show ipv6 eigrp topology

To display entries in the Enhanced Interior Gateway Routing Protocol (EIGRP) IPv6 topology table, use the **show ipv6 eigrp topology** command in privileged EXEC mode.

show ipv6 eigrp topology [*as-number* | *ipv6-address*] [**active** | **all-links** | **pending** | **summary** | **zero-successors**]

Syntax Description

as-number	(Optional) Autonomous system number.
ipv6-address	(Optional) IPv6 address.
active	(Optional) Displays only active entries in the EIGRP topology table.
all-links	(Optional) Displays all entries in the EIGRP topology table.
pending	(Optional) Displays all entries in the EIGRP topology table that are waiting for an update from a neighbor or are waiting to reply to a neighbor.
summary	(Optional) Displays a summary of the EIGRP topology table.
zero-successors	(Optional) Displays available routes in the EIGRP topology table.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The **show ipv6 eigrp topology** command can be used without any keywords or arguments. If this command is used without any keywords or arguments, then only routes that are feasible successors are displayed. The **show ipv6 eigrp topology** command can be used to determine diffusing update algorithm (DUAL) states and to debug possible DUAL problems.

Examples

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

```
Router# show ipv6 eigrp topology

IPv6-EIGRP Topology Table for AS(1)/ID(2001:0DB8:10::/64)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
r - reply Status, s - sia Status

P 2001:0DB8:3::/64, 1 successors, FD is 281600
via Connected, Ethernet1/0
```

show ipv6 eigrp traffic

To display the number of Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 packets sent and received, use the **show ipv6 eigrp traffic** command in user EXEC or privileged EXEC mode.

show ipv6 eigrp traffic [*as-number*]

Syntax Description

as-number	(Optional) Autonomous system number.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

Use the **show ipv6 eigrp traffic** command to provide information on packets received and sent.

Examples

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

```
Router# show ipv6 eigrp traffic

IPv6-EIGRP Traffic Statistics for process 9
 Hellos sent/received: 218/205
 Updates sent/received: 7/23
 Queries sent/received: 2/0
 Replies sent/received: 0/2
 Acks sent/received: 21/14
```

Table 167 describes the significant fields shown in the display.

Table 167 show ipv6 eigrp traffic Field Descriptions

Field	Description
process 9	Autonomous system number specified in the **ipv6 router eigrp** command.
Hellos sent/received	Number of hello packets sent and received.
Updates sent/received	Number of update packets sent and received.
Queries sent/received	Number of query packets sent and received.
Replies sent/received	Number of reply packets sent and received.
Acks sent/received	Number of acknowledgment packets sent and received.

Related Commands

Command	Description
ipv6 router eigrp	Configures the EIGRP for IPv6 routing process.

show ipv6 flow cache aggregation

To display the aggregation cache configuration, use the **show ipv6 cache flow aggregation** command in privileged EXEC mode.

show ipv6 flow cache aggregation *aggregation-type* [**verbose**]

Syntax Description

aggregation-type	Displays the configuration of a particular aggregation cache as follows: • Autonomous system • Destination prefix • Prefix • Protocol-port • Source prefix
verbose	(Optional) Displays additional information from the aggregation cache.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(7)T	This command was introduced.
12.2(30)S	This command was integrated into Cisco IOS Release 12.2(30)S.
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.

Examples

The following is an example display of an autonomous system aggregation cache using the **show iv6 flow cache aggregation as** command:

```
Router# show ipv6 flow cache aggregation as

IPv6 Flow Switching Cache, 278544 bytes
  2 active, 4094 inactive, 13 added
  178 ager polls, 0 flow alloc failures

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

The following is a sample display of an autonomous system aggregation cache for the prefix mask 2001::FFFC/64 using the **show ipv6 flow cache aggregation as** command:

```
Router# show ipv6 flow cache aggregation as

IPv6 Flow Switching Cache, 278544 bytes
  2 active, 4094 inactive, 13 added
  178 ager polls, 0 flow alloc failures

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

The following is a sample display of an autonomous system aggregation cache for Ethernet1/2 using the **show ipv6 flow cache verbose aggregation as** command:

```
Router# show ipv6 flow cache aggregation as verbose

IPv6 Flow Switching Cache, 278544 bytes
  2 active, 4094 inactive, 13 added
  178 ager polls, 0 flow alloc failures

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

Table 168 describes the significant fields shown in these examples.

Table 168 show ipv6 flow cache aggregation Field Descriptions

Field	Description
bytes	Number of bytes of memory used by the NetFlow cache.
active	Number of active flows in the NetFlow cache at the time this command was entered.
inactive	Number of flow buffers that are allocated in the NetFlow cache, but are not currently assigned to a specific flow at the time this command is entered.
added	Number of flows created since the start of the summary period.
ager polls	Number of times the NetFlow code looked at the cache to cause entries to expire (used by Cisco for diagnostics only).
flow alloc failures	Number of times the NetFlow code tried to allocate a flow but could not.
Src If	Specifies the source interface.
Src AS	Specifies the source autonomous system.
Dst If	Specifies the destination interface.
Dst AS	Specifies the destination autonomous system.
Flows	Number of flows.
Pkts	Number of packets.
B/Pk	Average number of bytes observed for the packets seen for this protocol (total bytes for this protocol or the total number of flows for this protocol for this summary period).
Active	Number of active flows in the NetFlow cache at the time this command was entered.

Related Commands

Command	Description
ipv6 flow-aggregation cache	Enables aggregation cache configuration mode.

show ipv6 flow export

To display the statistics for the data export, including the main cache and all other enabled caches, use the **showipv6 flow export** command in user EXEC or privileged EXEC mode.

show ipv6 flow export [**template**]

Syntax Description

template	(Optional) Displays export template statistics.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.3(7)T	This command was introduced.
12.2(30)S	This command was integrated into Cisco IOS Release 12.2(30)S.
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.

Examples

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

