Multi-homed network in EVPN

draft-hao-evpn-mhn-00

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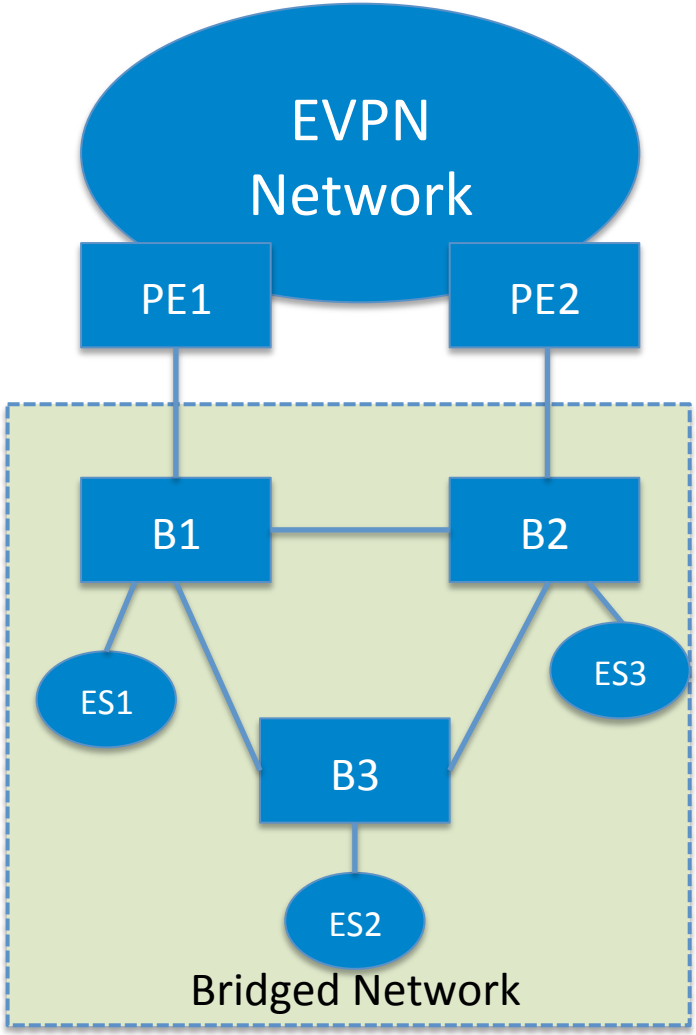
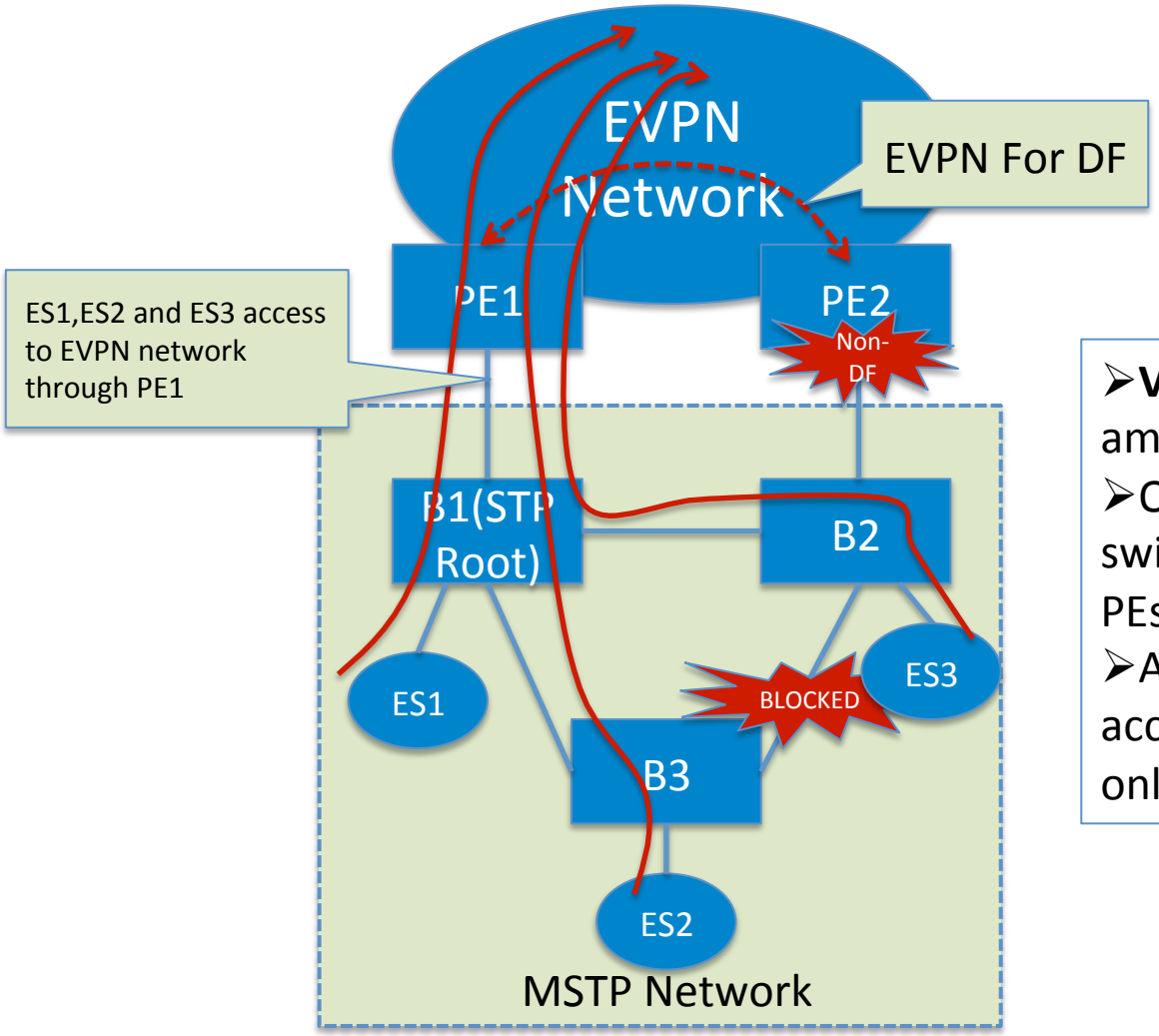
Multi-homed network (MHN) in EVPN scenarios



