

LSoE Based PE-CE Control Plane for EVPN

draft-malhotra-bess-evpn-lsoe-00

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Motivation – EVPN-IRB

No PE-CE Control Plane

- Data-plane source MAC gleaning for CE MAC learning.
- ARP snooping for CE IPv4-MAC learning.
- ND snooping for CE IPv6-MAC learning.
- Local policy configuration for CE Prefix learning.

Situation

Optional PE-CE Control Plane

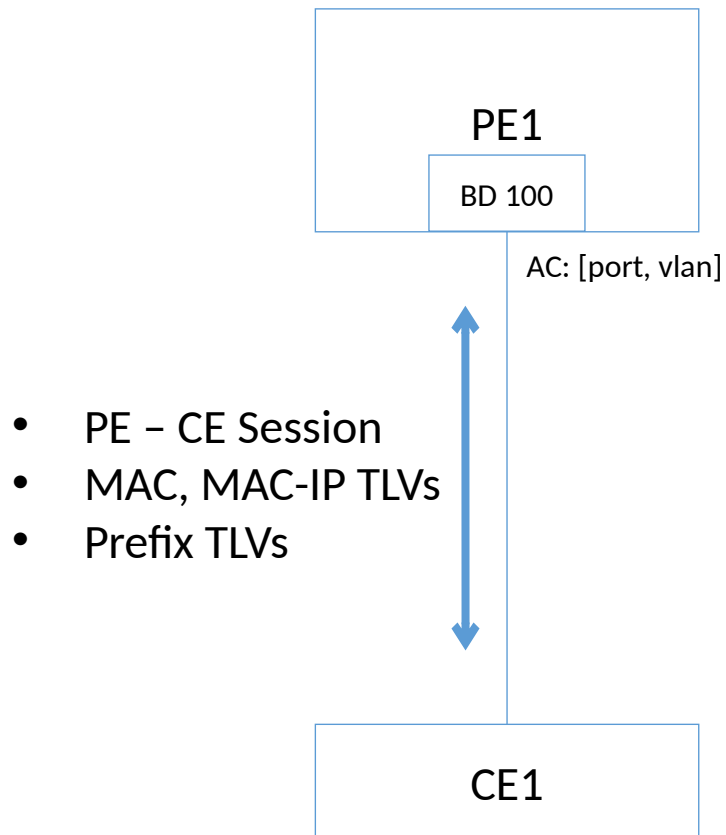
- PE-CE learning decoupled from non-deterministic periodicity of CE data traffic, in extreme case, from a silent CE host.
- PE-CE learning decoupled from non-deterministic CE behavior of unsolicited ARP and NAs on CE boot-up and CE moves.
- PE-CE learning decoupled from non-deterministic hashing of data, ARP, and ND packets over all-active multi-homed PE-CE LAG interfaces.
- PE-CE learning decoupled from data packet driven ARP/ND gleaning latency on a PE.
- PE-CE prefix learning when CE does not run a dynamic routing protocol

