P802.1CBec

FRER Improvements
Elimination of Contradicting Design Requirements

IEEE 802.1 TSN TG
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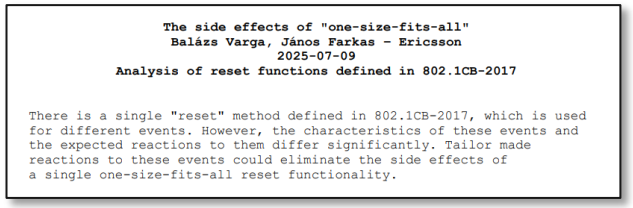
Recap

Reset functionality in current 802.1CB

- IEEE Std 802.1CB-2017 defines a single "reset" method, which is used for different events:
  1. BEGIN event related reset
  2. Management driven reset (frerSeqRcvyReset=True)
  3. RECOVERY_TIMEOUT related reset
- However, the characteristics of these events and the expected reactions to them differ significantly.
- Tailor-made handling of these events could eliminate the side effects of a single one-size-fits-all reset functionality.
- **Summary**:
  - The current single reset function is under-specified and sub-optimal
  - Tailor-made reset functions are needed for proper handling of the different events
  - Exclude the reaction to out-of-step situation from reset, and make it as an integral part of SeqRcvy

- Contribution link: [The side effects of "one-size-fits-all"]

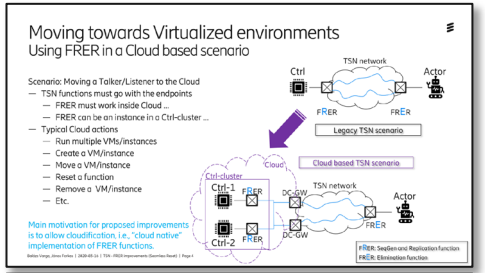

The side effects of "one-size-fits-all"
Balázs Varga, János Farkas – Ericsson
2025-07-09
Analysis of reset functions defined in 802.1CB-2017

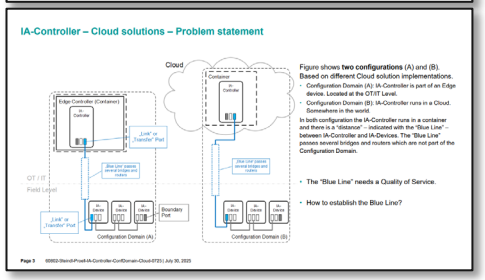
There is a single "reset" method defined in 802.1CB-2017, which is used for different events. However, the characteristics of these events and the expected reactions to them differ significantly. Tailor made reactions to these events could eliminate the side effects of a single one-size-fits-all reset functionality.

What could be solved?

Fixes

- Make the handling of current “reset situations” more tailor-made
  - Fix the reaction to “SeqNum out-of-step” situations
- Simplify the design of FRER parameters related to reset
  - Eliminate contradicting requirements (e.g., value gets small vs. gets large)
- Fix some error specific counters
  - Get rid of false positive / false negative scenarios caused by the current “reset” solution
- Adapt to virtualized environments
  - Much more dynamic setup of FRER components
  - Related former contributions:
    - FRER replication & elimination improvements
    - FRER improvements for seamless reset
    - IEC/IEEE 60802 amendment: "Cloud Solution"





What may be impacted?

Potential changes

- Reset functionality of
  - Sequence generation
  - Sequence recovery
- State machines
- R-Tag (e.g., reset related signaling)
- State variables, counters

Discussion