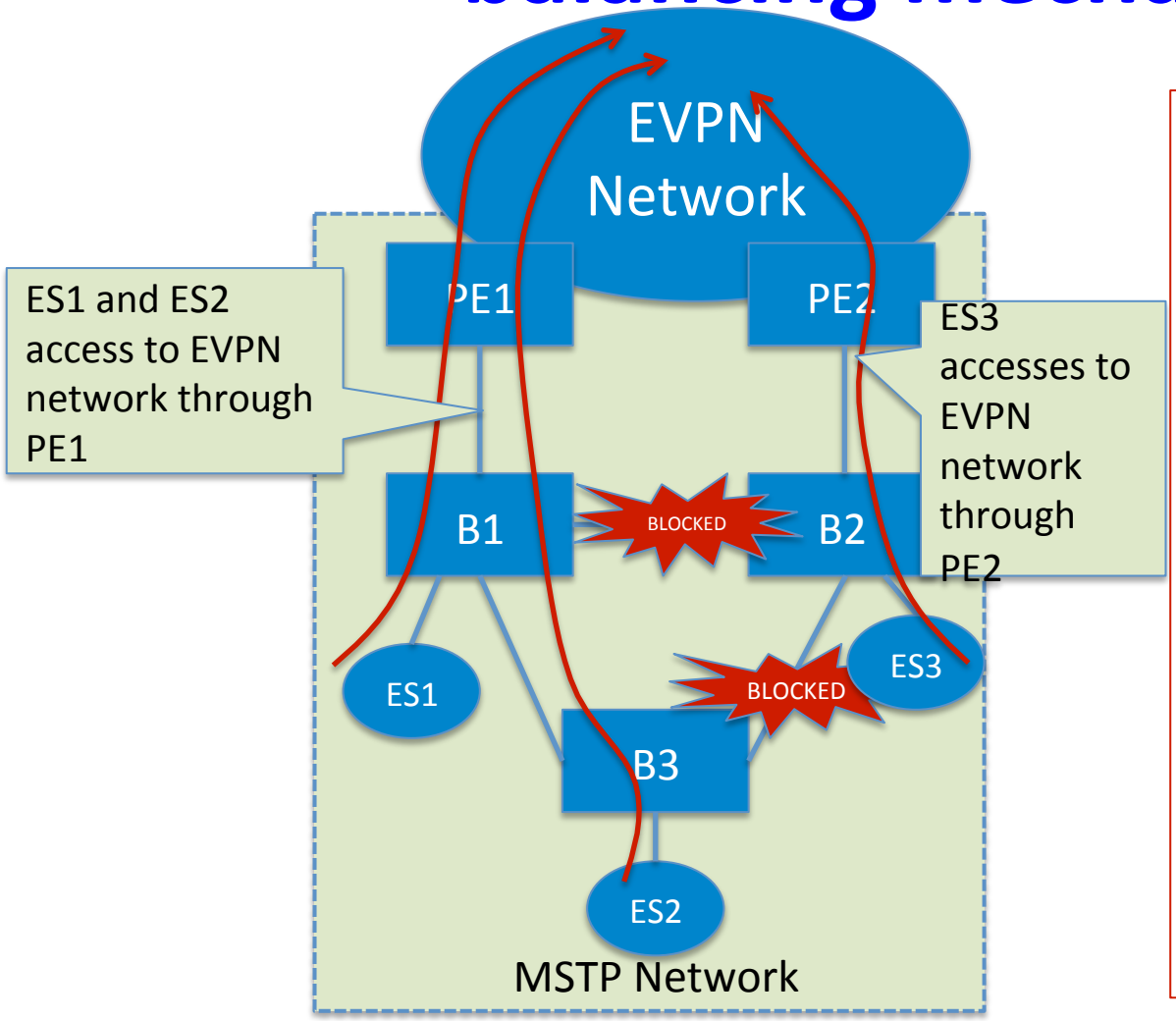
There are two categories of mechanisms to avoid the layer 2 traffic loop.
1, PEs doesn't participate in the control protocol of the bridged network , that is designated forwarder (DF) election mechanism.
2, PEs participate in the control protocol of the bridged network, active/active MAC-based load balancing can be achieved through the solution.

