



Multicast Routing and Forwarding Commands on Cisco ASR 9000 Series Router

This module describes the commands used to configure and monitor multicast routing on *the Cisco ASR 9000 Series Router*.

For detailed information about multicast routing concepts, configuration tasks, and examples, refer to the *Implementing Multicast Routing on Cisco IOS XR Software* configuration module in the *Cisco ASR 9000 Series Aggregation Services Router Multicast Configuration Guide*.

- [accounting per-prefix, page 4](#)
- [accounting per-prefix forward-only, page 6](#)
- [address-family \(multicast\), page 8](#)
- [boundary, page 11](#)
- [clear mfib counter, page 12](#)
- [clear mfib database, page 14](#)
- [clear mfib hardware adjacency-counters, page 15](#)
- [clear mfib hardware resource-counters, page 17](#)
- [clear mfib hardware route statistics, page 19](#)
- [disable \(multicast\), page 21](#)
- [enable \(multicast\), page 23](#)
- [forwarding-latency, page 25](#)
- [interface \(multicast\), page 27](#)
- [interface all enable, page 29](#)
- [interface-inheritance disable, page 31](#)
- [log-traps, page 33](#)
- [maximum disable, page 34](#)
- [mdt data, page 35](#)

- [mdt default](#), page 37
- [mdt mtu](#), page 39
- [mdt source](#), page 41
- [mhost default-interface](#), page 43
- [multicast-routing](#), page 45
- [multipath](#), page 47
- [nsf\(multicast\)](#), page 49
- [oom-handling](#), page 51
- [rate-per-route](#), page 53
- [show mfib connections](#), page 54
- [show mfib counter](#), page 56
- [show mfib encap-info](#), page 58
- [show mfib hardware interface](#), page 60
- [show mfib hardware ltrace](#), page 65
- [show mfib hardware resource-counters](#), page 69
- [show mfib hardware route accept-bitmap](#), page 72
- [show mfib hardware route internal](#), page 74
- [show mfib hardware route mofrr](#), page 79
- [show mfib hardware route olist](#), page 85
- [show mfib hardware route statistics](#), page 95
- [show mfib hardware route summary](#), page 99
- [show mfib hardware table](#), page 102
- [show mfib interface](#), page 104
- [show mfib nsf](#), page 107
- [show mfib route](#), page 110
- [show mfib table-info](#), page 116
- [show mhost default-interface](#), page 119
- [show mhost groups](#), page 121
- [show mrrib client](#), page 123
- [show mrrib nsf](#), page 126
- [show mrrib platform trace](#), page 128
- [show mrrib route](#), page 130
- [show mrrib route-collapse](#), page 132

- [show mrib route outgoing-interface](#), page 134
- [show mrib table-info](#), page 136
- [show mrib tlc](#), page 138
- [static-rpf](#), page 140
- [ttl-threshold \(multicast\)](#), page 142
- [vrf \(multicast\)](#), page 144

accounting per-prefix

To enable accounting for multicast routing, use the **accounting per-prefix** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

accounting per-prefix

no accounting per-prefix

Syntax Description This command has no keywords or arguments.

Command Default This feature is disabled by default.

Command Modes

- Multicast routing configuration
- Multicast routing address family IPv4 configuration
- Multicast VRF configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **accounting per-prefix** command is used to enable per-prefix counters only in hardware. Cisco IOS XR Software counters are always present. When enabled, every existing and new (S, G) route is assigned forward, punt, and drop counters on the ingress route and forward and punt counters on the egress route. The (*, G) routes are assigned a single counter.

There are a limited number of counters on all nodes. When a command is enabled, counters are assigned to routes only if they are available.

To display packet statistics, use the **show mfib route** and the **show mfib hardware route statistics** commands. These commands display “N/A” for counters when no hardware statistics are available or when the **accounting per-prefix** command is disabled.

Task ID	Task ID	Operations
	multicast	read, write

Examples

The following example shows how to enable accounting for multicast routing:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing  
RP/0/RSP0/CPU0:router(config-mcast)# accounting per-prefix
```

Related Commands

Command	Description
clear mfib hardware resource-counters , on page 17	Clears global resource counters.
show mfib hardware route statistics , on page 95	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib route , on page 110	Displays route entries in the Multicast Forwarding Information Base (MFIB).

accounting per-prefix forward-only

To reduce hardware statistics resource allocations when enabling accounting, particularly for multicast VPN (MVPN), use the **accounting per-prefix forward-only** command under multicast routing configuration mode. To return to the default mode of [accounting per-prefix](#), [on page 4](#), use the **no** form of this command.

accounting per-prefix forward-only

no accounting per-prefix forward-only

Syntax Description This command has no keywords or arguments.

Command Default If no counters were configured, there is no default.
If the accounting per-prefix counter was previously configured, it becomes the default.
If no accounting was configured for multicast routing, forwarding-only is the default mode and triggers a data MDT transition in the case of MVPN deployment.

Command Modes Multicast routing configuration
Multicast routing address family IPv4 and IPv6 configuration
Multicast VRF configuration

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.



Note The **accounting per-prefix forward-only** command has only one *fwd-only* counter. In other words, there is no *punt* or *drop* counter allocated.

We recommend this command for configuration of multicast VPN routing or for any line card that has a route-intensive configuration. Each individual router can support up to 150,000 routes.



Note To verify the number of statistics allocated or free on a line card, use the [show mfib hardware resource-counters](#), [on page 69](#) command in EXEC mode.

There are a limited number of counters on all nodes. When accounting on a prefix is enabled, counters are assigned to routes only if they are available.

To display packet statistics, use the **show mfib route** and the **show mfib hardware route statistics** commands. These commands display “N/A” for counters when no hardware statistics are available or when neither the [accounting per-prefix, on page 4](#) command nor the **accounting per-prefix forward-only** command are enabled.

You may switch between **accounting-perprefix** and **accounting per-prefix forward-only** statistics for ipv4 or ipv6 multicast family. However, be aware that only one set of counters is supported on the (*,G) routes (with fwd/punt/drop on ingress and fwd/drop on egress) regardless of whether you enabled the **accounting-perprefix** or **accounting-perprefix fwd-only** command.

Although you can switch accounting modes, this involves freeing the hardware statistics and reallocating them, thereby resulting in a loss of any previously collected data. Therefore, it is preferable to decide which statistics mode you want to use at the start to avoid the resource cost entailed by resetting the statistics counter values with a change in mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable accounting per-prefix forward-only for MVPN routing:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# accounting per-prefix forward-only
```

Related Commands

Command	Description
accounting per-prefix, on page 4	Enables accounting for multicast routing.
clear mfib hardware resource-counters, on page 17	Clears global resource counters.

address-family (multicast)

To display available IP prefixes to enable multicast routing and forwarding on all router interfaces, use the **address-family** command in multicast-routing configuration mode or multicast VRF configuration submode. To disable use of an IP address prefix for routing, use the **no** form of this command.

```
address-family [vrf vrf-name] ipv4
```

```
address-family [vrf vrf-name] ipv4
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	Specifies IPv4 address prefixes.

Command Default

No default behavior or values

Command Modes

Multicast routing configuration

Multicast VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **address-family** command either from multicast routing configuration mode or from multicast VRF configuration submode to enter multicast IPv4 address family configuration submode.

- Multicast Routing Information Base (MRIB)
- Multicast Forwarding Engine (MFWD)
- Protocol Independent Multicast Sparse mode (PIM-SM)
- Internet Group Management Protocol (IGMP)
- Multicast Listener Discovery Protocol (MLD)

Basic multicast services start automatically when the multicast PIE is installed, without any explicit configuration required. The following multicast services are started automatically:

- Multicast Routing Information Base (MRIB)

- Multicast Forwarding Engine (MFWD)
- Protocol Independent Multicast Sparse mode (PIM-SM)
- Internet Group Management Protocol (IGMP)

Other multicast services require explicit configuration before they start. For example, to start the Multicast Source Discovery Protocol (MSDP) process, you must enter the **router msdp** command and explicitly configure it.

To enable multicast routing and protocols on interfaces, you must explicitly enable the interfaces using the **interface** command in multicast routing configuration mode. This action can be performed on individual interfaces or by configuring a wildcard interface using the **alias** command.

To enable multicast routing on all interfaces, use the **interface all enable** command in multicast routing configuration mode. For any interface to be fully enabled for multicast routing, it must be enabled specifically (or configured through the **interface all enable** command for all interfaces) in multicast routing configuration mode, and it must not be disabled in the PIM and IGMP configuration modes.

**Note**

The **enable** and **disable** keywords available under the IGMP and PIM interface configuration modes have no effect unless the interface is enabled in multicast routing configuration mode—either by default or by explicit interface configuration.

To allow multicast forwarding functionality, while turning multicast routing functionality off, [interface-inheritance disable, on page 31](#) command on a per interface or **interface all enable** basis in PIM or IGMP configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enter IPv4 multicast routing configuration mode:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# address-family
ipv4
```

```
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4
)#
```

The following example shows how to enter IPv4 VRF multicast routing configuration submode:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf-name address-family
ipv4
```

```
RP/0/RSP0/CPU0:router(config-mcast-vrf-name-ipv4
)#
```

Related Commands

Command	Description
alias	Creates a command alias.
interface all enable, on page 29	Enables multicast routing and forwarding on all new and existing interfaces.
interface-inheritance disable, on page 31	Separates the disabling of multicast routing and forwarding.
interface (multicast), on page 27	Configures multicast interface properties.

boundary

To configure the multicast boundary on an interface for administratively scoped multicast addresses, use the **boundary** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

boundary *access-list*

no boundary *access-list*

Syntax Description

<i>access-list</i>	Access list specifying scoped multicast groups. The name cannot contain a space or quotation mark; it may contain numbers.
--------------------	--

Command Default

A multicast boundary is not configured.

Command Modes

Multicast routing interface configuration

Multicast routing VRF interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **boundary** command is used to set up a boundary to keep multicast packets from being forwarded.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to set up a boundary for all administratively scoped addresses:

```
RP/0/RSP0/CPU0:router# access-list 1 deny 239.0.0.0 0.255.255.255
RP/0/RSP0/CPU0:router# access-list 1 permit 224.0.0.0 15.255.255.255
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# interface GigE 0/2/0/2
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# boundary 1
```

clear mfib counter

To clear Multicast Forwarding Information Base (MFIB) route packet counters, use the **clear mfib counter** command in EXEC mode.

```
clear mfib [vrf vrf-name] ipv4 counter [group-address| source-address] [location {node-id| all}]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>group-address</i>	(Optional) IP address of the multicast group.
<i>source-address</i>	(Optional) IP address of the source of the multicast route.
location <i>node-id</i>	(Optional) Clears route packet counters from the designated node.
all	The all keyword clears route packet counters on all nodes

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.



Note

This command only clears MFIB route packet software counters. To clear MFIB hardware statistics counters use the **clear mfib hardware route statistics** command.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to clear MFIB route packet counters on all nodes:

```
RP/0/RSP0/CPU0:router# clear mfib counter location all
```

clear mfib database

To clear the Multicast Forwarding Information Base (MFIB) database, use the **clear mfib database** command in EXEC mode.

clear mfib ipv4 database [**location** {*node-id*} **all**]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	(Optional) Clears global resource counters from the designated node.
all	The all keyword clears all global resource counters.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

The following example shows how to clear the Multicast Forwarding Information Base (MFIB) database on all nodes:

```
RP/0/RSP0/CPU0:router# clear mfib database location all
```

clear mfib hardware adjacency-counters

To clear the platform-specific information related to resource counters for the Multicast Forwarding Information Base, use the **clear mfib hardware adjacency-counters** command in EXEC mode.

```
clear mfib [vrf vrf-name] [ipv4] hardware adjacency-counters [rx|tx] [location {node-id|all}]
```

Syntax Description	
vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
rx	Clears adjacency counters for packets received.
tx	Clears adjacency counters for packets sent.
location <i>node-id</i>	(Optional) Clears adjacency counters from the designated node.

Command Default IPv4 addressing is the default.

Command Modes EXEC

Command History	Release	Modification
	Release 4.0.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read, write, execute

Examples The following example shows how to clear all adjacency counters:

```
RP/0/RSP0/CPU0:router# clear mfib hardware adjacency-counters rx location all
```

```
clear mfib hardware adjacency-counters
```

Related Commands

Command	Description
show mfib hardware resource-counters , on page 69	Displays the allocated and freed hardware resources for the Multicast Forwarding Information Base (MFIB) process.

clear mfib hardware resource-counters

To clear global resource counters, use the **clear mfib hardware resource-counters** command in EXEC mode.

```
clear mfib [vrf vrf-name] [ipv4|ipv6] hardware resource-counters [location {node-id|all}]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	(Optional) Clears global resource counters from the designated node.
all	The all keyword clears all global resource counters.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear mfib hardware resource-counters** to estimate resource usage for an operation.

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

The following example shows how to clear all global resource counters:

```
RP/0/RSP0/CPU0:router# clear mfib hardware resource-counters location all
```

```
clear mfib hardware resource-counters
```

Related Commands

Command	Description
show mfib hardware resource-counters , on page 69	Displays the allocated and freed hardware resources for the Multicast Forwarding Information Base (MFIB) process.

clear mfib hardware route statistics

To reset all allocated counter values matching (S,G) or (*,G) criteria , use the **clear mfib hardware route statistics** command in EXEC mode.

```
clear mfib [vrf vrf-name] [ipv4] hardware route statistics ingress-and-egress [*| source-address]
[group-address [/prefix-length]] [location {node-id all}]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
ingress-and-egress	(Optional) Clears hardware statistics on both the incoming (ingress) and outgoing (egress) routes.
*	(Optional) Clears shared tree route statistics.
<i>source-address</i>	(Optional) IP address or hostname of the multicast route source.
<i>group-address</i>	(Optional) IP address or hostname of the multicast group.
<i>/ prefix-length</i>	(Optional) Prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
location	(Optional) Clears route packet counters from the designated node.
<i>node-id</i>	The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
all	The all keyword clears route packet counters on all nodes

Command Default

If not specified, IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs.

The Multicast Forwarding (MFWD) process exists on each line card and assigns hardware counters to each (S, G) route. Additionally, one global counter is assigned for all (*, G) routes, depending on resource availability.

To clear the set of counters for (*, G) routes, the MFWD process assigns a single set of counters to count packets that match (*, G) routes. Consequently, the **clear mfib hardware route statistics** command must be used in a form that either clears counters on all routes or matches all (*, G) routes.

**Note**

This command only clears MFIB hardware statistics counters. To clear MFIB route packet software counters, use the **clear mfib counter** command.

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

The following command shows how to clear counters by route statistics for all multicast routes on both ingress and egress forwarding engines for the line card 0/1/CPU0:

```
RP/0/RSP0/CPU0:router# clear mfib ipv4 hardware route statistics ingress-and-egress location 0/1/CPU0
```

Related Commands

Command	Description
show mfib hardware route statistics , on page 95	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.

disable (multicast)

To disable multicast routing and forwarding on an interface, use the **disable** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

disable

no disable

Syntax Description This command has no keywords or arguments.

Command Default Multicast routing and forwarding settings are inherited from the global **interface enable all** command. Otherwise, multicast routing and forwarding is disabled.

Command Modes Multicast routing interface configuration
Multicast routing VRF interface configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **disable** command modifies the behavior of a specific interface to disabled. This command is useful if you want to disable multicast routing on specific interfaces, but leave it enabled on all remaining interfaces.

The following guidelines apply when the **enable** and **disable** commands (and the **no** forms) are used in conjunction with the **interface all enable** command:

- If the **interface all enable** command is configured:
 - The **enable** and **no** forms of the command have no additional effect on a specific interface.
 - The **disable** command disables multicast routing on a specific interface.
 - The **no disable** command enables a previously disabled interface.
- If the **interface all enable** command is not configured:
 - The **enable** command enables multicast routing on a specific interface.
 - The **no enable** command enables the previously disabled interface.
 - The **disable** and **no** forms of the command have no additional effect on a specific interface.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable multicast routing on all interfaces and disable the feature only on GigabitEthernet interface 0/1/0/0:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# interface all enable
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# interface GigE 0/1/0/0
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

Related Commands

Command	Description
enable (multicast), on page 23	Enables multicast routing and forwarding on an interface.
interface all enable, on page 29	Enables multicast routing and forwarding on all new and existing interfaces.

enable (multicast)

To enable multicast routing and forwarding on an interface, use the **enable** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

enable

no enable

Syntax Description This command has no keywords or arguments.

Command Default Multicast routing and forwarding settings are inherited from the global **interface enable all** command. Otherwise, multicast routing and forwarding is disabled.

Command Modes Multicast routing interface configuration
Multicast routing VRF interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **enable** command modifies the behavior of a specific interface to enabled. This command is useful if you want to enable multicast routing on specific interfaces, but leave it disabled on all remaining interfaces.

