Multicast VPN Upstream Designated Forwarder Selection

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

<table>
<thead>
<tr>
<th>Global Administrator Field</th>
<th>Local Administrator Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-octet Global Unique Value</td>
<td>0</td>
</tr>
</tbody>
</table>

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