



## **Cisco Nexus 1000V REST API Plug-in Configuration Guide, Release 4.2(1)SV2(2.1a)**

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## Preface

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This preface contains the following sections:

- [Audience, on page v](#)
- [Document Conventions, on page v](#)
- [Related Documentation for Nexus 1000V Series NX-OS Software for VMware vSphere, on page vi](#)
- [Documentation Feedback, on page viii](#)
- [Obtaining Documentation and Submitting a Service Request, on page viii](#)

## Audience

This publication is for experienced network administrators who configure and maintain Cisco Nexus devices.

This guide is for network and server administrators with the following experience and knowledge:

- An understanding of virtualization
- Using VMware software to create a virtual machine and configure a VMware vSwitch



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**Note** Knowledge of VMware vNetwork Distributed Switch is not required.

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## Document Conventions

Command descriptions use the following conventions:

Convention	Description
<b>bold</b>	Bold text indicates the commands and keywords that you enter literally as shown.
<i>Italic</i>	Italic text indicates arguments for which the user supplies the values.
[x]	Square brackets enclose an optional element (keyword or argument).
[x   y]	Square brackets enclosing keywords or arguments separated by a vertical bar indicate an optional choice.

Convention	Description
{x   y}	Braces enclosing keywords or arguments separated by a vertical bar indicate a required choice.
[x {y   z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
<i>variable</i>	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Examples use the following conventions:

Convention	Description
<code>screen font</code>	Terminal sessions and information the switch displays are in screen font.
<b>boldface screen font</b>	Information you must enter is in boldface screen font.
<i>italic screen font</i>	Arguments for which you supply values are in italic screen font.
<>	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:



**Note**

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.



**Caution**

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

## Related Documentation for Nexus 1000V Series NX-OS Software for VMware vSphere

This section lists the documents used with the Cisco Nexus 1000V and available on Cisco.com at the following URL:

[http://www.cisco.com/en/US/products/ps9902/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps9902/tsd_products_support_series_home.html)

**General Information**

*Cisco Nexus 1000V Documentation Roadmap*

*Cisco Nexus 1000V Release Notes*

*Cisco Nexus 1000V and VMware Compatibility Information*

**Install and Upgrade**

*Cisco Nexus 1000V Installation and Upgrade Guide*

**Configuration Guides**

*Cisco Nexus 1000V High Availability and Redundancy Configuration Guide*

*Cisco Nexus 1000V Interface Configuration Guide*

*Cisco Nexus 1000V Layer 2 Switching Configuration Guide*

*Cisco Nexus 1000V License Configuration Guide*

*Cisco Nexus 1000V Network Segmentation Manager Configuration Guide*

*Cisco Nexus 1000V Port Profile Configuration Guide*

*Cisco Nexus 1000V Quality of Service Configuration Guide*

*Cisco Nexus 1000V REST API Plug-In Configuration Guide*

*Cisco Nexus 1000V Security Configuration Guide*

*Cisco Nexus 1000V System Management Configuration Guide*

*Cisco Nexus 1000V vCenter Plugin Configuration Guide*

*Cisco Nexus 1000V VXLAN Configuration Guide*

**Programming Guide**

*Cisco Nexus 1000V XML API Configuration Guide*

**Reference Guides**

*Cisco Nexus 1000V Command Reference*

*Cisco Nexus 1000V Resource Availability Reference*

**Troubleshooting and Alerts**

*Cisco Nexus 1000V Troubleshooting Guide*

*Cisco Nexus 1000V Password Recovery Procedure*

*Cisco NX-OS System Messages Reference*

**Cloud Services Platform Documentation**

The *Cisco Cloud Services Platform* documentation is available at [http://www.cisco.com/en/US/products/ps12752/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps12752/tsd_products_support_series_home.html).

**Virtual Security Gateway Documentation**

The *Cisco Virtual Security Gateway for Nexus 1000V Series Switch* documentation is available at [http://www.cisco.com/en/US/products/ps13095/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps13095/tsd_products_support_series_home.html).

**Virtual Wide Area Application Services (vWAAS) Documentation**

The *Virtual Wide Area Application Services* documentation is available at [http://www.cisco.com/en/US/products/ps6870/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps6870/tsd_products_support_series_home.html).

