Role-Based State Advertisement for Multicast in MPLS/BGP IP VPNs

draft-li-bess-mvpn-role-state-ad-00

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Introduction

- Introduce a new BGP attribute called the "Role D iscovery attribute" to advertise the mVRF's Role & State info.

- The role-based state advertisement can help opt imization of process in BGP MVPN.

History Review and Updates

- History Review
  - Presented IETF 87, Berlin
  - Previous is draft-li-l3vpn-mvpn-role-state-ad-02
- Updates
  - Add the new use case, Centralized Multicast Traffic Optimization.
  - BGP Extensions changed from " Role-Based Intra-AS I-PMSI A-D route " to " Role Discovery attribute ".
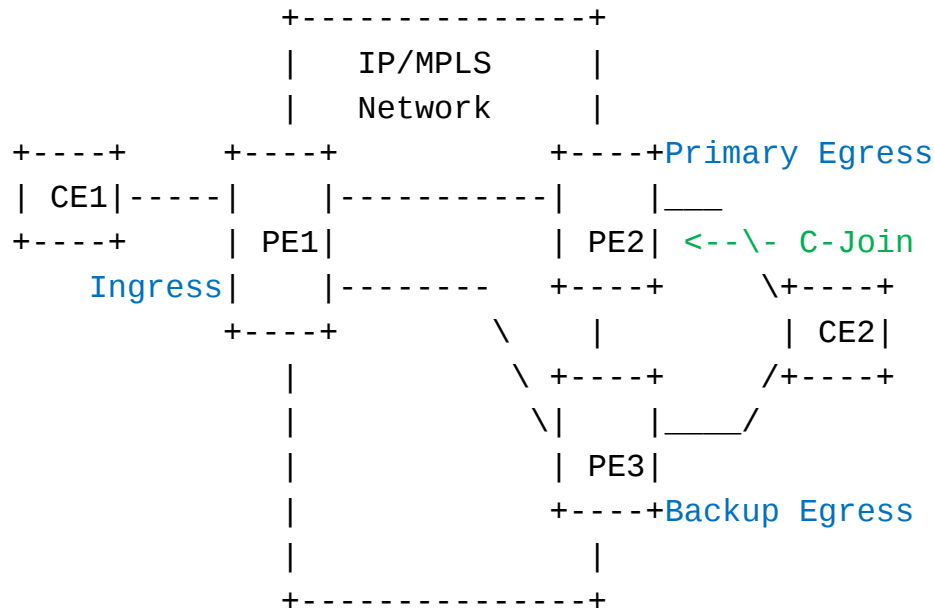
Scenario 1 - Easing Provision of mLD P P2MP LSP

- In Role Discovery attribute, mVRF's Root/Leaf Role information is supported.
- It can facilitate the provision of mLDP to setup P2MP LSP:
  - Because all LEAF nodes can learn ROOT node' IP Address thru this Role Discovery attribute in conjunction with A-D Route, and send Mapping Msg to ROOT automatically
  - LEAF node no need to configure root information under mLDP protocol.

