

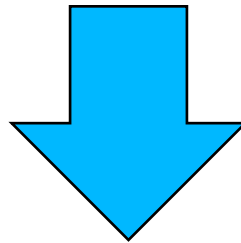
Bridge Model for ECMP Operation

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December 9, 2010
IEEE 802.1 Weekly Call on ECMP



Frame Format

PBB I-tag Format



ECMP Tag Format



Service-ID/Flow-ID

- In order to avoid deep packet inspection in the core bridges, the concept of flow ID is introduced:
 - The ingress BEB derives a 20-bit hash index from the five tuple representing a flow (C-MAC SA/DA, IP SA/DA, UDP port, etc.)
 - The ingress BEB derives a flow ID by modulating this hash index on top of the E-SID (e.g., by simply XORing E-SID with hash index)
 - The flow ID is used by all the BCBs for ECMP selection
 - On the egress PE, demodulation is performed by XORing hash index once again with the flow-ID thus retrieving E-SID
- **NOTE: The use of homogenous ECMP algorithm (per B-VID) enables the egress PE of demodulating flow-ID and retrieving E-SID (another advantage of having homogenous ECMP)**

ECMP Operation w/ only E-tag - Optional

Pros/Cons

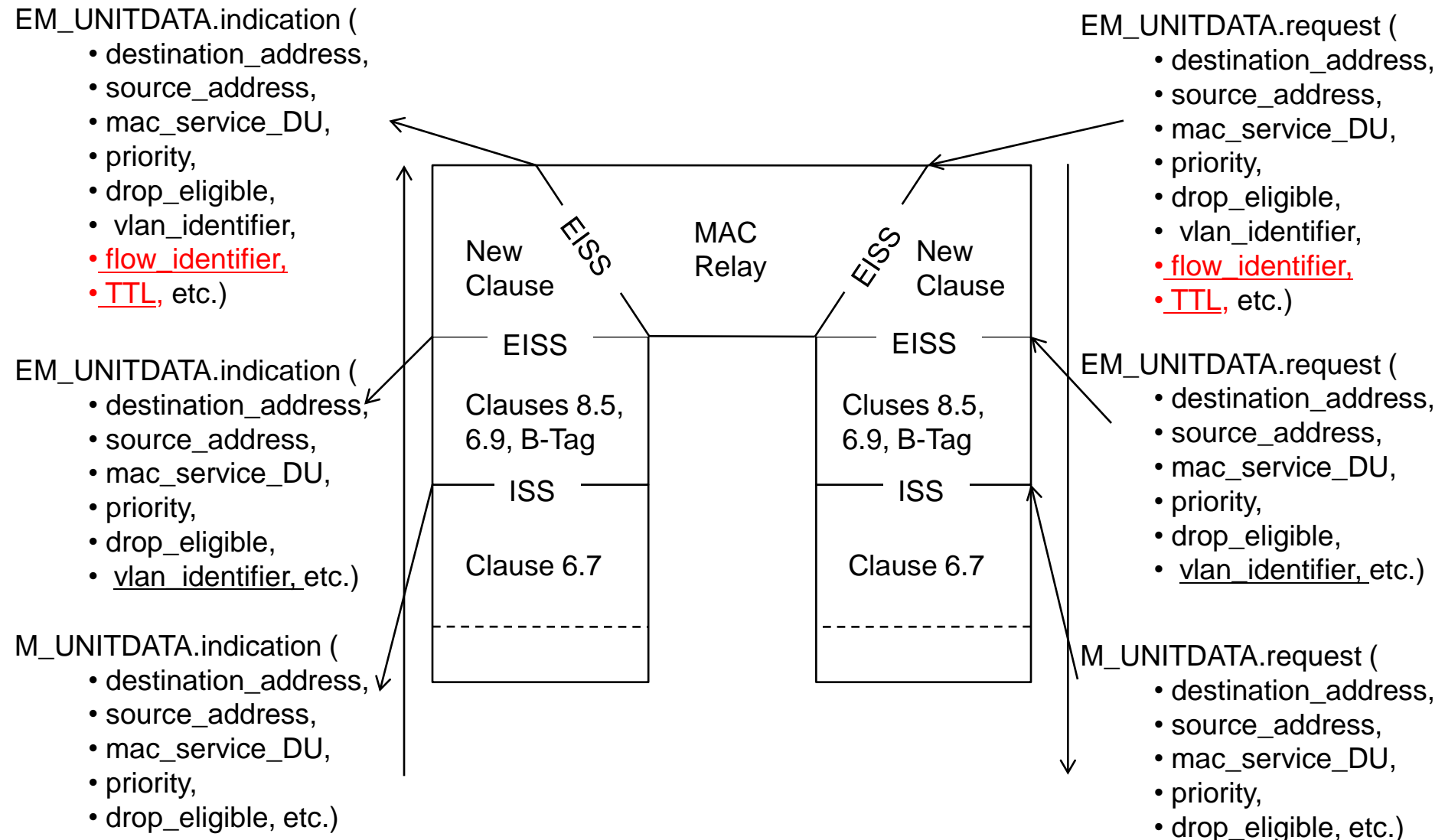
■ Pros

- Most efficient and compact encapsulation
- 6-bit TTL accommodates both SP and DC applications
- It is based on 802.1ah frame format that many vendors and providers are familiar with
- Use of flow ID avoids any deep packet inspection in the BCBs
- ECMP frames can optionally be sent w/o B-tag resulting in the most efficient encapsulation

