IPv6 Multicast Support

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Tip
For additional information about Cisco Catalyst 6500 Series Switches (including configuration examples and troubleshooting information), see the documents listed on this page:
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Prerequisites for IPv6 Multicast
None.

Restrictions for IPv6 Multicast
- The PFC and DFCs provide hardware support for the following:
  - Completely switched IPv6 multicast flows
  - IPv6 PIM-Sparse Mode (PIM-SM) (S,G) and (*,G) forwarding
  - Multicast RPF check for IPv6 PIM-SM (S,G) traffic using the NetFlow table
  - Rate limiting of IPv6 PIM-SM (S,G) traffic that fails the multicast RPF check
  - Static IPv6 multicast routes
  - SSM Mapping for IPv6 (PIM-SSM)
  - IPv6 multicast forwarding information base (MFIB) using the NetFlow table
  - IPv6 distributed MFIB (dMFIB) using the NetFlow table
  - Link-local and link-global IPv6 multicast scopes
Information About IPv6 Multicast Support

- Egress multicast replication with the `ipv6 mfib hardware-switching` command
- Ingress interface statistics for multicast routes (egress interface statistics not available)
- RPR and RPR+ redundancy mode (see Chapter 8, “Route Processor Redundancy (RPR)’’)
- Ingress and egress PFC QoS (see Chapter 58, “PFC QoS Overview”)
- Input and output Cisco access-control lists (ACLs)

- The PFC and DFCs do not provide hardware support for the following:
  - Partially switched IPv6 multicast flows
  - Multicast RPF check for PIM-SM (*,G) traffic
  - Multicast helper maps
  - Site-local multicast scopes
  - Manually configured IPv6 over IPv4 tunnels
  - IPv6 multicast 6to4 tunnels
  - IPv6 multicast automatic tunnels
  - IPv6 over GRE tunnels
  - IPv6-in-IPv6 PIM register tunnels
  - IPv6 multicast basic ISATAP tunnels
  - ISATAP tunnels with embedded 6to4 tunnels

Hardware-Supported IPv6 Layer 3 Multicast Features

- Control plane policing (CoPP)
- Egress forced replication mode
- Egress replication local
- Egress replication mode
- HW assisted SPT switchover
- Input ACL logging
- Input and output ACL filtering
- IPv6 Multicast over P2P IPv4 GRE/IP-in-IP tunnel (6over4)
- Load-Balancing of multicast packets on port-channels
- Multicast Layer 3 forwarding on routed ports
- Multicast Layer 3 forwarding on subinterfaces
- Multicast Layer 3 forwarding on SVI
- Multicast load-splitting across parallel links
- Netflow accounting
- Non-RPF protection
- PIM register decapsulation over IPv6
- PIM register encapsulation over IPv6
- PIM-SM (S,G) and (*,G) forwarding
- PIM-SSM
- QoS ingress mode marking
- QoS ingress mode policing
- Rate limiters
- Scope checking
- Statistics

**Partially Hardware-Supported IPv6 Layer 3 Multicast Features**
- Egress replication mode and QoS marking

**Software-Supported IPv6 Layer 3 Multicast Features**
- SSM mapping
- MET sharing
- MLDv1/v2

**Unsupported IPv6 Layer 3 Multicast Features**
- BIDIR PIM over P2P GRE tunnel
- Destination IP NAT multicast
- IPv4 multicast over P2P IPv6 GRE tunnel (4over6)
- IPv6 multicast over multipoint IPv4 GRE tunnel (6over4 mGRE)
- IPv6 multicast over multipoint IPv6 GRE tunnel
- IPv6 multicast over P2P IPv6 GRE tunnel
- IPv6 multicast over P2P IPv6 GRE tunnel with tunnel endpoints in VRF
- IPv6 multicast over P2P IPv6 VRF GRE tunnel
- MTR multicast: TOS based lookup
- Multicast VPN for IPv6 extranet support
- Multicast VPN for IPv6 intranet support
- Multicast VRF-lite
How to Configure IPv6 Multicast Support

The PFC and DFCs provide hardware support for IPv6 multicast traffic. Use these publications to configure IPv6 multicast in Cisco IOS Release 12.2SY:

- The Cisco IOS IPv6 Configuration Library, “Implementing IPv6 Multicast”:
- The Cisco IOS IPv6 Command Reference:

Verifying the IPv6 Multicast Layer 3 Configuration

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Verifying MGBP Clients

This example shows the complete output of the `show ipv6 mrib client` command:

```
Router# show ipv6 mrib client
```

Displaying the Switching Capability

This example displays the complete output of the `show platform software ipv6-multicast capability` command:

```
Router# show platform software ipv6-multicast capability
```

Verifying the (S,G) Forwarding Capability

This example shows how to verify the (S,G) forwarding:

```
Router# show platform software ipv6-multicast capability | include (S,G)
(S,G) forwarding for IPv6 supported using Netflow
```

Verifying the (*,G) Forwarding Capability

This example shows how to verify the (*,G) forwarding:

```
Router# show platform software ipv6-multicast capability | include (*,G)
(*,G) bridging for IPv6 is supported using FIB
```

Verifying the Subnet Entry Support Status

This example shows how to verify the subnet entry support status:

```
Router# show platform software ipv6-multicast capability | include entries
Directly-connected entries for IPv6 is supported using ACL-TCAM.
```

Verifying the Current Replication Mode

This example shows how to verify the current replication mode:

```
Router# show platform software ipv6-multicast capability | include Current
Current System HW Replication Mode : Ingress
```

**Note**

Enter the `no ipv6 mfib hardware-switching replication-mode ingress` command to enable replication mode auto-detection.

