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# Multiple Upstream Interface Support for IGMP/MLD Proxy

draft-asaeda-pim-multiif-igmpmldproxy-01

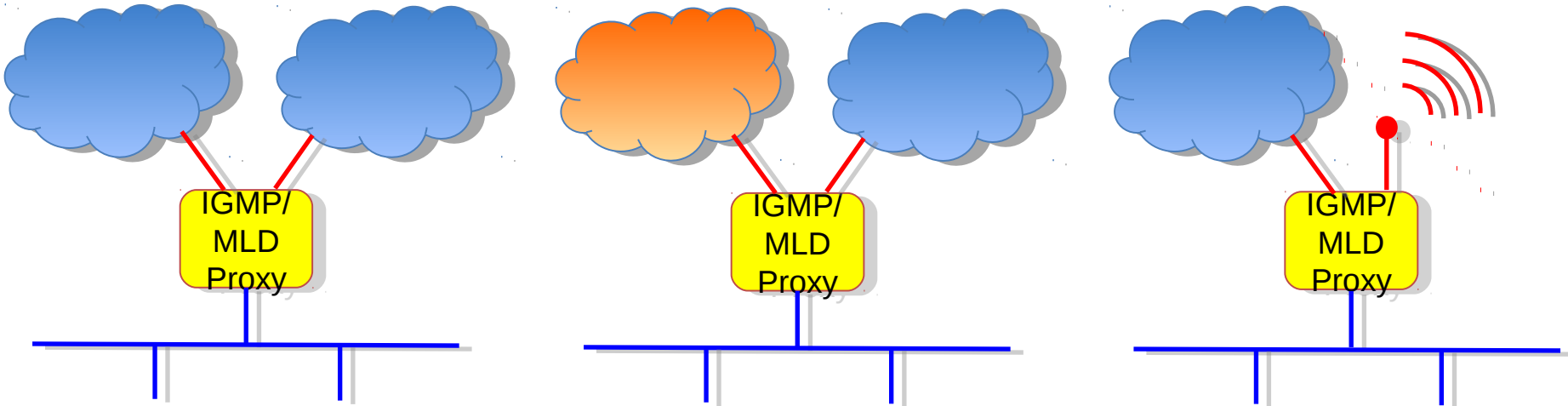
Hitoshi Asaeda (NICT)  
Eiichi Muramoto (Panasonic)  
Luis M. Contreras (Telefonica)

# Document History

- Multiple Upstream Interfaces Support for IGMP/MLD Proxy
  - draft-asaeda-pim-mldproxy-multif-00, Oct. 15, 2012
  - draft-asaeda-pim-mldproxy-multif-01, Feb. 25, 2013
  - draft-asaeda-pim-multiif-igmpmldproxy-00, Mar. 23, 2015
  - draft-asaeda-pim-multiif-igmpmldproxy-01, Jul. 6, 2015

# 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: subscriber-addr-prefix, S: source-addr-prefix, G: multicast-addr-prefix) (P: value) (B: IF-name)
  - Default: (null, null, null) (0) (null)
- Decision order
  - Subscriber prefix > Channel ID > Priority > Lowest IP address

# 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?