

PBB/PBB-TE Network with B-Service, B-VLAN and B-Tunnel layers

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Introduction

The following slides present an overview of the PBB/PBB-TE network containing a PBB Backbone Service, a PBB Backbone VLAN and a PBB-TE Backbone Tunnel layer as discussed on Wednesday 14 Nov 2007

- ❑ layers and their client/server relationships
- ❑ labels and addresses
- ❑ examples of 2-port and 4-port B-Service instances in
 - single domain PBB-TE network
 - multiple PBB-TE domains interconnected via PBB network
 - multiple PBB-TE domains interconnected via IP/MPLS network
- ❑ frames for B-Service over B-VLAN (802.1ah)
- ❑ frames for B-Service over B-Tunnel

Layer Stack for “B-Service over B-VLAN or B-Tunnel”

A combined PBB/PBB-TE network contains a

- ❑ PBB Backbone Service Instance layer (B-Service)
- ❑ PBB Backbone VLAN layer (B-VLAN) with mp2mp B-VLANs
- ❑ PBB-TE Backbone Tunnel layer (B-Tunnel) with p2p traffic engineered tunnels

B-Service layer is a client layer of both the B-VLAN and B-Tunnel layers

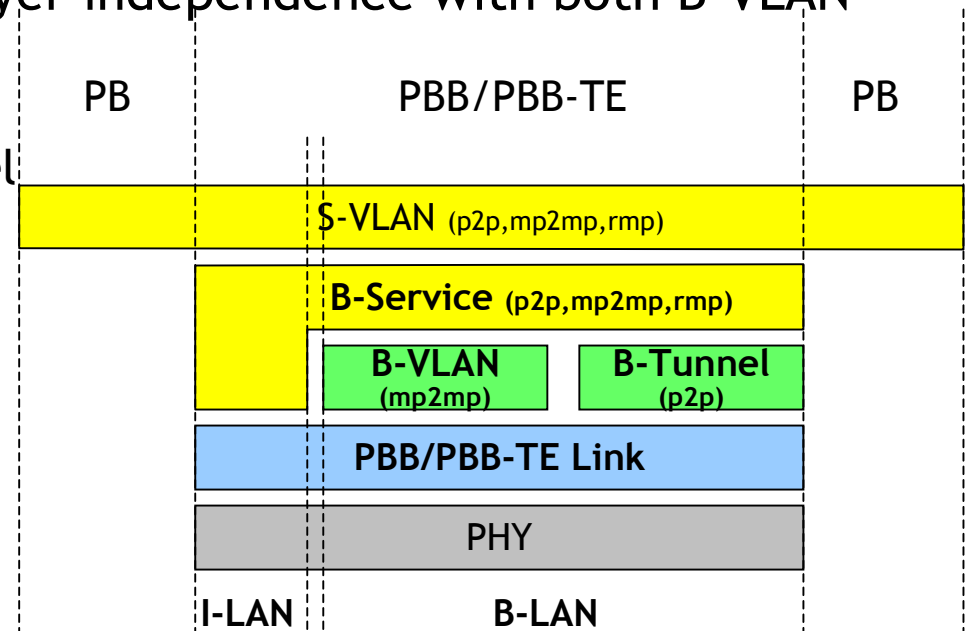
B-Service instances may be carried over either a B-VLAN, or a B-Tunnel instance

B-Service layer has client/server layer independence with both B-VLAN and B-Tunnel layers

- ❑ B-Service frames can pass through one or more B-VLAN and/or B-Tunnel instances towards a B-Service instance endpoint (PIP)

An I-LAN interface supports one or more B-Service instances

A B-LAN interface supports zero or more B-VLAN instances and zero or more B-Tunnel instances



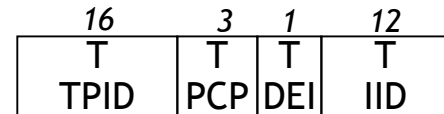
Labels for “B-Service over B-VLAN or B-Tunnel”

