Multicast Routing and Forwarding Commands

This module describes the commands used to configure and monitor multicast routing.

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 IOS XR Multicast Configuration Guide for the Cisco CRS Router.

- accounting per-prefix, page 4
- accounting per-prefix forward-only, page 6
- address-family (multicast), page 8
- boundary, page 11
- clear mfib counter, page 13
- clear mfib database, page 15
- clear mfib hardware resource-counters, page 17
- clear mfib hardware route statistics, page 19
- disable (multicast), page 22
- enable (multicast), page 24
- forwarding-latency, page 26
- interface (multicast), page 28
- interface all enable, page 30
- interface-inheritance disable, page 32
- log-traps, page 34
- maximum disable, page 35
- mdt data, page 36
- mdt data ingress replication, page 38
- mdt default, page 39
- mdt mtu, page 41
- mdt source, page 43
- multicast-routing, page 45
- multipath, page 47
- nsf (multicast), page 49
- oom-handling, page 52
- rate-per-route, page 54
- show mfib connections, page 56
- show mfib counter, page 58
- show mfib encap-info, page 60
- show mfib hardware interface, page 62
- show mfib hardware resource-counters, page 65
- show mfib hardware route accept-bitmap, page 68
- show mfib hardware route olist, page 72
- show mfib hardware route statistics, page 75
- show mfib hardware route summary, page 78
- show mfib hardware session-info, page 80
- show mfib interface, page 82
- show mfib mdt statistics, page 85
- show mfib nsf, page 86
- show mfib route, page 89
- show mfib table-info, page 93
- show mrib client, page 96
- show mrib fgid, page 99
- show mrib fgid standby, page 105
- show mrib label-table-info, page 111
- show mrib mdt-interface, page 112
- show mrib nsf, page 114
- show mrib nsr end, page 116
- show mrib route, page 118
- show mrib route-collapse, page 122
- show mrib route outgoing-interface, page 124
- show mrib table-info, page 126
- show mrib tlc, page 128
- static-rpf, page 130
• ttl-threshold (multicast), page 132
• vrf (multicast), page 134
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 and IPv6 configuration
Multicast VRF configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast VRF configuration mode.</td>
</tr>
</tbody>
</table>

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

Because the use of this counter can be resource-intensive when a large number of routes are configured, such as for multicast VPN (there is a limit of 150,000 routes to a router), use the `show mfib hardware resource-counters, on page 65` command in EXEC mode to check resource allocation. Should hardware resource allocation be an issue, we recommend the use of the `accounting per-prefix forward-only, on page 6` command.

To verify the number of statistics allocated or free on a line card, use the `show mfib hardware resource-counters, on page 65` command in EXEC mode.

You may switch between `accounting-perprefix` and `accounting per-prefix forward-only` statistics on any (S,G) route. 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.

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** command nor the **accounting per-prefix forward-only**, on page 6 command is enabled.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

```
RP/0/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# accounting per-prefix
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>accounting per-prefix forward-only</strong>, on page 6</td>
<td>Reduces hardware statistics resource allocations when enabling accounting, particularly for multicast VPN (MVPN).</td>
</tr>
<tr>
<td><strong>show mfib hardware route statistics</strong>, on page 75</td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.</td>
</tr>
<tr>
<td><strong>show mfib route</strong>, on page 89</td>
<td>Displays route entries in the Multicast Forwarding Information Base (MFIB).</td>
</tr>
</tbody>
</table>
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.

```plaintext
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

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.8.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

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**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 recommended 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.

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**Note**

To verify the number of statistics allocated or free on a line card, use the **show mfib hardware resource-counters**, on page 65 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.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td></td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

```
RP/0/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# accounting per-prefix forward-only
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>accounting per-prefix, on page 4</td>
<td>Enables accounting for multicast routing.</td>
</tr>
<tr>
<td>clear mfib hardware resource-counters, on page 17</td>
<td>Clears global resource counters.</td>
</tr>
</tbody>
</table>
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 | ipv6}
no address-family [vrf vrf-name] {ipv4 | ipv6}
```

**Syntax Description**

- `vrf vrf-name` (Optional) Specifies a VPN routing and forwarding (VRF) instance.
- `ipv4` Specifies IPv4 address prefixes.
- `ipv6` Specifies IPv6 address prefixes.

**Command Default**

No default behavior or values

**Command Modes**

Multicast routing configuration
Multicast VRF configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.7.0</td>
<td>This command was documented as a multicast command.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the 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 sub to enter either the multicast IPv4 or IPv6 address family configuration submode, depending on which keyword was chosen. Use the `address-family` command with the `multicast-routing`, on page 45 command to start the following multicast processes:

- 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, use `interface-inheritance disable`, on page 32 command on a per interface or `interface all enable` basis in PIM or IGMP configuration mode.

**Examples**

This example shows how to enter IPv4 and IPv6 multicast routing configuration mode:

```
RP/0/RP0/CP00:router(config)# multicast-routing
RP/0/RP0/CP00:router(config-mcast)# address-family ipv4
RP/0/RP0/CP00:router(config-mcast-default-ipv4)#
RP/0/RP0/CP00:router(config-mcast)# address-family ipv6
RP/0/RP0/CP00:router(config-mcast-default-ipv6)#
```

This example shows how to enter IPv4 and IPv6 VRF multicast routing configuration submode:

```
RP/0/RP0/CP00:router(config)# multicast-routing
RP/0/RP0/CP00:router(config-mcast)# vrf vrf-name address-family ipv4
RP/0/RP0/CP00:router(config-mcast-vrf-name-ipv4)#
```
RP/0/RP0/CPU0:router(config-mcast)# vrf vrf-name address-family ipv6
RP/0/RP0/CPU0:router(config-mcast-vrf-name-ipv6)#

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>alias</td>
<td>Creates a command alias.</td>
</tr>
<tr>
<td>interface all enable, on page 30</td>
<td>Enables multicast routing and forwarding on all new and existing interfaces.</td>
</tr>
<tr>
<td>interface all disable</td>
<td>Disables PIM processing on all new and existing interfaces.</td>
</tr>
<tr>
<td>interface-inheritance disable, on page 32</td>
<td>Separates the disabling of multicast routing and forwarding.</td>
</tr>
<tr>
<td>interface (multicast), on page 28</td>
<td>Configures multicast interface properties.</td>
</tr>
</tbody>
</table>
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**

| access-list | 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast routing VRF interface configuration mode.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

The `boundary` command is used to set up a boundary to keep multicast packets from being forward. The boundary acl can specify a mcast source address in addition to a mcast group address. The keyword "any" can be added before the mcast group range.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

```
RP/0/RP0/CPU0:router(config)# ipv4 access-list myboundary2
RP/0/RP0/CPU0:router(config)# 10 deny ipv4 any 239.0.0.0 0.255.255.255
RP/0/RP0/CPU0:router(config)# 20 permit ipv4 any 224.0.0.0 15.255.255.255
RP/0/RP0/CPU0:router(config)# multicast-routing
```
RP/0/RP0/CPU0:router (config-mcast) # address-family ipv4
RP/0/RP0/CPU0:router(config-mcast-default-ipv4)# interface GigE 0/2/0/2
RP/0/RP0/CPU0:router(config-mcast-default-ipv4-if)# boundary myboundary2
To clear Multicast Forwarding Information Base (MFIB) route packet counters, use the `clear mfib counter` command in the appropriate mode.

```
clear mfib [vrf vrf-name] [ipv4 | ipv6] counter [group-address | source-address] [location {node-id | all}]
```

**Syntax Description**
- `vrf vrf-name`: (Optional) Specifies a VPN routing and forwarding (VRF) instance.
- `ipv4`: (Optional) Specifies IPv4 address prefixes.
- `ipv6`: (Optional) Specifies IPv6 address prefixes.
- `group-address`: (Optional) IP address of the multicast group.
- `source-address`: (Optional) IP address of the source of the multicast route.
- `location node-id`: (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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.2</td>
<td>The <code>ipv4</code> and <code>ipv6</code> keywords were added.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The <code>vrf vrf-name</code> keyword and argument were added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the 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.
### clear mfib counter

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

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

```
RP/0/RP0/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 the appropriate mode.

`clear mfib [ipv4| ipv6] database [location {node-id| all}]`

**Syntax Description**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td>ipv6</td>
<td>(Optional) Specifies IPv6 address prefixes.</td>
</tr>
<tr>
<td>location</td>
<td>(Optional) Clears global resource counters from the designated node.</td>
</tr>
<tr>
<td>all</td>
<td>The <code>all</code> keyword clears all global resource counters.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.2</td>
<td>The <code>ipv4</code> and <code>ipv6</code> keywords were added.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The <code>location</code> keyword was changed from optional to required.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write, execute</td>
</tr>
</tbody>
</table>
The following example shows how to clear the Multicast Forwarding Information Base (MFIB) database on all nodes:

```
RP/0/RP0/CPU0:router# clear mfib database location all
```
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vrf vrf-name</td>
<td>(Optional) Specifies a VPN routing and forwarding (VRF) instance.</td>
</tr>
<tr>
<td>ipv4</td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td>ipv6</td>
<td>(Optional) Specifies IPv6 address prefixes.</td>
</tr>
<tr>
<td>location node-id</td>
<td>(Optional) Clears global resource counters from the designated node.</td>
</tr>
<tr>
<td>all</td>
<td>The <code>all</code> keyword clears all global resource counters.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
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<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.2</td>
<td>The <code>ipv4</code> and <code>ipv6</code> keywords were added.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The <code>vrf vrf-name</code> keyword and argument were added.</td>
</tr>
<tr>
<td></td>
<td>The <code>location</code> keyword was changed from optional to required.</td>
</tr>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write, execute</td>
</tr>
</tbody>
</table>
clear mfib hardware resource-counters

Examples

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

RP/0/RP0/CPU0:router# clear mfib hardware resource-counters location all

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mfib hardware resource-counters, on page 65</td>
<td>Displays the allocated and freed hardware resources for the Multicast Forwarding Information Base (MFIB) process.</td>
</tr>
<tr>
<td>show mfib hardware route statistics, on page 75</td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.</td>
</tr>
</tbody>
</table>
To reset all allocated counter values regardless of the Multicast Forwarding Information Base (MFIB) hardware statistics mode (accounting per-prefix or accounting per-prefix forward-only), use the clear mfib hardware route statistics command in EXEC mode.

```
clear mfib [vrf vrf-name] [ipv4] [ipv6] hardware route statistics {egress| ingress| ingress-and-egress} [*| source-address] [group-address [/prefix-length]] [location {node-id| all}]
```

**Syntax Description**
- `vrf vrf-name` (Optional) Specifies a VPN routing and forwarding (VRF) instance.
- `ipv4` (Optional) Specifies IPv4 address prefixes.
- `ipv6` (Optional) Specifies IPv6 address prefixes.
- `egress` (Optional) Clears hardware statistics only on the specified outgoing route.
- `ingress` (Optional) Clears hardware statistics only on the specified incoming route.
- `ingress-and-egress` (Optional) Clears hardware statistics on both the incoming (ingress) and outgoing (egress) routes.
- `*` (Optional) Clears shared tree route statistics.
- `source-address` (Optional) IP address or hostname of the multicast route source.
- `group-address` (Optional) IP address or hostname of the multicast group.
- `/prefix-length` (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.
- `node-id` The `node-id` argument is entered in the rack/slot/module 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
clear mfib hardware route statistics

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.2</td>
<td>The <code>ipv4</code> and <code>ipv6</code> keywords were added.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The <code>vrf vrf-name</code> keyword and argument were added.</td>
</tr>
<tr>
<td></td>
<td>The <code>location</code> keyword was changed from optional to required.</td>
</tr>
</tbody>
</table>

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.

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

This command can be used regardless of the statistics mode, in other words, either accounting per-prefix, on page 4 or accounting per-prefix forward-only, on page 6.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write, execute</td>
</tr>
</tbody>
</table>

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/RP0/CPU0:router# clear mfib ipv4 hardware route statistics ingress-and-egress location 0/1/CPU0
```
The following example shows how to clear the counters only on the ingress forwarding engine for (S, G) routes with the group address 224.1.1.1:

```
RP/0/RP0/CPU0:router# clear mfib hardware route statistics ingress 224.1.1.1 location 0/1/CPU0
```
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast routing VRF interface configuration mode.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

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/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# interface all enable
RP/0/RP0/CPU0:router(config-mcast-default-ipv4)# interface GigE 0/1/0/0
RP/0/RP0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>enable (multicast), on page 24</td>
<td>Enables multicast routing and forwarding on an interface.</td>
</tr>
<tr>
<td>interface all enable, on page 30</td>
<td>Enables multicast routing and forwarding on all new and existing interfaces.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast routing VRF interface configuration mode.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

