



CHAPTER 19

Managing Additional Device Types Using the VCB

This chapter describes how to manage devices that do not have supported VNE drivers in Cisco ANA by creating user-defined VNE (U-VNE) drivers using the VCB. The chapter contains the following sections:

- [Approaches to Managing Additional Device Types, page 19-1](#)
- [Managing Device Types—Detailed Procedures, page 19-3](#)
- [Device Type Customization Command Reference, page 19-18](#)

Approaches to Managing Additional Device Types

Use the VCB to manage unsupported devices by adding device types for Cisco ANA to recognize and discover. To do so, create U-VNEs; use the first of these approaches that is applicable:

1. Create a U-VNE by cloning from a developed VNE driver. Use this approach when the unsupported device has the same or a very similar management interface, and/or NE OS version, as the developed VNE driver.

For example, a new NE type that belongs to a supported NE series, or runs a new maintenance NE OS release would typically share the same management interface as a supported device. A U-VNE created by cloning inherits the behavior of the cloned-from VNE driver, and can be further extended using the VCB to add more device module discovery and event recognition. (For supported NEs types and OS versions, see [Cisco Active Network Abstraction 3.7.1 Reference Guide](#).)

2. Create a U-VNE by referencing a U-VNE template. Use this approach when the instrumentation or management interface for the unsupported device does not match that for any supported VNE. Typically, non-Cisco devices and Cisco device families for which there are no developed VNE drivers would be in this situation. For the instrumentation, advantages, and limitations afforded by U-VNE templates, see [U-VNE Templates, page 22-1](#).

U-VNEs created using either of the above approaches are separate VNE definitions in the Cisco ANA registry, and can be further extended using Cisco ANA Soft-properties and Command Builder features. Examples of creating a U-VNE by cloning and creating a U-VNE reference a template are included in [Adding a Device Type—A Step-by-Step Example, page 19-2](#).

Adding a Device Type—A Step-by-Step Example

The following example shows how to enable Cisco ANA to manage an unsupported device by creating a U-VNE.

Step 1 Obtain the sysOID for the NE that you want to manage by doing any of the following:

- Query the device; use, for example, the `snmpget` command

```
snmpget -c SNMPCommunityString IPAddress .1.3.6.1.2.1.1.2.0
```

- Use any MIB browser and query for the OID 1.3.6.1.2.1.1.2
- Look into the CISCO-PRODUCTS-MIB if you are investigating a Cisco product. The following URL opens the Cisco SNMP Object Navigator to the CISCO-PRODUCT-MIB:

<http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&mibName=CISCO-PRODUCTS-MIB>

Step 2 Confirm that Cisco ANA does not already support the sysOID by doing one of the following:

- Search for the sysOID in the output of the following command:

```
vcb uvne view -sysoid all | grep sysOID
```

If the value that you entered for `sysOID` is not listed, it is not supported.

- Add the device to Cisco ANA. If the device is not supported, a “Device Unsupported” service alarm appears.

Step 3 Add the “DeviceType” string or the unsupported NE using a command such as this:

```
vcb devicetype add -devicetype CISCO_XXXX -name "Cisco XXXX XXXX" -category ROUTER
```

If the device type string already exists, an error message will be displayed.



Note For a list of available device categories, enter the command `vcb devicetype view -devicetype all -user user name -password password`.

Step 4 To add a U-VNE, do one of the following:

- Add the U-VNE by cloning from a device family:
 - Identify a supported device series to which the unsupported NE type belongs. For information about supported device series, see [Cisco Active Network Abstraction 3.7.1 Reference Guide](#).

Obtain the sysoid of a particular device type in the series as follows:

```
vcb uvne view -sysoid all -user root -password admin
```



Note In the output of the command, ignore any entries for which the Device Family column contains base or da.

- Add the device, using the `vcb uvne add` command:

```
vcb uvne add -sysoid .1.2.3.4 -clonedevicefamily 10008 -user root -password admin
```

- Add a maintenance NE OS release by cloning from a device that runs an existing NE OS release:
 - Identify devices on which you will deploy a maintenance NE OS release.
 - For each device that you identified, add a U-VNE by entering a command such as the following one:

```
vcb uvne modify -sysoid .1.2.3.4 -softwareversion 12.6(2) -clonesoftwareversion
12.0(23)S3 -clonedevicefamily 100xx -user root -password admin
```



Note For information about supported NE OS, see [Cisco Active Network Abstraction 3.7.1 Reference Guide](#).

- Add the U-VNE by referencing a template:
 - View the list of available U-VNE templates by entering this command:

```
vcb uvne view -template all
```

- Add the device, using the `vcb uvne add` command:

```
vcb uvne add -sysoid .1.2.3.4 -template genericUVNE -devicetype CISCO_XXXX
-group uvne-product
```

Step 5 Restart the AVM.

Step 6 Prepare to test; see [Setting Up the Test Environment, page 19-7](#).

Step 7 Complete tests and certify the customization; see [Testing and Certifying Customized Device Types, page 19-11](#).

The above example outlines the procedure for performing device customization. For more information, see [Managing Device Types—Detailed Procedures, page 19-3](#).

Managing Device Types—Detailed Procedures

To manage additional device types, follow the steps used in the example, [Adding a Device Type—A Step-by-Step Example, page 19-2](#). While the example provides a quick reference, more detailed procedures are available for you to follow. [Table 19-1](#) provides pointers from the quick reference steps to more thorough information.

Table 19-1 Detailed Device Customization Process

Steps from the Example—Managing an Unsupported Device		Corresponding Detailed Procedures
Step 1	Obtain the sysObjectID for the NE	Planning Device Type Customization, page 19-4
Step 2	Confirm that Cisco ANA does not support the NE	
Step 3	Add the NE type as a device type	Customizing Device Types—Adding a U-VNE, page 19-6
Step 4	Add a U-VNE	
Step 5	Restart the AVM	

Table 19-1 Detailed Device Customization Process (continued)

Steps from the Example—Managing an Unsupported Device		Corresponding Detailed Procedures
Step 6	Prepare to test	Setting Up the Test Environment, page 19-7
Step 7	Complete tests and certify	Testing and Certifying Customized Device Types, page 19-11

Planning Device Type Customization

The initial steps of [Adding a Device Type—A Step-by-Step Example, page 19-2](#) describe obtaining the sysObjectID for a device and confirming that it is not supported in Cisco ANA before you start customizing. While you are in the planning phase, here are some additional steps to assist you in determining the approach to take when creating a U-VNE:

1. Perform research, investigating the NE that you want to add. Gather information from sources such as the following:
 - Vendor- or device- specific documentation or website for details
 - Element management systems (EMS) or other management systems for property or detail views
 - Device or network experts
 - Cisco ANA advance services or CA
 - VCB commands that enable you to view details for similar VNEs, modules, and events—See [Viewing Device Type Customizations, page 19-5](#),
 - [Cisco Active Network Abstraction 3.7.1 Reference Guide](#) to compare the supported device scope with the device scope that you need to manage. If gaps exist—in the areas of recognizing device type, hard cards, device maintenance software, SNMP traps, or syslogs—use the VCB to extend the VNE drivers.
2. Evaluate whether you can clone. To create a U-VNE by cloning from an existing VNE driver, you must identify a suitable VNE driver.

