Multicast Routing Forwarding Commands

accounting per-prefix

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

accounting per-prefix
no accounting per-prefix

Syntax Description

This command has no keywords or arguments.

Command Default

This feature is disabled by default.

Command Modes

Multicast routing configuration

Multicast routing address family IPv4 configuration

Multicast VRF configuration

Command History

Release	Modification
Release 6.0.1	This command was introduced.

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 statistics** command. These commands display “N/A” for counters when no hardware statistics are available or when the **accounting per-prefix** command is disabled.

Note Multicast route statistics is not supported.

For troubleshooting purposes, you can configure **accounting-per-prefix** under rmulticast-routing mode to enable accounting for multicast routing for a limited number of routes temporarily.

For more information, see the hw-module route-stats , on page 10 command to configure a filter to choose which (S.G) routes will have statistics enabled.

You must disable accounting-per-prefix immediately after troubleshooting.

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
Router(config)# multicast-routing
Router(config-mcast)#address-family ipv4
Router(config-mcast)# accounting per-prefix
```

Related Commands

Command	Description
show mfib route, on page 30	Displays route entries in the Multicast Forwarding Information Base (MFIB).
hw-module route-stats , on page 10	To configure multicast per-route statistics.

address-family (multicast)

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

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

Syntax Description

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

Command Default

No default behavior or values

Command Modes

Multicast routing configuration

Multicast VRF configuration

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Use the **address-family** command either from multicast routing configuration mode or from multicast VRF configuration sub to enter either the multicast IPv4 or IPv6 address family configuration submode, depending on which keyword was chosen. Use the **address-family** command with the multicast-routing, on page 17command 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 11command 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:

```
Router(config)# multicast-routing
Router(config-mcast)# address-family ipv4
Router(config-mcast-default-ipv4)#

Router(config-mcast)# address-family ipv6
Router(config-mcast-default-ipv6)#
```

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

```
Router(config)# multicast-routing
Router(config-mcast)# vrf vrf-name address-family ipv4
Router(config-mcast-vrf-name-ipv4)#

Router(config-mcast)# vrf vrf-name address-family ipv6
```

-

Related Commands

Command	Description
alias	Creates a command alias.
interface all enable, on page 13	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 11	Separates the disabling of multicast routing and forwarding.
interface (multicast), on page 14	Configures multicast interface properties.

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 counter** [{*group-addresssource-address*}] [**location** {*node-id* | **all**}]

Syntax Description

vrf *vrf-name*	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
group-address	(Optional) IP address of the multicast group.
source-address	(Optional) IP address of the source of the multicast route.

location *node-id*	(Optional) Clears route packet counters from the designated node.
all	The **all** keyword clears route packet counters on all nodes

Command Default IPv4 addressing is the default.

Command Modes EXEC

Command History

Release	Modification
Release 6.0.1	This command was introduced.

Usage Guidelines

Note This command only clears MFIB route packet software counters.

Task ID

Task ID	Operations
multicast	read, write

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

```
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.
location *node-id*	(Optional) Clears global resource counters from the designated node.
all	The **all** keyword clears all global resource counters.

Command Default IPv4 addressing is the default.

Command Modes EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# clear mfib database 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 7.0.12	This command was introduced.

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:

```
Router(config)# multicast-routing
Router(config-mcast)# interface all enable
Router(config-mcast-default-ipv4)# interface HundredGigE 0/0/0/24
Router(config-mcast-default-ipv4-if)# disable
```

Related Commands

Command	Description
enable (multicast), on page 8	Enables multicast routing and forwarding on an interface.
interface all enable, on page 13	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 7.0.12	This command was introduced.

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:

```
Router(config)# multicast-routing
Router(config-mcast)# interface HundredGigE 0/0/0/24
Router(config-mcast-default-ipv4-if)# enable
```

Related Commands

Command	Description
disable (multicast), on page 7	Disables multicast routing and forwarding on an interface.
interface all enable, on page 13	Enables multicast routing and forwarding on all new and existing interfaces.

hw-module multicast evpn ole-collapse-disable

To collapse the EVPN Core to Bridge ingress multicast ID (MCID) and Snooping default routes instead of the default L2 multicast routes, use the **hw-module multicast evpn ole-collapse-disable**command in the global configuration mode. To return to the default behavior, use the **no** form of this command.

```
hw-module multicast evpn ole-collapse-disable
```

```
no hw-module multicast evpn ole-collapse-disable
```

Syntax Description

This command has no keywords or arguments.

