Multicast VPN fast fail-over

draft-morin-l3vpn-mvpn-fast-failover-04

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This document describes two mechanisms to reduce connectivity restoration time for multicast traffic in a VPN context, for failures on the upstream PE side:

- UMH Selection based on P-tunnel status: avoid waiting for unicast convergence
- Standby C-multicast route: avoid signaling at failure-time by preparing the backup upstream PE

These mechanisms can be used in different combinations depending on the failure coverage and level of protection wanted

- Different levels of protection: cold, warm, hot, leaf hot
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Standby BGP C-Multicast route

- Idea: prepare the backup PE so that it is ready to become UMH when the primary PE fails

- How?
  - Besides advertising a normal (C-S,C-G) C-multicast Tree Join route to the nominal upstream PE, downstream PEs advertise a Standby C-multicast Tree Join route to the backup upstream PE
  - The backup upstream PE prepares for a possible failure (prepares more for hot standby, and less for cold or warm standby...)
  - The backup upstream PE monitors the reachability of C-S through the nominal/primary PE
  - On failure, traffic is forwarded by backup PE

- Failure detection can be done, for instance:
  - based on P2MP OAM
  - based on unicast VPN reachability to C-S
  - based on tunnel status (same criteria as in next slide)

Key: reduce the additional signaling at failure time
Reminder:
- “UMH Selection” specifies procedures by which a downstream PE determines the PE from which it will receive a said multicast flow (C-S, C-G)
- In the current spec, “UMH Selection” is done solely based on the VPN unicast routing information and does not take into account the state of the P-tunnel that the selected UMH uses to send (C-S, C-G) to the local PE

Idea: let UMH procedures take into account the state of the P-tunnel from the selected/primary UMH to the PE
- Make “UMH Selection” on a (downstream) PE switch to a backup (upstream) PE as soon as the (downstream) PE determines that the P-tunnel from the selected/primary (upstream) PE is down, without waiting for unicast VPN convergence
- Different possible ways for a PE to detect that a P-tunnel from the selected/primary UMH to the PE is down:
  - P2MP OAM (Multipoint BFD)
  - Traffic counters
  - P-Tunnel signaling (RSVP-TE PathTear)
  - …

Key: avoid waiting for unicast convergence
Next steps:
- Include Hot leaf standby support in an Inter-AS context
- Clarify on the different cases where "UMH Selection based on tunnel status" and "Standby C-multicast routes" need, should or can be used together

Good support to the document during the presentation made in previous IETF

We would like to ask for WG adoption if there is a recharter