

This tutorial will explain how to install Broadcom VNA in LINUX server and integrate it with cisco APIC, then present the data in Spectrum.

*After fulfilling all system requirements from Broadcom website as shown below:

Prepare to Install DX NetOps Virtual Network Assurance

Before you install VNA, verify that your system meets the requirements.

Follow these steps:

1. Verify that the VNA host meets the system requirements:

- **Memory:** 12 GB

Important

If you plan to install VNA on the *same host* as the data collector, ensure that you allocate enough memory to the host. **Best Practice:** Install VNA on a *separate* host as the data collector.

- **CPU:** 4vCPU
- **Disk:** 20 GB
- **Operating System:** RHEL/CentOS 6.5 through 7.x
- **Packages:** libaio and numactl

2. **(Scaled-Environment Only)** Verify that the VNA host meets the heap size requirements:

- **Heap Memory:** 16 GB
- **CPU:** 8vCPU
- **Disk:** SSD recommended 120 GB

*Start installing JDK:

```
[root@OPSAPIC ~]# yum install java-1.8.0-openjdk
```

*Install numctl

```
[root@OPSAPIC ~]# yum -y install numactl
```


*Install VNA and add "--no-prompt" to use the default setting:



```
GEN500000000002897.txe
[root@OPSAPIC DX NetOps Virtual Network Assurance 20.2.10]# ./GEN500000000002897
.txe --no-prompt
```

*The instalition end successfully:

```
Waiting for wildfly to start...
Installing the Open Collector
Installing the Gateway WAR file
Creating the default user domain: Default Domain
Deploying Plugins
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/openstack-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/bview-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/mod-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/next-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/contrail-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/opendaylight-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/openvswitch-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/aci-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/nuage-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/viptela-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/vsphere-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/versa-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/aws-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/meraki-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/one28t-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/silverpeak-plugin-20.2.10-RELEASE.jar
Installation completed successfully
Not displaying README
Please remove the install.sh file
/dump/vna/DX/CA_VNA_Install/DX_Virtual_Network_Assurance_install_27_06_2021_09_21_25.log at /opt/CA/VNA/logs
[root@OPSAPIC DX NetOps Virtual Network Assurance 20.2.10]#
```

*You can find below the path of VNA files and the installation logs:

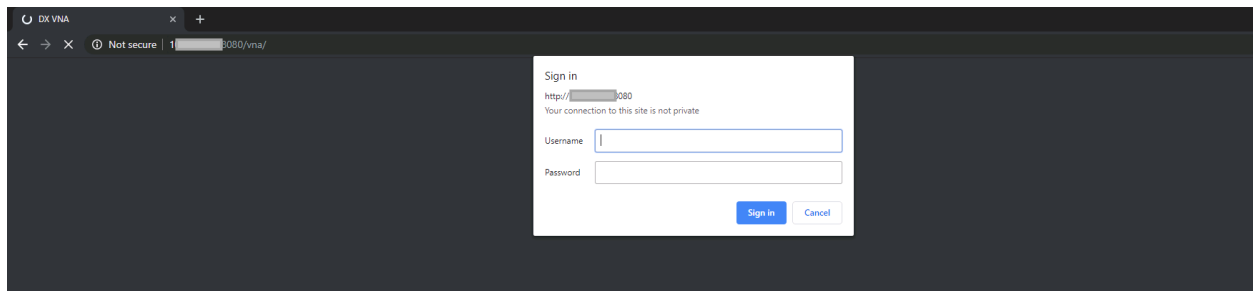
/opt/CA/VNA					
Name	Ext	Size	Changed	Rights	Owner
			6/27/2021 9:21:26 ...	rw-r--r--	root
apm			6/27/2021 9:21:29 ...	rw-r--r--	wildfly
collector			6/27/2021 9:21:26 ...	rw-r--r--	wildfly
config			6/27/2021 9:21:26 ...	rw-r--r--	wildfly
data			6/27/2021 9:21:26 ...	rw-r--r--	wildfly
database			6/27/2021 9:22:04 ...	rw-r--r--	wildfly
debug			6/27/2021 9:21:26 ...	rw-r--r--	wildfly
liquibase			6/27/2021 9:21:48 ...	rw-r--r--	root
logs			6/27/2021 9:22:30 ...	rw-r--r--	root
plugins			6/27/2021 9:22:30 ...	rw-r--r--	wildfly
schema			6/27/2021 9:21:48 ...	rw-r--r--	root
tools			6/27/2021 9:21:26 ...	rw-r--r--	wildfly
wildfly			6/27/2021 9:21:27 ...	rw-r--r--	wildfly
install.history		140 B	6/27/2021 9:22:30 ...	rw-r--r--	wildfly
NOTICE.txt		10,591 B	6/27/2021 9:21:26 ...	rw-r--r--	wildfly
README.txt		284 B	6/27/2021 9:21:26 ...	rw-r--r--	wildfly

