draft-sajassi-bess-evpn-vpws-fxc-00.txt

A. Sajassi (Cisco), P. Brissette (Cisco), J. Uttaro (ATT), J. Drake (Juniper), W. Lin (Juniper), S. Boutros (VMWare), J. Rabadan (Nokia)

IETF 96, July 2016

Berlin

Problem Statement

- EVPN-VPWS currently covers the following services interfaces (per section 2)

    - VLAN-based

    - VLAN-bundle

    - Port-based

- This draft defines a special type of VLAN-aware bundle service interface called Flexible Cross Connect (FXC)

Current Situation with EVPN VPWS

- Provides P2P connectivity between two Attachment Circuits (ACs) on two different PEs

  o AC can be defined as <port> or <port, VLAN> or <port, VLAN group>

- Cannot aggregate ACs across different ports on the same PE

- Each AC is signaled via BGP to other PEs

  o Remote PE with the right service-id creates cross-connect between its local AC and the one received via BGP signaling

- Upon failure (AC or port or PE), the EVPN route associated with the AC is withdrawn

What's more needed ?

1. Significantly reduce number of PWs by muxing VLANs across many interfaces

2. Reduce BGP signaling as much as possible (e.g., not to signal every VLAN/AC)

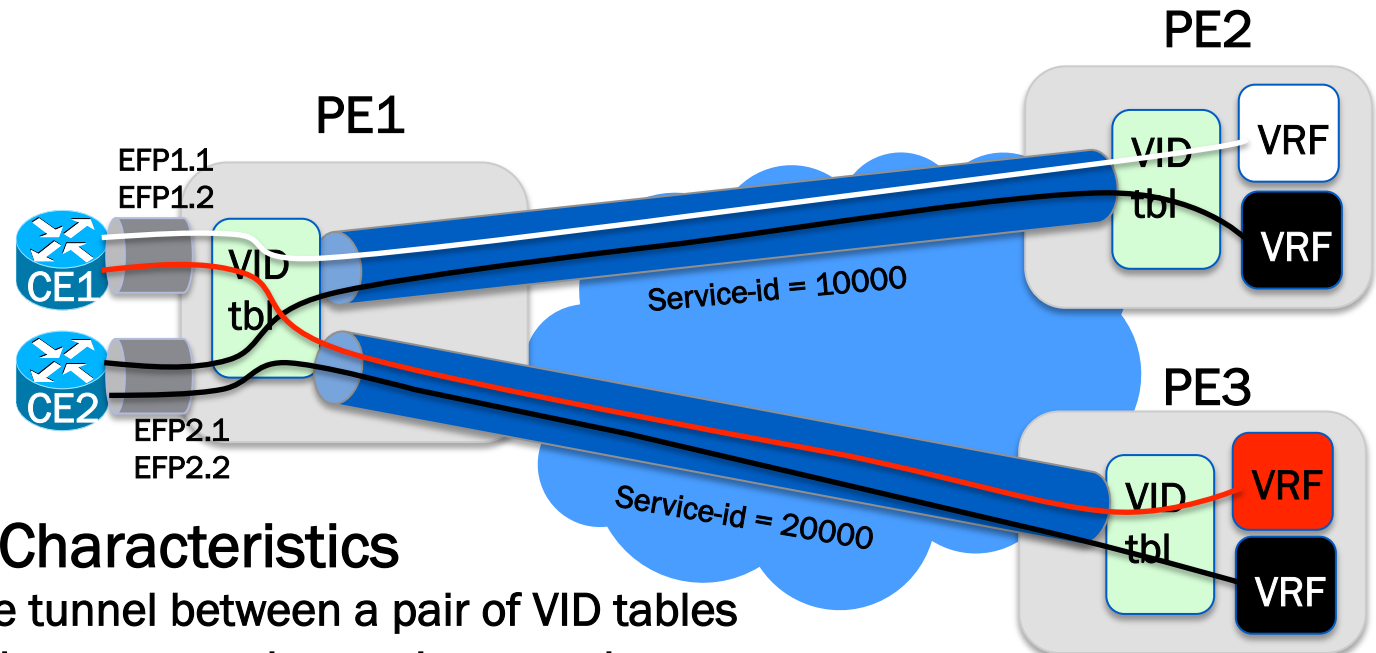3. Support All-Active (LAG) and Single-Active multi-homing

