CBP Address Translation Revisited
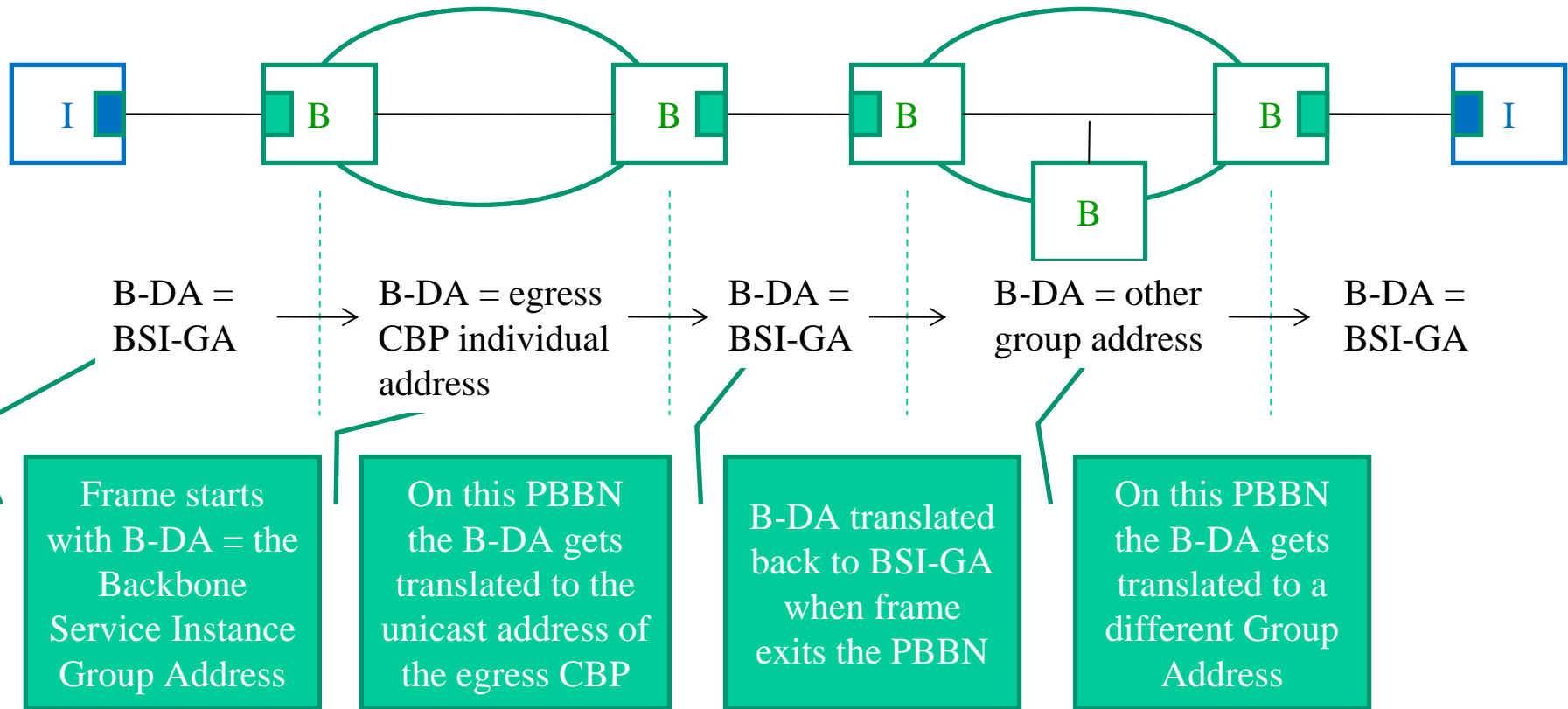## Version 1

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802.1 Interim, Los Gatos

CBP B-DA Translation Objectives

- Optionally optimize delivery of frames with the Backbone Service Instance Group Address (BSI-GA) within a PBBN:
  - Translate the BSI-GA to the individual address of the egress CBP if the backbone service instance is point-to-point within this PBBN.
    - This does not necessarily mean the entire backbone service instance is point-to-point (see example next slide).
  - Translate the BSI-GA to a different group address to allow multiple backbone service instances to use the same group address
    - Reduces processing and state information required to prune multicast trees in the PBBN.

B-DA Translation at CBP

B-DA = BSI-GA → B-DA = egress CBP individual address → B-DA = BSI-GA → B-DA = other group address → B-DA = BSI-GA

Frame starts with B-DA = the Backbone Service Instance Group Address

On this PBBN the B-DA gets translated to the unicast address of the egress CBP

B-DA translated back to BSI-GA when frame exits the PBBN

On this PBBN the B-DA gets translated to a different Group Address

Problem with CFM frames

- Backbone service instance level CFM frames (or any frames generated by a protocol entity positioned between back-to-back BSI multiplex entities) with a group B-DA cause problems:

  1. If don't translate the B-DA, the forwarding tree within PBBN will not be limited to the scope of the BSI.
     - CFM frames have the particular problem that they will not take the same forwarding tree as data frames, which violates a fundamental requirement of CFM.

