

PBB-TE Domain, Layers and Components Clarification

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September 2007

Introduction

PBB-TE networking differs from PBB networking

Which elements of 802.1ah are to be modified in 802.1Qay?

Initial questions for clarification

- What is the interpretation of “domain” in the 802.1Qay PAR
- Which layers are present in a PBB-TE network
- Which components are present in PBB-TE BEB nodes

Several alternatives are presented for discussion

PBB-TE Domain Clarification

PBB-TE “will not take account of multi domain networks“ (PAR)

❑ Three interpretations

- single administrative domain, which may include one or more PBB-TE Networks
- single PBB-TE Network with IB-BEB, I-BEB, B-BEB and PB nodes
- single PBB-TE Network with IB-BEB and PB nodes only (i.e. no I-BEBs)

❑ Interpretation on 802.1 mailing list, June 29, 2007

- Network with PBs and IB-BEBs only
- S-LAN and B-LAN interfaces, no I-LAN

PBB-TE Layers Clarification

How many PBB-TE layers?

☐ Two alternatives

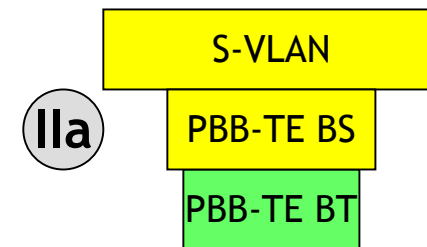
- **One PBB-TE layer** performing a backbone tunnel (BT) layer role
 - layer stack includes S-VLAN + PBB-TE BT layers
- **Two PBB-TE layers** performing backbone service (BS) and backbone tunnel (BT) layer roles
 - layer stack includes S-VLAN + PBB-TE BS + PBB-TE BT layers

☐ S-VLAN + PBB-TE BT (I)

- S-VLAN layer acts as Service Layer; p2p and mp services
- PBB-TE BT layer acts as Tunnel Layer; p2p tunnels

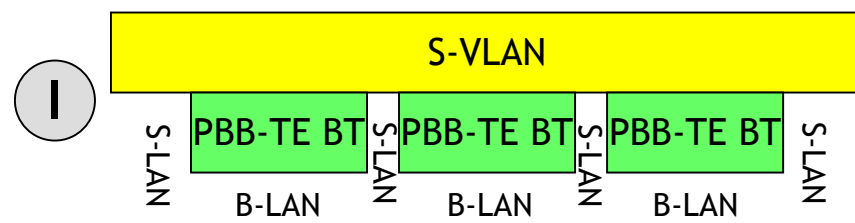
☐ S-VLAN + PBB-TE BS + PBB-TE BT (IIa, IIb)

- S-VLAN layer acts as Service Layer; p2p and mp services
- PBB-TE BS layer acts as Backbone Service Layer; p2p services
- PBB-TE BT layer acts as Backbone Tunnel Layer; p2p tunnels

