IGMP Static Group Range Support

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The IGMP Static Group Range Support feature introduces the capability to configure group ranges in class maps and attach class maps to the **ip igmp static-group** command. This feature is an enhancement that simplifies the administration of networks with devices that require many interfaces to be configured with many different **ip igmp static-group** command configurations.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Information About IGMP Static Group Range Support

IGMP Static Group Range Support Overview

Prior to the introduction of the IGMP Static Group Range Support feature in Cisco IOS software, the **ip igmp static-group** command did not provide an option to specify group ranges. Administering devices that

required many **ip igmp static-group** command configurations was challenging in some network environments, because each static group had to be configured individually with the **ip igmp static-group** command, which resulted in configurations that were excessively long and difficult to manage.

The IGMP Static Group Range Support feature introduces the capability to configure group ranges in class maps and attach class maps to the **ip igmp static-group** command. This feature is an enhancement that simplifies the administration of networks with devices that require many interfaces to be configured with many different **ip igmp static-group** command configurations.

Class Maps for IGMP Static Group Range Support

A class is a way of identifying a set of packets based on its contents. A class is designated through class maps. Typically, class maps are used to create traffic policies. Traffic policies are configured using the modular quality of service (QoS) command-line interface (CLI) (MQC). The normal procedure for creating traffic policies entails defining a traffic class (using the **class-map** command), creating a traffic policy (using the **policy-map** command), and attaching the policy to an interface (using the **service-policy** command).

Note Although IGMP Static Group Range Support feature uses the MQC to define class maps, the procedure for configuring Internet Group Management Protocol (IGMP) static group class maps is different from the normal procedure used to create class maps for configuring QoS traffic policies. See the General Procedure for Configuring IGMP Group Range Support, page 2 section for more information.

The IGMP Static Group Range Support feature introduces a type of class map that is used to define group ranges, group addresses, Source Specific Multicast (SSM) channels, and SSM channel ranges. Once created, the class map can be attached to interfaces.

General Procedure for Configuring IGMP Group Range Support

To configure the IGMP Static Group Range Support feature, you would complete the following procedure:

1 Create an IGMP static group class map (using the **class-map type multicast-flows** command).
2 Define the group entries associated with the class map (using the **group** command).
3 Attach the class map to an interface (using the **ip igmp static-group** command).

The **class-map type multicast-flows** command is used to enter multicast-flows class map configuration mode to create or modify an IGMP static group class map.

Unlike QoS class maps, which are defined by specifying numerous match criteria, IGMP static group class maps are defined by specifying multicast groups entries (group addresses, group ranges, SSM channels, and SSM channel ranges). The following forms of the group command are entered from multicast-flows class map configuration mode to define group entries to associate with the class map:

- **group** *group-address*

Defines a group address to be associated with an IGMP static group class map.

- **group** *group-address* **to** *group-address*

Defines a range of group addresses to be associated with an IGMP static group class map.

- **group** *group-address* **source** *source-address*

Defines an SSM channel to be associated with an IGMP static group class map.

- **group** *group-address* **to** *group-address* **source** *source-address*

Defines a range of SSM channels to be associated with an IGMP static group class map.

Unlike QoS class maps, IGMP static group range class maps are not configured in traffic policies. Rather, the **ip igmp static-group** command has been extended to support IGMP static group ranges. After creating an IGMP static group class map, you can attach the class map to interfaces using the **ip igmp static-group** command with the **class-map**keyword and *class-map-name* argument. Once a class map is attached to an interface, all group entries defined in the class map become statically connected members on the interface and are added to the IGMP cache and IP multicast route (mroute) table.

Additional Guidelines for Configuring IGMP Static Group Range Support

- Only one IGMP static group class map can be attached to an interface.
- If an IGMP static group class map is modified (that is, if group entries are added to or removed from the class map using the **group** command), the group entries that are added to or removed from the IGMP static group class map are added to or deleted from the IGMP cache and the mroute table, respectively.
- If an IGMP static group class map is replaced on an interface by another class map using the **ip igmp static-group** command, the group entries associated with old class map are removed, and the group entries defined in the new class map are added to the IGMP cache and mroute table.
- The **ip igmp static-group** command accepts an IGMP static group class map for the *class-map-name* argument, regardless of whether the class map configuration exists. If a class map attached to an interface does not exist, the class map remains inactive. Once the class map is configured, all group entries associated with the class map are added to the IGMP cache and mroute table.
- If a class map is removed from an interface using the **no** form of the **ip igmp static-group** command, all group entries defined in the class map are removed from the IGMP cache and mroute tables.