```
Router# show ipv6 flow export

Flow export is enabled
   Exporting flows to 10.42.42.1 (9991) 10.0.101.254 (9991)
   Exporting using source IP address 10.0.101.203
   Version 5 flow records
   Export Stats for 10.42.42.1 (9991)
           3 flows exported in 3 udp datagrams
           0 flows failed due to lack of export packet
           3 export packets were sent up to process level
           0 export packets were dropped due to no fib
           0 export packets were dropped due to adjacency issues
           0 export packets were dropped enqueuing for the RP
           0 export packets were dropped due to IPC rate limiting
   Export Stats for 10.0.101.254 (9991)
           7 flows exported in 7 udp datagrams
           0 flows failed due to lack of export packet
           6 export packets were sent up to process level
           0 export packets were dropped due to no fib
           0 export packets were dropped due to adjacency issues
           0 export packets were dropped enqueuing for the RP
           0 export packets were dropped due to IPC rate limiting
```

Table 169 describes the significant fields shown in the display.

Table 169 show ipv6 flow export Field Descriptions

Field	Description
Exporting flows to 10.42.42.1 (9991) 10.0.101.254 (9991)	Specifies the export destinations and ports. The ports are in parentheses.
Exporting using source IP address 10.0.101.203	Specifies the source address or interface.
Version 5 flow records	Specifies the version of the flow.
3 flows exported in 3udp datagrams	The total number of export packets sent, and the total number of flows contained within them.
0 flows failed due to lack of export packet	No memory was available to create an export packet.
0 export packets were sent up to process level	The packet could not be processed by CEF or by fast switching, possibly because another feature requires running on the packet.
0 export packets were dropped due to no fib 0 export packets were dropped due to adjacency issues	Indicates that CEF was unable to switch the packet or forward it up to the process level.
0 export packets were dropped enqueuing for the RP 0 export packets were dropped due to IPC rate limiting	Indicates that there was a problem transferring the export packet between the RP and the line card.

show ipv6 general-prefix

To display information on IPv6 general prefixes, use the **show ipv6 general-prefix** command in user EXEC or privileged EXEC mode.

show ipv6 general-prefix

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.3(4)T	This command was introduced.

Usage Guidelines

Use the **show ipv6 general-prefix** command to view information on IPv6 general prefixes.

Examples

The following example shows an IPv6 general prefix called my-prefix, which has been defined based on a 6to4 interface. The general prefix is also being used to define an address on interface loopback42.

```
Router# show ipv6 general-prefix

IPv6 Prefix my-prefix, acquired via 6to4
2002:B0B:B0B::/48
 Loopback42 (Address command)
```

Table 170 describes the significant fields shown in the display.

Table 170 show ipv6 general-prefix Field Descriptions

Field	Description
IPv6 Prefix	User-defined name of the IPv6 general prefix.
Acquired via	The general prefix has been defined based on a 6to4 interface. A general prefix can also be defined manually or acquired using DHCP for IPv6 prefix delegation.
2002:B0B:B0B::/48	The prefix value for this general prefix.
Loopback42 (Address command)	List of interfaces where this general prefix is used.

Related Commands

Command	Description
ipv6 general-prefix	Defines a general prefix for an IPv6 address manually.

show ipv6 inspect

To view Context-based Access Control (CBAC) configuration and session information, use the **show ipv6 inspect** command in privileged EXEC mode.

show ipv6 inspect {**name** *inspection-name* | **config** | **interfaces** | **session** [**detail**] | **all**}

Syntax Description

name *inspection-name*	Displays the configured inspection rule with the name *inspection-name*.
config	Displays the complete Cisco IOS firewall inspection configuration.
interfaces	Displays interface configuration with respect to applied inspection rules and access lists.
session [**detail**]	Displays existing sessions that are currently being tracked and inspected by Cisco IOS firewall. The optional **detail** keyword causes additional details about these sessions to be shown.
all	Displays all Cisco IOS firewall configuration and all existing sessions that are currently being tracked and inspected by Cisco IOS firewall.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(7)T	This command was introduced.

Examples

The following example asks for information about interfaces currently under inspection:

```
Router# show ipv6 inspect interfaces
```

Related Commands

Command	Description
ipv6 inspect	Applies a set of inspection rules to an interface.

show ipv6 interface

To display the usability status of interfaces configured for IPv6, use the **show ipv6 interface** command in user EXEC or privileged EXEC mode.

show ipv6 interface [**brief**] [*type number*] [**prefix**]

Syntax Description

brief	(Optional) Displays a brief summary of IPv6 status and configuration for each interface.
type	(Optional) The interface type about which to display information.
number	(Optional) The interface number about which to display information.
prefix	(Optional) Prefix generated from a local IPv6 prefix pool.

Command Default

All IPv6 interfaces are displayed.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.2(2)T	This command was introduced.
12.2(4)T	The OK, TENTATIVE, DUPLICATE, ICMP redirects, and ND DAD fields were added to the command output.
12.0(21)ST	This command was integrated into Cisco IOS Release 12.0(21)ST.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(25)S	Command output was updated to display information on the current Unicast RPF configuration.
12.4(2)T	Command output was updated to show the state of the default router preference (DRP) preference value as advertised by a router through an interface.
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.
12.4(4)T	Command output was updated to show Hot Standby Router Protocol (HSRP) for IPv6 information.
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.
12.4(24)T	Command output was updated to show the Dynamic Host Configuration Protocol (DHCP) originated addresses.

Usage Guidelines

The **show ipv6 interface** command provides output similar to the **show ip interface** command, except that it is IPv6-specific.

Use the **show ipv6 interface** command to validate the IPv6 status of an interface and its configured addresses. The **show ipv6 interface** command also displays the parameters that IPv6 is using for operation on this interface and any configured features.

If the interface's hardware is usable, the interface is marked up. If the interface can provide two-way communication for IPv6, the line protocol is marked up.

If you specify an optional interface type and number, the command displays information only about that specific interface. For a specific interface, you can enter the **prefix** keyword to see the IPv6 neighbor discovery (ND) prefixes that are configured on the interface.

Examples

Interface Information for a Specific Interface with IPv6 Configured

The **show ipv6 interface** command displays information about the specified interface.

