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 *Multicast Configuration Guide for Cisco CRS Routers*.

To use commands of this module, 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 any command, contact your AAA administrator for assistance.

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

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

Release	Modification
Release 3.0	This command was introduced.
Release 3.5.0	This command was supported in multicast VRF configuration mode.

Usage Guidelines

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 69 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 69 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 accouting 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.

Task ID

Task ID	Operations
multicast	read, write

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

Command	Description
accounting per-prefix forward-only, on page 6	Reduces hardware statistics resource allocations when enabling accounting, particularly for multicast VPN (MVPN).
show mfib hardware route statistics, on page 77	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib route, on page 88	Displays route entries in the Multicast Forwarding Information Base (MFIB).

accounting per-prefix forward-only

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

accounting per-prefix forward-only

Syntax Description

This command has no keywords or arguments.

Command Default

If no counters are 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

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

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

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

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

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

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

You may switch between **accounting-perprefix** and **accounting per-prefix forward-only** statistics for ipv4 or ipv6 multicast family. However, be aware that only one set of counters is supported on the (*,G) routes

(with fwd/punt/drop on ingress and fwd/drop on egress) regardless of whether you enabled the **accounting-perprefix** or **accounting-perprefix fwd-only** command.

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

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

Related Commands

Command	Description
accounting per-prefix, on page 4	Enables accounting for multicast routing.
clear mfib hardware resource-counters, on page 20	Clears global resource counters.

address-family (multicast)

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

address-family [**vrf** *vrf-name*] {**ipv4** | **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

Release	Modification
Release 2.0	This command was introduced.
Release 3.7.0	This command was documented as a multicast command.

Usage Guidelines

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 49 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, interface-inheritance disable, on page 33 command on a per interface or **interface all enable** basis in PIM or IGMP configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
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)#

RP/0/RP0/CPU0:router(config-mcast)# address-family ipv6
RP/0/RP0/CPU0:router(config-mcast-default-ipv6)#
```

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

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

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Related Commands

Command	Description
alias	Creates a command alias.
interface all enable, on page 31	Enables multicast routing and forwarding on all new and existing interfaces.
interface all disable	Disables PIM processing on all new and existing interfaces.

Command	Description
interface-inheritance disable, on page 33	Separates the disabling of multicast routing and forwarding.
interface (multicast), on page 29	Configures multicast interface properties.

address-family ipv4 mvpn (bgp)

To enable Border Gateway Protocol (BGP) on a specific IPV4 unicast destination address prefix, use the **address-family ipv4 mvpn** command in the BGP sub-configuration mode. To disable this feature, use the **no** form of this command.

address-family ipv4 mvpn [{**additional-paths** | **advertise best-external** | **as-path-loopcheck out disable** | **bgp** {**client-to-client reflection cluster-id** *ip_address* **disable** | **dampening** {*time value* | **route-policy policy** *param_value*} | **label-delay** *time*} | **inter-as install** | **nexthop** {**resolution prefix-length minimum** *value* | **route-policy policy** *param_value* | **trigger-delay** {**critical** *value* | **non-critical** *value*}} | **retain** | **route-target download** | **update limit** {**address-family** *limit* | **sub-group** {**ebgp** *limit* | **ibgp** *limit*}}}]

Syntax Description

additional-paths	Specifies the additional paths configuration.
advertise	Advertises the border gateway protocol path.
as-path-lookcheck	Configures AS path loop checking.
bgp	Configures the border gateway protocol commands.
inter-as	Controls the installation of the BGP MVPN routes into PIM/MLDP.
nexthop	Specifies the BGP nexthop location.
retain	Accepts or retains the specified BGP parameters.
route-target	Routes the target RIB installation.
update	Specifies the BGP update generation configuration.

Command Default

No default behavior or values

Command Modes

Multicast routing configuration

Multicast VRF configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.7.0	This command was documented as a multicast command.

Usage Guidelines

Use the **address-family** command either from multicast routing configuration mode or from multicast VRF configuration submode 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 49 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, interface-inheritance disable, on page 33 command on a per interface or **interface all enable** basis in PIM or IGMP configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

This example shows how to enter IPv4 andIPv6 multicast routing configuration mode:

```
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)#

RP/0/RP0/CPU0:router(config-mcast)# address-family ipv6
RP/0/RP0/CPU0:router(config-mcast-default-ipv6)#
```

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

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

Command	Description
alias	Creates a command alias.
interface all enable, on page 31	Enables multicast routing and forwarding on all new and existing interfaces.
interface all disable	Disables PIM processing on all new and existing interfaces.
interface-inheritance disable, on page 33	Separates the disabling of multicast routing and forwarding.
interface (multicast), on page 29	Configures multicast interface properties.

bgp auto-discovery mldp inter-as

To enable the MLDP I-PMSI core tree support, use the **bgp auto-discovery mldp inter-as** command in the BGP MVPN address-family sub configuration mode.

bgp auto-discovery mldp inter-as

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

BGP MVPN address-family sub configuration mode

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
multicast	read, write

```
RP/0/RP0/CPU0:router(config-mcast)# vrf vrf1
RP/0/RP0/CPU0:router(config-mcast-vrf1)# address-family ipv4
RP/0/RP0/CPU0:router(config-mcast-vrf1-ipv4)# bgp auto-discovery mldp inter-as
```

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*

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

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	This command was supported in multicast routing VRF interface configuration mode.

Usage Guidelines

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

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

Task ID	Operations
multicast	read, write

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
```

clear mfib counter

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-addresssource-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

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **ipv4** and **ipv6** keywords were added.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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

ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
location *node-id*	(Optional) Clears global resource counters from the designated node.
all	The **all** keyword clears all global resource counters.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **ipv4** and **ipv6** keywords were added.
Release 3.5.0	The **location** keyword was changed from optional to required.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

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

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

clear mfib hardware adjacency-counters

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

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

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

The following example shows how to clear all adjacency counters:

```
RP/0/RP0/CPU0:router# clear mfib hardware adjacency-counters rx location all
```

Related Commands

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

clear mfib hardware resource-counters

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

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

Syntax Description

vrf *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) Clears global resource counters from the designated node.
all	The **all** keyword clears all global resource counters.

Command Default

IPv4 addressing is the default.

Command Modes

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **ipv4** and **ipv6** keywords were added.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added. The **location** keyword was changed from optional to required.
Release 3.7.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

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

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

Related Commands

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

Command	Description
show mfib hardware route statistics, on page 77	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.

clear mfib hardware route statistics

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

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **ipv4** and **ipv6** keywords were added.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added. The **location** keyword was changed from optional to required.

Usage Guidelines

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

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

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

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

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.

Note This command does not clear global (*, G) counters.

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

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

```
RP/0/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
```

Related Commands

Command	Description
accounting per-prefix, on page 4	Enables accounting for multicast routing.
accounting per-prefix forward-only, on page 6	Reduces hardware statistics resource allocations when enabling accounting, particularly for multicast VPN (MVPN).
show mfib hardware route statistics, on page 77	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.

disable (multicast)

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

disable

Syntax Description

This command has no keywords or arguments.

Command Default

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

Command Modes

Multicast routing interface configuration

Multicast routing VRF interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	This command was supported in multicast routing VRF interface configuration mode.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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

Command	Description
enable (multicast), on page 26	Enables multicast routing and forwarding on an interface.
interface all enable, on page 31	Enables multicast routing and forwarding on all new and existing interfaces.

enable (multicast)

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

enable

Syntax Description

This command has no keywords or arguments.