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

```
RP/0/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# interface GigE 0/1/0/0
RP/0/RP0/CPU0:router(config-mcast-default-ipv4-if)# enable
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>disable (multicast)</code>, on page 22</td>
<td>Disables multicast routing and forwarding on an interface.</td>
</tr>
<tr>
<td><code>interface all enable</code>, on page 30</td>
<td>Enables multicast routing and forwarding on all new and existing interfaces.</td>
</tr>
</tbody>
</table>
**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**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>delay milliseconds</code></td>
<td>(Optional) Specifies the delay time in milliseconds. Range is 5 - 500.</td>
</tr>
</tbody>
</table>

**Command Default**

The default delay time is 30 milliseconds.

**Command Modes**

- Multicast routing configuration
- IPv4 and IPv6 multicast routing configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.8.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>
The following example shows how to delay traffic from being forwarded for 120 milliseconds:

RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/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**

- **type**: Interface type. For more information, use the question mark (?) online help function.

- **interface-path-id**: 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 IPv6 multicast routing configuration
Multicast VRF configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast VRF configuration mode.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>
The following example shows how to enable multicast routing on all interfaces and disable the feature only on GigabitEthernet interface 0/1/0/0:

```plaintext
RP/0/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# interface all enable
RP/0/RP0/CPU0:router(config-mcast-default-ipv4-if)# interface GigE 0/1/0/0
disable
```
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

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast VRF configuration mode.</td>
</tr>
</tbody>
</table>

Usage Guidelines

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**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/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# interface all enable
RP/0/RP0/CPU0:router(config-mcast)# interface GigE 0/1/0/0
RP/0/RP0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>disable (multicast), on page 22</td>
<td>Disables multicast routing and forwarding on an interface.</td>
</tr>
<tr>
<td>enable (multicast), on page 24</td>
<td>Enables multicast routing and forwarding on an interface.</td>
</tr>
</tbody>
</table>
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 or IPv6 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 or IPv6 configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.5.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the 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 or IPv6 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.

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. Whereas, if used from the address-family ipv6 configuration submode, it prevents MLD and PIM IPv6 from inheriting the multicast-routing interface configuration.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>
**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/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# address-family ipv4
RP/0/RP0/CPU0:router(config-mcast-default-ipv4)# interface-inheritance disable
RP/0/RP0/CPU0:router(config-mcast-default-ipv4)# interface loopback 1 enable

RP/0/RP0/CPU0:router(config-mcast-default-ipv4)# show run router pim
```

With the `interface-inheritance disable` command in use, IGMP, or MLD, 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/RP0/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 and IPv6 configuration
Multicast VRF configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.4.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast VRF configuration mode.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

```
RP/0/RP0/CPU0:router# multicast-routing
RP/0/RP0/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 and IPv6 configuration
- Multicast VRF configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.4.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast VRF configuration mode.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

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

```
RP/0/RP0/CPU0:router# multicast-routing
RP/0/RP0/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**

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

**Command Default**

```
threshold : 1
```

**Command Modes**

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

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.5.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.7.0</td>
<td>Additional keyword information was added to the command.</td>
</tr>
<tr>
<td></td>
<td>The bottom of the threshold value range was increased by 1.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

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

```
RP/0/RP0/CPU0:router# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# mdt data 172.23.2.2/24 threshold 1200 acl_A
```

The following example shows how to configure the data MDT group from the multicast VRF submode:

```
RP/0/RP0/CPU0:router(config)# multicast-mcast)# maximum disablerouting
RP/0/RP0/CPU0:router(config-mcast)# vrf vrf-name mdt data 172.23.2.2/24
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mdt default, on page 39</td>
<td>Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).</td>
</tr>
<tr>
<td>mdt mtu, on page 41</td>
<td>Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).</td>
</tr>
<tr>
<td>mdt source, on page 43</td>
<td>Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.</td>
</tr>
</tbody>
</table>
To configure ingress replication (IR) data for Multicast Distribution Trees (MDT), use the `mdt data ingress replication` command in the appropriate mode. To remove the configuration, use the `no` form of the command.

```
mdt data ingress replication [ acl_name | immediate-switch | number value | threshold value ]
no mdt data ingress replication [ acl_name | immediate-switch | number value | threshold value ]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>immediate-switch</td>
<td>Enables switching to data MDT immediately.</td>
</tr>
<tr>
<td>acl_name</td>
<td>ACL for vrf groups that are enabled for data MDT</td>
</tr>
<tr>
<td>number value</td>
<td>Maximum number of data MDTs to be triggered. Range is 1 to 262143.</td>
</tr>
<tr>
<td>immediate-switch value</td>
<td>Traffic rate threshold (in kbps) to trigger data MDT. Range is 1 to 4294967.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

Multicast routing VRF address-family configuration

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 5.1.1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

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

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

This example shows how to run the `mdt data ingress replication` command:

```
RP/0/RP0/CPU0:router (config-mcast-v1-ipv4) # mdt data ingress-replication immediate-switch
```
**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**

- `mdt-default-group-address`: IP address of the MDT default group entered in `A.B.C.D.` format.
- `ipv4`: Specifies IPv4-encapsulated MDT.
- `mdt-default-address`: MDT IPv4 default address entered in `A.B.C.D.` 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.5.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.7.0</td>
<td>Additional keyword information was added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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

```plaintext
RP/0/RP0/CPU0:router# multicast-routing
RP/0/RP0/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:

```plaintext
RP/0/RP0/CPU0:router# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# vrf vrf-name address-family ipv6
RP/0/RP0/CPU0:router(config-mcast-vrf-name-ipv6)# mdt default 172.16.10.1
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mdt data, on page 36</td>
<td>Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).</td>
</tr>
<tr>
<td>mdt mtu, on page 41</td>
<td>Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).</td>
</tr>
<tr>
<td>mdt source, on page 43</td>
<td>Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.</td>
</tr>
</tbody>
</table>
**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**

- `value` 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.5.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Examples**

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

```
RP/0/RP0/CPU0:router# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# vrf vrf_A
RP/0/RP0/CPU0:router(config-mcast-vrf_A-ipv4)# mdt mtu 2345
```
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mdt data, on page 36</td>
<td>Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).</td>
</tr>
<tr>
<td>mdt default, on page 39</td>
<td>Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).</td>
</tr>
<tr>
<td>mdt source, on page 43</td>
<td>Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.</td>
</tr>
</tbody>
</table>
**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.

```plaintext
mdt source type interface-path-id
no mdt source type interface-path-id
```

**Syntax Description**

- `type` Interface type. For more information, use the question mark (?) online help function.
- `interface-path-id` 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

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.5.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.9.0</td>
<td>Per VRF MDT source feature was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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

```
RP/0/RP0/CPU0:router# multicast-routing
RP/0/RP0/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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# address-family ipv4
RP/0/RP0/CPU0:router(config-mcast-default-ipv4)# mdt source loopback0
RP/0/RP0/CPU0:router(config-mcast-foo)# vrf foo
RP/0/RP0/CPU0:router(config-mcast-foo-ipv4)# address-family ipv4
RP/0/RP0/CPU0:router(config-mcast-foo-ipv4)# mdt source loopback1!
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mdt data, on page 36</td>
<td>Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).</td>
</tr>
<tr>
<td>mdt default, on page 39</td>
<td>Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).</td>
</tr>
<tr>
<td>mdt mtu, on page 41</td>
<td>Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

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

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

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

RP/0/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)#

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>accounting per-prefix, on page 4</td>
<td>Enables per-prefix counters only in hardware.</td>
</tr>
<tr>
<td>alias</td>
<td>Creates a command alias.</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>interface (multicast)</td>
<td>Configures multicast interface properties.</td>
</tr>
<tr>
<td>interface all enable</td>
<td>Enables multicast routing and forwarding on all new and existing interfaces.</td>
</tr>
</tbody>
</table>
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}]
[address-family ipv6] multipath [hash {interface-extended|source next-hop}]
no multipath
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>hash</code></td>
<td>(Optional) Enables multipath hashing.</td>
</tr>
<tr>
<td><code>interface-extended</code></td>
<td>(Optional) Enables extensions for non-unique next-hop addresses.</td>
</tr>
<tr>
<td><code>Note</code></td>
<td>This option is available for IPv6 addressing in IPv6 multicast routing configuration mode and IPv6 multicast VRF configuration mode only.</td>
</tr>
<tr>
<td><code>source</code></td>
<td>Enables source-based multipath hashing.</td>
</tr>
<tr>
<td><code>source-nexthop</code></td>
<td>(Optional) Enables source with next-hop hashing.</td>
</tr>
<tr>
<td><code>source-specific-hash</code></td>
<td>(Optional) Enables multipath hashing for the source only.</td>
</tr>
<tr>
<td><code>Note</code></td>
<td>This option is available only for IPv6 addressing.</td>
</tr>
</tbody>
</table>

**Command Default**

This command is disabled by default.

**Command Modes**

Multicast routing configuration
Multicast routing address-family ipv4 and ipv6 configuration
Multicast VRF configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.3.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast VRF configuration mode.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

The following example shows how to enable multipath functionality:

```
RP/0/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/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 and ipv6 configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.2</td>
<td>The <code>enable</code> and <code>disable</code> keywords.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The <code>lifetime</code> keyword and argument were added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the 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 (MFWD) 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.

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

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

```
RP/0/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# nsf
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>nsf lifetime (IGMP/MLD)</td>
<td>Configures the maximum time for the NSF timeout value under IGMP or MLD.</td>
</tr>
<tr>
<td>nsf lifetime (PIM)</td>
<td>Configures the NSF timeout value for the PIM process.</td>
</tr>
<tr>
<td>show igmp nsf</td>
<td>Displays the state of NSF operation in IGMP.</td>
</tr>
<tr>
<td>show mfib nsf</td>
<td>Displays the state of NSF operation for the MFIB line cards.</td>
</tr>
<tr>
<td>show mrib nsf, on page 114</td>
<td>Displays the state of NSF operation in the MRIB.</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>show pim nsf</td>
<td>Displays the state of NSF operation for PIM.</td>
</tr>
</tbody>
</table>
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 oom-handling` form of this command.

**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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.2</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>
The following example shows how to enable the out-of-memory functionality:

RP/0/RP0/CPU0:router# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# oom-handling

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show pim topology</td>
<td>Displays PIM topology table information.</td>
</tr>
</tbody>
</table>
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 and ipv6 configuration
Multicast VRF configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.4.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast VRF configuration mode.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

The following example shows how to enable individual route calculations:

```
RP/0/RP0/CPU0:router# multicast-routing vrf vpn12 address-family ipv4
RP/0/RP0/CPU0:router(config-mcast)# rate-per-route
```
## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mfib route, on page 89</td>
<td>Displays route entries in the Multicast Forwarding Information Base (MFIB).</td>
</tr>
</tbody>
</table>
show mfib connections

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

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td>ipv6</td>
<td>(Optional) Specifies IPv6 address prefixes.</td>
</tr>
<tr>
<td>location node-id</td>
<td>(Optional) Specifies MFIB connections associated with an interface of the designated node.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.4.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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

```
RP/0/RP0/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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mfib interface, on page 82</td>
<td>Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.</td>
</tr>
<tr>
<td>show mfib route, on page 89</td>
<td>Displays route entries in the Multicast Forwarding Information Base (MFIB).</td>
</tr>
</tbody>
</table>
**show mfib counter**

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

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

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Command Default</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vrf vrf-name</code></td>
<td>(Optional) Specifies a VPN routing and forwarding (VRF) instance.</td>
</tr>
<tr>
<td><code>ipv4</code></td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td><code>ipv6</code></td>
<td>(Optional) Specifies IPv6 address prefixes.</td>
</tr>
<tr>
<td><code>location node-id</code></td>
<td>(Optional) Specifies MFIB counter statistics associated with an interface of the designated node.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The <code>vrf vrf-name</code> keyword and argument were added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>
The following is sample output from the `show mfib counter` command:

```
RP/0/RP0/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 (larm nfn)] : 0
```

This table describes the significant fields shown in the display.

**Table 1: show mfib counter Field Descriptions**

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

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mfib interface</code>, on page 82</td>
<td>Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.</td>
</tr>
<tr>
<td><code>show mfib route</code>, on page 89</td>
<td>Displays route entries in the Multicast Forwarding Information Base (MFIB).</td>
</tr>
</tbody>
</table>
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 the appropriate mode.

```
show mfib [vrf vrf-name] [ipv4|ipv6] encap-info [location node-id]
```

**Syntax Description**

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

**Command Default**
IPv4 addressing is the default.

**Command Modes**
EXEC

**Command History**

```
<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.5.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>
```

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

This feature is useful for Multicast VPN network implementations.

