Multiple Upstream Interface Support for IGMP/MLD Proxy

draft-asaeda-pim-multiif-igmpmlldproxy-01

Hitoshi Asaeda (NICT)
Eiichi Muramoto (Panasonic)
Luis M. Contreras (Telefonica)
Document History

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Background

- There are many situations an IGMP/MLD proxy multiply attached to same or different networks (e.g., Internet and Intranet) or different interfaces (e.g., ethernet and wireless link), yet RFC4605 does not support such multihoming situations.
- Enable an IGMP/MLD proxy device to use multiple upstream interfaces and receive multicast packets through these interfaces.
Objective

• Support multiple upstream interfaces for an IGMP/MLD proxy device
  – An IGMP/MLD proxy device enables to receive multicast sessions/channels through the different upstream interfaces

• Follow the requirement draft recently published
Benefits

• Load balancing
  – Subscriber-based upstream selection: One or more upstream interface(s) is selected per subscriber/receiver
  – Channel-based upstream selection: One or more upstream interface(s) is selected per channel/session

• Robust data reception
  – More than one upstream interface used per channel/session when more than one upstream interface is enabled for the channel/session

• Upstream interface takeover
  – Switch inactive upstream IF to other active (backup) IF
Static Upstream Interface Configuration

• Parameters for candidate upstream interface configuration
  – Subscriber address prefix
  – Channel/session ID
    • Source address prefix and multicast address prefix
  – Priority value
  – Backup interface(s)

• Configuration syntax
  – \((R: \text{subscriber-addr-prefix}, S: \text{source-addr-prefix}, G: \text{multicast-addr-prefix}) (P: \text{value}) (B: \text{IF-name})\)
  – Default: \((\text{null, null, null}) (0) (\text{null})\)

• Decision order
  – Subscriber prefix > Channel ID > Priority > Lowest IP address

Called “address prefix record”
Default Interface

- The default of “address prefixes” is “(null, null, null)”
- The default of “priority” is (0)
- The default of “backup interface” is “null”

- When all values are default for all candidate upstream interfaces, the configured upstream interface having lowest IP address is selected as the upstream interface for all multicast channels
Automatic Configuration

• Bootstrapping using hash values
  – Given RFC2991: Multipath Issues in Unicast and Multicast Next-Hop Selection

• Open questions
  – How routers automatically select appropriate upstream interfaces for all channels?
    • Just a selection using hash value is sufficient?
    • BTW, what is “appropriate”?
  – How routers quickly detect inactive upstream interfaces?
    • Monitoring IGMP/MLD Query and/or PIM Hello does not give quick actions
    • Defining a new IGMP/MLD message costs
  – When (i.e., in what kinds of conditions) routers switch to the backup upstream interfaces?
Conclusion

• Multiple upstream interface support following the requirement draft
  – Load balancing and robust data reception
  – Upstream interface takeover
  – Configuration for each candidate upstream interface

• Open questions
  – How automatic upstream interface configuration should be detailed?
    • Just a selection using hash value is sufficient?