82nd IETF - Taipei, Taiwan

draft-wijnands-mpls-mldp-vpn-in-band-signaling-00

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Problem we᾿re solving

- draft-ietf-mpls-mldp-in-band-signaling-04, documents a solution to map (1:1) Multicast Source trees (S,G) to mLDP LSPs.

- This is documented for the sources that are in the global table context, no VRF.

- The assumption at the time was that this is mostly used for IPTV like deployment which is in global table context.

Problem we're solving (cont)

- Some providers use specific, dedicated VRF's to transport IPTV content across the network.
- The applicability of a simple 1:1 mapping of multicast Source trees to mLDP LSPs applies here as well.
- This draft documents the procedures needed to transport Multicast sources trees in a VRF context over mLDP LSPs via in-band signaling.

Solution

- Multicast tree information, like (S,G) or (*/M,G) is encoded in the opaque field of the mLDP FEC by the egress router(s).

- Including the RD of the Source (or RP) as advertised by BGP.

- The mLDP LSP is build through the MPLS core with (S,G,RD), or (*/M,G,RD).

- This follows a similar approach as the VPN-recursive opaque encoding in: draft-ietf-mpls-mldp-recurs-fec-04
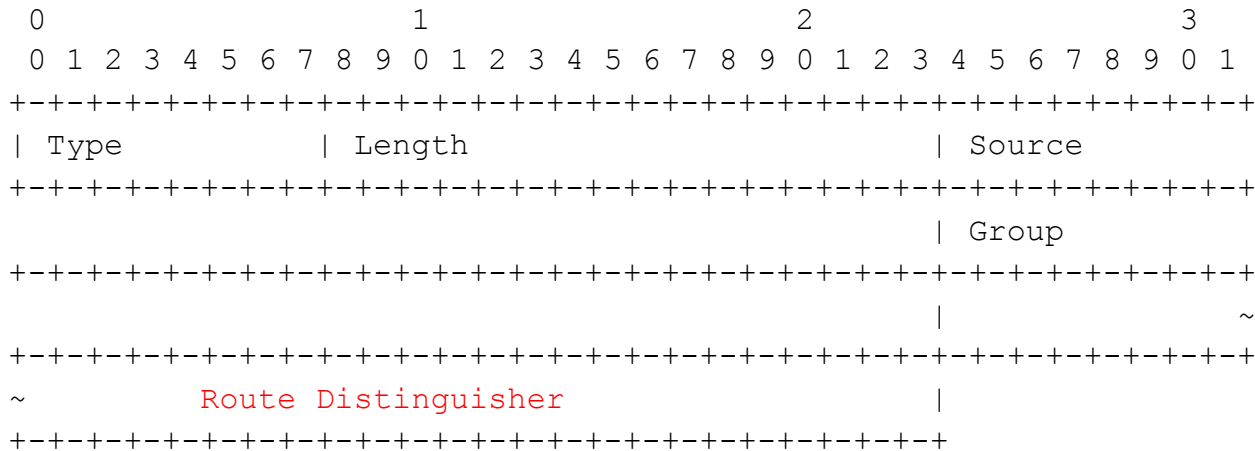
Solution (cont)

- By adding the RD we're making the LSP unique in the core network.

- This prevents overlapping addresses.

- Each VPN IP multicast flow creates a unique LSP in the core.

Opaque encodings

- We defined 4 new opaque encodings:
- Transit VPNv4 Source TLV
- Transit VPNv6 Source TLV
- Transit VPNv4 Bidir TLV
- Transit VPNv6 Bidir TLV

