NDE for VRF Interfaces

First Published: February 27th, 2007
Last Updated: February 27th, 2007

The NetFlow data export (NDE) for VRF Interfaces feature enables the creation and export of hardware NetFlow cache entries for traffic entering a router on the last multi-protocol label switching (MPL)S hop of an IPv4 MPLS virtual private network (VPN). The NDE for VRF Interfaces feature also ensures that the data collected in the hardware NetFlow cache for traffic that is received on an IPv4 interface configured for a per-site forwarding table (VRF) contains the routing information specific to the VRF.

Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the "Feature Information for NDE for VRF Interfaces" section on page 40.

Finding Support Information for Platforms and Cisco IOS and Catalyst OS Software Images

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

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Prerequisites for NDE for VRF Interfaces

Your router must be running Cisco IOS release 12.2(33)SRB or later to configure the NDE for VRF Interfaces feature.

Restrictions for NDE for VRF Interfaces

The NDE for VRF Interfaces feature supports only IPv4 traffic.

When you configure the NDE for VRF Interfaces feature for a MPLS VPN, the router assigns a reserved VLAN ID to the MPLS VPN. This will limit the number of VLAN IDs available for other features that you configure on the router and that require VLAN IDs.

Information About NDE for VRF Interfaces

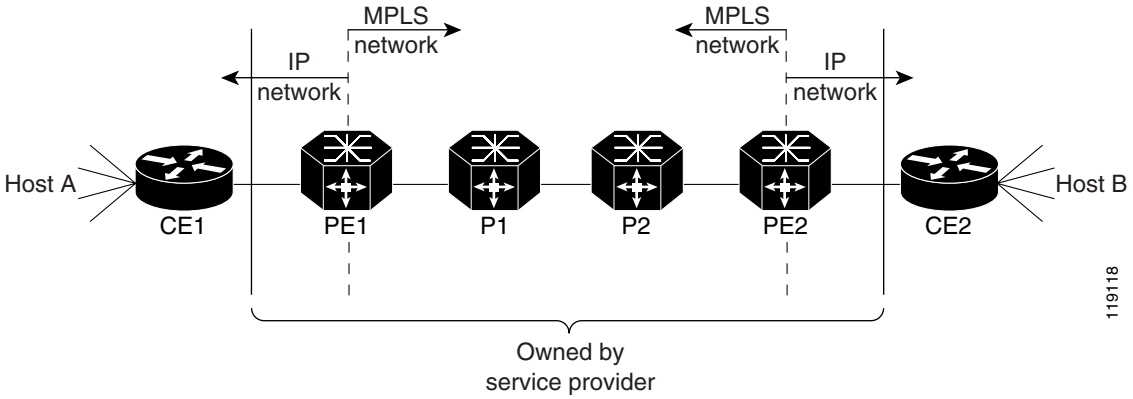
Before configuring the NDE for VRF Interfaces feature, you should understand the following concepts:

- Example of an MPLS VPN Network, page 2
- Analysis of Traffic Exiting the MPLS VPN Network with NetFlow, page 3
- MPLS Aggregate Labels, page 3
- NetFlow Cache Population, page 4
- VRF Name as the Source Interface in the NetFlow Cache, page 6

Example of an MPLS VPN Network

Figure 1 is an example of a simple MPLS virtual private network (VPN). Routers PE1 and PE2 are configured to support an MPLS VPN to carry the customer's traffic between the sites where routers CE1 and CE2 are located. Routers PE1 and PE2 use multi-protocol iBGP peers for routing traffic on the MPLS VPNs. The NDE for VRF Interfaces feature is applicable to routers PE1 and PE2 in this example.

Figure 1 Example of a simple MPLS VPN network

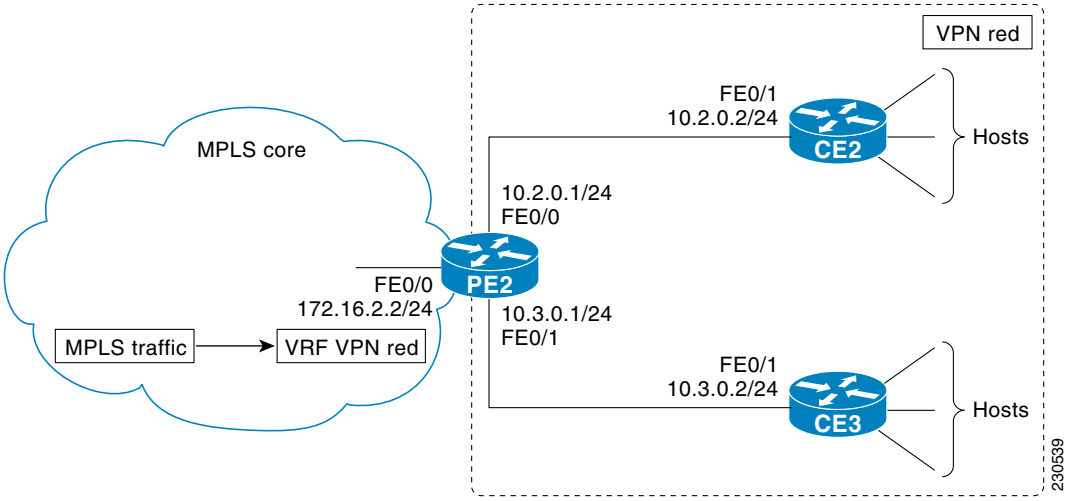


For more information about configuring MPLS on Cisco 7600 series routers, see the "Configuring PFC3BXL and PFC3B Multiprotocol Label Switching (MPLS)" chapter in the *Catalyst 7600 Series Cisco IOS Software Configuration Guide*, Release 12.2SR.

Analysis of Traffic Exiting the MPLS VPN Network with NetFlow

The NDE for VRF Interfaces feature captures traffic received by the router on the MPLS VPN VRF interface as it exits the MPLS network. For example, when you configure the NDE for VRF Interfaces feature on VPN Red on PE2 as shown in Figure 2, and the traffic to and from CE2 is assigned to VRF Red, the traffic is added to the NetFlow cache and shown as being received on VPN Red.

Figure 2 Example of a Router (PE2) Receiving Traffic over a MPLS VPN VRF Interface



MPLS Aggregate Labels

There are two types of VPN MPLS labels:

- Aggregate labels for traffic on which a routing decision must be made
- Non aggregate (specific) labels.

When you configure a MPLS VPN on a PE router the router allocates an aggregate MPLS label for the VPN.

Since aggregate MPLS labels correspond to the VRF to which a packet belongs, the router must consult the routing table for a VRF to determine the correct next hop IP address within the VPN domain in order to forward the packet. The next-hop IP address is required before the router can forward the packet because VPN domains are capable of supporting multiple next hop routers. For example, in Figure 2 there are two CE routers: CE2 and CE3. MPLS traffic arriving on VPN Red on PE1 could be destined to hosts attached to either CE2 or CE3. PE2 must perform another lookup to identify the correct CE router to which the traffic must be forwarded. The method that PE2 uses to perform the next-hop IP address lookup depends on the number of MPLS aggregate labels that the router has stored.

Stored MPLS Aggregate Labels

Traffic that uses one of the first 511 aggregate MPLS labels is forwarded by the router based on the entry for the MPLS VPN label in the VPN content addressable memory (CAM).

The following steps are performed by a PE router to forward MPLS traffic that uses one of the first 511 aggregate MPLS labels:

1. An MPLS packet carrying an aggregation label arrives at the egress PE router.
2. A lookup in the VPN CAM is performed for the MPLS aggregation label.
3. The MPLS aggregation label is removed and the corresponding VPN ID for the packet is identified.
4. The index from the VPN CAM is used to reference the MPLS VPN routing table.
5. A lookup is performed for the destination IP prefix in the VPN VRF that was derived from the MPLS VPN table. The lookup result contains the next hop IP address and all other rewrite information needed for forwarding the packet to the correct CE router.

More Than 511 Stored MPLS Aggregate Labels

When the number of MPLS aggregate labels in the network exceeds 511, the router can no longer store some MPLS aggregate labels in its VPN CAM. In this situation the router consults the MPLS FIB, strips off the label to reveal the IPv4 packet encapsulated inside, and recirculates the packet, at which point the VRF FIB determines the next hop.

Note The first 511 MPLS aggregate labels remain in the VPN CAM and are processed based on the steps in the "Stored MPLS Aggregate Labels" section on page 4.

The following steps are performed by a PE router to forward MPLS traffic when the aggregate MPLS label is not in the VPN CAM:

1. A lookup is performed in the TCAM and FIB.
2. The MPLS label is popped and the reserved VLAN associated with the MPLS aggregation label is assigned to the packet.

Note When the number of MPLS aggregate labels exceeds 511, a reserved VLAN interface is assigned for each new MPLS aggregate label.

3. The VPN ID for the reserved VLAN ID is derived from the VLAN RAM. The VPN ID is used as a part of the lookup key for the IP VRF Cisco express forwarding (CEF) lookup.
4. The IP VRF CEF lookup result contains the next hop IP address and all other rewrite information needed for forwarding the packet to the correct CE router.

NetFlow Cache Population

When the NDE for VRF Interfaces feature is configured for an MPLS VPN, a VLAN interface is reserved and NetFlow is enabled on the VLAN interface. The method used by the router to process the MPLS VPN IPv4 traffic and populate the NetFlow cache depends on the number of MLS aggregate labels that the router has stored.

MPLS Aggregate Labels in VPN CAM

When there are fewer than 512 VPN aggregate MPLS labels, the label and associated VPN are programmed in the MPLS VPN CAM, and packet recirculation is not required. The policy feature card (PFC) receives the packet as an IP packet. The PFC NetFlow function sees flows as sourced at the MPLS VPN not at the interface on which the traffic was received.

