PIM Triggered Joins

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The PIM Triggered Joins feature is a high availability (HA) multicast enhancement that improves the reconvergence of multicast routes (mroutes) after a supervisor engine switchover on a Catalyst 6500 series switch. In the event of a supervisor engine switchover, this feature utilizes the Generation ID (GenID) value as a mechanism to trigger adjacent Protocol Independent Multicast (PIM) neighbors on an interface to send PIM join messages for all (*, G) and (S, G) mroutes that use that interface as a reverse path forwarding (RPF) interface, immediately reestablishing those states on the newly active supervisor engine.

Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the "Feature Information for PIM Triggered Joins" section on page 6.

Finding Support Information for Platforms and Cisco IOS and Catalyst OS Software Images

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

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Restrictions for PIM Triggered Joins

All PIM neighbors must be compliant with RFC 4601 and be able to process GenID differences in PIM hello messages.

Information About PIM Triggered Joins

To understand the PIM Triggered Joins feature, you should be familiar with the following concept:

- Functional Overview of PIM Triggered Joins, page 2

Functional Overview of PIM Triggered Joins

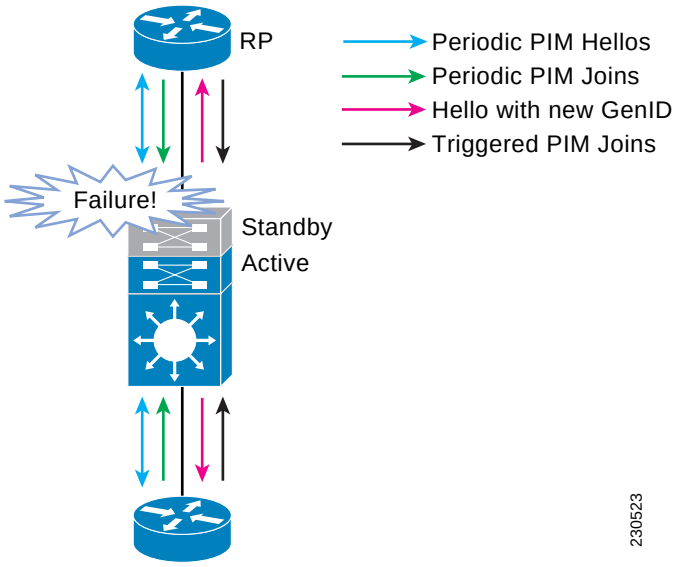
The PIM Triggered Joins feature is an HA multicast enhancement that improves the reconvergence of mroutes after a supervisor engine switchover on a Catalyst 6500 series switch. In the event of a supervisor engine switchover, this feature utilizes the GenID value as a mechanism to trigger adjacent PIM neighbors on an interface to send PIM join messages for all (*, G) and (S, G) mroutes that use that interface as an RPF interface, immediately reestablishing those states on the newly active supervisor engine. A GenID is a randomly generated 32-bit value regenerated each time PIM forwarding is started or restarted on an interface.

Note In order to process the GenID value in PIM hello messages, PIM neighbors must be running Cisco IOS software with an implementation of PIM that is compliant with RFC 4601. For more information about RFC 4601, see the "Additional References" section.

After a service engine switchover, all instances of PIM running on the newly active supervisor engine will modify the value of the GenID that is included in PIM hello messages sent to adjacent PIM neighbors. When an adjacent PIM neighbor receives a PIM hello message on an interface with a new GenID, the PIM neighbor will process the modified GenID as an indication that the PIM neighbor has gone down. A modified GenID, thus, is a mechanism to alert all adjacent PIM neighbors that PIM forwarding on that interface has been lost, which then triggers adjacent PIM neighbors to send PIM joins for all (*, G) and (S, G) mroute states that use that interface as an RPF interface.

Figure 1 illustrates the operations that occur in association with the PIM Triggered Joins feature during a service engine switchover.

Figure 1 Operation of PIM Triggered Joins During a Switchover



The mechanics of the PIM Triggered Joins feature are as follows:

- In steady state, PIM neighbors exchange periodic PIM hello messages.
- An active supervisor engine receives PIM joins to periodically refresh mroute states.
- When an active supervisor engine fails, the standby supervisor engine takes over to become the new active supervisor engine.
- PIM neighbors on the new active supervisor engine then modify the GenID value and send the new GenID in PIM hello messages to adjacent PIM neighbors as a means to alert adjacent PIM neighbors that PIM forwarding has been restarted.
- Adjacent PIM neighbors that receive PIM hello messages on an interface with a new GenID then send PIM triggered joins for all (*, G) and (S, G) mroutes that use that interface as an RPF interface, promptly reestablishing those states on the newly active supervisor engine.

Prior to the introduction of the PIM Triggered Joins feature in Cisco IOS Release 12.2(33)SXH, in the event of a supervisor engine switchover on a Catalyst 6500 series switch, all hardware entries would have been suspended until the control plane was reestablished. States for mroutes on the new active supervisor engine, thus, would not have been rebuilt until the periodic joins sent by adjacent PIM neighbors were received by PIM neighbors on the new active supervisor engine. The PIM Triggered Joins feature, thus, improves the recovergence time of mroutes after a supervisor engine switchover, enabling mroute states to be rebuilt promptly after a supervisor engine switchover.

Note If a PIM neighbor is unable to process the GenID value, the PIM neighbor will ignore the GenID value and behave in the manner that it would prior to the introduction of the PIM Triggered Joins feature in Cisco IOS Release 12.2(33)SXH.

Additional References

The following sections provide references related to the PIM Triggered Joins feature.

Related Documents

Related Topic	Document Title
Multicast configuration tasks on Catalyst 6500 series switches	"Configuring Multicast Services" module in the *Catalyst 6500 Series Software Configuration Guide*, 8.6
Multicast concepts and tasks	*Cisco IOS IP Multicast Configuration Guide*, Release 12.4T
IP multicast commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	*Cisco IOS IP Multicast Command Reference*, Release 12.2SX

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 releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
RFC 4601	*Protocol Independent Multicast - Sparse Mode (PIM-SM): Protocol Specification (Revised)*

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/techsupport

Feature Information for PIM Triggered Joins

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note Table 1 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

Table 1 Feature Information for PIM Triggered Joins

Feature Name	Releases	Feature Information
PIM Triggered Joins	12.2(33)SXH	The PIM Triggered Joins feature is an HA multicast enhancement that improves the reconvergence of mroutes after a supervisor engine switchover on a Catalyst 6500 series switch. In the event of a supervisor engine switchover, this feature utilizes the Generation ID value as a mechanism to trigger adjacent PIM neighbors on an interface to send PIM join messages for all (*, G) and (S, G) mroutes that use that interface as an RPF interface, immediately reestablishing those states on the newly active supervisor engine. In 12.2(33)SXH, this feature was introduced on the Catalyst 6500. The following command was modified by this feature: **debug ip mrouting**.