

VLAN-Aware Bundling for EVPN/VPLS

[draft-cai-l2vpn-evpn-vlan-aware-bundling-00](#)

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A simple scenario: DC LAN Extension

- **Solution 1: EVI/VFI per each VLAN**

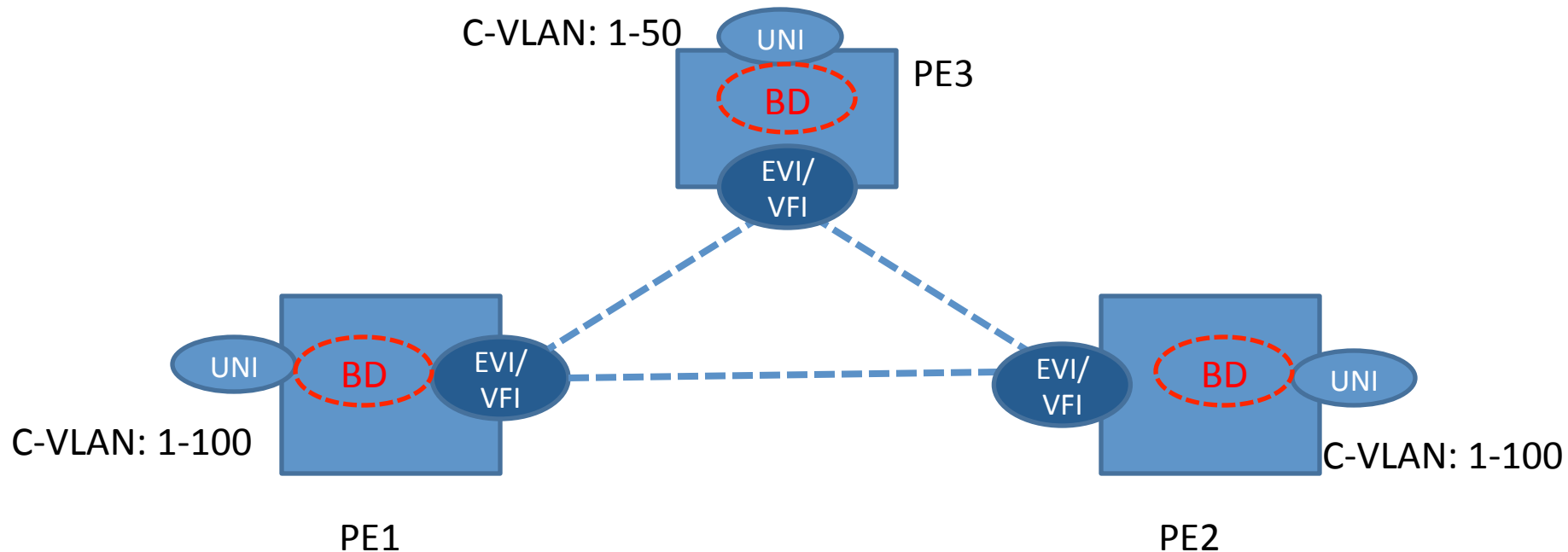
- Provisioning/configuration/scale overhead

