

Proactive fault detection in E-VPN

(draft-vgovindan-l2vpn-evpn-bfd-00)

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EVPN OAM Layering

(draft-salam-l2vpn-evpn-oam-req-frmwk-01)

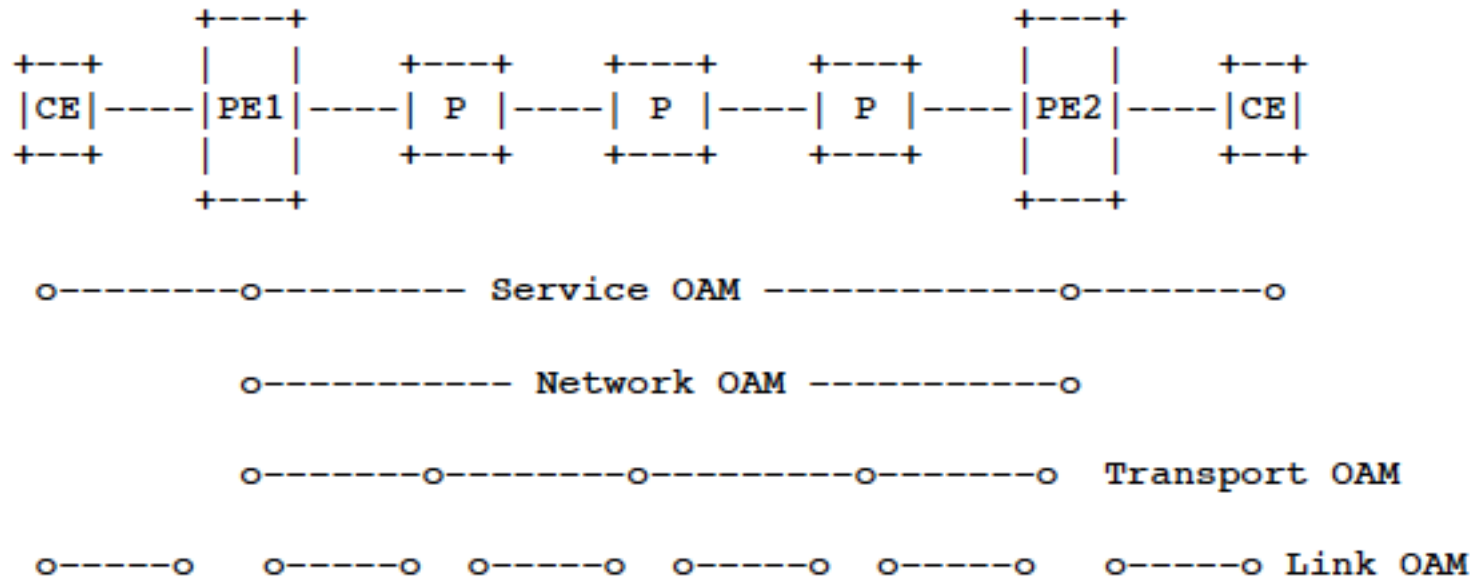


Figure 1: E-VPN OAM Layering

EVPN OAM Mechanisms

(draft-salam-l2vpn-evpn-oam-req-frmwk-01)

