

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

“Alternative C2”

Result of the discussion on Thursday 6 Sept 2007

Domains and layers

- Alternative Ila is selected

Nodes

- IB-BEB and BCB/PB

Components

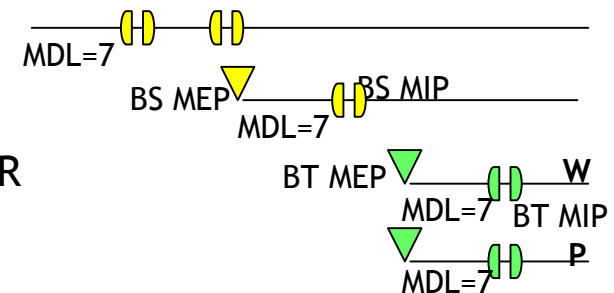
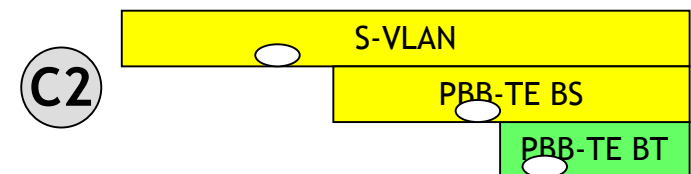
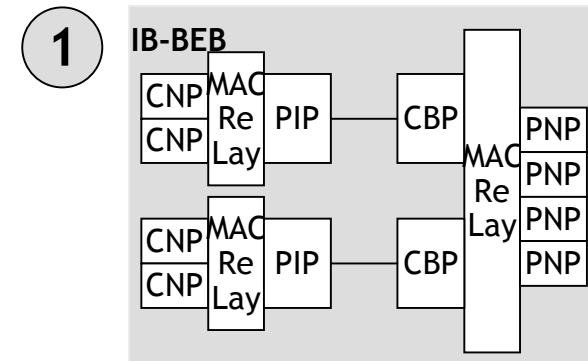
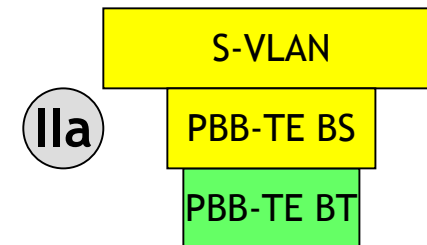
- Alternative 1 is selected

MEPs and MIPs

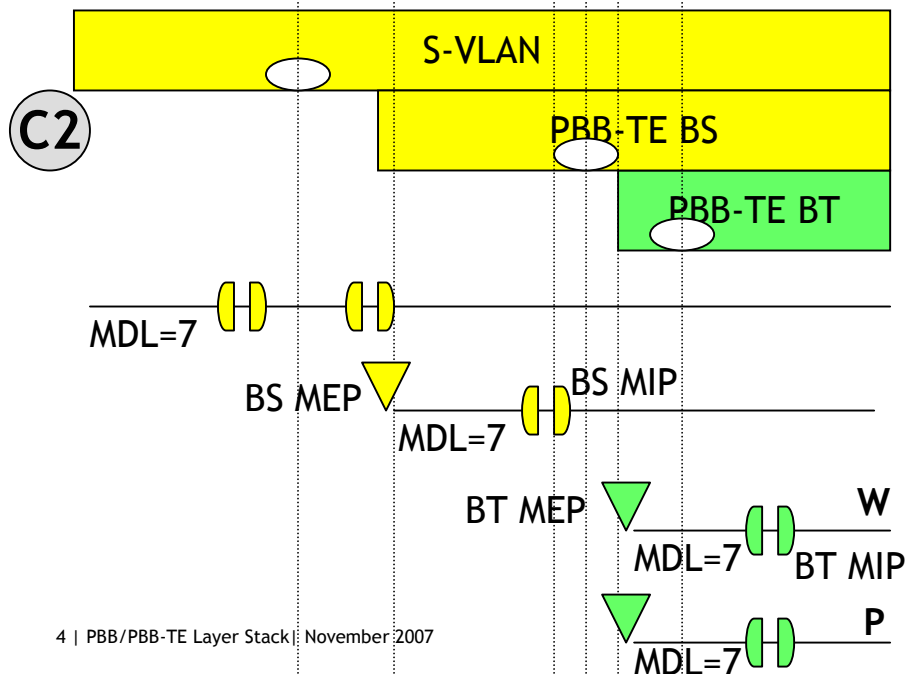
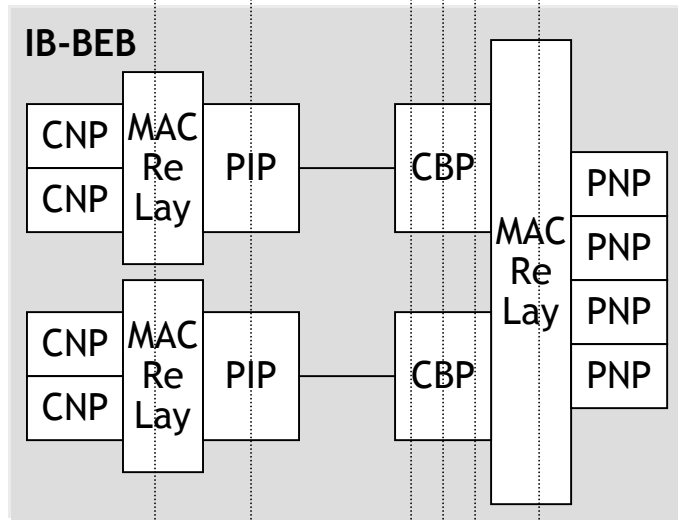
- Variation of alternative C is selected (C2)
- C2: PBB-TE BT connection between PIP and CBP is removed

Investigate what additional functionality would be required when in future a multi-domain PBB-TE network is to be supported

