P802.1Qbh Control Protocol Overview

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Introduction

- This version of the document has been updated to illustrate the incorporation of the M-Comp Centralized channel discovery mechanism as suggested in bg-bottorff-s-channel-ladders-v1 (slide 14).

Introduction

- P802.1Qbh specifies three major items:
  - A Port Extender
  - An M-Component which is used to make a Port Extender
  - A EVB Controlling Bridge, a bridge that is capable of being extended using Port Extenders
- The combination of the EVB Controlling Bridge and the Port Extenders is referred to as an Extended VLAN Bridge (E-VLAN Bridge)
- Some assumptions:
  - The Port Extender Configuration and Status Protocol operates over ECP
  - The VSI discovery protocol operates through Port Extenders transparently
  - The Channel Discovery and Configuration Protocol operates over LLDP using the nearest non-TPMR address
    - Therefore, the CDCP is terminated by a Port Extender at the edge of an Extended Bridge and translated into the appropriate PE CSP command (S-channel create)
    - Likewise, the edge Port Extender is responsible for initiating the CDCP LLDP frames based on its current S-channel configuration

This is the new stuff…

  - LLDP frames addressed to nearest customer bridge (e.g. VSI discovery) pass transparently through the Port Extenders to the C-VLAN component within the controlling bridge

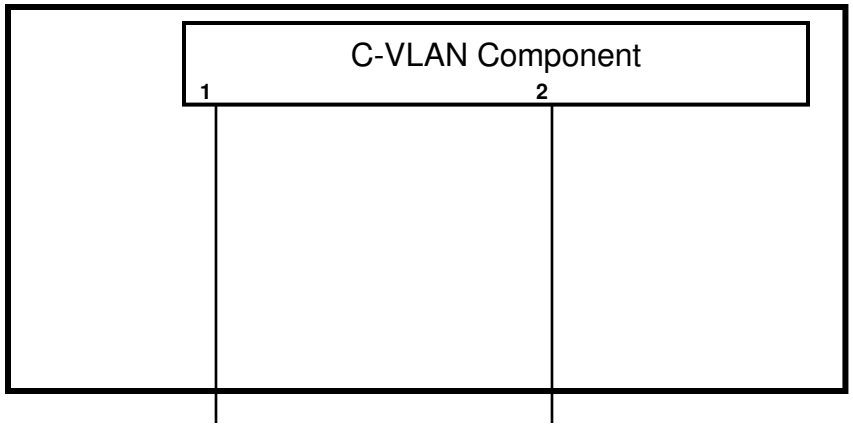
Use of Text Color

- Green text indicates an action operating over LLDP using the nearest customer bridge address
- Brown text indicates an action operating over LLDP using the nearest non-TPMR address
- Blue text indicates an action using the Port Extender Control and Status Protocol (which may use unicast addresses or a well known multicast address, TBD).

