VPLS PE Model with E-Tree Support

draft-jiang-l2vpn-vpls-etree-pe-04.txt

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Backgrounds

- **E-Tree Requirements in multiple SDOs**
  - Service Definition: MEF 6.1, MEF 10.2
  - Mobile backhaul: MEF 22
  - Broadband Network Architecture: BBF WT-145
  - MPLS in Carrier Ethernet: BBF WT-224
  - MPLS in Mobile Backhaul: BBF WT-221

- **Lack of E-Tree support in VPLS standard**
  - Non-standard mechanism for single root topology
    - Single VSI + extended split horizon mechanism
  - No VPLS support for multi-roots topology
    - Multiple nodes with root & leaf attached in a single domain
    - Multiple roots and leaves located diversely across multiple domains
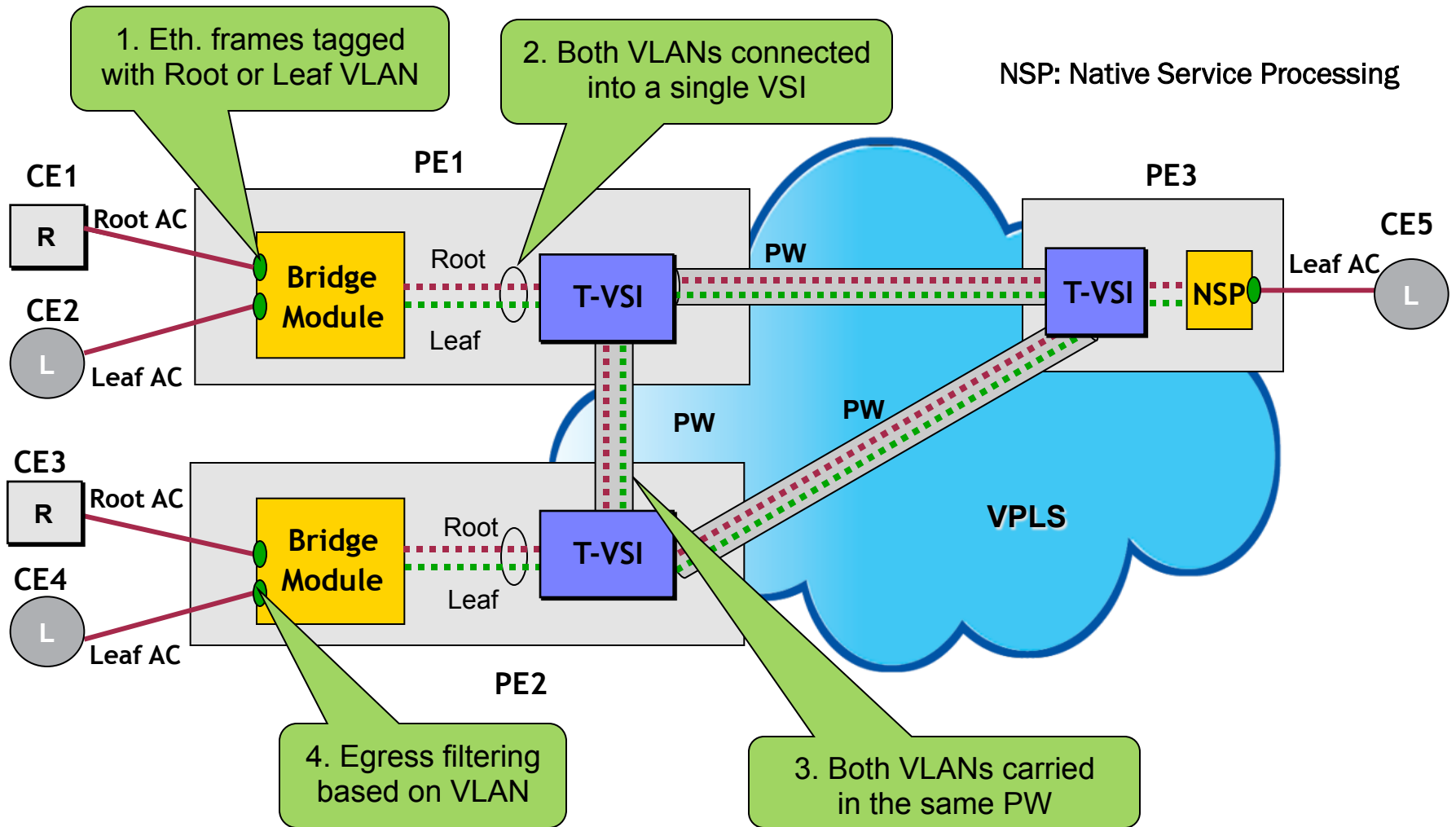
E-Tree Solution in Ethernet
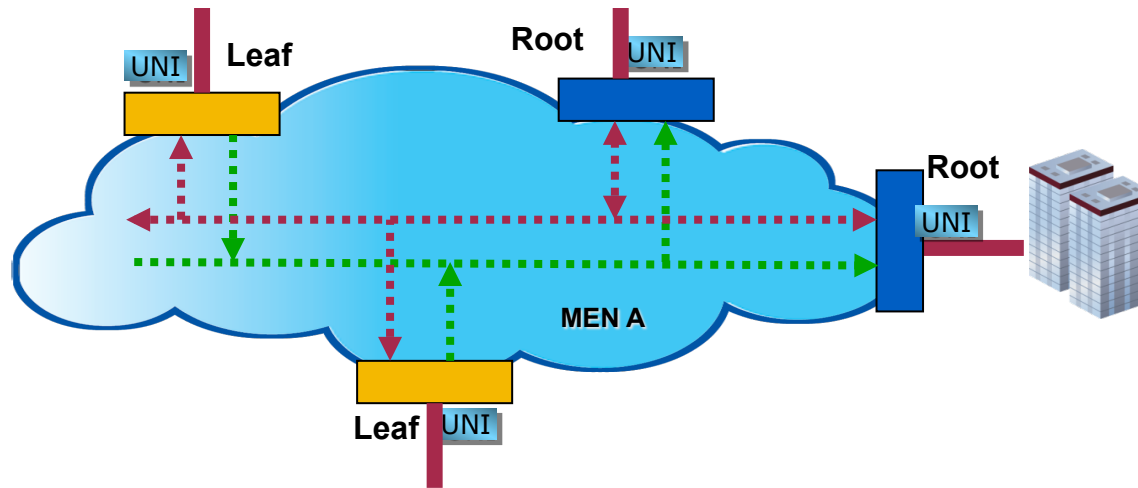
The green arrows show the forwarding of frames originated at a Leaf UNI
The red arrows show the forwarding of frames originated at a Root UNI
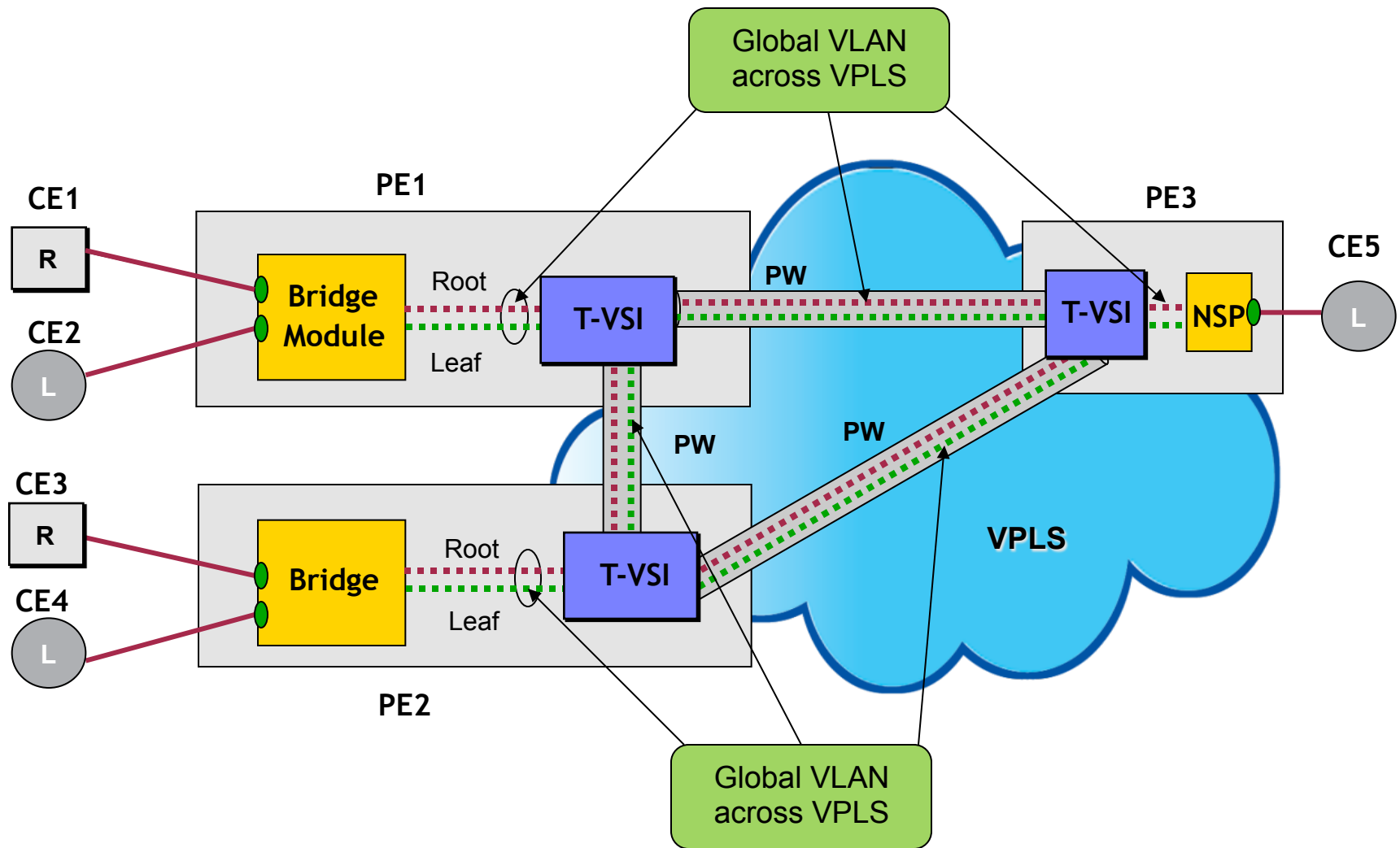
- ■ MEF E-Tree service model
  - • A UNI MUST be designated as Root or Leaf
  - • Forwarding rule at Root UNI and Leaf UNI are different

