MFIB Display Enhancements

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The Multicast Forwarding Information Base (MFIB) architecture provides modularity and separation between the multicast control plane (Protocol Independent Multicast [PIM] and Internet Group Management Protocol [IGMP]) and the multicast forwarding plane (MFIB). This architecture is used in Cisco IOS IPv6 multicast implementations. With the introduction of the IPv4 MFIB infrastructure, the Cisco IOS IPv4 multicast implementation has been enhanced, making the MFIB forwarding model the only forwarding engine used. The MFIB: Display Enhancements feature for IPv6 provides an enhanced display of MFIB data to provide better and more complete information for troubleshooting MFIB.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

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

Information About MFIB Display Enhancements

MFIB

The MFIB is a platform-independent and routing-protocol-independent library for IPv6 software. Its main purpose is to provide a Cisco platform with an interface with which to read the IPv6 multicast forwarding

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table and notifications when the forwarding table changes. The information provided by the MFIB has clearly defined forwarding semantics and is designed to make it easy for the platform to translate to its specific hardware or software forwarding mechanisms.

When routing or topology changes occur in the network, the IPv6 routing table is updated, and those changes are reflected in the MFIB. The MFIB maintains next-hop address information based on the information in the IPv6 routing table. Because there is a one-to-one correlation between MFIB entries and routing table entries, the MFIB contains all known routes and eliminates the need for route cache maintenance that is associated with switching paths such as fast switching and optimum switching.

How to Use MFIB Display Enhancements

Verifying MFIB Operation in IPv6 Multicast

Note Multicast forwarding is automatically enabled when IPv6 multicast routing is enabled.

SUMMARY STEPS

1. **enable**
2. **show ipv6 mfib** [**vrf** *vrf-name*] [**link-local** | **verbose** | *group-address-name* | *ipv6-prefix* / *prefix-length* | *source-address-name*| **active** | **count** | **interface** | **status** | **summary**]
3. **show ipv6 mfib** [**vrf** *vrf-name*] [**link-local**| *group-name* | *group-address*] **active** [*kbps*]
4. **show ipv6 mfib** [**vrf** *vrf-name*] [**all** | **linkscope**| *group-name* | *group-address* [*source-name* | *source-address*]] **count**
5. **show ipv6 mfib interface**
6. **show ipv6 mfib status**
7. **show ipv6 mfib** [**vrf** *vrf-name*] **summary**
8. **debug ipv6 mfib** [**vrf** *vrf-name*] [*group-name*| *group-address*] [**adjacency** | **db** | **fs** | **init** | **interface** | **mrib** [**detail**] | **nat** | **pak** | **platform** | **ppr** | **ps** | **signal** | **table**]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. - Enter your password if prompted.

	Command or Action	Purpose
Step 2	**show ipv6 mfib** [**vrf** *vrf-name*] [**link-local**	**verbose**	*group-address-name*	*ipv6-prefix* **/** *prefix-length*	*source-address-name*| **active**	**count**	**interface**	**status**	**summary**] **Example:** `Device# show ipv6 mfib`	Displays the forwarding entries and interfaces in the IPv6 MFIB.
Step 3	**show ipv6 mfib** [**vrf** *vrf-name*] [**link-local**	*group-name*	*group-address*] **active** [*kbps*] **Example:** `Device# show ipv6 mfib active`	Displays the rate at which active sources are sending to multicast groups.
Step 4	**show ipv6 mfib** [**vrf** *vrf-name*] [**all**	**linkscope**	*group-name*	*group-address* [*source-name*	*source-address*]] **count** **Example:** `Device# show ipv6 mfib count`	Displays summary traffic statistics from the MFIB about the group and source.
Step 5	**show ipv6 mfib interface** **Example:** `Device# show ipv6 mfib interface`	Displays information about IPv6 multicast-enabled interfaces and their forwarding status.
Step 6	**show ipv6 mfib status** **Example:** `Device# show ipv6 mfib status`	Displays general MFIB configuration and operational status.
Step 7	**show ipv6 mfib** [**vrf** *vrf-name*] **summary** **Example:** `Device# show ipv6 mfib summary`	Displays summary information about the number of IPv6 MFIB entries and interfaces.

Command or Action	Purpose
Step 8 **debug ipv6 mfib** [**vrf** *vrf-name*] [*group-name* | *group-address*] [**adjacency** | **db** | **fs** | **init** | **interface** | **mrib** [**detail**] | **nat** | **pak** | **platform** | **ppr** | **ps** | **signal** | **table**] **Example:** `Device# debug ipv6 mfib FF04::10 pak`	Enables debugging output on the IPv6 MFIB.