E-VLAN Bridge Model of Operation

- In the beginning…

  For example, a two port bridge



E-VLAN Bridge Model of Operation

- The Universe is created…

  A Port Extender and an end device are attached

  The PMSC is instantiated and the C-VLAN component ports 1 & 2 come up

  LLDP starts executing on CVC ports 1&2

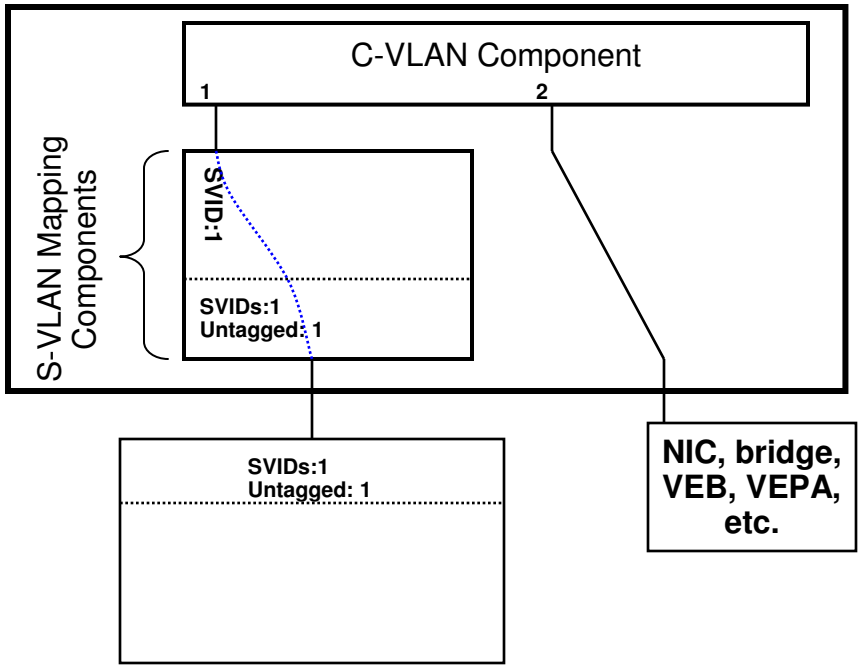
  Port Extender discovered on port 1

  Something else discovered on port 2

  EVB Control and Status Protocol (EVB CSP) starts executing on CVC Port 1

    Configures member set and untagged set on PE.

    Configures PE Uplink port parameters (PFC, ETS, etc.)



E-VLAN Bridge Model of Operation

- The Universe Expands…

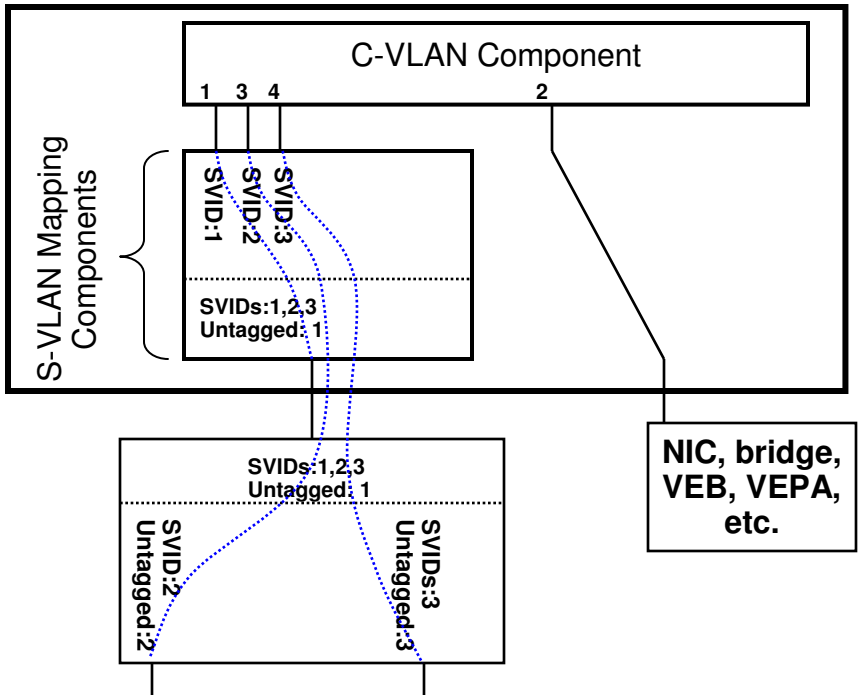
  The EVB Controlling Bridge discovers via the PE CSP that the PE has two ports active

  C-VLAN component ports 3 & 4 instantiated

  PMSC SVID member sets and untagged sets set-up

  Downlink port parameters Configured (PFC, ETS, etc.)

  The C-VLAN Component starts executing LLDP on ports 3 & 4.