Proposal

PE-CE Control Plane for EVPN - Overview

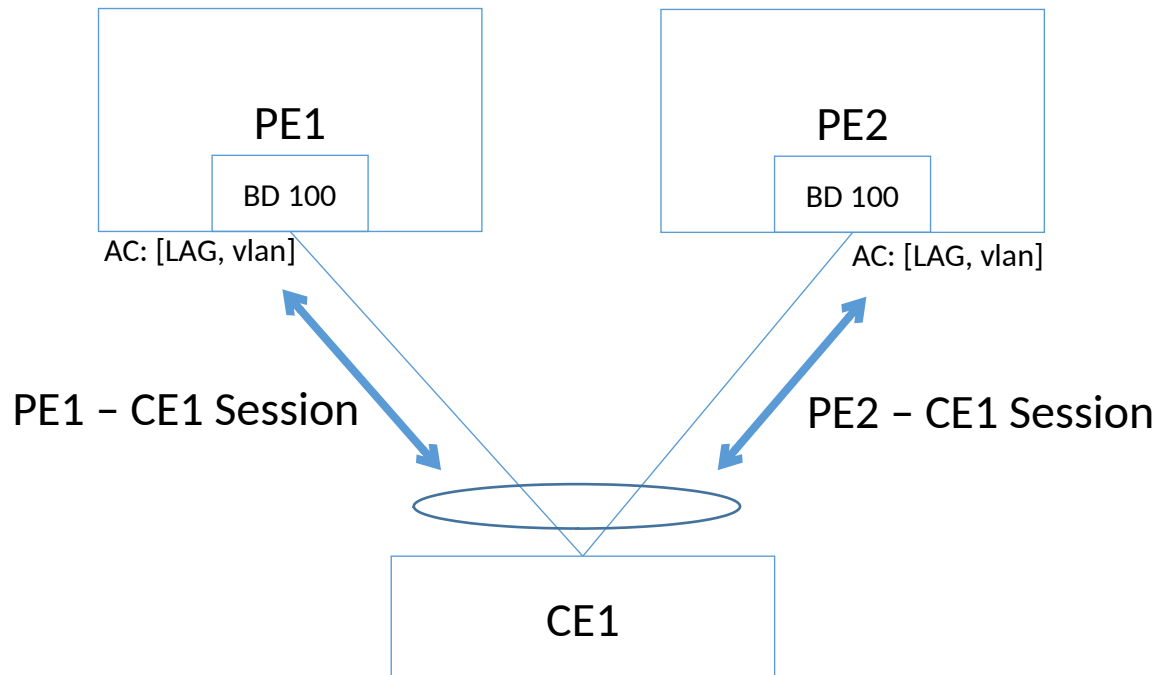
- Based on Link State over Ethernet (LSoE) – link layer auto-discovery protocol
- Procedures and TLVs for MAC learning via PE-CE control plane
- Procedures and TLVs for IPv4-MAC learning via PE-CE control plane
- Procedures and TLVs for IPv6-MAC learning via PE-CE control plane
- Procedures and TLVs for IPv4 and IPv6 Prefix learning via PE-CE control plane
- Procedures for learning with EVPN all-active multi-homing LAG
- Use Cases

PE-CE Control Plane for EVPN – Single Homed CE



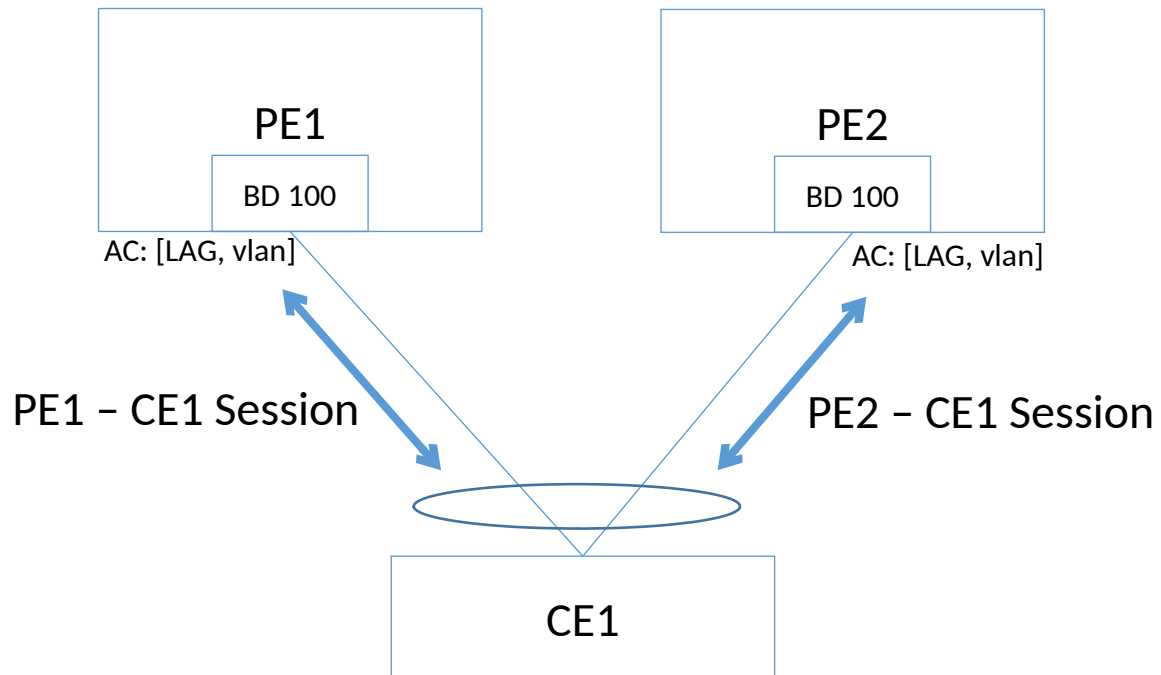
- PE-CE LSoE session on PE AC interface via HELLO, OPEN
- Overlay Host TLVs for MAC and IP-MAC learning
- Overlay Prefix TLVs for prefix learning
- Remote Overlay Host TLVs for ARP / ND suppression