B-Service instances are identified within a B-VLAN or B-Tunnel by their I-SID

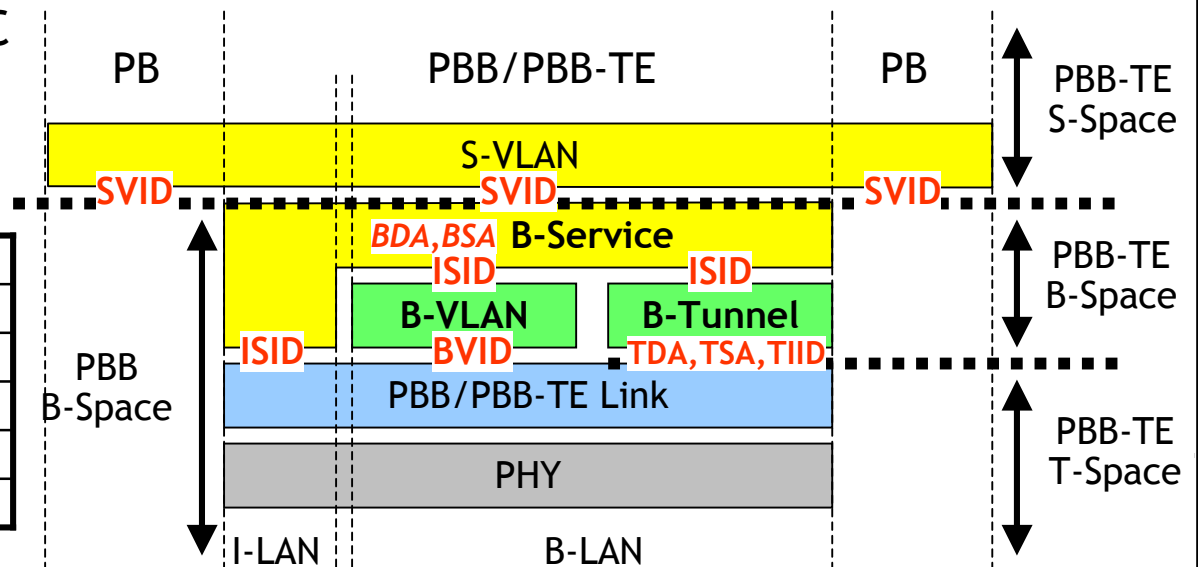
B-VLAN instances are identified within an 802.3 Link by their B-VID

B-Tunnel instances are identified within an 802.3 Link by their tuple <T-DA,T-SA,T-IID> (T-IID: Tunnel Instance Identifier)

- ❑ T-IID is part of a Backbone Tunnel Instance Tag (T-Tag):
- ❑ T-IID is a 12-bit identifier
- ❑ T-Tag also contains a 16-bit Backbone Tunnel Instance TPID (EtherType: TBD), a 3-bit Priority Code Point and a 1-bit Drop Eligible field
- ❑ T-DA/T-SA are Tunnel MAC (T-MAC) addresses which identify the B-Tunnel endpoints



Labels		
	PB	PBB/PBB-TE
S-VLAN	S-VID	S-VID or PVID
PBB B-Service	-	I-SID
PBB B-VLAN	-	B-VID
PBB-TE B-Tunnel	-	T-DA,T-SA,T-IID

