show ipv6 through udp-port

show ipv6 mfib

To display the forwarding entries and interfaces in the IPv6 Multicast Forwarding Information Base (MFIB), use the **show ipv6 mfib** command in user EXEC or privileged EXEC mode.

Cisco 3660 Series Routers, Cisco 10000 Series Routers, and Catalyst 6500 Series Routers

show ipv6 mfib [**vrf** *vrf-name*] [**all**| **linkscope**| **verbose**| *group-address-name*| *ipv6-prefix*/ *prefix-length*| *source-address-name*| **interface**| **status**| **summary**]

Cisco 7600 Series Routers

show ipv6 mfib [**vrf** *vrf-name*] [**all**| **linkscope**| **verbose**| **interface**| **status**| **summary**]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
all	(Optional) Displays all forwarding entries and interfaces in the IPv6 MFIB.
linkscope	(Optional) Displays the link-local groups.
verbose	(Optional) Provides additional information, such as the MAC encapsulation header and platform-specific information.
ipv6-prefix	(Optional) The IPv6 network assigned to the interface. The default IPv6 prefix is 128. This argument must be in the form documented in RFC 2373 where the address is specified in hexadecimal using 16-bit values between colons.
/ *prefix-length*	(Optional) The length of the IPv6 prefix. A decimal value that indicates how many of the high-order contiguous bits of the address comprise the prefix (the network portion of the address). A slash mark must precede the decimal value.
group-address-name	(Optional) IPv6 address or name of the multicast group.
source-address-name	(Optional) IPv6 address or name of the multicast group.
interface	(Optional) Interface settings and status.
status	(Optional) General settings and status.

Command Modes User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	The **link-local** keyword was added.
12.2(18)SXE	Support for this command was added for the Supervisor Engine 720.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.3(4)T	The **link-local** keyword was added.
12.3(7)T	The *ipv6-prefix* and *prefix-length* arguments were added.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.0(1)M	This command was modified. The **link-local** keyword was changed to **linkscope**.
Cisco IOS Release 15.1(1)S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.
Cisco IOS XE Release 3.2S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines Use the **show ipv6 mfib** command to display MFIB entries; and forwarding interfaces, and their traffic statistics. This command can be enabled on virtual IP (VIP) if the router is operating in distributed mode.

A forwarding entry in the MFIB has flags that determine the default forwarding and signaling behavior to use for packets matching the entry. The entry also has per-interface flags that further specify the forwarding behavior for packets received or forwarded on specific interfaces. The table below describes the MFIB forwarding entries and interface flags.

Table 1: MFIB Entries and Interface Flags

Flag	Description
F	Forward--Data is forwarded out of this interface.
A	Accept--Data received on this interface is accepted for forwarding.
IC	Internal copy--Deliver to the router a copy of the packets received or forwarded on this interface.
NS	Negate signal--Reverse the default entry signaling behavior for packets received on this interface.
DP	Do not preserve--When signaling the reception of a packet on this interface, do not preserve a copy of it (discard it instead).
SP	Signal present--The reception of a packet on this interface was just signaled.
S	Signal--By default, signal the reception of packets matching this entry.
C	Perform directly connected check for packets matching this entry. Signal the reception if packets were originated by a directly connected source.

Examples

The following example displays the forwarding entries and interfaces in the MFIB. The router is configured for fast switching, and it has a receiver joined to FF05::1 on Ethernet1/1 and a source (2001::1:1:20) sending on Ethernet1/2:

```
Router# show ipv6 mfib
IP Multicast Forwarding Information Base
Entry Flags: C - Directly Connected, S - Signal, IA - Inherit A flag,
             AR - Activity Required, D - Drop
Forwarding Counts: Pkt Count/Pkts per second/Avg Pkt Size/Kbits per second
Other counts: Total/RPF failed/Other drops
Interface Flags: A - Accept, F - Forward, NS - Negate Signalling
             IC - Internal Copy, NP - Not platform switched
             SP - Signal Present
Interface Counts: FS Pkt Count/PS Pkt Count
(*,FF00::/8) Flags: C
   Forwarding: 0/0/0/0, Other: 0/0/0
   Tunnel0 Flags: NS
(*,FF00::/15) Flags: D
   Forwarding: 0/0/0/0, Other: 0/0/0
(*,FF05::1) Flags: C
   Forwarding: 2/0/100/0, Other: 0/0/0
   Tunnel0 Flags: A NS
   Ethernet1/1 Flags: F NS
     Pkts: 0/2
(2001::1:1:200,FF05::1) Flags:
   Forwarding: 5/0/100/0, Other: 0/0/0
```

```
   Ethernet1/2 Flags: A
   Ethernet1/1 Flags: F NS
     Pkts: 3/2
(*,FF10::/15) Flags: D
   Forwarding: 0/0/0/0, Other: 0/0/0
```

The table below describes the significant fields shown in the display.

Table 2: show ipv6 mfib Field Descriptions

Field	Description
Entry Flags	Information about the entry.
Forwarding Counts	Statistics on the packets that are received from and forwarded to at least one interface.
Pkt Count/	Total number of packets received and forwarded since the creation of the multicast forwarding state to which this counter applies.
Pkts per second/	Number of packets received and forwarded per second.
Avg Pkt Size/	Total number of bytes divided by the total number of packets for this multicast forwarding state. There is no direct display for the total number of bytes. You can calculate the total number of bytes by multiplying the average packet size by the packet count.
Kbits per second	Bytes per second divided by packets per second divided by 1000.
Other counts:	Statistics on the received packets. These counters include statistics about the packets received and forwarded and packets received but not forwarded.
Interface Flags:	Information about the interface.
Interface Counts:	Interface statistics.

The following example shows forwarding entries and interfaces in the MFIB, with a group address of FF03:1::1 specified:

```
Router# show ipv6 mfib FF03:1::1
IP Multicast Forwarding Information Base
Entry Flags:C - Directly Connected, S - Signal, IA - Inherit A
flag,
            AR - Activity Required, D - Drop
Forwarding Counts:Pkt Count/Pkts per second/Avg Pkt Size/Kbits per
second
Other counts:Total/RPF failed/Other drops
Interface Flags:A - Accept, F - Forward, NS - Negate Signalling
             IC - Internal Copy, NP - Not platform switched
             SP - Signal Present
Interface Counts:FS Pkt Count/PS Pkt Count
```

```
*,FF03:1::1) Flags:C
  Forwarding:0/0/0/0, Other:0/0/0
  Tunnel1 Flags:A NS
  GigabitEthernet5/0.25 Flags:F NS
    Pkts:0/0
  GigabitEthernet5/0.24 Flags:F NS
    Pkts:0/0
(5002:1::2,FF03:1::1) Flags:
  Forwarding:71505/0/50/0, Other:42/0/42
  GigabitEthernet5/0 Flags:A
  GigabitEthernet5/0.19 Flags:F NS
    Pkts:239/24
  GigabitEthernet5/0.20 Flags:F NS
    Pkts:239/24
  GigabitEthernet5/0.21 Flags:F NS
    Pkts:238/24
.
.
.
GigabitEthernet5/0.16 Flags:F NS
Pkts:71628/24
```

The following example shows forwarding entries and interfaces in the MFIB, with a group address of FF03:1::1 and a source address of 5002:1::2 specified:

```
Router# show ipv6 mfib FF03:1::1 5002:1::2

IP Multicast Forwarding Information Base
Entry Flags:C - Directly Connected, S - Signal, IA - Inherit A flag,
             AR - Activity Required, D - Drop
Forwarding Counts:Pkt Count/Pkts per second/Avg Pkt Size/Kbits per second
Other counts:Total/RPF failed/Other drops
Interface Flags:A - Accept, F - Forward, NS - Negate Signalling
             IC - Internal Copy, NP - Not platform switched
             SP - Signal Present
Interface Counts:FS Pkt Count/PS Pkt Count
(5002:1::2,FF03:1::1) Flags:
   Forwarding:71505/0/50/0, Other:42/0/42
   GigabitEthernet5/0 Flags:A
   GigabitEthernet5/0.19 Flags:F NS
     Pkts:239/24
   GigabitEthernet5/0.20 Flags:F NS
     Pkts:239/24
.
.
.
   GigabitEthernet5/0.16 Flags:F NS
     Pkts:71628/24
```

The following example shows forwarding entries and interfaces in the MFIB, with a group address of FF03:1::1 and a default prefix of 128:

```
Router# show ipv6 mfib FF03:1::1/128
IP Multicast Forwarding Information Base
Entry Flags:C - Directly Connected, S - Signal, IA - Inherit A flag,
             AR - Activity Required, D - Drop
Forwarding Counts:Pkt Count/Pkts per second/Avg Pkt Size/Kbits per second
Other counts:Total/RPF failed/Other drops
Interface Flags:A - Accept, F - Forward, NS - Negate Signalling
             IC - Internal Copy, NP - Not platform switched
             SP - Signal Present
Interface Counts:FS Pkt Count/PS Pkt Count
(*,FF03:1::1) Flags:C
   Forwarding:0/0/0/0, Other:0/0/0
   Tunnel1 Flags:A NS
   GigabitEthernet5/0.25 Flags:F NS
     Pkts:0/0
   GigabitEthernet5/0.24 Flags:F NS
     Pkts:0/0
.
.
.
```

```
   GigabitEthernet5/0.16 Flags:F NS
     Pkts:0/0
```

The following example shows forwarding entries and interfaces in the MFIB, with a group address of FFE0 and a prefix of 15:

```
Router# show ipv6 mfib FFE0::/15
IP Multicast Forwarding Information Base
Entry Flags:C - Directly Connected, S - Signal, IA - Inherit A flag,
            AR - Activity Required, D - Drop
Forwarding Counts:Pkt Count/Pkts per second/Avg Pkt Size/Kbits per second
Other counts:Total/RPF failed/Other drops
Interface Flags:A - Accept, F - Forward, NS - Negate Signalling
            IC - Internal Copy, NP - Not platform switched
            SP - Signal Present
Interface Counts:FS Pkt Count/PS Pkt Count
(*,FFE0::/15) Flags:D
   Forwarding:0/0/0/0, Other:0/0/0
```

The following example shows output of the **show ipv6 mfib** command used with the **verbose** keyword. It shows forwarding entries and interfaces in the MFIB and additional information such as the MAC encapsulation header and platform-specific information.

```
Router# show ipv6 mfib ff33::1:1 verbose
IP Multicast Forwarding Information Base
Entry Flags: C - Directly Connected, S - Signal, IA - Inherit A flag,
            AR - Activity Required, K - Keepalive
Forwarding Counts: Pkt Count/Pkts per second/Avg Pkt Size/Kbits per second
Other counts: Total/RPF failed/Other drops
Platform per slot HW-Forwarding Counts: Pkt Count/Byte Count
Platform flags: HF - Forwarding entry,HB - Bridge entry,HD - NonRPF Drop entry,
                NP - Not platform switchable,RPL - RPF-ltl linkage,
                MCG - Metset change,ERR - S/w Error Flag,RTY - In RetryQ,
                LP - L3 pending,MP - Met pending,AP - ACL pending
Interface Flags: A - Accept, F - Forward, NS - Negate Signalling
            IC - Internal Copy, NP - Not platform switched
            SP - Signal Present
Interface Counts: Distributed FS Pkt Count/FS Pkt Count/PS Pkt Count
(10::2,FF33::1:1) Flags: K
   RP Forwarding: 0/0/0/0, Other: 0/0/0
   LC Forwarding: 0/0/0/0, Other: 0/0/0
   HW Forwd:   0/0/0/0, Other: NA/NA/NA
   Slot 6: HW Forwarding: 0/0, Platform Flags:  HF RPL
   Slot 1: HW Forwarding: 0/0, Platform Flags:  HF RPL
   Vlan10 Flags: A
   Vlan30 Flags: F NS
     Pkts: 0/0/0 MAC: 33330001000100D0FFFE180086DD
```

The table below describes the fields shown in the display.

Table 3: show ipv6 mfib verbose Field Descriptions

Field	Description
Platform flags	Information about the platform.
Platform per slot HW-Forwarding Counts	Total number of packets per bytes forwarded.

Related Commands

Command	Description
show ipv6 mfib active	Displays the rate at which active sources are sending to multicast groups.

Command	Description
show ipv6 mfib count	Displays summary traffic statistics from the MFIB about the group and source.
show ipv6 mfib interface	Displays information about IPv6 multicast-enabled interfaces and their forwarding status.
show ipv6 mfib status	Displays the general MFIB configuration and operational status.
show ipv6 mfib summary	Displays summary information about the number of IPv6 MFIB entries (including link-local groups) and interfaces.

show ipv6 mfib active

To display the rate at which active sources are sending to multicast groups, use the **show ipv6 mfib active** command in user EXEC or privileged EXEC mode.

show ipv6 mfib [**vrf** *vrf-name*] [**all**| **linkscope**] **active** [*kbps*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
all	(Optional) Displays a summary of traffic statistics from the IPv6 MFIB about multicast sources sending to both linkscope (reserved) and nonlinkscope (nonreserved) groups.
linkscope	(Optional) Displays a summary of traffic statistics from the IPv6 MFIB about multicast sources sending to linkscope (reserved) groups.
kbps	(Optional) Kilobits per second.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	The **link-local** keyword was added.
12.3(4)T	The **link-local** keyword was added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.0(1)M	This command was modified. The **link-local** keyword was changed to **linkscope**.

Release	Modification
Cisco IOS Release 15.1(1)S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.
Cisco IOS XE Release 3.2S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

Use the **show ipv6 mfib active** command to display MFIB entries actively used to forward packets. In many cases, it is useful to provide the optional *kbps* argument to limit the set of entries displayed to the ones that are forwarding an amount of traffic larger or equal to the amount set by the *kbps* argument.

Examples

The following example displays statistics on the rate at which active IP multicast sources are sending information. The router is switching traffic from 2001::1:1:200 to FF05::1:

```
Router# show ipv6 mfib active
Active IPv6 Multicast Sources - sending >= 4 kbps
Group: FF05::1
  Source: 2001::1:1:200
    Rate: 20 pps/16 kbps(1sec), 0 kbps(last 128 sec)
```

The table below describes the significant fields shown in the display.

Table 4: show ipv6 mfib active Field Descriptions

Field	Description
Group:	Summary information about counters for (*, G) and the range of (S, G) states for one particular group G. The following RP-tree: and Source: output fields contain information about the individual states belonging to this group. **Note** For Source Specific Multicast (PIM-SSM) range groups, the Group: displays are statistical. All SSM range (S, G) states are individual, unrelated SSM channels.
Rate...kbps	Bytes per second divided by packets per second divided by 1000. On an IP multicast fast-switching platform, the number of packets per second is the number of packets during the last second. Other platforms may use a different approach to calculate this number. Refer to the platform documentation for more information.

show ipv6 mfib count

To display summary traffic statistics from the IPv6 Multicast Forwarding Information Base (MFIB) about multicast sources and groups, use the **show ipv6 mfib count** command in user EXEC or privileged EXEC mode.

show ipv6 mfib [**vrf** *vrf-name*] [**all**| **linkscope**] **count**

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
all	(Optional) Displays a summary of traffic statistics from the IPv6 MFIB about multicast sources sending to both linkscope (reserved) and nonlinkscope (nonreserved) groups.
linkscope	(Optional) Displays a summary of traffic statistics from the IPv6 MFIB about multicast sources sending to linkscope (reserved) groups.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	The **link-local** keyword was added.
12.3(4)T	The **link-local** keyword was added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
15.0(1)M	This command was modified. The **link-local** keyword was changed to **linkscope**.
Cisco IOS Release 15.1(1)S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.

Release	Modification
Cisco IOS XE Release 3.2S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

Use the **show ipv6 mfib count** command to display the average packet size and data rate in kilobits per seconds.

Examples

The following example displays a summary of traffic statistics from the IPv6 MFIB about multicast sources sending to both reserved and nonreserved groups:

```
Router# show ipv6 mfib all count
```

show ipv6 mfib global

To display information from the IPv6 Multicast Forwarding Information Base (MFIB) global table, use the **show ipv6 mfib active** command in user EXEC or privileged EXEC mode.

show ipv6 mfib [**vrf** *vrf-name*] [**all**| **linkscope**] **global**

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
all	(Optional) Displays information in the IPv6 MFIB global table for both linkscope (reserved) and nonlinkscope (nonreserved) groups.
linkscope	(Optional) Displays information in the IPv6 MFIB global table for linkscope groups.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	The **link-local** keyword was added.
12.3(4)T	The **link-local** keyword was added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.0(1)M	This command was modified. The **link-local** keyword was changed to **linkscope**.
Cisco IOS Release 15.1(1)S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.
Cisco IOS XE Release 3.2S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.

Release	Modification
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

If no optional keywords or arguments are entered, global table information in the IPv6 MFIB associated with nonlinkscope multicast groups are displayed.

Examples

The following example enables you to display IPv6 MFIB global table information:

```
Router# show ipv6 mfib global
```

show ipv6 mfib instance

To display information about an IPv6 Multicast Forwarding Information Base (MFIB) table instance, use the **show ipv6 mfib instance**command in user EXEC or privileged EXEC mode.

show ipv6 mfib [**vrf** *vrf-name*] [**all**| **linkscope**] **instance**

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
all	(Optional) Displays all information about a.
linkscope	(Optional) Displays a summary of traffic statistics from the IPv6 MFIB about multicast sources sending to linkscope (reserved) groups.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	The **link-local** keyword was added.
12.3(4)T	The **link-local** keyword was added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.0(1)M	This command was modified. The **link-local** keyword was changed to **linkscope**.
Cisco IOS Release 15.1(1)S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.
Cisco IOS XE Release 3.2S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.

Release	Modification
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Examples

The following example enables you to display IPv6 MFIB instance information:

```
Router# show ipv6 mfib instance
```

show ipv6 mfib interface

To display information about IPv6 multicast-enabled interfaces and their forwarding status, use the **show ipv6 mfib interface** command in user EXEC or privileged EXEC mode.

show ipv6 mfib interface

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	This command was integrated into Cisco IOS Release 12.0(26)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Usage Guidelines

The **show ipv6 mfib interface** command displays the Multicast Forwarding Information Base (MFIB) interfaces and in what switching mode each MFIB has been configured.

Examples

The following example displays information about IPv6 multicast-enabled interfaces and their forwarding status. The router is configured for fast switching.

```
Router# show ipv6 mfib interface
IPv6 Multicast Forwarding (MFIB) status:
    Configuration Status: enabled
    Operational Status: running
MFIB interface       status    CEF-based output
                               [configured,available]
Ethernet1/1          up     [yes       ,yes      ]
Ethernet1/2          up     [yes       ,?        ]
Tunnel0              up     [yes       ,?        ]
Tunnel1              up     [yes       ,?        ]
```

The table below describes the significant fields shown in the display.