E-VLAN Bridge Model of Operation

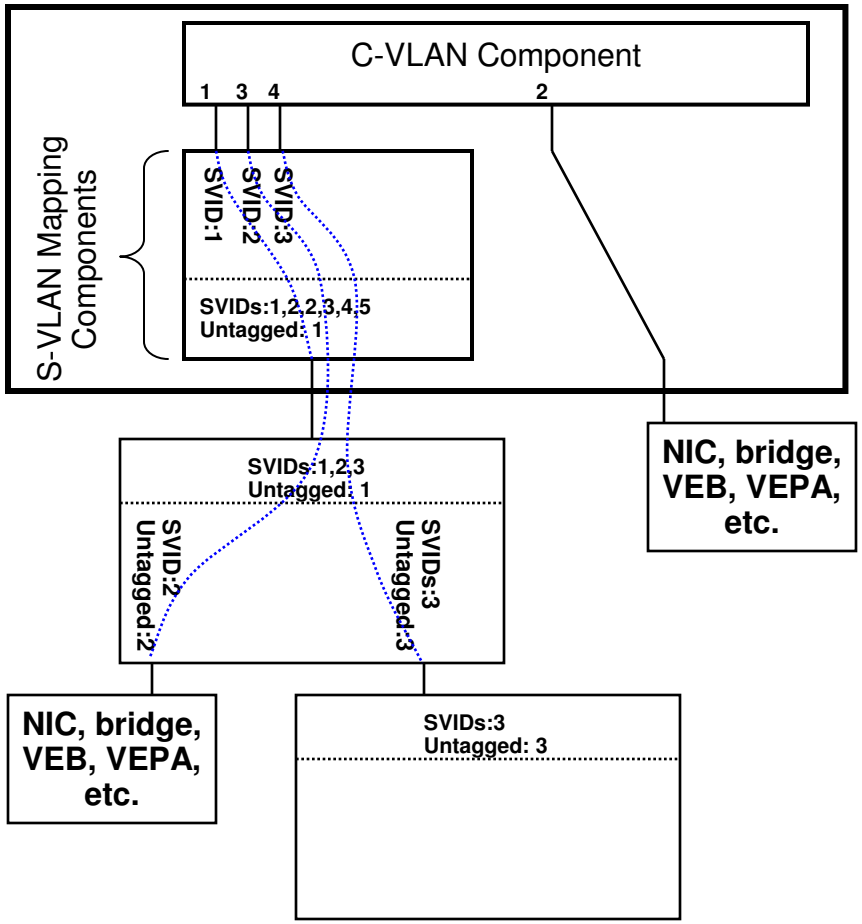
- The Universe Expands Some More…

  LLDP on CVC port 3 discovers something other than a PE.

  LLDP on CVC port 4 discovers the second PE.

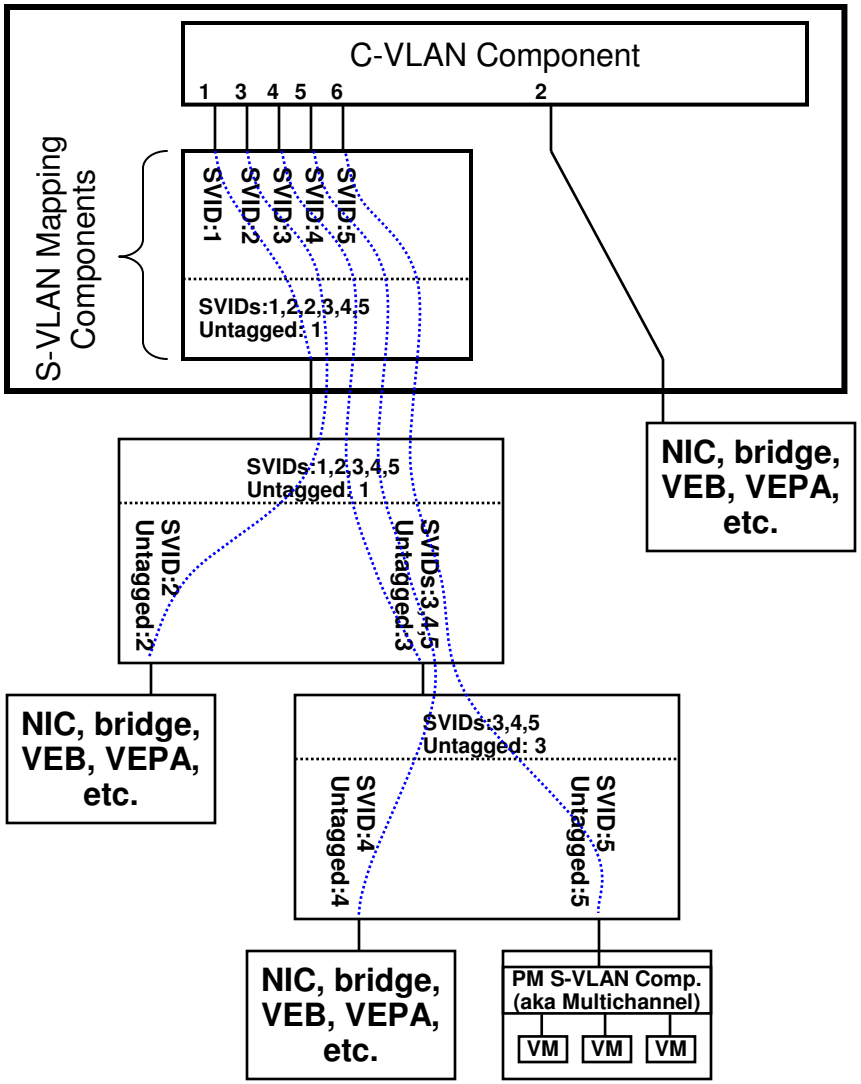
  EVB CSP Protocol starts executing on CVC port 4

