



Cisco MPLS VPN Solutions Command Reference

This appendix provides a command reference for the new or modified Cisco IOS commands used to configure MPLS VPNs. All other commands used with MPLS VPNs are documented in the *Cisco IOS Release 12.0 Command Reference*. The commands listed in this appendix are as follows:

address-family	route-target
clear ip route vrf	show ip bgp vpnv4
exit-address-family	show ip cef vrf
import map	show ip protocols vrf
ip route vrf	show ip route vrf
ip vrf	show ip vrf
ip vrf forwarding	show tag-switching forwarding vrf
neighbor activate	debug ip bgp
rd	

In Cisco IOS Release 12.0(1)T or later, you can search and filter the output for **show** and **more** commands. This functionality is useful when you need to sort through large amounts of output, or if you want to exclude output that you do not need to see.

To use this functionality, enter a **show** or **more** command followed by the pipe character (|), one of the keywords **begin**, **include**, or **exclude**, and an expression that you want to search or filter on:

```
command | {begin | include | exclude} regular-expression
```

Below is an example of the **show atm vc** command in which the command output begins with the first line where the expression "PeakRate" appears:

```
show atm vc | begin PeakRate
```

For more information on the search and filter functionality, refer to the Cisco IOS Release 12.0(1)T feature module titled *CLI String Search*.

address-family

To enter the address family submode for configuring routing protocols, such as BGP, RIP, and static routing, use the **address-family** global configuration command. To disable the address family submode for configuring routing protocols, use the **no** form of this command.

VPN-IPv4 unicast

```
address-family vpnv4 [unicast]
no address-family vpnv4 [unicast]
IPv4 unicast
address-family ipv4 [unicast]
no address-family ipv4 [unicast]
```

IPv4 unicast with CE router

```
address-family ipv4 [unicast] vrf vrf_name
no address-family ipv4 [unicast] vrf vrf_name
```

Syntax Description

ipv4	Configures sessions that carry standard IPv4 address prefixes.
vpnv4	Configures sessions that carry customer VPN-IPv4 prefixes, each of which has been made globally unique by adding an 8-byte route distinguisher.
unicast	(Optional) Specifies unicast prefixes.
vrf vrf_name	Specifies the name of a VPN routing/forwarding instance (VRF) to associate with submode commands.

Default

Routing information for address family IPv4 is advertised by default when you configure a BGP session using the **neighbor...remote-as** command unless you execute the **no bgp default ipv4-activate** command.

Usage Guidelines

Using the **address-family** command puts you in address family configuration submode (prompt: `(config-router-af)#`). Within this submode, you can configure address-family specific parameters for routing protocols, such as BGP, that can accommodate multiple Layer 3 address families.

To leave address family configuration submode and return to router configuration mode, enter **exit-address-family**, or simply **exit**.

Examples

The **address-family** command in the following example puts the router into address family configuration submode for the VPNv4 address family. Within the submode, you can configure advertisement of NLRI for the VPNv4 address family using **neighbor activate** and other related commands:

```
(config)# router bgp 100
(config-router)# address-family vpnv4
(config-router-af)#
```

The command in the following example puts the router into address family configuration submode for the IPv4 address family. Use this form of the command, which specifies a VRF, only to configure routing exchanges between PE and CE devices. This **address-family** command causes subsequent commands entered in the submode to be executed in the context of VRF vrf2. Within the submode, you can use **neighbor activate** and other related commands to accomplish the following:

- Configure advertisement of IPv4 NLRI between the PE and CE routers.
- Configure translation of the IPv4 NLRI (that is, translate IPv4 into VPNv4 for NLRI received from the CE, and translate VPNv4 into IPv4 for NLRI to be sent from the PE to the CE).
- Enter the routing parameters that apply to this VRF.