- **Solution 2: QinQ, VLANs are bundled into same EVI/VFI**

- No VLAN separation, for example, duplicated MAC across VLANs could cause issue

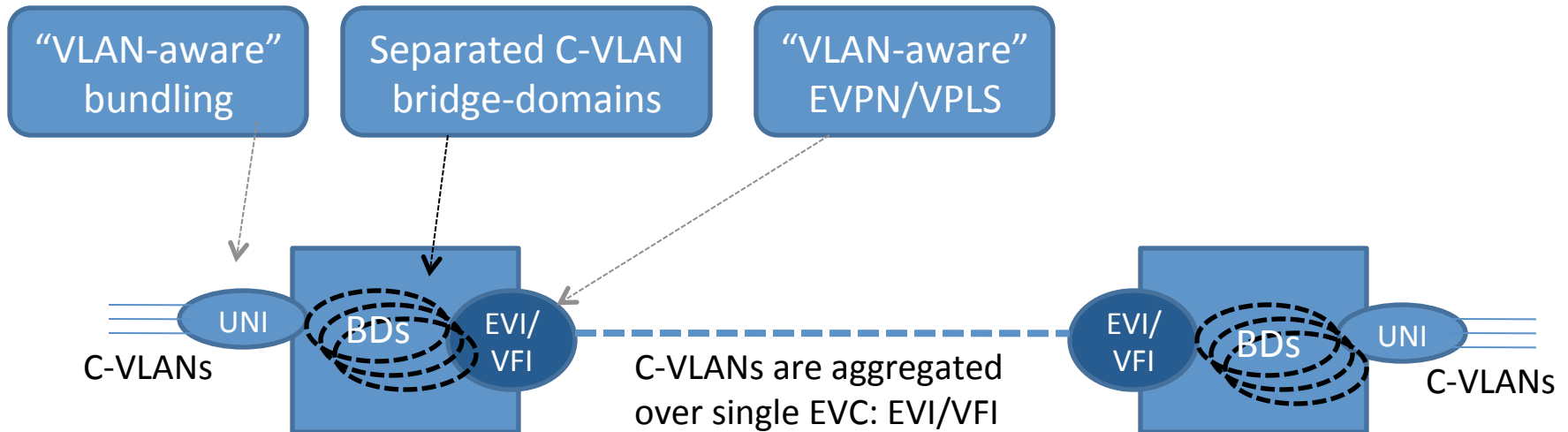
- Unnecessary packet flooding to PE3 for VLAN 51-100 (in this example)

- Unnecessary MAC withdrawal (in the multi-homing scenario)



What's the “VLAN-aware bundling”?

- It's “enhanced” QinQ with customer VLAN separation
- “VLAN-aware” means “VLAN separation”, which means:
 - Customer VLANs are in different broadcast domain
 - MAC learning/flushing is per customer VLAN
- “VLAN-aware” includes both UNI and WAN side
 - UNI: “vlan-aware” bundling (or “vlan-aware” qinq)
 - WAN side: “vlan-aware” evpn/vpls



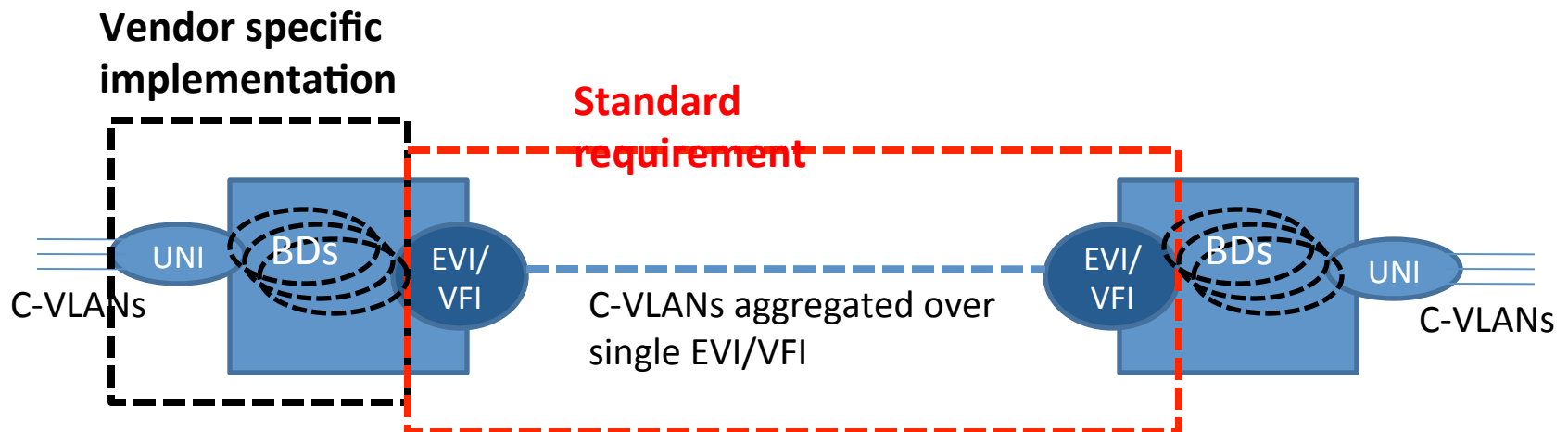
What do we gain?