When there are fewer than 512 VPN aggregate MPLS labels (all MPLS aggregate labels are stored in the VPN CAM), the NetFlow cache is populated for the MPLS traffic that is using the MPLS aggregate labels by enabling NetFlow on the MPLS interface with the **ip flow ingress** command. For example, to enable NetFlow for the traffic that is being forwarded based on the MPLS aggregation labels in the VPN CAM in router PE2 in Figure 2, you must configure the **ip flow ingress** command on interface FastEthernet0/0. This is sufficient to populate the cache. To cause the router to export the NetFlow data to a collector, the **flow hardware mpls-vpn ip** *vrf-id* command must be issued in global configuration mode.

MPLS Aggregate Labels Not in VPN CAM

When the number of MPLS aggregate labels in the network exceeds 511, the VPN CAM is full. Traffic must be recirculated if it does not use one of the MPLS aggregate labels stored in the VPN CAM. The packets are processed by the policy feature card (PFC) once to strip the MPLS label, and processed by the PFC a second time with the VLAN specified as the reserved VPN VLAN that was assigned when the NDE for VRF Interfaces feature was enabled. The VLAN RAM maps this VLAN to the VPN for use in routing. The PFC netflow function sees flows as sourced at the reserved VRF VLAN. The ternary content addressable memory (TCAM) entry for the reserved VLAN interface provides the flow mask to NetFlow.

Flows for MPLS VPN traffic received with aggregate label that is not in the VPN CAM are populated in the NetFlow cache by configuring the **flow hardware mpls-vpn ip** *vrf-id* command for each VPN VRF on the router in global configuration mode.

MPLS-Specific Labels

For the nonaggregate label case, by definition, the router does not need to examine the underlying IP packet to determine where to route the packet. In order to cause the IP flows to populate the cache, the **flow hardware mpls-vpn ip** *vrf-id* configuration command must be entered. This causes the specific label flow traffic to be stripped of its label and recirculated to the reserved VPN VLAN prior to being forwarded to the exit interface. This introduces more delay in forwarding the traffic than would otherwise be experienced.

Configuring MPLS VPN Netflow Capture and Export

To ensure that you have enabled the capturing and export of NetFlow data for all of the traffic that you want to analyze, regardless of the MPLS aggregate label it is using, you should configure the **ip flow ingress** command on the MPLS interface and configure the **flow hardware mpls-vpn ip** *vrf-id* command for each VPN VRF on the router in global configuration mode.

Note The steps required to configure NetFlow data export (NDE) for data in the NetFlow cache are provided in the "How to Configure NDE for VRF Interfaces for an MPLS VPN" section on page 6.

VRF Name as the Source Interface in the NetFlow Cache

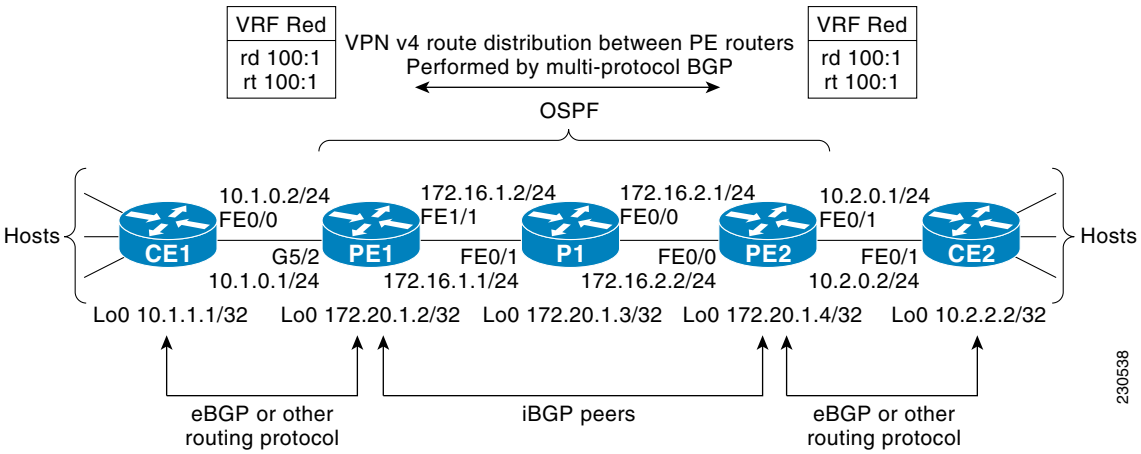
For traffic received for an MPLS VPN on an MPLS interface, the source interface for the traffic in the NetFlow cache is listed as the VPN name, not the physical interface on which the traffic was received. For example, traffic being received on FastEthernet0/0 on PE2 in Figure 2 will be displayed in the NetFlow cache on the router as being received over VPN Red, not interface FastEthernet0/0.

How to Configure NDE for VRF Interfaces for an MPLS VPN

Perform this task to configure the NDE for VRF Interfaces feature on an MPLS VPN. This configuration is appropriate for the router named PE1 in Figure 3. Repeat this task on router PE2 but remember to change the interface references to the appropriate interfaces for PE2.

Note This task does not include the commands to configure open shortest path first (OSPF) and border gateway protocol (BGP) that are required to activate the MPLS VPN between routers PE1 and PE2. See the "Configuration Examples for NDE for VRF Interfaces" section on page 11 for the complete configurations for all of the devices in the example network in Figure 3.

Figure 3 Example Network with One MPLS VPN



SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip vrf** *vrf-id*
4. **rd** *route-distinguisher*
5. **route-target** {**import** | **export** | **both**} *route-target-ext-community*
6. **interface** *type number*
7. **ip address** *ip-address mask*
8. **exit**
9. **mpls label protocol** {**ldp** | **tdp**}

10. **mpls ldp router-id** *type number*
11. **interface** *type number*
12. **ip address** *ip-address mask*
13. **mpls ip**
14. **ip flow ingress**
15. **interface** *type number*
16. **ip vrf forwarding** *vrf-id*
17. **ip address** *ip-address mask*
18. **exit**
19. **mls nde sender**
20. **mls flow ip** {**interface-destination-source** | **interface-full**}
21. **ip flow-export version 9**
22. **ip flow-export destination** {*ip-address* | *hostname*} *udp-port*
23. **flow hardware mpls-vpn ip** *vrf-id*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**ip vrf** *vrf-id* **Example:** `Router(config)# ip vrf red`	Defines a VPN routing and forwarding (VRF) instance and enters VRF configuration mode.
Step 4	**rd** *route-distinguisher* **Example:** `Router(config)# rd 200:2`	Creates a routing and forwarding table for a Virtual Private Network (VPN) routing/forwarding instance (VRF).
Step 5	**route-target** {**import** | **export** | **both**} *route-target-ext-community* **Example:** `Router(config)# route-target both 200:20`	Creates a route-target extended community for a VPN VRF.
Step 6	**interface** *type number* **Example:** `Router(config)# interface loopback 0`	Specifies the interface type and number to configure and enters interface configuration mode.

	Command or Action	Purpose
Step 7	**ip address** *ip-address mask* **Example:** `Router(config-if)# ip address 172.20.1.2 255.255.255.0`	Configure an IP address on the interface.
Step 8	**exit** **Example:** `Router(config-if)# exit`	Exits interface configuration mode and returns to global configuration mode.
Step 9	**mpls label** {**ldp** | **tdp**} **Example:** `Router(config)# mpls label protocol ldp`	Specifies the MPLS label distribution protocol.
Step 10	**mpls ldp router-id** *type number* **Example:** `Router(config)# mpls ldp router-id loopback0`	Specifies a preferred interface for determining the Label Distribution Protocol (LDP) router ID.
Step 11	**interface** *type number* **Example:** `Router(config-if)# interface fastethernet1/1`	Specifies the interface type and number to configure and enters interface configuration mode.
Step 12	**ip address** *ip-address mask* **Example:** `Router(config-if)# ip address 172.16.1.2 255.255.255.0`	Configures an IP address on the interface.
Step 13	**mpls ip** **Example:** `Router(config-if)# mpls ip`	Enables MPLS forwarding of IPv4 packets along normally routed paths for a particular interface.
Step 14	**ip flow ingress** **Example:** `Router(config-if)# ip flow ingress`	Enables NetFlow on the interface to capture traffic that is being received by the interface.
Step 15	**interface** *type number* **Example:** `Router(config)# interface GigabitEthernet5/2`	Specifies the interface type and number to configure and enters interface configuration mode.
Step 16	**ip vrf forwarding** *vrf-id* **Example:** `Router(config-if)# ip vrf forwarding red`	Associates a VPN VRF with an interface or subinterface.

	Command or Action	Purpose
Step 17	**ip address** *ip-address mask* **Example:** `Router(config-if)# ip address 10.1.0.1 255.255.255.0`	Configure an IP address on the interface.
Step 18	**exit** **Example:** `Router(config-if)# exit`	Exits interface configuration mode and returns to global configuration mode.
Step 19	**mls nde sender** **Example:** `Router(config)# mls nde sender`	Enables NetFlow on the PFC.
Step 20	**mls flow ip** {**interface-destination-source** | **interface-full**} **Example:** `Router(config)# mls flow ip interface-destination-source`	Specifies the NetFlow flow mask for IP traffic.
Step 21	**ip flow-export version 9** **Example:** `Router(config)# ip flow-export version 9`	Configures NetFlow data export to use the version 9 export format.
Step 22	**ip flow-export destination** {*ip-address* | *hostname*} *udp-port* **Example:** `Router(config)# ip flow-export destination 172.16.2.6 99`	Configures the IP address or hostname of the workstation to which you want to send the NetFlow information and the number of the UDP port on which the workstation is listening for this input.
Step 23	**flow hardware mpls-vpn ip** *vrf-id* **Example:** `Router(config)# flow hardware mpls-vpn ip red`	Enables the NDE for VRF Interfaces feature for the VRF.

