Multicast VPN Upstream Designated Forwarder Selection

draft-wang-bess-mvpn-upstream-df-selection-05

Fanghong Duan@Huawei

Siyu Chen@Huawei

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Background

IETF113 to 115, to combine advantages of both hot and warm root standby, we proposed:

- MVPN Extensions: IDF negotiation Community and BFD Discriminator Attribute

- IDF Election Procedure:

  - Primary and Standby DF elected in ingress site

  - RPF Checklists instead of RPF interface in egress site for fast failover

  - Failure detection with BFD session between primary and standby PEs

This time:

- Updates on position where PIM Join sent towards

- New format of UMH route and "Root Distinguisher Extended Community"

- Explicit tracking in inter-As segmented scenario

- Backward compatibility

Updates on Ingress PE

- **Previously,**

  - C-multicast routes sent towards all root PEs

  - Traffic received on all root PEs

- **This time:**

  - Egress PE still sends C-multicast route towards all ingress PE

  - Send PIM Join towards Client Network only if current PE is primary or standby IDF

  - When primary IDF is down, new standby IDF need to send PIM Join towards Client Network
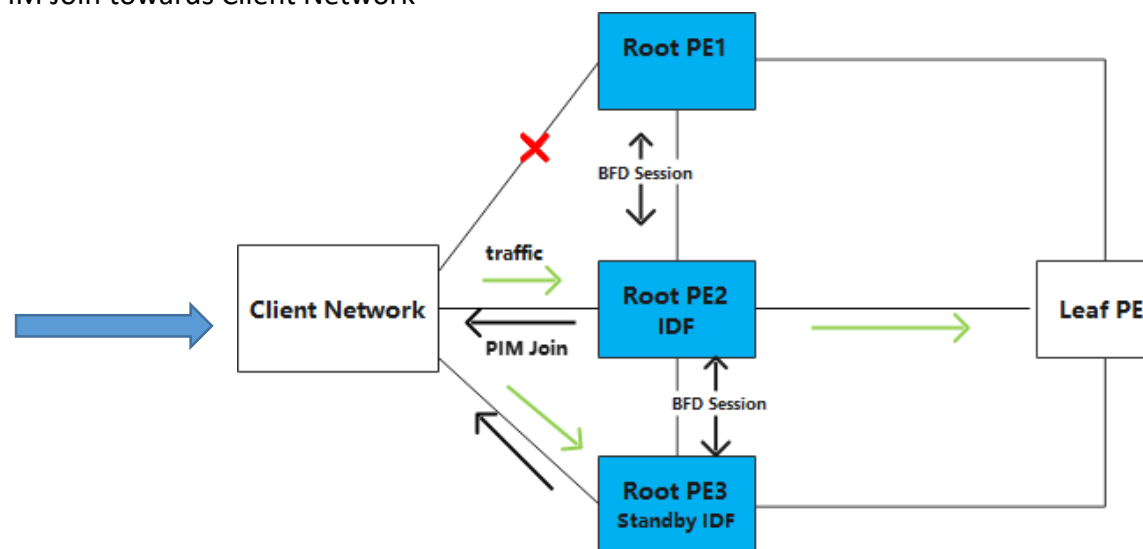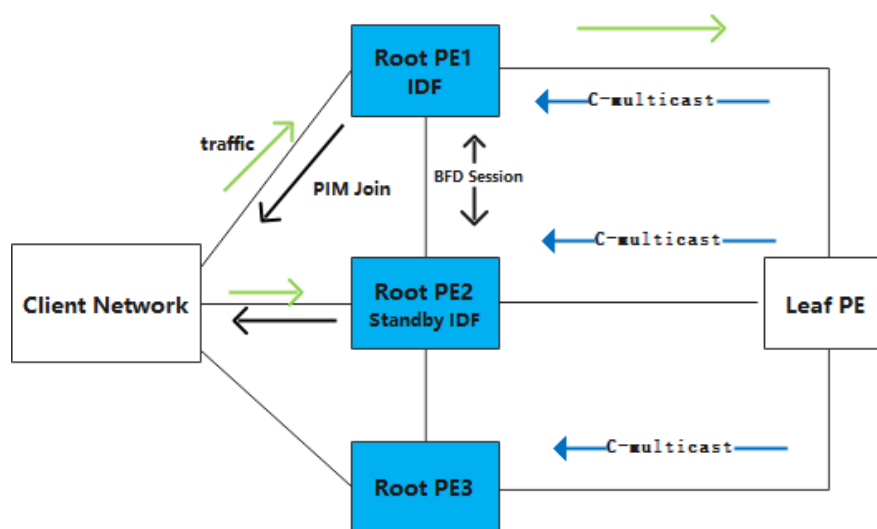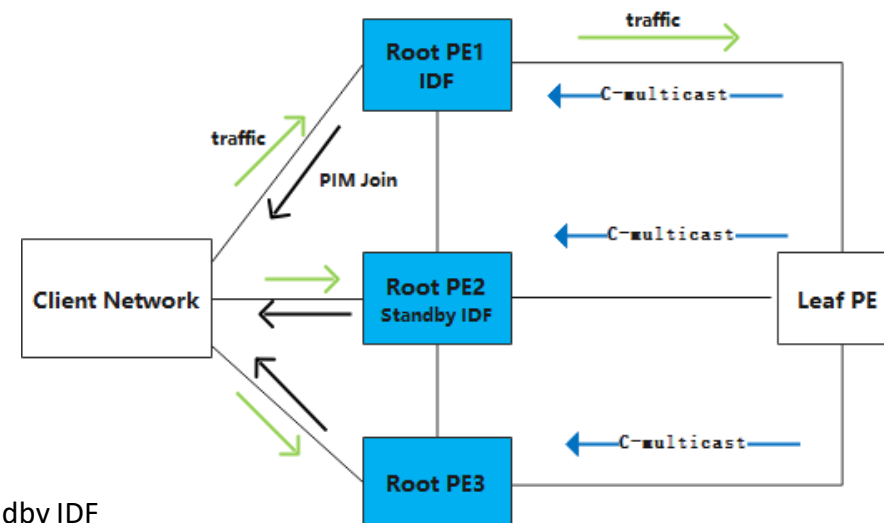
New UMH Route Format

