



Multicast Routing and Forwarding Commands on Cisco IOS XR Software

This module describes the commands used to configure and monitor multicast routing on *the Cisco IOS XR Software*.

For detailed information about multicast routing concepts, configuration tasks, and examples, refer to the *Implementing Multicast Routing on Cisco IOS XR Software* configuration module in the *Cisco IOS XR Multicast Configuration Guide for the Cisco XR 12000 Series Router*.

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accounting per-prefix

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

accounting per-prefix

no accounting per-prefix

Syntax Description This command has no keywords or arguments.

Command Default This feature is disabled by default.

Command Modes

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

| Command History | Release | Modification |
|-----------------|---------------|-----------------------------------------------------------------|
| | Release 3.2 | 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.

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

| Task ID | Task ID | Operations |
|---------|-----------|-------------|
| | multicast | read, write |

Examples

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

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

Related Commands

| Command | Description |
|---------------------------------------------|-----------------------------------------------------------------------------|
| show mfib route, on page 83 | Displays route entries in the Multicast Forwarding Information Base (MFIB). |

accounting per-prefix forward-only

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

accounting per-prefix forward-only

no accounting per-prefix forward-only

Syntax Description

This command has no keywords or arguments.

Command Default

If no counters were configured, there is no default.

If the accounting per-prefix counter was previously configured, it becomes the default.

If no accounting was configured for multicast routing, forwarding-only is the default mode and triggers a data MDT transition in the case of MVPN deployment.

Command Modes

Multicast routing configuration

Multicast routing address family IPv4 and IPv6 configuration

Multicast VRF configuration

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

Note

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

Related Commands

| Command | Description |
|--------------------------------------------------|-------------------------------------------|
| accounting per-prefix, on page 4 | Enables accounting for multicast routing. |

address-family (multicast)

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

```
address-family [vrf vrf-name] {ipv4| ipv6}
```

```
no address-family [vrf vrf-name] {ipv4| ipv6}
```

Syntax Description

| | |
|----------------------------|-------------------------------------------------------------------|
| vrf <i>vrf-name</i> | (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 3.2 | 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 41](#) 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 26](#) 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/0/0/CPU0:router(config)# multicast-routing
RP/0/0/CPU0:router(config-mcast)# address-family ipv4
RP/0/0/CPU0:router(config-mcast-default-ipv4)#
```

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

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

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

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

Related Commands

| Command | Description |
|------------------------------------------------------------|------------------------------------------------------------------------------|
| alias | Creates a command alias. |
| interface all enable , on page 24 | 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 26 | Separates the disabling of multicast routing and forwarding. |
| interface (multicast) , on page 22 | Configures multicast interface properties. |

boundary

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

boundary *access-list*

no boundary *access-list*

Syntax Description

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

Command Default

A multicast boundary is not configured.

Command Modes

Multicast routing interface configuration

Multicast routing VRF interface configuration

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------------------------|
| Release 3.2 | 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/0/0/CPU0:router(config) # ipv4 access-list myboundary2
RP/0/0/CPU0:router (config) # 10 deny ipv4 any 239.0.0.0 0.255.255.255
RP/0/0/CPU0:router(config) # 20 permit ipv4 any 224.0.0.0 15.255.255.255
RP/0/0/CPU0:router(config) # multicast-routing
```

boundary

```
RP/0/0/CPU0:router (config-mcast) # address-family ipv4  
RP/0/0/CPU0:router (config-mcast-default-ipv4) # interface GigE 0/2/0/2  
RP/0/0/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-address| source-address] signal [location {node-id| all}]
```

Syntax Description

| | |
|--------------------------------|-------------------------------------------------------------------|
| vrf <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| <i>group-address</i> | (Optional) IP address of the multicast group. |
| <i>source-address</i> | (Optional) IP address of the source of the multicast route. |
| signal | (Optional) Clears signal table statistics. |
| location <i>node-id</i> | (Optional) Clears route packet counters from the designated node. |
| all | The all keyword clears route packet counters on all nodes |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------|
| Release 3.2 | This command was introduced. |
| Release 3.4.0 | The signal keyword was added. |
| Release 3.5.0 | The vrf <i>vrf-name</i> 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/0/0/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 <i>node-id</i> | (Optional) Clears global resource counters from the designated node. |
| all | The all keyword clears all global resource counters. |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|--------------------------------------------------------------------|
| Release 3.2 | This command was introduced. |
| Release 3.5.0 | The location keyword was changed from optional to required. |

Usage Guidelines

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/0/0/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 <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| rx | Clears adjacency counters for packets received. |
| tx | Clears adjacency counters for packets sent. |
| location <i>node-id</i> | (Optional) Clears adjacency counters from the designated node. |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 4.0.0 | This command was introduced. |

Usage Guidelines

Task ID

| Task ID | Operations |
|-----------|----------------------|
| multicast | read, write, execute |

Examples

The following example shows how to clear all adjacency counters:

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


disable (multicast)

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

disable

no disable

Syntax Description This command has no keywords or arguments.

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

Command Modes Multicast routing interface configuration
Multicast routing VRF interface configuration

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------------------------|
| Release 3.2 | 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/0/0/CPU0:router(config)# multicast-routing
RP/0/0/CPU0:router(config-mcast)# interface all enable
RP/0/0/CPU0:router(config-mcast-default-ipv4)# interface GigE 0/1/0/0
RP/0/0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

Related Commands

| Command | Description |
|--------------------------------------------------|------------------------------------------------------------------------------|
| enable (multicast), on page 19 | Enables multicast routing and forwarding on an interface. |
| interface all enable, on page 24 | Enables multicast routing and forwarding on all new and existing interfaces. |

enable (multicast)

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

enable

no enable

Syntax Description This command has no keywords or arguments.

