



## Configuring IGMP Proxy

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### Prerequisites for IGMP Proxy

- All devices on the IGMP UDL have the same subnet address. If all devices on the UDL cannot have the same subnet address, the upstream device must be configured with secondary addresses to match all of the subnets to which the downstream devices are attached.
- IP multicast is enabled and the PIM interfaces are configured. When you are configuring PIM interfaces for IGMP proxy, use PIM sparse mode (PIM-SM) when the interface is operating in a sparse-mode region and you are running static RP, bootstrap (BSR), or Auto-RP with the Auto-RP listener capability.

### Information About IGMP Proxy

#### IGMP Proxy

An IGMP proxy enables hosts in a unidirectional link routing (UDLR) environment that are not directly connected to a downstream router to join a multicast group sourced from an upstream network.

The figure below illustrates a sample topology that shows two UDLR scenarios:

- Traditional UDL routing scenario--A UDL device with directly connected receivers.
- IGMP proxy scenario--UDL device without directly connected receivers.

IGMP UDLs are needed on the upstream and downstream devices.

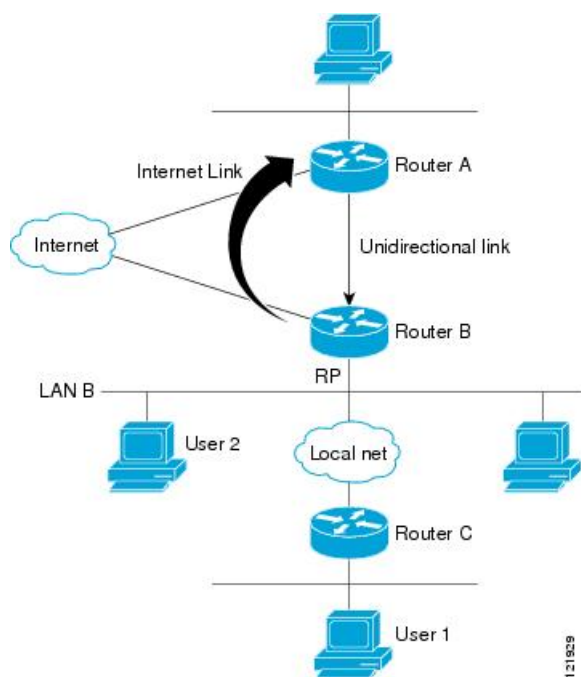


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**Note**

Although the following illustration and example uses routers in the configuration, any device (router or switch) can be used.

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### Scenario 1--Traditional UDLR Scenario (UDL Device with Directly Connected Receivers)

For scenario 1, no IGMP proxy mechanism is needed. In this scenario, the following sequence of events occurs:

1. User 2 sends an IGMP membership report requesting interest in group G.
2. Router B receives the IGMP membership report, adds a forwarding entry for group G on LAN B, and proxies the IGMP report to Router A, which is the UDLR upstream device.
3. The IGMP report is then proxied across the Internet link.
4. Router A receives the IGMP proxy and maintains a forwarding entry on the unidirectional link.

### Scenario 2--IGMP Proxy Scenario (UDL Device without Directly Connected Receivers)

For scenario 2, the IGMP proxy mechanism is needed to enable hosts that are not directly connected to a downstream device to join a multicast group sourced from an upstream network. In this scenario, the following sequence of events occurs:

1. User 1 sends an IGMP membership report requesting interest in group G.
2. Router C sends a PIM Join message hop-by-hop to the RP (Router B).
3. Router B receives the PIM Join message and adds a forwarding entry for group G on LAN B.
4. Router B periodically checks its mroute table and proxies the IGMP membership report to its upstream UDL device across the Internet link.
5. Router A creates and maintains a forwarding entry on the unidirectional link (UDL).

In an enterprise network, it is desirable to be able to receive IP multicast traffic via satellite and forward the traffic throughout the network. With unidirectional link routing (UDLR) alone, scenario 2 would not be

possible because receiving hosts must be directly connected to the downstream device, Router B. The IGMP proxy mechanism overcomes this limitation by creating an IGMP report for (\*, G) entries in the multicast forwarding table. To make this scenario functional, therefore, you must enable IGMP report forwarding of proxied (\*, G) multicast static route (mroute) entries (using the **ip igmp mroute-proxy** command) and enable the mroute proxy service (using the **ip igmp proxy-service** command) on interfaces leading to PIM-enabled networks with potential members.



**Note** Because PIM messages are not forwarded upstream, each downstream network and the upstream network have a separate domain.

## How to Configure IGMP Proxy

### Configuring the Upstream UDL Device for IGMP UDLR

Perform this task to configure the upstream UDL device for IGMP UDLR.

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> <pre>Device&gt; enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> <pre>Device# configure terminal</pre>	Enters global configuration mode.
<b>Step 3</b>	<b>interface <i>type number</i></b> <b>Example:</b> <pre>Device(config)# interface gigabitethernet 1/0/0</pre>	Enters interface configuration mode. <ul style="list-style-type: none"> <li>For the <i>type</i> and <i>number</i> arguments, specify the interface to be used as the UDL on the upstream device.</li> </ul>
<b>Step 4</b>	<b>ip igmp unidirectional-link</b> <b>Example:</b> <pre>Device(config-if)# ip igmp unidirectional-link</pre>	Configures IGMP on the interface to be unidirectional for IGMP UDLR.
<b>Step 5</b>	<b>end</b> <b>Example:</b> <pre>Device(config-if)# end</pre>	Ends the current configuration session and returns to privileged EXEC mode.

