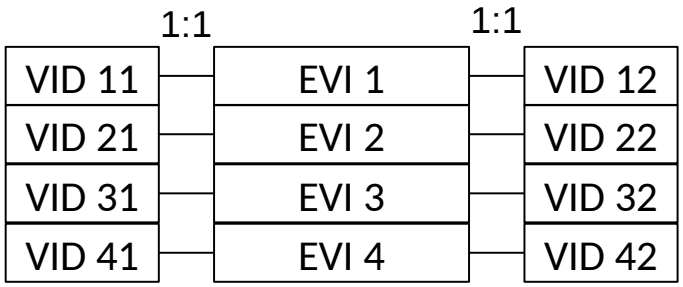
Layer-3 Accessible EVPN Services

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

Wei Wang (China Telecom)
Aijun Wang (China Telecom)
Haibo Wang (Huawei)
IETF 110, March. 2021

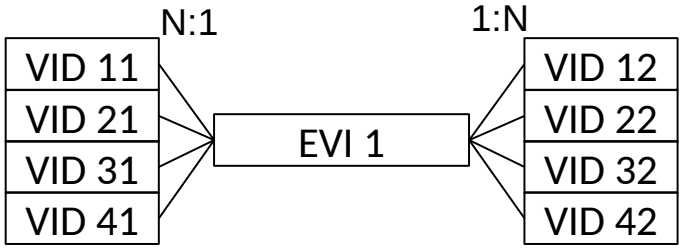
- Layer-3 accessible interfaces for EVPN Service
- Proposed Solutions
- Further Action

Layer-2 Accessible Interfaces for EVPN Service



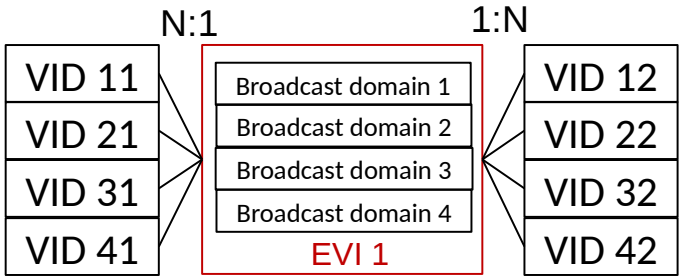
VLAN-Based Service Interface

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



VLAN-Bundle Service Interface

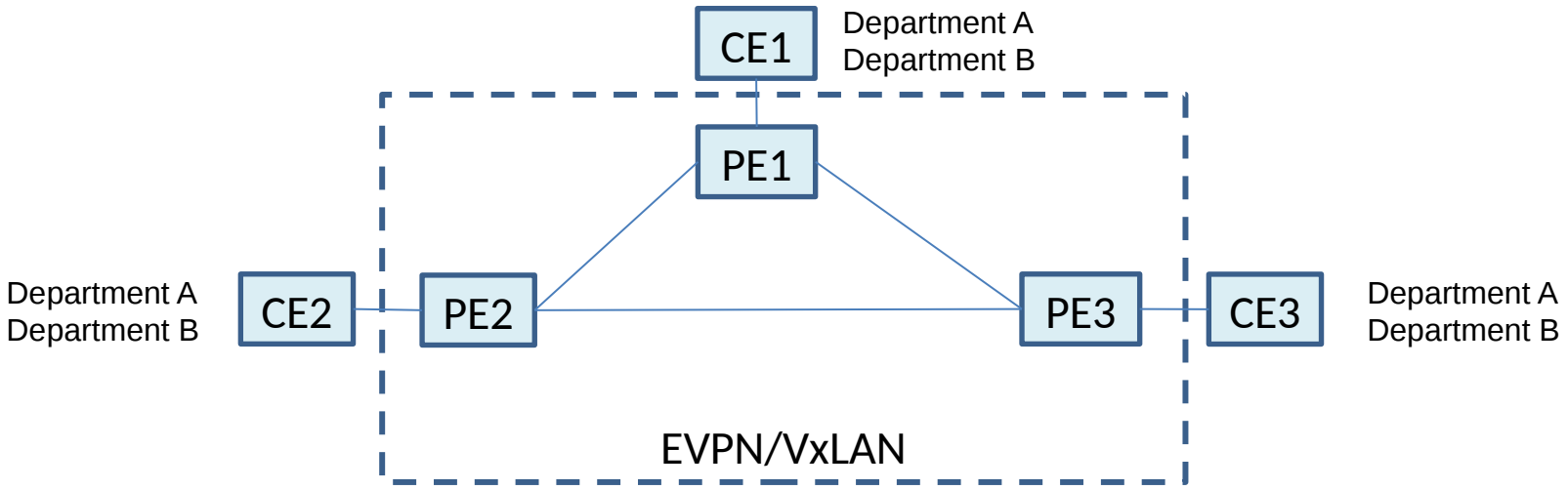
- N:1 mapping between VID and EVI
- Each EVI has a single broadcast domain
- MAC address MUST be unique