**ASA 1000V Cloud Firewall Documentation**

The *ASA 1000V Cloud Firewall* documentation is available at [http://www.cisco.com/en/US/products/ps12233/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps12233/tsd_products_support_series_home.html).

## Documentation Feedback

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## Obtaining Documentation and Submitting a Service Request

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Subscribe to *What's New in Cisco Product Documentation*, which lists all new and revised Cisco technical documentation, as an RSS feed and deliver content directly to your desktop using a reader application. The RSS feeds are a free service.





# CHAPTER 1

## New and Changed Information

This chapter contains the following sections:

- [New and Changed Information for REST API Plug-in Configuration Guide, on page 1](#)

## New and Changed Information for REST API Plug-in Configuration Guide

This section lists new and changed content in this document by software release.

**Table 1: New and Changed Features for REST API Plug-in Configuration Guide**

Feature	Description	Changed in Release	Where Documented
Web Interface	The REST API plug-in provides a Web interface to find the available APIs.	4.2(1)SV2(2.1a)	<a href="#">Web Interface, on page 5</a>
JSON Response Format	The REST API plug-in supports the JSON format for a response.	4.2(1)SV2(2.1a)	<a href="#">Using the REST API Plug-in, on page 7</a>
HTTP Formats	The REST API plug-in supports the GET, POST, and DELETE methods.	4.2(1)SV2(2.1a)	<a href="#">Using the REST API Plug-in, on page 7</a>
Cisco Nexus 1000V REST API Resources	The REST API plug-in supports the /api/port-profile, /api/span, /api/user, /api/vlan, /api/vnode, /api/vpath, and /api/vxlan resources.	4.2(1)SV2(2.1a)	<a href="#">Using the REST API Plug-in, on page 7</a>





## CHAPTER 2

# Overview

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This chapter contains the following sections:

- [Information About the Cisco Nexus 1000V REST API, on page 3](#)
- [REST API Architecture, on page 4](#)
- [Web Interface, on page 5](#)
- [Listing Supported Resource Names, on page 5](#)
- [Guidelines and Limitations, on page 6](#)
- [Feature History for Overview, on page 6](#)

## Information About the Cisco Nexus 1000V REST API

The REST API supports retrieving system information from the Cisco Nexus 1000V.

You can read an object on the Cisco Nexus 1000V Virtual Supervisor Module (VSM) using the Representational State Transfer (REST) web services API. In order to call any REST function, you can use tools such as a web browser, the cURL tool, and Windows PowerShell.

The following is the basic construct of a REST URL:

```
http[s]://<IP_address>/api/<resource locator>
```

The resource locator consists of two parts:

```
<resource locator> := <name space>/<resource name>
```

<name space> indicates the broader class of functions and <resource name> refers to the specific object.

For example, in the following URL:

```
http://10.10.10.2/api/n1k/license
```

n1k is the namespace and license is the resource name.

If you are using a browser, type in the URL. For example, if you want to get the license information of your VSM that has an IP address of 10.10.10.2, you type the URL as follows:

```
https://10.10.10.2/api/n1k/license
```

The browser prompts you for a username and a password and returns the HTML output.

To access the same through cURL, you use the following format:

```
curl http://username:password@10.10.10.2/api/n1k/license
```

You get the following XML output:

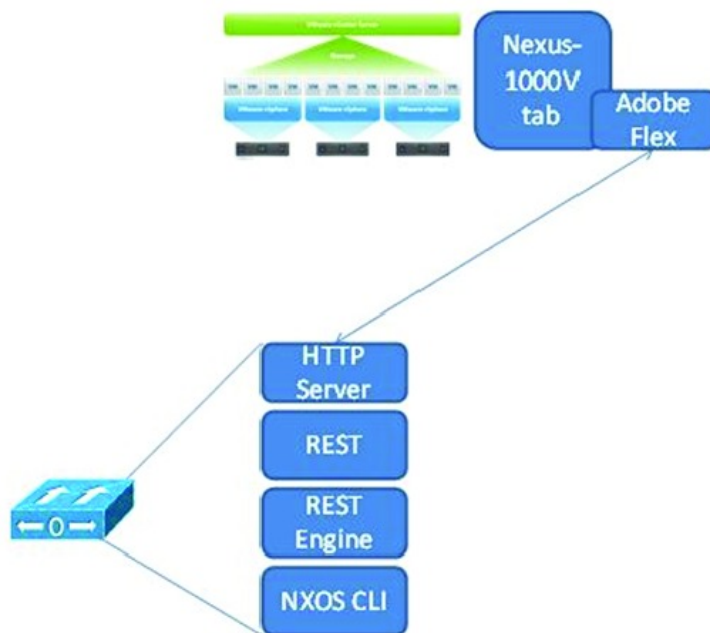
```
<set name="license_set">
<instance name="NEXUS_VSG_SERVICES_PKG" url="/api/nlk/license">
<properties>
<expires>04 May 2013</expires>
<type>NEXUS_VSG_SERVICES_PKG</type>
<available>512</available>
<status>Unused</status>
<used>0</used>
</properties>
</instance>
<instance name="NEXUS_ASA1000V_SERVICES_PKG" url="/api/nlk/license">
<properties>
<expires>04 May 2013</expires>
<type>NEXUS_ASA1000V_SERVICES_PKG</type>
<available>16</available>
<status>Unused</status>
<used>0</used>
</properties>
</instance>
<instance name="NEXUS1000V_LAN_SERVICES_PKG" url="/api/nlk/license">
<properties>
<expires>04 May 2013</expires>
<type>NEXUS1000V_LAN_SERVICES_PKG</type>
<available>1024</available>
<status>Unused</status>
<used>0</used>
</properties>
</instance>
</set>
```

## REST API Architecture

Starting with Cisco Nexus 1000V Release 4.2(1)SV2(2.1), an extensible plug-in architecture is supported on the Cisco Nexus 1000V. Additional REST APIs can be installed using this plug-in infrastructure to expand the capabilities of the API and retrieve a broader set of information from the switch.

See the following figure for the supported architecture on the Cisco Nexus 1000V switch. In the figure, the VMware Virtual Channel (VC) is an example of the REST API caller.

Figure 1: REST API Architecture



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## Web Interface

The REST API plug-in provides a Web interface to find the available APIs. You can access the Web interface from a browser by using the following URL:

```
http[s]://<IP_address>/api
```

For resources under `/api`, you can access the online documentation by appending `?meta` to the resource name as shown in the following example:

```
http[s]://<ip-addr>/api/port-profile?meta
```

## Listing Supported Resource Names

Every REST API function is associated with a resource name.

To find the list of Cisco Nexus 1000V resource names, construct the URL as follows:

```
https://10.10.10.2/api
```

You get the following output:

```
<?xml version="1.0" encoding="utf-8"?>
<instance url="/api">
  <children>
    <child name="span" url="/api/span" />
  </children>
</instance>
```

```

<child name="vpath" url="/api/vpath" />
<child name="vnode" url="/api/vnode" />
<child name="user" url="/api/user" />
<child name="port-profile" url="/api/port-profile" />
<child name="vxlan" url="/api/vxlan" />
<child name="vlan" url="/api/vlan" />
<child name="vc" url="/api/vc" />
</children>
</instance>

```

## Guidelines and Limitations

- Before you load the REST API plug-in, the plug-in must be available in the bootflash of the active and standby directory.
- Ensure that you unload the REST API plug-in that is installed during boot time before loading the REST API plug-in from the bootflash.




---

**Note** After unloading the REST API plug-in, wait for at least 10 seconds before loading the new REST API plug-in.

---

- You cannot install multiple plug-ins on the same system.
- The REST API plug-in load and unload commands are supported only in the VSM HA mode.
- Ensure that you do not switch over or reload the VSM immediately after unloading the REST API plug-in.

## Feature History for Overview

Feature	Releases	Feature Information
Support for Web Interface	4.2(1)SV2(2.1a)	This feature was introduced.