Note: some of the above requirements conflict w/ each other – ie, to support multi-homing and use a single PW to mux VLANs on multiple interfaces, requires per-VLAN signaling

Flex XC VLAN Unaware: Single-homed CEs

A-Leaf 1 Eth A-D Route
RD = 5500
ESI = 0
Eth.Tag ID = 10,000
Label = 123432

RT ext. community
RT =100

PE1

EFP1.1
EFP1.2

CE1

VID tbl

CE2

EFP2.1
EFP2.2

Service-id = 10000
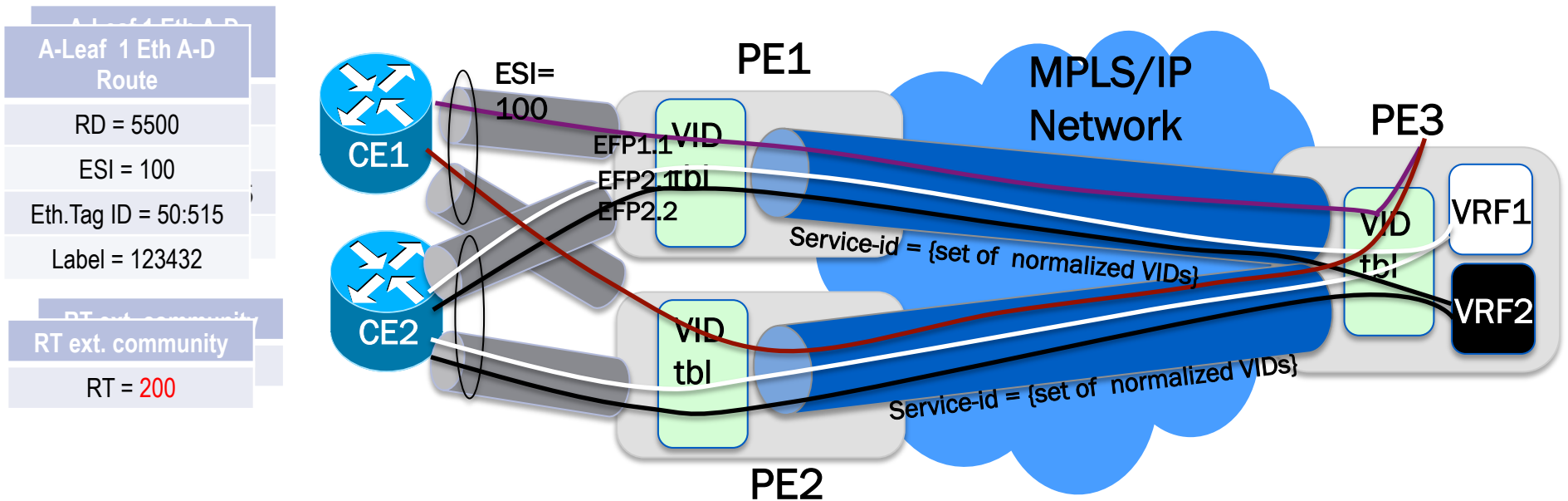
Service-id = 20000

PE2

VID tbl

VRF

VRF

PE3

VID tbl

VRF

VRF

Service Tunnel Characteristics

- One single service tunnel between a pair of VID tables
- A single service-id represents the service tunnel
- Normalized VIDs are unique in context of VID table
- VLAN unaware - VLAN failure is NOT signaled over BGP
- Muxes many VLANs across several interfaces on the PE
- Because of muxing, VID table is needed at disposition
- C-VIDs are normalized into double-tag S-VIDs and then sent over service tunnel
- When all VLANs (across all interfaces) for a service tunnel are failed, then the PE withdraws the route for that PW

Flex XC VLAN Aware: Multi-homed CEs

A-Leaf 1 Eth A-D Route

RD = 5500
ESI = 100
Eth.Tag ID = 50:515
Label = 123432

RT ext. community

RT = 200

Service Tunnel Characteristics

- One single service tunnel between a pair of VID tables
- Many service-ids (normalized VIDs) represent the tunnel
- Each EVI represent a single normalized VID space in this option
- Automatic cross-checking of normalized VIDs on PEs
- VLAN aware – VLAN failure is signaled over BGP
- Muxes many VLANs across several interfaces into a single service tunnel