**Task ID**

```
<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>
```

**Examples**

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

```
RP/0/RP0/CPU0:router# show mfib vrf vrf_a encap-info
```

---------------------------
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mfib interface</code>, on page 82</td>
<td>Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.</td>
</tr>
<tr>
<td><code>show mfb route</code>, on page 89</td>
<td>Displays route entries in the Multicast Forwarding Information Base (MFIB).</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Encaps String</th>
<th>Dependent</th>
<th>Encaps</th>
<th>MDT Name/ Routes #</th>
<th>Table ID</th>
<th>Handle</th>
</tr>
</thead>
<tbody>
<tr>
<td>(192.168.5.203, 255.1.1.1)</td>
<td>5</td>
<td>0xe0000000</td>
<td>mdtA1 (0x100a480)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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|ipv6] hardware interface [detail] [type interface-path-id] [location node-id]
```

**Syntax Description**

- `vrf vrf-name` (Optional) Specifies a VPN routing and forwarding (VRF) instance.
- `ipv4` (Optional) Specifies IPv4 address prefixes.
- `ipv6` (Optional) Specifies IPv6 address prefixes.
- `detail` (Optional) Displays detailed information about the MFIB interface.
- `type` (Optional) Interface type. For more information, use the question mark (?) online help function.
- `interface-path-id` (Optional) Physical interface or virtual interface.
- `location node-id` (Optional) Specifies an MFIB-designated node.

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.2</td>
<td>The <code>ipv4</code> and <code>ipv6</code> keywords were added.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The <code>vrf vrf-name</code> keyword and argument were added.</td>
</tr>
<tr>
<td>Release 3.8.0</td>
<td>New fields were added to the output to show potential memory leakage or increased resource use.</td>
</tr>
</tbody>
</table>
Usage Guidelines

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

Examples

The following is sample output from the `show mfib hardware interface` command. The first line displays information for the fabric interface (FI0/1/1) on the line card. The fabric interface is a special interface that represents the hardware connection to the fabric.

```
RP/0/RP0/CPU0:router# show mfib ipv4 hardware interface location 0/1/cpu0
LC Type: Trident
Interface Handle Ghandle RefCnt TTL uIDB E-uIDB Parent-I/F Enbld Comment
BP1 0x800d0 0x0 3 0 (Bundle, no local members) success
BP2 0x800f0 0x0 3 0 (Bundle, no local members) success
FI0/1/CPU0 0x1180020 0x0 2 0 0 Unknown Unknown False success
Te0/1/0/0 0x1180040 0x118004 3 0 1 1 N/A True success
Te0/1/0/1 0x1180060 0x118006 2 0 3 3 N/A True success
```

This table describes the significant fields shown in the display.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>MFIB interface name.</td>
</tr>
<tr>
<td>Handle</td>
<td>A 32-bit system-wide identifier of the MFIB interface.</td>
</tr>
<tr>
<td>Ghandle</td>
<td>Global interface handle. A 28-bit system-wide identifier of the interface derived from the 32-bit handle, but does not exist for all MFIB interfaces.</td>
</tr>
<tr>
<td>RefCnt</td>
<td>Number of times various data structures referred to this MFIB interface structure.</td>
</tr>
<tr>
<td>TTL</td>
<td>Multicast time-to-live threshold that was configured on this MFIB interface.</td>
</tr>
<tr>
<td>uIDB</td>
<td>MicroIDB. A unique identifier of the MFIB interface that exists on the line card.</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>E-uIDB</td>
<td>An identifier that is relevant only for virtual MFIB interfaces such as bundles and tunnels. For example, if an interface is a member of a bundle, the effective uIDB is that of the bundle.</td>
</tr>
<tr>
<td>Parent-I/F</td>
<td>Parent interface handle. Relevant only for bundles and tunnels showing the corresponding parent MFIB interface handle.</td>
</tr>
<tr>
<td>Enbld</td>
<td>If true, multicast is enabled on the MFIB interface.</td>
</tr>
<tr>
<td>Primary IP</td>
<td>Primary IP address of the MFIB interface.</td>
</tr>
<tr>
<td>Secondary IP</td>
<td>Secondary IP address of the MFIB interface.</td>
</tr>
<tr>
<td>Bound-ACL</td>
<td>The following states appear for this field:</td>
</tr>
<tr>
<td>ADJ ADDR</td>
<td>Indicates whether there were problems when reading hardware information.</td>
</tr>
<tr>
<td></td>
<td>• True if the multicast boundary is configured on the MFIB interface.</td>
</tr>
<tr>
<td></td>
<td>• False if no boundary is configured.</td>
</tr>
<tr>
<td></td>
<td>• Unknown if the MFIB interface is not applicable to multicast boundaries.</td>
</tr>
<tr>
<td></td>
<td>Table lookup unit (TLU) memory location of the MFIB interface adjacency information.</td>
</tr>
</tbody>
</table>

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mfib interface, on page 82</td>
<td>Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.</td>
</tr>
</tbody>
</table>
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] [ipv6] hardware resource-counters location node-id
```

**Syntax Description**

- `vrf vrf-name` (Optional) Specifies a VPN routing and forwarding (VRF) instance.
- `ipv4` (Optional) Specifies IPv4 address prefixes.
- `ipv6` (Optional) Specifies IPv6 address prefixes.
- `location node-id` Specifies an MFIB-designated node.

**Command Default**
IPv4 addressing is the default.

**Command Modes**
EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.4.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The <code>vrf vrf-name</code> keyword and argument were added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the 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. The output shows the following:

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

**Examples**

The following is sample output from the `show mfib hardware resource-counters` command:

```
RP/0/RP0/CPU0:router# show mfib ipv4 hardware resource-counters location 0/1/cpu0

LC Type: Trident
TLU blocks channel 0 : ingress: 0,0 egress: 1,0
TLU blocks channel 1 : ingress: 0,0 egress: 0,0
TLU blocks channel 2 : ingress: 80329,80283 egress: 48041,48007
TLU blocks channel 3 : ingress: 202582,202576 egress: 48042,48007
TLU blocks for PLU_EXTENSION: 80329,80283
TLU blocks for S_BITMAP: 202582,202576
TLU blocks for USE_ACCEPT_BITMAP: 0,0
TLU blocks for CONN_CHECK: 0,0
TLU blocks for OLIST: 96083,96014
TLU blocks for L2_LOAD_INFO: 1,0
TLU blocks for L2_TE: 0,0
TLU blocks for L2_MULTI: 0,0
TLU blocks for SWP_ENCAP: 0,0
TLU blocks for UNKNOWN: 0,0
Number of times having TLU block(s) allocation failures: 0
Number of times having TLU block(s) free failures: 0
Mstat success #calls: ingress: 3,0 egress: 2,0
Mstat failure #calls: ingress: 0,0 egress: 0,0

-- Shared Memory counters:
[table_ext] Alloc: 1 [ 20 bytes] Free: 0 [ 0 byte]
[Encap_Info] Alloc: 0 [ 0 bytes] Free: 0 [ 0 byte]

This table describes the significant fields shown in the display.

**Table 3: show mfib hardware resource counters Field Descriptions**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLU blocks channel n : ingress: n</td>
<td>TLU blocks allocated on ingress and egress for each</td>
</tr>
<tr>
<td></td>
<td>channel.</td>
</tr>
<tr>
<td>TLU blocks for PLU_EXTENSION</td>
<td>Resource use for storing extended data (in addition</td>
</tr>
<tr>
<td></td>
<td>to the PLU lookup result).</td>
</tr>
</tbody>
</table>
### Field Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLU blocks for S_BITMAP</td>
<td>Resource use for storing a bitmap to indicate which interfaces have signaling turned on for this route.</td>
</tr>
<tr>
<td>TLU blocks for USE_ACCEPT_BITMAP</td>
<td>Resource use for bidirectional routes to indicate which interfaces can accept packets for this route.</td>
</tr>
<tr>
<td>TLU blocks for CONN_CHECK</td>
<td>Resource use for data type CONN_CHECK.</td>
</tr>
<tr>
<td>TLU blocks for OLIST</td>
<td>Resource use for data type OLIST.</td>
</tr>
<tr>
<td>TLU blocks for L2_LOAD_INFO</td>
<td>Resource use for data type L2_LOAD_INFO.</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mfib interface, on page 82</td>
<td>Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.</td>
</tr>
</tbody>
</table>
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|ipv6] hardware route accept-bitmap [*] [source-address] [group-address [prefix-length]] [detail] [location node-id]
```

**Syntax Description**

- `vrf vrf-name` (Optional) Specifies a VPN routing and forwarding (VRF) instance.
- `ipv4` (Optional) Specifies IPv4 address prefixes.
- `ipv6` (Optional) Specifies IPv6 address prefixes.
- `*` (Optional) Displays shared tree entry.
- `source-address` (Optional) IP address or hostname of the multicast route source.
- `group-address` (Optional) IP address or hostname of the multicast group.
- `/prefix-length` (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 node-id` (Optional) Specifies an MFIB-designated node.

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>3.2</td>
<td>The <code>ipv4</code> and <code>ipv6</code> keywords were added.</td>
</tr>
<tr>
<td>3.5.0</td>
<td>The <code>vrf vrf-name</code> keyword and argument were added.</td>
</tr>
</tbody>
</table>
Usage Guidelines

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

Examples

In the following example, the bidirectional range is configured as 233.1.0.0/16 and 233.4.0.0/16:

```plaintext
RP/0/RP0/CP00:router (config)# ipv4 access-list bidir-range
RP/0/RP0/CP00:router (config-ipv4-acl)# permit 233.1.0.0 0.0.255.255
RP/0/RP0/CP00:router (config-ipv4-acl)# permit 233.4.0.0 0.0.255.255
RP/0/RP0/CP00:router (config-ipv4-acl)# commit
RP/0/RP0/CP00:router (config-ipv4-acl)# exit

RP/0/RP0/CP00:router (config)# router pim
RP/0/RP0/CP00:router (config-pim-default-ipv4)# no rp-address 10.1.1.1 bidir
RP/0/RP0/CP00:router (config-pim-default-ipv4)# rp-address 10.1.1.1 bidir-range bidir
RP/0/RP0/CP00:router (config-pim-default-ipv4)# commit
```

The sample output from the `show mfib hardware route accept-bitmap` command displays the accepting interface list for (*,233.1.0.0/16) and (*,233.4.0.0/16) only. The accepting interface list is POS0/1/1/0, POS0/1/1/1, and POS0/1/1/3.

```plaintext
RP/0/RP0/CP00:router# show mfib hardware route accept-bitmap detail location 0/1/CP00
```

LC Type: Trident
Source: Source address
iQoS: Ingress QoS tag
C: Directly connected check flag
RPF: Accepting interface for non-bidir entries
S: Signal on RPF interface
FU: For us
PLU_ext: PLU result extension address
FGID: Fabric Group ID
oQoS: Output QoS tag
FGID2: Secondary Fabric Group ID
A_num: Number of I/Fs in the accepting list
A_TLU: Address of the first TLU in the accepting list

<table>
<thead>
<tr>
<th>Interface: Accepting interface name</th>
<th>Source Group</th>
<th>M</th>
<th>iQoS</th>
<th>C</th>
<th>RPF</th>
<th>S</th>
<th>FU</th>
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<th>A_TLU</th>
</tr>
</thead>
<tbody>
<tr>
<td>A_TLU: Address of the first TLU in the accepting list</td>
<td>Source Group</td>
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</tr>
</tbody>
</table>
This table describes the significant fields shown in the display.

Table 4: show mfib hardware route accept-bitmap Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>iQoS</td>
<td>An identifier of a quality-of-service (QoS) policy. This field is currently unused.</td>
</tr>
<tr>
<td>C</td>
<td>Directly connected check flag. If “T” is displayed, hardware performs directly connected checks on the packet sources that match this route.</td>
</tr>
<tr>
<td>S</td>
<td>Signal on Reverse Path Forwarding (RPF) interface. If “T” is displayed, hardware punts the packet to the line card CPU to signal Protocol Independent Multicast (PIM) (by default) for all packets that match this route.</td>
</tr>
<tr>
<td>FU</td>
<td>For us. A packet is destined for this router. If “T” is displayed, at least one application is interested in packets on one or more interfaces that match this route.</td>
</tr>
<tr>
<td>P</td>
<td>Punt. If “T” is displayed, all packets that match the route punt to the line card CPU.</td>
</tr>
<tr>
<td>PF</td>
<td>Punt if forward. If “T” is displayed, when the ingress hardware sends a packet to the egress line cards across the fabric, it also punts a copy of the packet to the line card CPU.</td>
</tr>
</tbody>
</table>
Boundary access list (ACL). If “T” is displayed, the hardware punts the packet to the line card CPU for software switching when the incoming interface has a boundary access list configured.

