



Generic Routing Encapsulation Tunnel IP Source and Destination VRF Membership

This feature allows you to configure the source and destination of a tunnel to belong to any virtual private network (VPN) routing/forwarding (VRFs) tables. A VRF table stores routing data for each VPN. The VRF table defines the VPN membership of a customer site attached to the network access server (NAS). Each VRF table comprises an IP routing table, a derived Cisco Express Forwarding (CEF) table, and guidelines and routing protocol parameters that control the information that is included in the routing table.

Previously, Generic Routing Encapsulation (GRE) IP tunnels required the IP tunnel destination to be in the global routing table. The implementation of this feature allows you to configure a tunnel source and destination to belong to any VRF. As with existing GRE tunnels, the tunnel becomes disabled if no route to the tunnel destination is defined.

History for the Generic Routing Encapsulation Tunnel IP Source and Destination VRF Membership Feature

Release	Modification
12.0(23)S	This feature was introduced.
12.3(2)T	This feature was integrated into Cisco IOS Release 12.3(2)T.

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How to Configure GRE Tunnel IP Source and Destination VRF Membership

SUMMARY STEPS

1. `enable`
2. `configure {terminal | memory | network}`
3. `interface tunnel slot`
4. `ip vrf forwarding vrf-name`
5. `ip address ip-address subnet-mask`
6. `tunnel source (ip-address | type number)`
7. `tunnel destination ip-address {hostname | ip-address}`
8. `tunnel vrf vrf-name`

DETAILED STEPS

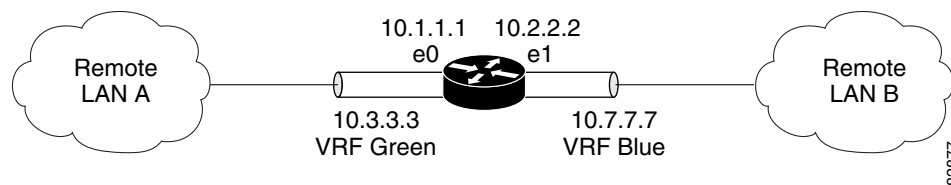
	Command or Action	Purpose
Step 1	<code>enable</code> Example: Router> enable	Enables higher privilege levels, such as privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	<code>configure {terminal memory network}</code> Example: Router# configure terminal	Enters global configuration mode.
Step 3	<code>interface tunnel slot</code> Example: Router(config)# interface tunnel 0	Enters interface configuration mode for the specified interface.
Step 4	<code>ip vrf forwarding vrf-name</code> Example: Router(config-if)# ip vrf forwarding green	Defines the VRF.

	Command or Action	Purpose
Step 5	<code>ip address ip-address subnet-mask</code> Example: Router(config-if)# ip address 10.7.7.7 255.255.255.255	Specifies the ip address and subnet mask.
Step 6	<code>tunnel source {ip-address type number}</code> Example: Router(config-if)# tunnel source loop 0	Specifies the tunnel source.
Step 7	<code>tunnel destination {hostname ip-address}</code> Example: Router(config-if)# tunnel destination 10.5.5.5	Defines the tunnel destination.
Step 8	<code>tunnel vrf vrf-name</code> Example: Router(config-if)# tunnel vrf financel	Defines the VRF.

GRE Tunnel IP Source and Destination VRF Membership Configuration: Example

In this example, packets received on interface e0 using VRF green, will be forwarded out of the tunnel through interface e1 using VRF blue. [Figure 1](#) shows a simple tunnel scenario:

Figure 1 GRE Tunnel Diagram



The following example shows the configuration for the tunnel in [Figure 1](#).

```
ip vrf blue
 rd 1:1

ip vrf green
 rd 1:2

interface loopback0
 ip vrf forwarding blue
 ip address 10.7.7.7 255.255.255.255

interface tunnel0
 ip vrf forwarding green
 ip address 10.3.3.3 255.255.255.0
 tunnel source loopback 0
 tunnel destination 10.5.5.5
```

Additional References

```
tunnel vrf blue

interface ethernet0
 ip vrf forwarding green
 ip address 10.1.1.1 255.255.255.0

interface ethernet1
 ip vrf forwarding blue
 ip address 10.2.2.2 255.255.255.0

ip route vrf blue 10.5.5.5 255.255.255.0 ethernet 1
```

Additional References

The following sections provide references related to Generic Routing Encapsulation Tunnel IP Source and Destination VRF Membership.

Related Documents

Related Topic	Document Title
VRF tables	"Configuring Multiprotocol Label Switching" chapter of the <i>Cisco IOS Switching Services Configuration Guide</i> , Release 12.3
Tunnels	<i>Cisco IOS Interface Configuration Guide</i> , Release 12.3

MIBs

MIB	MIBs Link
<ul style="list-style-type: none"> • • 	To locate and download MIBs for selected platforms, Cisco IOS 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 Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport

Command Reference

This section documents a new command only.

- [tunnel vrf](#)

tunnel vrf

To associate a VPN routing and forwarding (VRF) instance with a specific tunnel destination, interface or subinterface, use the **tunnel vrf** command in global configuration mode or interface configuration mode. To disassociate a VRF from the tunnel destination, use the no form of this command.

tunnel vrf *vrf-name*

no tunnel vrf *vrf-name*

Syntax Description

<i>vrf-name</i>	Name assigned to a VRF.
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Defaults

The default destination is determined by the global routing table.

Command Modes

Global configuration
Interface configuration

Command History

Release	Modification
12.0(23)S	This command was introduced.
12.3(2)T	This command was integrated into Cisco IOS Release 12.3(2)T.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.

Usage Guidelines

The tunnel source and destination must be in the same VRF.

Either the IP VRF or the tunnel VRF can be set to the global routing table (using the **no ip vrf forwarding** *vrf* command or the **no tunnel vrf** *vrf* command).

The tunnel will be disabled if no route to the tunnel destination is defined. If the tunnel VRF is set, there must be a route to that destination in the VRF.

Examples

The following example shows how to associate a VRF with a tunnel destination. The tunnel endpoint, 10.5.5.5 will be looked up in the blue VRF.

```
interface tunnel0
 ip vrf forwarding green
 ip address 10.3.3.3 255.255.255.0
 tunnel source loop 0
 tunnel destination 10.5.5.5
 tunnel vrf blue
```

Related Commands

Command	Description
ip route vrf	Establishes static routes for a VRF.
ip vrf	Configures a VRF routing table.

Command	Description
ip vrf forwarding	Associates a VPN VRF instance with an interface or subinterface.
tunnel destination	Specifies the destination for a tunnel interface.
tunnel source	Sets the source address for a tunnel interface.

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