Support for MAC Translation at PBBN-to-PBBN Border

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802.1ah Definition on MAC Translation

- In Clause 6.9, MAC Address Translation is defined as ..

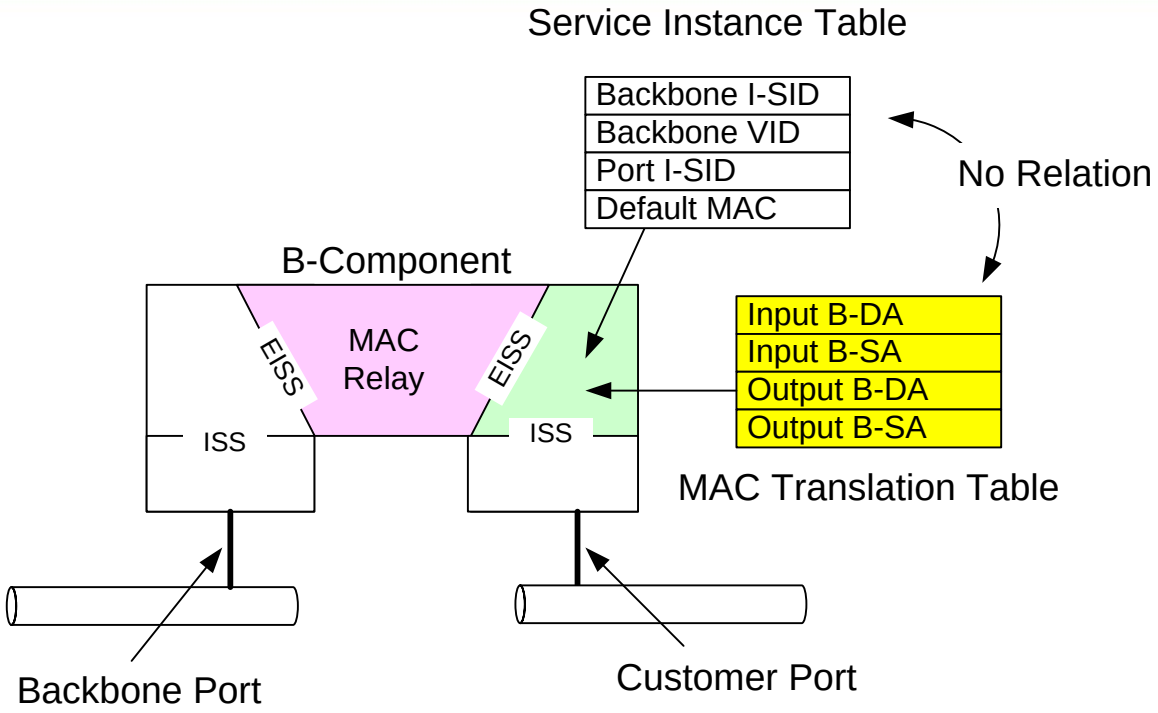
  "The **MAC address translation table** … may be used to perform a translation from the EISS MAC address .. to the ISS MAC address …"

- In Clause 24.6.2, **B-MAC regeneration** is defined as..

  " .. The Ethernet encapsulation is **regenerated** as the frame is moved over the E-NNI and replaced by a new encapsulation…"

- There have been dividing opinions on the MAC translation table in Beijing, and yet no clear specification is given on how to translate / regenerate B-MAC addresses.

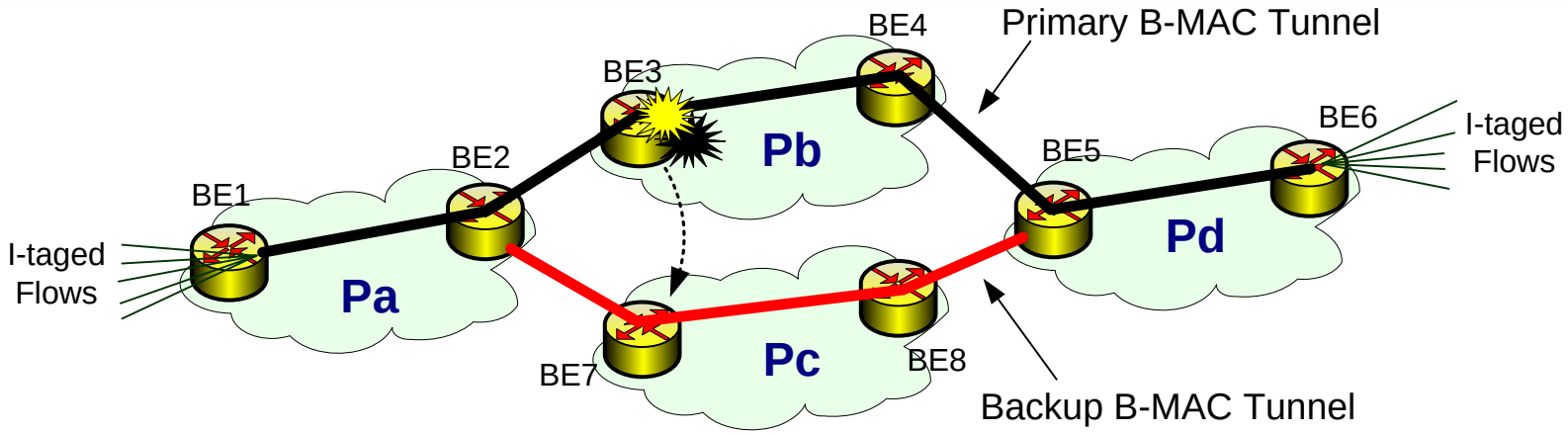
Service Instance Table & MAC Translation Table



