Asynchronous Gates
P802.1Qci

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Synchronous Gates in 802.1Q Today

General

Frame Processing
Gate
Further frame processing
Frame Processing
Gate
Frame Processing
Gate

Gate control list
T00: oCooCoo
T01: CoCooCoo
T98: oooCooCC
T99: CoooCoCo
C = closed, o = open

Synchronous gate control

802.1Qci
Stream Filter
Gate
Meter
Queueing

802.1Qbv
Queue for traffic class #7
Gate 7
Queue for traffic class #0
Gate 0
Queue for traffic class #1
Gate 1
...
Adding Asynchronous Gate Control

- Time-based gate control list can be masked, and asynchronous gate control can take over
- Both control lists and also the mask can be updated by/based-on Frame Processing

![Diagram showing gate control lists and mask updates]

- Asynchronous gate control
- Synchronous gate control

Gate control list:
- T00: oCooCoo
- T01: CoCooCo
- T98: oooCooCC
- T99: CoooCoCo

C = closed, o = open
Use Case 1 – Block Misbehaving Stream

› A Stream Filter detecting misbehaving stream can mask the time-based gate control and set the gate Closed in the asynchronous gate control

› A solution to the problems presented in


- Stream Filter detecting misbehaving stream
- Gate control list
- Mask: 1111100
- T00: oCooCooo
- T01: CoCooCoo
- .
- T98: oooCooCC
- T99: CoooCoCo
- C = closed, o = open

Queueing

Asynchronous Gates | P802.1Qci | San Diego, CA | 2016-07-27 | Page 4
Use Case 2 –
Goal: Assured Frame Order

› Frame of flow A and flow B arrive more or less the same time

› If we do not do anything, then the transmission order is not deterministic → delay variation

› Assured frame transmission order is desired, e.g., to decrease delay variation
Use Case 2 – Implementation

› Arrival/transmission of frame A (queue A) controls gate B (gate A is always open)
› Flow A is CBR, flow B is arbitrary (can be CBR as well)
› When frame A arrives and gets transmitted, gate B gets open and scheduled to be closed after Period minus Tolerance time
  – Can be made periodic based on local clock
› Frame B is transmitted when gate B is open and enough time left before it gets closed

Use Case 2

Queue B
Gate B
Queue A
Gate A

Gate control list
Mask:1111100
T00: oCooCooo
T01: CoCooCoo
...
T98: oooCooCC
T99: CoooCoCo

C = closed, o = open
Proposal

› Add support for asynchronous gate control