Table 5: show ipv6 mfib interface Field Descriptions

Field	Description
MFIB interface	Specifies the MFIB interface.
Status	Specifies the status of the MFIB interface.
CEF-based output	Provides information on the Cisco Express Forwarding-based output of the MFIB interface.

show ipv6 mfib route

To display the forwarding entries and interfaces in the IPv6 Multicast Forwarding Information Base (MFIB) without packet header information and forwarding counters, use the **show ipv6 mfib route**command in user EXEC or privileged EXEC mode.

show ipv6 mfib [**vrf** *vrf-name*] [**all**| **linkscope**] **route**

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
all	(Optional) Displays the forwarding entries and interfaces in the IPv6 MFIB for both linkscope (reserved) and nonlinkscope (nonreserved) groups.
linkscope	(Optional) Displays the forwarding entries and interfaces in the IPv6 MFIB for linkscope (reserved) groups.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	The **link-local** keyword was added.
12.3(4)T	The **link-local** keyword was added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.0(1)M	This command was modified. The **link-local** keyword was changed to **linkscope**.
Cisco IOS Release 15.1(1)S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.

Release	Modification
Cisco IOS XE Release 3.2S	This command was modified. New counters were added to the output to show (*,G/m) and the total number of unique groups in the database.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Examples

The following example enables you to display IPv6 MFIB instance information:

```
Router# show ipv6 mfib instance
```

show ipv6 mfib status

To display the general Multicast Forwarding Information Base (MFIB) configuration and operational status, use the **show ipv6 mfib status** command in user EXEC or privileged EXEC mode.

show ipv6 mfib status

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.0(26)S	This command was introduced.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Usage Guidelines

Use the **show ipv6 mfib status** to find such information as whether or not MFIB is enabled and running.

Examples

The following example displays MFIB information:

```
Router# show ipv6 mfib status
IPv6 Multicast Forwarding (MFIB) status:
    Configuration Status: enabled
    Operational Status: not running
    Notes: MFIB not running because multicast routing is disabled
```

The table below describes the significant fields shown in the displays.

Table 6: show ipv6 mfib status Field Descriptions

Field	Description
Configuration status: enabled	MFIB is enabled on the device.
Operational status: not running	Although MFIB is enabled on the device, it is not running.
Notes:	Information about MFIB configuration and operational status.

show ipv6 mfib summary

To display summary information about the number of IPv6 Multicast Forwarding Information Base (MFIB) entries (including link-local groups) and interfaces, use the **show ipv6 mfib summary** command in user EXEC or privileged EXEC mode.

show ipv6 mfib [**vrf** *vrf-name*] **summary**

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	This command was integrated into Cisco IOS Release 12.0(26)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

The **show ipv6 mfib summary** command shows the IP multicast routing table in abbreviated form. The command displays only the number of MFIB entries, the number of (*, G) and (S, G) entries, and the number of MFIB interfaces specified.

The **show ipv6 mfib summary** command counts all entries, including link-local entries.

Examples

The following example displays summary information about the number of IPv6 MFIB entries and interfaces:

```
Router# show ipv6 mfib summary

IPv6 MFIB summary:
```

```
54     total entries [1 (S,G), 7 (*,G), 46 (*,G/m)]
17     total MFIB interfaces
```

The table below describes the significant fields shown in the display.

Table 7: show ipv6 mfib summary Field Descriptions

Field	Description
54 total entries	Total number of MFIB entries, including the number of (*, G) and (S, G) entries.
17 total MFIB interfaces	Sum of all the MFIB interfaces in all the MFIB entries.

show ipv6 mld groups

To display the multicast groups that are directly connected to the router and that were learned through Multicast Listener Discovery (MLD), use the **show ipv6 mld groups** command in user EXEC or privileged EXEC mode.

show ipv6 mld [**vrf** *vrf-name*] **groups [link-local]** [*group-name*| *group-address*] [*interface-type interface-number*] [**detail**| **explicit**]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
link-local	(Optional) Displays the link-local groups.
group-name | *group-address*	(Optional) IPv6 address or name of the multicast group.
interface-type interface-number	(Optional) Interface type and number.
detail	(Optional) Displays detailed information about individual sources.
explicit	(Optional) Displays information about the hosts being explicitly tracked on each interface for each group.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	The **link-local** keyword was added.
12.3(4)T	The **link-local** keyword was added.
12.3(7)T	The **explicit** keyword was added.
12.2(25)S	The link-local and **explicit** keywords were added.
12.4(2)T	Information about MLD state limits was added to the command output.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Release	Modification
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.

Usage Guidelines

If you omit all optional arguments, the **show ipv6 mld groups** command displays by group address and interface type and number all directly connected multicast groups, including link-local groups (where the **link-local** keyword is not available) used.

Examples

The following is sample output from the **show ipv6 mld groups** command. It shows all of the groups joined by Fast Ethernet interface 2/1, including link-local groups used by network protocols.

```
Router# show ipv6 mld groups FastEthernet 2/1
MLD Connected Group Membership
Group Address           Interface           Uptime        Expires
FF02::2                 FastEthernet2/1     3d18h         never
FF02::D                 FastEthernet2/1     3d18h         never
FF02::16                FastEthernet2/1     3d18h         never
FF02::1:FF00:1          FastEthernet2/1     3d18h         00:00:27
FF02::1:FF00:79         FastEthernet2/1     3d18h         never
FF02::1:FF23:83C2       FastEthernet2/1     3d18h         00:00:22
FF02::1:FFAF:2C39       FastEthernet2/1     3d18h         never
FF06:7777::1            FastEthernet2/1     3d18h         00:00:26
```

The following is sample output from the **show ipv6 mld groups** command using the **detail** keyword:

```
Router# show ipv6 mld groups detail
Interface:      Ethernet2/1/1
Group:          FF33::1:1:1
Uptime:         00:00:11
Router mode:    INCLUDE
Host mode:      INCLUDE
Last reporter:  FE80::250:54FF:FE60:3B14
Group source list:
Source Address                          Uptime    Expires   Fwd  Flags
2004:4::6                               00:00:11  00:04:08  Yes  Remote Ac 4
```

The following is sample output from the **show ipv6 mld groups**command using the **explicit** keyword:

```
Router# show ipv6 mld groups explicit
Ethernet1/0, FF05::1
    Up:00:43:11 EXCLUDE(0/1) Exp:00:03:17
    Host Address                            Uptime   Expires
    FE80::A8BB:CCFF:FE00:800                00:43:11 00:03:17
    Mode:EXCLUDE
Ethernet1/0, FF05::6
    Up:00:42:22 INCLUDE(1/0) Exp:not used
    Host Address                            Uptime   Expires
    FE80::A8BB:CCFF:FE00:800                00:42:22 00:03:17
    Mode:INCLUDE
```

```
        300::1
        300::2
        300::3
Ethernet1/0 - Interface
ff05::1 - Group address
Up:Uptime for the group
EXCLUDE/INCLUDE - The mode the group is in on the router.
(0/1) (1/0) - (Number of hosts in INCLUDE mode/Number of hosts in EXCLUDE moe)
Exp:Expiry time for the group.
FE80::A8BB:CCFF:FE00:800 - Host ipv6 address.
00:43:11 - Uptime for the host.
00:03:17 - Expiry time for the host
Mode:INCLUDE/EXCLUDE - Mode the Host is operating in.
300::1, 300::2, 300::3 - Sources that the host has joined in the above specified mode.
```

The table below describes the significant fields shown in the display.

Table 8: show ipv6 mld groups Field Descriptions

Field	Description
Group Address	Address of the multicast group.
Interface	Interface through which the group is reachable.
Uptime	How long (in hours, minutes, and seconds) this multicast group has been known.
Expires	How long (in hours, minutes, and seconds) until the entry is removed from the MLD groups table. The expiration timer shows "never" if the router itself has joined the group, and the expiration timer shows "not used" when the router mode of the group is INCLUDE. In this situation, the expiration timers on the source entries are used.
Last reporter:	Last host to report being a member of the multicast group.
Flags Ac 4	Flags counted toward the MLD state limits configured.

Related Commands

Command	Description
ipv6 mld query-interval	Configures the frequency at which the Cisco IOS software sends MLD host-query messages.

show ipv6 mld groups summary

To display the number of (*, G) and (S, G) membership reports present in the Multicast Listener Discovery (MLD) cache, use the **show ipv6 mld groups summary** command in user EXEC or privileged EXEC mode.

show ipv6 mld groups summary

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	This command was integrated into Cisco IOS Release 12.0(26)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.

Usage Guidelines

The **show ipv6 mld groups summary** command displays the number of directly connected multicast groups (including link-local groups).

Examples

The following is sample output from the **show ipv6 mld groups summary**command:

```
Router# show ipv6 mld groups summary
MLD Route Summary
  No. of (*,G) routes = 5
  No. of (S,G) routes = 0
```

The table below describes the significant fields shown in the display.

Table 9: show ipv6 mld groups summary Field Descriptions

Field	Description
No. of (*,G) routes = 5	Displays the number of groups present in the MLD cache.
No. of (S,G) routes = 0	Displays the number of include and exclude mode sources present in the MLD cache.

show ipv6 mld host-proxy

To display IPv6 MLD host proxy information, use the **show ipv6 mld host-proxy** command in user EXEC or privileged EXEC mode.

show ipv6 mld host-proxy [*interface-type interface-number*] [**group** [*group-address*]]

Syntax Description

interface-type interface-number	(Optional) Interface type and number.
group	(Optional) Displays a list of group entries for which the specified interface is acting as a proxy interface.
group-address	(Optional) Specified group.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
15.1(2)T	This command was introduced.

Usage Guidelines

The show ipv6 mld host-proxy command displays MLD proxy information. When this command is used with the *interface-type interface-number*arguments, interface details such as interface state, IPv6 address, MLD state, etc., are displayed. If an interface is not specified, the **show ipv6 mld host-proxy** command displays all active proxy interfaces on the router.

The show ipv6 mld host-proxy command when used with the *interface-type interface-number*arguments and the **group** keyword displays information about group entries for which interface is acting as a proxy interface. If the *group-address* argument is specified, it display the group information for specified group.

Examples

The following example displays IPv6 MLD proxy information for the Ethernet 0/0 interface:

```
Router# show ipv6 mld host-proxy Ethernet0/0
Ethernet0/0 is up, line protocol is up
  Internet address is FE80::34/64
MLD is enabled on interface
  MLD querying router is FE80::12, Version: MLDv2
  Current MLD host version is 2
  MLD max query response time is 10 seconds
Number of MLD Query sent on interface : 10
Number of MLD Query received on interface : 20
Number of MLDv1 report sent : 5
Number of MLDv2 report sent : 10
Number of MLDv1 leave sent : 0
Number of MLDv2 leave sent : 1
```

The table below describes the significant fields shown in the display.

Table 10: show ipv6 mld host-proxy Field Descriptions

Field	Description
Ethernet0/0 is up, line protocol is up	State of the specified interface.
Internet address is FE80::34/64	IPv6 address of the specified interface.
MLD is enabled on interface	State of MLD on the interface, whether enabled or disabled.
MLD querying router is FE80::12, Version: MLDv2	IPv6 address and MLD version of the querying router.
Current MLD host version is 2	Configured MLD host version.
MLD max query response time is 10 seconds	Maximum allowed response time for the query.
Number of MLD Query sent on interface: 10	Number of MLD queries sent from the interface.
Number of MLD Query received on interface: 20	Number of MLD queries received on the interface.
Number of MLDv1 report sent : 5	Number of MLDv1 membership reports sent.
Number of MLDv2 report sent : 10	Number of MLDv2 membership reports sent.
Number of MLDv1 leave sent : 0	Number of MLDv1 leave reports sent.
Number of MLDv2 leave sent : 1	Number of MLDv2 leave reports sent.

The following example provides information about a group entry for the Ethernet 0/0 proxy interface:

```
Router# show ipv6 mld host-proxy Ethernet0/0 group
Group:               FF5E::12
Uptime:             00:00:07
Group mode:     INCLUDE
Version             MLDv2
Group source list:
  Source Address        Uptime
           5000::2                     00:00:07
           2000::2                     00:01:15
Group:               FF7E::21
Uptime:             00:02:07
Group mode:     EXCLUDE
Version              MLDv2
Group source list: Empty
```

The table below describes the significant fields shown in the display.

Table 11: show ipv6 mld host-proxy Field Descriptions

Field	Description
Group: FF5E::12	The IPv6 address of the group.
Uptime: 00:00:07	The length of time the group has been active.

Field	Description
Group mode: INCLUDE	The group mode.
Version MLDv2	The MLD version on the proxy interface.
Group source list:	Information on the group source list.

Related Commands

Command	Description
ipv6 mld host-proxy	Enables the MLD proxy feature.
ipv6 mld host-proxy interface	Enables the MLD proxy feature on a specified interface on an RP.

show ipv6 mld interface

To display multicast-related information about an interface, use the **show ipv6 mld interface** command in user EXEC or privileged EXEC mode.

show ipv6 mld [**vrf** *vrf-name*] **interface** [*type number*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
type number	(Optional) Interface type and number.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	This command was integrated into Cisco IOS Release 12.0(26)S.
12.4(2)T	Information about MLD state limits was added to the command output.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.

Usage Guidelines

If you omit the optional *type* and *number* arguments, the **show ipv6 mld interface** command displays information about all interfaces.

Examples

The following is sample output from the **show ipv6 mld interface** command for Ethernet interface 2/1/1:

```
Router# show ipv6 mld interface Ethernet 2/1/1
Global State Limit : 2 active out of 2 max
Loopback0 is administratively down, line protocol is down
  Internet address is ::/0
.
.
.
Ethernet2/1/1 is up, line protocol is up
  Internet address is FE80::260:3EFF:FE86:5649/10
  MLD is enabled on interface
  Current MLD version is 2
  MLD query interval is 125 seconds
  MLD querier timeout is 255 seconds
  MLD max query response time is 10 seconds
  Last member query response interval is 1 seconds
  Interface State Limit : 2 active out of 3 max
  State Limit permit access list:
  MLD activity: 83 joins, 63 leaves
  MLD querying router is FE80::260:3EFF:FE86:5649 (this system)
```

The table below describes the significant fields shown in the display.

Table 12: show ipv6 mld interface Field Descriptions

Field	Description
Global State Limit: 2 active out of 2 max	Two globally configured MLD states are active.
Ethernet2/1/1 is up, line protocol is up	Interface type, number, and status.
Internet address is...	Internet address of the interface and subnet mask being applied to the interface.
MLD is enabled in interface	Indicates whether Multicast Listener Discovery (MLD) has been enabled on the interface with the **ipv6 multicast-routing**command.
Current MLD version is 2	The current MLD version.
MLD query interval is 125 seconds	Interval (in seconds) at which the Cisco IOS software sends MLD query messages, as specified with the **ipv6 mld query-interval**command.
MLD querier timeout is 255 seconds	The length of time (in seconds) before the router takes over as the querier for the interface, as specified with the **ipv6 mld query-timeout**command.
MLD max query response time is 10 seconds	The length of time (in seconds) that hosts have to answer an MLD Query message before the router deletes their group, as specified with the **ipv6 mld query-max-response-time** command.

Field	Description
Last member query response interval is 1 seconds	Used to calculate the maximum response code inserted in group and source-specific query. Also used to tune the "leave latency" of the link. A lower value results in reduced time to detect the last member leaving the group.
Interface State Limit : 2 active out of 3 max	Two out of three configured interface states are active.
State Limit permit access list: change	Activity for the state permit access list.
MLD activity: 83 joins, 63 leaves	Number of groups joins and leaves that have been received.
MLD querying router is FE80::260:3EFF:FE86:5649 (this system)	IPv6 address of the querying router.

Related Commands

Command	Description
ipv6 mld join-group	Configures MLD reporting for a specified group and source.
ipv6 mld query-interval	Configures the frequency at which the Cisco IOS software sends MLD host-query messages.

show ipv6 mld snooping

To display Multicast Listener Discovery version 2 (MLDv2) snooping information, use the **show ipv6 mld snooping** command in privileged EXEC mode.

show ipv6 mld [**vrf** *vrf-name*] **snooping** {**explicit-tracking vlan** *vlan*| **mrouter** [**vlan** *vlan*]| **report-suppression vlan** *vlan*| **statistics vlan** *vlan*}

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
explicit-tracking vlan *vlan*	Displays the status of explicit host tracking.
mrouter	Displays the multicast router interfaces on an optional VLAN.
vlan *vlan*	(Optional) Specifies the VLAN number on the multicast router interfaces.
report-suppression vlan *vlan*	Displays the status of the report suppression.
statistics vlan *vlan*	Displays MLD snooping information on a VLAN.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(18)SXE	This command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

You can enter the **show ipv6 mld snooping mrouter** command without arguments to display all the multicast router interfaces.

Examples

This example shows how to display explicit tracking information on VLAN 25:

```
Router# show ipv6 mld snooping explicit-tracking vlan 25
Source/Group                    Interface    Reporter        Filter_mode
-------------------------------------------------------------------------
10.1.1.1/226.2.2.2              Vl25:1/2     10.27.2.3       INCLUDE
10.2.2.2/226.2.2.2              Vl25:1/2     10.27.2.3       INCLUDE
```

This example shows how to display the multicast router interfaces in VLAN 1:

```
Router# show
ipv6 mld snooping mrouter vlan 1
vlan            ports
-----+---------------------------------------
  1          Gi1/1,Gi2/1,Fa3/48,Router
```

This example shows the MLD snooping statistics information for VLAN 25:

```
Router# show ipv6 mld
 snooping statistics interface vlan 25
Snooping staticstics for Vlan25
#channels:2
#hosts   :1

Source/Group            Interface       Reporter      Uptime        Last-Join   Last-Leave
10.1.1.1/226.2.2.2      Gi1/2:Vl25      10.27.2.3     00:01:47      00:00:50      -
10.2.2.2/226.2.2.2      Gi1/2:Vl25      10.27.2.3     00:01:47      00:00:50      -
```

Related Commands

Command	Description
ipv6 mld snooping	Enables MLDv2 snooping globally.
ipv6 mld snooping explicit-tracking	Enables explicit host tracking.
ipv6 mld snooping querier	Enables the MLDv2 snooping querier.
ipv6 mld snooping report-suppression	Enables report suppression on a VLAN.

show ipv6 mld ssm-map

To display Source Specific Multicast (SSM) mapping information, use the **show ipv6 mld ssm-map static**command in user EXEC or privileged EXEC mode.

show ipv6 mld [**vrf** *vrf-name*] **ssm-map** [*source-address*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
source-address	(Optional) Source address associated with an MLD membership for a group identified by the access list.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(18)SXE	This command was introduced.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

If the optional *source-address* argument is not used, all SSM mapping information is displayed.