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

Command Modes Multicast routing interface configuration
Multicast routing VRF interface configuration

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------------------------|
| Release 3.2 | 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/0/0/CPU0:router(config)# multicast-routing
RP/0/0/CPU0:router(config-mcast)# interface GigE 0/1/0/0
RP/0/0/CPU0:router(config-mcast-default-ipv4-if)# enable
```

Related Commands

| Command | Description |
|--------------------------------------------------|------------------------------------------------------------------------------|
| disable (multicast), on page 17 | Disables multicast routing and forwarding on an interface. |
| interface all enable, on page 24 | Enables multicast routing and forwarding on all new and existing interfaces. |

forwarding-latency

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

forwarding-latency [*delay milliseconds*]

no forwarding-latency

Syntax Description

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

Command Default

The default delay time is 30 milliseconds.

Command Modes

Multicast routing configuration
IPv4 and IPv6 multicast routing configuration

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 3.8.0 | This command was introduced. |

Usage Guidelines

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

interface (multicast)

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

interface *type interface-path-id*

no interface *type interface-path-id*

Syntax Description

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

Command Default

No default behavior or values

Command Modes

Multicast routing configuration
IPv4 or IPv6 multicast routing configuration
Multicast VRF configuration

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------|
| Release 3.2 | 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/0/0/CPU0:router(config)# multicast-routing  
RP/0/0/CPU0:router(config-mcast)# interface all enable  
RP/0/0/CPU0:router(config-mcast-default-ipv4-if)# interface GigE 0/1/0/0  
  
RP/0/0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

Related Commands

| Command | Description |
|--------------------------------------------------|------------------------------------------------------------------------------|
| disable (multicast), on page 17 | Disables multicast routing and forwarding on an interface. |
| enable (multicast), on page 19 | Enables multicast routing and forwarding on an interface. |
| interface all enable, on page 24 | Enables multicast routing and forwarding on all new and existing interfaces. |

interface all enable

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

interface all enable

no interface all enable

Syntax Description This command has no keywords or arguments.

Command Default Multicast routing and forwarding is disabled by default.

Command Modes Multicast routing configuration
Multicast VRF configuration

| Release | Modification |
|---------------|-----------------------------------------------------------------|
| Release 3.2 | 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/0/0/CPU0:router(config)# multicast-routing
RP/0/0/CPU0:router(config-mcast)# interface all enable
RP/0/0/CPU0:router(config-mcast)# interface GigE 0/1/0/0
RP/0/0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

Related Commands

| Command | Description |
|-------------------------------------------------|------------------------------------------------------------|
| disable (multicast), on page 17 | Disables multicast routing and forwarding on an interface. |
| enable (multicast), on page 19 | 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

no interface-inheritance disable

Syntax Description This command has no keywords or arguments.

Command Default This feature is not enabled by default.

Command Modes Multicast routing configuration
Address- family IPv4 or IPv6 configuration

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

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

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

log-traps

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

log-traps

no log-traps

Syntax Description This command has no keywords or arguments.

Command Default This command is disabled by default.

Command Modes

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

| Command History | 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

| Task ID | Task ID | Operations |
|---------|-----------|-------------|
| | multicast | read, write |

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

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

maximum disable

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

maximum disable

no maximum disable

Syntax Description This command has no keywords or arguments.

Command Default Maximum state limits are enabled.

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

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

mdt data

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

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

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

Syntax Description

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

Command Default

threshold : 1

Command Modes

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

Command History

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

Usage Guidelines

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

Related Commands

| Command | Description |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| mdt default, on page 33 | Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT). |
| mdt mtu, on page 35 | Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT). |
| mdt source, on page 37 | 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*]

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

Syntax Description

| | |
|--------------------------------------|------------------------------------------------------------------------------|
| immediate-switch | Enables switching to data MDT immediately. |
| <i>acl_name</i> | ACL for vrf groups that are enabled for data MDT |
| number <i>value</i> | Maximum number of data MDTs to be triggered. Range is 1 to 262143. |
| immediate-switch <i>value</i> | 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

Task ID

| Task ID | Operation |
|-----------|-------------|
| multicast | read, write |

Examples

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

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


mdt default

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

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

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

Syntax Description

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

Command Default

The MDT default group address must be unique.

Command Modes

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

Command History

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

Usage Guidelines

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

Related Commands

| Command | Description |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| mdt data, on page 30 | Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN). |
| mdt mtu, on page 35 | Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT). |
| mdt source, on page 37 | Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address. |

mdt mtu

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

mdt mtu *value*

no mdt mtu *value*

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

| Command Default | The MDT tunnel default size is 1376. |
|-----------------|--------------------------------------|
|-----------------|--------------------------------------|

| Command Modes | Multicast VRF configuration |
|---------------|-----------------------------|
|---------------|-----------------------------|

| Command History | Release | Modification |
|-----------------|---------------|------------------------------|
| | Release 3.5.0 | This command was introduced. |

Usage Guidelines

| Task ID | Task ID | Operations |
|---------|-----------|-------------|
| | multicast | read, write |

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

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

| Related Commands | Command | Description |
|------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| | mdt data , on page 30 | Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN). |
| | mdt default , on page 33 | Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT). |

| Command | Description |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| mdt source , on page 37 | Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address. |

mdt source

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

mdt source *type interface-path-id*

no mdt source *type interface-path-id*

Syntax Description

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

Command Default

No default behavior or values

Command Modes

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

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

Related Commands

| Command | Description |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| mdt data, on page 30 | Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN). |
| mdt default, on page 33 | Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT). |
| mdt mtu, on page 35 | 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*

no mhost {**ipv4**|**ipv6**} **default-interface** *type interface-path-id*

Syntax Description

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

Command Default

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

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

Command Modes

Global configuration
Global VRF configuration

Command History

| Release | Modification |
|---------------|--------------------------------------------------------------|
| Release 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 because there is an IC (Internal Copy) flag on the interface and it has to accept all multicast packets on the interface.

Task ID

| Task ID | Operations |
|-----------|-------------|
| multicast | read, write |

Examples

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

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

Related Commands

| Command | Description |
|----------------------------------------------------------|-------------------------------------------------------------------------------|
| show mhost default-interface, on page 91 | Displays the active default interface for the Multicast Host (MHost) process. |

multicast-routing

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

multicast-routing
no multicast-routing

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values.

Command Modes Global configuration

| Command History | Release | Modification |
|-----------------|-------------|------------------------------|
| | Release 3.2 | This command was introduced. |

Usage Guidelines

| Task ID | Task ID | Operations |
|---------|-----------|-------------|
| | multicast | read, write |

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