- Such functionality is not required to support under this PAR

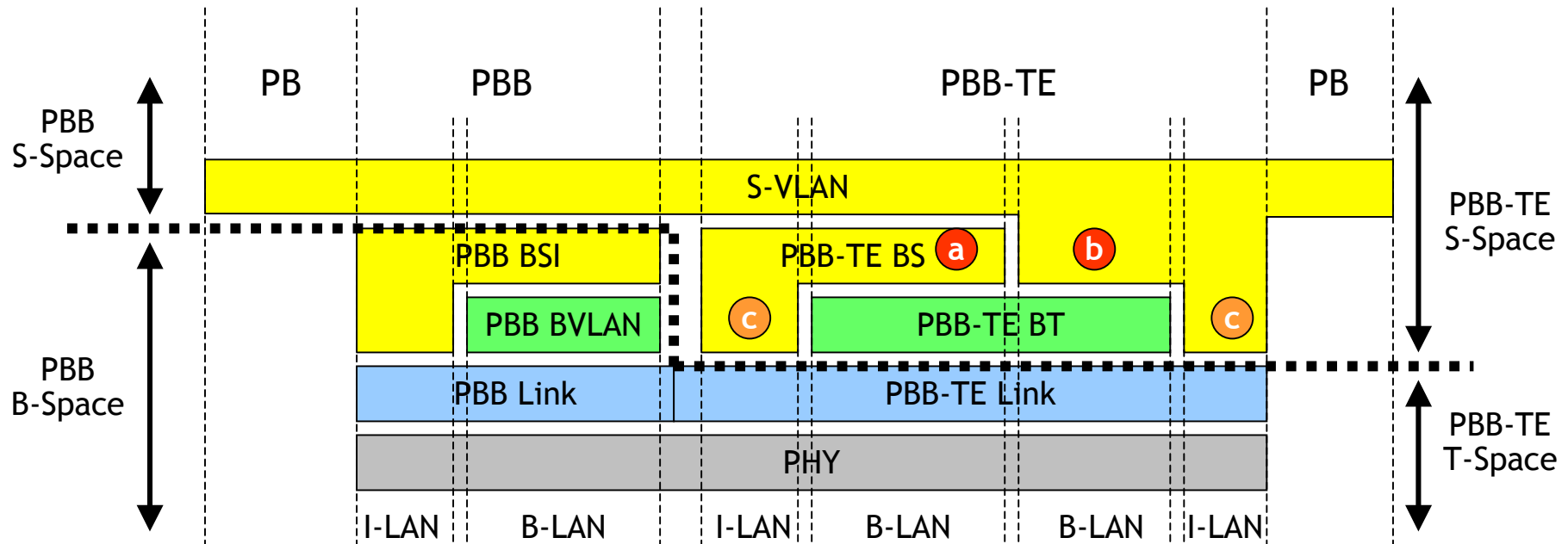


“Alternative C2” Characteristics



- ❑ PBB compatible model
 - S-VLAN is customer service layer
 - PBB BSI ↔ PBB-TE BS
 - PBB B-VLAN ↔ PBB-TE BT
- ❑ mixed PBB/PBB-TE operation supported on PIPs and CBPs
- ❑ BT connections between CBPs
 - BT label: B-DA+B-SA+B-VID
 - B-DA/SA carry CBP addresses
- ❑ PIP-to-CBP interconnect is logical connection within IB-BEB
- ❑ PIP→CBP: CBPs forward received BS-frame and insert B-DA/SA/VID
- ❑ CBP→PIP: CBPs strip off B-DA/SA/VID in received BS-frame and forward BS-frame
- ❑ service switch function in CBP (Service Instance Table) extended with BS protection switch function, switching groups of BS signals (load sharing)

Layer Stack PBB and PBB-TE for “Alternative C2”

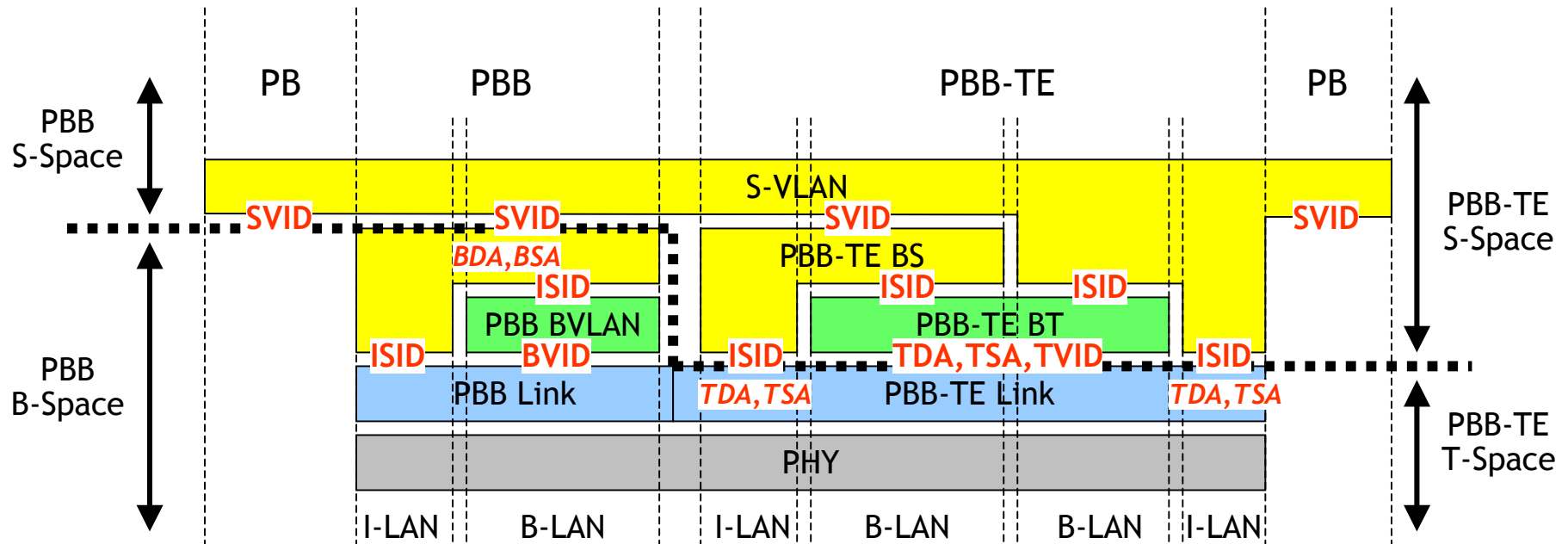


- a** c6.9 shim config'd with “Allow Only VLAN Tagged Frames” and VIP not a member of “untagged set”
- b** c6.9 shim config'd with “Allow Only Untagged & Priority-Tagged Frames” and VIP member of “untagged set”
- c** future extension; separate I-BEB and B-BEB

PBB and PBB-TE have different S-Space domains !!

