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)
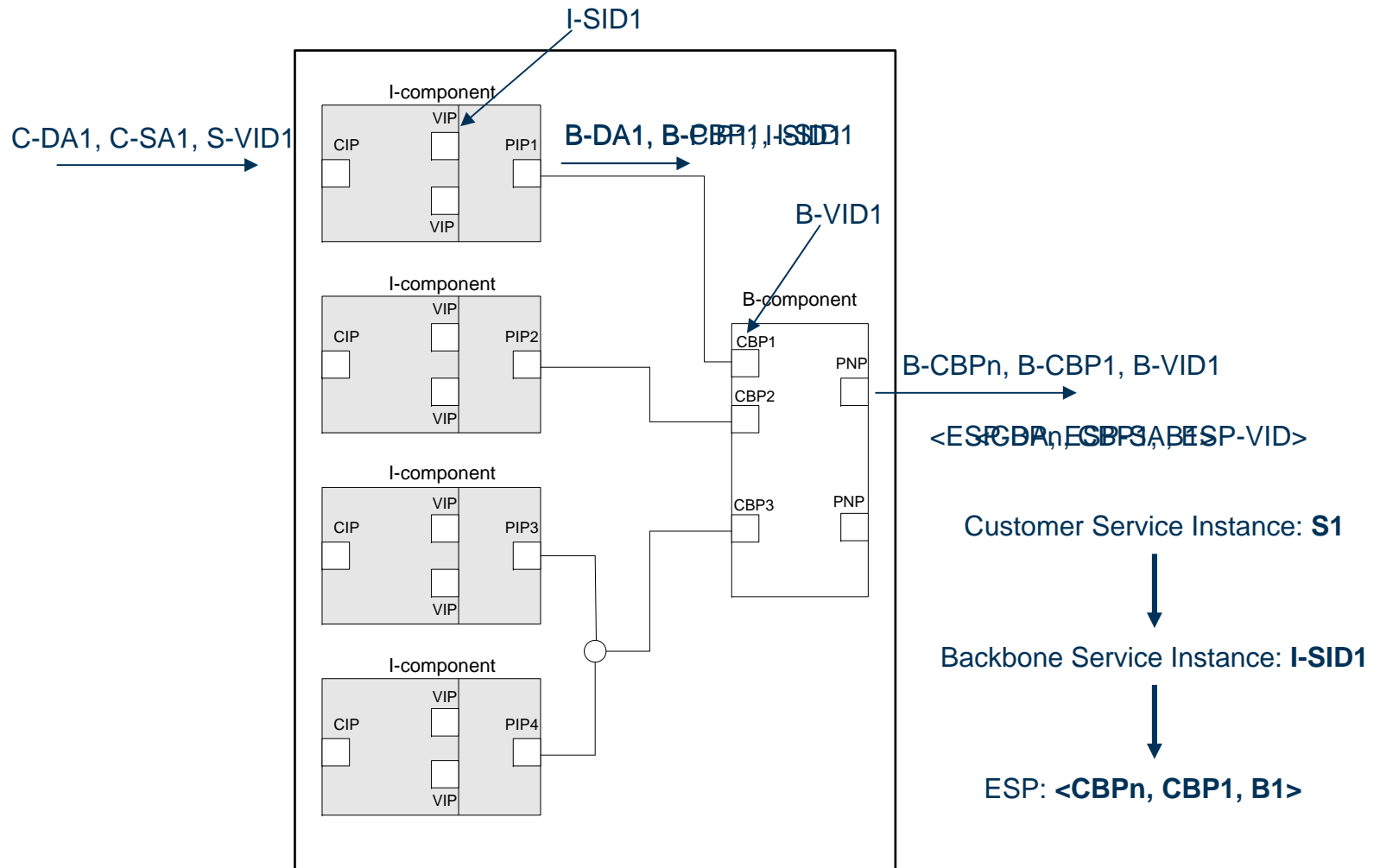
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Ethernet Switched Paths

