Proposal for a grocery shelf buffer for time-critical variables in TSN

Issue

The current buffer model of TSN is based on leaky bucket or token bucket concepts. These schemes imply that the queues can overflow. This should never be the case for critical messages, but could nevertheless occur in case a producer exceeds its contractual rate. In this case the time-critical variables should not be relegated to the same category as "best effort" or even completely discarded. A first-in, first out buffer makes little sense for process values.

Proposal

Proposed is a "grocery shelf" buffer scheme in which, when buffer space of a given stream becomes insufficient, the oldest data (head of queue) are discarded rather than the tail of queue.

This is an extension of the double-buffering or triple buffering schemes already existing, augmented by a limitation of the buffer size to keep the freshness of the data.

Therefore, the stream parameters should add which kind of discard is envisioned.

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