Output QoS policy identifier. This field is currently unused.

Number of accepting interfaces for a bidirectional route.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA</td>
<td>Boundary access list (ACL). If “T” is displayed, the hardware punts the packet to the line card CPU for software switching when the incoming interface has a boundary access list configured.</td>
</tr>
<tr>
<td>oQoS</td>
<td>Output QoS policy identifier. This field is currently unused.</td>
</tr>
<tr>
<td>A_num</td>
<td>Number of accepting interfaces for a bidirectional route.</td>
</tr>
</tbody>
</table>

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mfib interface, on page 82</td>
<td>Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.</td>
</tr>
</tbody>
</table>
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 the appropriate mode.

```
show mfib [vrf vrf-name] [ipv4| ipv6] hardware route olist {*|} [source-address] [group-address [/prefix-length]] [detail] [location node-id]
```

**Syntax Description**

- **vrf vrf-name** (Optional) Specifies a VPN routing and forwarding (VRF) instance.
- **ipv4** (Optional) Specifies IPv4 address prefixes.
- **ipv6** (Optional) Specifies IPv6 address prefixes.
- ***** (Optional) Displays shared tree entries.
- **source-address** (Optional) IP address or hostname of the multicast route source.
- **group-address** (Optional) IP address or hostname of the multicast group.
- **/prefix-length** (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. Requires 140 columns.
- **location node-id** Specifies an MFIB-designated node.

**Command Default**
IPv4 addressing is the default.

**Command Modes**
EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The vrf vrf-name keyword and argument were added.</td>
</tr>
</tbody>
</table>
Usage Guidelines

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

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

### Examples

The following is sample output from the `show mfib hardware route olist` command for line card 0/1/CPU0 (the output fields are described in the header):

```
RP/0/RP0/CPU0:router# show mfib hardware route olist location 0/1/CPU0

LC Type: Trident
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
FU : For us
FGID : Fabric Group ID
P : Route Punt
PF : Punt to CPU if packet is forwarded to the fabric
BA : Check if boundary ACL is configured on incoming interface
O_Null : Olist is empty
Interface: Output interface name
IC : Internal copy flag
OP : Output Punt: Punt instead of forwarding out

Source Group M C RPF S FU FGID P PF BA O_Null Interface IC OP
  * 224.0.0.0 4 T Null F F 41785 F F T True
  * 224.0.0.0 24 F Null F F 47206 F F T True
  * 224.0.1.39 32 F Null F F 47205 T F F True
  * 224.0.1.40 32 F Null F F 27202 T F F True
  * 232.0.0.0 8 F Null F F 47207 F F T True
  * 233.1.0.0 16 F Null F F 4106 F F T False NULL
  * 233.1.0.0 16 F Null F F 44106 F F T False NULL
  * 233.1.0.0 16 F Null F F 44106 F F T False NULL
  * 233.1.0.0 16 F Null F F 44106 F F T False NULL
  * 233.1.1.1 32 F Null F F 27205 F F T False NULL
  * 233.1.1.1 32 F Null F F 27205 F F T False NULL
  * 233.1.1.1 32 F Null F F 27205 F F T False NULL
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mfib hardware route accept-bitmap</code>, on page 68</td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td><code>show mfib hardware route statistics, on page 75</code></td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.</td>
</tr>
<tr>
<td><code>show mfib hardware route summary, on page 78</code></td>
<td>Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.</td>
</tr>
<tr>
<td><code>show mfib route, on page 89</code></td>
<td>Displays route entries in the Multicast Forwarding Information Base (MFIB).</td>
</tr>
</tbody>
</table>
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 | ipv6] hardware route statistics [detail] [*] [source-address] [group-address [/prefix-length]] [location node-id]**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>vrf vrf-name</td>
<td>(Optional) Specifies a VPN routing and forwarding (VRF) instance.</td>
</tr>
<tr>
<td>ipv4</td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td>ipv6</td>
<td>(Optional) Specifies IPv6 address prefixes.</td>
</tr>
<tr>
<td>*</td>
<td>(Optional) Displays shared tree entries.</td>
</tr>
<tr>
<td>source-address</td>
<td>(Optional) IP address or hostname of the multicast route source.</td>
</tr>
<tr>
<td>group-address</td>
<td>(Optional) IP address or hostname of the multicast group.</td>
</tr>
<tr>
<td>/ prefix-length</td>
<td>(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.</td>
</tr>
<tr>
<td>detail</td>
<td>(Optional) Displays a detailed list of the routing database.</td>
</tr>
<tr>
<td>location node-id</td>
<td>(Optional) Specifies an MFIB-designated node.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The vrf vrf-name keyword and argument were added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

### Examples

The following is sample output from the `show mfib hardware route statistics` command for line card 0/1/CPU0.

The first four lines indicate that a total of 2709724 packets representing 184261232 bytes matched all (*, G) routes and were punted to line card CPU for further processing.

The second four lines indicate that 753 packets matched the route (10.1.1.9, 233.1.1.2), were accepted for forwarding, and were sent into the fabric by the ingress forwarding engine. The lines indicate that 749 packets and 47936 bytes were received by the egress forwarding engine from the fabric, matched (10.1.1.9, 233.1.1.2), and were sent out of at least one interface from the output interface list.

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

```
RP/0/RP0/CPU0# show mfib hardware route statistics location 0/1/CPU0
LC Type: Trident
(*,G) Counter: Ingress Counter = 0x170 Egress Counter = 0x9110
Ingress: Forward = (0 , 0)                  Punt = (2709724 , 184261232)                  Drop = (0 , 0)                  Egress: Forward = (0 , 0)                  Drop = (0 , 0)
(10.1.1.9,233.1.1.1/64) Ingress Counter = 0x173 Egress Counter = 0x9112
Ingress: Forward = (753 , 51204)                  Punt = (0 , 0)                  Drop = (0 , 0)                  Egress: Forward = (749 , 47936)                  Drop = (0 , 0)
```

This table describes the significant fields shown in the display.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingress Counter</td>
<td>Unique identifier of the ingress counter.</td>
</tr>
<tr>
<td>Egress Counter</td>
<td>Unique identifier of the egress counter.</td>
</tr>
<tr>
<td>Forward</td>
<td>Number of forwarded packets and bytes.</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Punt</td>
<td>Number of bytes punted from the line card CPU.</td>
</tr>
<tr>
<td>Drop</td>
<td>Number of dropped bytes.</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mfib hardware route accept-bitmap,</td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB)</td>
</tr>
<tr>
<td>on page 68</td>
<td>information for the interface list that accepts bidirectional routes.</td>
</tr>
<tr>
<td>show mfib hardware route olist, on page 72</td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB)</td>
</tr>
<tr>
<td></td>
<td>information in the output interface list (olist) stored in the hardware.</td>
</tr>
<tr>
<td>show mfib hardware route summary, on page 78</td>
<td>Displays summary platform-specific Multicast Forwarding Information Base</td>
</tr>
<tr>
<td></td>
<td>(MFIB) hardware information for each route entry.</td>
</tr>
<tr>
<td>show mfib route, on page 89</td>
<td>Displays route entries in the Multicast Forwarding Information Base (MFIB).</td>
</tr>
</tbody>
</table>
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|ipv6] hardware route summary location node-id
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vrf vrf-name</td>
<td>(Optional) Specifies a VPN routing and forwarding (VRF) instance.</td>
</tr>
<tr>
<td>ipv4</td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td>ipv6</td>
<td>(Optional) Specifies IPv6 address prefixes.</td>
</tr>
<tr>
<td>location</td>
<td>(Optional) Specifies an MFIB-designated node.</td>
</tr>
<tr>
<td>node-id</td>
<td></td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.4.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The vrf vrf-name keyword and argument were added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>
The following is sample output from the `show mfib hardware route summary` command:

```plaintext
RP/0/RP0/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 (G, 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
```

This table describes the significant fields shown in the display.

### Table 6: show mfib hardware route summary Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of (*,G) routes</td>
<td>Number of (*,G) routes installed in hardware.</td>
</tr>
<tr>
<td>No. of (S,G) routes</td>
<td>Number of (S,G) routes installed in hardware.</td>
</tr>
<tr>
<td>Maximum supported MoFRR routes</td>
<td>Maximum number of MoFRR routes supported in hardware.</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mfib hardware route accept-bitmap</td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.</td>
</tr>
<tr>
<td>show mfib hardware route olist, on page 72</td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.</td>
</tr>
<tr>
<td>show mfib hardware route statistics, on page 75</td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.</td>
</tr>
<tr>
<td>show mfib route, on page 89</td>
<td>Displays route entries in the Multicast Forwarding Information Base (MFIB).</td>
</tr>
</tbody>
</table>
show mfib hardware session-info

To display hardware abstraction layer (HAL) session information for the Multicast Forwarding Information Base (MFIB) process, use the `show mfib hardware session-info` command in EXEC mode.

```
show mfib [ipv4 | ipv6] hardware session-info location node-id
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>location</td>
<td>Specifies an MFIB-designated node.</td>
</tr>
<tr>
<td>ipv4</td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td>ipv6</td>
<td>(Optional) Specifies IPv6 address prefixes.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.7.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Note**

This command is to be used only on request from Cisco Technical Support for troubleshooting. The command does not display any useful output if only RSP is specified or if no location is specified.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>
The following is sample output from the `show mfib hardware session-info` command:

```
RP/0/RP0/CPU0:router# show mfib hardware session-info location 0/3/cpu0

LC Type: Trident
HAL Session Info:(0x5276de8c):
  default key(0x5276dcb0): vmr_id 0x2860009c:0x2860009b
  default punt key(0x0): vmr_id 0x0:0x0
  default cluster(0x5276d4d4c): tlu address 0x2060000:0x0
  default punt cluster(0x0): tlu address 0x0:0x0
  default replicord(0x5276dde8): tlu address 0x0:0xa0000
  mlc table sram addr: 0x1c8000
```
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| ipv6] interface [type interface-path-id] [detail| route] [location node-id]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vrf vrf-name</td>
<td>(Optional) Specifies a VPN routing and forwarding (VRF) instance.</td>
</tr>
<tr>
<td>ipv4</td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td>ipv6</td>
<td>(Optional) Specifies IPv6 address prefixes.</td>
</tr>
<tr>
<td>type</td>
<td>(Optional) Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td>interface-path-id</td>
<td>(Optional) Physical interface or virtual interface.</td>
</tr>
<tr>
<td>detail</td>
<td>(Optional) Specifies detailed information for packet statistics on interfaces.</td>
</tr>
<tr>
<td>route</td>
<td>(Optional) Specifies a list of routes associated with the interface. This option is available if an interface type and instance are specified.</td>
</tr>
<tr>
<td>location node-id</td>
<td>(Optional) Specifies packet statistics associated with an interface of the designated node.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The <code>vrf vrf-name</code> keyword and argument were added.</td>
</tr>
</tbody>
</table>
Usage Guidelines

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

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/RP0/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/RP0/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 7: show mfib interface Field Descriptions**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Interface name. Enabled if the interface is configured for multicast routing. The word &quot;PHYSICAL&quot; is displayed if the interface is a nonvirtual interface.</td>
</tr>
<tr>
<td>Mcast pkts in</td>
<td>Number of incoming multicast packets entering the interface during software switching.</td>
</tr>
<tr>
<td>Mcast pkts out</td>
<td>Number of outgoing multicast packets exiting the interface during software switching.</td>
</tr>
<tr>
<td>TTL Threshold</td>
<td>Number of multicast packets that reach the configured multicast time-to-live threshold.</td>
</tr>
</tbody>
</table>
**show mfib interface**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VRF ID</td>
<td>VPN Routing and Forwarding instance ID.</td>
</tr>
<tr>
<td>Ref Count</td>
<td>Number of references to this interface structure in the MFIB process.</td>
</tr>
<tr>
<td>Primary address</td>
<td>Primary IP address of the interface.</td>
</tr>
<tr>
<td>Secondary address</td>
<td>Secondary IP address of the interface.</td>
</tr>
</tbody>
</table>

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mfib hardware interface, on page 62</td>
<td>Displays hardware switching interface information for the Multicast Forwarding Information Base (MFIB) process.</td>
</tr>
</tbody>
</table>
show mfib mdt statistics

To display information about mdt interface activity, use the `show mfib mdt statistics` command in EXEC mode.

```
show mfib [vrf vrf-name] [ipv4 ipv6] mdt statistics
```

**Syntax Description**

- `vrf vrf-name` (Optional) Specifies a VPN routing and forwarding (VRF) instance.
- `ipv4` (Optional) Specifies IPv4 address prefixes.
- `ipv6` (Optional) Specifies IPv6 address prefixes.