Command Default

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

Command Modes

Multicast routing interface configuration

Multicast routing VRF interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	This command was supported in multicast routing VRF interface configuration mode.

Usage Guidelines

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.

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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

Command	Description
disable (multicast), on page 24	Disables multicast routing and forwarding on an interface.
interface all enable, on page 31	Enables multicast routing and forwarding on all new and existing interfaces.

forwarding-latency

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

forwarding-latency [**delay** *milliseconds*]

Syntax Description

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

Command Default

The default delay time is 30 milliseconds.

Command Modes

Multicast routing configuration

IPv4 and IPv6 multicast routing configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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*

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

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	This command was supported in multicast VRF configuration mode.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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
```

```
RP/0/RP0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

Related Commands

Command	Description
disable (multicast), on page 24	Disables multicast routing and forwarding on an interface.
enable (multicast), on page 26	Enables multicast routing and forwarding on an interface.
interface all enable, on page 31	Enables multicast routing and forwarding on all new and existing interfaces.

interface all enable

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

interface all enable

Syntax Description

This command has no keywords or arguments.

Command Default

Multicast routing and forwarding is disabled by default.

Command Modes

Multicast routing configuration

Multicast VRF configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	This command was supported in multicast VRF configuration mode.

Usage Guidelines

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.

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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

Command	Description
disable (multicast), on page 24	Disables multicast routing and forwarding on an interface.
enable (multicast), on page 26	Enables multicast routing and forwarding on an interface.

interface-inheritance disable

To separate PIM and IGMP routing from multicast forwarding on all interfaces, use the **interface-inheritance disable** command under multicast routing address-family IPv4 or IPv6 submode. To restore the default functionality, use the **no** form of the command.

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

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

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.

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

Used from the address-family ipv4 configuration submode, it prevents IGMP and PIM from inheriting the multicast-routing interface configuration. Whereas, if used from the address-family ipv6 confguration submode, it prevents MLD and PIM IPv6 from inheriting the multicast-routing interface configuration.

Task ID

Task ID	Operations
multicast	read, write

Examples

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

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

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

```
RP/0/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

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

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.5.0	This command was supported in multicast VRF configuration mode.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read, write

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

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

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.5.0	This command was supported in multicast VRF configuration mode.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to disable maximum state limits:

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

mdt c-multicast-routing

To configure customer multicast routing (c-multicast-routing) for multicast distribution trees (MDT) and to enter the c-multicast-routing mode, use the **mdt c-multicast-routing** command in the appropriate mode. To delete the configuration, use the **no** form of the command.

mdt c-multicast-routing [**bgp** | **pim**]

Syntax Description

bgp	Enables customer multicast routing for BGP.
pim	Enables customer multicast routing for PIM.

Command Default

None

Command Modes

PIM VRF address-family configuration mode

Command History

Release	Modification
Release 4.3	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
multicast	read, write

Example

This example show how to run the **mdt c-multicast-routing**:

```
RP/0/RP0/CPU0:router(config-pim-v1-ipv4) # mdt c-multicast-routing bgp
```

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*]

Syntax Description

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

Command Default

threshold : 1

Command Modes

Multicast routing configuration

Multicast routing address family IPv4 and IPv6 configuration

Multicast VRF configuration

Command History

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

Usage Guidelines

When certain multicast streams exceed a configured bandwidth, the multicast data is moved to an MDT data group that is dynamically chosen from an available pool of multicast addresses. If the traffic bandwidth falls below the threshold, the source is switched back to the default MDT. To avoid transitions between the MDTs, traffic only reverts to the default MDT if traffic below the data MDT threshold is at least one minute old.

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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

Command	Description
mdt default, on page 41	Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt mtu, on page 43	Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt source, on page 44	Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.

mdt data ingress replication

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*]

Syntax Description

immediate-switch	Enables switching to data MDT immediately.
acl_name	ACL fo vrf groups that are enabled for data MDT
number *value*	Maximum number of data MDTs to be triggered. Range is 1 to 262143.
immediate-switch *value*	Traffic rate threshold (in kbps) to trigger data MDT. Range is 1 to 4294967.

Command Default

None

Command Modes

Multicast routing VRF address-family configuration

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
multicast	read, write

Example

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*}

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

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

Usage Guidelines

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

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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:

```
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

Command	Description
mdt data, on page 38	Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).
mdt mtu, on page 43	Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt source, on page 44	Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.

mdt mtu

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

mdt mtu *value*

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

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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
```

Related Commands

Command	Description
mdt data, on page 38	Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).
mdt default, on page 41	Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt source, on page 44	Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.

mdt source

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

mdt source *type interface-path-id*

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

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.9.0	Per VRF MDT source feature was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

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

Related Commands

Command	Description
mdt data, on page 38	Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).
mdt default, on page 41	Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt mtu, on page 43	Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).

mhost default-interface

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

mhost {**ipv4** | **ipv6**} **default-interface** *type interface-path-id*

Syntax Description

ipv4	Specifies IPv4 address prefixes.
ipv6	Specifies IPv6 address prefixes.
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

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

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

Command Modes

Global configuration

Global VRF configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	This command was supported in global VRF configuration mode.

Usage Guidelines

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

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

Note

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/RP0/CPU0:router(config)# mhost ipv4 default-interface loopback 1
```

Related Commands

Command	Description
show mhost default-interface, on page 94	Displays the active default interface for the Multicast Host (MHost) process.

migration route-policy

To support PIM And BGP c-multicast joins over the same or different MDTs, use the **migration route-policy**command in the appropriate mode. To disable the migration, use the **no**form of the command.

migration route-policy *policy-name*

Syntax Description

policy-name	Name of the policy.

Command Default

None

Command Modes

C-multicast routing configuration mode

Command History

Release	Modification
Release 4.3	This command was introduced.

Usage Guidelines

The policy name is used to match the upstream PEs (nexthop) and send joins through BGP or PIM.

Task ID

Task ID	Operation
multicast	read, write

Example

This example shows how to use the **migration route-policy**command:

```
RP/0/RP0/CPU0:router (config-pim-v1-ipv4-mdt-cmcast) # migration route-policy p1
```

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

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read, write

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

Command	Description
accounting per-prefix, on page 4	Enables per-prefix counters only in hardware.
alias	Creates a command alias.
interface (multicast), on page 29	Configures multicast interface properties.
interface all enable, on page 31	Enables multicast routing and forwarding on all new and existing interfaces.

multipath

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

[**address-family ipv4**] **multipath** [**hash** {**source** | **source next-hop**}]
[**address-family ipv6**] **multipath** [**hash** {**interface-extended** | **source next-hop**}]

Syntax Description

hash	(Optional) Enables multipath hashing.
interface-extended	(Optional) Enables extensions for non-unique next-hop addresses. **Note** This option is available for IPv6 addressing in IPv6 multicast routing configuration mode and IPv6 multicast VRF configuration mode only.
source	Enables source-based multipath hashing.
source-nexthop	(Optional) Enables source with next-hop hashing.
source-specific-hash	(Optional) Enables multipath hashing for the source only. **Note** This option is available only for IPv6 addressing.

Command Default

This command is disabled by default.

Command Modes

Multicast routing configuration

Multicast routing address-family ipv4 and ipv6 configuration

Multicast VRF configuration

Note Effective with IOS XR release 6.1.2 and later versions, **multipath** command is available only under the PIM configuration mode and not supported under the multicast routing configuration mode.

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.5.0	This command was supported in multicast VRF configuration mode.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable multipath functionality for IOS XR release versions prior to 6.1.2.

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

Note Effective with IOS XR release 6.1.2 and later versions, the **multipath** command is available only under the PIM configuration mode and not supported under the multicast routing configuration mode.

