Cl **118** *SC* **118.2.2** *P* **128** *L* **19** # 39

Ran, Adee Intel

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

The text on the left says

"When the PHY 200GXS or PHY 400GXS detects FEC degrade, the signal is propagated to the adjacent PCS, which can propagate that signal as local degrade"

How can it propagate that signal?

I would expect that the PHY "adjacent PCS" (facing the partner, so that it is _not_ a part of the PHY XS) _should_ propagate a degradation detected by the DTE XS. But the signaling of that PCS is specified in 119.2.4.4 using only the variable FEC_degraded_SER (which is defined in clause 119), without any input from the PHY XS PCS. Clause 119 does not assume clause 118.

A similar problem exists in the receive direction (right side). Degradation detected by the "adjacent PCS" should be propagated to the DTE XS, but how?

Also in P129, lines 38 and 43, the text says "the adjacent PCS sublayer indicates" - how does it indicate?

It seems that some interface between the PCS in the PHY XS and the adjacent PCS (in both directions) is missing. The figure only has "200GMII or 400GMII" which does not have a way to encode the "degradation" indication.

SuggestedRemedy

For propagation in the TX direction, perhaps specify in 119.2.4.4 that the FEC_degraded_SER variable can be set and cleared not only by the conditions specified, but also by an adjacent XS in an implementation-dependent manner (regardless of whether the PCS has the feature enabled or not).

For propagation in the RX direction, perhaps specify in 118.2.2 that adjacent_pcs_local_degraded and adjacent_pcs_rm_degraded can be set and cleared by the adjacent PCS in an implementation-dependent manner.

Alternatively, add service interface primitives between the adjacent "PHY PCS" and "PHY XS" to convey this information.

Response *Response Status* **U**

REJECT.

It was purposely left to the designer to provide the signaling path. Also the PCS in the layer stack is not the clause 119 PCS, it is some to be defined in the future PCS.

[Editor's note: page changed from 128 to 129]

Cl **120** *SC* **120.5.11.2.1** *P* **196** *L* **45** # 149

Dudek, Mike Cavium

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

The JP03A test pattern is used for measuring Jitter. With this pattern on all lanes crosstalk will not appear in the jitter measurement while it will degrade the jitter in the real application. We need to create the effect of the crosstalk during these tests by having a different pattern on the lanes not under test.

SuggestedRemedy

Add a per-lane enable for this pattern (and MDIO registers to match). Section 120.5.11.1.3 (square wave test pattern) provides a template for this.

Consider doing the same for JP03B however JP03B is not presently used. If it were used (eg for measuring EOJ) then this shold be done for that pattern as well.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Modify the text of 120.5.11.2.1 in accordance with the response to Comment #29

Even odd jitter is measured using JP03B through reference to 94.3.12.6.4.2. See response to D1.3 comment #33 where this test pattern was restored to the draft.
See response to comment #133.

Cl **120** *SC* **120.5.11.2.4** *P* **198** *L* **26** # 301

Hidaka, Yasuo Fujitsu Lab of America

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

The restriction of error counter "for isolated single bit errors" implicates that it does not increment for burst errors. It seems contradictory to the next sentence which says it should count at least one error whenever one or more errors occur in a sliding 1000-bit window.

SuggestedRemedy

Remove the phrase of "for isolated single bit errors" at the end of the sentence which begin with "The checker shall increment" in the second paragraph of 120.5.11.2.4.

Response *Response Status* **U**

REJECT.
See response to comment #430

Cl **120** *SC* **120.5.11.2.5** *P* **199** *L* **36** # 128

Dawe, Piers — Mellanox

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

This SSPRQ pattern will give inconsistent results when testing a range of transmitters.

SuggestedRemedy

If we can find a less extreme pattern that better achieves the objective of allowing TDEC measurements that correlate to the TDP we don't want to measure at line rate, change to that pattern.
If we can't, change to a pattern that is less extreme, and don't use it for TDEC testing.