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.6.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

```
RP/0/RP0/CPU0:router# show mfib vrf svpn1 mdt statistics

MDT Interface Statistics
Input Pkts   Input Bytes   Output Pkts   Output Bytes
591548     591540546     0              0
```
**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|ipv6] nsf [location node-id]
```

**Syntax Description**

- **ipv4** *(Optional)* Specifies IPv4 address prefixes.
- **ipv6** *(Optional)* Specifies IPv6 address prefixes.
- **location node-id** *(Optional)* Specifies the MFIB NSF designated node.

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

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

```
RP/0/RP0/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>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP MFWD Non-Stop Forwarding Status</td>
<td>MFIB NSF status of each node in the system: booting, normal, not forwarding, or activated.</td>
</tr>
<tr>
<td>NSF Time Remaining</td>
<td>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).</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>nsf lifetime (IGMP/MLD)</code></td>
<td>Configures the maximum time for the NSF timeout value under IGMP or MLD.</td>
</tr>
<tr>
<td><code>nsf (multicast)</code>, on page 49</td>
<td>Configures the NSF capability for the multicast routing system.</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>nsf lifetime (PIM)</td>
<td>Configures the NSF timeout value for the PIM process.</td>
</tr>
<tr>
<td>show igmp nsf</td>
<td>Displays the state of NSF operation in IGMP.</td>
</tr>
<tr>
<td>show mrib nsf, on page 114</td>
<td>Displays the state of NSF operation in the MRIB.</td>
</tr>
<tr>
<td>show pim nsf</td>
<td>Displays the state of NSF operation for PIM.</td>
</tr>
</tbody>
</table>
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|ipv6] route [rate] | * | source-IP-address| group-IP-address/prefix-length| detail| old-output| summary| location node-id]
```

**Syntax Description**

- **vrf vrf-name** (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 node-id** (Optional) Specifies an MFIB-designated node.
- **old-output** (Optional) Displays the old show output—available for backward compatibility.
- **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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The <code>detail</code> keyword was added.</td>
</tr>
<tr>
<td></td>
<td>The <code>vrf vrf-name</code> keyword and argument were added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the 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 `show mfib route rate` command is not supported on interfaces such as bundle virtual interfaces and Bridge Group virtual interfaces (BVIs).

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**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

**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/RP0/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, NT - MDT Threshold Crossed,
  MH - MDT Interface handle, CD - Conditional Decap,
  DT - MDT Decap True
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
```
The following is sample output from the `show mfib route` command with the `summary` and `location` keywords specified:

```
RP/0/RP0/CPU0:router# show mfib route summary location 0/1/CPU0
IP Multicast Forwarding Information Base Summary
No. of (*,G) routes = 20015
No. of (S,G) routes = 20020
```

The following is sample output from the `show mfib route` command with the `statistics` and `location` keywords specified. For route *, 239.1.1.1, the hardware counters show N/A, which means no hardware statistic blocks were assigned to the route *, 239.1.1.1. However, routes 200.180.161.9 and 239.1.1.1 show that both hardware and software statistic blocks were assigned. The output fields are described in the header.

```
RP/0/RP0/CPU0:router# show mfib route statistics 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
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
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mfib counter, on page 58</td>
<td>Displays Multicast Forwarding Information Base (MFIB) counter statistics for packets that have dropped.</td>
</tr>
<tr>
<td>show mfib hardware route accept-bitmap, on page 68</td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.</td>
</tr>
<tr>
<td>show mfib hardware route olist, on page 72</td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.</td>
</tr>
<tr>
<td>show mfib hardware route statistics, on page 75</td>
<td>Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.</td>
</tr>
<tr>
<td>show mfib interface, on page 82</td>
<td>Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.</td>
</tr>
<tr>
<td>show mrib route, on page 118</td>
<td>Displays all entries in the Multicast Routing Information Base (MRIB).</td>
</tr>
</tbody>
</table>
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| ipv6] table-info {table-id| vrf-name} [local| remote] [location node-id]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td>table-id</td>
<td>Specifies the table identifier. Range is 0 to 4294967295.</td>
</tr>
<tr>
<td>vrf-name</td>
<td>Specifies the VRF name.</td>
</tr>
<tr>
<td>local</td>
<td>Specifies local tables only.</td>
</tr>
<tr>
<td>remote</td>
<td>Specifies remote tables only.</td>
</tr>
<tr>
<td>location</td>
<td>(Optional) Specifies MFIB connections associated with an interface of the</td>
</tr>
<tr>
<td>node-id</td>
<td>designated node.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.5.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.6.0</td>
<td>The <code>local</code> and <code>remote</code> keywords were added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>
The following is sample output from the `show mfib table-info` command showing the number of receiver VRF routes and the default MDT handle associated with this VRF in boldface.

```
RP/0/RP0/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 9: show mfib table-info Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table Name</td>
<td>Name of the MFIB table.</td>
</tr>
<tr>
<td>VRid/TID/VID</td>
<td>Table identifiers.</td>
</tr>
<tr>
<td>Table type</td>
<td>Type of MFIB table.</td>
</tr>
<tr>
<td>Active/Linked</td>
<td>Table is active and linked.</td>
</tr>
<tr>
<td>Location</td>
<td>Location of the MFIB table.</td>
</tr>
<tr>
<td>Local ifcount</td>
<td>Local interface count.</td>
</tr>
<tr>
<td>Child routes</td>
<td>Child routes shows the number of extranet routes in receiver VRFs that reference this source VRF.</td>
</tr>
<tr>
<td>Default MDT Encap</td>
<td>Default MDT encapsulation.</td>
</tr>
<tr>
<td>Default MDT Handle</td>
<td>Default MDT interface handle for this VRF.</td>
</tr>
<tr>
<td>MDT Master LC</td>
<td>Field contains &quot;Y&quot; if this line card is a master line card for this VRF.</td>
</tr>
<tr>
<td>Loopback (Encap Src)</td>
<td>Loopback (encapsulation source).</td>
</tr>
<tr>
<td>Local EG intf cnt</td>
<td>Shows the number of local egress interfaces for this VRF and location.</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Data MDT</td>
<td>Routes for which multicast data for a multicast distribution tree (MDT) was triggered.</td>
</tr>
</tbody>
</table>
**show mrib client**

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

```
show mrib [vrf vrf-name] [ipv4|ipv6] [old-output] client [filter] [client-name]
```

**Syntax Description**

- **vrf vrf-name** (Optional) Specifies a VPN routing and forwarding (VRF) instance.
- **ipv4** (Optional) Specifies IPv4 address prefixes.
- **ipv6** (Optional) Specifies IPv6 address prefixes.
- **old-output** (Optional) Displays the old show output—available for backward compatibility.
- **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.
- **client-name** (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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>The <code>vrf vrf-name</code> keyword and argument were added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>
Examples

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

```
RP/0/RP0/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 10: show mrib client Field Descriptions**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>igmp</td>
<td>Name of the client.</td>
</tr>
<tr>
<td>417957</td>
<td>Personal identifier (PID) or a unique ID assigned by MRIB.</td>
</tr>
<tr>
<td>(connection id 0)</td>
<td>Unique client connection identifier.</td>
</tr>
<tr>
<td>ownership filter:</td>
<td>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.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>groups: include 0.0.0.0/0/interfaces: include All</td>
<td>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 &quot;All&quot; 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.</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mfib nsf, on page 86</td>
<td>Displays the state of a nonstop forwarding (NSF) operation for the Multicast Forwarding Information Base (MFIB) line cards.</td>
</tr>
<tr>
<td>show mfib route, on page 89</td>
<td>Displays route entries in the Multicast Forwarding Information Base (MFIB).</td>
</tr>
<tr>
<td>show mrib nsf, on page 114</td>
<td>Displays the state of nonstop forwarding (NSF) operation in the Multicast Routing Information Base (MRIB).</td>
</tr>
</tbody>
</table>
show mrib fgid

To display the platform-specific Multicast Routing Information Base (MRIB) fabric group identifier (FGID) data, use the show mrib fgid command in EXEC mode.

```
show mrib fgid [chkptdb| info| mstats| ostats| stats| nsf]
```

**Syntax Description**

- **chkptdb** (Optional) Dumps the MRIB FGID checkpoint database.
- **info** (Optional) Displays the MRIB FGID information.
- **mstats** (Optional) Displays the MRIB FGID memory statistics.
- **ostats** (Optional) Displays the MRIB FGID operation statistics.
- **stats** (Optional) Displays the MRIB FGID statistics.
- **nsf** (Optional) Displays the NSF FGID statistics.

**Command Default**
IPv4 addressing is the default.

**Command Modes**
EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.9.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>
Examples

The following is the sample output from the `show mrib fgid chkptdb` command:

```
RP/0/RP0/CPU0:router# show mrib fgid chkptdb
Wed Sep 24 22:45:15.565 UTC
Number of FGIDs in the chkpt DB : 11000
All the chkpt entries with IP/Label ctx are dumped to a file /tmp/mrib_chkpt.txt in the (D)RP.
To see the contents, run attach to the (D)RP and copy to a tftp server: cp /tmp/mrib_chkpt.txt /tftp:<directory>' or print from the RP: 'cat /tmp/mrib_chkpt.txt'
The following is the sample output from the `show mrib fgid info all` command:
```
RP/0/RP0/CPU0:router# show mrib fgid info all
Wed Sep 24 22:44:16.544 UTC
FGID information
-----------------
FGID (type, TOS): 46080 (Primary, 9)
Context : IP (0xe0000000, *, 224.0.1.39/32)
Members[ref] : No LC associated with this FGID
FGID chkpt context valid : TRUE
FGID chkpt context :
  table_id 0xe0000000 group 0x270100e0/32 source 0x00000000
  FGID chkpt info : 0x3000000
  FGID chkpt fapid mask :
    0x00000000 00000000 00000000 00000000 00000000
    00000000 00000000 00000000 00000000
  Joins batched : 0
  Leaves batched : 0
In PI retry list :N
FGID (type, TOS): 46081 (Primary, 9)
Context : IP (0xe0000000, *, 224.0.1.40/32)
Members[ref] : No LC associated with this FGID
FGID chkpt context valid : TRUE
FGID chkpt context :
  table_id 0xe0000000 group 0x280100e0/32 source 0x00000000
  FGID chkpt info : 0x3000000
  FGID chkpt fapid mask :
    0x00000000 00000000 00000000 00000000 00000000
    00000000 00000000 00000000 00000000
  Joins batched : 0
  Leaves batched : 0
In PI retry list :N
FGID (type, TOS): 46082 (Primary, 9)
Context : IP (0xe0000000, *, 232.0.0.0/24)
Members[ref] : No LC associated with this FGID
FGID chkpt context valid : TRUE
FGID chkpt context :
  table_id 0xe0000000 group 0x000000e0/24 source 0x00000000
  FGID chkpt info : 0x3000000
  FGID chkpt fapid mask :
    0x00000000 00000000 00000000 00000000 00000000
    00000000 00000000 00000000 00000000
  Joins batched : 0
  Leaves batched : 0
In PI retry list :N
FGID (type, TOS): 46083 (Primary, 9)
Context : IP (0xe0000000, *, 232.0.0.8)
Members[ref] : No LC associated with this FGID
```
FGID chkpt context valid : TRUE
FGID chkpt context :
  table_id 0xe0000000 group 0x000000e8/8 source 0x00000000
FGID chkpt info : 0x3000000
FGID chkpt fapid mask :
  0x00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
  00000000 00000000 00000000 00000000
Joins batched : 0
Leaves batched : 0
In PI retry list : N

The following is the sample output from the show mrib fgid mstats command:

RP/0/RP0/CPU0:router# show mrib fgid mstats

Wed Sep 24 22:44:31.749 UTC

FGID Memory statistics in Bytes
--------------------------------
iface_chunk_allocated : 0
plat_chunk_allocated : 116
join_chunk_allocated : 176
fapnode_chunk_allocated : 0
batch_chunk_allocated : 0
batch_sid_chunk_allocated : 0
lc_allocated : 256
lmrib_plat_chunk_allocated : 0
encapid_plat_chunk_allocated : 0
fgid_q_chunk_allocated : 0
chkpt_q_chunks : 0
fgid_pool_chunk_allocated : 44176

The following is the sample output from the show mrib fgid ostats command:

RP/0/RP0/CPU0:router# show mrib fgid ostats

Wed Sep 24 22:44:38.244 UTC

MRIB PD operational stats from PI
--------------------------------
Total FGID Request      : 4
Total FGID Release      : 0
Total FGID Req/Rel Failed : 0
Total FGID Joins        : 0
Total FGID Joins Failed : 0
Total FGID UnJoins      : 0
Total FGID UnJoins Failed : 0

LMRIB PD operational stats from PI
---------------------------------
Total FGID Request : 0
Total FGID Release : 0
Total FGID Req/Rel Failed : 0
Total FGID Joins : 0
Total FGID Joins Failed : 0
Total FGID UnJoins : 0
Total FGID UnJoins Failed : 0

FGID Batch statistics
---------------------
Current FGIDs Batched : 0
Total Batch modify Joins : 0
Total Batch modify Leaves : 0
FGID Joins Programmed : 0
FGID Leaves Programmed : 0

FGID Join/Leave Nullified : 0
FGID Sent & Not Nullified : 0

FGID Joins still in batch : 0
FGID Leaves still in batch : 0

FGID Aggregator statistics
Current Permit Bits : 0x7
#Requests to FGID Alloc. : 11
#Requests failed from FGID Alloc. : 0
#Release to FGID Allocator : 0
#Release failed from FGID Allocator: 0
Total # of JoinArray invoked : 0
Total # of JoinArray retried : 0
Total # of LeaveArray invoked : 0
Total # of LeaveArray retried : 0
FGID Aggr. Success Return : 0
FGID Aggr. Flow Control : 0
FGID Aggr. Error Return : 0
FGID Aggr. Server Not Avail. : 0
Total # of replays done from chkpt : 1
Total # of remarks done : 1

FGID & Chkpt thread stats

Current FGID Q Depth : 0
Max FGID Q Depth : 0
Total FGID Thread Pulses : 1
Current Chkpt Q Depth : 0
Max Chkpt Q Depth : 6000
Total Chkpt thread pulses : 13
Total PI upds_done : 13

MRIB init & FGID reuse time stamps

Platform init start time : Sep 24 22:09:33.759
Platform init end time : Sep 24 22:09:34.263
Checkpoint init start time : Sep 24 22:09:34.174
Checkpoint init end time : Sep 24 22:09:34.178
FGID replay start time : Sep 24 22:09:34.291
FGID replay end time : Sep 24 22:09:34.292
FGID reuse start time : Sep 24 22:09:34.263
FGID reuse end time : Jan 1 00:00:00.000
Stale(non-reuse) cleanup start : Sep 24 22:12:36.316
Stale(non-reuse) cleanup end : Sep 24 22:13:36.322

MRIB FGID Library Status : MRIB_INIT MRIB_WAIT_FOR_FGID_PULSE MRIB_WAIT_FOR_CHKPT_PULSE LMRIB_INIT

The following is the sample output from the show mrib fgid stats command:

RP/0/RP0/CPU0:router# show mrib fgid stats
Wed Sep 24 22:45:06.526 UTC

FGID FREE POOL STATISTICS

Total FGIDs from Allocator : 11000
FGIDs Reused : 0
MRIB used FGIDs : 4
LMRIB used FGIDs : 0
ENCAPID used FGIDs : 0
Total FGIDs available : 10996
Total FGIDs in USE : 4
FGID current pool head : 4
FGID current pool tail : 1000
FGID last pool head : 0
FGID last pool tail : 1000

FGID REUSE STATS

#FGIDs added to Joined-list : 0
Multicast Routing and Forwarding Commands

Cisco IOS XR Multicast Command Reference for the Cisco CRS Router, Release 5.2.x

<table>
<thead>
<tr>
<th>(FGID)</th>
<th>(IP)</th>
<th>(Label)</th>
<th>(ENCAP ID)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocated from Joined-list</td>
<td>Allocated from TRIE</td>
<td>Available in TRIE</td>
<td>Available in TRIE</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

FGID CHECKPOINT STATS

<table>
<thead>
<tr>
<th>(FGID)</th>
<th>(IP)</th>
<th>(Label)</th>
<th>(ENCAP ID)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chunks Create Event to Q</td>
<td>Allocated to Routes</td>
<td>Allocated from TRIE</td>
<td>Available in TRIE</td>
</tr>
<tr>
<td>11000</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

FGID REUSE CHECKPOINT STATS

<table>
<thead>
<tr>
<th>(FGID)</th>
<th>(IP)</th>
<th>(Label)</th>
<th>(ENCAP ID)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read from chkptDB</td>
<td>Delete Event to Q</td>
<td>Delete Event to Q</td>
<td>Delete Event to Q</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

FGID LEAKS

<table>
<thead>
<tr>
<th>(FGID)</th>
<th>(IP)</th>
<th>(Label)</th>
<th>(ENCAP ID)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freed</td>
<td>Free</td>
<td>Delete</td>
<td>Delete</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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

```
RP/0/RP0/CPU0:router# show mrib fgid nsf
Wed Sep 24 22:44:48.966 UTC
NSF information
---------------
NSF state : INACTIVE
Currently in ISSU? : NO
```
show mrib fgid standby

To display the platform-specific Multicast Routing Information Base (MRIB) fabric group identifier (FGID) data on a standby RP, use the `show mrib fgid standby` command in EXEC mode.

```
show mrib fgid [chkptdb| info| mstats| ostats| stats| nsf] standby
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>chkptdb</code></td>
<td>(Optional) Dumps the MRIB FGID checkpoint database.</td>
</tr>
<tr>
<td><code>info</code></td>
<td>(Optional) Displays the MRIB FGID information.</td>
</tr>
<tr>
<td><code>mstats</code></td>
<td>(Optional) Displays the MRIB FGID memory statistics.</td>
</tr>
<tr>
<td><code>ostats</code></td>
<td>(Optional) Displays the MRIB FGID operation statistics.</td>
</tr>
<tr>
<td><code>stats</code></td>
<td>(Optional) Displays the MRIB FGID statistics.</td>
</tr>
<tr>
<td><code>nsf</code></td>
<td>(Optional) Displays the NSF FGID statistics.</td>
</tr>
</tbody>
</table>

**Command Default**
IPv4 addressing is the default.

**Command Modes**
EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 5.2.2</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>
Examples

The following is the sample output from the **show mrib fgid chkptdb standby** command:

```plaintext
RP/0/RP0/CPU0:router# show mrib fgid chkptdb standby
Wed Sep 24 22:46:19.544 UTC

Number of FGIDs in the chkpt DB : 0
All the chkpt entries with IP/Label ctx are dumped to a file /tmp/mrib_chkpt.txt in the
(D)RP.

To see the contents, run attach to the (D)RP and copy to a tftp server: cp /tmp/mrib_chkpt.txt
'/tftp:<directory>' or print from the RP: 'cat /tmp/mrib_chkpt.txt'
```

The following is the sample output from the **show mrib fgid info all standby** command:

```plaintext
RP/0/RP0/CPU0:router# show mrib fgid info all standby
Wed Sep 24 22:45:27.004 UTC

FGID information
----------------
FGID (type, TOS): 46080 (Primary, 9)
Context : IP (0xe0000000, *, 224.0.1.39/32)
Members[ref] : No LC associated with this FGID

FGID chkpt context valid : TRUE
FGID chkpt context :
  table_id 0xe0000000 group 0x270100e0/32 source 0x00000000
  table_id 0xe0000000 group 0x280100e0/32 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000

Joins batched : 0
Leaves batched : 0
In PI retry list :N

FGID (type, TOS): 46081 (Primary, 9)
Context : IP (0xe0000000, *, 224.0.1.40/32)
Members[ref] : No LC associated with this FGID

FGID chkpt context valid : TRUE
FGID chkpt context :
  table_id 0xe0000000 group 0x280100e0/32 source 0x00000000
  table_id 0xe0000000 group 0x280100e0/32 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x00000e0/24 source 0x00000000

Joins batched : 0
Leaves batched : 0
In PI retry list :N

FGID (type, TOS): 46082 (Primary, 9)
Context : IP (0xe0000000, *, 232.0.0.0/8)
Members[ref] : No LC associated with this FGID

FGID chkpt context valid : TRUE
FGID chkpt context :
  table_id 0xe0000000 group 0x000000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x000000e0/24 source 0x00000000
  table_id 0xe0000000 group 0x000000e0/24 source 0x00000000

Joins batched : 0
Leaves batched : 0
In PI retry list :N

FGID (type, TOS): 46083 (Primary, 9)
Context : IP (0xe0000000, *, 232.0.0.8)
Members[ref] : No LC associated with this FGID
```

Cisco IOS XR Multicast Command Reference for the Cisco CRS Router, Release 5.2.x
FGID chkpt context valid : TRUE
FGID chkpt context :
    table_id 0xe0000000 group 0x000000e8/8 source 0x00000000
FGID chkpt info : 0x3000000
FGID chkpt fapid mask :
    0x00000000 00000000 00000000 00000000 00000000
    00000000 00000000 00000000 00000000
Joins batched : 0
Leaves batched : 0
In PI retry list :N

The following is the sample output from the `show mrib fgid mstats standby` command:

```
RP/0/RP0/CPU0:router# show mrib fgid mstats standby
Wed Sep 24 22:45:36.785 UTC
FGID Memory statistics in Bytes
----------------------------------
iface_chunk_alloced : 0
plat_chunk_alloced : 116
join_chunk_alloced : 176
fapnode_chunk_alloced : 0
batch_chunk_alloced : 0
batch_sid_chunk_alloced : 0
lc_alloced : 256
lmrib_plat_chunk_alloced : 0
encapid_plat_chunk_alloced : 0
fgid_q_chunk_alloced : 0
chkpt_q_chunk_alloced : 0
fgid_pool_chunk_alloced : 0
```

The following is the sample output from the `show mrib fgid ostats standby` command:

```
RP/0/RP0/CPU0:router# show mrib fgid ostats standby
Wed Sep 24 22:45:43.365 UTC
MRIB PD operational stats from PI
----------------------------------
Total FGID Request : 8
Total FGID Release : 0
Total FGID Req/Rel Failed : 4
Total FGID Joins : 0
Total FGID Joins Failed : 0
Total FGID UnJoins : 0
Total FGID UnJoins Failed : 0
LMRIB PD operational stats from PI
----------------------------------
Total FGID Request : 0
Total FGID Release : 0
Total FGID Req/Rel Failed : 0
Total FGID Joins : 0
Total FGID Joins Failed : 0
Total FGID UnJoins : 0
Total FGID UnJoins Failed : 0
FGID Batch statistics
----------------------
Current FGIDs Batched : 0
Total Batch modify Joins : 0
Total Batch modify Leaves : 0
FGID Joins Programmed : 0
FGID Leaves Programmed : 0
FGID Join/Leave Nullified : 0
FGID Sent & Not Nullified : 0
FGID Joins still in batch : 0
FGID Leaves still in batch : 0
```
FGID Aggregator statistics
---------------------------------
Current Permit Bits : 0x0

#Requests to FGID Alloc. : 0
#Requests failed from FGID Alloc. : 0

#Release to FGID Allocator : 0
#Release failed from FGID Allocator: 0

Total # of JoinArray invoked : 0
Total # of JoinArray retried : 0
Total # of LeaveArray invoked : 0
Total # of LeaveArray retried : 0

FGID Aggr. Success Return : 0
FGID Aggr. Flow Control : 0
FGID Aggr. Error Return : 0
FGID Aggr. Server Not Avail. : 0

Total # of replays done from chkpt : 0
Total # of remarks done : 0

FGID & Chkpt thread stats
---------------------------------
Current FGID Q Depth : 0
Max FGID Q Depth : 0
Total FGID Thread Pulses : 0

Current Chkpt Q Depth : 0
Max Chkpt Q Depth : 0
Total Chkpt thread pulses : 0
Total PI upds_done : 10

MRIB init & FGID reuse time stamps
---------------------------------
Platform init start time : Sep 24 22:09:34.509
Platform init end time : Sep 24 22:09:34.973
Checkpoint init start time : Sep 24 22:09:34.876
Checkpoint init end time : Sep 24 22:09:34.876
FGID replay start time : Jan 1 00:00:00.000
FGID replay end time : Jan 1 00:00:00.000
FGID reuse start time : Jan 1 00:00:00.000
FGID reuse end time : Sep 24 22:29:35.639
Stale(non-reuse) cleanup start : Jan 1 00:00:00.000
Stale(non-reuse) cleanup end : Jan 1 00:00:00.000

MRIB FGID Library Status : MRIB_INIT MRIB_WAIT_FOR_FGID_PULSE MRIB_WAIT_FOR_CHKPT_PULSE LMRIB_INIT

The following is the sample output from the show mrib fgid stats standby command:

RP/0/RP0/CPU0:router# show mrib fgid stats standby
Wed Sep 24 22:46:08.889 UTC

FGID FREE POOL STATISTICS
---------------------------------
Total FGIDs from Allocator : 0
FGIDs Reused : 4
MRIB used FGIDs : 4
LMRIB used FGIDs : 0
ENCAPID used FGIDs : 0

Total FGIDs available : 0
Total FGIDs in USE : 4

FGID REUSE STATS
---------------------------------
#FGIDs added to Joined-list : 4
#FGIDs allocated from Joined-list : 4
#FGIDs available in Joined-list : 4

#IPs added to TRIE : 4
# IPs allocated from TRIE : 4
# IPs available in TRIE : 4

# LABELs added to TRIE : 0
# LABELs allocated from TRIE : 0
# LABELs available in TRIE : 0

# ENCAP IDs added to TRIE : 0
# ENCAP IDs allocated from TRIE : 0
# ENCAP IDs available in TRIE : 0

# Unused FGIDs freed : 0
# Stale (non-reused) FGIDs freed : 0

FGID CHECKPOINT STATS
----------------------
FGID chunks create event to Q : 0
# FGIDs chkpt created : 0
# FGIDs chkpt create failed : 0

# FGIDs allocated to routes : 0
# IP chkpt created : 0
# Label chkpt created : 0
# ENCAP ID chkpt created : 0
# FGID chkpt create failed : 0
# IP chkpt create failed : 0
# Label chkpt create failed : 0
# ENCAP ID chkpt create failed : 0

# FGIDs chkpt node-id mask saved : 0
# FGIDs chkpt node-id mask failed : 0

# FGIDs freed : 0
# IP freed : 0
# Label freed : 0
# ENCAP ID freed : 0

# FGIDs free failed : 0
# IP free failed : 0
# Label free failed : 0
# ENCAP ID free failed : 0

# FGIDs delete event to Q : 0
# FGIDs chkpt deleted : 0
# FGIDs chkpt deleted failed : 0

FGID REUSE CHECKPOINT STATS
----------------------------
# FGIDs read from chkptDB : 0
# IPs read from chkptDB : 0
# Labels read from chkptDB : 0
# ENCAP IDs read from chkptDB : 0

# FGIDs delete event to Q : 0
# IP delete event to Q : 0
# Label delete event to Q : 0
# Encap ID delete event to Q : 0

# FGIDs chkpt deleted : 0
# IP chkpt deleted : 0
# Label chkpt deleted : 0
# ENCAP ID chkpt deleted : 0

# FGIDs chkpt deleted failed : 0
# IP chkpt delete failed : 0
# Label chkpt deleted failed : 0
# ENCAP ID chkpt deleted failed : 0

FGID LEAKS
----------
# Current FGIDs in FGID chkpt : 11000
Total FGIDs from Allocator (reuse) : 4
FGIDs Leak (create/read - delete) : 11000
#Current IPs in IP chkpt : 4
FGIDs in Joined list (reuse) : 0
IPs Leak (create/read - delete) : 4

#Current Labels in Label chkpt : 0
FGIDs in Joined list (reuse) : 0
Labels Leak (create/read - delete) : 0

#Current Encap IDs in ENCAP chkpt : 0
FGIDs in Joined list (reuse) : 0
Encap IDs Leak (create/read - delete) : 0

The following is the sample output from the `show mrib fgid nsf standby` command:

```
RP/0/RP0/CPU0:router# show mrib fgid nsf standby
Wed Sep 24 22:45:56.848 UTC

NSF information
----------------
NSF state : INACTIVE
Currently in ISSU? : Unknown
```
show mrib label-table-info

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

`show mrib label-table-info`

**Syntax Description**

This command has no keywords or arguments.

**Command Default**

None.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.9.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

The following is the sample output from the `show mrib label-table-info` command:

```
RP/0/RP0/CPU0:router# show mrib label-table-info
VRF: default [tid 0xe0000000]
Registered Client:
  te_control [ccbid: 4 cltid: 778528 restart: 60000 recovery: 60000]
  lmrib_bcdl [ccbid: 2 cltid: 1 restart: 0 recovery: 0]
```
**show mrib mdt-interface**

To verify that the Multicast Routing Information Base (MRIB) has correctly learned multicast distribution tree (MDT) interface handles from Protocol Independent Multicast (PIM) and that it shows the corresponding table ID for each handle, use the `show mrib mdt-interface` command in EXEC mode.

```
show mrib mdt-interface [detail| ifh]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>detail</td>
<td>(Optional) Shows the dependent VRF routes for the MDT interface handles learned from PIM.</td>
</tr>
<tr>
<td>ifh</td>
<td>(Optional) Specifies the mapping for a particular MDT interface handle learned from PIM.</td>
</tr>
</tbody>
</table>

**Command Default**
IPv4 addressing is the default.

**Command Modes**
EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.8.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

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

You can use the `show mrib mdt-interface` command to help debug an MVPN route collapse in MRIB when Extranet VRF dependencies are introduced. For example, MRIB may learn about a route update from PIM with an MDT handle associated with a different VRF table than the source VRF table. This database can then be useful in verifying that the MDT handle for the dependent VRF has been learned correctly.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

The following example illustrates detailed output from the `show mrib mdt-interface` command with the MDT interface handle name shown in parentheses in the output (mdtgreen):

```
RP/0/RP0/CPU0:router# show mrib mdt-interface detail
```
Fri Dec 12 00:12:16.001 UTC
IP Multicast MRIB MDT ifhandle Interface DB
MH - Handle update count, I - Intranet route count, EX - Extranet route count, Up - Uptime
0x9042b80(mdtvrf20) TID:0xe0000014 MH:1 I:0 EX:0 Up:6d01h
MDT route forward-reference DB:
0x9042c80(mdtvrf19) TID:0xe0000013 MH:1 I:0 EX:0 Up:6d01h
MDT route forward-reference DB:
0x9042d80(mdtvrf11) TID:0xe000000b MH:1 I:0 EX:0 Up:6d01h
MDT route forward-reference DB:
0x9042e80(mdtvrf10) TID:0xe000000a MH:1 I:250 EX:0 Up:6d01h
MDT route forward-reference DB:
(18.18.10.2,232.0.0.1/32) [tid:0xe000000a] recollapse: FALSE
(18.18.10.2,232.0.0.2/32) [tid:0xe000000a] recollapse: FALSE
(18.18.10.2,232.0.0.3/32) [tid:0xe000000a] recollapse: FALSE
(18.18.10.2,232.0.0.4/32) [tid:0xe000000a] recollapse: FALSE

... This table describes the significant fields shown in the display.

**Table 11: show mrib mdt-interface Field Descriptions**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TID, tid</td>
<td>VRF table ID associated with the MDT handle.</td>
</tr>
<tr>
<td>MH</td>
<td>Number of times the MDT interface handle has been received. Used for debugging, because it allows you to identify duplicate updates. Under normal conditions, the value should be 1.</td>
</tr>
<tr>
<td>I</td>
<td>Number of intranet routes using a specific MDT interface handle.</td>
</tr>
<tr>
<td>EX</td>
<td>Number of extranet routes using a specific MDT interface handle.</td>
</tr>
<tr>
<td>Up</td>
<td>Uptime—Elapsed time since MDT interface handle was learned.</td>
</tr>
<tr>
<td>recollapse</td>
<td>Set to TRUE in situations where the MDT information (such as default MDT group or MDT interface handle) for a dependent VRF table was not received from PIM during a route collapse. The route will be &quot;recollapsed&quot; when all the dependent information is received.</td>
</tr>
</tbody>
</table>

When you use the **detail** keyword, the output displays dependent VRF routes. Otherwise, only the MDT interface mappings appear.

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mrib route-collapse, on page 122</td>
<td>Displays the contents of the Multicast Routing Information Base (MRIB) route-collapse database.</td>
</tr>
</tbody>
</table>
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 the appropriate mode.

`show mrib [ipv4|ipv6] [old-output] nsf`

**Syntax Description**

- `ipv4` (Optional) Specifies IPv4 address prefixes.
- `ipv6` (Optional) Specifies IPv6 address prefixes.
- `old-output` (Optional) Displays the old show output—available for backward compatibility.

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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

```
RP/0/RP0/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 12: show mrib nsf Field Descriptions**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multicast routing state</td>
<td>Multicast NSF status of the MRIB (Normal or NSF Activated).</td>
</tr>
<tr>
<td>NSF Lifetime</td>
<td>Timeout for MRIB NSF, computed as the maximum of the PIM and Internet Group Management Protocol (IGMP) NSF lifetimes, plus 60 seconds.</td>
</tr>
<tr>
<td>NSF Time Remaining</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>nsf (multicast)</code> , on page 49</td>
<td>Configures the NSF capability for the multicast routing system.</td>
</tr>
<tr>
<td><code>nsf lifetime (IGMP/MLD)</code></td>
<td>Configures the maximum time for the NSF timeout value under IGMP or MLD.</td>
</tr>
<tr>
<td><code>nsf lifetime (PIM)</code></td>
<td>Configures the NSF timeout value for the PIM process.</td>
</tr>
<tr>
<td><code>show igmp nsf</code></td>
<td>Displays the state of NSF operation in IGMP.</td>
</tr>
<tr>
<td><code>show mfib nsf</code></td>
<td>Displays the state of NSF operation in the MFIB line cards.</td>
</tr>
<tr>
<td><code>show pim nsf</code></td>
<td>Displays the state of NSF operation for PIM.</td>
</tr>
</tbody>
</table>
show mrib nsr end

To display nonstop routing (NSR) operation in the Multicast Routing Information Base (MRIB), use the `show mrib nsr end` command in the appropriate mode.

`show mrib ipv4| ipv6 nsr end`  

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td>ipv6</td>
<td>(Optional) Specifies IPv6 address prefixes.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 5.2.2</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

Use this command after an NSR event (for example, RPFO or a process restart) to determine when each of the MRIB or MRIB6's NSR clients finished re-downloading the information to the MRIB and if any previously downloaded information was purged in the process.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

The following is sample output from the `show mrib nsr end` command:

```
RP/0/RP0/CPU0:router# show mrib nsr end
Time   Client   Idx  Change
Oct 17 18:43:36 Membership 1 N
Oct 17 18:43:40 Routing   2 Y
```

This table describes the significant fields shown in the display.
Table 13: show mrib nsr end Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>The time at which the client finished downloading information back to MRIB or MRIB6 after the NSR event.</td>
</tr>
<tr>
<td>Client</td>
<td>Client type (Membership - IGMP/MLD, Routing - PIM/PIM6)</td>
</tr>
<tr>
<td>Change</td>
<td>Was there an route or interface attribute purge Y - yes, N - no</td>
</tr>
</tbody>
</table>

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show msdp nsr</td>
<td>Displays the state of NSR operation for MSDP.</td>
</tr>
<tr>
<td>show igmp nsr</td>
<td>Displays the state of NSR operation for IGMP.</td>
</tr>
<tr>
<td>show pim nsr</td>
<td>Displays the state of NSR operation for PIM.</td>
</tr>
</tbody>
</table>
show mrib route

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

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

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>vrf vrf-name</strong></td>
<td>(Optional) Specifies a VPN routing and forwarding (VRF) instance.</td>
</tr>
<tr>
<td><strong>ipv4</strong></td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td><strong>ipv6</strong></td>
<td>(Optional) Specifies IPv6 address prefixes.</td>
</tr>
<tr>
<td>*****</td>
<td>(Optional) Displays shared tree entries.</td>
</tr>
</tbody>
</table>
| **source-address** | (Optional) Source IP address or hostname of the MRIB route. Format is:  
|               | A.B.C.D  or X:X::X.                                                                                                                        |
| **group-address** | (Optional) Group IP address or hostname of the MRIB route. Format is:  
|                | A.B.C.D  or X:X::X.                                                                                                                        |
| **/prefix-length** | (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:  
|                | A.B.C.D  or X:X::X.                                                                                                                        |
| **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 2.0: This command was introduced.
- Release 3.4.0: The **detail** keyword was added.
Release 3.5.0

The **vrf** *vrf-name* keyword and argument were added.

### Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the 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 mfib counter**, on page 58 command displays global counters independent of the routes.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

### Examples

The following is sample output from the **show mrib route** command (the output fields are described in the header):

```
RP/0/RP0/CPU0:router# show mrib route

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
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
II - Internal Interest, ID - Internal Disinterest, LI - Local Interest,
LD - Local Disinterest, DI - Decapsulation Interface
EI - Encapsulation Interface, MI - MDT Interface