- 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).
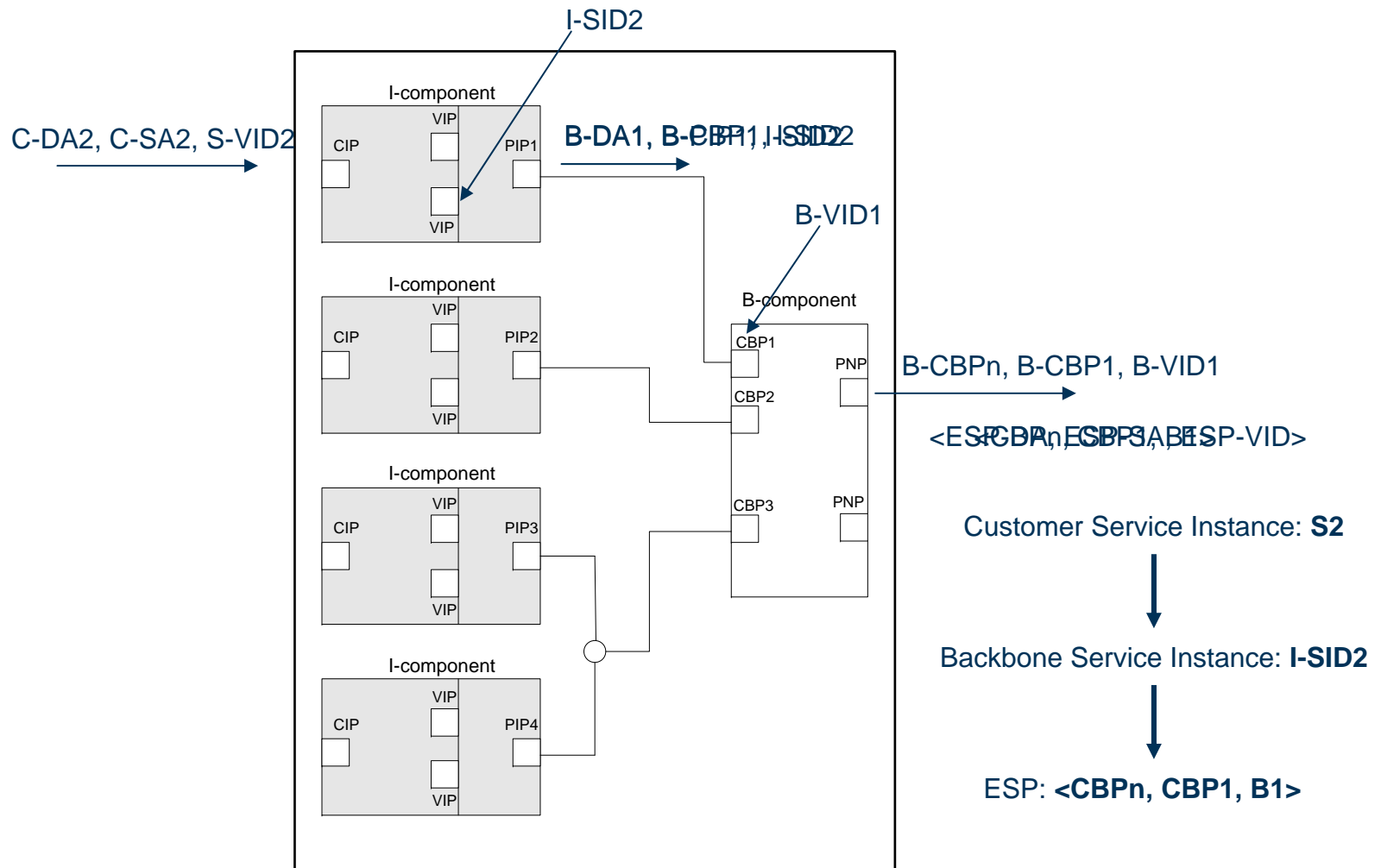
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PBB-TE service definition

- 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}.

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Mapping a customer instance to a PBB-TE service instance

