

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

draft-li-l3vpn-mvpn-role-state-ad-00

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# Motivations

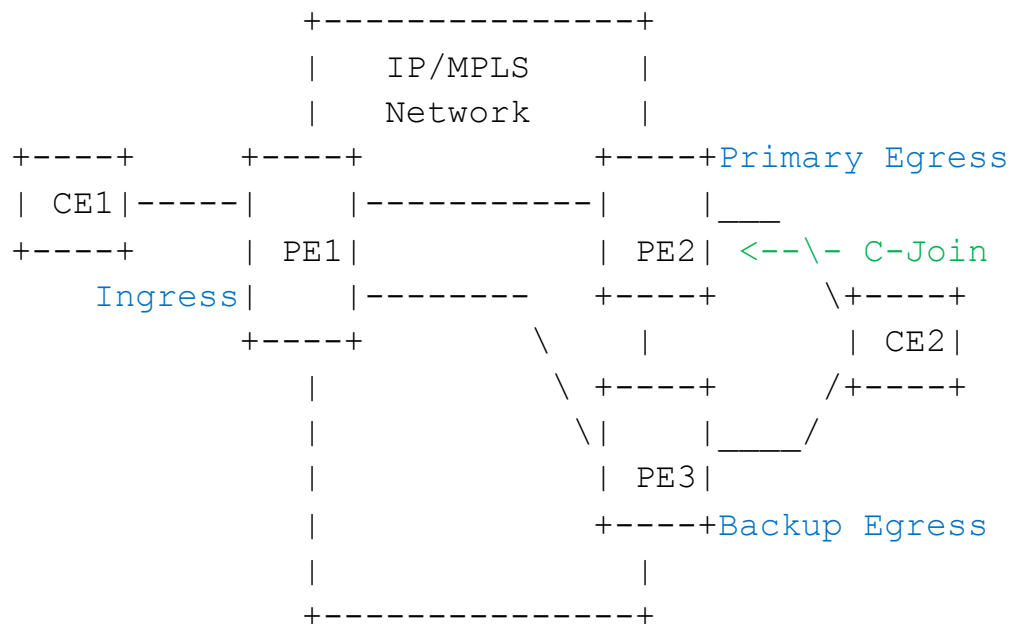
- Introduce a new type of Intra-AS I-PMSI A-D Route in BGP MVPN, this A-D Route contains additional mVRF's Role & State info.
- The goal is to optimize MVPN provision in some scenarios:
  1. Easing Provision of mLDP P2MP LSP.
  2. Reducing Unnecessary Traffic Replication.
  3. Auto Provision of Egress Local Protection for P2MP TE.

# Scenario 1 - Easing Provision of mLDP P2MP LSP

- In Role-Based Intra-AS I-PMSI A-D route, [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 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

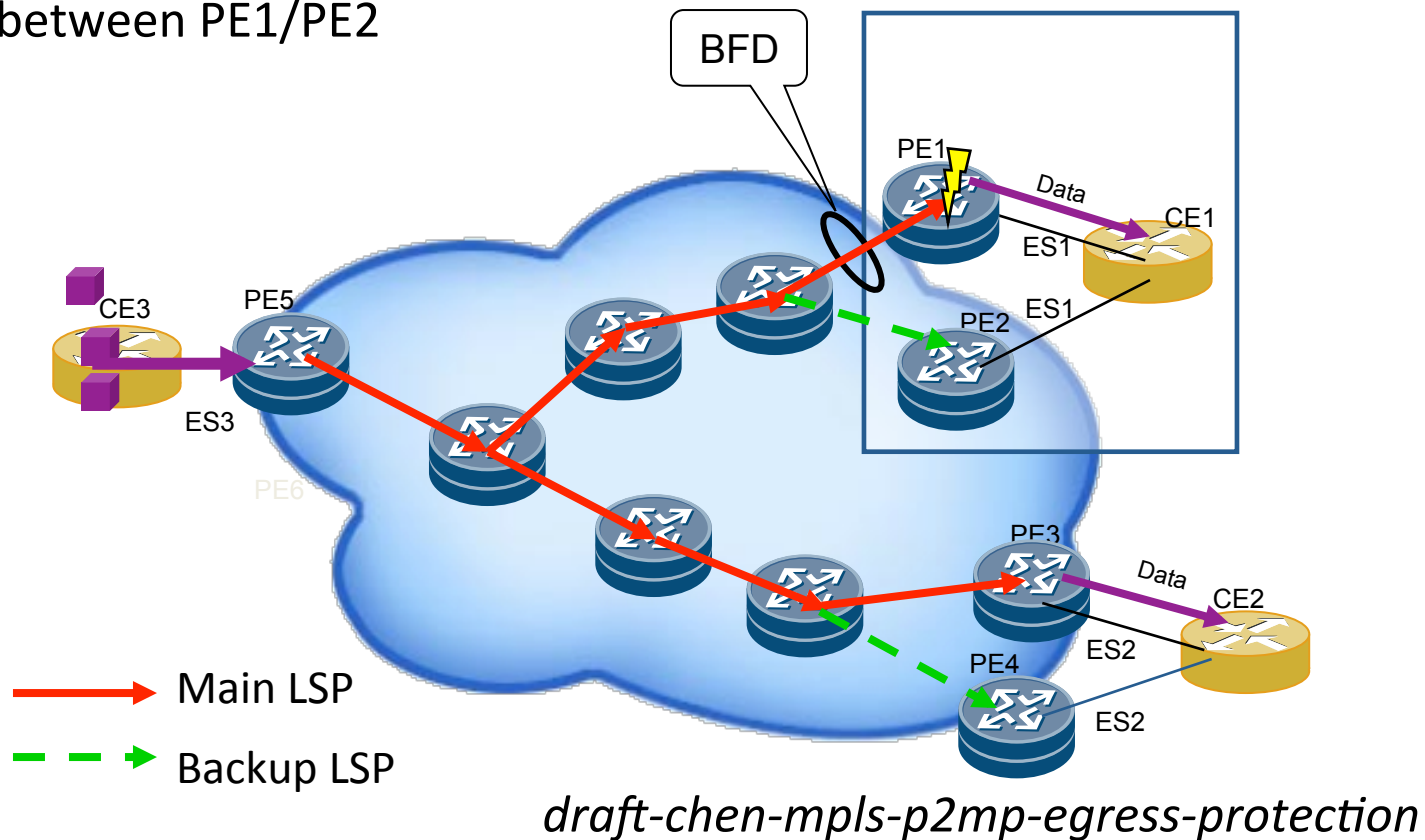
- Role-Based Intra-AS I-PMSI A-D route supports advertising **Leaf Role with Primary/Backup status** information