(*,224.0.0.0/4) RPF nbr: 10.11.1.20 Flags: L C
  Outgoing Interface List
  Decapstunnel0 Flags: NS

(*,224.0.0.0/24) Flags: D

(*,224.0.1.39) Flags: S
  Outgoing Interface List
  POS0/3/0/0 Flags: II LI

(*,238.1.1.1) RPF nbr: 10.11.1.20 Flags: C
  Outgoing Interface List
  POS0/3/0/0 Flags: F NS LI
  Decapstunnel0 Flags: A

(*,239.1.1.1) RPF nbr: 10.11.1.20 Flags: C
  Outgoing Interface List
  POS0/3/0/0 Flags: F NS
  Decapstunnel0 Flags: A
```
The following shows output when the `vrf` and `detail` keywords are used:

```plaintext
RP/0/RP0/CPU0:router# show mrib vrf vrf1 route detail
```

**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

Interface flags: F - Forward, A - Accept, IC - Internal Copy,
NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
II - Internal Interest, ID - Internal Disinterest, LI - Local Interest,
LD - Local Disinterest, DI - Decapsulation Interface
EI - Encapsulation Interface, MI - MDT Interface, LVIF - MPLS Encap,
EX - Extranet

`(*,0.0.0.101)` Ver: 0x818 Flags: MA, FMA: 0x0
    MDT Address: 5.5.5.5
    Up: 6d01h

`(*,0.0.0.102)` Ver: 0x5337 Flags: MA, FMA: 0x0
    MDT Address: 225.101.1.1
    Up: 6d01h

`(*,0.0.0.103)` Ver: 0x6cea Flags: ML, FMA: 0x0
    Master Linecard Slot: 0/3/CPU0
    Up: 6d01h

`(*,0.0.0.104)` Ver: 0x7ca Flags: MBH, FMA: 0x0
    BGP IFH: 0x9000180
    Up: 6d01h

`(*,0.0.0.105)` Ver: 0x5b67 Flags: MLF, FMA: 0x0
    Master Linecard Fallback Slot: 0/3/CPU0
    Up: 6d01h

`(*,0.0.0.107)` Ver: 0x382c Flags: MDT_IFH, FMA: 0x0
    MDT IFH: 0x9043d80

The following example shows detailed output for a source VRF route in a receiver on the source PE router in an MVPN extranet topology), with the MDT core tree ID of the receiver VRF displayed.

```plaintext
RP/0/RP0/CPU0:router# show mrib vrf vrf15 route 18.18.15.2 225.0.0.1 detail
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>nsf lifetime (IGMP/MLD)</td>
<td>Configures the maximum time for the NSF timeout value on the IGMP.</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>show mfib counter, on page 58</td>
<td>Displays MFIB counter statistics for packets that have dropped.</td>
</tr>
<tr>
<td>show mrib route-collapse, on page 122</td>
<td>Displays the contents of the MRIB route collapse database.</td>
</tr>
<tr>
<td>show mrib mdt-interface, on page 112</td>
<td>Helps in troubleshooting whether or not MRIB has correctly learned the MDT interface handles from PIM, and whether or not the corresponding table ID for each handle is shown.</td>
</tr>
<tr>
<td>show mfib route, on page 89</td>
<td>Displays all entries in the MFIB table.</td>
</tr>
</tbody>
</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 the appropriate mode.

```plaintext
show mrib [vrf vrf-name] [ipv4|ipv6] route-collapse [core-tree]
```

**Syntax Description**

- **vrf vrf-name** *(Optional)* Specifies a VPN routing and forwarding (VRF) instance.
- **ipv4** *(Optional)* Specifies IPv4 address prefixes.
- **ipv6** *(Optional)* Specifies IPv6 address prefixes.
- **core-tree** *(Optional)* IPv4 Multicast Distribution Tree (MDT) group address.

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.5.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.8.0</td>
<td>MVPN extant attributes were added to the output for this command.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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

```plaintext
RP/0/RP0/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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mrib route, on page 118</td>
<td>Displays all entries in the Multicast Routing Information Base (MRIB).</td>
</tr>
</tbody>
</table>
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 the appropriate mode.

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

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>(Optional) Displays shared tree entries.</td>
</tr>
<tr>
<td><code>A.B.C.D</code></td>
<td>(Optional) Source IP address or hostname of the MRIB route. Format is:</td>
</tr>
<tr>
<td></td>
<td><code>A.B.C.D</code> or <code>X:X::X</code>.</td>
</tr>
<tr>
<td><code>A.B.C.D</code></td>
<td>(Optional) Group IP address or hostname of the MRIB route and the prefix length.</td>
</tr>
<tr>
<td><code>/prefix-length</code></td>
<td>(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:</td>
</tr>
<tr>
<td></td>
<td><code>A.B.C.D</code> or <code>X:X::X</code>.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.9.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>
The following is sample output from the `show mrib route outgoing-interface` command:

```
RP/0/RP0/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
(*,224.0.1.39), 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:
(10.10.10,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.11.11,224.0.1.39), 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:
(10.12.12.12,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.13.13.13,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.14.14.14,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.15.15.15,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.16.16.16,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.17.17.17,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.18.18.18,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.19.19.19,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.20.20.20,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.21.21.21,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.22.22.22,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.23.23.23,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.24.24.24,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.25.25.25,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.26.26.26,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.27.27.27,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.28.28.28,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.29.29.29,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.30.30.30,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.31.31.31,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.32.32.32,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.33.33.33,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.34.34.34,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.35.35.35,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.36.36.36,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.37.37.37,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.38.38.38,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.39.39.39,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.40.40.40,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.41.41.41,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.42.42.42,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.43.43.43,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.44.44.44,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.45.45.45,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.46.46.46,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.47.47.47,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.48.48.48,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.49.49.49,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.50.50.50,224.0.1.40), Up:6d10h, OIF count:11, flags:
(*,225.0.0.0/8), Up:6d10h, OIF count:0, flags: C
(*,226.0.0.0/8), Up:6d10h, 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:2, 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:
(10.10.10,232.1.1.1), Up:6d10h, OIF count:2, flags:
(10.21.21.21,232.1.1.1), Up:6d10h, OIF count:3, flags:
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show mrib route, on page 118</td>
<td>Displays all entries in the Multicast Routing Information Base (MRIB).</td>
</tr>
</tbody>
</table>
**show mrib table-info**

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

`show mrib [vrf vrf-name] [ipv4|ipv6] table-info`

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vrf vrf-name</td>
<td>(Optional) Specifies a VPN routing and forwarding (VRF) instance.</td>
</tr>
<tr>
<td>ipv4</td>
<td>(Optional) Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td>ipv6</td>
<td>(Optional) Specifies IPv6 address prefixes.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 addressing is the default.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.5.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.8.0</td>
<td>New MVPN extranet attributes were added to command output.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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

```
RP/0/RP0/CPU0:router# show mrib vrf vrf101 table-info
VRF: default [tid 0xe0000000]
Registered Client:
  igmp [ccbid: 0 cltid: 4485366]
  pim [ccbid: 1 cltid: 4485368]
```
### Table 14: `show mrib table-info` Field Descriptions

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

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mrib tlc</code>, on page 128</td>
<td>Displays the contents of the Multicast Routing Information Base (MRIB) table-line card (TLC) database.</td>
</tr>
</tbody>
</table>
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 the appropriate mode.

```
show mrib [vrf vrf-name] [ipv4|ipv6] tlc [remote]
```

### Syntax Description

- `vrf vrf-name` (Optional) Specifies a VPN routing and forwarding (VRF) instance.
- `ipv4` (Optional) Specifies IPv4 address prefixes.
- `ipv6` (Optional) Specifies IPv6 address prefixes.
- `remote` (Optional) Displays the linked remote entry.

### Command Default
IPv4 addressing is the default.

### Command Modes
`EXEC`

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.5.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.6.0</td>
<td>The <code>remote</code> keyword was introduced.</td>
</tr>
</tbody>
</table>

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

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

### Examples

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

```
RP/0/RP0/CPU0:router# show mrib tlc
VRF: default [tid 0xe0000000]
Master LC slot: Not selected
```
This table describes the significant fields shown in the display.

**Table 15: show msdp peer Field Descriptions**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated MDT group</td>
<td>IP address of the MSDP peer.</td>
</tr>
<tr>
<td>Master LC slot</td>
<td>Indicates whether the master LC slot has been selected.</td>
</tr>
<tr>
<td>Forwarding LC node</td>
<td>Autonomous system to which the peer belongs.</td>
</tr>
<tr>
<td>Associated MDT group</td>
<td>Indicates the number of associated MDT groups.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>prefix-address</strong></td>
</tr>
<tr>
<td><strong>prefix-mask</strong></td>
</tr>
<tr>
<td><strong>type</strong></td>
</tr>
<tr>
<td><strong>interface-path-id</strong></td>
</tr>
<tr>
<td><strong>Note</strong></td>
</tr>
<tr>
<td><strong>next-hop-address</strong></td>
</tr>
</tbody>
</table>

**Command Default**

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

**Command Modes**

Multicast routing address family ipv4 and ipv6 configuration

Multicast VRF configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast VRF configuration mode.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

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

```
RP/0/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# vrf green
RP/0/RP0/CPU0:router(config-mcast)# static-rpf 10.0.0.1 32 GigE 0/0/5/0 10.1.1.1
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show pim bsr candidate-rp</code></td>
<td>Displays PIM candidate rendezvous point information for the BSR.</td>
</tr>
</tbody>
</table>
### 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.

**Syntax Description**

```
 ttl-threshold ttl
 no ttl-threshold ttl
```

**Syntax Description**

- `ttl` 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.3.0</td>
<td>This command was introduced as a replacement for the <code>multicast</code></td>
</tr>
<tr>
<td></td>
<td><code>ttl-threshold</code> command.</td>
</tr>
<tr>
<td>Release 3.5.0</td>
<td>This command was supported in multicast routing VRF interface configuration</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

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/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# interface GigE 0/1/0/CPU0
RP/0/RP0/CPU0:router(config-mcast-default-ipv4-if)# ttl-threshold 23
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ttl-threshold (MSDP)</td>
<td>Limits which multicast data packets are sent in SA messages to an MSDP peer.</td>
</tr>
</tbody>
</table>
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|ipv6]
novrf vrf-name [ipv4|ipv6]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vrf-name</code></td>
<td>Name of the VRF instance. The following names cannot be used: all, default, and global.</td>
</tr>
<tr>
<td><code>ipv4</code></td>
<td>(Optional) Configures IPv4 address prefixes.</td>
</tr>
<tr>
<td><code>ipv6</code></td>
<td>(Optional) Configures IPv6 address prefixes.</td>
</tr>
</tbody>
</table>

### Command Default

No default behavior or values.

### Command Modes

Multicast routing configuration

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.5.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.7.0</td>
<td>ipv4 and ipv6 submodes were supported.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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

```
RP/0/RP0/CPU0:router(config)# multicast-routing
RP/0/RP0/CPU0:router(config-mcast)# vrf vrf_1
RP/0/RP0/CPU0:router(config-mcast-vrf_1-ipv4)# mdt ?
```

```markdown
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>boundary, on page 11</td>
<td>Configures a boundary to keep multicast packets from being forwarded.</td>
</tr>
<tr>
<td>accounting per-prefix, on page 4</td>
<td>Enables per-prefix counters only in hardware.</td>
</tr>
<tr>
<td>interface (multicast), on page 28</td>
<td>Configures multicast interface properties.</td>
</tr>
<tr>
<td>log-traps, on page 34</td>
<td>Enables logging of trap events.</td>
</tr>
<tr>
<td>mdt data, on page 36</td>
<td>Configures the MDT data group address range.</td>
</tr>
<tr>
<td>mdt default, on page 39</td>
<td>Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).</td>
</tr>
<tr>
<td>mdt mtu, on page 41</td>
<td>Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).</td>
</tr>
<tr>
<td>mdt source, on page 43</td>
<td>Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.</td>
</tr>
<tr>
<td>multipath, on page 47</td>
<td>Enables Protocol Independent Multicast (PIM) to divide the multicast load among several equal-cost paths.</td>
</tr>
<tr>
<td>rate-per-route, on page 54</td>
<td>Enables individual (source, group [S, G]) rate calculations.</td>
</tr>
<tr>
<td>ssm</td>
<td>Defines the Protocol Independent Multicast (PIM)-Source Specific Multicast (SSM) range of IP multicast addresses.</td>
</tr>
<tr>
<td>static-rpf, on page 130</td>
<td>Configures a static Reverse Path Forwarding (RPF) rule for a specified prefix mask.</td>
</tr>
</tbody>
</table>
```