Multi-Upstream Interfaces IGMP/MLD Proxy

draft-zhang-pim-muiimp-00

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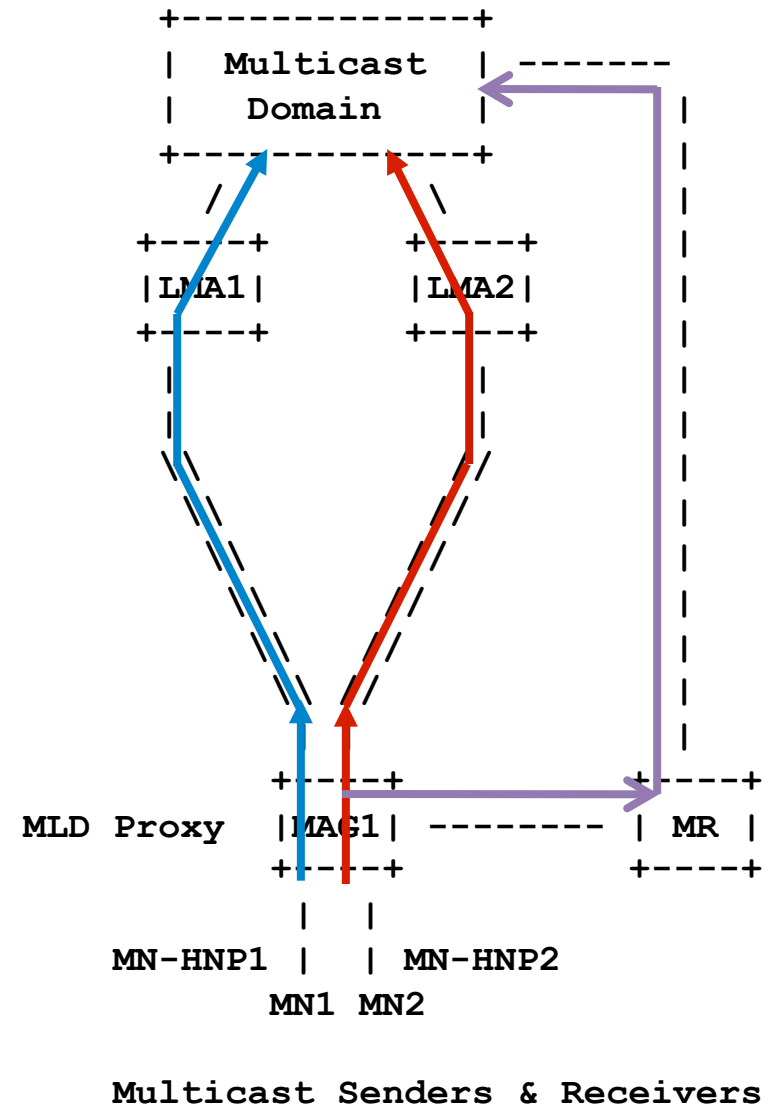2013.3

Why multi-upstream interfaces

➢ For PMIP mobile environments
1. Tunnel convergence
2. Route optimization

➢ For multihoming


```
                        +-------------+
                        |  Multicast  | -------
                        |   Domain    |        |
                        +-------------+ <----  |
                        /             \      | |
                  +----+               +----+ | |
                  |LMA1|               |LMA2| | |
                  +----+               +----+ | |
                                              | |
                                              | |
                                              | |
                                              | |
                                              | |
                                              | |
                  +----+               +----+ | |
    MLD Proxy     |MAG1| --------  | MR |
                  +----+               +----+
                   | |
        MN-HNP1 |   | MN-HNP2
              MN1 MN2

      Multicast Senders & Receivers
```

History of this Work

- Initial ideas in MAGMA
- Picked up in MULTIMOB
  - draft-zhang-multimob-msm-03, July 2011
  - draft-ietf-multimob-pmipv6-source-00, Jan 2012
- Work deferred to PIM WG
  - moved to Appendix in source-draft

Objectives & Requirements

- Requirements:
  - Unique coverage of receivers
  - Prevention of Routing Loops
- Objectives:
  - Distribute Multicast services according to local policies
  - Unambiguously guide traffic to/from upstream interfaces

Multi-Upstream Interfaces IGMP/MLD Proxy

✓ Inherits basic rule of the IGMP/MLD proxy

✓ Extends with multiple upstream interfaces

✓ Each upstream interface of an MUIIMP device MUST NOT send or subscribe the same data simultaneously.

✓ Approach: Route according to a filter table

✓ Policy List for default upstream interface (Uif) selection

✓ Different operation for source and receiver

Filter Table for MUIMP

Policy-based Upstream Routing

Group / Channel Specific Routing

Remaining Default

Multicast State	Upstream Interface
(S1$_{local}$, *)	UP-IF1
(*,G1)	UP-IF2
(S2,G2)	UP-IF3
(*,*)	UP-IF1

o Processing: Apply first matching filter

o For Sources:

- Can express policy-based routing

o For Receivers:

- Can sort according to Groups/Channels, but not policies
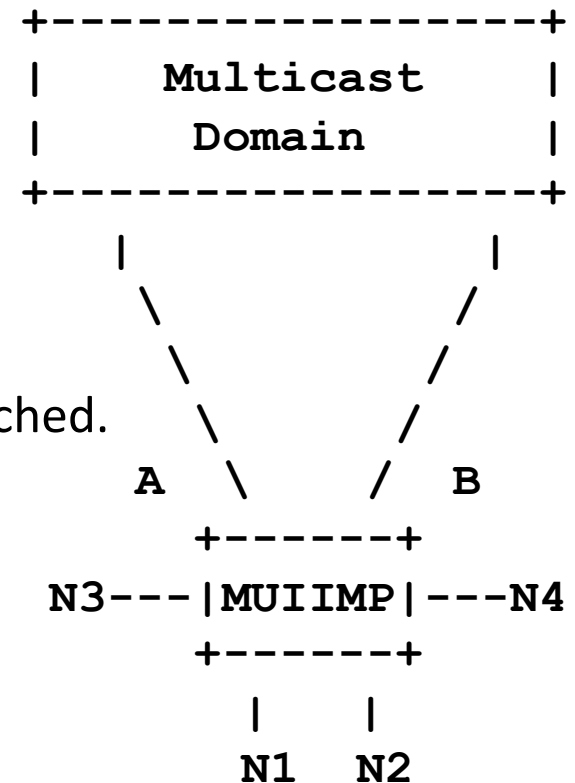
Multi-Upstream Interfaces IGMP/MLD Proxy

➢ Selection of the default upstream if

Policy List

(node prefix, G prefix/multicast state, Uif)

Node prefix represents the address prefix of the node attached.

Multicast group address indicates the channel that the
multicast listener is subscribing or the multicast source is
publishing.

Multicast state is only valid for multicast listeners.

```
+-------------------+
|     Multicast     |
|      Domain       |
+-------------------+
      |               |
       \             /
        \           /
         \         /
    A     \       /   B
           \     /
          +------+
    N3---|MUIIMP|---N4
          +------+
           |     |
          N1    N2
```

Node/Prefix	G prefix/subscription	Uif	S/R
N1	(S,G1)	A	R
N2	(*,G2)	B	R
N3 prefix	G3 prefix	B	R
N4	G4 prefix	A	S
N4	G5	B	S
*	*	A or B	*

Work of Interest?