



REPORT structure for the mL-ONU QoS Model

Ryan Hirth, Broadcom Corp.
Curtis Knittle, Cable Labs
Marek Hajduczenia, ZTE
Mike Emmendorfer, ARRIS

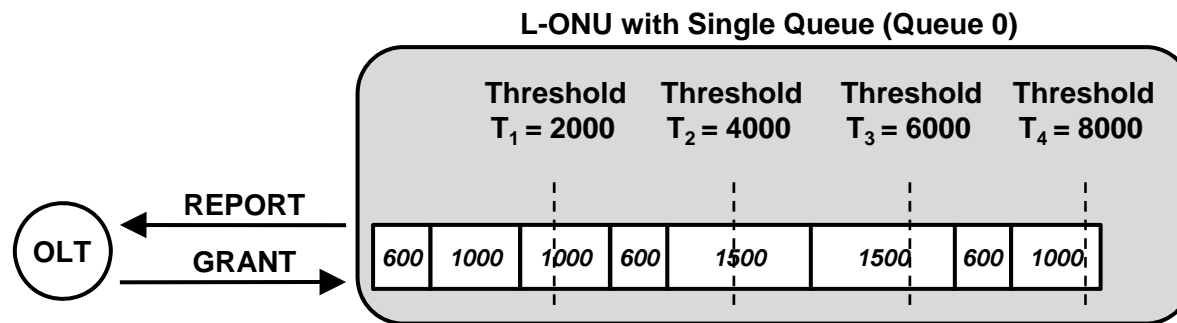
October, 2010

Tokyo

What is a Queue Set?

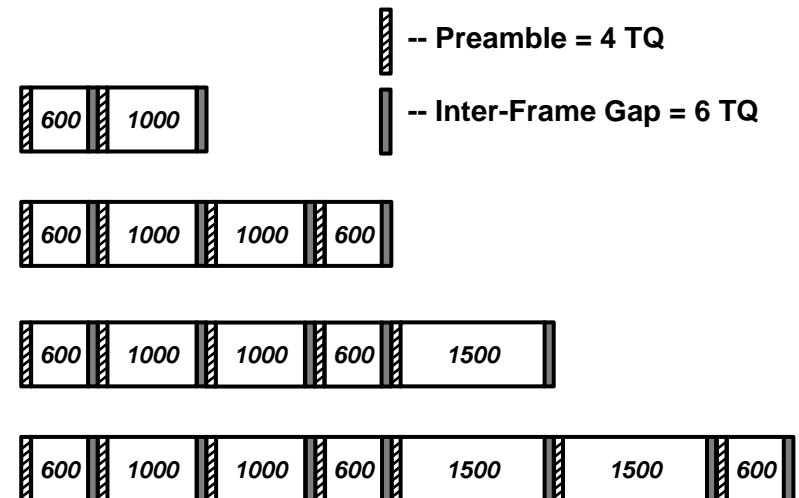
- A Queue Set represents a block of frames that fit within a defined threshold creating a “super” frame consisting of several Ethernet packets.
 - For example a Queue Set threshold of 4K may consist of four 1K frame or 2 1.5K frames.
- Queue Sets are built from the head of the queue.
 - The first Queue Set is filled until the next frame will no longer fit within the threshold.
 - The next frame begins filing the second Queue Set. The second Queue Set is filled until the threshold is reached or the end of queue is met.

Example: Queues, Thresholds, & Reports



Queue Composition & Thresholds (bytes)

of Queue Sets = 4
Report Bitmap = 00000001 ₂
Queue #0 Report = 820 (1640 bytes)
Report Bitmap = 00000001 ₂
Queue #1 Report = 1640 (3280 bytes)
Report Bitmap = 00000001 ₂
Queue #2 Report = 2400 (4800 bytes)
Report Bitmap = 00000001 ₂
Queue #3 Report = 3470 (6940 bytes)