Enter the address family submode as follows:

```
(config)# router bgp 100
(config-router)# address-family ipv4 unicast vrf v2
(config-router-af)#
```

Related Commands

exit-address-family	Exits address family submode.
neighbor activate	Exchanges an address with a neighboring router.

clear ip route vrf

To remove routes from the VRF routing table, use the **clear ip route vrf EXEC** command.

```
clear ip route vrf vrf_name {* | network [mask]}
```

Syntax Description

<i>vrf_name</i>	Name of the VPN routing/forwarding instance (VRF) for the static route.
*	Deletes all routes for a given VRF.

network	Destination to be removed, in dotted-decimal format.
mask	(Optional) Mask for the specified network destination, in dotted-decimal format.

Usage Guidelines

Use this command to clear routes from the routing table. Use the asterisk (*) to delete all routes from the forwarding table for a specified VRF, or enter the address and mask of a particular network to delete the route to that network.

Example

The following command removes the route to the network 10.13.0.0 in the v1 routing table:

```
Router#clear ip route vrf v1 10.13.0.0
```

Related Command

show ip route vrf	Displays the IP routing table associated with a VRF.
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exit-address-family

To exit from the address family submode, use the **exit-address-family** address family submode command.

```
exit-address-family
```

This command has no arguments or keywords. It has no default behavior or values.

You can abbreviate this command to **exit**.

Example

The following example shows how to exit the address-family command mode:

```
(config-router-af)#exit-address-family
```

Related Command

address-family	Enters the address family submode used to configure routing protocols.
-----------------------	--

import map

To configure an import route map for a VRF, use the **import** VRF submode command.

```
import map route-map
```

Syntax Description

route-map	Specifies the route map to be used as an import route map for the VRF.
-----------	--

There is no default. A VRF has no import route map unless one is configured using the **import map** command.

Usage Guidelines

Use an import route map when an application requires finer control over the routes imported into a VRF than provided by the import and export extended communities configured for the importing and exporting VRF.

The **import-map** command associates a route map with the specified VRF. You can filter routes that are eligible for import into a VRF, based on the route target extended community attributes of the route, through the use of a route map.

The route map might deny access to selected routes from a community that is on the import list.

Example

The following example shows how to configure an import route map for a VRF:

```
(config)#ip vrf v1:blue
(config-vrf)#import map blue_import_map
```

Related Commands

ip vrf	Enters VRF configuration mode.
route-target	Configures import and export extended community attributes for the VRF.
show ip vrf	Displays information about a VRF or all VRFs.

ip route vrf

To establish static routes for a VRF, use the **ip route vrf** global configuration command. To disable static routes, use the **no** form of this command.

```
ip route vrf vrf_name prefix mask [next-hop-address] [interface {interface-number}]
```

```
[global] [distance] [permanent] [tag tag]
no ip route vrf vrf_name prefix mask [next-hop-address] [interface {interface-number}]
[global] [distance] [permanent] [tag tag]
```

Syntax Description

<i>vrf_name</i>	Name of the VPN routing/forwarding instance (VRF) for the static route.
<i>prefix</i>	IP route prefix for the destination, in dotted-decimal format
<i>mask</i>	Prefix mask for the destination, in dotted-decimal format
<i>next-hop-address</i>	(Optional) IP address of the next hop (the forwarding router that can be used to reach that network).
<i>interface</i>	(Optional) Type of network interface to use: ATM, Ethernet, loopback, POS (packet over SONET), or null.
<i>interface-number</i>	Number identifying the network interface to use.
<i>global</i>	Specifies that the given next hop address is in the non-VRF routing table.
<i>distance</i>	(Optional) An administrative distance for this route
permanent	(Optional) Specifies that this route will not be removed, even if the interface shuts down.
tag tag	(Optional) Label value that can be used for controlling redistribution of routes through route maps.

Usage Guidelines

Use a static route when the Cisco IOS software cannot dynamically build a route to the destination.

If you specify an administrative distance when you set up a route, you are flagging a static route that can be overridden by dynamic information. For example, IGRP-derived routes have a default administrative distance of 100. To set a static route to be overridden by an IGRP dynamic route, specify an administrative distance greater than 100. Static routes each have a default administrative distance of 1.

