PBB/PBB-TE Layer Stack

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Introduction

PBB and PBB-TE coexist on
- provider backbone networks
- provider backbone LAN interfaces
- provider backbone networks network management
- I-Components
- B-Components
- BCB nodes

What will be the layer stack of such network and its interfaces
Layer Stack PBB and PBB-TE for “Alternative C2”

- **PBB** S-Space:
  - PB
  - S-VLAN
  - PBB BSI
  - PBB BVLAN
  - PBB Link

- **PBB-TE** S-Space:
  - S-VLAN
  - PBB-TE BS
  - PBB-TE BT
  - PBB-TE Link

- **I-LAN**
- **B-LAN**
- **PHY**

**Notes:**

- **a** c6.9 shim config’d with “Allow Only VLAN Tagged Frames” and VIP not a member of “untagged set”
- **b** c6.9 shim config’d with “Allow Only Untagged & Priority-Tagged Frames” and VIP member of “untagged set”
- **c** future extension; separate I-BEB and B-BEB

**Box:**

- PBB and PBB-TE have different S-Space domains !!
## Layer Stack PBB and PBB-TE for “Alternative C2”

### Labels

<table>
<thead>
<tr>
<th></th>
<th>PB</th>
<th>PBB</th>
<th>PBB-TE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S-VLAN</strong></td>
<td>S-VID</td>
<td>S-VID or PVID</td>
<td>S-VID or I-SID</td>
</tr>
<tr>
<td><strong>PBB BSI</strong></td>
<td>-</td>
<td>I-SID</td>
<td>-</td>
</tr>
<tr>
<td><strong>PBB B-VLAN</strong></td>
<td>-</td>
<td>B-VID</td>
<td>-</td>
</tr>
<tr>
<td><strong>PBB-TE BS</strong></td>
<td>-</td>
<td>-</td>
<td>I-SID</td>
</tr>
<tr>
<td><strong>PBB-TE BT</strong></td>
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<td>&lt;T-DA,T-SA,T-VID&gt;</td>
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Layer Stack PBB and PBB-TE for “Alternative C2”

**PBB Signals**

- **Untagged PBB BSI frame**
  - MSDU
  - TYPE 0x<EA>
  - B-SA
  - B-DA
  - C-SA
  - C-DA
  - I-SID
  - RES1+2
  - NCA
  - I-DEI
  - I-PCP
  - I-TPID 0xITAG

- **PBB BSI Tag**
  - I-TPID 0xITAG
  - I-SID
  - RES1+2
  - NCA
  - I-DEI
  - I-PCP

- **I-Tagged PBB BSI frame**
  - MSDU
  - TYPE 0x8902
  - I-SID
  - RES1+2
  - NCA=0
  - I-DEI
  - I-PCP
  - I-TPID 0xITAG
  - B-SA
  - B-DA

- **I-Tagged PBB BSI frame**
  - MSDU
  - TYPE 0x8902
  - I-SID
  - RES1+2
  - NCA=0
  - I-DEI
  - I-PCP
  - I-TPID 0xITAG
  - B-SA
  - B-DA

- **Untagged PBB B-VLAN frame**
  - MSDU
  - TYPE 0x8902
  - B-SA
  - B-DA

- **PBB B-VLAN Tag**
  - B-VID
  - B-DEI
  - B-PCP
  - B-TPID 0x88a8

- **I-Tagged PBB B-VLAN frame**
  - MSDU
  - TYPE 0x8902
  - B-SA
  - B-DA

- **I-Tagged PBB B-VLAN frame**
  - MSDU
  - TYPE 0x8902
  - B-SA
  - B-DA
Layer Stack PBB and PBB-TE for “Alternative C2”

**PBB-TE Signals**

- **Untagged PBB-TE BS frame**
  - MSDU
  - C-SA
  - C-DA
  - I-SID, RES1+2, NCA, I-DEI, I-PCP, I-TPID 0x????

- **PBB-TE BS OAM**
  - ETH OAM PDU
  - TYPE 0x8902
  - C-SA=0, C-DA=0

- **I-Tagged PBB-TE BS frame**
  - MSDU
  - C-SA, C-DA, I-SID, RES1+2, NCA=0, I-DEI, I-PCP, I-TPID 0x????
  - PBB-TE BS Tag
  - I-TPID 0x????

