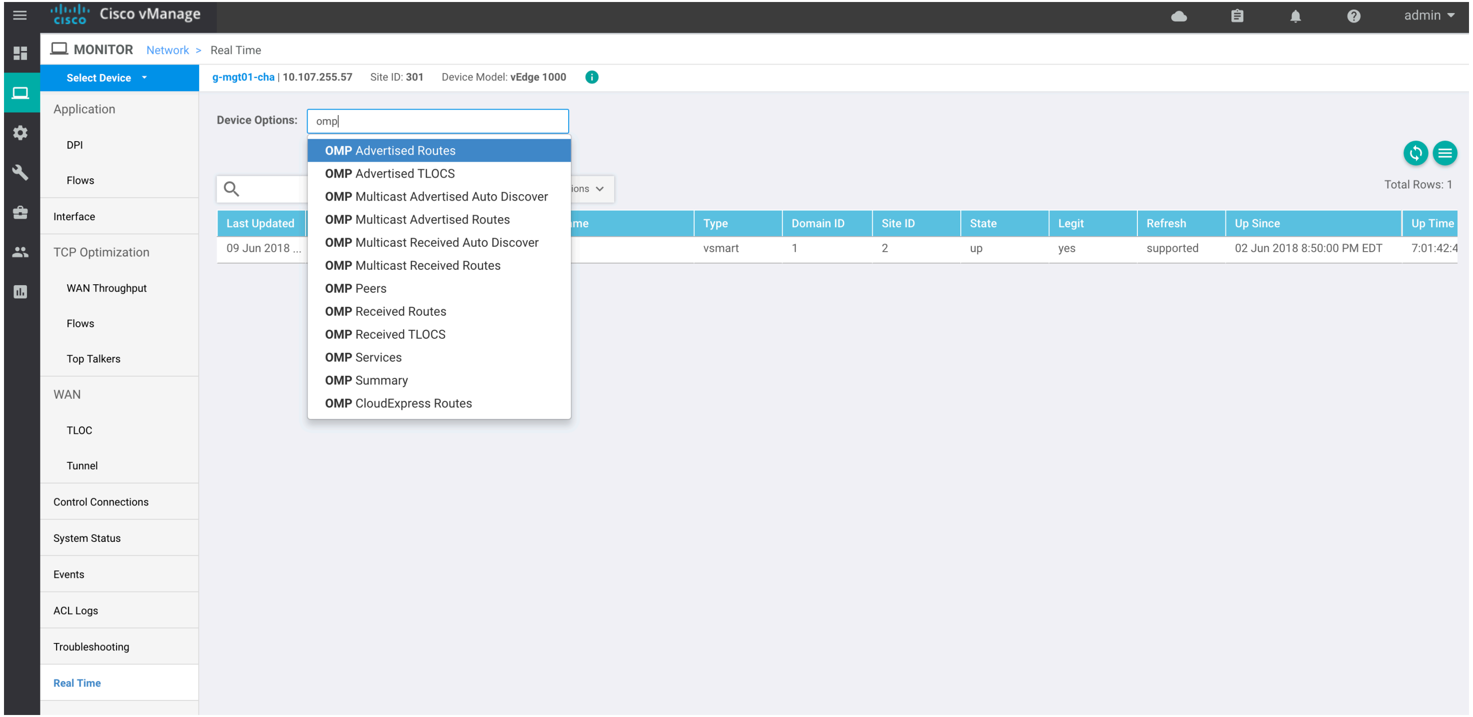
Control Plane Issues

- Incorrect routing
- Tunnels not established
- Best path selection

Data Plane Issues

- Incorrect path taken
- SLA Violations
- Application specific requirements

Troubleshooting Routing



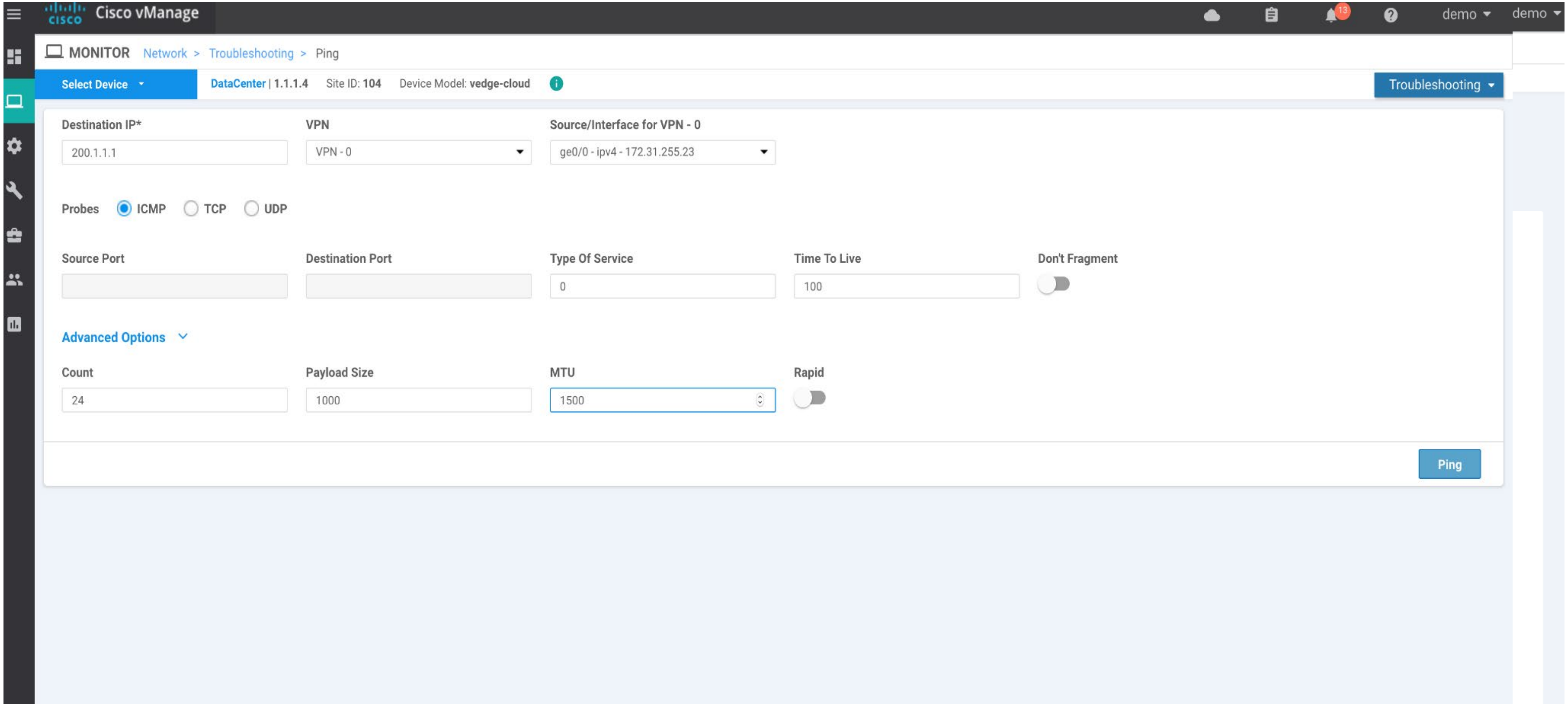
g-mgt01-cha | 10.107.255.57 Site ID: 301 Device Model: vEdge 1000

Device Options: omp

Total Rows: 1

Last Updated	me	Type	Domain ID	Site ID	State	Legit	Refresh	Up Since	Up Time
09 Jun 2018 ...		vsmart	1	2	up	yes	supported	02 Jun 2018 8:50:00 PM EDT	7:01:42:4

Troubleshooting Traffic



DataCenter | 1.1.1.4 Site ID: 104 Device Model: vedge-cloud

Destination IP*: 200.1.1.1

VPN: VPN - 0

Source/Interface for VPN - 0: ge0/0 - ipv4 - 172.31.255.23

Probes ● ICMP ○ TCP ○ UDP

Source Port:

Destination Port:

Type Of Service: 0

Time To Live: 100

Don't Fragment

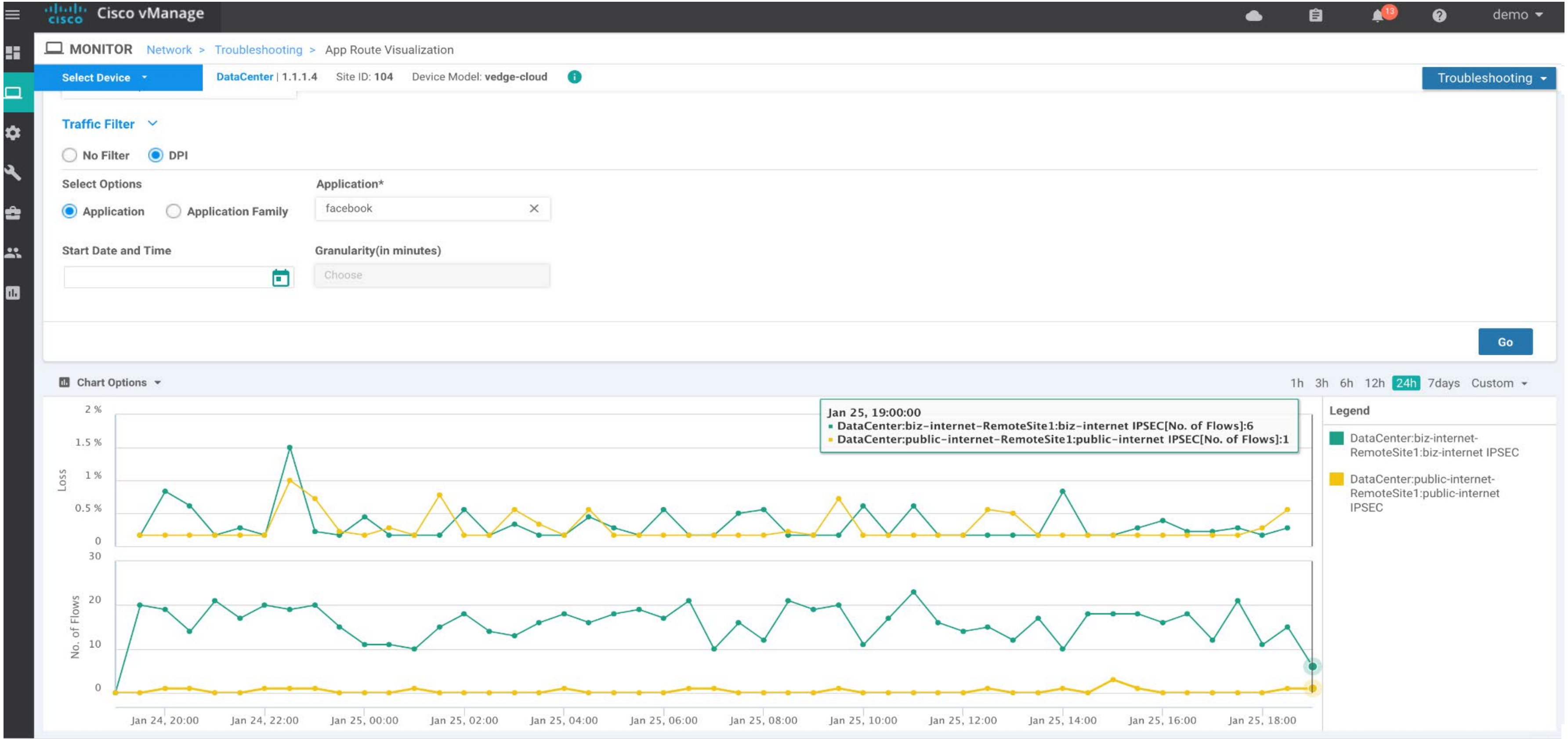
Count: 24

Payload Size: 1000

MTU: 1500

Rapid

Visualizing Application Paths



MONITOR Network > Troubleshooting > App Route Visualization

Select Device | DataCenter | 1.1.1.4 | Site ID: 104 | Device Model: vedge-cloud

Traffic Filter

○ No Filter ● DPI

Select Options: ● Application ○ Application Family

Application*: facebook

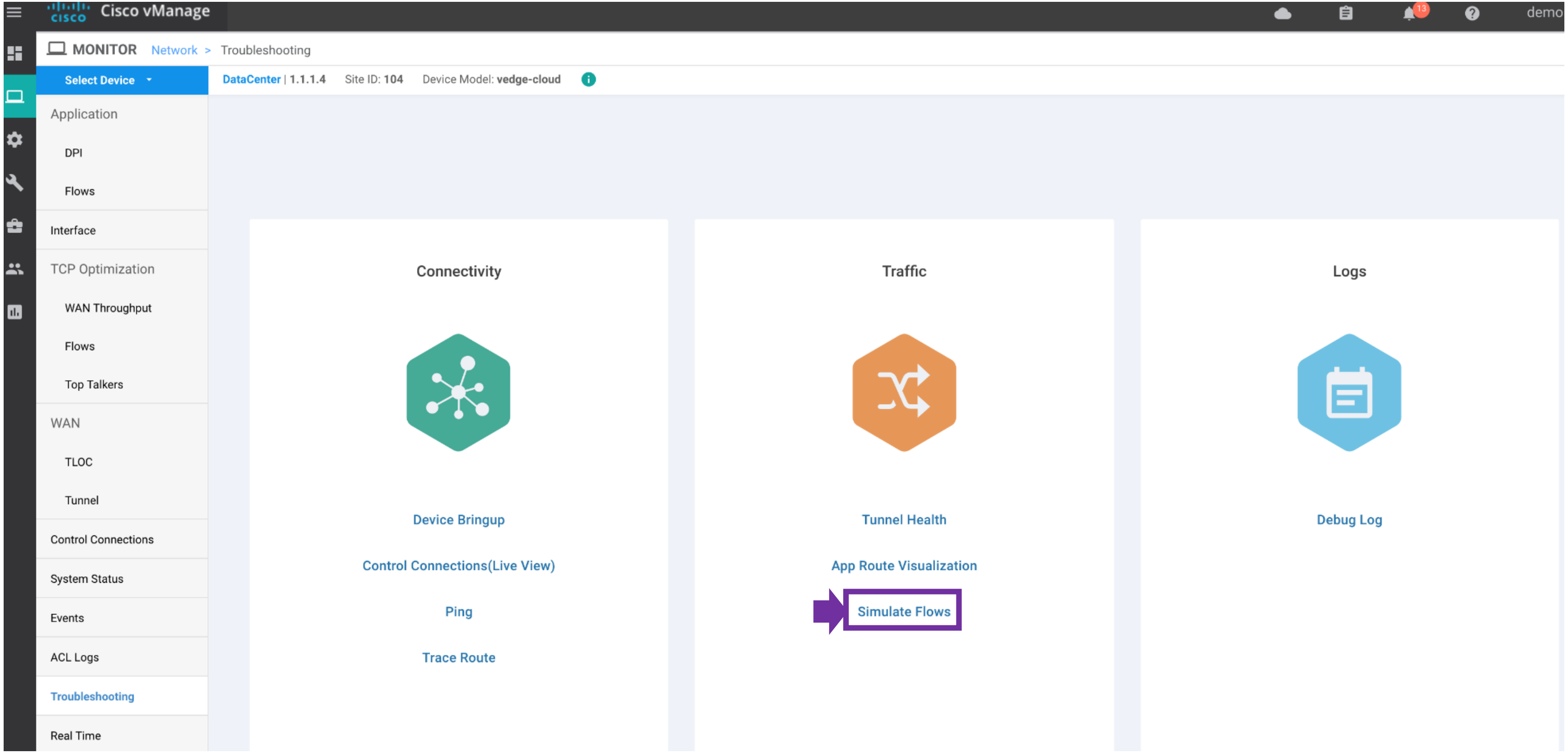
Start Date and Time:

Granularity(in minutes): Choose

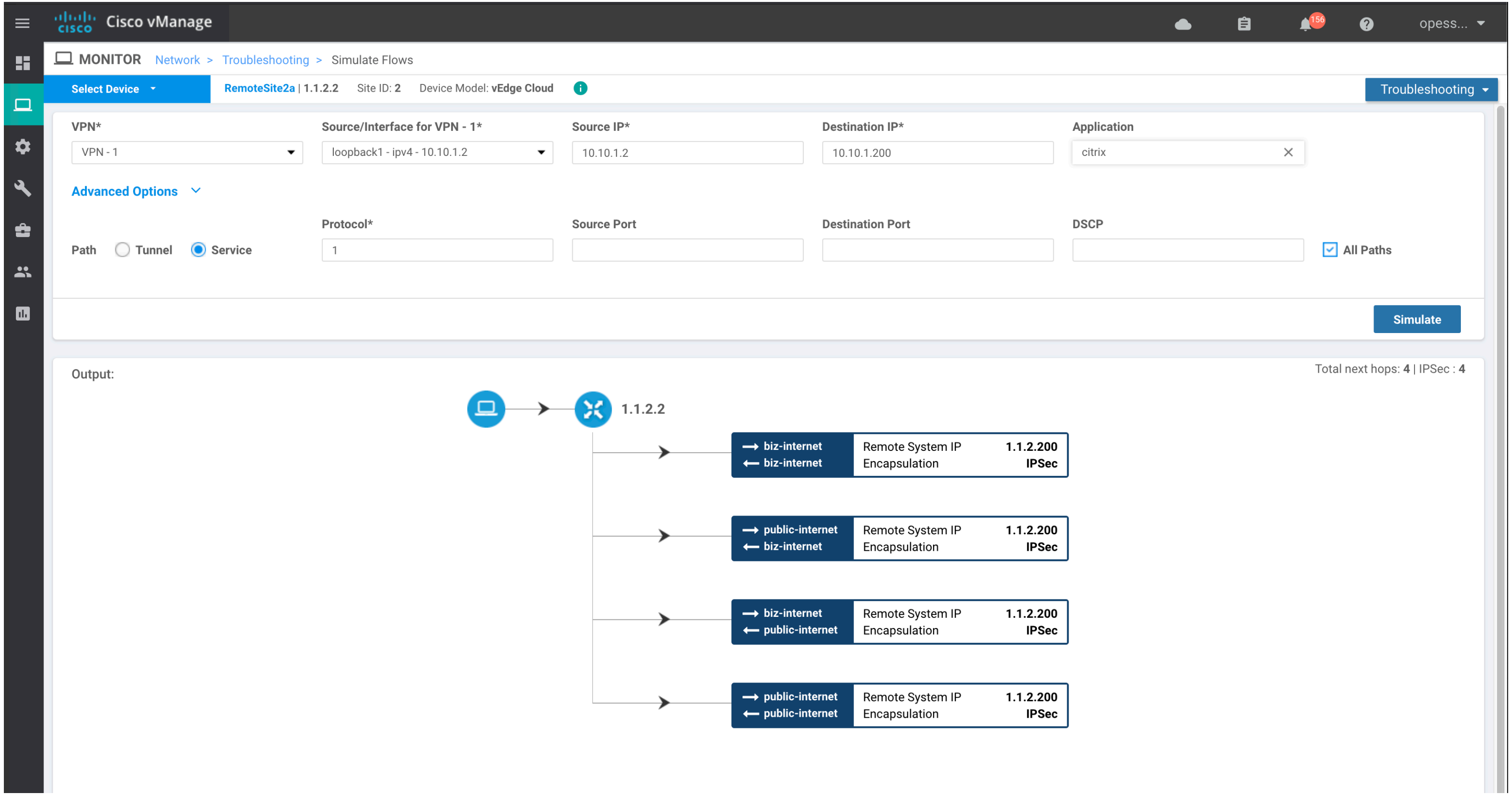
Jan 25, 19:00:00
- DataCenter:biz-internet-RemoteSite1:biz-internet IPSEC[No. of Flows]:6
- DataCenter:public-internet-RemoteSite1:public-internet IPSEC[No. of Flows]:1