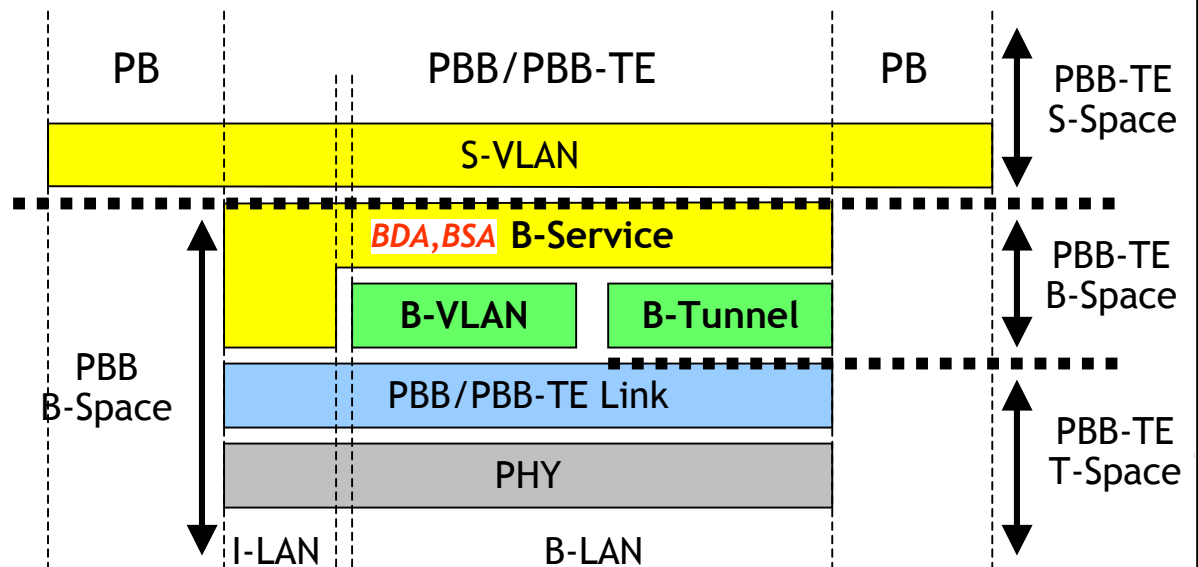


Addresses for “B-Service over B-VLAN or B-Tunnel”

B-MAC addresses (B-DA/B-SA) are inserted in the B-Service layer when creating the B-Service frame

B-MAC addresses identify the endpoints of a B-Service instance and are used to forward a B-Service frame to one or more of the endpoints of their B-Service instance

B-MAC addresses **MUST** be independent of the T-MAC addresses which identify the B-Tunnel endpoints