This example shows how to enable multipath functionality for IOS XR release 6.1.2 and later versions.

```
RP/0/RP0/CPU0:router(config)# router pim
RP/0/RP0/CPU0:router(config-pim)# 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*]

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

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **enable** and **disable** keywords.
Release 3.5.0	The **lifetime** *lifetime* keyword and argument were added.

Usage Guidelines

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.

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

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

Related Commands

Command	Description
nsf lifetime (IGMP/MLD)	Configures the maximum time for the NSF timeout value under IGMP or MLD.
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mfib nsf	Displays the state of NSF operation for the MFIB line cards.
show mrib nsf, on page 120	Displays the state of NSF operation in the MRIB.
show pim nsf	Displays the state of NSF operation for PIM.

oom-handling

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

oom-handling

Syntax Description

This command has no keywords or arguments.

Command Default

This command is disabled by default.

Command Modes

Multicast routing configuration

Multicast routing address family ipv4 configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

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

Related Commands

Command	Description
show pim topology	Displays PIM topology table information.

rate-per-route

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

rate-per-route

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

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.5.0	This command was supported in multicast VRF configuration mode.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read, write

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

Command	Description
show mfib route, on page 88	Displays route entries in the Multicast Forwarding Information Base (MFIB).

recursive-fec

To enable the MLDP Recursive FEC support, use the **recursive-fec** command in the MPLS LDP MLDP sub configuration mode.

recursive-fec

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

MPLS LDP MLDP sub configuration mode

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
multicast	read, write

```
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# router-id 1.23.4.4
RP/0/RP0/CPU0:router(config-ldp)# mldp
RP/0/RP0/CPU0:router(config-ldp-mldp)# recursive-fec
```

retain route-target all

To accept or retain updates containing at least one route target for the specified bgp parameters, use the **retain route-target all** command in the BGP Address-family configuration mode. To disable this feature, use the **no** form of this command.

retain route-target all

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

BGP Address-family Configuration mode

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
multicast	read, write

```
RP/0/RP0/CPU0:router(config)# router bgp 100 RP/0/RP0/CPU0:router(config-bgp)# bgp router-id
 10.10.10.10
RP/0/RP0/CPU0:router(config-bgp)# address-family ipv4 mvpn
RP/0/RP0/CPU0:router(config-bgp-af)# retain route-target all
```

route-policy

To apply route policy to a neighbor, either to inbound routes or outbound routes, use the **route-policy** command in the BGP neighbor address-family configuration mode. To disable this feature, use the **no** form of this command.

route-policy *policy_name* [**in** | **out**]

Syntax Description

policy-name	Specifies the name of the route policy.
in	Applies route policy to inbound routes.
out	Applies route policy to outbound routes.

Command Default

No default behavior or values

Command Modes

BGP Neighbor Address-family Configuration mode

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
multicast	read, write

```
RP/0/RP0/CPU0:router(config-bgp-nbr)# address-family vpnv4 unicast
RP/0/RP0/CPU0:router(config-bgp-nbr-af)# route-policy pass-all in
RP/0/RP0/CPU0:router(config-bgp-nbr-af)# route-policy pass-all out
```

shared-tree-prune delay

To set or change the prune installation time, use the **shared-tree-prune-delay**command in the appropriate mode. To disable the set time, use the **no** form of the command.

shared-tree-prune-delay *time*

Syntax Description

time	Delay in seconds. Range is 0 to 1800.

Command Default

60 seconds (for upstream prune)

Command Modes

C-multicast-routing configuration mode

Command History

Release	Modification
Release 4.3	This command was introduced.

Usage Guidelines

This command is used to change the prune installation time(C-S, C-G, RPT). This is required on PEs connected to the C-RP (under certain conditions), when a Type-5 route is received. This is applicable only to BGP C-multicast Routing.

Task ID

Task ID	Operation
multicast	read, write

Example

This example shows how to use the **shared-tree-prune-delay** command:

```
RP/0/RP0/CPU0:router (config-pim-v1-ipv4-mdt-cmcast) # shared-tree-prune-delay 100
```

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

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

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/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

Command	Description
show mfib interface, on page 83	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mfib route, on page 88	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib counter

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

show mfib [**vrf** *vrf-name*] [{ **ipv4** }] **counter** [**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 counter statistics associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/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 (iarm nfn)]      : 0
```

This table describes the significant fields shown in the display.

Table 1: show mfib counter Field Descriptions

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

Related Commands

Command	Description
show mfib interface, on page 83	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mfib route, on page 88	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib encap-info

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

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

This feature is useful for Multicast VPN network implementations.

Task ID

Task ID	Operations
multicast	read

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

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

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

Related Commands

Command	Description
show mfib interface, on page 83	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.

Command	Description
show mfib route, on page 88	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware interface

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

EXEC mode

.

show mfib [**vrf** *vrf-name*] [{**ipv4** | **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. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
location *node-id*	(Optional) Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **ipv4** and **ipv6** keywords were added.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.
Release 3.8.0	New fields were added to the output to show potential memory leakage or increased resource use.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib hardware interface** command. 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 Unknwn 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 2: show mfib hardware interface Field Descriptions

Field	Description
Interface	MFIB interface name.
Handle	A 32-bit system-wide identifier of the MFIB interface.
Ghandle	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.
RefCnt	Number of times various data structures referred to this MFIB interface structure.
TTL	Multicast time-to-live threshold that was configured on this MFIB interface.
uIDB	MicroIDB. A unique identifier of the MFIB interface that exists on the line card.
E-uIDB	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.
Parent-I/F	Parent interface handle. Relevant only for bundles and tunnels showing the corresponding parent MFIB interface handle.
Enbld	If true, multicast is enabled on the MFIB interface.
Primary IP	Primary IP address of the MFIB interface.
Secondary IP	Secondary IP address of the MFIB interface.
Bound-ACL	The following states appear for this field: • True if the multicast boundary is configured on the MFIB interface. • False if no boundary is configured. • Unknown if the MFIB interface is not applicable to multicast boundaries.

Field	Description
ADJ ADDR	Table lookup unit (TLU) memory location of the MFIB interface adjacency information.
Comment	Indicates whether there were problems when reading hardware information.

Related Commands

Command	Description
show mfib interface, on page 83	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.

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

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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