PE-CE Control Plane – EVPN All-active Multi-Homing



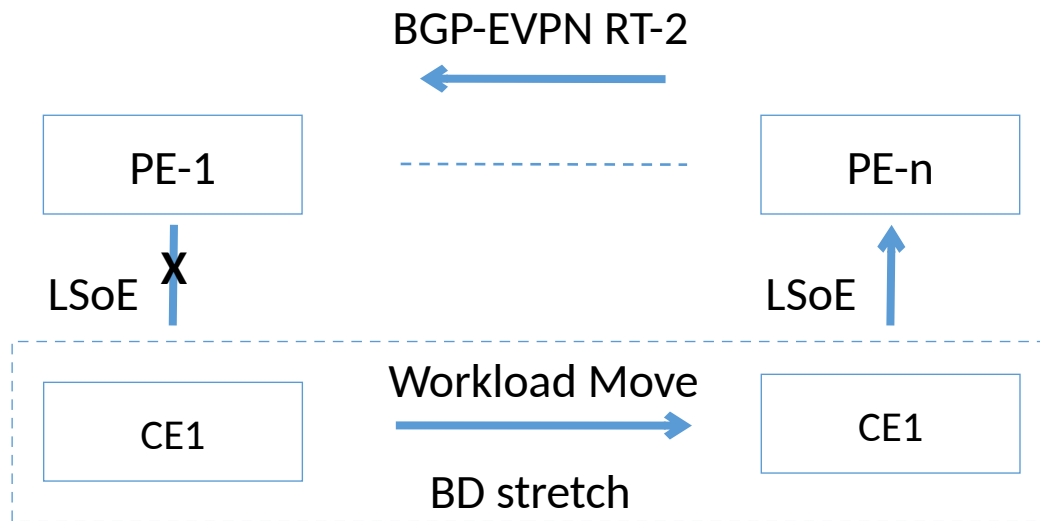
- Separate PE-CE LSoE session to each PE
- Learning TLVs exchanged over each session
- PE-CE failure handling