- **UMH Route:**

```
+---------------------------------------------------+
|  Key: RD (8 octets)                               |
+---------------------------------------------------+
|  IP Prefix Length (1 octet, 0 to 32 / 128)        |
+---------------------------------------------------+
|  Key:IP Prefix (4 / 16 octets )                   |
+---------------------------------------------------+
```

- **RD may not carried or not distinct:**
  - In [RFC 7716], RD is not carried in GTM scenario
  - In certain scenario, same RD is configured by different PEs

- **Same RD and same Multicast Source -----> Same UMH Route**

- **To distinguish different UMH routes, new UMH route format proposed :**

```
+---------------------------------------------------+
|  Key: RD (8 octets)                               |
+---------------------------------------------------+
|  IP Prefix Length (1 octet, 0 to 32 / 128)        |
+---------------------------------------------------+
|  Key: IP Prefix (4 / 16 octets )                  |
+---------------------------------------------------+
|  Key: Originating Router's IP Addr (4/16 octets)  |
+---------------------------------------------------+
```

  - Multi-homed PEs exchange new UMH routes with each other
  - High priority than existing UMH route

Root Distinguisher Extended Community

- **Non-segmented Inter-AS P-Tunnel over IPv6 infrastructure scenarios**

  As for C-multicast Route:

  4-octet Source AS cannot hold an IPv6 address **--->**   Hard to distinguish two C-Multicast routes

- **Solution: Root Distinguisher Extended Community**

Global Administrator Field	Local Administrator Field
4-octet Global Unique Value	0