```
Router# show ipv6 interface ethernet 0/0

Ethernet0 is up, line protocol is up
  IPv6 is enabled, link-local address is 2001:0DB8::/29
  Global unicast address(es):
    2000:0DB8::2, subnet is 2001:0DB8::/64
  Joined group address(es):
    FF02::1
    FF02::2
    FF02::1:FF11:6770
  MTU is 1500 bytes
  ICMP error messages limited to one every 500 milliseconds
  ICMP redirects are enabled
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
  ND advertised reachable time is 0 milliseconds
  ND advertised retransmit interval is 0 milliseconds
  ND router advertisements are sent every 200 seconds
  ND router advertisements live for 1800 seconds
  ND advertised default router preference is Medium
  Hosts use stateless autoconfig for addresses.
```

Table 171 describes the significant fields shown in the display.

Table 171 show ipv6 interface Field Descriptions

Field	Description
Ethernet 0 is up, down, administratively down (down and administratively down are not shown in sample output)	Indicates whether the interface hardware is active (whether line signal is present) and whether it has been taken down by an administrator. If the interface hardware is usable, the interface is marked "up." For an interface to be usable, both the interface hardware and line protocol must be up.
line protocol is up, down (down is not shown in sample output)	Indicates whether the software processes that handle the line protocol consider the line usable (that is, whether keepalives are successful or IPv6 CP has been negotiated). If the interface can provide two-way communication, the line protocol is marked up. For an interface to be usable, both the interface hardware and line protocol must be up.

Table 171 show ipv6 interface Field Descriptions (continued)

Field	Description
IPv6 is enabled, stalled, disabled (stalled and disabled are not shown in sample output)	Indicates that IPv6 is enabled, stalled, or disabled on the interface. If IPv6 is enabled, the interface is marked "enabled." If duplicate address detection processing identified the link-local address of the interface as being a duplicate address, the processing of IPv6 packets is disabled on the interface and the interface is marked "stalled." If IPv6 is not enabled, the interface is marked "disabled."
link-local address	Displays the link-local address assigned to the interface.
Global unicast address(es):	Displays the global unicast addresses assigned to the interface.
Joined group address(es):	Indicates the multicast groups to which this interface belongs.
MTU	Maximum transmission unit of the interface.
ICMP error messages	Specifies the minimum interval (in milliseconds) between error messages sent on this interface.
ICMP redirects	The state of Internet Control Message Protocol (ICMP) IPv6 redirect messages on the interface (the sending of the messages is enabled or disabled).
ND DAD	The state of duplicate address detection on the interface (enabled or disabled).
number of DAD attempts:	Number of consecutive neighbor solicitation messages that are sent on the interface while duplicate address detection is performed.
ND reachable time	Displays the neighbor discovery reachable time (in milliseconds) assigned to this interface.
ND advertised reachable time	Displays the neighbor discovery reachable time (in milliseconds) advertised on this interface.
ND advertised retransmit interval	Displays the neighbor discovery retransmit interval (in milliseconds) advertised on this interface.
ND router advertisements	Specifies the interval (in seconds) for neighbor discovery router advertisements sent on this interface and the amount of time before the advertisements expire. As of Cisco IOS Release 12.4(2)T, this field displays the default router preference (DRP) value sent by this router on this interface.
ND advertised default router preference is Medium	The DRP for the router on a specific interface.

show ipv6 interface Command Using the brief Keyword

The following is sample output from the **show ipv6 interface** command when entered with the **brief** keyword:

```
Router# show ipv6 interface brief

Ethernet0 is up, line protocol is up
Ethernet0                  [up/up]
    unassigned
```

```
Ethernet1                  [up/up]
    2001:0DB8:1000:/29
Ethernet2                  [up/up]
    2001:0DB8:2000:/29
Ethernet3                  [up/up]
    2001:0DB8:3000:/29
Ethernet4                  [up/down]
    2001:0DB8:4000:/29
Ethernet5                  [administratively down/down]
    2001:123::210:7BFF:FEC2:ACD8

Interface         Status                IPv6 Address
Ethernet0         up                    3FFE:C00:0:1:260:3EFF:FE11:6770
Ethernet1         up                    unassigned
Fddi0             up                    3FFE:C00:0:2:260:3EFF:FE11:6772
Serial0           administratively down unassigned
Serial1           administratively down unassigned
Serial2           administratively down unassigned
Serial3           administratively down unassigned
Tunnel0           up                    unnumbered (Ethernet0)
Tunnel1           up                    3FFE:700:20:1::12
```

IPv6 Interface with ND Prefix Configured

This sample output shows the characteristics of an interface that has generated a prefix from a local IPv6 prefix pool:

```
Router# show ipv6 interface Ethernet 0/0 prefix

interface Ethernet0/0
 ipv6 address 2001:0DB8::1/64
 ipv6 address 2001:0DB8::2/64
 ipv6 nd prefix 2001:0DB8:2::/64
 ipv6 nd prefix 2001:0DB8:3::/64 2592000 604800 off-link
end
.
.
.
IPv6 Prefix Advertisements Ethernet0/0
Codes: A - Address, P - Prefix-Advertisement, O - Pool
       U - Per-user prefix, D - Default
       N - Not advertised, C - Calendar

     default [LA] Valid lifetime 2592000, preferred lifetime 604800
AD   2001:0DB8:1::/64 [LA] Valid lifetime 2592000, preferred lifetime 604800
APD  2001:0DB8:2::/64 [LA] Valid lifetime 2592000, preferred lifetime 604800
P    2001:0DB8:3::/64 [A] Valid lifetime 2592000, preferred lifetime 604800
```

The default prefix shows the parameters that are configured using the **ipv6 nd prefix default** command.

IPv6 Interface with DRP Configured

This sample output shows the state of the DRP preference value as advertised by this router through an interface:

```
Router# show ipv6 interface gigabitethernet 0/1

  GigabitEthernet0/1 is up, line protocol is up
    IPv6 is enabled, link-local address is FE80::130
    Description: Management network (dual stack)
    Global unicast address(es):
      FEC0:240:104:1000::130, subnet is FEC0:240:104:1000::/64
    Joined group address(es):
      FF02::1
```

```
    FF02::2
    FF02::1:FF00:130
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
  ND advertised reachable time is 0 milliseconds
  ND advertised retransmit interval is 0 milliseconds
  ND router advertisements are sent every 200 seconds
  ND router advertisements live for 1800 seconds
  ND advertised default router preference is Low
  Hosts use stateless autoconfig for addresses.
```

IPv6 Interface with HSRP Configured

When HSRP IPv6 is first configured on an interface, the interface IPv6 link-local address is marked unactive (UNA) because it is no longer advertised, and the HSRP IPv6 virtual link-local address is added to the virtual link-local address list with the UNA and tentative DAD (TEN) flags set. The interface is also programmed to listen for the HSRP IPv6 multicast address.

This sample output shows the status of UNA and TEN flags, when HSRP IPv6 is configured on an interface:

```
Router# show ipv6 interface ethernet 0/0

Ethernet0/0 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80:2::2 [UNA]
  Virtual link-local address(es):
    FE80::205:73FF:FEA0:1 [UNA/TEN]
  Global unicast address(es):
    2001:2::2, subnet is 2001:2::/64
  Joined group address(es):
    FF02::1
    FF02::2
    FF02::66
    FF02::1:FF00:2
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ND DAD is enabled, number of DAD attempts: 1
```

After the HSRP group becomes active, the UNA and TEN flags are cleared, and the optimistic DAD (OPT) flag is set. The solicited node multicast address for the HSRP virtual IPv6 address is also added to the interface.

This sample output shows the status of UNA, TEN and OPT flags, when HSRP group is activated:

```
Router# show ipv6 interface ethernet 0/0

Ethernet0/0 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80:2::2 [UNA]
  Virtual link-local address(es):
    FE80::205:73FF:FEA0:1 [OPT]
  Global unicast address(es):
    2001:2::2, subnet is 2001:2::/64
  Joined group address(es):
    FF02::1
    FF02::2
    FF02::66
    FF02::1:FF00:2
    FF02::1:FFA0:1
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ND DAD is enabled, number of DAD attempts: 1
```

Table 172 describes additional significant fields shown in the displays for the **show ipv6 interface** command with HSRP configured.

Table 172 show ipv6 interface Command with HSRP Configured Field Descriptions

Field	Description
IPv6 is enabled, link-local address is FE80:2::2 [UNA]	The interface IPv6 link-local address is marked UNA because it is no longer advertised.
FE80::205:73FF:FEA0:1 [UNA/TEN]	The virtual link-local address list with the UNA and TEN flags set.
FF02::66	HSRP IPv6 multicast address.
FE80::205:73FF:FEA0:1 [OPT]	HSRP becomes active, and the HSRP virtual address marked OPT.
FF02::1:FFA0:1	HSRP solicited node multicast address.

IPv6 Interface with Minimum RA Interval Configured

When you enable Mobile IPv6 on an interface, you can configure a minimum interval between IPv6 router advertisement (RA) transmissions. The **show ipv6 interface** command output reports the minimum RA interval, when configured. If the minimum RA interval is not explicitly configured, then it is not displayed.

In the following example, the maximum RA interval is configured as 100 seconds, and the minimum RA interval is configured as 60 seconds on Ethernet interface 1/0:

```
Router(config-if)# ipv6 nd ra-interval 100 60
```

Subsequent use of the **show ipv6 interface** then displays the interval as follows:

```
Router(config)# show ipv6 interface ethernet 1/0

Ethernet1/0 is administratively down, line protocol is down
  IPv6 is enabled, link-local address is FE80::A8BB:CCFF:FE00:5A01 [TEN]
  No Virtual link-local address(es):
  No global unicast address is configured
  Joined group address(es):
    FF02::1
    FF02::2
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ICMP unreachables are sent
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
  ND advertised reachable time is 0 milliseconds
  ND advertised retransmit interval is 0 milliseconds
  ND router advertisements are sent every 60 to 100 seconds
  ND router advertisements live for 1800 seconds
  ND advertised default router preference is Medium
  Hosts use stateless autoconfig for addresses.
```

In the following example, the maximum RA interval is configured as 100 milliseconds (ms), and the minimum RA interval is configured as 60 ms on Ethernet interface 1/0:

```
Router(config)# show ipv6 interface ethernet 1/0

Ethernet1/0 is administratively down, line protocol is down
```

```
IPv6 is enabled, link-local address is FE80::A8BB:CCFF:FE00:5A01 [TEN]
No Virtual link-local address(es):
No global unicast address is configured
Joined group address(es):
  FF02::1
  FF02::2
MTU is 1500 bytes
ICMP error messages limited to one every 100 milliseconds
ICMP redirects are enabled
ICMP unreachables are sent
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 milliseconds
ND advertised retransmit interval is 0 milliseconds
ND router advertisements are sent every 60 to 100 milliseconds
ND router advertisements live for 1800 seconds
ND advertised default router preference is Medium
Hosts use stateless autoconfig for addresses.
```

Table 173 describes additional significant fields shown in the displays for the **show ipv6 interface** command with minimum RA interval information configured.

Table 173 show ipv6 interface Command with Minimum RA Interval Information Configuration Field Descriptions

Field	Description
ND router advertisements are sent every 60 to 100 seconds	ND RAs are sent at an interval randomly selected from a value between the minimum and maximum values. In this example, the minimum value is 60 seconds, and the maximum value is 100 seconds.
ND router advertisements are sent every 60 to 100 milliseconds	ND RAs are sent at an interval randomly selected from a value between the minimum and maximum values. In this example, the minimum value is 60 ms, and the maximum value is 100 ms.

Related Commands

Command	Description
ipv6 nd prefix	Configures which IPv6 prefixes are included in IPv6 router advertisements.
ipv6 nd ra interval	Configures the interval between IPv6 RA transmissions on an interface.
show ip interface	Displays the usability status of interfaces configured for IP.

show ipv6 local pool

To display information about any defined IPv6 address pools, use the **show ipv6 local pool** command in privileged EXEC mode.

show ipv6 local pool [*poolname* [**cache**]]

Syntax Description

poolname	(Optional) User-defined name for the local address pool.
cache	(Optional) Indicates that cache statistics are to be included in the output display

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(13)T	This command was introduced.

Usage Guidelines

If you omit the *poolname* argument, the command displays a generic list of all defined address pools and the IP addresses that belong to them. If you specify the *poolname* argument, the command displays detailed information about that pool.

Examples

The following command displays IPv6 prefix pool information, which includes cache statistics:

```
Router# show ipv6 local pool mypool

Prefix is 2001:0DB8::/29 assign /64 prefix
2 entries in use, 254 available, 0 rejected
0 entries cached, 1000 maximum