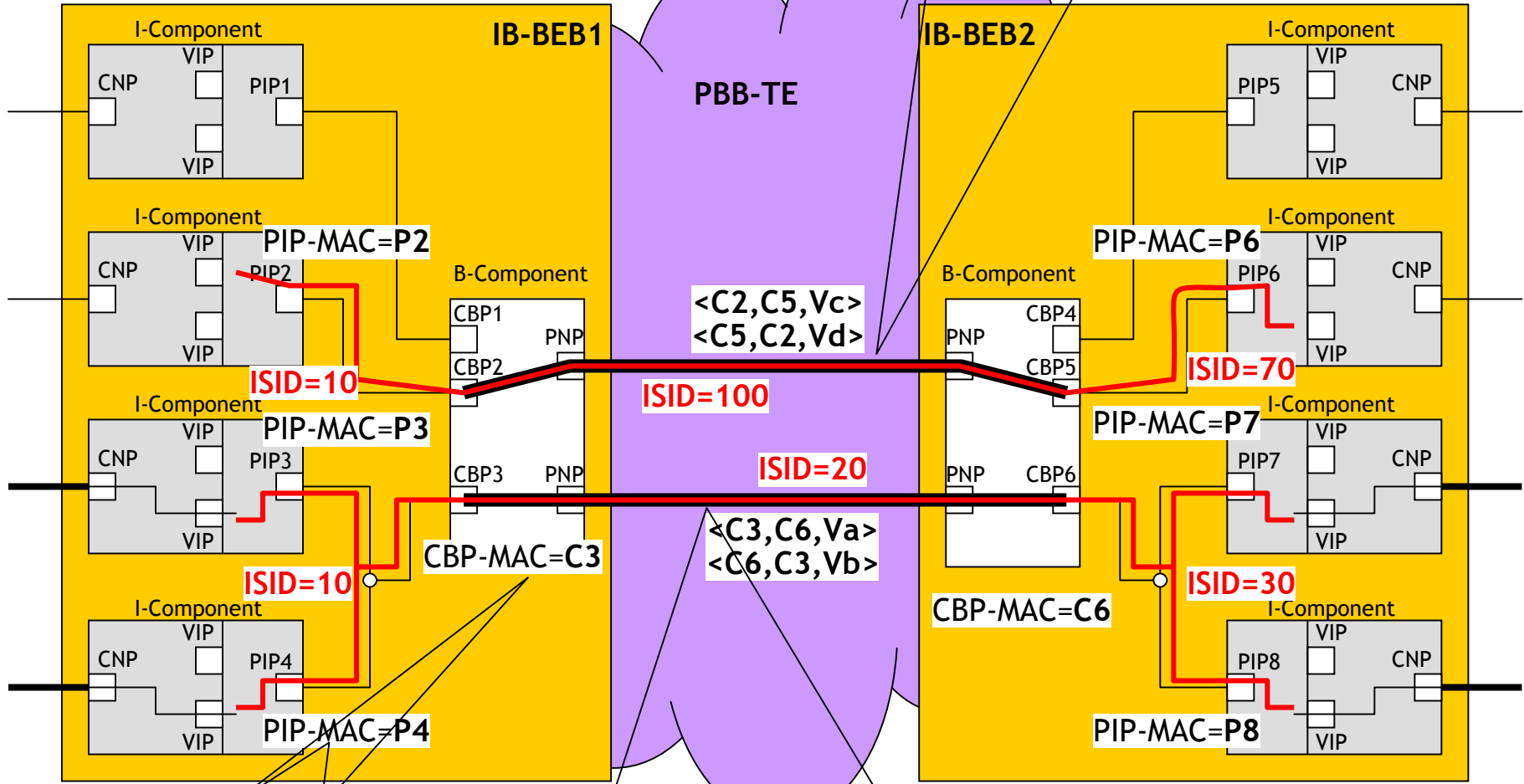


PBB-TE Network

2- and 4-port PBB Backbone Service Instances

IB-BEBs as per [ay-saltsidis-project-status-1107-v02.ppt](#)

B-Tunnel carries frames with
 → B-DA/SA=(P6,P2) and T-DA/SA=<C5,C2,Vd>
 ← B-DA/SA=(P2,P6) and T-DA/SA=<C2,C5,Vc>