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

Task ID

Task ID	Operations
multicast	read

Examples

The following is 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 OLIST1: 0,0
TLU blocks for OLIST2: 0,0
TLU blocks for ING_VPN_IPV4_ENCAP: 0,0
TLU blocks for EG_ACCEPT_BITMAP: 0,0
TLU blocks for P2MP_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]
[route_ext] Alloc:  80329 [    29882388 bytes]  Free:  80283 [    29865276 byte]
[intf_ext]  Alloc: 857102 [    47997712 bytes]  Free: 856905 [    47986680 byte]
[idb_ext]   Alloc:     27 [        2916 bytes]  Free:      7 [         756 byte]
[Encap_Info]Alloc:      0 [           0 bytes]  Free:      0 [           0 byte]
[TLU_Handle]Alloc: 277704 [    15551424 bytes]  Free: 277585 [    15544760 byte]
```

This table describes the significant fields shown in the display.

Table 3: show mfib hardware resource counters Field Descriptions

Field	Description
TLU blocks channel *n* : ingress: *n* egress: *n*	TLU blocks allocated on ingress and egress for each channel.
TLU blocks for PLU_EXTENSION	Resource use for storing extended data (in addition to the PLU lookup result).
TLU blocks for S_BITMAP	Resource use for storing a bitmap to indicate which interfaces have signaling turned on for this route.
TLU blocks for USE_ACCEPT_BITMAP	Resource use for bidirectional routes to indicate which interfaces can accept packets for this route.
TLU blocks for CONN_CHECK	Resource use for data type CONN_CHECK.
TLU blocks for OLIST	Resource use for data type OLIST.

Field	Description
TLU blocks for L2_LOAD_INFO	Resource use for data type L2_LOAD_INFO.

Related Commands

Command	Description
show mfib interface, on page 83	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.

show mfib hardware route accept-bitmap

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

show mfib [**vrf** *vrf-name*] [{**ipv4** | **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

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The **ipv4** and **ipv6** keywords were added.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/RP0/CPU0:router(config)# ipv4 access-list bidir-range
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 233.1.0.0 0.0.255.255
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 233.4.0.0 0.0.255.255
RP/0/RP0/CPU0:router(config-ipv4-acl)# deny any
RP/0/RP0/CPU0:router(config-ipv4-acl)# commit
RP/0/RP0/CPU0:router(config-ipv4-acl)# exit

RP/0/RP0/CPU0:router(config)# router pim
RP/0/RP0/CPU0:router(config-pim-default-ipv4)# no rp-address 10.1.1.1 bidir
RP/0/RP0/CPU0:router(config-pim-default-ipv4)# commit
RP/0/RP0/CPU0:router(config-pim-default-ipv4)# rp-address 10.1.1.1 bidir-range bidir
RP/0/RP0/CPU0: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.

```
RP/0/RP0/CPU0:router# show mfib hardware route accept-bitmap detail location 0/1/CPU0

LC Type: Trident
Source: Source address                  Group: Group Address    M: Mask Length
iQoS  : Ingress QoS tag                 C    : Directly connected check flag
RPF   : Accepting interface for non-bidir entries
S     : Signal on RPF interface         FU   : For us
PLUext: 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
Interface: Accepting interface name
Source Group    M  iQoS C RPF  S FU PLUext  FGID  FGID2 P PF BA oQoS A_num A_TLU Interface
*   224.0.0.0   4  0    T Null F F  200ae2c 41785 -1    F F  T   0    0    Null
*   224.0.0.0   24 0    F Null F F  200d00f 47206 -1    F F  T   0    0    Null
*   224.0.1.39  32 0    F Null F F  200d000 47205 -1    T F  F   0    0    Null
*   224.0.1.40  32 0    F Null F F  200d00d 27202 -1    T F  F   0    0    Null
*   232.0.0.0   8  0    F Null F F  200d010 47207 -1    F F  T   0    0    Null
*   233.1.0.0   16 0    F Null F F  200ae34 44106 -1    F F  T   0    3    4400  PO0/1/1/0
*   233.1.0.0   16 0    F Null F F  200ae34 44106 -1    F F  T   0    3    4400  PO0/1/1/1
*   233.1.0.0   16 0    F Null F F  200ae34 44106 -1    F F  T   0    3    4400  PO0/1/1/3
*   233.1.1.1   32 0    F Null F F  200a418 27205 -1    F F  T   0    0    4400
*   233.1.1.2   32 0    F Null F F  200a419 27206 -1    F F  T   0    0    4400
*   233.1.1.3   32 0    F Null F F  200a41c 27207 -1    F F  T   0    0    4400
*   233.1.1.4   32 0    F Null F F  200a41d 27208 -1    F F  T   0    0    4400
*   233.4.0.0   16 0    F Null F F  200ae3c 42043 -1    F F  T   0    3    4500  PO0/1/1/0

*  233.4.0.0    16 0    F Null F F  200ae3c 42043 -1    F F  T   0    3    4500  PO0/1/1/3


RP/0/RP0/CPU0:router# show mfib hardware route accept-bitmap detail location 0/0/CPU0

LC Type: Trident
Source: Source address   Group: Group Address    M: Mask Length
        iQoS  : Ingress QoS tag                  C    : Directly connected check flag
        RPF   : Accepting interface for non-bidir entries
        S     : Signal on RPF interface          FU   : For us
        FGID  : Fabric Group ID
        oQoS  : Output QoS tag
        FGID2 : Secondary Fabric Group ID
```

```
        A_num    : Number of I/Fs in the accepting list
Interface: Accepting interface name
Source          Group           M
Source: *               Group: 224.0.0.0       Mask length: 24
Source: *               Group: 224.0.1.39      Mask length: 32
Source: *               Group: 224.0.1.40      Mask length: 32
Source: *               Group: 227.0.0.1       Mask length: 32
Source: 4.0.0.2         Group: 227.0.0.1       Mask length: 64
Source: *               Group: 230.0.0.0       Mask length: 8
Source: *               Group: 232.0.0.0       Mask length: 8
```

This table describes the significant fields shown in the display.

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

Field	Description
iQoS	An identifier of a quality-of-service (QoS) policy. This field is currently unused.
C	Directly connected check flag. If "T" is displayed, hardware performs directly connected checks on the packet sources that match this route.
S	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.
FU	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.
P	Punt. If "T" is displayed, all packets that match the route punt to the line card CPU.
PF	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.
BA	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.
oQoS	Output QoS policy identifier. This field is currently unused.
A_num	Number of accepting interfaces for a bidirectional route.

Related Commands

Command	Description
show mfib interface, on page 83	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.

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

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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

Task ID	Operations
multicast	read

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  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 PO0/1/1/0  F  F
   *            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 PO0/1/1/1  F  F
   *            233.1.1.1       32 F Null       F F  27205  F F  T  False PO0/1/1/0  F  F
   *            233.1.1.2       32 F Null       F F  27206  F F  T  False NULL
   *            233.1.1.2       32 F Null       F F  27206  F F  T  False PO0/1/1/1  F  F
   *            233.1.1.2       32 F Null       F F  27206  F F  T  False PO0/1/1/0  F  F
```

Related Commands

Command	Description
show mfib hardware route accept-bitmap, on page 72	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route statistics, on page 77	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib hardware route summary, on page 80	Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.
show mfib route, on page 88	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware route statistics

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

show mfib [**vrf** *vrf-name*] [{**ipv4** | **ipv6**}] **hardware route statistics** [**detail**] [*****] [*source-address*] [*group-address* [*/prefix-length*]] [**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.
location *node-id*	(Optional) Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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

Task ID	Operations
multicast	read

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:router# show mfib hardware route statistics location 0/1/CPU0

LC Type: Trident
(*,G) Counter: Ingress Counter = 0xe170  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 = 0xe173  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 5: show mfib hardware route statistics Field Descriptions

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

Field	Description
Drop	Number of dropped bytes.

Related Commands

Command	Description
show mfib hardware route accept-bitmap, on page 72	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route olist, on page 75	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route summary, on page 80	Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.
show mfib route, on page 88	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware route summary

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

show mfib [**vrf** *vrf-name*] [{**ipv4** | **ipv6**}] **hardware route 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.
location *node-id*	(Optional) Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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

Task ID	Operations
multicast	read

Examples

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

```
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 (S, G) routes = 1
Number of hardware route-interfaces = 4
Number of hardware Rx adjacencies = 7
Number of hardware Tx adjacencies = 3
Number of ref to decap adjacency  = 0
Mvpn master LC status             = False
```

This table describes the significant fields shown in the display.

Table 6: show mfib hardware route summary Field Descriptions

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

Related Commands

Command	Description
show mfib hardware route accept-bitmap, on page 72	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route olist, on page 75	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route statistics, on page 77	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib route, on page 88	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware session-info

To display hardware abstraction layer (HAL) session information for the Multicast Forwarding Information Base (MFIB) process, use the **show mifb hardware session-info** command in

EXEC mode

.

show mfib [{**ipv4** | **ipv6**}] **hardware session-info location** *node-id*

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.0	This command was introduced.