Reported Values

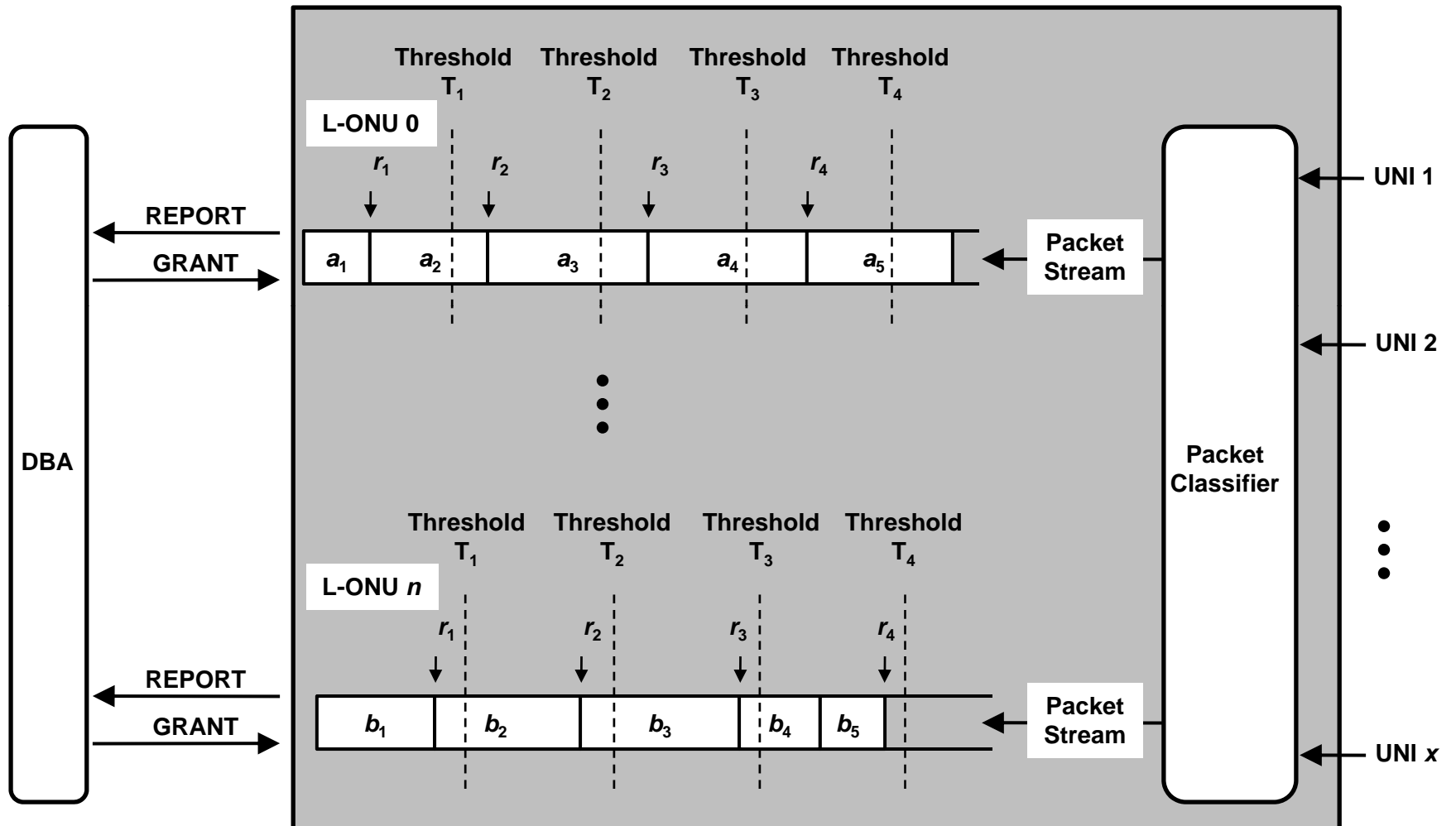
Why are Multiple Queues Sets (Thresholds) Needed?

- **No end-of-burst penalty for unfilled grants**
 - Queue Sets provide the OLT with a precise knowledge of the location of frame boundaries within the queue.
 - The OLT DBA can then grant on frame-length boundaries for maximum efficiency.
- **Priority fields do not provide frame-length boundary locations.**
 - Priority values change as new traffic is received.
 - Priority levels cannot be explicitly granted.
- **Multiple Queue Sets give finer granularity to the DBA, thus allowing reduced latency and high bandwidth**
 - A single Queue Set grant creates a small grant for fast reaction time
 - Multiple Queue Sets can be granted to create larger, high-BW grants for high efficiency
 - The DBA can rapidly adapt as the state of congestion changes.

MPCP Report Format for Multiple L-ONUs (mL-ONU)

- ❑ **Multiple L-ONU Configuration provides priority per L-ONU**
 - ❑ **Allows individual services to be granted**
 - ❑ **Single Queue per L-ONU**
- ❑ **4 Queue Sets (4 Equally Spaced Thresholds)**
 - ❑ **For frame length optimization**

L-ONU ↔ Queue ↔ Service Class



Report Format Description

DA
SA
Type
Opcode = 00-03
Timestamp
of Queue Sets = 4
Report Bitmap = 01
Queue #0 Report
Report Bitmap = 01
Queue #1 Report
Report Bitmap = 01
Queue #2 Report
Report Bitmap = 01
Queue #3 Report
Pad
FCS

- IEEE 802.3-2008 compliant
- Single queue L-ONU
- 4 queue sets

Example Reports

DA
SA
Type
Opcode = 00-03
Timestamp
of Queue Sets = 4
Report Bitmap = 01
Queue #0 Report = 3,040
Report Bitmap = 01
Queue #1 Report = 6,080
Report Bitmap = 01
Queue #2 Report = 9,120
Report Bitmap = 01
Queue #3 Report = 12,160
Pad
FCS

❑ ONU is full of 1,500 byte frames

Indicates the ONU is reporting with 4 thresholds

Note that each Queue #n Report is cumulative.

Proposal

Accept slides 4-6 of siepon_1010_hirth_1.pdf as the baseline proposal for Package A for the MPCP report format profile.

Moved: R. Hirth

Seconded:

Technical (75%)

Yes:

No:

Abstains:

Motion Passes/Fails