Mapping a customer instance to a PBB-TE service instance

I-SID2

I-component

VIP
CIP
PIP1
VIP

C-DA2, C-SA2, S-VID2

B-DA1, B-CBP1, I-SID2

B-VID1

I-component

VIP
CIP
PIP2
VIP

B-component

CBP1
CBP2
PNP

B-CBPn, B-CBP1, B-VID1

<ESP-DA, ESP-SA, ESP-VID>

I-component

VIP
CIP
PIP3
VIP

CBP3
PNP

Customer Service Instance: **S2**

I-component

VIP
CIP
PIP4
VIP

Backbone Service Instance: **I-SID2**
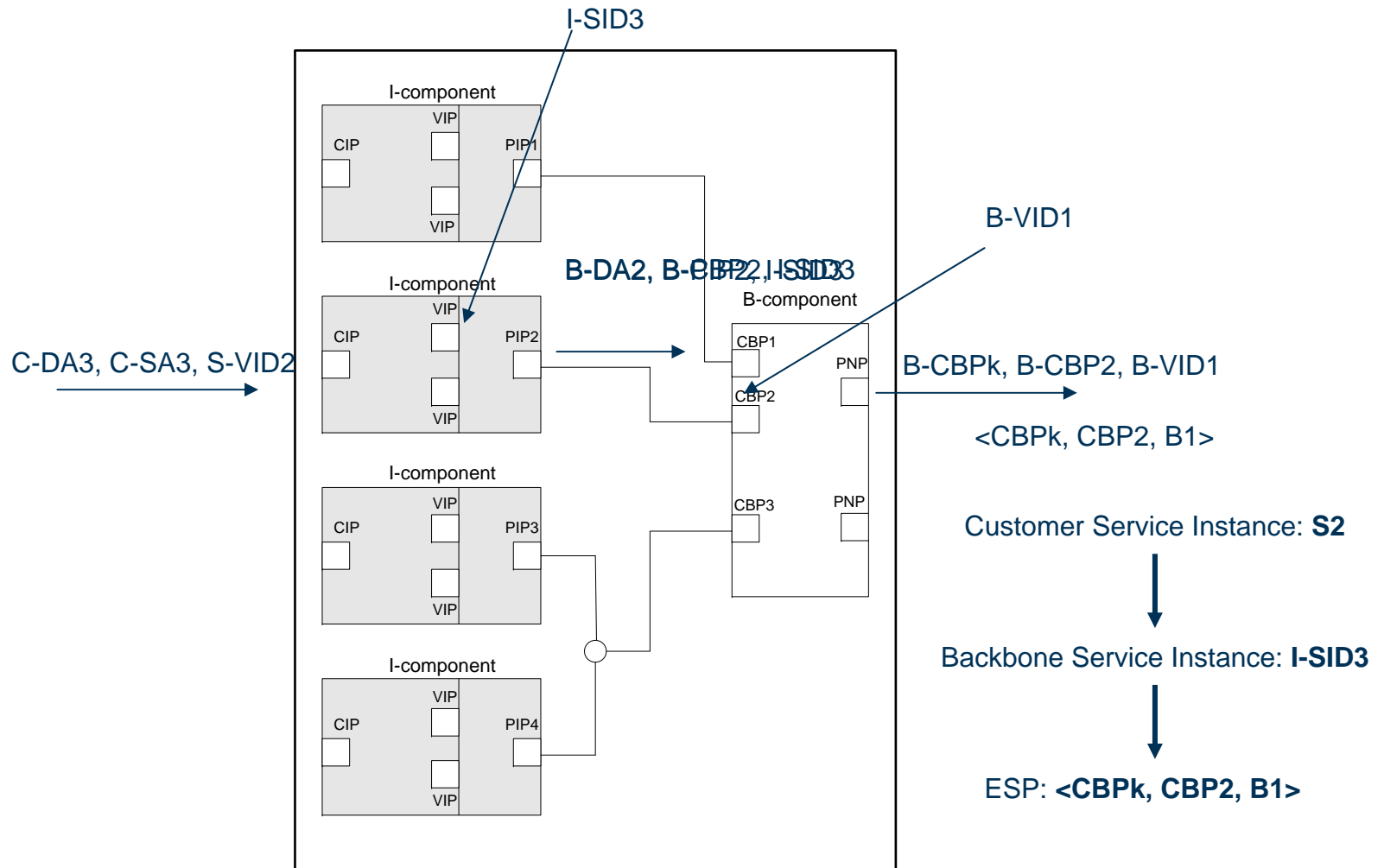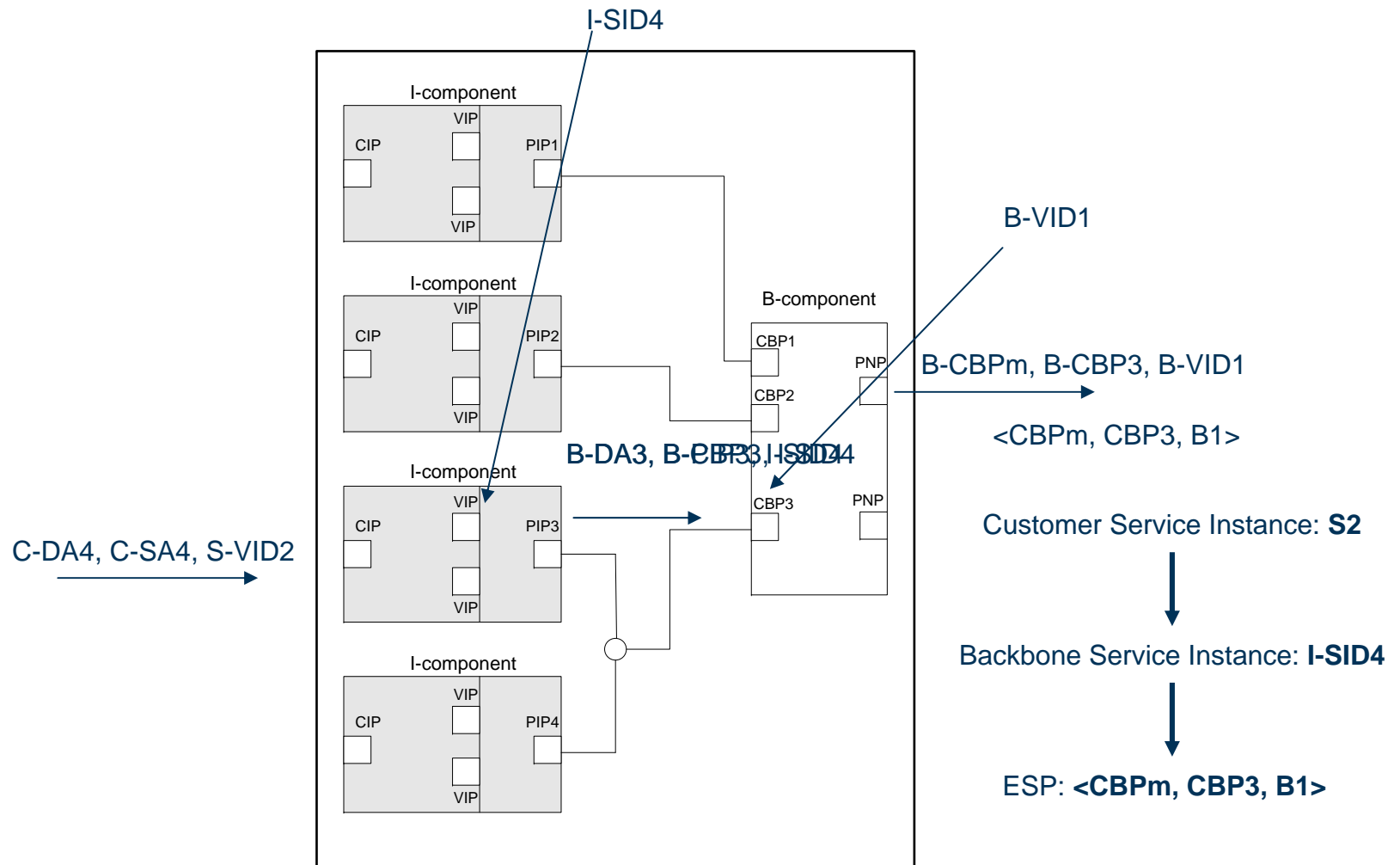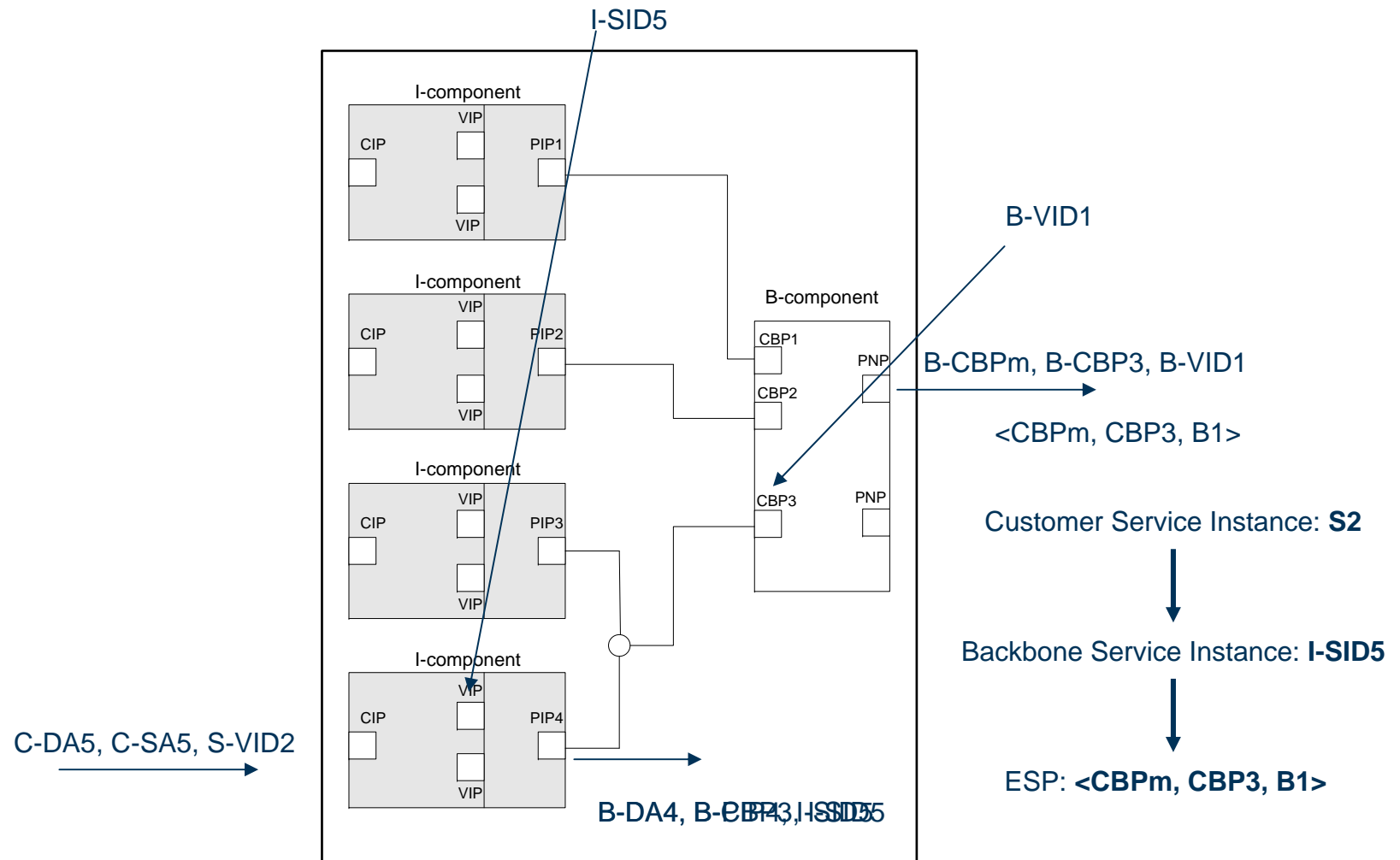
ESP: **<CBPn, CBP1, B1>**