The following guidelines apply when the **enable** and **disable** commands (and the **no** forms) are used in conjunction with the **interface all enable** command:

- If the **interface all enable** command is configured:
 - The **enable** and **no** forms of the command have no additional effect on a specific interface.
 - The **disable** command disables multicast routing on a specific interface.
 - The **no disable** command enables a previously disabled interface.
- If the **interface all enable** command is not configured:
 - The **enable** command enables multicast routing on a specific interface.
 - The **no enable** command enables a previously enabled interface.
 - The **disable** and **no** forms of the command have no additional effect on a specific interface.

enable (multicast)

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable multicast routing on a specific interface only:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# interface GigE 0/1/0/0
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# enable
```

Related Commands

Command	Description
disable (multicast), on page 21	Disables multicast routing and forwarding on an interface.
interface all enable, on page 29	Enables multicast routing and forwarding on all new and existing interfaces.

forwarding-latency

To delay traffic being forwarded on a route, use the **forwarding-latency** command. To return to the default behavior, use the **no** form of this command.

forwarding-latency [*delay milliseconds*]

no forwarding-latency

Syntax Description

delay milliseconds	(Optional) Specifies the delay time in milliseconds. Range is 5 - 500.
---------------------------	--

Command Default

The default delay time is 30 milliseconds.

Command Modes

Multicast routing configuration
IPv4 and IPv6 multicast routing configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **forwarding-latency** command when you expect a receiver to leave and rejoin the same multicast group within a very short period such as 20 or 30 milliseconds. The delay may be required to provide the router sufficient time to update its Multicast Forwarding Information Base (MFIB) table.

When the **forwarding-latency** command is enabled, each interface is allocated a separate table lookup unit (TLU) block in the output interface list (olist), thereby increasing TLU hardware resource usage, and, for this reason, it should be used with caution when many multicast routes are present.

When the **forwarding-latency** command is disabled, up to three interfaces may share a single TLU block in the olist.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to delay traffic from being forwarded for 120 milliseconds:

```
RP/0/RSP0/CPU0:router# configure  
RP/0/RSP0/CPU0:router(config)# multicast-routing  
RP/0/RSP0/CPU0:router# forwarding-latency delay 120
```

interface (multicast)

To configure multicast interface properties, use the **interface** command in the appropriate configuration mode. To disable multicast routing for interfaces, use the **no** form of this command.

interface *type interface-path-id*

no interface *type interface-path-id*

Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

No default behavior or values

Command Modes

Multicast routing configuration
IPv4 or multicast routing configuration
Multicast VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **interface** command to configure multicast routing properties for specific interfaces.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable multicast routing on all interfaces and disable the feature only on GigabitEthernet interface 0/1/0/0:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# interface all enable
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# interface GigE 0/1/0/0

RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

Related Commands

Command	Description
disable (multicast), on page 21	Disables multicast routing and forwarding on an interface.
enable (multicast), on page 23	Enables multicast routing and forwarding on an interface.
interface all enable, on page 29	Enables multicast routing and forwarding on all new and existing interfaces.

interface all enable

To enable multicast routing and forwarding on all new and existing interfaces, use the **interface all enable** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

interface all enable

no interface all enable

Syntax Description This command has no keywords or arguments.

Command Default Multicast routing and forwarding is disabled by default.

Command Modes Multicast routing configuration
Multicast VRF configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command modifies the default behavior for all new and existing interfaces to enabled unless overridden by the **enable** or **disable** keywords available in interface configuration mode.

The following guidelines apply when the **enable** and **disable** commands (and the **no** forms) are used in conjunction with the **interface all enable** command:

- If the **interface all enable** command is configured:
 - The **enable** and **no** forms of the command have no additional effect on a specific interface.
 - The **disable** command disables multicast routing on a specific interface.
 - The **no disable** command enables a previously disabled interface.
- If the **interface all enable** command is not configured:
 - The **enable** command enables multicast routing on a specific interface.
 - The **no enable** command enables a previously enabled interface.
 - The **disable** and **no** forms of the command have no additional effect on a specific interface.

interface all enable

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable multicast routing on all interfaces and disable the feature only on GigabitEthernet interface 0/1/0/0:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# interface all enable
RP/0/RSP0/CPU0:router(config-mcast)# interface GigE 0/1/0/0
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

Related Commands

Command	Description
disable (multicast), on page 21	Disables multicast routing and forwarding on an interface.
enable (multicast), on page 23	Enables multicast routing and forwarding on an interface.

interface-inheritance disable

To separate PIM and IGMP routing from multicast forwarding on all interfaces, use the **interface-inheritance disable** command under multicast routing address-family IPv4 submode. To restore the default functionality, use the **no** form of the command.

interface-inheritance disable
no interface-inheritance disable

Syntax Description This command has no keywords or arguments.

Command Default This feature is not enabled by default.

Command Modes Multicast routing configuration
 Address- family IPv4 configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use of the **interface-inheritance disable** command together with the **interface type interface-path-id** or **interface all enable** command under multicast routing address-family IPv4 submode separates PIM and IGMP routing functionality from multicast forwarding on specified interfaces. You can nonetheless enable multicast routing functionality explicitly under PIM or IGMP routing configuration mode for individual interfaces.



Note Although you can explicitly configure multicast routing functionality on individual interfaces, you cannot explicitly disable the functionality. You can only disable the functionality on all interfaces.

Used from the address-family ipv4 configuration submode, it prevents IGMP and PIM from inheriting the multicast-routing interface configuration.

Task ID	Task ID	Operations
	multicast	read, write

Examples

The following configuration disables PIM and IGMP routing functionality on all the interfaces using the **interface-inheritance disable** command, but multicast forwarding is still enabled on all the interfaces in the example, based on use of the keywords **interface all enable**.

PIM is enabled on *Loopback 0* based on its explicit configuration (**interface Loopback0 enable**) under router pim configuration mode.

IGMP protocol is enabled on GigabitEthernet0/6/0/3, because it too has been configured explicitly under router igmp configuration mode (**interface GigabitEthernet0/6/0/3 router enable**):

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# interface-inheritance disable
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# interface loopback 1 enable
```

```
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# show run router pim
```

With the **interface-inheritance disable** command in use, IGMP and PIM configuration are enabled in the protocol configuration as follows:

```
router igmp
  interface loopback 0
    router enable
```

```
router pim
  interface loopback 0
    enable
```

```
router pim vrf default address-family ipv4
  interface Loopback0
    enable
```

```
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# show run router igmp
```

```
router igmp
  vrf default
  interface GigabitEthernet0/6/0/3
    router enable
```


log-traps

To enable logging of trap events, use the **log-traps** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

log-traps
no log-traps

Syntax Description This command has no keywords or arguments.

Command Default This command is disabled by default.

Command Modes

- Multicast routing configuration
- Multicast routing address family IPv4 configuration
- Multicast VRF configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read, write

Examples The following example shows how to enable logging of trap events:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# log-traps
```

maximum disable

To disable maximum state limits, use the **maximum disable** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

maximum disable

no maximum disable

Syntax Description This command has no keywords or arguments.

Command Default Maximum state limits are enabled.

Command Modes

- Multicast routing configuration
- Multicast routing address family IPv4 configuration
- Multicast VRF configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **maximum disable** command to override the default software limit on the number of multicast routes.

Task ID	Task ID	Operations
	multicast	read, write

Examples The following example shows how to disable maximum state limits:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# maximum disable
```

mdt data

To configure multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN), use the **mdt data** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

mdt data *mdt-group-address/mask* [**threshold** *threshold-value*] [*acl-name*]

no mdt data *mdt-group-address/prefix-length* [**threshold** *threshold-value*] [*acl-name*]

Syntax Description

<i>mdt-group-address</i>	IP address of the MDT group.
<i>/ mask</i>	A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
threshold <i>threshold</i>	Specifies the traffic rate threshold to trigger data MDT. Range is 1 to 4294967295.
<i>acl-name</i>	Access list (ACL) for the customer's VRF groups allowed to perform data MDT.

Command Default

threshold : 1

Command Modes

Multicast routing configuration
 Multicast routing address family IPv4 and IPv6 configuration
 Multicast VRF configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.7.0	Additional keyword information was added to the command. The bottom of the threshold value range was increased by 1.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When certain multicast streams exceed a configured bandwidth, the multicast data is moved to an MDT data group that is dynamically chosen from an available pool of multicast addresses. If the traffic bandwidth falls

below the threshold, the source is switched back to the default MDT. To avoid transitions between the MDTs, traffic only reverts to the default MDT if traffic below the data MDT threshold is at least one minute old.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the data MDT group:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# mdt data 172.23.2.2/24 threshold 1200 acl_A
```

Related Commands

Command	Description
mdt default, on page 37	Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt mtu, on page 39	Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt source, on page 41	Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.

mdt default

To configure the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT), use the **mdt default** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

mdt default {*mdt-default-group-address*| **ipv4** *mdt-default-address*}

no mdt default {*mdt-default-group-address*| **ipv4** *mdt-default-address*}

Syntax Description

<i>mdt-default-group-address</i>	IP address of the MDT default group entered in <i>A.B.C.D.</i> format.
ipv4	Specifies IPv4-encapsulated MDT.
<i>mdt-default-address</i>	MDT IPv4 default address entered in <i>A.B.C.D.</i> format

Command Default

The MDT default group address must be unique.

Command Modes

Multicast routing configuration
 Multicast routing address family IPv4 and IPv6 configuration
 Multicast VRF configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.7.0	Additional keyword information was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The default MDT has a unique group address used to create MVPN multicast tunnel interfaces.

Although within the multicast VRF configuration submode, the MDT configuration uses either the **ipv4** or **ipv6** keyword to distinguish the appropriate multicast VPN, the MDT core tree is IPv4.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the MDT default group address from multicast routing configuration mode:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# mdt default
172.16.10.1
```

The following example shows how to configure the MDT default group address from multicast VRF configuration submode for an IPv6 address family:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf-name address-family ipv6
RP/0/RSP0/CPU0:router(config-mcast-vrf-name-ipv6)#mdt default 172.16.10.1
```

Related Commands

Command	Description
mdt data, on page 35	Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).
mdt mtu, on page 39	Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt source, on page 41	Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.

mdt mtu

To configure the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT), use the **mdt mtu** command in multicast VPN configuration mode. To remove this functionality, use the **no** form of this command.

mdt mtu *value*

no mdt mtu *value*

Syntax Description

<i>value</i>	Specifies the MTU value and ranges between 401 to 65535. The configured mdt mtu value includes 24 bytes of GRE encapsulation.
--------------	---

Command Default

The MDT tunnel default size is 1376.

Command Modes

Multicast VRF configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the MTU of the multicast distribution tree:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf_A
RP/0/RSP0/CPU0:router(config-mcast-vrf_A-ipv4)# mdt mtu 2345
```

Related Commands

Command	Description
mdt data, on page 35	Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).
mdt default, on page 37	Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt source, on page 41	Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.

mdt source

To configure the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address, use the **mdt source** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

mdt source *type interface-path-id*

no mdt source *type interface-path-id*

Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

No default behavior or values

Command Modes

Multicast routing configuration
Multicast routing address family IPv4 configuration
Multicast VRF configuration

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **mdt source** command to identify the root of the multicast distribution tree in the service provider network. This address is used to update all MVPN peers through multiprotocol BGP.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the interface used to set the MDT source address:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# mdt source POS 0/1/0/0
```

**Note**

Per VRF MDT Source is a new feature introduced in IOS XR Software Release 3.9.0 apart from the existing default MDT source. Each VRF can have its own MDT source interface co-existing with the default MDT source to achieve core diversity.

The following example shows how to configure a per VRF MDT source:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# mdt source loopback0
RP/0/RSP0/CPU0:router(config-mcast)# vrf foo
RP/0/RSP0/CPU0:router(config-mcast-foo)# address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast-foo-ipv4)# mdt source loopback1 !
```

Related Commands

Command	Description
mdt data, on page 35	Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).
mdt default, on page 37	Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt mtu, on page 39	Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).

mhost default-interface

To configure the default interface for IP multicast transmission and reception to and from the host stack, use the **mhost default-interface** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

mhost ipv4 default-interface *type interface-path-id*

no mhost ipv4 default-interface *type interface-path-id*

Syntax Description

ipv4	Specifies IPv4 address prefixes.
ipv6	Specifies IPv6 address prefixes.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

If no Multicast Host (MHost) default interface is configured, an arbitrary interface is selected as the active MHost default.

If multicast routing feature is enabled, a multicast-enabled interface is always selected as the MHost default interface.

Command Modes

Global configuration
Global VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **mhost default-interface** command configures the interface that the automatic route processing (Auto-RP), ping, and mtrace applications use for multicast transmissions, and the interface to which multicast groups are joined for reception.

The ping and mtrace features may use the MHost default interface to process multicast messaging. When IP multicast routing is enabled, packets sent to the MHost default interface are switched on other interfaces with a matching forwarding state. In addition, an arbitrary interface may be chosen to be the active MHost default interface if the configured interface is not operational. If no MHost default interface is configured with this command, an arbitrary interface is selected as the active MHost default.

**Note**

- The MHost default interface must be configured explicitly (preferably use a loopback interface).
- If the MHost default interface is not configured explicitly, then the router picks an interface.
- If the router picked multicast interface happens to be an ASBR link (on an ASBR router) and if that interface is configured with multicast boundary, then it may not work as intended because there is an IC (Internal Copy) flag on the interface and it has to accept all multicast packets on the interface.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure Loopback interface 1 as the default interface:

```
RP/0/RSP0/CPU0:router(config)# mhost ipv4 default-interface loopback 1
```

Related Commands

Command	Description
show mhost default-interface , on page 119	Displays the active default interface for the Multicast Host (MHost) process.

multicast-routing

To enter multicast routing configuration mode, use the **multicast-routing** command in global configuration mode. To return to the default behavior, use the **no** form of this command.

multicast-routing

no multicast-routing

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values.

Command Modes Global configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read, write

Examples The following example shows how to enter multicast routing configuration mode:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)#
```

Related Commands	Command	Description
	accounting per-prefix, on page 4	Enables per-prefix counters only in hardware.
	alias	Creates a command alias.
	interface (multicast), on page 27	Configures multicast interface properties.

Command	Description
interface all enable , on page 29	Enables multicast routing and forwarding on all new and existing interfaces.

multipath

To enable Protocol Independent Multicast (PIM) to divide the multicast load among several equal cost paths, use the **multipath** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

```
[address-family ipv4] multipath [hash {source| source next-hop}]
no multipath
```

Syntax Description

hash	(Optional) Enables multipath hashing.
source	Enables source-based multipath hashing.
source-nexthop	(Optional) Enables source with next-hop hashing. Note This option is available only for IPv6 addressing.

Command Default

This command is disabled by default.

Command Modes

Multicast routing configuration
Multicast routing address-family ipv4
Multicast VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

By default, equal-cost multipath (ECMP) paths are not load balanced. A single path from each unicast route is used for all multicast routes (which is the equivalent of the **no** form of the multipath command).

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable multipath functionality:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing  
RP/0/RSP0/CPU0:router(config-mcast)# multipath hash
```


nsf (multicast)

To turn on the nonstop forwarding (NSF) capability for the multicast routing system, use the **nsf** command in multicast routing configuration mode. To turn off this function, use the **no** form of this command.

nsf [*lifetime seconds*]

no nsf [*lifetime*]

Syntax Description

lifetime seconds	(Optional) Specifies the maximum time (in seconds) for NSF mode. Range is 30 to 3600.
-------------------------	---

Command Default

This command is disabled by default.

Command Modes

Multicast routing configuration
Multicast routing address family ipv4 configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **nsf** command does not enable or disable the multicast routing system, but just the NSF capability for all the relevant components. When the **no** form of this command is used, the NSF configuration is returned to its default disabled state.

Enable multicast NSF when you require enhanced availability of multicast forwarding. When enabled, failures of the control-plane multicast routing components Multicast Routing Information Base (MRIB) or Protocol Independent Multicast (PIM) will not cause multicast forwarding to stop. When these components fail or communication with the control plane is otherwise disrupted, existing Multicast Forwarding Information Base (MFIB) entries continue to forward packets until either the control plane recovers or the MFIB NSF timeout expires.

Enable multicast NSF when you upgrade control-plane Cisco IOS XR Software packages so that the live upgrade process does not interrupt forwarding.

When the MFIB partner processes enter NSF mode, forwarding on stale (nonupdated) MFIB entries continues as the control-plane components attempt to recover gracefully. Successful NSF recovery is signaled to the Multicast Forwarding Engine (MFW) partner processes by MRIB. MRIB remains in NSF mode until Internet Group Management Protocol (IGMP) has recovered state from the network and host stack *and* until PIM has recovered state from the network and IGMP. When both PIM and IGMP have recovered and fully updated

the MRIB, MRIB signals the MFIBs that NSF is ending, and begins updating the stale MFIB entries. When all updates have been sent, the MFWD partner processes delete all remaining stale MFIB entries and returns to normal operation, ending the NSF mode. MFIB NSF timeout prior to the signal from MRIB may cause NSF to end, and thus forwarding to stop.

When forwarding is in NSF mode, multicast flows may continue longer than necessary when network conditions change due to multicast routing protocols, unicast routing protocol reachability information, or local sender and receiver changes. The MFWD partner processes halt forwarding on stale MFIB entries when the potential for a multicast loop is detected by receipt of incoming data on a forwarding interface for the matching MFIB entry.

**Note**

For NSF to operate successfully in your multicast network, you must also enable NSF for the unicast protocols (such as Intermediate System-to-Intermediate System [IS-IS], Open Shortest Path First [OSPF] and Border Gateway Protocol [BGP]) that PIM relies on for Reverse Path Forwarding (RPF) information. See the appropriate configuration modules to learn how to configure NSF for unicast protocols.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable NSF for the multicast routing system:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# nsf
```

Related Commands

Command	Description
nsf lifetime (IGMP)	Configures the maximum time for the NSF timeout value under IGMP.
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mfib nsf, on page 107	Displays the state of NSF operation for the MFIB line cards.
show mrrib nsf, on page 126	Displays the state of NSF operation in the MRIB.
show pim nsf	Displays the state of NSF operation for PIM.

oom-handling

To enable the out-of-memory (OOM) functionality on multicast routing software components, use the **oom-handling** command in multicast routing configuration mode. To remove this functionality, use the **no** form of this command.

oom-handling

no oom-handling

Syntax Description This command has no keywords or arguments.

Command Default This command is disabled by default.

Command Modes Multicast routing configuration
Multicast routing address family ipv4 configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When the **oom-handling** command is enabled, and the router memory is low or in a warning state, the following states are not created:

- Protocol Independent Multicast (PIM) route states in response to PIM join and prune messages, and register messages
- Internet Group Management Protocol (IGMP) group states
- External Source-Active (SA) states in Multicast Source Discovery Protocol (MSDP)

Multicast routing **show** commands such as the **show pim topology** command indicate when the router is running low on memory and that new state creation has stopped.

Task ID	Task ID	Operations
	multicast	read, write

Examples

The following example shows how to enable the out-of-memory functionality:

```
RP/0/RSP0/CPU0:router# multicast-routing  
RP/0/RSP0/CPU0:router(config-mcast)# oom-handling
```

Related Commands

Command	Description
show pim topology	Displays PIM topology table information.

rate-per-route

To enable individual (source, group [S, G]) rate calculations, use the **rate-per-route** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

rate-per-route

no rate-per-route

Syntax Description This command has no keywords or arguments.

Command Default This command is disabled by default.

Command Modes

- Multicast routing configuration
- Multicast routing address family ipv4 configuration
- Multicast VRF configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read, write

Examples The following example shows how to enable individual route calculations:

```
RP/0/RSP0/CPU0:router# multicast-routing vrf vpn12 address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast)# rate-per-route
```

Related Commands	Command	Description
	show mfib route , on page 110	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib connections

To display the status of Multicast Forwarding Information Base (MFIB) connections to servers, use the **show mfib connections** command in EXEC mode.

show mfib ipv4 connections [*location node-id*]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	(Optional) Specifies MFIB connections associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show mfib connections** command to display a list of servers connected to the MFIB and the status of the connections.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib connections** command:

```
RP/0/RSP0/CPU0:router# show mfib connections
Netio           : connected
IM              : connected
Pakman          : connected
MRIB            : connected
IFH             : connected
SysDB-Global   : connected
```

```
SysDB-Local      : connected
SysDB-NSF       : connected
SYSDB-EDM       : connected
SYSDB-Action    : connected
AIB             : connected
MLIB            : connected
IDB             : connected
IIR             : connected
IPARM           : connected
GSP             : connected
```

Related Commands

Command	Description
show mfib interface, on page 104	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mfib route, on page 110	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib counter

To display Multicast Forwarding Information Base (MFIB) counter statistics for packets that have dropped, use the **show mfib counter** command in EXEC mode.

```
show mfib [vrf vrf-name] ipv4 counter [location node-id]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	(Optional) Specifies MFIB counter statistics associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mfib counter** command displays packet drop statistics for packets that cannot be accounted for under route counters.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib counter** command:

```
RP/0/RSP0/CPU0:router# show mfib counter location 0/1/CPU0

MFIB global counters are :
* Packets [no input idb]           : 0
* Packets [failed route lookup]    : 0
```



```
* Packets [Failed idb lookup] : 0
* Packets [Mcast disabled on input I/F] : 0
* Packets [encap drops due to ratelimit] : 0
* Packets [MC disabled on input I/F (iarm nfn)] : 0
```

This table describes the significant fields shown in the display.

Table 1: show mfib counter Field Descriptions

Field	Description
Packets [no input idb]	Packets dropped because no input interface information was found in the packet.
Packets [failed route lookup]	Packets dropped because of failure to match any multicast route.
Packets [Failed idb lookup]	Packets dropped because the descriptor block was not found for an interface (incoming or outgoing).
Packets [Mcast disabled on input I/F]	Packets dropped because arriving on an interface that was not enabled for the multicast routing feature.
Packets [encap drops due to ratelimit]	Packets dropped because of rate limit.