Static routes that point to an interface are advertised through RIP, IGRP, and other dynamic routing protocols, regardless of whether the routes are redistributed into those routing protocols. That is, static routes configured by specifying an interface lose their static nature when installed into the routing table.

However, if you define a static route to an interface not defined in a network command, no dynamic routing protocols advertise the route unless a redistribute static command is specified for these protocols.

Example

The following command reroutes packets addressed to network 137.23.0.0 in VRF vpn3 to router 131.108.6.6:

```
(config)#ip route vrf vpn3 137.23.0.0 255.255.0.0 131.108.6.6
```

Related Command

show ip route vrf Displays the IP routing table associated with a VRF.

ip vrf

To configure a VRF routing table, use the **ip vrf** global configuration command. To remove a VRF routing table, use the **no** form of this command.

```
ip vrf vrf_name  
no ip vrf vrf_name
```

Syntax Description

vrf_name Name assigned to a VRF.

By default, no VRFs are defined. No import or export lists are associated with a VRF. No route maps are associated with a VRF.

Usage Guidelines

The **ip vrf vrf_name** command creates a VRF routing table and a CEF (forwarding) table, both named *vrf_name*.

The default route distinguisher value route-distinguisher is also associated with these tables

Example

The following example imports a route map to a VRF:

```
(Router-config)#ip vrf v2  
(config-vrf)#rd 100:2  
route-target both 100:2  
route-target import 100:1
```

Related Command

ip vrf forwarding Associates a VRF with an interface or subinterface.

ip vrf forwarding

To associate a VRF with an interface or subinterface, use the **ip vrf forwarding** interface configuration command. To disassociate a VRF, use the **no** form of this command.

Executing this command on an interface removes the IP address. The IP address should be reconfigured.

```
ip vrf forwarding vrf_name
no ip vrf forwarding vrf_name
```

Syntax Description

vrf_name Name assigned to a VRF.

The default for an interface is the global routing table.

Example

The following example shows how to link a VRF to ATM interface 0/0:

```
(config)#interface atm0/0
(config-if)#ip vrf forwarding vpn1
```

Related Commands

ip vrf Defines a VRF.

ip route vrf Establishes static routes for a VRF.

neighbor activate

To enable the exchange of information with a BGP neighboring router, use the **neighbor activate** router configuration command. To disable the exchange of an address with a neighboring router, use the **no** form of this command.

```
neighbor {ip-address | peer-group-name} activate
no neighbor {ip-address | peer-group-name} activate
```

Syntax Description

ip-address IP address of the neighboring router.

peer-group-name Name of BGP peer group.

Defaults

The exchange of IP addresses with neighbors is enabled by default for the VPN IPv4 address family. You can disable IPv4 address exchange using the general command **no default bgp ipv4 activate**, or you can disable it for a particular neighbor using the **no** form of this command.

For all other address families, address exchange is disabled by default. You can explicitly activate the default command using the appropriate address family submode.

Example

In the following example, a BGP router activates the exchange of a customer's IP address 10.15.0.15 to a neighboring router.

```
router bgp 100
neighbor 10.15.0.15 remote-as 100
neighbor 10.15.0.15 update-source loopback0
address-family vpnv4 unicast
neighbor 10.15.0.15 activate
exit-address-family
```

Related Commands

address-family Enters the address family submode.

exit-address-family Exits the address family submode.

rd

To create routing and forwarding tables for a VRF, use the **rd** VRF submode command.

```
rd route-distinguisher
```

Syntax Description

route-distinguisher Adds an 8-byte value to an IPv4 prefix to create a VPN IPv4 prefix.

There is no default. For a VRF to be functional, a route-distinguisher must be configured.

Usage Guidelines

A route distinguisher (RD) creates routing and forwarding tables and specifies the default route-distinguisher for a VPN. The RD is added to the beginning of the customer's IPv4 prefixes to change them into globally unique VPN-IPv4 prefixes.