```
RP/0/0/CPU0:router(config)# multicast-routing
RP/0/0/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 22 | Configures multicast interface properties. |

| Command | Description |
|---------------------------------------------------|------------------------------------------------------------------------------|
| interface all enable , on page 24 | 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 [source-specific-hash]

[address-family ipv6] multipath [interface-extended-hash| source-specific-hash]

no multipath

Syntax Description

| | |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| interface-extended-hash | (Optional) Enables extensions for non-unique next-hop addresses. Note This option is available for IPv6 addressing. |
| 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

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:

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

nsf (multicast)

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

nsf [*lifetime seconds*]

no nsf [*lifetime*]

Syntax Description

| | |
|--------------------------------|---------------------------------------------------------------------------------------|
| lifetime <i>seconds</i> | (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 3.2 | This command was introduced. |
| Release 3.5.0 | The lifetime <i>lifetime</i> 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/0/0/CPU0:router(config)# multicast-routing
RP/0/0/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, on page 80 | Displays the state of NSF operation for the MFIB line cards. |
| show mrrib nsf, on page 101 | Displays the state of NSF operation in the MRIB. |
| show pim nsf | Displays the state of NSF operation for PIM. |

oom-handling

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

oom-handling

no oom-handling

Syntax Description This command has no keywords or arguments.

Command Default This command is disabled by default.

Command Modes Multicast routing configuration
Multicast routing address family ipv4 configuration

| Command History | Release | Modification |
|------------------------|----------------|------------------------------|
| | Release 3.2 | 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/0/0/CPU0:router# multicast-routing
RP/0/0/CPU0:router(config-mcast)# oom-handling
```

Related Commands

| Command | Description |
|-------------------|------------------------------------------|
| show pim topology | Displays PIM topology table information. |

rate-per-route

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

rate-per-route

no rate-per-route

Syntax Description This command has no keywords or arguments.

Command Default This command is disabled by default.

Command Modes Multicast routing configuration
Multicast routing address family ipv4 and ipv6 configuration
Multicast VRF configuration

| Command History | Release | Modification |
|-----------------|---------------|-----------------------------------------------------------------|
| | Release 3.4.0 | This command was introduced. |
| | Release 5.0.0 | This command was introduced. |
| | Release 3.5.0 | This command was supported in multicast VRF configuration mode. |

Usage Guidelines

| Task ID | Task ID | Operations |
|---------|-----------|-------------|
| | multicast | read, write |

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

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

| Related Commands | Command | Description |
|------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------|
| | show mfib route , on page 83 | Displays route entries in the Multicast Forwarding Information Base (MFIB). |

show mfib bvi

To display the Bridge Virtual Interface (BVI) details in the Multicast Forwarding Information Base (MFIB), use the **show mfib bvi** command EXEC mode.

```
show mfib bvi[interface| route]bvibvi_number
```

Syntax Description

| | |
|-------------------|-------------------------------------------------|
| interface | MFIB BVI interface. |
| route | BVI route entry. |
| <i>bvi_number</i> | BVI interface number. Range is from 1 to 65535. |

Command Default

None

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 5.1.1 | This command was introduced. |

Usage Guidelines

Task ID

| Task ID | Operation |
|-----------|-----------|
| multicast | read |

Examples

This example shows how to run the **show mfib bvi** command:

```
RP/0/0/CPU0:router # show mfib bvi route bvi 200
```

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 .

```
show mfib [ipv4|ipv6] connections [location node-id]
```

| 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 3.5.0 | 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/0/0/CPU0:router# show mfib connections
Netio           : connected
IM              : connected
Pakman          : connected
MRIB            : connected
IFH             : connected
SysDB-Global   : connected
SysDB-Local    : connected
SysDB-NSF      : connected
```

show mfib connections

```

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 76 | Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process. |
| show mfib route, on page 83 | 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|ipv6] counter [location node-id]
```

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------|
| Release 3.2 | This command was introduced. |
| Release 3.5.0 | The vrf <i>vrf-name</i> 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/0/0/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 76 | Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process. |
| show mfib route, on page 83 | 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 <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| location <i>node-id</i> | (Optional) Specifies MFIB connections associated with an interface of the designated node. |

Command Default

IPv4 addressing is the default.

Command Modes

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 3.5.0 | This command was introduced. |

Usage Guidelines

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/0/0/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 76 | Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process. |
| show mfib route, on page 83 | Displays route entries in the Multicast Forwarding Information Base (MFIB). |

show mfib hardware api-counter

To display hardware platform API counters for the Multicast Forwarding Information Base (MFIB) process, use the **show mfib hardware api-counter** command in EXEC mode

show mfib [ipv4| ipv6] hardware api-counter location *node-id*

Syntax Description

| | |
|--------------------------------|---------------------------------------------|
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| location <i>node-id</i> | Specifies an MFIB-designated node. |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 3.7.0 | This command was introduced. |