- CE2 multi-homes to two PEs (PE2 and PE3), suppose PE2 is Primary Egress PE
- With help of new A-D Route, 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

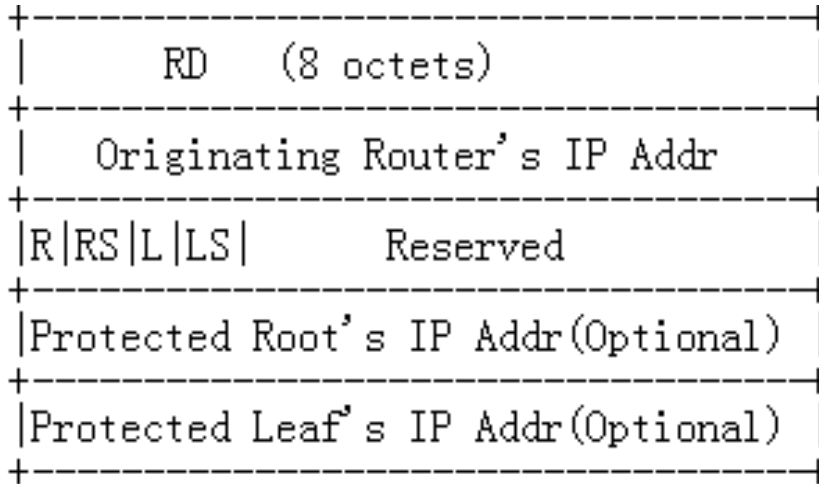
- Role-Based Intra-AS I-PMSI A-D route supports advertising **Leaf Role with Primary/Backup Relationship** information
- With the info in A-D route that PE1 is protected by PE2, Ingress PE5 could setup RSVP P2MP LSP with Egress Node Local Protection between PE1/PE2



# BGP Extensions:

## Role-Based Intra-AS I-PMSI A-D route

- Role-Based Intra-AS I-PMSI A-D route Format :



- **RD** with **Originating Router's IP Addr** are utilized to identify the mVPN VRF being advertised
- **R** bit set to 1 to identify if the PE is root node.
- **RS field** uses two bits to identify primary/backup state of root node
  - 0 means the PE is used as the primary root node.
  - 1 means the PE is used as the backup root node, but the protected root 's IP address is not specified.
  - 2 means the PE is used as the backup root node and the protected root 's IP address is specified

# BGP Extensions: Role-Based Intra-AS I-PMSI A-D route(Cont.)

RD (8 octets)	
Originating Router's IP Addr	
R RS L LS	Reserved
Protected Root's IP Addr(Optional)	
Protected Leaf's IP Addr(Optional)	

- L bit set to 1 to identify if the PE is Leaf node.
- **LS field** uses two bits to identify primary/backup state of leaf node
  - 0 means the PE is used as the primary leaf node.
  - 1 means the PE is used as the backup leaf node. But the protected leaf node's IP address does not specified.
  - 2 means the PE is used as the backup leaf node and the protected leaf node's IP address is specified
- **Protected Root's IP Addr** is an optional field. It specifies ip address of the protected root node. The field value is valid only when RS field is set with value 2.
- **Protected Leaf's IP Addr** is an optional field. It specifies ip address of the protected leaf node. The field value is valid only when LS field is set with value 2.

# Next Steps

- Solicit more comments & feedbacks
- More scenarios will be taken into account
- Revise the draft