Configure SD-AVC on SD-WAN

Contents

Introduction

This document describes how to configure Software Defined-Application Visibility and Control (SD-AVC) on a Software-Defined Wide Area Network (SD-WAN).

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- SD-WAN
- SD-AVC

The virtual machine of Cisco vManage must have these minimum resources:

- RAM:32 GB
- Storage:500 GB
- vCPU:16

Components Used

The information in this document is based on these software and hardware versions:

- Cisco vManage Release 20.3.x or later.
- vManage Version 20.6.3
- vBond Version 20.6.3
- vSmart Version 20.6.3
- Integrated Service Routers (ISR)4321/K9 Version 17.5.1a

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background

What is SD-AVC?

Cisco SD-AVC is a component of Cisco Application Visibility Control (AVC). AVC incorporates into the routing devices application recognition and performance monitoring capabilities traditionally available as dedicated appliances. It works as a centralized network service and operates with specific devices in the network.

For details, see SD-AVC Features and Benefits.

What is Cisco Cloud Connector?

Cisco Cloud Connector is a Cloud service provided by Cisco that improves traffic classification. It uses the latest information available about the server address used by public Internet sites and services to improve SD-AVC classification of traffic.

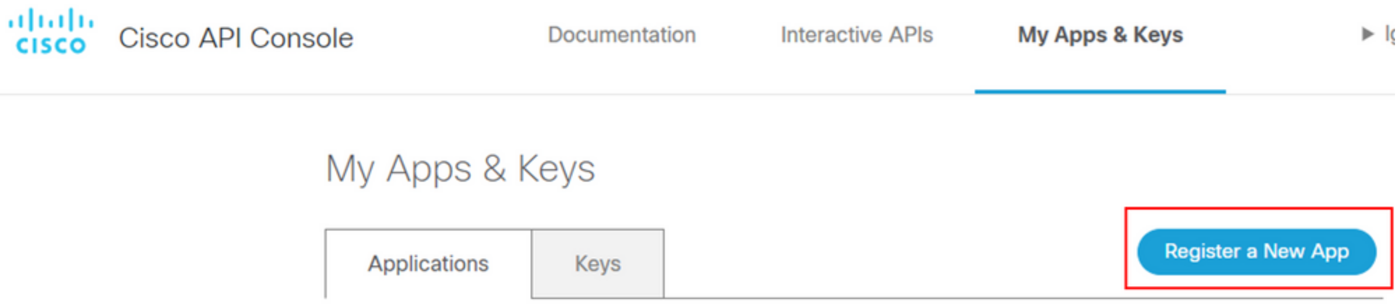
Configure

Enable Cloud Connector

1. Open the Cisco API Console and click **My Apps & Keys.**

Note: The device hosted SD-AVC network requires access to Cisco SD-AVC cloud server domains: **api.cisco.com, cloudsso.cisco.com, prod.sdavc-cloud-api.com.**

2. Click **Register a New App** as shown in the image.



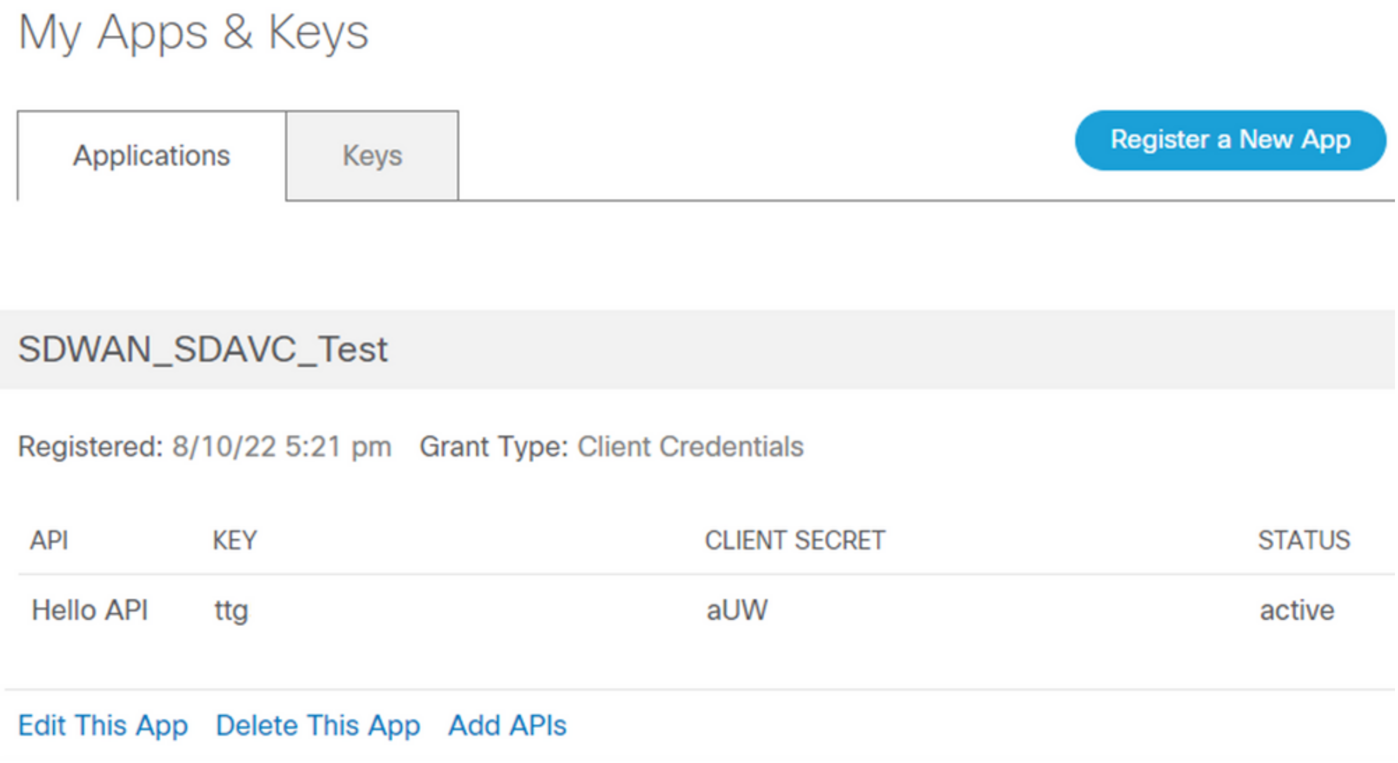
3. In the **Name of your application** field, enter a descriptive name for your application.

4. Check the **Client Credentials** check box.

5. Check the **Hello API** check box.

6. Check the check box to agree with Terms of Service.

7. Click Register. The Cisco API Console page displays the Client ID and Client Secret details. Keep this page open to complete the procedure as shown in this image.



