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Gate Operations and “Automatic Guard Band” Feature

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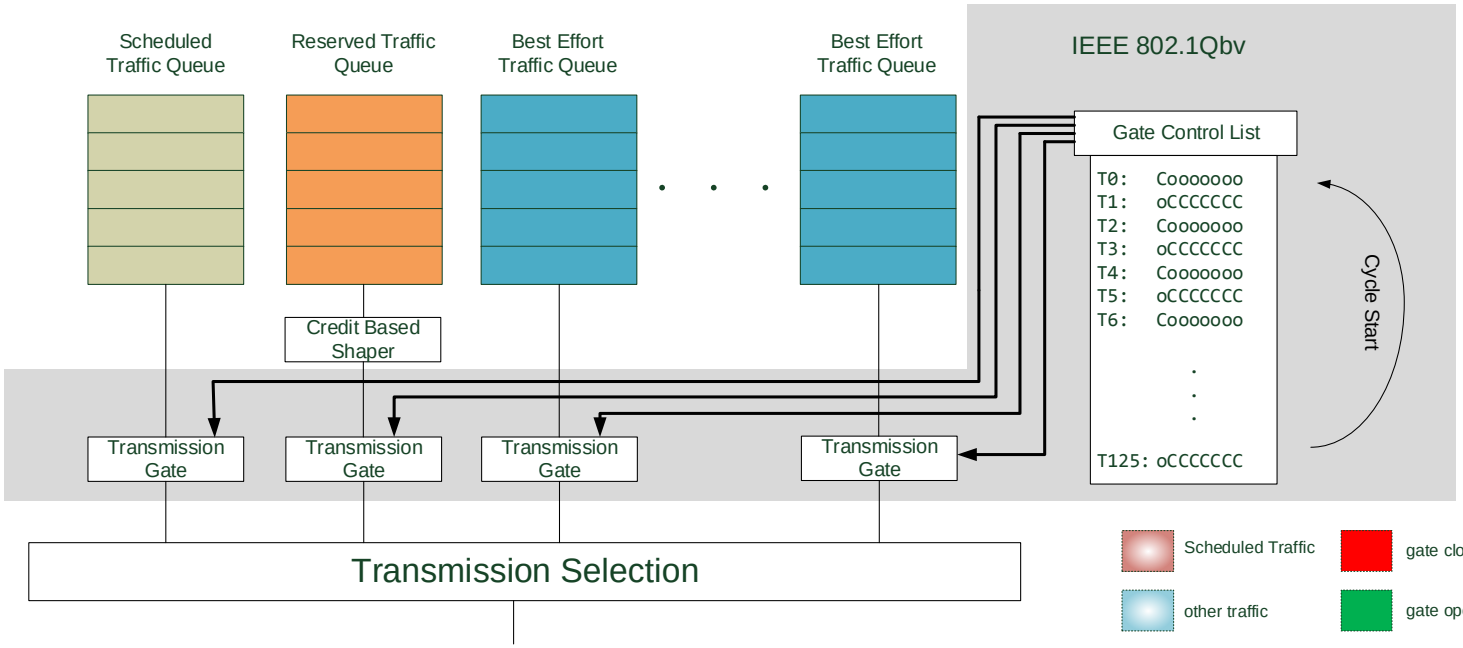
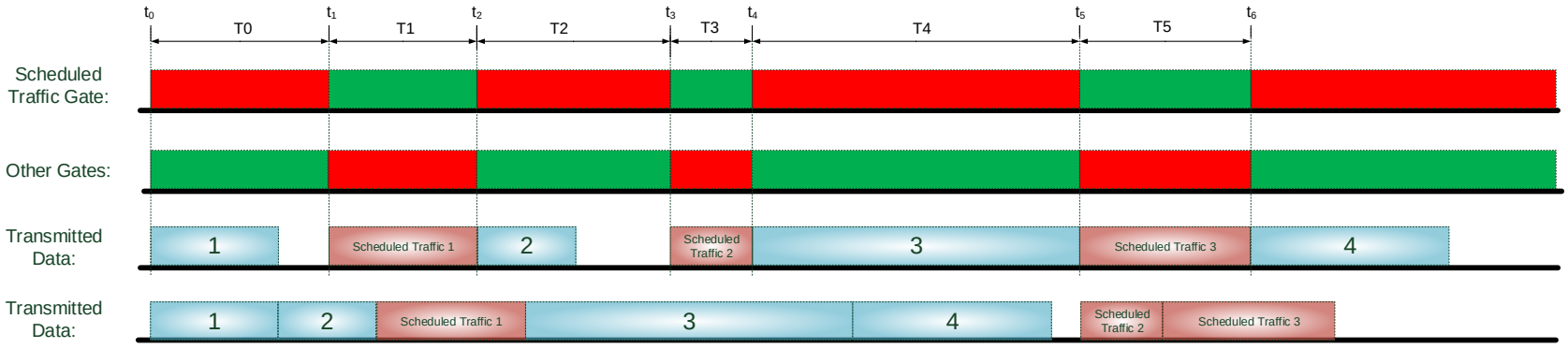
Current Problem