For the technologies that are modeled for a particular scheme under a particular device series, see [Cisco Active Network Abstraction 3.7.1 Reference Guide](#). After you identify the device series, use the `vcb uvne view` command to obtain the sysoid of a particular device type as follows:

```
vcb uvne view -sysoid all -user root -password admin
```



Note In the output of the command, ignore any entries for which the Device Family column contains base or da.

3. If the cloning approach is not a good fit for the device that you want to discover, add the U-VNE by referencing a template. Perform analysis, looking for gaps between the information that you gathered and the information in the templates; see [U-VNE Templates, page 22-1](#). Evaluate the U-VNE templates to determine which template most closely matches the data that you gathered.

Viewing Device Type Customizations

Use the **vcb mode view** commands to print information about VNE configurations to the system console where *mode* is one of these:

- **uvne**—Used to view VNEs and U-VNEs. For more information, see [Viewing U-VNEs, page 19-5](#).
- **devicetype**—Use to view user-experience attributes. For more information, see [Viewing Device-Type Associations, page 19-6](#).

Use **vcb mode view** commands to obtain information before executing **vcb mode add** commands. For example, before creating a device type, look up the names of all device types found on your system using the command **vcb devicetype view -devicetype all -user root -password admin**.



Tip

Use the **l more** filter with view commands to display the output one screen at a time. For example, enter the command **vcb uvne view -sysoid all -user username -password password l more** to display details about all the VNEs in your managed network one screen at a time. Press **Enter** to display the next screen of information.

Viewing U-VNEs

To view U-VNE configurations, enter one or more of the commands listed in [Table 19-2](#).

Table 19-2 VCB U-VNE View Commands

To View...	Use This Command...
The details of a particular device type based on its sysObjectID	vcb uvne view -sysoid <i>sysoid</i> -user <i>username</i> -password <i>password</i> Note If you enter the sysObjectID of a U-VNE, this command returns the U-VNE template on which the U-VNE is based.
The details of all VNEs in the system	vcb uvne view -sysoid <i>all</i> -user <i>username</i> -password <i>password</i>
The list of sysObjectIDs and U-VNE templates found within a particular group	vcb uvne view -group <i>template filename</i> -user <i>username</i> -password <i>password</i>
The list of U-VNE templates found in each group	vcb uvne view -group <i>all</i> -user <i>username</i> -password <i>password</i>
The user-experience attributes defined for a specific device type that is associated with a U-VNE	vcb uvne view -devicetype <i>device type</i> -user <i>username</i> -password <i>password</i>
The user-experience attributes for each device type in the system	vcb uvne view -devicetype <i>all</i> -user <i>username</i> -password <i>password</i>

Viewing Device-Type Associations

To view device-type associations, enter one or more of the commands listed in [Table 19-3](#).

Table 19-3 VCB Devicetype View Commands

To View...	Use This Command...
The user-experience attributes (user-friendly name, device category) of a specified device type (developed VNE or U-VNE)	<code>vcb devicetype view -devicetype device type -user username -password password</code>
The list of all device types configured in the system	<code>vcb devicetype view -devicetype all -user username -password password</code>

Customizing Device Types—Adding a U-VNE

Use the VCB to enable Cisco ANA to discover a device type that does not have a developed VNE. The complete procedure for creating a U-VNE typically involves issuing the following series of commands:

- **vcb devicetype add**—Creates a new device type and assigns user-experience attributes that enable users to identify the new device type in the Cisco ANA client.
- **vcb uvne add**—Creates the U-VNE by replicating the U-VNE template that contains the implementation which is best suited for this device type.

To create a U-VNE:

Step 1 Enter the following command on the Cisco ANA gateway:

```
vcb devicetype add -devicetype device type -category ana device category -name device name -user username -password password
```

Where:

- The device type is the name to assign to the new device type.
- The ana device category is the category to assign to the device type.
- The device name is the name that should be displayed in the Cisco ANA client for devices of this type.

For example:

```
vcb devicetype add -devicetype Cisco_MWR1941-DC-A -category ROUTER -name "Cisco MWR 1941-DC-A Mobile Wireless Edge Router" -user root -password admin
```

This command creates a device type and assigns a user-friendly name (in this example, Cisco MWR 1941-DC-A Mobile Wireless Edge Router), device category (ROUTER), and icon that enable users to identify VNEs based on this device type in the Cisco ANA UI.

Step 2 Enter the following command:

```
vcb uvne add -sysoid sysoid -group template filename -template template name [-devicetype device type ] -user username -password password
```

Where:

- The sysoid is the unique sysObjectID of the device for which to create a U-VNE-driver.
- The template filename is the name of the group file that contains the U-VNE templates.

- The template name is the name of the U-VNE template to use for creating the U-VNE-driver.
- The device type is the device type name to associate with the U-VNE-driver. Use this option to associate the new U-VNE with the user-experience attributes defined with the **vcb devicetype add** command. If this option is not used, the device type is defined as UNKNOWN.

For example:

```
vcb uvne add -sysoid .1.3.6.1.4.1.9.1.520 -group uvne-product -template genericUVNE
-devicetype Cisco_MWR1941-DC-A -user root -password admin
```

This command creates a U-VNE for a device (identified by its sysObjectID) using the implementation defined in the specified U-VNE template (which is found in the specified group). In addition, it assigns a device type to the U-VNE, from which it obtains the attributes configured with the **vcb devicetype** command.

Alternatively, create a U-VNE by copying information from existing VNEs. Enter one of the following commands:

```
vcb uvne add -sysoid sysoid -clonesysoid clone-sysoid [-devicetype device type] -user
username -password password
vcb uvne add -sysoid sysoid -clonedevicefamily devicefamily [-devicetype device type]
-user username -password password
vcb uvne add -sysoid sysoid -softwareversion software-version -clonesoftwareversion
clone-softwareversion -clonedevicefamily devicefamily [-devicetype device type] -user
username -password password
```

Where:

- clone-sysoid—Is the sysObject ID of an already supported VNE. To view sysOIDs for supported VNEs, use the **vcb uvne view -sysoid all** command.
- devicefamily—Is a supported device family. For a list of supported device families, use the command **vcb uvne view -sysoid all -user user -password password**. For more information, see [vcb uvne view, page 19-21](#).
- software-version—Is the software version that you want to add for a U-VNE. (Obtain the software version string using the **show version** command.)
- clone-softwareversion—Is an already supported software version that you want to clone.