My Apps & Keys

Applications | Keys | Register a New App

SDWAN_SDAVC_Test

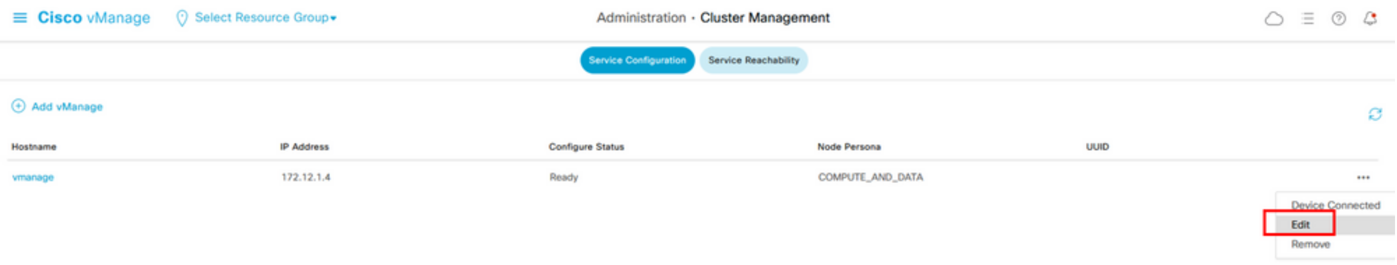
Registered: 8/10/22 5:21 pm   Grant Type: Client Credentials

API	KEY	CLIENT SECRET	STATUS
Hello API	ttg	aUW	active

Edit This App   Delete This App   Add APIs

Enable SD-AVC on vManage

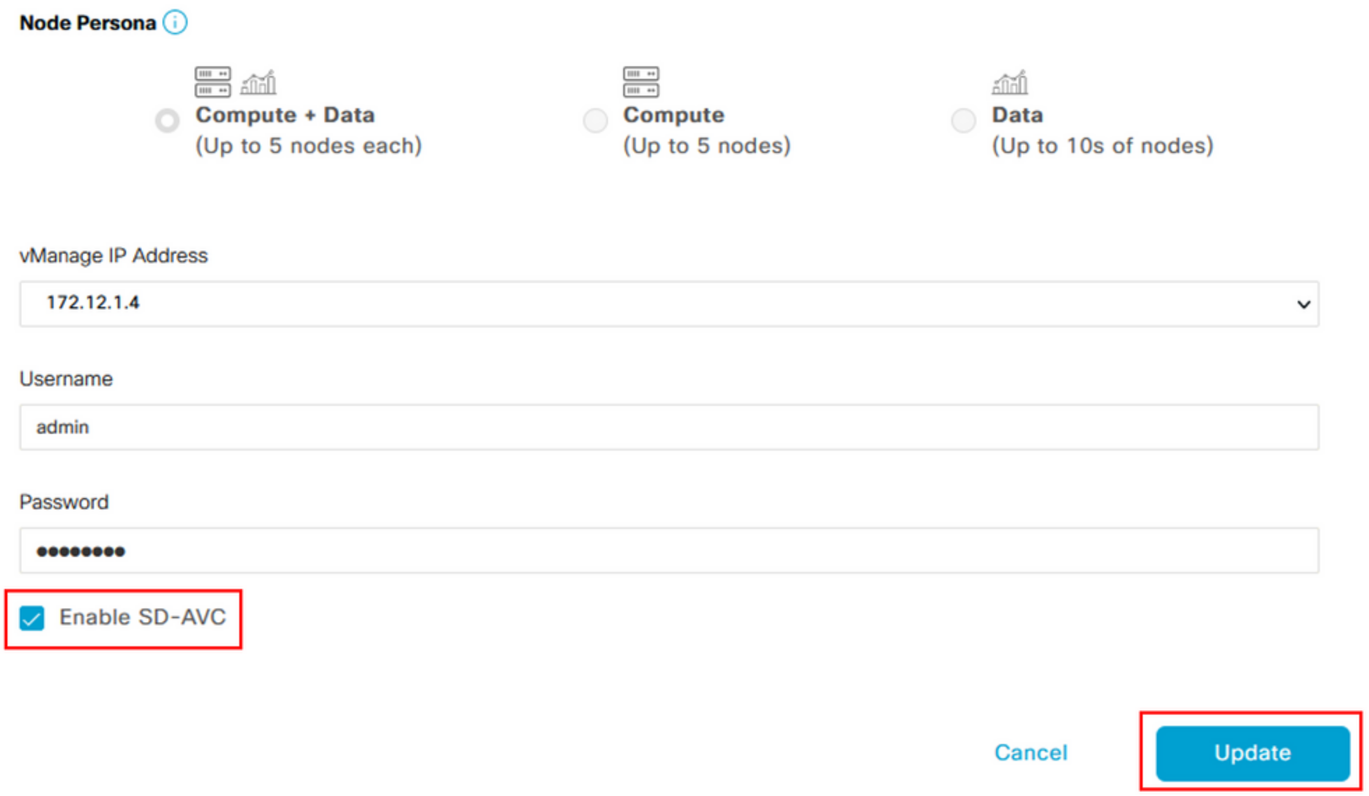
1. Navigate to **Administration** > **Cluster Management** > **Service Configuration**. Click **(...) More Actions** and choose **Edit.**



Hostname	IP Address	Configure Status	Node Persona	UUID
vmanage	172.12.1.4	Ready	COMPUTE_AND_DATA	

Note: Do not use a VPN 0 tunnel/transport or VPN 512 interface to enable SD-AVC. The cluster interface in vpn 0 can be used.

2. In the vManage IP Address section, click the IP address. Select the a non-tunnel IP address in VPN 0. Enter your credentials, check the **Enabled SD-AVC** check box, and click Update, as shown in the image.



