Inter-AS Option B between NVO3 and MPLS EVPN network

draft-hao-l2vpn-inter-nvo3-evpn-00

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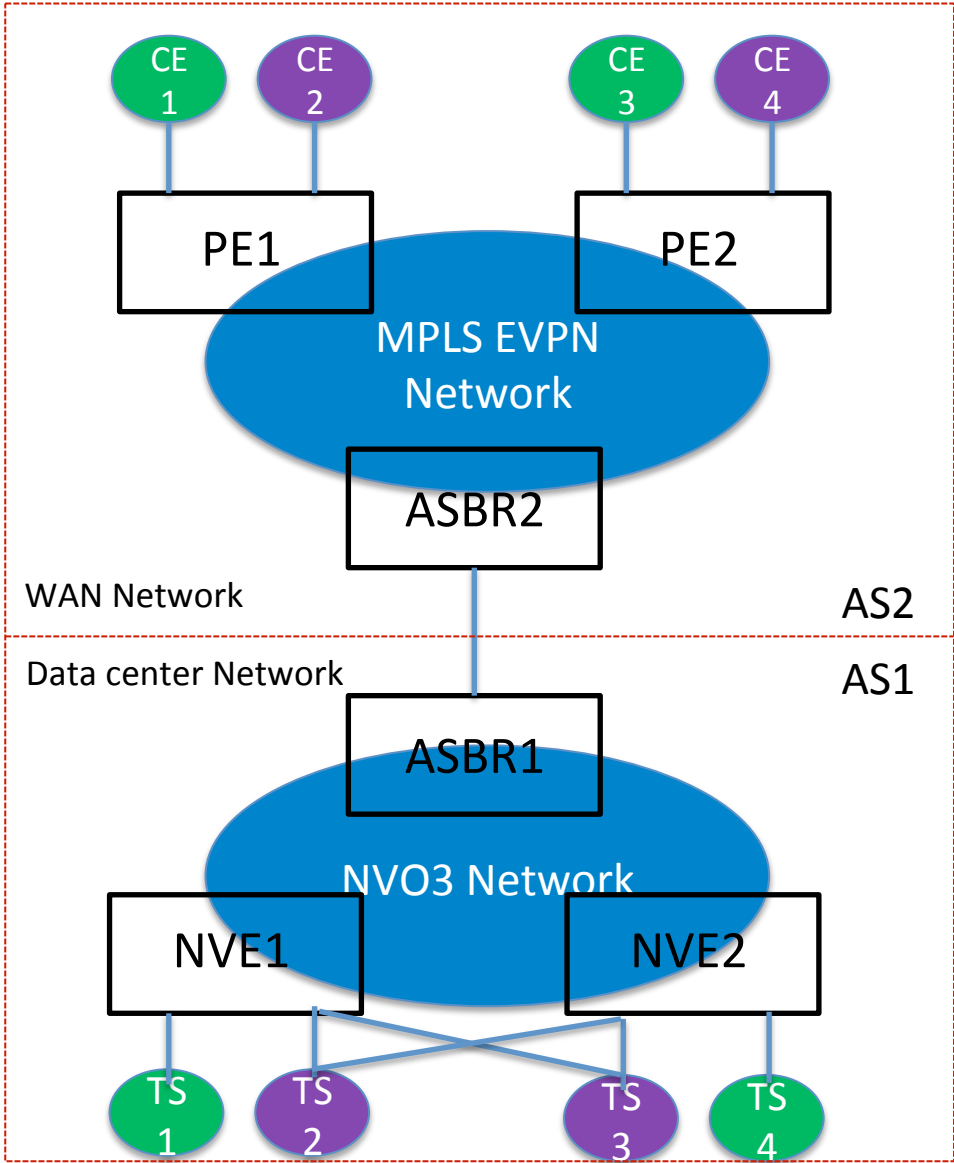Vic Liu(China Mobile)