Usage Guidelines

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

Task ID	Operations
multicast	read

Examples

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(0x5276dd4c): 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

vrf *vrf-name*	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
detail	(Optional) Specifies detailed information for packet statistics on interfaces.
route	(Optional) Specifies a list of routes associated with the interface. This option is available if an interface *type* and *instance* are specified.
location *node-id*	(Optional) Specifies packet statistics associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/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

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

Related Commands

Command	Description
show mfib hardware interface, on page 66	Displays hardware switching interface information for the Multicast Forwarding Information Base (MFIB) process.

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

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

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

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/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 8: show mfib nsf Field Descriptions

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

Related Commands

Command	Description
nsf lifetime (IGMP/MLD)	Configures the maximum time for the NSF timeout value under IGMP or MLD.
nsf (multicast) , on page 52	Configures the NSF capability for the multicast routing system.
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mrib nsf, on page 120	Displays the state of NSF operation in the MRIB.
show pim nsf	Displays the state of NSF operation for PIM.

show mfib route

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

show mfib [**vrf** *vrf-name*] [{**ipv4** | **ipv6**}] **route** [{**rate** | ***source-IP-address** | *group-IP-address/prefix-length* | **detail** | **old-output** | **summary** | **location** *node-id*}]

Syntax Description

*****	(Optional) Display shared tree entries.
source-IP-address	(Optional) IP address or hostname of the multicast route source. Format is: *A.B.C.D* or *X:X::X*.
group-IP-address	(Optional) IP address or hostname of the multicast group. Format is: *A.B.C.D* or *X:X::X*.
/prefix-length	(Optional) Group IP prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). Format is: *A.B.C.D/length* or *X:X::X/length* A slash must precede the decimal value.
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

Release	Modification
Release 2.0	This command was introduced.

Release	Modification
Release 3.5.0	The **detail** keyword was added.
	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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

Task ID	Operations
multicast	read

Examples

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

```
RP/0/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, MT - MDT Threshold Crossed,
  MH - MDT interface handle, CD - Conditional Decap,
  DT - MDT Decap True
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
  NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
  EG - Egress, EI - Encapsulation Interface, MI - MDT Interface SW/HW Forwarding Counts:
Packets in/Packets out/Bytes out SW Failure Counts: RPF / TTL / Empty Olist / Encap RL /
Other HW Drop Counts: Ingress / Egress HW Forwarding Rates: bps In/pps In/bps Out/pps Out

(*,224.0.0.0/4),   Flags:  C
  Last Used: 22:27:18
  SW Forwarding Counts: 608/0/0
  SW Failure Counts: 598/0/0/0
  HW Forwarding Counts: 840/6460964/284000578
  HW Drop Counts: N/A /N/A
  HW Forwarding Rates: N/A /N/A /N/A /N/A

(*,224.0.0.0/24),   Flags:  D
  Last Used: never
  SW Forwarding Counts: 0/0/0
```

```
  SW Failure Counts: 0/0/0/0
  HW Forwarding Counts: 0/6460964/284000578
  HW Drop Counts: N/A /N/A
  HW Forwarding Rates: N/A /N/A /N/A /N/A

.....
```

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

(*,224.0.0.0/4), Flags: C
  Last Used: 03:24:50
  SW Forwarding Counts: 9038/0/0
  SW Failure Counts: 0/0/0/0
  HW Forwarding Counts: N/A /N/A /N/A
  HW Drop Counts: N/A /N/A
  HW Forwarding Rates: N/A /N/A /N/A /N/A

(*,224.0.0.0/24), Flags: D
  Last Used: never
  SW Forwarding Counts: 0/0/0
  SW Failure Counts: 0/0/0/0
  HW Forwarding Counts: N/A /N/A /N/A
  HW Drop Counts: N/A /N/A
  HW Forwarding Rates: N/A /N/A /N/A /N/A

(*,239.1.1.1), Flags: C
Last Used: 03:24:48
  SW Forwarding Counts: 3/0/0
  SW Failure Counts: 0/0/0/0
  HW Forwarding Counts: N/A /N/A /N/A
  HW Drop Counts: N/A /N/A
  HW Forwarding Rates: N/A /N/A /N/A /N/A
```

```
POS0/2/0/2 Flags: NS EG
POS0/2/0/1 Flags: NS EG

(200.180.161.9,239.1.1.1), Flags:
  Last Used: 00:01:08
  SW Forwarding Counts: 146/0/0
  SW Failure Counts: 0/0/0/0
  HW Forwarding Counts: 61327/61327/3924928
  HW Drop Counts: 0/0
  HW Forwarding Rates: N/A /N/A /N/A /N/A
POS0/2/0/2 Flags: NS EG
POS0/2/0/1 Flags: A EG

(*,239.1.1.2), Flags: C
  Last Used: 03:24:37
  SW Forwarding Counts: 7/0/0
  SW Failure Counts: 0/0/0/0
  HW Forwarding Counts: N/A /N/A /N/A
  HW Drop Counts: N/A /N/A
  HW Forwarding Rates: N/A /N/A /N/A /N/A
```

Related Commands

Command	Description
show mfib counter, on page 62	Displays Multicast Forwarding Information Base (MFIB) counter statistics for packets that have dropped.
show mfib hardware route accept-bitmap, on page 72	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route olist, on page 75	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route statistics, on page 77	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib interface, on page 83	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mrib route, on page 124	Displays all entries in the Multicast Routing Information Base (MRIB).

show mfib table-info

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

show mfib [{**ipv4** | **ipv6**}] **table-info** {*table-idvrf-name*} [{**local** | **remote**}] [**location** *node-id*]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
table-id	Specifies the table identifier. Range is 0 to 4294967295.
vrf-name	Specifies the VRF name.
local	Specifies local tables only.
remote	Specifies remote tables only.
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

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.6.0	The **local** and **remote** keywords were added.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

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

show mhost default-interface

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

show mhost [{**ipv4** | **ipv6**}] **default-interface**

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

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

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

Task ID

Task ID	Operations
network	read

Examples

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

```
RP/0/RP0/CPU0:router# show mhost default-interface

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

Related Commands

Command	Description
mhost default-interface, on page 46	Configures the default interface for IP multicast transmission and reception to and from the host stack.

show mhost groups

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

show mhost [{**ipv4** | **ipv6** }] **groups** *type interface-path-id* [**location** *node-id*]

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
network	read

Examples

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

```
RP/0/RP0/CPU0:router# show mhost groups loopback 0

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

