



CHAPTER 20

Viewing IP and MPLS Multicast Configurations

These topics provide an overview of the IP Multicast technology and describe how to view IP and multicast configurations in Prime Network Vision:

- [IP and MPLS Multicast Configuration - An Overview, page 20-1](#)
- [User Roles Required to View IP and Multicast Configurations, page 20-2](#)
- [Viewing the Multicast Configurations, page 20-2](#)

IP and MPLS Multicast Configuration - An Overview

IP Multicast is a bandwidth-conserving technology that reduces traffic by simultaneously delivering a single stream of information to thousands of corporate recipients and homes. Applications that take advantage of multicast include video conferences, corporate communications, distance learning, and distribution of software, stock quotes, and news.

IP Multicast delivers source traffic to multiple receivers without adding any additional burden on the source or the receivers while using the least network bandwidth of any competing technology. Multicast packets are replicated in the network by Cisco routers enabled with Protocol Independent Multicast (PIM), Multicast Label Distribution Protocol (MLDP) and other supporting multicast protocols resulting in the most efficient delivery of data to multiple receivers possible.

Multicast is based on the concept of a group. An arbitrary group of receivers expresses an interest in receiving a particular data stream. This group does not have any physical or geographical boundaries—the hosts can be located anywhere on the Internet. Hosts that are interested in receiving data flowing to a particular group must join the group using Internet Group Management Protocol (IGMP). Hosts must be a member of the group to receive the data stream.

In Prime Network, IP and multicast support is available for the following network elements:

- Cisco Aggregation Service Router (ASR) 9000 series network elements
- Cisco Carrier Routing System (CRS) network elements
- Cisco Gigabit Switch Router (GSR) network elements

User Roles Required to View IP and Multicast Configurations

This topic identifies the roles that are required to work with IP and Multicast Support. Prime Network determines whether you are authorized to perform a task as follows:

- For GUI-based tasks (tasks that do not affect elements), authorization is based on the default permission that is assigned to your user account.
- For element-based tasks (tasks that do affect elements), authorization is based on the default permission that is assigned to your account. That is, whether the element is in one of your assigned scopes and whether you meet the minimum security level for that scope.

For more information on user authorization, see the topic on device scopes in the [Cisco Prime Network 3.10 Administrator Guide](#).

Table 20-1 Default Permission/Security Level Required for IP and Multicast Support

Task	Viewer	Operator	OperatorPlus	Configurator	Administrator
View multicast configuration details	X	X	X	X	X
View Multicast Label Switch details	X	X	X	X	X
View Routing entities	X	X	X	X	X
View VRF Properties	X	X	X	X	X

Viewing the Multicast Configurations

This topic contains the following sections:

- [Viewing Multicast Node, page 20-2](#)
- [Viewing Multicast Protocols, page 20-4](#)
- [Multicast Label Switching, page 20-9](#)
- [Multicast Routing Entities, page 20-10](#)

Viewing Multicast Node

To view the Multicast node:

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- Step 1** Right-click on the required device and choose the **Inventory** option.
- Step 2** In the Inventory window, choose **Logical Inventory > Multicast**. The Route Policies and Multicast Global Interfaces tabs are displayed in the content pane as show in [Figure 20-1](#). You can click on the tabs to view more details.