Setting Up the Test Environment

After using the VCB to perform device customizations, you must test the VNE or U-VNE to verify that the device and its components can be managed by Cisco ANA to your satisfaction. To test the results of your VCB commands, we recommend that you add a single instance of the customized VNE to its own AVM in Cisco ANA.

Depending on the approach that you selected to create a U-VNE, by cloning or by referencing a template, obtain technology and application support information for the cloned-from device (see [Cisco Active Network Abstraction 3.7.1 Administrator Guide](#)) or the template (see [U-VNE Templates, page 22-1](#)). Use the references to do the following:

- Rigorously assess compatibility issues
- Identify potential side effects on your device, network, and management application (Cisco ANA)

Examples of the support you should test for include:

- Physical containment
- Logical inventory
- Topology
- Events

We recommend that you record the results of your tests in a compliance report, which certifies the capabilities of the customized VNE. See [Preparing Compliance Reports, page 19-11](#). After you successfully complete the testing process, create additional VNE instances to manage the rest of the devices of this type in the network.



Note

When performing the tests described in this chapter, bear in mind that unlike developed VNEs, U-VNEs are not optimized for a particular device type. The VCB enables you to extend VNEs and create U-VNEs as specified in this document. Other Cisco ANA features, such as Soft Properties and Command Builder described in separate sections, offer further extensibility to the U-VNE and developed VNE drivers. Cisco ANA users who need more management capability—or who prefer to have developed VNE drivers for devices that are not already in the Cisco ANA VNE support scope—can contact their Cisco account representative for any available Cisco Advanced Services alternative.

Before beginning the testing process, you must ensure that:

- All the mandatory processes—avm11, avm0, and avm100 (only for event support)—are running normally.
- You have access to the device.
- You complete the actions described in [Table 19-4](#).

Table 19-4 **Actions to Perform Before You Begin Testing**

Action	Purpose	For More Information
Configure the device to send traps to the Cisco ANA server.	This is required before you test whether Cisco ANA can receive traps from the VNE.	Configuring a Device to Send Events, page 21-17
Create an AVM for hosting the VNE instance on which you will perform the tests.	By isolating the test VNE on its own AVM, you prevent any actions that might impact the functionality of your network.	Creating a Test AVM, page 19-9
Add a single instance of the VNE to Cisco ANA.	This will be the VNE on which you perform the tests described in this chapter.	Creating a Test Instance of the VNE, page 19-9
Measure device performance (such as CPU and memory usage) on the device, with and without the VNE.	This enables you to determine whether the VNE is placing an unreasonable load on the device.	Measuring Device Performance, page 19-11
Open the relevant VNE documentation.	The information contained in the VNE documentation helps you during the testing process to verify how well Cisco ANA handles the VNE customizations you created.	<ul style="list-style-type: none"> • U-VNE Templates, page 22-1 • Cisco Active Network Abstraction 3.7.1 Reference Guide
Prepare a compliance report	Fill in the compliance report during testing to track your results against the list of supported technologies and properties outlined in U-VNE Templates, page 22-1 .	Preparing Compliance Reports, page 19-11

Creating a Test AVM

We recommend that you create an AVM for the sole purpose of hosting the VNE instance on which you will perform the tests described in this chapter. Placing the VNE instance in its own AVM enables you to test your customizations in a safe environment, where the logs and any errors generated by the VNE are isolated from the rest of your network. This enables you to proceed with testing without having your VNE customizations impact the network, until you are satisfied that the customizations function as required.

For further details about this procedure, see “Creating an AVM” in the *Cisco Active Network Abstraction 3.7.1 Administrator Guide*.

**Note**

To create an AVM, you must be logged in as a user with the admin role.

Creating a Test Instance of the VNE

For testing purposes, we recommend that you create a single instance of the VNE that you have customized with the VCB. This can be a VNE created from a U-VNE template or a developed VNE for which you have added a new module.

Testing a single VNE instance helps you scale a rollout more easily. For example, if you have 100 devices of a certain type that you are introducing to your managed network, first create a single VNE instance on which to test your customizations. After testing is complete, create additional VNEs for the other 99 devices.

To create a single instance of the U-VNE:

-
- Step 1** Log in to Cisco ANA as a user with the admin role.
- Step 2** In the Administration window, right-click the AVM that you created for testing purposes, then choose **New VNE**. The New VNE dialog box opens.
- Step 3** Enter the details of the U-VNE, then click **OK**. You must enter the following:
- IP address of the device.
 - **Scheme**—Select product.
 - SNMP credentials.
 - Telnet credentials and login sequence. Cisco ANA can model the physical containment without this information, but certain physical and logical properties will not be modeled.
- Step 4** Verify that the communication state and investigation state of the new VNE are normal. See:
- [Checking the Communication State of the Test Instance, page 19-10](#)
 - [Checking the Investigation State of the Test Instance, page 19-10](#)
-

**Note**

For more information, see “Adding a VNE” in *Cisco Active Network Abstraction 3.7.1 Administrator Guide*.

Checking the Communication State of the Test Instance

After you create a test instance of the U-VNE, you must verify that Cisco ANA can communicate with the device that it manages.

To check the communication state of the test instance:

-
- Step 1** Using the Cisco ANA client, navigate to the Inventory window.
- Step 2** Locate the device, then double-click it, or right-click and choose **Properties**.
The device will be listed using the user-friendly name you defined with the command.
- Step 3** Check the status of the Communication State field.
- Step 4** Do one of the following:
- If the status is Device Reachable, this indicates that all of the enabled protocols on the device are responding.
 - If the status is Device Unreachable, this indicates that at least one of the enabled protocols is not responding. If this occurs, troubleshoot the problem, as described in [Device Not Reachable](#), page 19-16.
-

Checking the Investigation State of the Test Instance

The investigation state indicates whether Cisco ANA can discover the physical and logical inventory of the device. An investigation that is stuck or that is otherwise incomplete might indicate a problem that requires you to delete the U-VNE.

To check the investigation state:

-
- Step 1** Using the Cisco ANA client, navigate to the Inventory window.
- Step 2** Locate the device, then double-click it, or right-click and select **Properties**.
The device will be listed using the user-friendly name you defined with the command.
- Step 3** Check the status of the Investigation State field.
- Step 4** Do one of the following:
- If the status is Normal, proceed to the next test.
 - If the status is Incomplete, this indicates that Cisco ANA is unable to model all the components in the device. You must investigate further to determine whether the components or properties that cannot be modeled prevent you from using the U-VNE in your network. For troubleshooting details, see [Investigation State Not Operational](#), page 19-17.
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**Note**

To learn how to stop a VNE that becomes stuck during the investigation phase, see “Changing VNE Status (Start, Stop, Maintenance)” in the [Cisco Active Network Abstraction 3.7.1 Administrator Guide](#).