Examples

The following example shows all SSM mappings for the router:

```
Router# show ipv6 mld ssm-map
SSM Mapping  : Enabled
DNS Lookup   : Enabled
```

The following examples show SSM mapping for the source address 2001:0DB8::1:

```
Router# show ipv6 mld ssm-map 2001:0DB8::1
 Group address  : 2001:0DB8::1
 Group mode ssm : TRUE
 Database       : STATIC
 Source list    : 2001:0DB8::2
                  2001:0DB8::3
Router# show ipv6 mld ssm-map 2001:0DB8::2
 Group address  : 2001:0DB8::2
```

```
Group mode ssm : TRUE
Database       : DNS
Source list    : 2001:0DB8::3
                 2001:0DB8::1
```

The table below describes the significant fields shown in the displays.

Table 13: show ipv6 mld ssm-map Field Descriptions

Field	Description
SSM Mapping	The SSM mapping feature is enabled.
DNS Lookup	The DNS lookup feature is automatically enabled when the SSM mapping feature is enabled.
Group address	Group address identified by a specific access list.
Group mode ssm : TRUE	The identified group is functioning in SSM mode.
Database : STATIC	The router is configured to determine source addresses by checking static SSM mapping configurations.
Database : DNS	The router is configured to determine source addresses using DNS-based SSM mapping.
Source list	Source address associated with a group identified by the access list.

Related Commands

Command	Description
debug ipv6 mld ssm-map	Displays debug messages for SSM mapping.
ipv6 mld ssm-map enable	Enables the SSM mapping feature for groups in the configured SSM range
ipv6 mld ssm-map query dns	Enables DNS-based SSM mapping.
ipv6 mld ssm-map static	Configures static SSM mappings.

show ipv6 mld traffic

To display the Multicast Listener Discovery (MLD) traffic counters, use the **show ipv6 mld traffic** command in user EXEC or privileged EXEC mode.

show ipv6 mld [**vrf** *vrf-name*] **traffic**

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.0(26)S	This command was introduced.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

Use the **show ipv6 mld traffic**commandto check if the expected number of MLD protocol messages have been received and sent.

Examples

The following example displays the MLD protocol messages received and sent.

```
Router# show ipv6 mld traffic

MLD Traffic Counters
Elapsed time since counters cleared:00:00:21
                              Received     Sent
Valid MLD Packets               3           1
Queries                         1           0
Reports                         2           1
Leaves                          0           0
Mtrace packets                  0           0
Errors:
Malformed Packets                           0
Bad Checksums                               0
Martian source                              0
Packets Received on MLD-disabled Interface  0
```

The table below describes the significant fields shown in the display.

Table 14: show ipv6 mld traffic Field Descriptions

Field	Description
Elapsed time since counters cleared	Indicates the amount of time (in hours, minutes, and seconds) since the counters cleared.
Valid MLD packets	Number of valid MLD packets received and sent.
Queries	Number of valid queries received and sent.
Reports	Number of valid reports received and sent.
Leaves	Number of valid leaves received and sent.
Mtrace packets	Number of multicast trace packets received and sent.
Errors	Types of errors and the number of errors that have occurred.

show ipv6 mrib client

To display information about the clients of the Multicast Routing Information Base (MRIB), use the **show ipv6 mrib client** command in user EXEC or privileged EXEC mode.

show ipv6 mrib [**vrf** *vrf-name*] **client [filter]** [**name** {*client-name*| *client-name* **:** *client-id*}]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
filter	(Optional) Displays information about MRIB flags that each client owns and that each client is interested in.
name	(Optional) The name of a multicast routing protocol that acts as a client of MRIB, such as Multicast Listener Discovery (MLD) and Protocol Independent Multicast (PIM).
client-name **:** *client-id*	The name and ID of a multicast routing protocol that acts as a client of MRIB, such as MLD and PIM. The colon is required.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	This command was integrated into Cisco IOS Release 12.0(26)S.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.

Usage Guidelines

Use the **filter** keyword to display information about the MRIB flags each client owns and the flags in which each client is interested.

Examples

The following is sample output from the **show ipv6 mrib client**command:

```
Router# show ipv6 mrib client
IP MRIB client-connections
igmp:145        (connection id 0)
pim:146 (connection id 1)
mfib ipv6:3     (connection id 2)
slot 3  mfib ipv6 rp agent:16   (connection id 3)
slot 1  mfib ipv6 rp agent:16   (connection id 4)
slot 0  mfib ipv6 rp agent:16   (connection id 5)
slot 4  mfib ipv6 rp agent:16   (connection id 6)
slot 2  mfib ipv6 rp agent:16   (connection id 7)
```

The table below describes the significant fields shown in the display.

Table 15: show ipv6 mrib client Field Descriptions

Field	Description
igmp:145 (connection id 0) pim:146 (connection id 1) mfib ipv6:3 (connection id 2) mfib ipv6 rp agent:16 (connection id 3)	Client ID (client name:process ID)

show ipv6 mrib route

To display Multicast Routing Information Base (MRIB) route information, use the **show ipv6 mrib route** command in user EXEC or privileged EXEC mode.

show ipv6 mrib [**vrf** *vrf-name*] **route** [**link-local**| **summary**| [*sourceaddress-or-name*| *****] [*groupname-or-address* [*prefix-length*]]]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
link-local	(Optional) Displays the link-local groups.
summary	(Optional) Displays the number of MRIB entries (including link-local groups) and interfaces present in the MRIB table.
sourceaddress-or-name	(Optional) IPv6 address or name of the source.
*	(Optional) Displays all MRIB route information.
groupname or-address	(Optional) IPv6 address or name of the multicast group.
prefix-length	(Optional) IPv6 prefix length.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	The **link-local** keyword was added.
12.3(4)T	The **link-local** keyword was added.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Release	Modification
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.

Usage Guidelines

All entries are created by various clients of the MRIB, such as Multicast Listener Discovery (MLD), Protocol Independent Multicast (PIM), and Multicast Forwarding Information Base (MFIB). The flags on each entry or interface serve as a communication mechanism between various clients of the MRIB. The entries reveal how PIM sends register messages for new sources and the action taken.

The **summary** keyword shows the count of all entries, including link-local entries.

The interface flags are described in the table below.

Table 16: Description of Interface Flags

Flag	Description
F	Forward--Data is forwarded out of this interface
A	Accept--Data received on this interface is accepted for forwarding
IC	Internal copy
NS	Negate signal
DP	Do not preserve
SP	Signal present
II	Internal interest
ID	Internal uninterest
LI	Local interest
LD	Local uninterest
C	Perform directly connected check

Special entries in the MRIB indicate exceptions from the normal behavior. For example, no signaling or notification is necessary for arriving data packets that match any of the special group ranges. The special group ranges are as follows:

- Undefined scope (FFX0::/16)
- Node local groups (FFX1::/16)

- Link-local groups (FFX2::/16)
- Source Specific Multicast (SSM) groups (FF3X::/32).

For all the remaining (usually sparse-mode) IPv6 multicast groups, a directly connected check is performed and the PIM notified if a directly connected source arrives. This procedure is how PIM sends register messages for new sources.

Examples

The following is sample output from the **show ipv6 mrib route**command using the **summary** keyword:

```
Router# show ipv6 mrib route summary
MRIB Route-DB Summary
  No. of (*,G) routes = 52
  No. of (S,G) routes = 0
  No. of Route x Interfaces (RxI) = 10
```

The table below describes the significant fields shown in the display.

Table 17: show ipv6 mrib route Field Descriptions

Field	Description
No. of (*, G) routes	Number of shared tree routes in the MRIB.
No. of (S, G) routes	Number of source tree routes in the MRIB.
No. of Route x Interfaces (RxI)	Sum of all the interfaces on each MRIB route entry.

show ipv6 mroute

To display the information in the PIM topology table in a format similar to the **show ip mroute** command, use the **show ipv6 mroute** command in user EXEC or privileged EXEC mode.

show ipv6 mroute [**vrf** *vrf-name*] [**link-local**| [*group-name*| *group-address* [*source-address*| *source-name*]]] **[summary] [count]**

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
link-local	(Optional) Displays the link-local groups.
group-name | *group-address*	(Optional) IPv6 address or name of the multicast group.
source-address | *source-name*	(Optional) IPv6 address or name of the source.
summary	(Optional) Displays a one-line, abbreviated summary of each entry in the IPv6 multicast routing table.
count	(Optional) Displays statistics from the Multicast Forwarding Information Base (MFIB) about the group and source, including number of packets, packets per second, average packet size, and bytes per second.

Command Default

The **show ipv6 mroute** command displays all groups and sources.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	The **link-local** keyword was added.
12.3(4)T	The **link-local** keyword was added.
12.2(25)S	The **link-local** keyword was added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Release	Modification
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.

Usage Guidelines

The IPv6 multicast implementation does not have a separate mroute table. For this reason, the **show ipv6 mroute** command enables you to display the information in the PIM topology table in a format similar to the **show ip mroute** command.

If you omit all optional arguments and keywords, the **show ipv6 mroute** command displays all the entries in the PIM topology table (except link-local groups where the **link-local** keyword is available).

The Cisco IOS software populates the PIM topology table by creating (S,G) and (*,G) entries based on PIM protocol messages, MLD reports, and traffic. The asterisk (*) refers to all source addresses, the "S" refers to a single source address, and the "G" is the destination multicast group address. In creating (S, G) entries, the software uses the best path to that destination group found in the unicast routing table (that is, through Reverse Path Forwarding [RPF]).

Use the **show ipv6 mroute**command to display the forwarding status of each IPv6 multicast route.

Examples

The following is sample output from the **show ipv6 mroute**command:

```
Router# show ipv6 mroute ff07::1
Multicast Routing Table
Flags:D - Dense, S - Sparse, B - Bidir Group, s - SSM Group,
       C - Connected, L - Local, I - Received Source Specific Host Report,
       P - Pruned, R - RP-bit set, F - Register flag, T - SPT-bit set,
       J - Join SPT
Timers:Uptime/Expires
Interface state:Interface, State
(*, FF07::1), 00:04:45/00:02:47, RP 2001:0DB8:6::6, flags:S
  Incoming interface:Tunnel5
  RPF nbr:6:6:6::6
  Outgoing interface list:
    POS4/0, Forward, 00:04:45/00:02:47
(2001:0DB8:999::99, FF07::1), 00:02:06/00:01:23, flags:SFT
  Incoming interface:POS1/0
  RPF nbr:2001:0DB8:999::99
  Outgoing interface list:
    POS4/0, Forward, 00:02:06/00:03:27
```

The following is sample output from the **show ipv6 mroute**command with the **summary**keyword:

```
Router# show ipv6 mroute ff07::1 summary
Multicast Routing Table
Flags:D - Dense, S - Sparse, B - Bidir Group, s - SSM Group,
       C - Connected, L - Local, I - Received Source Specific Host Report,
       P - Pruned, R - RP-bit set, F - Register flag, T - SPT-bit set,
       J - Join SPT
Timers:Uptime/Expires
Interface state:Interface, State
```

```
(*, FF07::1), 00:04:55/00:02:36, RP 2001:0DB8:6::6, OIF count:1, flags:S
(2001:0DB8:999::99, FF07::1), 00:02:17/00:01:12, OIF count:1, flags:SFT
```

The following is sample output from the **show ipv6 mroute**command with the **count**keyword:

```
Router# show ipv6 mroute ff07::1 count
IP Multicast Statistics
71 routes, 24 groups, 0.04 average sources per group
Forwarding Counts:Pkt Count/Pkts per second/Avg Pkt Size/Kilobits per second
Other counts:Total/RPF failed/Other drops(OIF-null, rate-limit etc)
Group:FF07::1
  RP-tree:
   RP Forwarding:0/0/0/0, Other:0/0/0
   LC Forwarding:0/0/0/0, Other:0/0/0
  Source:2001:0DB8:999::99,
   RP Forwarding:0/0/0/0, Other:0/0/0
   LC Forwarding:0/0/0/0, Other:0/0/0
   HW Forwd:  20000/0/92/0, Other:0/0/0
  Tot. shown:Source count:1, pkt count:20000
```

The table below describes the significant fields shown in the display.

Table 18: show ipv6 mroute Field Descriptions

Field	Description		
Flags:			• J--join SPT. For (*, G) entries, indicates that the rate of traffic flowing down the shared tree is exceeding the SPT-Threshold value set for the group. (The default SPT-Threshold setting is 0 kbps.) When the J - Join shortest path tree (SPT) flag is set, the next (S, G) packet received down the shared tree triggers an (S, G) join in the direction of the source, thereby causing the router to join the source tree. The default SPT-Threshold value of 0 kbps is used for the group, and the J - Join SPT flag is always set on (*, G) entries and is never cleared. The router immediately switches to the shortest path source tree when traffic from a new source is received.
		Timers: Uptime/Expires	"Uptime" indicates per interface how long (in hours, minutes, and seconds) the entry has been in the IPv6 multicast routing table. "Expires" indicates per interface how long (in hours, minutes, and seconds) until the entry will be removed from the IPv6 multicast routing table.

Field	Description
	Provides information about the entry. • S--sparse. Entry is operating in sparse mode. • s--SSM group. Indicates that a multicast group is within the SSM range of IP addresses. This flag is reset if the SSM range changes. • C--connected. A member of the multicast group is present on the directly connected interface. • L--local. The router itself is a member of the multicast group. • I--received source specific host report. Indicates that an (S, G) entry was created by an (S, G) report. This flag is set only on the designated router (DR). • P--pruned. Route has been pruned. The Cisco IOS software keeps this information so that a downstream member can join the source. • R--RP-bit set. Indicates that the (S, G) entry is pointing toward the RP. This is typically prune state along the

Field	Description
	shared tree for a particular source. • F--register flag. Indicates that the software is registering for a multicast source. • T--SPT-bit set. Indicates that packets have been received on the shortest path source tree.
Interface state:	Indicates the state of the incoming or outgoing interface. • Interface. Indicates the type and number of the interface listed in the incoming or outgoing interface list. • Next-Hop. "Next-Hop" specifies the IP address of the downstream neighbor. • State/Mode. "State" indicates that packets will either be forwarded, pruned, or null on the interface depending on whether there are restrictions due to access lists. "Mode" indicates that the interface is operating in sparse mode.

Field	Description
(*, FF07::1) and (2001:0DB8:999::99)	Entry in the IPv6 multicast routing table. The entry consists of the IPv6 address of the source router followed by the IPv6 address of the multicast group. An asterisk (*) in place of the source router indicates all sources. Entries in the first format are referred to as (*, G) or "star comma G" entries. Entries in the second format are referred to as (S, G) or "S comma G" entries; (*, G) entries are used to build (S, G) entries.
RP	Address of the RP router.
flags:	Information set by the MRIB clients on this MRIB entry.
Incoming interface:	Expected interface for a multicast packet from the source. If the packet is not received on this interface, it is discarded.
RPF nbr	IP address of the upstream router to the RP or source.
Outgoing interface list:	Interfaces through which packets will be forwarded. For (S,G) entries, this list will not include the interfaces inherited from the (*,G) entry.

Related Commands

Command	Description
ipv6 multicast-routing	Enables multicast routing using PIM and MLD on all IPv6-enabled interfaces of the router and enables multicast forwarding.
show ipv6 mfib	Displays the forwarding entries and interfaces in the IPv6 MFIB.

show ipv6 mroute active

To display the active multicast streams on the router, use the **show ipv6 mroute active**command in user EXEC or privileged EXEC mode.

show ipv6 mroute [**vrf** *vrf-name*] [**link-local**| *group-name*| *group-address*] **active [kbps]**

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
link-local	(Optional) Displays the link-local groups.
group-name | *group-address*	(Optional) IPv6 address or name of the multicast group.
kbps	(Optional) Displays the rate that active sources are sending to multicast groups. Active sources are those sending at the kbps value or higher. The *kbps* argument defaults to 4 kbps.

Command Default

The *kbps* argument defaults to 4 kbps.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	The **link-local** keyword was added.
12.3(4)T	The **link-local** keyword was added.
12.2(25)S	The **link-local** keyword was added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Release	Modification
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

The **show ipv6 mroute active**command displays active multicast streams with data rates that are greater than or equal to the kilobits per second set by the user. The command default is 4 kbps.

Examples

The following is sample output from the **show ipv6 mroute active**command:

```
Router# show ipv6 mroute active
Active IPv6 Multicast Sources - sending >= 4 kbps
Group:FF05::1
 Source:2001::1:1:1
   Rate:11 pps/8 kbps(1sec), 8 kbps(last 8 sec)
```

The table below describes the significant fields shown in the display.

Table 19: show ipv6 mroute active Field Descriptions

Field	Description
Group:	Summary information about counters for (*, G) and the range of (S, G) states for one particular group G. The following RP-tree: and Source: output fields contain information about the individual states belonging to this group. **Note** For Source Specific Multicast (PIM-SSM) range groups, the Group: displays are statistical. All SSM range (S, G) states are individual, unrelated SSM channels.
Rate...kbps	Bytes per second divided by packets per second divided by 1000. On an IP multicast fast-switching platform, the number of packets per second is the number of packets during the last second. Other platforms may use a different approach to calculate this number. Please refer to the platform documentation for more information.

show ipv6 pim anycast-RP

To verify IPv6 PIM anycast RP operation, use the **show ipv6 pim anycast-RP** command in user EXEC or privileged EXEC mode.

show ipv6 pim anycast-RP *rp-address*

Syntax Description

rp-address	RP address to be verified.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)S	This command was introduced.
Cisco IOS XE Release 3.4S	This command was integrated into Cisco IOS XE Release 3.4S.
Cisco IOS Release 15.2(3)T	This command was integrated into Cisco IOS Release 15.2(3)T.
Cisco IOS Release 15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.

Usage Guidelines

Examples

```
Router# show ipv6 pim anycast-rp 110::1:1:1

Anycast RP Peers For 110::1:1:1   Last Register/Register-Stop received
  20::1:1:1 00:00:00/00:00:00
```

Related Commands

Command	Description
ipv6 pim anycast-RP	Configures the address of the PIM RP for an anycast group range.

show ipv6 pim bsr

To display information related to Protocol Independent Multicast (PIM) bootstrap router (BSR) protocol processing, use the **show ipv6 pim bsr** command in user EXEC or privileged EXEC mode.

show ipv6 pim [**vrf** *vrf-name*] **bsr** {**election**| **rp-cache**| **candidate-rp**}

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
election	Displays BSR state, BSR election, and bootstrap message (BSM)-related timers.
rp-cache	Displays candidate rendezvous point (C-RP) cache learned from unicast C-RP announcements on the elected BSR.
candidate-rp	Displays C-RP state on devices that are configured as C-RPs.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.0(26)S	This command was introduced.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T.
12.0(28)S	The **election**, **rp-cache**, and **candidate-rp** keywords were added.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.3(11)T	The **election**, **rp-cache**, and **candidate-rp** keywords were added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Release	Modification
Cisco IOS XE Release 3.7S	Command output when using the **election** keyword was modified.