Benefits of IGMP Static Group Range Support

The IGMP Static Group Range Support feature provides the following benefits:

- Simplifies the administration of devices that require many interfaces to be configured with many different **ip igmp static-group** command configurations by introducing the capability to configure group ranges in class maps and attach class maps to the **ip igmp static-group** command.
- Reduces the number of commands required to administer devices that require many **ip igmp static-group** command configurations.

How to Configure IGMP Static Group Range Support

Configuring IGMP Static Group Range Support

The IGMP Static Group Range Support feature is an enhancement that simplifies the administration of devices that require many interfaces to be configured with many different **ip igmp static-group** command

configurations by introducing the capability to configure group ranges in class maps and attach class maps to the **ip igmp static-group** command.

Perform this task to configure IGMP static group class maps and attach class maps to the **ip igmp static-group** command.

Note   Although the IGMP Static Group Range Support feature uses the MQC to define class maps, the procedure for configuring IGMP static group class maps is different from the normal procedure used to create class maps for configuring QoS traffic policies. For more information about IGMP static group class maps, including configuration guidelines, see the Class Maps for IGMP Static Group Range Support, page 2 section.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **class-map type multicast-flows** *class-map-name*
4. **group** *group-address* [**to** *group-address*] [**source** *source-address*]
5. Repeat Step 4 to add group entries to the class map in Step 3.
6. Repeat Step 3 to Step 5, if you want to create additional class maps.
7. **exit**
8. **interface** *type number*
9. **ip igmp static-group class-map** *class-map-name*
10. Repeat Step 8 and 9, if you want to attach class maps to additional interfaces.
11. **ip igmp static-group ***
12. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** Router> enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** Router# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
Step 3	**class-map type multicast-flows** *class-map-name* **Example:** `Router(config)# class-map type multicast-flows static1`	Enters multicast-flows class map configuration mode to create or modify an IGMP static group class map.
Step 4	**group** *group-address* [**to** *group-address*] [**source** *source-address*] **Example:** `Router(config-mcast-flows-cmap)# group 232.1.1.7 to 232.1.1.20`	Defines the group entries to be associated with the class map. • Specify the optional **to** keyword and *group-address* argument to define a range of multicast groups. • Specify the optional **source** keyword and *source-address* argument to define a (S, G) channel or a range of (S, G) channels.
Step 5	Repeat Step 4 to add group entries to the class map in Step 3.	--
Step 6	Repeat Step 3 to Step 5, if you want to create additional class maps.	--
Step 7	**exit** **Example:** `Router(config-mcast-flows-cmap)# exit`	Exits multicast-flows class-map configuration mode and returns to global configuration mode.
Step 8	**interface** *type number* **Example:** `Router(config)# interface FastEthernet 0/1`	Enters interface configuration mode.
Step 9	**ip igmp static-group class-map** *class-map-name* **Example:** `Router(config-if)# ip igmp static-group class-map static1`	Attaches an IGMP static group class map to the interface. • Once a class map is attached to an interface, all group entries defined in the class map become statically connected members on the interface and are added to the IGMP cache and mroute table.
Step 10	Repeat Step 8 and 9, if you want to attach class maps to additional interfaces.	--

Command or Action	Purpose
Step 11 **ip igmp static-group *** **Example:** `Router(config-if)# ip igmp static-group *`	(Optional) Places the interface into all created multicast route (mroute) entries. • **For Cisco IOS Release 15.1(1)T and later releases**: Required if the interface of a last hop router does not have any PIM neighbors and does not have a receiver. Configure this command before any receiver joins (before any (*, G) state is created on the router) to simulate the presence of a receiver for all multicast group addresses on the interface, causing the interface to be added to the olist of the mroute entry and preventing incoming last-hop router traffic for a dense mode group on the interface from being dropped.
Step 12 **end** **Example:** `Router(config-if)# end`	Exits interface configuration mode, and enters privileged EXEC mode.

Verifying IGMP Static Group Range Support

Perform this optional task to verify the contents of IGMP static group class maps configurations, and to confirm that all group entries defined in class maps were added to the IGMP cache and the mroute table after you attach class maps to interfaces.

SUMMARY STEPS

1. **show ip igmp static-group class-map** [**interface** [*type number*]]
2. **show ip igmp groups** [*group-name | group-address| interface-type interface-number*] [**detail**]
3. **show ip mroute**

DETAILED STEPS

Step 1 **show ip igmp static-group class-map** [**interface** [*type number*]]
Use this command to display the contents of IGMP static group class maps and the interfaces using class maps:

• Specify the **interface** keyword to filter the output to display only the interfaces using class maps.
• Specify the **interface** keyword and the *type number* arguments to filter the output to display only the class map attached to a particular interface.