An RD is either ASN-relative, in which case it is composed of an autonomous system number and an arbitrary number, or it is IP-address-relative, in which case it is composed of an IP address and an arbitrary number.

You can enter an RD in either of these formats:

- 16-bit AS number: your 32-bit number
For example, 101:3
- 32-bit IP address: your 16-bit number
For example, 192.168.122.15:1

Example

The following example configures a default RD for two VRFs. It illustrates the use of both AS-relative and IP address-relative RDs:

```
(config)#ip vrf v1:blue
(config-vrf)#rd 100:3
(config-vrf)#ip vrf v2:red
(config-vrf)#rd 173.13.0.12:200
```

Related Commands

ip vrf	Enters VRF configuration mode.
show ip vrf	Displays information about a VRF.

route-target

To create a route-target extended community for a VRF, use the **route-target** VRF submode command. To disable the configuration of a route-target community option, use the **no** form of this command.

```
route-target {import | export | both} route-target-ext-community
no route-target {import | export | both} route-target-ext-community
```

Syntax Description

import	Imports routing information from the target VPN extended community.
export	Exports routing information to the target VPN extended community.

both	Imports both import and export routing information to the target VPN extended community.
<i>route-target-ext-community</i>	adds the route-target extended community attributes to the VRF's list of import, export, or both (import and export) route-target extended communities.

There are not defaults. A VRF has no route-target extended community attributes associated with it until specified by the **route-target** command.

Usage Guidelines

The **route-target** command creates lists of import and export route target extended communities for the specified VRF.

Execute the command one time for each target community. Learned routes that carry a specific route target extended community are imported into all VRFs configured with that extended community as an import route target. Routes learned from a VRF site (for example, by BGP, RIP, or static route configuration) contain export route targets for extended communities configured for the VRF added as route attributes to control the VRFs into which the route is imported.

The route-target specifies a target VPN extended community. Like a route-distinguisher, an extended community is composed of either an autonomous system number and an arbitrary number, or an IP address and an arbitrary number.

You can enter the numbers in either of these formats:

- 16-bit AS number: your 32-bit number
For example, 101:3
- 32-bit IP address: your 16-bit number
For example, 192.168.122.15:1

Example

The following example shows how to configure route-target extended community attributes for a VRF. The result of the command sequence is that VRF v1:blue has two export extended communities (1000:1 and 1000:2) and two import extended communities (1000:1 and 173.27.0.130:200).

```
(config)#ip vrf v1:blue
(config-vrf)#route-target both 1000:1
(config-vrf)#route-target export 1000:2
(config-vrf)#route-target import 173.27.0.130:200
```

Related Commands

ip vrf	Enters VRF configuration mode.
import	Configures an import route map for the VRF.

show ip bgp vpnv4

To display VPN address information from the BGP table, use the **show ip bgp vpnv4** EXEC command.

```
show ip bgp vpnv4 {all | rd route-distinguisher | vrf vrf_name}
[ip-prefix/length [longer-prefixes] [output-modifiers]]
[network-address [mask] [longer-prefixes] [output-modifiers]] [cidr-only] [community]
[community-list] [dampened-paths] [filter-list] [flap-statistics] [inconsistent-as]
[neighbors] [paths [line]] [peer-group] [quote-regexp] [regexp] [summary] [tags]
```

