Multicast using Multicast Routing Header

draft-chen-pim-mrh6

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1. **Introduction** [6MAN]

2. Brief Description

3. Encoding of P2MP Path/Tree

4. **Multicast Routing Header** (MRH) [6MAN]
   - Format
   - Ingress, transit, egress behavior

1. **Introduction**

- Existing solutions
  - ietf-sr-p2mp-policy
  - chen-pim-srv6-p2mp-path (comments received from WG)

- But have weaknesses

- This MRH: a good alternative
  - Taking those comments into account
  - More scalable
Multicast Routing Header (MRH): Format, Ingress

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Next Header  | Hdr Ext Len | RoutingType=TBD | SL
---|---|---|---

+b| Rsv | nB |
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Sub-tree from NH encoded by link numbers:

SL: points to sub-tree from NH
nB: # branches/links from NH
b: bits used for links from NH

Ingress (e.g., PE1) encaps packet in MRH for each NH and sends it to NH.
MRH includes sub-tree from NH (e.g., P1);
SL, nB, b in MRH are set to values for link to NH (i.e., b=1, nB, SL=11)

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P2MP Path

link

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P1 to P1

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P1 to P2, P3, PE8, PE9

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sub-tree from P1

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P1 to PE8

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P1 to PE9

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P2 to PE2

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sub-tree from P2

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ngress (e.g., PE1)

encaps packet in MRH for each NH and sends it to NH.
MRH includes sub-tree from NH (e.g., P1);
SL, nB, b in MRH are set to values for link to NH (i.e., b=1, nB, SL=11)
Packet received by P1: 4 branches/links from P1: P1→P2, P3, PE8, PE9

P1 sends a copy to each NH: P2, P3, PE8, PE9

P1→P2: b, nB, SL in MRH are set to values for P1→P2 (i.e., b=0, nB = 2, SL = 6); P1→PE8 (Egress): SL = 0.

IPv6 Packet Received by P1

IPv6 header
DA=P1's IPv6, SA=PE1’s IPv6
Routing Type=TBD, SL=11, b=1, nB
sub-tree from from P1 to PE2-PE9

MRH
size |L|B|Link-No|N-Branches|S-Branches+| Link
+++=+===================================================
11 |0|1|0|1|1|1|0|0| P1 to P2, P3, PE8, PE9
|P| S-Bits | Bits |
+++=+================================================================
9 |0|2|6 | P1 to P2
|0|0|1|4 | P1 to P3
|1| +-----
|1| +-----
6 |1|1|Pad| +-----
P2 to PE2 sub-tree from P2

IPv6 Packet Received by P1

IPv6 header
DA=PE8’s IPv6, SA=P1’s IPv6
Routing Type=TBD, SL=0, b, nB
sub-tree/leaf PE8

MRH
+++=+================================================================
P1 to PE8
|1| +-----
P1 to PE9
|1| +-----
+++=+=====================================================
P2 to PE2 sub-tree from P2

Egress PE8: (SL == 0):
Decaps, sends it to IP multicast forwarding