Usage Guidelines

Use the **show ipv6 pim bsr** command to display details of the BSR election-state machine, C-RP advertisement state machine, and the C-RP cache. Information on the C-RP cache is displayed only on the elected BSR device, and information on the C-RP state machine is displayed only on a device configured as a C-RP.

Examples

The following example displays BSM election information:

```
device# show ipv6 pim bsr election
PIMv2 BSR information
BSR Election Information
Scope Range List: ff00::/8
This system is the Bootstrap Router (BSR)
BSR Address: 60::1:1:4
Uptime: 00:11:55, BSR Priority: 0, Hash mask length: 126
RPF: FE80::A8BB:CCFF:FE03:C400,Ethernet0/0
BS Timer: 00:00:07
This system is candidate BSR
Candidate BSR address: 60::1:1:4, priority: 0, hash mask length: 126
```

The table below describes the significant fields shown in the display.

Table 20: show ipv6 pim bsr election Field Descriptions

Field	Description
Scope Range List	Scope to which this BSR information applies.
This system is the Bootstrap Router (BSR)	Indicates this device is the BSR and provides information on the parameters associated with it.
BS Timer	On the elected BSR, the BS timer shows the time in which the next BSM will be originated. On all other devices in the domain, the BS timer shows the time at which the elected BSR expires.
This system is candidate BSR	Indicates this device is the candidate BSR and provides information on the parameters associated with it.

The following example displays information that has been learned from various C-RPs at the BSR. In this example, two candidate RPs have sent advertisements for the FF00::/8 or the default IPv6 multicast range:

```
Device# show ipv6 pim bsr rp-cache
PIMv2 BSR C-RP Cache
BSR Candidate RP Cache
Group(s) FF00::/8, RP count 2
  RP 10::1:1:3
    Priority 192, Holdtime 150
    Uptime: 00:12:36, expires: 00:01:55
```

```
  RP 20::1:1:1
    Priority 192, Holdtime 150
    Uptime: 00:12:36, expires: 00:01:5
```

The following example displays information about the C-RP. This RP has been configured without a specific scope value, so the RP will send C-RP advertisements to all BSRs about which it has learned through BSMs it has received.

```
Device# show ipv6 pim bsr candidate-rp
PIMv2 C-RP information
    Candidate RP: 10::1:1:3
      All Learnt Scoped Zones, Priority 192, Holdtime 150
      Advertisement interval 60 seconds
      Next advertisement in 00:00:33
```

The following example confirms that the IPv6 C-BSR is PIM-enabled. If PIM is disabled on an IPv6 C-BSR interface, or if a C-BSR or C-RP is configured with the address of an interface that does not have PIM enabled, the **show ipv6 pim bsr** command used with the **election** keyword would display that information instead.

```
Device# show ipv6 pim bsr election

PIMv2 BSR information

BSR Election Information
  Scope Range List: ff00::/8
     BSR Address: 2001:DB8:1:1:2
     Uptime: 00:02:42, BSR Priority: 34, Hash mask length: 28
     RPF: FE80::20:1:2,Ethernet1/0
     BS Timer: 00:01:27
```

show ipv6 pim df

To display the designated forwarder (DF)-election state of each interface for each rendezvous point (RP), use the **show ipv6 pim df**command in user EXEC or privileged EXEC mode.

show ipv6 pim [**vrf** *vrf-name*] **df** [*interface-type interface-number*] [*rp-address*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
interface-type interface-number	(Optional) Interface type and number. For more information, use the question mark (?) online help function.
rp-address	(Optional) RP IPv6 address.

Command Default

If no interface or RP address is specified, all DFs are displayed.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(7)T	This command was introduced.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

Use the **show ipv6 pim df** command to display the state of the DF election for each RP on each Protocol Independent Multicast (PIM)-enabled interface if the bidirectional multicast traffic is not flowing as expected.

Examples

The following example displays the DF-election states:

```
Router# show ipv6 pim df
Interface          DF State     Timer         Metrics
Ethernet0/0        Winner       4s 8ms        [120/2]
    RP :200::1
Ethernet1/0        Lose         0s 0ms        [inf/inf]
    RP :200::1
```

The following example shows information on the RP:

```
Router# show ipv6 pim df
Interface          DF State     Timer         Metrics
Ethernet0/0        None:RP LAN 0s 0ms        [inf/inf]
    RP :200::1
Ethernet1/0        Winner       7s 600ms      [0/0]
    RP :200::1
Ethernet2/0        Winner       9s 8ms        [0/0]
    RP :200::1
```

The table below describes the significant fields shown in the display.

Table 21: show ipv6 pim df Field Descriptions

Field	Description
Interface	Interface type and number that is configured to run PIM.
DF State	The state of the DF election on the interface. The state can be: • Offer • Winner • Backoff • Lose • None:RP LAN The None:RP LAN state indicates that no DF election is taking place on this LAN because the RP is directly connected to this LAN.
Timer	DF election timer.
Metrics	Routing metrics to the RP announced by the DF.
RP	The IPv6 address of the RP.

Related Commands

Command	Description
debug ipv6 pim df-election	Displays debug messages for PIM bidirectional DF-election message processing.
ipv6 pim rp-address	Configures the address of a PIM RP for a particular group range.
show ipv6 pim df winner	Displays the DF-election winner on each interface for each RP.

show ipv6 pim df winner

To display the designated forwarder (DF)-election winner on each interface for each rendezvous point (RP), use the **show ipv6 pim df winner**command in user EXEC or privileged EXEC mode.

show ipv6 pim [**vrf** *vrf-name*] **df winner** [*interface-type interface-number*] [*rp-address*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
interface-type interface-number	(Optional) Interface type and number. For more information, use the question mark (?) online help function.
rp-address	(Optional) RP IPv6 address.

Command Default

If no interface or RP address is specified, all DFs are displayed.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(7)T	This command was introduced.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

Use the **show ipv6 pim df winner** command to display the DF election winner for each RP on each Protocol Independent Multicast (PIM)-enabled interface if the bidirectional multicast traffic is not flowing as expected.

Examples

The following example shows the DF winner for the IPv6 address 200::1:

```
Router# show ipv6 pim df winner ethernet 1/0 200::1
Interface          Metrics
Ethernet1/0        [120/2]
RP        : 200::1
DF Winner : FE80::A8BB:CCFF:FE00:601
```

The table below describes the significant fields shown in the display.

Table 22: show ipv6 pim df winner Field Descriptions

Field	Description
Interface	Interface type and number that is configured to run PIM.
Metrics	Routing metrics to the RP announced by the DF.
RP	The IPv6 address of the RP.
DF Winner	The IPv6 address of the DF election winner.

Related Commands

Command	Description
debug ipv6 pim df-election	Displays debug messages for PIM bidirectional DF-election message processing.
ipv6 pim rp-address	Configures the address of a PIM RP for a particular group range.
show ipv6 pim df	Displays the DF -election state of each interface for each RP.

show ipv6 pim group-map

To display an IPv6 Protocol Independent Multicast (PIM) group mapping table, use the **show ipv6 pim group-map** command in user EXEC or privileged EXEC mode.

{**show ipv6 pim** [**vrf** *vrf-name*] **group-map** [*group-name*| *group-address*]| [*group-range*| *group-mask*] [**info-source** {**bsr**| **default**| **embedded-rp**| **static**}]}

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
group-name | *group-address*	(Optional) IPv6 address or name of the multicast group.
group-range | *group-mask*	(Optional) Group range list. Includes group ranges with the same prefix or mask length.
info-source	(Optional) Displays all mappings learned from a specific source, such as the bootstrap router (BSR) or static configuration.
bsr	Displays ranges learned through the BSR.
default	Displays ranges enabled by default.
embedded-rp	Displays group ranges learned through the embedded rendezvous point (RP).
static	Displays ranges enabled by static configuration.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	This command was integrated into Cisco IOS Release 12.0(26)S.
12.0(28)S	The *group-range* and *group-mask*arguments were added, and the **info-source bsr**, **static**, and **default** keywords were added.

Release	Modification
12.2(25)S	The *group-range* and *group-mask*arguments were added, and the **info-source bsr**, **static**, and **default** keywords were added.
12.3(11)T	The *group-range* and *group-mask*arguments were added, and the **info-source bsr**, **static**, and **default** keywords were added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.

Usage Guidelines

Use the **show ipv6 pim group-map** command to find all group mappings installed by a given source of information, such as BSR or static configuration.

You can also use this command to find which group mapping a router at a specified IPv6 group address is using by specifying a group address, or to find an exact group mapping entry by specifying a group range and mask length.

Examples

The following is sample output from the **show ipv6 pim group-map**command:

```
Router# show ipv6 pim group-map
FF33::/32*
      SSM
      Info source:Static
      Uptime:00:08:32, Groups:0
  FF34::/32*
      SSM
      Info source:Static
      Uptime:00:09:42, Groups:0
```

The table below describes the significant fields shown in the display.

Table 23: show ipv6 pim group-map Field Descriptions

Field	Description
RP	Address of the RP router if the protocol is sparse mode or bidir.

Field	Description
Protocol	Protocol used: sparse mode (SM), Source Specific Multicast (SSM), link-local (LL), or NOROUTE (NO). LL is used for the link-local scoped IPv6 address range (ff[0-f]2::/16). LL is treated as a separate protocol type, because packets received with these destination addresses are not forwarded, but the router might need to receive and process them. NOROUTE or NO is used for the reserved and node-local scoped IPv6 address range (ff[0-f][0-1]::/16). These addresses are nonroutable, and the router does not need to process them.
Groups	How many groups are present in the topology table from this range.
Info source	Mappings learned from a specific source; in this case, static configuration.
Uptime	The uptime for the group mapping displayed.

The following example displays the group mappings learned from BSRs that exist in the PIM group-to-RP or mode-mapping cache. The example shows the address of the BSR from which the group mappings have been learned and the associated timeout.

```
Router# show ipv6 pim group-map info-source bsr
FF00::/8*
    SM, RP: 20::1:1:1
    RPF: Et1/0,FE80::A8BB:CCFF:FE03:C202
    Info source: BSR From: 60::1:1:4(00:01:42), Priority: 192
    Uptime: 00:19:51, Groups: 0
FF00::/8*
    SM, RP: 10::1:1:3
    RPF: Et0/0,FE80::A8BB:CCFF:FE03:C102
    Info source: BSR From: 60::1:1:4(00:01:42), Priority: 192
    Uptime: 00:19:51, Groups: 0
```

show ipv6 pim interface

To display information about interfaces configured for Protocol Independent Multicast (PIM), use the **show ipv6 pim interface** command in privileged EXEC mode.

show ipv6 pim [**vrf** *vrf-name*] **interface [state-on] [state-off]** [*type number*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
state-on	(Optional) Displays interfaces with PIM enabled.
state-off	(Optional) Displays interfaces with PIM disabled.
type number	(Optional) Interface type and number.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	The **state-on** and **state-off**keywords were added.
12.3(4)T	The **state-on** and **state-off**keywords were added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.6	Command output was modified to display passive interface information.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.
15.3(2)S	This command was modified. The output has been modified to include information about interfaces configured for BFD support for multicast (PIM).

Release	Modification
Cisco IOS XE Release 3.9S	This command was integrated into Cisco IOS XE Release 3.9S.

Usage Guidelines

The **show ipv6 pim interface** command is used to check if PIM is enabled on an interface, the number of neighbors, and the designated router (DR) on the interface.

Examples

The following is sample output from the **show ipv6 pim interface** command using the **state-on** keyword:

```
Router# show ipv6 pim interface state-on
Interface          PIM  Nbr   Hello  DR
                        Count Intvl  Prior
Ethernet0          on   0     30     1
    Address:FE80::208:20FF:FE08:D7FF
    DR     :this system
POS1/0             on   0     30     1
    Address:FE80::208:20FF:FE08:D554
    DR     :this system
POS4/0             on   1     30   1
    Address:FE80::208:20FF:FE08:D554
    DR     :FE80::250:E2FF:FE8B:4C80
POS4/1             on   0     30   1
    Address:FE80::208:20FF:FE08:D554
    DR     :this system
Loopback0          on   0     30     1
    Address:FE80::208:20FF:FE08:D554
    DR     :this system
```

The table below describes the significant fields shown in the display.

Table 24: show ipv6 pim interface Field Descriptions

Field	Description
Interface	Interface type and number that is configured to run PIM.
PIM	Whether PIM is enabled on an interface.
Nbr Count	Number of PIM neighbors that have been discovered through this interface.
Hello Intvl	Frequency, in seconds, of PIM hello messages.
DR	IP address of the designated router (DR) on a network.
Address	Interface IP address of the next-hop router.

The following is sample output from the **show ipv6 pim interface** command, modified to display passive interface information:

```
Router(config)# show ipv6 pim interface gigabitethernet0/0/0

    Interface              PIM   Nbr   Hello  DR  BFD
```

```
                          Count Intvl Prior

   GigabitEthernet0/0/0   on/P  0     30     1   On
      Address: FE80::A8BB:CCFF:FE00:9100
      DR     : this system
```

The table below describes the significant change shown in the display.

Table 25: show ipv6 pim interface Field Description

Field	Description
PIM	Whether PIM is enabled on an interface. When PIM passive mode is used, a "P" is displayed in the output.
BFD	Whether BFD is enabled on an interface. When BFD support for multicast (PIM) is enabled on an interface, an "on" is displayed in the output.

Related Commands

Command	Description
show ipv6 pim neighbor	Displays the PIM neighbors discovered by the Cisco IOS software.

show ipv6 pim join-prune statistic

To display the average join-prune aggregation for the most recently aggregated 1000, 10,000, and 50,000 packets for each interface, use the **show ipv6 pim join-prune statistic** command in user EXEC or privileged EXEC mode.

show ipv6 pim [**vrf** *vrf-name*] **join-prune statistic** [*interface-type*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
interface-type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.0(26)S	This command was introduced.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

When Protocol Independent Multicast (PIM) sends multiple joins and prunes simultaneously, it aggregates them into a single packet. The **show ipv6 pim join-prune statistic** command displays the average number of joins and prunes that were aggregated into a single packet over the last 1000 PIM join-prune packets, over the last 10,000 PIM join-prune packets, and over the last 50,000 PIM join-prune packets.

Examples

The following example provides the join/prune aggregation on Ethernet interface 0/0/0:

```
Router# show ipv6 pim join-prune statistic Ethernet0/0/0
PIM Average Join/Prune Aggregation for last (1K/10K/50K) packets
Interface             Transmitted             Received
Ethernet0/0/0      0    / 0    / 0         1    / 0    / 0
```

The table below describes the significant fields shown in the display.

Table 26: show ipv6 pim join-prune statistics Field Descriptions

Field	Description
Interface	The interface from which the specified packets were transmitted or on which they were received.
Transmitted	The number of packets transmitted on the interface.
Received	The number of packets received on the interface.

show ipv6 pim limit

To display Protocol Independent Multicast (PIM) interface limit, use the **show ipv6 pim limit** command in privileged EXEC mode.

show ipv6 pim [**vrf** *vrf-name*] **limit** [*interface*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
interface	(Optional) Specific interface for which limit information is provided.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SRE	This command was introduced.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

The **show ipv6 pim limit** command checks interface statistics for limits. If the optional *interface* argument is enabled, only information for the specified interface is shown.

Examples

The following example displays s PIM interface limit information:

```
Router# show ipv6 pim limit
```

Related Commands

Command	Description
ipv6 multicast limit	Configures per-interface mroute state limiters in IPv6.
ipv6 multicast limit cost	Applies a cost to mroutes that match per interface mroute state limiters in IPv6.

show ipv6 pim neighbor

To display the Protocol Independent Multicast (PIM) neighbors discovered by the Cisco software, use the **show ipv6 pim neighbor** command in privileged EXEC mode.

show ipv6 pim [**vrf** *vrf-name*]**neighbor** [**detail**] [*interface-type interface-number* | **count**]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
detail	(Optional) Displays the additional addresses of the neighbors learned, if any, through the routable address hello option.
interface-type interface-number	(Optional) Interface type and number.
count	(Optional) Displays neighbor counts on each interface.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	This command was integrated into Cisco IOS Release 12.0(26)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.1(4)M	The **vrf***vrf-name* keyword and argument were added.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.

Usage Guidelines

The **show ipv6 pim neighbor** command displays which routers on the LAN are configured for PIM.

Examples

The following is sample output from the **show ipv6 pim neighbor** command using the detail keyword to identify the additional addresses of the neighbors learned through the routable address hello option:

```
Router# show ipv6 pim neighbor detail

Neighbor Address(es)       Interface          Uptime    Expires DR pri Bidir

FE80::A8BB:CCFF:FE00:401   Ethernet0/0        01:34:16  00:01:16 1      B
60::1:1:3

FE80::A8BB:CCFF:FE00:501   Ethernet0/0        01:34:15  00:01:18 1      B
60::1:1:4
```

The table below describes the significant fields shown in the display.

Table 27: show ipv6 pim neighbor Field Descriptions

Field	Description
Neighbor addresses	IPv6 address of the PIM neighbor.
Interface	Interface type and number on which the neighbor is reachable.
Uptime	How long (in hours, minutes, and seconds) the entry has been in the PIM neighbor table.
Expires	How long (in hours, minutes, and seconds) until the entry will be removed from the IPv6 multicast routing table.
DR	Indicates that this neighbor is a designated router (DR) on the LAN.
pri	DR priority used by this neighbor.
Bidir	The neighbor is capable of PIM in bidirectional mode.

Related Commands

Command	Description
show ipv6 pim interfaces	Displays information about interfaces configured for PIM.

show ipv6 pim range-list

To display information about IPv6 multicast range lists, use the **show ipv6 pim range-list**command in privileged EXEC mode.

show ipv6 pim [**vrf** *vrf-name*] **range-list [config]** [*rp-address*| *rp-name*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
config	(Optional) The client. Displays the range lists configured on the router.
rp-address | *rp-name*	(Optional) The address of a Protocol Independent Multicast (PIM) rendezvous point (RP).

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	This command was integrated into Cisco IOS Release 12.0(26)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.

Usage Guidelines

The **show ipv6 pim range-list** command displays IPv6 multicast range lists on a per-client and per-mode basis. A client is the entity from which the specified range list was learned. The clients can be config, and the modes can be Source Specific Multicast (SSM) or sparse mode (SM).

Examples

The following is sample output from the **show ipv6 pim range-list**command:

```
Router# show ipv6 pim range-list
config SSM Exp:never Learnt from :::
 FF33::/32 Up:00:26:33
 FF34::/32 Up:00:26:33
 FF35::/32 Up:00:26:33
 FF36::/32 Up:00:26:33
 FF37::/32 Up:00:26:33
 FF38::/32 Up:00:26:33
 FF39::/32 Up:00:26:33
 FF3A::/32 Up:00:26:33
 FF3B::/32 Up:00:26:33
 FF3C::/32 Up:00:26:33
 FF3D::/32 Up:00:26:33
 FF3E::/32 Up:00:26:33
 FF3F::/32 Up:00:26:33
config SM RP:40::1:1:1 Exp:never Learnt from :::
 FF13::/64 Up:00:03:50
config SM RP:40::1:1:3 Exp:never Learnt from :::
 FF09::/64 Up:00:03:50
```

The table below describes the significant fields shown in the display.