Layer Stack PBB and PBB-TE for “Alternative C2”

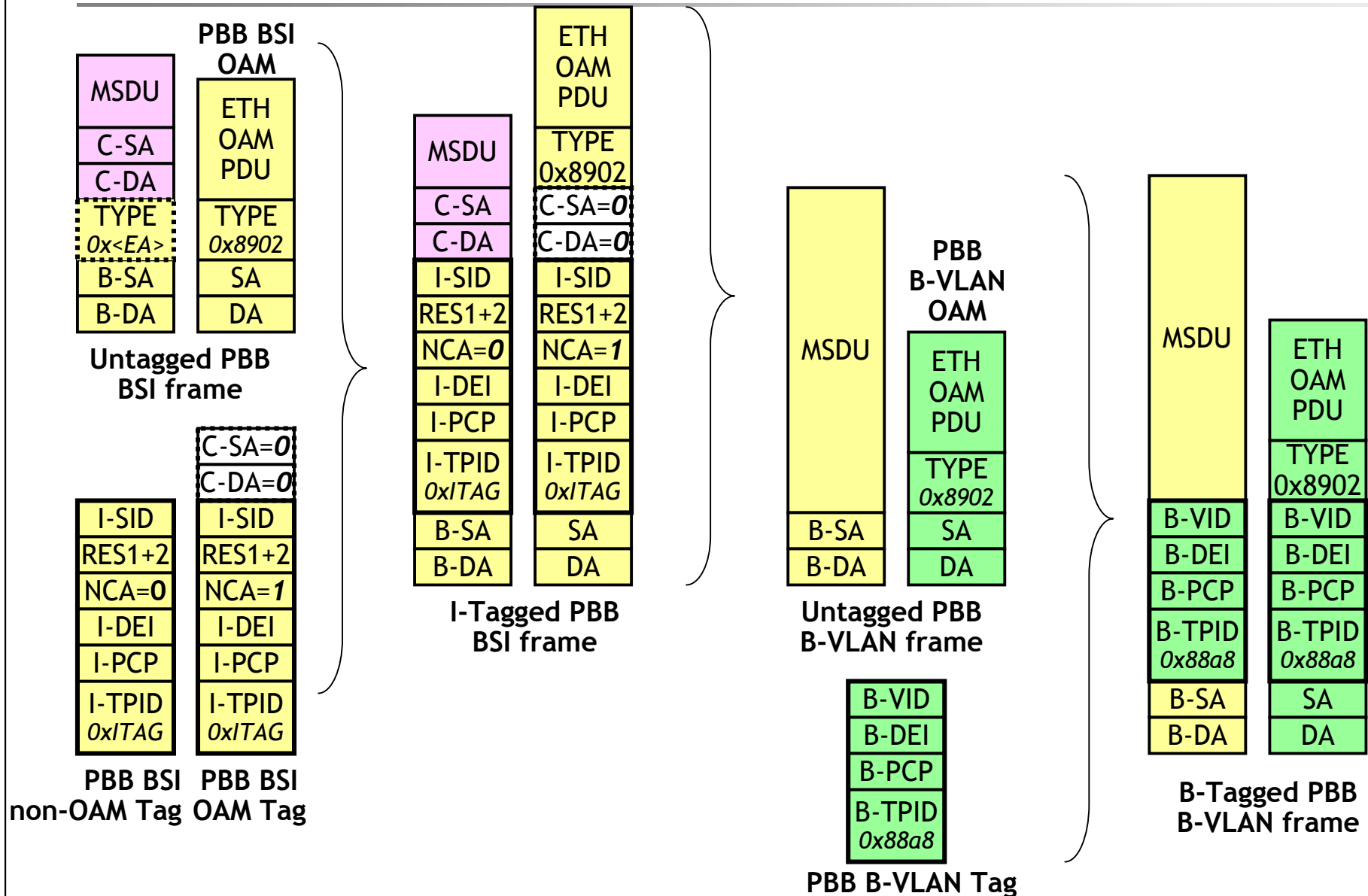
Labels



Labels			
	PB	PBB	PBB-TE
S-VLAN	S-VID	S-VID or PVID	S-VID or I-SID
PBB (B-Service (BSI))	-	I-SID	-
PBB B-VLAN	-	B-VID	-
PBB-TE B-Service (BS)	-	-	I-SID
PBB-TE B-Tunnel (BT)	-	-	<T-DA, T-SA, T-VID>