Command Default

This feature is disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.11.1	This command was introduced.

Usage Guidelines

To apply the disable or re-enable EVPN OLE collapse settings, you must reload the chassis and all the installed line cards.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to collapse the EVPN Core to Bridge ingress multicast ID (MCID) and Snooping default routes instead of the default L2 multicast routes:

```
Router(config)# hw-module multicast
Router(config)# hw-module multicast evpn
Router(config)# hw-module multicast evpn ole-collapse-disable
```

hw-module route-stats

To configure multicast per-route statistics, use the **hw-module route-stats** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

hw-module route-stats l3mcast [**vrf** *vrf-name*]{**ipv4** | **ipv6**} *access-list*

Syntax Description

vrf *vrf-name*	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4 *access-list*	(Optional) Specifies IPv4 access-list.
ipv6 *access-list*	(Optional) Specifies IPv6 access-list.

Command Default

This feature is disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

For troubleshooting purposes, you need to configure **accounting-per-prefix** under multicast-routing mode to enable accounting for a limited number of routes temporarily. If the number of multicast routes exceeds the available statistics, you can use the **hw-module route-stats** command to apply a filter on which specific (S,G) routes will have allocated statistics counters.

(S,G) routes that match the access-list used in the configuration will have statistics enabled, and other routes will not. There is no need to reload the router or reload the line card for the filter to take effect.

To reassign statistics to different (S,G) you need to remove the **accounting-per-prefix** and **hw-module route-stats** configurations, modify the access-list and reapply the configuration again.

Note The **hw-module route-stats** command should only be used in conjunction with the **accounting-per-prefix** configuration and it is recommended that the **accounting-per-prefix** configuration be disabled after troubleshooting.

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
Router(config)# ipv4 access-list mcast-counter
Router(config-acl)# 10 permit ipv4 host 10.1.1.2 host 224.2.151.1
Router(config-acl)# 30 permit ipv4 10.1.1.0/24 232.0.4.0/22
Router(config-acl)# 50 permit ipv4 192.168.0.0/24 232.0.4.0/22
Router(config-acl)#commit
Router(config-acl)#exit
Router(config)# hw-module route-stats l3mcast vrf default ipv4 mcast-counter
```

interface-inheritance disable

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

interface-inheritance disable
no interface-inheritance disable

Syntax Description This command has no keywords or arguments.

Command Default This feature is not enabled by default.

Command Modes Multicast routing configuration

Address- family IPv4 configuration

Command History

Release	Modification
Release 7.0.12	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 submode separates PIM and IGMP routing functionality from multicast forwarding on specified interfaces. You can nonetheless enable multicast routing functionality explicitly under PIM or IGMP routing configuration mode for individual interfaces.

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

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

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

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

```
RP/0/0RP0RSP0/CPU0:router:hostname(config)# multicast-routing
RP/0/0RP0RSP0/CPU0:router:hostname(config-mcast)# address-family ipv4
RP/0/0RP0RSP0/CPU0:router:hostname(config-mcast-default-ipv4)# interface-inheritance disable

RP/0/0RP0RSP0/CPU0:router:hostname(config-mcast-default-ipv4)# interface loopback 1 enable


RP/0/0RP0RSP0/CPU0:router:hostname(config-mcast-default-ipv4)# show run router pim
```

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

```
router igmp
  interface loopback 0
    router enable

router pim
   interface loopback 0
     enable

router pim vrf default address-family ipv4
```

```
 interface Loopback0
  enable


RP/0/0RP0RSP0/CPU0:router:hostname(config-mcast-default-ipv4)# show run router igmp

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

interface all enable

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

interface all enable
no interface all enable

Syntax Description

This command has no keywords or arguments.

Command Default

Multicast routing and forwarding is disabled by default.