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

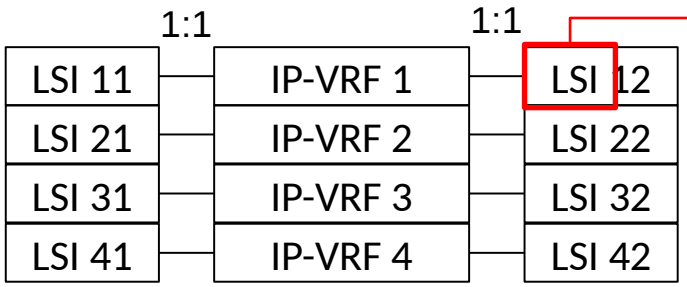
Considerations for Layer-3 Accessible EVPN Service



EVPN scenario

- EVPN service interfaces mentioned in RFC7432 requires that the network between CE and PE is a layer-2 network.
- In most of provider network, CE-PE need to cross a Layer-3 network, then the above service interfaces should be extended to adapt to the layer-3 network.

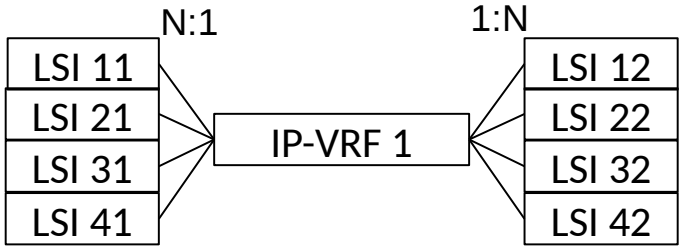
Layer-3 Accessible Interfaces for EVPN Services



LSI-Based Service Interface

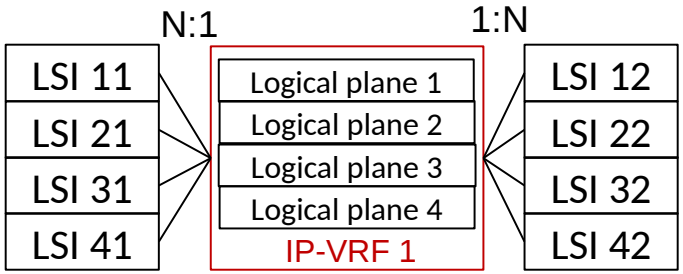
LSI: Logical Session Identifier, related to VNI/SPI.

- 1:1 mapping between LSI and IP-VRF
- Each IP-VRF has a single logical plane



LSI-Bundle Service Interface

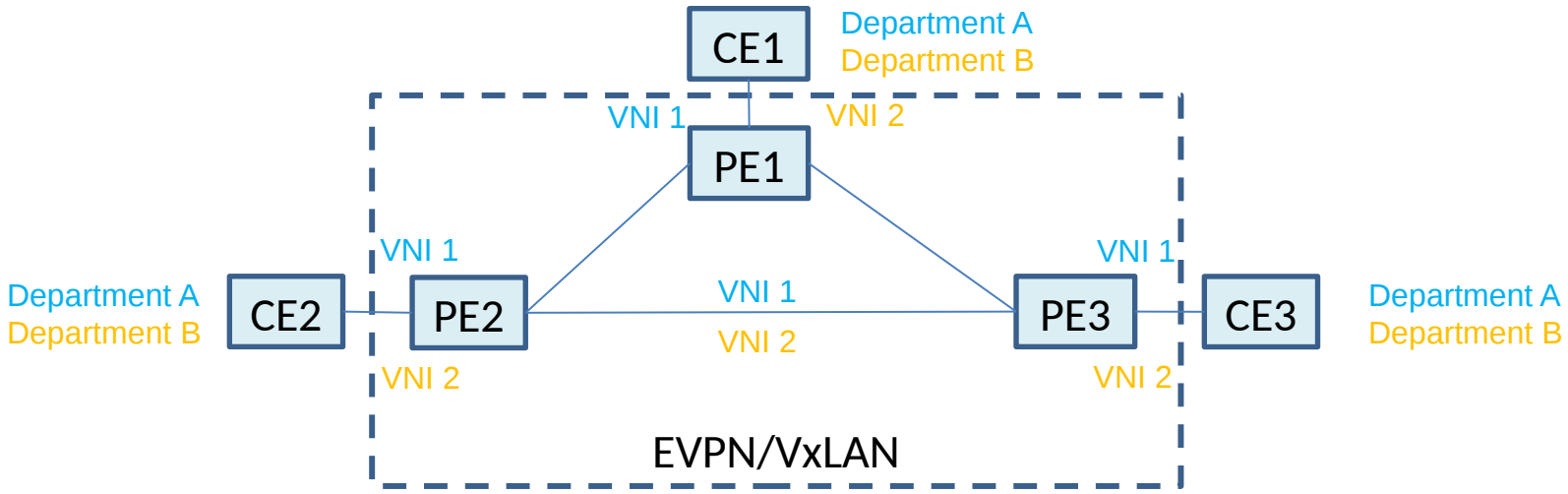
- N:1 mapping between LSI and IP-VRF
- Each IP-VRF has a single logical plane
- IP address MUST be unique