Response *Response Status* **U**

REJECT.
No alternative test pattern proposed. If the optical track selects a different test pattern than SSPRQ, the PMA can generate it.

Cl **120B** *SC* **120B** *P* **329** *L* **1** # 258

Hidaka, Yasuo — Fujitsu Lab of America

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

IS_SIGNAL.indication primitive is mandaory for chip-to-chip 200GAUI-8 and 400GAUI-16, because they are physical instantiations of the PMA service interface, but it is completely missing.

It was also missing in CAUI-4, CAUI-10 and 25GAUI.

SuggestedRemedy

Add a specification of IS_SIGNAL.indication.
It is a uni-directional signal from lower PMA to upper PMA.
It may refer to 120.5.8 Link status for the detail.

Response *Response Status* **U**

REJECT.
The AUI is a physical instantiation of the IS_UNITDATA_i.request and PMA:IS_UNITDATA_i.indication primitives between two adjacent PMA sublayers. There is no specification for the physical instantiation of the IS_SIGNAL.indication primitive. How this is communicated between the PMA sublayers is implementation dependent. Consequently, it would be inappropriate to add this here.

Cl **120C** *SC* **120C** *P* **336** *L* **1** # 259

Hidaka, Yasuo — Fujitsu Lab of America

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

IS_SIGNAL.indication primitive is mandaory for chip-to-module 200GAUI-8 and 400GAUI-16, because they are physical instantiations of the PMA service interface, but it is completely missing.

It was also missing in CAUI-4, CAUI-10, and 25GAUI.

SuggestedRemedy

Add a specification of IS_SIGNAL.indication.
It is a uni-directional signal from lower PMA to upper PMA.
It may refer to 120.5.8 Link status for the detail.

Response *Response Status* **U**

REJECT.
The AUI is a physical instantiation of the IS_UNITDATA_i.request and PMA:IS_UNITDATA_i.indication primitives between two adjacent PMA sublayers. There is no specification for the physical instantiation of the IS_SIGNAL.indication primitive. How this is communicated between the PMA sublayers is implementation dependent. Consequently, it would be inappropriate to add this here.

Cl **120D** *SC* **120D** *P* **344** *L* **1** # 260

Hidaka, Yasuo — Fujitsu Lab of America

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

IS_SIGNAL.indication primitive is mandaory for chip-to-chip 200GAUI-4 and 400GAUI-8, because they are physical instantiations of the PMA service interface, but it is completely missing.

It was also missing in CAUI-4, CAUI-10, and 25GAUI.

SuggestedRemedy

Add a specification of IS_SIGNAL.indication.
It is a uni-directional signal from lower PMA to upper PMA.
It may refer to 120.5.8 Link status for the detail.

Response *Response Status* **U**

REJECT.
The AUI is a physical instantiation of the IS_UNITDATA_i.request and PMA:IS_UNITDATA_i.indication primitives between two adjacent PMA sublayers. There is no specification for the physical instantiation of the IS_SIGNAL.indication primitive. How this is communicated between the PMA sublayers is implementation dependent. Consequently, it would be inappropriate to add this here.
See also comment #261

Cl **120D** *SC* **120D.3.1.1** *P* **347** *L* **48** # 131

Dawe, Piers — Mellanox

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

Should not use such an unrepresentative pattern

SuggestedRemedy

Measure jitter with PRBS13Q. Either apply the spec to a subset of emphasis settings, or apply to all emphasis settings but ignore the edges that are not present when emphasis is off.
Remove the JP03A test pattern generator and registers.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
Further contributions are solicited on jitter measurement using the PRBSQ13 test pattern.

Cl **120D** *SC* **120D.3.1.1** *P* **348** *L* **28** # 565

Dawe, Piers — Mellanox

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

Should not use such an unrepresentative pattern; should not require such a strange pattern for just one spec item.
Should not rely on Clause 94.