Command Modes

Multicast routing configuration

Multicast VRF configuration

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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:

```
Router(config)# multicast-routing
Router(config-mcast)# interface all enable
Router(config-mcast)# interface HundredGigE 0/0/0/24
Router(config-mcast-default-ipv4-if)# disable
```

Related Commands

Command	Description
disable (multicast), on page 7	Disables multicast routing and forwarding on an interface.
enable (multicast), on page 8	Enables multicast routing and forwarding on an interface.

interface (multicast)

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

interface *type interface-path-id*
no interface *type interface-path-id*

Syntax Description

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

Command Default

No default behavior or values

Command Modes

Multicast routing configuration

IPv4 or multicast routing configuration

Multicast VRF configuration

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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:

```
Router(config)# multicast-routing
Router(config-mcast)# interface all enable
Router(config-mcast-default-ipv4-if)# interface HundredGigE 0/0/0/24
Router(config-mcast-default-ipv4-if)# disable
```

Related Commands

Command	Description
disable (multicast), on page 7	Disables multicast routing and forwarding on an interface.
enable (multicast), on page 8	Enables multicast routing and forwarding on an interface.
interface all enable, on page 13	Enables multicast routing and forwarding on all new and existing interfaces.

log-traps

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

log-traps
no log-traps

Syntax Description

This command has no keywords or arguments.

Command Default

This command is disabled by default.

Command Modes

Multicast routing configuration

Multicast routing address family IPv4 configuration

Multicast VRF configuration

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# multicast-routing
RP/0/0RP0RSP0/CPU0:router:hostname(config-mcast)# log-traps
```

migration route-policy

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

migration route-policy *policy-name*
nomigration route-policy *policy-name*

Syntax Description

policy-name	Name of the policy.

Command Default

None

Command Modes

C-multicast routing configuration mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
multicast	read, write

Example

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

```
RP/0/0RP0RSP0/CPU0:router:hostname (config-pim-v1-ipv4-mdt-cmcast) # migration route-policy
 p1
```

multicast-routing

To enter multicast routing configuration mode, use the **multicast-routing** command in

global

XR Config

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

XR Config

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname(config)# multicast-routing
RP/0/0RP0RSP0/CPU0:router:hostname(config-mcast)#
```

Related Commands

Command	Description
accounting per-prefix, on page 2	Enables per-prefix counters only in hardware.
alias	Creates a command alias.
interface (multicast), on page 14	Configures multicast interface properties.
interface all enable, on page 13	Enables multicast routing and forwarding on all new and existing interfaces.

multipath

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

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

Syntax Description

source	Enables source-based multipath hashing.
source-nexthop	(Optional) Enables source with next-hop hashing.

Command Default

This command is disabled by default.

Command Modes

Multicast routing configuration

Multicast routing address-family ipv4

Multicast VRF configuration

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

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read, write

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname(config)# multicast-routing
RP/0/0RP0RSP0/CPU0:router:hostname(config-mcast)# multipath hash
```

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

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

```
RP/0/0RP0RSP0/CPU0:router:hostname(config)# router pim
RP/0/0RP0RSP0/CPU0:router:hostname(config-pim)# multipath hash
```

nsf (multicast)

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

nsf [**lifetime** *seconds*]
no nsf [**lifetime**]

Syntax Description

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

Command Default

This command is disabled by default.

Command Modes

Multicast routing configuration

Multicast routing address family ipv4 configuration

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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/0/0RP0RSP0/CPU0:router:hostname(config)# multicast-routing
RP/0/0RP0RSP0/CPU0:router:hostname(config-mcast)# nsf
```

Related Commands

Command	Description
nsf lifetime (IGMP)	Configures the maximum time for the NSF timeout value under IGMP.
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mfib nsf	Displays the state of NSF operation for the MFIB line cards.
show mrib nsf, on page 42	Displays the state of NSF operation in the MRIB.
show pim nsf	Displays the state of NSF operation for PIM.

rate-per-route

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

rate-per-route
no rate-per-route

Syntax Description This command has no keywords or arguments.

Command Default This command is disabled by default.