DF Mechanism



- **VLAN-based load balancing** among PEs can be achieved.
- Only one of the links between the switched bridged network and the PEs is active for a given VLAN.
- All end systems of one VLAN can access the EVPN network through only one PE.

Active/Active MAC-based load balancing mechanism



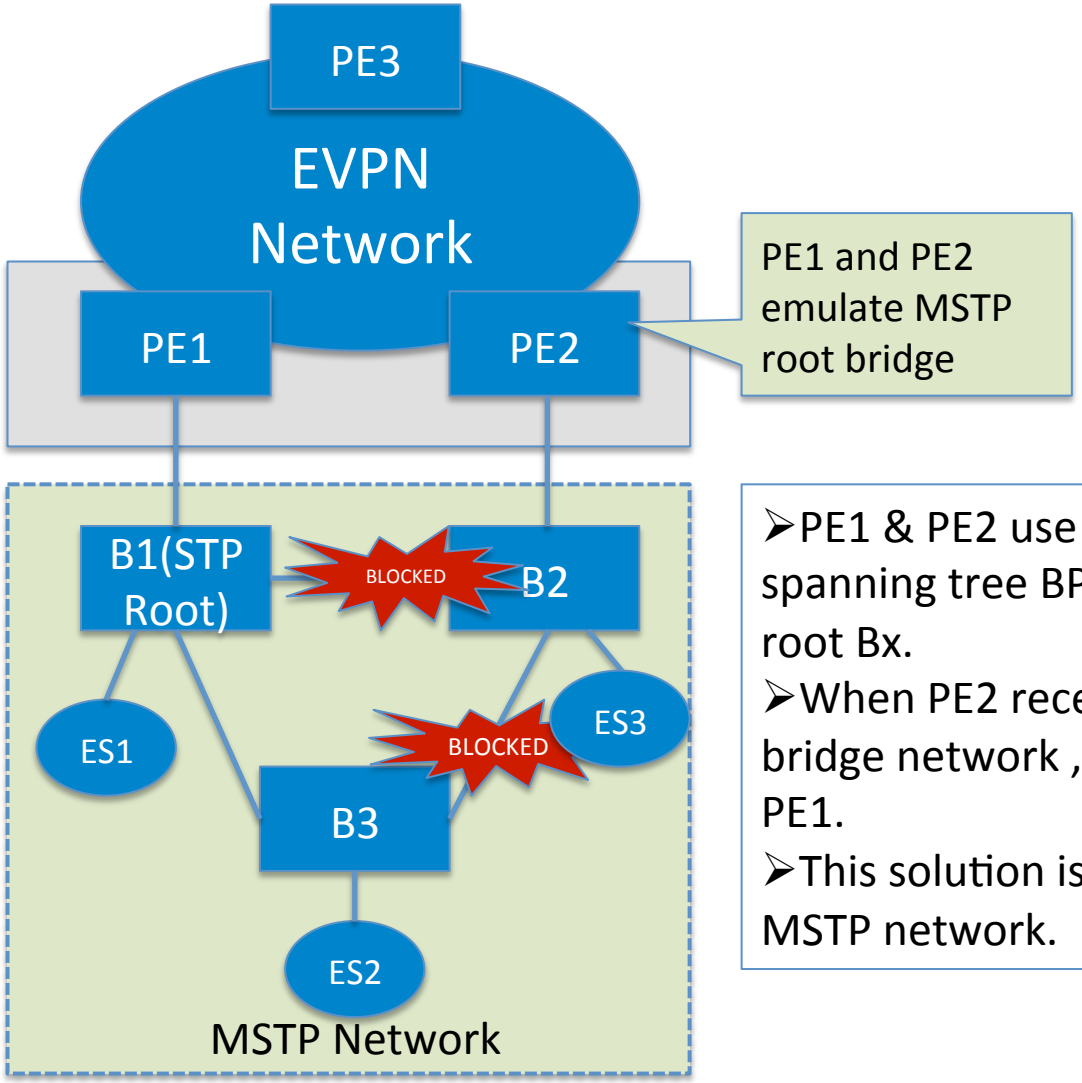
- The mechanism requires PEs participate in the control plane protocol of the bridged network.
- per-vlan MAC-based load balancing can be achieved through the mechanism , so it can achieve better load balancing than DF election.

Two solutions:

1, emulated MSTP root bridge solution.