- Use a simple example
 - 5 DC sites, each site has two PEs
 - 1000 VLANs

Scale per PE	Classic VPLS	VLAN-aware VPLS
VFIs	1000	1
PWs	10,000	9
ACs	1000	1
Bridge-domains	1000	1000
Lines of configuration	~ nx1000 lines, depend on the platform	~10 lines

Standard requirement

- UNI and C-VLAN separation(bridge-domain)
 - Vendor specific implementation
- NNI (WAN): EVPN/VPLS
 - Need inter-operation between vendors
 - The focus of this presentation

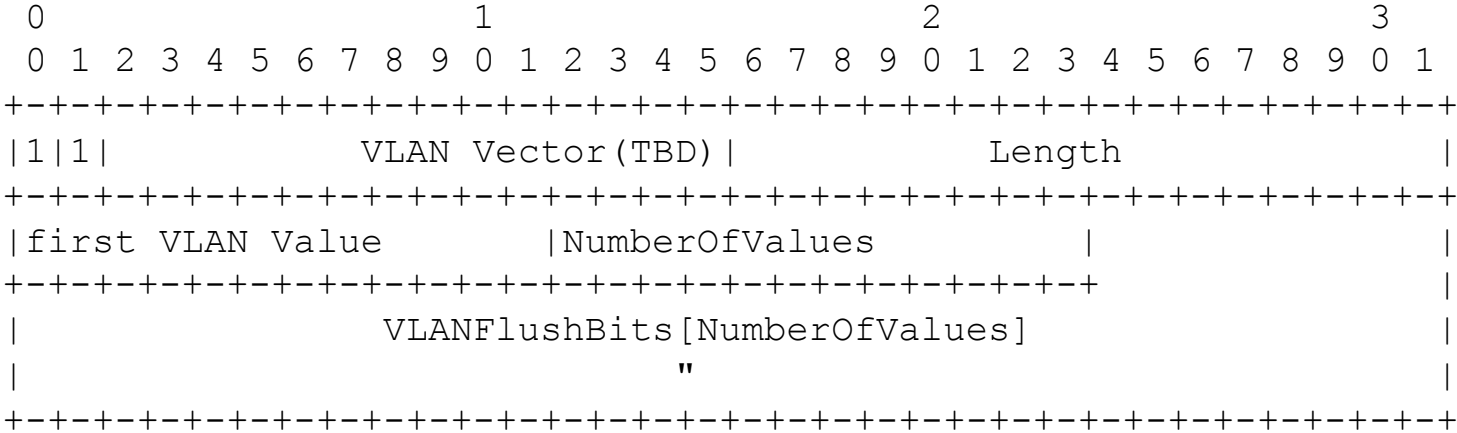


“VLAN-aware bundling” for EVPN

- This draft recommend to use **Ethernet Tag** field in the Ethernet Auto-Discovery Route, Mac Advertisement route, and inclusive multicast Ethernet tag route to to multiplex VLANs over the same EVI
- Please refer to the EVPN draft for details: [draft-ietf-l2vpn-evpn-01](#)

“VLAN-aware bundling” for VPLS

The PW VLAN Vector TLV is described as below



A new PW VLAN vector TLV is defined, the new PW VLAN Vector TLV will be included in LDP PW label mapping messages, as well it can be included in the MAC flush message

“VLAN-aware” VPLS/EVPN Operation (1)

- Flooding packet pruning
 - PE only flood the packet based on the VLAN list which it receive from peer PEs
 - IGMP/PIM snooping still works as before
- Mac withdrawal
 - MAC learning, pruning is per each customer VLAN or bridge-domain basis, not per VFI/EVI
 - VPLS Mac withdrawal message or EVPN Ethernet AD route should include the list of VLANs. Those VLAN need to have mac flushing on the remote PEs
 - VLAN 0 is for the wildcat

“VLAN-aware” VPLS/EVPN Operation (2)

- VLAN translation
 - VLAN translation is per local PE
 - After VLAN translation, the VLAN ID must be global significant among all PEs within the same VFI/EVI
- OAM
 - Customer domain OAM will work transparently over VLAN-aware VPLS/EVPN
 - Current MPLS OAM mechanisms need to be extended to verify connectivity in the E-VPN or VPLS instance shared by the customer bridge-domains. However, MPLS OAM extensions is out of scope of the document

Next steps

- Comments are appreciated

Thank you