Mapping a customer instance to a PBB-TE service instance

Mapping a customer instance to a PBB-TE service instance

Mapping a customer instance to a PBB-TE service instance

I-SID5

I-component

CIP
VIP
VIP
PIP1

I-component

CIP
VIP
VIP
PIP2

I-component

CIP
VIP
VIP
PIP3

I-component

CIP
VIP
VIP
PIP4

B-VID1

B-component

CBP1
CBP2
PNP
CBP3
PNP

B-CBPm, B-CBP3, B-VID1

<CBPm, CBP3, B1>

Customer Service Instance: **S2**

Backbone Service Instance: **I-SID5**

ESP: **<CBPm, CBP3, B1>**

C-DA5, C-SA5, S-VID2

B-DA4, B-CBP3, I-SID5

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Summarizing examples

- **First two examples**
  - Same customer

  S1 -> I-SID1
  S2 -> I-SID2 → **<CBPn, CBP1, B1>**
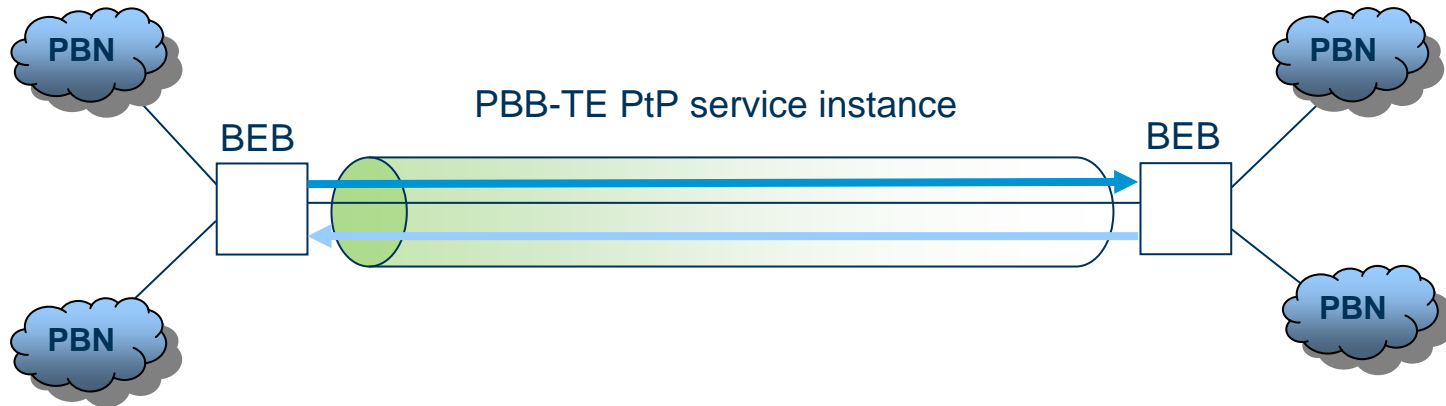
- **Third example**
  - Different customer