User           Prefix               Interface
joe            3FFE:FFFF:A::/64      Vi1
john           3FFE:FFFF:A:1::/64    Vi2
```

The following command displays IPv6 prefix pool information for all prefix pools:

```
Router# show ipv6 local pool

Pool Prefix Free In use
mypool 2001:0DB8::/29 65516 20
myrouter#
myrouter# show ipv6 local pool mypool
Prefix is 1234::/48 assign /64 prefix
20 entries in use, 65516 available, 0 rejected
0 entries cached, 1000 maximum
User Prefix Interface
user1-72b 1234::/64 Vi1.21
user1-72b 1234:0:0:1::/64 Vi1.22
user1-72b 1234:0:0:2::/64 Vi1.23
user1-72b 1234:0:0:3::/64 Vi1.24
user1-72b 1234:0:0:4::/64 Vi1.25
user1-72b 1234:0:0:5::/64 Vi1.26
```

```
user1-72b 1234:0:0:6::/64 Vi1.27
user1-72b 1234:0:0:7::/64 Vi1.28
user1-72b 1234:0:0:8::/64 Vi1.29
user1-72b 1234:0:0:9::/64 Vi1.30
user1-72b 1234:0:0:A::/64 Vi1.31
user1-72b 1234:0:0:B::/64 Vi1.32
user1-72b 1234:0:0:C::/64 Vi1.33
user1-72b 1234:0:0:D::/64 Vi1.34
user1-72b 1234:0:0:E::/64 Vi1.35
user1-72b 1234:0:0:F::/64 Vi1.36
user1-72b 1234:0:0:10::/64 Vi1.37
user1-72b 1234:0:0:11::/64 Vi1.38
user1-72b 1234:0:0:12::/64 Vi1.39
user1-72b 1234:0:0:13::/64 Vi1.40
```

Table 174 describes the significant fields shown in the displays.

Table 174 show ipv6 local pool Field Descriptions

Field	Description
Scope	The type of access.
Pool	Pool and group names and associations, if created.
Begin	The first IP address in the defined range of addresses in this pool.
End	The last IP address in the defined range of addresses in this pool.
Free	The number of addresses available.
InUse	The number of addresses in use.

Related Commands

Command	Description
ipv6 local pool	Configures a local pool of IPv6 addresses to be used when a remote peer connects to a point-to-point interface.

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.

Release	Modification
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. Table 175 describes the MFIB forwarding entries and interface flags.

Table 175 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
```

Table 176 describes the significant fields shown in the display.

Table 176 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. See Table 175 for further information on interface flags.
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
```

Table 177 describes the fields shown in the display.

Table 177 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.
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**.
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)
```

Table 178 describes the significant fields shown in the display.

Table 178 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.
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.
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.
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       ,?        ]
```

Table 179 describes the significant fields shown in the display.

Table 179 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.
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
```

Table 180 describes the significant fields shown in the displays.

Table 180 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
```

Table 181 describes the significant fields shown in the display.

Table 181 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.
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

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.
```

Table 182 describes the significant fields shown in the display.

Table 182 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.

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
```

Table 183 describes the significant fields shown in the display.

Table 183 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
```

Table 184 describes the significant fields shown in the display.

Table 184 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
```

Table 184 describes the significant fields shown in the display.

Table 185 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.
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.

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)
```

Table 186 describes the significant fields shown in the display.

Table 186 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.
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.

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
```

Table 187 describes the significant fields shown in the displays.

Table 187 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** command to 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
```

Table 188 describes the significant fields shown in the display.

Table 188 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 mobile binding

To display information about the binding cache, use the **show ipv6 mobile binding** command in user EXEC or privileged EXEC mode.

show ipv6 mobile binding [**care-of-address** *address* | **home-address** *address* | *interface-type interface-number*]

Syntax Description

care-of-address	(Optional) Provides information about the mobile node's current location.
address	(Optional) Current address of the mobile node.
home-address	(Optional) IPv6 address is assigned to the mobile node within its home subnet prefix on its home link.
interface-type interface-number	(Optional) Interface type and number.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.3(14)T	This command was introduced.
12.4(11)T	Command output was updated to display the tunnel interface and the tunnel end point details.

Usage Guidelines

The **show ipv6 mobile binding** command displays details of all bindings that match all search criteria. If no optional keywords or arguments are specified, all bindings are displayed.

Examples

The following example displays information about the binding cache:

```
Router# show ipv6 mobile binding

Mobile IPv6 Binding Cache Entries:

  2001:1::8
    via care-of address 2001:2::1
    home-agent 2001:1::2
    state ACTIVE, sequence 1, flags AHrlK
    lifetime:remaining 1023 (secs), granted 1024 (secs), requested 1024 (secs)
    interface Ethernet1/3
    0 tunneled, 0 reversed tunneled
Selection matched 1 bindings
```

The following example displays information about the tunnel interface and the tunnel end point details:

```
Router# show ipv6 mobile bindings
```

```
Tunnel Interface: tunnel0
Tunnel Source 2001:0DB1:1:1
Tunnel Destination: 2001:0DB1:2:1
Input: 20 packets, 1200 bytes, 0 drops
Output: 20 packets, 1200 bytes, 0 drops
```

Table 180 describes the significant fields shown in the displays.

Table 189 show ipv6 mobile binding Field Descriptions

Field	Description
2001:1::8	Home IPv6 address of the mobile node.
via care-of address 2001:2::1	Care-of address of the mobile node.
home-agent 2001:1::2	Home-agent address
state ACTIVE, sequence 1, flags AHrlK	• State: State of the mobile binding. • Sequence number. • Flags: Services requested by mobile node. The mobile node requests these services by setting bits in the registration request. Uppercase characters denote bit set.
lifetime:remaining 1023 (secs), granted 1024 (secs), requested 1024 (secs)	• Remaining: The time remaining until the registration is expired. It has the same initial value as lifetime granted, and is counted down by the home agent. • Granted: The lifetime granted to the mobile node for this registration. Number of seconds in parentheses. • Requested: The lifetime requested by the mobile node for this registration. Number of seconds in parentheses.
interface Ethernet1/3	The interface being used.
0 tunneled, 0 reversed tunneled	Number of bindings tunneled and reverse tunneled.
Selection matched 1 bindings	Total number of mobility bindings that were matched.
Tunnel Interface	The tunnel interface being used.
Tunnel Source	Tunnel source IPv6 address.
Tunnel Destionation	Tunnel destination IPv6 address.
Input	Number of packets in.
Output	Number of packets out.