  Configures second PE Uplink member sets, untagged sets, and port parameters.



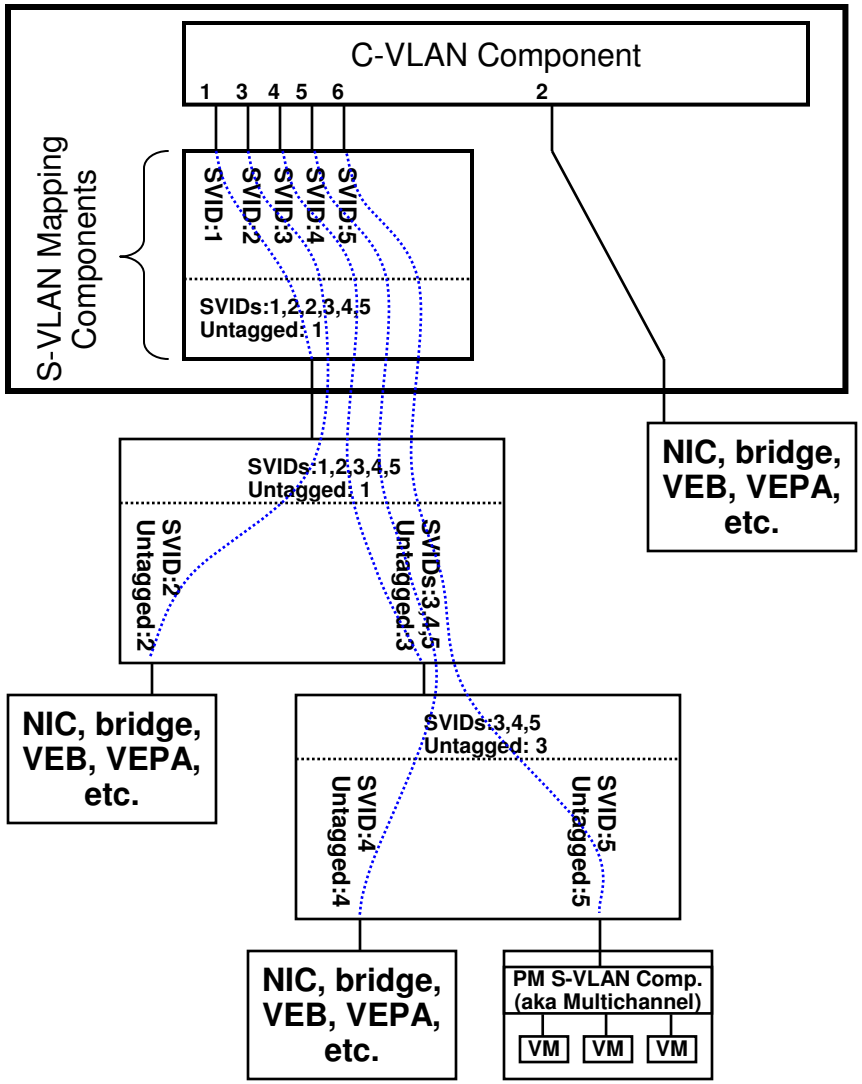
E-VLAN Bridge Model of Operation

- The Universe Expands Even More…
  - EVB CSP on C-VLAN component port 3 discovers two ports on the second PE.
    - CVC ports 5 & 6 instantiated
    - EVB CSP sets up member sets and untagged sets in PE Ports
  - LLDP on CVC port 5 & 6 discovers something other than a PE.
- See next slide for the Multichannel Configuration