Measuring Device Performance

We recommend that you use an element manager or similar application to measure CPU and memory usage on the device before you start managing it with the VNE. This provides a baseline for comparison when you later measure the load on the VNE as part of the testing process. You should simulate various scenarios, including those that place heavy loads on the device, so that you can later determine the effect of your VNE customizations on device performance. See [Testing CPU and Memory Usage, page 19-14](#).

Testing and Certifying Customized Device Types

To test and certify U-VNEs, we recommend that you follow these procedures:

- [Preparing Compliance Reports, page 19-11](#)
- [Testing the Physical Inventory, page 19-12](#)
- [Testing the Logical Inventory, page 19-13](#)
- [Testing the Topology, page 19-14](#)
- [Testing CPU and Memory Usage, page 19-14](#)
- [Testing That Cisco ANA Receives Events from an NE and Generates Tickets, page 19-14](#)
- [Verifying Module Events, page 19-15](#)

Preparing Compliance Reports

As you complete the tests described in this chapter, we recommend that you capture the results in a compliance report. A compliance report makes it easier for you to evaluate whether the U-VNE suits your needs or whether you will need to try again by cloning from a different device or using a different U-VNE template.

Create a compliance report using the information provided in [Cisco Active Network Abstraction 3.7.1 Reference Guide](#) (for a U-VNE that was cloned from an existing device family) or [U-VNE Templates, page 22-1](#) (for a template-based U-VNE). Use the information to do the following:

1. Copy each technology table to a file (such as a spreadsheet).
2. Remove any columns that describe support for templates other than the one you are using.
3. Add a column for verifying whether each supported property is modeled in Cisco ANA.
4. Fill out the final column, identifying the supported and unsupported properties.

Assessing a customization requires that you test on a reasonable configuration (test-to-success) and that you evaluate extreme cases (test-to-fail).



Note

You cannot use the VCB to change the templates themselves; for example, to support additional CLIs or MIBs or to modify the parsing of the device results.

If you find gaps in the modeling of the U-VNE, you can try using Soft Properties. If you need more management capability or you prefer to have developed VNE drivers for devices that are not already in the Cisco ANA VNE support scope, contact your Cisco account representative for any available Cisco Advanced Services alternative.

Testing the Physical Inventory

The physical inventory reflects the physical components of the managed network element, including its:

- Port Connector—Port details.
- Shelf—Chassis or rack where various types of equipment may be placed or inserted.
- Slot—Details on where the modules are inserted.
- Module—Physical module or adapter card details; hardware description.



Note

The list of components that are actually displayed for the U-VNE in the Cisco ANA client are dependent on the device from which the U-VNE was cloned or on the template that was used to create the U-VNE.

To view the physical inventory:

-
- Step 1** Launch Cisco ANA Network Vision.
 - Step 2** Add the U-VNE into a map.
 - Step 3** Double-click the U-VNE.
 - Step 4** Expand the **Physical Inventory** tree node.
 - Step 5** Compare the physical containment displayed in the Physical Inventory tree with the actual components contained in the device managed by the U-VNE. In particular, make sure that the following information is accurate:
 - Slot Number
 - Number of Ports
 - Connector Type
 - Step 6** Look for signs that the U-VNE does not fully model the device, including:
 - Blue icons indicating that a component that was not modeled properly. Gray icons are OK.
 - A module without ports; for example, if the WS-X6724 module is described as having 24 ports, but no ports appear beneath the module in the tree.
 - Step 7** Select each component in the tree, then check the Properties window to verify that the physical inventory includes all the properties that are supported by the U-VNE (as defined in the U-VNE template on which it is based).
 - Step 8** Record your results in a compliance report. See [Preparing Compliance Reports, page 19-11](#).
 - Step 9** If there are components or properties that are missing or incomplete, you must decide whether these components or properties prevent you from using the U-VNE in your network:
 - If you determine that the U-VNE can be managed successfully by Cisco ANA without the unsupported component or property, proceed to the next test.



Tip

In the case of a missing property, try adding it using the Soft Property Builder.

- If you need more management capability or you prefer to have developed VNE drivers for devices that are not already in the Cisco ANA VNE support scope, you can contact your Cisco account representative for any available Cisco Advanced Services alternative.

(The VCB enables you to extend VNEs and create U-VNEs as specified in this document. Other Cisco ANA features, such as Soft Properties and Command Builder, described in separate sections, offer further extensibility to the U-VNE and developed VNE drivers.)



Note To delete a U-VNE; see [vcb uvne delete](#), page 19-25.

Testing the Logical Inventory

The Logical Inventory tab of the Cisco ANA client displays a hierarchical (tree) view of the logical inventory of the U-VNE which can include:

- Cisco Discovery Protocol
- Routing Entity
- ARP Entity
- IP Interfaces

The list of components that are actually displayed in the Cisco ANA client are dependent on the technologies supported either the device family from which the U-VNE was cloned or by the template that was used to create the U-VNE.

To view the logical inventory:

-
- Step 1** Launch Cisco ANA Network Vision.
 - Step 2** Add the U-VNE into a map.
 - Step 3** Double-click the U-VNE.
 - Step 4** Expand the **Logical Inventory** tree node.
 - Step 5** Compare the information displayed in the Logical Inventory tree with the actual technologies supported by the U-VNE, as defined by the template on which the U-VNE is based. See [U-VNE Templates](#), page 22-1.
 - Step 6** Select each component in the tree, then check the Properties view to verify that the logical inventory includes all the properties that are supported by the U-VNE (as defined in the U-VNE template on which it is based).

Verify the IP interfaces by querying the device for its list of IP interfaces and verifying that all of them appear under IP Flow Points.
 - Step 7** Record your results in a compliance report. See [Preparing Compliance Reports](#), page 19-11.
 - Step 8** If any technologies or properties are missing or incomplete, you must investigate further to determine whether these technologies or properties prevent you from using the U-VNE in your network:
 - If you determine that the device can be managed successfully by Cisco ANA without the unsupported technology or property, proceed to the next test.
 - If you need more management capability or you prefer to have developed VNE drivers for devices that are not already in the Cisco ANA VNE support scope, you can contact your Cisco account representative for any available Cisco Advanced Services alternative.
-

Testing the Topology

**Note**

Ensure that you perform both positive testing (on a reasonable configuration) and negative testing (on simulations of expected network scenarios).

The topology map displays the status of the network elements and the connectivity between them. The topology map is used as a general dashboard to view the network elements, their status, the relationships between them, and the alarms that are raised on them. To view the topology map, use the Monitoring window.

To create an Ethernet topology, Cisco ANA must model the following properties of the U-VNE:

- The MAC address of the port that is part of the topology.
- The sysname of the U-VNE.