Command Modes

Multicast routing configuration

Multicast routing address family ipv4 configuration

Multicast VRF configuration

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable individual route calculations:

```
RP/0/0RP0RSP0/CPU0:router:hostname# multicast-routing vrf vpn12 address-family ipv4
RP/0/0RP0RSP0/CPU0:router:hostname(config-mcast)# rate-per-route
```

Related Commands

Command	Description
show mfib route, on page 30	Displays route entries in the Multicast Forwarding Information Base (MFIB).

route-policy

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

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

Syntax Description

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

Command Default

No default behavior or values

Command Modes

BGP Neighbor Address-family Configuration mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
multicast	read, write

```
RP/0/0RP0RSP0/CPU0:router:hostname(config-bgp-nbr)# address-family vpnv4 unicast
RP/0/0RP0RSP0/CPU0:router:hostname(config-bgp-nbr-af)# route-policy pass-all in
RP/0/0RP0RSP0/CPU0:router:hostname(config-bgp-nbr-af)# route-policy pass-all out
```

shared-tree-prune delay

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

shared-tree-prune-delay *time*
noshared-tree-prune-delay *time*

Syntax Description

time	Delay in seconds. Range is 0 to 1800.

Command Default 60 seconds (for upstream prune)

Command Modes C-multicast-routing configuration mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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

Task ID

Task ID	Operation
multicast	read, write

Example

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

```
RP/0/0RP0RSP0/CPU0:router:hostname (config-pim-v1-ipv4-mdt-cmcast) # shared-tree-prune-delay
 100
```

show mfib connections

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

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
location *node-id*	(Optional) Specifies MFIB connections associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

XR EXEC

EXEC

Command History

Release	Modification
Release 7.0.12	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/0/0RP0RSP0/CPU0:router:hostname# show mfib connections

Netio            : connected
IM               : connected
Pakman           : connected
MRIB             : connected
IFH              : connected
SysDB-Global     : connected
SysDB-Local      : connected
SysDB-NSF        : connected
SYSDB-EDM        : connected
SYSDB-Action     : connected
```

```
AIB             : connected
MLIB            : connected
IDB             : connected
IIR             : connected
IPARM           : connected
GSP             : connected
```

Related Commands

Command	Description
show mfib interface, on page 26	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mfib route, on page 30	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib counter

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

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

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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/0/0RP0RSP0/CPU0:router:hostname# 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 26	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mfib route, on page 30	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib encap-info

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

show mfib [**vrf** *vrf-name*] [{**ipv4** | **ipv6**}] **encap-info** [**location** *node-id*]

Syntax Description

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

Command Default IPv4 addressing is the default.

Command Modes EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# 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 26	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mfib route, on page 30	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib interface

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

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

Syntax Description

vrf *vrf-name*	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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

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:

```
Router# show mfib interface HundredGigE 0/0/0/24 location 0/2/CPU0

Interface : HundredGigE0/0/0/24 (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:

```
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 : HundredGigE0/0/0/24 [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 2: show mfib interface Field Descriptions

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

show mfib nsf

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

show mfib [{**ipv4**}] **nsf** [**location** *node-id*]

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	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/0/0RP0RSP0/CPU0:router:hostname# 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 3: show mfib nsf Field Descriptions

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

Related Commands

Command	Description
nsf lifetime (IGMP)	Configures the maximum time for the NSF timeout value under IGMP.

Command	Description
nsf (multicast) , on page 19	Configures the NSF capability for the multicast routing system.
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mrib nsf, on page 42	Displays the state of NSF operation in the MRIB.
show pim nsf	Displays the state of NSF operation for PIM.

show mfib route

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

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

Syntax Description

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

Command Default IPv4 addressing is the default.

Command Modes EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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.
.

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

The show mfib route rate command is not supported on interfaces such as bundle virtual interfaces and Bridge Group virtual interfaces (BVIs).

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

Task ID

Task ID	Operations
multicast	read

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

```
Router# show mfib route location 0/1/CPU0

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

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

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

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

(*,227.0.0.1),   Flags:  C
  Up: 02:16:51
  Last Used: 02:16:50
  SW Forwarding Counts: 282/0/0
  SW Failure Counts: 205/0/0/0/0
 HundredGigE0/0/0/4 Flags:  NS EG, Up:02:16:46
  HundredGigE0/0/0/8 Flags:  NS EG, Up:02:16:50
  HundredGigE0/0/0/6 Flags:  NS EG, Up:02:16:50