Examples

The following output of the **show mls nde** command displays the NDE configuration and statistics.

```
PE1# show mls nde
 Netflow Data Export enabled
 Exporting flows to  172.16.2.6 (99)
 Exporting flows from 172.16.1.2 (51203)
 Version: 9
 Layer2 flow creation is disabled
 Layer2 flow export is disabled
 Include Filter not configured
 Exclude Filter not configured
 Total Netflow Data Export Packets are:
    4 packets, 0 no packets, 19 records
 Total Netflow Data Export Send Errors:
```

```
        IPWRITE_NO_FIB = 0
        IPWRITE_ADJ_FAILED = 0
        IPWRITE_PROCESS = 0
        IPWRITE_ENQUEUE_FAILED = 0
        IPWRITE_IPC_FAILED = 0
        IPWRITE_OUTPUT_FAILED = 0
        IPWRITE_MTU_FAILED = 0
        IPWRITE_ENCAPFIX_FAILED = 0
 Netflow Aggregation Disabled

PE1#
```

The following output of the **show mls netflow ip module** command displays the Netflow entries in the PFC. The first row of output shows traffic on VPN red.

Note Module 5 is the active supervisor 720 on this Cisco 7600 series router.

```
Router# show mls netflow ip module 5

Displaying Netflow entries in module 5
DstIP            SrcIP            Prot:SrcPort:DstPort  Src i/f          :AdjPtr
-------------------------------------------------------------------------------
Pkts          Bytes          Age   LastSeen  Attributes
-----------------------------------------------
10.1.1.1         10.2.0.2         0   :0      :0        vpn:red          :0x0
504           398020         1     23:20:48   L3 - Dynamic
224.0.0.5        172.16.1.1       89  :0      :0        Fa1/1            :0x0
1             84             7     23:20:42   L2 - Dynamic
0.0.0.0          0.0.0.0          0   :0      :0        --               :0x0
2238          1582910        33    23:20:48   L3 - Dynamic
224.0.0.2        172.16.1.1       udp :646    :646      Fa1/1            :0x0
5             310            21    23:20:46   L2 - Dynamic
172.16.2.6       172.16.1.2       0   :0      :0        Fa1/1            :0x0
1             140            22    23:20:27   L2 - Dynamic

Router#
```

The following output of the **show ip cache flow** command displays the data in the NetFlow cache. The last line of data in the output shows that the source interface for this traffic is VPN Red.

```
PE1# show ip cache flow

------------------------------------------------------------------------------
MSFC:
IP packet size distribution (3139 total packets):
   1-32   64   96  128  160  192  224  256  288  320  352  384  416  448  480
   .000 .685 .309 .000 .000 .000 .000 .003 .000 .000 .000 .000 .000 .000 .000

    512  544  576 1024 1536 2048 2560 3072 3584 4096 4608
   .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000

IP Flow Switching Cache, 278544 bytes
  2 active, 4094 inactive, 56 added
  20904 ager polls, 0 flow alloc failures
  Active flows timeout in 30 minutes
  Inactive flows timeout in 15 seconds
IP Sub Flow Cache, 33992 bytes
  0 active, 1024 inactive, 4 added, 4 added to flow
  0 alloc failures, 0 force free
  1 chunk, 2 chunks added
  last clearing of statistics never
```

```
Protocol         Total    Flows   Packets Bytes  Packets Active(Sec) Idle(Sec)
--------         Flows     /Sec     /Flow  /Pkt     /Sec     /Flow     /Flow
TCP-BGP             10      0.0         1    49      0.0       0.0      15.3
TCP-other            6      0.0         2    49      0.0       4.5      15.5
UDP-other           28      0.0        74    63      0.1     320.5      12.7
IP-other             6      0.0       153    80      0.0    1488.3       1.7
Total:              50      0.0        60    68      0.2     358.6      12.2

SrcIf         SrcIPaddress    DstIf         DstIPaddress    Pr SrcP DstP  Pkts
Fa1/1         172.16.1.1      Null          224.0.0.2       11 0286 0286    74
Fa1/1         172.16.1.1      Null          224.0.0.5       59 0000 0000    33

--------------------------------------------------------------------------------
PFC:

Displaying Hardware entries in Module 5
 SrcIf            SrcIPaddress          DstIPaddress      Pr       SrcP      Dss
 Fa1/1            172.20.1.2            172.20.1.3        0        0         0
 Fa1/1            172.20.1.3            172.20.1.2        0        0         0
 Fa1/1            172.16.1.2            172.16.2.6        0        0         0
 Fa1/1            172.16.1.1            224.0.0.2         udp      646       64
 --               0.0.0.0               0.0.0.0           0        0         0
 vpn:red          10.2.0.2              10.1.1.1          0        0         0
.
.
.
PE1#
```

Configuration Examples for NDE for VRF Interfaces

The following configuration example shows how to configure a simple network topology with the NDE for VRF Interfaces feature configured on two PE routers.

This section contains the following example configurations:

- Configurations for the Example Network with One MPLS VPN: Example, page 11
- Configuring the NDE for VRF Interfaces Feature on a VRF: Example, page 15

Configurations for the Example Network with One MPLS VPN: Example

This section contains the configurations for all of the devices in Figure 3. The NDE for VRF Interfaces feature is configured on routers PE1 and PE2.

CE1

```
!
hostname CE1
!
ip cef
!
interface Loopback0
 no shutdown
 ip address 10.1.1.1 255.255.255.255
!
interface FastEthernet0/0
 no shutdown
 ip address 10.1.0.2 255.255.255.0
!
```

```
ip default-network 0.0.0.0
ip route 0.0.0.0 0.0.0.0 10.1.0.1
!
end
```

PE1

```
!
hostname PE1
!
ip cef distributed
!
mls nde sender
mls flow ip interface-destination-source
ip flow-export destination 172.16.2.6 99
ip flow-export version 9
!
ip vrf red
 rd 200:2
 route-target export 200:20
 route-target import 200:20
!
flow hardware mpls-vpn ip red
!
multilink bundle-name authenticated
mpls label protocol ldp
!
interface Loopback0
 ip address 172.20.1.2 255.255.255.255
!
interface gigabitEthernet5/2
 no shutdown
 ip vrf forwarding red
 ip address 10.1.0.1 255.255.255.0
!
interface FastEthernet1/1
  no shutdown
 interface FastEthernet1/1
 ip address 172.16.1.2 255.255.255.0
 ip flow ingress
 mpls ip
!
router ospf 100
 router-id 172.20.1.2
 log-adjacency-changes
 network 172.16.0.0 0.0.255.255 area 0
 network 172.20.1.2 0.0.0.0 area 0
!
router bgp 200
 no synchronization
 bgp log-neighbor-changes
 network 172.0.0.0 mask 255.0.0.0
 neighbor as200 peer-group
 neighbor as200 remote-as 200
 neighbor as200 description as200
 neighbor as200 update-source Loopback0
 neighbor as200 route-reflector-client
 neighbor 172.20.1.4 remote-as 200
 neighbor 172.20.1.4 description iBGP with r4
 neighbor 172.20.1.4 update-source Loopback0
 no auto-summary
 !
 address-family vpnv4
```

```
 neighbor 172.20.1.4 activate
 neighbor 172.20.1.4 send-community both
 exit-address-family
 !
 address-family ipv4 vrf red
 no synchronization
 network 10.1.0.0 mask 255.255.255.0
 network 10.1.1.1 mask 255.255.255.255
 exit-address-family
!
ip route 172.0.0.0 255.0.0.0 Null0
ip route vrf red 10.1.1.1 255.255.255.255 10.1.0.2
!
mpls ldp router-id Loopback0
!
end
```

P1

```
!
hostname P1
!
ip cef
!
no ip domain lookup
!
mpls label protocol ldp
!
interface Loopback0
 no shutdown
 ip address 172.20.1.3 255.255.255.255
!
interface FastEthernet0/0
 no shutdown
 ip address 172.16.2.1 255.255.255.0
 mpls ip
!
interface FastEthernet0/1
 no shutdown
 ip address 172.16.1.1 255.255.255.0
 mpls ip
!
router ospf 100
 router-id 172.20.1.3
 log-adjacency-changes
 network 172.16.0.0 0.0.255.255 area 0
 network 172.20.1.3 0.0.0.0 area 0
!
mpls ldp router-id Loopback0
!
end
```

PE2

```
!
hostname PE2
!
ip cef distributed
!
mls nde sender
mls flow ip interface-destination-source
ip flow-export destination 172.16.2.6 99
ip flow-export version 9
!
```

```
ip vrf red
 rd 200:2
 route-target export 200:20
 route-target import 200:20
!
flow hardware mpls-vpn ip red
!
multilink bundle-name authenticated
mpls label protocol ldp
!
interface Loopback0
 no shutdown
 ip address 172.20.1.4 255.255.255.255
!
interface FastEthernet0/0
 no shutdown
 ip address 172.16.2.2 255.255.255.0
 mpls ip
 ip flow ingress
!
interface FastEthernet0/1
 no shutdown
 ip vrf forwarding red
 ip address 10.2.0.1 255.255.255.0
!
router ospf 100
 router-id 172.20.1.4
 log-adjacency-changes
 network 172.16.0.0 0.0.255.255 area 0
 network 172.20.1.4 0.0.0.0 area 0
!
router bgp 200
 no synchronization
 bgp log-neighbor-changes
 network 172.0.0.0 mask 255.0.0.0
 neighbor as200 peer-group
 neighbor as200 remote-as 200
 neighbor as200 description as200
 neighbor as200 update-source Loopback0
 neighbor as200 route-reflector-client
 neighbor 172.20.1.2 remote-as 200
 neighbor 172.20.1.2 description iBGP with r2
 neighbor 172.20.1.2 update-source Loopback0
 no auto-summary
 !
 address-family vpnv4
 neighbor 172.20.1.2 activate
 neighbor 172.20.1.2 send-community both
 exit-address-family
 !
 address-family ipv4 vrf red
 no synchronization
 network 10.2.0.0 mask 255.255.255.0
 network 10.2.2.2 mask 255.255.255.255
 exit-address-family
!
ip route 172.0.0.0 255.0.0.0 Null0
ip route vrf red 10.2.2.2 255.255.255.255 10.2.0.2
!
mpls ldp router-id Loopback0
!
end
```

CE2

```
!
hostname CE2
!
ip cef
!
interface Loopback0
 no shutdown
 ip address 10.2.2.2 255.255.255.255
!
interface FastEthernet0/1
 no shutdown
 ip address 10.2.0.2 255.255.255.0
!
ip default-network 0.0.0.0
ip route 0.0.0.0 0.0.0.0 10.2.0.1
!
end
```

Configuring the NDE for VRF Interfaces Feature on a VRF: Example

This example configuration shows how to configure the NDE for VRF Interfaces feature for a VRF. When you enable NetFlow on interface GigabitEthernet2/3 with the **ip flow ingress** command, the NetFlow cache will contain information for traffic for VPN vpn1.