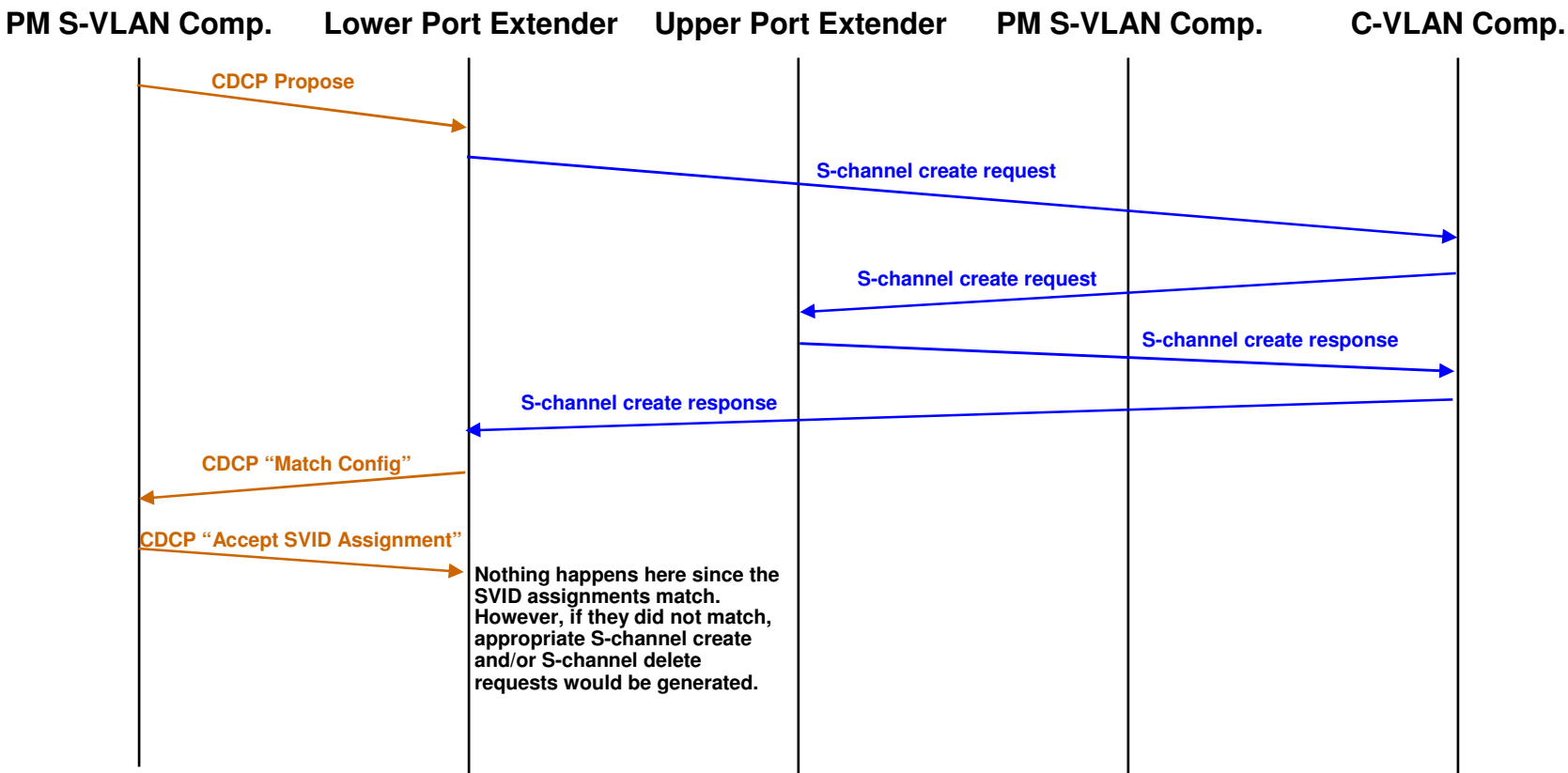


E-VLAN Bridge Model of Operation

- The Multichannel is configured:
  - CDCP (nearest non-TPMR LLDP) propose takes place between the PMSC and the bottom PE
  - Bottom PE issues a S-channel create CSP message.
  - Controlling Bridge issues an S-channel create CSP message to the top PE and waits for the response
  - Controlling Bridge issues an S-channel response message to the bottom PE
  - Bottom PE initiates sending of CDCP frames which acknowledges the proposal
  - PMSC configures the multichannel