Syntax Description

all	Displays the complete VPNv4 database.
rd <i>route-distinguisher</i>	Displays NLRI that have a matching route distinguisher.
vrf <i>vrf_name</i>	Displays NLRI associated with the named VRF.
<i>ip-prefix/length</i>	(Optional) IP prefix address (in dotted decimal format) and length of mask (0 to 32).
longer-prefixes	(Optional) Displays the entry, if any, that exactly matches the specified prefix parameter, as well as all entries that match the prefix in a "longest-match" sense. That is, prefixes for which the specified prefix is an initial sub-string
<i>output-modifiers</i>	(Optional) For a list of associated keywords and arguments, use context-sensitive help.
<i>network-address</i>	(Optional) IP address of a network in the BGP routing table.
mask	(Optional) Mask of the network address, in dotted decimal format.
cidr-only	(Optional) Displays only routes that have nonnatural net masks.
community	(Optional) Displays routes matching this community.
community-list	(Optional) Displays routes matching this community list.
dampened-paths	(Optional) Displays paths suppressed due to dampening (BGP route from peer is up and down).
filter-list	(Optional) Displays routes conforming to the filter list.
flap-statistics	(Optional) Displays flap statistics of routes.
inconsistent-as	(Optional) Displays only routes that have inconsistent autonomous systems of origin.

neighbors	(Optional) Displays details about TCP and BGP neighbor connections.
paths	(Optional) Displays path information.
line	(Optional) A regular expression to match the BGP AS paths.
peer-group	(Optional) Displays information about peer groups.
quote-regex	(Optional) Displays routes matching the AS path “regular expression.”
regex	(Optional) Displays routes matching the AS path “regular expression.”
summary	(Optional) Displays BGP neighbor status.
tags	(Optional) Displays incoming and outgoing BGP labels for each NLRI.

Usage Guidelines

Use this command to display VPNv4 information from the BGP database. The command `show ip bgp vpnv4 all` displays all available VPNv4 information. The command `show ip bgp vpnv4 summary` displays BGP neighbor status.

Examples

The following example shows output for all available VPNv4 information in a BGP routing table:

```
Router#show ip bgp vpnv4 all
BGP table version is 18, local router ID is 14.14.14.14
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Network          Next Hop        Metric      LocPrf   Weight  Path
Route Distinguisher: 100:1 (v1:blue)
*> 11.0.0.0      50.0.0.1        0           0        101 i
*>i12.0.0.0     13.13.13.13     0           0        100    0    102 i
*> 50.0.0.0      50.0.0.1        0           0        101 i
*>i51.0.0.0     13.13.13.13     0          100        0        102 i
```

Table B-1 Show IP BGP VPNv4 Field Descriptions

Field	Description
Network	Displays the network address from the BGP table.
Next Hop	Displays the address of the BGP next hop.
Metric	Displays the BGP metric.
LocPrf	Displays the local preference.

Table B-1 Show IP BGP VPNv4 Field Descriptions

Field	Description
Weight	Displays the BGP weight.
Path	Displays the BGP path per route.

The following example shows how to display a table of labels for NLRIs that have a route-distinguisher value of 100:1.

```
Router#show ip bgp vpnv4 rd 100:1 tags
Network          Next Hop          In tag/Out tag
Route Distinguisher: 100:1 (vrf1)
2.0.0.0          10.20.0.60        34/notag
10.0.0.0         10.20.0.60        35/notag
12.0.0.0         10.20.0.60        26/notag
                  10.20.0.60        26/notag
13.0.0.0         10.15.0.15        notag/26
```

Table B-2 Show IP BGP VPNv4 rd Tags Field Descriptions

Field	Description
Network	Displays the network address from the BGP table.
Network	Displays the network address from the BGP table.
Next Hop	Specifies the BGP next hop address.
In Tag	Displays the label (if any) assigned by this router.
Out Tag	Displays the label assigned by the BGP next hop router.

The following example shows VPNv4 routing entries for the VRF called vrf1.

```
Router#show ip bgp vpnv4 vrf v1
BGP table version is 18, local router ID is 14.14.14.14
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Network          Next Hop          Metric    LocPrf      WeightPath
Route Distinguisher: 100:1 (vrf1)
*> 11.0.0.0      50.0.0.1          0         0           101 i
*>i12.0.0.0      13.13.13.13       0         0           100      0      102 i
*> 50.0.0.0      50.0.0.1          0         0           101 i
*>i51.0.0.0      13.13.13.13       0         100         0         102 i
```