Related Commands

binding	Configures binding options for the Mobile IPv6 home agent feature in home-agent configuration mode.
ipv6 mobile home-agent (interface configuration)	Initializes and starts the Mobile IPv6 home agent on a specific interface.

show ipv6 mobile globals

To display global Mobile IPv6 parameters, use the **show ipv6 mobile globals** command in user EXEC or privileged EXEC mode.

show ipv6 mobile globals

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.3(14)T	This command was introduced.
12.4(11)T	Command output was updated to show the Mobile IPv6 tunnel information on the home agent.

Usage Guidelines

The **show ipv6 mobile globals** command displays the values of all global configuration parameters associated with Mobile IPv6 and lists the interfaces on which home agent functionality is operating.

Examples

In the following example, the **show ipv6 mobile globals** command displays the binding parameters:

```
Router# show ipv6 mobile globals

Mobile IPv6 Global Settings:

  1 Home Agent service on following interfaces:
    Ethernet1/2
  Bindings:
    Maximum number is unlimited.
    1 bindings are in use
    1 bindings peak
    Binding lifetime permitted is 262140 seconds
    Recommended refresh time is 300 seconds
```

In the following example, the **show ipv6 mobile globals** command displays the Mobile IPv6 tunnel information parameters on the home agent:

```
Router# show ipv6 mobile globals

Tunnel Encapsulation Mode: IPv6/IPv6
ICMP Unreachable for tunnel interfaces <enabled/disabled>
Tunnel Path MTU Discovery: <enabled/disabled>
```

Table 180 describes the significant fields shown in the displays.

Table 190 show ipv6 mobile globals Field Descriptions

Field	Description
1 Home Agent service on following interfaces: Ethernet1/2	Interface on which the home agent service is enabled.
Bindings:	Information on bindings.
Maximum number is unlimited.	The amount of bindings allowed on the home agent.
1 bindings are in use.	How many bindings are being used.
1 bindings peak	The maximum number of bindings that have been used in this session.
Binding lifetime permitted is 262140 seconds	The configured binding lifetime.
Recommended refresh time is 300 seconds	The configured refresh time.
Tunnel Encapsulation Mode:	Tunnel encapsulation type.
ICMP Unreachable for tunnel interfaces	Enabled or disabled.
Tunnel Path MTU Discovery:	Enabled or disabled.

Related Commands

Command	Description
address (IPv6 mobile router)	Specifies the home address of the IPv6 mobile node.
binding	Configures binding options for the Mobile IPv6 home agent feature in home agent configuration mode.
ipv6 mobile home-agent (global configuration)	Enters home agent configuration mode.
host group	Creates a host configuration in Mobile IPv6.

show ipv6 mobile home-agents

To display local and discovered neighboring home agents, use the **show ipv6 mobile home-agents** command in user EXEC or privileged EXEC mode.

show ipv6 mobile home-agents [*interface-type interface-number* [*prefix*]]

Syntax Description

interface-type interface-number	(Optional) Interface type and number.
prefix	(Optional) IPv6 address prefix of the care-of address or the home address of neighboring agents.

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

The **show ipv6 mobile home-agents** command displays information about local and discovered neighboring home agents. You can choose to display information on a specified interface using the optional *interface-type* and *interface-number* arguments, and you can further choose to display only those addresses that match the optional *prefix* argument.

If no argument or keyword is entered, the home agent list for each interface on which the router is acting as a home agent is displayed. Each list is displayed in decreasing order of preference.

Examples

In the following example, the fact that no neighboring mobile home agents were found is displayed:

```
Router# show ipv6 mobile home-agents

Home Agent information for Ethernet1/3
  Configured:
    FE80::20B:BFFF:FE33:501F
    preference 0 lifetime 1800
      global address 2001:0DB8:1::2/64
  Discovered Home Agents:
    FE80::4, last update 0 min
    preference 0 lifetime 1800
      global address 2001:0DB8:1::4/64
```

Table 180 describes the significant fields shown in the display.

Table 191 show ipv6 mobile home-agents Field Descriptions

Field	Description
Home Agent information for Ethernet1/3	The interface on which the home agent is configured.
Configured: FE80::20B:BFFF:FE33:501F	The IPv6 address on which the home agent is configured.
preference 0 lifetime 1800	The configured home agent preference and lifetime.
global address 2001:0DB8:1::2/64	The configured global address.
Discovered Home Agents: FE80::4, last update 0 min preference 0 lifetime 1800 global address 2001:0DB8:1::4/64	The address and configuration information about discovered home agents.

Related Commands

Command	Description
binding	Configures binding options for the Mobile IPv6 home agent feature in home agent configuration mode.

show ipv6 mobile host groups

To display information about IPv6 mobile host groups, use the **show ipv6 mobile host groups** command in user EXEC or privileged EXEC mode.

show ipv6 mobile host groups [*profile-name*]

Syntax Description

profile-name	(Optional) Host group profile name.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.4(11)T	This command was introduced.

Usage Guidelines

The **show ipv6 mobile host groups** command lists the configuration of all configured host groups. To display information about a specific host group, use the optional *profile-name* keyword.

Examples

In the following example, information about a host group named localhost is displayed:

```
Router# show ipv6 mobile host groups

Mobile IPv6 Host Configuration
Mobile Host List:

Host Group Name: localhost
    NAI: sai@cisco.com
    Address: CAB:C0:CA5A:CA5A::CA5A

    Security Association Entry:
      SPI: (Hex: 501) (Decimal Int: 1281)
      Key Format: Hex    Key: baba
      Algorithm: HMAC_SHA1
      Replay Protection: On    Replay Window: 6 secs
```

Table 180 describes the significant fields shown in the display.

Table 192 show ipv6 mobile host groups Field Descriptions

Field	Description
Host Group Name: localhost	Configuration information about the host group named localhost to follow.
NAI: sai@cisco.com	Network access identifier (NAI) for localhost host group.
Address: 2001:0DB8:CA5A:CA5A::CA5A	IPv6 address for localhost host group.