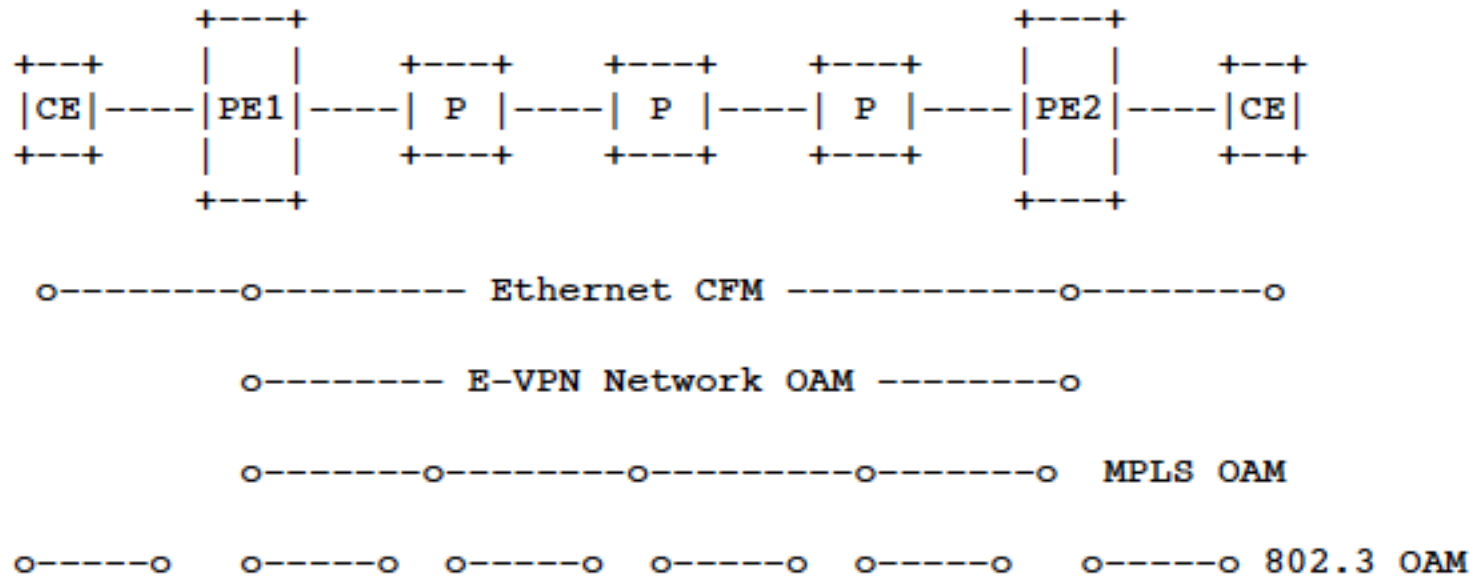


Figure 2: E-VPN OAM Example

EVPN Network Layer OAM

- Visible to PE nodes
- Analogous to VCCV (RFC 5085)
- Provides mechanism to check correct operation of data plane, and to verify the data plane against control plane for following EVPN functions
 - MP2P tunnels used for transport of unicast traffic
 - MP2P tunnels used for aliasing unicast traffic
 - Multicast tunnels (P2MP & MP2P) for BUM traffic
 - ESI split-horizon filtering function
 - DF filtering mechanism

Scope and Problem Definition

- Proposal addresses fault detection by setting up BFD sessions for the following types of E-VPN tunnels:
 - MP2P tunnels created for Unicast.
 - Tunnels created for BUM traffic using:
 - Ingress replication: MP2P tunnels.
 - LSM : P2MP tunnels.
- Problems to be addressed for setting up and maintaining BFD sessions for the E-VPN tunnel types:
 - Disambiguation of the source of the BFD session in MP2P tunnels used for unicast and ingress replication.
 - De-multiplexing the BFD session and identification of source of the BFD session in P2MP tunnels.
 - The solution proposal should NOT rely on the source IP as it may not be present when using GAL/ G-Ach encapsulations.

Fault detection mechanisms -1/2

- Unicast (MP2P) E-VPN tunnels:
 - Use out-of-band BFD discriminator exchange using MPLS Ping [RFC5884].
 - Use entropy labels for monitoring the multi-path network.
- Ingress replication (MP2P) E-VPN tunnels:
 - BFD session bootstrapped on reception of Inclusive multicast route from the tail containing the downstream allocated BUM label.
 - Use out-of-band BFD discriminator exchange using MPLS Ping [RFC5884]. Note that the head makes an individual copy for each tail. Hence the BFD packet can be custom-built for each tail.
 - Use entropy labels for monitoring the multi-path network.

Fault detection mechanisms -2/2

- LSM (P2MP) E-VPN tunnels:
 - P2MP BFD proposed in draft-ietf-multipoint-01 can be applied to LSM tunnels.
 - LSM label can be used to de-multiplex BFD sessions at the multicast tails since it uniquely identifies a source (P2MP head) and the P-Tunnel. BFD packets MUST use LSM label as yourDisc.
 - Use LSM label + Context label (upstream assigned) for Aggregate Inclusive Multicast trees.