Discussion of Questions related to the proposed P802.1Qcb PAR:
”Short Introduction to Frame Replication and Elimination for Reliability”

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Representatives of Industrial Control and Automotive have shown significant interest in an IEEE standardized solution for Seamless Redundancy by:

- Repeatedly presenting use cases and market potential
- Preparing technical proposals for the integration of Seamless Redundancy techniques into IEEE 802.1
- Carefully addressing concerns related to the feasibility of the proposed solution.
- Intensively discussing these topics multiple times within the 802.1 TSN task group in the course of the last 2 years.

The purpose of this presentation to refresh the memory of all participants on the general concepts by giving a birds eye view of the proposal.
Objectives

The basic use cases are characterized by the following three requirements:

- Enable fault tolerance in applications with very tight latency constraints.
- Enable mission critical applications.
- Enable fail operational behavior:
  In case of a failure of e.g. a link or a bridge, the communication is maintained without interruption. Current mechanisms like RSTP require a certain reconfiguration time before communication is re-enabled.
Core Characteristics of the Proposal

- The proposal relies on the following core characteristics / mechanisms:
  - Sending redundant copies of messages in parallel over two paths.
  - This requires two operations:
    - Replication of messages (to “generate” redundant copies) where the two paths fork
    - Elimination of duplicates where the two paths merge.

- Path Discovery and configuration are not part of the proposal
  - This is in the scope of P802.1Qca.
Multiple industrial and automotive use cases have been shown in previous presentations.
Which applications / traffic classes require Seamless Redundancy:

- We do not require Seamless Redundancy support for:
  - Best Effort Traffic (Strict Priority Scheduling)

- We propose to provide Seamless Redundancy support for the following traffic classes:
  - Reserved Traffic (Credit based Shaper)
  - Scheduled Traffic

- Of course it is **NOT REQUIRED** to send all reserved traffic or all scheduled traffic redundantly, but it is **POSSIBLE**.

- Seamless redundancy can be used for streams that we classify to be mission critical!