Flex XC VLAN Unaware: Multi-homed CEs
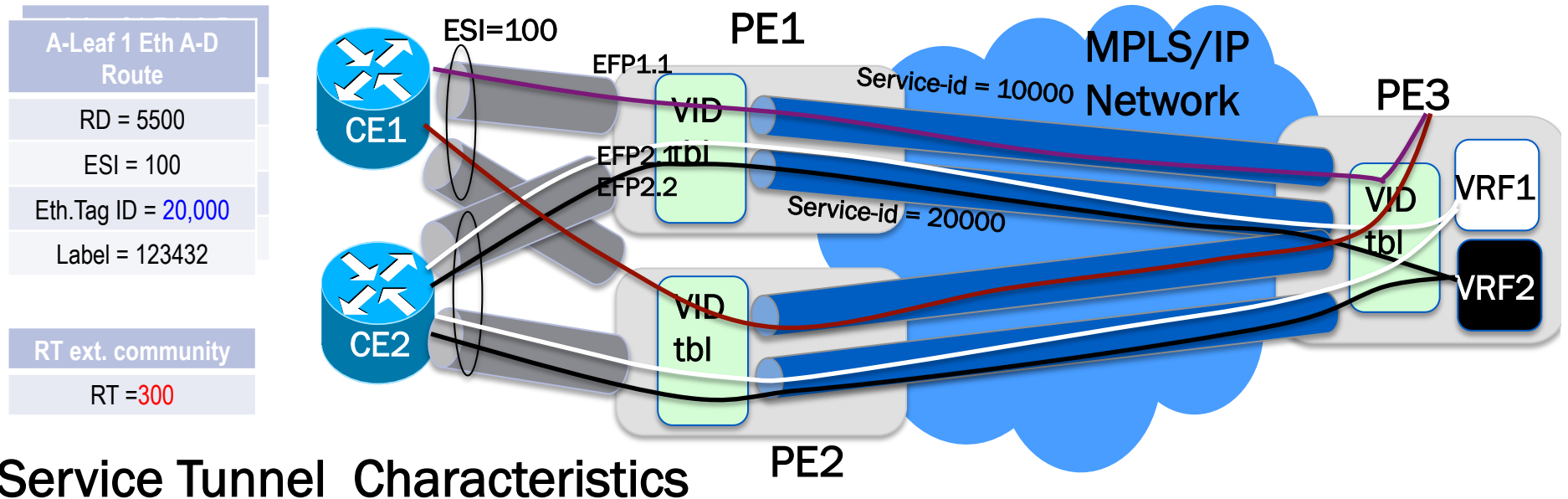
Service Tunnel Characteristics

- One single service tunnel for vlan bundles between two PEs
- A single service-id represents the service tunnel
- VLAN unaware - VLAN failure is NOT signaled over BGP
- Muxes group of VLANs on a **single** interface on the PE
- VID table may not be used at disposition PE
- C-VIDs are normalized into double-tag S-VIDs and then sent over service tunnel
- When Ether1 on PE1 fails, then it is signaled via BGP to remote PEs so that they removePE1 from their path list – e.g., traffic for black VLAN is sent to only PE2

BGP Extension

```
+-----------------------------------+
|  Type(0x06)/Sub-type(TBD)(2 octet) |
+-----------------------------------+
|  Control Flags (2 octets)         |
+-----------------------------------+
|  L2 MTU (2 octets)                |
+-----------------------------------+
|  Reserved (2 octets)              |
+-----------------------------------+
```

```
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      MBZ          | V | M |C|P|B|
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

```
Name       Meaning

B,P,C      per definition in [EVPN-VPWS]

M          00 mode of operation as defined in [EVPN-VPWS]
           01 VLAN-aware FXC
           10 VLAN-unaware FXC



V          00 operating per [EVPN-VPWS]
           01 single-VID normalization
           10 double-VID normalization
```

Next Step

- Questions ?

- Discussions on the mailing list