

Easy Virtual Network Management and Troubleshooting

This module describes how to manage and troubleshoot Easy Virtual Network (EVN).

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Prerequisites for EVN Management and Troubleshooting

- Read the "Overview of Easy Virtual Network" section and the "Configuring Easy Virtual Network" section, and implement EVN.

Information About EVN Management and Troubleshooting

Routing Context for EXEC Mode Reduces Repetitive VRF Specification

There may be occasions when you want to issue several EXEC commands to apply to a single virtual network. In order to reduce the repetitive entering of virtual routing and forwarding (VRF) names for multiple EXEC commands, the **routing-context vrf** command allows you to set the VRF context of such EXEC commands once, and then proceed using EXEC commands.

The table below shows four EXEC commands in Cisco IOS XE software without routing context and in routing context. Note that in the left column, each EXEC command must specify the VRF. In the right column, the VRF context is specified once and the prompt changes to reflect that VRF; there is no need to specify the VRF in each command.

Table 1: EXEC Commands Routing Context

EXEC Commands CLI without Routing Context	EXEC Routing Context
—	`Router# routing-context vrf red` `Router%red#`
`Router# show ip route vrf red` [Routing table output for VRF red]	`Router%red# show ip route` [Routing table output for VRF red]
`Router# ping vrf red 10.1.1.1` [Ping result using VRF red]	`Router%red# ping 10.1.1.1` [Ping result using VRF red]
`Router# telnet 10.1.1.1 /vrf red` [Telnet to 10.1.1.1 in VRF red]	`Router%red# telnet 10.1.1.1` [Telnet to 10.1.1.1 in VRF red]
`Router# traceroute vrf red 10.1.1.1` [Traceroute output in VRF red]	`Router%red# traceroute 10.1.1.1` [Traceroute output in VRF red]

Output of traceroute Command Indicates VRF Name and VRF Tag

Output of the **traceroute** command is enhanced to make troubleshooting easier by displaying the incoming VRF name/tag and the outgoing VRF name/tag, as shown in the following example:

```
Router# traceroute vrf red 10.0.10.12
Type escape sequence to abort.
Tracing the route to 10.0.10.12
VRF info: (vrf in name/id, vrf out name/id)
  1 10.1.13.15 (red/13,red/13) 0 msec
    10.1.16.16 (red/13,red/13) 0 msec
    10.1.13.15 (red/13,red/13) 1 msec
  2 10.1.8.13 (red/13,red/13) 0 msec
    10.1.7.13 (red/13,red/13) 0 msec
    10.1.8.13 (red/13,red/13) 0 msec
  3 10.1.2.11 (red/13,blue/10) 1 msec 0 msec 0 msec
  4  *  *  *
```

Debug Output Filtering Per VRF

Using EVN, you can filter debug output per VRF by using the **debug condition vrf** command. The following is sample output from the **debug condition vrf** command:

```
Router# debug condition vrf red

Condition 1 set
CEF filter table debugging is on
CEF filter table debugging is on
R1#
```

```
*Aug 19 23:06:38.178: vrfmgr(0) Debug: Condition 1, vrf red triggered, count 1
R1#
```

CISCO-VRF-MIB

EVN provides a CISCO-VRF-MIB for VRF discovery and management.

How to Manage and Troubleshoot EVN

Setting the Routing Context for EXEC Mode to a Specific VRF

To reduce the repeated entering of virtual routing and forwarding (VRF) names when you are issuing EXEC commands on a router, set the routing context of the EXEC commands once, and then proceed with entering them in any order. Perform this task to set the routing context for EXEC mode to a specific VRF, issue EXEC commands, and then restore the system to the global EXEC context.

SUMMARY STEPS

1. **enable**
2. **routing-context vrf** *vrf-name*
3. **show ip route** [*ip-address* [*mask*] [**longer-prefixes**] | *protocol* [*process-id*] | **static download**]
4. **ping** [*protocol* [**tag**] {*host-name* | *system-address*}]
5. **telnet** *host* [*port*]
6. **traceroute** [**vrf** *vrf-name* | **topology** *topology-name*] [*protocol*] *destination*
7. **routing-context vrf global**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**routing-context vrf** *vrf-name* **Example:** `Router# routing-context vrf red`	Enters the routing context for EXEC mode to a specified VRF.
Step 3	**show ip route** [*ip-address* [*mask*] [**longer-prefixes**]	*protocol* [*process-id*]	**static download**] **Example:**	(Optional) Displays the current state of the routing table. • The system prompt changes to reflect the target VRF.

	Command or Action	Purpose
	`Router%red# show ip route`	• This example shows the **show ip route** command issued within the context of vNET red. The routing table for vNET red would be displayed.
Step 4	**ping** [*protocol* [**tag**] {*host-name* | *system-address*}] **Example:** `Router%red# ping 10.1.1.1`	(Optional) Sends an echo request packet to an address. • This example shows the **ping** command issued within the context of vNET red. Ping results using vNET red would be displayed.
Step 5	**telnet** *host* [*port*] **Example:** `Router%red# telnet 10.1.1.1`	(Optional) Logs in to a host that supports Telnet.
Step 6	**traceroute** [**vrf** *vrf-name* | **topology** *topology-name*] [*protocol*] *destination* **Example:** `Router%red# traceroute 10.1.1.1`	(Optional) Displays the route that packets will take to the destination.