```
<no source filter>
224.0.0.1 : includes 0, excludes 1, mode EXCLUDE
<no source filter>
224.0.0.13 : includes 0, excludes 1, mode EXCLUDE
<no source filter>
224.0.1.40 : includes 0, excludes 2, mode EXCLUDE
<no source filter>
```

This table describes the significant fields shown in the display.

Table 10: show mhost groups Field Descriptions

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

Related Commands

Command	Description
show mfib hardware route accept-bitmap, on page 72	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route olist, on page 75	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route statistics, on page 77	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib hardware route summary, on page 80	Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.
show mfib route, on page 88	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mrib client

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

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/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 11: show mrib client Field Descriptions

Field	Description
igmp	Name of the client.
417957	Personal identifier (PID) or a unique ID assigned by MRIB.
(connection id 0)	Unique client connection identifier.
ownership filter:	Specifies all the route entry and interface-level flags that are owned by the client. As the owner of the flag, only the client can add or remove the flag. For example, only the Internet Group Management Protocol (IGMP) client can add the II flag on an interface. MRIB does not allow a non-owner to register or modify the same flag.
groups: include 0.0.0.0/0interfaces: include All	Groups and interfaces registered by the clients consisting of two lists. One is an include list (items for which the client requests to be notified.) The use of "All" implies all interfaces and 0.0.0.0/0 to indicate all groups. Not shown in this example is the exclude list. This list contains items for which the client requests not to be notified when modifications occur.
interface attributes: II ID LI LD	Interface-level flags set on the interface belong to a route.
interest filter:	Specifies all the flags, groups, and interfaces from which the client requests information. When a flag of interest for a client is modified, the client is notified.

Field	Description
entry attributes: S C IA IF D	Entry-level flags that are set on the route.

Related Commands

Command	Description
show mfib nsf, on page 86	Displays the state of a nonstop forwarding (NSF) operation for the Multicast Forwarding Information Base (MFIB) line cards.
show mfib route, on page 88	Displays route entries in the Multicast Forwarding Information Base (MFIB).
show mrib nsf, on page 120	Displays the state of nonstop forwarding (NSF) operation in the Multicast Routing Information Base (MRIB).

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

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

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, *, 224.0.0.0/24)
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, *, 232.0.0.0/8)
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
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_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   : 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
#FGIDs alloced from Joined-list    : 0
#FGIDs available in Joined-list    : 0

#IPs added to TRIE                 : 0
#IPs alloced from TRIE             : 0
#IPs available in TRIE             : 0

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

#ENCAP IDs added to TRIE           : 0
#ENCAP IDs alloced 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      : 11
#FGIDs chkpt created               : 11000
#FGIDs chkpt create failed         : 0

#FGIDs allocated to routes         : 4
#IP chkpt created                  : 4
#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) : 11000
FGIDs Leak (create/read - delete)  : 0

#Current IPs in IP chkpt           : 4
FGIDs in Joined list (reuse)       : 4
IPs Leak (create/read - delete)    : 0

#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** 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**

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

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
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:

```
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
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, *, 224.0.0.0/24)
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, *, 232.0.0.0/8)
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
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 alloced from Joined-list    : 4
#FGIDs available in Joined-list    : 4

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

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

#ENCAP IDs added to TRIE           : 0
#ENCAP IDs alloced 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

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

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

detail	(Optional) Shows the dependent VRF routes for the MDT interface handles learned from PIM.
ifh	(Optional) Specifies the mapping for a particular MDT interface handle learned from PIM.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

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

Task ID	Operations
multicast	read

Examples

The following example illustrates detailed output from the **show mrib mdt-interface** command with the MDT interface handle name shown in parantheses 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 12: show mrib mdt-interface Field Descriptions

Field	Description
TID, tid	VRF table ID associated with the MDT handle.
MH	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.
I	Number of intranet routes using a specific MDT interface handle.
EX	Number of extranet routes using a specific MDT interface handle.
Up	Uptime—Elapsed time since MDT interface handle was learned.
recollapse	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 “recollapsed” when all the dependent information is received.

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

Related Commands

Command	Description
show mrib route-collapse, on page 128	Displays the contents of the Multicast Routing Information Base (MRIB) route-collapse database.

show mrib mpls forwarding

To display the Multicast Routing Information Base (MRIB) MPLS forwarding table information of all tunnels, use the **show mrib mpls forwarding** command in

EXEC mode

.

show mrib mpls forwarding [{**detail** | **labels** | **s2l** | **source** | **summary** | **tunnels**}]

Syntax Description

detail	Provides the detail information of each tunnel.
labels	Filters based on label.
s2l	Filters based on s2l.
source	Filters based on source PE address.
summary	Displays the summary output of entries.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

The following is a sample output from the **show mrib mpls forwarding** command:

```
RP/0/RP0/CPU0:router# show mrib mpls forwarding

LSP information (RSVP-TE) :
  Name: tunnel-mte26 Role: Head State: binding
    TUNNEL-ID: 26  P2MP-ID: 26  LSP-ID: 10012
    Source Address: 192.1.1.1  Extended-ID: 192.1.1.1(0xc0010101)

      Incoming Label       : (16008)
      Transported Protocol : IPv4
      Explicit Null        : IPv6 Explicit Null
      IP lookup            : enabled

      Outsegment Info #1 [Head/Push]:
        Outgoing Label: 16008  Outgoing IF: GigabitEthernet0/0/0/5(P) Outgoing Node ID: 0x1
```

```
  Nexthop: 192.14.1.44


LSP information (RSVP-TE) :
  Name: tunnel-mte27 Role: Head State: binding
    TUNNEL-ID: 27  P2MP-ID: 27  LSP-ID: 10012
    Source Address: 192.1.1.1  Extended-ID: 192.1.1.1(0xc0010101)

      Incoming Label       : (16007)
      Transported Protocol : IPv4
      Explicit Null        : IPv6 Explicit Null
      IP lookup            : enabled
      Platform information : FGID: 51075, 51076 frr_slotmask: 0x1

      Outsegment Info #1 [Head/Push]:
        Outgoing Label: 16007  Outgoing IF: GigabitEthernet0/0/0/5(P) Outgoing Node ID: 0x1
  Nexthop: 192.14.1.44
```

The following is a sample output from the **show mrib mpls forwarding** command with the detail keyword:

```
RP/0/RP0/CPU0:router# show mrib mpls forwarding tunnel 27 detail

LSP information (RSVP-TE) :
  Name: ------ Role: Bud
    TUNNEL-ID: 27  P2MP-ID: 27  LSP-ID: 10002
    Source Address: 192.1.1.1  Extended-ID: 192.1.1.1(0xc0010101)

      Incoming Label       : 16001
      Transported Protocol : IPv4
      Explicit Null        : IPv6 Explicit Null
      IP lookup            : enabled
      Platform information : FGID: 44045, 44046 frr_slotmask: 0x24

      Outsegment Info #1 [Tail/Pop]:
        No info.
      Outsegment Info #2 [Mid/Swap]:
        Outgoing Label: 16001  Outgoing IF: GigabitEthernet0/5/0/6(P) Outgoing Node ID:
0x51  Nexthop: 192.168.12.2
      Outsegment Info #3 [Mid/Swap]:
        Outgoing Label: 16001  Outgoing IF: GigabitEthernet0/2/0/4(P) Outgoing Node ID:
0x21  Nexthop: 192.168.13.2

RP/0/RP0/CPU0:router# show mrib mpls forwarding tunnel 26 detail

LSP information (RSVP-TE) :
  Name: ------ Role: Tail
    TUNNEL-ID: 26  P2MP-ID: 26  LSP-ID: 10012
    Source Address: 192.1.1.1  Extended-ID: 192.1.1.1(0xc0010101)

      Incoming Label       : 16008
      Transported Protocol : IPv4
      Explicit Null        : IPv6 Explicit Null
      IP lookup            : enabled
      Platform information : FGID: 51082, 51083 frr_slotmask: 0x0
Outsegment Info #1 [Tail/Pop]:
        No info.
```

show mrib mpls route

To display the Multicast Routing Information Base (MRIB) multicast groups to tunnels mappings, use the **show mrib mpls route** command in EXEC mode.

show mrib mpls route [{**interface** | **summary**}]

Syntax Description

interface	(Optional) Specify the type of interface.
summary	(Optional) Displays the summary information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

This is a sample output from the **show mrib mpls route** command:

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

Tunnel Interface: tunnel-mte28
    (192.19.1.9, 239.232.2.1) (192.19.1.9, 239.232.2.2) (192.19.1.9, 239.232.2.3)
Tunnel Interface: tunnel-mte27
    (192.19.1.9, 239.232.1.1) (192.19.1.9, 239.232.1.2) (192.19.1.9, 239.232.1.3)
Tunnel Interface: tunnel-mte26
    (192.19.1.9, 239.232.0.1) (192.19.1.9, 239.232.0.2) (192.19.1.9, 239.232.0.3)
```

show mrib mpls traffic-eng fast-reroute

To display the Multicast Routing Information Base (MRIB) MPLS traffic engineering fast reroute information, use the **show mrib mpls traffic-eng fast-reroute** command in EXEC mode

.

show mrib mpls traffic-eng fast-reroute database {**backup-interface** | **labels** | **role** | **state** | **summary**}

Syntax Description

database	Displays the fast reroute database information.
backup-interface	(Optional) Filter based on backup outgoing interface
labels	(Optional) Filter based on incoming label
role	(Optional) Filter based on LSPs with specified role
state	(Optional) Filter based on LSPs with specified FRR (fast-reroute) state
summary	(Optional) Summary of total active and ready FRR states in MRIB

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

This is a sample output from the **show mrib mpls traffic-eng fast-reroute** command:

```
RP/0/RP0/CPU0:router# show mrib mpls traffic-eng fast-reroute database

LSP midpoint  item frr information:
ExtTunId/TunId/P2MPId/LSPId   In Lbl  Out intf/Lbl      FRR intf/Lbl   Status
-----------------------       ------  ---------------   ------------   -----
192.192.5.3/3001/3001/10002   16513   Te0/5/0/0:17028   tt21:17028     Ready
                                      Te0/5/0/5:1048564 tt24:1048564   Ready
192.192.5.3/3002/3002/10002   16514   Te0/5/0/0:17029   tt21:17029     Ready
                                      Te0/5/0/5:1048565 tt24:1048565   Ready
192.192.5.3/3003/3003/10002   16515   Te0/5/0/0:17030   tt21:17030     Ready
                                      Te0/5/0/5:1048566 tt24:1048566   Ready
192.192.5.3/3004/3004/10002   16516   Te0/5/0/0:17031   tt21:17031     Ready
                                      Te0/5/0/5:1048567 tt24:1048567   Ready
192.192.5.3/3005/3005/10002   16517   Te0/5/0/0:17032   tt21:17032     Ready
```

```
                                          Te0/5/0/5:1048568 tt24:1048568   Ready
192.192.5.3/3006/3006/10002   16518   Te0/5/0/0:17033   tt21:17033     Ready
                                          Te0/5/0/5:1048569 tt24:1048569   Ready
192.192.5.3/3007/3007/10002   16519   Te0/5/0/0:17034   tt21:17034     Ready
```

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

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/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 13: show mrib nsf Field Descriptions

Field	Description
Multicast routing state	Multicast NSF status of the MRIB (Normal or NSF Activated).
NSF Lifetime	Timeout for MRIB NSF, computed as the maximum of the PIM and Internet Group Management Protocol (IGMP) NSF lifetimes, plus 60 seconds.

Field	Description
NSF Time Remaining	If MRIB NSF state is activated, the time remaining until MRIB reverts to Normal mode displays. Before this timeout, MRIB receives notifications from IGMP and PIM, triggering a successful end of NSF and cause the transition to normal state. If notifications are not received, the timer triggers a transition back to normal mode, causing new routes to download to MFIB and old routes to be deleted.

Related Commands

Command	Description
nsf (multicast) , on page 52	Configures the NSF capability for the multicast routing system.
nsf lifetime (IGMP/MLD)	Configures the maximum time for the NSF timeout value under IGMP or MLD.
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mfib nsf	Displays the state of NSF operation in the MFIB line cards.
show pim nsf	Displays the state of NSF operation for PIM.

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

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 5.2.2	This command was introduced.

Usage Guidelines

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

Task ID	Operations
multicast	read

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 14: show mrib nsr end Field Descriptions

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

Related Commands

Command	Description
show msdp nsr	Displays the state of NSR operation for MSDP.
show igmp nsr	Displays the state of NSR operation for IGMP.
show pim nsr	Displays the state of NSR operation for PIM.

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

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) 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. F ormat 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

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 62 command displays global counters independent of the routes.

Task ID

Task ID	Operations
multicast	read

The following sample shows output from the **show mrib route**

```
Router# show mrib vrf BVI ipv6 route 2001:DB8:1::1 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
    MoFE - MoFRR Enabled, MoFS - MoFRR State
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
    NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
    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, A2 - Secondary Accept

(*,2001:DB8:1::1/32) Ver: 0x7380 Flags: D, FMA: 0x501b4944
  Up: 12:09:55

(*,2001:DB8:1::6/32) Ver: 0x1b11 Flags: S, FMA: 0x501b4938
  Up: 12:09:55

(*,2001:DB8:1::7/32) Ver: 0x4521 Flags: S, FMA: 0x501b492c
  Up: 12:09:55
  Outgoing Interface List
    GigabitEthernet0/0/0/8 Flags: II LI, Up: 03:32:28
```

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

(*,224.0.1.40) 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:

```
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
  Up: 6d01h
  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.

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

Related Commands

Command	Description
nsf lifetime (IGMP/MLD)	Configures the maximum time for the NSF timeout value on the IGMP.
show mfib counter, on page 62	Displays MFIB counter statistics for packets that have dropped.
show mrib route-collapse, on page 128	Displays the contents of the MRIB route collapse database.
show mrib mdt-interface, on page 113	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.
show mfib route, on page 88	Displays all entries in the MFIB table.

show mrib route-collapse

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

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

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.8.0	MVPN extanet attributes were added to the output for this command.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
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

Command	Description
show mrib route, on page 124	Displays all entries in the Multicast Routing Information Base (MRIB).

show mrib route outgoing-interface

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

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

Syntax Description

*****	(Optional) Displays shared tree entries.
A.B.C.D	(Optional) Source IP address or hostname of the MRIB route. Format is: *A.B.C.D* or *X:X::X*.
A.B.C.D	(Optional) Group IP address or hostname of the MRIB route and the prefix length.
/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*.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

Related Commands

Command	Description
show mrib route, on page 124	Displays all entries in the Multicast Routing Information Base (MRIB).

show mrib table-info

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

show mrib [**vrf** *vrf-name*] [{ **ipv4** | **ipv6** }] **table-info**

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

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.8.0	New MVPN extranet attributes were added to command output.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

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]
  bcdl_agent [ccbid: 2 cltid: 1]
  msdp [ccbid: 3 cltid: 8827135]
```

Table 15: show mrib table-info Field Descriptions

Field	Description
VRF	Default VRF or a VRF configured for the purpose of an override in MVPN.
cltid	Client ID.
bcdl_agent	A process like igmp and pim, which is used to download routes to line card.

Field	Description
MDT handle	MDT interface handle for this VRF.
MDT group	Default MDT group associated with this VRF.
MDT source	Per-VRF MDT source information.

Related Commands

Command	Description
show mrib tlc, on page 134	Displays the contents of the Multicast Routing Information Base (MRIB) table-line card (TLC) database.

show mrib tlc

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

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.6.0	The **remote** keyword was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

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
Associated MDT group: 0
Forwarding LC node: 0
```

This table describes the significant fields shown in the display.

Table 16: show msdp peer Field Descriptions

Field	Description
Associated MDT group	IP address of the MSDP peer.
Master LC slot	Indicates whether the master LC slot has been selected.