(4.0.0.2,227.0.0.1),   Flags:
  Up: 02:16:50
  Last Used: 00:00:12
  SW Forwarding Counts: 125/0/0
  SW Failure Counts: 0/0/0/0/0
  HundredGigE0/0/0/8 Flags:  NS EG, Up:02:16:50
  HundredGigE0/0/0/6 Flags:  NS EG, Up:02:16:50
  HundredGigE0/0/0/4 Flags:  A EG, Up:02:16:50

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

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

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

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

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

```
HW Forwarding Rates: bps In/pps In/bps Out/pps Out

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

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

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

(*,227.0.0.1),   Flags:  C
  Up: 02:21:14
  Last Used: 02:21:14
  SW Forwarding Counts: 282/0/0
  SW Failure Counts: 205/0/0/0
  HW Forwarding Counts: 0/0/0
  HW Drop Counts: 0/0
  HW Forwarding Rates: N/A /N/A /N/A /N/A
  HundredGigE0/0/0/4 Flags:  NS EG, Up:02:21:10
  HundredGigE0/0/0/8 Flags:  NS EG, Up:02:21:14
  HundredGigE0/0/0/6 Flags:  NS EG, Up:02:21:14

(4.0.0.2,227.0.0.1),   Flags:
  Up: 02:21:14
  Last Used: 00:01:06
  SW Forwarding Counts: 128/0/0
  SW Failure Counts: 0/0/0/0
  HW Forwarding Counts: 8474282/8474283/389817018
  HW Drop Counts: 0/0
  HW Forwarding Rates: N/A /N/A /N/A /N/A
  HundredGigE0/0/0/8 Flags:  NS EG, Up:02:21:14
  HundredGigE0/0/0/6 Flags:  NS EG, Up:02:21:14
  HundredGigE0/0/0/4 Flags:  A EG, Up:02:21:14

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

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

```
Route# show mfib route

IP Multicast Forwarding Information Base
Entry flags: C - Directly-Connected Check, S - Signal, D - Drop,
  IA - Inherit Accept, IF - Inherit From, MA - MDT Address,
  ME - MDT Encap, MD - MDT Decap, MT - MDT Threshold Crossed,
  MH - MDT interface handle, CD - Conditional Decap,
  DT - MDT Decap True, EX - Extranet
  MoFE - MoFRR Enabled, MoFS - MoFRR State
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
  NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
  EG - Egress, EI - Encapsulation Interface, MI - MDT Interface,
  EX - Extranet, A2 - Secondary Accept
Forwarding/Replication Counts: Packets in/Packets out/Bytes out
Failure Counts: RPF / TTL / Empty Olist / Encap RL / Other
(20.20.20.1,225.0.0.1),   Flags:  MoFE MoFS
  Up: 03:22:30
  Last Used: never
  SW Forwarding Counts: 0/0/0
  SW Replication Counts: 0/0/0
  SW Failure Counts: 0/0/0/0/0
  HundredGigE0/0/0/8 Flags:  A, Up:03:22:30
  HundredGigE0/0/0/18 Flags:  A2, Up:03:22:30
  HundredGigE0/0/0/28 Flags:  NS, Up:03:22:30

(20.20.20.1,225.0.0.2),   Flags:  MoFE MoFS
  Up: 03:22:30
  Last Used: never
  SW Forwarding Counts: 0/0/0
  SW Replication Counts: 0/0/0
  SW Failure Counts: 0/0/0/0/0
  HundredGigE0/0/0/8 Flags:  A, Up:03:22:30
  HundredGigE0/0/0/18 Flags:  A2, Up:03:22:30
  HundredGigE0/0/0/28 Flags:  NS, Up:03:22:30
```

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

```
Route# show mfib route detail

IP Multicast Forwarding Information Base
Entry flags: C - Directly-Connected Check, S - Signal, D - Drop,
  IA - Inherit Accept, IF - Inherit From, MA - MDT Address,
  ME - MDT Encap, MD - MDT Decap, MT - MDT Threshold Crossed,
  MH - MDT interface handle, CD - Conditional Decap,
  DT - MDT Decap True, EX - Extranet
  MoFE - MoFRR Enabled, MoFS - MoFRR State
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
  NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
  EG - Egress, EI - Encapsulation Interface, MI - MDT Interface,
  EX - Extranet, A2 - Secondary Accept
Forwarding/Replication Counts: Packets in/Packets out/Bytes out
Failure Counts: RPF / TTL / Empty Olist / Encap RL / Other
(20.20.20.1,225.0.0.1),   Flags:  MoFE MoFS
  Up: 03:25:31
  Last Used: never
  SW Forwarding Counts: 0/0/0
  SW Replication Counts: 0/0/0
  SW Failure Counts: 0/0/0/0/0
  Route ver: 0x4a13
  MVPN Info :-
    MDT Handle: 0x0, MDT Probe:N [N], Rate:N, Acc:N
```