Figure 20-1 Multicast Content Pane

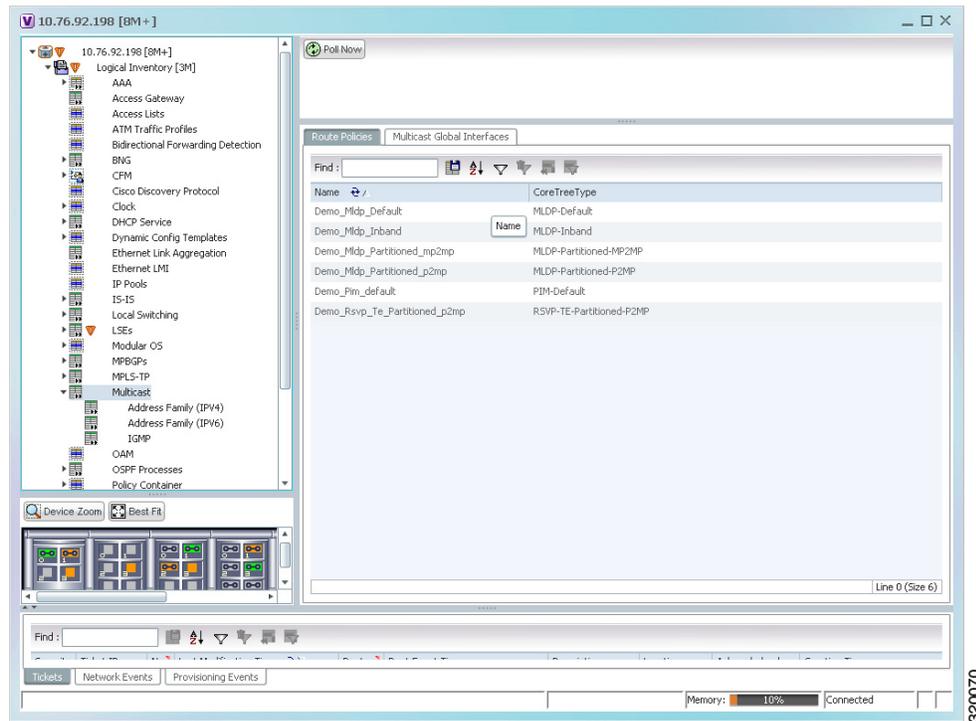


Table 20-2 describes the fields that are displayed in the Route Policies tab.

Table 20-2 Route Policies Tab

Field Name	Description
Name	The name of the multicast route policy.
Core Tree Type	The type of the Multicast Distribution Tree (MDT) core tree configured in the route policy. Values are: <ul style="list-style-type: none"> MLDP-Default MLDP-Inband MLDP-Partitioned-MP2MP MLDP-Partitioned-P2MP PIM-Default RSVP-TE-Partitioned-P2MP

Multicast Global Interfaces Tab

Interface Name	The name of the multicast enabled logical or physical interface.
Associated Entity	The link to the associated routing entity, which when clicked will highlight the associated Default routing entity record under the Routing Entity node.

Viewing Multicast Protocols

The following Multicast protocols are available in Prime Network:

- Address Family (IPv4)—See [Viewing the Address Family \(IPv4\) Profile](#), page 20-4.
- Address Family (IPv6)—See [Viewing the Address Family \(IPv6\) Profile](#), page 20-5.
- IGMP—[Viewing the IGMP profile](#), page 20-5.
- PIM—[Viewing the PIM Profile](#), page 20-7.

Viewing the Address Family (IPv4) Profile

To view the Address Family (IPv4) profile:

- Step 1** Right-click on the required device and choose the **Inventory** option.
- Step 2** In the Inventory window, choose **Logical Inventory > Multicast > Address Family (IPV4)**. The profile details are displayed in the content pane.

[Table 20-3](#) describes the fields that are displayed in the **Address Family (IPV4)** profile.

Table 20-3 Address Family (IPV4) Profile

Field Name	Description
MDT Source Interface	The source interface to set the multicast VPN data. Note This interface can identify the root of the MDT in the service provider network. This interface and its corresponding address is used to update all Multicast VPN (MVPN) peers through multiprotocol Border Gateway Protocol (BGP).
MDT Static	The interface used for transporting MDT data.
Interface All	Indicates whether the multicast routing and protocols are enabled on the interfaces. Note You must enable the interfaces using the Interface command in the multicast-routing configuration mode.
NSF Status	Indicates whether the non-stop forwarding capability is enabled for all the relevant components. Note If this feature is enabled, then multicast forwarding will not stop on failure of the control plane multicast routing components.
Address Family	The address family, which in this instance is IPV4.
MDT MLDP	Indicates whether the Multicast Distribution Tree (MDT) Multipoint Extensions to Label Distribution Protocol (MLDP) in-band signalling is enabled.

Viewing the Address Family (IPv6) Profile

To view the Address Family (IPv6) profile:

- Step 1** Right-click on the required device and choose the **Inventory** option.
- Step 2** In the Inventory window, choose **Logical Inventory > Multicast > Address Family (IPv6)**. The profile details are displayed in the content pane.

Table 20-4 describes the fields that are displayed in the **Address Family (IPv6)** profile.

Table 20-4 Address Family (IPv6) profile

Field Name	Description
Interface All	Indicates whether the multicast routing and protocols are enabled on the interface. Note You must enable the interfaces using the Interface command in the multicast-routing configuration mode.
NSF Status	Indicates whether the non-stop forwarding capability is enabled for all the relevant components. Note If this feature is enabled, then multicast forwarding will not stop if the control plane multicast routing components fail.
Address Family	The address family, which in this instance is IPV6.
MDT MLDP	Indicates whether the Multicast Distribution Tree (MDT) Multipoint Extensions to Label Distribution Protocol (MLDP) in-band signalling is enabled.
MDT Static	The interface used for transporting MDT data.
MDT Source Interface	The source interface to set the multicast VPN data. Note This interface can identify the root of the MDT in the service provider network. This interface and its corresponding address is used to update all Multicast VPN (MVPN) peers through multiprotocol Border Gateway Protocol (BGP).