Usage Guidelines

This command is to be used only on request from Cisco Technical Support for troubleshooting. 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 sample output is from the **show mfib hardware api-counter** command:

```
RP/0/0/CPU0:router# show mfib hardware api-counter location 0/3/cpu0

LC Type: Trident
API counter
c12k_get_ipv4_mc_iinfo 7525805
c12k_get_ipv4_mc_rinfo 7539683
c12k_v4mc_delete_aib 0
c12k_v4mc_update_aib 9
```

show mfib hardware api-counter

```
c12kmc_enable_disable_acct 10
c12kmc_enable_disable_mcast 10
c12kmc_handle_mtu_update 10
c12kmc_handle_mtu_delete 0
c12kmc_im_bulk_allocate 5
c12kmc_im_bulk_free 5
c12kmc_im_process 24
c12kmc_rpf_bitmap_operation 0
c12kmc_update_adj_mtu 0
c12kmc_update_idb_qbase 0
ipmc_platform_vpn_info_operation 1
ipv4mc_platform_get_hw_eg_stats 0
ipv4mc_platform_get_hw_in_stats 0
ipv4mc_platform_idb_operation 158
ipv4mc_platform_intf_operation 15107418
ipv4mc_platform_intf_delete 10338
ipv4mc_platform_route_operation 19
ipv4mc_platform_route_delete 1
ipv4mc_platform_table_operation 19
```

show mfib hardware mlc

To display master line card information for the Multicast Forwarding Information Base (MFIB) process, use the **show mfib hardware mlc** command in .

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

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 3.6.0 | This command was introduced. |

Usage Guidelines

Note

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

Task ID

| Task ID | Operations |
|-----------|------------|
| multicast | read |

Examples

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

```
RP/0/0/CPU0:router# show mfib hardware mlc location 0/3/cpu
LC Type: Trident
Line card: 0/3/CPU0 is not a master line card for table: default
Hardware address is: 0x1c8000
RP/0/0/CPU0:jli-iox1#sh mfib vrf red hardware mlc location 0/3/cpu0
```

```
show mfib hardware mlc
```

```
Line card: 0/3/CPU0 is master line card for table: red  
Hardware address is: 0x1c8000
```

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 [ipv4|ipv6] hardware route accept-bitmap [*] [ source-address ] [group-address [/prefix-length]]
location node-id
```

Syntax Description

| | |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| | (Optional) Displays shared tree entry. |
| <i>source-address</i> | (Optional) IP address or hostname of the multicast route source: |
| <i>group-address</i> | (Optional) IP address or hostname of the multicast group. |
| <i>/ prefix-length</i> | (Optional) Prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value. |
| location node-id | Specifies an MFIB-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

Note

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

show mfib hardware route accept-bitmap

Task ID

| Task ID | Operations |
|-----------|------------|
| multicast | read |

Examples

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/0/0/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/0/0/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 2: 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 76 | Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process. |

show mfib hardware route ingress

To display information about the routes on ingress for the platform-specific Multicast Forwarding Information Base (MFIB) in the hardware, use the **show mfib hardware route ingress** command in EXEC mode

show mfib [*vrf vrf-name*] [*ipv4*|*ipv6*] **hardware route ingress location** *node-id*

Syntax Description

| | |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| vrf <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| location <i>node-id</i> | Specifies the <i>node-id</i> for an MFIB-designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation. |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 3.6.0 | This command was introduced. |

Usage Guidelines

Note Due to the size of the output from this command, output is deposited to /tmp/show_mfwd_hw_route_ingress on the line card. 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 ingress` command:

```
RP/0/0/CPU0:router# show mfib hardware route ingress location 0/3/cpu0

LC Type: Trident
done. file is at /tmp/show_mfwd_hw_route_ingress on LC

RP/0/0/CPU0:router# run cat /net/node0_3_CPU0/tmp/show_mfwd_hw_route_ingress

  group   source  tlu-addr  slotmask  mtu  flag   gp  rpf  rpf-ptr  mdt  dma_addr  pkts
e2030100      0  20e6440      8 2000   6 11 ffff      0  0         0    0
e2020001      0  20e6400      8 2000   6 11 ffff      0  0         0    0
e2010001      0  20e63c0      8 2000   6 11 ffff      0  0         0    0
e2040001      0  20e6380      8 2000   6 11 ffff      0  0         0    0
e3010490 13d0206 20cec00      8 2000   2 11  4      0  0      2a90c 11147429
e3010e96 13d0206 20cebc0      8 2000   2 11  4      0  0      2a89c 11147455
e3010e95 13d0206 20ceb80      8 2000   2 11  4      0  0      2a89a 11147455
e3010e94 13d0206 20ceb40      8 2000   2 11  4      0  0      2a8a0 11147455
```

Related Commands

| Command | Description |
|----------------------------------------------|-----------------------------------------------------------------------------|
| show mfib route , on page 83 | Displays route entries in the Multicast Forwarding Information Base (MFIB). |

show mfib hardware route location

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

```
show mfib [vrf vrf-name] [ipv4|ipv6] [*] [ source-address ] [group-address [/prefix-length]] location node-id
```

Syntax Description

| | |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| vrf <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| | (Optional) Displays shared tree entry. |
| <i>source-address</i> | (Optional) IP address or hostname of the multicast route source. |
| <i>group-address</i> | (Optional) IP address or hostname of the multicast group. |
| <i>/ prefix-length</i> | (Optional) Prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value. |
| <i>node-id</i> | Node ID for an MFIB-designated node. |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------|
| Release 3.2 | This command was introduced. |
| Release 3.5.0 | The vrf <i>vrf-name</i> keyword and argument were added. |

Usage Guidelines

T

**Note**

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

Task ID

| Task ID | Operations |
|-----------|------------|
| multicast | read |

Examples

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

```
RP/0/0/CPU0:router# show mfib hardware route 1.1.1.1 228.1.1.1 location 0/3/cpu0

