PIM Triggered Joins

The PIM Triggered Joins feature is a high availability (HA) multicast enhancement that improves the reconvergence of multicast routes (mroutes) after an RP switchover.

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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 at the end of this module.

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.

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

Functional Overview of PIM Triggered Joins

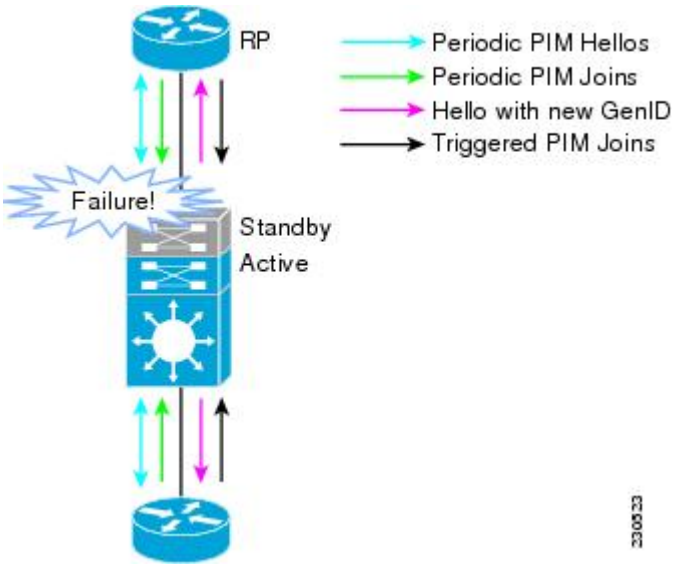
The PIM Triggered Joins feature is an HA multicast enhancement that improves the reconvergence of mroutes after an RP switchover. In the event of an RP switchover, this feature utilizes the Protocol Indepedent Multicast sparse mode (PIM-SM) GenID value as a mechanism to trigger adjacent PIM neighbors 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 RP. 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 an RP switchover, all instances of PIM running on the newly active RP 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.

The figure illustrates the operations that occur in association with the PIM Triggered Joins feature during an RP 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 RP receives PIM joins to periodically refresh mroute states.
- When an active RP fails, the standby RP takes over to become the new active RP.
- The new active RP then modifies the GenID value and sends the new GenID in PIM hello messages to adjacent PIM neighbors.
- 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 interfaces as an RPF interface.
- Those mroute states are then immediately reestablished on the newly active RP.

Prior to the introduction of the PIM Triggered Joins feature, in the event of an RP switchover, all hardware entries would have been suspended until the control plane was reestablished. States for mroutes on the new active RP, thus, would not have been rebuilt until the periodic joins sent by adjacent PIM neighbors were received by PIM neighbors on the new active RP. The PIM Triggered Joins feature, thus, improves the recovergence time of mroutes after an RP switchover, enabling mroute states to be rebuilt promptly after an RP 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.

Generation IDs

A Generation ID (GenID) is a randomly generated 32-bit value that is regenerated each time PIM forwarding is started or restarted on an interface. In order to process the GenID value in PIM hello messages, PIM neighbors must be running software with an implementation of PIM that is compliant with RFC 4601.

Note PIM neighbors that are not compliant with RFC 4601 and are unable to process GenID differences in PIM hello messages will ignore the GenIDs.

PIM Triggered Joins and Multicast Traffic Flow

Multicast traffic flow on the neighbors is not affected if it detects a PIM triggered join or PIM hello message from a node with the failing RP within the default PIM hello hold-time interval. Multicast traffic flow on a failing RP is not affected if it is NSF capable.

Caution The default PIM hello hold-time interval is 3.5 x the PIM hello period. Multicast HA operations may not behave properly if the PIM hello interval is configured with a value lower than the default value of 30 seconds.

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

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

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 PIM Triggered Joins

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.

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Table 1: Feature Information for PIM Triggered Joins

Feature Name	Releases	Feature Information
PIM Triggered Joins	12.2(33)SXH Cisco IOS XE Release 2.6 15.0(1)M 12.2(33)SRE 15.1(1)SG Cisco IOS XE Release 3.3SG	The PIM Triggered Joins feature is an HA multicast enhancement that improves the reconvergence of mroutes after an RP switchover. In the event of an RP switchover, this feature utilizes the PIM-SM 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 RP.