Transit VPNv4 Source TLV

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Type          | Length                        | Source
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
                                                | Group
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
                                                |             ~
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
~          Route Distinguisher                  |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
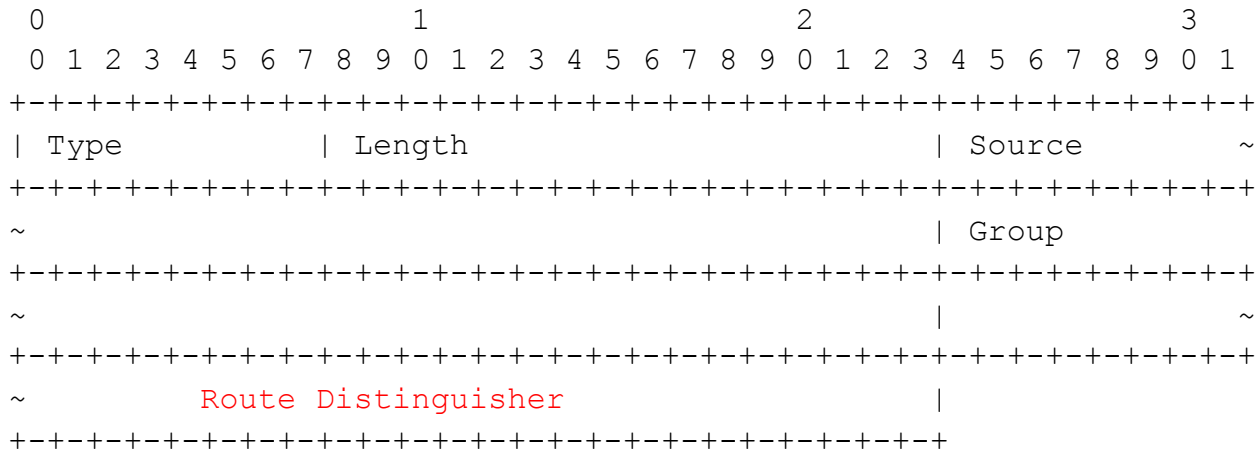
Type: (to be assigned by IANA).

Length:16

Source: IPv4 multicast source address, 4 octets.

Group: IPv4 multicast group address, 4 octets.

RD: Route Distinguisher, 8 octets.

Transit VPNv6 Source TLV

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Type          | Length                        | Source      ~
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
~                                               | Group
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
~                                               |               ~
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
~           Route Distinguisher                 |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
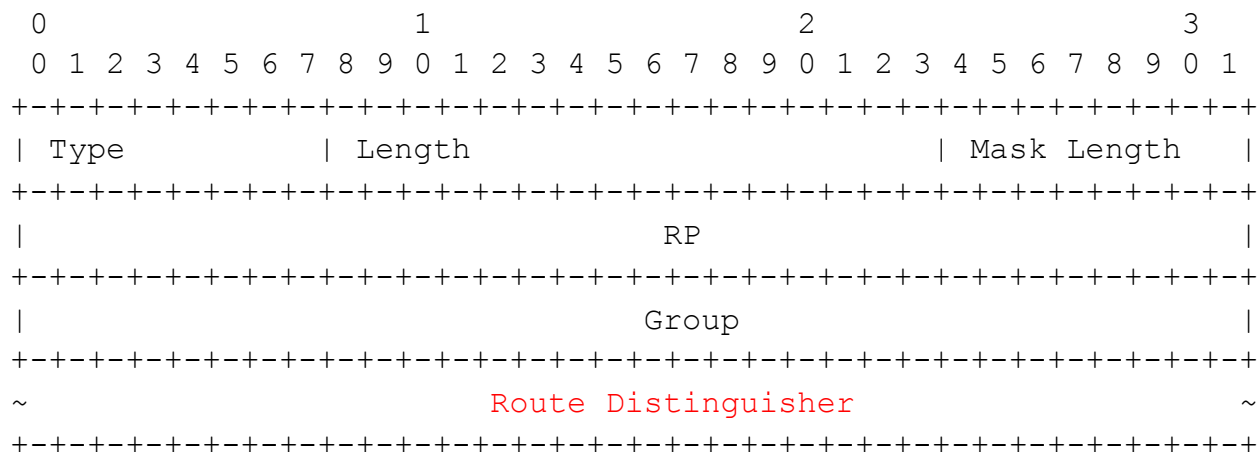
Type: (to be assigned by IANA).