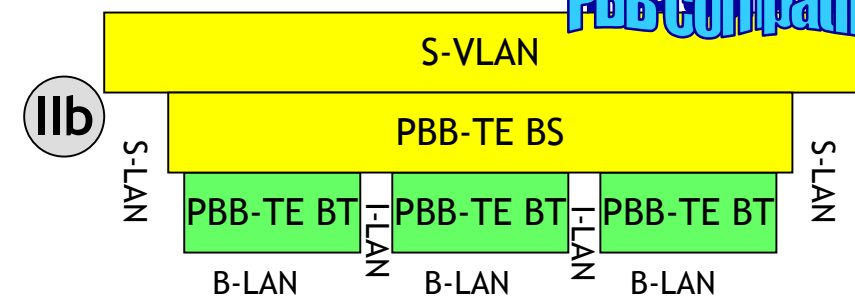


IIa

PBB Compatible



I



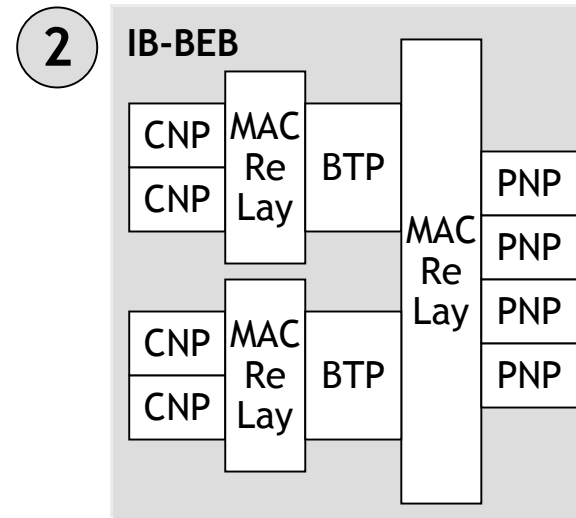
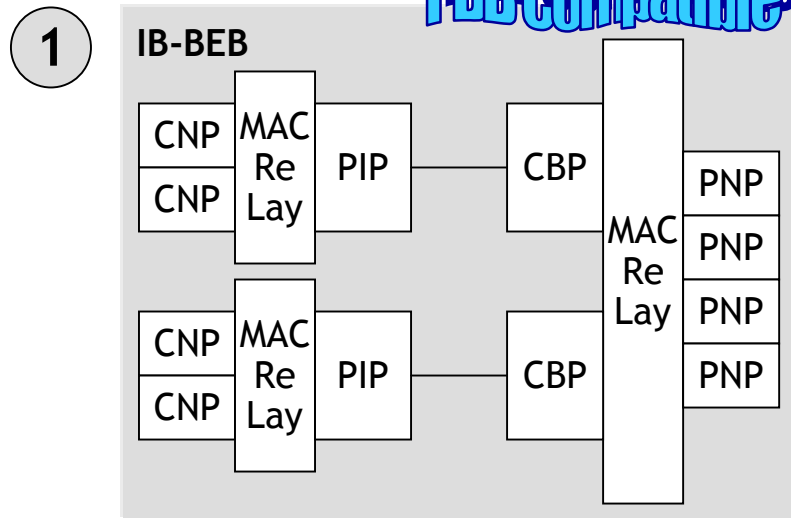
IIb