```
    MDT SW Ingress Encap V4/V6, Egress decap: 0 / 0, 0
  MOFRR State: Inactive Sequence No 1
  HundredGigE0/0/0/8 Flags:  A, Up:03:25:31
  HundredGigE0/0/0/18 Flags:  A2, Up:03:25:31
  HundredGigE0/0/0/28 Flags:  NS, Up:03:25:31
(20.20.20.1,225.0.0.2),   Flags:  MoFE MoFS
  Up: 03:25:31
  Last Used: never
  SW Forwarding Counts: 0/0/0
  SW Replication Counts: 0/0/0
  SW Failure Counts: 0/0/0/0/0
  Route ver: 0x443e
  MVPN Info :-
    MDT Handle: 0x0, MDT Probe:N [N], Rate:N, Acc:N
    MDT SW Ingress Encap V4/V6, Egress decap: 0 / 0, 0
  MOFRR State: Inactive Sequence No 1
  HundredGigE0/0/0/8 Flags:  A, Up:03:25:31
  HundredGigE0/0/0/18 Flags:  A2, Up:03:25:31
  HundredGigE0/0/0/28 Flags:  NS, Up:03:25:31
```

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

Related Commands

Command	Description
show mfib counter, on page 24	Displays Multicast Forwarding Information Base (MFIB) counter statistics for packets that have dropped.
show mfib interface, on page 26	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mrib route, on page 46	Displays all entries in the Multicast Routing Information Base (MRIB).

show mfib table-info

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

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

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
table-id	Specifies the table identifier. Range is 0 to 4294967295.
vrf-name	Specifies the VRF name.
local	Specifies local tables only.
remote	Specifies remote tables only.

location *node-id*	(Optional) Specifies MFIB connections associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# show mfib table-info table-id location 0/0/CPU0

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


RP/0/0RP0RSP0/CPU0:router:hostname#show mfib table-info vrf 101

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

Default MDT Handle   : 0x0 (Ha0x0)


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

This table describes the significant fields shown in the display.

Table 4: show mfib table-info Field Descriptions

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

show 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 client** [**filter**] [*client-name*]

Syntax Description

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

Command Default IPv4 addressing is the default.

Command Modes EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# 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 5: show mrib client Field Descriptions

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

Related Commands

Command	Description
show mfib nsf, on page 28	Displays the state of a nonstop forwarding (NSF) operation for the Multicast Forwarding Information Base (MFIB) line cards.
show mfib route, on page 30	Displays route entries in the Multicast Forwarding Information Base (MFIB).
show mrib nsf, on page 42	Displays the state of nonstop forwarding (NSF) operation in the Multicast Routing Information Base (MRIB).

show mrib mpls forwarding

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

EXEC mode

XR EXEC

.

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# show mrib mpls forwarding

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

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

      Outsegment Info #1 [Head/Push]:
        Outgoing Label: 16008  Outgoing IF: GigabitEthernet0/0/0/5(P) Outgoing Node ID: 0x1
  Nexthop: 192.14.1.44


LSP information (RSVP-TE) :
  Name: tunnel-mte27 Role: Head State: binding
    TUNNEL-ID: 27  P2MP-ID: 27  LSP-ID: 10012
```

```
    Source Address: 192.1.1.1  Extended-ID: 192.1.1.1(0xc0010101)

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

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

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# show mrib mpls forwarding tunnel 27 detail

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

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

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

RP/0/0RP0RSP0/CPU0:router:hostname# show mrib mpls forwarding tunnel 26 detail

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

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

show mrib mpls route

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

XR EXEC

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# show mrib mpls route

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

show mrib 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 nsf

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.12	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/0/0RP0RSP0/CPU0:router:hostname# 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 6: 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 19	Configures the NSF capability for the multicast routing system.
nsf lifetime (IGMP)	Configures the maximum time for the NSF timeout value under IGMP.
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mfib nsf	Displays the state of NSF operation in the MFIB line cards.
show pim nsf	Displays the state of NSF operation for PIM.

show mrib nsr end

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

show mrib ipv4| ipv6 nsr end

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# show mrib nsr end
Time               Client       Idx    Change
Oct 17 18:43:36    Membership   1      N
Oct 17 18:43:40    Routing      2      Y
```

This table describes the significant fields shown in the display.