Table 28: show ipv6 pim range-list Field Descriptions

Field	Description
config	Config is the client.
SSM	Protocol being used.
FF33::/32	Group range.
Up:	Uptime.

show ipv6 pim topology

To display Protocol Independent Multicast (PIM) topology table information for a specific group or all groups, use the **show ipv6 pim topology** command in user EXEC or privileged EXEC mode.

show ipv6 pim [**vrf** *vrf-name*] **topology** [*groupname-or-address* [*sourcename-or-address*]| **link-local**| **route-count [detail]**]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
groupname-or-address	(Optional) IPv6 address or name of the multicast group.
sourcename-or-address	(Optional) IPv6 address or name of the source.
link-local	(Optional) Displays the link-local groups.
route-count	(Optional) Displays the number of routes in PIM topology table.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	This command was modified. The **link-local** keyword was added.
12.3(4)T	This command was modified. The **link-local** keyword was added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Release	Modification
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.

Usage Guidelines

This command shows the PIM topology table for a given group--(*, G), (S, G), and (S, G) Rendezvous Point Tree (RPT)-- as internally stored in a PIM topology table. The PIM topology table may have various entries for a given group, each with its own interface list. The resulting forwarding state is maintained in the Multicast Routing Information Base (MRIB) table, which shows which interface the data packet should be accepted on and which interfaces the data packet should be forwarded to for a given (S, G) entry. Additionally, the Multicast Forwarding Information Base (MFIB) table is used during forwarding to decide on per-packet forwarding actions.

The **route-count**keyword shows the count of all entries, including link-local entries.

PIM communicates the contents of these entries through the MRIB, which is an intermediary for communication between multicast routing protocols (such as PIM), local membership protocols (such as Multicast Listener Discovery [MLD]), and the multicast forwarding engine of the system.

For example, an interface is added to the (*, G) entry in PIM topology table upon receipt of an MLD report or PIM (*, G) join message. Similarly, an interface is added to the (S, G) entry upon receipt of the MLD INCLUDE report for the S and G or PIM (S, G) join message. Then PIM installs an (S, G) entry in the MRIB with the immediate olist (from (S, G)) and the inherited olist (from (*, G)). Therefore, the proper forwarding state for a given entry (S, G) can be seen only in the MRIB or the MFIB, not in the PIM topology table.

Examples

The following is sample output from the **show ipv6 pim topology** command:

```
Router# show ipv6 pim topology
IP PIM Multicast Topology Table
Entry state:(*/S,G)[RPT/SPT] Protocol Uptime Info
Entry flags:KAT - Keep Alive Timer, AA - Assume Alive, PA - Probe Alive,
    RA - Really Alive, LH - Last Hop, DSS - Don't Signal Sources,
    RR - Register Received, SR - Sending Registers, E - MSDP External,
    DCC - Don't Check Connected
Interface state:Name, Uptime, Fwd, Info
Interface flags:LI - Local Interest, LD - Local Dissinterest,
II - Internal Interest, ID - Internal Dissinterest,
LH - Last Hop, AS - Assert, AB - Admin Boundary
(*,FF05::1)
SM UP:02:26:56 JP:Join(now) Flags:LH
RP:40::1:1:2
RPF:Ethernet1/1,FE81::1
  Ethernet0/1          02:26:56  fwd LI LH
(50::1:1:200,FF05::1)
SM UP:00:00:07 JP:Null(never) Flags:
RPF:Ethernet1/1,FE80::30:1:4
  Ethernet1/1          00:00:07  off LI
```

The table below describes the significant fields shown in the display.

Table 29: show ipv6 pim topology Field Descriptions

Field	Description
Entry flags: KAT	The keepalive timer (KAT) associated with a source is used to keep track of two intervals while the source is alive. When a source first becomes active, the first-hop router sets the keepalive timer to 3 minutes and 30 seconds, during which time it does not probe to see if the source is alive. Once this timer expires, the router enters the probe interval and resets the timer to 65 seconds, during which time the router assumes the source is alive and starts probing to determine if it actually is. If the router determines that the source is alive, the router exits the probe interval and resets the keepalive timer to 3 minutes and 30 seconds. If the source is not alive, the entry is deleted at the end of the probe interval.
AA, PA	The assume alive (AA) and probe alive (PA) flags are set when the router is in the probe interval for a particular source.
RR	The register received (RR) flag is set on the (S, G) entries on the Route Processor (RP) as long as the RP receives registers from the source Designated Router (DR), which keeps the source state alive on the RP.
SR	The sending registers (SR) flag is set on the (S, G) entries on the DR as long as it sends registers to the RP.

Related Commands

Command	Description
show ipv6 mrib client	Displays information about the clients of the MRIB.
show ipv6 mrib route	Displays MRIB route information.

show ipv6 pim traffic

To display the Protocol Independent Multicast (PIM) traffic counters, use the **show ipv6 pim traffic** command in user EXEC or privileged EXEC mode.

show ipv6 pim [**vrf** *vrf-name*] **traffic**

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.0(26)S	This command was introduced.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

Use the **show ipv6 pim traffic** command to check if the expected number of PIM protocol messages have been received and sent.

Examples

The following example shows the number of PIM protocol messages received and sent.

```
Router# show ipv6 pim traffic

PIM Traffic Counters
Elapsed time since counters cleared:00:05:29
                              Received     Sent
Valid PIM Packets               22          22
Hello                           22          22
Join-Prune                      0           0
Register                        0           0
Register Stop                   0           0
Assert                          0           0
Bidir DF Election               0           0
Errors:
Malformed Packets                           0
Bad Checksums                               0
```

```
Send Errors                                 0
Packet Sent on Loopback Errors              0
Packets Received on PIM-disabled Interface  0
Packets Received with Unknown PIM Version   0
```

The table below describes the significant fields shown in the display.

Table 30: show ipv6 pim traffic Field Descriptions

Field	Description
Elapsed time since counters cleared	Indicates the amount of time (in hours, minutes, and seconds) since the counters cleared.
Valid PIM Packets	Number of valid PIM packets received and sent.
Hello	Number of valid hello messages received and sent.
Join-Prune	Number of join and prune announcements received and sent.
Register	Number of PIM register messages received and sent.
Register Stop	Number of PIM register stop messages received and sent.
Assert	Number of asserts received and sent.

show ipv6 pim tunnel

To display information about the Protocol Independent Multicast (PIM) register encapsulation and de-encapsulation tunnels on an interface, use the **show ipv6 pim tunnel**command in privileged EXEC mode.

show ipv6 pim [**vrf** *vrf-name*] **tunnel** [*interface-type interface-number*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a virtual routing and forwarding (VRF) configuration.
interface-type interface-number	(Optional) Tunnel interface type and number.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.0(26)S	This command was integrated into Cisco IOS Release 12.0(26)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.

Usage Guidelines

If you use the **show ipv6 pim tunnel** command without the optional *interface* keyword, information about the PIM register encapsulation and de-encapsulation tunnel interfaces is displayed.

The PIM encapsulation tunnel is the register tunnel. An encapsulation tunnel is created for every known rendezvous point (RP) on each router. The PIM decapsulation tunnel is the register decapsulation tunnel. A decapsulation tunnel is created on the RP for the address that is configured to be the RP address.

Examples

The following is sample output from the **show ipv6 pim tunnel**command on the RP:

```
Router# show ipv6 pim tunnel
Tunnel0*
 Type  :PIM Encap
 RP    :100::1
 Source:100::1
Tunnel0*
 Type  :PIM Decap
 RP    :100::1
 Source: -
```

The following is sample output from the **show ipv6 pim tunnel**command on a non-RP:

```
Router# show ipv6 pim tunnel
Tunnel0*
 Type  :PIM Encap
 RP    :100::1
 Source:2001::1:1:1
```

The table below describes the significant fields shown in the display.

Table 31: show ipv6 pim tunnel Field Descriptions

Field	Description
Tunnel0*	Name of the tunnel.
Type	Type of tunnel. Can be PIM encapsulation or PIM de-encapsulation.
source	Source address of the router that is sending encapsulating registers to the RP.

show ipv6 rpf

To check Reverse Path Forwarding (RPF) information for a given unicast host address and prefix, use the **show ipv6 rpf** command in user EXEC or privileged EXEC mode.

show ipv6 rpf {*source-vrf* [*access-list*]| **vrf** *receiver-vrf*{*source-vrf* [*access-list*]| **select**}}

Syntax Description

source-vrf	Name or address of the virtual routing and forwarding (VRF) on which lookups are to be performed.
receiver-vrf	Name or address of the VRF in which the lookups originate.
access-list	Name or address of access control list (ACL) to be applied to the group-based VRF selection policy.
vrf	Displays information about the VRF instance.
select	Displays group-to-VRF mapping information.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.0(26)S	This command was introduced.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.1(4)M	The **vrf** *receiver-vrf* keyword and argument were added.
15.3(1)S	This command was integrated into Cisco IOS Release 15.3(1)S.

Usage Guidelines

The **show ipv6 rpf**command displays information about how IPv6 multicast routing performs Reverse Path Forwarding (RPF). Because the router can find RPF information from multiple routing tables (for example, unicast Routing Information Base [RIB], multiprotocol Border Gateway Protocol [BGP] routing table, or static mroutes), the **show ipv6 rpf**command to display the source from which the information is retrieved.

Examples

The following example displays RPF information for the unicast host with the IPv6 address of 2001::1:1:2:

```
Router# show ipv6 rpf 2001::1:1:2
RPF information for 2001::1:1:2
  RPF interface:Ethernet3/2
  RPF neighbor:FE80::40:1:3
  RPF route/mask:20::/64
  RPF type:Unicast
  RPF recursion count:0
  Metric preference:110
  Metric:30
```

The table below describes the significant fields shown in the display.

Table 32: show ipv6 rpf Field Descriptions

Field	Description
RPF information for 2001::1:1:2	Source address that this information concerns.
RPF interface:Ethernet3/2	For the given source, the interface from which the router expects to get packets.
RPF neighbor:FE80::40:1:3	For the given source, the neighbor from which the router expects to get packets.
RPF route/mask:20::/64	Route number and mask that matched against this source.
RPF type:Unicast	Routing table from which this route was obtained, either unicast, multiprotocol BGP, or static mroutes.
RPF recursion count	Indicates the number of times the route is recursively resolved.
Metric preference:110	The preference value used for selecting the unicast routing metric to the Route Processor (RP) announced by the designated forwarder (DF).
Metric:30	Unicast routing metric to the RP announced by the DF.

show mls ip multicast

To display the MLS IP information, use the **show mls ip multicast** command in user EXEC or privileged EXEC mode.

show mls ip multicast [**capability** [**module** *num*]| **connected**| **group** *hostname*| *ip-address* [*ip-mask*]| **interface** *type number*| **module** *number*| **mdt**| **source** *hostname*| *ip-address*| **statistics**| **summary**]

Syntax Description

capability	Displays information about the multicast-replication capabilities.
module *num*	(Optional) Specifies the module number.
connected	(Optional) Displays the installed interface or mask entries.
group	(Optional) Displays the entries for a specific multicast-group address.
hostname	Group IP hostname.
ip-address	Group IP address.
ip-mask	(Optional) IP mask for group IP address.
interface	(Optional) Specifies an interface.
type	Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan**.
number	Module and port number; see the “Usage Guidelines” section for valid values.
module *number*	(Optional) Displays the entries that are downloaded on the specified module; see the “Usage Guidelines” section for valid values.
mdt	(Optional) Displays hardware-accelerated MDT information.
source *hostname*	(Optional) Displays the entries for a specific source address.
source *ip-address*	(Optional) Displays the entries for a specific source IP address.

statistics	(Optional) Displays the statistics from multicast entries.
summary	(Optional) Displays a summary of statistics from multicast entries.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged 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 is supported on releases prior to Release 12.2(17a)SX only.
12.2(17b)SXA	On Cisco 7600 series routers that are configured with a Supervisor Engine 720, this command is replaced by the show mls netflow ip command.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to the 12.2 SX release. This command was changed to include the **capability** [**module** *num*] keywords.
12.2(18)SXF	The output of the **show mls ip multicast capability** command was changed to include egress information.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The output of the **show mls ip multicast capability** command on Cisco 6500 and Cisco 7600 series routers that are configured with a Supervisor Engine 32 does not include egress information.

The **pos**, **atm**, and **ge-wan**keywords are not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 720.

The following syntax is supported on Cisco 6500 and Cisco 7600 series routers that are configured with a Supervisor Engine 2:

show mls ip multicast complete partial group *hostname ip-address ip-mask* **interface** *interface interface-number* **source** *hostname ip-address*

show mls ip multicast connected summary

show mls ip multicast statistics group *hostname ip-address* **source** *hostname ip-address*

The *number* argument designates the module and port number. Valid values for *number* depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the

module number are from 1 to 13 and valid values for the port number are from 1 to 48. These valid values also apply when entering the **module** *number* keyword and argument.

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

Examples

This example shows how to display general MLS IP-multicast information:

```
Router# show mls ip multicast

Multicast hardware switched flows:
(*, 224.1.1.1) Incoming interface: Vlan0, Packets switched: 0
Hardware switched outgoing interfaces: Vlan202
RPF-MFD installed
Total hardware switched flows : 1
```

This example shows how to display a summary of MLS information:

```
Router# show mls ip multicast
 summary

1 MMLS entries using 168 bytes of memory
Number of partial hardware-switched flows: 0
Number of complete hardware-switched flows: 1
Directly connected subnet entry install is enabled
Aggregation of routed oif is enabled
Hardware shortcuts for mvpn mroutes supported
Egress Mode of replication is enabled
Maximum route support is enabled
Router#
```

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

```
Router#
show mls ip multicast interface fastethernet 5/9
DstIP           SrcIP           Dst i/f:DstMAC       Pkts          Bytes
------------------------------------------------------------------------------
SrcDstPorts   SrcDstEncap Age   LastSeen
---------------------------------------
172.20.52.37    0.0.0.0         100: 00d0.5870.a4ff 1            129
Fa5/9,----- ARPA,ARPA   107   06:10:02
172.20.52.36    0.0.0.0         100 : 0050.7312.0cff 50           6403
Fa5/9,----- ARPA,ARPA   107   06:10:04
 Number of Entries Found = 2
```

This example shows how to display information about the multicast-replication capabilities:

```
Router#
show mls ip multicast capability
Current mode of replication is Ingress
auto replication mode detection is ON
 Slot           Multicast replication capability
    2                       Egress
    5                       Egress
    6                       Egress
    8                       Ingress
    9                       Ingress
```

Related Commands

Command	Description
mls ip multicast (interface configuration)	Enables MLS IP shortcuts on the interface.
show mls ip multicast consistency-check	Displays consistency-checker information.

show mls ip multicast bidir

To display the Bidir hardware-switched entries, use the **show mls ip multicast bidir** command in user EXEC or privileged EXEC mode..

show mls ip multicast bidir [**group** *hostname*| *ip-address* [*ip-mask*]| **interface** *type number*| **source** *hostname*| *ip-addres* **s**]

Syntax Description

group	(Optional) Displays the entries for a specific multicast-group address.
hostname	Group IP hostname.
ip-address	Group IP address.
ip-mask	(Optional) IP mask for group IP address.
interface	(Optional) Specifies an interface.
type	Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, and **tengigabitethernet**.
number	Module and port number.
source *hostname*	(Optional) Displays the entries for a specific source address.
source *ip-address*	(Optional) Displays the entries for a specific source IP address.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged 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 is supported on releases prior to Release 12.2(17a)SXonly.
12.2(17b)SXA	This command is replaced by the **show mls netflow ip** command.

Release	Modification
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

Examples

This example shows how to display the Bidir hardware-switched entries:

```
Router# show mls ip multicast bidir
Multicast hardware switched flows:
(*, 226.1.4.0) Incoming interface: Vlan51, Packets switched: 0
Hardware switched outgoing interfaces: Vlan51 Vlan30
RPF-MFD installed
(*, 227.1.4.0) Incoming interface: Gi2/1, Packets switched: 0
Hardware switched outgoing interfaces: Gi2/1 Vlan30
RPF-MFD installed
```

Related Commands

Command	Description
mls ip multicast bidir gm-scan-interval	Sets the RPF scan interval for the Bidir rendezvous point.

show mls ip multicast rp-mapping

To display the mappings for the PIM-Bidir group to active rendezvous points, use the **show mls ip multicast rp-mapping** command in user EXEC or privileged EXEC mode.

show mls ip multicast rp-mapping [*rp-address*] [**df-cache**| **gm-cache**]

Syntax Description

rp-address	(Optional) Rendezvous-point address.
df-cache	(Optional) Displays information on the DF list in the rendezvous-point mapping cache in the hardware.
gm-cache	(Optional) Displays information on the group/mask ranges in the rendezvous-point mapping cache in the hardware.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged 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 is supported on releases prior to Release 12.2(17a)SX only.
12.2(17b)SXA	This command is replaced by the **show mls netflow ip** command.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

Examples

This example shows how to display the mappings for the PIM group-to-active rendezvous points:

```
Router# show mls ip multicast rp-mapping
RP Address State DF-count GM-count
10.2.2.2 H 1 1
10.9.9.9 H 1 2
```

This example shows how to display information that is based on the DF list in the mapping cache of the route processor:

```
Router# show mls ip multicast rp-mapping df-cache
RP Address   State   DF    State
10.9.9.9      H       Vl30  H
```

This example shows how to display information that is based on the mapping cache of the route processor:

```
Router# show mls ip multicast rp-mapping gm-cache
State: H - Hardware Switched, I - Install Pending, D - Delete Pending,
Z - Zombie
RP Address State Group Mask State Packet/Byte-count
10.0.0.60 H 172.16.0.0 255.255.0.0 H 100/6400
```

show mls ip multicast sso

To display information about multicast high-availability SSO, use the **show mls ip multicast sso** command in user EXEC or privileged EXEC mode .

show mls ip multicast sso [statistics]

Syntax Description

statistics	(Optional) Displays multicast high-availability SSO statistical information.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(18)SXD	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

Examples

This example shows how to display multicast high-availability SSO information:

```
Router# show mls ip multicast sso
Multicast SSO is enabled
Multicast HA Parameters
-------------------------------------------------+------+
protocol convergence timeout                     120 secs
flow leak percent                                10
flow leak interval                               20 secs
heartquake#
```

This example shows how to display statistical information about multicast high-availability SSO:

```
Router# show mls ip multicast sso
 statistics

Multicast HA Statistics: ACTIVE
-------------------------------------------------+------+
CHKPT msgs sent                                  5
CHKPT msgs send failed                           0
CHKPT msgs send aborted                          0
CHKPT met add msg sent                           5
CHKPT met del msg sent                           1
```

```
CHKPT icroif msg sent                              1
MET HA met add enqueued                            5
MET HA met del enqueued                            1
ICROIF HA add enqueued                             1
ICROIF HA del enqueued                             0
CHKPT buffer failure                               0
MET HA Reconstruction Statistics
-------------------------------------------------+------+
Number of met blks reconstructed                   0
Number of normal sets reconstructed                0
Number of fixed sets reconstructed                 0
Number of sets deleted                             0
Number of blks not found                           0
normal sets reconstruction failed                  0
fixed set reconstruction failed                    0
Multicast HA Statistics: STANDBY
-------------------------------------------------+------+
CHKPT msgs rcvd                                    5
CHKPT met add msg rcvd                             5
CHKPT met del msg rcvd                             1
CHKPT icroif msg rcvd                              1
CHKPT msg unknown                                  0
CHKPT buffer failure                               0
```

Related Commands

Command	Description
mls ip multicast sso	Configures the SSO parameters.

show mpls mldp bindings

To display the bindings (the upstream and downstream label assignments) for Multicast Label Distribution Protocol (MLDP) traffic, use the **show mpls mldp bindings**command in user EXEC or privileged EXEC mode.

show mpls mldp bindings [**id** *id*] [**opaque_type** *type*] **[summary]**

Syntax Description

id *id*	(Optional) The Label Switched Multicast (LSM) ID whose MLDP entry is to be displayed.
opaque_type *type*	(Optional) The opaque type to be used for filtering. The following types are supported: • **ipv4** *source-group* --this represents the "IPv4 Protocol Independent Source-Specific Transit" multicast application type. The IPv4 source address and group address are also specified. • **ipv6** *source-group* --this represents the "IPv6 Protocol Independent Source-Specific Transit" multicast application type.The IPv6 source address and group address are also specified. • **mdt** *vpn-id mdt-number* --this represents the "Multicast Virtual Private Network (MVPN)" multicast application type. The VPN identifier and the Multicast Distribution Tree (MDT) number are also specified. • **vpnv4** *source-group route-distinguisher* --this represents the "Direct MDT (VPNv4) " multicast application type.The IPv4 source address, group address, and the VPN route distinguisher are also specified. • *type-number* --the type-number. Valid values are from 0-65535.
summary	(Optional) The MLDP database summary.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)S	This command was introduced.