Legend
- 🟩 DataCenter:biz-internet-RemoteSite1:biz-internet IPSEC
- 🟨 DataCenter:public-internet-RemoteSite1:public-internet IPSEC

Simulating Traffic Flows



Simulating Traffic Flows



RemoteSite2a | 1.1.2.2 Site ID: 2 Device Model: vEdge Cloud

VPN*: VPN - 1

Source/Interface for VPN - 1*: loopback1 - ipv4 - 10.10.1.2

Source IP*: 10.10.1.2

Destination IP*: 10.10.1.200

Application: citrix

Path ○ Tunnel ● Service

Protocol*: 1

Source Port:

Destination Port:

DSCP:

☑ All Paths

Output:

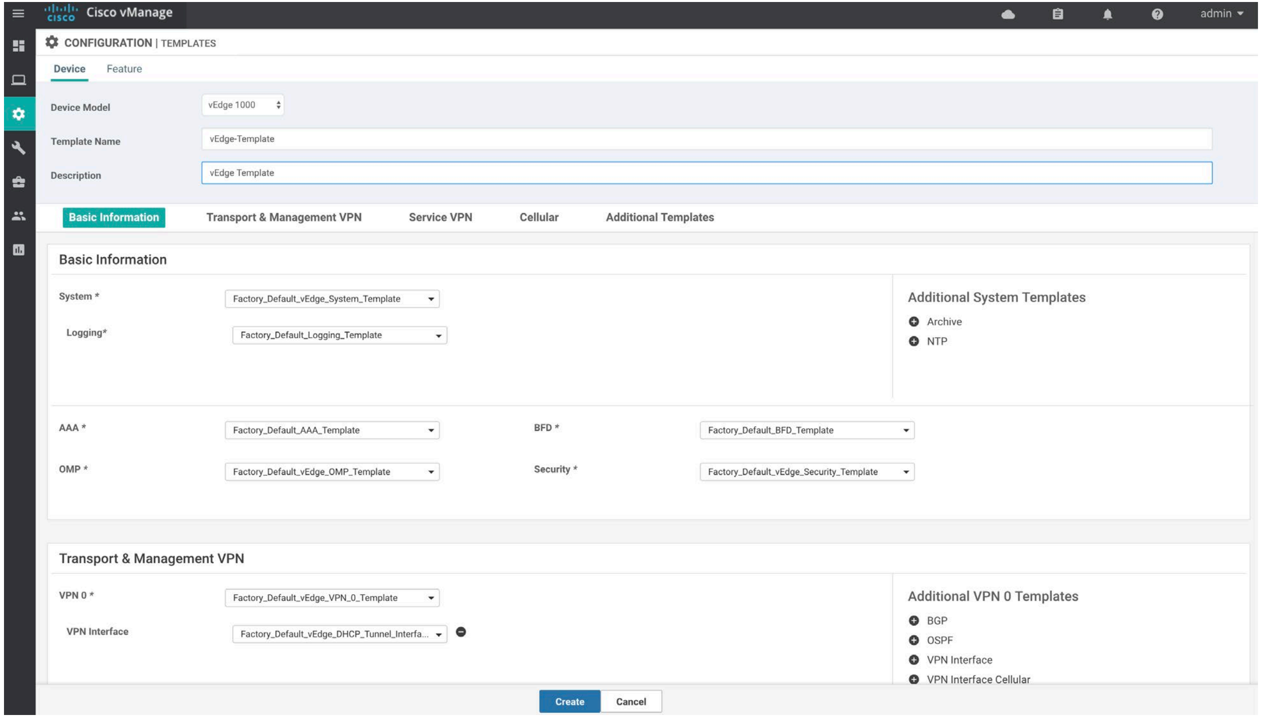
Total next hops: 4 | IPSec : 4

1.1.2.2

→ biz-internet ← biz-internet	Remote System IP Encapsulation	1.1.2.200 IPSec
→ public-internet ← biz-internet	Remote System IP Encapsulation	1.1.2.200 IPSec
→ biz-internet ← public-internet	Remote System IP Encapsulation	1.1.2.200 IPSec
→ public-internet ← public-internet	Remote System IP Encapsulation	1.1.2.200 IPSec

Deploy - Device & Configuration Management

Building the template



Device Model: vEdge 1000

Template Name: vEdge-Template

Description: vEdge Template

Basic Information

System *: Factory_Default_vEdge_System_Template

Logging*: Factory_Default_Logging_Template

Additional System Templates
- Archive
- NTP

AAA *: Factory_Default_AAA_Template

BFD *: Factory_Default_BFD_Template

OMP *: Factory_Default_vEdge_OMP_Template

Security *: Factory_Default_vEdge_Security_Template

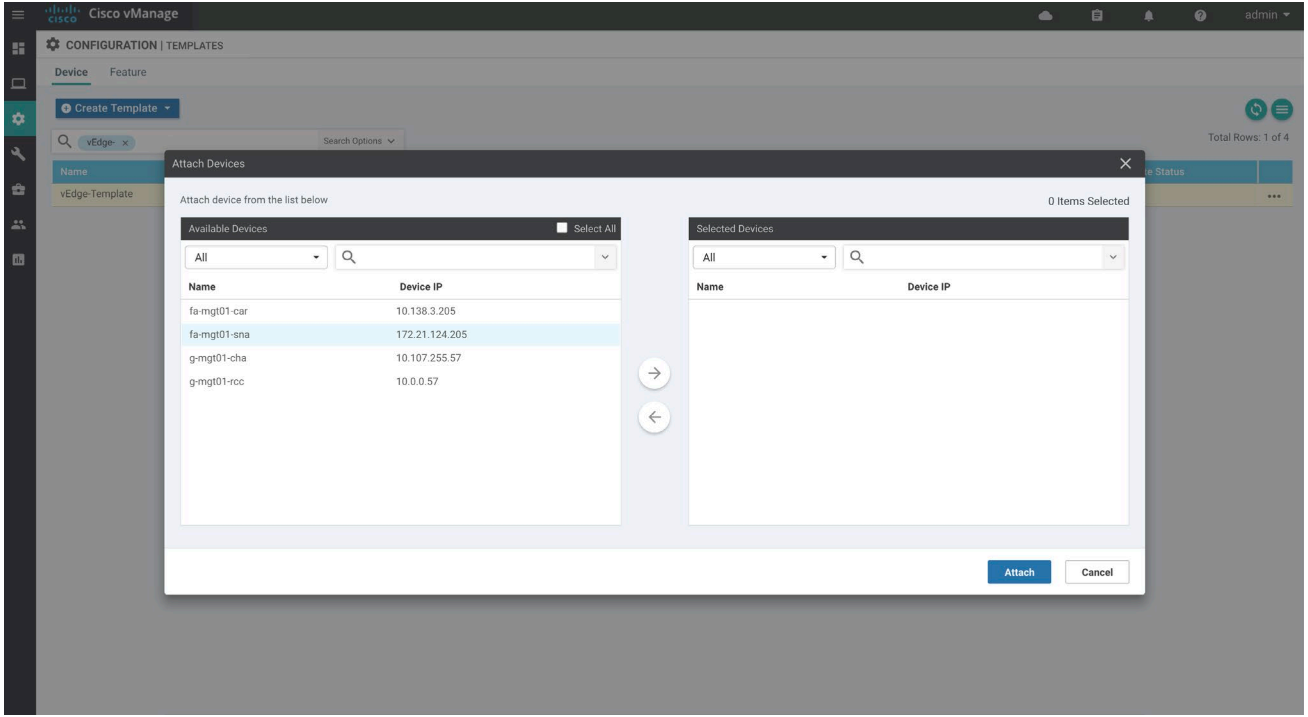
Transport & Management VPN

VPN 0 *: Factory_Default_vEdge_VPN_0_Template

VPN Interface: Factory_Default_vEdge_DHCP_Tunnel_Interfa...

Additional VPN 0 Templates
- BGP
- OSPF
- VPN Interface
- VPN Interface Cellular

Deploying the template



Attach Devices

Attach device from the list below

0 Items Selected

Available Devices □ Select All

All

Name	Device IP
fa-mgt01-car	10.138.3.205
fa-mgt01-sna	172.21.124.205
g-mgt01-cha	10.107.255.57
g-mgt01-rcc	10.0.0.57