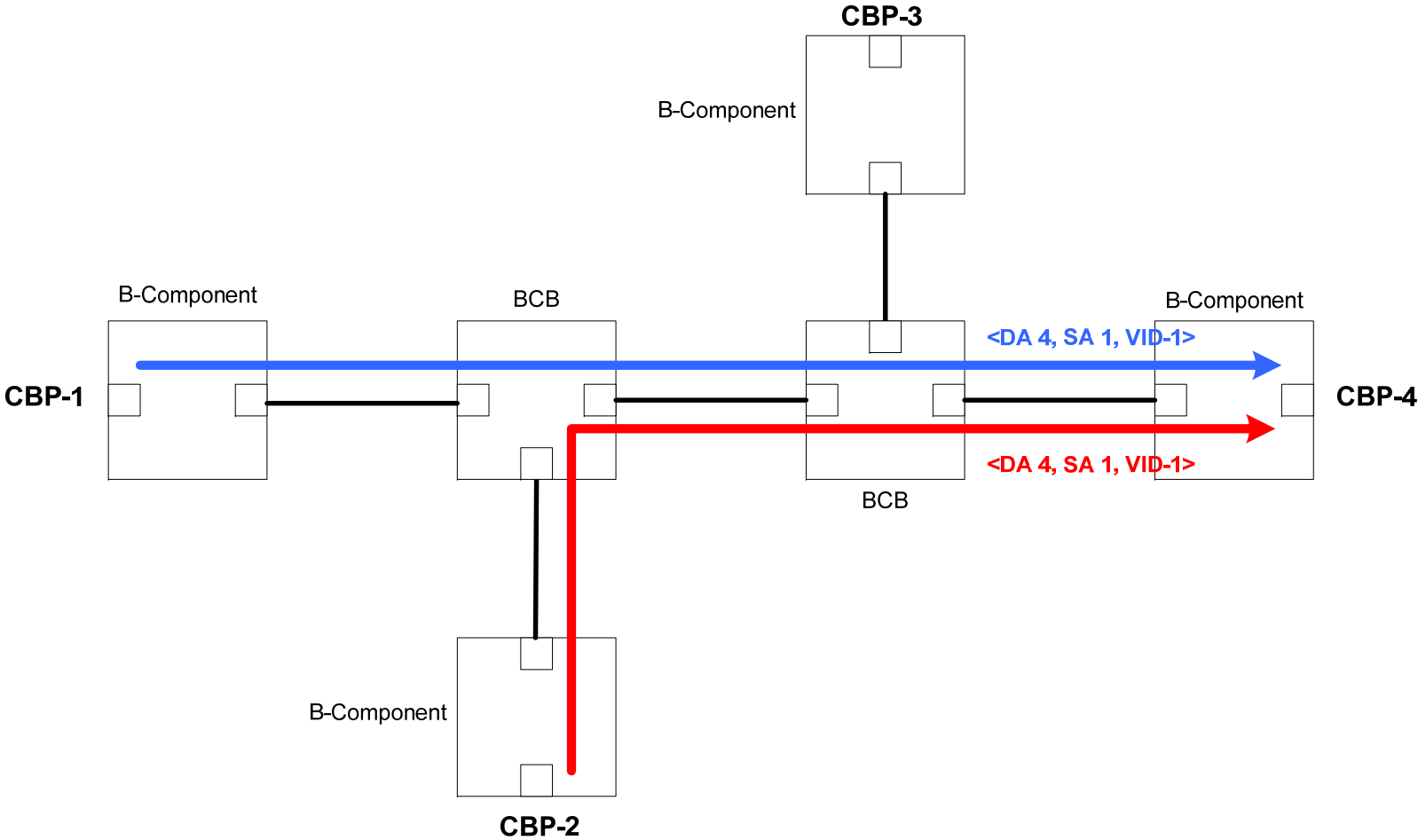 S2 -> I-SID3 → **<CBPk, CBP2, B1>**

- **Forth and fifth examples**
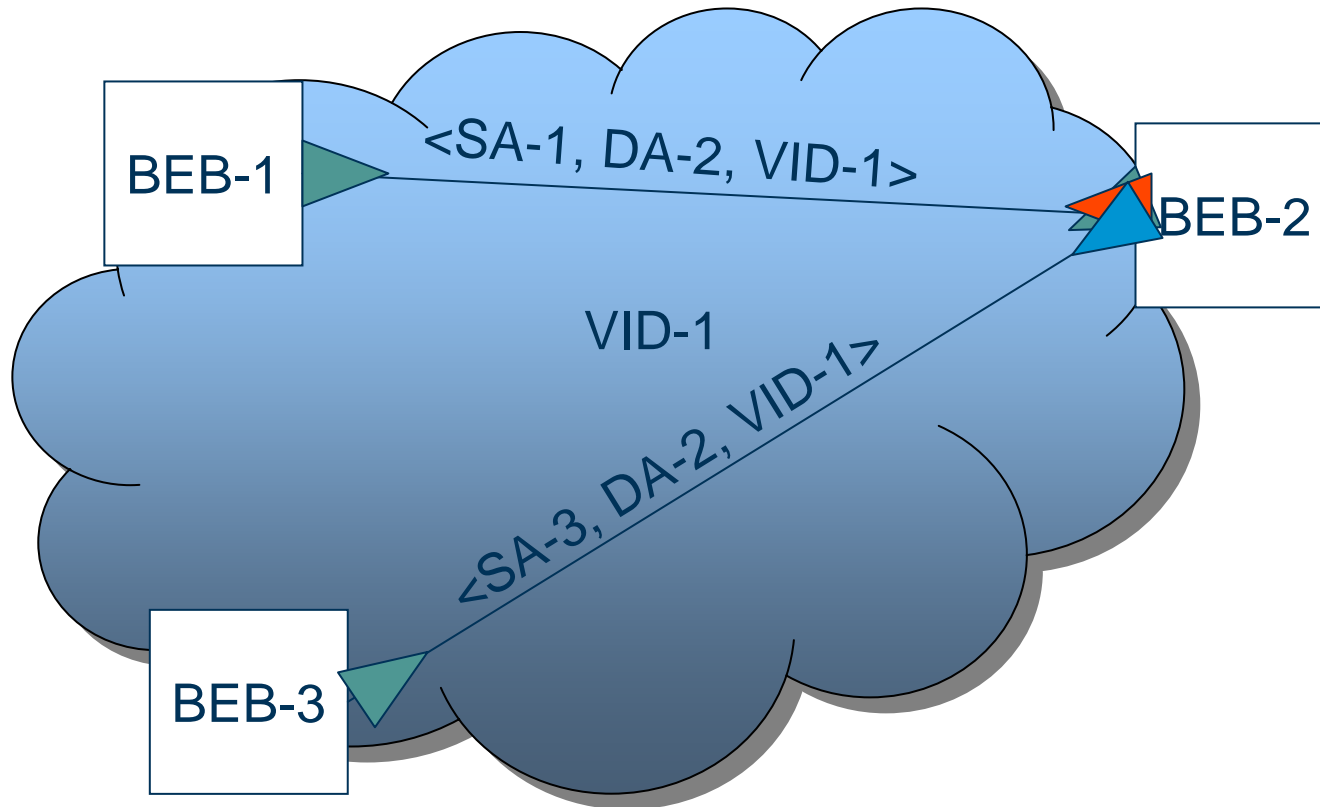 - Different sets of customers

