Supporting Cut Through in Qbv

v1 – March, 2013

802.1 TSN Face to Face – Orlando, FL

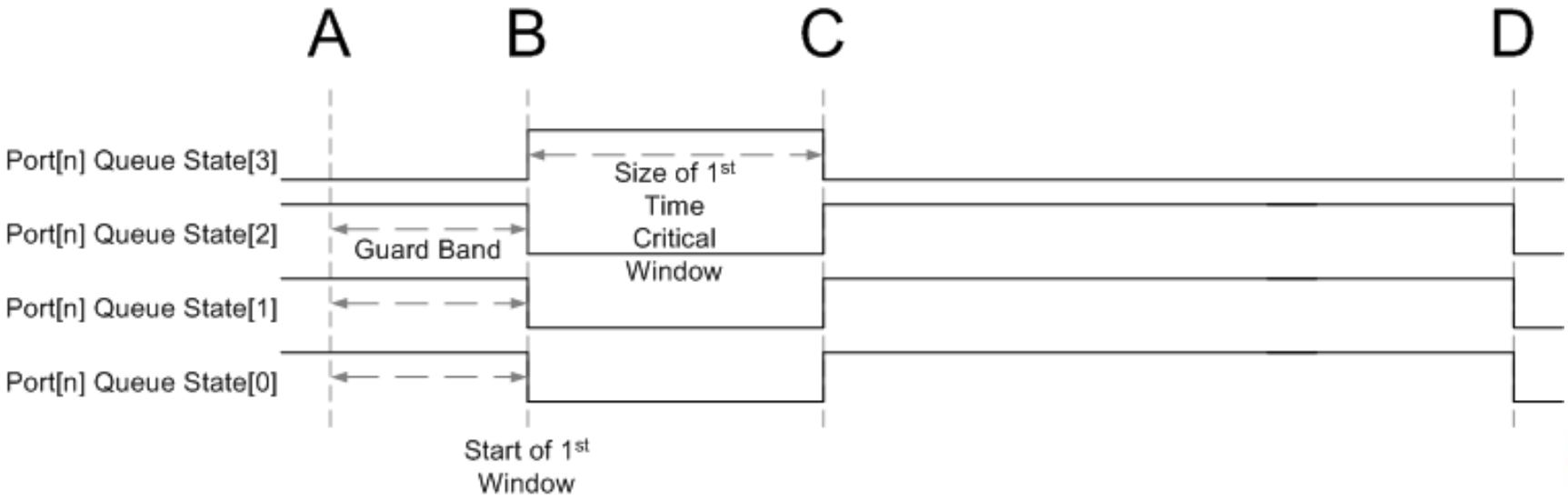
Don Pannell - dpannell@marvell.com

Issues

- **There is a desire to allow frames to egress ‘gate-closing’ queues as long as the frame’s transmission will be complete before the queue’s ‘gate-closing event’ time occurs**
  - This optimization is needed only during the ‘guard band’ time
- **This support is captured in D0.2 in section 8.6.8 item c)**
  - “If there are gate events associated with that queue, then there is sufficient time available to transmit the entirety of that frame before the next gate-close event associated with that queue…”
- **But this prevents cut through frame operation on even the ‘open’ queues as there is no frame size known at the time the cut through frame would want to be selected for its lower latency transmission**

Assumptions

- **Frame size checking as part of a condition of frame selection for transmission is only needed during the 'guard band' time**
- **For any given port, the required 'guard band' time is a fixed value**
  - It is the time needed to transmit a maximum size frame, or
  - It is the maximum time to preempt a frame



Proposed Solution

- **Remove the frame size check on frames that are being selected for transmission on any scheduled traffic queue**
  - i.e., remove 8.6.8 item c)
  - This allows selection of cut through frames
  - If a frame is present in a queue and that queue's gate opens for less than a frame time, the head of line frame will still be transmitted assuming it otherwise would have been
- **Change the definition of 'guard band' to be**
  - "The time interval before a gate-closing event on non scheduled traffic queues where frames shall be selected for transmission only if the competition of the frame's transmission will complete before the gate-closing event"

Other Observations

- **Since the guard band is a fixed time for a given port this can be easily specified/known**
- **Only the gate-closing event and gate-opening event times need to be specified for each window for each queue for each port**
  - The guard band start time for each window does not need to be defined as it can be computed from that data
  - This saves needing to specify a redundant piece of information in the protocol saving bandwidth
  - Alternatively the guard band start time can be defined instead of the gate-closing event time
  - Only one or the other needs to be defined and the gate-closing event time makes more sense to me

Other Observations

- For implementations that don't want to support the transmission of small frames during the guard band, they simply take the defined gate-closing event time (B) and subtract its known guard band time moving its internal gate-closing event time to (A)

- Thanks for your time