In addition, the Operational Status of the port must be OK.

We recommend that you use path trace when checking important topology or root cause analysis use cases.

Testing CPU and Memory Usage

**Note**

Ensure that you perform both positive testing (on a reasonable configuration) and negative testing (on simulations of expected network scenarios).

In addition to verifying how well the U-VNE models the device, we recommend that you measure the CPU and memory usage demands placed by the U-VNE on the device. During test preparation, before adding the VNE instance, you measured CPU and memory usage on the NE; (see [Measuring Device Performance, page 19-11](#)). Now, compare the usage on the NE against the usage for the VNE instance on the Cisco ANA AVM and unit as follows:

- To view CPU usage, look at the properties of the U-VNE in the Inventory window.
- To monitor additional information, such as memory usage, use the Cisco ANA diagnostic client. To access the diagnostic client, enter the following address in your web browser:

`http://gatewayIPAddress:6080/ana/services/install/index.html`

Testing That Cisco ANA Receives Events from an NE and Generates Tickets

This topic describes events and alarms and provides steps for verifying that Cisco ANA receives events from an NE and that the VNE driver parses the events correctly, generating tickets if the events are ticketable.

**Note**

Event parsing depends on the completeness and correctness of the modeling. Parsing BGP events, for example, depends on BGP being modeled correctly in the inventory.

Cisco ANA receives events and generate alarms:

- **Events**—An indication of a distinct occurrence that happened at a specific point in time. Events are derived from incoming traps and notifications, and from detected status changes.
- **Alarms**—A scenario that involves a fault occurring in the network or management system. An alarm is composed of a sequence of events, each representing a specific point in the alarm lifecycle. Alarms represent the complete fault lifecycle, from the time that the alarm is opened (when the fault is first detected) until it is closed and acknowledged.

For you to use tickets, Cisco ANA must be able to generate them from the events and alarms generated by the NE. A ticket represents the complete alarm correlation tree of a specific fault scenario. It can also be identified by the topmost or “root of all roots” alarm.

Tickets are displayed in the Troubleshooting window. From this window, drill down to view the alarm hierarchy.

Before You Begin

Make sure that you have configured the device to send events to the Cisco ANA server. See [Configuring a Device to Send Events, page 21-17](#).

To check for events from the NE:

-
- Step 1** Switch to the Troubleshooting window in Cisco ANA.
 - Step 2** Check whether the Link Down event that you generated during your test preparations appears in the table.
 - Step 3** Filter the table to display alarms with a severity level of Cleared, then click **Go**.
 - Step 4** Check whether the Link Up event that you generated during your test preparations appears in the table.
 - Step 5** Using the list of supported events (listed in [Cisco Active Network Abstraction 3.7.1 Reference Guide](#) for the cloned-from device family or listed in [U-VNE Templates, page 22-1](#) for a template-based U-VNE), generate additional events from the device and see whether the events are captured in the Troubleshooting window.
 - Step 6** If the events do not appear in Cisco ANA, proceed as follows:
 - Check for mistakes in the device configuration.
 - Use an external tool, such as a MIB browser, to determine whether traps are being sent by the device.
 - Use the steps for troubleshooting event customization illustrated in [Figure 21-3](#) (and described in the procedure that follows it).
-

Verifying Module Events

Verify that a new module that you added is managed properly by Cisco ANA, by doing the following:

1. Look in the Troubleshooting window and confirm that there are no Module Unsupported alarms.
2. Check whether traps generated by the ports on the module (for example, Port Down/Port Up traps) are associated with the correct interface. If the ports are not modeled properly, any traps generated by the ports on that module are associated to the VNE or the U-VNE.

**Note**

Use the Location column to determine which component is associated with each event. For example, events associated with the U-VNE are marked by the name of the network element. If the event is associated with a module, the slot number is appended to the network element. If the event is associated with a specific interface, the interface name is appended.

Troubleshooting Device Type Customizations

This section describes basic troubleshooting procedures to perform when Cisco ANA cannot communicate with a U-VNE, and includes the following topics:

- [Device Not Reachable, page 19-16](#)
- [Investigation State Not Operational, page 19-17](#)

Device Not Reachable

If you cannot communicate with a U-VNE, try the following:

- Launch Cisco ANA Manage and verify the Admin Status and Operational Status of the VNE. The Admin Status should be Enabled and the Operational Status should be Up.
- Verify that you are using the correct SNMP and Telnet credentials for the device.
- Ping the device from the Cisco ANA server.

**Note**

For more information, see [Cisco Active Network Abstraction 3.7.1 Administrator Guide](#).

Investigation State Not Operational

If the investigation state of the U-VNE is any value other than Operational, perform the actions described in the following table.

Table 19-5 Troubleshooting the Investigation State

State	Description	Action
Partially Discovered	The U-VNE is encountering a problem, such as an exception caused by a particular discovery command or an unsupported module.	<p>Examine the AVM log for messages about:</p> <ul style="list-style-type: none"> Failed commands or OIDs. Unsupported modules. See Log Entry for Unsupported Module, page 19-17. <p>Note For more information, see Cisco ANA Logs in <i>Cisco Active Network Abstraction 3.7.1 Administrator Guide</i>.</p> <p>To add modules, see Managing Additional Modules Using the VCB, page 20-1. After adding a module, you must restart the AVM that contains the U-VNE.</p>
Unsupported	The U-VNE is encountering registration problems.	<p>Use the vcb sitechanges view command to verify that the U-VNE registrations were created properly. In particular, make sure that you used the correct sysObjectID for this device type when using the VCB to create the U-VNE-driver.</p> <p>If the sysObjectID is not correct:</p> <ul style="list-style-type: none"> Use the vcb delete commands to remove the U-VNE-driver. See vcb uvne delete, page 19-25. Recreate the U-VNE driver using the correct sysObjectID. See Customizing Device Types—Adding a U-VNE, page 19-6.

Log Entry for Unsupported Module

The log entry for an unsupported module looks like this:

```
ERROR [07 07 2010 17:07:47.810 IST] - PhysicalCommandHandler.isEntitySupported -
192.168.20.1 can't create module with entry
value spec/physical/modules/.1.3.6.1.4.1.9.12.3.1.9.29.118.1/loaders will use
default module loader
```

If you have an unsupported module, your choices are to either use the VCB to add the module (see [Managing Additional Modules Using the VCB](#), page 20-1), or manage the device in Cisco ANA without managing that particular module.

Moving Tested and Certified Customizations to Production



Tip

Always perform customization in a maintenance window.

Export the configuration from your lab setup and import it into the production setup using the following procedures:

- [Exporting VCB Registry Customizations, page 18-7](#)
- [Importing VCB Registry Customizations, page 18-7](#)

After you import the changes to the production server:

1. Restart Cisco ANA or at a minimum, restart all VNEs and AVMs that need to support the customizations.
2. Repeat testing and certification to ensure that the customizations are functioning as expected in your production environment. See [Testing and Certifying Customized Device Types, page 19-11](#).

