Layer-3 Accessible EVPN Services

[draft-wang-bess-l3-accessible-evpn]

Wei Wang (China Telecom)

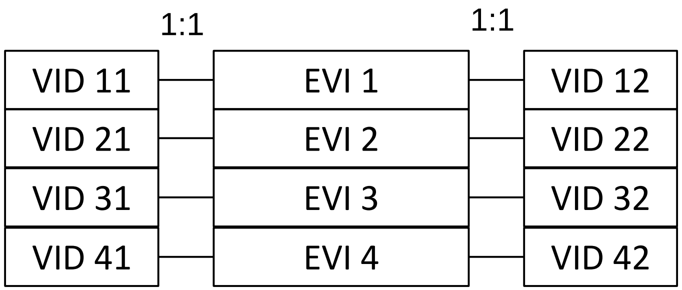
Aijun Wang (China Telecom)

Haibo Wang (Huawei)

IETF 122, March. 2025

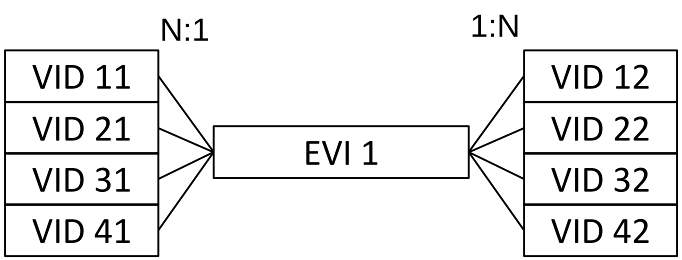
- Layer-3 accessible interfaces for EVPN Service
- Proposed Solutions
- Further Action

Layer-2 Accessible Interfaces for EVPN Service



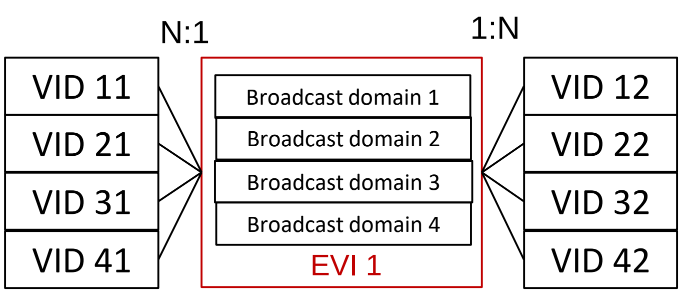
VLAN-Based Service Interface

- 1:1 mapping between VID and EVI
- Each EVI has a single broadcast domain



VLAN-Bundle Service Interface

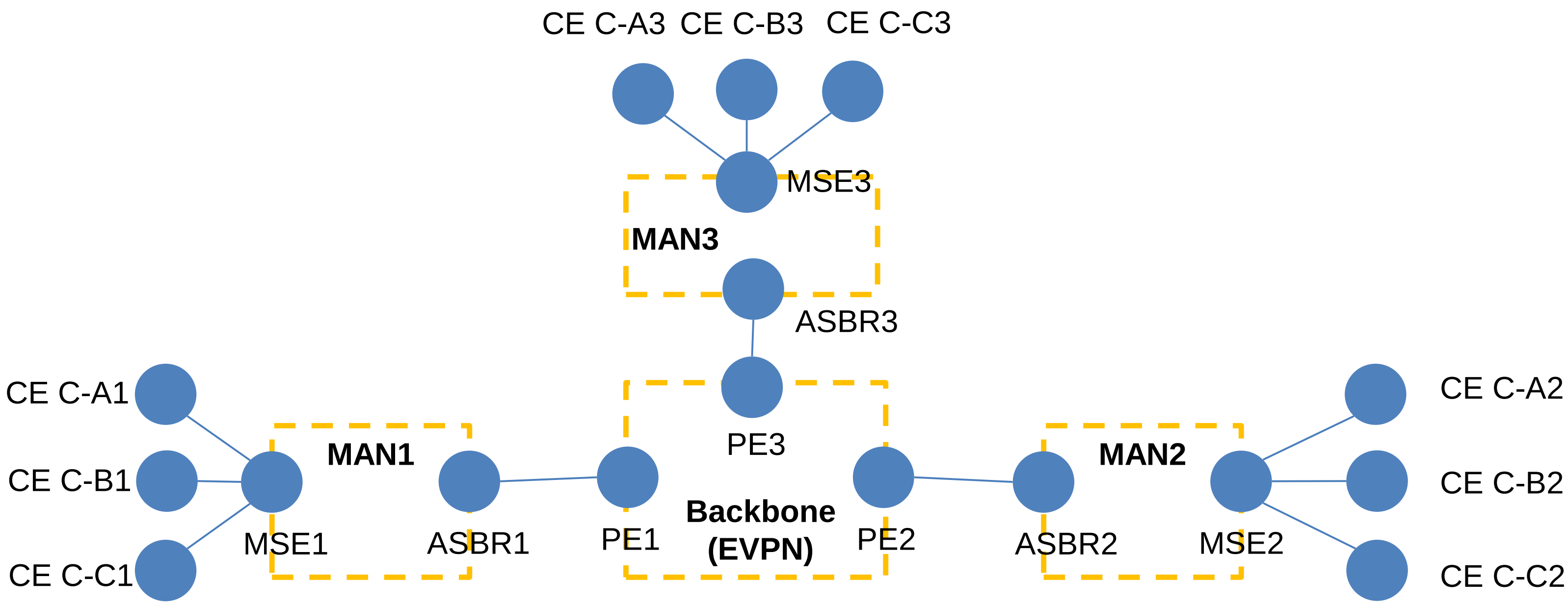
- N:1 mapping between VID and EVI
- Each EVI has a single broadcast domain
- MAC address MUST be unique