LSI-Aware Bundle Service Interface

- N:1 mapping between LSI and IP-VRF
- Each IP-VRF has multiple logical plane
- IP address can overlap
- 1:1 mapping between LSI and logical plane

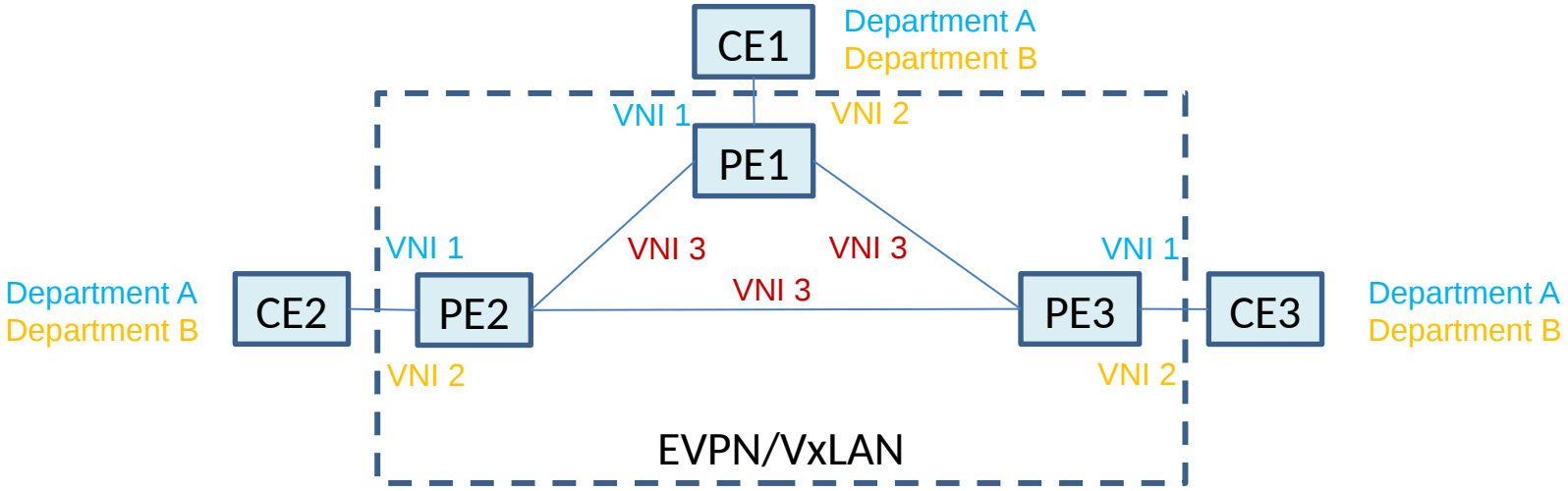
Considerations for LSI-Aware Bundle Service Interface



LSI-aware bundle service interface scenario

- PE1, PE2 and PE3 are EVPN peers, the customer traffic transmission between PEs relies on VxLAN. CE1, CE2 and CE3 are connected to the sites of customer for its department A and B.
- **If each VNI has its own IP-VRF:**
  - each PE and CE maintain an IP-VRF for each department of the customer;
  - department traffic can be isolated by different VNIs
  - no need for extending control plane/forwarding plane protocols.