PE1

```
!
ip vrf vpn1
 rd 100:1
 route-target export 100:1
 route-target import 100:1
!
mls flow ip interface-full
!
interface GigabitEthernet2/3
 ip vrf forwarding vpn1
 ip address 10.0.0.1 255.0.0.0
 ip flow ingress
!
interface GigabitEthernet2/7
 ip vrf forwarding vpn1
 ip address 172.16.20.1 255.255.255.0
!
ip flow-export version 9
ip flow-export destination 192.168.10.2 20000
end
```

Where to Go Next

- See the “Configuring NetFlow and NDE” chapter of the *Cisco 7600 Series Cisco IOS Software Configuration Guide*, Release 12.2SR for more information on configuring NetFlow features on Cisco 7600 series routers.

- See the “Configuring PFC3BXL and PFC3B Mode Multiprotocol Label Switching” chapter of the *Cisco 7600 Series Cisco IOS Software Configuration Guide*, Release 12.2SR for more information on configuring MPLS features on Cisco 7600 series routers.

Additional References

The following sections provide references related to the NDE for VRF Interfaces feature.

Related Documents

Related Topic	Document Title
NetFlow commands, complete command syntax, command mode, defaults, command history, usage guidelines, and examples.	*Cisco IOS NetFlow Command Reference*
Information for configuring NetFlow, MPLS, and other features on Cisco 7600 series routers.	*Cisco 7600 Series Cisco IOS Software Configuration Guide*, Release 12.2SR

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIB	MIBs Link
No new or modified MIBS are supported by this feature, and support for existing MIBs has not been modified by this feature.	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

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register on Cisco.com.	http://www.cisco.com/techsupport

Command Reference

This section documents new and modified commands only.

- flow hardware mpls-vpn ip
- show ip cache flow
- show ip cache flow aggregation
- show mls netflow ip

flow hardware mpls-vpn ip

To ensure the creation and export of hardware NetFlow cache entries for traffic entering the router on the last MPLS hop of an IPv4 MPLS VPN network, use the flow **hardware mpls-vpn ip** command in global configuration mode. To disable the creation and export of hardware NetFlow cache entries for this traffic, use the **no** form of this command.

flow hardware mpls-vpn ip *vrf-id*

no flow hardware mpls-vpn ip *vrf-id*

Syntax Description

vrf-id	The name of a VRF that you have previously configured.

Command Default

Creation and export of hardware NetFlow cache entries for traffic entering the router on the last MPLS hop of an IPv4 MPLS VPN network is not enabled.

Command Modes

Global configuration

Command History

Release	Modification
12.2(33)SRB	This command was introduced.

Usage Guidelines

NetFlow Aggregation

If you want to include IPV4 MPLS VPN traffic in a NetFlow aggregation scheme on your router, you must configure the **flow hardware mpls-vpn ip** command.

NetFlow Sampling

If you want to include IPV4 MPLS VPN traffic in the traffic that is analyzed using NetFlow sampling on your router, you must configure the **flow hardware mpls-vpn ip** command.

Examples

The following example configures NDE for VRF vpn1:

```
Router(config)# flow hardware mpls-vpn ip vpn1
```

Related Commands

Command	Description
show mls netflow ip	Displays information about the hardware NetFlow IP flows.

show ip cache flow

To display a summary of the NetFlow accounting statistics, use the **show ip cache flow** command in user EXEC or privileged EXEC mode.

show ip cache flow

Syntax Description

This command has no keywords or arguments.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.1	This command was introduced.
11.1CA	The information display for the command was updated.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.3(1)	Support for the NetFlow Multicast Support feature was added.
12.2(18)S	Support for the NetFlow Multicast Support feature was added.
12.3(4)T, 12.3(6), 12.2(20)S	The **execute-on** command was implemented on the Cisco 7500 platforms to include the remote execution of the **show ip cache flow** command.
12.3(11)T	Support for egress flow accounting was added, and the [*prefix mask*] and [*type number*] arguments were removed.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17b)SXA	The output was changed to include hardware-entry information.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to the 12.2 SX release.
12.2(18)SXF	This command was integrated into Cisco IOS Release 12.2(18)SXF.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SRB	This command was modified to show the VPN name and VPN ID in the display output.

Usage Guidelines

Some of the content in the display of the **show ip cache flow** command uses multiline headings and multiline data fields. Figure 5 shows how to associate the headings with the correct data fields when there are two lines of headings and two lines of data fields. The first line of the headings is associated with the first line of data fields. The second line of the headings is associated with the second line of data fields.

When other features such as IP Multicast are configured, the number of lines in the headings and data fields increases. The method for associating the headings with the correct data fields remains the same.

Figure 4 How to Use the Multiline Headings and Multiline Data Fields in the Display Output of the show ip cache flow Command

```
Router# show ip cache verbose flow
IP packet size distribution (25229 total packets):
   1-32   64   96  128  160  192  224  256  288  320  352  384  416  448  480
   .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000
    512  544  576 1024 1536 2048 2560 3072 3584 4096 4608
   .000 .000 .000 .206 .793 .000 .000 .000 .000 .000 .000

IP Flow Switching Cache, 278544 bytes
  6 active, 4090 inactive, 17 added
  505 ager polls, 0 flow alloc failures
  Active flows timeout in 1 minutes
  Inactive flows timeout in 10 seconds
IP Sub Flow Cache, 25736 bytes
  12 active, 1012 inactive, 39 added, 17 added to flow
  0 alloc failures, 0 force free
  1 chunk, 1 chunk added
  last clearing of statistics never
Protocol         Total    Flows   Packets Bytes  Packets Active(Sec) Idle(Sec)
--------         Flows     /Sec     /Flow  /Pkt     /Sec     /Flow     /Flow
TCP-Telnet           1      0.0       362   940      2.7      60.2       0.0
TCP-FTP              1      0.0       362   840      2.7      60.2       0.0
TCP-FTPD             1      0.0       362   840      2.7      60.1       0.1
TCP-SMTP             1      0.0       361  1040      2.7      60.0       0.1
UDP-other            5      0.0         1    66      0.0       1.0      10.6
ICMP                 2      0.0      8829  1378    135.8      60.7       0.0
Total:              11      0.0      1737  1343    147.0      33.4       4.8

SrcIf          SrcIPaddress    DstIf          DstIPaddress    Pr TOS Flgs Pkts
Port Msk AS                    Port Msk AS    NextHop              B/Pk  Active
Et0/0.1        10.251.138.2    Et1/0.1        172.16.10.2     06 80  00    65
0015 /0  0                     0015 /0  0     0.0.0.0                840   10.8
MAC: (VLAN id) aaaa.bbbb.cc03  (005)          aaaa.bbbb.cc06  (006)
Min plen:      840                           Max plen:       840
Min TTL:        59                           Max TTL:         59
IP id:           0
                                                                        127034
```

Displaying Detailed NetFlow Cache Information on Platforms Running Distributed Cisco Express Forwarding

On platforms running distributed Cisco Express Forwarding (dCEF), NetFlow cache information is maintained on each line card or Versatile Interface Processor. To display this information on a distributed platform by use of the **show ip cache flow** command, you must enter the command at a line card prompt.

Cisco 7600 Series Platforms

The **module** *num* keyword and argument are supported on DFC-equipped modules only.

The VPN name and ID are shown in the display output in the format VPN:vpn-id.

Cisco 7500 Series Platform

The Cisco 7500 series platorms are not supported by Cisco IOS Release 12.4T and later. Cisco IOS Release 12.4 is the last Cisco IOS release to support the Cisco 7500 series platorms.

To display NetFlow cache information using the **show ip cache flow** command on a Cisco 7500 series router that is running dCEF, enter the following sequence of commands:

```
Router# if-con slot-number
LC-slot-number# show ip cache flow
```

For Cisco IOS Releases 12.3(4)T, 12.3(6), and 12.2(20)S and later, enter the following command to display NetFlow cache information:

```
Router# execute-on slot-number show ip cache flow
```

Cisco 12000 Series Platform

To display NetFlow cache information using the **show ip cache flow** command on a Cisco 12000 Series Internet Router, enter the following sequence of commands:

```
Router# attach slot-number
LC-slot-number# show ip cache flow
```

For Cisco IOS Releases 12.3(4)T, 12.3(6), and 12.2(20)S and later, enter the following command to display NetFlow cache information:

```
Router# execute-on slot-number show ip cache flow
```