Use Cases – Simplified All-active Multi-Homing



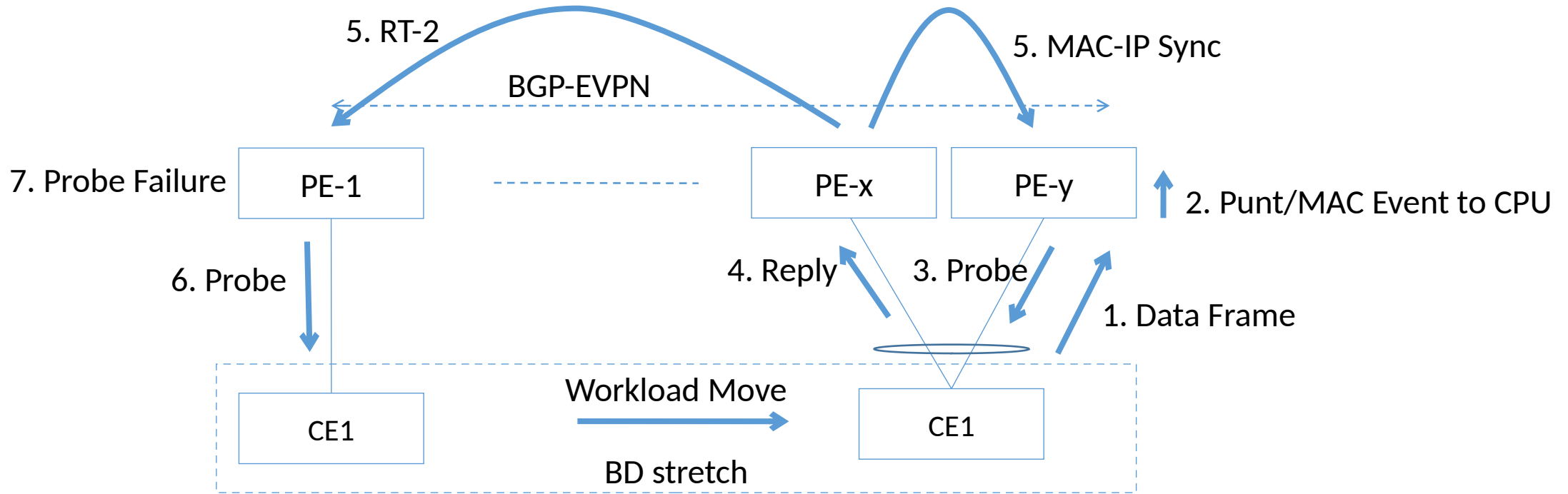
- Automatic MAC, ARP, ND table sync
- Only handle solicited ARP/ND response
- MAC ECMP without aliasing
- IP ECMP without RT-2 re-origination

Use Cases – Simplified Workload Mobility

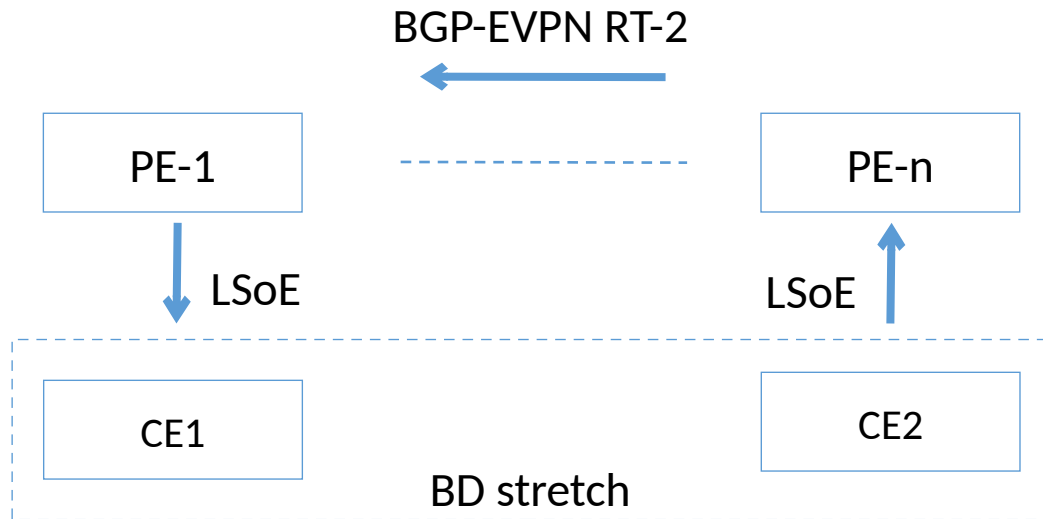


- Move detection decoupled from CE data traffic
- Move detection decoupled from CE unsolicited ARP / NA
- No black-holing, flooding to silent hosts
- No probing on MAC, MAC-IP local/remote mismatch
- No probing on MAC age-outs
- Deterministic convergence on host move