  S2 -> I-SID4
  S2 -> I-SID5 → **<CBPm, CBP3, B1>**

Tunnelling example

PBB-TE PtP service instance

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B-VID re-use

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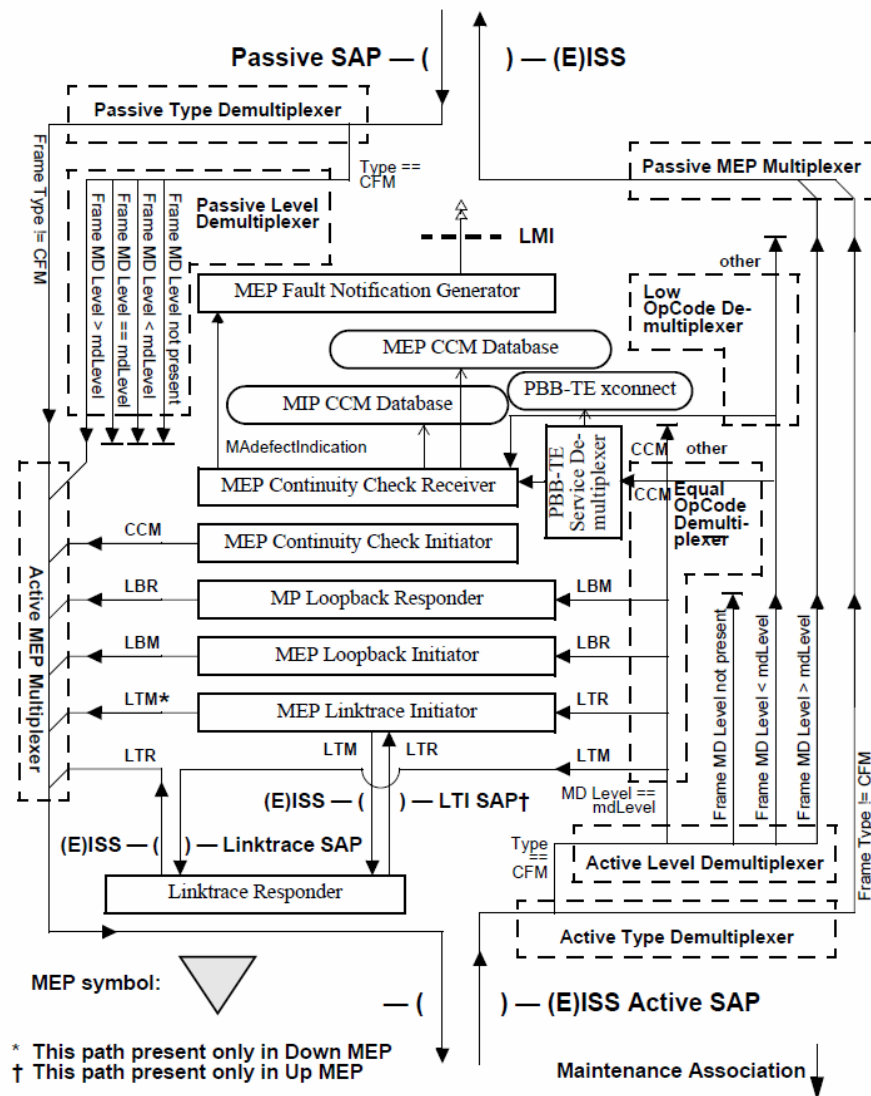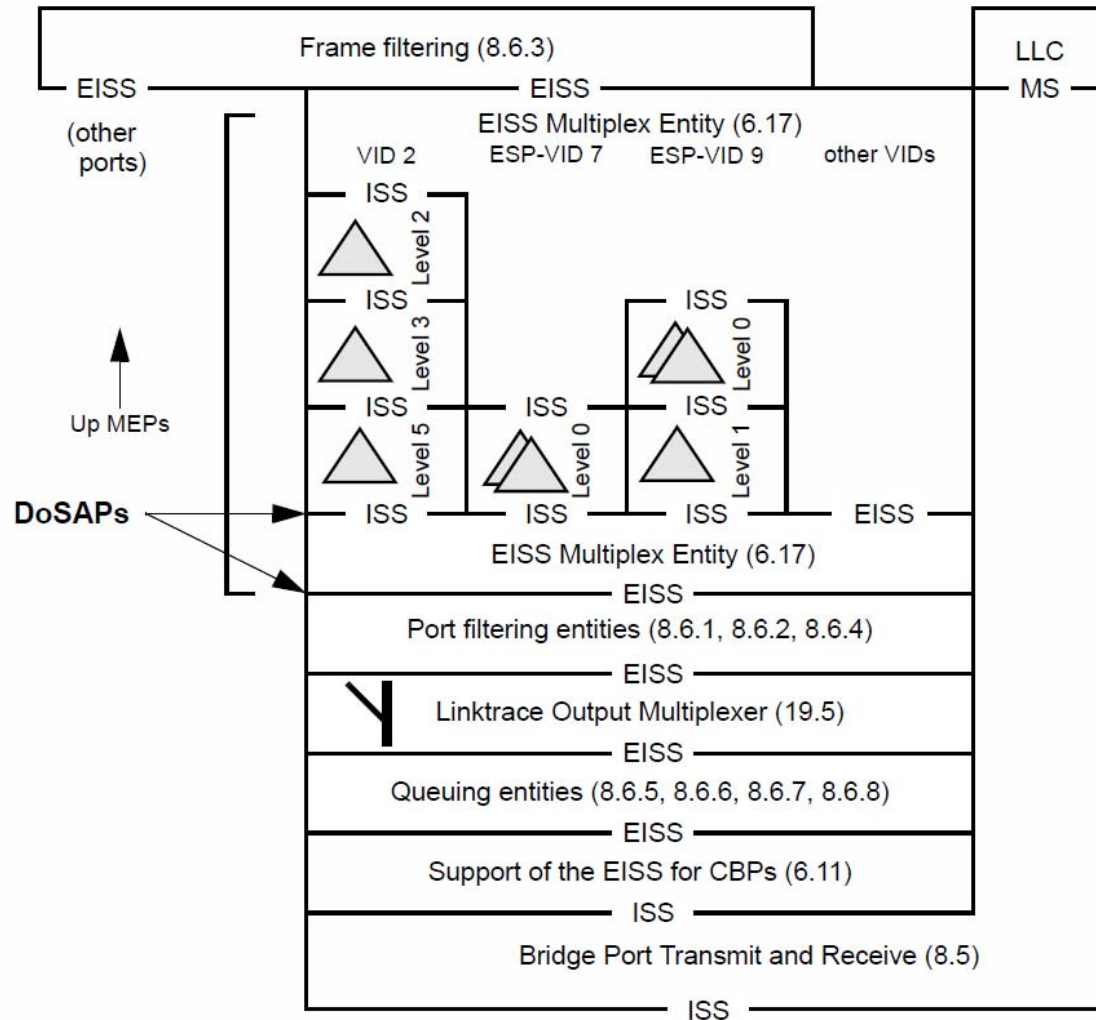# CFM issues in PBB-TE