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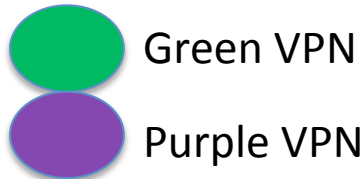frank.xialiang@huawei.com
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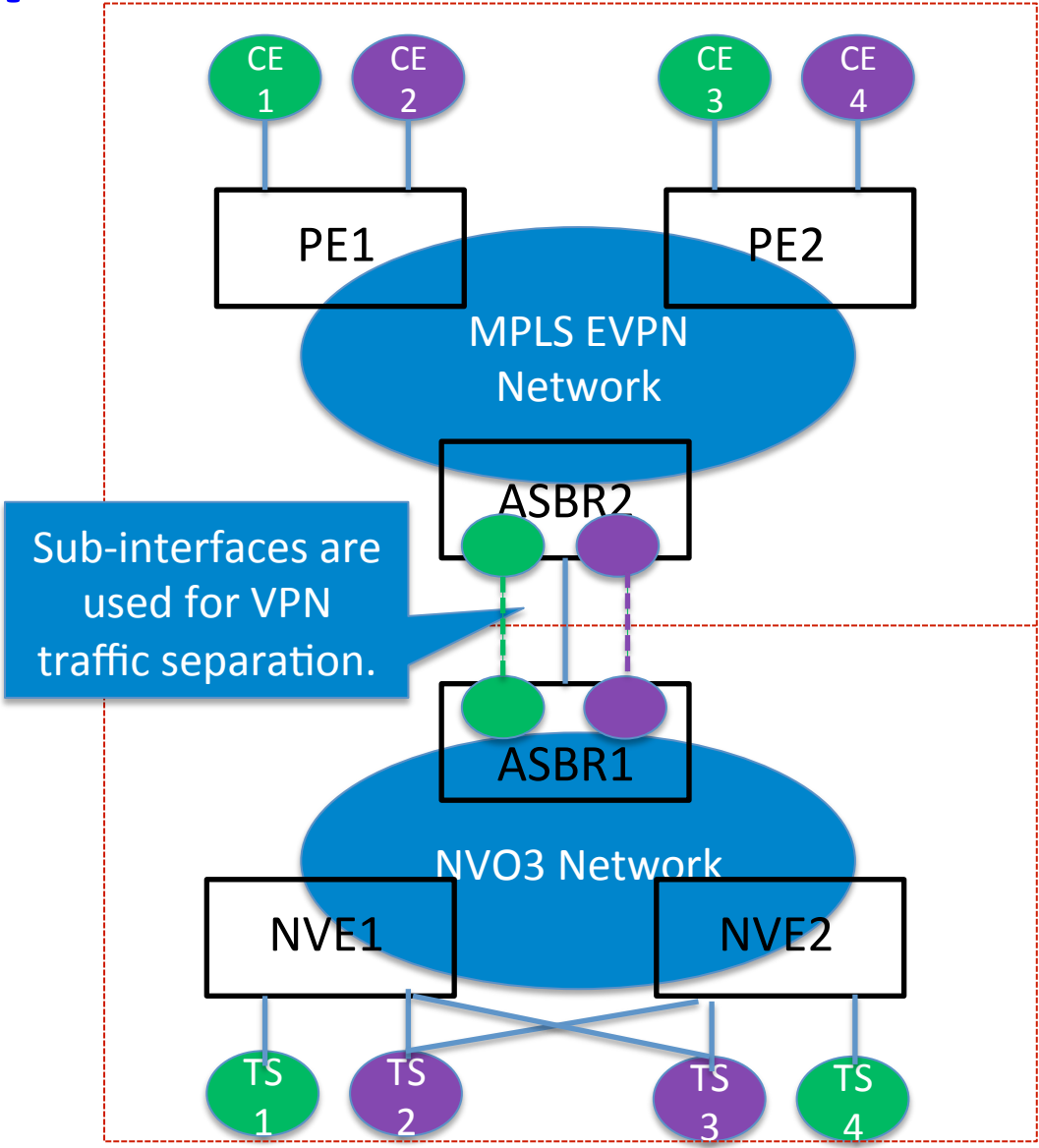liuzhiheng@chinamobile.com

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Scenario

Inter-as connection should be setup between ASBRs. Two solutions:
1. Option-A
2. Option-B.

Inter-as NVO3 and EVPN

Option-A solution

CE 1 · CE 2 · CE 3 · CE 4

PE1 · PE2

MPLS EVPN Network

ASBR2

Sub-interfaces are used for VPN traffic separation.