VLAN-Aware Bundle Service Interface

- N:1 mapping between VID and EVI
- Each EVI has multiple broadcast domains
- MAC address can overlap
- 1:1 mapping between VID and Broadcast domain

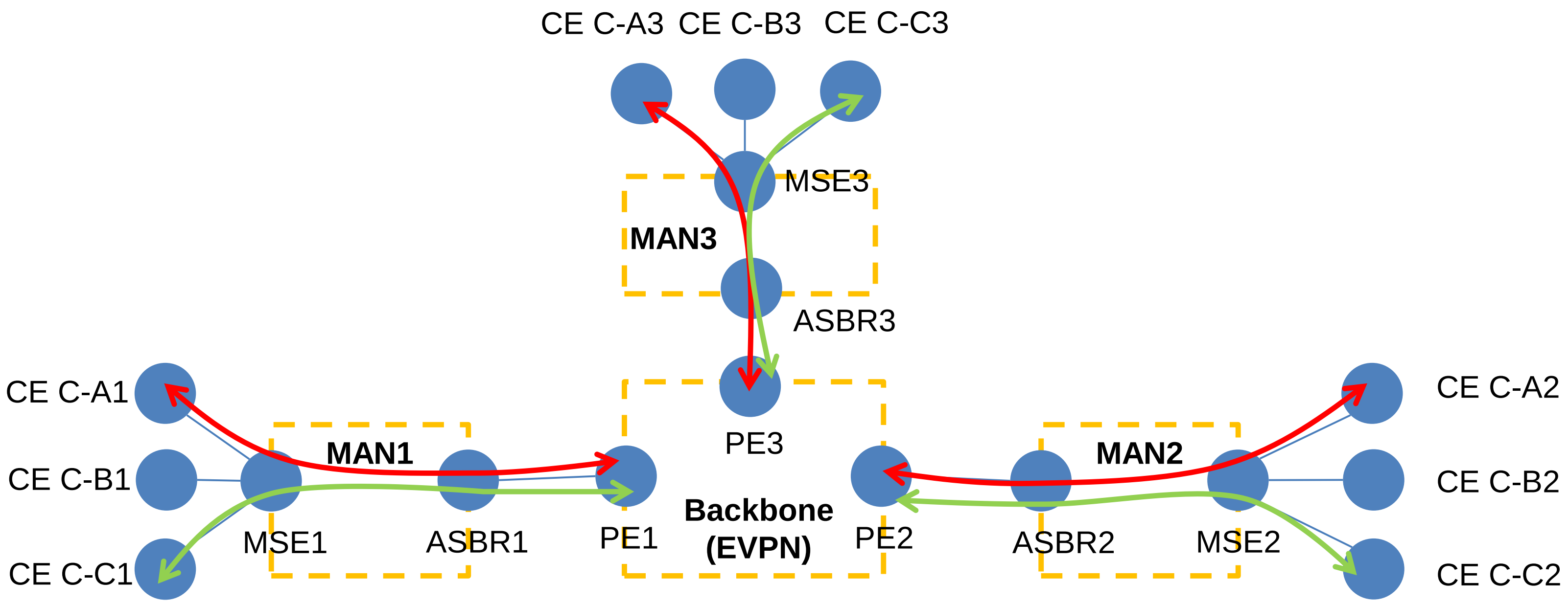
Requirements for Layer-3 Accessible EVPN Service



- Backbone is EVPN domain, and MAN1-3 are Layer-3 network.
- Customer C has different branches that located in sites under different MAN(Metro Area Network).
- Customer C buys the EVPN service within the backbone from the service provider.
- Customer C wants its branches in different sites(C-A1/C-A2/C-A3) communicates in layer 2 mode, and keep the traffic isolation among different branches(C-A, C-B, C-C).