Device Type Customization Command Reference

This command reference contains the following sections:

- [vcb uvne, page 19-18](#)
- [vcb devicetype, page 19-26](#)

vcb uvne

Use the following **vcb uvne** commands to create, view, modify, and delete U-VNE-drivers:

- [vcb uvne add, page 19-18](#)
- [vcb uvne view, page 19-21](#)
- [vcb uvne modify, page 19-23](#)
- [vcb uvne delete, page 19-25](#)

vcb uvne add

The **vcb uvne add** command creates a U-VNE-driver by: associating a U-VNE template with the device type associated with the given sysOID, or by cloning from an existing device or device family.

Synopsis

```
vcb uvne add -sysoid sysoid -template template name -group template filename [-devicetype
device type name] -user username -password password

vcb uvne add -sysoid sysoid -clonesysoid clone_sysoid [-devicetype device type name]
-user username -password password

vcb uvne add -sysoid sysoid -clonedevicefamily devicefamily [-devicetype device type]
-user username -password password
```

```
vcb uvne add -sysoid sysoid -softwareversion software-version -clonesoftwareversion
clone-softwareversion -clonedevicefamily devicefamily [-devicetype device type name]
-user username -password password
```

Description

The **vcb uvne add** command creates a U-VNE-driver for the device type associated with the given sysOID using the specified U-VNE template. Creating a U-VNE-driver enables the Auto Detect feature in Cisco ANA to associate a device with this sysOID with the VNE-driver implementation defined by the template.

This command creates a separate registry configuration for the U-VNE. Any configuration setting given in the command parameters affect this copy.



Note

This command does not create the device category for the device. For more information, see [vcb devicetype add](#), page 19-26.

Usage Examples

Example 1

```
vcb uvne add -sysoid .1.2.3.4 -template GenericUVNE -group uvne-product -user root
-password admin
```

Enables discovery of the device with sysOID 1.2.3.4 using the *GenericUVNE* template, which is located in group *uvne-product*.

The command does not create any network element attributes for the newly added device. To assign the device a user-friendly name and the right network element category, use the **-devicetype** option (see the “[vcb devicetype add](#)” section on page 19-26).

Example 2

```
vcb uvne add -sysoid .1.2.3.4 -clonesysoid .1.3.6.1.4.1.9.1.108 -user root -password
admin
```

Enables discovery of a new network element (with sysOID .1.2.3.4) that points to registration—[scheme](#) and instrumentation commands—of the already supported sysOID .1.3.6.1.4.1.9.1.108.

(To create a list of already supported VNEs, see [vcb uvne view](#), page 19-21.)

Example 3

```
vcb uvne add -sysoid .1.2.3.4 -softwareversion 12.6(2) -clonesoftwareversion 12.0(23)S2
-clonedevicefamily 10008 -user root -password admin
```

Adds support for a new network element (with sysOID .1.2.3.4), that points to registrations—[scheme](#) and instrumentation commands—of the already supported software version 12.0(23)S2 for the device family 100xx. (For a list of already supported software versions, see [vcb uvne view](#), page 19-21.)

Example 4

```
vcb uvne add -sysoid .1.2.3.4 -clonedevicefamily 10008 -user root -password admin
```

Enables discovery of a new network element (with sysOID .1.2.3.4), that points to registrations—[scheme](#) and instrumentation commands—for the device family 10008.

Options

Table 19-6 Options and Arguments—`vcb uvne add`

Option Argument	Description
<code>sysoid</code> <i>sysoid</i>	The sysObject ID of the device for which to create a U-VNE-driver using the implementation defined in the U-VNE template. Note Each sysOID value in the system must be unique.
<code>template</code> <i>template name</i>	The name of the U-VNE template from which to create the U-VNE-driver. See U-VNE Templates, page 22-1 . Note This option is mutually exclusive with the -clonesysoid and -clonedevicefamily options.
<code>group</code> <i>template filename</i>	The name of the file in which the U-VNE template is located. U-VNE templates are located in the uvne-product file. Note Use this option with the -template option only.
<code>devicetype</code> <i>device type name</i>	(Optional) The U-VNE devicetype name. If not specified, the device type is: <ul style="list-style-type: none"> Defined as Unknown when you use the -template option. Inherited from the device or device family when you use the -clonesysoid or -clonedevicefamily options. <p>The device type name appears in the UI and is associated with a category; its category determines which icon is displayed, and other presentation aspects are derived from this reference. To use a new device type name, first add it using the vcb devicetype add command. For more information, see vcb devicetype add, page 19-26.</p>
<code>clonesysoid</code> <i>clone-sysoid</i>	The sysObject ID of an already supported VNE.. To view sysOIDs for supported VNEs, use the vcb uvne view -sysoid all command.
<code>softwareversion</code> <i>software-version</i>	The software version that you want to add for a U-VNE. To obtain the software version string, use the show version command.
<code>clonesoftwareversion</code> <i>clone-softwareversion</i>	An already supported software version that you want to clone. The software version must already be supported for a particular device family. For a list of supported device families, use the command vcb uvne view -sysoid all -user user -password password . For more information, see vcb uvne view, page 19-21 .
<code>clonedevicefamily</code> <i>devicefamily</i>	A supported device family. For a list of supported device families, use the command vcb uvne view -sysoid all -user user -password password . For more information, see vcb uvne view, page 19-21 . Note This option is mutually exclusive with the -template option.



Note

For the list of global options, see [Global Command Options, page 18-9](#).

Error Codes

Table 19-7 Error Codes—*vcb uvne add*

Code	Description
101	The sysOID already exists and is already modeled as a VNE.
102	U-VNE template file not found.
103	No such template name in the templates file.
104	No such device type configuration exists.



Note

For the list of general VCB error codes, see [General Error Codes, page 18-10](#).

vcb uvne view

The **vcb uvne view** command returns an existing U-VNE configuration.

Synopsis

```
vcb uvne view -sysoid {sysoid | all} -user username -password password
vcb uvne view -group {template filename| all} -user username -password password
vcb uvne view -devicetype {device type | all} -user username -password password
```

Description

Use the **vcb uvne view** command to:

- Display information based on the specified sysOID.
- Display available templates found in the specified group.
- Display information based on the specified device type name.

Usage Examples

Example 1

```
vcb uvne view -sysoid 1.2.3.4 -user root -password admin
```

Returns the configuration of the VNE with the sysOID 1.2.3.4, including the U-VNE template (or the device family for a developed VNE). If device-type associations are defined (using the **vcb devicetype add** command), these associations are also displayed.

Example 2

```
vcb uvne view -sysoid all -user root -password admin
```

Returns all known configured sysOIDs (both U-VNE and regular VNEs) and associated U-VNE templates.