Table 192 show ipv6 mobile host groups Field Descriptions (continued)

Field	Description
Security Association Entry:	Security association for the host group named localhost to follow.
SPI: (Hex: 501) (Decimal Int: 1281)	SPI for localhost.
Key Format: Hex Key: baba	Key format and name for localhost.
Algorithm: HMAC_SHA1	Authentication algorithm.
Replay Protection: On Replay Window: 6 secs	Replay protection is activated, and the number of seconds that the router uses for replay protection is 6.

Related Commands

Command	Description
address (Mobile IPv6)	Specifies the home address of the IPv6 mobile node.
authentication (Mobile IPv6)	Specifies the authentication properties for the IPv6 mobile node by creating either a unidirectional or bidirectional SPI.
host group	Creates a host group configuration in IPv6 Mobile.
nai	Specifies the NAI for the IPv6 mobile node.
show ipv6 mobile globals	Displays global Mobile IPv6 parameters.

show ipv6 mobile router

To display configuration information and monitoring statistics about the IPv6 mobile router, use the **show ipv6 mobile router** command in user EXEC or privileged EXEC mode.

show ipv6 mobile router [**running-config** | **status**]

Syntax Description

running-config	(Optional) Displays IPv6 mobile router running configuration information.
status	(Optional) Displays IPv6 mobile router status information.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.4(20)T	This command was introduced.

Usage Guidelines

The **show ipv6 mobile router** display includes the mobile router configuration information such as the home address and network mask, home agent, and registration settings, and operational information such as status, tunnel interface, active foreign agent, and care-of address.

Examples

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

```
Router# show ipv6 mobile router

Mobile Reverse Tunnel established
---------------------------------
using Nemo Basic mode
Home Agent: 2001:DB8:2000::2001
CareOf Address: 2001:DB8::A8BB:CCFF:FE01:F611
Attachment Router: FE80::A8BB:CCFF:FE01:F511
Attachment Interface: Ethernet1/1
Home Network: 2001:DB8:2000:0:FDFF:FFFF:FFFF:FFFE/64
Home Address: 2001:DB8:2000::1111
```

Table 193 describes the significant fields shown in the display.

Table 193 show ipv6 mobile router Field Descriptions

Field	Description
Mobile Reverse Tunnel established	If reverse tunnel is enabled or disabled, this information is displayed or absent, respectively.
using Nemo Basic mode	Type of mode being used by the mobile router.
Home Agent:	Home agent with which the mobile router registers. The mobile router registers only to the home agent with the highest priority when multiple addresses are configured.

Table 193 show ipv6 mobile router Field Descriptions (continued)

Field	Description
CareOf Address:	Care-of address used by the registered mobile router.
Attachment Router:	Attachment point in the foreign network.
Attachment Interface:	Attachment interface used in the foreign network.
Home Network:	IPv6 address of the mobile router home network.
Home Address:	IPv6 address of the mobile router.

show ipv6 mobile traffic

To display information about binding updates received and binding acknowledgments sent, use the **show ipv6 mobile traffic** command in user EXEC or privileged EXEC mode.

show ipv6 mobile traffic

Syntax Description

The command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

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

Usage Guidelines

The **show ipv6 mobile traffic** command displays counters and other information associated with Mobile IPv6. The following counters are maintained globally across all interfaces:

- Dynamic home agent discovery requests received
- Binding updates received
- Home agent registrations received
- Successful home agent registrations
- Home agent deregistrations (lifetime of zero or care-of address equals home address)
- Home agent registrations rejected, defined in the status as sent in the binding acknowledgment with a separate counter for every reason code defined in Table 194, and generated by the implementation
- Time of last registration acceptance
- Time of last registration denial
- Status code for last registration denial
- Binding updates discarded through rate limiting
- Binding acknowledgments discarded through rate limiting
- Binding cache high-water mark, maintained and displayed for registrations

Table 194 shows possible binding status values and reasons for use of these values.

Table 194 show ipv6 mobile traffic Field Descriptions

Reason Code	Binding Status Value
0	Binding update accepted
128	Reason unspecified
129	Administratively prohibited

Table 194 show ipv6 mobile traffic Field Descriptions

Reason Code	Binding Status Value
130	Insufficient resources
131	Home registration not supported
132	Not home subnet
133	Not home agent for this mobile node
134	Duplicate address detection (DAD) failed
135	Sequence number out of window

Examples

In the following example, information about IPv6 Mobile traffic is displayed:

```
Router# show ipv6 mobile traffic

    MIPv6 statistics:
      Rcvd: 6477 total
          0 truncated, 0 format errors
          0 checksum errors
        Binding Updates received:6477
          0 no HA option, 0 BU's length
          0 options' length, 0 invalid CoA
      Sent: 6477 generated
        Binding Acknowledgements sent:6477
          6477 accepted (0 prefix discovery required)
          0 reason unspecified, 0 admin prohibited
          0 insufficient resources, 0 home reg not supported
          0 not home subnet, 0 not home agent for node
          0 DAD failed, 0 sequence number
        Binding Errors sent:0
          0 no binding, 0 unknown MH

  Home Agent Traffic:
    6477 registrations, 0 deregistrations
    00:00:23 since last accepted HA registration
    unknown time since last failed HA registration
    unknown last failed registration code
    Traffic forwarded:
      0 tunneled, 0 reversed tunneled
    Dynamic Home Agent Address Discovery:
      1 requests received, 1 replies sent
    Mobile Prefix Discovery:
      0 solicitations received, 0 advertisements sent
```

Table 195 describes the significant fields shown in the display.

Table 195 show ipv6 mobile traffic Field Descriptions

Field	Description
MIPv6 statistics:	Information about binding updates received by the mobility agent.
Sent:	Information about binding acknowledgments sent by the mobility agent.
Binding Errors sent:	Information about binding errors sent by the mobility agent.