Current Workload Mobility

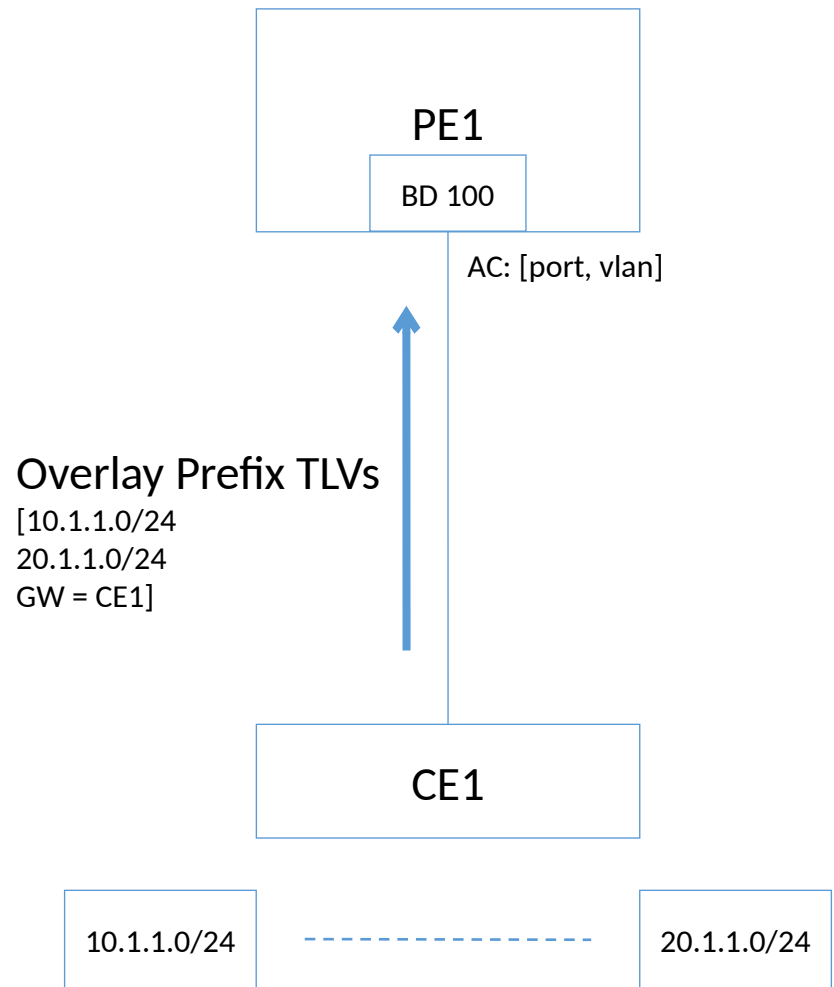


Use Cases – Overlay ARP/ND Learning



- Pre-emptive remote CE to CE ARP/ND learning to eliminate all flooding
- No ARP/ND gleaning latency on PE for inter-subnet routing

Use Cases – Prefix Learning



- Prefix learning when CE is not running dynamic routing
- Avoids local policy configuration on PE for advertising prefixes behind a CE

PE-CE Control Plane for EVPN - Summary

- Deterministic convergence on boot-up, moves, failures
- Decoupled from non-deterministic CE behavior – data flows, unsolicited ARP/NA
- Decoupled from non-deterministic hashing of data frames on all-active MH LAG
- Prefix learning in absence of dynamic routing on CE
- Extensible for additional use cases

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Thank You

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