Length:40

Source: IPv6 multicast source address, 16 octets.

Group: IPv6 multicast group address, 16 octets.

RD: Route Distinguisher, 8 octets.

Transit VPNv4 bidir TLV

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Type          | Length                        | Mask Length   |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                               RP                              |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                             Group                             |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
~                       Route Distinguisher                     ~
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

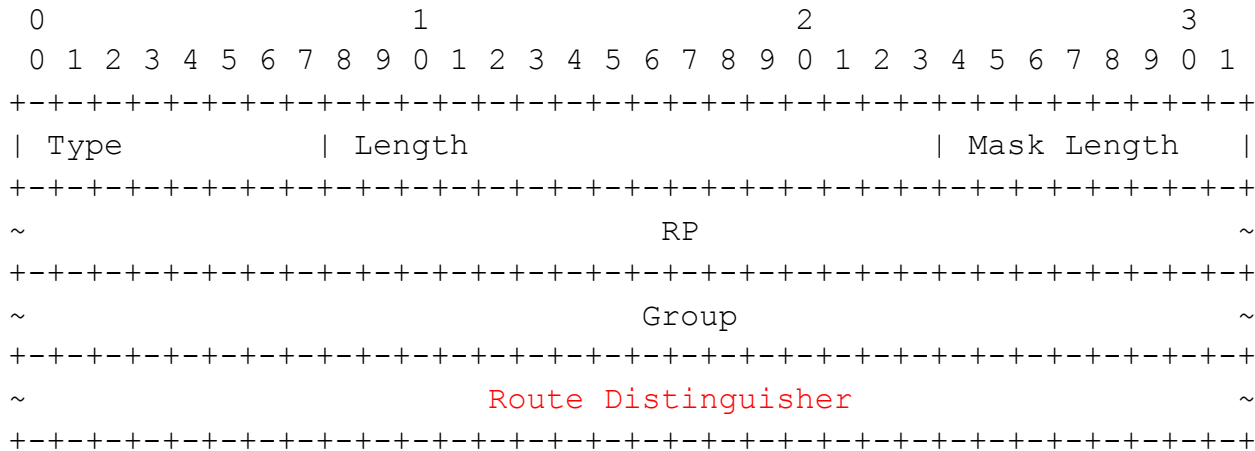Type: (to be assigned by IANA).

Length:17

Mask Length: Length of the mask for group address, 1 octet.

RP: IPv4 multicast address, 4 octets.

Group: IPv4 multicast group address, 4 octets.

RD: Route Distinguisher, 8 octets.

Transit VPNv6 bidir TLV

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Type          | Length                        | Mask Length   |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
~                               RP                               ~
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
~                             Group                              ~
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
~                       Route Distinguisher                      ~
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Type: (to be assigned by IANA).

Length:41

Mask Length: Length of the mask for group address, 1 octet.

RP: IPv6 multicast address, 16 octets.

Group: IPv6 multicast group address, 16 octets.

RD: Route Distinguisher, 8 octets.

Scalability

- Each IP multicast flow maps to a LSP.
- Works well if the number of multicast flows is under control by the operator.
- mLDP is receiver driven, so its expected to scale well for thousands of LSPs.
- Scalability consideration is the same for both global table and VPN sourced multicast trees.

Applicability

- This solution is NOT intended to be used as general purpose MVPN, like in; draft-ietf-l3vpn-2547bis-mcast-10

- It is a specific use-case where VRF's just happen to be used for transporting IPTV like multicast traffic.

- Don't panic.

L3VPN

- This draft does describe minimal L3VPN specific procedures, the use of RD.

- draft-ietf-mpls-mldp-recurs-fec-04, does exactly the same.

- I propose to follow the same path as done for recurs-fec, do the work in MPLS WG, potentially do an last-call in L3VPN WG.

Going forward

- Authors like to get comments on the draft.

- The intention is to make this a WG document.

Questions?