Release	Modification
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.
Cisco IOS XE Release 3.8S	This command was integrated into Cisco IOS XE Release 3.8S.

Usage Guidelines

This command displays the bindings (the upstream and downstream label assignments) for MLDP traffic. The bindings map Multicast Data Trees (MDTs) to Multicast Label Switch Paths (LSPs). LSPs are used to transmit multicast traffic within an MPLS core network.

Examples

The following is sample output from the **show mpls mldp bindings**command.

```
Router# show mpls mldp bindings
System ID: D3000001
Type: MP2MP, Root Node: 172.30.20.1, Opaque Len: 14
Opaque value: [mdt 1:1 0]
lsr: 172.30.20.1:0, remote binding[U]: 30, local binding[D]: 30 active
```

The table below describes the significant fields shown in the display.

Table 33: show mpls mldp bindings Field Descriptions

Field	Description
System ID	The LSM ID whose MLDP entry is displayed.
Type	The type of LSP used (can be point-to-multipoint (P2MP) or multipoint-to-multipoint (MP2MP)).
Root Node	The root of the MDT.
Opaque value	A value which is used to uniquely identify the MP LSP.
lsr	The Label Switched Router ID.
remote binding	The label used remotely to map MDTs to Multicast LSPs.
local binding	The label used locally to map MDTs to Multicast LSPs.

Related Commands

Command	Description
show mpls mldp database	Displays MLDP information.

show mpls mldp count

To display Multicast Label Distribution Protocol (MLDP) count information, use the **show mpls mldp count**command in user EXEC or privileged EXEC mode.

show mpls mldp count

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)S	This command was introduced.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.
Cisco IOS XE Release 3.8S	This command was integrated into Cisco IOS XE Release 3.8S.

Usage Guidelines

This command displays the MLDP count information, which is the total number of MLDP entries in the MLDP database. An entry can be a point-to-multipoint (P2MP) Label Switched Path (LSP) or an multipoint-to-multipoint (MP2MP) LSP. These statistics provide a summary on the usage of MLDP. LSPs are used to transmit multicast traffic within an MPLS core network.

Examples

The following is sample output from the **show mpls mldp label count**command:

```
Router# show mpls mldp label count
MLDP Database Summary:
  Number of MP2MP Entries : 1
  Number of P2MP Entries  : 0
  Total Number of Entries : 1
```

Related Commands

Command	Description
show mpls mldp database	Displays MLDP information.

show mpls mldp database

To display Multicast Label Distribution Protocol (MLDP) information, use the **show mpls mldp database**command in user EXEC or privileged EXEC mode.

show mpls mldp database [**id** *id*] [**opaque_type** *type*] **[summary]**

Syntax Description

id *id*	(Optional) The Label Switched Multicast (LSM) ID whose MLDP entry is to be displayed.
opaque_type *type*	(Optional) The opaque type to be used for filtering. The following types are supported: • **ipv4** *source-group* --this represents the "IPv4 Protocol Independent Source-Specific Transit" multicast application type. The IPv4 source address and group address are also specified. • **ipv6** *source-group* --this represents the "IPv6 Protocol Independent Source-Specific Transit" multicast application type.The IPv6 source address and group address are also specified. • **mdt** *vpn-id mdt-number* --this represents the "Multicast Virtual Private Network (MVPN)" multicast application type. The VPN identifier and the Multicast Distribution Tree (MDT) number are also specified. • **vpnv4** *source-group route-distinguisher* --this represents the "Direct MDT (VPNv4)" multicast application type.The IPv4 source address, group address, and the VPN route distinguisher are also specified. • **vpnv6** *source-group route-distinguisher*—this represents the "Direct MDT (VPNv6)" multicast application type. The IPv6 source address, group address, and the VPN route distinguisher are also specified. • *type-number* --the type-number. Valid values are from 0-65535.
summary	(Optional) The MLDP database summary.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)S	This command was introduced.
15.1(3)S	This command was modified. The output was modified to include the scope of the MDT FEC.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.
Cisco IOS XE Release 3.8S	This command was integrated into Cisco IOS XE Release 3.8S.

Usage Guidelines

This command displays the contents for MLDP entries in the MLDP database. Each MLDP entry provides the configuration details associated with each point-to-multipoint (P2MP) and multipoint-to-multipoint (MP2MP) Label Switched Path (LSP) used to transmit multicast traffic within an MPLS core network.

Examples

The following is sample output from the **show mpls mldp database**command.

```
Router# show mpls mldp database opaque_type mdt 100:2
* Indicates MLDP recursive forwarding is enabled
LSM ID : D3000001 (RNR LSM ID: 8A000002)   Type: MP2MP   Uptime : 00:04:54
  FEC Root           : 172.30.20.1
  Opaque decoded     : [mdt 100:2 0]
  Opaque length      : 11 bytes
  Opaque value       : 07 000B 000001000000100000000
  RNR active LSP     : (this entry)
  Upstream client(s) :
    172.30.20.1:0    [Active]
      Expires        : Never         Path Set ID  : 99000001
      Out Label (U)  : 32            Interface    : Ethernet1/0*
      Local Label (D): 30            Next Hop     : 10.0.1.7
  Replication client(s):
    MDT  (VRF blue)
      Uptime         : 00:04:54      Path Set ID  : 5000002
      Interface      : Lspvif0
```

The table below describes the significant fields shown in the display.

Table 34: show mpls mldp database Field Descriptions

Field	Description
LSM ID	The LSM ID whose MLDP entry is displayed.
Type	The type of LSP used. This can P2MP or MP2MP.
FEC Root	The root of the MDT.
Opaque value	A value which is used to uniquely identify the MP LSP.
RNR active LSP	The primary root for upstream forwarding.

Field	Description
Upstream client(s)	The upstream clients are the upstream nodes of the MP2MP LSP.
Replication client(s)	The Replication Clients are the downstream nodes of the MP2MP LSP. They receive multipoint replicated traffic.

Related Commands

Command	Description
show mpls mldp bindings	Displays the bindings (the upstream and downstream label assignments) for MLDP traffic.

show mpls mldp filter

To display infromation about filters for the Cisco Multicast Label Distribution Protocol (MLDP) label-based Multicast Virtual Private Network (MVPN) solution, use the **show mpls mldp filter** command in user or privileged EXEC mode.

show mpls mldp filter

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)S	This command was introduced.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.

Examples

```
Router# show mpls mldp filter

 Filter Id        : 1
  ACL             : 50
  State           : ACTIVE
  Peers filtered  : 2.2.2.2:0

 Filter Id        : 2
  ACL             : 50
  State           : ACTIVE
  Peers filtered  : 2.2.2.2:0
```

The table below describes the significant fields shown in the display.

Table 35: show mpls mldp filter Field Descriptions

Field	Description
Filter ID	Unique ID of MLDP filter.
ACL	Peer-list standard access list for which a FEC is to be filtered.
Peers filtered	Peers that match the FEC.

Related Commands

Command	Description
mpls mldp filter	Filters MLDP flows in the core.

show mpls mldp ha count

To display the number of MDT trees for a Multicast Label Distribution Protocol (MLDP) label-based Multicast Virtual Private Network (MVPN), use the **show mpls mldp ha count** command in user EXEC or privileged EXEC mode.

show mpls mldp ha count

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)S	This command was introduced.

This command displays the MLDP HA count information, which is the total number of MLDP entries in the MLDP database. An entry can be a point-to-multipoint (P2MP) Label Switched Path (LSP) or an multipoint-to-multipoint (MP2MP) LSP. These statistics provide a summary on the usage of MLDP. LSPs are used to transmit multicast traffic within an MPLS core network.

Examples

```
PE2# show mpls mldp ha count
MLDP Database Summary:
  Number of MP2MP HA Entries : 1
  Number of P2MP HA Entries  : 0
  Total Number of HA Entries : 1

MLDP Root Count:
  Total Number of MLDP roots: 1

MLDP Neighbor Count:
  Total Number of MLDP neighbors: 1
```

show mpls mldp ha database

To display check pointed database information for a Multicast Label Distribution Protocol (MLDP) label-based Multicast Virtual Private Network (MVPN), use the **show mpls mldp ha database** command in user EXEC or privileged EXEC mode.

show mpls mldp ha database[summary]

Syntax Description

summary	Displays only synched database information.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)S	This command was introduced.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.

Usage Guidelines

Use this command to display information to be used to determine the state of check pointed information on the standby router. This command displays the contents for MLDP entries in the check pointed MLDP database. Each MLDP entry provides the configuration details associated with each point-to-multipoint (P2MP) and multipoint-to-multipoint (MP2MP) Label Switched Path (LSP) used to transmit multicast traffic within an MPLS core network.

Examples

```
PE2# show mpls mldp ha database
LSM ID : 98000001 (RNR LSM ID: 8F000002)   Type: MP2MP
FEC Root               :      100.100.100.100
  Opaque decoded     :    [mdt 1:1 0]
  Opaque length      :      11 bytes
  Opaque value       :       07 000B 0000010000000100000000
 Upstream client(s) :
    50.50.50.50:0    Path Set ID  : EE000001
 Replication client(s):
    MDT                Path Set ID  : EA000002
PE2# show mpls mldp ha database summary
LSM ID     Type    Root             Decoded Opaque Value     Client Cnt.
98000001   MP2MP   100.100.100.100   [mdt 1:1 0]             1
```

The table below describes the significant fields shown in the display.

Table 36: show mpls mldp ha database Field Descriptions

Field	Description
LSM ID	The LSM ID whose MLDP entry is displayed.

Field	Description
Type	The type of LSP used. This can P2MP or MP2MP.
FEC Root	The root of the MDT.
Opaque value	A value which is used to uniquely identify the MP LSP.
Upstream client(s)	The upstream clients are the upstream nodes of the MP2MP LSP.
Replication client(s)	The Replication Clients are the downstream nodes of the MP2MP LSP. They receive multipoint replicated traffic.

show mpls mldp ha neighbors

To display synched peer information for a Multicast Label Distribution Protocol (MLDP) label-based Multicast Virtual Private Network (MVPN), use the **show mpls mldp ha neighbors** command in user EXEC or privileged EXEC mode.

show mpls mldp ha neighbors

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)S	This command was introduced.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.

Usage Guidelines

This command displays the MLDP HA peers (neighbors) known to the router. Use this command to display information to be used to determine the state of check pointed information on the standby router.

Examples

```
PE2# show mpls mldp ha neighbors
  MLDP peer ID    : 50.50.50.50:0,
  Path count     : 1
  Path(s)        : 10.0.4.5       Ethernet1/0
  Nhop count     : 1
  Nhop list      : 10.0.4.5
```

The table below describes the significant fields shown in the display.

Table 37: show mpls mldp ha neighbor Field Descriptions

Field	Description
MLDP peer ID	The MLDP identifier of the neighbor (peer).
Path count	The number of LSPs.
Path(s)	A value which is used to uniquely identify the MP LSP.
Nhop count	The number of configured next hops.
Nhop list	The addresses of the next hops.

show mpls mldp ha root

To display synched root information for a Multicast Label Distribution Protocol (MLDP) label-based Multicast Virtual Private Network (MVPN), use the **show mpls mldp ha root** command in user EXEC or privileged EXEC mode.

show mpls mldp ha root

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Usage Guidelines

This command displays synched Multicast Label Distribution Protocol (MLDP) root information. The root is the common entry between multiple Label Switch Paths (LSPs). LSPs are used to transmit multicast traffic within an MPLS core network.

Command History

Release	Modification
15.1(3)S	This command was introduced.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.

Examples

```
PE2# show mpls mldp root
  Root node    : 100.100.100.100
  Path count   : 1
  Path(s)      : 10.0.4.5
```

The table below describes the significant fields shown in the display.

Table 38: show mpls mldp ha root Field Descriptions

Field	Description
Root node	The root node ID.
Path count	The number of LSPs.
Path(s)	A value which is used to uniquely identify the MP LSP.

show mpls mldp interface

To display a list of interfaces for a device along with information about whether Cisco Multicast Label Distribution Protocol (MLDP) is enabled or disabled on each interface, use the **show mpls mldp interface** command in user EXEC or privileged EXEC mode.

show mpls mldp interface

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)S	This command was introduced.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.

Examples

```
PE2# show mpls mldp interface
Interface            IP         mLDP
EOBC0/0              Disabled   Disabled
EOBC0/2              Disabled   Disabled
GigabitEthernet1/1   Enabled    Enabled
.
.
.
```

Related Commands

Command	Description
mpls mldp	Enables MLDP on an interface.

show mpls mldp label release

To display Multicast Label Distribution Protocol (MLDP) labels that have been withdrawn and awaiting release, use the **show mpls mldp label release**command in user EXEC or privileged EXEC mode.

show mpls mldp label release

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)S	This command was introduced.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.
Cisco IOS XE Release 3.8S	This command was integrated into Cisco IOS XE Release 3.8S.

Usage Guidelines

This command displays the MLDP labels that have been withdrawn and awaiting release. These are the labels that are no longer being used by point-to-multipoint (P2MP) Label Switched Paths (LSPs) or multipoint-to-multipoint (MP2MP) LSPs. LSPs are used to transmit multicast traffic within an MPLS core network.

Examples

The following is sample output from the **show mpls mldp label release**command:

```
Router# show mpls mldp label release
Label releaseQ, scan scheduled in: 00:00:12
Label 30   expire: 00:00:12
```

Related Commands

Command	Description
mpls mldp	Enables the MLDP feature.

show mpls mldp neighbors

To display Multicast Label Distribution Protocol (MLDP) neighbor information, use the **show mpls mldp neighbors**command in user EXEC or privileged EXEC mode.

show mpls mldp neighbors[*hostname*| *source-address*]

Syntax Description

hostname	(Optional) The neighbor hostname.
source-address	(Optional) The source address whose MLDP entry is to be displayed.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)S	This command was introduced.
15.1(3)S	This command was modified. The output was modified to include the filters by which a particular peer is filtered.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.
Cisco IOS XE Release 3.8S	This command was integrated into Cisco IOS XE Release 3.8S.

Usage Guidelines

This command displays the MLDP peers (neighbors) known to the router. It also displays the associated Label Switched Path (LSP). LSPs are used to transmit multicast traffic within an MPLS core network.

Examples

The following is sample output from the **show mpls mldp neighbors**command:

```
Router# show mpls mldp neighbors
MLDP peer ID    : 172.30.20.2:0, uptime 00:05:10 Up,
  Target Adj     : No
  Session hndl   : 1
  Upstream count : 0
  Branch count   : 0
  Path count     : 1
  Path(s)        : 10.0.1.4          LDP Ethernet1/0
  Nhop count     : 0
  Filter list    : 2 1
MLDP peer ID    : 172.30.20.2:0, uptime 00:05:09 Up,
  Target Adj     : No
  Session hndl   : 2
  Upstream count : 1
  Branch count   : 0
  Path count     : 1
```

```
Path(s)         : 10.0.1.7          LDP Ethernet1/0
Nhop count      : 1
Nhop list       : 10.0.1.7
Filter list     : 2 1
```

The table below describes the significant fields shown in the display.

Table 39: show mpls mldp neighbors Field Descriptions

Field	Description
MLDP peer ID	The MLDP identifier of the neighbor (peer).
Upstream count	The number of nodes upstream of the LSP.
Path count	The number of LSPs.
Path(s)	A value which is used to uniquely identify the MP LSP.
Nhop count	The number of configured next hops.
Nhop list	The addresses of the next hops.
Filter list	Filter by which a peer list was filtered.

Related Commands

Command	Description
show mpls mldp database	Displays MLDP information.

show mpls mldp root

To display Multicast Label Distribution Protocol (MLDP) root information, use the **show mpls mldp root**command in user EXEC or privileged EXEC mode.

show mpls mldp root[*hostname*| *source-address*]

Syntax Description

hostname	(Optional) The root hostname.
source-address	(Optional) The source address whose MLDP entry is to be displayed.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)S	This command was introduced.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.
Cisco IOS XE Release 3.8S	This command was integrated into Cisco IOS XE Release 3.8S.

Usage Guidelines

This command displays Multicast Label Distribution Protocol (MLDP) root information. The root is the common entry between multiple Label Switch Paths (LSPs). LSPs are used to transmit multicast traffic within an MPLS core network.

Examples

The following is sample output from the **show mpls mldp label root**command:

```
Router# show mpls mldp label root 10.0.0.1
Root node    : 172.30.20.1
  Metric      : 20
  Distance    : 115
  Interface   : Ethernet1/0 (via unicast RT)
  FEC count   : 1
  Path count  : 1
  Path(s)     : 10.0.1.7         LDP nbr: 100.100.100.100:0 Ethernet1/0
```

The table below describes the significant fields shown in the display.