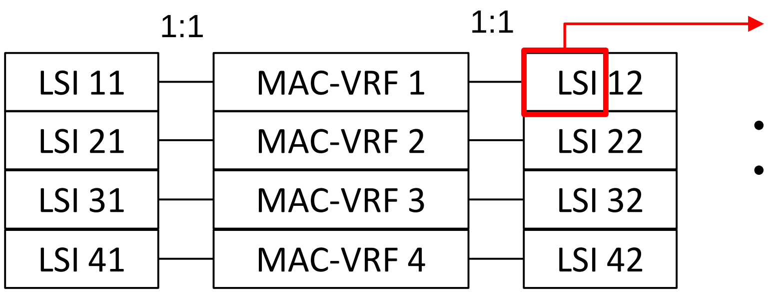
- If MAN is one layer 2 network, we can utilize the Layer-2 accessible EVPN service
- Currently, MAN is one layer 3 network, we must find other ways to meet the customer's requirements.

Solution for Layer-3 Accessible EVPN Service



- Backbone is EVPN domain, and MAN1-3 are Layer-3 network.
- We connect the sites under the MAN to the Backbone EVPN, via one pseudo wire(for example, VxLAN) to transport the Ethernet frame to the PE of the Backbone EVPN.
- The identification of pseudo wire(LSI, Logical Session Identifier) can be used to differentiate the traffic from customer's different branches.
- Similar with the layer-2 accessible EVPN, there will be three kinds of layer-3 accessible EVPN services: LSI-Based, LSI-Bundle, LSI-Aware Bundle

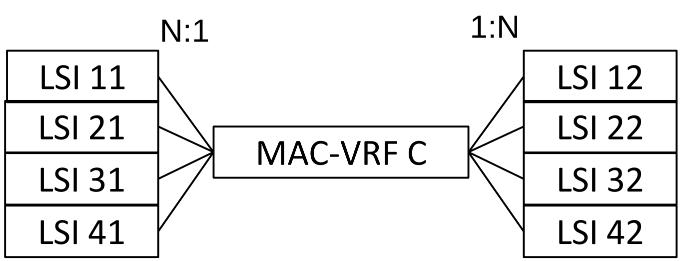
Layer-3 Accessible Interfaces for EVPN Services



LSI-Based Service Interface

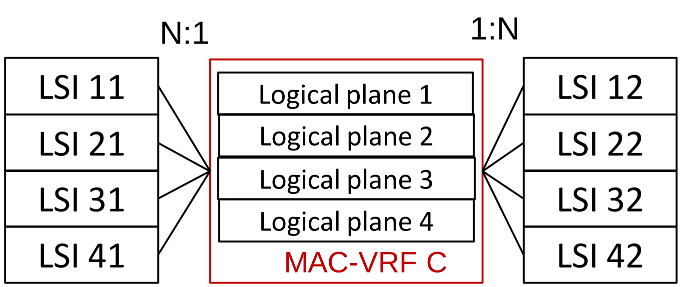
LSI: Logical Session Identifier, for example VNI.

- 1:1 mapping between LSI and MAC-VRF
- Each MAC-VRF has a single broadcast domain



LSI-Bundle Service Interface

- N:1 mapping between LSI and MAC-VRF
- Each MAC-VRF has a single broadcast domain
- MAC address MUST be unique



LSI-Aware Bundle Service Interface

- N:1 mapping between LSI and MAC-VRF
- Each MAC-VRF has multiple broadcast domain
- MAC address can overlap
- 1:1 mapping between LSI and broadcast domain

Forwarding Plane Extension for LSI-Aware Bundle Service

```
VXLAN Header:
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|R|S|R|R|I|R|R|R|            Reserved   |           LSI          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|            VXLAN Network Identifier (VNI) |   Reserved    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

The extensions to VxLAN header(Based on RFC 7348)

- For LSI-Aware Bundle Service, if the customer want to differentiate the traffic from its different branches, there should be indicator(LSI) within the VxLAN header.
- We define one flag “S” from the reserved bits of the current VxLAN header, to indicate the last 16 bits of first 4-bytes indicates the value of “LSI”

Control Plane Extensions for LSI-Aware Bundle Service

```
+---+---+---+---+---+---+---+---+---+---+
| T | Reserved  | CE Identifier |  LSI  |
+---+---+---+---+---+---+---+---+---+---+
```

Figure 5: The format of new ESI type

Where:

* T (1 octet): specify the ESI Type. The recommended value is 0x06.

* CE Identifier (3 octets): the route ID/IPv4 address of CE.

* LSI (2 octets): the LSI information.

Control Plane Extensions for LSI-Aware Bundle Service

- We propose to define one new type of ESI(Ethernet Segment Identifier) to transfer the LSI information, that associated with the destination MAC address advertisements.

Further Action

- After several presentations and offline/online discussions, the scenarios and solutions are clear now.
- We would like to ask WG to begin the WG adoption call.
- Some contents will be refined later upon the comments.

wangw36@chinatelecom.cn
wangaj3@chinatelecom.cn
rainsword.wang@huawei.com
IETF122