/opt/CA/VNA/logs	
Name	Ext
	..
	DX_Virtual_Network_Assurance_install_27_06_...

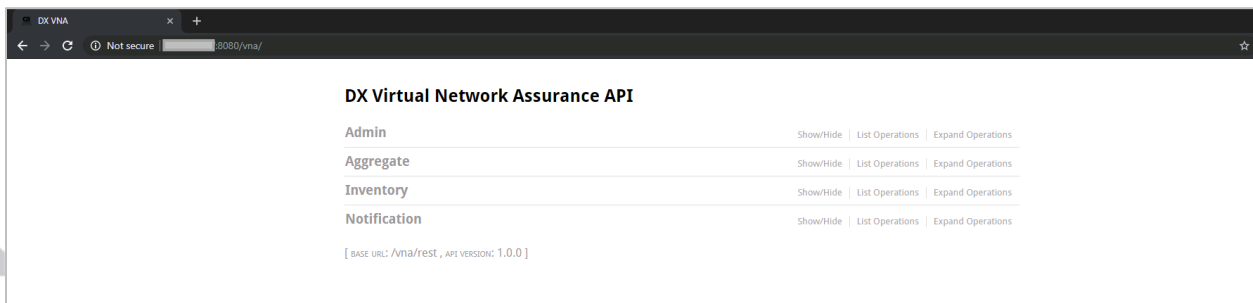
```
/opt/CA/VNA/logs/DX_Virtual_Network_Assurance_install_27_06_2021_09_21_25.log - root@
VNA 20.2.10 installation started...
Java version 8 is installed
Java version installed is a supported version from Oracle
Creating user: wildfly
Creating user: mysql
Installing Wildfly
Setting up standalone.xml
Configuring Wildfly startup
Enable wildfly to run at system startup
Configuring Wildfly
Added admin and app users to Wildfly configurations
Updated admin and app users to Wildfly configurations
Copying APM configuration files
Installing MySQL
Configuring MySQL startup
Initializing MySQL
MySQL successfully initialized
Using Asia/Riyadh as the system timezone
Copying Liquibase
Executing Database Update (logLevel = severe)
Liquibase: Update has been successful.
ID Cache file (/opt/CA/VNA/data/ID_CACHE.dat) does not exist; skipping migration
Aggregator Cache file (/opt/CA/VNA/data/REMOTE_VNA_CACHE.dat) does not exist; skipping migration
Waiting for wildfly to start...
Create MySQL data source in Wildfly
MySQL DataSource Successfully added to Wildfly
Waiting for wildfly to start...
Installing the Open Collector
Installing the Gateway WAR file
Creating the default user domain: Default Domain
Deploying Plugins
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/openstack-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/bview-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/mod-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/nsxt-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/contrail-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/opendaylight-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/openvswitch-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/aci-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/nuage-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/viptela-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/vsphere-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/versa-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/aws-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/meraki-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/one28t-plugin-20.2.10-RELEASE.jar
Deploying Plugin: /dump/vna/DX/CA_VNA_Install/silverpeak-plugin-20.2.10-RELEASE.jar
Installation completed successfully
Not displaying README
Please remove the install.sh file
/dump/vna/DX/CA_VNA_Install/DX_Virtual_Network_Assurance_install_27_06_2021_09_21_25.log at /opt/CA/VNA/logs
```

*Now open the following VNA URL in Web browser <http://IPofVNAserver:8080/vna/>,

Then enter the default username & password.