Table 40: show mpls mldp root Field Descriptions

Field	Description
Root node	The root node ID.

Field	Description
Path count	The number of LSPs.
Path(s)	A value which is used to uniquely identify the MP LSP.

Related Commands

Command	Description
show mpls mldp database	Displays MLDP information.

show platform software multicast ip bidir

Todisplay bidirectional (Bidir) information, use the **show platform software multicast ip bidir**command in privileged EXEC mode.

show platform software multicast ip bidir[**group** *group-name*| **interface**[**gigabitethernet** *1-6*| **port-channel** *1-256*| **tengigabitethernet** *1-6*| **vlan** *1-4094*]| **source** *A.B.C.D*]

Syntax Description

group	Displays entries for a specific multicast group address.
group-name	Hostname or group IP address.
interface	Displays entries for a specific interface.
gigabitethernet 1-6	Specifies the GigabitEthernet interface number. The range is 1 through 6.
port-channel 1-256	Specifies the port-channel interface number. The range is 1 through 256.
tengigabitethernet 1-6	Specifies the TenGigabitEthernet interface number. The range is 1 through 6.
vlan 1-4094	Specifies the VLAN interface number. The range is 1 through 4094.
source	Displays entries for a specific source.
A.B.C.D.	Specifies source IP address.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(33)SRE	This command was introduced on the Cisco 7600 series routers.

Examples

This example shows how to display bidirectional (Bidir) information:

```
Router# show platform software multicast ip bidir
Multicast hardware switched flows:
Total hardware switched flows: 0
```

This example shows how to display bidirectional (Bidir) information for a specific multicast group address:

```
Router# show platform software multicast ip bidir group 232.0.1.4
Multicast hardware switched flows:
Total hardware switched flows: 0
Router#
```

This example shows how to display bidirectional (Bidir) information for a specific interface:

```
Router# show platform software multicast ip bidir interface tengigabitethernet 4/2
Multicast hardware switched flows:
Total hardware switched flows: 0
Router#
```

This example shows how to display bidirectional (Bidir) information for a specific source:

```
Router# show platform software multicast ip bidir source 40.0.0.2
Multicast hardware switched flows:
Total hardware switched flows: 0
Router#
```

Related Commands

Command	Description
show platform software multicast ip bidir	Displays bidirectional (Bidir) information.
show platform software multicast ip capability	Displays multicast replication capability.
show platform software multicast ip complete	Displays complete hardware switched entries.
show platform software multicast ip connected	Displays installed interface and mask entries.
show platform software multicast ip group	Displays entries for a specific multicast group address.
show platform software multicast ip interface	Displays entries for a specific interface.
show platform software multicast ip partial	Displays partially hardware switched entries for a specific interface.
show platform software multicast ip source	Displays partially hardware switched entries for a specific source.
show platform software multicast ip statistics	Displays partially hardware switched entries for a specific source.
show platform software multicast ip summary	Displays a summary of installed-hardware shortcuts.
show platform software multicast ip vrf	Displays entries for a specific VRF.

show platform software multicast ip capability

To display multicast replication capability, use the **show platform software multicast ip capability**command in privileged EXEC mode.

show platform software multicast ip capability[**module** *module-id*]

Syntax Description

module *module-id*	(Optional) Displays module specific multicast repliecation capability. The *module-id* range is 1 through 6.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(33)SRE	This command was introduced on the Cisco 7600 series routers.

Examples

This example shows how to display multicast replication capability:

```
Router# show platform software multicast ip capability
Current System HW Replication Mode : Egress
Auto-detection of Replication Mode : ON
Slot Replication-Capability Replication-Mode
   2 Egress                 Egress
   3 Egress                 Egress
   4 Egress                 Egress
   6 Egress                 Egress
Router#
```

Related Commands

Command	Description
show platform software multicast ip bidir	Displays bidirectional (Bidir) information.
show platform software multicast ip capability	Displays multicast replication capability.
show platform software multicast ip complete	Displays complete hardware switched entries.
show platform software multicast ip connected	Displays installed interface and mask entries.
show platform software multicast ip group	Displays entries for a specific multicast group address.
show platform software multicast ip interface	Displays entries for a specific interface.

Command	Description
show platform software multicast ip partial	Displays partially hardware switched entries for a specific interface.
show platform software multicast ip source	Displays partially hardware switched entries for a specific source.
show platform software multicast ip statistics	Displays partially hardware switched entries for a specific source.
show platform software multicast ip summary	Displays a summary of installed-hardware shortcuts.
show platform software multicast ip vrf	Displays entries for a specific VRF.

show platform software multicast ip complete

To display complete hardware switched entries, use the **show platform software multicast ip complete**command in privileged EXEC mode.

show platform software multicast ip complete[**group** *A.B.C.D*| **interface**[**gigabitethernet** *1-6*| **port-channel** *1-256*| **tengigabitethernet** *1-6*| **vlan** *1-4094*]| **source** *A.B.C.D*]

Syntax Description

group	Displays entries for a specific multicast group address.
A.B.C.D	Specifies the group IP address.
interface	Displays entries for a specific interface.
gigabitethernet 1-6	Specifies the GigabitEthernet interface number. The range is 1 through 6.
port-channel 1-256	Specifies the port-channel interface number. The range is 1 through 256.
tengigabitethernet 1-6	Specifies the TenGigabitEthernet interface number. The range is 1 through 6.
vlan 1-4094	Specifies the VLAN interface number. The range is 1 through 4094.
source	Displays entries for a specific source.
A.B.C.D.	Specifies source IP address.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(33)SRE	This command was introduced on the Cisco 7600 series routers.

Examples

This example shows how to display complete hardware switched entries:

```
Router# show platform software multicast ip complete
Multicast hardware switched flows:
(40.0.0.2, 232.0.1.4) Incoming interface: GigabitEthernet3/2/1, Packets Switched: 6610137
Hardware switched outgoing interfaces:
     Tunnel10
```

```
Total hardware switched flows: 1
Router
```

This example shows how to display entries for a specific multicast group address:

```
Router# show platform software multicast ip complete group 232.0.1.4
Multicast hardware switched flows:
(40.0.0.2, 232.0.1.4) Incoming interface: GigabitEthernet3/2/1, Packets Switched: 6799184
Hardware switched outgoing interfaces:
     Tunnel10

Total hardware switched flows: 1
Router#
```

This example shows how to display complete hardware switched entries for a specific inteface:

```
Router# show platform software multicast ip complete interface gigabitethernet 3/2/1
Multicast hardware switched flows:
(40.0.0.2, 232.0.1.4) Incoming interface: GigabitEthernet3/2/1, Packets Switched: 7008473
Hardware switched outgoing interfaces:
     Tunnel10

Total hardware switched flows: 1
Router#
```

This example shows how to display complete hardware switched entries for a specific group:

```
Router# show platform software multicast ip complete group 232.0.1.4
Multicast hardware switched flows:
(40.0.0.2, 232.0.1.4) Incoming interface: GigabitEthernet3/2/1, Packets Switched: 7163170
Hardware switched outgoing interfaces:
     Tunnel10

Total hardware switched flows: 1
PE1-7600#
```

Related Commands

Command	Description
show platform software multicast ip bidir	Displays bidirectional (Bidir) information.
show platform software multicast ip capability	Displays multicast replication capability.
show platform software multicast ip complete	Displays complete hardware switched entries.
show platform software multicast ip connected	Displays installed interface and mask entries.
show platform software multicast ip group	Displays entries for a specific multicast group address.
show platform software multicast ip interface	Displays entries for a specific interface.
show platform software multicast ip partial	Displays partially hardware switched entries for a specific interface.
show platform software multicast ip source	Displays partially hardware switched entries for a specific source.
show platform software multicast ip statistics	Displays partially hardware switched entries for a specific source.
show platform software multicast ip summary	Displays a summary of installed-hardware shortcuts.

Command	Description
show platform software multicast ip vrf	Displays entries for a specific VRF.

show platform software multicast ip connected

To display installed interface and mask entries, use the **show platform software multicast ip connected**command in privileged EXEC mode.

show platform software multicast ip connected

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(33)SRE	This command was introduced on the Cisco 7600 series routers.

Examples

This example shows how to display installed interface and mask entries:

```
Router# show platform software multicast ip connected
Multicast CEF Entries for VPN#0
Flags: R - Control, S - Subnet, B - Bidir, C - Complete, P - Partial, E - Encapsulation, D
 - Decapsulation, M - MAC rewrite, T - Forwarding
       c - Central Rewrite, p - Primary Input, r - Recirculation, h - Entry sitting on
Encap/Decap VRF layer
Source/mask         Destination/mask    RPF/DF  Flags  #packets      #bytes
rwindex  Output Vlans/Info
+---------------+---------------+-----+----+----------+-------------+------+---------------------+
Found 0 entries. 0 are mfd entries
PE1-7600
```

Related Commands

Command	Description
show platform software multicast ip bidir	Displays bidirectional (Bidir) information.
show platform software multicast ip capability	Displays multicast replication capability.
show platform software multicast ip complete	Displays complete hardware switched entries.
show platform software multicast ip connected	Displays installed interface and mask entries.
show platform software multicast ip group	Displays entries for a specific multicast group address.
show platform software multicast ip interface	Displays entries for a specific interface.
show platform software multicast ip partial	Displays partially hardware switched entries for a specific interface.

Command	Description
show platform software multicast ip source	Displays partially hardware switched entries for a specific source.
show platform software multicast ip statistics	Displays partially hardware switched entries for a specific source.
show platform software multicast ip summary	Displays a summary of installed-hardware shortcuts.
show platform software multicast ip vrf	Displays entries for a specific VRF.

show platform software multicast ip interface

To display entries for a specific interface, use the **show platform software multicast ip interface**command in privileged EXEC mode.

show platform software multicast ip interface[**gigabitethernet** *1-6*| **port-channel** *1-256*| **tengigabitethernet** *1-6*| **vlan** *1-4094*]

Syntax Description

gigabitethernet 1-6	Specifies the GigabitEthernet interface number. The range is 1 through 6.
port-channel 1-256	Specifies the port-channel interface number. The range is 1 through 256.
tengigabitethernet 1-6	Specifies the TenGigabitEthernet interface number. The range is 1 through 6.
vlan 1-4094	Specifies the VLAN interface number. The range is 1 through 4094.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(33)SRE	This command was introduced on the Cisco 7600 series routers.

Examples

This example shows how to display entries for a gigabitethernet interface:

```
Router# show platform software multicast ip interface gigabitethernet 3/2/1
Multicast hardware switched flows:
(40.0.0.2, 232.0.1.4) Incoming interface: GigabitEthernet3/2/1, Packets Switched: 8206582
Hardware switched outgoing interfaces:
     Tunnel10

Total hardware switched flows: 1
PE1-7600#
```

Related Commands

Command	Description
show platform software multicast ip bidir	Displays bidirectional (Bidir) information.
show platform software multicast ip capability	Displays multicast replication capability.

Command	Description
show platform software multicast ip complete	Displays complete hardware switched entries.
show platform software multicast ip connected	Displays installed interface and mask entries.
show platform software multicast ip group	Displays entries for a specific multicast group address.
show platform software multicast ip interface	Displays entries for a specific interface.
show platform software multicast ip partial	Displays partially hardware switched entries for a specific interface.
show platform software multicast ip source	Displays partially hardware switched entries for a specific source.
show platform software multicast ip statistics	Displays partially hardware switched entries for a specific source.
show platform software multicast ip summary	Displays a summary of installed-hardware shortcuts.
show platform software multicast ip vrf	Displays entries for a specific VRF.

show platform software multicast ip partial

To display partially hardware switched entries, use the **show platform software multicast ip partial**command in privileged EXEC mode.

show platform software multicast ip partial[**group** *group-name*| **interface**[**gigabitethernet** *1-6*| **port-channel** *1-256*| **tengigabitethernet** *1-6*| **vlan** *1-4094*]| **source** *A.B.C.D*]

Syntax Description

group	Displays entries for a specific multicast group address.
group-name	Hostname or group IP address.
interface	Displays entries for a specific interface.
gigabitethernet 1-6	Specifies the GigabitEthernet interface number. The range is 1 through 6.
port-channel 1-256	Specifies the port-channel interface number. The range is 1 through 256.
tengigabitethernet 1-6	Specifies the TenGigabitEthernet interface number. The range is 1 through 6.
vlan 1-4094	Specifies the VLAN interface number. The range is 1 through 4094.
source	Displays entries for a specific source.
A.B.C.D.	Specifies source IP address.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(33)SRE	This command was introduced on the Cisco 7600 series routers.

Examples

This example shows how to display partially hardware switched entries for a specific group:

```
Router# show platform software multicast ip partial group 232.0.1.4
Multicast hardware switched flows:
Total hardware switched flows: 0
PE1-7600#
```

This example shows how to display partially hardware switched entries for a specific interface:

```
Router# show platform multicast ip partial interface gigabitethernet 3/2/1
Multicast hardware switched flows:
Total hardware switched flows: 0
PE1-7600
```

Related Commands

Command	Description
show platform software multicast ip bidir	Displays bidirectional (Bidir) information.
show platform software multicast ip capability	Displays multicast replication capability.
show platform software multicast ip complete	Displays complete hardware switched entries.
show platform software multicast ip connected	Displays installed interface and mask entries.
show platform software multicast ip group	Displays entries for a specific multicast group address.
show platform software multicast ip interface	Displays entries for a specific interface.
show platform software multicast ip partial	Displays partially hardware switched entries for a specific interface.
show platform software multicast ip source	Displays partially hardware switched entries for a specific source.
show platform software multicast ip statistics	Displays partially hardware switched entries for a specific source.
show platform software multicast ip summary	Displays a summary of installed-hardware shortcuts.
show platform software multicast ip vrf	Displays entries for a specific VRF.

show platform software multicast ip source

To display partially hardware switched entries for a specific source, use the **show platform software multicast ip source**command in privileged EXEC mode.

show platform software multicast ip *source source-ip*

Syntax Description

source *source-ip*	Displays hardware-entry information based on the specified source IP address.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(33)SRE	This command was introduced on the Cisco 7600 series routers.

Examples

This example shows how to display partially hardware switched entries for a specific source:

```
PE1-7600# show platform software multicast ip source 40.0.0.2
Multicast hardware switched flows:
(40.0.0.2, 232.0.1.4) Incoming interface: GigabitEthernet3/2/1, Packets Switched: 8778143
Hardware switched outgoing interfaces:
     Tunnel10

Total hardware switched flows: 1
PE1-7600#
```

Related Commands

Command	Description
show platform software multicast ip bidir	Displays bidirectional (Bidir) information.
show platform software multicast ip capability	Displays multicast replication capability.
show platform software multicast ip complete	Displays complete hardware switched entries.
show platform software multicast ip connected	Displays installed interface and mask entries.
show platform software multicast ip group	Displays entries for a specific multicast group address.
show platform software multicast ip interface	Displays entries for a specific interface.
show platform software multicast ip partial	Displays partially hardware switched entries for a specific interface.

Command	Description
show platform software multicast ip source	Displays partially hardware switched entries for a specific source.
show platform software multicast ip statistics	Displays partially hardware switched entries for a specific source.
show platform software multicast ip summary	Displays a summary of installed-hardware shortcuts.
show platform software multicast ip vrf	Displays entries for a specific VRF.

show platform software multicast ip statistics

To display partially hardware switched entries for a specific source, use the **show platform software multicast ip statistics**command in privileged EXEC mode.

show platform software multicast ip statistics[**group** *group-id*]

Syntax Description

group *group-id*	(Optional) Displays hardware-entry information that is based on the specified group IP address.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(33)SRE	This command was introduced on the Cisco 7600 series routers.

Examples

This example shows how to display partially hardware switched entries for a specific source:

```
Router# show platform software multicast ip statistics group 232.0.1.4
Warning: No stats to be printed
```

Related Commands

Command	Description
show platform software multicast ip bidir	Displays bidirectional (Bidir) information.
show platform software multicast ip capability	Displays multicast replication capability.
show platform software multicast ip complete	Displays complete hardware switched entries.
show platform software multicast ip connected	Displays installed interface and mask entries.
show platform software multicast ip group	Displays entries for a specific multicast group address.
show platform software multicast ip interface	Displays entries for a specific interface.
show platform software multicast ip partial	Displays partially hardware switched entries for a specific interface.
show platform software multicast ip source	Displays partially hardware switched entries for a specific source.

Command	Description
show platform software multicast ip statistics	Displays partially hardware switched entries for a specific source.
show platform software multicast ip summary	Displays a summary of installed-hardware shortcuts.
show platform software multicast ip vrf	Displays entries for a specific VRF.

show platform software multicast ip summary

To display a summary of installed-hardware shortcuts, use the **show platform software multicast ip summary**command in privileged EXEC mode.

show platform software multicast ip summary

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(33)SRE	This command was introduced on the Cisco 7600 series routers.

Examples

This example shows how to display a summary of installed-hardware shortcuts:

```
Router# show platform software multicast ip summary
IPv6 Multicast Netflow SC summary on Slot[7]:
Shortcut Type               Shortcut count
---------------------------+--------------
(S, G)                      0
IPv6 Multicast FIB SC summary on Slot[7]:
Shortcut Type               Shortcut count
---------------------------+--------------
(*, G/128)                  0
(*, G/m)                    0
```

Related Commands

Command	Description
show platform software multicast ip bidir	Displays bidirectional (Bidir) information.
show platform software multicast ip capability	Displays multicast replication capability.
show platform software multicast ip complete	Displays complete hardware switched entries.
show platform software multicast ip connected	Displays installed interface and mask entries.
show platform software multicast ip group	Displays entries for a specific multicast group address.
show platform software multicast ip interface	Displays entries for a specific interface.
show platform software multicast ip partial	Displays partially hardware switched entries for a specific interface.

Command	Description
show platform software multicast ip source	Displays partially hardware switched entries for a specific source.
show platform software multicast ip statistics	Displays partially hardware switched entries for a specific source.
show platform software multicast ip summary	Displays a summary of installed-hardware shortcuts.
show platform software multicast ip vrf	Displays entries for a specific VRF.

show platform software multicast ip vrf

To display entries for a specific VRF, use the **show platform software multicast ip vrf**command in privileged EXEC mode.

show platform software multicast ip *vrf vrfp-id*

Syntax Description

vrf *vrf-id*	Displays hardware-entry information that is based on the specified VRF ID; valid values are from 0 to 4095.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(33)SRE	This command was introduced on the Cisco 7600 series routers.