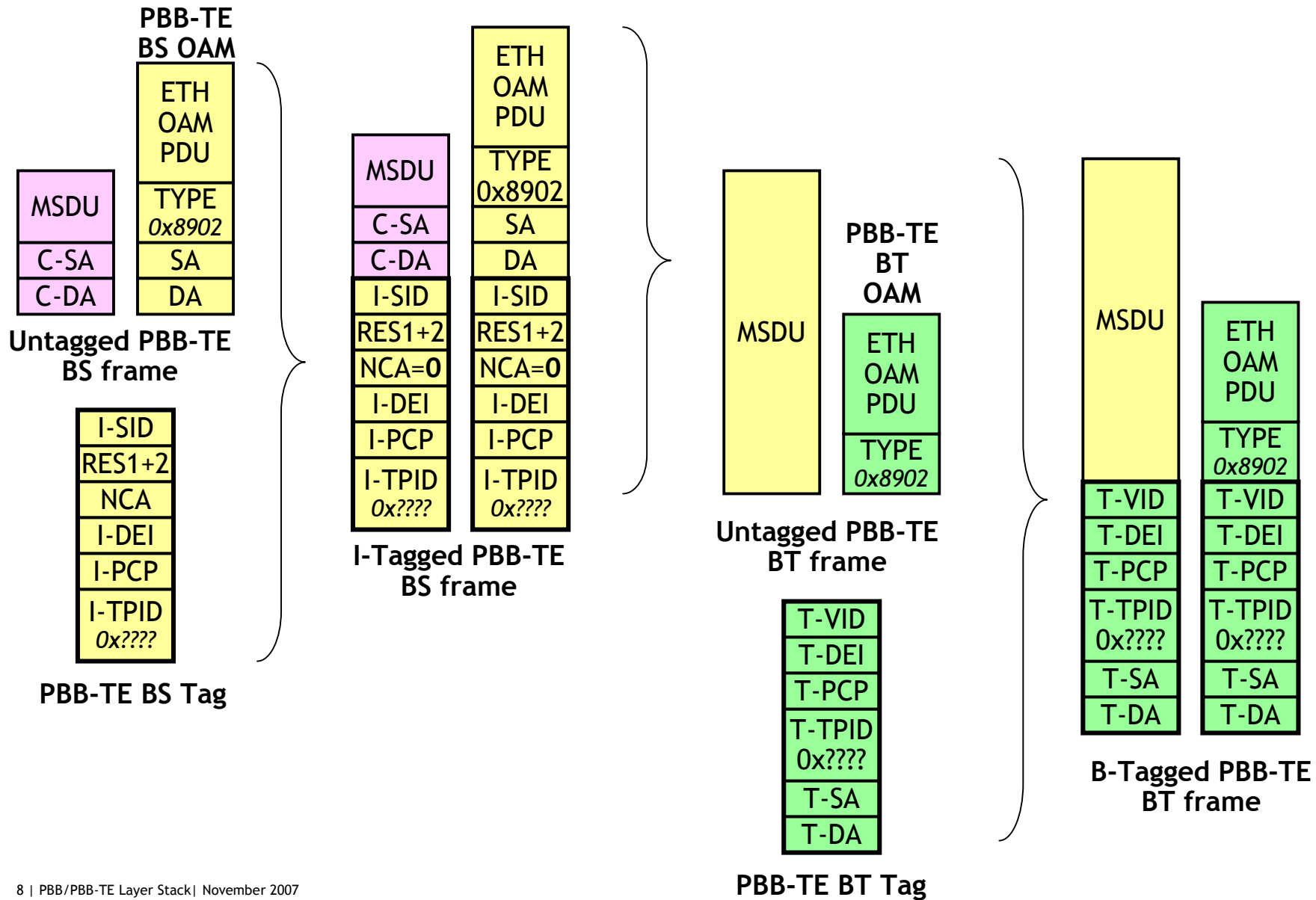
PBB Signals

destination_address/source_address parameters represented as fields

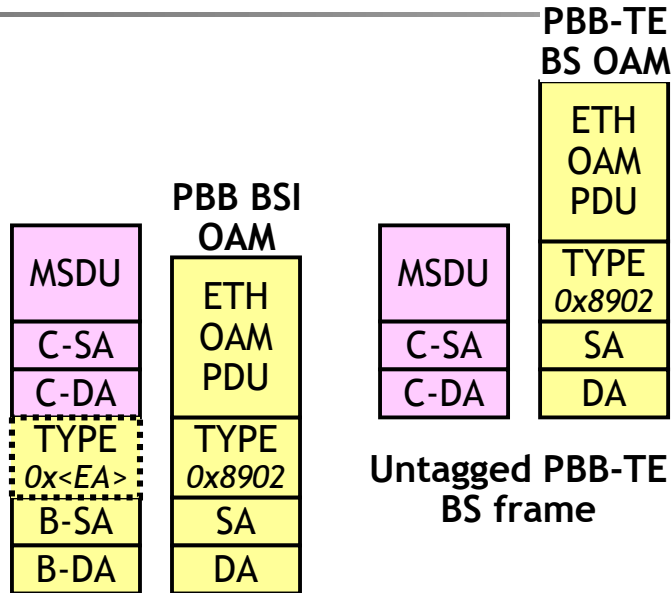


PBB-TE Signals (“Alternative C2”)

destination_address/source_address parameters represented as fields

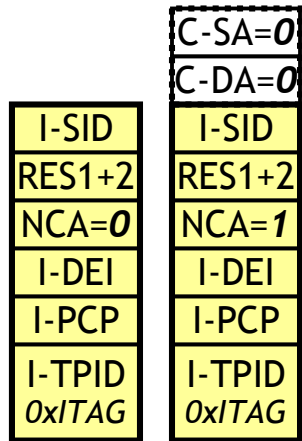


PBB and PBB-TE Signal comparison (I)

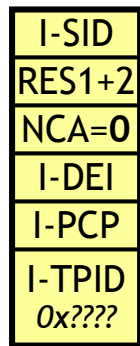


Untagged PBB BSI frame

Untagged PBB-TE BS frame



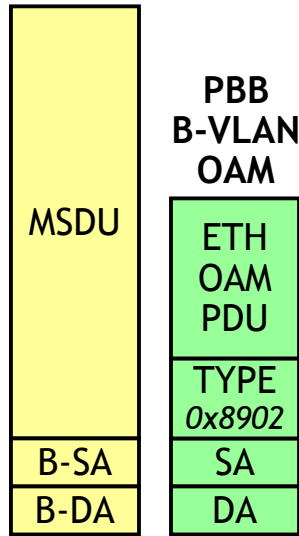
PBB BSI non-OAM Tag



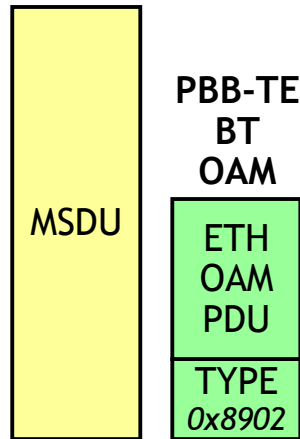
PBB-TE BS Tag

- 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 BSI has two Tag formats
 - One for OAM frames, including C-SA and C-DA fields with value all-0's
 - One for non-OAM frames, which removes the "Encapsulated Addresses" TYPE field when inserted
- PBB-TE BS has single Tag format
 - Applicable for both OAM and non-OAM frames
- 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

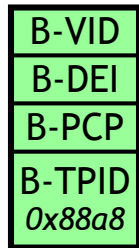
PBB and PBB-TE Signal comparison (II)