Related Command

show ip vrf Displays VRFs and associated interfaces.

show ip cef vrf

To display the CEF forwarding table associated with a VRF, use the show ip cef vrf EXEC command.

```
show ip cef vrf vrf_name [ip-prefix [mask [longer-prefixes]] [detail] [output-modifiers]]
[interface interface-number] [adjacency [interface interface-number] [detail] [discard]
[drop] [glean] [null] [punt] [output-modifiers]] [detail [output-modifiers]]
[non-recursive [detail] [output-modifiers]] [summary [output-modifiers]]
[traffic [prefix-length] [output-modifiers]] [unresolved [detail] [output-modifiers]]
```

Syntax Description

<i>vrf_name</i>	Name assigned to the VRF.
<i>ip-prefix</i>	(Optional) IP prefix of entries to show, in dotted decimal format (A.B.C.D).
mask	(Optional) Mask of the IP prefix, in dotted decimal format.
longer-prefixes	(Optional) Displays table entries for all of the more specific routes.
detail	(Optional) Displays detailed information for each CEF table entry.
<i>output-modifiers</i>	(Optional) For a list of associated keywords and arguments, use context-sensitive help.
interface	(Optional) Type of network interface to use: ATM, Ethernet, Loopback, POS (packet over SONET) or Null.
interface-number	Number identifying the network interface to use.
adjacency	(Optional) Displays all prefixes resolving through adjacency.
discard	Discards adjacency.
drop	Drops adjacency.
glean	Gleans adjacency.
null	Null adjacency.
punt	Punts adjacency.
non-recursive	(Optional) Displays only nonrecursive routes.
summary	(Optional) Displays a CEF table summary.
traffic	(Optional) Displays traffic statistics.

- `prefix-length` (Optional) Displays traffic statistics by prefix size.
- `unresolved` (Optional) Displays only unresolved routes.

Usage Guidelines

Used with only the `vrf_name` argument, the **show ip cef vrf** command shows a shortened display of the CEF table. Used with the `detail` argument, the **show ip cef vrf** command shows detailed information for all CEF table entries.

Example

This example shows the forwarding table associated with the VRF called `vrf1`.

```
Router#show ip cef vrf vrf1
Prefix                Next Hop      Interface
0.0.0.0/32           receive
11.0.0.0/8           50.0.0.1     Ethernet1/3
12.0.0.0/8           52.0.0.2     POS6/0
50.0.0.0/8           attached     Ethernet1/3
50.0.0.0/32          receive
50.0.0.1/32          50.0.0.1     Ethernet1/3
50.0.0.2/32          receive
50.255.255.255/32    receive
51.0.0.0/8           52.0.0.2     POS6/0
224.0.0.0/24         receive
255.255.255.255/32   receive
```

Table B-3 Show IP CEF vrf Field Descriptions

Field	Description
Prefix	Specifies the network prefix.
Next Hop	Specifies the BGP next hop address.
Interface	Specifies the VRF interface.

Related Commands

- show ip vrf** Displays VRFs and associated interfaces.
- show ip route vrf** Displays the IP routing table associated with a VRF.

show ip protocols vrf

To display the routing protocol information associated with a VRF, use the **show ip protocols vrf EXEC** command.

```
show ip protocols vrf vrf_name
```

Syntax Description

vrf_name Name assigned to a VRF.

Example

The following example shows information about a VRF called vpn1:

```
Router#show ip protocols vrf v2
Routing Protocol is "bgp 100"
Sending updates every 60 seconds, next due in 0 sec
Outgoing update filter list for all interfaces is
Incoming update filter list for all interfaces is
IGP synchronization is disabled
Automatic route summarization is disabled
Redistributing:connected, static
Routing for Networks:
Routing Information Sources:
    Gateway         Distance    Last Update
    13.13.13.13      200         03:26:15
    18.18.18.18      200         03:26:54
Distance:external 20 internal 200 local 200
```

Table B-4 Show IP Protocols vrf Field Descriptions

Field	Description
Gateway	Displays the IP address of the router identifier for all routers in the network
Distance	Displays the metric used to access the destination route.
Last update	Displays the last time the routing table was updated from the source.