## CHAPTER 3

# Using the REST API Plug-in

This chapter contains the following sections:

- [Supported Response Formats, on page 7](#)
- [Supported HTTP Methods, on page 8](#)
- [Cisco Nexus 1000V REST API Resources, on page 10](#)
- [Saving Resource Changes, on page 16](#)
- [Feature History for Using the REST API Plug-in, on page 17](#)

## Supported Response Formats

### JSON Format

The REST API plug-in supports the JavaScript Object Notation (JSON) format for a response. For JSON response, specify `Accept: application/json` in the HTTP header as shown in the following example:

```
GET /api/vc/summary HTTP/1.1
Host: 10.10.10.2
Accept: application/json
Authorization: Basic YWRtaW46U2Zpc2gxmjM=
```

To specify the JSON response format through cURL, use the following:

```
curl -u <user>:<password> <vsm-ip>/api/port-profile -H "Accept: application/json"
```

The following example shows the response received in the JSON format:

```
HTTP/1.1 200 OK
Date: Wed, 21 Aug 2013 19:33:56 GMT
Content-Type: application/json; charset=utf-8
{
  "": {
    "url": "/api/vc/summary",
    "properties": {
      "vcStatus": "Connected",
      "vcIpAddress": "10.10.10.4",
      "switchMode": "Advanced",
      "ip": "10.10.10.2",
      "vcUuid": "12 57 2f 50 07 e8 b4 ea-1c 0e ba 78 23 52 96 3e",
      "name": "nlkv-cy",
      "datacenterName": "Sample-DC",
```

```

        "haStatus": true,
        "mode": "L3",
        "version": "version 4.2(1u)SV2(2.1au) [build 4.2(1)SV2(2.1a)]",
        "connectionName": "vcenter"
    }
}
}

```

## XML Format

The REST API plug-in supports the XML format for a response. For XML response, specify `Accept: application/xml` in the HTTP header as shown in the following example:

```

GET /api/vc/summary HTTP/1.1
Host: 10.10.10.2
Accept: application/xml
Authorization: Basic YWRtaW46U2Zpc2gXMjM=

```

To specify the XML response format through cURL, use the following:

```
curl -u <user>:<password> <vsm-ip>/api/port-profile -H "Accept: application/xml"
```

The following example shows the response received in the XML format:

```

<?xml version="1.0" encoding="utf-8"?>
<instance url="/api/vc/summary">
  <properties>
    <vcStatus>Connected</vcStatus>
    <vcIpAddress>10.10.10.4</vcIpAddress>
    <switchMode>Advanced</switchMode>
    <ip>10.10.10.2</ip>
    <vcUuid>12 57 2f 50 07 e8 b4 ea-1c 0e ba 78 23 52 96 3e</vcUuid>
    <name>nlkv-cy</name>
    <datacenterName>Sample-DC</datacenterName>
    <haStatus>true</haStatus>
    <mode>L3</mode>
    <version>version 4.2(1u)SV2(2.1au) [build 4.2(1)SV2(2.1a)]</version>
    <connectionName>vcenter</connectionName>
  </properties>
</instance>

```

## Supported HTTP Methods

### GET Method

The GET method lists the entities in a specific resource. The format of the GET method is as follows:

```
/api/<resource>
```

The following is an example of the GET method in cURL:

```

curl -u admin:password 10.10.10.2/api/port-profile/profile1 -H "Accept: application/json"

{
  "profile1": {
    "url": "\/api\/port-profile\/profile1",

```



```
"properties": {
  "minPorts": 1,
  "description": "",
  "switchportMode": "trunk",
  "state": false,
  "name": "profile1",
  "portBinding": "static",
  "portGroupName": "",
  "capability": "",
  "maxPorts": 32,
  "type": "Vethernet"
}
}
```

## POST Method

The POST method creates a new instance of a resource or updates the identified instance. To create a new resource, the format of the POST method is as follows:

```
/api/<resource>
```

The following is an example of the POST method to create an instance of a resource in cURL:

```
curl -X POST -u admin:password 10.10.10.2/api/port-profile -d '{"name" : "profile1",
"switchportMode" : "access", "shutdown" ; false}'
```

```
Successfully created "port-profile profile1"
```

To modify a specific instance, the format of the POST method is as follows:

```
/api/<endpoint>/<instance>
```

The following is an example of the POST method to modify a specific instance in cURL:

```
curl -X POST -u admin:password 10.10.10.2/api/port-profile/profile1 -d '{"switchportMode"
: "trunk", "shutdown" : false}'
```

```
Successfully modified "port-profile profile1"
```

## DELETE Method

The DELETE method deletes the specified instance. The format of the DELETE method is as follows:

```
/api/<resource>/<instance>
```

The following is an example of the DELETE method in cURL:

```
curl -u admin:password -X DELETE 10.10.10.2/api/port-profile/profile1
```

```
Successfully deleted "port-profile profile1"
```

# Cisco Nexus 1000V REST API Resources

## /api/port-profile

Use this resource to create, update, delete, and view a list of port-profiles.