- **PBB-TE BT OAM**
  - MSDU
  - ETH OAM PDU
  - TYPE 0x8902
  - I-TPID 0x????

- **B-Tagged PBB-TE BT frame**
  - MSDU
  - ETH OAM PDU
  - TYPE 0x8902
  - T-VID, T-DEI, T-PCP, T-TPID 0x????
  - PBB-TE BT Tag
  - T-SA, T-DA

- **Untagged PBB-TE BT frame**
  - MSDU
  - T-SA, T-DA
  - T-TPID 0x????
  - T-VID, T-DEI, T-PCP

**Notes:**
- I-SID
- RES1+2
- NCA
- I-DEI
- I-PCP
- I-TPID 0x????
- T-VID
- T-DEI
- T-PCP
- T-TPID 0x????
- T-SA
- T-DA
Layer Stack PBB and PBB-TE for “Alternative C2”

PBB and PBB-TE Signal comparison (I)

- Untagged PBB BSI frame includes B-DA, B-SA and TYPE fields
- Untagged PBB-TE BS frame does not include B-DA, B-SA and TYPE fields
- PBB MAC-in-MAC (PBB-MiM) process learns B-MAC ⇔ C-MAC relation
- B-DA is a function of C-DA
- PBB configures SVID ⇔ ISID relation
- PBB-TE configures SVID ⇔ ISID relation
Layer Stack PBB and PBB-TE for “Alternative C2”

PBB and PBB-TE Signal comparison (II)

- Untagged PBB B-VLAN frame includes B-DA and B-SA fields
- Untagged PBB-TE BT frame does not include B-DA and B-SA fields
- PBB-TE BT Tag includes T-DA and T-SA fields
- PBB-TE MAC-in-MAC (PBB-TE-MiM) process does not learn B-MAC↔C-MAC relation
- T-DA is not a function of C-DA
- PBB configures ISID↔BVID relation
- PBB-TE configures ISID↔TVID+TMAC relations
Layer Stack PBB and PBB-TE for “Alternative C2”

Future I-LAN
PIP function in PBB and PBB-TE for “Alternative C2”

Decomposed PIP view

PIP function in PBB

MAC Relay Entity (Clause 8)

- Support of the EISS (6.9)
  - VIP-EISS
  - VIP-ISS
  - MAC Encapsulation
  - Support of the (I-Tagged) EISS
  - Support of the ISS (6.7 or 6.14)

PIP function in PBB-TE

(mac without MAC Encapsulation function)

MAC Relay Entity (Clause 8)

- Support of the EISS (6.9)
  - VIP-EISS
  - VIP-ISS
  - MAC Encapsulation

- PBB-TE Support of the (I-Tagged) EISS

replacement functions in future PBB-TE I-LAN within multi-domain PBB-TE
CBP function in PBB and PBB-TE for “Alternative C2”

Decomposed CBP view

CBP function in PBB

MAC Relay Entity (Clause 8)

- EISS Mulitplex Entity
- Support of the (I-Tagged) EISS
- Backbone Service Instance Switch
- Support of the (I-Tagged) EISS
- Support of the ISS (6.7 or 6.14)

CBP function in PBB-TE (with MAC Encapsulation function)

MAC Relay Entity (Clause 8)

- EISS-TE Mulitplex Entity
- MAC Encaps
- Support of the (I-Tagged) EISS
- PBB-TE Backbone Service Instance Switch
- Support of the ISS-TE (6.7 or 6.14)
- MAC
- MAC Encaps

Replacement functions in future PBB-TE I-LAN within multi-domain PBB-TE

MAC Encapsulation

Support of the ISS (6.7 or 6.14)
New Alternative X

*PBB BSI over PBB-TE BT*
Layer Stack PBB and PBB-TE for “Alternative X”

New alternative having “PBB BSI over PBB-TE BT”

On Friday afternoon someone indicated that “Alternative C2” had not been the expected layer stack. The expected layer stack was one that contained the PBB BSI layer and the PBB-TE BT layer. This alternative layer stack is depicted.

The consequence is the presence of three MAC address Spaces: S-Space, B-Space and T-Space.

PBB and PBB-TE S-Space domains are the same!
PBB-TE has additional T-Space domain!
Layer Stack PBB and PBB-TE for “Alternative X”

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