A Ladder Diagram



Note: While preparing this slide, I noticed an error in the draft 0.2 version of the 802.1Qbh specification. In this draft, it indicates that only a PE can initiate an S-channel create request. This request can be initiated by either a PE or a controlling bridge.

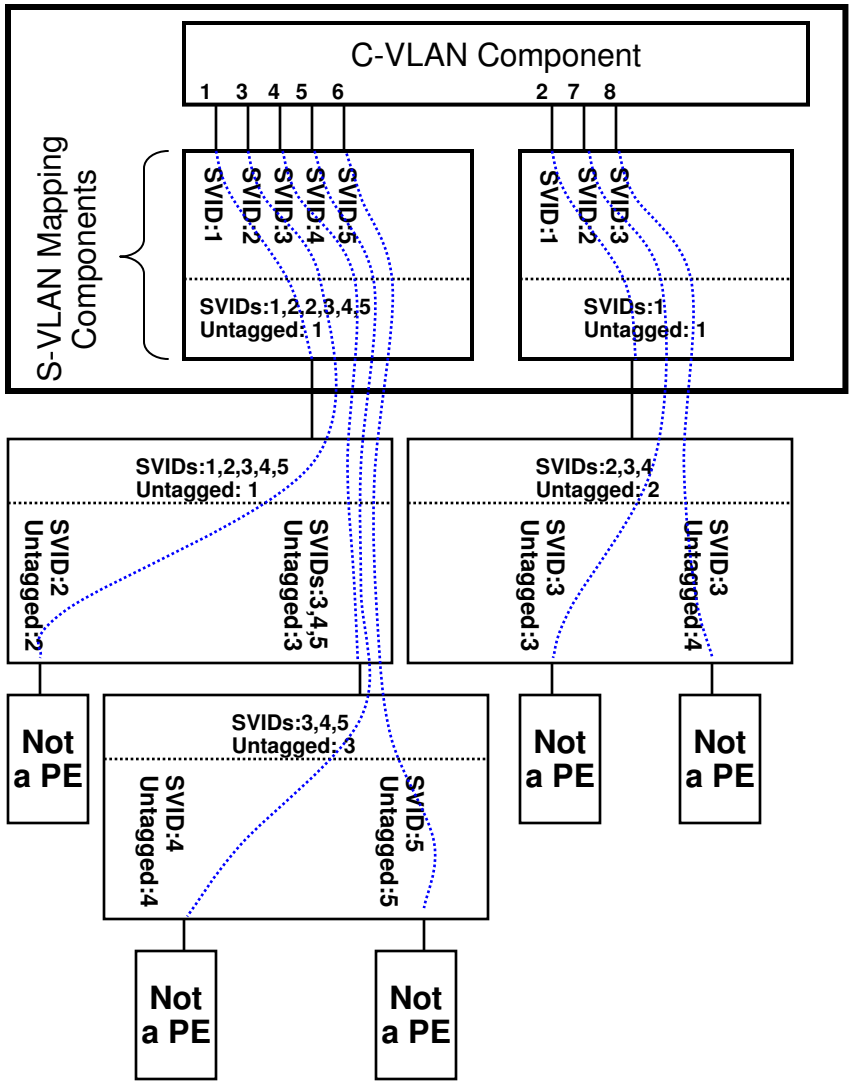
E-VLAN Bridge Model of Operation

- The Universe Expands Just a Little Bit More…

  (I need another PE to make my multicast examples interesting ;-)