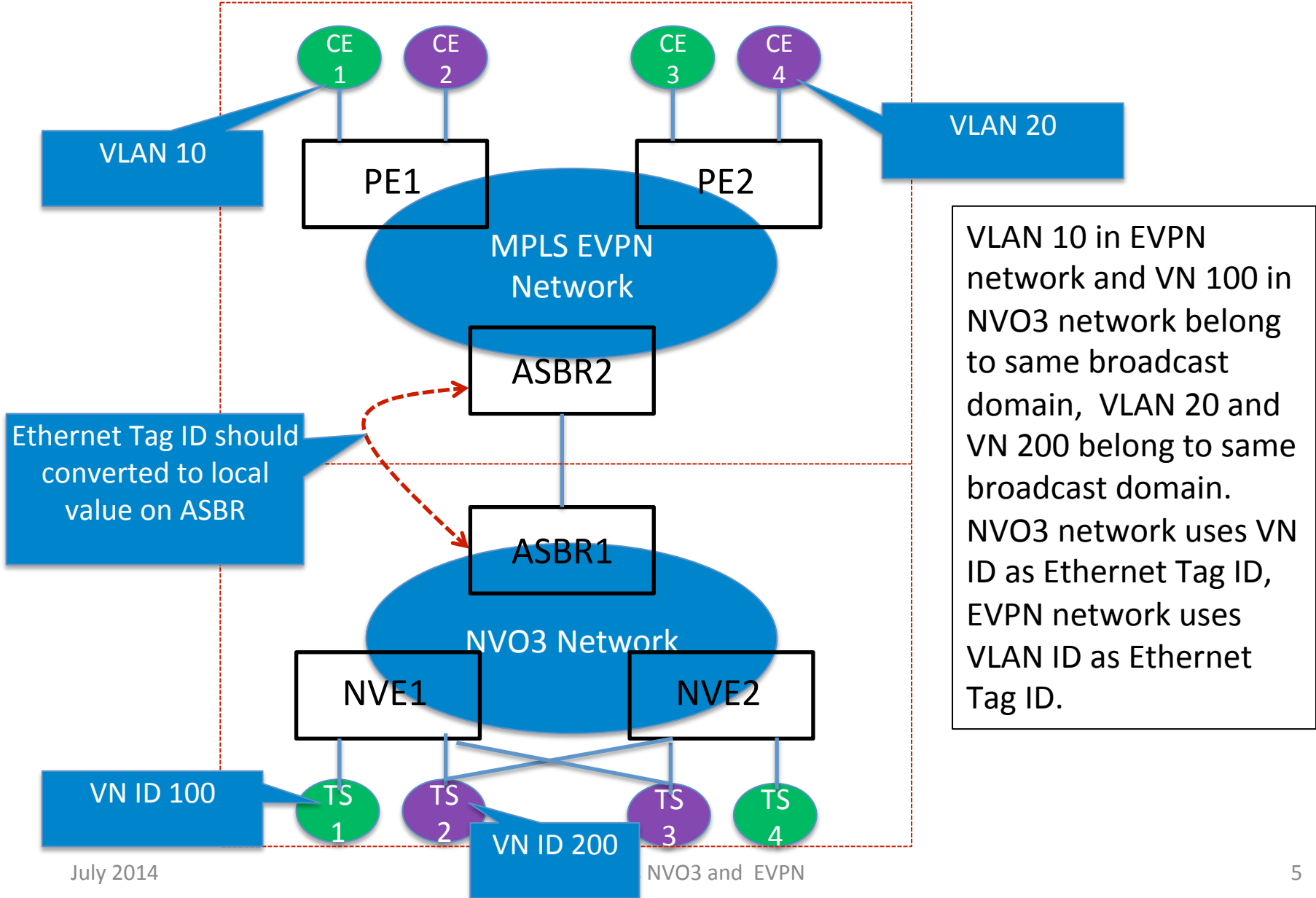ASBR1

NVO3 Network

NVE1 · NVE2

TS 1 · TS 2 · TS 3 · TS 4

Option-A inter-as solution issues:
➢ Up to 16M sub-interfaces between ASBRs.
➢ Up to 16M EVPN instances on ASBRs.
➢ Several million MAC routing entries on ASBRs.