SuggestedRemedy

Either: measure EOJ with PRBS13Q (or a shorter PRBSnQ if we have one) as in D1.4 120E.3.3.2 Even-odd jitter, but with 120D style slicing levels based on 120D.3.1.2.2. Apply the spec to a subset of emphasis settings, or apply to all emphasis settings but ignore the edges that are not present when emphasis is off. This will be a by-product of the SNDR and other jitter measurement, avoiding a separate measurement.
Or, if we think that J_RMS, J5 (J4), SNDR, and linear fit components provide good enough coverage, remove the EOJ spec.
Remove the JP03B test pattern generator and registers.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
Further contributions are solicited on EOJ measurement using the PRBS13Q test pattern.

Cl **120E** *SC* **120E** *P* **358** *L* **1** # 261

Hidaka, Yasuo — Fujitsu Lab of America

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

IS_SIGNAL.indication primitive is mandaory for chip-to-module 200GAUI-4 and 400GAUI-8, because they are physical instantiations of the PMA service interface, but it is completely missing.

It was also missing in CAUI-4, CAUI-10, and 25GAUI.

SuggestedRemedy

Add a specification of IS_SIGNAL.indication.
It is a uni-directional signal from lower PMA to upper PMA.
It may refer to 120.5.8 Link status for the detail.

Response *Response Status* **U**

REJECT.
The AUI is a physical instantiation of the IS_UNITDATA_i.request and PMA:IS_UNITDATA_i.indication primitives between two adjacent PMA sublayers. There is no specification for the physical instantiation of the IS_SIGNAL.indication primitive. How this is communicated between the PMA sublayers is implementation specific. Consequently, it would be inappropriate to add this here..
See also comment #260

Cl **120E** *SC* **120E.3.1.6** *P* **363** *L* **35** # 126

Dawe, Piers — Mellanox

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

This crosstalk generator is intended to represent a module, and generate broadband energy. The spec allows an implementer to achieve the letter of the spec by using a lot of emphasis but miss the intention.

SuggestedRemedy

This transition time spec should be replaced by a slew time spec, e.g. 4.5 ps between +/- 0.1 V. Definition of slew time similar to transition time but with fixed thresholds instead of the signal-dependent 20% and 80%. Same for the counter propagating crosstalk channels during calibration of the module stressed input signal (120E.3.4.1.1).
We don't need to change the spec for the crosstalk generator in the opposite direction because that's a slower signal so an implementer won't be using emphasis.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
No change to the document on this draft due to lack of consensus. Further presentations solicited.
See response to comment #127

Cl **120E** *SC* **120E.3.2** *P* **366** *L* **32** # 127

Dawe, Piers — Mellanox

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

The module output transition time min. spec is there to protect the module's input from too much crosstalk when connected to a host with more NEXT than the MCB. "Too much" doesn't depend on the module's output amplitude setting, so we should have an absolute spec here not a relative one.

SuggestedRemedy

This transition time spec should be replaced by a slew time spec, e.g. 3.5 ps between +/- 0.1 V. Definition of slew time similar to transition time but with fixed thresholds instead of the signal-dependent 20% and 80%.
There is less need to change the transition time spec for the host output because the connector is on the host board, so the NEXT is already in the measurement.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

No change to the document on this draft due to lack of consensus. Further presentations solicited.

Straw Poll
1)
Replace "Transition time (min, 20% to 80%)" with "Slew time (min) " in Table 120E-3, with units of ps and a value of 3.5
Add footnote "Measured between +/- 0.1V"
2)
Make no change

1): 4; 2): 4; No consensus

Cl **121** *SC* **121.7.1** *P* **218** *L* **16** # 567

Dawe, Piers — Mellanox

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

The SMSR spec has been described variously as a diagnostic, a component level spec for buying lasers to make into PMDs, an early warning, a comfort blanket / included by default, or something that can be measured relatively easily in a component lab. Any SMSR problems will contribute to TDECQ - but we haven't quantified them. The effect of SMSR will depend strongly on the amount of dispersion which varies from one PMD to another and lane to lane, and on laser technology. We should not obstruct innovative implementations.