LC Type: Trident
(*,227.0.0.0/8)
version:0x00001dc0
tlu address:0x02060140:NA
slotmask:0000 bmainfo:NA loq:c000 mdt_uidx:0000 rpf_uidx:ffff next_tid:0000
mtu:punt(lo):NA gather:RX_PUNT_FBHDR(0):NA(NA) RPF bitmap ptr:0x00000000
SG fwd flag hw addr[tlu]:0x0[0x0]:0x0[NA] (flag:0x0_0x0:0x0_0x0)
ingress flags:0x04 [dcs]
pkts/bytes:4972739/268527906:NA/NA
vmr id: invalid vmr id
11:11:51 AM?
11:11:51 AM?
11:11:52 AM?RP/0/0/CPU0:jli-iox1#sh mfib hardware route 226.1.0.1 loc 0/3/cpu0 (*,226.1.0.1)
version:0x00001118
tlu address:0x020e63c0:NA
slotmask:0008 bmainfo:NA loq:c000 mdt_uidx:0000 rpf_uidx:ffff next_tid:0000
mtu:8192:NA gather:RX_PUNT_FBHDR(0):NA(NA) RPF bitmap ptr:0x00000000
SG fwd flag hw addr[tlu]:0x0[0x0]:0x0[NA] (flag:0x0_0x0:0x0_0x0)
ingress flags:0x06 [signal rpf failure, dcs]
pkts/bytes:0/0:NA/NA
vmr id: invalid vmr id
```

Related Commands

| Command | Description |
|--------------------------------------------------------------|-----------------------------------------------------------------------------|
| show mfib route , on page 83 | Displays route entries in the Multicast Forwarding Information Base (MFIB). |

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 <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| | (Optional) Displays shared tree entries. |
| <i>source-address</i> | (Optional) IP address or hostname of the multicast route source. |
| <i>group-address</i> | (Optional) IP address or hostname of the multicast group. |
| <i>/ prefix-length</i> | (Optional) Prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value. |
| location <i>node-id</i> | Specifies an MFIB-designated node. |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------|
| Release 3.2 | This command was introduced. |
| Release 3.5.0 | The vrf <i>vrf-name</i> 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 0/3/CPU0:

```
RP/0/0/CPU0:router# show mfib hardware route olist 225.0.0.0 location 0/3/cpu0 (*,225.0.0.0)

LC Type: Trident
tlu_addr:0x001b8280
  l2:(14)01005E0000000012442551FD0800 gp:11 mtu:1500
  flags:0x02 uidb:0x0006 next:0x0e00dc16
  pkt/bytes:0/0
tlu_addr:0x001b82c0
  l2:(14)01005E0000000012442552010800 gp:17 mtu:1500
  flags:0x02 uidb:0x000a next:0x00000000
  pkt/bytes:0/0

tlu_addr - TLU address
l2: L2 encapsulation string
gp: Gather profile
mtu: Maximum transmission unit (MTU)
uidb: UIDB index
next: Next TLU address
pkt: Packet counter
bytes: Byte counter
```

Related Commands

| Command | Description |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| show mfib hardware route qos, on page 70 | Displays the status of Multicast Forwarding Information Base (MFIB) quality of service (QoS) information. |
| show mfib route, on page 83 | Displays route entries in the Multicast Forwarding Information Base (MFIB). |

show mfib hardware route qos

To display the status of Multicast Forwarding Information Base (MFIB) quality of service (QoS) information, use the **show mfib hardware route qos** command in EXEC mode.

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

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 3.5.0 | This command was introduced. |

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

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

```
RP/0/0/CPU0:router# show mfib hardware route qos 1.61.2.6 227.1.1.4 location 0/0/5cpu0
LC Type: Trident
(1.61.2.6,227.1.1.4)
version:0x000059ec
```

Related Commands

| Command | Description |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| show mfib hardware route olist , on page 68 | 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 72 | Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry. |
| show mfib route , on page 83 | 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 <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| location <i>node-id</i> | (Required) 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 <i>vrf-name</i> 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/0/0/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 3: 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 61 | Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes. |
| show mfib hardware route olist , on page 68 | Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware. |
| show mfib route , on page 83 | Displays route entries in the Multicast Forwarding Information Base (MFIB). |

show mfib hardware trace

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

```
show mfib [ipv4| ipv6] hardware trace {events| exceptions} [file file-name original file file-name]
[hexdump] [last n-entries] [location node-id all] [reverse] [stats] [tailf] [unique] [verbose] [wrapping]
```

Syntax Description

| | |
|-------------------------|-----------------------------------------------------------------------------------|
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| events | Displays event traces. |
| exceptions | Displays exception traces. |
| file file-name | (Optional) Displays a specific file. |
| original | (Optional) Specifies that the original location of a specified file be displayed. |
| hexdump | (Optional) Displays traces in hexadecimal format. |
| last n-entries | (Optional) Displays the last numbered entries. Range is 1 to 4294967295. |
| location node-id | (Optional) Specifies an MFIB-designated node. |
| all | Specifies all locations. |
| reverse | (Optional) Displays the latest traces first. |
| stats | (Optional) Displays statistics. |
| tailf | (Optional) Displays new traces as they are added. |
| unique | (Optional) Displays unique entries with counts. |
| verbose | (Optional) Displays information for internal debugging. |
| wrapping | (Optional) Displays the wrapping entries in the command output. |

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 events keyword was introduced. |

Usage Guidelines

Note The **exceptions** keyword is used for troubleshooting.

| Task ID | Task ID | Operations |
|---------|-----------|------------|
| | multicast | read |

Examples

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