Option-B solution characteristic

- No MAC-VRF exists on ASBR

- No sub-interface associated with each VRF exists between ASBRs

- Only VN ID and MPLS Label switching on ASBR

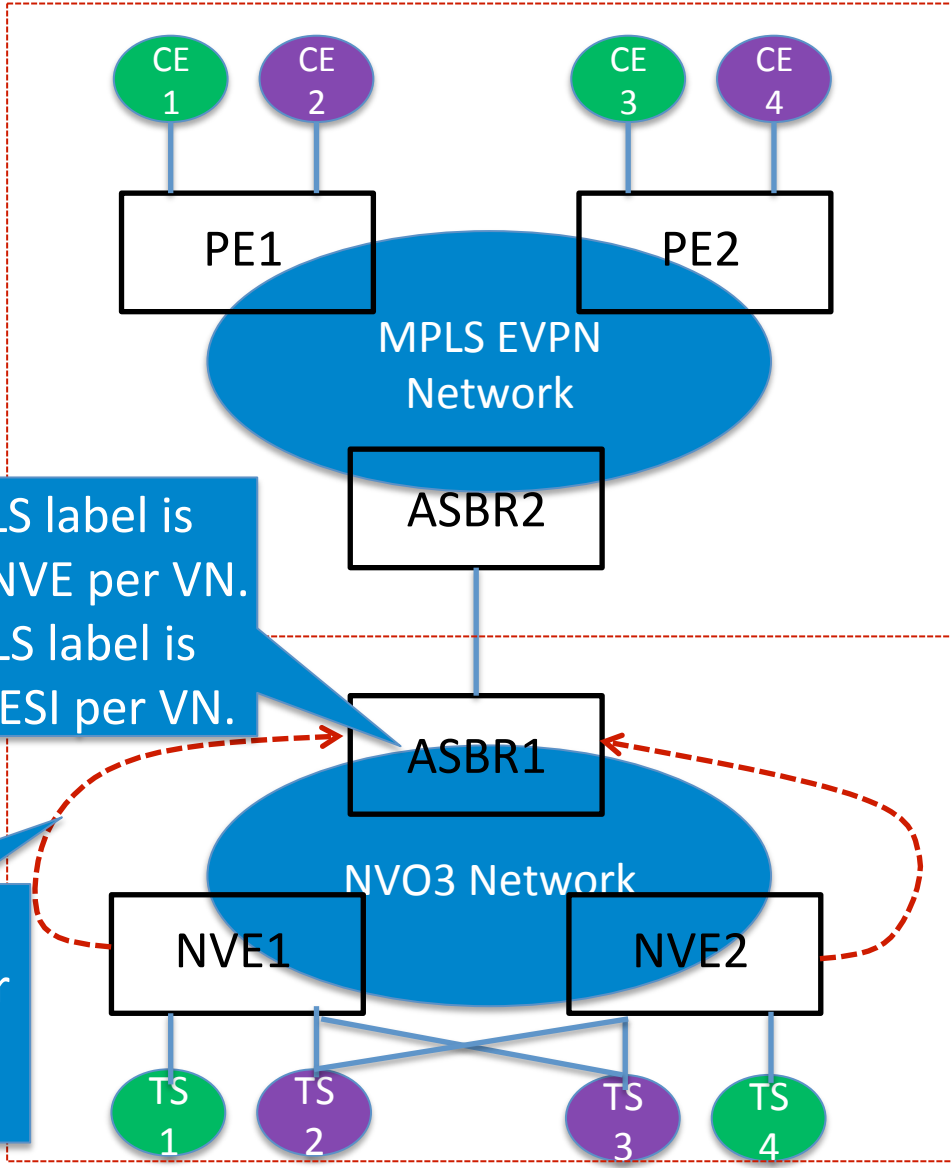# Option-B solution：Ethernet Tag ID conversion on ASBR

VLAN 10 in EVPN network and VN 100 in NVO3 network belong to same broadcast domain, VLAN 20 and VN 200 belong to same broadcast domain. NVO3 network uses VN ID as Ethernet Tag ID, EVPN network uses VLAN ID as Ethernet Tag ID.