*The below page will appear:



*Starting the integration process with APIC:

By following the instruction that explained clearly how to configure ACI (APIC) plugin instance in VNA in the video that has been added below in the references,

*Click on **Inventory** then choose “**POST /v1/inventory/usersdomain/{domainname}**”

Add in the parameters:

domainName: **ACI_Domain**

Inventory Show/Hide | List Operations | Expand Operations

POST	/v1/inventory	Get the inventory, applying the (optional) specified filter
GET	/v1/inventory/entity/{entityId}	Gets the Entity information from the inventory for the passed ID
POST	/v1/inventory/hypervisors	Get the hypervisors from the inventory
GET	/v1/inventory/relations/{entityId}	Gets the Relation information from the inventory for the passed ID
GET	/v1/inventory/stats	Get the current inventory statistics
GET	/v1/inventory/userdomains	Get user defined domain groups
POST	/v1/inventory/userdomains/{domainName}	Create a user defined domain group (domainName should be unique across all VNAs)

Parameters

Parameter	Value	Description	Parameter Type	Data Type
domainName	ACI_Domain	Domain name	path	string

Response Messages

HTTP Status Code	Reason	Response Model	Headers
default	successful operation		

Try it out!

*Click “Try it out” and it will return the response code **201** that indicate a successful creation:

POST /v1/inventory/userdomains/{domainName} Create a user defined domain group (domainName should be unique across all VNAs)

Parameters

Parameter	Value	Description	Parameter Type	Data Type
domainName	ACI_Domain	Domain name	path	string

Response Messages

HTTP Status Code	Reason	Response Model	Headers
default	successful operation		

[Try it out!](#) [Hide Response](#)

Curl

```
curl -X POST --header 'Content-Type: application/json' --header 'Accept: application/json' 'http://[redacted]:8080/vna/rest/v1/in
```

Request URL

```
http://[redacted]:8080/vna/rest/v1/inventory/userdomains/ACI_Domain
```

Response Body

```
{
  "vnaUUID": "95938302-e078-454d-955a-8e4046bd4f44",
  "userDomainEntity": {
    "id": 2,
    "tstamp": null,
    "creationTime": 1625647978515,
    "lastUpdateTime": 1625647978515,
    "userDomainId": null,
    "instanceId": null,
    "typeName": "USER_DOMAIN",
    "subtypeName": null,
    "keysForReference": [],
    "subEntityId": null,
    "customProperties": {},
    "label": null,
    "description": null,
    "certificationName": null,
    "displayAlias": null,
    "displayName": "ACI_Domain",
    "sourceElementId": null,
  }
}
```

Response Code

```
201
```

Response Headers

```
{
  "date": "Sun, 27 Jun 2021 06:22:05 GMT",
  "connection": "keep-alive",
  "content-length": "2201",
  "content-type": "application/json"
}
```

*Click on “GET /v1/admin/plugins” then Try it out:

Admin

Show/Hide

List Operations

Expand Operations

GET	/v1/admin/engines	Provides a list of installed engines and their current status
GET	/v1/admin/engines/configs	Provides configuration of all the deployed plugin
DELETE	/v1/admin/engines/{engineid}	Remove an engine
GET	/v1/admin/engines/{engineid}	Provide current status of an engine
GET	/v1/admin/engines/{engineid}/config	Provides the saved configuration of this engine
GET	/v1/admin/engines/{engineid}/pollStatus	Provide current Poll status of an engine
PUT	/v1/admin/engines/{engineid}/{action}	Change status of an engine
GET	/v1/admin/ping	Get current SDN Gateway server status
GET	/v1/admin/plugins	Provides a list of installed plugins and their current status

Response Messages

HTTP Status Code	Reason	Response Model	Headers
default	successful operation		

Try it out!

