Cl **1** SC **1.4.244a** P **23** L **18** # D20459

Thompson, Geoff GraCaSI S.A./Independent

Comment Type **ER** *Comment Status* **R**

I believe that this is the first use of the term “envelope” in this context. Please refer to it as a “timing envelope” to distinguish it from an envelope frame.

SuggestedRemedy

Change the following text: "In the Multi-Channel Reconciliation Sublayer (MCRS, see Clause 143), an envelope encapsulates data belonging to a specific LLID being transmitted on a specific MCRS channel," TO READ: "In the Multi-Channel Reconciliation Sublayer (MCRS, see Clause 143), a timing envelope encompasses data belonging to a specific LLID being transmitted on a specific MCRS channel,"

Response *Response Status* **U**

REJECT.

When selecting the term "envelope", the TF has reviewed the base document to ensure there was no conflict of terms. In the existing body of IEEE Std 802.3, the word "envelope" mostly used in two contexts:
1) "envelope frame(s)" - always used as this combination of words
2) Envelope of a signal - always clear from the PMD focus of a given clause.
The TF felt that using the word "envelope" by itself in EPON-related clauses will not be confusing to readers. However, the term "timing envelope" may be confusing because the term "envelope" is not related to time, but rather it is related to a number of bits/octets being transmitted or received.

Cl **1** SC **1.4.244b** P **23** L **22** # D20460

Thompson, Geoff GraCaSI S.A./Independent

Comment Type **ER** *Comment Status* **R**

Per the previous comment, the general term "envelope" is already used elsewhere in 802.3. This will be a cause for confusion.

SuggestedRemedy

Please refer to the PON use at this level as a “timing envelope” to distinguish it from other uses of the term envelope. The change is needed here and many places elsewhere throughout your draft. Please do a global search and examine each use of the term "envelope" for possible modification.

Response *Response Status* **U**

REJECT.

There are no other "envelopes" used in the standard today, so there is no confusion with other terms. The term itself is defined as a term (1.4.244a) and used consistently throughout the draft.

See comment #459.

Cl **56** SC **56.1.2** P **46** L **38** # D20378

Dawe, Piers Mellanox

Comment Type **TR** *Comment Status* **R**

This PHY sensibly keeps the 25.78125 GBd line rate but uses stronger FEC with 20% (Fig 142-5) or 1-1/0.848 = 17.9% (142.2.4.2) overhead. Even after reclaiming about 3% by 257b recoding, that's around 21.4 Gb/s MAC rate, which is too far from 25 to say "nominal MAC data rate of 25 Gb/s".

SuggestedRemedy

Giving the PHY types names with 25G in them is fair, because that represents the technology used - but this part of the draft text is misleading.

In this paragraph, change "25 Gb/s" to "21.4 Gb/s" and "50 Gb/2" to "42.8 Gb/s".

Response *Response Status* **U**

REJECT.

The nominal (how quickly MAC transmits bits, i.e., what the resulting bit time is) MAC rate is correct in here, the effective MAC rate (how many bits it can effectively transmit within a second) is lower and affected by FEC overhead, just like any other PHY that uses FEC and PCS encoding. MAC does not always transmit data, but when it does, it transmits it at 25Gb/s

Cl **141** SC **141.5.1** P **66** L **27** # D20416

Dawe, Piers Mellanox

Comment Type **TR** *Comment Status* **R**

An extinction ratio minimum of 8 dB sounds like an unhelpful constraint, which may force implementers to set up at worse TDP than they could have done.

SuggestedRemedy

Relax the extinction ratio minimum, add another OMA-TDP class at line 24 as necessary. This will cost the receiver nothing and widen the implementation options for the transmitter. Adjust note b from "at minimum extinction ratio" to "at 8 dB extinction ratio".

Response *Response Status* **U**

REJECT.

All PMD parameter calculations have been done around ER (min) of 8dB and any changes to ER value would cause ripple effects for all receive side specs. A complete proposal for Tx and Rx specifications for lower ER (min) value would be needed. To date experimental data shows ER (min) of 8dB not presenting any issues.