The following is sample output from the **show ip igmp static-group class-map** command:

Example:

```
Router# show ip igmp static-group class-map
Class-map static1
  Group address range 228.8.8.7 to 228.8.8.9
  Group address 232.8.8.7, source address 10.1.1.10
```

```
  Interfaces using the classmap:
    Loopback0
Class-map static
  Group address range 232.7.7.7 to 232.7.7.9, source address 10.1.1.10
  Group address 227.7.7.7
  Group address range 227.7.7.7 to 227.7.7.9
  Group address 232.7.7.7, source address 10.1.1.10
  Interfaces using the classmap:
    FastEthernet3/1
```

The following is sample output from the **show ip igmp static-group class-map**command with the **interface** keyword:

Example:

```
Router# show ip igmp static-group class-map interface

Loopback0
  Class-map attached: static1
FastEthernet3/1
  Class-map attached: static
```

The following is sample output from the **show ip igmp static-group class-map**command with the **interface** keyword and *type number* arguments:

Example:

```
Router# show ip igmp static-group class-map interface FastEthernet 3/1
FastEthernet3/1
  Class-map attached: static
```

Step 2   **show ip igmp groups** [*group-name | group-address| interface-type interface-number*] [**detail**]

Use this command to display the multicast groups with receivers that are directly connected to the router and that are learned through IGMP.

When verifying an IGMP static group range configuration, use this command after attaching a class map to confirm that the group entries defined in the class map were added to the IGMP cache.

The following is sample output from the **show ip igmp groups** command:

Example:

```
Router# show ip igmp groups
IGMP Connected Group Membership
Group Address    Interface           Uptime    Expires   Last Reporter
232.7.7.7        FastEthernet3/1     00:00:09  stopped   0.0.0.0
232.7.7.9        FastEthernet3/1     00:00:09  stopped   0.0.0.0
232.7.7.8        FastEthernet3/1     00:00:09  stopped   0.0.0.0
227.7.7.7        FastEthernet3/1     00:00:09  stopped   0.0.0.0
227.7.7.9        FastEthernet3/1     00:00:09  stopped   0.0.0.0
227.7.7.8        FastEthernet3/1     00:00:09  stopped   0.0.0.0
224.0.1.40       FastEthernet3/2     01:44:50  00:02:09  10.2.2.5
224.0.1.40       Loopback0           01:45:22  00:02:32  10.3.3.4
```

Step 3   **show ip mroute**

Use this command to display the contents of the mroute table.

When verifying an IGMP static group range configuration, use this command after attaching a class map to confirm that group entries defined in the class map were added to the mroute table.

The following is sample output from the **show ip mroute** command:

Example:

```
Router# show ip mroute
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
       L - Local, P - Pruned, R - RP-bit set, F - Register flag,
       T - SPT-bit set, J - Join SPT, M - MSDP created entry,
       X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
       U - URD, I - Received Source Specific Host Report, Z - Multicast Tunnel
       Y - Joined MDT-data group, y - Sending to MDT-data group
Outgoing interface flags: H - Hardware switched, A - Assert winner
 Timers: Uptime/Expires
 Interface state: Interface, Next-Hop or VCD, State/Mode
(10.1.1.10, 232.7.7.7), 00:00:17/00:02:42, flags: sTI
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.5
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:17/00:02:42
(10.1.1.10, 232.7.7.9), 00:00:17/00:02:42, flags: sTI
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.5
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:17/00:02:42
(10.1.1.10, 232.7.7.8), 00:00:18/00:02:41, flags: sTI
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.5
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:18/00:02:41
(*, 227.7.7.7), 00:00:18/00:02:41, RP 10.2.2.6, flags: SJC
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.6
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:18/00:02:41
(*, 227.7.7.9), 00:00:18/00:02:41, RP 10.2.2.6, flags: SJC
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.6
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:18/00:02:41
(*, 227.7.7.8), 00:00:18/00:02:41, RP 10.2.2.6, flags: SJC
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.6
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:18/00:02:41
(*, 224.0.1.40), 00:01:40/00:02:23, RP 10.2.2.6, flags: SJCL
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.6
  Outgoing interface list:
    Loopback0, Forward/Sparse-Dense, 00:01:40/00:02:23
```

Configuration Examples for IGMP Static Group Range Support

Configuring IGMP Static Group Support Example

The following example shows how to configure a class map and attach the class map to an interface. In this example, a class map named static is configured and attached to FastEthernet interface 3/1.

```
class-map type multicast-flows static
 group 227.7.7.7
 group 232.7.7.7 to 232.7.7.9 source 10.1.1.10
 group 232.7.7.7 source 10.1.1.10
 group 227.7.7.7 to 227.7.7.9
 .
 .
```

```
  .
  !
interface FastEthernet3/1
 ip address 192.168.1. 2 255.255.255.0
 ip pim sparse-dense-mode
 ip igmp static-group class-map static
!
```