* It will return 200 response code that indicate a successful installed ACI plugin for SDN technologies:

GET

/v1/admin/plugins

Provides a list of installed plugins and their current status

Response Messages

HTTP Status Code	Reason	Response Model	Headers
default	successful operation		

Try it out!

Hide Response

Curl

```
curl -X GET --header 'Accept: application/json' 'http://[REDACTED]:8080/vna/rest/v1/admin/plugins'
```

Request URL

```
http://[REDACTED]:8080/vna/rest/v1/admin/plugins
```

Response Body

```
{
  "pluginName": "BView Plugin",
  "pluginStatus": "INSTALLED",
  "pluginVersion": "20.2.10-RELEASE"
},
{
  "pluginName": "ACI Plugin",
  "pluginStatus": "INSTALLED",
  "pluginVersion": "20.2.10-RELEASE"
},
{
  "pluginName": "Nuage Plugin",
  "pluginStatus": "INSTALLED",
  "pluginVersion": "20.2.10-RELEASE"
},
{
  "pluginName": "SilverPeak Plugin",
  "pluginStatus": "INSTALLED",
  "pluginVersion": "20.2.10-RELEASE"
},
{
  "pluginName": "MoD Plugin",
```

Response Code

```
200
```

Response Headers

```
{
  "date": "Sun, 27 Jun 2021 06:22:05 GMT",
  "connection": "keep-alive",
  "content-length": "1481",
  "content-type": "application/json"
}
```

*SDN technology provide a Cisco ACI plugin configuration template in JSON with variables and their parameter,

Click on “GET /v1/admin/plugins/{pluginName}/template”.

Admin

Show/Hide | List Operations | Expand Operations

GET	/v1/admin/engines	Provides a list of installed engines and their current status
GET	/v1/admin/engines/configs	Provides configuration of all the deployed plugins
DELETE	/v1/admin/engines/{engineid}	Remove an engine
GET	/v1/admin/engines/{engineid}	Provide current status of an engine
GET	/v1/admin/engines/{engineid}/config	Provides the saved configuration of this engine
GET	/v1/admin/engines/{engineid}/pollStatus	Provide current Poll status of an engine
PUT	/v1/admin/engines/{engineid}/{action}	Change status of an engine
GET	/v1/admin/ping	Get current SDN Gateway server status
GET	/v1/admin/plugins	Provides a list of installed plugins and their current status
POST	/v1/admin/plugins	Upload a new southbound plugin and prepare it for configuration
POST	/v1/admin/plugins/{pluginName}	Configures a new instance of a plugin
PUT	/v1/admin/plugins/{pluginName}	Reconfigures an existing instance of a plugin
GET	/v1/admin/plugins/{pluginName}/configs	Displays a list of Open Collector configurations for this plugin
GET	/v1/admin/plugins/{pluginName}/template	Generates a template the can be used to configure the named plugin

Parameters

Parameter	Value	Description	Parameter Type	Data Type
pluginName	<input type="text" value="ACI Plugin"/>		path	string

Response Messages

HTTP Status Code	Reason	Response Model	Headers
default	successful operation		

Try it out!

*After selected the **Try it out** button and ensure 200 response code appear, copy the JSON template.

GET

/v1/admin/plugins/{pluginName}/template

Generates a template the can be used to configure the named plugin

Parameters

Parameter	Value	Description	Parameter Type	Data Type
pluginName	ACI Plugin		path	string

Response Messages

HTTP Status Code	Reason	Response Model	Headers
default	successful operation		

Try it out!