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PBB-TE MEP

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
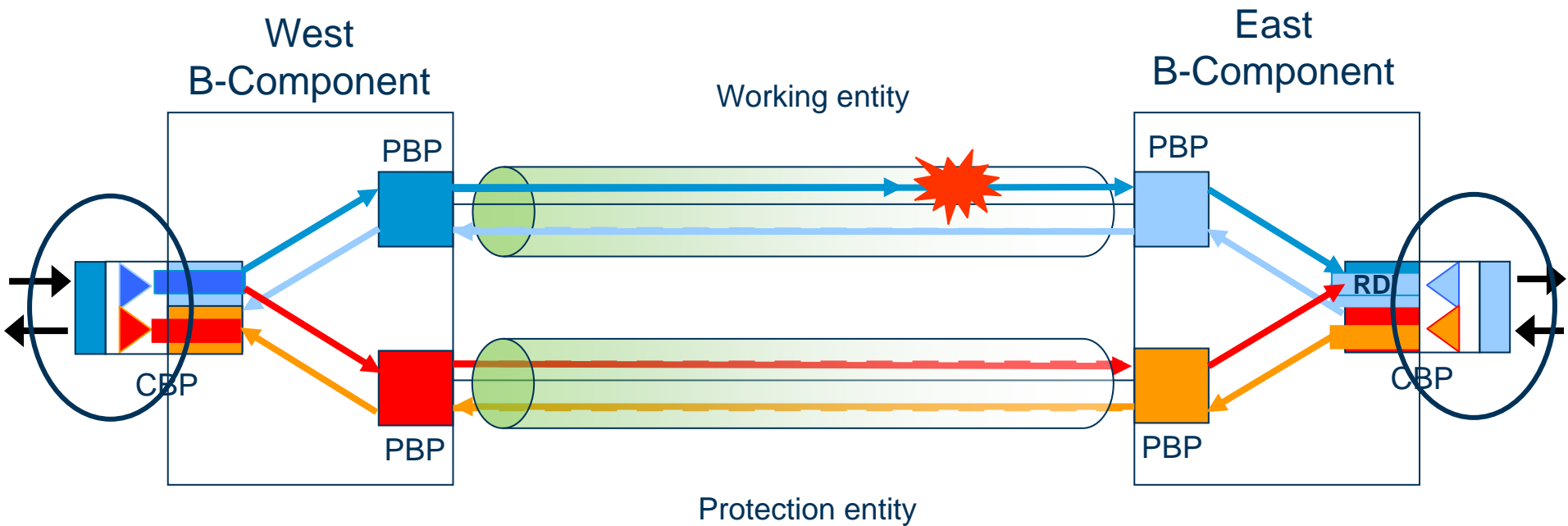
CFM protocol changes

- **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.

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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

West B-Component

East B-Component

PBP

PBP

CBP

RD

CBP

Working entity

Protection entity

PBP

PBP

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APS frame

	1	2	3	4
8 7 6	5 4 3 2 1	8 7 6 5 4 3 2 1	8 7 6 5 4 3 2 1	8 7 6 5 4 3 2 1
MEL	Version (0)	OpCode (APS=39)	Flags (0)	TLV Offset (4)
APS-Specific Information				
END TLV (0)				

	1	2	3	4
8 7 6 5	4 3 2 1	8 7 6 5 4 3 2 1	8 7 6 5 4 3 2 1	8 7 6 5 4 3 2 1
Request/ State	Prot. Type A B D R	Requested Signal	Bridged Signal	Reserved

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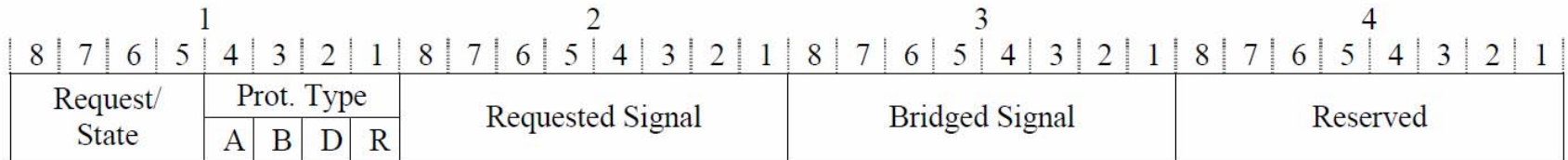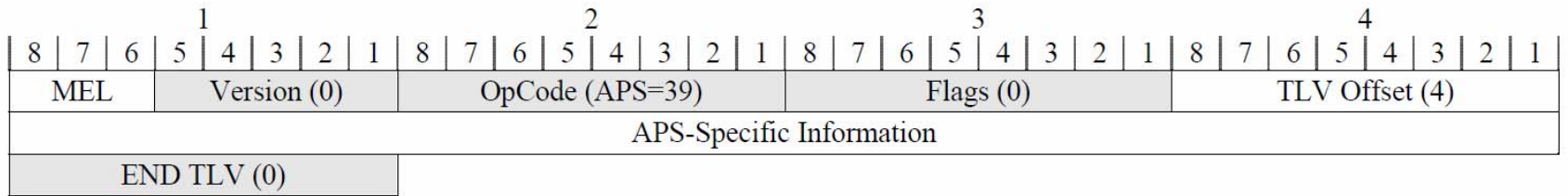
Administrative commands

- **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

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