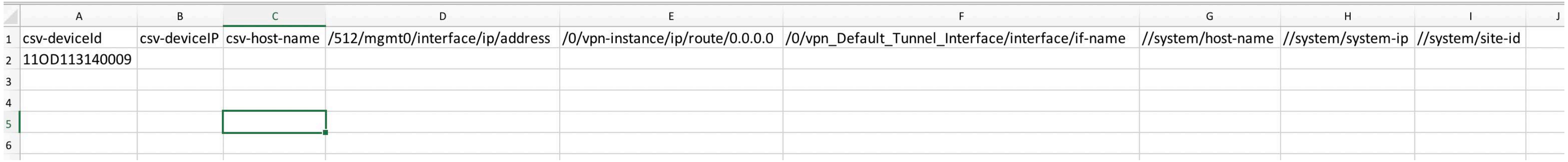
Selected Devices

All

Name	Device IP

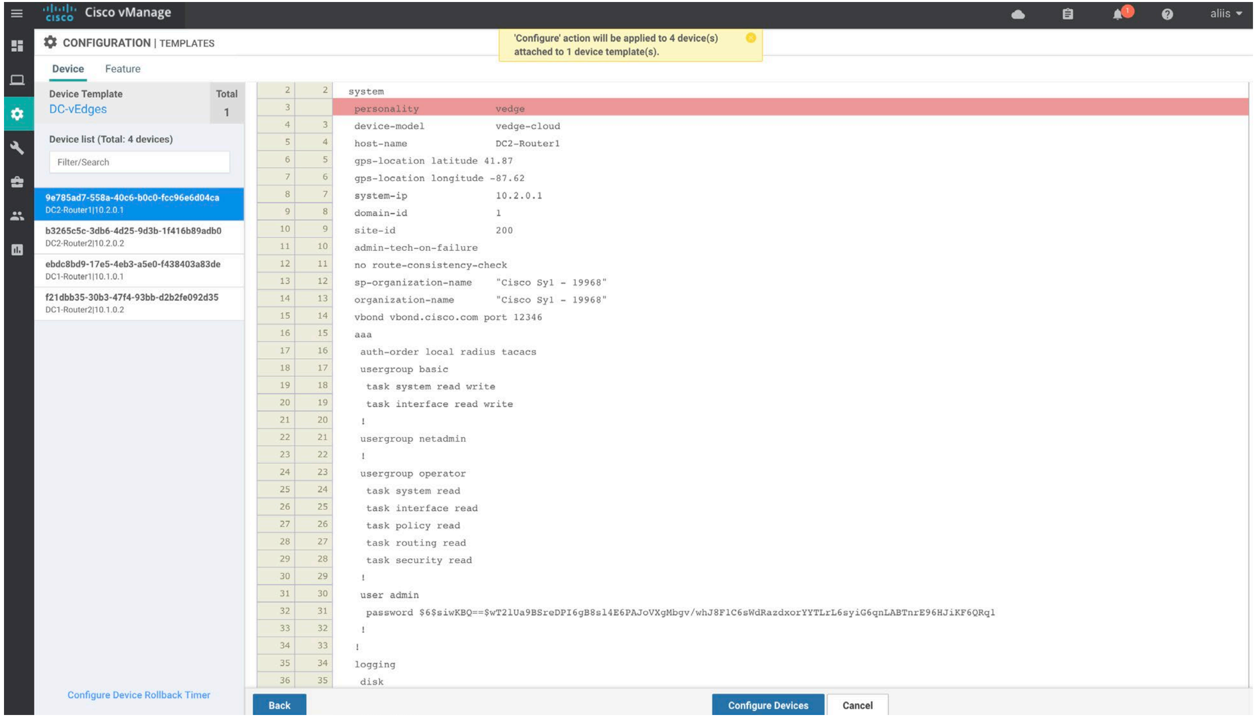
Attach Cancel

Adding device values



	A	B	C	D	E	F	G	H	I	J
1	csv-deviceId	csv-deviceIP	csv-host-name	/512/mgmt0/interface/ip/address	/0/vpn-instance/ip/route/0.0.0.0	/0/vpn_Default_Tunnel_Interface/interface/if-name	//system/host-name	//system/system-ip	//system/site-id	
2	11OD113140009									
3										
4										
5										
6										

Validation of Configuration



'Configure' action will be applied to 4 device(s) attached to 1 device template(s).

Device Template	Total
DC-vEdges	1

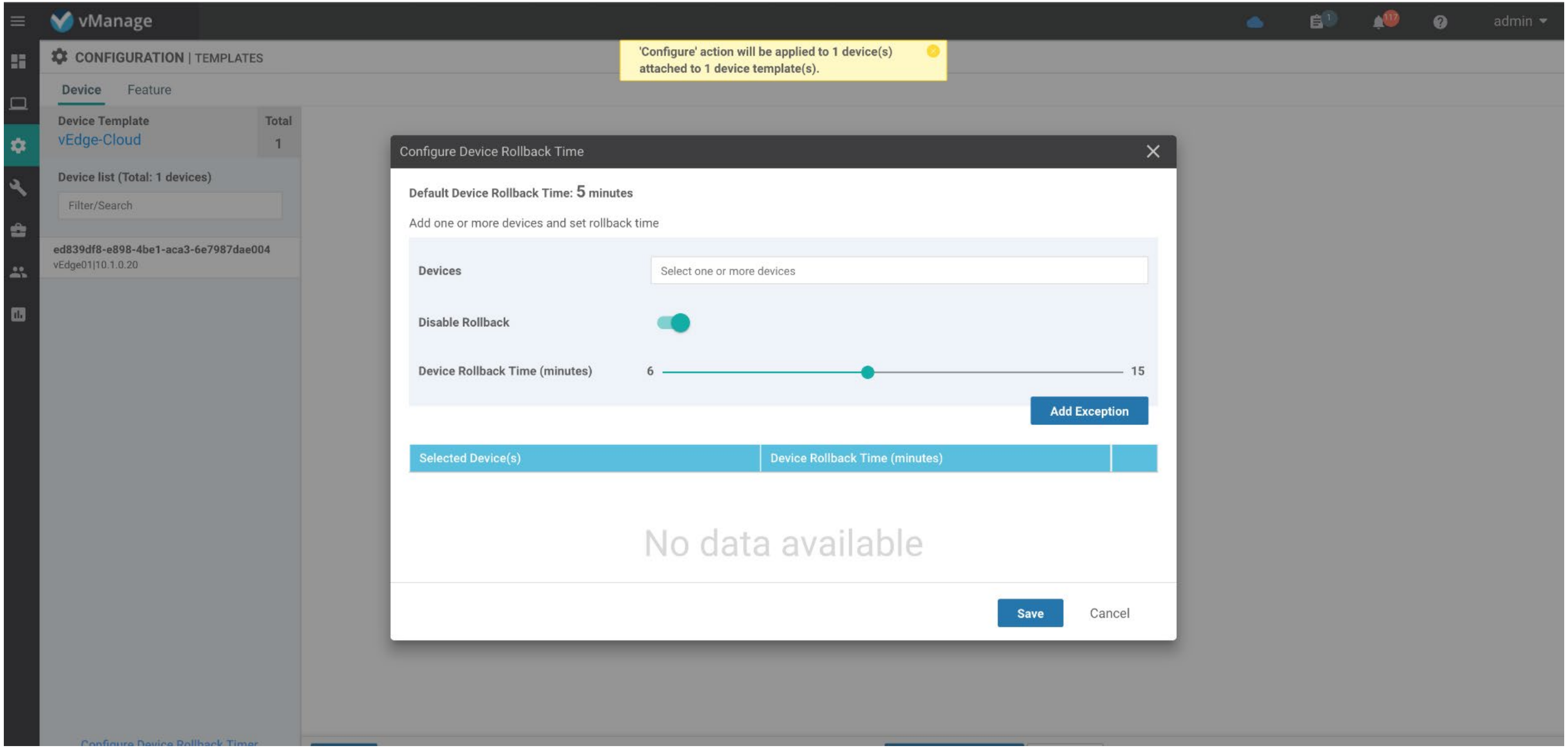
Device list (Total: 4 devices)

Filter/Search

- 9e785ad7-558a-40c6-b0c0-fcc96e6d04ca
DC2-Router1|10.2.0.1
- b3265c5c-3db6-4d25-9d3b-1f416b89adb0
DC2-Router2|10.2.0.2
- ebdc8bd9-17e5-4eb3-a5e0-f438403a83de
DC1-Router1|10.1.0.1
- f21dbb35-30b3-47f4-93bb-d2b2fe092d35
DC1-Router2|10.1.0.2

```
system
 personality             vedge
 device-model            vedge-cloud
 host-name               DC2-Router1
 gps-location latitude 41.87
 gps-location longitude -87.62
 system-ip               10.2.0.1
 domain-id               1
 site-id                 200
 admin-tech-on-failure
 no route-consistency-check
 sp-organization-name    "Cisco Syl - 19968"
 organization-name       "Cisco Syl - 19968"
 vbond vbond.cisco.com port 12346
 aaa
  auth-order local radius tacacs
  usergroup basic
   task system read write
   task interface read write
  !
  usergroup netadmin
  !
  usergroup operator
   task system read
   task interface read
   task policy read
   task routing read
   task security read
  !
  user admin
   password $6$siwKBQ==$wT2lUa9BSreDPI6gB8sl4E6PAJoVXgMbgv/whJ8F1C6sWdRazdxorYYTLrL6syiG6qnLABTnrE96HJiKF6QRql
  !
 !
 logging
  disk
```

Configuration Rollback



'Configure' action will be applied to 1 device(s) attached to 1 device template(s).

Device Template	Total
vEdge-Cloud	1

Device list (Total: 1 devices)

ed839df8-e898-4be1-aca3-6e7987dae004
vEdge01|10.1.0.20

Configure Device Rollback Time

Default Device Rollback Time: 5 minutes

Add one or more devices and set rollback time

Devices: Select one or more devices

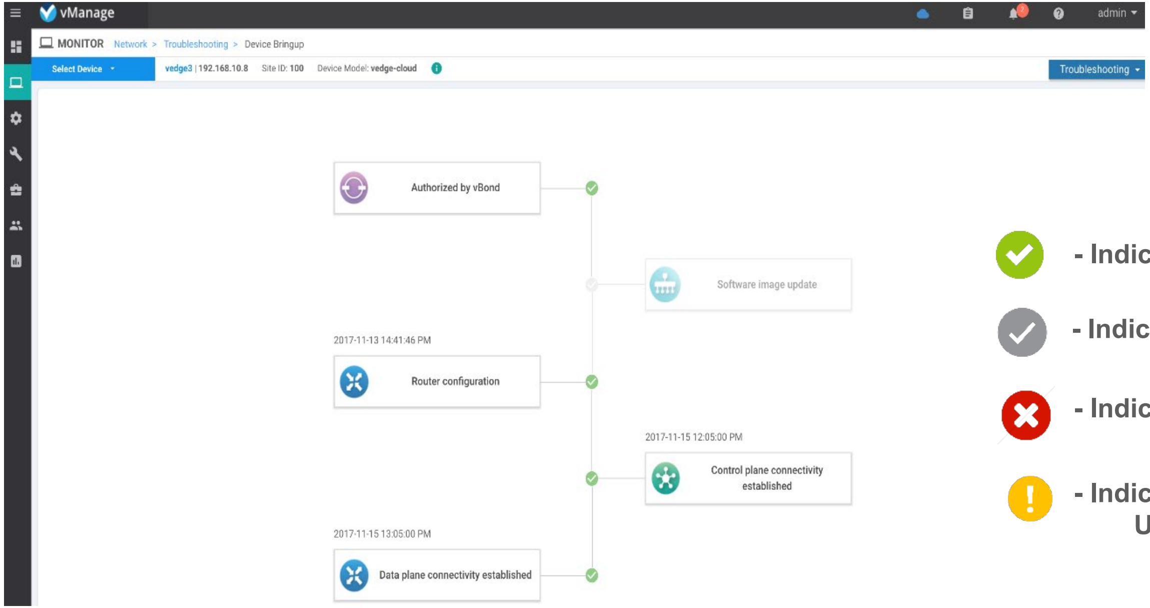
Disable Rollback: ●

Device Rollback Time (minutes): 6 — 15

Selected Device(s)	Device Rollback Time (minutes)	

