Qcc D1.1 Comment #11

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The Traffic Class Queue Reservation managed object is used to reserve space in the queue of a traffic class, according to the worst-case bandwidth expected by management. There is one Traffic Class Queue Reservation Table per Port of a bridge component. Each table row contains a set of parameters for each traffic class that is not using the credit-based shaper algorithm (8.6.8.2). The Traffic Class Queue Reservation Table is specified in Table 12-87. Rows in the table can be created or removed dynamically in implementations that support dynamic configuration of ports and components.

In order for a traffic class to be listed as a valid row of the Traffic Class Queue Reservation Table, its *transmission selection algorithm* (12.20.2) shall use a value other than one (Table 8-5 value for credit-based shaper). Queue reservation management for traffic classes that use the credit-based shaper is provided by adminIdleSlope of 12.20.1.

The Traffic Class Queue Reservation managed object configures the queue resource of the traffic class, and does not affect the egress behavior (i.e. shaping or scheduling) of the traffic class.

Table 12-87—Traffic Class Reservation Table row elements

Name	Data type	Operations supported[a]	Conformance[b]	References
Traffic class (row index)	unsigned integer [0..7]	R	BE	3.239, 6.5.9, 8.6.6
reservationInterval	unsigned integer	RW	BE	12.31.6.1
maxFrameSize	unsigned integer	RW	BE	12.31.6.2
maxFramesPerInterval	unsigned integer	RW	BE	12.31.6.3

Comment #11: The Over-Reservation Issue

The Comment: As stated in the resolution of Qcc D1.0 comment #9, the editor suggested to use *maxFrameSize* and *maxFramesPerInterval* together with an *interval* value to specify bandwidth for **a traffic class**, based on the fact that these parameters are already used to describe the bandwidth of a single stream in TSpec. However, adopting such a set of parameters for specifying bandwidth of a traffic class consisting of multiple streams may **result in severe over-reservation**.

e.g. Stream A with 10 frames each 150B and Stream B with 1 frame of 1500B use the same bandwidth. The description of the sum will be 11 frames and max. size of 1500 Bytes, meaning 11X1500 Bytes, which is much larger than the actual 1X1500+10x150 Bytes.

150B/frame X 10 frames
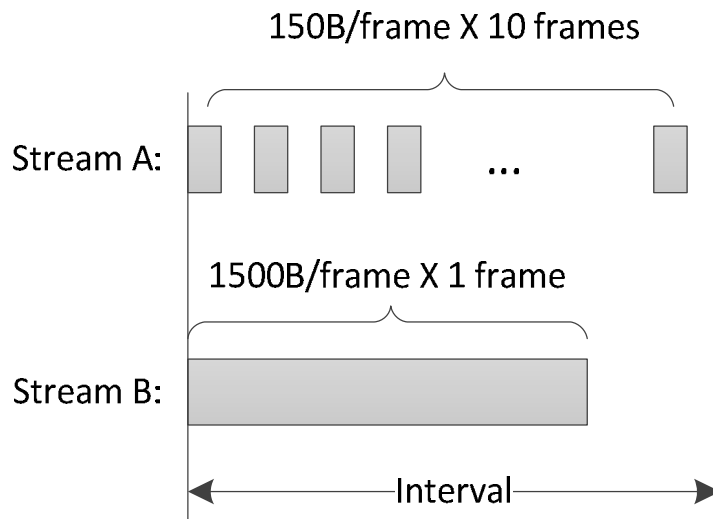
Per-class bandwidth described using managed objects in Table 12-87

Stream A: ▯ ▯ ▯ ▯ ▯ ... ▯

maxFrameSize = 1500B
maxFramesPerInterval = 11   => **1500B X 11 / Interval**

1500B/frame X 1 frame

actual bandwidth = **(150B X 10 + 1500B X 1) / Interval**

Stream B:

described = 5.5 X actual

←——————Interval——————→

Suggest Remedy for Comment #11

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❑ **Commenter's thoughts**
- The bandwidth parameters defined in Table 12-87 are similar to the TSpec parameters that are already used to describe stream bandwidth.

- Using such parameters to describe the total bandwidth of a traffic class that consists of a number of streams with different TSpecs is inaccurate and could result in severe over-reservation.

❑ **Commenter's suggested remedy:**
- Not use the parameters in Table 12-87 for traffic class bandwidth

- Consider reusing the existing parameters or adding new parameters in Table 12-4

❑ **Editor's suggested changes:**
- Remove 12.31.6 entirely.
- Edit the Conformance column for adminIdleSlope and classMeasurementInterval in 12.20.1 to state that they are required for Stream reservation remote management.
- Add adminIdleSlope and classMeasurementInterval to 5.4.1.8.
- As needed, clarify that adminIdleSlope and ~~classMeasurementInterval~~ are the only features in 12.20 that do not apply to SRP (e.g. usable for fully-centralized).

Bandwidth Availability Parameters

❑ 12.20.1 The Bandwidth Availability Parameter Table for FQTSS
    (*to be expanded beyond CBS for any shaper in the next Qcc draft*)

Table 12-4—Bandwidth Availability Parameter Table row elements

Name	Data type	Operations supported[a]	Conformance[b]	References
Traffic class	unsigned integer [0..7]	R	BE	34.3
deltaBandwidth	percentage	RW	BE	34.3
adminIdleSlope	unsigned integer	RW	BE	34.3
operIdleSlope	unsigned integer	R	BE	34.3
classMeasurementInterval	unsigned integer	RW	be	34.3.2, 34.4
srClassId	unsigned integer	R	be	35.2.2.9.2

deltaBandwidth (% of portTransmitRate)
- additional bandwidth configured by management (support bandwidth sharing)
- used to calculate max. bandwidth allowed for this queue – as an **upper bound** value

adminIdleSlope (bits per second)
- the **actual reserved** bandwidth configured by management
- effective only if SRP not in operation

operIdleSlope (bits per second)
- the **actual reserved** bandwidth configured by SRP

Proposals for Traffic Class Bandwidth Parameters

❑ **Proposal 1: add a new bandwidth parameter (in percentage of portTransmitRate) for management to specify the maximally allowed bandwidth used by the traffic class that is mapped to a non-CBS shaper. Bandwidth sharing is not implied.**

- The current deltaBandwidth contains bandwidth sharing concept, which was intended only for use between several traffic classes mapped to the same shaper, i.e. CBS.

❑ **Proposal 2: expand use of operIdleSlope for any shaper, representing currently reserved bandwidth by a SRP protocol**

❑ **Proposal 3: expand use of adminIdleSlope for any shaper, representing currently reserved bandwidth by management (incl. CNC)**

- **Question:** is this parameter sufficient for CNC to configure resource at each bridge, considering the fact that bridges do NOT receive per-stream TSpec in the centralized configuration model with CNC?

Thank you for your attention!

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