Field	Description
Forwarding LC node	Autonomous system to which the peer belongs.
Associated MDT group	Indicates the number of associated MDT groups.

show mrib vrf vrf_name route

To display the detail routing DB with platform data information for multicast routing information base, use the **show mrib vrf** *vrf_name* **route** command in the EXEC mode.

show mrib vrf *vrf_name* **route** *ip_address* **detail**

Syntax Description

detail	Displays routing DB with platform data.
ip_address	Specifies the group IP address.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
multicast	read

```
RP/0/RP0/CPU0:router# show mrib vrf vrf1 route  232.1.1.1 detail
(192.1.1.2,232.1.1.1) Ver: 0x32b9 RPF nbr: 192.1.1.2 Flags: EID,
 PD: Slotmask: 0x0
     MGID: 17754
  Up: 12:35:50, Route node: 0x504f8df8
  RPF-ID: 0, Encap-ID: 4, EPtr: 0x505463c4, Hd: 0x502df6f8, Cts: 1, 0, 0, 0
  Acc: 1 (MDT: 0), Fwd: 1 (0), SRD: (0,0), Encap-next: 0x0
  Incoming Interface List
    GigabitEthernet0/0/0/1.1 Flags: A, Up: 05:30:09, Ptrs: 0x502df438, 0x0
  Outgoing Interface List
    tunnel-mte1 Flags: F NS LI LVIF, Up: 12:35:50, Ptrs: 0x502df6f8, 0x0
       LI add redist count: 2
```

static-rpf

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

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

Syntax Description

prefix-address	IP address of a prefix for an address range.
prefix-mask	Prefix mask for an address range. Range is 0 to 32 for IPv4 and 0 to 128 for IPv6.
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.
next-hop-address	IP address for an RPF neighbor.

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

Release	Modification
Release 2.0	This command was introduced.
Release 3.5.0	This command was supported in multicast VRF configuration mode.

Usage Guidelines

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

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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

Command	Description
show pim bsr candidate-rp	Displays PIM candidate rendezvous point information for the BSR.

source-tree-prune-delay

To set the delay-time for the (S,G) prune of the ingress-PE (provider edge), use the **source-tree-prune-delay** command in the appropriate mode. To remove the set delay, use the **no**form of the command.

source-tree-prune-delay *time*

Syntax Description

time	Delay in seconds. Range is 0 to 300.

Command Default

60 seconds

Command Modes

C-multicast-routing configuration mode

Command History

Release	Modification
Release 4.3	This command was introduced.

Usage Guidelines

This command is used to delay (S,G) Prune on the Ingress-PE, when the last Type-7 route is withdrawn.

Task ID

Task ID	Operation
multicast	read, write

Example

This example shows how to use the **source-tree-prune-delay** command:

```
RP/0/RP0/CPU0:router (config-pim-v1-ipv4-mdt-cmcast) # source-tree-prune-delay 100
```

suppress-pim-data-signaling

To suppress PIM data signaling, use the **suppress-pim-data-signaling** command in the appropriate mode. To remove the suppressed condition, use the **no** form of the command.

suppress-pim-data-signaling

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

PIM C-multicast routing configuration mode

Command History

Release	Modification
Release 4.3	This command was introduced.

Usage Guidelines

This command supports c-anycast RP and can be used only under the PIM c-multicast routing mode.

Task ID

Task ID	Operation
multicast	read, write

Example

This example shows how to use the **suppress-pim-data-signaling**command:

```
RP/0/RP0/CPU0:router (config-pim-v1-ipv4-mdt-cmcast) # suppress-pim-data-signaling
```

suppress-shared-tree-join

To suppress shared tree joins and support the SPT-only mode, use the **suppress-shared-tree-join** command in the appropriate mode.

To remove the suppress condition, use the **no**form of the command.

suppress-shared-tree-join

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

C-multicast-routing configuration mode

Command History

Release	Modification
Release 4.3	This command was introduced.

Usage Guidelines

This command enables the SPT-only (Shortest Path Tree) mode.

Task ID

Task ID	Operation
multicast	read, write

Example

This command shows how to use the **suppress-shared-tree-join** command:

```
RP/0/RP0/CPU0:router(config-pim-v1-ipv4-mdt-cmcast) # suppress-shared-tree-join
```

ttl-threshold (multicast)

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

ttl-threshold *ttl*

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

Release	Modification
Release 3.3.0	This command was introduced as a replacement for the **multicast ttl-threshold** command.
Release 3.5.0	This command was supported in multicast routing VRF interface configuration mode.

Usage Guidelines

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

Configure the TTL threshold only on border routers.

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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

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

unicast-reachability

To disable VPN-IP attributes, use the **unicast-reachability** command in the appropriate mode. To restore the attributes, use the **no**form of the command.

unicast-reachability [**connector-disable** | **source-as-disable** | **vrf-route-import-disable**]

Syntax Description

connector-disable	Disables connector addition.
source-as-disable	Disables source AS extended community addition.
vrf-route-import-disable	Disables VRF route import extended community addition.

Command Default

None

Command Modes

C-multicast routing configuration mode

Command History

Release	Modification
Release 4.3	This command was introduced.

Usage Guidelines

This command controls addition of extended communities to unicast VPN-IP routes. These attributes have specific purposes in PIM and BGP C-multicast Routing.

Task ID

Task ID	Operation
multicast	read, write

Example

This example shows how to use the **unicast-reachability** command:

```
RP/0/RP0/CPU0:router (config-pim-v1-ipv4-mdt-cmcast) # unicast-reachability connector-disable
```

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**}]

Syntax Description

vrf-name	Name of the VRF instance. The following names cannot be used: all, default, and global.
ipv4	(Optional) Configures IPv4 address prefixes.
ipv6	(Optional) Configures IPv6 address prefixes.

Command Default

No default behavior or values.

Command Modes

Multicast routing configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.7.0	ipv4 and ipv6 submodes were supported.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/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 ?

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

Related Commands

Command	Description
boundary, on page 15	Configures a boundary to keep multicast packets from being forwarded.
accounting per-prefix, on page 4	Enables per-prefix counters only in hardware.

Command	Description
interface (multicast), on page 29	Configures multicast interface properties.
log-traps, on page 35	Enables logging of trap events.
mdt data, on page 38	Configures the MDT data group address range.
mdt default, on page 41	Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt mtu, on page 43	Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt source, on page 44	Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.
multipath, on page 50	Enables Protocol Independent Multicast (PIM) to divide the multicast load among several equal-cost paths.
rate-per-route, on page 55	Enables individual (source, group [S, G]) rate calculations.
ssm	Defines the Protocol Independent Multicast (PIM)-Source Specific Multicast (SSM) range of IP multicast addresses.
static-rpf, on page 137	Configures a static Reverse Path Forwarding (RPF) rule for a specified prefix mask.

cef platform lsm frr-holdtime

To configure the frr-holdtime of MLDP LSPs in a scale setup (with more than 500 LSPs configured), use the cef platform lsm frr-holdtime command in Global Configuration mode.

cef platform lsm frr-holdtime *seconds*
Global Configuration mode

Syntax Description

seconds	The number of seconds to set the frr-holdtime. Default value is 2 seconds.
Note	The range of the frr-holdtime (in seconds) is 3 to 180 seconds.

Command Default

None

Command Modes

Global Configuration

Command History

Release	Modification
Release 5.3.2	This command is introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Example

The following example shows how to set the frr-holdtime value to 45 seconds.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# cef platform lsm frr-holdtime 45
```