<C2,C5,Vc>
<C5,C2,Vd>

ISID=100

ISID=20

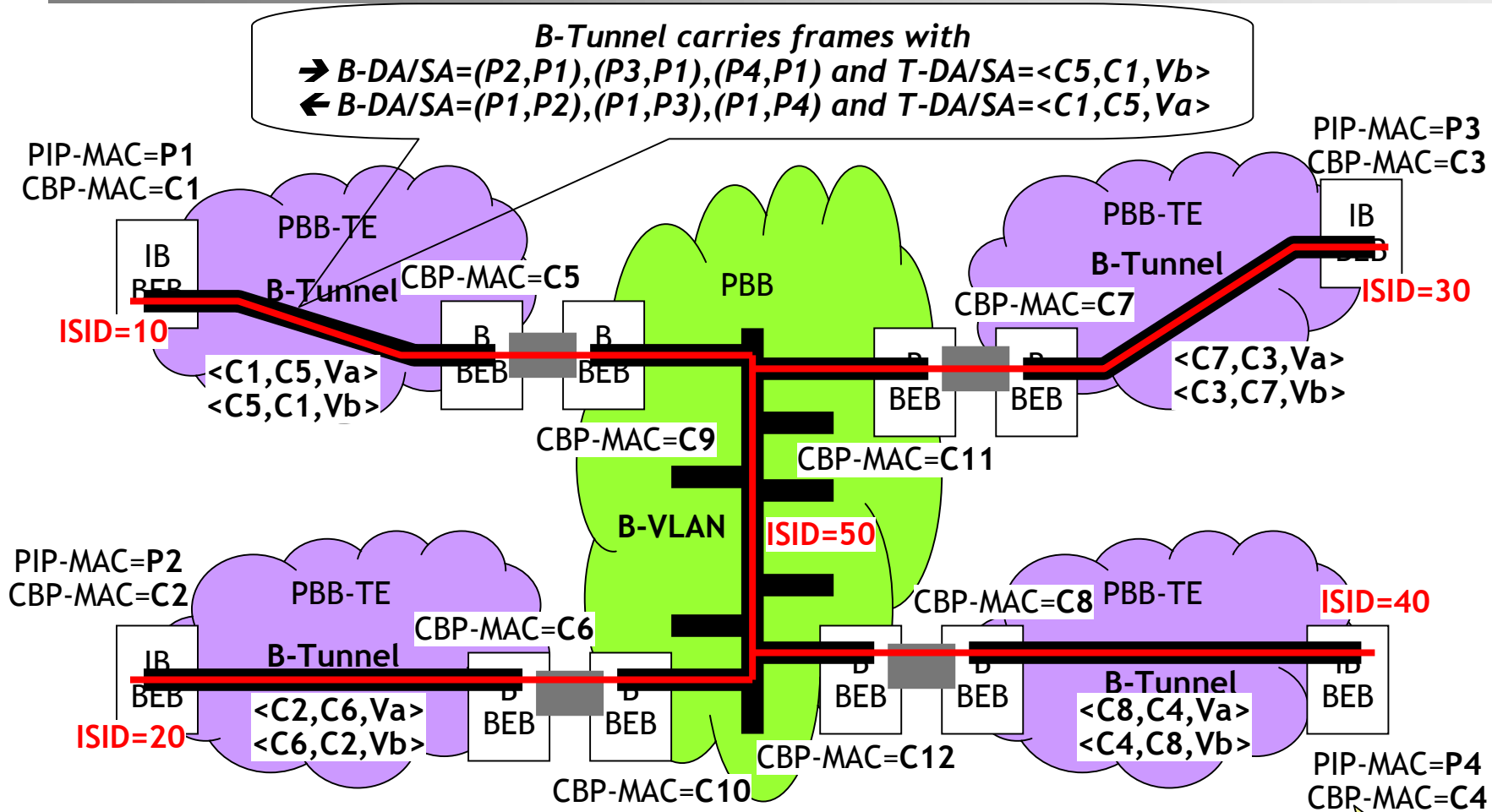
<C3,C6,Va>
<C6,C3,Vb>

B-Service Addresses must be independent of B-Tunnel addresses

B-Tunnel carries frames with
 → B-DA/SA=(P7,P3),(P7,P3),(P8,P3),(P8,P4) and T-DA/SA=<C6,C3,Vb>
 ← B-DA/SA=(P3,P7),(P3,P8),(P4,P7),(P4,P8) and T-DA/SA=<C3,C6,Va>

