PBB-TE Segment Protection Requirements:

Focus on the Distinction between *Infrastructure* Segment Protection and *Data Path* Segment Protection

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Purpose of this Presentation

• Two distinct protection types have been introduced under the heading of Segment Protection;
• These are *Infrastructure* Segment Protection (ISP) and *Data Path* Segment Protection (DPSP);
• At the last meeting, it was suggested that the two types (and associated solutions) could be evaluated in separate charts;
• This would allow work on the two types to proceed without confusion;
Purpose of this Presentation (continued)

• This will also simplify each chart by reducing the number of columns needed to compare solutions;
• For each of the two types, an independent evaluation can be made as to the requirements and solutions;
• If both types are to be addressed, they are sufficiently similar to be grouped in the same PAR and described in a single amendment;
• This presentation is intended to verify that people have a common understanding of the two types of segment protection.
Infrastructure Segment Protection
(1 hop example)

- Provision segment of network to be protected;
- Provision backup segment providing protection;
- Detect failure on protected segment;
- TESIs carried on backup segment.
- Protect specific link prone to failure due to flood, earthquake, vandalism, etc.
Infrastructure Segment Protection
(2 hop example)

- Protects against failure of a specific segment of the network, including failure of a bridge;
- Protects set of TESIs crossing the segment;

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Independent Segment Protection Domains

- Provision *independent* protection domains
- TESIs survive failure in *each* domain
Adjacent Segment Protection Domains

- Provision *adjacent* protection domains
- TESIs survive failure in one domain
- TESIs survive failure in both domains
- NOTE: The figure shows ‘no backtracking’ when both segments fail. While this improves performance and may be necessary with some solutions, this is not a requirement.
Provision segment protection domain
Fault in FDB or other provisioning fault affecting an individual TESI
*Only failed TESI* shifted to backup segment
Requires monitoring *each individual* TESI at segment endpoints
Two Distinct Segment Protection Functions

1. **Infrastructure:** Protect *all* traffic (TESIs) associated with a protected segment from a failure of that segment. After failure, traffic is carried on the backup segment (requires monitoring *per segment*).

2. **Data Path:** Protect *each* TESI associated with a segment from a failure of *that* TESI within the segment. After failure, traffic associated with the failed TESI(s) is carried on the backup segment (requires monitoring *per TESI* associated with the segment).

• We do *not* currently see a strong requirement for Data Path Segment Protection but we certainly invite more data on this.
And now….

• Does anyone have questions about the difference between *Infrastructure Segment Protection* and *Data Path Segment Protection* as described?
Infrastructure Segment Protection Solutions

- **Redirection**: change FDB outbound port value; one advantage is that frame is not modified;
- **Triple MAC** (client/server): segment endpoints deploy BEB function; segments appear as TESIs; 1:1 TESI protection is deployed; this probably requires little or no new standards content; cost of two MAC encapsulations;
- **Triple Q**: stack additional VLAN tag; requires frame modification; reduces number FDB entries required as forwarding is determined by VID; requires additional tag.
Infrastructure Segment Protection Benefits

• Address the relatively high failure rate of particular links or bridges within a network.
• Address the likelihood of concurrent failures occurring in different segments of a network.
• Allow maintenance activities to be performed independently in different segments of the network.
• Allow maintenance activities to be performed in one segment of a network without disabling protection in another segment.
• Localize changes in traffic distribution due to failure or maintenance actions.
• Provide an efficient means of protecting portions of a PtMP TESI.
Requirements Still In Discussion

• Degree of end-to-end integrity required
• M:1 segment protection
• Data Path Segment Protection
Going Forward

- We think we can iron-out these issues by May meeting.

- We have clearly described a number of solutions; may be able to agree on one as a direction by May.

- Consider motion to authorize pre-circulation of Segment Protection Draft PAR in case we resolve issues by May meeting.