Examples

The following is a sample display of a main cache using the **show ip cache flow** command:

```
Router# show ip cache flow
IP packet size distribution (2381 total packets):
   1-32   64   96  128  160  192  224  256  288  320  352  384  416  448  480
   .092 .000 .003 .000 .141 .048 .000 .000 .000 .093 .000 .000 .000 .000 .000

    512  544  576 1024 1536 2048 2560 3072 3584 4096 4608
   .000 .000 .048 .189 .381 .000 .000 .000 .000 .000 .000

IP Flow Switching Cache, 278544 bytes
  22 active, 4074 inactive, 45 added
  2270 ager polls, 0 flow alloc failures
  Active flows timeout in 1 minutes
  Inactive flows timeout in 100 seconds
IP Sub Flow Cache, 25736 bytes
  23 active, 1001 inactive, 47 added, 45 added to flow
  0 alloc failures, 0 force free
  1 chunk, 1 chunk added
  last clearing of statistics never
Protocol         Total    Flows   Packets Bytes  Packets Active(Sec) Idle(Sec)
--------         Flows     /Sec     /Flow  /Pkt     /Sec     /Flow     /Flow
TCP-FTP              4      0.0        67   840      2.6      59.4       0.7
TCP-SMTP             1      0.0        67   168      0.6      59.4       0.5
TCP-BGP              1      0.0        68  1140      0.6      60.3       0.4
TCP-NNTP             1      0.0        68  1340      0.6      60.2       0.2
TCP-other            7      0.0        68   913      4.7      60.3       0.4
UDP-TFTP             1      0.0        68   156      0.6      60.2       0.1
UDP-other            4      0.0        36   151      1.4      45.6      14.7
ICMP                 4      0.0        67   529      2.7      60.0       0.2
Total:              23      0.2        62   710     14.3      57.5       2.9

SrcIf         SrcIPaddress    DstIf         DstIPaddress    Pr SrcP DstP  Pkts
Et2/0         192.168.137.78  Et3/0*        192.168.10.67   06 0041 0041    39
Et2/0         172.19.216.196  Et3/0*        192.168.10.38   06 0077 0077    39
Et0/0.1       10.56.78.128    Et1/0.1       172.16.30.231   06 00B3 00B3    48
Et0/0.1       10.10.18.1      Et1/0.1       172.16.30.112   11 0043 0043    47
Et0/0.1       10.162.37.71    Et1/0.1       172.16.30.218   06 027C 027C    48
Et0/0.1       172.16.6.1      Null          224.0.0.9       11 0208 0208     1
Et0/0.1       10.231.159.251  Et1/0.1       172.16.10.2     06 00DC 00DC    48
Et2/0         10.234.53.1     Et3/0*        192.168.10.32   06 0016 0015    39
Et2/0         10.210.211.213  Et3/0*        192.168.10.127  06 006E 006E    38
Et0/0.1       10.234.53.1     Et1/0.1       172.16.30.222   01 0000 0000    47
Et0/0.1       10.90.34.193    Et1/0.1       172.16.10.2     06 0016 0015    48
Et0/0.1       10.10.10.2      Et1/0.1       172.16.10.2     06 0016 0015    48
Et2/0         10.10.18.1      Et3/0*        192.168.10.162  11 0045 0045    39
Et0/0.1       192.168.3.185   Et1/0.1       172.16.10.2     06 0089 0089    48
```

```
Et0/0.1       10.10.11.1      Et1/0.1       172.16.30.51    06 0019 0019    49
Et0/0.1       10.254.254.235  Et1/0.1       172.16.10.2     11 00A1 00A1    48
Et2/0         192.168.23.2    Et3/0*        192.168.10.2    01 0000 0000    39
Et0/0.1       10.251.10.1     Et1/0.1       172.16.10.2     01 0000 0800    47
R3#
```

Note The asterisk (*) immediately following the "DstIf" field indicates that the flow being shown is an egress flow.

The following output of the **show ip cache flow** command shows the source interface some of the traffic in the NetFlow hardware cache on the PFC is VPN Red.

```
PE1# show ip cache flow

------------------------------------------------------------------------------
MSFC:
IP packet size distribution (3139 total packets):
   1-32   64   96  128  160  192  224  256  288  320  352  384  416  448  480
   .000 .685 .309 .000 .000 .000 .000 .003 .000 .000 .000 .000 .000 .000 .000

    512  544  576 1024 1536 2048 2560 3072 3584 4096 4608
   .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000

IP Flow Switching Cache, 278544 bytes
  2 active, 4094 inactive, 56 added
  20904 ager polls, 0 flow alloc failures
  Active flows timeout in 30 minutes
  Inactive flows timeout in 15 seconds
IP Sub Flow Cache, 33992 bytes
  0 active, 1024 inactive, 4 added, 4 added to flow
  0 alloc failures, 0 force free
  1 chunk, 2 chunks added
  last clearing of statistics never
Protocol         Total    Flows   Packets Bytes  Packets Active(Sec) Idle(Sec)
--------         Flows     /Sec     /Flow  /Pkt     /Sec     /Flow     /Flow
TCP-BGP             10      0.0         1    49      0.0       0.0      15.3
TCP-other            6      0.0         2    49      0.0       4.5      15.5
UDP-other           28      0.0        74    63      0.1     320.5      12.7
IP-other             6      0.0       153    80      0.0    1488.3       1.7
Total:              50      0.0        60    68      0.2     358.6      12.2

SrcIf         SrcIPaddress    DstIf         DstIPaddress    Pr SrcP DstP  Pkts
Fa1/1         172.16.1.1      Null          224.0.0.2       11 0286 0286    74
Fa1/1         172.16.1.1      Null          224.0.0.5       59 0000 0000    33

------------------------------------------------------------------------------
PFC:

Displaying Hardware entries in Module 5
 SrcIf            SrcIPaddress          DstIPaddress      Pr       SrcP      Dss
 Fa1/1            172.20.1.2            172.20.1.3        0        0         0
 Fa1/1            172.20.1.3            172.20.1.2        0        0         0
 Fa1/1            172.16.1.2            172.16.2.6        0        0         0
 Fa1/1            172.16.1.1            224.0.0.2         udp      646       64
 --               0.0.0.0               0.0.0.0           0        0         0
 vpn:red          10.2.0.2              10.1.1.1          0        0         0
.
.
.
PE1#
```

Table 1 describes the significant fields shown in the flow switching cache lines of the display.

Table 1 show ip cache flow Field Descriptions in Flow Switching Cache Display

Field	Description
bytes	Number of bytes of memory used by the NetFlow cache.
active	Number of active flows in the NetFlow cache at the time this command was entered.
inactive	Number of flow buffers that are allocated in the NetFlow cache, but were not currently assigned to a specific flow at the time this command was entered.
added	Number of flows created since the start of the summary period.
ager polls	Number of times the NetFlow code looked at the cache to cause entries to expire (used by Cisco for diagnostics only).
flow alloc failures	Number of times the NetFlow code tried to allocate a flow but could not.
last clearing of statistics	Standard time output (hh:mm:ss) since the **clear ip flow stats** privileged EXEC command was executed. This time output changes to hours and days after the time exceeds 24 hours.

Table 2 describes the significant fields shown in the activity by protocol lines of the display.

Table 2 show ip cache flow Field Descriptions in Activity by Protocol Display

Field	Description
Protocol	IP protocol and the well-known port number. (Refer to http://www.iana.org, *Protocol Assignment Number Services*, for the latest RFC values.) **Note** Only a small subset of all protocols is displayed.
Total Flows	Number of flows in the cache for this protocol since the last time the statistics were cleared.
Flows/Sec	Average number of flows for this protocol per second; equal to the total flows divided by the number of seconds for this summary period.
Packets/Flow	Average number of packets for the flows for this protocol; equal to the total packets for this protocol divided by the number of flows for this protocol for this summary period.
Bytes/Pkt	Average number of bytes for the packets for this protocol; equal to the total bytes for this protocol divided by the total number of packets for this protocol for this summary period.
Packets/Sec	Average number of packets for this protocol per second; equal to the total packets for this protocol divided by the total number of seconds for this summary period.
Active(Sec)/Flow	Number of seconds from the first packet to the last packet of an expired flow divided by the number of total flows for this protocol for this summary period.
Idle(Sec)/Flow	Number of seconds observed from the last packet in each nonexpired flow for this protocol until the time at which the **show ip cache verbose flow** command was entered divided by the total number of flows for this protocol for this summary period.

Table 3 describes the significant fields in the NetFlow record lines of the display.

Table 3 show ip cache flow Field Descriptions in NetFlow Record Display

Field	Description
SrcIf	Interface on which the packet was received.
SrcIPaddress	IP address of the device that transmitted the packet.
DstIf	Interface from which the packet was transmitted. **Note** If an asterisk (*) immediately follows the DstIf field, the flow being shown is an egress flow.
DstIPaddress	IP address of the destination device.
Pr	IP protocol "well-known" port number, displayed in hexadecimal format. (Refer to http://www.iana.org, *Protocol Assignment Number Services*, for the latest RFC values.)
SrcP	The source protocol port number in hexadecimal.
DstP	The destination protocol port number in hexadecimal.
Pkts	Number of packets switched through this flow.

Related Commands

Command	Description
clear ip flow stats	Clears the NetFlow accounting statistics.
show ip cache verbose flow	Displays a detailed summary of the NetFlow accounting statistics.
show ip flow interface	Displays NetFlow accounting configuration for interfaces.
show ip interface	Displays the usability status of interfaces configured for IP.

show ip cache flow aggregation

To display the NetFlow accounting aggregation cache statistics, use the **show ip cache flow aggregation** command in user EXEC or privileged EXEC mode.

show ip cache [*prefix mask*] [*interface-type interface-number*] [**verbose**] **flow aggregation** {**as** | **as-tos** | **bgp-nexthop-tos** | **destination-prefix** | **destination-prefix-tos** | **prefix** | **prefix-port** | **prefix-tos** | **protocol-port** | **protocol-port-tos** | **source-prefix** | **source-prefix-tos**}

Syntax Description

prefix mask	(Optional) Displays only the entries in the cache that match the prefix and mask combination.
interface-type interface-number	(Optional) Displays only the entries in the cache that match the interface type and interface number combination.
verbose	(Optional) Displays additional information from the aggregation cache.
as	Displays the configuration of the autonomous system aggregation cache scheme.
as-tos	Displays the configuration of the autonomous system type of service (ToS) aggregation cache scheme.
bgp-nexthop-tos	Displays the BGP next hop and ToS aggregation cache scheme.
destination-prefix	Displays the configuration of the destination prefix aggregation cache scheme.
destination-prefix-tos	Displays the configuration of the destination prefix ToS aggregation cache scheme.
prefix	Displays the configuration of the prefix aggregation cache scheme.
prefix-port	Displays the configuration of the prefix port aggregation cache scheme.
prefix-tos	Displays the configuration of the prefix ToS aggregation cache scheme.
protocol-port	Displays the configuration of the protocol port aggregation cache scheme.
protocol-port-tos	Displays the configuration of the protocol port ToS aggregation cache scheme.
source-prefix	Displays the configuration of the source prefix aggregation cache scheme.
source-prefix-tos	Displays the configuration of the source prefix ToS aggregation cache scheme.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.0(3)T	This command was introduced.
12.0(15)S	This command was modified to include new **show** output for ToS aggregation schemes.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.3(1)	Support for the BGP Next Hop Support feature was added.
12.2(18)S	Support for the BGP Next Hop Support feature was added.
12.0(26)S	Support for the BGP Next Hop Support feature was added.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17b)SXA	The output was changed to include hardware-entry information.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to the 12.2 SX release.
12.2(18)SXF	This command was integrated into Cisco IOS Release 12.2(18)SXF.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SRB	This command was modified to show the VPN name and VPN ID in the display output.