PBB-TE Components Clarification

IB-BEB Components

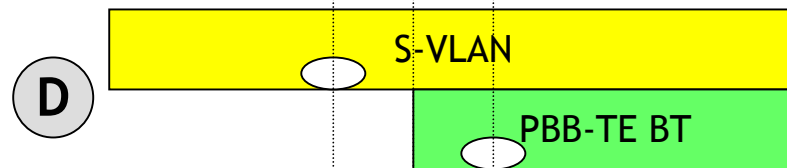
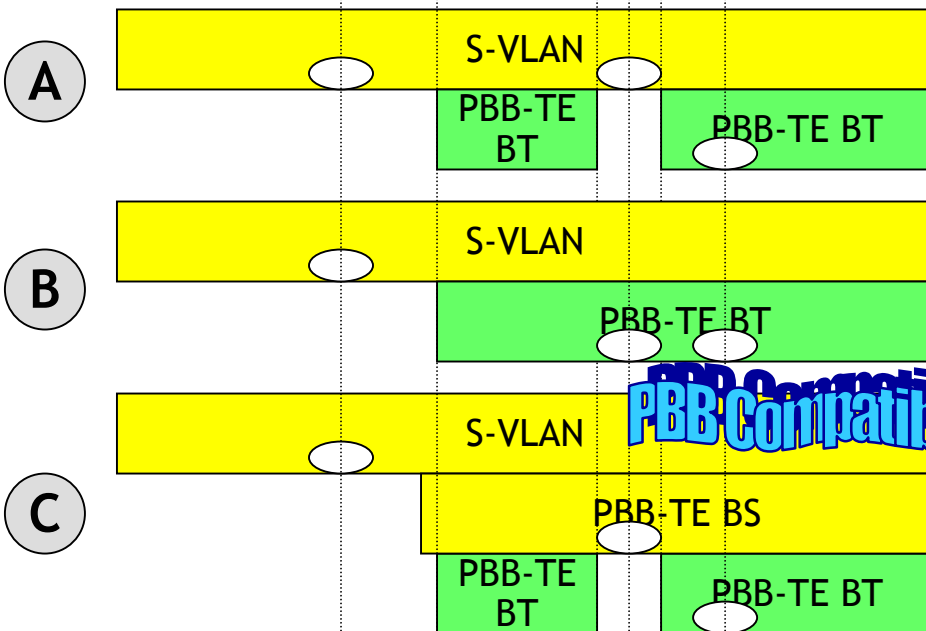
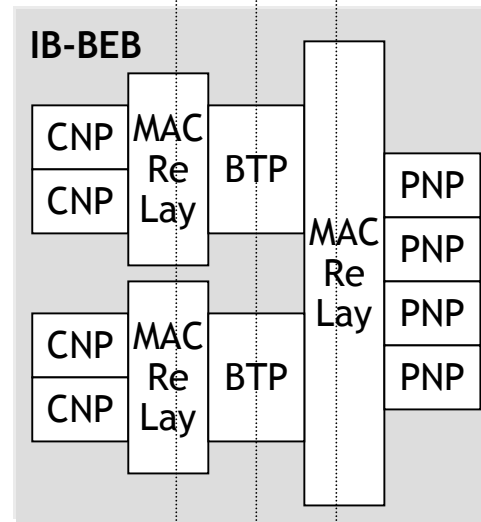
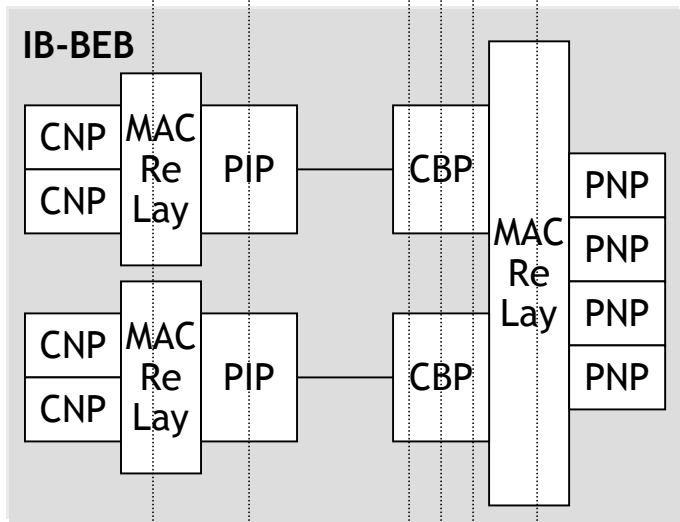
Two alternatives

- Separate I-Component and B-Component interconnected via clause 6.14 shims
 - Supports two PBB-TE (BS and BT) layers case
 - Supports one PBB-TE (BT) layer case
- Single B-Component with integrated “PIP/CBP” function (Backbone Tunnel Port (BTP))
 - Supports one PBB-TE (BT) layer case