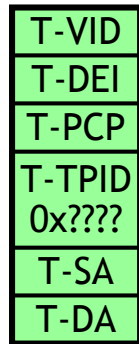
Untagged PBB B-VLAN frame



Untagged PBB-TE BT frame



PBB B-VLAN Tag

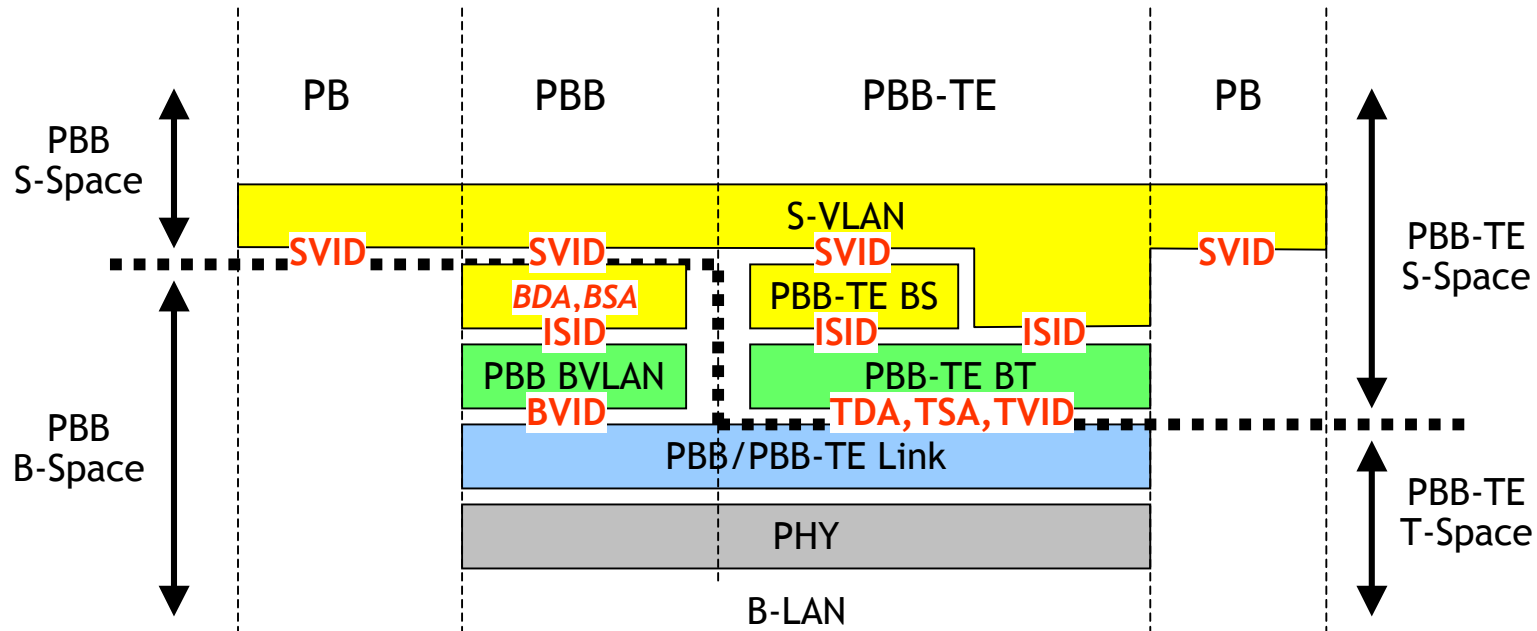


PBB-TE BT Tag

- 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 T-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

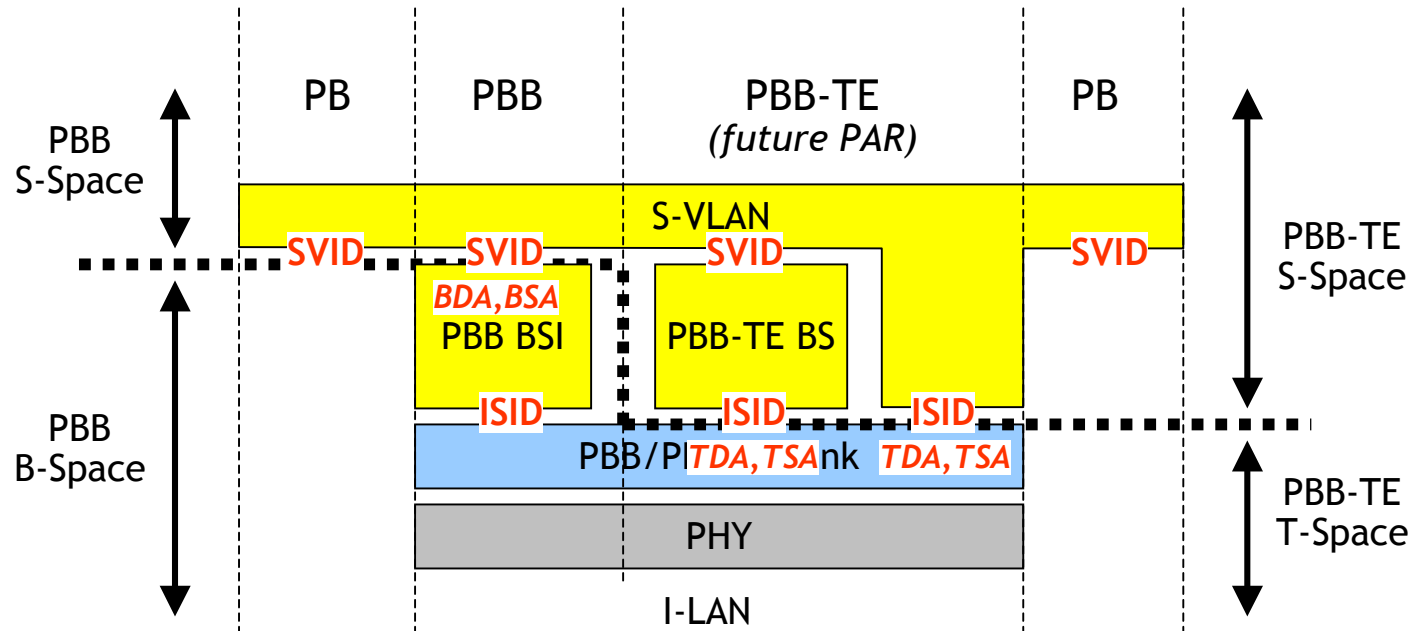
Layer Stack PBB and PBB-TE for “Alternative C2”

B-LAN



Layer Stack PBB and PBB-TE for “Alternative C2”