Ethernet Tag ID should converted to local value on ASBR

NVO3 and EVPN

Option-B solution： Ethernet Auto-Discovery Route process

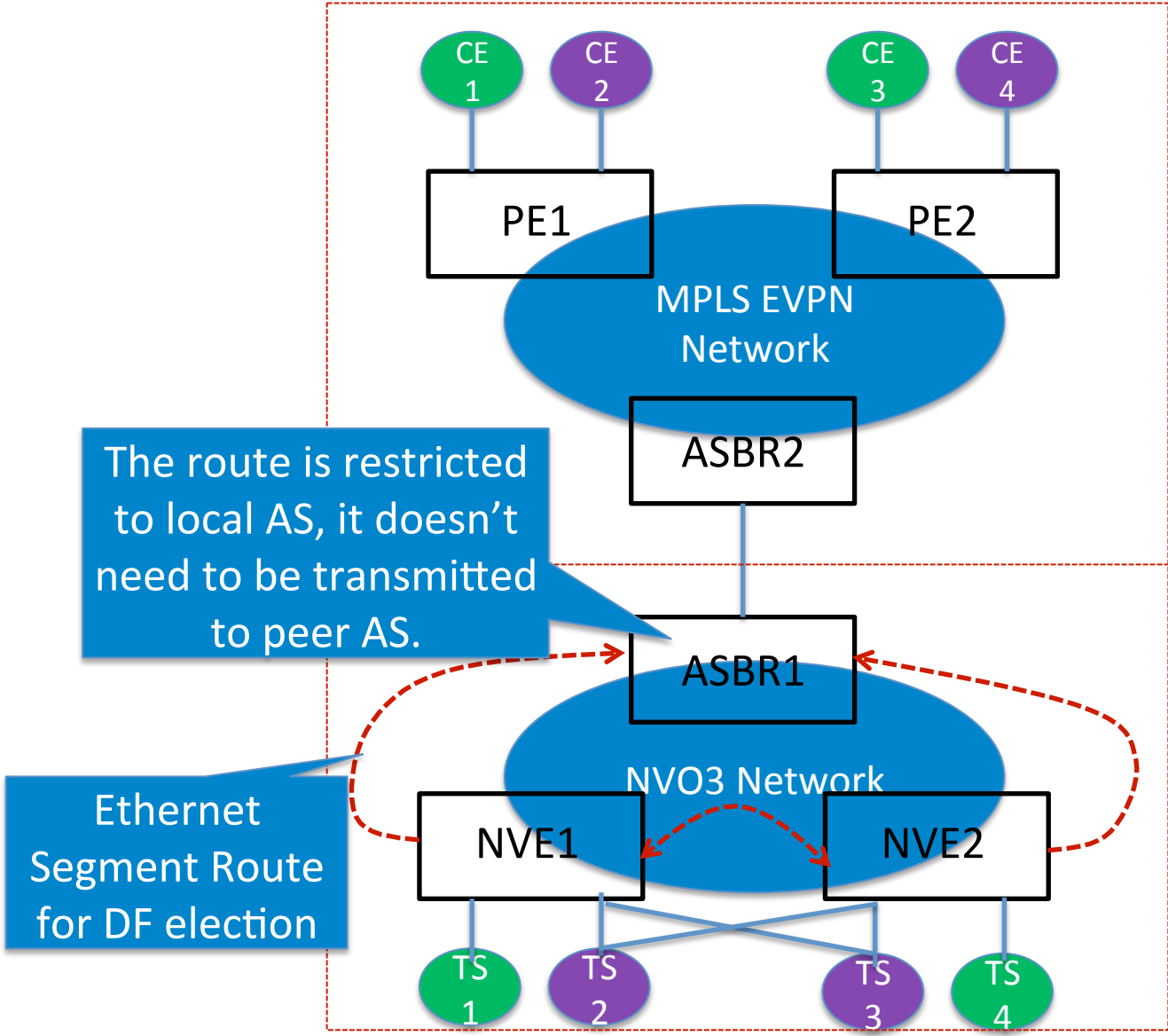If multiple ESIs share same set of NVEs, these ESIs can share MPLS Label on ASBR1.

CE 1
CE 2
CE 3
CE 4

PE1
PE2

MPLS EVPN Network

ASBR2

ESI =0 : MPLS label is allocated per NVE per VN.
ESI !=0: MPLS label is allocated per ESI per VN.

ASBR1

MPLS Label and <remote NVE(s), VN ID> correspondence is used to generate incoming forwarding table on ASBR1.