Node Persona

○ Compute + Data (Up to 5 nodes each)

○ Compute (Up to 5 nodes)

○ Data (Up to 10s of nodes)

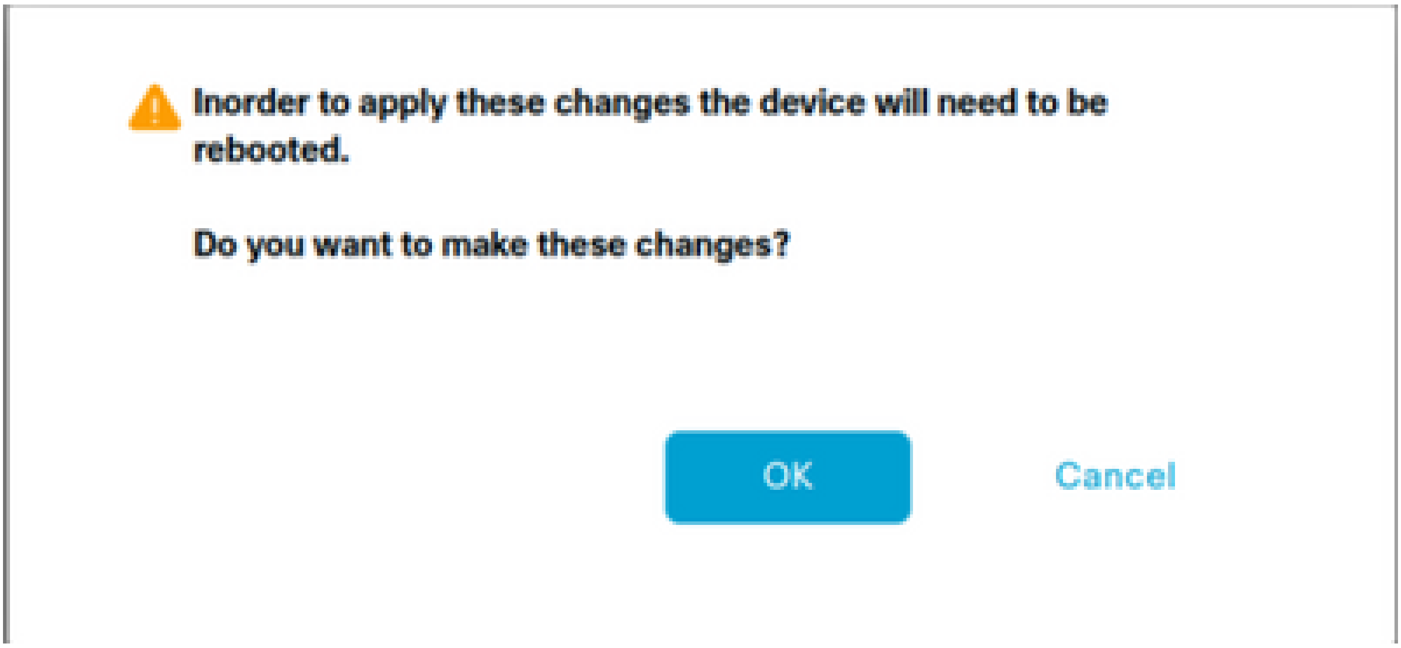
vManage IP Address: 172.12.1.4

Username: admin

Password: ●●●●●●●●

☑ Enable SD-AVC

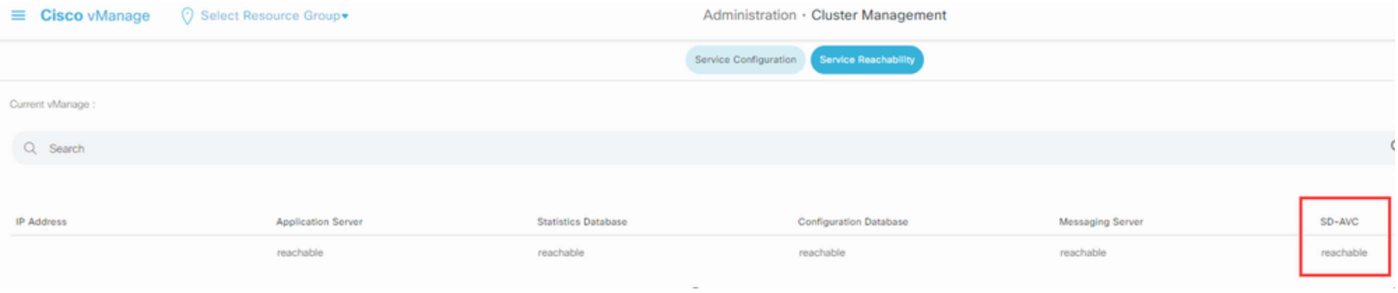
3. Once the update has been confirmed, click OK in order to reboot the device as shown in the image.



Inorder to apply these changes the device will need to be rebooted.

Do you want to make these changes?

4. After the vManage has rebooted, navigate to Administration > Cluster Management > Service Reachability. SD-AVC appears **Reachable.**



IP Address	Application Server	Statistics Database	Configuration Database	Messaging Server	SD-AVC
	reachable	reachable	reachable	reachable	reachable

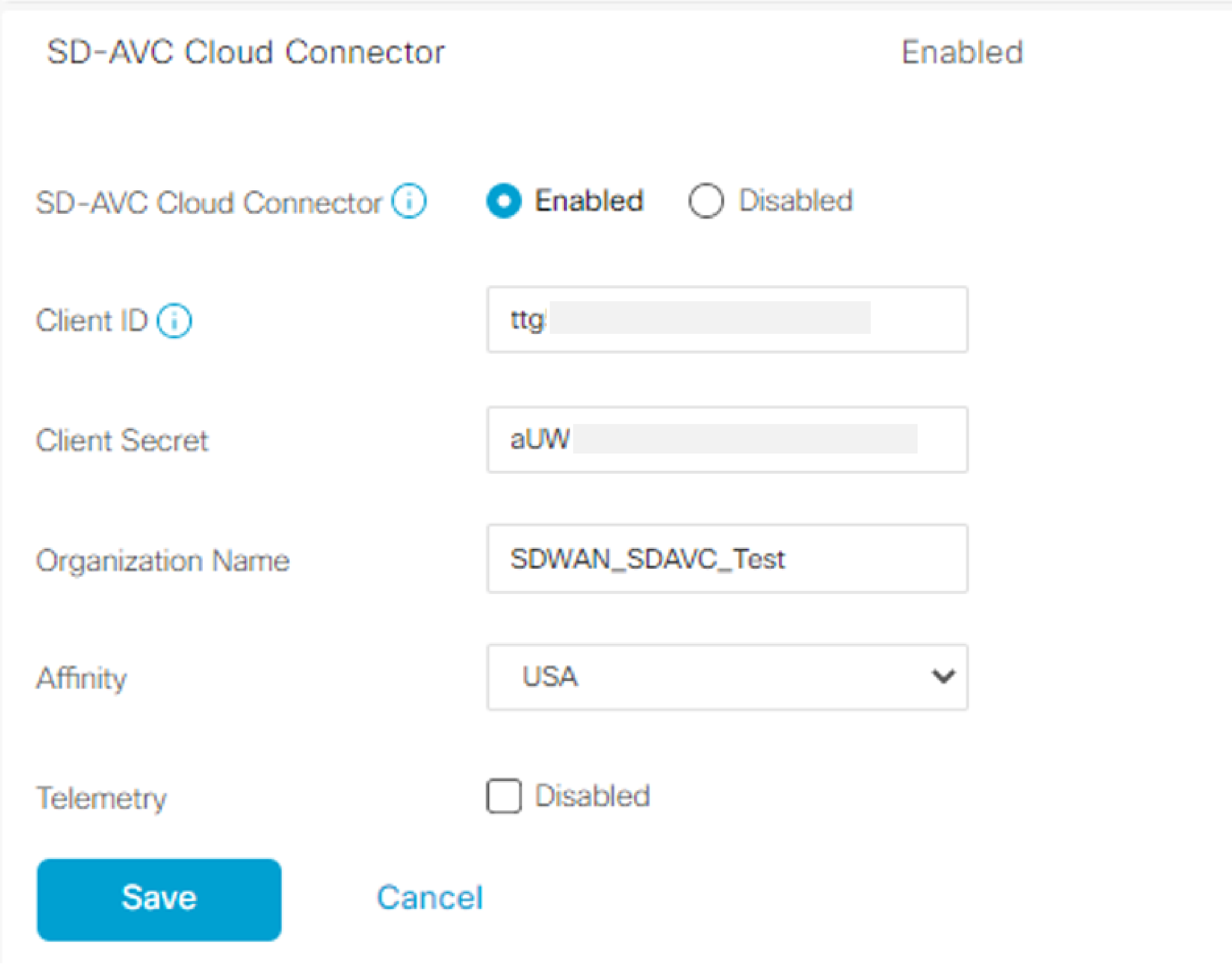
Enable SD-AVC Cloud Connector on vManage