- Two types of Tables are defined between EISS-ISS (Clause 6.9)
- SIT can be used for I-tag translation, and MAC Table can be used for address swapping
- **I-tag is not used for B-MAC regeneration**

  → **It is MAC Translation Table that changes B-MAC**

Why MAC Translation? : Fast Rerouting



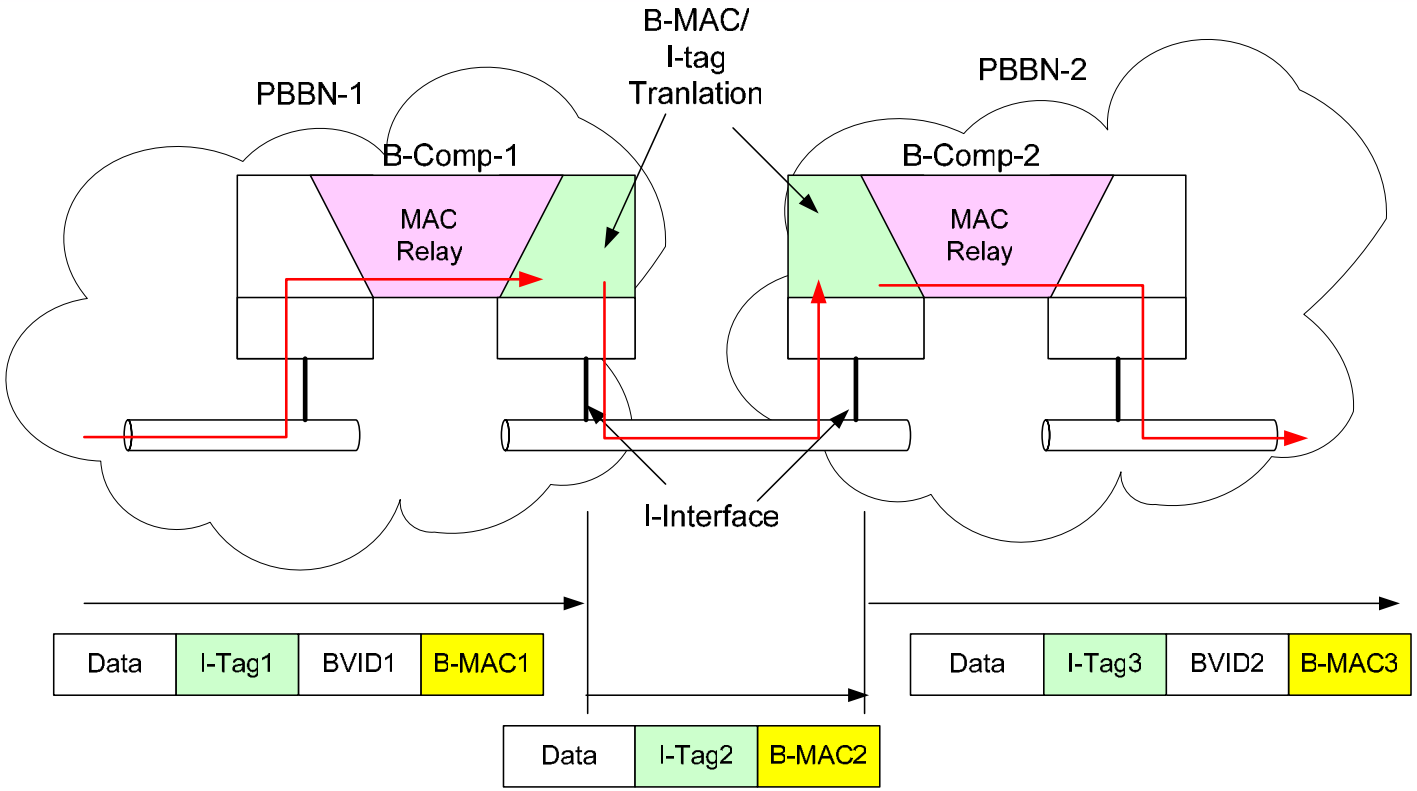
- B-MAC Tunnel is Established between BE1<->BE6
  - Multiple I-tagged flows are multiplexed in the B-MAC tunnel
  - PBBN Pa,Pb,Pc,Pd runs independent spanning trees
  - RSTP doesn't work between PBBNs
- In Case of Failure, Group of I-tagged Flows has to be Rerouted to Backup Tunnel
- **The Backup Path Need to be a Different B-MAC**