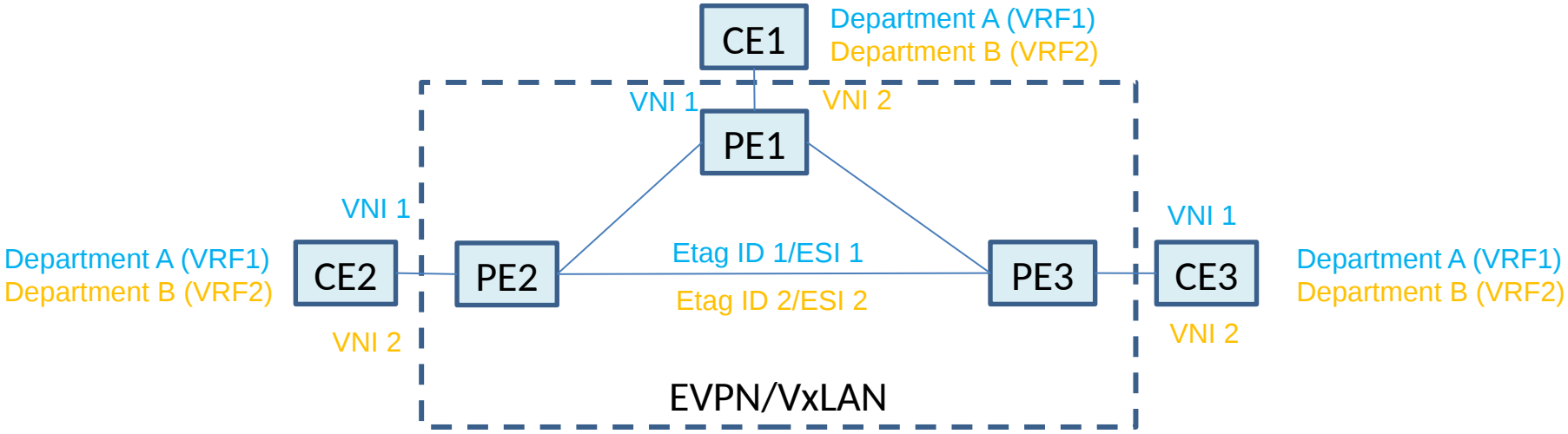
Considerations for LSI-Aware Bundle Service Interface



LSI-aware bundle service interface scenario

- PE1, PE2 and PE3 are EVPN peers, the customer data transmission between PEs relies on VxLAN. CE1, CE2 and CE3 are connected to the sites of customer for its department A and B.
- **If all VNIs share one IP-VRF:**
  - each CE maintains an IP-VRF for each department, but each PE maintains only one IP-VRF for a customer.
  - department traffic cannot be isolated by VNIs

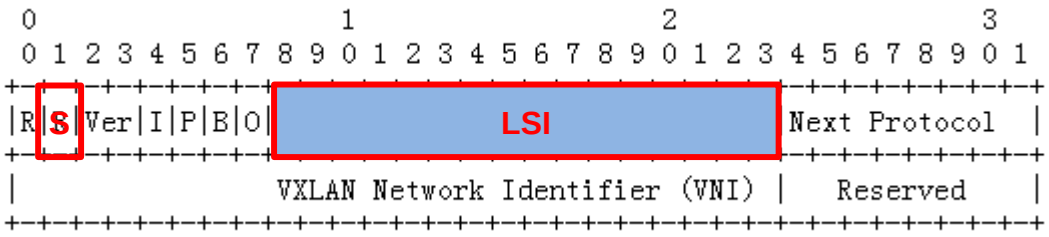
Control plane extension for sharing VRF scenario



LSI-aware bundle service interface scenario

- Using **LSI information** to identify different department routes/traffic
- Reusing **Ethernet Tag ID/ESI** to transfer LSI information
- PE lookup IP-VRF with **Ethernet Tag ID/ESI** to determine the next forwarding behavior
- The existing EVPN Route Type can carry **Ethernet Tag ID/ESI**

Forwarding plane consideration for sharing VRF scenario



The extensions to VxLAN header

- The forwarding plane protocol need to be extended to transmit the **LSI information (Ethernet Tag ID/ESI)**
- With VxLAN, we define a **S bit**. If the value is **1**, it indicates that **the field after O bit is LSI information**
- 1:1 mapping between LSI and VNI/SPI
- PEs should maintain the mapping table of LSI and VNI/SPI

Further Action

- Refine the extension scheme of control plane & data plane protocol needed by the above solution
- More solutions are welcome.
- More comments are welcome.

wangw36@chinatelecom.cn
wangaj3@chinatelecom.cn
rainsword.wang@huawei.com
IETF110