PBB-TE Aggregation Networks interconnected via PBB Core Network

4-port PBB Backbone Service Instance



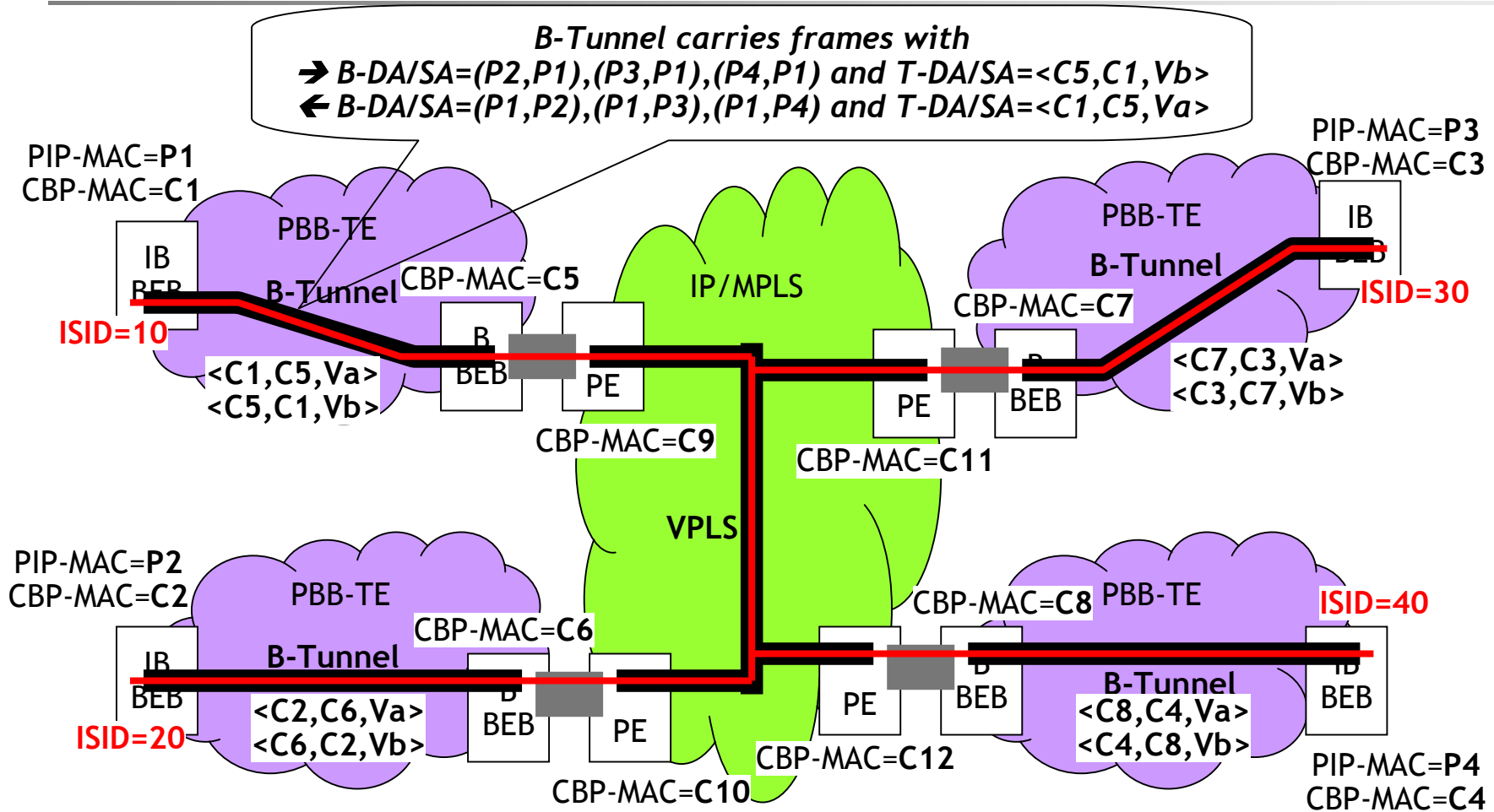
4-port PBB Backbone Service Instance carried over

- PBB-TE Backbone Tunnels in metro/aggregation domains and
- B-VLAN in PBB core domain