Enable SD-AVC Cloud Connector, Pre-20.10

1. In the vManage GUI section, navigate to Administration > Settings > SD-AVC Cloud Connector and click **Edit.**

2.For SD-AVC Cloud Connector, click the Enabled radio button. Enter the values in these fields generated in the Enable Cloud Connector section, as shown in the image.

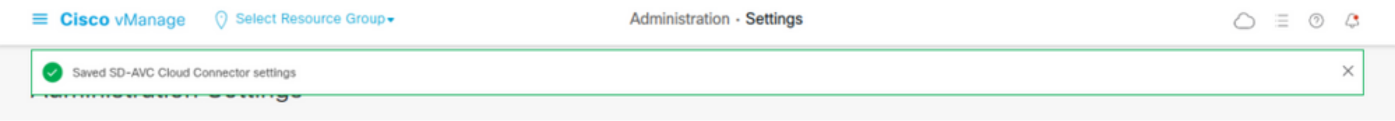
- Client ID
- Client Secret
- Organization Name
- Affinity
- Telemetry (optional)



SD-AVC Cloud Connector Enabled

SD-AVC Cloud Connector	● Enabled ○ Disabled
Client ID	ttg[redacted]
Client Secret	aUW[redacted]
Organization Name	SDWAN_SDAVC_Test
Affinity	USA
Telemetry	□ Disabled

3. Click Save and verify the notification as shown in this image.



Saved SD-AVC Cloud Connector settings

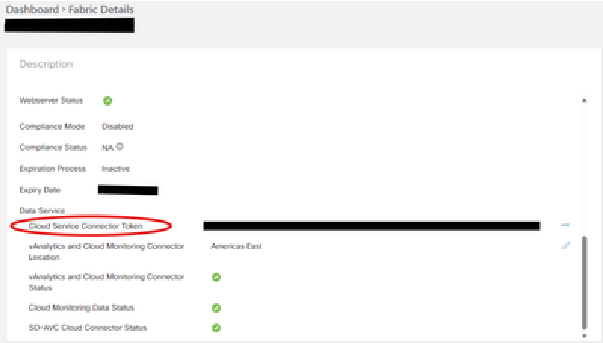
Enable SD-AVC Cloud Connector, through 20.13

Beginning with 20.10.1, enabling the Cloud Connector requires a cloud gateway URL and a one-time password (OTP) instead of a client ID and client secret.
For new Cisco-hosted installations of 20.10.1 or later, Cloud Connector is enabled by default and entry of credentials is not required.

1. In the vManage GUI section, navigate to Administration > Settings > SD-AVC and click **Edit.**

2.For Cloud Connector, click the Enabled radio button. Enter the values in these fields generated in the Enable Cloud Connector section, as shown in the image.

- OTP
  - Cloud-hosted: Use the Cisco Catalyst SD-WAN Portal to get the OTP. See the Cisco Catalyst SD-WAN Portal Configuration Guide for details.