Related Commands

Command	Description
show mfib interface, on page 104	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mfib route, on page 110	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib encap-info

To display the status of encapsulation information for Multicast Forwarding Information Base (MFIB), use the **show mfib encap-info** command in EXEC mode.

```
show mfib [vrf vrf-name] ipv4 encap-info [location node-id]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
location <i>node-id</i>	(Optional) Specifies MFIB connections associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib encap-info** command:

```
RP/0/RSP0/CPU0:router# show mfib vrf vrf_a encap-info
```

```
-----
Encaps String                Dependent   Encaps      MDT Name/
                             Routes #    Table ID    Handle
```

```
(192.168.5.203, 255.1.1.1)          5          0xe0000000  mdtA1 (0x100a480)
```

Related Commands

Command	Description
show mfib interface, on page 104	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mfib route, on page 110	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware interface

To display hardware switching interface information for the Multicast Forwarding Information Base (MFIB) process, use the **show mfib hardware interface** command in EXEC mode.

show mfib [*vrf vrf-name*] [*ipv4*] **hardware interface** [*detail*] [*type interface-path-id*] [*location node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
detail	(Optional) Displays detailed information about the MFIB interface.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
location <i>node-id</i>	(Optional) Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mfib hardware interface** command displays multicast-specific information about the software switching interfaces of the router hardware. This command will not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib hardware interface** command.

```
RP/0/RSP0/CPU0:router# show mfib hardware interface location 0/0/CPU0
```

```
LC Type: Trident
```

```
-----
```

Interface	Handle	RefCnt	TTL	Routes	uIDB	Enbl'd	Comment
Gi0/0/0/4	0x180	5	0	2	5	True	success
Gi0/0/0/5	0x1c0	27	0	0	6	True	success
Gi0/0/0/6	0x200	5	0	2	7	True	success
Gi0/0/0/7	0x240	25	0	0	8	True	success
Gi0/0/0/8	0x280	30	0	2	9	True	success

```
-----
```

ROUTE INFORMATION:

Legend:

S: Source, G: Group, P: Prefix length, PI: Packets cn, PO: packets out,
 RF: RPF failures, TF: TTL failures, OF: OLIST failures, F: Other failures
 Route flags - (Ingress)

C: Chip ID, IC: BAACL check, IP: Punt this packet to LC CPU,
 ID: Directly connected, IS: RPF interface signal, IU: Punt copy to RP,
 IF: Punt to LC CPU if forwarded, IM: Result match, IV: Valid entry,
 IR: RPF IF, IA: Fabric slotmask, IG: Multicast group ID

Route flags - (Egress)

ET: Table ID to be used for OLIST lookup, EO: OLIST count bit,
 ER: Route MGID to be used for OLIST/NRPF lookup, EM: Result match,
 EV: Valid entry, EC: Count of OLIST members on this chip,
 BS: Base of the statistics pointer

Interface: Gi0/0/0/4

```
S:4.0.0.2 G:227.0.0.1 P:32 PI:1 PO:0 RF:0 TF:0 OF:0 F:0
```

```
-----
```

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	F	F	F	F	F	F	T	T	0x180	0x1	0x8006	0	F	6	T	T	0	0x5518a
1	F	F	F	F	F	F	T	T	0x180	0x1	0x8006	0	F	6	T	T	0	0x5518a
2	F	F	F	F	F	F	T	T	0x180	0x1	0x8006	0	F	6	T	T	0	0x5518a
3	F	F	F	F	F	F	T	T	0x180	0x1	0x8006	1	T	6	T	T	3	0x555c2

```
-----
```

```
S:0.0.0.0 G:227.0.0.1 P:32 PI:4 PO:0 RF:0 TF:0 OF:0 F:0
```

```
-----
```

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	F	F	T	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
1	F	F	T	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
2	F	F	T	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
3	F	F	T	F	F	F	T	T	0x0	0x1	0x8004	1	T	5	T	T	3	0x555bd

```
-----
```

Interface: Gi0/0/0/5

This interface is not part of the olist of any route

Interface: Gi0/0/0/6

```
S:4.0.0.2 G:227.0.0.1 P:32 PI:1 PO:0 RF:0 TF:0 OF:0 F:0
```

```
-----
```

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

```
-----
```

show mfib hardware interface

```

0 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
1 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
2 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
3 F F F F F F T T 0x180 0x1 0x8006 1 T 6 T T 3 0x555c2
-----

```

```
S:0.0.0.0 G:227.0.0.1 P:32 PI:4 PO:0 RF:0 TF:0 OF:0 F:0
-----
```

```

C IC IP ID IS IU IF IM IV IR IA IG ET EO ER EM EV EC BS
-----
0 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
1 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
2 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
3 F F T F F F T T 0x0 0x1 0x8004 1 T 5 T T 3 0x555bd
-----

```

Interface: Gi0/0/0/7

This interface is not part of the olist of any route

Interface: Gi0/0/0/8

```
S:4.0.0.2 G:227.0.0.1 P:32 PI:1 PO:0 RF:0 TF:0 OF:0 F:0
-----
```

```

C IC IP ID IS IU IF IM IV IR IA IG ET EO ER EM EV EC BS
-----
0 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
1 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
2 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
3 F F F F F F T T 0x180 0x1 0x8006 1 T 6 T T 3 0x555c2
-----

```

```
S:0.0.0.0 G:227.0.0.1 P:32 PI:4 PO:0 RF:0 TF:0 OF:0 F:0
-----
```

```

C IC IP ID IS IU IF IM IV IR IA IG ET EO ER EM EV EC BS
-----
0 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
1 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
2 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
3 F F T F F F T T 0x0 0x1 0x8004 1 T 5 T T 3 0x555bd
-----

```

The following example shows a sample output for **show mfib hardware interface** command on the Cisco ASR 9000 Series SIP-700 line card:

```
RP/0/RSP0/CPU0:router# show mfib hardware interface serial 0/4/0/0/1 location 0/4/CPU0
```

```
LC Type: A9K-SIP-700
```

```
Hardware Interface Information
```

```

-----
Interface Handle Type TTL Number of Routes Multicast Enabled Num bundles
-----
Se0/4/0/0/1 0xc000ec0 0 0 2 True 0
-----

```

```

Header : IDB Route Information
Source : Source address
Group : Group Address
M : Mask Length
PI : Packets in
PO : Packets out
RF : RPF failures
TF : TTL failures
OF : OLIST failures
F : Other failures
C : Directly connected check flag
RPF : Accepting interface for non-bidir entries
S : Signal if packet arrived on RPF interface
IC : Aggregated Internal copy flag
PR : Punt to RP flag for Internal copy in the Loopback interface
PK : PEEK flag

```

```

FGID          : Fabric Group ID
MGID          : Multicast Group ID

Interface: Se0/4/0/0/1

Source: 12.12.12.2 Group: 225.0.0.0 M: 64 PI: 1 PO: 0 RF: 0 TF: 0 OF: 0 F: 0
C: F RPF: Se0/4/0/0/1 S: F IC: F PR: F PK: F FGID: 64 MGID: 17024

Ingress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbcfb0, Flags: 0 First leaf: 9dcbccfc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900200

Egress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbcfb0, Flags: 0 First leaf: 9dcbccfc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80200

Route OCE Entry Information
-----

**** Leaf Info (in cp) : [9dcbccfc]
oce flags = 0x2 next obj type : 11 next obj handle : a73e9104
**** Leaf Info (in cpp): [0]
leaf_flags= 0x1 oce_flags: 0 oce_ptr: 0x8c5800c0

Source: 0.0.0.0 Group: 225.0.0.0 M: 32 PI: 1 PO: 0 RF: 0 TF: 0 OF: 0 F: 0
C: T RPF: Se0/4/0/0/1 S: F IC: F PR: F PK: F FGID: 64 MGID: 17013

Ingress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbd530, Flags: 2 First leaf: 9dcbd9bc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900080

Egress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbd530, Flags: 2 First leaf: 9dcbd9bc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80080

Route OCE Entry Information
-----

**** Leaf Info (in cp) : [9dcbd9bc]
oce flags = 0x6 next obj type : 11 next obj handle : a73e9104
**** Leaf Info (in cpp): [0]
leaf_flags= 0x1 oce_flags: 0 oce_ptr: 0x8c5800c0
This table describes the significant fields shown in the display.

```

Table 2: show mfib hardware interface Field Descriptions

Field	Description
Interface	MFIB interface name.

Field	Description
Handle	A 32-bit system-wide identifier of the MFIB interface.
RefCnt	Number of times various data structures referred to this MFIB interface structure.
TTL	Multicast time-to-live threshold that was configured on this MFIB interface.
Routes	The number of routes that include this interface as a member.
uIDB	The ucode Interface Descriptor Block index.
EnblD	If true, multicast is enabled on the MFIB interface.
Comment	Indicates whether there were problems when reading hardware information.

Related Commands

Command	Description
show mfib interface, on page 104	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.

show mfib hardware ltrace

To display IP Multicast platform specific trace information for the Multicast Forwarding Information Base (MFIB) process, use the **show mfib hardware ltrace** command in EXEC mode.

```
show mfib [vrf vrf-name] [ipv4] hardware ltrace [error| event| frequent-event| hexdump| init| last| netio|
reverse| stats| tailf| unique| verbose| wrapping] file file-name location node-id
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
error	(Optional) Displays error events.
event	(Optional) Displays non-frequent events.
frequent-event	(Optional) Displays frequent events.
hexdump	(Optional) Displays traces in hexadecimal output.
init	(Optional) Displays initiation and configuration events.
last	(Optional) Displays the last n entries.
netio	(Optional) Displays the netio events.
reverse	(Optional) Displays the traces in the reverse order starting with the latest events.
stats	(Optional) Displays the statistics.
tailf	(Optional) Displays the new traces as they are added.
unique	(Optional) Displays the unique entries with the counts.
verbose	(Optional) Displays the internal debugging information.
wrapping	(Optional) Displays the wrapping entries.
file <i>file-name</i>	(Optional) Specifies the file name.
location <i>node-id</i>	Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

**Note**

This command will not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib hardware ltrace** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware ltrace error location 0/1/cpu
3079 wrapping entries (4096 possible, 0 filtered, 4242 total)
May 21 01:45:32.865 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
May 21 01:45:32.877 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f2
May 21 01:58:37.019 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
May 21 01:58:37.019 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f2
May 21 02:15:38.620 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
May 21 02:15:38.620 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f2
May 21 02:26:06.440 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
May 21 02:26:06.440 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f2
May 21 03:11:18.805 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
May 21 03:11:18.805 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f2
May 21 03:36:31.240 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
```

The following is a sample output for the **show mfib hardware ltrace** command on the Cisco ASR 9000 Series SIP-700 line card:

```
RP/0/RSP0/CPU0:router# show mfib hardware ltrace location 0/4/CPU0
```

```

438 wrapping entries (88064 possible, 0 filtered, 438 total)
Aug 25 00:22:02.978 mfwd_ipv4_hw/init 0/4/CPU0 t1 ==>> Proc started jid=199, pid=163944
Aug 25 00:22:02.978 mfwd_ipv4_hw/event 0/4/CPU0 t1 ==>> Proc started jid=199, pid=163944
Aug 25 00:22:02.978 mfwd_ipv4_hw/error 0/4/CPU0 t1 ==>> Proc started jid=199, pid=163944
Aug 25 00:22:02.978 mfwd_ipv4_hw/fevent 0/4/CPU0 t1 ==>> Proc started jid=199, pid=163944
Aug 25 00:22:02.978 mfwd_ipv4_hw/netio 0/4/CPU0 t1 ==>> Proc started jid=199, pid=163944
Aug 25 00:22:03.001 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib initialization started
Aug 25 00:22:03.001 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully got shared memory window
header
Aug 25 00:22:03.001 mfwd_ipv4_hw/init 0/4/CPU0 t1 Platform extension does not exist - cold
boot
Aug 25 00:22:03.042 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC Gtrie Lib Init done: rc=0
Aug 25 00:22:03.075 mfwd_ipv4_hw/init 0/4/CPU0 t1 Library not initialized previously,
establishing connections
Aug 25 00:22:23.990 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC PAL Lib Init done: rc=0
Aug 25 00:22:24.851 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC iox Init done: rc=0
Aug 25 00:22:24.852 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully initiated thread ctx and
API ctx
Aug 25 00:22:24.871 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully done binding with CPP GIC
Server
Aug 25 00:22:24.898 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully done binding with CPP GIC
Server
Aug 25 00:22:24.902 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Rx Adjacency
APIs Lib
Aug 25 00:22:24.904 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Tx Adjacency
APIs Lib
Aug 25 00:22:24.906 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Tx Adjacency
APIs Lib
Aug 25 00:22:24.906 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized interface lib
Aug 25 00:22:24.979 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized EDM backend
Aug 25 00:22:24.999 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized utilities lib
Aug 25 00:22:25.000 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib initialization
completed
Aug 25 00:22:26.046 mfwd_ipv4_hw/event 0/4/CPU0 t1 table: table id -536870912 vrf id
1610612736 got created/commit_table_ext 0x9dc89c10
Aug 25 00:22:26.098 mfwd_ipv4_hw/init 0/4/CPU0 t1 gtrie: Platform gtrie lib init started
Aug 25 00:22:26.099 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC gtrie init done prot=2 tab=0
rc=0
Aug 25 00:22:26.099 mfwd_ipv4_hw/init 0/4/CPU0 t1 gtrie: successfully initiated gtrie
0xa6039dec for protocol 0, table id 0, use shmем 1, shmем id 1
Aug 25 00:23:00.459 mfwd_ipv4_hw/event 0/4/CPU0 t1 CPP Create adj cpp 1 adj handle 0xa73e907c
ifh 91 link 1 enctype 0 flags 1 hw addr 0x8c580000
Aug 25 00:24:25.780 mfwd_ipv4_hw/event 0/4/CPU0 t1 CPP Create adj cpp 1 adj handle 0xa73e90c0
ifh 98 link 1 enctype 0 flags 1 hw addr 0x8c580010
Aug 25 21:43:52.966 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib terminate started,
terminate reason 2
Aug 25 21:43:52.982 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib terminate completed
Aug 25 21:43:55.783 mfwd_ipv4_hw/fevent 0/4/CPU0 t1 ==>> Proc started jid=199, pid=217192
Aug 25 21:43:55.783 mfwd_ipv4_hw/netio 0/4/CPU0 t1 ==>> Proc started jid=199, pid=217192
Aug 25 21:43:55.783 mfwd_ipv4_hw/error 0/4/CPU0 t1 ==>> Proc started jid=199, pid=217192
Aug 25 21:43:55.783 mfwd_ipv4_hw/event 0/4/CPU0 t1 ==>> Proc started jid=199, pid=217192
Aug 25 21:43:55.783 mfwd_ipv4_hw/init 0/4/CPU0 t1 ==>> Proc started jid=199, pid=217192
Aug 25 21:43:55.784 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib initialization started
Aug 25 21:43:55.784 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully got shared memory window
header
Aug 25 21:43:55.784 mfwd_ipv4_hw/init 0/4/CPU0 t1 Platform extension exists - warm boot
Aug 25 21:43:55.785 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC Gtrie Lib Init done: rc=0
Aug 25 21:43:55.797 mfwd_ipv4_hw/init 0/4/CPU0 t1 gtrie: Platform gtrie lib re-init started
for gtrie 0xa6039dec, shmем id 1
Aug 25 21:43:55.797 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC gtrie re init done prot=2 tab=0
rc=0
Aug 25 21:43:55.797 mfwd_ipv4_hw/init 0/4/CPU0 t1 gtrie: successfully re-initiated gtrie
0xa6039dec for protocol 0, table id 0, use shmем 1, shmем id 1
Aug 25 21:43:55.826 mfwd_ipv4_hw/init 0/4/CPU0 t1 Library not initialized previously,
establishing connections
Aug 25 21:43:56.241 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC PAL Lib Init done: rc=0
Aug 25 21:43:56.422 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC iox Init done: rc=0
Aug 25 21:43:56.423 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully initiated thread ctx and
API ctx
Aug 25 21:43:56.431 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully done binding with CPP GIC
Server
Aug 25 21:43:56.442 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully done binding with CPP GIC
Server

```

show mfib hardware ltrace

```
Aug 25 21:43:56.444 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Rx Adjacency
  APIs Lib
Aug 25 21:43:56.445 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Tx Adjacency
  APIs Lib
Aug 25 21:43:56.445 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Tx Adjacency
  APIs Lib
Aug 25 21:43:56.445 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized interface lib
Aug 25 21:43:56.464 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized EDM backend
Aug 25 21:43:56.466 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized utilities lib
Aug 25 21:43:56.471 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib initialization
completed
Aug 25 21:43:58.412 mfwd_ipv4_hw/event 0/4/CPU0 t1 CPP Modify adj cpp 1 adj handle 0xa73e907c
  ifh 91 link 1 enctype 0 flags 1 hw addr 0x8c580000
Aug 25 21:43:58.412 mfwd_ipv4_hw/event 0/4/CPU0 t1 CPP Modify adj cpp 1 adj handle 0xa73e90c0
  ifh 98 link 1 enctype 0 flags 1 hw addr 0x8c580010
Aug 26 22:25:50.253 mfwd_ipv4_hw/error 0/4/CPU0 t1 ===>> Proc started jid=227, pid=163930
Aug 26 22:25:50.253 mfwd_ipv4_hw/netio 0/4/CPU0 t1 ===>> Proc started jid=227, pid=163930
Aug 26 22:25:50.253 mfwd_ipv4_hw/fevent 0/4/CPU0 t1 ===>> Proc started jid=227, pid=163930
Aug 26 22:25:50.253 mfwd_ipv4_hw/event 0/4/CPU0 t1 ===>> Proc started jid=227, pid=163930
```

show mfib hardware resource-counters

To display the allocated and freed hardware resources for the Multicast Forwarding Information Base (MFIB) process, use the **show mfib hardware resource-counters** command in EXEC mode.

```
show mfib [vrf vrf-name] ipv4 hardware resource-counters location node-id
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show mfib hardware resource-counters** command to understand the table lookup unit (TLU) resource usage by MFIB.