■ Cons

- Reduces the Service ID field to 20 bits (but this doesn't create any inter-op issue as we will see)

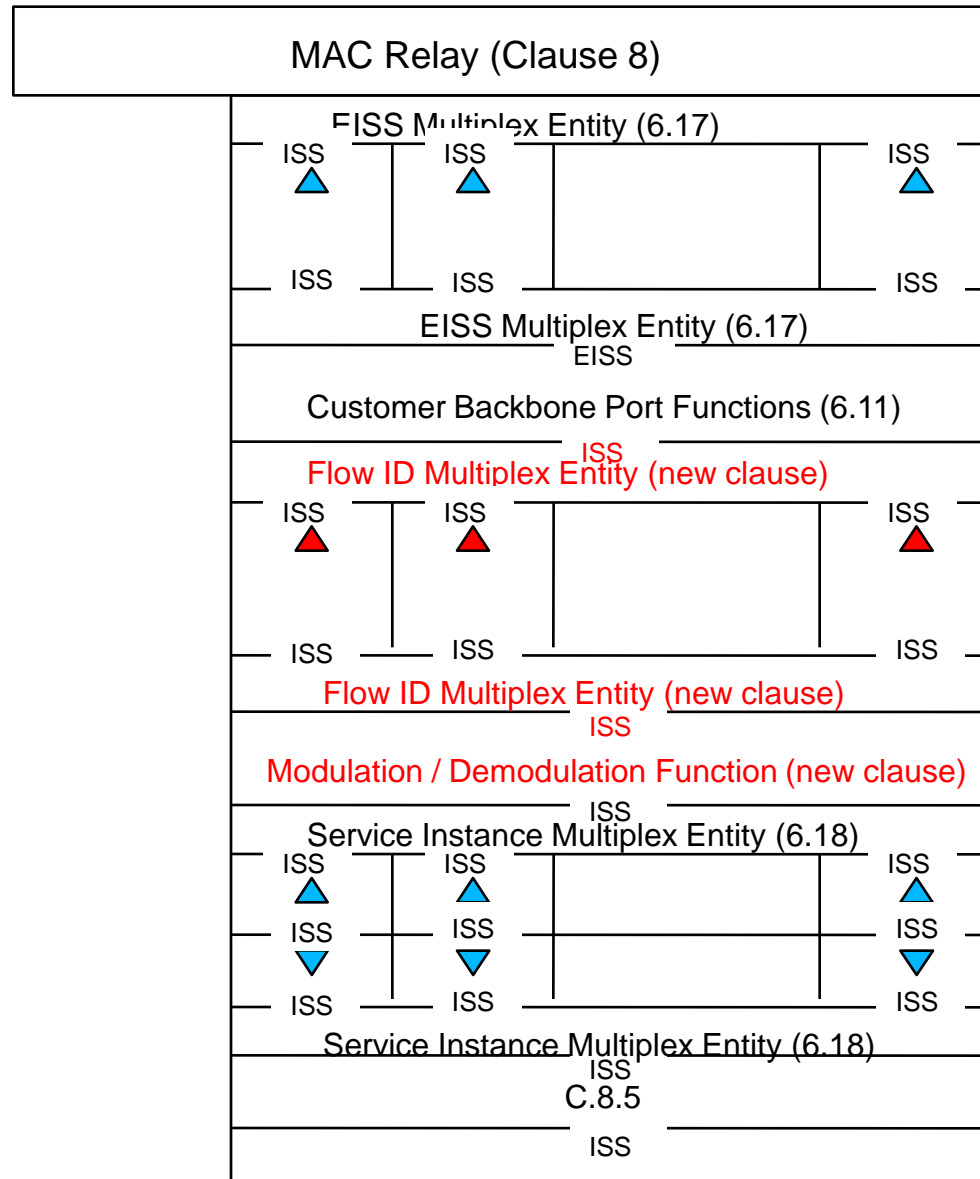
Modified Baggy Pants Diagram for only TTL processing at BCB



New Clause

- If next tag (after B-tag/S-tag) is E-tag, then extract TTL and flow_identifier and perform the following functions
- Use the flow_identifier in the MAC relay to select among ECMPs
- Use TTL to perform loop mitigation as follow:
 - Upon receiving TTL, if zero then discard the frame; otherwise, decrement TTL and process the frame
 - After decrementing TTL, if $TTL == 0$ and $UCA == 0$, then perform OAM processing
 - When setting TTL for unicast frames, it should be set to more than the min. required to accommodate re-forwarding during failure scenarios
 - When setting TTL for multicast frames, it should be set to the longest branch in the multicast tree plus a delta

Baggy Pants Diagram for OAM operation at BEB



Baggy Pants Diagram for OAM operation at BCB