Usage Guidelines

Some of the content in the display of the **show ip cache flow** command uses multiline headings and multiline data fields. Figure 5 shows how to associate the headings with the correct data fields when there are two lines of headings and two lines of data fields. The first line of the headings is associated with the first line of data fields. The second line of the headings is associated with the second line of data fields.

When other features such as IP Multicast are configured, the number of lines in the headings and data fields increases. The method for associating the headings with the correct data fields remains the same.

Figure 5 How to Use the Multiline Headings and Multiline Data Fields in the Display Output of the show ip cache flow aggregation Command

```
Router# show ip cache verbose flow
IP packet size distribution (25229 total packets):
   1-32   64   96  128  160  192  224  256  288  320  352  384  416  448  480
   .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000
    512  544  576 1024 1536 2048 2560 3072 3584 4096 4608
   .000 .000 .000 .206 .793 .000 .000 .000 .000 .000 .000

IP Flow Switching Cache, 278544 bytes
  6 active, 4090 inactive, 17 added
  505 ager polls, 0 flow alloc failures
  Active flows timeout in 1 minutes
  Inactive flows timeout in 10 seconds
IP Sub Flow Cache, 25736 bytes
  12 active, 1012 inactive, 39 added, 17 added to flow
  0 alloc failures, 0 force free
  1 chunk, 1 chunk added
  last clearing of statistics never
Protocol         Total    Flows   Packets Bytes  Packets Active(Sec) Idle(Sec)
--------         Flows     /Sec     /Flow  /Pkt     /Sec     /Flow     /Flow
TCP-Telnet           1      0.0       362   940      2.7      60.2       0.0
TCP-FTP              1      0.0       362   840      2.7      60.2       0.0
TCP-FTPD             1      0.0       362   840      2.7      60.1       0.1
TCP-SMTP             1      0.0       361  1040      2.7      60.0       0.1
UDP-other            5      0.0         1    66      0.0       1.0      10.6
ICMP                 2      0.0      8829  1378    135.8      60.7       0.0
Total:              11      0.0      1737  1343    147.0      33.4       4.8

SrcIf          SrcIPaddress    DstIf          DstIPaddress    Pr TOS Flgs Pkts
Port Msk AS                    Port Msk AS    NextHop              B/Pk  Active
Et0/0.1        10.251.138.2    Et1/0.1        172.16.10.2     06 80  00     65
0015 /0  0                     0015 /0  0     0.0.0.0                840    10.8
MAC: (VLAN id) aaaa.bbbb.cc03  (005)          aaaa.bbbb.cc06  (006)
Min plen:      840                           Max plen:       840
Min TTL:        59                           Max TTL:         59
IP id:           0                                                    127034
```

Cisco 7600 Series Platforms

If you enter the **show ip cache flow aggregation** command without the **module** *num*, the software-switched aggregation cache on the RP is displayed.

The **module** *num* keyword and argument are supported on DFC-equipped modules only.

The VPN name and ID are shown in the display output in the format VPN:vpn-id.

Displaying Detailed NetFlow Cache Information on Platforms Running Distributed Cisco Express Forwarding

On platforms running Distributed Cisco Express Forwarding (dCEF), NetFlow cache information is maintained on each line card or Versatile Interface Processor. To display this information on a distributed platform by use of the **show ip cache flow** command, you must enter the command at a line card prompt.

Cisco 7500 Series Platform

The Cisco 7500 series platorms are not supported by Cisco IOS Release 12.4T and later. Cisco IOS Release 12.4 is the last Cisco IOS release to support the Cisco 7500 series platorms.

To display NetFlow cache information using the **show ip cache flow** command on a Cisco 7500 series router that is running dCEF, enter the following sequence of commands:

```
Router# if-con slot-number
LC-slot-number# show ip cache flow
```

For Cisco IOS Releases 12.3(4)T, 12.3(6), and 12.2(20)S and later, enter the following command to display NetFlow cache information:

```
Router# execute-on slot-number show ip cache flow
```

Cisco 12000 Series Platform

To display NetFlow cache information using the **show ip cache flow** command on a Cisco 12000 Series Internet Router, enter the following sequence of commands:

```
Router# attach slot-number
LC-slot-number# show ip cache flow
```

For Cisco IOS Releases 12.3(4)T, 12.3(6), and 12.2(20)S and later, enter the following command to display NetFlow cache information:

```
Router# execute-on slot-number show ip cache flow
```

Examples

The following is a sample display of an autonomous system aggregation cache with the **show ip cache flow aggregation as** command:

```
Router# show ip cache flow aggregation as

IP Flow Switching Cache, 278544 bytes
  2 active, 4094 inactive, 13 added
  178 ager polls, 0 flow alloc failures

Src If       Src AS  Dst If       Dst AS  Flows   Pkts  B/Pk  Active
Fa1/0         0      Null          0         1      2     49    10.2
Fa1/0         0      Se2/0         20        1      5    100     0.0
```

The following is a sample display of an autonomous system aggregation cache for the prefix mask 10.0.0.0 255.0.0.0 with the **show ip cache flow aggregation as** command:

```
Router# show ip cache 10.0.0.0 255.0.0.0 flow aggregation as

IP Flow Switching Cache, 278544 bytes
  2 active, 4094 inactive, 13 added
  178 ager polls, 0 flow alloc failures

Src If        Src AS  Dst If         Dst AS     Flows    Pkts  B/Pk  Active
e1/2           0      Null           0            1      2       49    10.2
e1/2           0      e1/2           20           1      5      100     0.0
```

The following is a sample display of an destination prefix TOS cache with the **show ip cache flow aggregation destination-prefix-tos** command:

```
Router# show ip cache flow aggregation destination-prefix-tos

IP Flow Switching Cache, 278544 bytes
  7 active, 4089 inactive, 21 added
  5970 ager polls, 0 flow alloc failures
  Active flows timeout in 5 minutes
  Inactive flows timeout in 15 seconds
IP Sub Flow Cache, 25736 bytes
  7 active, 1017 inactive, 21 added, 21 added to flow
  0 alloc failures, 0 force free
  1 chunk, 1 chunk added

Dst If         Dst Prefix      Msk  AS    TOS Flows  Pkts B/Pk  Active
Null           224.0.0.0       /24  0     C0     2     6    72   132.1
```

```
Et1/0.1         172.16.30.0     /24  0     00     2   134    28   121.1
Et1/0.1         172.16.30.0     /24  0     80    12   804   780   124.6
Et1/0.1         172.16.10.0     /24  0     00     4   268  1027   121.1
Et1/0.1         172.16.10.0     /24  0     80    12   804   735   123.6
Et3/0           192.168.10.0    /24  0     80    10   669   755   121.8
Et3/0           192.168.10.0    /24  0     00     2   134    28   121.2
Router#
```

The following is a sample display of an prefix port aggregation cache with the **show ip cache flow aggregation prefix-port** command:

```
Router# show ip cache flow aggregation prefix-port

IP Flow Switching Cache, 278544 bytes
  21 active, 4075 inactive, 84 added
  26596 ager polls, 0 flow alloc failures
  Active flows timeout in 5 minutes
  Inactive flows timeout in 15 seconds
IP Sub Flow Cache, 25736 bytes
  0 active, 1024 inactive, 0 added, 0 added to flow
  0 alloc failures, 0 force free
  1 chunk, 1 chunk added

Src If        Src Prefix     Msk  Dst If        Dst Prefix     Msk Flows  Pkts
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.10.0    /24    2    132
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.30.0    /24    1     66
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.30.0    /24    1     67
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.30.0    /24    1     67
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.10.0    /24    1     66
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.30.0    /24    1     66
Et2/0         0.0.0.0        /0   Et3/0         192.168.10.0   /24    1     66
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.30.0    /24    1     66
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.10.0    /24    1     66
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.10.0    /24    1     67
Et0/0.1       172.16.6.0     /24  Null          224.0.0.0      /24    1      3
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.10.0    /24    1     66
Et2/0         0.0.0.0        /0   Et3/0         192.168.10.0   /24    1     66
Et2/0         0.0.0.0        /0   Et3/0         192.168.10.0   /24    1     66
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.30.0    /24    1     66
Et2/0         0.0.0.0        /0   Et3/0         192.168.10.0   /24    1     66
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.30.0    /24    1     67
Et2/0         0.0.0.0        /0   Et3/0         192.168.10.0   /24    1     67
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.10.0    /24    1     66
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.10.0    /24    1     66
Et2/0         0.0.0.0        /0   Et3/0         192.168.10.0   /24    1     67
Router#
```