- Usage for each channel
- Storing of specific data
- Allocation counts for metro statistics
- Failure counts for metro statistics



Note

Use the location option in the **show mfib hardware resource-counters** command to indicate for which linecard you need information. The command will not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following is a sample output from the **show mfib hardware resource-counters** command on the Cisco ASR 9000 Series SIP-700 line card:

```
RP/0/RSP0/CPU0:router# show mfib hardware resource-counters location 0/4/CPU0
```

```
LC Type: A9K-SIP-700
```

```
PD Memory Alloc/Free/In Use Stats:
```

```
-----
```

Type	Allocated	Freed	In Use
global	0	0	0
table extension	1	0	1
route extension	18	11	7
interface extension	18	10	8
idb extension	3	0	3
EDM bag data	26	24	2
vpn extension	0	0	0
mdt ea extension	0	0	0

```
-----
```

```
Ingress Hardware Resource Counters:
```

```
-----
```

Type	Allocated	Freed	In Use
prefix stats resource	18	11	7
PLU prefix resource	18	11	7
prefix replica resource	0	0	0

```
-----
```

```
Egress Hardware Resource Counters:
```

```
-----
```

Type	Allocated	Freed	In Use
prefix stats resource	18	11	7
PLU prefix resource	18	11	7
prefix replica resource	21	12	9

```
-----
```

```
Ingress Hardware Global Multicast Statistics:
```

```
-----
```

Punt Packets:	3
Punt Drop Packets:	0
Inject Packets:	0
Inject Drop Packets:	0
Drop Packets/Bytes:	0/0

```
-----
```

```
Egress Hardware Global Multicast Statistics:
```

```
-----
```

Punt Packets:	0
Punt Drop Packets:	0
Inject Packets:	0
Inject Drop Packets:	0
Drop Packets/Bytes:	0/0

```
-----
```

The following is a sample out put of **show mfib hardware resource-counters** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware resource-counters location 0/0/CPU0
```

```
LC Type: Trident
prm_stat success calls: ingress: 4250,4092      egress: 0,0
prm_stat failure calls: ingress: 0,0          egress: 0,0
```

```
Memory alloc stats
```

Type	Allocated	Freed	Delta
global	0	0	0
table extension	0	0	0
route extension	187	180	7
interface extension	221	215	6
idb extension	52	47	5
kmrs	159	159	0
kmrs key	652	652	0
kmrs result	488	488	0
uidb data	437	437	0
EDM bag data	5	3	2

This table describes the significant fields shown in the display.

Table 3: show mfib hardware resource counters Field Descriptions

Field	Description
prm_stat success calls	The number of successful calls to allocate and free statistics blocks, for ingress and egress statistics.
prm_stat failure calls	The number of failed calls to allocate and free statistics blocks, for ingress and egress statistics.
Type	Describes the structure type.
Allocated	The number of blocks allocated per structure type.
Freed	The number of blocks freed per structure type.
Delta	The difference between allocated and freed blocks per structure type.

Related Commands

Command	Description
clear mfib hardware adjacency-counters , on page 15	Clears the platform-specific information related to resource counters for the Multicast Forwarding Information Base.
show mfib interface , on page 104	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.

show mfib hardware route accept-bitmap

To display platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes, use the **show mfib hardware route accept-bitmap** command in EXEC mode.

show mfib [**vrf** *vrf-name*] **ipv4 hardware route accept-bitmap** [*] [*group-address* [/i>prefix-length]] [**detail**] [**location** *node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
	(Optional) Displays shared tree entry.
<i>source-address</i>	(Optional) IP address or hostname of the multicast route source.
<i>group-address</i>	(Optional) IP address or hostname of the multicast group.
<i>/ prefix-length</i>	(Optional) Prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
detail	(Optional) Detailed list of the routing database.
location <i>node-id</i>	(Optional) Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

**Note**

The command does not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Related Commands

Command	Description
show mfib interface, on page 104	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.

show mfib hardware route internal

To display the route internal structures for the platform-specific Multicast Forwarding Information Base (MFIB) in the hardware, use the **show mfib hardware route internal** command in EXEC mode.

```
show mfib [vrf vrf-name] [ipv4] hardware route internal [*] [ source-address ] [group-address
[/prefix-length]] [detail] [location node-id]
```

Syntax Description

*	(Optional) Displays shared tree entries.
<i>A.B.C.D</i>	(Optional) Source IP address or hostname of the MFIB route.
<i>A.B.C.D/length</i>	(Optional) Group IP address or hostname of the MFIB route and the prefix length. Prefix length of the MFIB group address is a decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
detail	(Optional) Details of each route (requires 140 columns).
location <i>node-id</i>	(Optional) Specifies the MFIB location.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.



Note

The command does not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following example shows a sample output of the **show mfib hardware route internal** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware route internal detail location 0/1/CPU0
```

```
LC Type: Trident
```

```
-----
Legend:
```

```
Route Information - (Ingress)
NP: Network Processor, IC: BAcl check, IP: Punt this packet to LC CPU,
ID: Directly connected, IS: RPF interface signal, IU: Punt copy to RP,
IF: Punt to LC CPU if forwarded, IM: Result match, IV: Valid entry,
IR: RPF IF, IA: Fabric slotmask, IG: Multicast group ID
```

```
Route Information - (Egress)
ET: Table ID to be used for OLIST lookup, EO: OLIST count bit,
ER: Route MGID to be used for OLIST/NRPF lookup, EM: Result match,
EV: Valid entry, EC: Count of OLIST members on this chip,
BS: Base of the statistics pointer
```

```
Route Information - (MDT)
TU: Tunnel Route, TE: Tunnel Encap, TD: Tunnel Decap,
CD: Conditional Decap, MI: MVET Index
```

```
MDT Encap Information
NP: Network Processor, UC: Use Customer ToS,
Csum: IP Checksum, TID: Table ID, UIDB: Tunnel UIDB,
T-ifh: Tunnel Interface Handle, StatP: Tunnel Stat Ptr,
CMG: Core Route Multicast Group ID, TMTU: Tunnel MTU
```

```
Software Route Information (PD)
T: Tunnel Route, E: Encap, D: Decap, CD: Conditional Decap,
MVET-ID: MDT Encap Table ID, MVD: MVET Entry Dirty,
TUS: Tunnel UIDB Set, TID: Table ID, UIDB: Tunnel UIDB
TMTU: Tunnel MTU
-----
```

```
Source: *                      Group: 224.0.0.0           Mask length: 4   RPF Int: None
```

```
Route Information
```

```
-----
N I I I I I I I I I           I   I   E E E   E E E   B       T T T
P C P D S U F M V R           A   G   T O R   M V C   S       U E D
-----
0 T F T F F F T T 0x0       0x0   0x8080 0 F 3   T T 0   0x3640f  F F F
1 T F T F F F T T 0x0       0x0   0x8080 0 F 3   T T 0   0x3640f  F F F
2 T F T F F F T T 0x0       0x0   0x8080 0 F 3   T T 0   0x3640f  F F F
3 T F T F F F T T 0x0       0x0   0x8080 0 F 3   T T 0   0x3640f  F F F
-----
```

```
Software Route Information (PD)
```

```
-----
T E D CD MVET-ID MVD TUS TID           UIDB   T-ifh           TMTU
-----
F F F F 0x0       F   F   0x0           0x0   0x0           0
-----
```

```
Source: *                      Group: 224.0.0.0           Mask length: 24  RPF Int: None
```

```
Route Information
```

```
-----
N I I I I I I I I I           I   I   E E E   E E E   B       T T T
P C P D S U F M V R           A   G   T O R   M V C   S       U E D
-----
0 T F F F F F T T 0x0       0x0   0x8084 0 F 0   T T 0   0x36400  F F F
1 T F F F F F T T 0x0       0x0   0x8084 0 F 0   T T 0   0x36400  F F F
2 T F F F F F T T 0x0       0x0   0x8084 0 F 0   T T 0   0x36400  F F F
3 T F F F F F T T 0x0       0x0   0x8084 0 F 0   T T 0   0x36400  F F F
-----
```

```
Software Route Information (PD)
```

```
-----
T E D CD MVET-ID MVD TUS TID           UIDB   T-ifh           TMTU
-----
```

show mfib hardware route internal

```

F F F F 0x0      F  F  0x0      0x0      0x0      0
-----

```

```

Source: *                Group: 224.0.1.39      Mask length: 32  RPF Int: None

```

```

Route Information
-----

```

```

N I I I I I I I I      I  I      E E E      E E E      B      T T T
P C P D S U F M V R      A  G      T O R      M V C      S      U E D
-----
0  F T F F F F T T 0x0      0x0      0x8085 0 F 1      T T 0      0x36405 F F F
1  F T F F F F T T 0x0      0x0      0x8085 0 F 1      T T 0      0x36405 F F F
2  F T F F F F T T 0x0      0x0      0x8085 0 F 1      T T 0      0x36405 F F F
3  F T F F F F T T 0x0      0x0      0x8085 0 F 1      T T 0      0x36405 F F F

```

```

Software Route Information (PD)
-----

```

```

T E D CD MVET-ID MVD TUS TID      UIDB      T-ifh      TMTU
-----
F F F F 0x0      F  F  0x0      0x0      0x0      0
-----

```

```

Source: *                Group: 224.0.1.40      Mask length: 32  RPF Int: None

```

```

Route Information
-----

```

```

N I I I I I I I I      I  I      E E E      E E E      B      T T T
P C P D S U F M V R      A  G      T O R      M V C      S      U E D
-----
0  F T F F F F T T 0x0      0x0      0x8086 0 F 7      T T 0      0x36423 F F F
1  F T F F F F T T 0x0      0x0      0x8086 0 F 7      T T 0      0x36423 F F F
2  F T F F F F T T 0x0      0x0      0x8086 0 F 7      T T 0      0x36423 F F F
3  F T F F F F T T 0x0      0x0      0x8086 0 F 7      T T 0      0x36423 F F F

```

```

Software Route Information (PD)
-----

```

```

T E D CD MVET-ID MVD TUS TID      UIDB      T-ifh      TMTU
-----
F F F F 0x0      F  F  0x0      0x0      0x0      0
-----

```

```

Source: *                Group: 232.0.0.0      Mask length: 8   RPF Int: None

```

```

Route Information
-----

```

```

N I I I I I I I I      I  I      E E E      E E E      B      T T T
P C P D S U F M V R      A  G      T O R      M V C      S      U E D
-----
0  T F F F F F T T 0x0      0x0      0x8087 0 F 2      T T 0      0x3640a F F F
1  T F F F F F T T 0x0      0x0      0x8087 0 F 2      T T 0      0x3640a F F F
2  T F F F F F T T 0x0      0x0      0x8087 0 F 2      T T 0      0x3640a F F F
3  T F F F F F T T 0x0      0x0      0x8087 0 F 2      T T 0      0x3640a F F F

```

```

Software Route Information (PD)
-----

```

```

T E D CD MVET-ID MVD TUS TID      UIDB      T-ifh      TMTU
-----
F F F F 0x0      F  F  0x0      0x0      0x0      0
-----

```

```

Source: *                Group: 239.60.0.0      Mask length: 16  RPF Int: Gi0/1/

```

```

Route Information
-----

```

```

N I I I I I I I I      I  I      E E E      E E E      B      T T T
P C P D S U F M V R      A  G      T O R      M V C      S      U E D
-----
0  T F F F F F T T 0x2000500  0x0      0x8081 0 F 6      T T 0      0x3641e F F F
1  T F F F F F T T 0x2000500  0x0      0x8081 0 F 6      T T 0      0x3641e F F F

```

```

2  T F F F F F T T 0x2000500 0x0 0x8081 0 F 6 T T 0 0x3641e F F F
3  T F F F F F T T 0x2000500 0x0 0x8081 0 F 6 T T 0 0x3641e F F F

```

Software Route Information (PD)

```

-----
T E D CD MVET-ID MVD TUS TID UIDB T-ifh TMTU
-----
F F F F 0x0 F F 0x0 0x0 0x0 0
-----

```

Source: * Group: 239.60.60.60 Mask length: 32 RPF Int: None

Route Information

```

-----
N I I I I I I I I I I I A G T O R M V C S U E D
P C P D S U F M V R
-----
0  T F F F F F T T 0x0 0x40 0x8089 0 F 5 T T 0 0x36419 F F F
1  T F F F F F T T 0x0 0x40 0x8089 0 F 5 T T 0 0x36419 F F F
2  T F F F F F T T 0x0 0x40 0x8089 0 F 5 T T 0 0x36419 F F F
3  T F F F F F T T 0x0 0x40 0x8089 0 F 5 T T 0 0x36419 F F F

```

Software Route Information (PD)

```

-----
T E D CD MVET-ID MVD TUS TID UIDB T-ifh TMTU
-----
F F F F 0x0 F F 0x0 0x0 0x0 0
-----

```

Source: * Group: 239.60.62.62 Mask length: 32 RPF Int: None

Route Information

```

-----
N I I I I I I I I I I I A G T O R M V C S U E D
P C P D S U F M V R
-----
0  T F F F F F T T 0x0 0x40 0x8088 0 F 4 T T 0 0x36414 F F F
1  T F F F F F T T 0x0 0x40 0x8088 0 F 4 T T 0 0x36414 F F F
2  T F F F F F T T 0x0 0x40 0x8088 0 F 4 T T 0 0x36414 F F F
3  T F F F F F T T 0x0 0x40 0x8088 0 F 4 T T 0 0x36414 F F F

```

Software Route Information (PD)

```

-----
T E D CD MVET-ID MVD TUS TID UIDB T-ifh TMTU
-----
F F F F 0x0 F F 0x0 0x0 0x0 0
-----

```

Source: * Group: 239.60.64.64 Mask length: 32 RPF Int: None

Route Information

```

-----
N I I I I I I I I I I I A G T O R M V C S U E D
P C P D S U F M V R
-----
0  T F F F F F T T 0x0 0x2 0x8082 0 F 8 T T 0 0x36428 F F F
1  T F F F F F T T 0x0 0x2 0x8082 1 T 8 T T 1 0x36428 F F F
2  T F F F F F T T 0x0 0x2 0x8082 0 F 8 T T 0 0x36428 F F F
3  T F F F F F T T 0x0 0x2 0x8082 0 F 8 T T 0 0x36428 F F F

```

Software Route Information (PD)

```

-----
T E D CD MVET-ID MVD TUS TID UIDB T-ifh TMTU
-----
F F F F 0x0 F F 0x0 0x0 0x0 0
-----

```

Source: * Group: 239.60.66.66 Mask length: 32 RPF Int: None

Route Information

show mfib hardware route internal

```

-----
N I I I I I I I I I      I   I   E E E   E E E   B       T T T
P C P D S U F M V R      A   G   T O R   M V C   S       U E D
-----
0 T F F F F F T T 0x0      0x2   0x8083 0 F 9   T T 0   0x3642d F F F
1 T F F F F F T T 0x0      0x2   0x8083 1 T 9   T T 1   0x3642d F F F
2 T F F F F F T T 0x0      0x2   0x8083 0 F 9   T T 0   0x3642d F F F
3 T F F F F F T T 0x0      0x2   0x8083 0 F 9   T T 0   0x3642d F F F

Software Route Information (PD)
-----
T E D CD MVET-ID MVD TUS TID      UIDB   T-ifh      TMTU
F F F F 0x0      F   F   0x0      0x0   0x0      0
-----

```

show mfib hardware route mofrr

To display the platform-specific Multicast Forwarding Information Base (MFIB) information for the MoFRR (multicast only fast reroute)- enabled list stored in the hardware, use the **show mfib hardware route mofrr** command in EXEC mode.

```
show mfib hardware route mofrr {[*]} [ source-address ] [group-address [/prefix-length]] [detail]} [location node-id]
```

Syntax Description

*	(Optional) Displays all the MoFRR routes configured in the platform.
<i>source-address</i>	(Optional) IP address or hostname of the multicast route source.
<i>group-address</i>	(Optional) IP address or hostname of the multicast group.
detail	(Optional) Displays a detailed list of the MoFRR routing database.
location <i>node-id</i>	Specifies the Node ID for an MFIB-designated node.

Command Default

IPv4 addressing is the default. Currently, MoFRR supports only IPv4 routes.

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

MoFRR is a mechanism in which two copies of the same multicast stream flow through disjoint paths in the network. At the point in the network (usually the PE closer to the receivers) where the two streams merge, one of the streams is accepted and forwarded on the downstream links, while the other stream is discarded. When a failure is detected in the primary stream due to a link or node failure in the network, MoFRR instructs the forwarding plane to start accepting packets from the backup stream (which now becomes the primary stream).

MoFRR is triggered when the hardware detects traffic loss on the primary path of a given flow or route. Traffic loss is defined as no data packet having been received for 30 ms. When MoFRR is triggered, the primary and secondary reverse-path forwarding (RPF) interfaces are exposed to the forwarding plane and switchover occurs entirely at the hardware level.

The **show mfib hardware route mofrr** command displays the output MoFRR route list of the platform. If there is no MoFRR route enabled in the platform, then the output result is “There are no MoFRR routes configured”.

The command does not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following is a sample output from the **show mfib hardware route mofrr** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware route mofrr location 0/0/cpu0

LC Type: Trident
-----
Legend:
Route MoFRR Information
A: Active RPF interface, MS: Monitoring State,
WDI: Watchdog Count Index, NP: Network Processor,
-----

Source: 20.20.20.1      Group: 225.0.0.1      Mask length: 64  RPF Int: Gi0/0/0/8
-----
RPF      Interface      A  MS  WDI
-----
Primary:  Gi0/0/0/8      T  2   1846768
Backup:   Gi0/0/0/18      F  0   1846769
-----

OIFS
-----
NP  Intf
-----
1   Gi0/0/0/28
-----

Sequence num: 1  Num of switchovers: 0

WatchDog Counters:
-----
          NP  Profile  Valid  Current-Cnt  Last-cnt
-----
Prim WDC  0         0       0         3848         12
Prim WDC  1         0       0         3848         12
Prim WDC  2         0       0         3848         12
Prim WDC  3         1       1         3848         12
Back WDC  0         0       0         3848         12
Back WDC  1         0       0         3848         12
Back WDC  2         0       0         3848         12
Back WDC  3         0       0         3848         12
-----

MoFRR Statistics:
-----
NP  Prim pkt rx  Back pkt rx  Interrupts  Punts
-----
0   0            0            0            0
1   0            0            0            0
2   0            0            0            0
3   406213      0            1            1
-----

Source: 20.20.20.1      Group: 225.0.0.2      Mask length: 64  RPF Int: Gi0/0/0/8
```



```

-----
RPFs      Interface      A  MS  WDI
-----
Primary:   Gi0/0/0/8          T  2  1846770
Backup:    Gi0/0/0/18        F  0  1846771
-----

OIFS
-----
NP  Intf
-----
1   Gi0/0/0/28
-----

Sequence num: 1  Num of switchovers: 0

WatchDog Counters:
-----
          NP  Profile  Valid  Current-Cnt  Last-cnt
-----
Prim WDC  0      0      0      3848         12
Prim WDC  1      0      0      3848         12
Prim WDC  2      0      0      3848         12
Prim WDC  3      1      1      3848         12
Back WDC  0      0      0      3848         12
Back WDC  1      0      0      3848         12
Back WDC  2      0      0      3848         12
Back WDC  3      0      0      3848         12
-----

MoFRR Statistics:
-----
NP  Prim pkt rx  Back pkt rx  Interrupts  Punts
-----
0      0            0            0            0
1      0            0            0            0
2      0            0            0            0
3     406212      0            1            1
-----

```

The following is sample output from the show mfib hardware route MoFRR command with only one multicast group:

```

RP/0/RSP0/CPU0:router# show mfib hardware route mofrr 225.0.0.1 location 0/0/CPU0

LC Type: Trident
-----
Legend:
Route MoFRR Information
A: Active RPF interface, MS: Monitoring State,
WDI: Watchdog Count Index, NP: Network Processor,
-----

Source: 20.20.20.1      Group: 225.0.0.1      Mask length: 64  RPF Int: Gi0/0/0/8
-----
RPFs      Interface      A  MS  WDI
-----
Primary:   Gi0/0/0/8          T  2  1846772
Backup:    Gi0/0/0/18        F  0  1846773
-----

OIFS
-----
NP  Intf
-----
1   Gi0/0/0/28
-----

Sequence num: 1  Num of switchovers: 0

WatchDog Counters:
-----

```

show mfib hardware route mofrr

	NP	Profile	Valid	Current-Cnt	Last-cnt
Prim WDC	0	0	0	3848	12
Prim WDC	1	0	0	3848	12
Prim WDC	2	0	0	3848	12
Prim WDC	3	1	1	3848	12
Back WDC	0	0	0	3848	12
Back WDC	1	0	0	3848	12
Back WDC	2	0	0	3848	12
Back WDC	3	0	0	3848	12

MoFRR Statistics:

NP	Prim pkt rx	Back pkt rx	Interrupts	Punts
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	400465	0	1	1

The following is sample output from the show mfib hardware route MoFRR command with only one multicast source:

```
RP/0/RSP0/CPU0:router# show mfib hardware route mofrr 20.20.20.1 location 0/0/CPU0
```

```
LC Type: Trident
```

```
Legend:
```

```
Route MoFRR Information
```

```
A: Active RPF interface, MS: Monitoring State,  
WDI: Watchdog Count Index, NP: Network Processor,
```

```
Source: 20.20.20.1      Group: 225.0.0.1      Mask length: 64  RPF Int: Gi0/0/0/8
```

RPFS	Interface	A	MS	WDI
Primary:	Gi0/0/0/8	T	2	1846772
Backup:	Gi0/0/0/18	F	0	1846773

```
OIFS
```

```
NP Intf
```

```
1 Gi0/0/0/28
```

```
Sequence num: 1  Num of switchovers: 0
```

```
WatchDog Counters:
```

	NP	Profile	Valid	Current-Cnt	Last-cnt
Prim WDC	0	0	0	3848	12
Prim WDC	1	0	0	3848	12
Prim WDC	2	0	0	3848	12
Prim WDC	3	1	1	3848	12
Back WDC	0	0	0	3848	12
Back WDC	1	0	0	3848	12
Back WDC	2	0	0	3848	12
Back WDC	3	0	0	3848	12

MoFRR Statistics:

NP	Prim pkt rx	Back pkt rx	Interrupts	Punts
0	0	0	0	0
1	0	0	0	0

```

2          0          0          0          0
3          0          0          1          1
-----
Source: 20.20.20.1      Group: 225.0.0.2      Mask length: 64  RPF Int: Gi0/0/0/8
-----
RPFs      Interface      A  MS  WDI
-----
Primary:   Gi0/0/0/8        T  2   1846774
Backup:    Gi0/0/0/18       F  0   1846775
-----

OIFS
-----
NP  Intf
-----
1   Gi0/0/0/28
-----

Sequence num: 1  Num of switchovers: 0

WatchDog Counters:
-----
          NP  Profile  Valid  Current-Cnt  Last-cnt
-----
Prim WDC  0          0        0          3848          12
Prim WDC  1          0        0          3848          12
Prim WDC  2          0        0          3848          12
Prim WDC  3          1        1          3848          12
Back WDC  0          0        0          3848          12
Back WDC  1          0        0          3848          12
Back WDC  2          0        0          3848          12
Back WDC  3          0        0          3848          12
-----

MoFRR Statistics:
-----
NP  Prim pkt rx  Back pkt rx  Interrupts  Punts
-----
0   0            0            0            0            0
1   0            0            0            0            0
2   0            0            0            0            0
3   0            0            1            1            1
-----

```

This table describes the significant fields shown in the display.

Table 4: show mfib hardware route mofrr Field Descriptions

Field	Description
RPFS	Primary and backup RPF of the route.
A	Currently active RPF for forwarding the traffic to the egress (OLIST). T: means true, F: means false.
MS	Monitoring state. It has three states. MS=0, indicates that the monitoring state disabled. MS=1, indicates that active RPF is monitoring traffic activity. MS=2, indicates that active RPF is monitoring traffic loss.
WDI	Watchdog Count Index. Each MoFRR route has two Line card specific watchdog indexes, associated with primary and backup RPF, respectively.

Field	Description
OIFS	Output Interfaces in the local line card.
Sequence num	MoFRR specific route sequence number.
Num of switchovers	Total number of switchovers triggered by traffic loss detection in the data plane.
Watchdog Counters	Internal Hardware watchdog counters
MoFRR Statistics	Internal software watchdog counters

If there is no MoFRR route enabled in the platform, the output result will be as follows:

```
RP/0/RSP0/CPU0:router# show mfib hardware route mofrr location 0/0/CPU0
LC Type: Trident
No matching routes in MFIB
There are no MoFRR routes configured.
```

Related Commands

Command	Description
show mfib hardware route olist , on page 85	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route statistics , on page 95	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib hardware route summary , on page 99	Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.
show mfib route , on page 110	Displays route entries in the Multicast Forwarding Information Base (MFIB).
show mrrib route , on page 130	Displays all entries in the Multicast Routing Information Base (MRIB).

show mfib hardware route olist

To display platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware, use the **show mfib hardware route olist** command in EXEC mode.

```
show mfib [vrf vrf-name] ipv4 hardware route olist {[*] [ source-address ] [group-address [/prefix-length]]}
[location node-id]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
	(Optional) Displays shared tree entries.
<i>source-address</i>	(Optional) IP address or hostname of the multicast route source.
<i>group-address</i>	(Optional) IP address or hostname of the multicast group.
<i>/ prefix-length</i>	(Optional) Prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
location <i>node-id</i>	Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mfib hardware route olist** command displays the output interface list (olist) for each route. The Multicast Forwarding (MFWD) process stores olist interfaces in a table lookup unit (TLU) block (in groups of three). As such, the command displays each route three times. The command does not display any useful output if only RSP is specified or if no location is specified.

show mfib hardware route olist

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib hardware route olist** command. (The output fields are described in the header.)

```
RP/0/RSP0/CPU0:router# show mfib hardware route olist location 0/0/CPU0
```

```
LC Type: Trident
```

```
Legend:
```

```
Route Information - (Ingress)
```

```
C: Chip ID, IC: BAACL check, IP: Punt this packet to LC CPU,
ID: Directly connected, IS: RPF interface signal, IU: Punt copy to RP,
IF: Punt to LC CPU if forwarded, IM: Result match, IV: Valid entry,
IR: RPF IF, IA: Fabric slotmask, IG: Multicast group ID
```

```
Route Information - (Egress)
```

```
ET: Table ID to be used for OLIST lookup, EO: OLIST count bit,
ER: Route MGID to be used for OLIST/NRPF lookup, EM: Result match,
EV: Valid entry, EC: Count of OLIST members on this chip,
BS: Base of the statistics pointer
```

```
Hardware Information
```

```
C: Chip ID; T: Table ID; M: Member ID; Intf: Interface, U: uIDB index,
I: HW IC flag, B: HW BAACL bit, Base: Base of statistics pointer
```

```
Source: *                Group: 224.0.0.0        Mask length: 24
```

```
Route Information
```

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	F	F	F	F	T	T	0x0	0x0	0x8002	0	F	2	T	T	0	0x5516c
1	T	F	F	F	F	F	T	T	0x0	0x0	0x8002	0	F	2	T	T	0	0x5516c
2	T	F	F	F	F	F	T	T	0x0	0x0	0x8002	0	F	2	T	T	0	0x5516c
3	T	F	F	F	F	F	T	T	0x0	0x0	0x8002	0	F	2	T	T	0	0x555a4

```
Source: *                Group: 224.0.1.39        Mask length: 32
```

```
Route Information
```

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	F	T	F	F	F	F	T	T	0x0	0x0	0x8000	0	F	0	T	T	0	0x55162
1	F	T	F	F	F	F	T	T	0x0	0x0	0x8000	0	F	0	T	T	0	0x55162
2	F	T	F	F	F	F	T	T	0x0	0x0	0x8000	0	F	0	T	T	0	0x55162
3	F	T	F	F	F	F	T	T	0x0	0x0	0x8000	0	F	0	T	T	0	0x5559a

```
Source: *                Group: 224.0.1.40        Mask length: 32
```

```
Route Information
```

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	F	T	F	F	F	F	T	T	0x0	0x0	0x8001	0	F	1	T	T	0	0x55167
1	F	T	F	F	F	F	T	T	0x0	0x0	0x8001	0	F	1	T	T	0	0x55167
2	F	T	F	F	F	F	T	T	0x0	0x0	0x8001	0	F	1	T	T	0	0x55167
3	F	T	F	F	F	F	T	T	0x0	0x0	0x8001	0	F	1	T	T	0	0x5559f

```
Source: *                Group: 227.0.0.0        Mask length: 16
```

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	F	F	F	F	T	T	0x280	0x0	0x8009	0	F	6	T	T	0	0x55199
1	T	F	F	F	F	F	T	T	0x280	0x0	0x8009	0	F	6	T	T	0	0x55199
2	T	F	F	F	F	F	T	T	0x280	0x0	0x8009	0	F	6	T	T	0	0x55199
3	T	F	F	F	F	F	T	T	0x280	0x0	0x8009	0	F	6	T	T	0	0x555d1

Source: * Group: 227.0.0.1 Mask length: 32

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
1	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
2	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
3	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	1	T	5	T	T	3	0x555bd

Interface Information

C	T	M	Intf	U	I	B	Base
3	1	0	Gi0/0/0/8	9	F	F	0x5540c
3	1	1	Gi0/0/0/4	5	F	F	0x5540f
3	1	2	Gi0/0/0/6	7	F	F	0x55412

Source: * Group: 230.0.0.0 Mask length: 8

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	T	F	F	F	T	T	0x0	0x0	0x8005	0	F	4	T	T	0	0x55176
1	T	F	T	F	F	F	T	T	0x0	0x0	0x8005	0	F	4	T	T	0	0x55176
2	T	F	T	F	F	F	T	T	0x0	0x0	0x8005	0	F	4	T	T	0	0x55176
3	T	F	T	F	F	F	T	T	0x0	0x0	0x8005	0	F	4	T	T	0	0x555ae

Source: * Group: 232.0.0.0 Mask length: 8

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	F	F	F	F	T	T	0x0	0x0	0x8003	0	F	3	T	T	0	0x55171
1	T	F	F	F	F	F	T	T	0x0	0x0	0x8003	0	F	3	T	T	0	0x55171
2	T	F	F	F	F	F	T	T	0x0	0x0	0x8003	0	F	3	T	T	0	0x55171
3	T	F	F	F	F	F	T	T	0x0	0x0	0x8003	0	F	3	T	T	0	0x555a9

Source: * Group: 233.1.0.0 Mask length: 16

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	F	F	F	F	T	T	0x180	0x0	0x8007	0	F	7	T	T	0	0x5518f
1	T	F	F	F	F	F	T	T	0x180	0x0	0x8007	0	F	7	T	T	0	0x5518f
2	T	F	F	F	F	F	T	T	0x180	0x0	0x8007	0	F	7	T	T	0	0x5518f
3	T	F	F	F	F	F	T	T	0x180	0x0	0x8007	0	F	7	T	T	0	0x555c7

Source: * Group: 233.4.0.0 Mask length: 16

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

```
show mfib hardware route olist
```

```

0 T F F F F F T T 0x180 0x0 0x8008 0 F 8 T T 0 0x55194
1 T F F F F F T T 0x180 0x0 0x8008 0 F 8 T T 0 0x55194
2 T F F F F F T T 0x180 0x0 0x8008 0 F 8 T T 0 0x55194
3 T F F F F F T T 0x180 0x0 0x8008 0 F 8 T T 0 0x555cc
-----

```

```
RP/0/RSP0/CPU0:router# show mfib hardware route olist location 0/4/CPU0
```

```
LC Type: A9K-SIP-700
```

```

Header      : Hardware Route Information
Source      : Source address
Group       : Group Address
M           : Mask Length
C           : Directly connected check flag
RPF         : Accepting interface for non-bidir entries
S           : Signal if packet arrived on RPF interface
IC          : Aggregated Internal copy flag
PR          : Punt to RP flag for Internal copy in the Loopback interface
PK          : PEEK flag
FGID        : Fabric Group ID
MGID        : Multicast Group ID
PAL Olist   : PAL Olist handle
CPP Olist   : CPP Olist handle
Num OCE     : Number of OCE entries

```

```

Header      : Route OCE Entry Information
Interface   : Interface name
Handle      : Interface handle
IC          : Internal copy flag
Accept      : Accept flag
NS          : Negate Signal flag
F/EG       : Forwarding flag

```

```
Hardware Route Information
```

```

-----
Source |Group |M |C|RPF |S|IC|PR|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*      |224.0.0.0 |4 |T|Null |F|F|F|F|0 |16964|0xa6039538 |0x9dc8688c
      |0 |

```

```
Ingress CPP Prefix Information
```

```

==== QFP Multicast prefix info ====
Root: a60394c4, Flags: 2 First leaf: 0
Number of nodes: 0x000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900100

```

```
Egress CPP Prefix Information
```

```

==== QFP Multicast prefix info ====
Root: a60394c4, Flags: 2 First leaf: 0
Number of nodes: 0x000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80100

```

```
Route OCE Entry Information
```

```
Route OLIST Information
```

```

-----
TREE .. : root : a60394c4 num_nodes 1 num_leaves 0
(in cp) Node: a60394c4 num_child:0 cum[wt:0 free:7]
(in cpp) Node : 0x8d080060 flags : 0x4
child[0]: [NULL]
child[1]: [NULL]
child[2]: [NULL]
child[3]: [NULL]
child[4]: [NULL]
child[5]: [NULL]

```



```
child[6]: [NULL]
```

```
Route Rx Adjacency Information
```

```
-----
OCE RX Adj Data for 0x8bb00000:
  base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
  pd_16: 0x0      pd_32: 0x4244
  output_uidb: 0x1fab      counters_ptr: 0x893f5c30
  byte count: 0      packet count: 0
```

```
Hardware Route Information
```

```
-----
Source   |Group   |M |C|RPF   |S|I|C|P|R|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*        |224.0.0.0 |24 |F|Null   |F|F|F|F|0   |16962|0x9e07d2e4   |0x9dc86924
      |0        |    |    |    |    |    |    |    |    |    |    |    |    |    |
```

```
Ingress CPP Prefix Information
```

```
-----
=== QFP Multicast prefix info ===
Root: 9e07d270, Flags: 0 First leaf: 0
Number of nodes: 0x000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900180
```

```
Egress CPP Prefix Information
```

```
-----
=== QFP Multicast prefix info ===
Root: 9e07d270, Flags: 0 First leaf: 0
Number of nodes: 0x000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80180
```

```
Route OCE Entry Information
```

```
Route OLIST Information
```

```
-----
TREE .. : root : 9e07d270 num_nodes 1 num_leaves 0
(in cp) Node: 9e07d270 num_child:0 cum[wt:0 free:7]
(in cpp) Node : 0x8d080120 flags : 0x4
  child[0]: [NULL]
  child[1]: [NULL]
  child[2]: [NULL]
  child[3]: [NULL]
  child[4]: [NULL]
  child[5]: [NULL]
  child[6]: [NULL]
```

```
Route Rx Adjacency Information
```

```
-----
OCE RX Adj Data for 0x8bb00120:
  base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
  pd_16: 0x0      pd_32: 0x4242
  output_uidb: 0x1fab      counters_ptr: 0x893f5c10
  byte count: 0      packet count: 0
```

```
Hardware Route Information
```

```
-----
Source   |Group   |M |C|RPF   |S|I|C|P|R|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*        |224.0.1.39|32 |F|Null   |T|F|F|F|0   |16960|0x9e07d678   |0x9dc86970
      |0        |    |    |    |    |    |    |    |    |    |    |    |    |
```

```
Ingress CPP Prefix Information
```

show mfib hardware route olist

```

=== QFP Multicast prefix info ===
Root: 9e07d604, Flags: 1 First leaf: 0
Number of nodes: 0x000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b9001c0

Egress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9e07d604, Flags: 1 First leaf: 0
Number of nodes: 0x000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce801c0

Route OCE Entry Information
Route OLIST Information
-----

TREE .. : root : 9e07d604 num_nodes 1 num_leaves 0
(in cp) Node: 9e07d604 num_child:0 cum[wt:0 free:7]
(in cpp) Node : 0x8d080140 flags : 0x4
  child[0]: [NULL]
  child[1]: [NULL]
  child[2]: [NULL]
  child[3]: [NULL]
  child[4]: [NULL]
  child[5]: [NULL]
  child[6]: [NULL]

Route Rx Adjacency Information
-----

OCE RX Adj Data for 0x8bb000f0:
  base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
  pd_16: 0x0      pd_32: 0x4240
  output_uidb: 0x1fab      counters_ptr: 0x893f5c00
  byte count: 0      packet count: 0

Hardware Route Information
-----
Source      |Group      |M  |C|RPF      |S|IC|PR|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*           |224.0.1.40|32 |F|Null     |T| F| F|F |0   |16961|0x9dcbda4   |0x9dc869bc
           |0         |
-----

Ingress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbda40, Flags: 1 First leaf: 0
Number of nodes: 0x000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b9000c0

Egress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbda40, Flags: 1 First leaf: 0
Number of nodes: 0x000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce800c0

Route OCE Entry Information
Route OLIST Information
-----

TREE .. : root : 9dcbda40 num_nodes 1 num_leaves 0
(in cp) Node: 9dcbda40 num_child:0 cum[wt:0 free:7]

```

```
(in cpp) Node : 0x8d0800c0 flags : 0x4
  child[0]: [NULL]
  child[1]: [NULL]
  child[2]: [NULL]
  child[3]: [NULL]
  child[4]: [NULL]
  child[5]: [NULL]
  child[6]: [NULL]
```

Route Rx Adjacency Information

```
-----
OCE RX Adj Data for 0x8bb00040:
  base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
  pd_16: 0x0      pd_32: 0x4241
  output_uidb: 0x1fab      counters_ptr: 0x893f5c40
  byte count: 0      packet count: 0
```

Hardware Route Information

```
-----
Source      |Group      |M |C|RPF      |S|IC|PR|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*           |225.0.0.0 |32 |T|Se0/4/0/0/1|F| F| F|F |64      |17013|0x9dcbd5a4      |0x9dc86a08
           |2         |
```

Ingress CPP Prefix Information

```
-----
=== QFP Multicast prefix info ===
Root: 9dcbd530, Flags: 2 First leaf: 9dcbd9bc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900080
```

Egress CPP Prefix Information

```
-----
=== QFP Multicast prefix info ===
Root: 9dcbd530, Flags: 2 First leaf: 9dcbd9bc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80080
```

Route OCE Entry Information

```
-----
Interface  Handle      IC Accept NS      F/EG
-----
Se0/4/0/0/1 0xc000ec0      F T      T      F
```

```
**** Leaf Info (in cp) : [9dcbd9bc]
  oce flags = 0x6 next obj type : 11 next obj handle : a73e9104
**** Leaf Info (in cpp): [0]
  leaf_flags= 0x1 oce_flags: 0 oce_ptr: 0x8c5800c0
```

```
-----
Interface  Handle      IC Accept NS      F/EG
-----
Gi0/4/3/0 0xc000080      F F      T      T
```

```
**** Leaf Info (in cp) : [9dcbd450]
  oce flags = 0x5 next obj type : 11 next obj handle : a73e907c
**** Leaf Info (in cpp): [0x8c5800f0]
  leaf_flags= 0x1 oce_flags: 0x2 oce_ptr: 0x8c580000
```