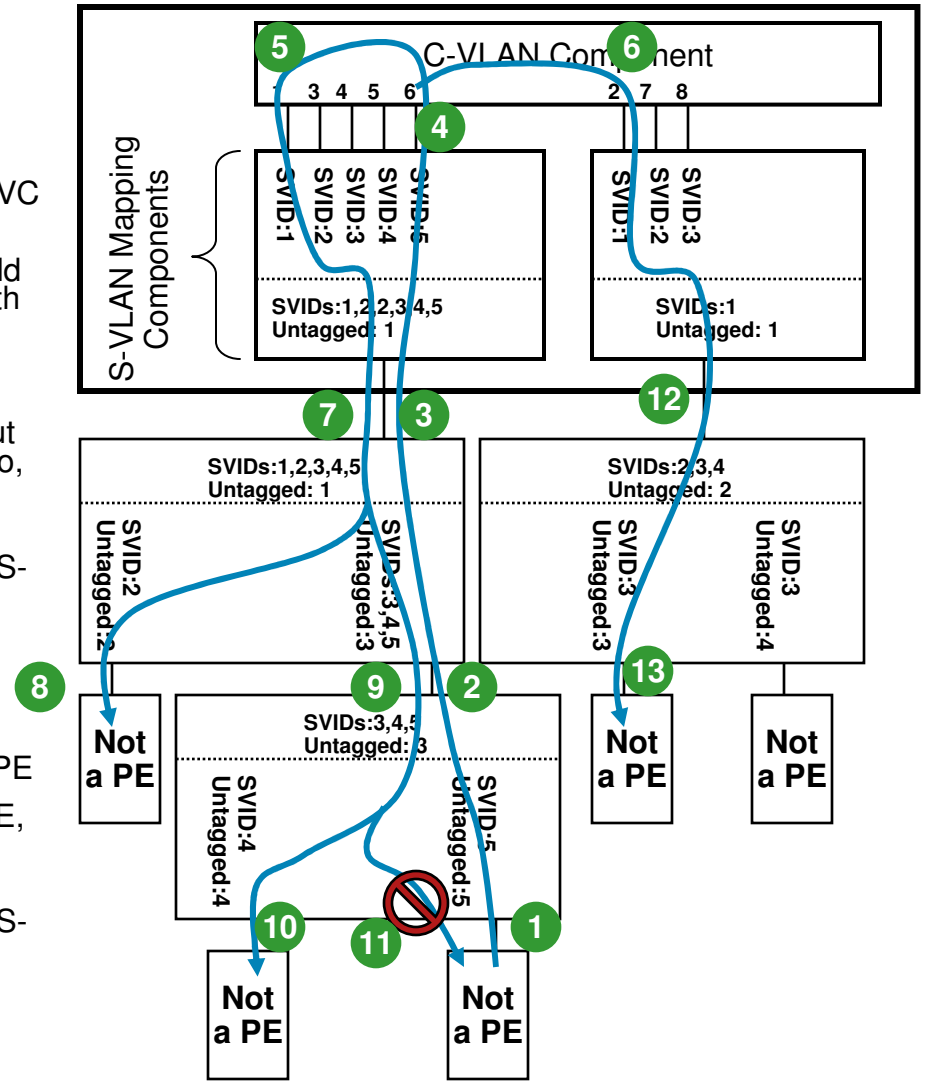
  EVB CSP and LLDP operate as previously described

    Details left as an exercise to the reader



E-VLAN Bridge Model of Operation

- A Multicast Example…
  1. Multicast frame originated (no S-TAG)
  2. PE adds S-TAG with SVID 5
  3. SVID Still 5
  4. S-TAG removed, frame received on CVC port 6
  5. Without remote replication, frame would be forwarded on CVC ports 3 & 5. With remote replication, frame forward to Primary PE port with M-TAG; filter set true, source SVID set to 5.
  6. Frame could be sent to CVC port 8, but we'll keep this a multicast example. So, frame is M-Tagged with filter set false and SVID set to 0.
  7. Frame forwarded with M-TAG and no S-TAG
  8. PE does replication. M-TAG removed since this is the last PE.
  9. Frame has M-TAG and no S-TAG.
  10. M-TAG removed since this is the last PE
  11. PE filters frame since this is the last PE, filter set TRUE, and SVID matches source SVID in M-TAG.
  12. Frame forwarded with M-TAG and no S-TAG
  13. M-TAG removed since last PE

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