Viewing the IGMP profile

The IGMP runs between hosts and their immediately neighboring multicast routers. The mechanisms of the protocol allow a host to inform its local router that it wishes to receive transmissions addressed to a specific multicast group. Also, routers periodically query the LAN to determine if known group members are still active. If there is more than one router on the LAN performing IP multicasting, one of the routers is elected querier and assumes the responsibility of querying the LAN for group members. Based on the group membership information learned from the IGMP, a router is able to determine which (if any) multicast traffic needs to be forwarded to each of its leaf sub networks. Multicast routers use this information, in conjunction with a multicast routing protocol, to support IP multicasting across the Internet.

There are three versions of IGMP:

- **IGMP Version 1**
- **IGMP Version 2**
- **IGMP Version 3**

To view the IGMP profile:

Step 1 Right-click on the required device and choose the **Inventory** option.

Step 2 In the **Inventory** window, choose **Logical Inventory > Multicast > IGMP**. The IGMP details are displayed in the content pane. You can click on the tabs to view more details.

[Table 20-5](#) describes the fields that are displayed in the **IGMP** profile.

Table 20-5 IGMP Profile Details

Field Name	Description
NSF Status	The non-stop forwarding status, which can be Normal or Non-Stop Forwarding Activated . Note The Non-Stop Forwarding Activated status implies that recovery of an IGMP failure is in progress.
Interfaces Tab	
Interface Name	The name of the interface.
Associated Entity	The link to the associated entity, which when clicked will highlight the associated Default routing entity record under the Routing Entity node.
Interface Address	The internet address of the interface.
VRF	The VRF to which the interface belongs. This is a link, which when clicked will take you to the relevant record under the VRF node.
IGMP Status	Indicates whether IGMP is enabled or disabled on the interface.
IGMP Version	The IGMP version installed on the interface.
Groups Tab	
Group Address	The address of the multicast group.
Interface Name	The name of the interface used to reach the group.
Associated Entity	The associated entity for the IGMP profile. Click this link to view the related record under the Subscriber Access Point node.
VRF	The VPN Routing and Forwarding (VRF) to which the interface belongs. This is a link, which when clicked will take you to the relevant record under the VRF node.
Up Time	The period from when the multicast group is available. This information is displayed in terms of hours, minutes, and seconds.
Expires	The duration after which the multicast group will be removed from the IGMP groups table. This information is displayed in terms of hours, minutes, and seconds.
Last Reporter	The most recent host that has reported being a member of the multicast group.

Table 20-5 IGMP Profile Details (continued)

Field Name	Description
Group Ranges Tab	
Group Range	The multicast group range in CDIR format, which is basically the Multicast Group IP address followed by the CDIR prefix.
Protocol	The PIM protocol that is used by the IGMP group range.

Viewing the PIM Profile

PIM is a family of multicast routing protocols for Internet Protocol (IP) networks that provide one-to-many and many-to-many distribution of data over a LAN, WAN or the Internet. It is termed protocol-independent because PIM does not include its own topology discovery mechanism, but instead uses routing information supplied by other traditional routing protocols such as the Routing Information Protocol, Open Shortest Path First, Border Gateway Protocol and Multicast Source Discovery Protocol. There are four variants of PIM:

- PIM Sparse Mode (PIM-SM)
- PIM Dense Mode (PIM-DM)
- Bidirectional PIM
- PIM source-specific multicast (PIM-SSM)

Although PIM is called a multicast routing protocol, it actually uses the unicast routing table to perform the Reverse Path Forwarding (RPF) check function instead of building up a completely unrelated multicast routing table. PIM does not send and receive multicast routing updates between routers like other routing protocols.

To view the PIM profile:

- Step 1** Right-click on the required device and choose the **Inventory** option.
- Step 2** In the Inventory window, choose **Logical Inventory > Multicast > PIM**. The profile details are displayed in the content pane. You can click on the tabs to view more details.

[Table 20-6](#) describes the fields that are displayed in the **PIM** profile.