```
RP/0/0/CPU0:router# show mfib hardware trace events location 0/3/cpu0

LC Type: Trident
201 wrapping entries (2048 possible, 0 filtered, 201 total)
Jun 2 18:03:01.215 c12k_ipv4_mcast 0/3/CPU0 t1 init_event: read_only = FALSE, plat_ext =
0x5276de84
Jun 2 18:03:05.034 c12k_ipv4_mcast 0/3/CPU0 t1 idb_operation: action = 0x00040000, idb =
0x00000000, sec_idb = 0x00000000, op_spec = 0x0801c868
Jun 2 18:03:05.034 c12k_ipv4_mcast 0/3/CPU0 t1 idb_operation: action = 0x00000800, idb =
0x00000000, sec_idb = 0x00000000, op_spec = 0x0801c868
Jun 2 18:03:05.034 c12k_ipv4_mcast 0/3/CPU0 t1 idb_operation: action = 0x00040000, idb =
0x00000000, sec_idb = 0x00000000, op_spec = 0x0801c868
```

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------|
| Release 3.2 | This command was introduced. |
| Release 3.5.0 | The vrf <i>vrf-name</i> 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/0/0/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/0/0/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 4: 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. |

| Field | Description |
|-------------------|-----------------------------------------------------------------------|
| 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. |

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 <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 3.6.0 | This command was introduced. |

Usage Guidelines

Task ID

| Task ID | Operations |
|-----------|------------|
| multicast | read |

Examples

```
RP/0/0/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 <i>node-id</i> | (Optional) Specifies the MFIB NSF designated node. |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|-------------|------------------------------|
| Release 3.2 | 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/0/0/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 5: 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 45 | 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. |

| Command | Description |
|---------------------------------------------|--------------------------------------------------|
| show mrib nsf , on page 101 | 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|statistics] *| source-IP-address|
group-IP-address/prefix-length [detail|old-output|summary|location node-id]
```

| Syntax | Description |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| * | (Optional) Display shared tree entries. |
| <i>source-IP-address</i> | (Optional) IP address or hostname of the multicast route source. Format is: <i>A.B.C.D</i> or <i>X:X::X</i> . |
| <i>group-IP-address</i> | (Optional) IP address or hostname of the multicast group. Format is: <i>A.B.C.D</i> or <i>X:X::X</i> . |
| <i>/prefix-length</i> | (Optional) Group IP prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). Format is: <i>A.B.C.D/length</i> or <i>X:X::X/length</i> . A slash must precede the decimal value. |
| vrf <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| detail | (Optional) Specifies detailed route information. |
| location <i>node-id</i> | (Optional) Specifies an MFIB-designated node. |
| 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. |
| statistics | (Optional) Displays both hardware and software forwarding statistics. |
| 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

| Release | Modification |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Release 3.2 | This command was introduced. |
| Release 3.5.0 | The detail keyword was added. The vrf vrf-name keyword and argument were added. |
| Release 3.8.0 | MVPN extranet-related attributes were added to the output for this command when the vrf , statistics , and detail keywords are used. |

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 (BVI).

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/0/0/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/0/0/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/0/0/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

```

show mfib route

```

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

```

The following output displays the MVPN extranet attributes entry and interfaces, as well as the count of egress interfaces, when using the **vrf**, **detail**, and **location** keywords.

If a route has a forwarding MDT interface from an extranet receiver VRF, the encapsulation information for that receiver VRF appears in the display, as well as the RPF table ID (shown in boldface in the example).

```
RP/0/0/CPU0:router# show mfib vrf vrf15 route 18.18.15.2 225.0.0.1 location 0/3/CPU0 detail
```

```

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

(18.18.15.2,225.0.0.1), Flags: EX, FMA: 0x80000 ,
TID: 0xe000000f
Up: 00:17:41
Last Used: never
SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0
Route ver: 0x2fb5
MVPN Info :-
  Associated Table ID : 0xe0000000
  MDT Handle: 0x9046380, MDT Probe:Y [Y], Rate:N, Acc:N
  MDT SW Egress decap: 0
  Encap : (5.5.5.5,232.101.1.16/32) , Rate: 0 Kbps / 0 bps
  EG count: 1
mdtvrf16 Flags: F NS MI EX, Up:00:16:25
GigabitEthernet0/3/0/2.216 Flags: NS EG EX, Up:00:17:41
GigabitEthernet0/3/0/2.15 Flags: A NS, Up:00:17:41

```

Related Commands

| Command | Description |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| show mfib counter, on page 53 | Displays Multicast Forwarding Information Base (MFIB) counter statistics for packets that have dropped. |
| show mfib hardware route olist, on page 68 | Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware. |
| show mrrib route, on page 104 | 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-id|vrf-name} [local|remote] [location node-id]
```

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|--------------------------------------------------------------------------------|
| Release 3.5.0 | This command was introduced. |
| Release 3.6.0 | The local and remote keywords were added. |
| Release 3.8.0 | MVPN extranet attributes were added to the output for this command. |
| Release 3.9.0 | A new field was added to the output to display per-VRF MDT source information. |

Usage Guidelines

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. The default MDT encap field shows the results of a VRF-override.

```
RP/0/0/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 Encap    : (*, */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 6: 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. When so specified, shows the source MDT information for a per-VRF configuration |
| 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). |

| Field | Description |
|-------------------|----------------------------------------------------------------------------------------|
| 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 3.2 | This command was introduced. |

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

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

The active interface is the one currently being used as the default. The active interface may differ from the one configured when multicast routing is enabled and the configured interface is not operational. This command is useful when applications such as 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/0/0/CPU0:router# show mhost default-interface
```

```
show mhost default-interface
```

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

Related Commands

| Command | Description |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| mhost default-interface , on page 39 | 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. |
| <i>type</i> | Interface type. For more information, use the question mark (?) online help function. |
| <i>interface-path-id</i> | Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function. |
| location node-id | (Optional) Specifies a designated node. |

Command Default IPv4 addressing is the default.

Command Modes EXEC

| Command History | Release | Modification |
|-----------------|-------------|------------------------------|
| | Release 3.2 | 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/0/0/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 7: 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 61 | Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes. |
| show mfib hardware route olist, on page 68 | 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 72 | Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry. |
| show mfib route, on page 83 | 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 <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| 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. |
| <i>client-name</i> | (Optional) Name of a multicast routing protocol that acts as a client of MRIB, such as Protocol Independent Multicast (PIM) or Internet Group Management Protocol (IGMP). |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------|
| Release 3.2 | This command was introduced. |
| Release 3.5.0 | The vrf <i>vrf-name</i> keyword and argument were added. |

Usage Guidelines

Task ID

| Task ID | Operations |
|-----------|------------|
| multicast | read |

Examples

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

