



## 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:

[http://www.cisco.com/en/US/products/hw/switches/ps708/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html)

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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

- 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 10, “Route Processor Redundancy \(RPR\)”](#))
- Ingress and egress PFC QoS (see [Chapter 64, “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

## Information About IPv6 Multicast Support

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## 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

- MVPN over P2P IPv6 GRE tunnel
- PIM-BIDIR
- PIM-DM (S,G) forwarding
- Source IP NAT multicast
- Egress replication mode and QoS policing
- QoS ingress and egress: shaping support
- MIB support
- Multicast boundary
- Multicast helper map
- Output ACL logging
- PGM router assist
- PGM router assist in VRF
- QoS Marking for multicast bridged frames undergoing routing

## 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 15.4SY:

- The *Cisco IOS IPv6 Configuration Library*, “Implementing IPv6 Multicast”:  
<http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6/configuration/15-2mt/ip6-15-2mt-book.html>
- The *Cisco IOS IPv6 Command Reference*:  
[http://www.cisco.com/en/US/docs/ios/ipv6/command/reference/ipv6\\_book.html](http://www.cisco.com/en/US/docs/ios/ipv6/command/reference/ipv6_book.html)

## Verifying the IPv6 Multicast Layer 3 Configuration

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- [Verifying the \(S,G\) Forwarding Capability, page 52-5](#)
- [Verifying the \(\\*,G\) Forwarding Capability, page 52-5](#)
- [Verifying the Subnet Entry Support Status, page 52-5](#)
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- [Displaying the Shared and Well-Known Hardware Adjacency Counters, page 52-8](#)

## Verifying MFIB 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 mrib 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::
```




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

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## 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:

```
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:

```
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



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