PBB-TE Components and Layers

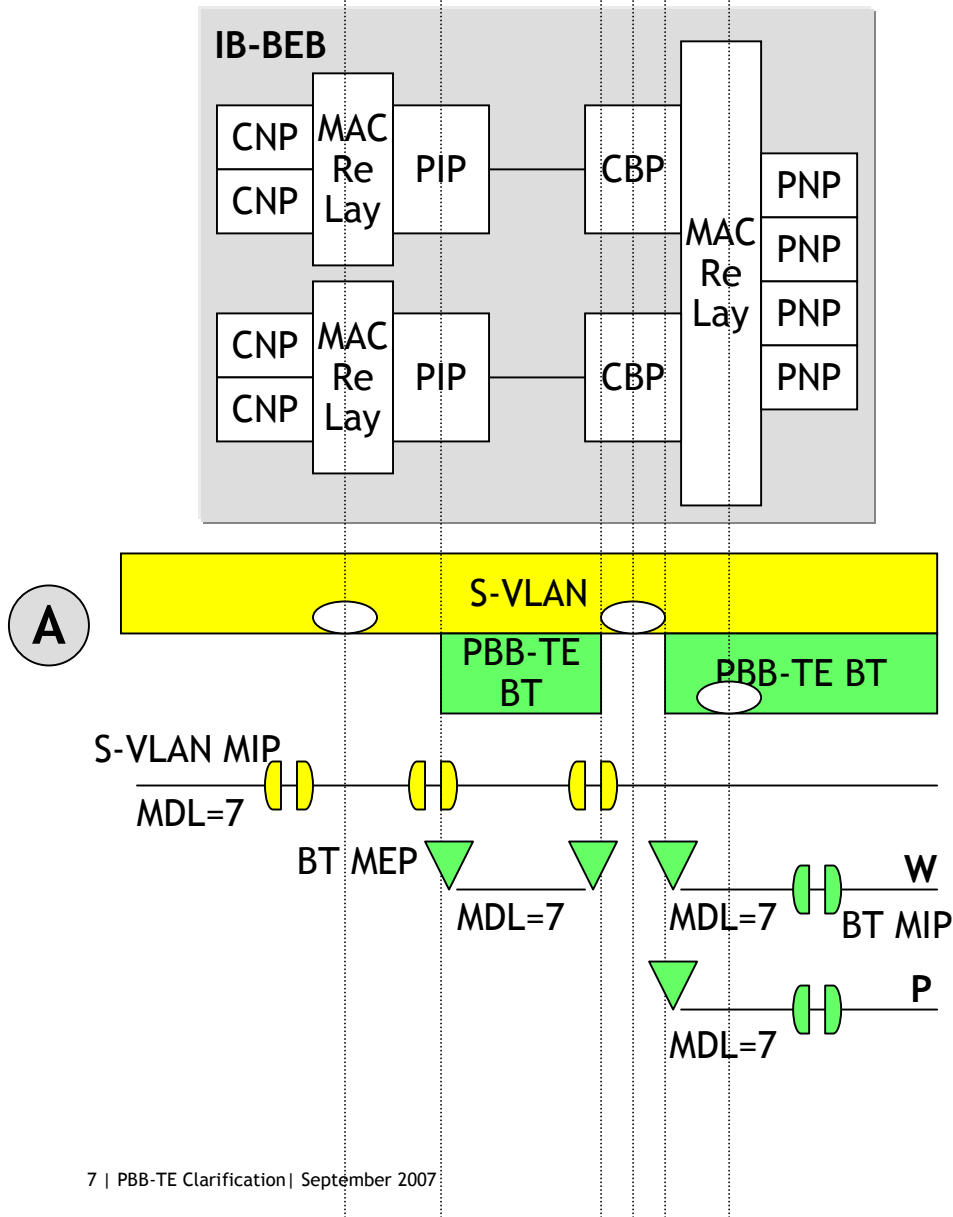
Four Alternative Combinations



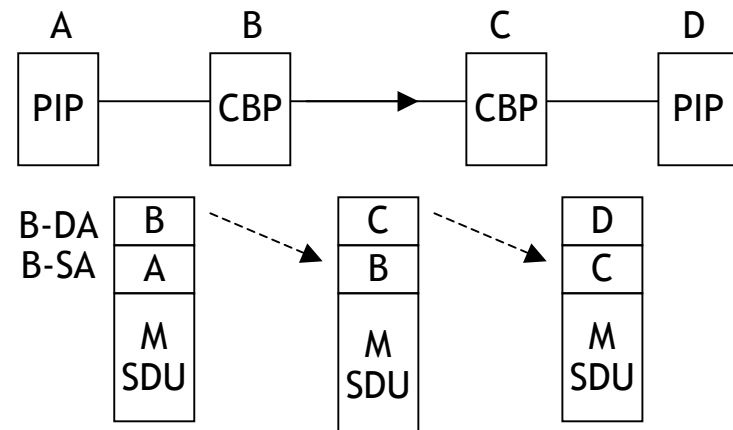
- A: PBB-TE BT Instances terminate in CBP (Extra PBB-TE BT Instance between PIP and CBP S-VLAN switch (Service Instance Table) in CBP)
- B: PBB-TE BT Instances terminate in PIP (PBB-TE BT switch in CBP)
- C: PBB-TE BS Instances terminate in PIP, PBB-TE BT Instances terminate in CBP (Extra PBB-TE BT Instance between PIP and CBP PBB-TE BS switch (Service Instance Table) in CBP)
- D: PBB-TE Instances terminate in BTP