NVO3 Network

Ethernet A-D router per ES or per EVI/VN

NVE1
NVE2

TS 1
TS 2
TS 3
TS 4

Option-B solution： Ethernet Segment Route process

Option-B solution：Inclusive Multicast Ethernet Tag Route

CE 1

CE 2

CE 3

CE 4

PE1

PE2

MPLS EVPN Network

- LDP/RSVP-TE P2P LSP
- RSVP-TE P2MP LSP
- mLDP P2MP LSP

ASBR2

Stitching segmented P-multicast tree on ASBR

ASBR1

NVO3 Network

- PIM-SSM Tree
- PIM-SM Tree
- BIDIR-PIM Tree
- Ingress Replication

NVE1

NVE2

TS 1

TS 2

TS 3

TS 4
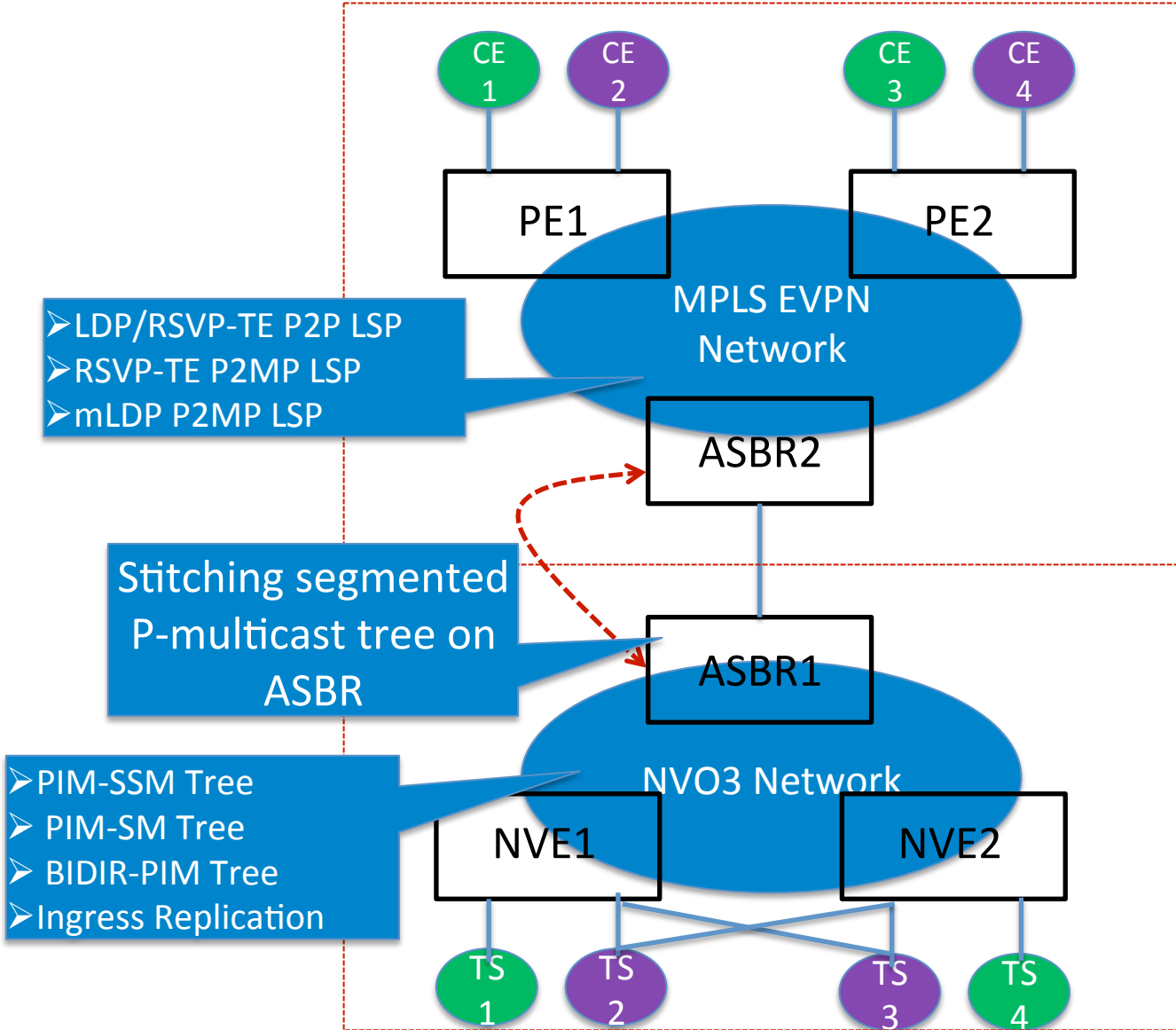
The re-advertised Inclusive Multicast Ethernet Tag Route on ASBR is same with original ones, except for Ethernet Tag ID and the PMSI Tunnel attribute.