Table 7: show mrib nsr end Field Descriptions

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

Related Commands

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

show mrib route-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 route-collapse** [*core-tree*]

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# show mrib route-collapse

226.1.1.1  TID: 0xe0000038   TLC TID: 0xe0000038
  Customer route database count: 5
    (192.168.5.204,224.0.1.40/32)
    (*,226.226.226.226/32)
    (*,228.228.228.228/32)
    (192.168.113.17,228.228.228.228/32)
    (*,229.229.229.229/32)
  Core route database count: 4
    (*,226.1.1.1/32)
```

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

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

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

Related Commands

Command	Description
show mrib route, on page 46	Displays all entries in the Multicast Routing Information Base (MRIB).

show mrib route

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

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

Syntax Description

vrf *vrf-name*	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
*	(Optional) Displays shared tree entries.
source-address	(Optional) Source IP address or hostname of the MRIB route. Format is: *A.B.C.D* or *X:X::X*.
group-address	(Optional) Group IP address or hostname of the MRIB route. Format is: *A.B.C.D* or *X:X::X*.

/prefix-length	(Optional) Prefix length of the MRIB group address. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value. Format is: *A.B.C.D* or *X:X::X*.
outgoing-interface	(Optional) Displays the outgoing-interface information.
summary	(Optional) Displays a summary of the routing database.
detail	(Optional) Displays the routing database with the platform data.
rate	(Optional) Displays the outgoing interface (OIF) egress rates per mroute.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.
Release 7.11.1	The **rate** keyword is introduced in this command to display the OIF egress rates per mroute.

Usage Guidelines

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

The show mfib counter, on page 24 command displays global counters independent of the routes.

Task ID

Task ID	Operations
multicast	read

The following sample output shows the **show mrib route** command with the **rate** keyword:

```
RP/0/RSP0/CPU0:LA# show mrib route rate

Fri Dec 17 19:30:21.733 UTC
(11.1.1.2,232.1.1.1) RPF nbr: 11.1.1.2 Flags: RPF
  Up: 00:40:52
  Incoming Interface List
    HundredGigE0/0/0/2 Flags: A, Up: 00:40:52
    Node Rate (0/0/CPU0):    99 pps / 38407 bps
      HW Incoming count: 205444 packets
      HW Drop count:     0 packets
  Outgoing Interface List
    HundredGigE0/0/0/1 Flags: F NS, Up: 00:40:52
    Node Rate (0/0/CPU0):      99 pps / 38407 bps
      HW Forwarding count: 205444 packets
      HW Drop count:       0 packets
     Interface Rates:
        Interface: HundredGigE0/0/0/1
        Outgoing Packet Rate (PPS rate / BPS rate): 100 / 100
```

```
        HW Forwarding count: 10000 packets
        HW Drop count: 0 packets


(11.1.1.2,232.2.2.2) RPF nbr: 11.1.1.2 Flags: RPF
  Up: 00:40:52
  Incoming Interface List
    HundredGigE0/0/0/2 Flags: A, Up: 00:40:52
   Node Rate (0/0/CPU0):    74 pps / 28798 bps
      HW Incoming count: 154084 packets
      HW Drop count:     0 packets
  Outgoing Interface List
    HundredGigE0/0/0/1 Flags: F NS, Up: 00:40:52
    Node Rate (0/0/CPU0):      74 pps / 28798 bps
      HW Forwarding count: 154084 packets
      HW Drop count:       0 packets
     Interface Rates:
        Interface: HundredGigE0/0/0/1
        Outgoing Packet Rate (PPS rate / BPS rate): 100 / 100
        HW Forwarding count: 10000 packets
        HW Drop count: 0 packets
```

Related Commands

Command	Description
show mfib counter, on page 24	Displays MFIB counter statistics for packets that have dropped.
show mrib route-collapse, on page 45	Displays the contents of the MRIB route collapse database.
show mfib route, on page 30	Displays all entries in the MFIB table.

show mrib route outgoing-interface

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

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

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# 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 46	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 table-info**

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# 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 8: 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 51	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 tlc**

Syntax Description

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

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/0RP0RSP0/CPU0:router:hostname# 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 9: 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.

show mrib vrf vrf_name route

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

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

Syntax Description

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

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
multicast	read