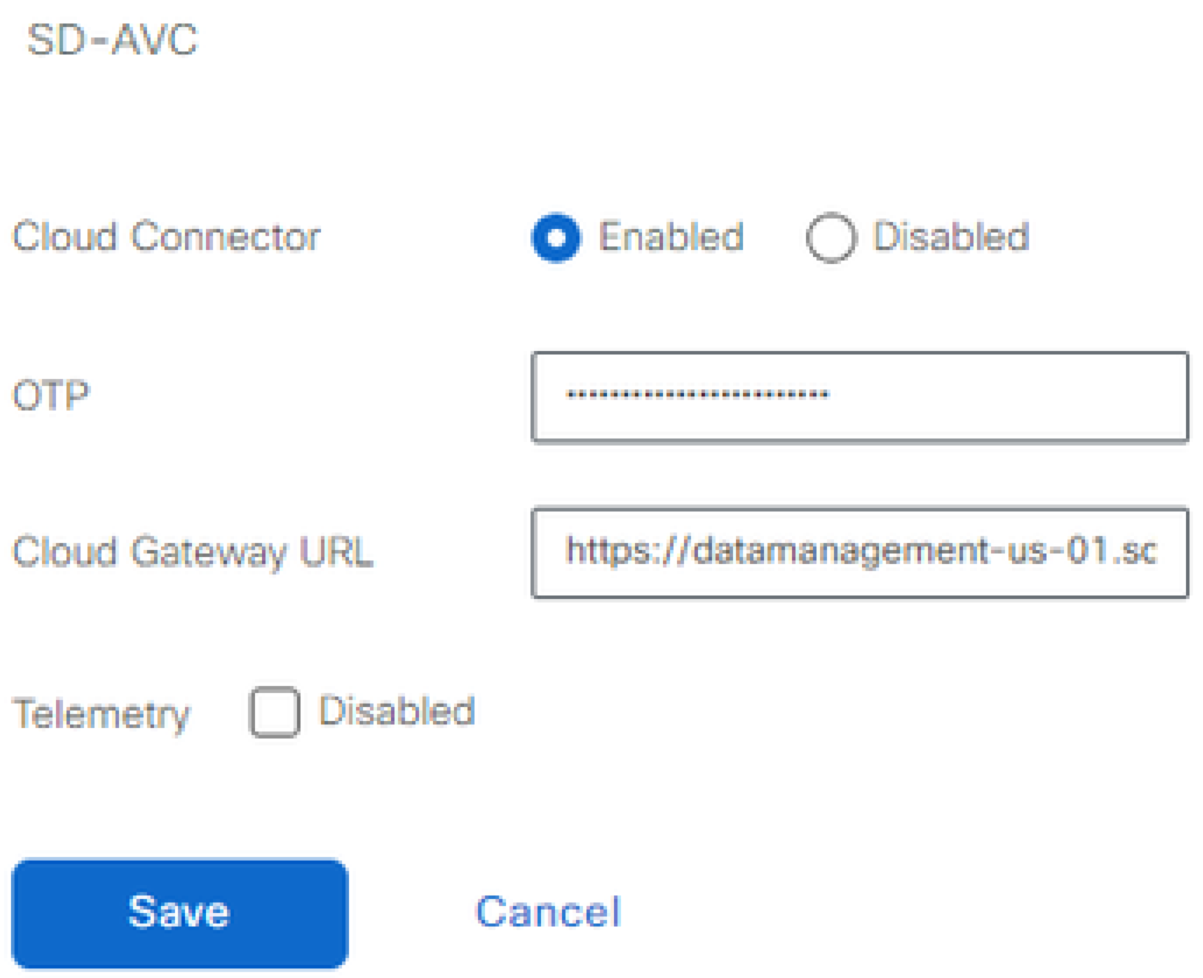


[redacted]

Description

Webserver Status ✓
Compliance Mode Disabled
Compliance Status NA
Expiration Process Inactive
Expiry Date [redacted]
Data Service
Cloud Service Connector Token [redacted]
vAnalytics and Cloud Monitoring Connector Location Americas East
vAnalytics and Cloud Monitoring Connector Status ✓
Cloud Monitoring Data Status ✓
SD-AVC Cloud Connector Status ✓

  - On-prem: Open a Cisco TAC case for the OTP
- Cloud gateway URL
  Use https://datamanagement-us-01.sdwan.cisco.com/validate_sdavc/


SD-AVC

Cloud Connector ● Enabled ○ Disabled

OTP ••••••••••••••••••••••••••••••

Cloud Gateway URL https://datamanagement-us-01.sc

Telemetry □ Disabled

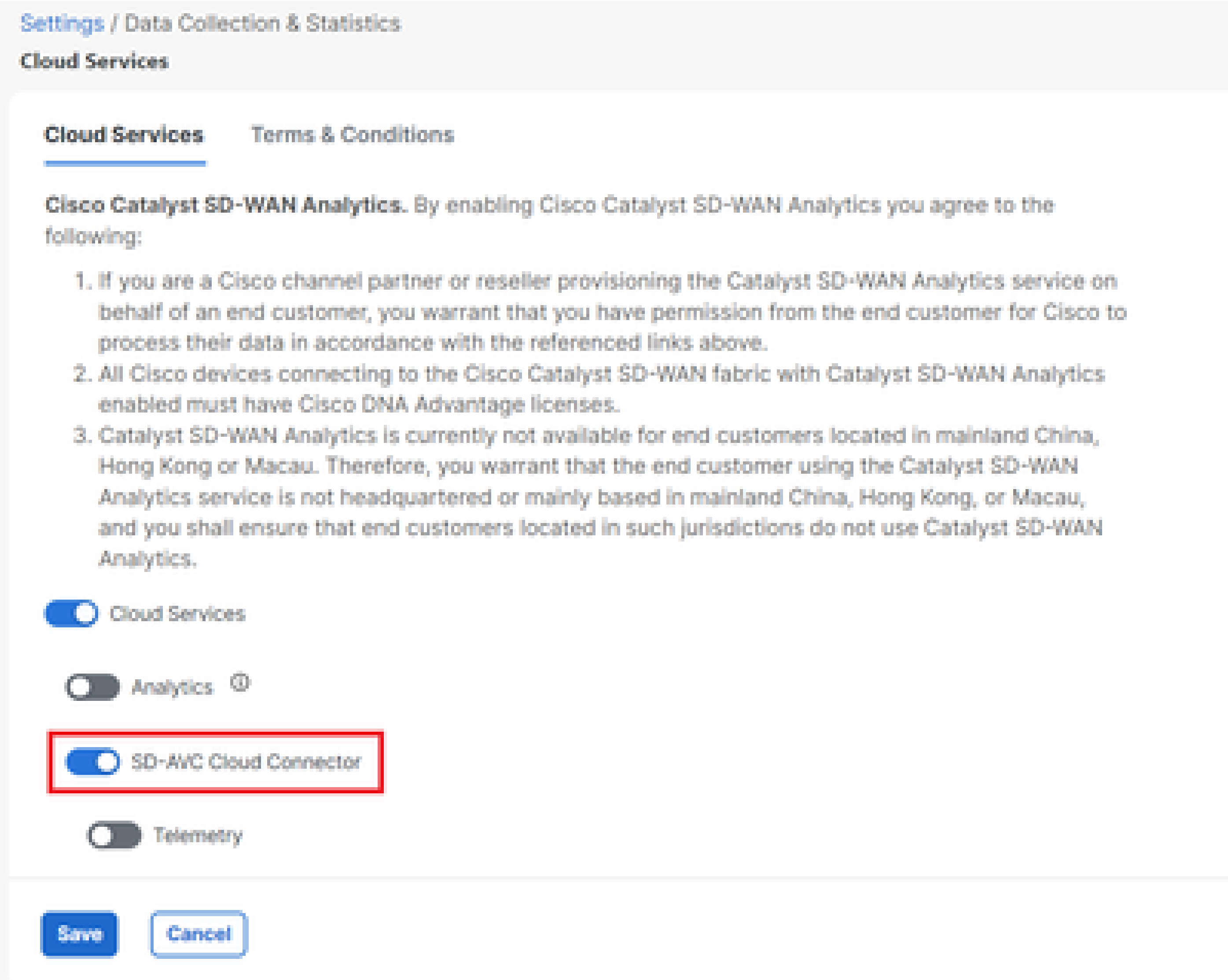
3. Click Save and verify the notification confirms settings were applied.

EnableSD-AVC Cloud Connector, 20.14 and later

20.14.1 introduces a new procedure for enabling Cisco SD-AVC Cloud Connector from the Cloud Services option in Administration > Settings. From this release, enabling Cloud Connector does not require an OTP or opening a TAC case.

1. In the vManage GUI section, navigate to Administration > Settings > Cloud Services. Confirm Cloud Services are enabled.

2.For Cloud Connector, click the Enabled radio button.