PBB-TE Components and Layers

Alternative A

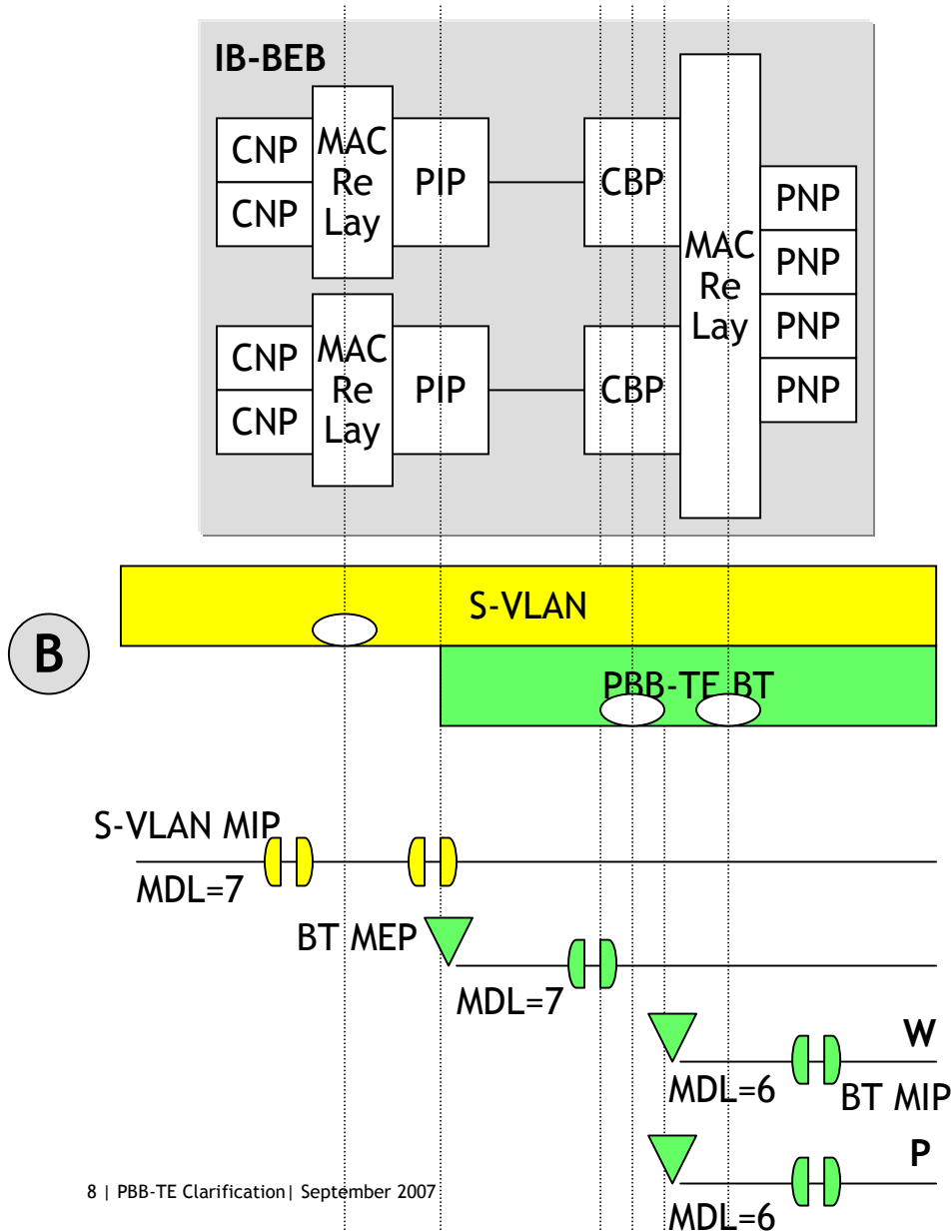


- S-VLAN over BT, no BS layer
- not compatible with PBB model
- additional BT connection between PIP and CBP
 - BT label: B-DA+B-SA, no B-VID!
 - B-DA/SA carry PIP and CBP addresses
- BT connections between CBPs
 - BT label: B-DA+B-SA+B-VID
 - B-DA/SA carry CBP addresses
- CBPs strip off B-DA/SA, forward S-VLAN frame, insert new B-DA/SA
- CBPs extended with S-VLAN protection, switching groups of S-VLANs (load sharing)