SuggestedRemedy

Make the SMSR limit a recommendation not a PICS requirement. All optical PMDs in this project.

Response *Response Status* **U**

REJECT.
In response to similar comments, #219 and #221, to draft 1.0, it was agreed not remove the SMSR limit with the following justification:
"Measuring SMSR is not required - it must pass if it is measured. The background of this spec is related to unstable laser performance, probably being very temperature sensitive. Even though measuring SMSR in a DWDM environment is less straightforward than in Clause 122, it is believed that this parameter should be specified.
30 dB value for SMSR is considered to be an appropriate value for this interface."

Cl **121** *SC* **121.7.1** *P* **218** *L* **31** # 566

Dawe, Piers — Mellanox

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

Does the extinction ratio matter much in PAM4?

SuggestedRemedy

Unless it's important, reduce the limit to 3 dB, or as appropriate, for each optical PMD.

Response *Response Status* **U**

REJECT.
Commenter is invited to demonstrate that there is a need to relax the ER for this PMD and that this will not impact the ability of receivers to meet the sensitivity requirements.

Cl **121** *SC* **121.7.1** *P* **218** *L* **33** # 130

Dawe, Piers Mellanox

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

Now we have a TDECQ spec, we should look again at the RIN spec. The effect of RIN is included in TDECQ; the acceptable level of RIN depends strongly on other transmitter impairments. All we could *require* in a spec is the amount of RIN that would create substantially all of the TDECQ limit, which I don't think is this number. It would be hard to *recommend* any number without making assumptions on behalf of all future transmitter implementers that we can't justify.
As 52.9.6 says "This procedure describes a component test that may not be appropriate for a system level test depending on the implementation. If used..."
and "In order to measure the noise, the modulation to the DUT is turned off." A transmitter that's trying to deliver 4 well-spaced PAM4 levels can't be expected to do anything in particular if the modulation to the DUT is turned off!

SuggestedRemedy

As we no longer need a RIN spec and it would be difficult to choose a recommended value - delete the RIN22.8OMA row in Table 121-6, and in Table 121-10. Delete 121.8.7.
In 121.8.5.1 and 121.8.5.2, we could change "The state of polarization of the back reflection is adjusted to create the greatest RIN" to "The state of polarization of the back reflection is adjusted for the greatest TDECQ".
Similarly in clauses 122, 124.

Response *Response Status* **U**

REJECT.
Insufficient justification in the comment and incomplete Remedy proposal. The commenter is invited to bring in a presentation clarifying why a RINxOMA spec is no longer needed and why the current specification in draft 2.0 is broken. The transmitter RINxOMA spec is intended to screen out potentially bad transmitters even if the noise correction required by the TDECQ test is not very accurate.

Cl **121** *SC* **121.8.5** *P* **221** *L* **37** # 129

Dawe, Piers Mellanox

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

This SSPRQ pattern will give inconsistent results when testing a range of transmitters.

SuggestedRemedy

If we can find a less extreme pattern that better achieves the objective of allowing TDEC measurements that correlate to the TDP we don't want to measure at line rate, change to that pattern.
If we can't, use PRBS13Q, which is much more representative, for TDECQ testing. Tell the implementer to be careful about low frequency effects.
Similarly in clauses 122, 124.

Response *Response Status* **U**

REJECT.
Incomplete remedy.

The commenter is invited to bring in a proposal for an alternative pattern that allows TDECQ measurements that correlate to the TDP.
One of the patterns for measurement of TDEC in Clause 95 is PRBS31 and the SSPR pattern is made up of segments of PRBS31.