Related Commands

show ip vrf Displays VRFs and associated interfaces.

show ip route vrf

To display the IP routing table associated with a VRF (VPN routing/forwarding instance), use the **show ip route vrf EXEC** command.

```
show ip route vrf vrf_name [connected] [protocol [as-number] [tag] [output-modifiers]]
```

```
[list number [output-modifiers]] [profile] [static [output-modifiers]]
[summary [output-modifiers]] [supernets-only [output-modifiers]]
[traffic-engineering [output-modifiers]]
```

Syntax Description

<i>vrf_name</i>	Name assigned to the VPN routing/forwarding instance (VRF).
connected	Displays all connected routes in a VRF.
<i>protocol</i>	To specify a routing protocol, use one of the following keywords: bgp, egp, eigrp, hello, igrp, isis, ospf, or rip.
as-number	Autonomous system number.
tag	IOS routing area label.
output-modifiers	(Optional) For a list of associated keywords and arguments, use context-sensitive help.
list number	Specifies the IP access list to display.
profile	Displays the IP routing table profile.
static	Displays static routes.
summary	Displays a summary of routes.
supernets-only	Displays supernet entries only.
traffic-engineering	Displays only traffic-engineered routes.

Examples

This example shows the IP routing table associated with the VRF called v1:

```
Router#show ip route vrf v1
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
       U - per-user static route, o - ODR
       T - traffic engineered route
Gateway of last resort is not set
B    51.0.0.0/8 [200/0] via 13.13.13.13, 00:24:19
C    50.0.0.0/8 is directly connected, Ethernet1/3
B    11.0.0.0/8 [20/0] via 50.0.0.1, 02:10:22
B    12.0.0.0/8 [200/0] via 13.13.13.13, 00:24:20
```

This example shows BGP entries in the IP routing table associated with the VRF called v1:

```
Router#show ip route vrf v1 bgp
B 51.0.0.0/8 [200/0] via 13.13.13.13, 03:44:14
B 11.0.0.0/8 [20/0] via 51.0.0.1, 03:44:12
B 12.0.0.0/8 [200/0] via 13.13.13.13, 03:43:14
```

Related Commands

show ip vrf	Displays VRFs and associated interfaces.
show ip cef vrf	Displays the CEF forwarding table associated with a VRF.

show ip vrf

To display the set of defined VRFs (VPN routing/forwarding instances) and associated interfaces, use the **show ip vrf EXEC** command.

```
show ip vrf [{brief | detail | interfaces}] [vrf_name] [output-modifiers]
```

Syntax Description

brief	.(Optional) Displays concise information on the VRF(s) and associated interfaces.
detail	(Optional) Displays detailed information on the VRF(s) and associated interfaces.
interfaces	(Optional) Displays detailed information about all interfaces bound to a particular VRF, or any VRF.
<i>vrf_name</i>	Name assigned to the VPN routing/forwarding instance (VRF).
output-modifiers	(Optional) For a list of associated keywords and arguments, use context-sensitive help.

When no optional parameters are specified, the command shows concise information about all configured VRFs.

Usage Guidelines

Use this command to display information about VRFs. Two levels of detail are available: use the **brief** keyword or **no** keyword to display concise information, or use the **detail** keyword to display all information. To display information about all interfaces bound to a particular VRF, or to any VRF, use the **interfaces** keyword.

Examples

This example shows brief information for the VRFs currently configured:

```
Router#show ip vrf
      Name                Default RD           Interfaces
-----
vrf1                100:1                Ethernet1/3
vrf2                100:2                Ethernet0/3
```

Table B-5 Show IP vrf Field Descriptions

Field	Description
Name	Specifies the VRF name.
Default RD	Specifies the default route distinguisher.
Interfaces	Specifies the network interfaces.

