Recursive Static Route

The Recursive Static Route feature enables you to install a recursive static route into the Routing Information Base (RIB) even if the next-hop address of the static route or the destination network itself is already available in the RIB as part of a previously learned route. This module explains recursive static routes and how to configure the Recursive Static Route feature.

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

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.

Restrictions for Recursive Static Route

When recursive static routes are enabled using route maps, only one route map can be entered per virtual routing and forwarding (VRF) instance or topology. If a second route map is entered, the new map will overwrite the previous one.

Information About Recursive Static Route

How to Install Recursive Static Route

Installing Recursive Static Routes in a VRF

Perform these steps to install recursive static routes in a specific virtual routing and forwarding (VRF) instance. You can configure the recursive-static-route functionality on any number of VRFs. Installing recursive static routes in specific VRFs allows you to retain the default RIB behavior (of removing recursive static routes) for the rest of the network.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **vrf definition** *vrf-name*
4. **rd** *route-distinguisher*
5. **address-family** {**ipv4 | ipv6**}
6. **exit**
7. **exit**
8. **ip route** [**vrf** *vrf-name*] *prefix mask ip-address*
9. **ip route static install-routes-recurse-via-nexthop** [**vrf** *vrf-name*]
10. **end**
11. **show running-config | include install**
12. **show ip route vrf** *vrf-name*

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**vrf definition** *vrf-name* **Example:** `Device(config)# vrf definition vrf1`	Creates a virtual routing and forwarding (VRF) routing table instance and enters VRF configuration mode.

	Command or Action	Purpose
Step 4	**rd** *route-distinguisher* **Example:** `Device(config-vrf)# rd 100:1`	Specifies a route distinguisher for a VRF instance.
Step 5	**address-family** {**ipv4** | **ipv6**} **Example:** `Device(config-vrf)# address-family ipv4`	Enters VRF address family configuration mode to specify an IPv4 or IPv6 address family for a VRF.
Step 6	**exit** **Example:** `Device(config-vrf-af)# exit`	Exits VRF address family configuration mode.
Step 7	**exit** **Example:** `Device(config-vrf)# exit`	Exits VRF configuration mode.
Step 8	**ip route** [**vrf** *vrf-name*] *prefix mask ip-address* **Example:** `Device(config)# ip route vrf vrf1 10.0.2.0 255.255.255.0 10.0.1.1`	Configures a static route for a specific VRF instance.
Step 9	**ip route static install-routes-recurse-via-nexthop** [**vrf** *vrf-name*] **Example:** `Device(config)# ip route static install-routes-recurse-via-nexthop vrf vrf1`	Enables recursive static routes to be installed in the RIB of a specific VRF instance.
Step 10	**end** **Example:** `Device(config)# end`	Exits global configuration mode and returns to privileged EXEC mode.
Step 11	**show running-config | include install** **Example:** `Device# show running-config | inc install`	Displays all recursive static route configurations.
Step 12	**show ip route vrf** *vrf-name* **Example:** `Device# show ip route vrf vrf1`	Displays the IP routing table associated with a specific VRF.

Installing Recursive Static Routes Using a Route Map

Perform this task to install recursive static routes in a virtual routing and forwarding (VRF) instance defined by a route map. You can perform this task if you want to install recursive static routes for only a certain range of networks. If the **route-map** keyword is used without the **vrf** keyword, recursive static routes defined by the route map will be applicable for the global VRF or topology.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **vrf definition** *vrf-name*
4. **rd** *route-distinguisher*
5. **address-family** {**ipv4 | ipv6**}
6. **exit**
7. **exit**
8. **ip route** [**vrf** *vrf-name*] *prefix mask ip-address*
9. **access-list** *access-list-number* **permit** *source* [*source-wildcard*]
10. **route-map** *map-tag*
11. **match ip address** *access-list-number*
12. **exit**
13. **ip route static install-routes-recurse-via-nexthop** [**vrf** *vrf-name*] [**route-map** *map-name*]
14. **end**
15. **show running-config | include install**
16. **show ip route vrf** *vrf-name*

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**vrf definition** *vrf-name* **Example:** `Device(config)# vrf definition vrf1`	Creates a virtual routing and forwarding (VRF) routing table instance and enters VRF configuration mode.
Step 4	**rd** *route-distinguisher* **Example:** `Device(config-vrf)# rd 100:1`	Specifies a route distinguisher for a VRF instance.
Step 5	**address-family** {**ipv4	ipv6**} **Example:** `Device(config-vrf)# address-family ipv4`	Enters VRF address family configuration mode to specify an IPv4 or an IPv6 address-family type for a VRF.