```
RP/0/0RP0RSP0/CPU0:router:hostname# show mrib vrf vrf1 route  232.1.1.1 detail
(192.1.1.2,232.1.1.1) Ver: 0x32b9 RPF nbr: 192.1.1.2 Flags: EID,
 PD: Slotmask: 0x0
     MGID: 17754
  Up: 12:35:50, Route node: 0x504f8df8
  RPF-ID: 0, Encap-ID: 4, EPtr: 0x505463c4, Hd: 0x502df6f8, Cts: 1, 0, 0, 0
  Acc: 1 (MDT: 0), Fwd: 1 (0), SRD: (0,0), Encap-next: 0x0
  Incoming Interface List
    GigabitEthernet0/0/0/1.1 Flags: A, Up: 05:30:09, Ptrs: 0x502df438, 0x0
  Outgoing Interface List
    tunnel-mte1 Flags: F NS LI LVIF, Up: 12:35:50, Ptrs: 0x502df6f8, 0x0
       LI add redist count: 2
```

source-tree-prune-delay

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

source-tree-prune-delay *time*
nosource-tree-prune-delay *time*

Syntax Description

time	Delay in seconds. Range is 0 to 300.

Command Default

60 seconds

Command Modes

C-multicast-routing configuration mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
multicast	read, write

Example

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

```
RP/0/0RP0RSP0/CPU0:router:hostname (config-pim-v1-ipv4-mdt-cmcast) # source-tree-prune-delay
 100
```

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

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

Command Default

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

Command Modes

Multicast routing address family ipv4 and ipv6 configuration

Multicast VRF configuration

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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:

```
Router(config)# multicast-routing
```

```
Router(config-mcast)# vrf green
Router(config-mcast)# static-rpf 10.0.0.1 32 HundredGigE 10.1.1.1
```

Related Commands

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

suppress-pim-data-signaling

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

suppress-pim-data-signaling
nosuppress-pim-data-signaling

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes PIM C-multicast routing configuration mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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

Task ID

Task ID	Operation
multicast	read, write

Example

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

```
RP/0/0RP0RSP0/CPU0:router:hostname (config-pim-v1-ipv4-mdt-cmcast) #
suppress-pim-data-signaling
```

suppress-shared-tree-join

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

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

suppress-shared-tree-join

nosuppress-shared-tree-join

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes C-multicast-routing configuration mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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

Task ID

Task ID	Operation
multicast	read, write

Example

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

```
RP/0/0RP0RSP0/CPU0:router:hostname(config-pim-v1-ipv4-mdt-cmcast) # suppress-shared-tree-join
```

unicast-reachability

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

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

Syntax Description

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

Command Default None

Command Modes C-multicast routing configuration mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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

Task ID

Task ID	Operation
multicast	read, write

Example

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

```
RP/0/0RP0RSP0/CPU0:router:hostname (config-pim-v1-ipv4-mdt-cmcast) # unicast-reachability
connector-disable
```

vrf (multicast)

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

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

Syntax Description

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

Command Default No default behavior or values.

Command Modes Multicast routing configuration

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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/0/0RP0RSP0/CPU0:router:hostname(config)# multicast-routing
```

```
RP/0/0RP0RSP0/CPU0:router:hostname(config-mcast)# vrf vrf_1
RP/0/0RP0RSP0/CPU0:router:hostname(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
accounting per-prefix, on page 2	Enables per-prefix counters only in hardware.
interface (multicast), on page 14	Configures multicast interface properties.
log-traps, on page 15	Enables logging of trap events.
multipath, on page 18	Enables Protocol Independent Multicast (PIM) to divide the multicast load among several equal-cost paths.
rate-per-route, on page 20	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 54	Configures a static Reverse Path Forwarding (RPF) rule for a specified prefix mask.