Table 195 show ipv6 mobile traffic Field Descriptions (continued)

Field	Description
Home Agent Traffic: 6477 registrations, 0 deregistrations	Number of registrations and deregistrations accepted by the home agent.
00:00:23 since last accepted HA registration	Length of time since the last registration was accepted by the home agent.
unknown time since last failed HA registration	Length of time since the last failed registration by the home agent.
unknown last failed registration code	Reason why the registration failed, if it did fail.
Dynamic Home Agent Address Discovery:	Number of dynamic home agent discovery requests received and replies sent.
Mobile Prefix Discovery:	Number of mobile prefix discovery solicitations received and advertisements sent by the home agent.

Related Commands

Command	Description
binding	Configures binding options for the Mobile IPv6 home agent feature in home agent configuration mode.

show ipv6 mobile tunnels

To list the Mobile IPv6 tunnels on the home agent, use the **show ipv6 mobile tunnels** command in user EXEC or privileged EXEC mode.

show ipv6 mobile tunnels [**summary** | **tunnel** *if-number*]

Syntax Description

tunnel *if-number*	(Optional) Tunnel interface.
summary	(Optional) Summary of tunnels on the home agent.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.4(11)T	This command was introduced.

Usage Guidelines

The **show ipv6 mobile tunnels** command displays active tunnels on the Mobile IPv6 home agent. Use the **summary** keyword to view a summary of all tunnels on the home agent, or the **tunnel** *if-number* keyword and argument to view information on a specific tunnel.

Examples

The following example displays information about the Mobile IPv6 tunnels on the home agent:

```
Router# show ipv6 mobile tunnels

Tunnel1:
 Source: 2001:0DB1:1:1
 Destination: 2001:0DB1:2:1
 Encapsulation Mode: IPv6/IPv6
 Egress Interface: Ethernet 1/0
 Switching Mode: Process
 Keep-Alive: Not Supported
 Path MTU Discovery: Enabled
 Input: 20 packets, 1200 bytes, 0 drops
 Output: 20 packets, 1200 bytes, 0 drops
 NEMO Options: Not Supported
```

Table 180 describes the significant fields shown in the display.

Table 196 show ipv6 mobile tunnels Field Descriptions

Field	Description
Source:	Source IPv6 tunnel address.
Destination:	Destination IPv6 tunnel address.
Encapsulation Mode:	Tunnel encapsulation type.
Egress interface:	Interface used for egress (outgoing packets).

Table 196 show ipv6 mobile tunnels Field Descriptions (continued)

Field	Description
Switching mode:	Type of switching mode used.
Keep-alive:	Supported or not supported.
Path MTU Discovery:	Enabled or disabled.
Input:	Number of packets in.
Output:	Number of packets out.
NEMO Options:	Supported or not supported.

Related Commands

Command	Description
show ipv6 mobile home-agent	Displays local and discovered neighboring home agents.

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.

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)
```

Table 197 describes the significant fields shown in the display.

Table 197 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.
15.1(4)M	The **vrf** *vrf-name* keyword and argument were added.

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 Table 198.

Table 198 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
```

Table 199 describes the significant fields shown in the display.

Table 199 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.
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 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
```

Table 200 describes the significant fields shown in the display.

Table 200 show ipv6 mroute Field Descriptions

Field	Description
Flags:	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 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.
	• 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.

Table 200 show ipv6 mroute Field Descriptions (continued)

Field	Description
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.
(*, 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.
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)
```

Table 201 describes the significant fields shown in the display.

Table 201 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 mtu

To display maximum transmission unit (MTU) cache information for IPv6 interfaces, use the **show ipv6 mtu** command in user EXEC or privileged EXEC mode.

show ipv6 mtu [**vrf** *vrfname*]

Syntax Description

vrf	(Optional) Displays an IPv6 Virtual Private Network (VPN) routing/forwarding instance (VRF).
vrfname	(Optional) Name of the IPv6 VRF.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.2(2)T	This command was introduced.
12.0(21)ST	This command was integrated into Cisco IOS Release 12.0(21)ST.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)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)SB	The **vrf** keyword and *vrfname* argument were added.

Usage Guidelines

The **vrf** keyword and *vrfname* argument allow you to view MTUs related to a specific VRF.

Examples

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

```
Router# show ipv6 mtu

MTU     Since    Destination Address
1400    00:04:21  5000:1::3
1280    00:04:50  FE80::203:A0FF:FED6:141D
```

The following is sample output from the **show ipv6 mtu** command using the **vrf** keyword and *vrfname* argument. This example provides information about the VRF named vrfname1:

```
Router# show ipv6 mtu vrf vrfname1

MTU   Since       Source Address     Destination Address
1300  00:00:04    2001:0DB8:2        2001:0DB8:7
```

Table 202 describes the significant fields shown in the display.

Table 202 show ipv6 mtu Field Descriptions

Field	Description
MTU	MTU, which was contained in the Internet Control Message Protocol (ICMP) packet-too-big message, used for the path to the destination address.
Since	Age of the entry since the ICMP packet-too-big message was received.
Destination Address	Address contained in the received ICMP packet-too-big message. Packets originating from this router to this address should be no bigger than the given MTU.

Related Commands

Command	Description
ipv6 mtu	Sets the MTU size of IPv6 packets sent on an interface.

show ipv6 nat statistics

To display Network Address Translation—Protocol Translation (NAT-PT) statistics, use the **show iv6 nat statistics** command in user EXEC or privileged EXEC mode.

show ipv6 nat statistics

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.2(13)T	This command was introduced.

Examples

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

```
Router# show ipv6 nat statistics

Total active translations: 4 (2 static, 2 dynamic; 2 extended)
NAT-PT interfaces:
  Ethernet3/1, Ethernet3/3
Hits: 1  Misses: 1
Expired translations: 0
```

Table 203 describes the significant fields shown in the display.

Table 203 show ipv6 nat statistics Field Descriptions

Field	Description
Total active translations	Number of translations active in the system. This number increments by one each time a translation is created and is decremented each time a translation is cleared or times out. Displays the numbers for each type of translation.
NAT-PT interfaces	The interfaces, by type and number, that are configured to run NAT-PT translations.
Hits	Number of times the software does a translations table lookup and finds an entry.
Misses	Number of times the software does a translations table lookup, fails to find an entry, and must try to create one.
Expired translations	Cumulative count of translations that have expired since the router was booted.

Related Commands

Command	Description
show ipv6 nat translations	Displays active NAT-PT translations.