The following is a sample display of an prefix port aggregation cache for the prefix mask 172.16.0.0 255.255.0.0 with the **show ip cache 172.16.0.0 255.255.0.0 flow aggregation prefix-port** command:

```
Router# show ip cache 172.16.0.0 255.255.0.0 flow aggregation prefix-port

IP Flow Switching Cache, 278544 bytes
  21 active, 4075 inactive, 105 added
  33939 ager polls, 0 flow alloc failures
  Active flows timeout in 5 minutes
  Inactive flows timeout in 15 seconds
IP Sub Flow Cache, 25736 bytes
  0 active, 1024 inactive, 0 added, 0 added to flow
  0 alloc failures, 0 force free
  1 chunk, 1 chunk added

Src If        Src Prefix     Msk  Dst If        Dst Prefix     Msk Flows  Pkts
Et0/0.1       0.0.0.0        /0   Et1/0.1       172.16.10.0    /24    6    404
```

```
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.30.0     /24    3    203
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.30.0     /24    3    203
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.30.0     /24    3    202
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.10.0     /24    3    203
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.30.0     /24    3    201
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.30.0     /24    3    202
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.10.0     /24    3    202
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.10.0     /24    3    202
Et0/0.1       172.16.6.0      /24  Null          224.0.0.0       /24    2      6
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.10.0     /24    3    203
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.30.0     /24    3    203
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.30.0     /24    3    203
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.10.0     /24    3    202
Et0/0.1       0.0.0.0         /0   Et1/0.1       172.16.10.0     /24    3    203
Router#
```

The following is a sample display of an protocol port aggregation cache with the **show ip cache flow aggregation protocol-port** command:

```
Router# show ip cache flow aggregation protocol-port

IP Flow Switching Cache, 278544 bytes
  19 active, 4077 inactive, 627 added
  150070 ager polls, 0 flow alloc failures
  Active flows timeout in 5 minutes
  Inactive flows timeout in 300 seconds
IP Sub Flow Cache, 25736 bytes
  0 active, 1024 inactive, 0 added, 0 added to flow
  0 alloc failures, 0 force free
  1 chunk, 2 chunks added

Protocol  Source Port  Dest Port  Flows  Packets  Bytes/Packet  Active
  0x01       0x0000      0x0000      4      270        28        242.4
  0x01       0x0000      0x0000      8      541       290        244.4
  0x06       0x0041      0x0041      4      271      1140        243.3
  0x06       0x0041      0x0041      4      271      1140        243.4
  0x11       0x00A1      0x00A1      4      271       156        243.4
  0x11       0x0043      0x0043      4      271       156        243.4
  0x06       0x00B3      0x00B3      4      271      1140        243.4
  0x06       0x0035      0x0035      4      270      1140        242.5
  0x11       0x0045      0x0045      4      271       156        243.3
  0x06       0x0016      0x0015      4      270       840        242.5
  0x06       0x0016      0x0015     12      810       840        244.5
  0x06       0x0077      0x0077      4      271      1340        243.3
  0x01       0x0000      0x0800      4      270      1500        242.5
  0x06       0x0019      0x0019      4      271       168        243.4
  0x06       0x0089      0x0089      4      271       296        243.4
  0x11       0x0208      0x0208      3        9        72        222.1
  0x06       0x00DC      0x00DC      4      271      1140        243.4
  0x06       0x006E      0x006E      4      271       296        243.4
  0x06       0x027C      0x027C      4      271      1240        243.4
Router#
```

Table 4 describes the significant fields shown in the output of the **show ip cache flow aggregation** command.

Table 4 Field Descriptions for the show ip cache flow aggregation command

Field	Description
bytes	Number of bytes of memory used by the NetFlow cache.
active	Number of active flows in the NetFlow cache at the time this command was entered.
inactive	Number of flow buffers that are allocated in the NetFlow cache, but are not currently assigned to a specific flow at the time this command is entered.
added	Number of flows created since the start of the summary period.
ager polls	Number of times the NetFlow code looked at the cache to cause entries to expire. (Used by Cisco for diagnostics only.)
Src If	Specifies the source interface.
Src AS	Specifies the source autonomous system.
Src Prefix	The prefix for the source IP addresses.
Msk	The numbers of bits in the source or destination prefix mask.
Dst If	Specifies the destination interface.
AS	Autonomous system. This is the source or destination AS number as appropriate for the keyword used. For example, if you enter the **show ip cache flow aggregation destination-prefix-tos** command, this is the destination AS number.
TOS	The value in the type of service (ToS) field in the packets.
Dst AS	Specifies the destination autonomous system.
Dst Prefix	The prefix for the destination IP addresses
Flows	Number of flows.
Pkts	Number of packets.
B/Pk	Average number of bytes observed for the packets seen for this protocol (total bytes for this protocol or the total number of flows for this protocol for this summary period).
Active	The length of time that this flow has been active. This is measured from the time that the flow to the time the **show ip cache verbose flow aggregation** command was entered.
Protocol	IP protocol “well-known” port number, displayed in hexadecimal format. (Refer to http://www.iana.org, *Protocol Assignment Number Services*, for the latest RFC values.)
Source Port	The source port value in hexadecimal.
Dest Port	The destination port value in hexadecimal.
Packets	The number of packets sene in the aggregated flow.
Bytes/Packet	The average size of packets sene in the aggregated flow.

Related Commands

Command	Description
cache	Defines operational parameters for NetFlow accounting aggregation caches.
enabled (aggregation cache)	Enables a NetFlow accounting aggregation cache.
export destination (aggregation cache)	Enables the exporting of NetFlow accounting information from NetFlow aggregation caches.
ip flow-aggregation cache	Enables NetFlow accounting aggregation cache schemes.
mask (IPv4)	Specifies the source or destination prefix mask for a NetFlow accounting prefix aggregation cache.
show ip cache flow aggregation	Displays a summary of the NetFlow aggregation cache accounting statistics.
show ip cache verbose flow	Displays a detailed summary of the NetFlow accounting statistics.
show ip flow export	Displays the statistics for the data export.
show ip flow interface	Displays NetFlow accounting configuration for interfaces.

show mls netflow ip

To display information about the hardware NetFlow IP in the EXEC command mode, use the **show mls netflow ip** command.

show mls netflow ip any

show mls netflow ip count [**module** *number*]

show mls netflow ip destination {*hostname* | *ip-address*}[*/ip-mask*] [**count** [**module** *number*] | **detail** | **dynamic** | **flow** {**icmp** | **tcp** | **udp**} | **module** *number* | **nowrap** | **qos** | **source** {*hostname* | *ip-address*}[*/ip-mask*]] | **sw-installed** [**non-static** | **static**]]

show mls netflow ip detail [**module** *number* | **nowrap** [**module** *number*]]

show mls netflow ip dynamic [**count** [**module** *number*]] [**detail**] [**module** *number*] [**nowrap** [**module** *number*] [**qos** [**module** *number*] [**nowrap** [**module** *number*]]]

show mls netflow ip flow {**icmp** | **tcp** | **udp**} [**count** [**module** *number*] | **destination** {*hostname* | *ip-address*}[*/ip-mask*] | **detail** | **dynamic** | **flow** {**icmp** | **tcp** | **udp**} | **module** *number* | **nowrap** | **qos** | **source** {*hostname* | *ip-address*} | s**w-installed** [**non-static** | **static**]]

show mls netflow ip module *number*

show mls netflow ip qos [**module** *number* | **nowrap** [**module** *number*]]

show mls netflow ip source {*hostname* | *ip-address*}[*/ip-mask*] [**count** [**module** *number*]] | **detail** | **dynamic** | **flow** {**icmp** | **tcp** | **udp**} | **module** *number* | **nowrap** | **qos** | **sw-installed** [**non-static** | **static**]

Syntax Description

any	Displays detailed NetFlow table-entry information with no test wrap.
count	Displays the total number of MLS NetFlow IP entries.
destination *hostname*	Displays the entries for a specific destination hostname.
destination *ip-address*	Displays the entries for a specific destination IP address.
detail	(Optional) Specifies a detailed output.
dynamic	Displays the hardware-created dynamic entries; see the **show mls netflow ip dynamic** command.
flow icmp	Displays information about the ICMP flows.
flow tcp	Displays information about the TCP flows.
flow udp	Displays information about the UDP flows.
/ip-mask	Masks the ip address.
module *number*	Displays the entries that are downloaded on the specified module; see the "Usage Guidelines" section for valid values.
nowrap	Displays information without text wrap.
qos	Displays QoS microflow policing information.
source *hostname*	Displays the entries for a specific source address.

source *ip-address*	Displays the entries for a specific source IP address.
sw-installed	(Optional) Displays the routing NetFlow entries; see the **show mls netflow ip sw-installed** command.
non-static	(Optional) Displays information for software-installed static IP entries; see the **show mls netflow ip sw-installed** command.
static	(Optional) Displays information for the software-installed nonstatic IP entries; see the **show mls netflow ip sw-installed** command.

Defaults

This command has no default settings.

Command Modes

EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17a)SX	This command was changed as follows: • Enhanced the **show mls netflow aggregation flowmask** command output to include a list of aggregation caches with minimum flow mask and NetFlow-aggregation schemes such as destination-prefix, source-prefix, protocol-port, and prefix. • Included support for the **ipv6** option.
12.2(17b)SXA	Changed the syntax from **show mls** [**ip** | **ipv6** | **mpls**] to **show mls netflow** [**ip** | **ipv6** | **mpls**] and added the **nowrap** keyword.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(18)SXD	This command was changed to include the following keywords: • The **icmp** keyword to display information about ICMP flows. • The **qos** keyword to display QoS microflow policing information.
12.2(18)SXF	This command was changed to remove support for the **any** keyword.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRB	This command was modified to show the VPN name and VPN ID in the display output.

Usage Guidelines

If you enter the **show mls netflow ip** command with no arguments, the output of the **show mls netflow ip sw-installed** and **show mls netflow ip dynamic** commands are displayed.

When you view the output, note that a colon (:) is used to separate the fields.

The **multicast** keyword appears on systems that are not configured with a Supervisor Engine 720.