```
RP/0/0/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 8: show mrib client Field Descriptions

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

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

Related Commands

| Command | Description |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| show mrib nsf, on page 80 | Displays the state of a nonstop forwarding (NSF) operation for the Multicast Forwarding Information Base (MFIB) line cards. |
| show mrib route, on page 83 | Displays route entries in the Multicast Forwarding Information Base (MFIB). |
| show mrib nsf, on page 101 | Displays the state of nonstop forwarding (NSF) operation in the Multicast Routing Information Base (MRIB). |

show mrib bvi

To display the Bridge Virtual Interface (BVI) details in the Multicast Routing Information Base (MRIB), use the **show mrib bvi** command EXEC mode.

```
show mrib bvi[interface| route]bvi_bvi_number
```

Syntax Description

| | |
|-------------------|-------------------------------------------------|
| interface | MRIB BVI interface. |
| route | BVI route entry. |
| <i>bvi_number</i> | BVI interface number. Range is from 1 to 65535. |

Command Default

None

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 5.1.1 | This command was introduced. |

Usage Guidelines

Task ID

| Task ID | Operation |
|-----------|-----------|
| multicast | read |

Examples

This example shows how to run the **show mrib bvi** command:

```
RP/0/0/CPU0:router # show mrib bvi route bvi 200
```

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/0/0/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
```

show mrib mdt-interface

```

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 9: 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 108 | Displays the contents of the Multicast Routing Information Base (MRIB) route-collapse database. |

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 3.2 | 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/0/0/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 10: show mrib nsf Field Descriptions

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

Related Commands

| Command | Description |
|----------------------------------------------|--------------------------------------------------------------------------|
| nsf (multicast) , on page 45 | 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 , on page 80 | Displays the state of NSF operation in the MFIB line cards. |
| show pim nsf | Displays the state of NSF operation for PIM. |

show mrib platform trace

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

```
show mrib [vrf vrf-name] [ipv4|ipv6] platform trace [file|hexdump|last|reverse|stats|tailf|unique|
verbose|wrapping] [location all|node-id]
```

Syntax Description

| | |
|----------------------------|-------------------------------------------------------------------|
| vrf <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |

Command Default

Command Modes

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 3.6.0 | This command was introduced. |

Usage Guidelines

Task ID

| Task ID | Operations |
|-----------|------------|
| multicast | read |

Examples

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

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

show mrib route

To display all entries in the Multicast Routing Information Base (MRIB), use the **show mrib route** command in 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 <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| * | (Optional) Displays shared tree entries. |
| <i>source-address</i> | (Optional) Source IP address or hostname of the MRIB route. Format is: <i>A.B.C.D</i> or <i>X:X::X</i> . |
| <i>group-address</i> | (Optional) Group IP address or hostname of the MRIB route. F ormat is: <i>A.B.C.D</i> or <i>X:X::X</i> . |
| <i>/prefix-length</i> | (Optional) Prefix length of the MRIB group address. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value. Format is: <i>A.B.C.D</i> or <i>X:X::X</i> . |
| outgoing-interface | (Optional) Displays the outgoing-interface information. |
| summary | (Optional) Displays a summary of the routing database. |
| detail | (Optional) Displays the routing database with the platform data. |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|--------------------------------------|
| Release 3.2 | This command was introduced. |
| Release 3.4.0 | The detail keyword was added. |

| Release | Modification |
|---------------|----------------------------------------------------------------------------|
| Release 3.5.0 | The <code>vrf vrf-name</code> keyword and argument were added. |
| Release 3.8.0 | MVPN extant attributes were added to the detailed output for this command. |

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 mrib counter, on page 53](#) command displays global counters independent of the routes.

Task ID

| Task ID | Operations |
|-----------|------------|
| multicast | read |

Examples

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

```
RP/0/0/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
```

show mrib route

```

POS0/3/0/0 Flags: F NS
Decapstunnel0 Flags: A

```

The following shows output when the **vrf** and **detail** keywords are used:

```

RP/0/0/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/0/0/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. |

| Command | Description |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| show mfib counter, on page 53 | Displays MFIB counter statistics for packets that have dropped. |
| show mrib route-collapse, on page 108 | Displays the contents of the MRIB route collapse database. |
| show mrib mdt-interface, on page 99 | 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 83 | 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 <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| <i>core-tree</i> | (Optional) IPv4 Multicast Distribution Tree (MDT) group address. |

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|--------------------------------------------------------------------|
| Release 3.5.0 | This command was introduced. |
| Release 3.8.0 | MVPN extanet attributes were added to the output for this command. |
| Release 5.0.0 | This command was introduced. |

Usage Guidelines

Task ID

| Task ID | Operations |
|-----------|------------|
| multicast | read |

Examples

In the following example, identical prefixes from an extranet deployment receiver VRF and the source VRF are inserted into the route-collapse database, with the table ID shown in boldfaced brackets:

```
RP/0/0/CPU0:router# show mrib route-collapse 225.101.1.14
225.101.1.14 TID: 0xe000000e RMT TID: 0x0 TLC TID: 0xe000000e RMT TLC TID: 0x0
```