  → MAC Translation is necessary at BE2 and BE5

Other Reasons: If B-MAC is NOT Changed

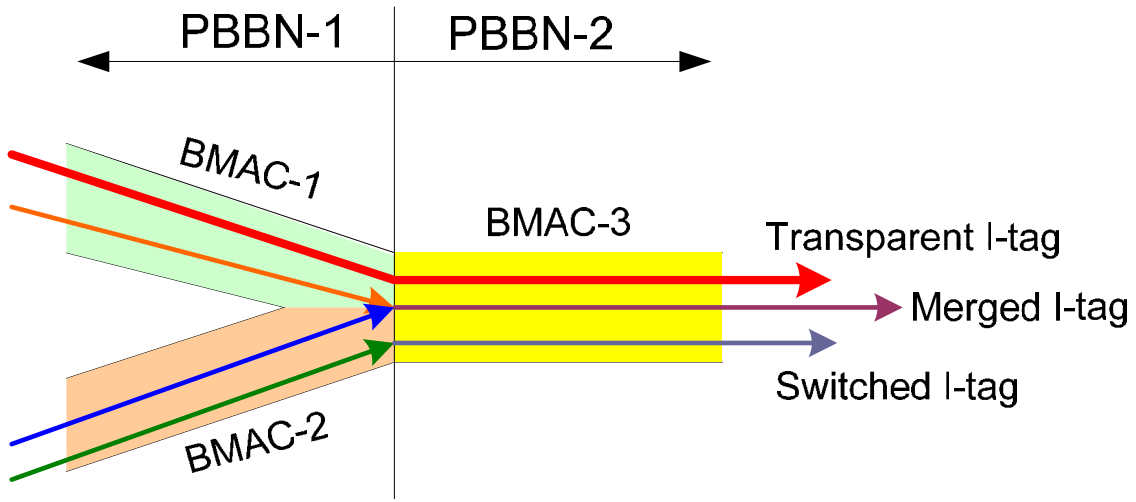
1. PBBN operators need to buy their own OUI number for service
   - → not only cost burden but it may result in **possible depletion of OUI space**
2. Single change of B-MAC of a PBBN node will propagate to all other PBBNs
   - →May increase instability of global network
3. No aggregation of B-MACs
   - → (n x n) p2p B-MAC tunnels are necessary
   - → Potential B-MAC explosion at border
4. No MAC information hiding
   - → Easy to detect which B-MAC of whose network carries which customer frames
   - → Potential security threat

PBBN Peering and B-MAC Translation



- I-tag may/may not be changed at border
- B-VID should be removed at border
  → because PBBN runs spanning tree independently
- B-MAC should be regenerated at either side or both side of peer interfaces

Type of B-MAC / I-tag Translation



- I-tag can be Untouched, Changed or Merged
  - I-tag can be transparently delivered between service edge to edge
- B-MAC can be Changed, Merged, but not Split
  - Unicast B-MACs can be 1:1 or m:1 mapped, but not 1:m mapped
  - Only multicast B-MAC can be swapped or split to multiple paths
  - When B-MACs are merged, scalability is improved

Conclusion & Request

- MAC Translation is useful and should be defined in 802.1ah in detail

- Detail of MAC translation operation need to be specified
  - What happen if Default MAC in SIT and B-DA in MAC translation table conflict ?
  - Why B-DA and B-SA changed separately in clause 6.9 ? Why not change them together ?
  - Specify the standard procedure for B-MAC tunnel switching in case of failure.
  - Define E-NNI interface in detail, such as whether B-VID information should be delivered.