Resetting MFIB Traffic Counters

SUMMARY STEPS

1. **enable**
2. **clear ipv6 mfib** [**vrf** *vrf-name*] **counters** [*group-name* \| *group-address* [*source-address* \| *source-name*]]

DETAILED STEPS

Command or Action	Purpose
Step 1 **enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2 **clear ipv6 mfib** [**vrf** *vrf-name*] **counters** [*group-name* | *group-address* [*source-address* | *source-name*]] **Example:** `Device# clear ipv6 mfib counters FF04::10`	Resets all active MFIB traffic counters.

Disabling MFIB on the device

Multicast forwarding is automatically enabled when IPv6 multicast routing is enabled. However, a user may want to disable multicast forwarding on the router.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **no ipv6 mfib**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** Device> enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** Device# configure terminal	Enters global configuration mode.
Step 3	**no ipv6 mfib** **Example:** Device(config)# no ipv6 mfib	Disables IPv6 multicast forwarding on the device.

Disabling MFIB Interrupt-Level IPv6 Multicast Forwarding

MFIB interrupt-level IPv6 multicast forwarding of outgoing packets on a specific interface is enabled on interfaces that support Cisco Express Forwarding. However, you may want to disable MFIB interrupt-level forwarding on a specified interface.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **no ipv6 mfib cef output**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** Device> enable	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**interface** *type number* **Example:** `Device(config)# interface FastEthernet 1/0`	Specifies an interface type and number, and places the device in interface configuration mode.
Step 4	**no ipv6 mfib cef output** **Example:** `Device(config-if)# no ipv6 mfib cef output`	Disables MFIB interrupt-level IPv6 multicast forwarding of outgoing packets on a specific interface.

Configuration Examples for MFIB Display Enhancements

Example: MFIB Display Enhancements

Sample Output from the show ipv6 mfib Command

The following example displays the forwarding entries and interfaces in the MFIB.

```
Device# 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:DB8:1:1:200,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
```

Sample Output from the show ipv6 mfib active Command

The following example displays statistics on the rate at which active IP multicast sources are sending information. The device is switching traffic from 2001:DB8:1:1:200 to FF05::1:

```
Device# show ipv6 mfib active

Active IPv6 Multicast Sources - sending >= 4 kbps
Group: FF05::1
  Source: 2001:DB8:1:1:200
    Rate: 20 pps/16 kbps(1sec), 0 kbps(last 128 sec)
```

Sample Output from the show ipv6 mfib count Command

The following example displays statistics from the MFIB about the group and source. The device is switching traffic from 2001:DB8:1:1:200 to FF05::1:

```
Device# show ipv6 mfib count

IP Multicast Statistics
54 routes, 7 groups, 0.14 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: FF00::/8
  RP-tree:    Forwarding: 0/0/0/0, Other: 0/0/0
Group: FF00::/15
  RP-tree:    Forwarding: 0/0/0/0, Other: 0/0/0
Group: FF05::1
  RP-tree:    Forwarding: 2/0/100/0, Other: 0/0/0
  Source: 10::1:1:200,   Forwarding: 367/10/100/7, Other: 0/0/0
  Tot. shown: Source count: 1, pkt count: 369
Group: FF10::/15
  RP-tree:    Forwarding: 0/0/0/0, Other: 0/0/0
Group: FF20::/15
  RP-tree:    Forwarding: 0/0/0/0, Other: 0/0/0
```

Sample Output from the show ipv6 mfib interface Command

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

```
Device# 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       ,?        ]
```

Sample Output from the show ipv6 mfib summary Command

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

```
Device# show ipv6 mfib summary

IPv6 MFIB summary:
  54     total entries [1 (S,G), 7 (*,G), 46 (*,G/m)]
  17     total MFIB interfaces
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	*Cisco IOS Master Commands List, All Releases*
IP multicast commands	*Cisco IOS IP Multicast Command Reference*
IPv6 commands	*Cisco IOS IPv6 Command Reference*
IPv6 features	*Cisco IOS IPv6 Feature Mapping*
IPv6 addressing and connectivity	*IPv6 Configuration Guide*

Standards and RFCs

Standard/RFC	Title
RFCs for IPv6	*IPv6 RFCs*

MIBs

MIB	MIBs Link
No new or modified MIBs are supported, and support for existing MIBs has not been modified.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for MFIB Display Enhancements

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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

Table 1   Feature Information for MFIB Display Enhancements

Feature Name	Releases	Feature Information
MFIB: Display Enhancements	12.0(26)S 12.2(18)S 12.3(2)T 12.4 12.4(2)T	The MFIB: Display Enhancements feature for IPv6 provides an enhanced display of MFIB data to provide better and more complete information for troubleshooting MFIB. The following command was introduced: **show ipv6 mfib**.