Settings / Data Collection & Statistics

Cloud Services

Cisco Catalyst SD-WAN Analytics. By enabling Cisco Catalyst SD-WAN Analytics you agree to the following:

1. If you are a Cisco channel partner or reseller provisioning the Catalyst SD-WAN Analytics service on behalf of an end customer, you warrant that you have permission from the end customer for Cisco to process their data in accordance with the referenced links above.
2. All Cisco devices connecting to the Cisco Catalyst SD-WAN fabric with Catalyst SD-WAN Analytics enabled must have Cisco DNA Advantage licenses.
3. Catalyst SD-WAN Analytics is currently not available for end customers located in mainland China, Hong Kong or Macau. Therefore, you warrant that the end customer using the Catalyst SD-WAN Analytics service is not headquartered or mainly based in mainland China, Hong Kong, or Macau, and you shall ensure that end customers located in such jurisdictions do not use Catalyst SD-WAN Analytics.

Cloud Services: on

Analytics: off

SD-AVC Cloud Connector: on

Telemetry: off

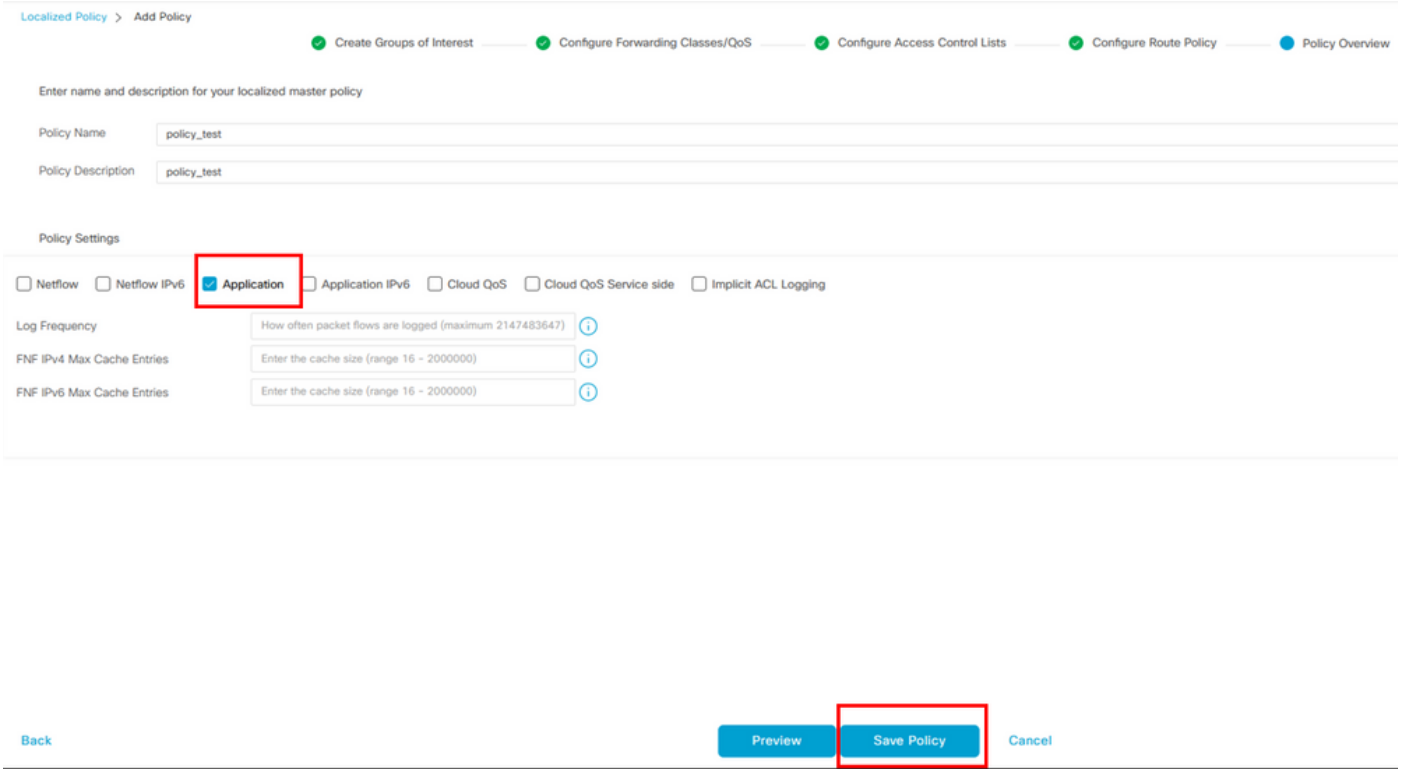
3. Click Save and verify the notification confirms settings were applied.

Policy Configuration

Once SD-AVC has been enabled, you need to create a localized policy and enable app visibility.

1. Navigate to the vManage GUI, and choose **Configuration** > **Policies** > **Localized Policy** > **Add Policy**.

2. Navigate to **Policy Overview**,. In the Policy Settings section, check the **Application** check box and click **Save Policy**.



Localized Policy > Add Policy

Create Groups of Interest — Configure Forwarding Classes/QoS — Configure Access Control Lists — Configure Route Policy — Policy Overview

Enter name and description for your localized master policy

Policy Name: policy_test

Policy Description: policy_test

Policy Settings

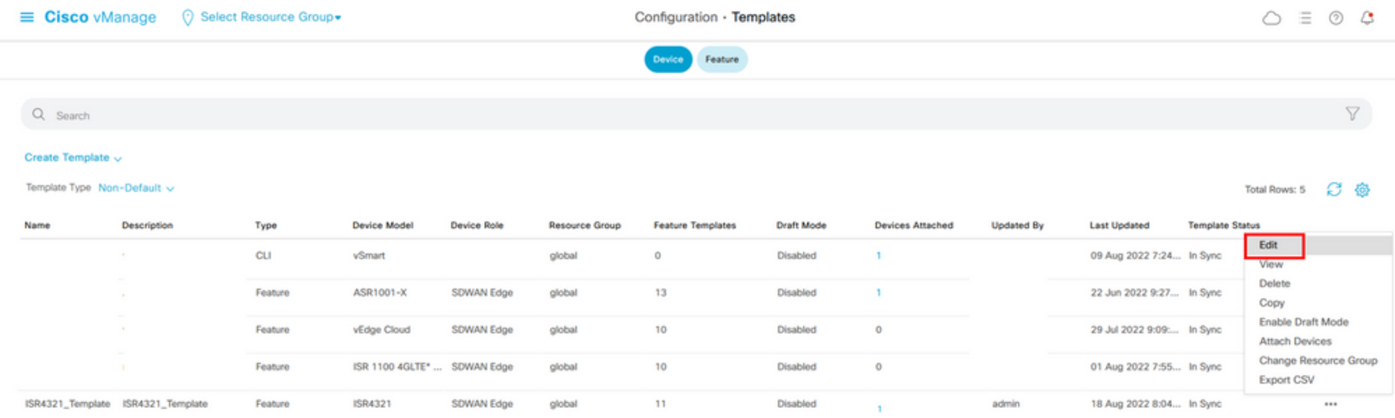
☐ Netflow ☐ Netflow IPv6 ☑ Application ☐ Application IPv6 ☐ Cloud QoS ☐ Cloud QoS Service side ☐ Implicit ACL Logging