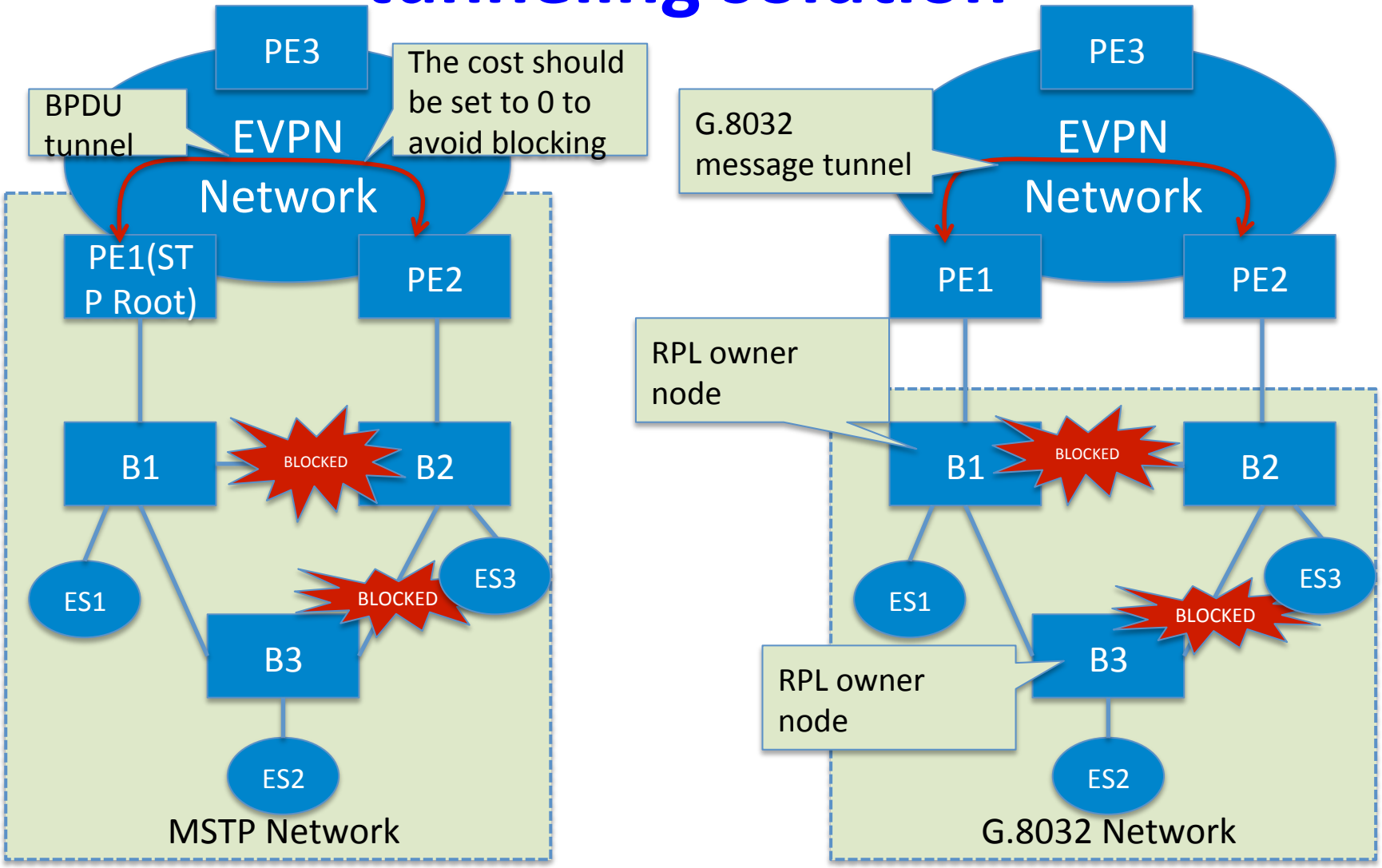
2, bridge control plane protocol tunneling solution.

Emulated MSTP root bridge solution



- PE1 & PE2 use the same bridge ID to emit spanning tree BPDUs as the highest priority root Bx.
- When PE2 receives TC BPDU from the bridge network , PE2 tunnel the TC BPDU to PE1.
- This solution is only applicable for STP/ MSTP network.

Bridge control plane protocol tunneling solution



Bridge control plane protocol tunneling solution

The solution can be used for both MSTP and G.8032 domain.

Scenario 1: Local bridged network is MSTP

PE1 and PE2 act as normal MSTP bridge nodes. BPDU message can be sent through tunnel over EVPN network between PE1 and PE2.

Scenario 2: Local bridged network is G.8032

PE1 and PE2 act as normal G.8032 ring nodes. They support standard FDB MAC learning, forwarding, flush behavior and port blocking/unblocking mechanisms. G.8032 message can be sent through tunnel over EVPN network between PE1 and PE2.

EVPN protocol extension

ESI Label Extended Community

- "M" bit is introduced to indicate multi-homing mode of MAC-based all active without DF Election.
- DF selection procedures should be skipped if "M" bit is set to be 1.
- When remote PE receives Ethernet A-D route withdraw message, it simply invalidates the MAC entries for the segment that corresponding to the Ethernet A-D route.

Next Steps

- Does WG think this can be put into EVPN base protocol?
- Any other comments and suggestions?