This example shows detailed information for the VRF called v1:

```
Router#show ip vrf detail v1
VRF vrf1; default RD 100:1
  Interfaces:
    Ethernet1/3
  Connected addresses are in global routing table
  Export VPN route-target communities
    RT:100:1
  Import VPN route-target communities
    RT:100:1
  No import route-map
```

Table B-6 Show IP vrf Detail Field Descriptions

Field	Description
Interfaces	Specifies the network interfaces.
Export	Specifies VPN route-target export communities.
Import	Specifies VPN route-target import communities.

This example shows the interfaces bound to a particular VRF:

```
router#show ip vrf interfaces
Interface          IP-Address          VRF                Protocol
-----
Ethernet2          130.22.0.33         blue_vrf            up
Ethernet4          130.77.0.33         hub                 up
router#
```

Table B-7 Show IP vrf Interfaces Field Descriptions

Field	Description
Interface	Specifies the network interfaces for a VRF.
IP-Address	Specifies the IP address of a VRF interface.
VRF	Specifies the VRF name.
Protocol	Displays the state of the protocol (up/down) for each VRF interface.

Related Commands

ip vrf	Enters VRF configuration mode.
rd	Configures a default route distinguisher (RD) for a VRF.
route-target	Configures import and export extended community attributes for the VRF.
import	Configures an import route map for a VRF.
ip vrf forwarding	Associates a VRF with an interface or subinterface.

show tag-switching forwarding vrf

To display label forwarding entries associated with a particular VRF or IP prefix, use the **show tag-switching forwarding vrf EXEC** command. To disable the display of label forwarding information, use the **no** form of this command.

```
show tag-switching forwarding vrf vrf_name [ip-prefix/length [mask]] [detail]
[output-modifiers]
```

```
no show tag-switching forwarding vrf vrf_name [ip-prefix/length [mask]] [detail]
[output-modifiers]
```

Syntax Description

<i>vrf_name</i>	Displays NLRIs associated with the named VRF.
<i>ip-prefix/length</i>	(Optional) IP prefix address (in dotted decimal format) and length of mask (0 to 32).
<i>mask</i>	(Optional) Destination network mask, in dotted decimal format.

detail	(Optional) Displays detailed information on the VRF routes.
output-modifiers	(Optional) For a list of associated keywords and arguments, use context-sensitive help.

Example

The following example shows label forwarding entries that correspond to the VRF called v2:

```
Router#show tag-switching forwarding vrf v2 detail
```

Related Commands

show tag-switching forwarding	Displays label forwarding information.
show ip cef vrf	Displays the CEF forwarding table associated with a VRF.

debug ip bgp

To display information related to processing BGPs, use the **debug ip bgp EXEC** command. To disable the display of BGP information, use the **no** form of this command.

```
debug ip bgp [A.B.C.D. | dampening | events | in | keepalives | out | updates | vpnv4]
no debug ip bgp [A.B.C.D. | dampening | events | in | keepalives | out | updates | vpnv4]
```

Syntax Description

A.B.C.D.	(Optional) Displays the BGP neighbor IP address.
dampening	(Optional) Displays BGP dampening.
events	(Optional) Displays BGP events.
in	(Optional) BGP inbound information.
keepalives	(Optional) Displays BGP keepalives.
out	(Optional) Displays BGP outbound information.
updates	(Optional) Displays BGP updates.
vpnv4	(Optional) Displays VPNv4 NLRI information.

Example

The following example displays the output from this command:

```
Router#debug ip bgp vpnv4
03:47:14:vpn:bgp_vpnv4_bnetinit:100:2:58.0.0.0/8
03:47:14:vpn:bnettable add:100:2:58.0.0.0 / 8
03:47:14:vpn:bestpath_hook route_tag_change for v2:58.0.0.0/255.0.0.0(ok)
03:47:14:vpn:bgp_vpnv4_bnetinit:100:2:57.0.0.0/8
```