Step 7	**routing-context vrf global**
	Example:
	`Router%red# routing-context vrf global`
	Example:
	`Router>`
		(Optional) Restores the system to the global EXEC context.
		• The prompt returns to the user EXEC prompt.

Enabling Debug Output for VRFs

SUMMARY STEPS

1. **enable**
2. **debug vrf** {**create** | **delete** | **error** | **ha** | **initialization** | **interface** | **ipv4** | **ipv6** | **issu** | **lock** | **lookup** | **mpls** | **selection**}

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:**	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
	`Router> enable`	
Step 2	**debug vrf** {**create** | **delete** | **error** | **ha** | **initialization** | **interface** | **ipv4** | **ipv6** | **issu** | **lock** | **lookup** | **mpls** | **selection**} **Example:** `Router# debug vrf ipv4`	Displays VRF debugging information.

Setting SNMP v2c Context for Virtual Networks

Perform this task to map an SNMP v2c context to a VRF. The following SNMP v2c configurations will then be done by the system automatically:

- Context creation (instead of the **snmp-server context** command), using the same name as the *context-name* entered in the **snmp context** command.
- Group creation (instead of the **snmp-server group** command), using the same name as the *community-name* entered in the **snmp context** command.
- Community creation (instead of the **snmp-server community** command), using the same name as the *community-name* entered in the **snmp context** command. The default permission is **ro** (read-only).
- Community context mapping (instead of the **snmp mib community-map** command).

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **vrf definition** *vrf-name*
4. **address-family ipv4**
5. **snmp context** *context-name* [**community** *community-name* [**rw** | **ro**]]

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:**	Enters global configuration mode.

	Command or Action	Purpose
	`Router# configure terminal`	
Step 3	**vrf definition** *vrf-name* **Example:** `Router(config)# vrf definition vrf1`	Defines a virtual routing and forwarding instance (VRF) and enters VRF configuration mode.
Step 4	**address-family ipv4** **Example:** `Device(config-vrf)# address-family ipv4`	Enters address family configuration mode to configure a routing session using standard IPv4 address prefixes.
Step 5	**snmp context** *context-name* [**community** *community-name* [**rw** | **ro**]] **Example:** `Router(config-vrf)# snmp context xxx community yyy`	Sets the SNMP v2c context for the VRF. • The default is read-only (**ro**).

Setting SNMP v3 Context for Virtual Networks

Perform this task to map an SNMP v3 context to a virtual routing and forwarding (VRF). The following SNMP v3 configurations will then be done by the system automatically:

- Context creation (instead of the **snmp-server context** command), using the same name as the *context-name* entered in the **snmp context** command.
- Group creation (instead of the **snmp-server group** command). The group name will be generated by appending "_acnf" to the *context-name* entered in the **snmp context** command.
- User creation (instead of the **snmp-server user** command). The user will be created using the details configured in the **snmp context** command.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **vrf definition** *vrf-name*
4. **address-family ipv4**
5. **snmp context** *context-name* [**user** *username* [**credential** | [**encrypted**] [**auth** {**md5** *password* | **sha** *password*}] [**access** {*access-list-number* | *access-list-name* | **ipv6** *access-list-name*}]]]

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable**	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: `Router> enable`	• Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**vrf definition** *vrf-name* **Example:** `Router(config)# vrf definition vrf1`	Defines a VRF and enters VRF configuration mode.
Step 4	**address-family ipv4** **Example:** `Device(config-vrf)# address-family ipv4`	Enters address family configuration mode to configure a routing session using standard IPv4 address prefixes.
Step 5	**snmp context** *context-name* [**user** *username* [**credential** | [**encrypted**] [**auth** {**md5** *password* | **sha** *password*}] [**access** {*access-list-number* | *access-list-name* | **ipv6** *access-list-name*}]]] **Example:** `Router(config-vrf)# snmp context green_ctx user green_comm encyrpted`	Sets the SNMP v3 context for the VRF.

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Command List, All Releases
Easy Virtual Network commands	Easy Virtual Network Command Reference
Overview of Easy Virtual Network	"Overview of Easy Virtual Network" module in the *Easy Virtual Network Configuration Guide*
Configuring Easy Virtual Network	"Configuring Easy Virtual Network" module in the *Easy Virtual Network Configuration Guide*
Easy Virtual Network shared services and route replication	"Easy Virtual Network Shared Services" module in the *Easy Virtual Network Configuration Guide*

MIBs

MIB	MIBs Link
Any MIB that gives VRF information will continue to work with Easy Virtual Network. VRF-independent MIBs report information on every VRF in a system: • CISCO-MVPN-MIB • MPLS-VPN-MIB • CISCO-VRF-MIB	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for EVN Management and Troubleshooting

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 2: Feature Information for EVN Management and Troubleshooting

Feature Name	Releases	Feature Information
EVN Cisco EVN MIB		EVN Cisco EVN MIB simplifies SNMP configuration. The following command was modified: **snmp context**. .
EVN Traceroute		EVN Traceroute enhances output of the **traceroute** command to display the VRF name and tag. The following command was modified: **traceroute**. .
EVN VNET Trunk		Users can filter debug output per VRF by using the **debug condition vrf** command. The following commands were introduced: **debug condition vrf** , **debug vrf** .