  2. If do translate the B-DA, the original address is lost (the reverse translation at the egress CBP will use the BSI-GA for the B-DA).

  3. If translate group B-DA to the egress CBP individual address, then frames originally addressed to the egress CBP are indistinguishable from frames that had their original address translated, and will erroneously have their B-DA translated to the BSI-GA at the egress CBP.

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Current Resolution to these problems

1. The BSI Multiplexing Entity replaces the B-DA of any frame using any of the CCM or LTM group addresses with BSI-GA. The CBP may translate this address just as it would translate the BSI-GA on any other frame.

   - Assures CFM frames take the same path as data frames.

2. The CFM protocols were modified to accept received frames with any group address.

   - Eliminates problem with not translating the address back to the original CCM or LTM group address.

3. The CBP has two individual addresses with the restriction that the address used for B-DA translation is different than the address used for BSI level CFM.

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Remaining Issue

- In the two address solution to problem 3, the address used for B-DA translation never appears as the SA in any frame. Therefore bridges in the PBBN do not learn this address, and any frames that have their B-DA translated to this address will be flooded to the entire B-VLAN.

Paul's Proposal (d4.0 comment 27)

- The root problem is that translating the B-DA of any frames generated between back-to-back BSI Multiplex Entities (frames with NCA bit set, e.g. CFM) causes a loss of information – specifically the original DA is lost.

- Paul's proposal is to copy the original address to the C-DA field of the I-tag, which is not otherwise used when the NCA bit is set, where it can be retrieved after the B-DA address translation has been done.

Changes to 6.18.2 Multiplexing

1. Changes to the creation of the mac_service_data_unit:

   d) If the initial two octets of the mac_service_data_unit do not match the encapsulated Addresses type value, then a complete I-TAG is prepended to the mac_service_data_unit. The NCA field contains a value of one. The ~~Res1, Res2, C-DA and C-SA fields all~~ Res1 and Res2 fields contain a value of zero. The C-DA and C-SA fields contain the **destination_address** and **source_address** from the received primitive respectively. The I-SID field contains the value of the Backbone Service Instance Identifier corresponding to the multiplexed ISS SAP at which the primitive was received. The values of the I-PCP and I-DEI fields are encoded from the **drop_eligible** and **priority** parameters as specified in 6.18.3.

2. Changes to the creation of the B-DA and B-SA:

   a) If the destination_address in the received primitive is ~~one of the CFM Continuity Check Message Group Addresses in Table 8-9 or one of the CFM Link Trace Message Group Addresses in Table 8-10,~~ a group address and the NCA bit is set, then the destination_address parameter contains the Backbone Service Instance Group Address constructed from the Backbone Service Instance Identifier corresponding the the multiplexed ISS SAP at which the primitive was received;

Changes to 6.18.1 Demultiplexing

1. Changes to the creation of the mac_service_data_unit:

   The ~~destination_address, source_address~~ and **connection_identifier**
   parameter~~s~~ contain<u>s</u> the same value as in the received primitive.

   <u>The **destination_address** and **source_address** parameters are determined as
   follows:</u>

   <u>a) if the NCA bit is zero, the destination_address and source_address parameters
   contain the respective values in the received primitive;</u>
   <u>b) otherwise the destination_address and source_address parameters contain the
   respective values in the C-DA and C-SA fields of the I-TAG;</u>

Other changes:

1. It is no longer necessary for 802.1ah to make any changes to 802.1ag. Therefore delete clauses 19 and 20 from the 802.1ah document. Also delete the last paragraph of 26.4.3.

2. It is no longer necessary for the CBP to have two addresses. Delete the last two sentences of the third paragraph of 26.4.3.

3. The definition of the NCA bit is now slightly misleading. Recommend changing in 9.8:

   c) ~~No~~ *Use* Customer Addresses (~~NCA~~*UCA*) - ~~This 1 bit field indicates whether the C-DA and C-SA fields of the tag contain valid addresses. A value of zero indicates the C-DA and C-SA fields contain valid addresses. A value of one indicates the C-DA and C-SA fields do not contain valid addresses.~~ *A single bit flag that, when containing a value of one, signals a Backbone Service Instance Multiplex Entity (6.18) to use the addresses contained in the C-DA and C-SA fields.*

Advantages of this solution

1. No lost information (original DA is maintained and presented to peer entities).

2. General solution for NCA frames

    - no specific decodes based on CFM addresses, ethertypes, or opcodes
    - future-proof for any new protocol entity located at same position in the interface stack

3. B-DA of CFM frames scoped to the BSI (just like B-DA of service frames)

4. CBP address translation the same for all frames (including CFM)

5. Eliminates need for two addresses at the CBP

6. Eliminates need for any changes to CFM