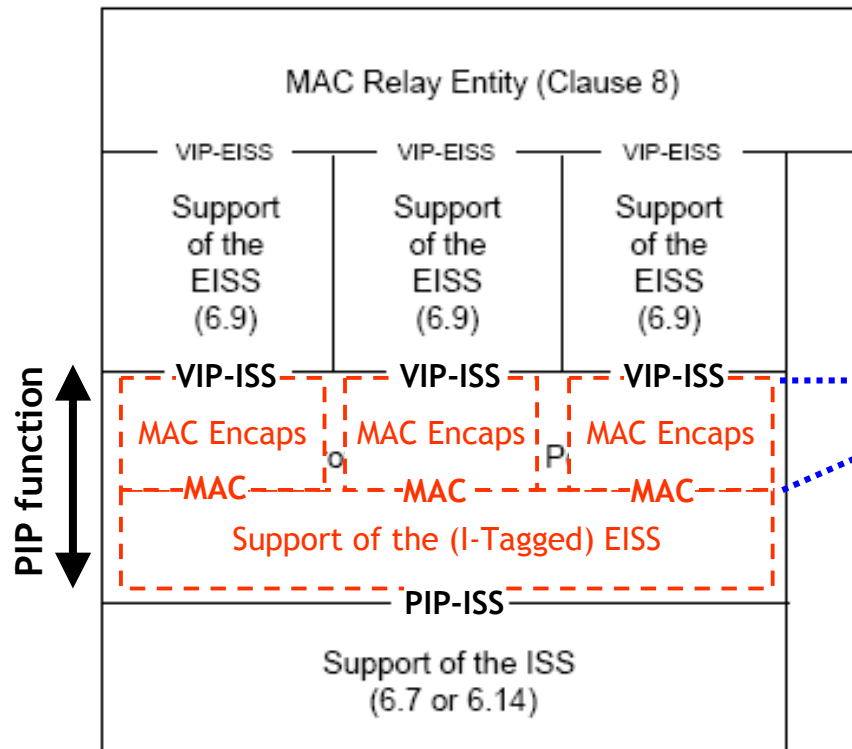
Future I-LAN



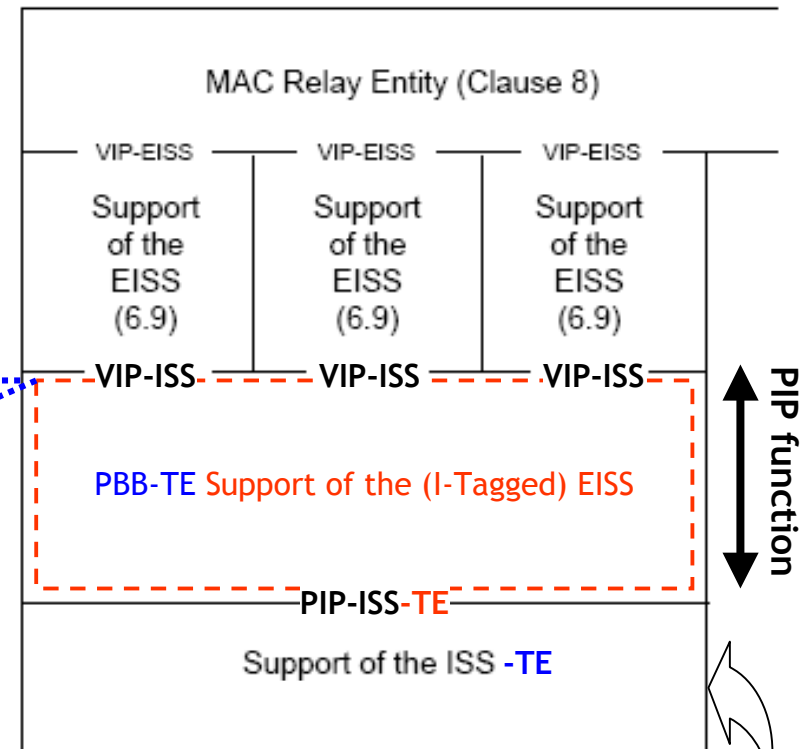
PIP function in PBB and PBB-TE for “Alternative C2”

Decomposed PIP view

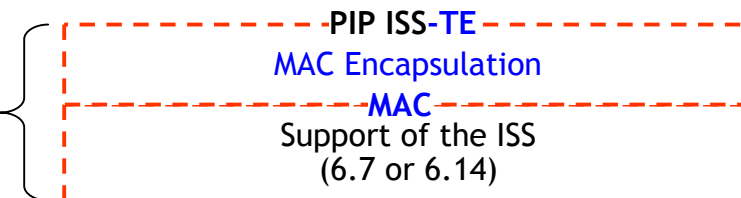
PIP function in PBB



PIP function in PBB-TE (without MAC Encapsulation function)



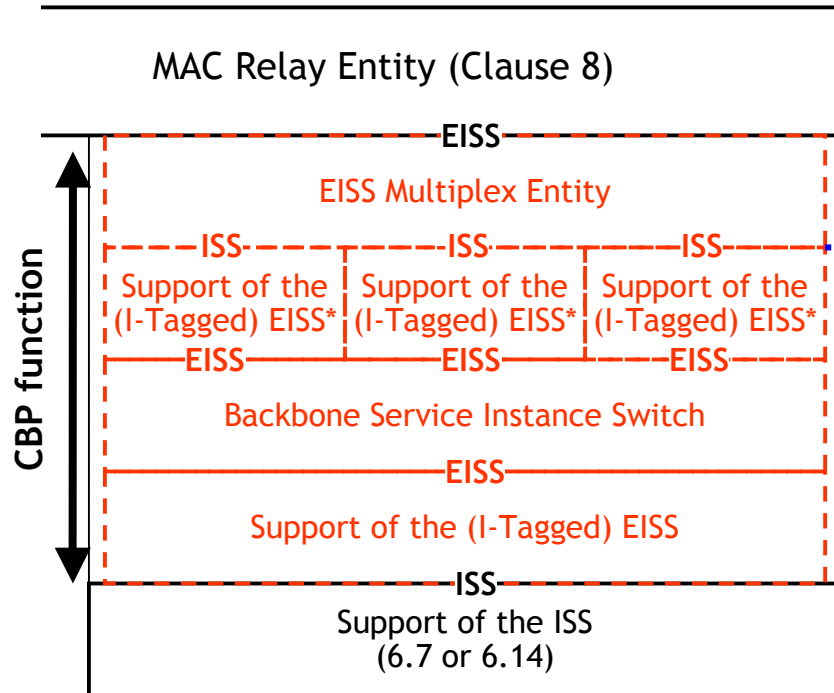
replacement functions
in future PBB-TE I-LAN
within multi-domain
PBB-TE



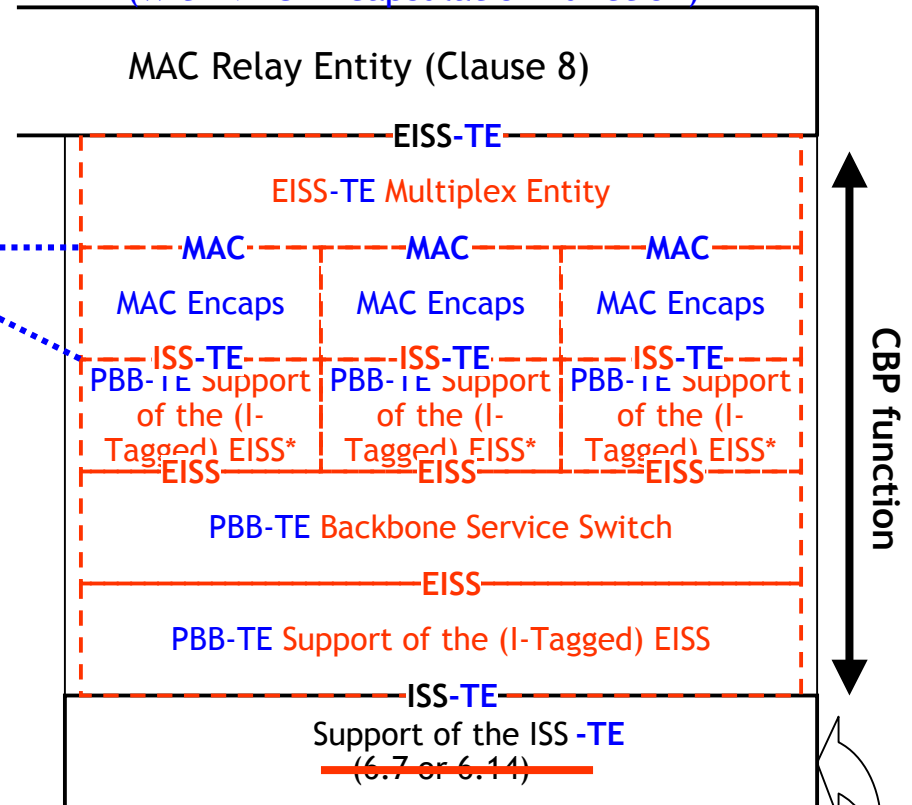
CBP function in PBB and PBB-TE for “Alternative C2”