  Carried by Intra-AS A-D or wildcard S-PMSI A-D routes

  Fill Source AS with Root Distinguishing value of root PE

Root PE Explicit Tracking in Segmented Inter-AS Scenario

- **Segmented Inter-AS Scenario:**

  Different Intra-AS A-D routes aggregated and Originator's IP discarded

  Leaf PE in downstream AS cannot distinguish multicast traffic from different root PEs
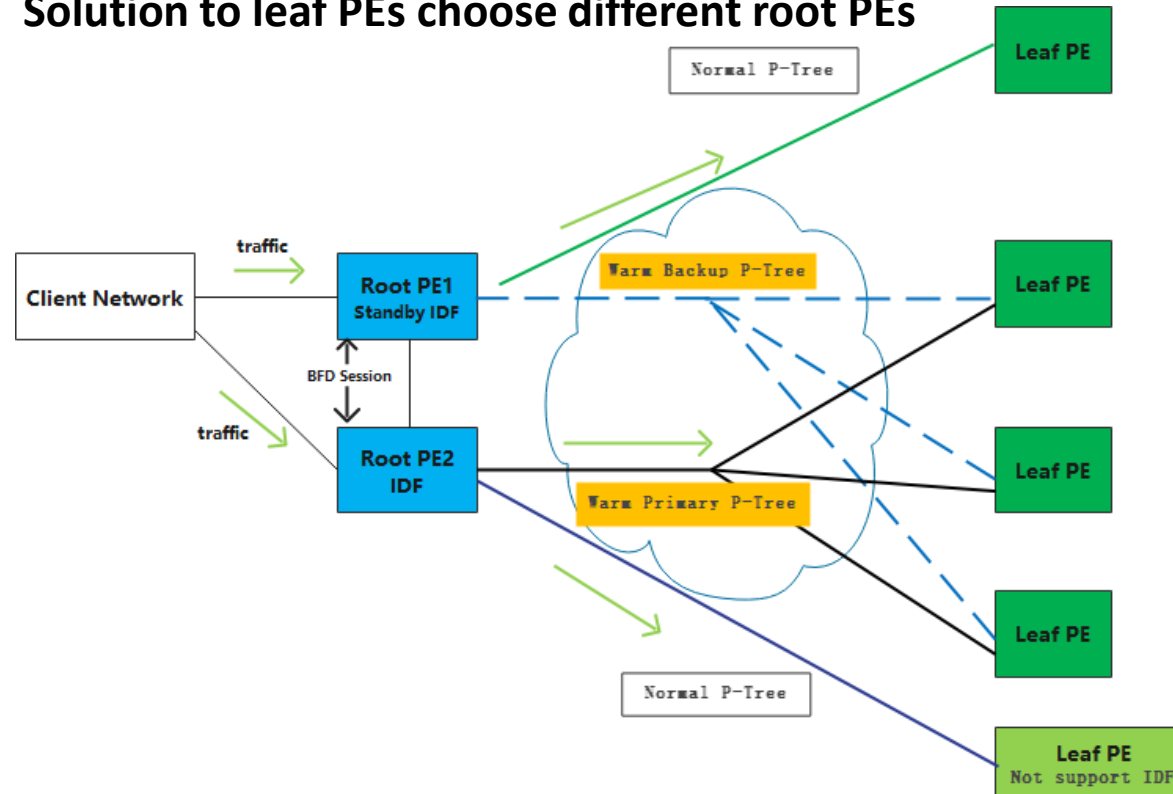

- **To perform root PE explicit tracking:**

  Solution A : Wildcard S-PMSI AD route in [RFC6625]

  Solution B : PE Distinguisher Labels Attribute in [RFC6514]

  　　　　　Distributed in Inter-AS A-D route

Backward Compatibility

- **Procedures for**
  - Root Not Support IDF Election
  - Leaf Not Support IDF Election

- **Solution to leaf PEs choose different root PEs**

Next Steps

- BESS WG Reviews and Comments

- Call for Adoption

Thanks