PBB-TE Components and Layers

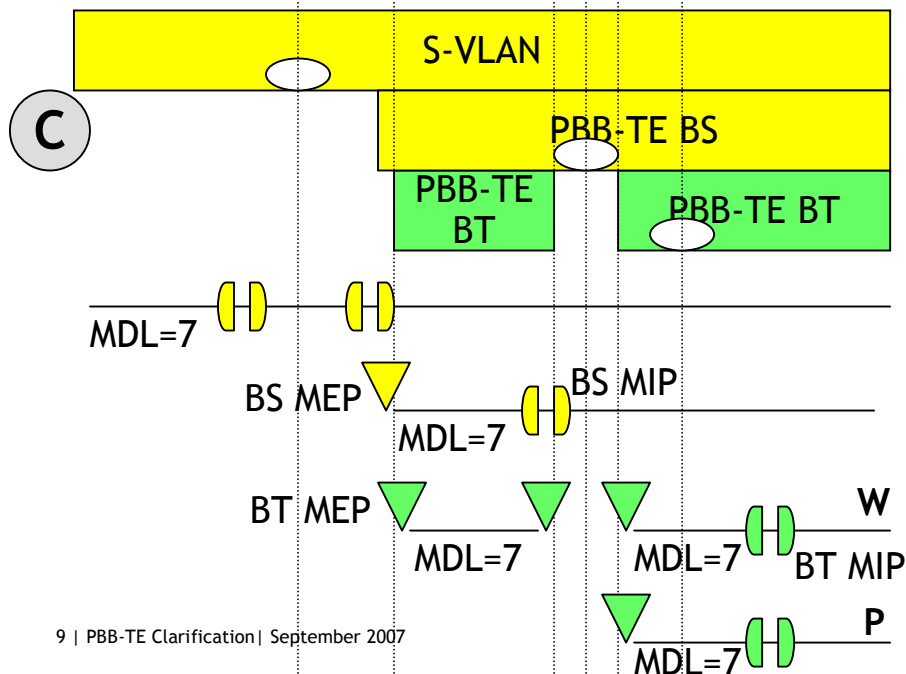
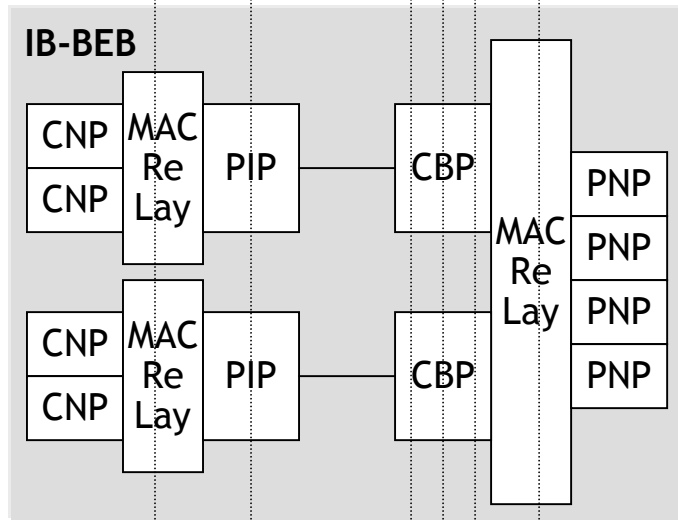
Alternative B