Decomposed CBP view

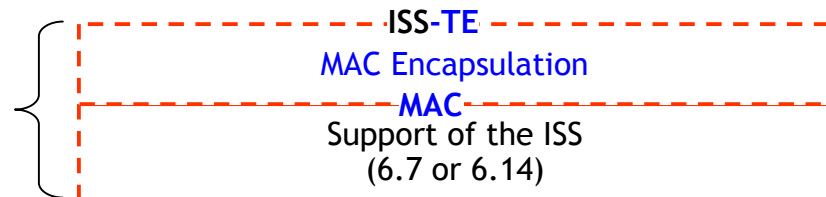
CBP function in PBB



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

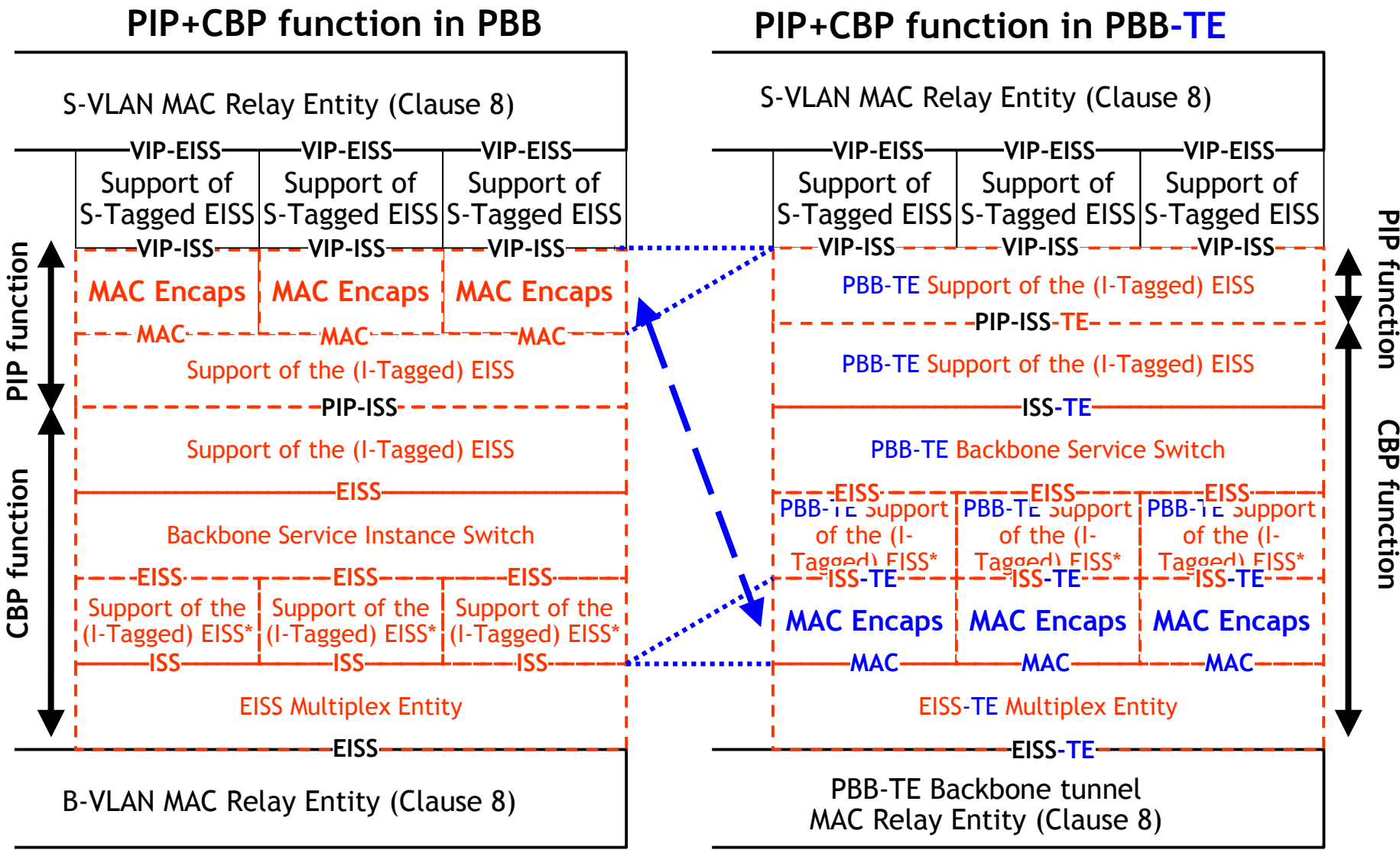


replacement functions
in future PBB-TE I-LAN
within multi-domain
PBB-TE



PBB and PBB-TE shim stacks

Different position of MAC Encapsulation functions



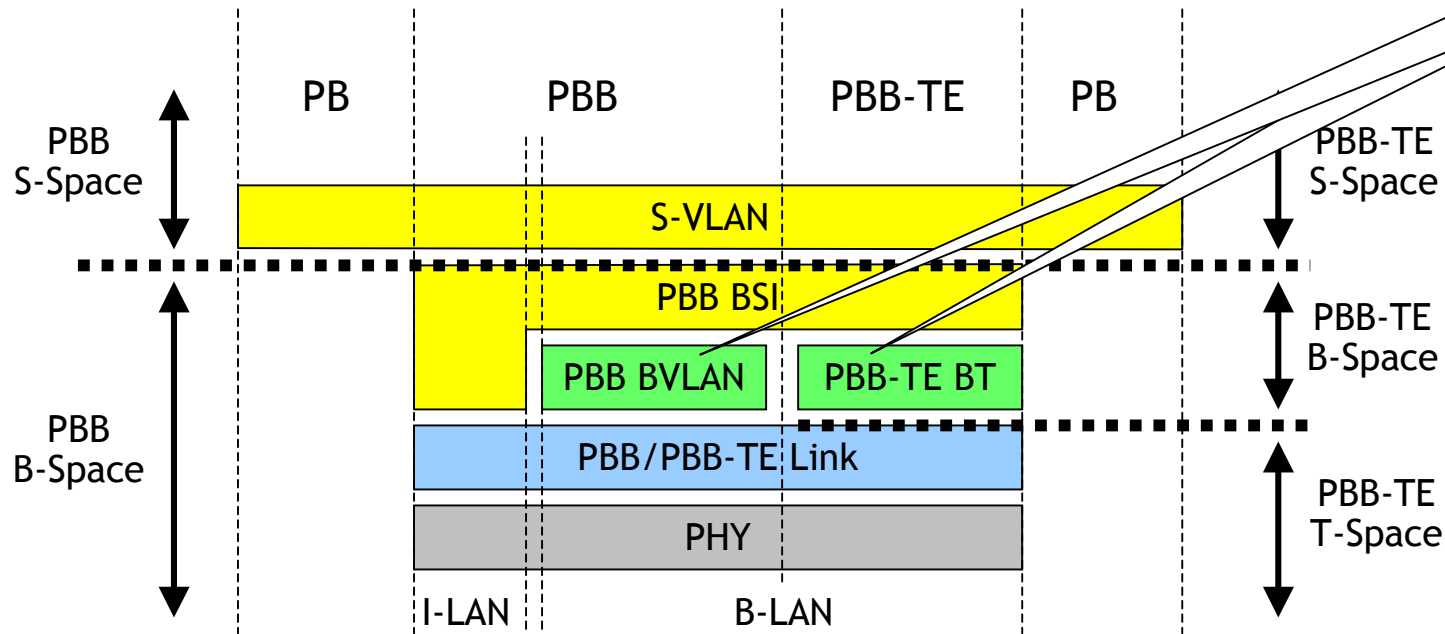
Illustrating difference between
B-MAC and T-MAC

PBB B-Service over PBB-TE B-Tunnel

Layer Stack “PBB B-Service over PBB-TE B-Tunnel”

Another alternative as illustration for B-MAC/T-MAC difference

B-VLAN layer replaced by B-Tunnel (BT) layer



Another alternative layer stack for PBB-TE could have been PBB BSI layer on top of PBB-TE BT layer