Log Frequency: How often packet flows are logged (maximum 2147483647)

FNF IPv4 Max Cache Entries: Enter the cache size (range 16 - 2000000)

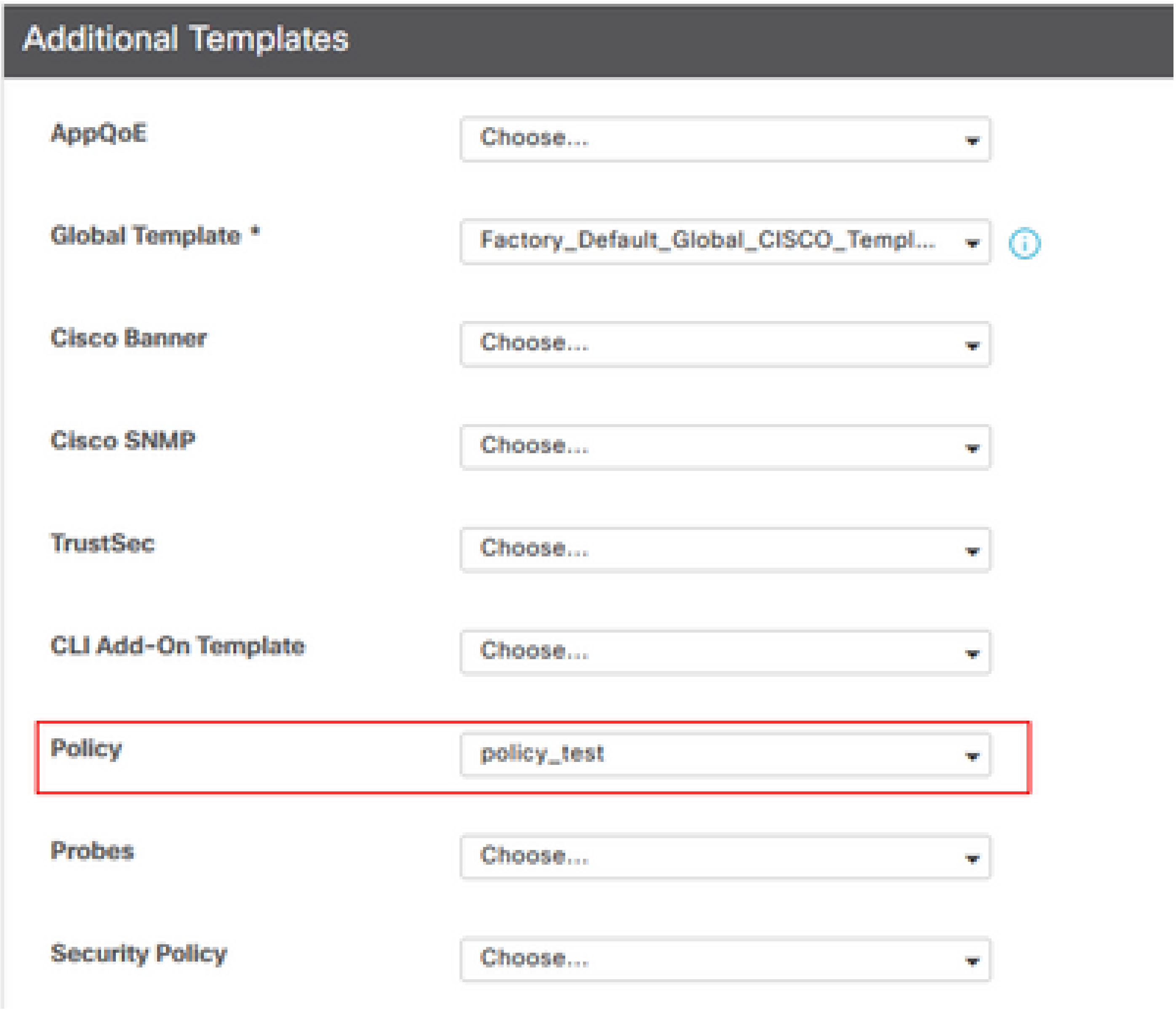
FNF IPv6 Max Cache Entries: Enter the cache size (range 16 - 2000000)

3. Navigate to Configuration > Templates. Identify the template name of your Cisco Edge Router, click (...) More Actions and choose Edit as shown in the image.



Name	Description	Type	Device Model	Device Role	Resource Group	Feature Templates	Draft Mode	Devices Attached	Updated By	Last Updated	Template Status
		CLI	vSmart		global	0	Disabled	1		09 Aug 2022 7:24...	In Sync
		Feature	ASR1001-X	SDWAN Edge	global	13	Disabled	1		22 Jun 2022 9:27...	In Sync
		Feature	vEdge Cloud	SDWAN Edge	global	10	Disabled	0		29 Jul 2022 9:09:...	In Sync
		Feature	ISR 1100 4GLTE* ...	SDWAN Edge	global	10	Disabled	0		01 Aug 2022 7:55...	In Sync
ISR4321_Template	ISR4321_Template	Feature	ISR4321	SDWAN Edge	global	11	Disabled	1	admin	18 Aug 2022 8:04...	In Sync

4. Navigate to **Additional Templates.** From the **Policy** drop-down list, choose the Localized Policy created previously.



Additional Templates

AppQoE: Choose...

Global Template *: Factory_Default_Global_CISCO_Templ...

Cisco Banner: Choose...

Cisco SNMP: Choose...

TrustSec: Choose...

CLI Add-On Template: Choose...

Policy: policy_test

Probes: Choose...

Security Policy: Choose...

5. Save the template.

Verify

Use this section to confirm that your configuration works properly.

1. In the Cisco Edge device, enter this command in order to verify the connectivity between the Cisco Edge device and the SD-AVC controller.

