PBB-TE Status Report

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PBB-TE Next steps

- Editorial draft (P802.1Qay/D1.0) is available
- New draft after the November meeting (ask for authorization to start a Task Group Ballot)
- Aim is to enter a Sponsor Ballot in the 2nd quarter of 2009
  - 8 more meetings till March 2009
  - One new draft version per meeting
  - Start ballot in January or March 2007 (usually 5-6 ballots are enough to carry a project to the Sponsor Ballot phase)
Ethernet Switched Paths

- Ethernet Switched Path (ESP): A provisioned path between two or more CBPs which extends over a PBBN. The path is identified by the 3-tuple <ESP-MAC DA, ESP-MAC SA, ESP-VID>
  - The ESP-MAC SA is the address of the Provider Instance Port (PIP) encapsulating the customer service instance in a backbone service instance identified by an I-SID value;
  - The ESP-MAC DA is identifying the PIP destination address; and
  - The ESP-VID is the vlan_identifier related to the service. It can only take values that are allocated to the PBB-TE domain identified by a special Multiple Spanning Tree Instance Identifier (MSTID).
PBB-TE service definition

- PBB-TE service instance: An instance of the MAC service provided by a number of co-routed ESPs:
  - A PointToPoint (PtP) PBB-TE service instance (PBB-TE trunk) is provided by a pair of co-routed unidirectional ESPs which are identified by a pair of 3-tuples:
    - <DA1, SA1, VID1>
    - <SA1, DA1, VID2>
  - A PointToMultipoint (PtMP) PBB-TE service instance is provided by one multipoint multicast ESP plus n unidirectional ESPs, routed along the leaves of the multicast ESP which are identified by following n+1 3-tuples:
    - <DA, SA, VID>
    - <SA, SA1, VID1>
    - <SA, SA2, VID2>
    - ...
    - <SA, SAn, VIDn>
    DA is identifying the list of MAC addresses {SA1, SA2, ..., SAn}. 


Mapping a customer instance to a PBB-TE service instance

Customer Service Instance: S1

Backbone Service Instance: I-SID1

ESP: <CBPn, CBP1, B1>
Mapping a customer instance to a PBB-TE service instance

Customer Service Instance: S2
Backbone Service Instance: I-SID2
ESP: <CBPn, CBP1, B1>
Mapping a customer instance to a PBB-TE service instance

Customer Service Instance: S2

Backbone Service Instance: I-SID3

ESP: <CBPk, CBP2, B1>
Mapping a customer instance to a PBB-TE service instance

Customer Service Instance: S2

Backbone Service Instance: I-SID4

ESP: <CBPm, CBP3, B1>
Mapping a customer instance to a PBB-TE service instance
Summarizing examples

- First two examples
  - Same customer
    \[\begin{align*}
    S1 &\rightarrow \text{I-SID1} \\
    S2 &\rightarrow \text{I-SID2}
    \end{align*}\] \[\rightarrow \langle \text{CBP}_n, \text{CBP}_1, \text{B}_1 \rangle\]

- Third example
  - Different customer
    \[\begin{align*}
    S2 &\rightarrow \text{I-SID3} \\
    S2 &\rightarrow \text{I-SID4} \\
    S2 &\rightarrow \text{I-SID5}
    \end{align*}\] \[\rightarrow \langle \text{CBP}_k, \text{CBP}_2, \text{B}_1 \rangle\]

- Fourth and fifth examples
  - Different sets of customers
    \[\begin{align*}
    S2 &\rightarrow \text{I-SID4} \\
    S2 &\rightarrow \text{I-SID5}
    \end{align*}\] \[\rightarrow \langle \text{CBP}_m, \text{CBP}_3, \text{B}_1 \rangle\]
Tunnelling example
B-VID re-use
CFM issues in PBB-TE
Figure 19-2—Maintenance association End Point (MEP)
PBB-TE MEPs in a CBP
MEP addressing changes

- PBB-TE MAs are identified by the same of parameters that are used to identify the corresponding service instance that is a series of 3-tuples

- The MAC address of the MEP is the MAC address of the CBP port upon which the MEP is operating.

- The Primary VID is not writable but always gets the value of the ESP-VID parameter identifying the component ESP that has the MEP’s MAC address as its ESP-MAC SA parameter
CFM protocol changes

- CFM PDUs use the addressing information corresponding to the monitored ESP.
  - CCMs emitted by a MEP with a source address MEP SA, use as destination MAC address and VID identifiers the values corresponding to the ESP-MAC DA and ESP-MAC SA fields of the monitored ESP having the MEP SA in its ESP-MAC SA field (<ESP-MAC DA, MEP SA, ESP-VID>)
  - LBMs and LTMs use the same rule as CCMs
  - LBRs and LTRs use parameters of the reversed direction component ESP. The PBB-TE TLV sent in the corresponding LBMs and LTMs provide MIPs with the appropriate info.
PBB-TE Requirement Assumptions

- The protected domain extent is CBP-CBP
- A uni-directional ESP is identified by <DA, SA, B-VID>
- A trunk is a pair of uni-directional ESPs
- Bi-directional switching
  - Helps avoid operations errors
- Revertive or Non-revertive mode
  - Operational preference
- Lightweight APS protocol
  - Operator requests are handled by Management action rather than via protection signaling
PBB-TE 1:1 Protection Switching Example
### APS frame

**APS-Specific Information**

**END TLV (0)**

<table>
<thead>
<tr>
<th>Request/State</th>
<th>Prot. Type</th>
<th>Requested Signal</th>
<th>Bridged Signal</th>
<th>Reserved</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>A B D R</td>
<td></td>
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<td></td>
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</tbody>
</table>
Administrative commands

- **Lockout protection**
  - the protection group is inactive, i.e. traffic should not be switched to the protection trunk

- **Force switch to working / protection**
  - traffic will be switched without checking the trunk’s operational state

- **Manual switch to working / protection**
  - traffic will be switched only if the trunk’s operational state is up

- **Exercise**
  - Exercise of the APS protocol. The signal is chosen so as not to modify the selector.
Proposals for LO and MS

- Extensions to CCM Interface Status TLV to signal switch requests
  - CCM Interface Status TLV
    - The Interface Status TLV indicates the status of the interface on which the MEP transmitting the CCM is configured
- Leave it to the management system
- Emulate at one end the condition
- Use the APS PDU
Major remaining parts

- Conformance statements
- Managed objects / MIBs