



Reporting at 10Gb/s

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How does ONU report?

- From 93.3.6.3, “[t]he reported length shall be adjusted to account for the necessary inter-frame spacing and FEC parity data overhead, if FEC is enabled.”
- ONU must begin burst at start of FEC codeword boundary and must end burst at end of full FEC codeword.
- It makes most sense for ONU to request integer number of FEC codewords in the REPORT messages (rounded up to the nearest time_quantum).
- Must also request overhead of 2 IDLE blocks at beginning of burst.

Errors in reporting

- ONU needs to request full FEC codewords.
 - Need to round up to next codeword boundary
 - Possible error of up to 247 bytes
- ONU can only request in units of time_quanta.
 - Need to round up to next time_quantum
 - Possible error of up to 19 bytes
- ONU does not know exact IPG
 - Need to round up for deficit idle count
 - Possible error of up to 3 bytes
- Single priority versus multiple priority reporting
 - How is overhead calculated?

Report for single priority

- Data = Length1 + Length2 + ... + LengthN
 - Preamble = N*8
 - IPG = N*12 + 3
 - Burst = 16
 - Payload = Data + Preamble + IPG + Burst
 - FEC_Data = Ceiling(Payload/216) * 216
 - FEC_Par = Ceiling(Payload/216) * 32
 - Report = Ceiling((FEC_Data + FEC_Par) / 20)
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- Single 64-byte frame report = 13 time_quanta
 - Eight 64-byte frames report = 50 time_quanta

Report for multiple priority

- Calculate per priority:

Pri0 64-byte frame request = 13 TQ

Pri1 64-byte frame request = 13 TQ

...

Pri7 64-byte frame request = 13 TQ

Total time requested = 108 TQ

Actual time if all granted = 50 TQ

Empty time on PON = 58 TQ

- A mechanism to aggregate different priorities with a single set of overheads is needed.

Need to revisit how ONU reports

- How can ONU efficiently report its status to waste as little bandwidth as possible?
- Is there a way to aggregate multiple priorities together?
- Do we need to restructure REPORT format?
- Something else?

What if ONU only reports bytes?

- **Single Priority**
 - Single 64-byte frame report = 84 bytes
 - Eight 64-byte frames report = 672 bytes

- **Multiple priorities**
 - Pri0 64-byte frame request = 84 bytes
 - Pri1 64-byte frame request = 84 bytes
 - ...
 - Pri7 64-byte frame request = 84 bytes
 - Total time requested = 672 bytes

- ONU reports data + preamble + ipg
- Let OLT determine overhead for each LLID.



How do we define new REPORT message?

- Reuse existing message
 - Confusion will arise if fields are interpreted differently depending on whether the REPORT was sent by 1G or 10G ONU.
 - Need two different shall statements on how REPORT is filled out, one for 1G and one for 10G.
 - How does OLT know if REPORT transmitted by 1G or 10G ONU?
- Create new 10G-EPON REPORT message
 - New message with new opcode and new fields.
 - No confusion over how fields are interpreted.
 - No confusion over which speed associated with message.

Possible structure of new REPORT message

- Opcode = 00-07
 - Next unused value
 - Only for 10G REPORT
- Queue #n Report
 - Length of queue (data, pre, ipg)
 - Units are bytes
- The rest of the message remains unchanged.

Proposed REPORT	Octets
Destination Address	6
Source Address	6
Length/Type = 88-08	2
Opcode = 00-07	2
Timestamp	4
Number of queue sets	1
Report bitmap	1
Queue #0 Report	0/2
Queue #1 Report	0/2
Queue #2 Report	0/2
Queue #3 Report	0/2
Queue #4 Report	0/2
Queue #5 Report	0/2
Queue #6 Report	0/2
Queue #7 Report	0/2
Pad/Reserved	0-39
FCS	4

Changes needed to Annex 31A

- Many references to annex 31A in Clause 93
 - We want to leave Clause 93 alone and make single change/addition in Annex 31A.
 - Allow all state diagrams to maintain current operation.
- Add new message to Table 31A-1.
- Note added to make it clear that 00-02 is used for 1G upstream and 00-07 is used for 10G upstream.