Route OLIST Information

```
-----
TREE .. : root : 9dcbd530 num_nodes 1 num_leaves 1
(in cp) Node: 9dcbd530 num_child:1 cum[wt:1 free:6]
(in cpp) Node : 0x8d080080 flags : 0x4
  child[0]: [Leaf] in cp : 9dcbd450 in cpp : 0x8c5800f0
```

show mfib hardware route olist

```

child[1]: [NULL]
child[2]: [NULL]
child[3]: [NULL]
child[4]: [NULL]
child[5]: [NULL]
child[6]: [NULL]

Route Rx Adjacency Information
-----

OCE RX Adj Data for 0x8bb00160:
base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
pd_16: 0x40      pd_32: 0x4275
output_uidb: 0x1fab      counters_ptr: 0x893f5c50
byte count: 9800      packet count: 196

Hardware Route Information
-----
Source      |Group      |M  |C|RPF      |S|IC|PR|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
12.12.12.2|225.0.0.0 |64 |F|Se0/4/0/0/1|F| F| F|F |64   |17024|0x9dcbcecc      |0x9dc86a54
      |2      |
Ingress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbcfb0, Flags: 0 First leaf: 9dcbccfc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900200

Egress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbcfb0, Flags: 0 First leaf: 9dcbccfc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80200

Route OCE Entry Information
-----
Interface  Handle          IC Accept NS      F/EG
-----
Se0/4/0/0/1 0xc000ec0      F T      F      F

**** Leaf Info (in cp) : [9dcbccfc]
oce flags = 0x2 next obj type : 11 next obj handle : a73e9104
**** Leaf Info (in cpp): [0]
leaf_flags= 0x1 oce_flags: 0  oce_ptr: 0x8c5800c0

-----
Interface  Handle          IC Accept NS      F/EG
-----
Gi0/4/3/0 0xc000080      F F      T      T

**** Leaf Info (in cp) : [9dcbcdcc]
oce flags = 0x5 next obj type : 11 next obj handle : a73e907c
**** Leaf Info (in cpp): [0x8c5800d0]
leaf_flags= 0x1 oce_flags: 0x2  oce_ptr: 0x8c580000

Route OLIST Information
-----

TREE .. : root : 9dcbcfb0 num_nodes 1 num_leaves 1
(in cp) Node: 9dcbcfb0 num_child:1 cum[wt:1 free:6]
(in cpp) Node : 0x8d080000 flags : 0x4
child[0]: [Leaf] in cp : 9dcbcdcc in cpp : 0x8c5800d0]
child[1]: [NULL]
child[2]: [NULL]

```

```
child[3]: [NULL]
child[4]: [NULL]
child[5]: [NULL]
child[6]: [NULL]
```

Route Rx Adjacency Information

```
-----
OCE RX Adj Data for 0x8bb00050:
base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
pd_16: 0x40      pd_32: 0x4280
output_uidb: 0x1fab      counters_ptr: 0x893f5c60
byte count: 348116500      packet count: 6962330
```

Hardware Route Information

```
-----
Source      |Group      |M |C|RPF      |S|I|C|P|R|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*           |232.0.0.0 |8 |F|Null      |F|F|F|F|0 |16963|0x9e07d184      |0x9dc868d8
           |0         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
```

Ingress CPP Prefix Information

```
-----
=== QFP Multicast prefix info ===
Root: 9e07d110, Flags: 0 First leaf: 0
Number of nodes: 0x0000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900140
```

Egress CPP Prefix Information

```
-----
=== QFP Multicast prefix info ===
Root: 9e07d110, Flags: 0 First leaf: 0
Number of nodes: 0x0000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80140
```

Route OCE Entry Information

Route OLIST Information

```
-----
TREE .. : root : 9e07d110 num_nodes 1 num leaves 0
(in cp) Node: 9e07d110 num_child:0 cum[wt:0 free:7]
(in cpp) Node : 0x8d0800e0 flags : 0x4
child[0]: [NULL]
child[1]: [NULL]
child[2]: [NULL]
child[3]: [NULL]
child[4]: [NULL]
child[5]: [NULL]
child[6]: [NULL]
```

Route Rx Adjacency Information

```
-----
OCE RX Adj Data for 0x8bb00080:
base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
pd_16: 0x0      pd_32: 0x4243
output_uidb: 0x1fab      counters_ptr: 0x893f5c20
byte count: 0      packet count: 0
```

The following is sample output from the **show mfib hardware route olist** command with only one multicast group:

```
RP/0/RSP0/CPU0:router# show mfib hardware route olist 227.0.0.1 location 0/0/CPU0
```

```
-----
Legend:
Route Information - (Ingress)
```

show mfib hardware route olist

```

C: Chip ID, IC: BACL check, IP: Punt this packet to LC CPU,
ID: Directly connected, IS: RPF interface signal, IU: Punt copy to RP,
IF: Punt to LC CPU if forwarded, IM: Result match, IV: Valid entry,
IR: RPF IF, IA: Fabric slotmask, IG: Multicast group ID
Route Information - (Egress)
ET: Table ID to be used for OLIST lookup, EO: OLIST count bit,
ER: Route MGID to be used for OLIST/NRPF lookup, EM: Result match,
EV: Valid entry, EC: Count of OLIST members on this chip,
BS: Base of the statistics pointer
Hardware Information
C: Chip ID; T: Table ID; M: Member ID; Intf: Interface, U: uIDB index,
I: HW IC flag, B: HW BACL bit, Base: Base of statistics pointer
-----

```

```
Source: *                Group: 227.0.0.1        Mask length: 32
```

Route Information

```
-----
C  IC IP ID IS IU IF IM IV IR        IA   IG    ET EO ER    EM EV EC    BS
-----
0  T  F  F  F  F  F  T  T  0x0    0x1  0x8004 0  F  5    T  T  0    0x55185
1  T  F  F  F  F  F  T  T  0x0    0x1  0x8004 0  F  5    T  T  0    0x55185
2  T  F  F  F  F  F  T  T  0x0    0x1  0x8004 0  F  5    T  T  0    0x55185
3  T  F  F  F  F  F  T  T  0x0    0x1  0x8004 1  T  5    T  T  3    0x555bd
-----

```

Interface Information

```
-----
C  T  M  Intf              U   I  B  Base
-----
3  1  0  Gi0/0/0/8           9   F  F  0x5540c
3  1  1  Gi0/0/0/4           5   F  F  0x5540f
3  1  2  Gi0/0/0/6           7   F  F  0x55412
-----

```

Related Commands

Command	Description
show mfib hardware route accept-bitmap, on page 72	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route statistics, on page 95	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib hardware route summary, on page 99	Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.
show mfib route, on page 110	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware route statistics

To display platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route, use the **show mfib hardware route statistics** command in EXEC mode.

```
show mfib [vrf vrf-name] ipv4 hardware route statistics [detail] [*] [ source-address ] [group-address
[/prefix-length]] [location node-id]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
*	(Optional) Displays shared tree entries.
<i>source-address</i>	(Optional) IP address or hostname of the multicast route source.
<i>group-address</i>	(Optional) IP address or hostname of the multicast group.
<i>/ prefix-length</i>	(Optional) Prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
detail	(Optional) Displays a detailed list of the routing database.
location <i>node-id</i>	(Optional) Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show mfib hardware route statistics** command to display the hardware packet and byte counter for a route. Route counters are kept for (S, G) routes only. A single set of counters is provided for all (*, G) routes.

show mfib hardware route statistics

This command displays the hardware packet and bytes count on a per-route basis. Per-route hardware counters are kept for (S, G) routes only. However, counters are managed dynamically and allocated on a priority basis and may not be available for each (S, G) route. There is a single set of counters for all

(* , G) routes. For example, interface counters and access list counters have higher priority than route counters.

**Note**

Route counters are local to each line card.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib hardware route statistics** command.

```
RP/0/RSP0/CPU0:router# show mfib hardware route statistics location 0/4/CPU0
```

```
LC Type: A9K-SIP-700
```

```
Hardware Prefix Statistics
```

```
-----
(s, g) RX/TX: Pkt/Byte:      Forward(Pkt/Byte) Punt(Pkt/Byte) RPF Fail (Pkt/Byte) Drop(Pkt/Byte)
-----
(*      , 224.0.0.0 ) RX: 0/0                      0/0                0/0
0/0
(*      , 224.0.0.0 ) TX: 0/0                      0/0                0/0
0/0
(*      , 224.0.0.0 ) RX: 0/0                      0/0                0/0
0/0
(*      , 224.0.0.0 ) TX: 0/0                      0/0                0/0
0/0
(*      , 224.0.1.39) RX: 0/0                      0/0                0/0
0/0
(*      , 224.0.1.39) TX: 0/0                      0/0                0/0
0/0
(*      , 224.0.1.40) RX: 0/0                      0/0                0/0
0/0
(*      , 224.0.1.40) TX: 0/0                      0/0                0/0
0/0
(*      , 225.0.0.0 ) RX: 196/9016                    1/46                0/0
0/0
(*      , 225.0.0.0 ) TX: 196/9016                    0/0                0/0
0/0
(12.12.12.2, 225.0.0.0 ) RX: 7931284/364839064          3/138                0/0
0/0
(12.12.12.2, 225.0.0.0 ) TX: 7931288/364839248          0/0                0/0
0/0
(*      , 232.0.0.0 ) RX: 0/0                      0/0                0/0
0/0
(*      , 232.0.0.0 ) TX: 0/0                      0/0                0/0
0/0
-----
```

```
RP/0/RSP0/CPU0:router# show mfib hardware route statistics location 0/0/CPU0
```

```
LC Type: Trident
```

```
Legend:
```

```
S: Source, G: Group, Pr: Prefix Length, C: Chip ID, R: Received,
P: Punted to CPU, F: Forwarded, ID: Ingress Drop, ED: Egress Drop
```

```
S: *   G: 224.0.0.0   Pr:24
-----
```



```

C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      0:0 / 0:0 / 0 / 0 / 0
-----
No OLIST interfaces found for this route

S: *   G: 224.0.1.39  Pr:32
-----
C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      0:0 / 0:0 / 0 / 0 / 0
-----
No OLIST interfaces found for this route

S: *   G: 224.0.1.40  Pr:32
-----
C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      0:0 / 0:0 / 0 / 0 / 0
-----
No OLIST interfaces found for this route

S: *   G: 227.0.0.1  Pr:32
-----
C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      504844:30290640 / 504843:23222778 / 504856 / 0 / 0
-----
Interface Statistics:
-----
Interface      F/P/D (packets:bytes)
-----
Gi0/0/0/8      504843:23222778 / 0:0 / 0:0
Gi0/0/0/4      0:0 / 0:0 / 0:0
Gi0/0/0/6      504843:23222778 / 0:0 / 0:0
-----

S: 4.0.0.2  G: 227.0.0.1  Pr:64
-----
C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      3869:232140 / 3869:177974 / 0 / 0 / 0
-----
Interface Statistics:
-----
Interface      F/P/D (packets:bytes)
-----
Gi0/0/0/4      0:0 / 0:0 / 0:0
Gi0/0/0/8      3869:177974 / 0:0 / 0:0
Gi0/0/0/6      3869:177974 / 0:0 / 0:0
-----

S: *   G: 230.0.0.0  Pr:8
-----
C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0

```

show mfib hardware route statistics

```

2      0:0 / 0:0 / 0 / 0 / 0
3      0:0 / 0:0 / 0 / 0 / 0
-----
No OLIST interfaces found for this route

S: *   G: 232.0.0.0   Pr:8
-----
C      R(packets:bytes) / F(packets:bytes) / P(packets) / ID(packets) / ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      0:0 / 0:0 / 0 / 0 / 0
-----
No OLIST interfaces found for this route
This table describes the significant fields shown in the display.

```

Table 5: show mfib hardware route statistics Field Descriptions

Field	Description
Ingress Counter	Unique identifier of the ingress counter.
Egress Counter	Unique identifier of the egress counter.
Forward	Number of forwarded packets and bytes.
Punt	Number of bytes punted from the line card CPU.
Drop	Number of dropped bytes.

Related Commands

Command	Description
show mfib hardware route accept-bitmap, on page 72	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route olist, on page 85	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route summary, on page 99	Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.
show mfib route, on page 110	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware route summary

To display summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry, use the **show mfib hardware route summary** command in EXEC mode.

```
show mfib [vrf vrf-name] ipv4 hardware route summary location node-id
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	(Optional) Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show mfib hardware summary** command to display hardware information for the route of the node.

The hardware information of MoFRR (multicast only fast reroute) enabled routes are also displayed. In IOS XR Software Release 3.9.0, the maximum platform supported MoFRR routes are 1024.

The longest-prefix match route is displayed depending on the provided source and group addresses. The command does not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib hardware route summary** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware route summary location 0/1/cpu0

LC Type: Trident
H/W IP Multicast Forwarding Information Base Summary
  No. of (*,G) routes = 5
  No. of (S,G) routes = 10

RP/0/RSP0/CPU0:router# show mfib hardware route summary location 0/0/CPU0

LC Type: Trident
H/W IP Multicast Forwarding Information Base Summary
  No. of (*,G) routes = 6
  No. of (S,G) routes = 5
  No. of (S,G) MoFRR routes = 0,   Maximum supported MoFRR routes = 1024

RP/0/RSP0/CPU0:router# show mfib hardware route summary location 0/4/cPU0

LC Type: A9K-SIP-700
Hardware IP Multicast Forwarding Information Base Route Summary
Number of hardware (*, G) routes = 6
Number of hardware (S, G) routes = 1
Number of hardware route-interfaces = 4
Number of hardware Rx adjacencies = 7
Number of hardware Tx adjacencies = 3
Number of ref to decap adjacency = 0
Mvpn master LC status = False
```

If there is no MoFRR configured in the platform:

```
RP/0/RSP0/CPU0:router# show mfib hardware route summary location 0/0/CPU0

LC Type: Trident
H/W IP Multicast Forwarding Information Base Summary
No. of (*,G) routes = 6
  No. of (S,G) routes = 5
  No. of (S,G) MoFRR routes = 0,   Maximum supported MoFRR routes = 1024
```

This table describes the significant fields shown in the display.

Table 6: show mfib hardware route summary Field Descriptions

Field	Description
No. of (*,G) routes	Number of (*,G) routes installed in hardware.
No. of (S,G) routes	Number of (S,G) routes installed in hardware.
No. of (S,G) MoFRR routes	Number of MoFRR (S,G) routes installed in hardware.
Maximum supported MoFRR routes	Maximum number of MoFRR routes supported in hardware.

Related Commands

Command	Description
show mfib hardware route accept-bitmap , on page 72	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.

Command	Description
show mfib hardware route mofrr , on page 79	Displays the platform-specific Multicast Forwarding Information Base (MFIB) information for the MoFRR (multicast only fast reroute)- enabled list stored in the hardware.
show mfib hardware route olist , on page 85	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route statistics , on page 95	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib route , on page 110	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware table

To display the platform-specific multicast table information for the Multicast Forwarding Information Base (MFIB) in the hardware, use the **show mfib hardware table** command in EXEC mode.

```
show mfib [vrf vrf-name] [ipv4|ipv6] hardware table [detail] [location node-id]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
detail	(Optional) Displays detailed platform-specific multicast table information.
location <i>node-id</i>	(Optional) Specifies the MFIB location.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.



Note

The command does not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following example shows a sample output of the **show mfib hardware table** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware table detail location 0/1/CPU0
```

LC Type: Trident

Legend:

NP: Network Processor, MNP: Master NP, SW OC: Software OLIST Count
TID: Table ID, MLC: Master Linecard (PD Flag)
MNP_id: Master NP ID, C_NP_MASK: Composite NP Mask

NP MNP SW OC

0 F 0
1 F 0
2 F 0
3 F 0

TID MLC MNP_id C_NP_MASK

0x0 F 0 0x0

This table describes the significant fields shown in the display.

Table 7: show mfib hardware table Field Descriptions

Field	Description
NP	Specifies the network processor.
MNP	Specifies the master network processor.
SW OC	Specifies the software OLIST count.
TID	Specifies the Table ID.

show mfib interface

To display interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process, use the **show mfib interface** command in EXEC mode.

show mfib [*vrf vrf-name*] **ipv4 interface** [*type interface-path-id*] [**detail**] **route**] [**location** *node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
detail	(Optional) Specifies detailed information for packet statistics on interfaces.
route	(Optional) Specifies a list of routes associated with the interface. This option is available if an interface <i>type</i> and <i>instance</i> are specified.
location <i>node-id</i>	(Optional) Specifies packet statistics associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mfib interface** command displays counters for the number of packets and bytes that are handled by software switching. Counters for packets processed by hardware are displayed by the appropriate **show mfib hardware** command.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib interface** command for the multicast route on node 0/2/CPU0 that is associated with the Gigabit Ethernet interface 0/2/0/2:

```
RP/0/RSP0/CPU0:router# show mfib interface GigE 0/2/0/2 location 0/2/CPU0
```

```
Interface : GigE0/2/0/2 (Enabled)
Mcast pkts in : 5839, Mcast pkts out : 0 TTL Threshold : 0 Ref Count : 18
```

The following is sample output from the **show mfib interface** command with the **detail** and **location** keywords specified:

```
RP/0/RSP0/CPU0:router# show mfib interface detail location 0/2/CPU0
```

```
Interface : FINT0/2/CPU0 [0x3000000] (Disabled) PHYSICAL Create Unknown Mcast pkts in: 0,
Mcast pkts out: 0 TTL Threshold : 0, VRF ID: 0x60000000, Multicast Adjacency Ref Count: 2,
Route Count: 0, Handle: 0x3000000 Primary address : 0.0.0.0/32 Secondary address : 0.0.0.0/32
```

```
Interface : GigE0/2/0/2 [0x3000900] (Enabled) PHYSICAL Create Rcvd Mcast pkts in: 5844,
Mcast pkts out: 0 TTL Threshold : 0, VRF ID: 0x60000000, Multicast Adjacency Ref Count: 18,
Route Count: 15, Handle: 0x3000900 Primary address : 112.112.112.203/24 Secondary address
: 0.0.0.0/32
```

This table describes the significant fields shown in the display.

Table 8: show mfib interface Field Descriptions

Field	Description
Interface	Interface name. Enabled if the interface is configured for multicast routing. The word “PHYSICAL” is displayed if the interface is a nonvirtual interface.
Mcast pkts in	Number of incoming multicast packets entering the interface during software switching.
Mcast pkts out	Number of outgoing multicast packets exiting the interface during software switching.
TTL Threshold	Number of multicast packets that reach the configured multicast time-to-live threshold.
VRF ID	VPN Routing and Forwarding instance ID.
Ref Count	Number of references to this interface structure in the MFIB process.

show mfib interface

Field	Description
Primary address	Primary IP address of the interface.
Secondary address	Secondary IP address of the interface.

Related Commands

Command	Description
show mfib hardware interface , on page 60	Displays hardware switching interface information for the Multicast Forwarding Information Base (MFIB) process.

show mfib nsf

To display the state of a nonstop forwarding (NSF) operation for the Multicast Forwarding Information Base (MFIB) line cards, use the **show mfib nsf** command in EXEC mode.