No data available

Checking Device Bring-Up


vManage
admin
MONITOR Network > Troubleshooting > Device Bringup
Select Device
vedge3 | 192.168.10.8 Site ID: 100 Device Model: vedge-cloud
Troubleshooting

Authorized by vBond

Software image update

2017-11-13 14:41:46 PM

Router configuration

2017-11-15 12:05:00 PM

Control plane connectivity established

2017-11-15 13:05:00 PM

Data plane connectivity established

✓ **- Indicates control plane connections are successful**

✓ **- Indicates ZTP is disabled. Seen during SW upgrade only**

✗ **- Indicates control plane connection failure**

! **- Indicates that the reason for device bring-up failure is Unknown**

Failure Scenarios

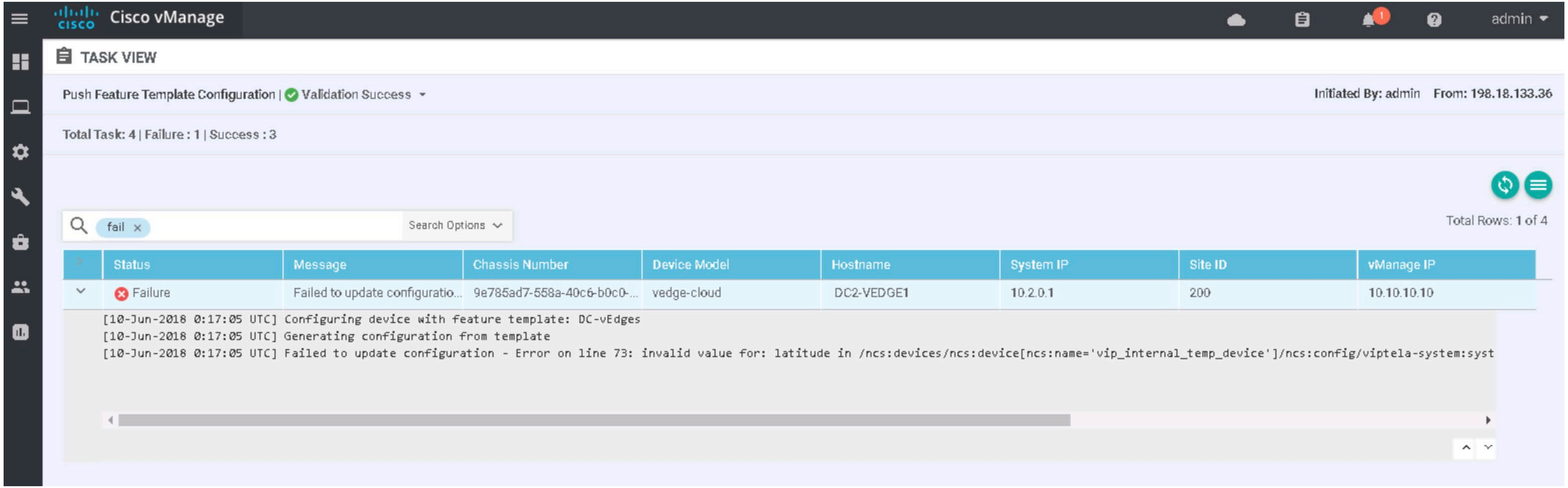
Connectivity Loss

- ➢ Accidental misconfiguration
- ➢ Interfaces shutdown
- ➢ Incorrect addressing

Unsupported Behavior

- ➢ Bad data
- ➢ Unsupported configuration
- ➢ Conflicting information

Troubleshooting Configuration



Push Feature Template Configuration | Validation Success

Initiated By: admin From: 198.18.133.36

Total Task: 4 | Failure : 1 | Success : 3

fail × Search Options

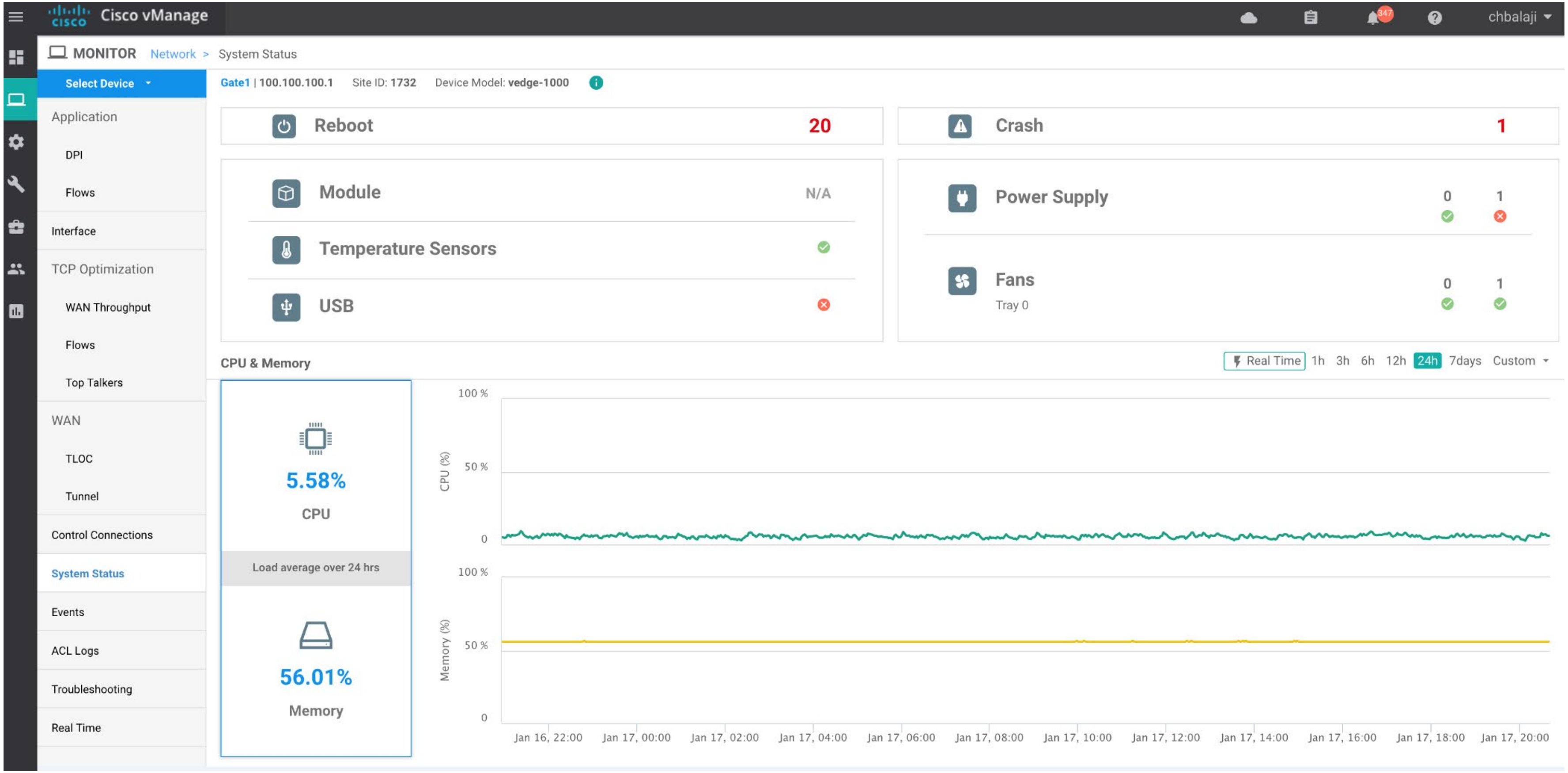
Total Rows: 1 of 4

	Status	Message	Chassis Number	Device Model	Hostname	System IP	Site ID	vManage IP
⌄	✖ Failure	Failed to update configuratio...	9e785ad7-558a-40c6-b0c0-...	vedge-cloud	DC2-VEDGE1	10.2.0.1	200	10.10.10.10

```
[10-Jun-2018 0:17:05 UTC] Configuring device with feature template: DC-vEdges
[10-Jun-2018 0:17:05 UTC] Generating configuration from template
[10-Jun-2018 0:17:05 UTC] Failed to update configuration - Error on line 73: invalid value for: latitude in /ncs:devices/ncs:device[ncs:name='vip_internal_temp_device']/ncs:config/viptela-system:syst
```