[Hide Response](#)

Curl

```
curl -X GET --header 'Accept: application/json' 'http://[redacted]:8080/vna/rest/v1/admin/plugins/ACI%20Plugin/template'
```

Request URL

```
http://[redacted]:8080/vna/rest/v1/admin/plugins/ACI%20Plugin/template
```

Response Body

```
{
  "PLUGIN_CONFIG": {
    "APIC_HOST_IP": "10.241.17.185",
    "APIC_HOST_aaaUser_NAME": "api",
    "APIC_HOST_aaaUser_PASSWORD": "apiReadOnly",
    "APIC_MAX_PAGE_SIZE": 15,
    "PROTOCOL": "https",
    "USE_PROXY": false,
    "PROXY_IP": "0.0.0.0",
    "PROXY_PORT": 0,
    "PROXY_PROTOCOL": "http",
    "PROXY_USERNAME": "",
    "PROXY_PASSWORD": "",
    "INVENTORY_ENABLE_ENDPOINTS": "Yes",
    "INVENTORY_POLL_RATE": "0 * /10 **",
    "INVENTORY_DELTA_TIME": 600,
    "PERFORMANCE_POLL_RATE": "0 * /5 **",
    "PERFORMANCE_DELTA_TIME": 300,
    "AVAILABILITY_POLL_RATE": "0 * /5 **",
    "AVAILABILITY_DELTA_TIME": 300,
  }
}
```

Response Code

```
200
```

Response Headers

```
{
  "date": "Sun, 27 Jun 2021 06:22:05 GMT",
  "connection": "keep-alive",
  "content-length": "712",
  "content-type": "application/json"
}
```

*Paste the copied JSON templet and change the needed then click **Try it out** button.

*For more information regarding the **ConfigDesc** and **Cisco ACI plug-in configuration** see the References.

POST

/v1/admin/plugins/{pluginName}

Configures a new instance of a plugin

Parameters

Parameter	Value	Description
pluginName	ACI Plugin	Plugin Name
configDesc	ACI_Plugin1	Enter a meaningful description for this configuration that will identify it. You need make changes in the future.

engineConfig

```
{  "PLUGIN_CONFIG": {    "APIC_HOST_IP": "10.241.17.185",    "APIC_HOST_aaaUser_NAME": "api",    "APIC_HOST_aaaUser_PASSWORD": "apiReadOnly",    "APIC_MAX_PAGE_SIZE": 15,    "PROTOCOL": "https",    "USE_PROXY": false,    "PROXY_IP": "0.0.0.0",    "PROXY_PORT": 0,    "PROXY_PROTOCOL": "http",    "PROXY_USERNAME": "",    "PROXY_PASSWORD": "",    "INVENTORY_ENABLE_ENDPOINTS": "Yes",    "INVENTORY_POLL_RATE": "0 */10 *",    "INVENTORY_DELTA_TIME": 600,    "PERFORMANCE_POLL_RATE": "0 */5 *",    "PERFORMANCE_DELTA_TIME": 300,    "AVAILABILITY_POLL_RATE": "0 */5 *",    "AVAILABILITY_DELTA_TIME": 300,    "FAULT_SUBSCRIPTION_ENABLED": true,    "EVENT_SUBSCRIPTION_ENABLED": false,    "HISTORICAL_EVENT_DAYS": 1,    "DOMAIN_ID": 0  }}
```

Plugin configuration for the engine

Parameter content type: application/json

Response Messages

HTTP Status Code	Reason	Response Model	Headers
default	successful operation		

Try it out!