Cl **141** *SC* **141.5.1** *P* **66** *L* **34** # D20417

Dawe, Piers — Mellanox

Comment Type **TR** *Comment Status* **A**

10GBASE-SR: BER 1e-12, TDP max 3.9, mask {0.25, 0.40, 0.45, 0.25, 0.28, 0.40} ("no hits") or
{0.235, 0.395, 0.45, 0.235, 0.265, 0.4} at 5e10-5 hits/sample
40GBASE-SR4: BER 1e-12, TDP max 3.5, mask {0.23, 0.34, 0.43, 0.27, 0.35, 0.4} at 5e10-5 hits/ sample
25GBASE-SR: BER 5e10-5, TDEC max 4.3 dB, mask {0.3, 0.38, 0.45, 0.35, 0.41, 0.5} at 1.5e-3 hits/sample. KR FEC
25GBASE-LR, ER: BER 5e10-5, TDP max 2.7 dB, {0.31, 0.4, 0.45, 0.34, 0.38, 0.4} at 5e-5 hits/sample. KR FEC
This draft OLT: BER 1e-2, TDP max 1.5 dB, {0.25, 0.4, 0.45, 0.25, 0.28, 0.4} at 5e-5 hits/sample. QC-LDPC FEC
ONU BER 1e-2, TDP max 2 dB, mask coordinates as 25GBASE-LR, ER. QC-LDPC FEC

SuggestedRemedy

So we need a new mask hit ratio, somewhere near 1e-2, and should review the mask coordinates when that is known.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Insert an editor's note indicating that the new mask will be needed and submitted as a comment against the next draft(s).

Cl **141** *SC* **141.5.2** *P* **68** *L* **32** # D20418

Dawe, Piers — Mellanox

Comment Type **TR** *Comment Status* **R**

If these PMDs use FEC, probably the stressed receive signal should be defined by SEC, J2 and J4, as 25GBASE-SR, LR and ER, rather than VECP, J2 and J9 as 40GBASE-SR4.

SuggestedRemedy

But as the pre-BER is 1e-2, even J4 is wrong. Maybe Jrms and J3 would be suitable. SEC can easily be defined for a BER of 1e-2.

Response *Response Status* **U**

REJECT.

Per http://www.ieee802.org/3/cc/public/adhoc/160907/tamura_3cc_adhoc_01.pdf, the current .3ca method of SRS measurement based on 100GBASE-LR/ER SRS is more conservative than SRS for a single wavelength of 100GBASE-SR4/LR/ER. There is no need to rework the specification at this time.

See http://www.ieee802.org/3/ca/public/meeting_archive/2019/07/powell_3ca_2a_0719.pdf for detailed discussion.

Cl **141** *SC* **141.7.13.2** *P* **78** *L* **1** # D2098

Anslow, Pete — Ciena

Comment Type **ER** *Comment Status* **A** *redraw*

Some of the figures in the draft are appropriately drawn. However, a number of the figures are inserted as bit maps.
This has several drawbacks: the rendition of the figures is poor making small text difficult to read, the use of bit maps increases the file size unnecessarily, the text content of the figures is not searchable and most importantly, including non-editable figures makes life difficult if changes are required in Maintenance after the figure has been incorporated into the next revision.

SuggestedRemedy

Go through the entire draft replacing figures that have been pasted as bit maps with versions that are drawn in FrameMaker.
If there are any figures illustrating equations, use a vector graphics (e.g. .svg format) and apply any text annotations in FrameMaker.
Example figures needing to be replaced are Figures 141-3, 142-2, 142-5, 142-6, 142-7, 142-8, 142-9, 142-13, 142-14, 142-15, 142-16, 142-18, 143-1, 143-2, 143-3, 143-4, 143-5, 143-6, 143-7, 143-8, 143-9, 143-12, 143-13, 143-15, 143-16, 144-3, 144-4, 144-5, 144-6, 144-7, 144-8, 144-9, 144-10, 144-11, 144-12, 144-13, 144-13, 144-14, 144-15, 144-16, 144-17, 144-18, 144-20, 144-21, 144-22, 144-23, 144-24, 144-25, 144-26, 144-27, 144-28, 144-29, 144-31, 144-32, 144-33, 144-34, 142A-1

Response *Response Status* **W**

ACCEPT.

Cl **142** *SC* **142.2.4.2** *P* **116** *L* **5** # D20379

Dawe, Piers — Mellanox

Comment Type **TR** *Comment Status* **A**

I don't know what you mean by pi-1info. Similar problem at line 9.