Verifying IGMP Static Group Support Example

The following is sample output from the **show ip igmp static-group class-map** command. In this example, the output displays the contents of the IGMP static group class map named static (the class map configured in the Configuring IGMP Static Group Support Example, page 8 section).

```
Router# show ip igmp static-group class-map

Class-map static
  Group address range 227.7.7.7 to 227.7.7.9
  Group address 232.7.7.7, source address 10.1.1.10
  Group address range 232.7.7.7 to 232.7.7.9, source address 10.1.1.10
  Group address 227.7.7.7
  Interfaces using the classmap:
    FastEthernet3/1
```

The following is sample output from the **show ip igmp groups** command. In this example, the command is issued to confirm that the group entries defined in the class map named static (the class map configured in the Configuring IGMP Static Group Support Example, page 8 section) were added to the IGMP cache.

```
Router# show ip igmp groups
IGMP Connected Group Membership
Group Address    Interface              Uptime     Expires    Last Reporter
232.7.7.7        FastEthernet3/1        00:00:09   stopped    0.0.0.0
232.7.7.9        FastEthernet3/1        00:00:09   stopped    0.0.0.0
232.7.7.8        FastEthernet3/1        00:00:09   stopped    0.0.0.0
227.7.7.7        FastEthernet3/1        00:00:09   stopped    0.0.0.0
227.7.7.9        FastEthernet3/1        00:00:09   stopped    0.0.0.0
227.7.7.8        FastEthernet3/1        00:00:09   stopped    0.0.0.0
224.0.1.40       FastEthernet3/2        01:44:50   00:02:09   10.2.2.5
224.0.1.40       Loopback0              01:45:22   00:02:32   10.3.3.4
```

The following is sample output from the **show ip mroute** command. In this example, the command is issued to confirm that the group entries defined in the class map named static (the class map configured in the Configuring IGMP Static Group Support Example, page 8 section) were added to the mroute table.

```
Router# show ip mroute
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
       L - Local, P - Pruned, R - RP-bit set, F - Register flag,
       T - SPT-bit set, J - Join SPT, M - MSDP created entry,
       X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
       U - URD, I - Received Source Specific Host Report, Z - Multicast Tunnel
       Y - Joined MDT-data group, y - Sending to MDT-data group
Outgoing interface flags: H - Hardware switched, A - Assert winner
 Timers: Uptime/Expires
 Interface state: Interface, Next-Hop or VCD, State/Mode
(10.1.1.10, 232.7.7.7), 00:00:17/00:02:42, flags: sTI
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.5
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:17/00:02:42
(10.1.1.10, 232.7.7.9), 00:00:17/00:02:42, flags: sTI
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.5
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:17/00:02:42
(10.1.1.10, 232.7.7.8), 00:00:18/00:02:41, flags: sTI
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.5
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:18/00:02:41
```

```
(*, 227.7.7.7), 00:00:18/00:02:41, RP 10.2.2.6, flags: SJC
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.6
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:18/00:02:41
(*, 227.7.7.9), 00:00:18/00:02:41, RP 10.2.2.6, flags: SJC
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.6
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:18/00:02:41
(*, 227.7.7.8), 00:00:18/00:02:41, RP 10.2.2.6, flags: SJC
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.6
  Outgoing interface list:
    FastEthernet3/1, Forward/Sparse-Dense, 00:00:18/00:02:41
(*, 224.0.1.40), 00:01:40/00:02:23, RP 10.2.2.6, flags: SJCL
  Incoming interface: FastEthernet3/2, RPF nbr 10.2.2.6
  Outgoing interface list:
    Loopback0, Forward/Sparse-Dense, 00:01:40/00:02:23
```

Additional References

Related Documents

Related Topic	Document Title
IP multicast commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	Cisco IOS IP Multicast Command Reference

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS XE software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	--

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for IGMP Static Group Range Support

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1　　　*Feature Information for IGMP Static Group Range Support*

Feature Name	Releases	Feature Information
IGMP Static Group Range Support	12.2(18)SXF5 15.0(1)M 12.2(33)SRE	The IGMP Static Group Range Support feature introduces the capability to configure group ranges in class maps and attach class maps to the **ip igmp static-group** command. This feature is an enhancement that simplifies the administration of networks with devices that require many interfaces to be configured with many **ip igmp static-group** commands. The following commands were introduced or modified by this feature: **class-map type multicast-flows**, **group (multicast-flows)**, **ip igmp static-group**, **show ip igmp static-group class-map**.