B-Service Addresses must be independent of B-Tunnel addresses

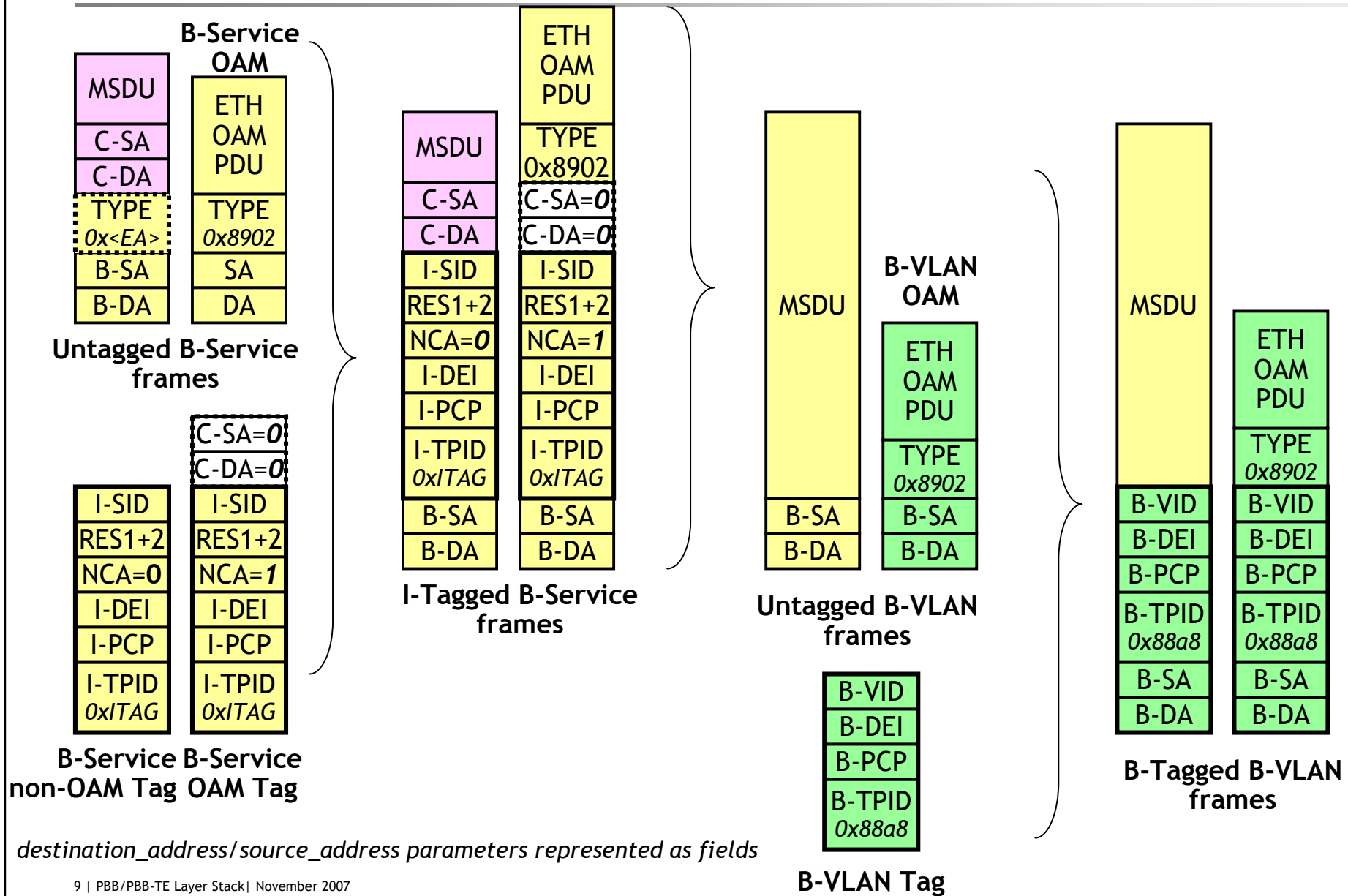
PBB-TE Aggregation Networks interconnected via IP/MPLS Core Network