SuggestedRemedy

Explain, or better, use more familiar notation

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

append the following sentence to the end of the paragraph on Page 116, Lines 3-5 : “pi(-1)_{info} represents the de-interleaver mapping of information bits that permutes u* to u’’.” and also append the following sentence to the end of the paragraph on Page 116, Lines 6-8: “pi_{parity} represents the interleaver mapping of parity bits that permutes p’’ to p*.”

Cl **142** *SC* **142.2.4.3** *P* **116** *L* **25** # D20382

Dawe, Piers Mellanox

Comment Type **TR** *Comment Status* **A**

I don't know what you mean by "Omega networks".

SuggestedRemedy

Define what you are talking about. If it doesn't matter, don't mention them.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Add an informative reference to

Lawrie, Duncan H. (December 1975). "Access and Alignment of Data in an Array Processor". IEEE Transactions on Computers. C-24 (12): 1145–55. https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=1672750

at the first instance of Omega network used as a term

Cl **142** *SC* **142.4** *P* **137** *L* **53** # D20385

Dawe, Piers Mellanox

Comment Type **TR** *Comment Status* **A** *PMA*

Missing text

SuggestedRemedy

Introduce / summarise the PMA

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See comment #386.

Cl **142** *SC* **142.4.1** *P* **137** *L* **3** # D20387

Dawe, Piers Mellanox

Comment Type **TR** *Comment Status* **A**

This isn't an adequate definition of "differential encoding".

SuggestedRemedy

Define it properly, including: What is it for? When is it used or useful? What is it - is it "precoding"? Are Xi and Yi bits, 257-bit vectors, or what? What is "Register" - a 1-bit delay? Define what you mean by a + in a circle.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

(1) precoding was used (twice) interchangeably for differential encoding in D2.0 (once in 142.4.2 and once in Figure 142-20). The more commonly used industry term is differential encoding, so precoding will be removed from subsequent draft versions.
=> replace "precoding" with "differential encoding" in two the following locations
- Subclause 142.4.2
- Figure 142-20

(2) Text is proposed to be added to 142.4 as follows to provide a brief definition of differential encoding and some guidelines on usage.

142.4 Nx25G-EPON PMA
"The PMA includes a downstream differential encoding option at the serial bit rate (output bits represent changes to succeeding input values rather than respect to a given reference). This encoding technique facilitates the use of lower bandwidth receivers."

(3) Implement changes to Figure 142-19 and Figure 142-20 as shown in http://www.ieee802.org/3/ca/public/meeting_archive/2019/07/powell_3ca_1a_0719.pdf (changed marked in red)

Cl **144** *SC* **144** *P* **180** *L* **1** # D20464

Thompson, Geoff GraCaSI S.A./Independent

Comment Type **TR** *Comment Status* **R**

This clause is out of scope. It is shown in Fig. 144-2 as residing in the MAC sub-layer. This is a Physical Layer project which said it would "extend the operation of EPON protocols". That means to me the augmentation of what is specified in clause 64, not the creation of an entire new specification misplaced in the Physical Layer.

SuggestedRemedy

Rewrite the draft to fit what was promised in the PAR. Presumably that will include deleting lause 144.

Response *Response Status* **U**

REJECT.

The PAR scope states that this project "… also extends the operation of Ethernet Passive Optical Networks (EPON) protocols, such as MultiPoint Control Protocol (MPCP) and Operation Administration and Management (OAM)." Just like previous generations of Multi-Point Control Protocol (MPCP), the new generation uses GATE and REPORT MPCPDUs to provide time-based transmission arbitration for multiple connected ONUs. However, the new MPCP extends the existing MPCP specification by supporting multiple channels, and specifying finer granularity for transition units (2.56 ns EQs instead of 16 ns TQs). There are numerous other enhancements.

The TF strongly disagrees that the statement "extends the operation of Ethernet Passive Optical Networks (EPON) protocols, such as MultiPoint Control Protocol (MPCP)" implies that all the changes need to be confined to one of the existing MPCP clauses (see Clause 64 or Clause 77), and not be defined as a new clause. The TF made a decision to create a new clause instead of modifying an existing clause for clarity of presentation and for the convenience of users of the standard. This is not unlike an earlier WG decision to specify the simplified full-duplex MAC as a separate Annex 4A instead of modifying the operation of the existing CSMA/CD MAC in Clause 4.