Using BGP between PE and CE in EVPN

draft-zhuang-bess-evpn-pe-ce-00

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Introduction

• This document identifies the possible applications which can benefit from MAC learning through the control plane between PEs and CEs.
History Review and Updates

• History Review
  – Presented in IETF 90 Toronto
  – Previous is draft-li-l2vpn-evpn-pe-ce-02

• Updates
  – Refine EVPN Inter-AS Option A & Fast Convergence Use Case
  – Add DCI Traffic Optimization Use Case
Use case 1: DCI Traffic Optimization

1) PE1 Learns MAC2 via BGP from both GW1 and GW2
2) Controller instructs PE1 to select the NextHop for MAC2 on demand, e.g., changing the NextHop from GW2 to GW1
3) NVE3 can visit MAC2 through different links between GW3/4 and PE3/4
4) Controller instructs PE3/4 to change the path attributes of the EVPN MAC routes that is advertised to GW3/4 on demand, e.g., Pretending AS for the route advertising from all BGP sessions between PE3/4 and GW3/4 except PE3-GW3

• Using BGP EVPN between GWs and WAN PEs
• Outbound Traffic Control:
  - Controller controls the multiple paths to the same destination which are receiving from different GWs and decide which MAC route to be used for outbound traffic.
• Inbound Traffic Control:
  - Controller controls the path attributes of the EVPN MAC route that is advertised to the different GWs and steer the inbound traffic.
Use case 2: Inter-AS EVPN Option-A solution

Inter-AS EVPN Option-A solution:

- Using BGP between ASBRs.
  - Learning of MAC Addresses can be controlled via Peer-Based Policy between ASBRs;
  - MP-BGP is always adopted for Inter-AS L3VPN Option-A. Unified Control-Plane for MAC routing information.

Sub-interfaces are used for VPN traffic separation.
Use case 3: Fast Convergence

- Fast Convergence
- The network convergence time is not dependent of the local MAC learning and advertisement of MAC addresses learned by the PE any more.
Options of Protocol Extensions

• Option 1: Add one new type of EVPN route, C-MAC Advertisement Route.
• Option 2: Reuse EVPN MAC/IP Advertisement Route (Type 2) for public MAC/IP route.
Option 1: C-MAC Advertisement Route

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Route Type:  + 6 C-MAC advertisement Route

C-MAC Advertisement Route Specific Content
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- Ethernet Segment Identifier (10 octets)
- Ethernet Tag ID (4 octets)
- MAC Address Length (1 octet)
- MAC Address (6 octets)
- IP Address Length (1 octet)
- IP Address (4 or 16 octets)
Option 2: Reuse EVPN MAC/IP Advertisement Route

- Reusing EVPN MAC/IP Advertisement Route defined in [RFC7432] to exchange MAC/IP route information between CE and PE.
  - In this case RD, MPLS Label1 and MPLS Label2 fields MUST be set as 0.
  - In addition, the RT for the route MUST also be set as 0.
Next Step

• Solicit comments on options of protocol extensions.
• Propose protocol extensions for the type 5 route based on the well accepted option.
• Revise the draft.