IGMPv3 Host Stack

This module describes how to configure Internet Group Management Protocol (IGMP) Version 3 (v3) Host Stack feature for enabling devices to function as multicast network endpoints or hosts.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and 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.

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.

Prerequisites for IGMPv3 Host Stack

- IP multicast is enabled and all Protocol Independent Multicast (PIM) interfaces have been configured using the tasks described in the "Configuring Basic IP Multicast" module of the *IP Multicast: PIM Configuration Guide*.
- IGMP version 3 must be configured on the interface.
- The device must be configured for SSM. IGMPv3 membership reports are sent for SSM channels only.

Information About IGMPv3 Host Stack

IGMPv3

Internet Group Management Protocol (IGMP) is the protocol used by IPv4 devices to report their IP multicast group memberships to neighboring multicast devices. Version 3 (v3) of IGMP adds support for source filtering. Source filtering enables a multicast receiver host to signal from which groups it wants to receive multicast traffic, and from which sources this traffic is expected. That information may be used by multicast routing protocols to avoid delivering multicast packets from specific sources to networks where there are no interested receivers.

In addition, IGMPv3 supports the link local address 224.0.0.22, which is the destination IP address for IGMPv3 membership reports; all IGMPv3-capable multicast devices must listen to this address. RFC 3376 defines IGMPv3.

IGMPv3 Host Stack

The IGMPv3 Host Stack feature enables devices to function as multicast network endpoints or hosts. The feature adds INCLUDE mode capability to the IGMPv3 host stack for Source Specific Multicast (SSM) groups. Enabling the IGMPv3 host stack ensures that hosts on a LAN can leverage SSM by enabling the device to initiate IGMPv3 joins, such as in environments where fast channel change is required in a SSM deployments.

To support of the IGMPv3 Host Stack feature, you must configure the INCLUDE mode capability on the IGMPv3 host stack for SSM groups. When the IGMPv3 Host Stack feature is configured, an IGMPv3 membership report is sent when one of the following events occurs:

- When an interface is configured to join a group and source and there is no existing state for this (S, G) channel, an IGMPv3 report of group record type ALLOW_NEW_SOURCES for the source specified is sent on that interface.

- When membership for a group and source is cancelled and there is state for this (S, G) channel, an IGMPv3 report of group record type BLOCK_OLD_SOURCES for the source specified is sent on that interface.

- When a query is received, an IGMPv3 report is sent as defined in RFC 3376.

Note   For more information about IGMPv3 group record types and membership reports, see *RFC 3376, Internet Group Management Protocol, Version 3* .

How to Configure IGMPv3 Host Stack

Enabling the IGMPv3 Host Stack

Note If the **ip igmp join-group** command is configured for a group and source and IGMPv3 is not configured on the interface, (S, G) state will be created but no IGMPv3 membership reports will be sent.

Perform this task to add INCLUDE mode capability to the IGMPv3 host stack for SSM groups

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SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type* *number*
4. **ip igmp version 3**
5. **ip igmp join-group** *group - address* **source** *source - address*
6. **end**
7. **show ip igmp groups detail**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** Device> enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** Device# configure terminal	Enters global configuration mode.
Step 3	**interface** *type* *number* **Example:** Device(config)# interface FastEthernet 1	Enters interface configuration mode. The specified interface must be connected to hosts.

	Command or Action	Purpose
Step 4	**ip igmp version 3** **Example:** Device(config-if)# ip igmp version 3	Enables IGMPv3 on the interface.
Step 5	**ip igmp join-group** *group* - *address* **source** *source* - *address* **Example:** Device(config-if)# ip igmp join-group 232.2.2.2 source 10.1.1.1	Configures the interface to join the specified (S, G) channel and enables the device to provide INCLUDE mode capability for the (S, G) channel . **Note** Repeat this step for each channel to be configured with the INCLUDE mode capability.
Step 6	**end** **Example:** Device(config-if)# end	Returns to privileged EXEC mode.
Step 7	**show ip igmp groups detail** **Example:** Device# show ip igmp groups detail	Displays directly-connected multicast groups that were learned through IGMP.

Configuration Examples for IGMPv3 Host Stack

Example: Enabling the IGMPv3 Host Stack

The following example shows how to add INCLUDE mode capability to the IGMPv3 host stack for SSM groups:

```
interface FastEthernet0/0/0
 ip igmp join-group 232.2.2.2 source 10.1.1.1
 ip igmp join-group 232.2.2.2 source 10.5.5.5
 ip igmp join-group 232.2.2.2 source 10.5.5.6
 ip igmp join-group 232.2.2.4 source 10.5.5.5
 ip igmp join-group 232.2.2.4 source 10.5.5.6
 ip igmp version 3
```