Monitor – vManage, APIs & Programmability

Checking System Status



Gate1 | 100.100.100.1 Site ID: 1732 Device Model: vedge-1000

Reboot	20
Crash	1
Module	N/A
Temperature Sensors	✓
USB	☒

	0	1
Power Supply	✓	☒
Fans Tray 0	✓	✓

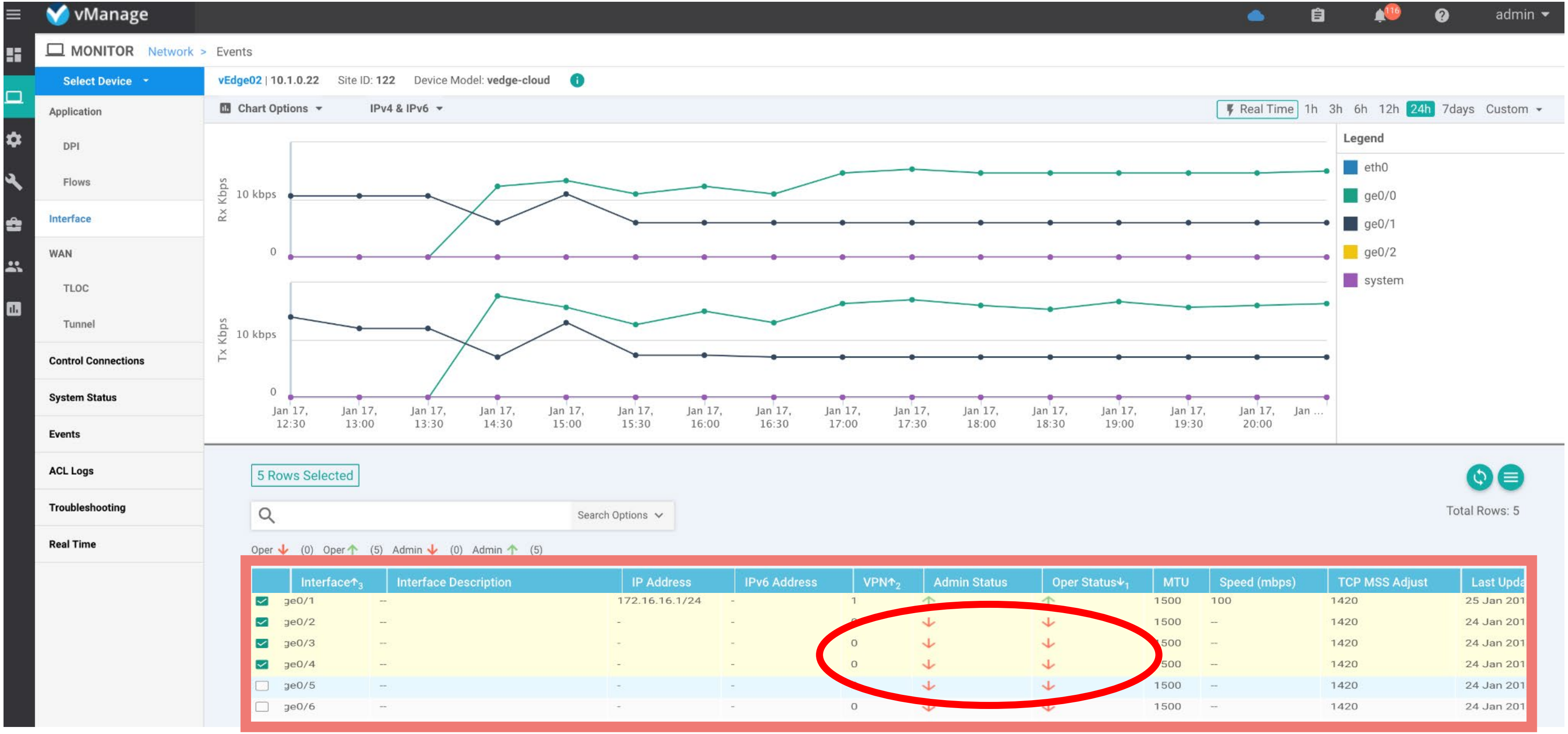
CPU & Memory

5.58%
CPU

Load average over 24 hrs

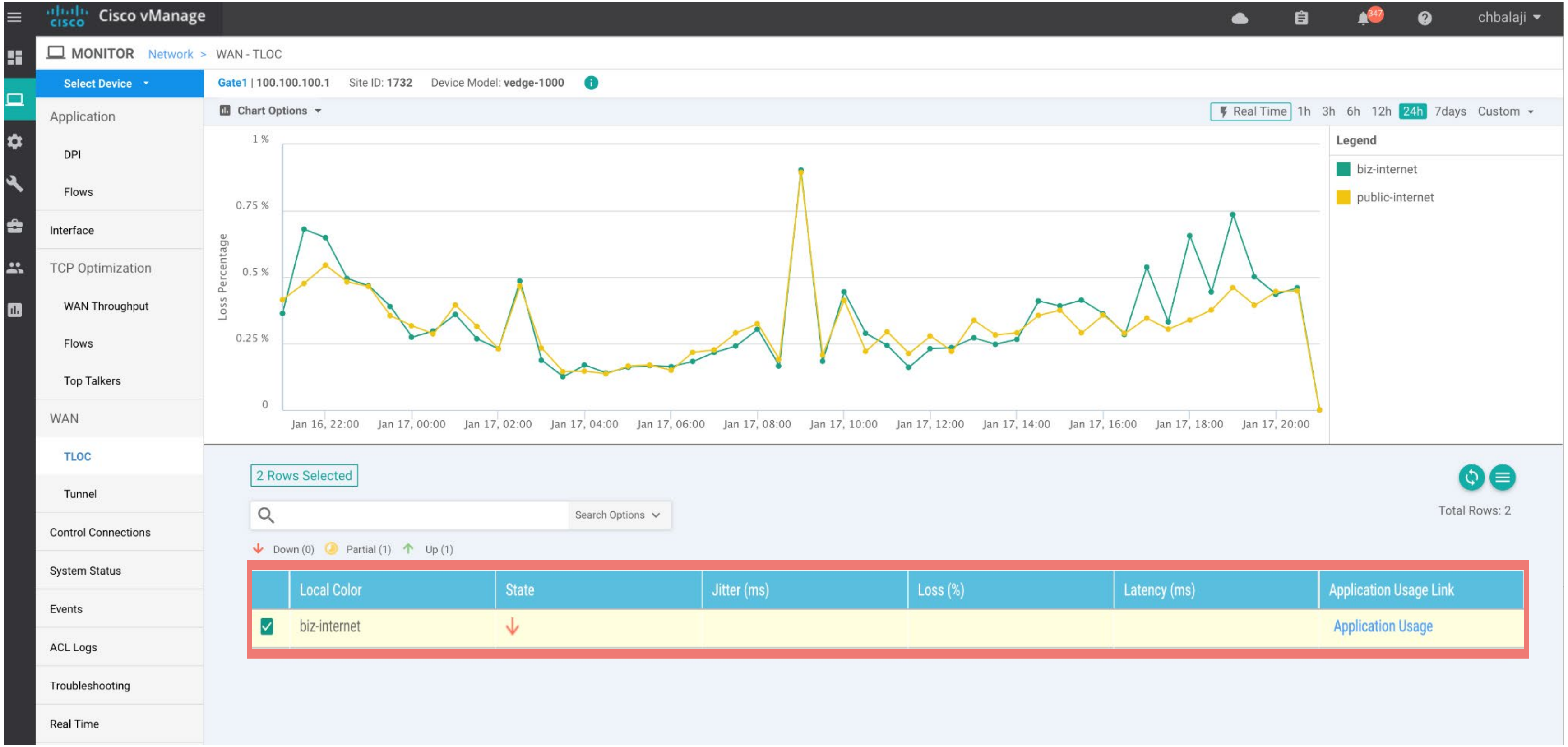
56.01%
Memory

Checking Interface Utilization



	Interface↑3	Interface Description	IP Address	IPv6 Address	VPN↑2	Admin Status	Oper Status↓1	MTU	Speed (mbps)	TCP MSS Adjust	Last Upda
☑	ge0/1	--	172.16.16.1/24	-	1	↑	↑	1500	100	1420	25 Jan 201
☑	ge0/2	--	-	-	0	↓	↓	1500	--	1420	24 Jan 201
☑	ge0/3	--	-	-	0	↓	↓	1500	--	1420	24 Jan 201
☑	ge0/4	--	-	-	0	↓	↓	1500	--	1420	24 Jan 201
□	ge0/5	--	-	-	[illegible]	↓	↓	1500	--	1420	24 Jan 201
□	ge0/6	--	-	-	0	↓	↓	1500	--	1420	24 Jan 201