- S-VLAN over BT, no BS layer
- not compatible with PBB model
- BT endpoint in PIP, replacing the PBB BS endpoint
- service switch function in PBB CBP (Service Instance Table) replaced by tunnel (BT) switch function supporting protection (with load sharing)
 - must pass through untagged frames (BT OAM)
- extra BT MD level to monitor working/protection connections
- 1+1 or 1:1 SNC Protection (no load sharing) or Tunnel Aggregation (TAG) (load sharing)
 - Tunnel Aggregation, a kind of LAG/ECMP for the BT
 - selection based on ISID and BT OAM
- BT MIP in CBP, replacing PBB BS MIP

PBB-TE Components and Layers

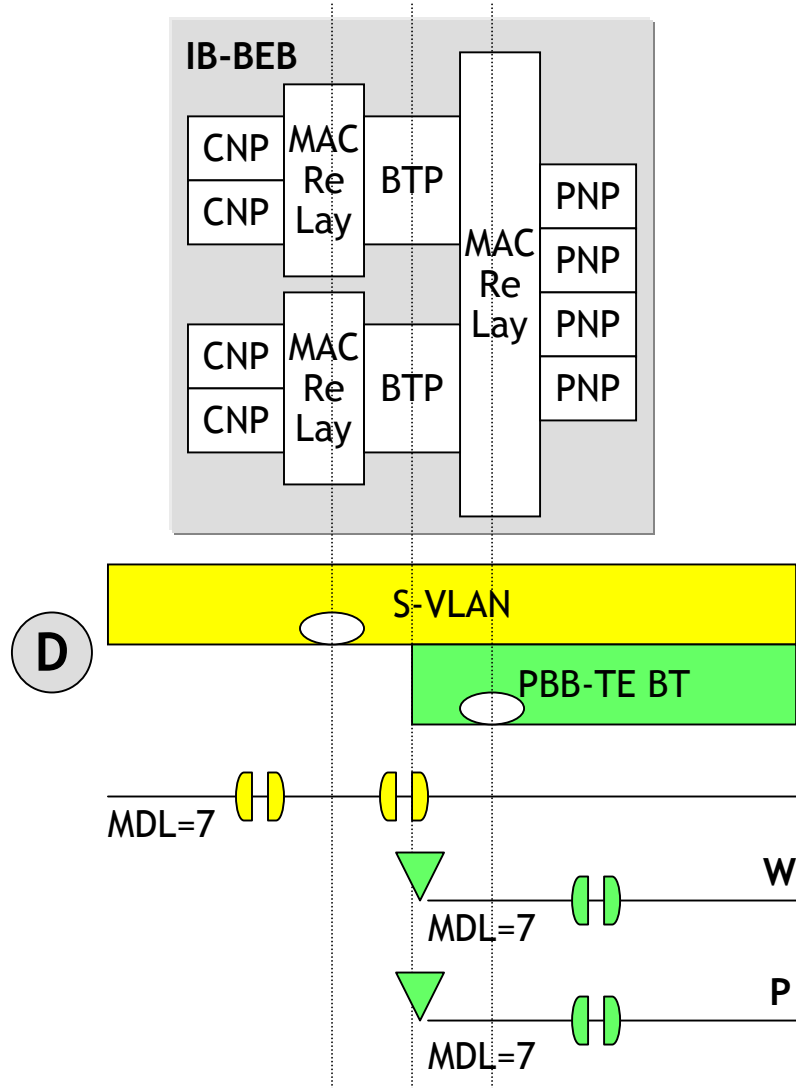
Alternative C



- 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
- additional BT connection between PIP and CBP
 - see alternative A
- BT connections between CBPs
 - see alternative A
- CBPs strip off B-DA/SA, forward BS-frame, insert new B-DA/SA/VID
- service switch function in CBP (Service Instance Table) extended with BS protection switch function, switching groups of BS signals (load sharing)

PBB-TE Components and Layers

Alternative D



- minimized complexity model
- single service layer (S-VLAN) in provider network
- S-VLAN MAC Relay extended with S-VLAN protection switch function, switching groups of S-VLAN signals
- BT layer with single MD level
- not PBB compatible
 - within scope of PBB-TE PAR?
 - S-VLAN MAC Relays and Service Instance Tables of PBB and PBB-TE must be co-located; in this alternative every Service Instance Table is replaced by S-VLAN MAC Relay function