<#root>

```
ISR4321#

show avc sd-service info summary
```

```
Status : CONNECTED <<<<<<<<<<<<<<<< The device is connected with SD-AVC
Device ID: ISR4321
Device segment name: <organization name>
Device address:<device ip address>
Device OS version:17.03.05
Device Type: ISR4321/K9

Active  controller:
Type   :  Primary
IP        :  <system-ip>
Status:  Connected
Version                 :4.0.0
Last connection: 21:20:28.000 UTC Thu Jul 31 2022

Active SDAVC import files
Protocol pack:                             Not loaded
Secondaru protocol pack          PPDK_af575ccaebf99b0c4740dfc7a611d6.pack
```

2.Log in the vManage CLI and verify the container status.

<#root>

```
vManage#
```

```
request nms container-manager status
```

```
Container Manager is running<<<<<<<<<<<<<<<<<<
```

<#root>

```
vManage#
```

```
request nms-container sdavc status
```

```
b'Container: sdavc\nCreated: 7 weeks ago ago\nStatus: Up 7 weeks\n' <<<<<<<<<<<<
```

<#root>

```
vManage#
```

```
request nms container-manager diagnostics
```

```
NMS container manager
Checking container-manager status
Listing all images
------------------------
REPOSITORY                  TAG                 IMAGE ID            CREATED             SIZE
sdwan/cluster-oracle        1.0.1               aa5d2a4523a4        5 months ago        357MB
cloudagent-v2               fb3fc5c0841         fa24f9ef31a7        6 months ago        590MB
sdwan/host-agent            1.0.1               038ad845f080        7 months ago        152MB
sdwan/statistics-db         6.8.10              08fc31a50152        8 months ago        877MB
sdwan/coordination-server   3.6.2               5f4497812153        13 months ago       260MB
sdwan/configuration-db      4.1.7               ad351b31f7b9        13 months ago       736MB
sdwan/messaging-server      0.20.0              a46dc94d4993        13 months ago       71.2MB
sdavc                       4.1.0               721c572475f9        14 months ago       1.17GB
```

```
sdwan/support-tools         latest              0c3a995f455c        15 months ago       16.9MB
sdwan/service-proxy         1.17.0              4e3c155026d8        15 months ago       205MB
sdwan/ratelimit             master              f2f93702ef35        16 months ago       47.6MB

Listing all containers
-----------------------

CONTAINER ID        IMAGE                             COMMAND                  CREATED             STATU
270601fc94ec        cloudagent-v2:fb3fc5c0841         "python ./main.py"       6 weeks ago         Up 6
53bba5216b24        sdwan/ratelimit:master            "/usr/local/bin/rate…"   6 weeks ago         Up 6
59bf900edf14        sdwan/service-proxy:1.17.0        "/entrypoint.sh /run…"   6 weeks ago         Up 6
62defa38c798        sdwan/messaging-server:0.20.0     "/entrypoint.sh /mes…"   6 weeks ago         Up 6
3fbf32dd8d73        sdwan/coordination-server:3.6.2   "/docker-entrypoint.…"   6 weeks ago         Up 6
c2e7b672774c        sdwan/configuration-db:4.1.7      "/sbin/tini -g -- /d…"   6 weeks ago         Up 6
f42ac9b8ab37        sdwan/statistics-db:6.8.10        "/bin/tini -- /usr/l…"   6 weeks ago         Up 1
112f3d9b578b        sdavc:4.1.0                       "/usr/local/bin/scri…"   7 weeks ago         Up 7
06b09f3b030c        sdwan/host-agent:1.0.1            "python ./main.py --…"   7 weeks ago         Up 7
3484957576ee        sdwan/cluster-oracle:1.0.1        "/entrypoint.sh java…"   7 weeks ago         Up 7
Docker info
-----------------------
Client:
 Debug Mode: false
Server:
 Containers: 10
  Running: 10
  Paused: 0
  Stopped: 0
 Images: 11
 Server Version: 19.03.12
 Storage Driver: aufs
  Root Dir: /var/lib/nms/docker/aufs
  Backing Filesystem: extfs
  Dirs: 149
  Dirperm1 Supported: true
 Logging Driver: json-file
 Cgroup Driver: cgroupfs
 Plugins:
  Volume: local
  Network: bridge host ipvlan macvlan null overlay
  Log: awslogs fluentd gcplogs gelf journald json-file local logentries splunk syslog
 Swarm: inactive
 Runtimes: runc
 Default Runtime: runc
 Init Binary: docker-init
 containerd version: fd103cb716352c7e19768e4fed057f71d68902a0.m
 runc version: 425e105d5a03fabd737a126ad93d62a9eeede87f-dirty
 init version: fec3683-dirty (expected: fec3683b971d9)
 Kernel Version: 4.9.57-ltsi
 Operating System: Linux
 OSType: linux
 Architecture: x86_64
 CPUs: 16
 Total Memory: 30.46GiB
 Name: vManage
 ID: XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXXX
 Docker Root Dir: /var/lib/nms/docker
 Debug Mode: false
 Registry: https://index.docker.io/v1/
 Labels:
 Experimental: false
 Insecure Registries:
  127.0.0.0/8
 Live Restore Enabled: false
WARNING: No cpu cfs quota support
WARNING: No cpu cfs period support
WARNING: bridge-nf-call-iptables is disabled
WARNING: bridge-nf-call-ip6tables is disabled
WARNING: the aufs storage-driver is deprecated, and will be removed in a future release.
```

In 20.10, there is a behavior change in the output of 'request nms all status':
When using Cisco Catalyst SD-WAN Control Components Release 20.10.x or later, in a Cisco-hosted installation of Cisco Catalyst SD-WAN, the SD-AVC components operate differently than in earlier releases. Consequently, running the request nms all status command on the Cisco Catalyst SD-WAN instance shows that the "NMS SDAVC server" component is not enabled. This is expected behavior, and does not indicate any problem with SD-AVC. Note that the "NMS SDAVC gateway" component shows as enabled.

```
NMS SDAVC server
        Enabled: false
        Status: not running
NMS SDAVC gateway
        Enabled: true
        Status: running PID:23722 for 125s.
vManage Device Data Collector
        Enabled: true

vmanage_20_12_1# request nms sdavc-gw status
NMS SDAVC gateway
        Enabled: true
        Status: running PID:23722 for 130s
```

Troubleshoot

This section provides information you can use to troubleshoot your configuration.

In vManage logs, verify these paths:

```
/var/log/nms/vmanage-server.log
/var/log/nms/containers/sdavc/avc/sdavc_application.log
```

Enter this command:

<#root>

```
request nms container-manager

 {

status
```

```
 |
diagnostics
}
```

In Cisco Edge Cisco IOS® XE, enter these commands:

<#root>

```
Router#
show avc sd-service info connectivity
```

```
show avc sd-service info
 {
export
 |
import
}
```

Related Information

[Cisco Catalyst SD-WAN Getting Started Guide - Hardware and Software Installation]