Checking Transport Quality



Gate1 | 100.100.100.1 Site ID: 1732 Device Model: vedge-1000

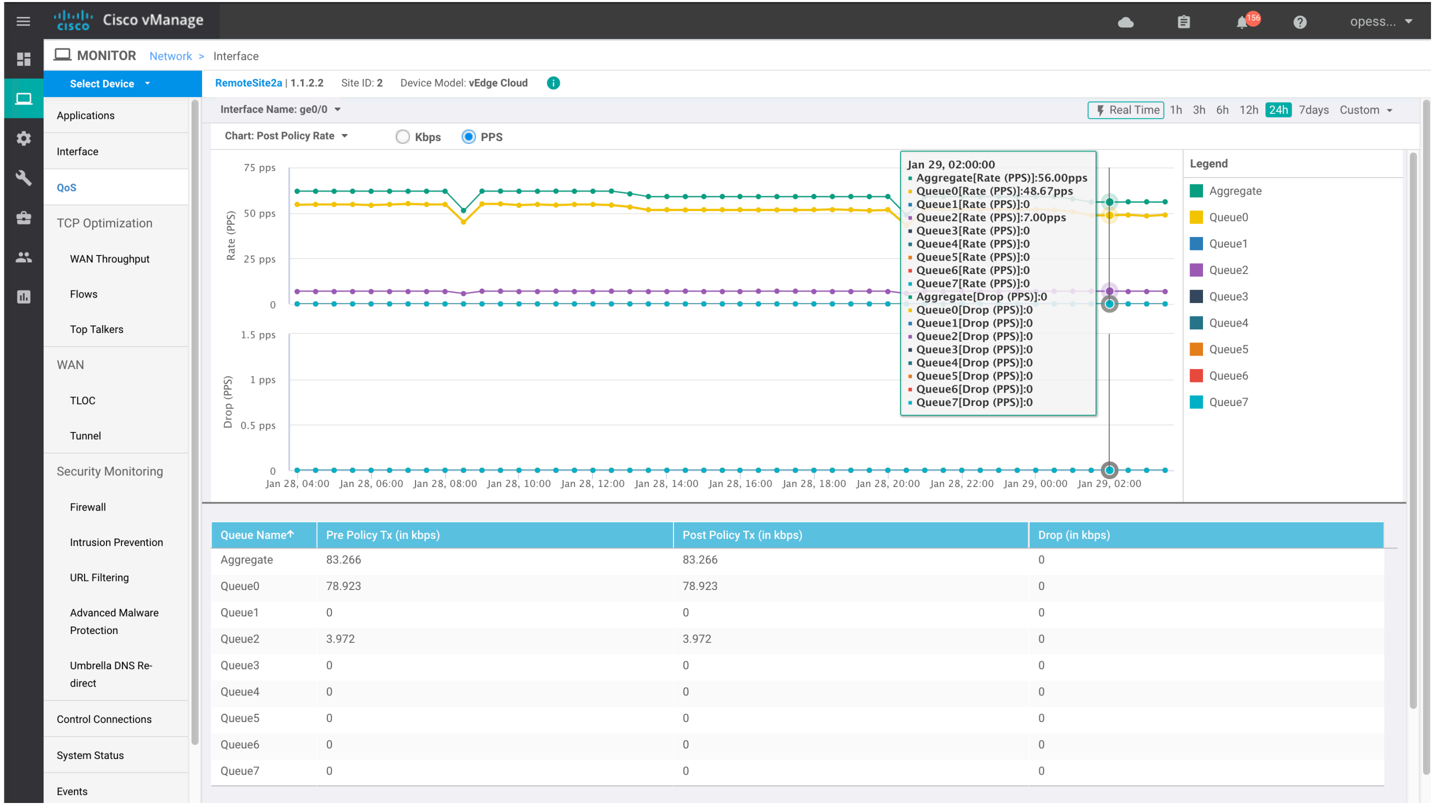
2 Rows Selected

Total Rows: 2

↓ Down (0) Partial (1) ↑ Up (1)

	Local Color	State	Jitter (ms)	Loss (%)	Latency (ms)	Application Usage Link
☑	biz-internet	↓				Application Usage

Checking QoS



RemoteSite2a | 1.1.2.2 Site ID: 2 Device Model: vEdge Cloud

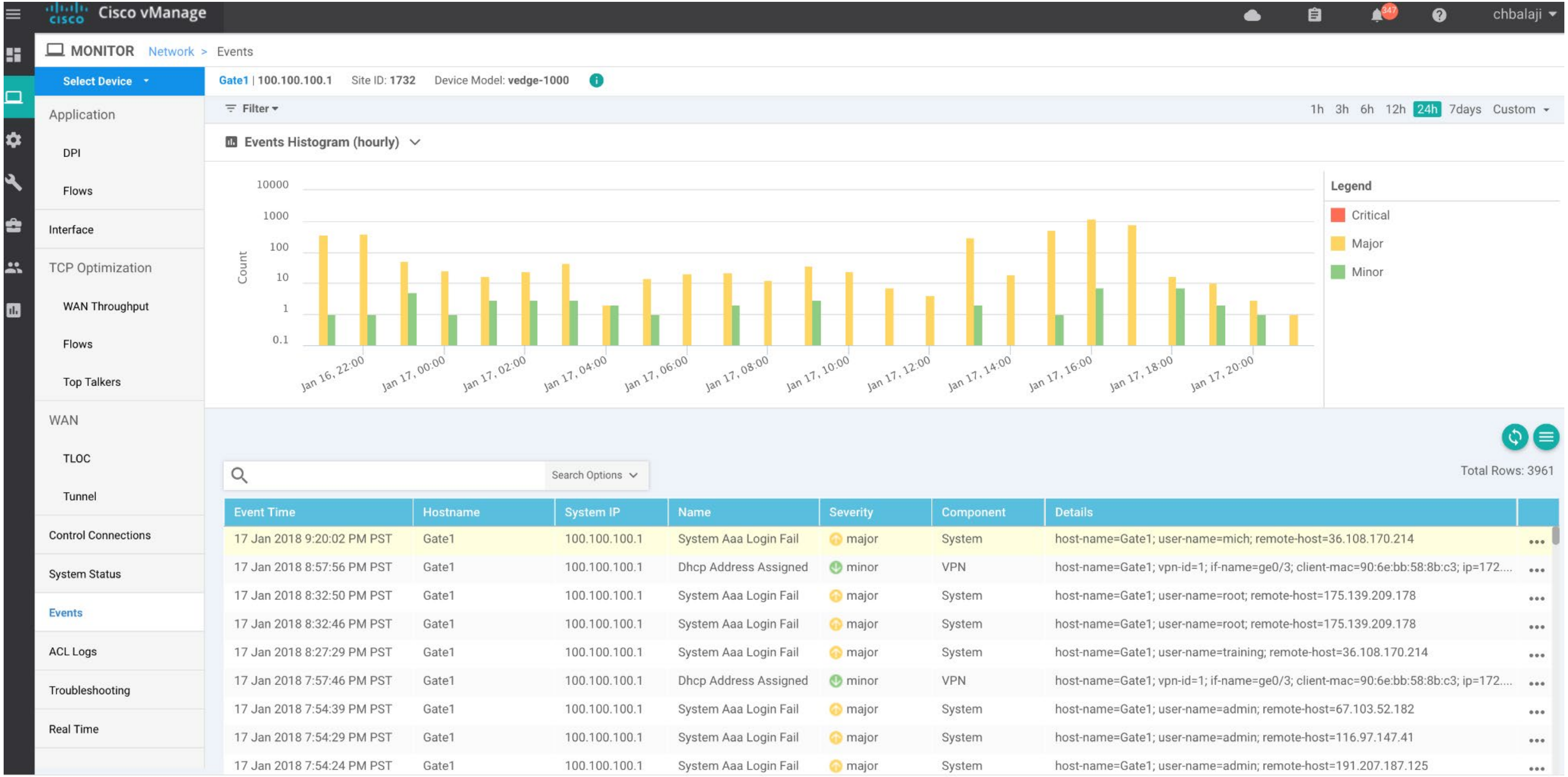
Interface Name: ge0/0

Chart: Post Policy Rate ○ Kbps ● PPS

Jan 29, 02:00:00
- Aggregate[Rate (PPS)]:56.00pps
- Queue0[Rate (PPS)]:48.67pps
- Queue1[Rate (PPS)]:0
- Queue2[Rate (PPS)]:7.00pps
- Queue3[Rate (PPS)]:0
- Queue4[Rate (PPS)]:0
- Queue5[Rate (PPS)]:0
- Queue6[Rate (PPS)]:0
- Queue7[Rate (PPS)]:0
- Aggregate[Drop (PPS)]:0
- Queue0[Drop (PPS)]:0
- Queue1[Drop (PPS)]:0
- Queue2[Drop (PPS)]:0
- Queue3[Drop (PPS)]:0
- Queue4[Drop (PPS)]:0
- Queue5[Drop (PPS)]:0
- Queue6[Drop (PPS)]:0
- Queue7[Drop (PPS)]:0

Queue Name↑	Pre Policy Tx (in kbps)	Post Policy Tx (in kbps)	Drop (in kbps)
Aggregate	83.266	83.266	0
Queue0	78.923	78.923	0
Queue1	0	0	0
Queue2	3.972	3.972	0
Queue3	0	0	0
Queue4	0	0	0
Queue5	0	0	0
Queue6	0	0	0
Queue7	0	0	0

Checking Events



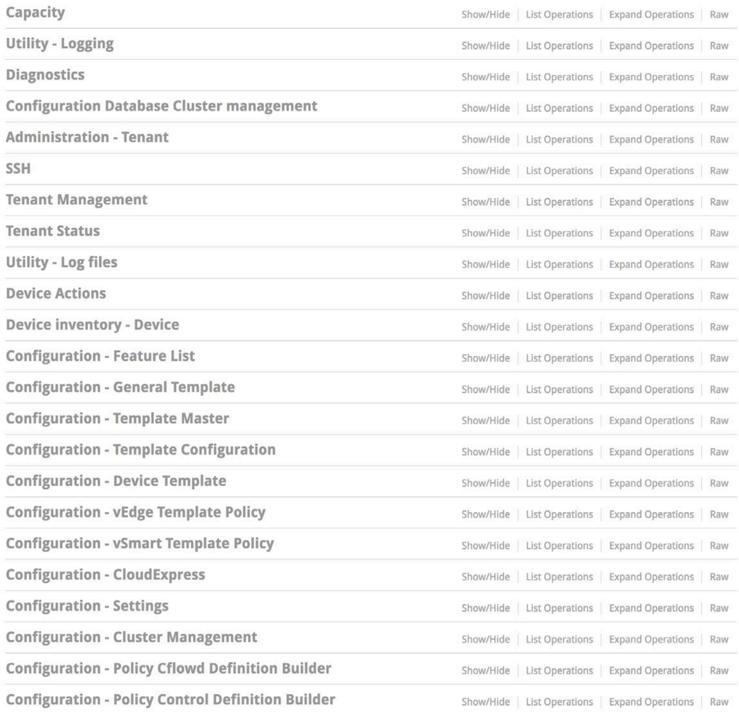
Gate1 | 100.100.100.1 Site ID: 1732 Device Model: vedge-1000