Property	Example
minPorts	1
description	Profile for VLAN 3603
switchportMode	access
capability	l3control
state	false
switchportAccessVLAN	3603
name	vlan3603
shutdown	false
portGroupName	vlan3603
portBinding	static
maxPorts	32
type	vethernet

## /api/span

Use this resource to create, update, and delete a session and view a list of configured sessions.

Properties	Example
id	2
type	local
sources	[{ "type": "Vethernet", "source": ["1"], "direction": "rx" }]

## /api/user

Use this resource to create, update, and delete a user and view a list of configured users.

Property	Example
expire	14 Sep 2013
name	admin
role	network-admin

## /api/vc

The APIs under /api/vc are used internally by the Cisco Nexus 1000V vCenter plug-in and are read-only. These APIs are changed according to the requirements of the Cisco Nexus 1000V vCenter plug-in.

### /api/vc/license

Use this resource to get the licensing status of the Cisco Nexus 1000V switch. This resource is read-only.

Property	Example
expires	14 Sep 2013
type	NEXUS_VSG_SERVICES_PKG
available	512
status	Unused
used	0

### /api/vc/limits

Use this resource to get information about the resources available on the Cisco Nexus 1000V switch. This resource is read-only.

Property	Example
vemMax	128
vethUsed	90
vxlansUsed	529
vlansUsed	529
vemUsed	4
vxlansMax	2048

Property	Example
vethMax	4096
vethPerHostMax	300
vethPerHostUsed	90
vlansMax	2048
portprofilesUsed	69
portprofileMax	2048

## /api/vc/port-profile

Use this resource to get details of the port profiles configured on the VSM. This resource is read-only.

Property	Example
module	3, 7
minPorts	1
systemVlans	1609
usedPorts	6
name	up1
type	Ethernet
status	1
mode	trunk
maxPorts	32
vlans	1544-1545,1590-1600,1609, 2100

## /api/vc/summary

Use this resource to get a summary of the Cisco Nexus 1000V switch. This resource is read-only.

Property	Example
vcStatus	Connected
vcIpAddress	10.10.10.4
switchMode	Advanced
ip	10.10.10.2

Property	Example
vcUuid	12 57 2f 50 07 e8 b4 ea-1c 0e ba 78 23 52 96 3e
name	n1kv
datacenterName	Sample-DC
haStatus	true
mode	L3
version	version 4.2(1)SV2(2.1a)
connectionName	vCenter

## /api/vc/uplink

Use this resource to get detailed information about the uplinks configured on the VSM. This resource is read-only.

Property	Example
module	4
portChannelType	Eth
packetsTx	1421
mtu	1550
packetsRx	4248
vlangs	1544-1545,1590-1600,1609
portChannel	1
portChannelMembers	Ethernet4/1,Ethernet4/3
name	Ethernet4/3
ethernet	Ethernet
speed	auto-speed
mode	trunk
portProfile	vxgw-uplink
status	up

## /api/vc/vem

Use this resource to get details of the Virtual Ethernet Modules (VEMs) attached on the VSM. This resource is read-only.

Property	Example
module	3
licenseUsage	1
esxVersion	VMware ESXi 5.0.0 Releasebuild-914586 (3.0)
ip	10.10.10.2
vethMax	300
status	ok
license	licensed
mac	Not applicable
type	Virtual Ethernet Module
numVM	71
nSockets	1
vethUsed	74
datacenterName	Sample-DC
macMax	32000
macUsed	176
version	4.2(1)SV2(2.1a)
model	NA
lic_version	1.0
ports	332
name	10.10.10.2
srvuuid	0bd195e1-80cd-11df-ab4e-d0d0fd094538

## /api/vc/vnic

Use this resource to get details of the virtual Ethernet ports connected to the Cisco Nexus 1000V switch. This resource is read-only.