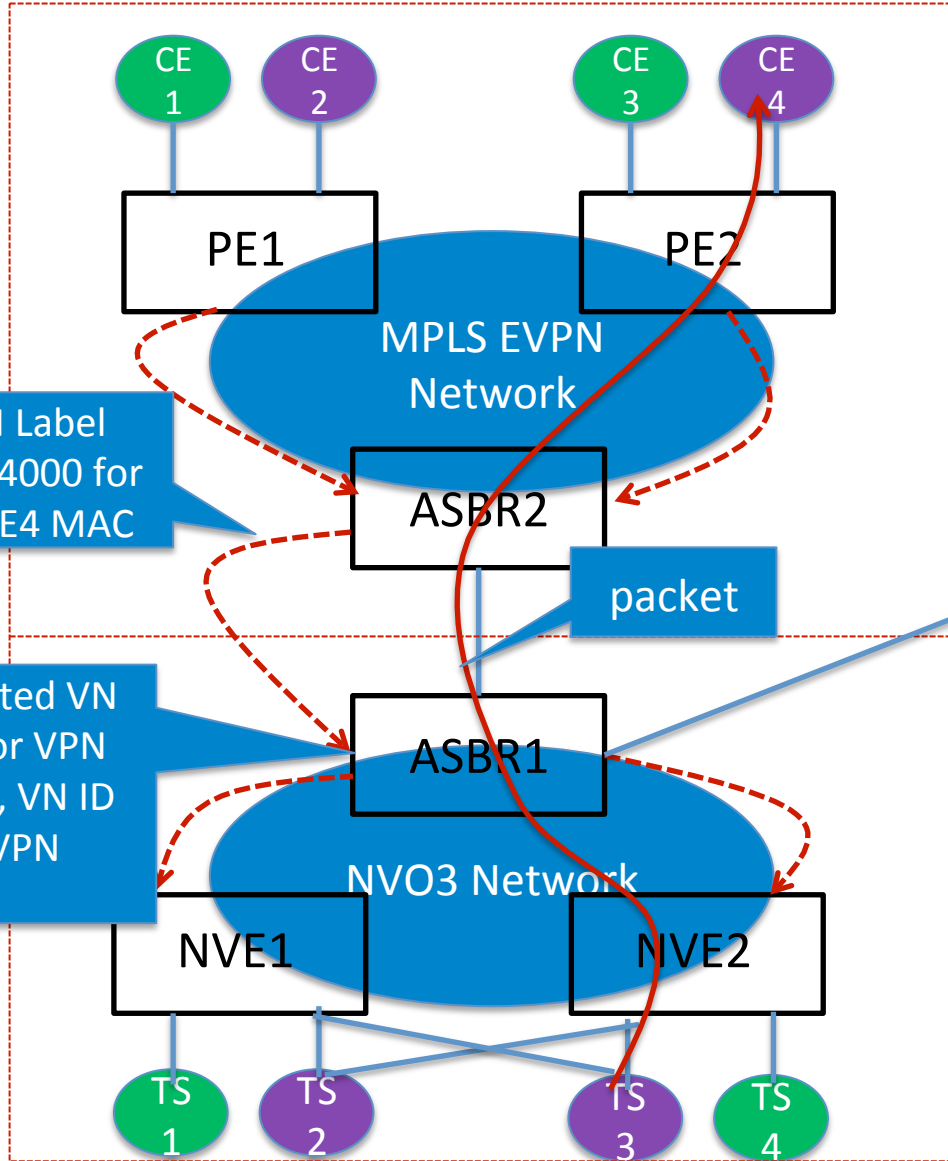# Option-B solution：MAC/IP advertisement route(1)
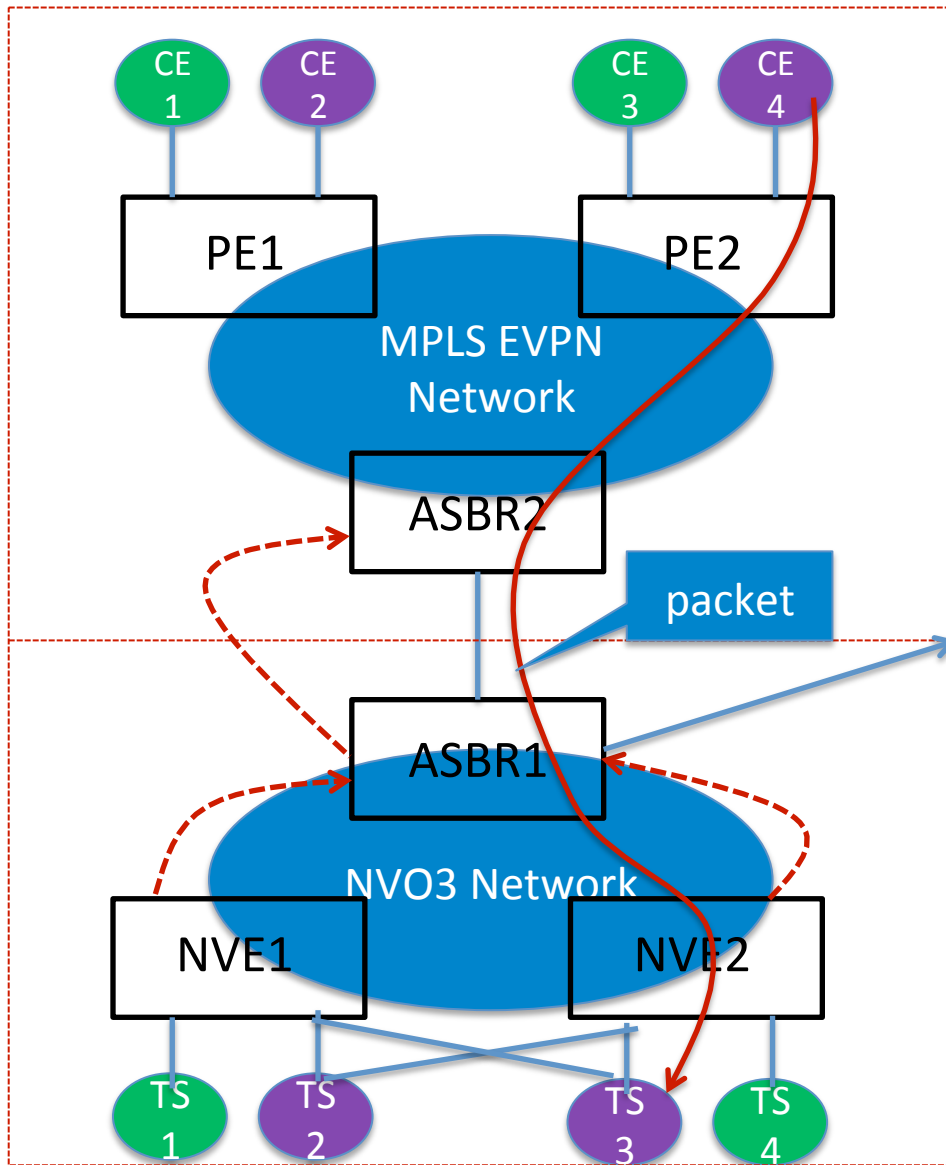
MPLS VPN Label	NVE+VN ID
1000	NVE1+ 100
2000	NVE2 + 100
3000	NVE1+200 NVE2+200

Incoming forwarding table

🟢 VN ID 100

🟣 VN ID 200

Option-B solution：MAC/IP advertisement route(2)

CE 1

CE 2

CE 3

CE 4

PE1

PE2

MPLS EVPN Network

ASBR2

packet
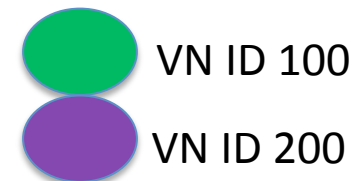
MPLS VPN Label 3000 and 4000 for CE1 and CE4 MAC

New allocated VN ID 10000 for VPN Label 3000, VN ID 20000 for VPN Label 4000

ASBR1

NVO3 Network

NVE1

NVE2

TS 1

TS 2

TS 3

TS 4

VN ID	MPLS VPN Label
10000	3000
20000	4000

Outgoing forwarding table

VN ID 100

VN ID 200

Next Steps

- Discuss the modes of VN ID allocations.

- P-Multicast tree stitching solution on ASBR.

- NVO3 and PBB MPLS EVPN interconnection

- Solicit other comments and suggestions.