Multiple Upstream Interface Support for IGMP/MLD Proxy

draft-asaeda-pim-multiif-igmpmldproxy-07

Hitoshi Asaeda (NICT), Luis M. Contreras (Telefonica)

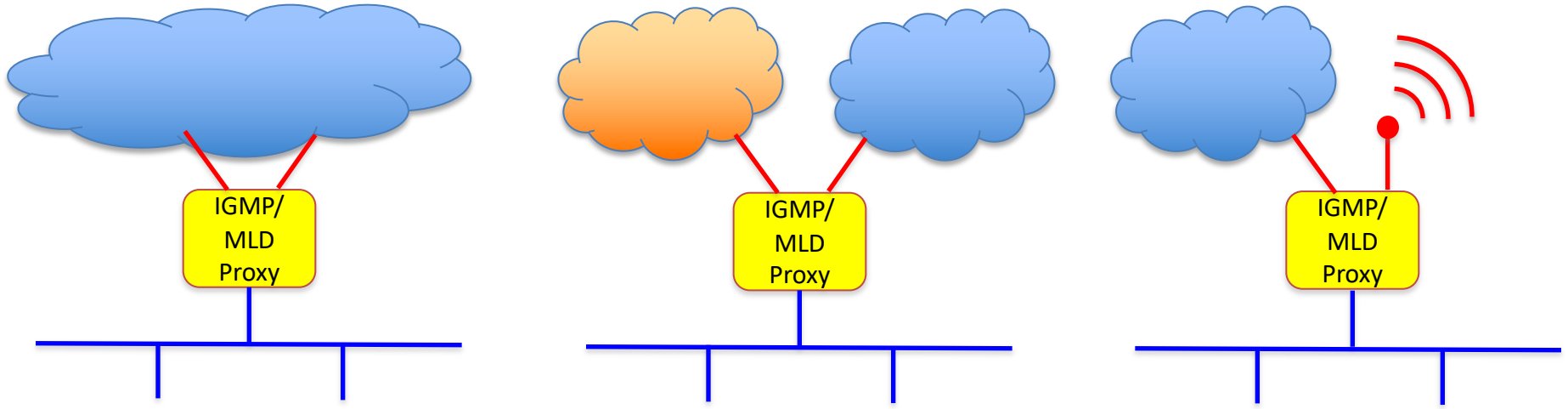
Multipath Support for IGMP/MLD Proxy

draft-asaeda-pim-multiif-igmpmldproxy-07

Hitoshi Asaeda (NICT), Luis M. Contreras (Telefonica)

Background

- There are many situations where an IGMP/MLD proxy is multiply attached to the different networks (e.g., ISP-A and ISP-B) or by means of different interfaces (e.g., wired and wireless links, WiFi and 5G).
- 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.



Objectives and expected benefits

Objectives

- Support multiple upstream interfaces for an IGMP/MLD proxy device
  - An IGMP/MLD proxy device enables the reception of multicast sessions/channels through the different upstream interfaces
- Propose two solutions (static and dynamic configurations) based on the following requirements draft
  - draft-ietf-pim-multiple-upstreams-reqs-08 (expired)

Benefits

- Flexible operation
  - Subscriber-based (i.e., client address 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 path to another active (backup) path

Upstream selection mechanisms

- draft-asaeda-pim-multiif-igmpmldproxy (intended status: Informational) specifies:
  - Static upstream interface configurations
    - Subscriber-based UIF selection
    - Channel-based UIF selection
      - UIF selected per (S,G) or (*,G) or (S,*) basis
    - Interface priority-based UIF selection
  - Use default upstream interface if no/wrong configuration
  - Introduce SDN-like controller-based upstream interface configuration
    - Detail specification will be described in a separate document
  - Introduce dynamic upstream interface configuration with the following document
- draft-contreras-pim-multiif-config (intended status: Proposed Standard) specifies:
  - Dynamic (i.e., signaling-based) upstream interface configuration
    - Requires IGMP/MLD extensions

Current and next steps

- PoC performed and documented in a publication
  - D. Fernández, L.M. Contreras, R. Flores Moyano, S. García, “NFV/SDN Based Multiple Upstream Interfaces Multicast Proxy Service”, 24th Conference on Innovation in Clouds, Internet and Networks (ICIN), Paris, France, March 2021.
- Next step
  - Define default active interval to detect an inactive upstream interface
  - Consider interaction with signaling methods (i.e., IGMP/MLD messages)
  - Consider security threats from potential DoS attacks
  - Request updating IGMP/MLD proxy YANG model (after publication)
- WG draft adoption?