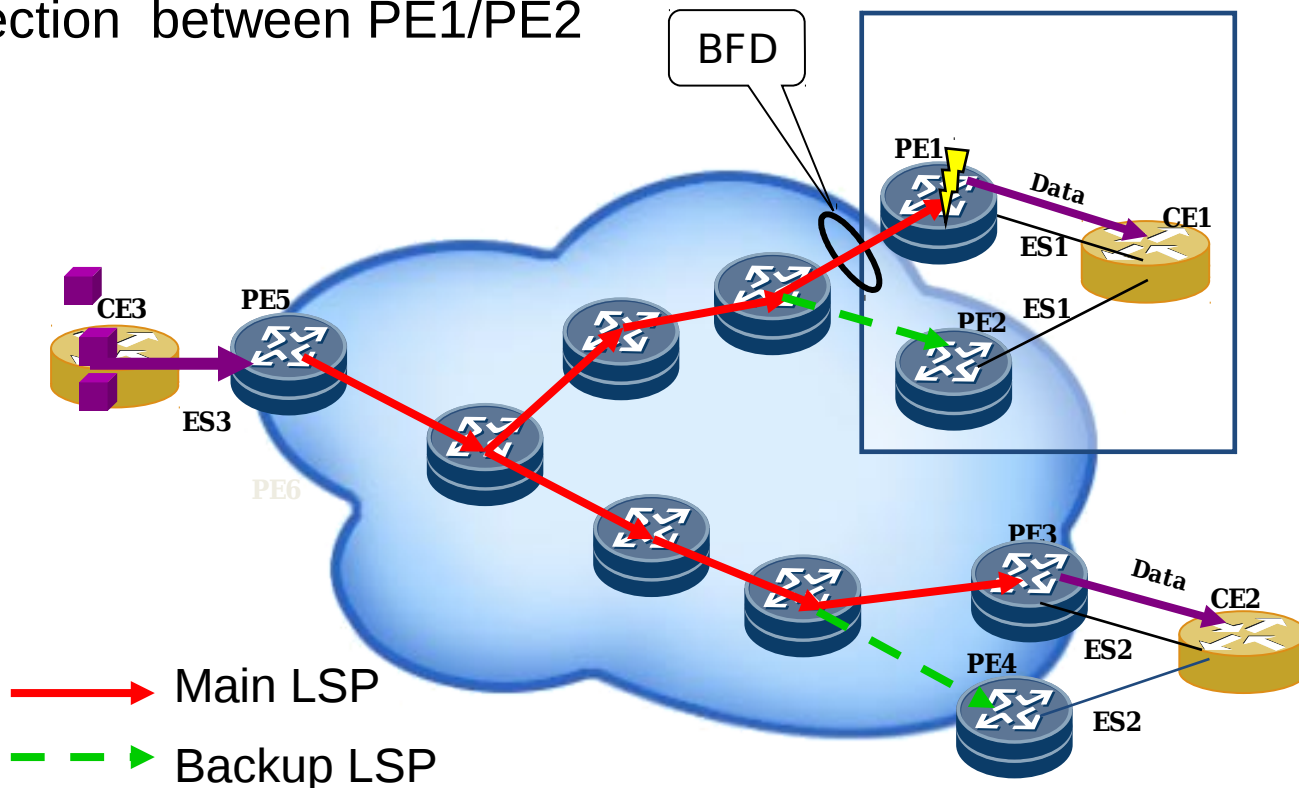# Scenario 2 - Reducing Unnecessary Traffic Replication

- Role Discovery attribute supports advertising Leaf Role with Primary/Backup status information

```
                 +---------------+
                 |   IP/MPLS     |
                 |   Network     |
  +----+    +----+            +----+Primary Egress
  | CE1|----|    |-----------|    |___
  +----+    | PE1|           | PE2| <--\- C-Join
      Ingress|    |--------   +----+     \+----+
         +----+        \    |          | CE2|
            |           \ +----+    /+----+
            |            \|    |___/
            |            | PE3|
            |            +----+Backup Egress
            |                |
            +---------------+
```

- CE2 multi-homes to two PEs(PE2 and PE3), suppose PE2 is Primary Egress PE

- With help of new Role Discovery attribute , PE1 can learn the Egress Backup relationship between PE2/PE3, the bandwidth can be saved in the network since PE1 can stop to setup the ingress replication tunnel or P2MP LSPs to Backup Egress PE3

Scenario 3 - Local Protection of Egress Nodes

- Role Discovery attribute supports advertising Leaf Role with Primary/Backup Relationship information
- With the info in Role Discovery attribute that PE1 is protected by PE2, Ingress PE5 could setup RSVP P2MP LSP with Egress Node Local Protection between PE1/PE2

BFD

PE1

Data

CE1

ES1

ES1

PE2

CE3

PE5

ES3

PE6

PE3

Data

CE2

ES2

PE4

ES2

Main LSP

Backup LSP

draft-ietf-mpls-rsvp-egress-protection

Scenario 4: Centralized Multicast Traffic Optimization

- Centralized Multicast Traffic Optimization
  - As the development of central controlled multicast application such as PCE-initiated P2MP LSP [I-D.palle-pce-stateful-pce-initiated-p2mp-lsp], PCE can be used to initiate the setup of RSVP-TE P2MP LSP for the purpose of traffic optimization.
  - In order to support such applications, the controller should learn the roles of Multicast VPN instances distributed on different PEs.

Protocol Extensions

- This document defines and uses a new BGP attribute called the "Role Discovery attribute".

- The Role Discovery attribute can be used in conjunction with Intra-AS I-PMSI A-D routes.

```
+-----------------------------------+
|R|RS|L|LS|          Reserved       |
+-----------------------------------+
|Protected Root's IP Addr(Optional) |
+-----------------------------------+
|Protected Leaf's IP Addr(Optional) |
+-----------------------------------+
```

Next Step

- Solicit comments and feedbacks
- Revise the draft