```
show mfib [ipv4] nsf [location node-id]
```

Syntax Description	
ipv4	(Optional) Specifies IPv4 address prefixes.
location node-id	(Optional) Specifies the MFIB NSF designated node.

Command Default IPv4 addressing is the default.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mfib nsf** command displays the current multicast NSF state for the MFIB process contained on all line cards and route processors (RPs) in the router.

For multicast NSF, the state may be one of the following:

- **Normal**—Normal operation: The MFIBs in the card contain only up-to-date MFIB entries.
- **Boot Card Booting**—Card is initializing and has not yet determined its NSF state.
- **Not Forwarding**—Multicast Forwarding Disabled: Multicast routing failed to recover from a failure-induced NSF state prior to the MFIB NSF timeout.
- **Non-stop Forwarding Activated**—Multicast NSF active: The router is operating in NSF mode while attempting to recover from a control-plane failure. In this mode, data is forwarded based on MFIB entries that are either updated by the recovered Multicast Routing Information Base (MRIB), or MFIB entries that were marked stale when NSF mode began. The times remaining until multicast NSF and multicast-unicast NSF expiration are displayed.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib nsf** command:

```
RP/0/RSP0/CPU0:router# show mfib nsf

IP MFWD Non-Stop Forwarding Status:
  NSF Lifetime: 00:15:00

On node 0/1/CPU0 :
Multicast routing state: Non-Stop Forwarding is activated
NSF Time Remaining: 00:14:54

On node 0/3/CPU0 :
Multicast routing state: Non-Stop Forwarding is activated
NSF Time Remaining: 00:14:54

On node 0/4/CPU0 :
Multicast routing state: Non-Stop Forwarding is activated
NSF Time Remaining: 00:14:53

On node 0/6/CPU0 :
Multicast routing state: Non-Stop Forwarding is activated
NSF Time Remaining: 00:14:53
```

This table describes the significant fields shown in the display.

Table 9: show mfib nsf Field Descriptions

Field	Description
IP MFWD Non-Stop Forwarding Status	MFIB NSF status of each node in the system: booting, normal, not forwarding, or activated.
NSF Time Remaining	If MSB NSF is activated, the time remaining until NSF fails and all routes are deleted displays. Before timeout, MRIB signals that NSF (in the control plane) is finished and new, updated routes are populated in the MFIB (which makes the transition to Normal status).

Related Commands

Command	Description
nsf lifetime (IGMP)	Configures the maximum time for the NSF timeout value under IGMP.
nsf (multicast) , on page 49	Configures the NSF capability for the multicast routing system.

Command	Description
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mrib nsf , on page 126	Displays the state of NSF operation in the MRIB.
show pim nsf	Displays the state of NSF operation for PIM.

show mfib route

To display route entries in the Multicast Forwarding Information Base (MFIB), use the **show mfib route** command in EXEC mode.

show mfib [*vrf vrf-name*] **ipv4 route** [*rate*] *| *source-IP-address*| *group-IP-address*/**prefix-length**| **detail**| **summary**| **location** *node-id*]

Syntax Description

*	(Optional) Display shared tree entries.
<i>source-IP-address</i>	(Optional) IP address or hostname of the multicast route source. Format is: <i>A.B.C.D</i>
<i>group-IP-address</i>	(Optional) IP address or hostname of the multicast group. Format is: <i>A.B.C.D</i>
<i>/prefix-length</i>	(Optional) Group IP prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). Format is: <i>A.B.C.D/length</i>
vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
detail	(Optional) Specifies detailed route information.
location <i>node-id</i>	(Optional) Specifies an MFIB-designated node.
rate	(Optional) Displays individual (S, G) rates.
sources-only	(Optional) Restricts display of any shared-tree entries.
summary	(Optional) Displays a brief list of the routing database.
tech-support	(Optional) Displays technical support information.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

All entries in the MFIB table are derived from the Multicast Routing Information Base (MRIB). The flags have the same connotation as in the MRIB. The flags determine the forwarding and signaling behavior according to a set of forwarding rules for multicast packets. In addition to the list of interfaces and flags, each route entry shows various counters. Byte count is the number of total bytes forwarded. Packet count is the number of packets received for this entry.

The **show mfib counter** command displays global counters independent of the routes.

This command displays counters for the number of packets and bytes that are handled by software switching. Counters for packets processed by hardware are displayed by the appropriate **show mfib hardware** command.

The command displays the cumulative rates per route for all line cards in the Multicast Forwarding Information Base (MFIB) table when the **rate** keyword is used with the source and group IP addresses.

The command displays the rate per route for one line card in Multicast Forwarding Information Base (MFIB) table when the **statistics** keyword is used.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib route** command with the **location** keyword specified (the output fields are described in the header):

```
RP/0/RSP0/CPU0:router# show mfib route location 0/1/CPU0

IP Multicast Forwarding Information Base
Entry flags: C - Directly-Connected Check, S - Signal, D - Drop,
             IA - Inherit Accept, IF - Inherit From, MA - MDT Address,
             ME - MDT Encap, MD - MDT Decap, MT - MDT Threshold Crossed,
             MH - MDT interface handle, CD - Conditional Decap,
             DT - MDT Decap True
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
               NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
               EG - Egress, EI - Encapsulation Interface, MI - MDT Interface
Forwarding Counts: Packets in/Packets out/Bytes out
Failure Counts: RPF / TTL / Empty Olist / Encap RL / Other

(*,224.0.0.0/24),   Flags: D
Up: 02:16:52
Last Used: never
SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0
```

show mfib route

```

(*,224.0.1.39),   Flags: S
  Up: 02:16:52
  Last Used: never
  SW Forwarding Counts: 0/0/0
  SW Failure Counts: 0/0/0/0/0

(*,224.0.1.40),   Flags: S
  Up: 02:16:52
  Last Used: never
  SW Forwarding Counts: 0/0/0
  SW Failure Counts: 0/0/0/0/0

(*,227.0.0.1),   Flags: C
  Up: 02:16:51
  Last Used: 02:16:50
  SW Forwarding Counts: 282/0/0
  SW Failure Counts: 205/0/0/0/0
  GigabitEthernet0/0/0/4 Flags: NS EG, Up:02:16:46
  GigabitEthernet0/0/0/8 Flags: NS EG, Up:02:16:50
  GigabitEthernet0/0/0/6 Flags: NS EG, Up:02:16:50

(4.0.0.2,227.0.0.1),   Flags:
  Up: 02:16:50
  Last Used: 00:00:12
  SW Forwarding Counts: 125/0/0
  SW Failure Counts: 0/0/0/0/0
  GigabitEthernet0/0/0/8 Flags: NS EG, Up:02:16:50
  GigabitEthernet0/0/0/6 Flags: NS EG, Up:02:16:50
  GigabitEthernet0/0/0/4 Flags: A EG, Up:02:16:50

(*,232.0.0.0/8),   Flags: D
  Up: 02:16:52
  Last Used: never
  SW Forwarding Counts: 0/0/0
  SW Failure Counts: 0/0/0/0/0

```

The following is sample output from the **show mfib route** command with the **summary** and **location** keywords specified:

```

RP/0/RSP0/CPU0:router# show mfib route summary location 0/0/CPU0
IP Multicast Forwarding Information Base Summary for VRF default
  No. of (*,G) routes = 5
  No. of (S,G) routes = 1

```

The following is sample output from the **show mfib route** command with the **statistics** and **location** keywords specified. If the hardware counters show N/A, it means no hardware statistic blocks were assigned to the route. However, routes may show that both hardware and software statistic blocks are assigned. The output fields are described in the header.

```

RP/0/RSP0/CPU0:router# show mfib route statistics location 0/0/CPU0
IP Multicast Forwarding Information Base
Entry flags: C - Directly-Connected Check, S - Signal, D - Drop,
  IA - Inherit Accept, IF - Inherit From, MA - MDT Address,
  ME - MDT Encap, MD - MDT Decap, MT - MDT Threshold Crossed,
  MH - MDT interface handle, CD - Conditional Decap,
  DT - MDT Decap True
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
  NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
  EG - Egress, EI - Encapsulation Interface, MI - MDT Interface
SW/HW Forwarding Counts: Packets in/Packets out/Bytes out
SW Failure Counts: RPF / TTL / Empty Olist / Encap RL / Other
HW Drop Counts: Ingress / Egress
HW Forwarding Rates: bps In/pps In/bps Out/pps Out

(*,224.0.0.0/24),   Flags: D
  Up: 02:21:15
  Last Used: never
  SW Forwarding Counts: 0/0/0
  SW Failure Counts: 0/0/0/0
  HW Forwarding Counts: 0/0/0
  HW Drop Counts: 0/0

```



```

HW Forwarding Rates: N/A /N/A /N/A /N/A

(*,224.0.1.39),   Flags:  S
Up: 02:21:15
Last Used: never
SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0
HW Forwarding Counts: 0/0/0
HW Drop Counts: 0/0
HW Forwarding Rates: N/A /N/A /N/A /N/A

(*,224.0.1.40),   Flags:  S
Up: 02:21:15
Last Used: never
SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0
HW Forwarding Counts: 0/0/0
HW Drop Counts: 0/0
HW Forwarding Rates: N/A /N/A /N/A /N/A

(*,227.0.0.1),   Flags:  C
Up: 02:21:14
Last Used: 02:21:14
SW Forwarding Counts: 282/0/0
SW Failure Counts: 205/0/0/0
HW Forwarding Counts: 0/0/0
HW Drop Counts: 0/0
HW Forwarding Rates: N/A /N/A /N/A /N/A
GigabitEthernet0/0/0/4 Flags:  NS EG, Up:02:21:10
GigabitEthernet0/0/0/8 Flags:  NS EG, Up:02:21:14
GigabitEthernet0/0/0/6 Flags:  NS EG, Up:02:21:14

(4.0.0.2,227.0.0.1),   Flags:
Up: 02:21:14
Last Used: 00:01:06
SW Forwarding Counts: 128/0/0
SW Failure Counts: 0/0/0/0
HW Forwarding Counts: 8474282/8474283/389817018
HW Drop Counts: 0/0
HW Forwarding Rates: N/A /N/A /N/A /N/A
GigabitEthernet0/0/0/8 Flags:  NS EG, Up:02:21:14
GigabitEthernet0/0/0/6 Flags:  NS EG, Up:02:21:14
GigabitEthernet0/0/0/4 Flags:  A EG, Up:02:21:14

(*,232.0.0.0/8),   Flags:  D
Up: 02:21:15
Last Used: never
SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0
HW Forwarding Counts: 0/0/0
HW Drop Counts: 0/0
HW Forwarding Rates: N/A /N/A /N/A /N/A

```

The following is a sample output for MoFRR enabled route without and with the detail keyword:

```

RP/0/RSP0/CPU0:router# show mfib route

IP Multicast Forwarding Information Base
Entry flags: C - Directly-Connected Check, S - Signal, D - Drop,
  IA - Inherit Accept, IF - Inherit From, MA - MDT Address,
  ME - MDT Encap, MD - MDT Decap, MT - MDT Threshold Crossed,
  MH - MDT interface handle, CD - Conditional Decap,
  DT - MDT Decap True, EX - Extranet
MoFE - MoFRR Enabled, MoFS - MoFRR State
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
  NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
  EG - Egress, EI - Encapsulation Interface, MI - MDT Interface,
  EX - Extranet, A2 - Secondary Accept
Forwarding/Replication Counts: Packets in/Packets out/Bytes out
Failure Counts: RPF / TTL / Empty Olist / Encap RL / Other
(20.20.20.1,225.0.0.1),   Flags:  MoFE MoFS
Up: 03:22:30
Last Used: never

```

show mfib route

```

SW Forwarding Counts: 0/0/0
SW Replication Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0
GigabitEthernet0/0/0/8 Flags: A, Up:03:22:30
GigabitEthernet0/0/0/18 Flags: A2, Up:03:22:30
GigabitEthernet0/0/0/28 Flags: NS, Up:03:22:30

(20.20.20.1,225.0.0.2), Flags: MoFE MoFS
Up: 03:22:30
Last Used: never
SW Forwarding Counts: 0/0/0
SW Replication Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0
GigabitEthernet0/0/0/8 Flags: A, Up:03:22:30
GigabitEthernet0/0/0/18 Flags: A2, Up:03:22:30
GigabitEthernet0/0/0/28 Flags: NS, Up:03:22:30

```

In the above command, A flag represents the primary RPF of the MoFRR route, and A2 flag represents the backup RPF of the MoFRR route.

```
RP/0/RSP0/CPU0:router# show mfib route detail
```

```

IP Multicast Forwarding Information Base
Entry flags: C - Directly-Connected Check, S - Signal, D - Drop,
IA - Inherit Accept, IF - Inherit From, MA - MDT Address,
ME - MDT Encap, MD - MDT Decap, MT - MDT Threshold Crossed,
MH - MDT interface handle, CD - Conditional Decap,
DT - MDT Decap True, EX - Extranet
MoFE - MoFRR Enabled, MoFS - MoFRR State
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
EG - Egress, EI - Encapsulation Interface, MI - MDT Interface,
EX - Extranet, A2 - Secondary Accept
Forwarding/Replication Counts: Packets in/Packets out/Bytes out
Failure Counts: RPF / TTL / Empty Olist / Encap RL / Other
(20.20.20.1,225.0.0.1), Flags: MoFE MoFS
Up: 03:25:31
Last Used: never
SW Forwarding Counts: 0/0/0
SW Replication Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0
Route ver: 0x4a13
MVPN Info :-
MDT Handle: 0x0, MDT Probe:N [N], Rate:N, Acc:N
MDT SW Ingress Encap V4/V6, Egress decap: 0 / 0, 0
MOFRR State: Inactive Sequence No 1
GigabitEthernet0/0/0/8 Flags: A, Up:03:25:31
GigabitEthernet0/0/0/18 Flags: A2, Up:03:25:31
GigabitEthernet0/0/0/28 Flags: NS, Up:03:25:31
(20.20.20.1,225.0.0.2), Flags: MoFE MoFS
Up: 03:25:31
Last Used: never
SW Forwarding Counts: 0/0/0
SW Replication Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0
Route ver: 0x443e
MVPN Info :-
MDT Handle: 0x0, MDT Probe:N [N], Rate:N, Acc:N
MDT SW Ingress Encap V4/V6, Egress decap: 0 / 0, 0
MOFRR State: Inactive Sequence No 1
GigabitEthernet0/0/0/8 Flags: A, Up:03:25:31
GigabitEthernet0/0/0/18 Flags: A2, Up:03:25:31
GigabitEthernet0/0/0/28 Flags: NS, Up:03:25:31

```

The detail option illustrates the MoFRR state of each MoFRR route. At any moment, only one RPF forwards the traffic to the egress. The inactive state means the primary RPF forwards the traffic to the egress. The active state means that the backup RPF forwards the traffic to the egress. The sequence number reflects the number of switchovers of the MoFRR route.

Related Commands

Command	Description
show mfib counter, on page 56	Displays Multicast Forwarding Information Base (MFIB) counter statistics for packets that have dropped.
show mfib hardware route accept-bitmap, on page 72	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route olist, on page 85	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route statistics, on page 95	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib interface, on page 104	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mrib route, on page 130	Displays all entries in the Multicast Routing Information Base (MRIB).

show mfib table-info

To display Multicast Forwarding Information Base (MFIB) table information, use the **show mfib table-info** command in EXEC mode.

```
show mfib ipv4 table-info {table-id| vrf-name} [local| remote] [location node-id]
```

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
<i>table-id</i>	Specifies the table identifier. Range is 0 to 4294967295.
<i>vrf-name</i>	Specifies the VRF name.
local	Specifies local tables only.
remote	Specifies remote tables only.
location <i>node-id</i>	(Optional) Specifies MFIB connections associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib table-info** command:

```
RP/0/RSP0/CPU0:router# show mfib table-info table-id location 0/0/CPU0
```

```
Table Name          : default
VRid/TID/VID       : 0x0 / 0xe0000000 / 0x60000000
Table type         : TBL_TYPE_TID
Active/Linked     : Y / ^Y
Prev Table ID     : 0x0
Location          : Local
Local ifcount     : 16
Default MDT Encap : (*, */32)
MDT Master LC     : N
Loopback (Encap Src) : 0x0 (Ha0x0)
Local EG intf cnt : 6
Data MDT         : Acl - (-), All vrf routes N, 0 Kbps
```

```
RP/0/RSP0/CPU0:router#show mfib table-info vrf 101
```

```
Table Name          : vrf15
VRid/TID/VID       : 0x0 / 0xe000000f / 0x6000000f
Table type         : TBL_TYPE_NAME_VID
Active/Linked     : Y / ^Y
Prev Table ID     : 0x0
Location          : Local
Local ifcount     : 2
Child routes      : (5.5.5.5, 225.101.1.15/32)
```

```
Default MDT Handle : 0x0 (Ha0x0)
```

```
MDT Master LC     : Y
Loopback (Encap Src) : 0x9000180 (Loopback0)
Local EG intf cnt : 508
Data MDT         : Acl - (-), All vrf routes N, 0 Kbps
```

This table describes the significant fields shown in the display.

Table 10: show mfib table-info Field Descriptions

Field	Description
Table Name	Name of the MFIB table.
VRid/TID/VID	Table identifiers.
Table type	Type of MFIB table.
Active/Linked	Table is active and linked.
Location	Location of the MFIB table.
Local ifcount	Local interface count.
Child routes	Child routes shows the number of extranet routes in receiver VRFs that reference this source VRF.
Default MDT Encap	Default MDT encapsulation.

Field	Description
Default MDT Handle	Default MDT interface handle for this VRF.
MDT Master LC	Field contains "Y" if this line card is a master line card for this VRF.
Loopback (Encap Src)	Loopback (encapsulation source).
Local EG intf cnt	Shows the number of local egress interfaces for this VRF and location.
Data MDT	Routes for which multicast data for a multicast distribution tree (MDT) was triggered.

show mhost default-interface

To display the active default interface for the Multicast Host (MHost) process, use the **show mhost default-interface** command in EXEC mode.

show mhost ipv4 default-interface

Syntax Description	
ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.

Command Default IPv4 addressing is the default.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs.

The **show mhost default-interface** command is used to show both the configured and active MHost default interfaces. The configured interface is the one specified by the **mhost default-interface** command; otherwise, the configured interface is displayed as none.

The active interface is the one currently being used as the default. The active interface may differ from the one configured when multicast routing is enabled and the configured interface is not operational. This command is useful when applications such as ping, or MTrace are not functioning as expected.

Task ID	Task ID	Operations
	network	read

Examples The following is sample output for the **show mhost default-interface** command that shows that loopback interface 0 was configured as the MHost default interface, and it is the active default interface:

```
RP/0/RSP0/CPU0:router# show mhost default-interface
```

```
show mhost default-interface
```

```
mhost configured default interface is 'Loopback0'  
mhost active default interface is 'Loopback0'
```

Related Commands

Command	Description
mhost default-interface, on page 43	Configures the default interface for IP multicast transmission and reception to and from the host stack.

show mhost groups

To display various multicast groups joined directly on the interface, use the **show mhost groups** command in EXEC mode.

```
show mhost [ipv4] groups type interface-path-id [location node-id]
```

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
location node-id	(Optional) Specifies a designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mhost groups** command is used to display the groups joined by applications and verifies that the MHost application is functioning properly.

Task ID

Task ID	Operations
network	read

Examples

The following is sample output from the **show mhost groups** command that shows the MHost groups 239.1.1.1, 224.0.0.22, 224.0.0.2, 224.0.0.1, 224.0.0.13, and 224.0.1.40 have joined on loopback 0 interface:

```
RP/0/RSP0/CPU0:router# show mhost groups loopback 0

Loopback 0
239.1.1.1 : includes 1, excludes 0, mode INCLUDE
33.3.3.3 : includes 1, excludes 0, active in INCLUDE filter
224.0.0.22 : includes 0, excludes 1, mode EXCLUDE
<no source filter>
224.0.0.2 : includes 0, excludes 1, mode EXCLUDE
<no source filter>
224.0.0.1 : includes 0, excludes 1, mode EXCLUDE
<no source filter>
224.0.0.13 : includes 0, excludes 1, mode EXCLUDE
<no source filter>
224.0.1.40 : includes 0, excludes 2, mode EXCLUDE
<no source filter>
```

This table describes the significant fields shown in the display.

Table 11: show mhost groups Field Descriptions

Field	Description
includes	Number of source addresses in the include list.
excludes	Number of source addresses in the exclude list.
mode	Multicast socket filter mode: include or exclude.
33.3.3.3	Source address list to be included or excluded based on the multicast filter mode.

Related Commands

Command	Description
show mfib hardware route accept-bitmap , on page 72	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route olist , on page 85	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route statistics , on page 95	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib hardware route summary , on page 99	Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.
show mfib route , on page 110	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mrib client

To display the state of the Multicast Routing Information Base (MRIB) client connections, use the **show mrib client** command in EXEC mode.