Cl **122** *SC* **122.1** *P* **239** *L* **1** # 558

Booth, Brad — Microsoft

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

400GBASE-FR8 does not satisfy broad market potential or economic feasibility. It is well understood in the Ethernet industry that all solutions for 2 km optical PMDs are considered "client" or "grey" optics. These PMDs must be able to satisfy the faceplate density requirements (32 ports per 1 RU) to be considered economically feasible. The current power estimations for 400GBASE-FR8 does not permit the PMD to meet the power envelope or cost requirements needed to satisfy this requirement. Because the PMD will not be economically feasible, it is therefore unlikely to have broad market potential.

SuggestedRemedy

Two options:
1) Delete 400GBASE-FR8 from the draft and remove the objective from the project.
2) Consider other options that will result in a solution that satisfies the economic feasibility and broad market potential requirements.

As #2 is highly unlikely at this point in time, option #1 is the preferred suggested remedy.

Response *Response Status* **U**

REJECT.
Based on data presented that supported the development of the responses to the Broad Market Potential and Economic Feasibility Criteria, the Study Group and subsequently the 802.3 WG approved these responses. This data covered the solution that was eventually adopted by the Task Force and is specified in P802.3bs Draft 2.0.
The SMF objective for 2km was adopted based on data presenting its need across multiple applications. This need across multiple application areas is noted in the Broad Market Potential Response in the IEEE P802.3bs CSD (https://mentor.ieee.org/802-ec/dcn/16/ec-16-0057-00-ACSD-802-3bs.pdf). The commenter notes a specific implementation of faceplate density (32 ports per 1 RU) as a requirement that must be satisfied. However, the stated requirement is not supported by reference to an existing presentation or new data that demonstrates this requirement across the different application areas that have been noted in the Broad Market Potential Response.
Additionally, the commenter used the noted implementation for determining a power envelope and cost requirements for the optical solutions, and then continues with statements regarding "current power estimations." However, the commenter has not provided any reference to an existing presentation or new data regarding the power envelope, cost requirements, or "current power estimations" that can be considered.

Cl **122** *SC* **122.7.3** *P* **252** *L* **8** # 17

Swanson, Steven — Corning Incorporated

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

In Table 122-13, the channel insertion loss for 200GBASE-LR4 and 400GBASE-LR8 is specified at 6.3 dB. However 10km x 0.46 dB/km plusthe 2.0 dB allocation for connectors = 6.6 dB.

SuggestedRemedy

Change the channel insertion loss for 200GBASE-LR4 and 400GBASE-LR8 in Table 122-13 to 6.6 dB.

Response *Response Status* **U**

REJECT.
There was no consensus on increasing the loss budget of 200GBASE-LR4 and 400GBASE-LR8.

Cl **123** *SC* **123.1** *P* **269** *L* **1** # 559

Booth, Brad — Microsoft

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

400GBASE-SR16 requires twice the number of fibers as two 200GBASE-SR4; therefore, it does not satisfy the balanced cost requirement of economic feasibility. Because the PMD does not meet the economically feasibility, it is unlikely to have broad market potential.

SuggestedRemedy

Two options:
1) Delete 400GBASE-SR16 from the draft and remove the objective from the project.
2) Modify the PMD to be 400GBASE-SR8 based on the same technology proposed for 200GBASE-SR4.

As #1 is highly unlikely at this point in time, option #2 is the preferred suggested remedy.

Response *Response Status* **U**

REJECT.

As noted in the Economic Feasibility response, "the project will examine alternatives that trade off between PMD complexity and the number of fibers in order to maintain a reasonable balance between these two costs." The selection examined these tradeoffs and concluded that the cost balance for this PMD is reasonable. The PMD specifications have been developed in the light of the state of technology for MMF optics. In addition the PMD specs potentially allow optical interface compatibility between individual lanes of 25GBASE-SR, 100GBASE-SR4 and 400GBASE-SR16.