Example 3

```
vcb uvne view -devicetype all -user root -password admin
```

Returns the list of device-type associations, including the unique name of each association and the user-friendly name displayed in Cisco ANA for any device that uses this association.

Options**Table 19-8 Options and Arguments—vcb uvne view**

Option Argument	Description
sysoid <i>sysoid</i>	Returns the configuration of the specified VNE, including the device type, the user-friendly name, and the template (for U-VNEs). Tip Enter all as the <i>sysoid</i> to view the configuration of all sysOIDs (U-VNEs and developed VNEs) configured in the system.
group <i>template filename</i>	Returns the configuration of all sysOIDs and templates contained in the specified group. Tip Enter all as the <i>template filename</i> to view the template associations for each group in the system.
devicetype <i>device type</i>	Returns the device-type associations (including the user-friendly name and NE category) for the named device type. Tip Enter all as the <i>device type</i> to view the device-type associations for each device type in the system.

**Note**

For the list of global options, see [Global Command Options, page 18-9](#).

Error Codes**Table 19-9 Error Codes—vcb uvne view**

Code	Description
102	U-VNE template file not found.
103	No such template name in the templates file.
104	No such device type configuration exists.
111	The SysOID specified does not exist.

**Note**

For the list of general VCB error codes, see [General Error Codes, page 18-10](#).

vcb uvne modify

The **vcb uvne modify** command modifies the configuration of an existing U-VNE.

Synopsis

```
vcb uvne modify -sysoid sysoid -template template name -group template filename -user username -password password  
vcb uvne modify -sysoid sysoid -devicetype device type -user username -password password  
vcb uvne modify -sysoid sysoid -clonesysoid sysoid -user username -password password  
vcb uvne modify -sysoid sysoid -softwareversion softwareversion -clonesoftwareversion clonesoftwareversion -clonedevicefamily devicefamily -user username -password password  
vcb uvne modify -sysoid sysoid -clonedevicefamily devicefamily -user username -password password
```

Description

Use the **vcb uvne modify** command to:

- Associate the U-VNE with another U-VNE template.
- Change the device type associated with the U-VNE.

Usage Examples

Example 1

```
vcb uvne modify -sysoid .1.2.3.4 -group uvne-product -template cisco-chassis-mib-template -user root -password admin
```

Modifies the template of the U-VNE to the newly specified template defined in the given group.

Example 2

```
vcb uvne modify -sysoid .1.2.3.4 -devicetype CISCO_1760 -user root -password admin
```

Modifies the device type for the U-VNE with sysOID 1.2.3.4.

Example 3

```
vcb uvne modify -sysoid .1.2.3.4 -clonesysoid .1.3.6.1.4.1.9.1.108 -user root -password admin
```

Modifies a network element, with sysOID .1.2.3.4, to point to a new device family based on the clone sysoid .1.3.6.1.4.1.9.1.108.

Example 4

```
vcb uvne modify -sysoid .1.2.3.4 -softwareversion 12.6(2) -clonesoftwareversion 12.0(23)S3 -clonedevicefamily 100xx -user root -password admin
```

Modifies support for a network element with sysOID .1.2.3.4, to point to a new software version, 12.0(23)S3, for the device family 100xx.

Example 5

```
vcb uvne modify -sysoid .1.2.3.4 -clonedevicefamily 12xxx -user root -password admin
```

Modifies support for a new network element, with sysOID .1.2.3.4, to point to registrations—[scheme](#) and instrumentation commands—of the device family 12xxx.

Options

Table 19-10 Options and Arguments—vcb uvne modify

Option Argument	Description
sysoid <i>sysoid</i>	The sysObject ID of the U-VNE-driver configuration that you want to modify.
template <i>template name</i>	The name of the U-VNE template to which the U-VNE should be associated. Use this option to modify the U-VNE template from which the U-VNE-driver derives its configuration. Note Using this option does not overwrite other configuration changes made with the VCB, such as user-experience attributes that are defined with the vcb devicetype add command.
group <i>template filename</i>	The name of the group that includes the U-VNE template, such as uvne-product.
devicetype <i>device type</i>	The device type associated with the U-VNE.
clonesysoid <i>clone-sysoid</i>	The sysObject ID of an already supported VNE. To view sysOIDs for supported VNEs, use the vcb uvne view -sysoid all command.
softwareversion <i>software-version</i>	The software version that you want to support for a U-VNE. To obtain the software version string, use the show version command.
clonesoftwareversion <i>clone-softwareversion</i>	An already supported software version that you want to clone. The software version must already be supported for a particular device family.
clonedevicefamily <i>deviceFamily</i>	A supported device family. For a list of supported device families, use the command vcb uvne view -sysoid all -user user -password password . For more information, see vcb uvne view, page 19-21 .

**Note**

For the list of global options, see [Global Command Options, page 18-9](#).

Error Codes

Table 19-11 Error Codes—vcb uvne modify

Code	Description
102	U-VNE template file not found.
103	No such template name in the templates file.

Table 19-11 Error Codes—*vcb uvne modify* (continued)

Code	Description
104	No such device type configuration exists.
112	The sysOID does not exist or already exists and is already modeled as a VNE.

**Note**

For the list of general VCB error codes, see [General Error Codes, page 18-10](#).

vcb uvne delete

The **vcb uvne delete** command deletes a U-VNE.

Synopsis

```
vcb uvne delete -sysoid sysoid -user username -password password
vcb uvne delete -sysoid sysoid -devicefamily DeviceFamilyName -scheme schemeName
-softwareversion "softwareVersionNumber" -user username -password password
```

Description

The **vcb uvne delete** command is useful when migrating from a U-VNE to a developed VNE. If, in an upgrade, Cisco ANA provides a DSP that contains a developed VNE to support the device type, the need for the U-VNE is eliminated. You must delete the U-VNE before Cisco ANA can use the developed VNE to model and manage the device.

Deleting a template-based U-VNE has no effect on the U-VNE template from which it derives its implementation.

Usage Example

Example 1

```
vcb uvne delete -sysoid .1.2.3.4 -user root -password admin
```

Deletes the U-VNE-driver configured for the device with sysOID 1.2.3.4.

Example 2

```
vcb uvne delete -sysoid .1.2.3.4 -devicefamily 70xx -scheme product
-softwareversion "12.0(23)S3"
```

Deletes the U-VNE driver configured for the device with sysOID .1.2.3.4 and running software version 12.0(23)S3 from device family 70xx in the product scheme.

Options

Table 19-12 Options and Arguments—*vcb uvne delete*

Option Argument	Description
<code>sysoid <i>sysoid</i></code>	The sysObject ID of the U-VNE configuration that you want to delete. Note Deleting the U-VNE does not delete or otherwise affect the U-VNE template from which the U-VNE was created.