```

Customer route database count: 15
(18.18.15.2,232.0.0.1/32) [tid 0xe000000e]
(18.18.15.2,232.0.0.2/32) [tid 0xe000000e]
(18.18.15.2,232.0.0.3/32) [tid 0xe000000e]
(18.18.15.2,232.0.0.4/32) [tid 0xe000000e]
(18.18.15.2,232.0.0.5/32) [tid 0xe000000e]
(18.18.15.2,232.0.0.6/32) [tid 0xe000000e]
(18.18.15.2,232.0.0.7/32) [tid 0xe000000e]
(18.18.15.2,232.0.0.8/32) [tid 0xe000000e]
(18.18.15.2,232.0.0.9/32) [tid 0xe000000e]
(18.18.15.2,232.0.0.10/32) [tid 0xe000000e]
(18.18.15.2,232.0.0.1/32) [tid 0xe000000f]
(18.18.15.2,232.0.0.2/32) [tid 0xe000000f]
(18.18.15.2,232.0.0.3/32) [tid 0xe000000f]
(18.18.15.2,232.0.0.4/32) [tid 0xe000000f]
(18.18.15.2,232.0.0.5/32) [tid 0xe000000f]
Core route database count: 2
(*,225.101.1.14/32)
(3.3.3.3,225.101.1.14/32)
Core egress node database count: 1
nodeid      slot      Refcount/Remote/NSF Remote
0x30        0/3/CPU0  1/N/N

```

This output contains self-documenting header information with the exception of the information in this table.

Table 11: show mrib route collapse Field Descriptions

| Field | Descriptions |
|-------------------------|---------------------------------------|
| Route-Collapse CTID | Identifies the receiver VRF MDT group |
| EX | Extranet |
| MDT IFH | MDT interface handle |
| FMA | Fabric Multicast Address |
| Up | Uptime |
| RPF TID | Reverse-path forwarding table ID |
| Incoming Interface List | Identifies the incoming interfaces |
| Outgoing Interface List | Identifies the outgoing interfaces |

Related Commands

| Command | Description |
|-----------------------------------------------|------------------------------------------------------------------------|
| show mrib route , on page 104 | 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* [/i>prefix-length]]

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 3.9.0 | This command was introduced. |

Usage Guidelines

Task ID

| Task ID | Operations |
|-----------|------------|
| multicast | read |

Examples

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

```
RP/0/0/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 104 | 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 <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |

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. |
| Release 3.9.0 | A new field was added to the command output to display per-VRF MDT source information. |

Usage Guidelines

Task ID

| Task ID | Operations |
|-----------|------------|
| multicast | read |

Examples

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

```
RP/0/0/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 12: show mrib table-info Field Descriptions

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

Related Commands

| Command | Description |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------|
| show mrib tlc, on page 114 | 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 <i>vrf-name</i> | (Optional) Specifies a VPN routing and forwarding (VRF) instance. |
| ipv4 | (Optional) Specifies IPv4 address prefixes. |
| ipv6 | (Optional) Specifies IPv6 address prefixes. |
| 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

Task ID

| Task ID | Operations |
|-----------|------------|
| multicast | read |

Examples

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

```
RP/0/0/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 13: show msdp peer Field Descriptions

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

static-rpf

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

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

no static-rpf

Syntax Description

| | |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>prefix-address</i> | IP address of a prefix for an address range. |
| <i>prefix-mask</i> | Prefix mask for an address range. Range is 0 to 32 for IPv4 and 0 to 128 for IPv6. |
| <i>type</i> | Interface type. For more information, use the question mark (?) online help function. |
| <i>interface-path-id</i> | Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function. |
| <i>next-hop-address</i> | IP address for an RPF neighbor. |

Command Default

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

Command Modes

Multicast routing address family ipv4 and ipv6 configuration
Multicast VRF configuration

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------|
| Release 3.2 | 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/0/0/CPU0:router(config)# multicast-routing
RP/0/0/CPU0:router(config-mcast)# vrf green
RP/0/0/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. |

ttl-threshold (multicast)

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

ttl-threshold *ttl*

no ttl-threshold *ttl*

Syntax Description

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

Command Default

ttl : 0

Command Modes

Multicast routing interface configuration
 Multicast routing VRF interface configuration

Command History

| Release | Modification |
|---------------|----------------------------------------------------------------------------------------------|
| Release 3.3.0 | 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/0/0/CPU0:router(config)# multicast-routing  
RP/0/0/CPU0:router(config-mcast)# interface GigE 0/1/0/CPU0  
RP/0/0/CPU0:router(config-mcast-default-ipv4-if)# ttl-threshold 23
```

Related Commands

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

vrf (multicast)

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

vrf *vrf-name* [**ipv4**| **ipv6**]

no vrf *vrf-name* [**ipv4**| **ipv6**]

Syntax Description

| | |
|-----------------|-----------------------------------------------------------------------------------------|
| <i>vrf-name</i> | Name of the VRF instance. The following names cannot be used: all, default, and global. |
| ipv4 | (Optional) Configures IPv4 address prefixes. |
| 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/0/0/CPU0:router(config)# multicast-routing
RP/0/0/CPU0:router(config-mcast)# vrf vrf_1
RP/0/0/CPU0:router(config-mcast-vrf_1-ipv4)# mdt ?
```



```

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

```

Related Commands

| Command | Description |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| boundary , on page 11 | Configures a boundary to keep multicast packets from being forwarded. |
| accounting per-prefix , on page 4 | Enables per-prefix counters only in hardware. |
| interface (multicast) , on page 22 | Configures multicast interface properties. |
| log-traps , on page 28 | Enables logging of trap events. |
| mdt data , on page 30 | Configures the MDT data group address range. |
| mdt default , on page 33 | Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT). |
| mdt mtu , on page 35 | Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT). |
| mdt source , on page 37 | Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address. |
| multipath , on page 43 | Enables Protocol Independent Multicast (PIM) to divide the multicast load among several equal-cost paths. |
| rate-per-route , on page 49 | 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 116 | Configures a static Reverse Path Forwarding (RPF) rule for a specified prefix mask. |