Property	Example
mac	0050 .56a3.0b0c
vlan	2100
vnic	Vethernet2
portGroup	vmnet-2100
status	down
adapter	Network Adapter 1
vm	Ostinato1
dvport	DVPort64

## /api/vlan

Use this resource to create, update, and delete a VLAN and view a list of configured VLANS.

Property	Example
id	3603
state	active
name	vlan3603
shutdown	false

## /api/vnode

Use this resource to create, update, and delete a vService node and view a list of configured vService nodes.

Property	Example
type	vsg
name	vnode-test
failmode	close

## /api/vpath

Use this resource to create, update, and delete a vService path and view a list of configured vService paths.

Property	Example
name	vpath-test
nodes	[{ "order": 1, "node": "vnode-test", "profileName": "prof-test" }]

## /api/vxlan

Use this resource to create, update, and delete a VXLAN and view a list of configured VXLANs.

Property	Example
state	UP
macLearn	enabled
group	NULL
ports	0
mode	Unicast-only
id	16000000
macDist	Enable

## Saving Resource Changes

To make the changes done for a resource (through POST or DELETE method) persistent, use the POST method to send an HTTP request to the following link:

```
http://vsm-ip/api/cli
```

Include the following in the request body:

```
{"cmd": "copy r s"}
```

To do the same using cURL, use the following command:

```
curl -u username:password 10.10.10.2/api/cli -d '{"cmd": "copy r s"}' -i
```



## Feature History for Using the REST API Plug-in

Feature	Releases	Feature Information
Support for JSON Response Format	4.2(1)SV2(2.1a)	This feature was introduced.
Support for HTTP Methods	4.2(1)SV2(2.1a)	This feature was introduced.
Support for /api/port-profile resource	4.2(1)SV2(2.1a)	This feature was introduced.
Support for /api/span resource	4.2(1)SV2(2.1a)	This feature was introduced.
Support for /api/user resource	4.2(1)SV2(2.1a)	This feature was introduced.
Support for /api/vlan resource	4.2(1)SV2(2.1a)	This feature was introduced.
Support for /api/vnode resource	4.2(1)SV2(2.1a)	This feature was introduced.
Support for /api/vpath resource	4.2(1)SV2(2.1a)	This feature was introduced.
Support for /api/vxlan resource	4.2(1)SV2(2.1a)	This feature was introduced.





## CHAPTER 4

# Configuring the REST API Plug-in

This chapter contains the following sections:

- [Configuring the REST API Plug-in, on page 19](#)

## Configuring the REST API Plug-in

You can configure the REST API plug-in and dynamically load content.

### SUMMARY STEPS

1. switch (config)# **plugin unload** *plugin\_name*
2. switch (config)# **plugin load** *location*
3. switch (config)# **show plugin status**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	switch (config)# <b>plugin unload</b> <i>plugin_name</i>	Unloads the REST API plug-in completely from the system. <b>Note</b> After unloading the REST API plug-in, wait for at least 10 seconds before you proceed to the next step to load the REST API plug-in. <b>Note</b> When you unload the default REST API plug-in, the only way to reinstall the REST API plug-in is from the Cisco website and then load it on the Cisco Nexus 1000V switch.
<b>Step 2</b>	switch (config)# <b>plugin load</b> <i>location</i>	Loads the REST API plug-in. <b>Note</b> When the VSM is an HA pair, ensure the REST API plug-in image is available on both the supervisors. Copying the file to bootflash://sup-standby/ also copies the file to the standby VSM.

	Command or Action	Purpose
<b>Step 3</b>	switch (config)# <b>show plugin status</b>	Displays the status of all the plug-ins installed in the system.

### Example

This example shows how to unload and load the REST API plug-in:

```
switch(config)# plugin unload rest
switch(config)# plugin load bootflash:///rest_sup1sf.gbin
```

This example shows how to display the status of the installed plug-in:

```
switch(config) # show plugin status
Plugin-name          Version          Status
-----
Rest Plugin          1.0(1)          Loaded
```