- ■ IEEE uses a pair of S-VLAN IDs - Trunk S-VLAN ID and Branch S-VLAN ID to support generic E-Tree, which is incorporated in the latest IEEE 802.1Q standard
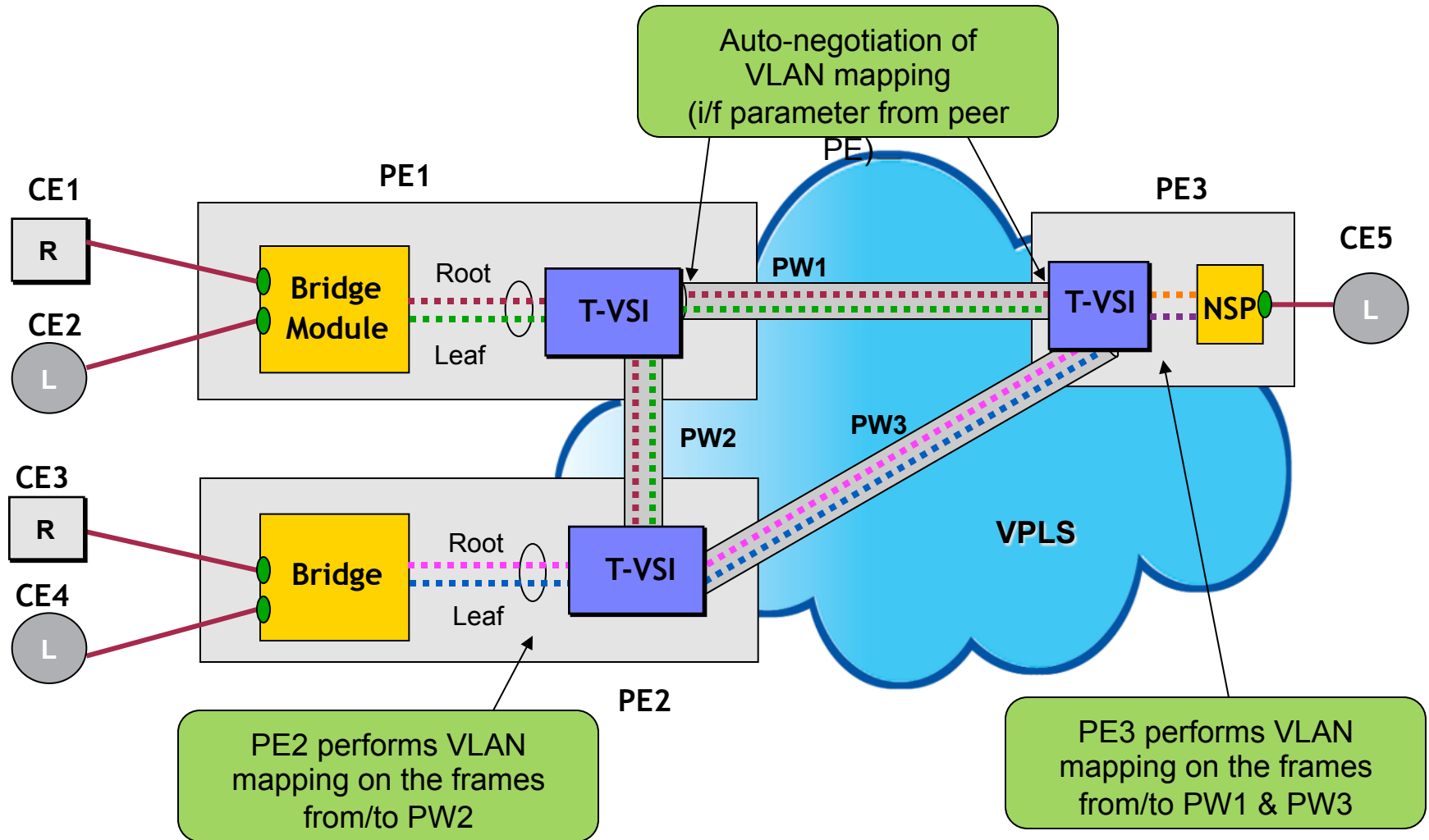
VLAN Based E-Tree Solution in VPLS