```
show mrib [vrf vrf-name] ipv4 client [filter] [ client-name ]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
filter	(Optional) Displays route and interface level flag changes that various MRIB clients have registered and shows what flags are owned by the MRIB clients.
<i>client-name</i>	(Optional) Name of a multicast routing protocol that acts as a client of MRIB, such as Protocol Independent Multicast (PIM) or Internet Group Management Protocol (IGMP).

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mrib client** command using the **filter** option:

```
RP/0/RSP0/CPU0:router# show mrib client filter

IP MRIB client-connections
igmp:417957 (connection id 0)
ownership filter:
  interface attributes: II ID LI LD
  groups:
    include 0.0.0.0/0
  interfaces:
    include All
pim:417959 (connection id 1)
interest filter:
  entry attributes: E
  interface attributes: SP II ID LI LD
  groups:
    include 0.0.0.0/0
  interfaces:
    include All
ownership filter:
  entry attributes: L S C IA IF D
  interface attributes: F A IC NS DP DI EI
  groups:
    include 0.0.0.0/0
  interfaces:
    include All
bcdl_agent:1 (connection id 2)
interest filter:
  entry attributes: S C IA IF D
  interface attributes: F A IC NS DP SP EI
  groups:
    include 0.0.0.0/0
  interfaces:
    include All
ownership filter:
  groups:
    include 0.0.0.0/0
  interfaces:
    include All
```

This table describes the significant fields shown in the display.

Table 12: show mrib client Field Descriptions

Field	Description
igmp	Name of the client.
417957	Personal identifier (PID) or a unique ID assigned by MRIB.
(connection id 0)	Unique client connection identifier.
ownership filter:	Specifies all the route entry and interface-level flags that are owned by the client. As the owner of the flag, only the client can add or remove the flag. For example, only the Internet Group Management Protocol (IGMP) client can add the II flag on an interface. MRIB does not allow a non-owner to register or modify the same flag.

Field	Description
groups: include 0.0.0.0/0 interfaces: include All	Groups and interfaces registered by the clients consisting of two lists. One is an include list (items for which the client requests to be notified.) The use of “All” implies all interfaces and 0.0.0.0/0 to indicate all groups. Not shown in this example is the exclude list. This list contains items for which the client requests not to be notified when modifications occur.
interface attributes: II ID LI LD	Interface-level flags set on the interface belong to a route.
interest filter:	Specifies all the flags, groups, and interfaces from which the client requests information. When a flag of interest for a client is modified, the client is notified.
entry attributes: S C IA IF D	Entry-level flags that are set on the route.

Related Commands

Command	Description
show mrib nsf, on page 107	Displays the state of a nonstop forwarding (NSF) operation for the Multicast Forwarding Information Base (MFIB) line cards.
show mrib route, on page 110	Displays route entries in the Multicast Forwarding Information Base (MFIB).
show mrib nsf, on page 126	Displays the state of nonstop forwarding (NSF) operation in the Multicast Routing Information Base (MRIB).

show mrib nsf

To display the state of nonstop forwarding (NSF) operation in the Multicast Routing Information Base (MRIB), use the **show mrib nsf** command in EXEC mode.

show mrib ipv4 nsf

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
------	---

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mrib nsf** command displays the current multicast NSF state for the MRIB. The state may be normal or activated for NSF. The activated state indicates that recovery is in progress due to a failure in MRIB or Protocol Independent Multicast (PIM). The total NSF timeout and time remaining are displayed until NSF expiration.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/RSP0/CPU0:router# show mrib nsf

IP MRIB Non-Stop Forwarding Status:
Multicast routing state: Non-Stop Forwarding Activated
NSF Lifetime: 00:03:00
NSF Time Remaining: 00:01:40
This table describes the significant fields shown in the display.
```

Table 13: show mrib nsf Field Descriptions

Field	Description
Multicast routing state	Multicast NSF status of the MRIB (Normal or NSF Activated).
NSF Lifetime	Timeout for MRIB NSF, computed as the maximum of the PIM and Internet Group Management Protocol (IGMP) NSF lifetimes, plus 60 seconds.
NSF Time Remaining	If MRIB NSF state is activated, the time remaining until MRIB reverts to Normal mode displays. Before this timeout, MRIB receives notifications from IGMP and PIM, triggering a successful end of NSF and cause the transition to normal state. If notifications are not received, the timer triggers a transition back to normal mode, causing new routes to download to MFIB and old routes to be deleted.

Related Commands

Command	Description
nsf (multicast) , on page 49	Configures the NSF capability for the multicast routing system.
nsf lifetime (IGMP)	Configures the maximum time for the NSF timeout value under IGMP .
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mfib nsf , on page 107	Displays the state of NSF operation in the MFIB line cards.
show pim nsf	Displays the state of NSF operation for PIM.

show mrib platform trace

To display platform-specific data for the Multicast Routing Information Base (MRIB), use the **show mrib platform trace** command in EXEC mode.

show mrib [*vrf vrf-name*] **ipv4 platform trace** [*file| hexdump| last| reverse| stats| tailf| unique| verbose| wrapping*] [*location all| node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
file	(Optional) Specifies the filename.
hexdump	(Optional) Displays the traces in hexadecimal form.
last	(Optional) Displays the last <i>n</i> entries.
reverse	(Optional) Displays the traces in reverse order.
stats	(Optional) Displays statistics.
tailf	(Optional) Displays new traces as they are added.
unique	(Optional) Displays unique entries with counts.
verbose	(Optional) Displays internal debugging information.
wrapping	(Optional) Displays wrapping entries.
location <i>node -id</i>	(Optional) Specifies the location of the trace.
location <i>all</i>	(Optional) Specifies that the trace be performed for all locations.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following example shows a sample output of **show mrib platform trace** command:

```
RP/0/RSP0/CPU0:router#show mrib platform trace
2 wrapping entries (512 possible, 0 filtered, 2 total)
```

show mrib route

To display all entries in the Multicast Routing Information Base (MRIB), use the **show mrib route** command in EXEC mode.

```
show mrib [vrf vrf-name] [ipv4 | ipv6] [old-output] route [summary | outgoing-interface] [*] source-address
[group-address [/prefix-length]] [detail]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
*	(Optional) Displays shared tree entries.
<i>source-address</i>	(Optional) Source IP address or hostname of the MRIB route. Format is: <i>A.B.C.D</i> or <i>X:X::X</i> .
<i>group-address</i>	(Optional) Group IP address or hostname of the MRIB route. F ormat is: <i>A.B.C.D</i> or <i>X:X::X</i> .
<i>/prefix-length</i>	(Optional) Prefix length of the MRIB group address. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value. Format is: <i>A.B.C.D</i> or <i>X:X::X</i> .
outgoing-interface	(Optional) Displays the outgoing-interface information.
summary	(Optional) Displays a summary of the routing database.
detail	(Optional) Displays the routing database with the platform data.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release 3.7.2

This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Each line card has an individual Multicast Forwarding Information Base (MFIB) table. The MFIB table maintains a subset of entries and flags updated from MRIB. The flags determine the forwarding and signaling behavior according to a set of forwarding rules for multicast packets. In addition to the list of interfaces and flags, each route entry shows various counters. Byte count is the number of total bytes forwarded. Packet count is the number of packets received for this entry.

The [show mrib counter, on page 56](#) command displays global counters independent of the routes.

Task ID

Task ID	Operations
multicast	read

Related Commands

Command	Description
nsf lifetime (IGMP)	Configures the maximum time for the NSF timeout value on the IGMP.
show mrib counter, on page 56	Displays MFIB counter statistics for packets that have dropped.
show mrib route-collapse, on page 132	Displays the contents of the MRIB route collapse database.
show mrib route, on page 110	Displays all entries in the MFIB table.

show mrib route-collapse

To display the contents of the Multicast Routing Information Base (MRIB) route-collapse database, use the **show mrib route-collapse** command in EXEC mode.

```
show mrib [vrf vrf-name] ipv4 route-collapse [ core-tree ]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>core-tree</i>	(Optional) IPv4 Multicast Distribution Tree (MDT) group address.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mrib route-collapse** command:

```
RP/0/RSP0/CPU0:router# show mrib route-collapse
226.1.1.1 TID: 0xe0000038 TLC TID: 0xe0000038
Customer route database count: 5
(192.168.5.204,224.0.1.40/32)
(*,226.226.226.226/32)
(*,228.228.228.228/32)
(192.168.113.17,228.228.228.228/32)
(*,229.229.229.229/32)
Core route database count: 4
```

```

(*,226.1.1.1/32)
(192.168.5.201,226.1.1.1/32)
(192.168.5.202,226.1.1.1/32)
(192.168.5.204,226.1.1.1/32)
Core egress node database count: 1
nodeid      slot      refcount
0x20        0/2/CPU0  1

192.168.27.1 TID: 0xe0000039  TLC TID: 0xe0000039
Customer route database count: 1
(192.168.113.33,227.227.227.227/32)
Core route database count: 3
(*,227.27.27.1/32)
(192.168.5.201,227.27.27.1/32)
(192.168.5.202,227.27.27.1/32)
Core egress node database count: 1
nodeid      slot      refcount
0x20        0/2/CPU0  1

192.168.28.1 TID: 0xe000003a  TLC TID: 0xe000003a
Customer route database count: 2
(192.168.5.204,224.0.1.40/32)
(192.168.113.49,229.229.229.229/32)
Core route database count: 3
(192.168.5.201,228.28.28.1/32)
(192.168.5.202,228.28.28.1/32)
(192.168.5.204,228.28.28.1/32)
Core egress node database count: 1
nodeid      slot      refcount
0x20        0/2/CPU0  1

```

Related Commands

Command	Description
show mrib route , on page 130	Displays all entries in the Multicast Routing Information Base (MRIB).

show mrib route outgoing-interface

To display the outgoing-interface information on the Multicast Routing Information Base (MRIB), use the **show mrib route outgoing-interface** command in EXEC mode.

```
show mrib route outgoing-interface [*| source-address] [group-address [/prefix-length]]
```

Syntax Description

*	(Optional) Displays shared tree entries.
<i>A.B.C.D</i>	(Optional) Source IP address or hostname of the MRIB route. Format is: <i>A.B.C.D</i>
<i>A.B.C.D</i>	(Optional) Group IP address or hostname of the MRIB route and the prefix length.
<i>/prefix-length</i>	(Optional) Prefix length of the MRIB group address. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value. Format is: <i>A.B.C.D</i>

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mrib route outgoing-interface** command:

```
RP/0/RSP0/CPU0:router# show mrib route outgoing-interface

IP Multicast Routing Information Base
Entry flags: L - Domain-Local Source, E - External Source to the Domain,
             C - Directly-Connected Check, S - Signal, IA - Inherit Accept,
             IF - Inherit From, D - Drop, MA - MDT Address, ME - MDT Encap,
             MD - MDT Decap, MT - MDT Threshold Crossed, MH - MDT interface handle
             CD - Conditional Decap, MPLS - MPLS Decap, MF - MPLS Encap, EX - Extranet
             MoFE - MoFRR Enabled, MoFS - MoFRR State

(*,224.0.0.0/4), Up:6d10h, OIF count:0, flags: C
(*,224.0.0.0/24), Up:6d10h, OIF count:0, flags: D
(*,224.0.0.1.39), Up:6d10h, OIF count:3, flags: S
(10.1.1.1,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.2.2.2,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.3.3.3,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.4.4.4,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.5.5.5,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.6.6.6,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.7.7.7,224.0.1.39), Up:00:04:17, OIF count:11, flags:
(10.8.8.8,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.9.9.9,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.10.10.10,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.21.21.21,224.0.1.39), Up:6d06h, OIF count:11, flags:
(*,224.0.1.40), Up:6d10h, OIF count:2, flags: S
(10.1.1.1,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.2.2.2,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.6.6.6,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.13.4.3,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.14.4.4,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.14.8.4,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.21.21.21,224.0.1.40), Up:6d06h, OIF count:11, flags:
(10.23.4.3,224.0.1.40), Up:00:02:38, OIF count:11, flags:
(10.23.8.3,224.0.1.40), Up:00:02:38, OIF count:11, flags:
(10.34.4.3,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.34.8.3,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.35.4.3,224.0.1.40), Up:00:02:38, OIF count:11, flags:
(10.35.4.5,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.38.4.8,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.45.4.5,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.49.4.9,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.105.4.10,224.0.1.40), Up:6d10h, OIF count:11, flags:
(*,225.0.0.0/8), Up:6d06h, OIF count:0, flags: C
(*,226.0.0.0/8), Up:6d06h, OIF count:0, flags: C
(*,232.0.0.0/8), Up:6d10h, OIF count:0, flags: D
(10.6.6.6,232.1.1.1), Up:6d10h, OIF count:3, flags:
(10.7.7.7,232.1.1.1), Up:6d10h, OIF count:2, flags:
(10.8.8.8,232.1.1.1), Up:6d10h, OIF count:2, flags:
(10.9.9.9,232.1.1.1), Up:6d10h, OIF count:2, flags:
(10.10.10.10,232.1.1.1), Up:6d10h, OIF count:2, flags:
(10.21.21.21,232.1.1.1), Up:6d06h, OIF count:3, flags:
```

Related Commands

Command	Description
show mrib route , on page 130	Displays all entries in the Multicast Routing Information Base (MRIB).

show mrib table-info

To display Multicast Routing Information Base (MRIB) table information, use the **show mrib table-info** command in EXEC mode.

show mrib [*vrf vrf-name*] **ipv4 table-info**

Syntax Description	
vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default IPv4 addressing is the default.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read

Examples The following is sample output from the **show mrib table-info** command:

```
RP/0/RSP0/CPU0:router# show mrib vrf vrf101 table-info
VRF: default [tid 0xe0000000]
Registered Client:
  igmp [ccbid: 0 cltid: 4485366]
  pim [ccbid: 1 cltid: 4485368]
  bcdl_agent [ccbid: 2 cltid: 1]
  msdp [ccbid: 3 cltid: 8827135]
```


Table 14: show mrib table-info Field Descriptions

Field	Description
VRF	Default VRF or a VRF configured for the purpose of an override in MVPN.
cltid	Client ID.
bcdl_agent	A process like igmp and pim, which is used to download routes to line card.
MDT handle	MDT interface handle for this VRF.
MDT group	Default MDT group associated with this VRF.
MDT source	Per-VRF MDT source information.

Related Commands

Command	Description
show mrib tlc, on page 138	Displays the contents of the Multicast Routing Information Base (MRIB) table-line card (TLC) database.

show mrib tlc

To display the contents of the Multicast Routing Information Base (MRIB) table-line card (TLC) database, use the **show mrib tlc** command in EXEC mode.

show mrib [*vrf vrf-name*] **ipv4 tlc**

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/RSP0/CPU0:router# show mrib tlc
```

```
VRF: default [tid 0xe0000000]
Master LC slot: Not selected
Associated MDT group: 0
Forwarding LC node: 0
```

This table describes the significant fields shown in the display.

Table 15: show msdp peer Field Descriptions

Field	Description
Associated MDT group	IP address of the MSDP peer.
Master LC slot	Indicates whether the master LC slot has been selected.
Forwarding LC node	Autonomous system to which the peer belongs.
Associated MDT group	Indicates the number of associated MDT groups.

static-rpf

To configure a static Reverse Path Forwarding (RPF) rule for a specified prefix mask, use the **static-rpf** command in an appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

static-rpf *prefix-address prefix-mask type path-id next-hop-address*

no static-rpf

Syntax Description

<i>prefix-address</i>	IP address of a prefix for an address range.
<i>prefix-mask</i>	Prefix mask for an address range. Range is 0 to 32 for IPv4 .
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
<i>next-hop-address</i>	IP address for an RPF neighbor.

Command Default

A static RPF rule for a specified prefix mask is not configured.

Command Modes

Multicast routing configuration
Multicast VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **static-rpf** command is used to configure incompatible topologies for unicast and multicast traffic.

Use the **static-rpf** command to configure a static route to be used for RPF checking in Protocol Independent Multicast (PIM) instead of using the unicast routing table.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example configures the static RPF rule for IP address 10.0.0.1:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# vrf green
RP/0/RSP0/CPU0:router(config-mcast)# static-rpf 10.0.0.1 32 GigE 0/0/5/0 10.1.1.1
```

Related Commands

Command	Description
show pim context	Displays reverse path forwarding (RPF) table information configured for a VRF context.

ttl-threshold (multicast)

To configure the time-to-live (TTL) threshold for packets being forwarded out an interface, use the **ttl-threshold** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

ttl-threshold *ttl*

no ttl-threshold *ttl*

Syntax Description

<i>ttl</i>	Time to live value. Range is 1 to 255.
------------	--

Command Default

ttl : 0

Command Modes

Multicast routing interface configuration
 Multicast routing VRF interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Only multicast packets with a TTL value greater than the threshold are forwarded out of the interface. The TTL threshold is compared to the TTL of the packet after it has been decremented by one and before being forwarded.

Configure the TTL threshold only on border routers.



Note

Do not confuse this command with the **ttl-threshold (MSDP)** command in router MSDP configuration mode that is used to confine the multicast data packet TTL to be sent by an Multicast Source Discovery Protocol (MSDP) Source-Active (SA) message.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the TTL threshold to 23, which means that a multicast packet is dropped and not forwarded out of the GigE 0/1/0/0 interface:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing  
RP/0/RSP0/CPU0:router(config-mcast)# interface GigE 0/1/0/CPU0  
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# ttl-threshold 23
```

Related Commands

Command	Description
ttl-threshold (MSDP)	Limits which multicast data packets are sent in SA messages to an MSDP peer.

vrf (multicast)

To configure a virtual routing and forwarding (VRF) instance for a VPN table, use the **vrf** command in multicast routing configuration mode. To remove the VRF instance from the configuration file and restore the system to its default condition, use the **no** form of this command.

vrf *vrf-name* **ipv4**

no vrf *vrf-name* **ipv4**

Syntax Description

<i>vrf-name</i>	Name of the VRF instance. The following names cannot be used: all, default, and global.
ipv4	(Optional) Configures IPv4 address prefixes.

Command Default

No default behavior or values.

Command Modes

Multicast routing configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A VRF instance is a collection of VPN routing and forwarding tables maintained at the provider edge (PE) router.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure a VRF instance and enter VRF configuration mode:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf_1
RP/0/RSP0/CPU0:router(config-mcast-vrf_1-ipv4)# mdt ?
```



```

data      Data MDT group configuration
default  MDT default group address
mtu      MDT mtu configuration
source   Interface used to set MDT source address

```

Related Commands

Command	Description
boundary , on page 11	Configures a boundary to keep multicast packets from being forwarded.
accounting per-prefix , on page 4	Enables per-prefix counters only in hardware.
interface (multicast) , on page 27	Configures multicast interface properties.
log-traps , on page 33	Enables logging of trap events.
multipath , on page 47	Enables Protocol Independent Multicast (PIM) to divide the multicast load among several equal-cost paths.
rate-per-route , on page 53	Enables individual (source, group [S, G]) rate calculations.
ssm	Defines the Protocol Independent Multicast (PIM)-Source Specific Multicast (SSM) range of IP multicast addresses.
static-rpf , on page 140	Configures a static Reverse Path Forwarding (RPF) rule for a specified prefix mask.