## Configuring the Downstream UDL Device for IGMP UDLR with IGMP Proxy Support

Perform this task to configure the downstream UDL device for IGMP UDLR with IGMP proxy support.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> <pre>Device&gt; enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> <pre>Device# configure terminal</pre>	Enters global configuration mode.
<b>Step 3</b>	<b>interface <i>type number</i></b> <b>Example:</b> <pre>Device(config)# interface gigabitethernet 0/0/0</pre>	Enters interface configuration mode. <ul style="list-style-type: none"> <li>• For the <i>type</i> and <i>number</i> arguments, specify the interface to be used as the UDL on the downstream device for IGMP UDLR.</li> </ul>
<b>Step 4</b>	<b>ip igmp unidirectional-link</b> <b>Example:</b> <pre>Device(config-if)# ip igmp unidirectional-link</pre>	Configures IGMP on the interface to be unidirectional for IGMP UDLR.
<b>Step 5</b>	<b>exit</b> <b>Example:</b> <pre>Device(config-if)# exit</pre>	Exits interface configuration mode and returns to global configuration mode.
<b>Step 6</b>	<b>interface <i>type number</i></b> <b>Example:</b> <pre>Device(config)# interface gigabitethernet 1/0/0</pre>	Enters interface configuration mode. <ul style="list-style-type: none"> <li>• For the <i>type</i> and <i>number</i> arguments, select an interface that is facing the nondirectly connected hosts.</li> </ul>
<b>Step 7</b>	<b>ip igmp mroute-proxy <i>type number</i></b> <b>Example:</b> <pre>Device(config-if)# ip igmp mroute-proxy loopback 0</pre>	Enables IGMP report forwarding of proxied (*, G) multicast static route (mroute) entries. <ul style="list-style-type: none"> <li>• This step is performed to enable the forwarding of IGMP reports to a proxy service interface for all (*, G) forwarding entries in the multicast forwarding table.</li> </ul>

	Command or Action	Purpose
		<ul style="list-style-type: none"> <li>In this example, the <b>ip igmp mroute-proxy</b> command is configured on Gigabit Ethernet interface 1/0/0 to request that IGMP reports be sent to loopback interface 0 for all groups in the mroute table that are forwarded to Gigabit Ethernet interface 1/0/0.</li> </ul>
<b>Step 8</b>	<b>exit</b> <b>Example:</b> <pre>Device(config-if)# exit</pre>	Exits interface configuration mode and returns to global configuration mode.
<b>Step 9</b>	<b>interface</b> <i>type number</i> <b>Example:</b> <pre>Device(config)# interface loopback 0</pre>	<p>Enters interface configuration mode for the specified interface.</p> <ul style="list-style-type: none"> <li>In this example, loopback interface 0 is specified.</li> </ul>
<b>Step 10</b>	<b>ip igmp helper-address udl</b> <i>interface-type interface-number</i> <b>Example:</b> <pre>Device(config-if)# ip igmp helper-address udl gigabitethernet 0/0/0</pre>	<p>Configures IGMP helping for UDLR.</p> <ul style="list-style-type: none"> <li>This step allows the downstream device to helper IGMP reports received from hosts to an upstream device connected to a UDL associated with the interface specified for the <i>interface-type</i> and <i>interface-number</i> arguments.</li> <li>In the example topology, IGMP helping is configured over loopback interface 0 on the downstream device. Loopback interface 0, thus, is configured to helper IGMP reports from hosts to an upstream device connected to Gigabit Ethernet interface 0/0/0.</li> </ul>
<b>Step 11</b>	<b>ip igmp proxy-service</b> <b>Example:</b> <pre>Device(config-if)# ip igmp proxy-service</pre>	<p>Enables the mroute proxy service.</p> <ul style="list-style-type: none"> <li>When the mroute proxy service is enabled, the device periodically checks the static mroute table for (*, G) forwarding entries that match interfaces configured with the <b>ip igmp mroute-proxy</b> command (see Step 7) based on the IGMP query interval. Where there is a match, one IGMP report is created and received on this interface.</li> </ul>

	Command or Action	Purpose
		<p><b>Note</b> The <b>ip igmp proxy-service</b> command is intended to be used with the <b>ip igmp helper-address</b> (UDL) command.</p> <ul style="list-style-type: none"> <li>In this example, the <b>ip igmp proxy-service</b> command is configured on loopback interface 0 to enable the forwarding of IGMP reports out the interface for all groups on interfaces registered through the <b>ip igmp mroute-proxy</b> command (see Step 7).</li> </ul>
<b>Step 12</b>	<b>end</b> <b>Example:</b> <pre>Device(config-if)# end</pre>	Ends the current configuration session and returns to privileged EXEC mode.
<b>Step 13</b>	<b>show ip igmp interface</b> <b>Example:</b> <pre>Device# show ip igmp interface</pre>	(Optional) Displays multicast-related information about an interface.
<b>Step 14</b>	<b>show ip igmp udldr</b> <b>Example:</b> <pre>Device# show ip igmp udldr</pre>	(Optional) Displays UDLR information for directly connected multicast groups on interfaces that have a UDL helper address configured.

## Feature History for IGMP Proxy

This table provides release and related information for the features explained in this module.

These features are available in all the releases subsequent to the one they were introduced in, unless noted otherwise.

Release	Feature	Feature Information
Cisco IOS XE Everest 16.5.1a	IGMP Proxy	An IGMP proxy enables hosts in a unidirectional link routing (UDLR) environment that are not directly connected to a downstream router to join a multicast group sourced from an upstream network.

Use the Cisco Feature Navigator to find information about platform and software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>.