Examples

This example shows how to display entries for a specific VRF:

```
Router# show platform software multicast ip vrf vrfp-id
SIP-600-3#sh platform software multicast ip cmfib vrf red 232.5.5.5 verbose
Multicast CEF Entries for VPN#3
(10.0.0.1, 232.5.5.5)
IOSVPN:258  (1) PI:1 (1) CR:0 (1) Recirc:0 (1)
Vlan:1037 AdjPtr:131076 FibRpfNf:1 FibRpfDf:1 FibAddr:0x30056
rwvlans:1037 rwindex:0x7FFA adjmac:0008.e287.65c0 rdt:1 E:0 CAP1:0
fmt:Mcast l3rwvld:1 DM:0 mtu:1518 rwtype:L2&L3 met2:0xD met3:0x7
packets:0000001266681 bytes:000000000506672400
Starting Offset: 0x000D
V E L0 C:1019 I:0x0200F ----------->index of egress multicast vlan of vrf
Starting Offset: 0x0007
V E C:1041
MLSVPN:264  (1) PI:1 (1) CR:1 (1) Recirc:1 (1)
Vlan:1037 AdjPtr:131078 FibRpfNf:1 FibRpfDf:1 FibAddr:0x3005A
rwvlans:1037 rwindex:0x7FFF adjmac:0000.0000.0000 rdt:1 E:0 CAP1:0
fmt:Mcast l3rwvld:0 DM:0 mtu:1522 rwtype:- met2:0x0 met3:0x0
packets:0000000000000 bytes:000000000000000000
IOSVPN:258  (1) PI:0 (1) CR:1 (1) Recirc:0 (1)
Vlan:1019 AdjPtr:131077 FibRpfNf:0 FibRpfDf:1 FibAddr:0x30058
rwvlans:1019 rwindex:0x7FFA adjmac:0008.e287.65c0 rdt:1 E:0 CAP1:0
fmt:Mcast l3rwvld:1 DM:0 mtu:1518 rwtype:L3 met2:0x0 met3:0x7
packets:0000000000000 bytes:000000000000000000
Starting Offset: 0x0007
V E C:1041
Annotation-data: [0x4E2B1B80]
A-vlan: 1037 NS-vlan: 0 RP-rpf-vlan: 0
Anntn flags: [0x100010]  H MT
MTU: 1500 Retry-count: 65534
Sec-entries count: 2
Met-handle: 0x46C8E080 New-Met-handle: 0x0
Met2-handle: 0x56141BAC
HAL L3-data : [0x56141E28]
Flags: 0x4 FIB-index: 0x86C ADJ-index: 0x20004 NF-addr: 0x0
```

```
ML3 entry type: 0x0 [(S,G) shortcut]
Flags: 0xA1000000 Vpn: 258 Rpf: 1037 Rw_index: 0x7FFA
Adj_mtu: 1514 Met2: 0xD Met3: 0x7
V6-data: NULL
---Secondary entry [1]---
HAL L3-data : [0x56141EE4]
Flags: 0x4 FIB-index: 0x86E ADJ-index: 0x20006 NF-addr: 0x0
ML3 entry type: 0x0 [(S,G) shortcut]
Flags: 0xB9400000 Vpn: 264 Rpf: 1037 Rw_index: 0x7FFF
Adj_mtu: 1514 Met2: 0x0 Met3: 0x0
V6-data: NULL
---Secondary entry [2]---
HAL L3-data : [0x46C8E37C]
Flags: 0x4 FIB-index: 0x86D ADJ-index: 0x20005 NF-addr: 0x0
ML3 entry type: 0x0 [(S,G) shortcut]
Flags: 0x90000000 Vpn: 258 Rpf: 1019 Rw_index: 0x7FFA
Adj_mtu: 1514 Met2: 0x0 Met3: 0x7
V6-data: NULL
---TE entries---
```

Related Commands

Command	Description
show platform software multicast ip bidir	Displays bidirectional (Bidir) information.
show platform software multicast ip capability	Displays multicast replication capability.
show platform software multicast ip complete	Displays complete hardware switched entries.
show platform software multicast ip connected	Displays installed interface and mask entries.
show platform software multicast ip group	Displays entries for a specific multicast group address.
show platform software multicast ip interface	Displays entries for a specific interface.
show platform software multicast ip partial	Displays partially hardware switched entries for a specific interface.
show platform software multicast ip source	Displays partially hardware switched entries for a specific source.
show platform software multicast ip statistics	Displays partially hardware switched entries for a specific source.
show platform software multicast ip summary	Displays a summary of installed-hardware shortcuts.
ipv6 mfib hardware-switching	Configures hardware switching for IPv6 multicast packets on a global basis.

show router-guard

To display router guard status and configuration information, use the **show router-guard** command in privileged EXEC mode.

show router-guard [**interface** [*type mod*/*port*]]

Syntax Description

interface	(Optional) Specifies a list of all interfaces.
type	(Optional) Specifies the interface type; possible valid values are **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **port-channel** *num*, and **vlan** *vlan-id*.
mod / *port*	Module and port number.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC (#)

Command History

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

Usage Guidelines

If the port is in the shutdown state, the system cannot determine if the port is in trunk mode or access mode, and you will not be able to display the status by entering the **show router-guard** command. In this case, you can enter the **show running-config interface** command to display the configuration.

Examples

Note This section does not contain output description tables as the output fields are self-explanatory.

The following example shows how to display global router guard configuration information:

```
Router# show router-guard
Router Guard for IP Multicast:
  Globally enabled for all switch ports
```

The following example shows how to display a list of all interfaces for which router guard is enabled:

```
Router# show router-guard interface
Router Guard for IP Multicast:
Globally enabled for all switchports
```

```
Interfaces:
Gi1/3/46: Disabled on this port for VLANS: ALL
```

The following example shows how to display router guard configuration and statistics for a specified interface:

```
Router# show router-guard interface gigabitethernet 1/3/48
Router Guard for IP Multicast:
Globally enabled for all switch ports
Enabled on this interface
Packets denied:
  IGMP Queries:                x
  PIMv2 Messages:              x
  PIMv1 Messages:              x
  DVMRP Messages:              x
  RGMP Messages:               x
  CGMP Messages:               x
```

Related Commands

Command	Description
clear router-guard ip multicast statistics	Clears the router guard statistical information.
router-guard ip multicast	Enables or disables the router guard for switch ports that are connected to multicast routers.
router-guard ip multicast switchports	Enables or disables the router guard on all switch ports.
show running-config interface	

snmp-server enable traps mvpn

To enable Multicast Virtual Private Network (MVPN) routing and forwarding (MVRF) trap notifications, use the **snmp-server enable traps mvpn** command in global configuration mode. To disable MVRF trap notifications, use the **no** form of this command.

snmp-server enable traps mvpn

no snmp-server enable traps mvpn

Syntax Description

This command has no arguments or keywords.

Command Default

MVRF traps are disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(29)S	This command was introduced.
12.3(14)T	This command was integrated into Cisco IOS Release 12.3(14)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

SNMP notifications can be sent as traps or informs. This command enables trap notification requests only.

This command controls (enables or disables) MVRF (ciscoMvpnMvrfChange) trap notifications. A ciscoMvpnMvrfChange trap notification signifies a change about a MVRF in the device. The change event can be the creation of an MVRF, the deletion of an MVRF, or an update on the default or data multicast distribution tree (MDT) configuration of an MVRF. The change event is indicated by the ciscoMvpnGenOperStatusChange object embedded in the trap notification.

MVRF trap notifications are defined by the ciscoMvpnMvrfChange object in the MVPN MIB. When this object is queried from a network management system (NMS) workstation, one of the following values is appended to the object to indicate the configuration state of MVRF trap notifications:

- true(1)--MVRF trap notifications are enabled.
- false(2)--MVRF trap notifications are disabled.

The following MVPN MIB tables can be queried to gather details about MVRF change events:

- ciscoMvpnGenericTable
- ciscoMvpnMdtDefaultTable

- ciscoMvpnMdtDataTable

Note For a complete description of the ciscoMvpnMvrfChange trap notification and MVPN MIB tables, see the CISCO_MVPN_MIB.my file, available on Cisco.com at http://www.cisco.com/go/mibs .

The **snmp-server enable traps mvpn** command is used in conjunction with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications. To send SNMP notifications, you must configure at least one **snmp-server host** command.

Examples

The following example shows how to enable MVRF traps to the host at IP address 10.3.32.154 using the community string defined as public:

```
snmp-server enable traps mvpn
snmp-server host 10.3.32.154 version 2c public
```

Related Commands

Command	Description
snmp -server community	Enables SNMP and sets the community string and access privileges.
snmp -server host	Specifies the recipient of an SNMP notification operation.

snmp-server enable traps pim

To enable Protocol Independent Multicast (PIM) Simple Network Management Protocol (SNMP) notifications, use the **snmp-server enable traps pim**command in global configuration mode. To disable PIM-specific SNMP notifications, use the **no**form of this command.

snmp-server enable traps pim [**neighbor-change**| **rp-mapping-change**| **invalid-pim-message**]

no snmp-server enable traps pim

Syntax Description

neighbor-change	(Optional) Enables notifications indicating when a router's PIM interface is disabled or enabled, or when a router's PIM neighbor adjacency expires.
rp-mapping-change	(Optional) Enables notifications indicating a change in the rendezvous point (RP) mapping information due to either Auto-RP or bootstrap router (BSR) messages.
invalid-pim-message	(Optional) Enables invalid PIM message traps. For example, an invalid PIM message could result when a router receives a join or prune message for which the RP specified in the packet is not the RP for the multicast group.

Command Default

SNMP notifications are disabled.

Command Modes

Global configuration

Command History

Release	Modification
12.2(4)T	This command was introduced.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

SNMP notifications can be sent as traps or inform requests. This command enables both traps and inform requests for the specified notification types. PIM notifications are defined in the CISCO-PIM-MIB.my and PIM-MIB.my files, available from Cisco.com at http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml .

Examples

The following example shows how to configure a router to generate notifications indicating that a PIM interface on the router has been enabled:

```
! Configure PIM traps to be sent as SNMPv2c traps to host with IP address 10.0.0.1.
Router(config)# snmp-server host 10.0.0.1 traps version 2c public pim

! Configure router to send the neighbor-change class of notifications to host.
Router(config)# snmp-server enable traps pim neighbor-change

! Enable PIM sparse-dense mode on Ethernet interface 0/0.
Router(config)# interface ethernet0/0

Router(config-if)# ip pim sparse-dense-mode
```

Related Commands

Command	Description
snmp-server enable traps	Enables all available SNMP notifications on your system.
snmp-server host	Specifies the recipient of an SNMP notification operation.
snmp-server trap-source	Specifies the interface from which an SNMP trap should originate.

tunnel udlr address-resolution

To enable the forwarding of the Address Resolution Protocol (ARP) and Next Hop Resolution Protocol (NHRP) over a unidirectional link (UDL), use the **tunnel udlr address-resolution** command in interface configuration mode. To disable forwarding, use the **no** form of this command.

tunnel udlr address-resolution

no tunnel udlr address-resolution

Syntax Description

This command has no arguments or keywords.

Command Default

The command is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command is configured on the send-only tunnel interface of a downstream router.

Examples

The following example shows how to configure the **tunnel udlr address-resolution** command on an interface to enable ARP and NHRP over a send-only tunnel. An ARP address resolution request received from the upstream router on the UDL (Ethernet interface 0) will be replied to over the send-only tunnel of the receiver. Likewise, an ARP request may be sent by the downstream router over the send-only tunnel, and the response will be received over the UDL.

```
interface tunnel 0
tunnel udlr send-only ethernet 0
tunnel udlr address-resolution
```

Related Commands

Command	Description
tunnel udlr send-only	Configures a unidirectional, GRE tunnel to act as a back channel that can send messages, when another interface is configured for UDLR to receive messages.

tunnel udlr receive-only

To configure a unidirectional, generic routing encapsulation (GRE) tunnel to act as a back channel that can receive messages, when another interface is configured for unidirectional link routing (UDLR) to send messages, use the **tunnel udlr receive-only**command in interface configuration mode. To remove the tunnel, use the **no** form of this command.

tunnel udlr receive-only *interface-type interface-number*

no tunnel udlr receive-only *interface-type interface-number*

Syntax Description

interface-type interface-number	Interface type and number. The *interface-type* and *interface-number* arguments must match the unidirectional send-only interface type and number specified by the **interface** command. Thus, when packets are received over the tunnel, the upper layer protocols will treat the packets as if they are received over the unidirectional send-only interface.

Command Default

No UDLR tunnel is configured.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(3)T	This command was introduced.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Use this command to configure a router that has a unidirectional interface with send-only capabilities. One example of when you might configure this command is if you have traffic traveling via a satellite.

The *interface-type* and *interface-number* arguments must match the send-only interface type and number specified by the **interface** command.

You must configure the **tunnel udlr send-only** command at the opposite end of the tunnel.

If you have a large number of receivers, you should configure UDLR by an alternative means: Internet Group Management Protocol (IGMP) UDLR. See the description of the **ip igmp unidirectional-link** command.

Examples

In the following example, Router A (the upstream router) is configured with Open Shortest Path First (OSPF) and Protocol Independent Multicast (PIM). Serial interface 0 has send-only capability. Therefore, the UDLR tunnel is configured as receive-only, and points to serial interface 0.

Examples

```
ip multicast-routing
!
! Serial0 has send-only capability
!
interface serial 0
 encapsulation hdlc
 ip address 10.1.0.1 255.255.0.0
 ip pim sparse-dense-mode
!
! Configure tunnel as receive-only UDLR tunnel.
!
interface tunnel 0
 tunnel source ethernet 0
 tunnel destination <downstream-router>
 tunnel udlr receive-only serial 0
!
! Configure OSPF.
!
router ospf <pid>
 network 10.0.0.0 0.255.255.255 area 0
```

Router B (the downstream router) is configured with OSPF and PIM. Serial interface 1 has receive-only capability. Therefore, the UDLR tunnel is configured as send-only, and points to serial interface 1.

Examples

```
ip multicast-routing
!
! Serial1 has receive-only capability
!
interface serial 1
 encapsulation hdlc
 ip address 10.1.0.2 255.255.0.0
 ip pim sparse-dense-mode

!
! Configure tunnel as send-only UDLR tunnel.
!
interface tunnel 0
 tunnel source ethernet 0
 tunnel destination <upstream-router>
 tunnel udlr send-only serial 1
!
! Configure OSPF.
!
router ospf <pid>
 network 10.0.0.0 0.255.255.255 area 0
```

Related Commands

Command	Description
interface	Defines the IP addresses of the server, configures an interface type, and enters interface configuration mode.
interface tunnel	Configures a tunnel interface.

Command	Description
ip igmp unidirectional-link	Configures an interface to be unidirectional and enables it for IGMP UDLR.
tunnel udlr send-only	Configures a unidirectional, GRE tunnel to act as a back channel that can send messages, when another interface is configured for UDLR to receive messages.

tunnel udlr send-only

To configure a unidirectional, generic routing encapsulation (GRE) tunnel to act as a back channel that can send messages, when another interface is configured for unidirectional link routing (UDLR) to receive messages, use the **tunnel udlr send-only**command in interface configuration mode. To remove the tunnel, use the **no** form of this command.

tunnel udlr send-only *interface-type interface-number*

no tunnel udlr send-only *interface-type interface-number*

Syntax Description

interface-type interface-number	Interface type and number. The *interface-type* and *interface-number* arguments must match the unidirectional receive-only interface type and number specified by the **interface** command. Thus, when packets are sent by upper layer protocols over the interface, they will be redirected and sent over this GRE tunnel.

Command Default

No UDLR tunnel is configured.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(3)T	This command was introduced.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Use this command to configure a router that has a unidirectional interface with receive-only capabilities. The UDLR tunnel will act as a back channel. One example of when you might configure this command is if you have traffic traveling via a satellite.

The *interface-type* and *interface-number* arguments must match the receive-only interface type and number specified by the **interface** command.

You must configure the **tunnel udlr receive-only** command at the opposite end of the tunnel.

Examples

In the following example, Router A (the upstream router) is configured with Open Shortest Path First (OSPF) and Protocol Independent Multicast (PIM). Serial interface 0 has send-only capability. Therefore, the UDLR tunnel is configured as receive-only, and points to serial interface 0.

Examples

```
ip multicast-routing
!
! Serial0 has send-only capability
!
interface serial 0
 encapsulation hdlc
 ip address 10.1.0.1 255.255.0.0
 ip pim sparse-dense-mode
!
! Configure tunnel as receive-only UDLR tunnel.
!
interface tunnel 0
 tunnel source ethernet 0
 tunnel destination <downstream-router>
 tunnel udlr receive-only serial 0
```

Router B (the downstream router) is configured with OSPF and PIM. Serial interface 1 has receive-only capability. Therefore, the UDLR tunnel is configured as send-only, and points to serial interface 1.

Examples

```
ip multicast-routing
!
! Serial1 has receive-only capability
!
interface serial 1
 encapsulation hdlc
 ip address 10.1.0.2 255.255.0.0
 ip pim sparse-dense-mode

!
! Configure tunnel as send-only UDLR tunnel.
!
interface tunnel 0
 tunnel source ethernet 0
 tunnel destination <upstream-router>
 tunnel udlr send-only serial 1
```

Related Commands

Command	Description
interface	Defines the IP addresses of the server, configures an interface type, and enters interface configuration mode.
interface tunnel	Configures a tunnel interface.
ip igmp unidirectional-link	Configures an interface to be unidirectional and enables it for IGMP UDLR.
tunnel udlr address-resolution	Enables the forwarding of ARP and NHRP over a UDL.

Command	Description
tunnel udlr receive-only	Configures a unidirectional, GRE tunnel to act as a back channel that can receive messages, when another interface is configured for UDLR to send messages.

udp-port

To change the User Datagram Protocol (UDP) port numbers to which a Test Sender sends test packets or a Test Receiver sends status reports during Multicast Routing Monitor (MRM) tests, use the **udp-port**command in MRM manager configuration mode. To restore the default settings, use the **no** form of this command.

udp-port [**test-packet** *port-number*] [**status-report** *port-number*]

no udp-port

Syntax Description

test-packet *port-number*	(Optional) Specifies the UDP port number to which test packets are sent by a Test Sender. The port number must be even if the packets are Real-Time Transport Protocol (RTP)-encapsulated. The range is from 16384 to 65535. By default, the Test Sender uses UDP port number 16834 to send test packets.
status-report *port-number*	(Optional) Specifies the UDP port number to which status reports are sent by a Test Receiver. The port number must be odd if the packets are RTP Control Protocol (RTCP)-encapsulated. The range is from 16834 to 65535. By default, the Test Receiver uses UDP port number 65535 to send status reports.

Command Default

Test Senders use UDP port number 16834 to send test packets, and Test Receivers use UDP port number 65535 to send status reports.

Command Modes

MRM manager configuration (config-mrm-manager)

Command History

Release	Modification
12.0(5)S	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following example shows how to change the UDP port to which test packets are sent by a Test Sender to UDP port number 20302:

```
ip mrm manager test
 udp-port test-packet 20302
```

Related Commands

Command	Description
ip mrm	Configures an interface to operate as a Test Sender or Test Receiver, or both, for MRM.