Total Rows: 3961

Event Time	Hostname	System IP	Name	Severity	Component	Details
17 Jan 2018 9:20:02 PM PST	Gate1	100.100.100.1	System Aaa Login Fail	major	System	host-name=Gate1; user-name=mich; remote-host=36.108.170.214
17 Jan 2018 8:57:56 PM PST	Gate1	100.100.100.1	Dhcp Address Assigned	minor	VPN	host-name=Gate1; vpn-id=1; if-name=ge0/3; client-mac=90:6e:bb:58:8b:c3; ip=172....
17 Jan 2018 8:32:50 PM PST	Gate1	100.100.100.1	System Aaa Login Fail	major	System	host-name=Gate1; user-name=root; remote-host=175.139.209.178
17 Jan 2018 8:32:46 PM PST	Gate1	100.100.100.1	System Aaa Login Fail	major	System	host-name=Gate1; user-name=root; remote-host=175.139.209.178
17 Jan 2018 8:27:29 PM PST	Gate1	100.100.100.1	System Aaa Login Fail	major	System	host-name=Gate1; user-name=training; remote-host=36.108.170.214
17 Jan 2018 7:57:46 PM PST	Gate1	100.100.100.1	Dhcp Address Assigned	minor	VPN	host-name=Gate1; vpn-id=1; if-name=ge0/3; client-mac=90:6e:bb:58:8b:c3; ip=172....
17 Jan 2018 7:54:39 PM PST	Gate1	100.100.100.1	System Aaa Login Fail	major	System	host-name=Gate1; user-name=admin; remote-host=67.103.52.182
17 Jan 2018 7:54:29 PM PST	Gate1	100.100.100.1	System Aaa Login Fail	major	System	host-name=Gate1; user-name=admin; remote-host=116.97.147.41
17 Jan 2018 7:54:24 PM PST	Gate1	100.100.100.1	System Aaa Login Fail	major	System	host-name=Gate1; user-name=admin; remote-host=191.207.187.125

REST API

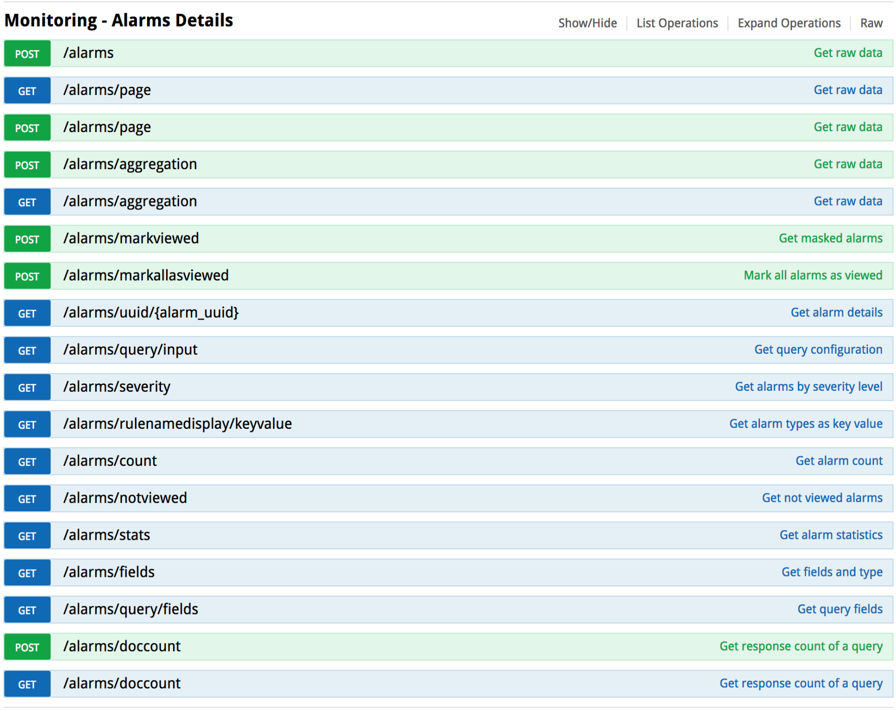
https://{vManage}/apidocs/



Capacity	Show/Hide | List Operations | Expand Operations | Raw
Utility - Logging	Show/Hide | List Operations | Expand Operations | Raw
Diagnostics	Show/Hide | List Operations | Expand Operations | Raw
Configuration Database Cluster management	Show/Hide | List Operations | Expand Operations | Raw
Administration - Tenant	Show/Hide | List Operations | Expand Operations | Raw
SSH	Show/Hide | List Operations | Expand Operations | Raw
Tenant Management	Show/Hide | List Operations | Expand Operations | Raw
Tenant Status	Show/Hide | List Operations | Expand Operations | Raw
Utility - Log files	Show/Hide | List Operations | Expand Operations | Raw
Device Actions	Show/Hide | List Operations | Expand Operations | Raw
Device inventory - Device	Show/Hide | List Operations | Expand Operations | Raw
Configuration - Feature List	Show/Hide | List Operations | Expand Operations | Raw
Configuration - General Template	Show/Hide | List Operations | Expand Operations | Raw
Configuration - Template Master	Show/Hide | List Operations | Expand Operations | Raw
Configuration - Template Configuration	Show/Hide | List Operations | Expand Operations | Raw
Configuration - Device Template	Show/Hide | List Operations | Expand Operations | Raw
Configuration - vEdge Template Policy	Show/Hide | List Operations | Expand Operations | Raw
Configuration - vSmart Template Policy	Show/Hide | List Operations | Expand Operations | Raw
Configuration - CloudExpress	Show/Hide | List Operations | Expand Operations | Raw
Configuration - Settings	Show/Hide | List Operations | Expand Operations | Raw
Configuration - Cluster Management	Show/Hide | List Operations | Expand Operations | Raw
Configuration - Policy Cflowd Definition Builder	Show/Hide | List Operations | Expand Operations | Raw
Configuration - Policy Control Definition Builder	Show/Hide | List Operations | Expand Operations | Raw

REST API

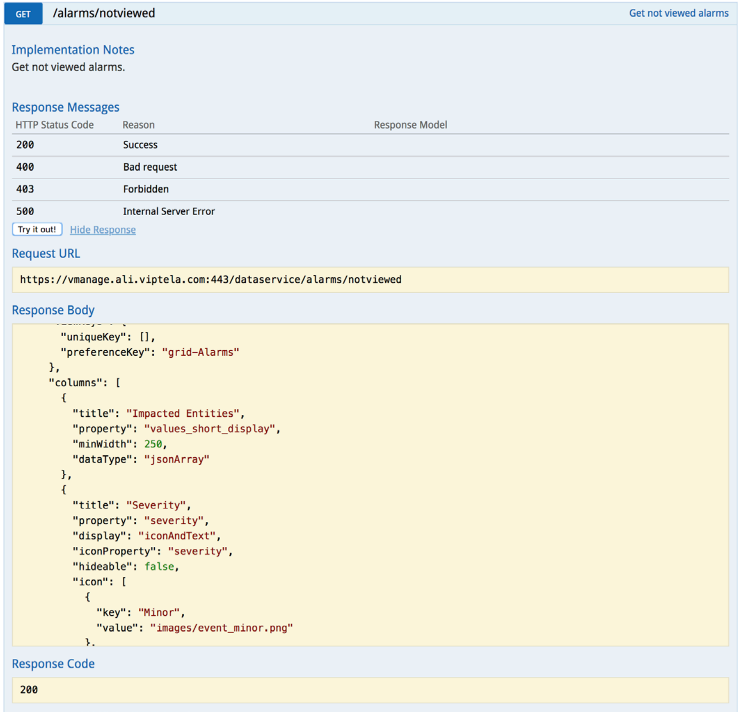
https://{vManage}/apidocs/



Monitoring - Alarms Details

POST	/alarms	Get raw data
GET	/alarms/page	Get raw data
POST	/alarms/page	Get raw data
POST	/alarms/aggregation	Get raw data
GET	/alarms/aggregation	Get raw data
POST	/alarms/markviewed	Get masked alarms
POST	/alarms/markallasviewed	Mark all alarms as viewed
GET	/alarms/uuid/{alarm_uuid}	Get alarm details
GET	/alarms/query/input	Get query configuration
GET	/alarms/severity	Get alarms by severity level
GET	/alarms/rulenamedisplay/keyvalue	Get alarm types as key value
GET	/alarms/count	Get alarm count
GET	/alarms/notviewed	Get not viewed alarms
GET	/alarms/stats	Get alarm statistics
GET	/alarms/fields	Get fields and type
GET	/alarms/query/fields	Get query fields
POST	/alarms/doccount	Get response count of a query
GET	/alarms/doccount	Get response count of a query

REST API



/alarms/notviewed

Implementation Notes

Get not viewed alarms.

Response Messages

HTTP Status Code	Reason	Response Model
200	Success	
400	Bad request	
403	Forbidden	
500	Internal Server Error	

Request URL

```
https://vmanage.ali.viptela.com:443/dataservice/alarms/notviewed
```

Response Body

```
        "uniqueKey": [],
        "preferenceKey": "grid-Alarms"
      },
      "columns": [
        {
          "title": "Impacted Entities",
          "property": "values_short_display",
          "minWidth": 250,
          "dataType": "jsonArray"
        },
        {
          "title": "Severity",
          "property": "severity",
          "display": "iconAndText",
          "iconProperty": "severity",
          "hideable": false,
          "icon": [
            {
              "key": "Minor",
              "value": "images/event_minor.png"
            },
```

Response Code

```
200
```

Conclusion

Summary

- Step 1: Bring up infrastructure and inventory management
  - System – Dynamic orchestration of TLS connections to establish the control plane
  - User – Be able to troubleshoot IP connectivity and SSL certificate messages
- Step 2: Centralized routing and application policies
  - System – vSmart controllers handle routing updates and IPsec information
  - User – Be able to read OMP tables and traffic simulation tools
- Step 3: Centralized device configurations through device templates
  - System – vManage pushes configurations to devices directly
  - User – Be able to read build templates and read template XML messages
- Step 4: APIs and programmability
  - System – vManage provides a REST interface to control the overlay
  - User – Be able to create custom automations and integrations

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