*After clicked the **Try it out** it should return 200 response code.

```
INVENTORY_DELTA_TIME": 600,  
"PERFORMANCE_POLL_RATE": "0 */5 *",  
"PERFORMANCE_DELTA_TIME": 300,  
"AVAILABILITY_POLL_RATE": "0 */5 *",  
"AVAILABILITY_DELTA_TIME": 300,  
"FAULT_SUBSCRIPTION_ENABLED": true,  
"EVENT_SUBSCRIPTION_ENABLED": false,  
"HISTORICAL_EVENT_DAYS": 1,  
"DOMAIN_ID": 2  
}  
}
```

Parameter content type: application/json ▼

Response Messages

HTTP Status Code	Reason	Response Model	Headers
default	successful operation		

[Try it out!](#)

[Hide Response](#)

Curl

```
curl -X POST --header 'Content-Type: application/json' --header 'Accept: text/plain' -d '{  
  "PLUGIN_CONFIG": {  
    "APIC_HOST_IP": " ",  
    "APIC_HOST_aaaUser_NAME": " ",  
    "APIC_HOST_aaaUser_PASSWORD": " ",  
    "APIC_MAX_PAGE_SIZE": 15,  
    "PROTOCOL": "https",  
    "USE_PROXY": false,  
    "PROXY_IP": "0.0.0.0",  
    "PROXY_PORT": 0,  
    "PROXY_PROTOCOL": "http",  
    "PROXY_USERNAME": "",  
    "PROXY_PASSWORD": "",  
    "INVENTORY_ENABLE_ENDPOINTS": "Yes",  
    "INVENTORY_POLL_RATE": "0 */10 *",  
    "INVENTORY_DELTA_TIME": 600,  
    "PERFORMANCE_POLL_RATE": "0 */5 *",  
    "PERFORMANCE_DELTA_TIME": 300,  
    "AVAILABILITY_POLL_RATE": "0 */5 *",  
    "AVAILABILITY_DELTA_TIME": 300,  
    "FAULT_SUBSCRIPTION_ENABLED": true,  
    "EVENT_SUBSCRIPTION_ENABLED": false,  
    "HISTORICAL_EVENT_DAYS": 1,  
    "DOMAIN_ID": 2  
  }  
}', http:// :8080/vna/rest/v1/admin/plugins/ACI%20Plugin?configDesc=ACI_Plugin1'
```

Request URL

http:// :8080/vna/rest/v1/admin/plugins/ACI%20Plugin?configDesc=ACI_Plugin1

Response Body

no content

Response Code

200

Response Headers

```
{  
  "connection": "keep-alive",  
  "date": "Sun, 27 Jun 2021 06:22:05 GMT",  
  "content-length": "0",  
  "content-type": null  
}
```

* To ensure the engine is running select “GET /v1/admin/plugins/{pluginName}/configs

*Enter the pluginName then click on **Try it out**, copy the **configid** value.

GET /v1/admin/plugins/{pluginName}/configs Displays a list of Open Collector configurations for this plugin

Parameters

Parameter	Value	Description	Parameter Type	Data Type
pluginName	ACI Plugin		path	string

Response Messages

HTTP Status Code	Reason	Response Model	Headers
default	successful operation		

[Try it out!](#) [Hide Response](#)

Curl

```
curl -X GET --header 'Accept: application/json' 'http://[redacted]:8080/vna/rest/v1/admin/plugins/ACI%20Plugin/configs'
```

Request URL

```
http://[redacted]:8080/vna/rest/v1/admin/plugins/ACI%20Plugin/configs
```

Response Body

```
[
  {
    "pluginName": "ACI Plugin",
    "configId": "ACI_8e6ce974-64f4-4237-ad5b-b783acb05c16",
    "configDesc": "ACI_Plugin1"
  }
]
```

Response Code

200

Response Headers

```
{
  "date": "Sun, 27 Jun 2021 06:22:05 GMT",
  "connection": "keep-alive",
  "content-length": "110",
  "content-type": "application/json"
}
```

*Select “GET /v1/admin/engines/{engineid}”, paste the copied value in **engineid** then click **Try it out**, it should return 200 response code and RUNNING string value in the Response Body box.

* Now is operating and configured successfully.