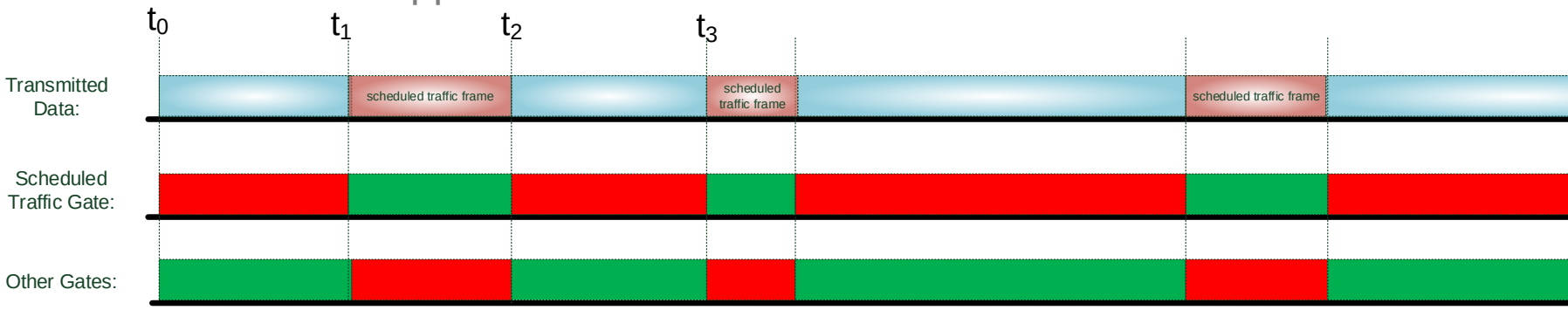




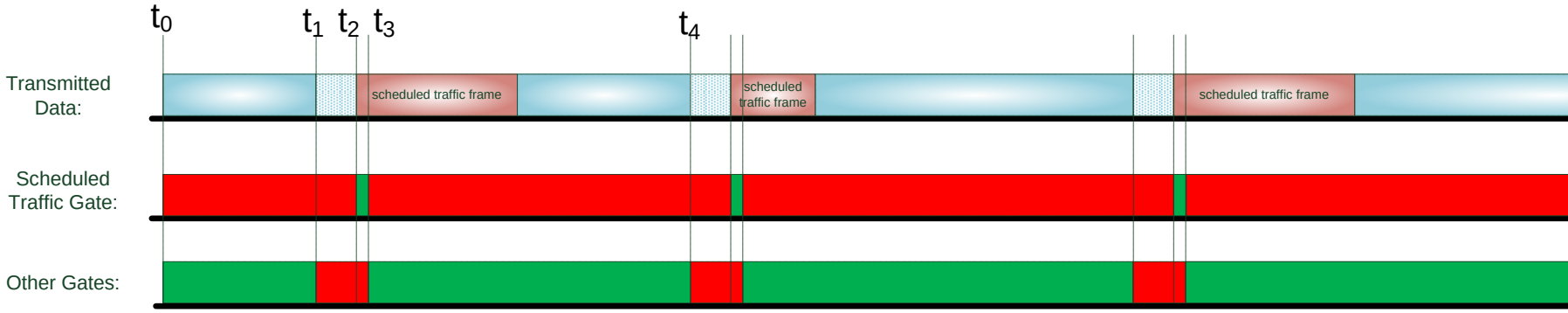
Current Scheduled Traffic Description

Qbv currently describes two different types of traffic schedules

- "Window approach"



- "Transmission Gate approach"



Current Scheduled Traffic Description

- The “window approach” is the default description for scheduled traffic

  “In addition to the other checks carried out by the transmission selection algorithm, a frame on a traffic class queue is not available for transmission (as required for tests (a) and (b) in 8.6.8) if the transmission gate is in the closed state or if the frame size is known and there is insufficient time available to transmit the entirety of that frame before the next gate-close event (3.1) associated with that queue.“

- The “gate approach is used when the frame size is unknown

What is the problem with this description?

- The “god box” that calculates the schedule does not know which of the two versions is used by a bridge
- Two different bridges with the same configuration might show two entire different behaviors
- It is very vague
- What does “if the frame size is known” mean?
- My assumption is that a 802.1Q bridge knows the size of a frame (implementations might not), therefore this part seems to be irrelevant from an standards point of view
- From an implementation point of view (I don’t think that we should define implementations) especially when proprietary features like cut-through are supported the frame size might be unknown
- But even if one would interpret this condition as a condition for an implementation and not the behavior of the standards model, this is in reality very complicated
- What if for some queues the frame size is known and for others not?
- What if the frame size is known for small frames e.g. 64 byte frames but not for bigger frames?

Proposal

- We should get rid of the “if the frame size is known”
- The “gate approach” shall be mandatory (every bridge that supports scheduled traffic should be capable to support this)
  - This requires almost no changes, in most parts of the document this is already the case, e.g. definition of open and close:

    “a) *Open*: Queued frames are selected for transmission, in accordance with the definition of the transmission selection algorithm associated with the queue.
    b) *Closed*: Queued frames are not selected for transmission.”
- Define an optional configurable “automaticGuardBand” feature that covers the “window approach”

  In addition to the other checks carried out by the transmission selection algorithm, a frame on a traffic class queue is not available for transmission (as required for tests (a) and (b) in 8.6.8) if the transmission gate is in the closed state or if ~~the frame size is known~~ automaticGuardBand is active and there is insufficient time available to transmit the entirety of that frame before the next gate-close event (3.1) associated with that queue.

“automaticGuardBand”

- “automaticGuardBand” should be configured with the schedule
- “automaticGuardBand” is optional and might not be supported by every device / port / queue or in every configuration mode
- “automaticGuardBand” should be configured on a per queue basis, this would for example allow the following configuration:
  - “automaticGuardBand” is not activated on the high priority scheduled traffic queues
  - “automaticGuardBand” is active for the other queues

Thank You