	Command or Action	Purpose
Step 6	**exit** **Example:** `Device(config-vrf-af)# exit`	Exits VRF address family configuration mode.
Step 7	**exit** **Example:** `Device(config-vrf)# exit`	Exits VRF configuration mode.
Step 8	**ip route** [**vrf** *vrf-name*] *prefix mask ip-address* **Example:** `Device(config)# ip route vrf vrf1 10.0.2.0 255.255.255.0 10.0.1.1`	Configures a static route for a specific VRF instance.
Step 9	**access-list** *access-list-number* **permit** *source* [*source-wildcard*] **Example:** `Device(config)# access-list 10 permit 10.0.2.0 255.255.255.0`	Defines a standard access list permitting addresses that need to be translated.
Step 10	**route-map** *map-tag* **Example:** `Device(config)# route-map map1`	Defines a route map to control route redistribution and enters route-map configuration mode.
Step 11	**match ip address** *access-list-number* **Example:** `Device(config-route-map)# match ip address 10`	Matches routes that have a destination network address that is permitted by a standard or extended access list.
Step 12	**exit** **Example:** `Device(config-route-map)# exit`	Exits route-map configuration mode.
Step 13	**ip route static install-routes-recurse-via-nexthop** [**vrf** *vrf-name*] [**route-map** *map-name*] **Example:** `Device(config)# ip route static install-routes-recurse-via-nexthop vrf vrf1 route-map map1`	Enables installation of recursive static routes defined by a route map into the RIB of a specific VRF.
Step 14	**end** **Example:** `Device(config)# end`	Exits global configuration mode and returns to privileged EXEC mode.
Step 15	**show running-config | include install** **Example:** `Device# show running-config | inc install`	Displays all recursive static route configurations.

	Command or Action	Purpose
Step 16	**show ip route vrf** *vrf-name* **Example:** `Device# show ip route vrf vrf1`	Displays the IP routing table associated with a specific VRF.

Configuration Examples for Recursive Static Route

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Example: Installing Recursive Static Routes in a VRF

The following example shows how to install recursive static routes into a specific virtual routing and forwarding instance. By using the **vrf** keyword, you can ensure that recursive static routes are installed in the Routing Information Base (RIB) of only the specified VRF. The rest of the network retains the default behavior of not installing recursive static routes in the RIB. This example is based on the assumption that a 10.0.0.0/8 route is already installed dynamically or statically in the RIB of vrf1.

```
Device> enable
Device# configure terminal
Device(config)# vrf definition vrf1
Device(config-vrf)# rd 1:100
Device(config-vrf)# address-family ipv4
Device(config-vrf-af)# exit
Device(config-vrf)# exit
Device(config)# ip route vrf vrf1 10.0.2.0 255.255.255.0 10.0.1.1
Device(config)# ip route static install-routes-recurse-via-nexthop vrf vrf1
Device(config)# end
```

Example: Installing Recursive Static Routes using a Route Map

You can use the **route-map** keyword to install recursive static routes defined by the route map into the Routing Information Base (RIB). You can also specify a route map for a specific virtual routing and forwarding (VRF) instance to ensure that the route map is applied to only the specified VRF. In the example given below, a route map is specified for a specific VRF. This example is based on the assumption that a 10.0.0.0/8 route is already installed statically or dynamically in the RIB of vrf1.

```
Device> enable
Device# configure terminal
Device(config)# vrf definition vrf1
Device(config-vrf)# rd 100:2
Device(config-vrf)# address-family ipv4
Device(config-vrf-af)# exit
Device(config-vrf)# exit
Device(config)# access-list 10 permit 10.0.2.0 255.255.255.0
Device(config)# route-map map1
Device(config-route-map)# match ip address 10
Device(config-route-map)# exit
Device(config)# ip route static install-routes-recurse-via-nexthop vrf vrf1 route-map map1
Device(config)# ip route vrf vrf1 10.0.2.0 255.255.255.0 10.0.1.1
```

```
Device(config)# ip route vrf vrf1 10.0.3.0 255.255.255.0 10.0.1.1
Device(config)# end
```

In the example above, route 10.0.2.0 255.255.255.0 10.0.1.1 will be installed in the RIB, but the route 10.0.3.0 255. 255.255.0 10.0.1.1 will not be installed in the RIB because this route does not match the network defined in the route map.

Additional References for Recursive Static Route

Related Documents

Related Topic	Document Title
IP routing protocol-independent commands	Cisco IOS IP Routing: Protocol-Independent Command Reference

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 Recursive Static Routes

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.

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Table 1: Feature Information for Recursive Static Routes