Based on the configuration presented in the preceding example, the following is sample output from the **debug igmp** command. The messages confirm that IGMPv3 membership reports are being sent after IGMPv3 and SSM are enabled:

```
Device# debug igmp

*May 4 23:48:34.251: IGMP(0): Group 232.2.2.2 is now in the SSM range, changing
*May 4 23:48:34.251: IGMP(0): Building v3 Report on GigabitEthernet0/0/0
```

```
*May 4 23:48:34.251: IGMP(0): Add Group Record for 232.2.2.2, type 5
*May 4 23:48:34.251: IGMP(0): Add Source Record 10.1.1.1
*May 4 23:48:34.251: IGMP(0): Add Source Record 10.5.5.5
*May 4 23:48:34.251: IGMP(0): Add Source Record 10.5.5.6
*May 4 23:48:34.251: IGMP(0): Add Group Record for 232.2.2.2, type 6
*May 4 23:48:34.251: IGMP(0): No sources to add, group record removed from report
*May 4 23:48:34.251: IGMP(0): Send unsolicited v3 Report with 1 group records on
FastEthernet0/0/0
*May 4 23:48:34.251: IGMP(0): Group 232.2.2.4 is now in the SSM range, changing
*May 4 23:48:34.251: IGMP(0): Building v3 Report on GigabitEthernet0/0/0
*May 4 23:48:34.251: IGMP(0): Add Group Record for 232.2.2.4, type 5
*May 4 23:48:34.251: IGMP(0): Add Source Record 10.5.5.5
*May 4 23:48:34.251: IGMP(0): Add Source Record 10.5.5.6
*May 4 23:48:34.251: IGMP(0): Add Group Record for 232.2.2.4, type 6
*May 4 23:48:34.251: IGMP(0): No sources to add, group record removed from report
*May 4 23:48:34.251: IGMP(0): Send unsolicited v3 Report with 1 group records on
FastEthernet0/0/0
*May 4 23:48:35.231: IGMP(0): Building v3 Report on GigabitEthernet0/0/0
*May 4 23:48:35.231: IGMP(0): Add Group Record for 232.2.2.2, type 5
*May 4 23:48:35.231: IGMP(0): Add Source Record 10.1.1.1
*May 4 23:48:35.231: IGMP(0): Add Source Record 10.5.5.5
*May 4 23:48:35.231: IGMP(0): Add Source Record 10.5.5.6
*May 4 23:48:35.231: IGMP(0): Add Group Record for 232.2.2.2, type 6
*May 4 23:48:35.231: IGMP(0): No sources to add, group record removed from report
*May 4 23:48:35.231: IGMP(0): Send unsolicited v3 Report with 1 group records on
FastEthernet0/0/0
*May 4 23:48:35.231: IGMP(0): Building v3 Report on GigabitEthernet0/0/0
*May 4 23:48:35.231: IGMP(0): Add Group Record for 232.2.2.4, type 5
*May 4 23:48:35.231: IGMP(0): Add Source Record 10.5.5.5
*May 4 23:48:35.231: IGMP(0): Add Source Record 10.5.5.6
*May 4 23:48:35.231: IGMP(0): Add Group Record for 232.2.2.4, type 6
*May 4 23:48:35.231: IGMP(0): No sources to add, group record removed from report
*May 4 23:48:35.231: IGMP(0): Send unsolicited v3 Report with 1 group records on
FastEthernet0/0/0
```

The following is sample output from the **show ip igmp groups detail** command for this configuration example scenario. This command can be used to verify that the device has received membership reports for (S, G) channels that are configured to join a group. When the device is correctly receiving IGMP membership reports for a channel, the "Flags:" output field will display the L and SSM flags.

```
Device# show ip igmp groups detail

Flags: L - Local, U - User, SG - Static Group, VG - Virtual Group,
       SS - Static Source, VS - Virtual Source
Interface:      FastEthernet0/0/0
Group:          232.2.2.2
Flags:          L SSM
Uptime:         00:04:12
Group mode:     INCLUDE
Last reporter:  10.4.4.7
Group source list: © - Cisco Src Report, U - URD, R - Remote, S - Static,
                   V - Virtual, Ac - Accounted towards access control limit,
                   M - SSM Mapping, L - Local)
  Source Address   Uptime    v3 Exp   CSR Exp   Fwd  Flags
  10.1.1.1         00:04:10  stopped  stopped   Yes  L
  10.5.5.5         00:04:12  stopped  stopped   Yes  L
  10.5.5.6         00:04:12  stopped  stopped   Yes  L
Interface:      FastEthernet0/0/0
Group:          232.2.2.3
Flags:          L SSM
Uptime:         00:04:12
Group mode:     INCLUDE
Last reporter:  10.4.4.7
Group source list: © - Cisco Src Report, U - URD, R - Remote, S - Static,
                   V - Virtual, Ac - Accounted towards access control limit,
                   M - SSM Mapping, L - Local)
  Source Address   Uptime    v3 Exp   CSR Exp   Fwd  Flags
  10.5.5.5         00:04:14  stopped  stopped   Yes  L
  10.5.5.6         00:04:14  stopped  stopped   Yes  L
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
IP multicast commands	Cisco IOS IP Multicast Command Reference

Standards and RFCs

Standard/RFC	Title
RFC 3376	*Internet Group Management Protocol, Version 3*

MIBs

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

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for IGMPv3 Host Stack

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 IGMPv3 Host Stack

Feature Name	Releases	Feature Information
IGMPv3 Host Stack	12.3(14)T 12.2(33)SRE Cisco IOS XE Release 2.1 Cisco IOS XE Release 3.3SG 15.1(1)SG 15.1(1)SY	The IGMPv3 Host Stack feature enables Cisco devices to function as multicast network endpoints or hosts. The feature adds the INCLUDE mode capability to the IGMPv3 host stack for SSM groups. Enabling the IGMPv3 host stack ensures that hosts on a LAN can leverage SSM by enabling the device to initiate IGMPv3 joins, such as in environments where fast channel change is required in a SSM deployments. The following commands were introduced or modified: **ip igmp join-group**.