- ❑ multipoint-to-multipoint Backbone VLAN in PBB is replaced by set of point-to-point Backbone Tunnels in PBB-TE

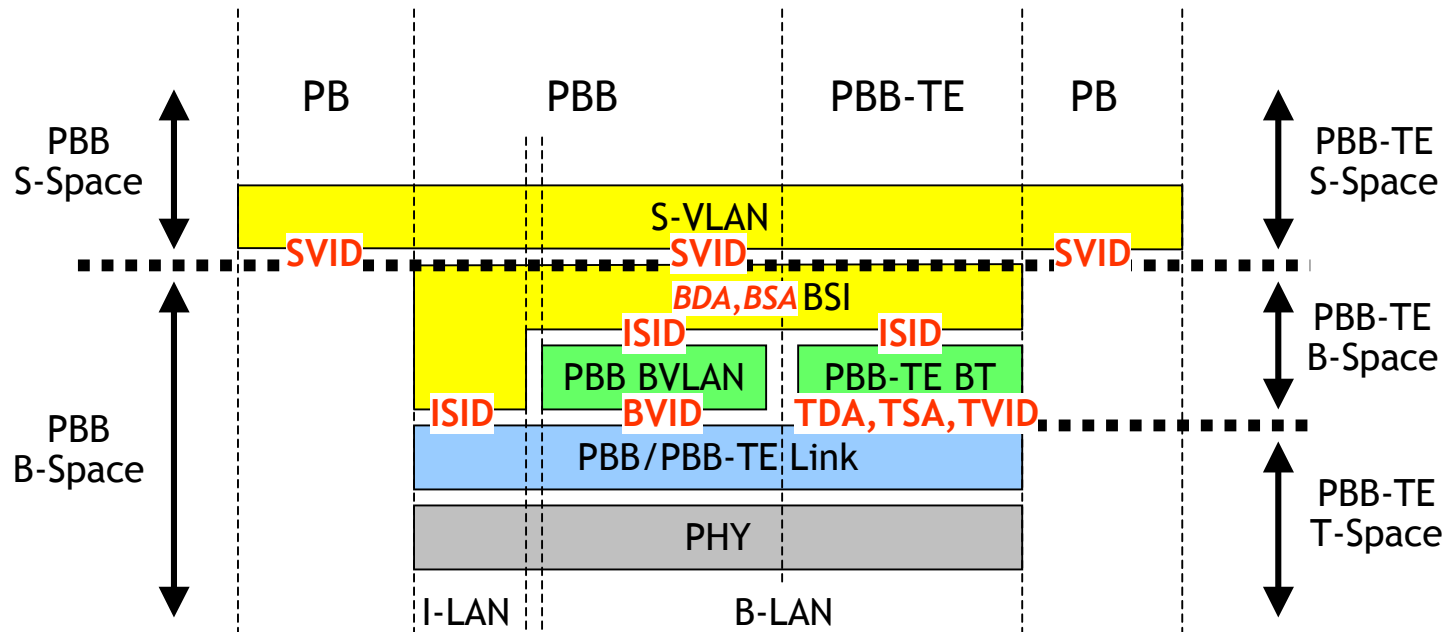
B-MAC address identifies endpoint of a Backbone Service Instance (I-Component)

T-MAC address identifies endpoint of a Backbone Tunnel instance (B-Component)

**PBB and PBB-TE S-Space domains are the same !
PBB-TE has additional T-Space domain !**

Layer Stack “PBB B-Service over PBB-TE B-Tunnel”

Labels



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	PB	PBB	PBB-TE
S-VLAN	S-VID	S-VID or PVID	S-VID or PVID
PBB B-Service (BSI)	-	I-SID	I-SID
PBB B-VLAN	-	B-VID	-
PBB-TE B-Tunnel (BT)	-	-	T-DA, T-SA, T-VID

PBB/PBB-TE Signals for “PBB B-Service over PBB-TE B-Tunnel”

destination_address/source_address parameters represented as fields