4-port PBB Backbone Service Instance

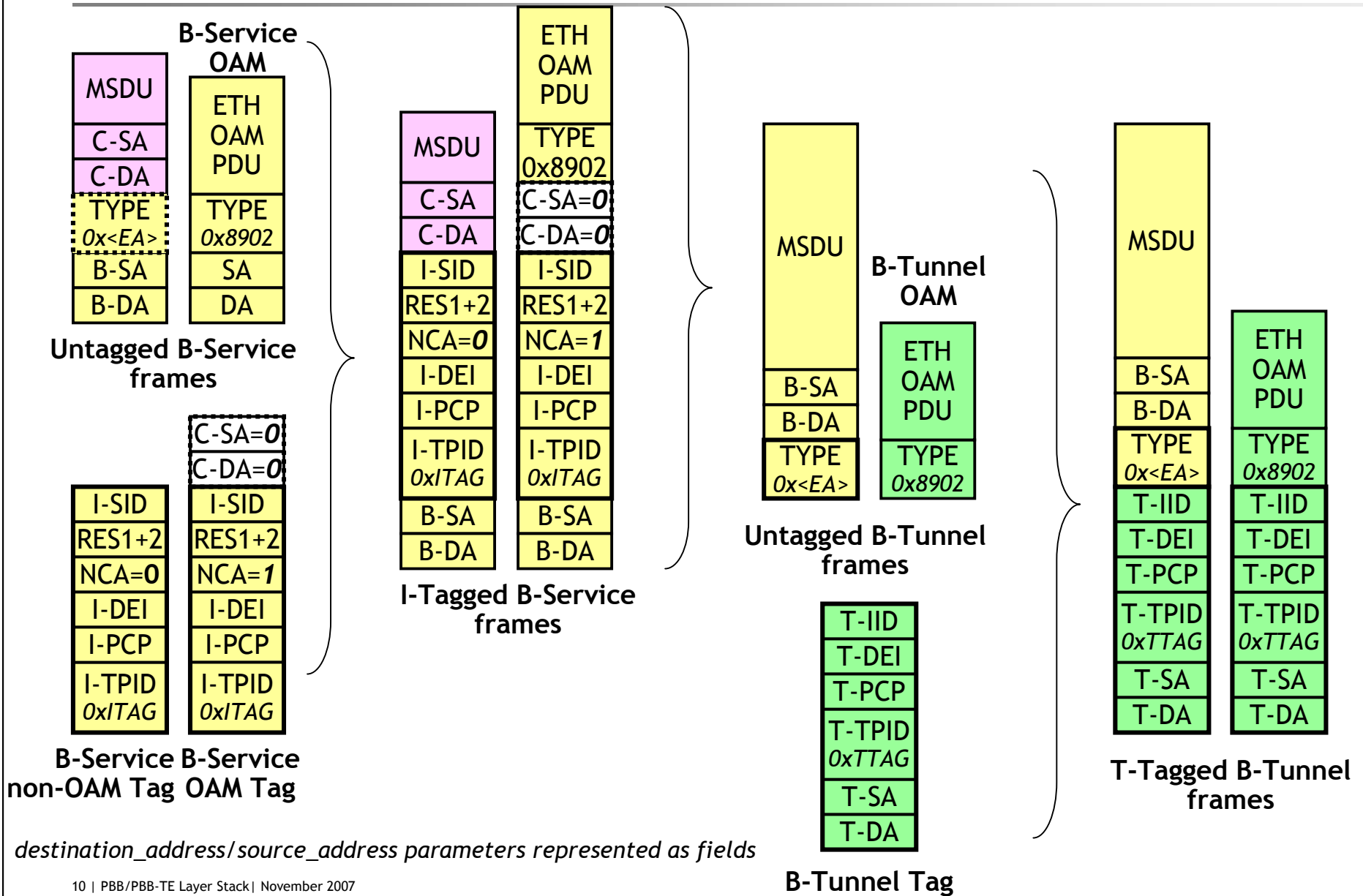


- 4-port PBB Backbone Service Instance carried over
- PBB-TE Backbone Tunnels in metro/aggregation domains and
 - VPLS in IP/MPLS core domain

Frames for "B-Service over B-VLAN"



Frames for "B-Service over B-Tunnel"



802.1ah extensions

The PBB/PBB-TE network described in those slides

- ❑ deploys the 802.1ah PIP
- ❑ deploys the 802.1ah CBP with the following extensions
 - introduction of B-Service Group protection switching
 - introduction of B-Tunnel endpoint (complementing B-VLAN endpoint)
 - introduction of B-Tunnel MEP (complementing B-VLAN MEP)
 - introduction of T-MAC header (T-DA, T-SA, TYPE)
 - T-SA is local CBP address, T-DA is derived from Default Backbone Destination field in the Backbone Service Instance Table
- ❑ deploys the 802.1ah PNP with the following extension(s)
 - complementing B-Tag insertion/extraction with T-Tag insertion/extraction
 - introduction of B-Tunnel MIP
 - B-Tunnel MEPs on the PNP are only required when the B-Tunnel instances are in future supported by more than one operator and the PNP will terminate an E-NNI