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
  - LLDP (and the multichannel discovery TLV) operates through Port Extenders transparently
  - Channel Discovery of Port Extenders is done via the PE CSP protocol to support large number of channels
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.
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