GET /v1/admin/engines/{engineid} Provide current status of an engine

Parameters

Parameter	Value	Description	Parameter Type	Data Type
engineid	ACI_8e6ce974-64f4-4237-ad5b-b783acb05c16	Engine ID	path	string

Response Messages

HTTP Status Code	Reason	Response Model	Headers
default	successful operation		

[Try it out!](#) [Hide Response](#)

Curl

```
curl -X GET --header 'Accept: text/plain' 'http://10.10.10.10:8080/vna/rest/v1/admin/engines/ACI_8e6ce974-64f4-4237-ad5b-b783acb05c16'
```

Request URL

http://10.10.10.10:8080/vna/rest/v1/admin/engines/ACI_8e6ce974-64f4-4237-ad5b-b783acb05c16

Response Body

RUNNING

Response Code

200

Response Headers

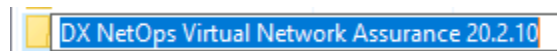
```
{
  "date": "Sun, 27 Jun 2021 06:22:05 GMT",
  "connection": "keep-alive",
  "content-length": "7",
  "content-type": "text/plain; charset=UTF-8"
}
```

*After linking VNA with Spectrum, you will find VNA data in **SDN Manager** under **ACI_Domain** as you name it before in **Inventory**.

SDN Manager (2)	4	2	5
ACI_Domain (3)	4	2	5
Fabric (2)			
Technologies (1)	4	1	4
Tenants (8)		1	
TEST			

Troubleshooting:

Since it's LINUX OS you need to remove the spaces between the words or just delete them:

 DX NetOps Virtual Network Assurance 20.2.10

 DX

If you don't remove the spaces in the installation process you will face the below error:

```
GEN500000000002897.txe
[root@OPSAPIC DX NetOps Virtual Network Assurance 20.2.10]# ./GEN500000000002897
.txe --no-prompt

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CUSTOMER ACKNOWLEDGES THAT THIS AGREEMENT HAS BEEN READ AND UNDERSTOOD AND BY CLICKING THE BUTTON OR MARKING THE BOX INDICATING ACCEPTANCE, CUSTOMER ACCEPTS ITS TERMS AND CONDITIONS.

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Y
install.sh: line 6: /dump/vna/DX: No such file or directory
install.sh: line 7: /dump/vna/DX: No such file or directory
install.sh: line 8: /dump/vna/DX: No such file or directory
install.sh: line 9: /dump/vna/DX: No such file or directory
install.sh: line 10: /dump/vna/DX: No such file or directory
install.sh: line 11: /dump/vna/DX: No such file or directory
install.sh: line 12: /dump/vna/DX: No such file or directory
install.sh: line 13: /dump/vna/DX: No such file or directory
install.sh: line 40: log: command not found
install.sh: line 43: log: command not found
install.sh: line 50: log_to_file: command not found
install.sh: line 68: create_users: command not found
Usage: grep [OPTION]... PATTERN [FILE]...
Try 'grep --help' for more information.
```

References:

1-

https://www.google.com/search?q=ca+vna+and+APIC&hl=ar&ei=7d7pYJOYEr3cgweZILG4Bw&oq=ca+vna+and+APIC&gs_lcp=Cgdnd3Mtd2l6EANKBAhBGABQpjdY6j9gzUFoAHACeACAAbIBiAGyAZIBAzAuMZgBAKABAaoBB2d3cy13aXrAAQE&scient=gws-wiz&ved=0ahUKEwjTwuGuidnxAhU97uAKHRIKDHcQ4dUDCA4&uact=5

2- https://access.redhat.com/documentation/en-us/openjdk/8/html/installing_and_using_openjdk_8_for_rhel/installing-openjdk8-on-rhel

3- https://www.youtube.com/watch?v=X0FrdpPQBWY&ab_channel=Educate

4- <https://techdocs.broadcom.com/us/en/ca-enterprise-software/it-operations-management/virtual-network-assurance/3-7/building/cisco-aci.html>