Examples

This example shows how to display information about any MLS NetFlow IP:

```
Router# show mls netflow ip
```

```
Displaying Netflow entries in Supervisor Earl
DstIP SrcIP Prot:SrcPort:DstPort Src i/f:AdjPtr
------------------------------------------------------------------------------
Pkts Bytes Age LastSeen Attributes
-------------------------------------------------
10.1.1.2 11.1.1.2 tcp :3 :5 Fa5/11 :0x0
459983 21159218 6 07:45:13 L3 - Dynamic
10.1.1.2 11.1.1.3 tcp :3 :5 Fa5/11 :0x0
459984 21159264 6 07:45:13 L3 - Dynamic
Router#
```

This example shows how to display detailed NetFlow table-entry information:

```
Router# show mls netflow ip detail

Displaying Netflow entries in Supervisor Earl
DstIP SrcIP Prot:SrcPort:DstPort Src i/f:AdjPtr
------------------------------------------------------------------
Pkts Bytes Age LastSeen Attributes
-------------------------------------------------
Mask Pi R CR Xt Prio Dsc IP_EN OP_EN Pattern Rpf FIN_RDT FIN/RST
----+--+-+--+--+----+---+-----+-----+-------+---+-------+-------
Ig/acli Ig/aclo Ig/qosi Ig/qoso Fpkt Gemini MC-hit Dirty Diags
-------+-------+-------+-------+----+------+------+-----+------
QoS Police Count Threshold Leak Drop Bucket Use-Tbl Use-Enable
-----------+------------+---------+-----------+----+-------+-------+----------+
172.30.46.2 172.30.45.2 4 :0 :0 Gi7/1: 0x0
140063 6442898 15 01:42:52 L3 - Dynamic
1 1 0 0 1 0 0 1 1 0 0 0 0
0 0 0 0 0 0 0 0 0
0x0 672645504 0 0 NO 31784 NO NO
Router#
```

This example shows how to display NetFlow table-entry information with no test wrap:

```
Router# show mls netflow ip nowrap

 Displaying Netflow entries in Supervisor Earl
 DstIP SrcIP Prot:SrcPort:DstPort Src i/f
 :AdjPtr Pkts Bytes Age LastSeen Attributes
 ------------------------------------------------------------------------
 -
 ----------------------------------------------------------------
 10.1.1.2 11.1.1.92 udp :63 :63 Fa5/11
 :0x0 176339 8111594 912 22:31:15 L3 - Dynamic
 10.1.1.2 11.1.1.93 udp :63 :63 Fa5/11
 :0x0 176338 8111548 912 22:31:15 L3 - Dynamic
 10.1.1.2 11.1.1.94 udp :63 :63 Fa5/11
 :0x0 176338 8111548 912 22:31:15 L3 - Dynamic
 10.1.1.2 11.1.1.95 udp :63 :63 Fa5/11
 :0x0 176338 8111548 912 22:31:15 L3 - Dynamic
 10.1.1.2 11.1.1.96 udp :63 :63 Fa5/11
 :0x0 176338 8111548 912 22:31:15 L3 - Dynamic
 10.1.1.2 11.1.1.97 udp :63 :63 Fa5/11
 :0x0 176337 8111502 912 22:31:15 L3 - Dynamic
 10.1.1.2 11.1.1.98 udp :63 :63 Fa5/11
 :0x0 176337 8111502 912 22:31:15 L3 - Dynamic
 10.1.1.2 11.1.1.99 udp :63 :63 Fa5/11
 :0x0 176337 8111502 912 22:31:15 L3 - Dynamic
 10.1.1.2 11.1.1.100 udp :63 :63 Fa5/11
 :0x0 176337 8111502 912 22:31:15 L3 - Dynamic
Router#
```

This example shows how to display information about the MLS NetFlow on a specific interface:

```
Router# show mls netflow ip interface FastEthernet 3/1

Displaying Netflow entries in Supervisor Earl
DstIP           SrcIP           Prot:SrcPort:DstPort  Src i/f:AdjPtr
---------------------------------------------------------------------
Pkts         Bytes       Age   LastSeen  Attributes
-------------------------------------------------
172.20.52.19    0.0.0.0         0   :0      :0        0   : 0
0            0           1635  11:05:26   L3 - Dynamic
Router#
```

This example shows how to display information about the MLS NetFlow on a specific IP address:

```
Router# show mls netflow ip destination 172.20.52.122

Displaying Netflow entries in Supervisor Earl
DstIP           SrcIP           Prot:SrcPort:DstPort  Src i/f:AdjPtr
---------------------------------------------------------------------
Pkts         Bytes       Age   LastSeen  Attributes
-------------------------------------------------
Router#
```

This example shows how to display information about the MLS NetFlow on a specific flow:

```
Router# show mls netflow ip flow udp

Displaying Netflow entries in Supervisor Earl
DstIP           SrcIP           Prot:SrcPort:DstPort  Src i/f:AdjPtr
---------------------------------------------------------------------
Pkts         Bytes       Age   LastSeen  Attributes
-------------------------------------------------
172.20.52.19    0.0.0.0         0   :0      :0        0   : 0
0            0           1407  11:01:32   L3 - Dynamic
Router#
```

This example shows how to display detailed information about the MLS NetFlow on a full-flow mask:

```
Router# show mls netflow ip detail
Displaying Netflow entries in Supervisor Earl
DstIP           SrcIP           Prot:SrcPort:DstPort  Src i/f:AdjPtr
---------------------------------------------------------------------
Pkts         Bytes       Age   LastSeen  Attributes
-------------------------------------------------

    QoS     Police Count Threshold    Leak     Drop Bucket  Use-Tbl Use-Enable
-----------+------------+---------+-----------+----+-------+-------+-----------+
172.20.52.19    0.0.0.0         0   :0      :0        0   : 0
0            0           1464  11:02:31   L3 - Dynamic
  0x0          0               0        0       NO   64        NO       NO
Router#
```

This example shows how to display detailed information about a specific flow type:

```
Router# show mls netflow ip flow icmp

Displaying Netflow entries in Supervisor Earl
DstIP SrcIP Prot:SrcPort:DstPort Src i/f
:AdjPtr
>
>---------------------------------------------------------------------------
-
-
Pkts Bytes Age LastSeen Attributes
```

```
-----------------------------------------------
10.1.1.2 11.1.10.151 icmp:0 :0 Fa5/11
:0x0
1945 89470 1062 08:45:15 L3 - Dynamic
10.1.1.2 11.1.10.153 icmp:0 :0 Fa5/11
:0x0
1945 89470 1062 08:45:15 L3 - Dynamic
10.1.1.2 11.1.10.155 icmp:0 :0 Fa5/11
:0x0
1945 89470 1062 08:45:15 L3 - Dynamic
10.1.1.2 11.1.10.157 icmp:0 :0 Fa5/11
:0x0
1945 89470 1062 08:45:15 L3 - Dynamic
10.1.1.2 11.1.10.159 icmp:0 :0 Fa5/11
:0x0
1945 89470 1062 08:45:15 L3 - Dynamic
10.1.1.2 11.1.10.161 icmp:0 :0 Fa5/11
:0x0
1945 89470 1062 08:45:15 L3 - Dynamic
10.1.1.2 11.1.10.163 icmp:0 :0 Fa5/11
:0x0
Router#
```

This example shows how to display QoS information:

```
Router# show mls netflow ip qos

Displaying netflow qos information in Supervisor Earl
DstIP            SrcIP           Prot:SrcPort:DstPort Src i/f:AdjPtr
-------------------------------------------------------------------------------
Pkts         Bytes        LastSeen   QoS   PoliceCount Threshold  Leak
-------------------------------------------------------------------------------
Drop  Bucket
------------
xxx.xxxx.xxx.xxx xxx.xxx.xxx.xxx xxxx:63     :63      Fa5/11 :0x0
772357       35528422     17:59:01   xxx   xxx         xxx        xxx
xxx   xxx
Router#
```

This example shows how to display VPN information on a 7600:

```
Router# show mls netflow ip module 5
Displaying Netflow entries in module 5
DstIP           SrcIP           Prot:SrcPort:DstPort  Src i/f          :AdjPtr
-------------------------------------------------------------------------------
Pkts         Bytes         Age   LastSeen  Attributes
-----------------------------------------------
10.1.1.1        10.2.0.2        0   :0      :0        vpn:red          :0x0
504          398020        1     23:20:48   L3 - Dynamic
224.0.0.5       172.16.1.1      89  :0      :0        Fa1/1            :0x0
1            84            7     23:20:42   L2 - Dynamic
0.0.0.0         0.0.0.0         0   :0      :0        --               :0x0
2238         1582910       33    23:20:48   L3 - Dynamic
224.0.0.2       172.16.1.1      udp :646    :646      Fa1/1            :0x0
5            310           21    23:20:46   L2 - Dynamic
172.16.2.6      172.16.1.2      0   :0      :0        Fa1/1            :0x0
1            140           22    23:20:27   L2 - Dynamic

Router#
```

Related Commands

Command	Description
clear mls netflow	Clears the MLS NetFlow-shortcut entries.
ip flow-aggregation cache	Creates a flow-aggregation cache and enters the aggregation cache configuration mode.
show ip cache flow	Displays a summary of the NetFlow cache-flow entries.

Feature Information for NDE for VRF Interfaces

Table 5 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note Table 5 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

Table 5 Feature Information for NDE for VRF Interfaces

Feature Name	Releases	Feature Information
NDE for VRF Interfaces	12.2(33)SRB	The NDE support for VRF interfaces features enables capturing and exporting NetFlow flow information from VRF interfaces. In 12.2(33)SRB, this feature was introduced on the Cisco 7600 series routers. The following sections provide information about this feature: • Information About NDE for VRF Interfaces, page 2 • How to Configure NDE for VRF Interfaces for an MPLS VPN, page 6> The following commands were introduced or modified by this feature: **flow hardware mpls-vpn ip**, **show ip cache flow**, **show ip cache flow aggregation**, **show mls netflow ip**.

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