PIM Proxy in EVPN Networks
draft-skr-bess-evpn-pim-proxy-00

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Background and objectives

Why PIM Proxy for EVPN networks

- Need to reduce flooding in an EVPN Broadcast Domains that are used as a “shared-LANS” for PIM routers.
  - Similarly to proxy-ARP/ND and IGMP proxy in EVPN
  - VPLS also supports PIM Proxy

• Objectives
  1. Reduce/eliminate PIM message flooding in the core and to hosts/non-multicast routers. Focus on Hello and J/P messages.
  2. Forward IP multicast streams efficiently.
  3. Avoid IP multicast duplication and Assert procedures in the EVPN BD.
  4. Provide a fast failover multi-homing solution for PIM routers.
PIM Proxy for EVPN procedures

Multicast Router Discovery for PIM Proxy
PIM Join/Prune Proxy Procedures
PIM Assert Optimization for EVPN BDs
EVPN multi-homing and PIM state synchronization
Interaction with IGMP hosts and sources in the same EVPN BD
Multicast Router Discovery routes

1. Hellos (and Queries) trigger MRD routes
2. Hellos (and Queries) generated for MRD routes
3. PIM Nbrs from local hellos or remote MRD routes (timers, gen-id handled locally)

Multicast Router Discovery (MRD) route
New Route type that replaces soft-state hellos and queries

- RD (8 octets)
- Ethernet Segment ID (10 octets)
- Ethernet Tag ID (4 octets)
- Original Router Length (1 octet)
- Original Router Address (Variable)
- Mcast Router Length (1 octet)
- Mcast Router Address 1 (variable)
- Secondary Mcast Router Address 1 (variable)
- Secondary Mcast Router Address n (variable)
- DR Priority (4 octets)
- Flags (1 octet)

Flags:
- Q: Querier flag. It indicates the encoded multicast router is a Querier.
- P: PIM router flag. It indicates that the multicast router is a PIM router.
- Q and P may be set simultaneously.
PE sends a SMET route per Join source, group (a withdrawal indicates a prune message)

PE sends an RPT-prune route per Prune (s,g,rpt) (a withdrawal indicates a join (s,g,rpt)
Avoiding multicast duplication in a shared BD

**PE1**

- If two Joins for same (*,G) different Nbr are received, a SMET route is issued with the highest IP.
- Same for (S,G)
- If two Joins with (*,G) and (S,G) for different Nbr are received, two SMET routes are issued.

**UPSTREAM PEs**

- A single Upstream Nbr is selected per group (IP4)
- Tie-breaking rules (in order):
  1. Nbr in (S,G) SMET is preferred over (*,G) SMET
  2. Highest Upstream Nbr is preferred
- PE instructs data path to discard multicast on an interface connected to non-selected Nbr (mcast for G1 from R5 is discarded on PE4)
- PE4 issues a P(S1,G1,IP5,rpt)

**DOWNSTREAM PEs**

- If two Joins for same (*,G) different Nbr are received, a SMET route is issued with the highest IP.
- Same for (S,G)
Avoiding multicast duplication in a shared BD

Join/RPT-Prune synch routes to synch PIM state
- Following the procedures of IGMP/NLD proxy draft

MRD with non-zero ESI to synch PIM Nbr DB
- All PEs in the ES will add R1 to their PIM Nbr DB and the DF will generate hellos upon receiving remote MRD routes.

(modified)
Join Synch route
For PIM Proxy

RPT-Prune Synch route
For PIM Proxy
Conclusions and next steps

PIM proxy for EVPN completes the set of multicast optimizations for EVPN BDs

Need to agree on the new route types to be supported

- SMET routes for PIM proxy can be reused from IGMP proxy draft OR new route types can be asked for
- Same thing for PIM Join synch route

Need to agree whether other PIM procedures should be covered

- PIM Bootstrap and RP Discovery?
- PIM-DM?

We need feedback / comments from the WG
Thank you