1. Eth. frames tagged with Root or Leaf VLAN

2. Both VLANs connected into a single VSI

NSP: Native Service Processing

CE1

R

Root AC

CE2

L

Leaf AC

PE1

Bridge Module

Root

Leaf

T-VSI

PW

T-VSI

NSP

Leaf AC

CE5

L

PW

CE3

R

Root AC

CE4

L

Leaf AC

PE2

Bridge Module

Root

Leaf

T-VSI

PW

VPLS

PE3

4. Egress filtering based on VLAN

3. Both VLANs carried in the same PW

Global VLAN based provisioning

Local VLAN based provisioning

Benefits

- Reusing E-Tree solution in Ethernet
  - ✓ Data plane of bridge module is the same as in Ethernet
  - ✓ Data plane of VSI is the same as in traditional VPLS
  - ✓ No change in PW layer semantics

- A single unified solution
  - ✓ Applicable to both "VPLS only" and "VPLS-Ethernet interworking" scenarios
  - ✓ Applicable to all known VPLS PE models

- Scalability
  - ✓ only a single VSI and a single suite of PWs needed
  - ✓ Redundant PWs are avoided

Changes in draft-04

- Data plane operation simplified
  - ✓ Add or translate VLAN tag only once for each frame upon arrival
  - ✓ Only one E-tree service per T-VSI, thus no need for (PW, VLAN) lookup in the reverse direction

- VLAN manipulation simplified
  - 3 different ways described in version-03
  - Now summarized into "Global VLAN based" and "Local VLAN based"

- Tagged Mode as well as Raw Mode PW may be used to carry E-Tree service

- Quite a few other improvements on texts and diagrams

Questions

- Any other concerns unresolved?
- Could this be accepted as WG draft?

Thank You