Displaying the Replication Mode Auto-Detection Status

This example shows how to display the replication mode auto-detection status:

```
Router# show platform software ipv6-multicast capability | include detection
Auto-detection of Replication Mode : ON
```
Displaying the Replication Mode Capabilities

This example shows how to display the replication mode capabilities of the installed modules:

```
Router# show platform software ipv6-multicast capability | begin ^Slot
Slot Replication-Capability Replication-Mode
1 Ingress                Ingress
2 Egress                 Ingress
6 Egress                 Ingress
8 Ingress                Ingress
```

Displaying Subnet Entries

This example shows how to display subnet entries:

```
Router# show platform software ipv6-multicast connected
IPv6 Multicast Subnet entries
Flags : H - Installed in ACL-TCAM
        X - Not installed in ACL-TCAM due to label-full exception
Interface: Vlan20 [ H ]
          S:20::1 G:FF00::
Interface: Vlan10 [ H ]
          S:10::1 G:FF00::
```

**Note** In this example, there are subnet entries for VLAN 10 and VLAN 20.

Displaying the IPv6 Multicast Summary

This example shows how to display the IPv6 multicast summary:

```
Router# show platform software ipv6-multicast summary
IPv6 Multicast Netflow SC summary on Slot[1]:
Shortcut Type    Shortcut count
----------------+--------------
(S, G)           100
(*, G)           0
IPv6 Multicast FIB SC summary on Slot[1]:
Shortcut Type    Shortcut count
----------------+--------------
(*, G/128)       10
(*, G/m)         47
IPv6 Multicast Netflow SC summary on Slot[6]:
Shortcut Type    Shortcut count
----------------+--------------
(S, G)           100
(*, G)           0
IPv6 Multicast FIB SC summary on Slot[6]:
Shortcut Type    Shortcut count
----------------+--------------
(*, G/128)       10
(*, G/m)         47
```
Displaying the NetFlow Hardware Forwarding Count

This example shows how to display the NetFlow hardware forwarding count:

```console
Router# show platform software ipv6-multicast summary
IPv6 Multicast Netflow SC summary on Slot[1]:
Shortcut Type           Shortcut count
-----------------------+--------------
(S, G)                  100
(*, G)                   0

<...Output deleted...>

IPv6 Multicast Netflow SC summary on Slot[6]:
Shortcut Type           Shortcut count
-----------------------+--------------
(S, G)                  100
(*, G)                   0

<...Output truncated...>
```

Note

The NetFlow (*, G) count is always zero because PIM-SM (*,G) forwarding is supported in software on the RP.

Displaying the FIB Hardware Bridging and Drop Counts

This example shows how to display the FIB hardware bridging and drop hardware counts:

```console
Router# show platform software ipv6-multicast summary | begin FIB
IPv6 Multicast FIB SC summary on Slot[1]:
Shortcut Type           Shortcut count
-----------------------+--------------
(*, G/128)              10
(*, G/m)                47

<...Output deleted...>

IPv6 Multicast FIB SC summary on Slot[6]:
Shortcut Type           Shortcut count
-----------------------+--------------
(*, G/128)              10
(*, G/m)                47
```

Note

- The (*, G/128) value is a hardware bridge entry count.
- The (*, G/m) value is a hardware bridge/drop entry count.
Displaying the Shared and Well-Known Hardware Adjacency Counters

The `show platform software ipv6-multicast shared-adjacencies` command displays the shared and well-known hardware adjacency counters used for IPv6 multicast by entries in FIB and ACL-TCAM.

```
Router# show platform software ipv6-multicast shared-adjacencies

---- SLOT [1] ----
Shared IPv6 Mcast Adjacencies Index     Packets       Bytes
-------------------------------------- ------------- ------------------
Subnet bridge adjacency                0x7F802  0             0
Control bridge adjacency               0x7      0             0
StarG_M bridge adjacency               0x8      0             0
S_G bridge adjacency                   0x9      0             0
Default drop adjacency                 0xA      0             0
StarG (spt == INF) adjacency           0xB      0             0
StarG (spt != INF) adjacency           0xC      0             0

---- SLOT [6] ----
Shared IPv6 Mcast Adjacencies Index     Packets       Bytes
-------------------------------------- ------------- ------------------
Subnet bridge adjacency                0x7F802  0             0
Control bridge adjacency               0x7      0             0
StarG_M bridge adjacency               0x8      0             0
S_G bridge adjacency                   0x9      0             0
Default drop adjacency                 0xA      28237         3146058
StarG (spt == INF) adjacency           0xB      0             0
StarG (spt != INF) adjacency           0xC      0             0
```

Tip

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