Note

For the list of global options, see [Global Command Options, page 18-9](#).

Error Codes

Table 19-13 Error Codes—*vcb uvne delete*

Code	Description
112	The sysOID does not exist or already exists and is already modeled as a VNE.



Note

For the list of general VCB error codes, see [General Error Codes, page 18-10](#).

vcb devicetype

Use the following **vcb devicetype** commands to create, view, modify, and delete user-experience attributes for the specified device type:

- [vcb devicetype add, page 19-26](#)
- [vcb devicetype view, page 19-28](#)
- [vcb devicetype modify, page 19-29](#)
- [vcb devicetype delete, page 19-31](#)

vcb devicetype add

The **vcb devicetype add** command creates new user-experience attributes for the specified device type. Each device type is associated with a user-friendly name, icon, and device grouping.

Synopsis

```
vcb devicetype add -devicetype device type -category ana device category -name device name [-key device type key]-user root -password admin
```

Description

The **vcb devicetype add** command creates user-experience attributes that affect how a device type is managed and displayed in Cisco ANA.



Note

This command is typically used before adding a new U-VNE using the **vcb uvne add** command. For more information, see [vcb uvne add, page 19-18](#).

Usage Example

```
vcb devicetype add -devicetype CISCO_1760 -category ROUTER -name "Cisco 1760 Router"
-user root -password admin
```

Adds a device-type definition for the Cisco 1760 router, including the device category and user-friendly name that will appear in the Cisco ANA UI. Reference this definition when adding U-VNE definitions for a Cisco 1760 device using the **vcb uvne add** command.

Options

Table 19-14 Options and Arguments—vcb devicetype add

Option Argument	Description
devicetype <i>device type</i>	The name to assign to the new device type. Each name must be unique. To see existing device types, use the vcb devicetype view command.
category <i>ana device category</i>	The category to assign to the new device type, entered as a string (router, switch, unknown, and so on). By default, the device category defined in the U-VNE template is used.
name <i>device name</i>	The name to display for this device type in Cisco ANA. By default, the name is empty. Note The name need not be unique. The VCB does not enforce a naming convention for this value.
key <i>device type key</i>	(Optional) The unique ID of the new device type. This value is not displayed in Cisco ANA. Note We recommend that you <i>not</i> use this option, and let the VCB define the key instead.



Note

For the list of global options, see [Global Command Options, page 18-9](#).

Error Codes

Table 19-15 Error Codes—*vcb devicetype add*

Code	Description
501	Device type name already exists in the deviceTypes
502	Category value does not match any of the possible values
503	Key for this template is not unique
504	Device type name contains illegal characters
505	SysOID not found or not bound to device type in devicetypes.xml



Note

For the list of general VCB error codes, see [General Error Codes, page 18-10](#).

vcb devicetype view

The **vcb devicetype view** command returns an existing device-type association.

Synopsis

```
vcb devicetype view -devicetype {device type | all} -user root -password admin
```

Description

Use the **vcb devicetype view** command to:

- Display user-experience attributes based on the specified device type.
- Display the list of device types defined in the system.
- Display all available device categories.

Usage Examples

Example 1

```
vcb devicetype view -devicetype all -user root -password admin
```

Returns a list of all device types defined in Cisco ANA.

Example 2

```
vcb devicetype view -devicetype CISCO_1760 -user root -password admin
```

Returns the device type details for device type CISCO_1760, including the category and user-friendly name defined for this type.

Options

Table 19-16 Options and Arguments—*vcb devicetype* view

Option Argument	Description
<code>devicetype</code> <i>device type</i>	The name of the device type user-experience attributes (including name and device category) that you want to view. Tip Enter all as the <i>devicetype</i> to view a list of all device types defined in the system.
<code>category all</code>	Returns all defined device categories (router, switch, and so on) and their numeric equivalents.



Note

For the list of global options, see [Global Command Options, page 18-9](#).

Error Codes

Table 19-17 Error Codes—*vcb devicetype* view

Code	Description
511	deviceType not found



Note

For the list of general VCB error codes, see [General Error Codes, page 18-10](#).

vcb devicetype modify

The **vcb devicetype modify** command modifies the user-experience attributes associated with specific device types.

Synopsis

```
vcb devicetype modify -devicetype device type name [-category ana device category]
[-name device name] [-key device type key]-user username -password password
```

Description

The **vcb devicetype modify** command overwrites the user-experience settings defined for a device type, including the name, icon, and device category as they appear in Cisco ANA.

Usage Example

```
vcb devicetype modify -devicetype CISCO_1760 -category DSLAM -name "Cisco 1760 DSLAM"
-user root -password admin
```

Modifies the category and name assigned to the specified device type. Any VNE that uses the U-VNE-driver associated with this device type inherits these modified user-experience attributes.

Options

Table 19-18 Options and Arguments—*vcb devicetype modify*

Option Argument	Description
devicetype <i>device type</i>	The name of the device type user-experience attributes that you want to modify.
category <i>ana device category</i>	(Optional) Modifies the category assigned to the device type. Enter the category as a string (router, switch, unknown, and so on).
name <i>device name</i>	(Optional) Modifies the name that is displayed for this device type in Cisco ANA.
key <i>device type key</i>	(Optional) Modifies the unique ID of the device type. This value is not displayed in Cisco ANA. Note We recommend that you <i>not</i> use this option, and let the VCB define the key instead.



Note

For the list of global options, see [Global Command Options, page 18-9](#).

Error Codes

Table 19-19 Error Codes—*vcb devicetype modify*

Code	Description
502	Category value does not match any of the possible values for this enum
503	Key for this device type is not unique
504	Device type name contains illegal characters
511	Device type not found



Note

For the list of general VCB error codes, see [General Error Codes, page 18-10](#).

vcb devicetype delete

The **vcb devicetype delete** command deletes the user-experience attributes that are defined for the specified device type.

Synopsis

```
vcb devicetype delete -devicetype device type -userdefined -user username
                        -password password
```

Description

The **vcb devicetype delete** command deletes the user-friendly name, icon, and grouping that were defined for the specified device type from the site.xml file. It does not delete or otherwise modify the U-VNE template from which the U-VNE for this device type was created.

Usage Example

```
vcb devicetype delete -devicetype CISCO_1760 -userdefined -user root -password admin
```

Deletes the user-experience attributes defined for the CISCO_1760 device type.

Options

Table 19-20 Options and Arguments—vcb devicetype delete

Option Argument	Description
devicetype <i>device type</i>	The name of the device type from which you want to delete user-experience attributes.



Note

For the list of global options, see [Global Command Options, page 18-9](#).

Error Codes

Table 19-21 Error Codes—vcb devicetype delete

Code	Description
511	Device type not found.



Note

For the list of general VCB error codes, see [General Error Codes, page 18-10](#).