Table 20-6 PIM Profile Details

Field Name	Description
NSF Status	The non-stop forwarding status, which can be Normal or Non-Stop Forwarding Activated . Note The Non-Stop Forwarding Activated status implies that recovery of an IGMP failure is in progress.
Interfaces Tab	
Interface Name	The name or ID of the interface on which PIM is enabled.
Associated Entity	The link to the associated entity, which when clicked will highlight the associated Default routing entity record under the Routing Entity node.

Table 20-6 PIM Profile Details (continued)

Field Name	Description
IP Address	The IP address of the interface.
VRF	The name of the VRF associated to the interface. This is a link, which when clicked will take you to the relevant record under the VRF node.
PIM Status	Indicates whether the PIM is enabled (ON) or disabled (OFF) on the interface.
Hello Interval	The frequency at which PIM hello messages are sent over the PIM enabled interfaces. These messages are sent at regular intervals by routers on all the PIM enabled interfaces. The router sends these messages to advertise their existence as a PIM router on the subnet.
Designated Router	The IP address of the designated router on the LAN. Note Serial lines do not have a designated router. Hence, the IP address is displayed as 0.0.0.0. If the interface on the router is the designated router, then the words “This system” is displayed. If not, then the IP address of the external neighbor is displayed.
Designated Router Priority	The priority of the designated router, which is advertised by the neighbor in the hello messages. This value in this field will range from 0 to 4294967295
Rendezvous Points Tab	
RP Address	The address of the interface serving as a rendezvous point for the group range or list. A Rendezvous Point (RP) is a router in a multicast network domain that acts as a shared root for a multicast shared tree. Any number of routers can be configured to work as RPs and they can be configured to cover different group ranges. For correct operation, every multicast router within a Protocol Independent Multicast (PIM) domain must be able to map a particular multicast group address to the same RP.
Mode	The PIM protocol mode for which the router is advertised as a rendezvous point. The mode can be PIM-SM or bidirectional PIM .
Scope	The number of candidate announcement messages sent out from the rendezvous point.
Priority	The value of the candidate rendezvous point priority.
Uptime	The amount of time from when the rendezvous point is available.
Group List	The IP access list number or name of the group prefixes that are advertised in association with the rendezvous point address.
RP Type	The type of rendezvous point, which can be BSR or Auto RP . Note The Bootstrap Router (BSR) is a mechanism for a router to learn RP information. It ensures that all routers in the PIM domain have the same RP cache as the BSR. Auto-RP is a mechanism to automate distribution of RP information in a multicast network. The Auto-RP mechanism operates using two basic components, the candidate RPs and the RP mapping agents.

Table 20-6 PIM Profile Details (continued)

Field Name	Description
Topology Tab	
Source Address	The IP address of the source of the multicast entry. In case the IP address is not available, a "*" or 0.0.0.0 is displayed here.
Group Address	The multicast group address or prefix for which the entry is associated with.
PIM Mode	The PIM mode of the topology entry, which can be Sparse, Source Specific, Dense, or Bidirectional.
Tree Type	The MDT tree type for the route entry, which can be Shortest Path Tree or Rendezvous Point Tree.
Uptime	The amount of time from which the topology is available. This value is displayed in terms of seconds.
RP Address	The Rendezvous Point address. This value is displayed only if the PIM Mode is SM or Bidirectional.
Join Prune Status	Indicates whether a join or prune message is sent to the RPF neighbor for the route.
RPF	The IP address and interface ID, along with the MoFFR information, of the Reverse Path Forwarding for the topology.
Flags	The comma separated flag information for this topology.
Neighbors Tab	
Neighbor IP Address	The IP address of the neighbor.
Interface Name	The interface name on which the neighbor can be reached.
Associated Entity	The link to the associated entity, which when clicked will highlight the associated Default routing entity record under the Routing Entity node.
VRF	The name of the VRF.
Flags	The flags that provide information about various states of the neighbor.
Designated Router Priority	The priority of the PIM interface for DR election. The default value is 1.
UpTime	The amount of time from which the interface is available.

Multicast Label Switching

Prime Network provides multicast support for MPLS services.

For more information on multicast label switching, see [Multicast Label Switching, page 19-42](#).

Multicast Routing Entities

Prime Network provides multicast support for routing entities. If you have configured multicast route information for a VRF, Prime Network displays a separate tab for the related VRF wherein you can view the multicast routing information.

For details on multicast routing entities, see [Viewing Routing Entities, page 19-31](#) and [Viewing VRF Properties, page 19-27](#).