802.3db Editors' Report

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IEEE P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force

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Editorial Team

- Earl Parsons, CommScope, Co-editor
- Ramana Murty, Broadcom, Co-editor

Update since last meeting

- Draft 0.2 was posted to P802.3db private area April 8th
- Open for informal comments through April 12th
- Comments were received from two individuals as well as the editors
- Thank you to everyone who commented!

Comment distribution table

Clause	E	T	ER	TR	Open	Closed	Total
167	1	5	-	-	6	0	6
Total	1	5	-	-	6	0	6

David Lewis

1. Table 167-7 footnote b does not seem to be in the right place. Why is average launch power (min) and OMA (min) dependent upon the choice of stressed receiver sensitivity? Is it that SRS (max) has not been determined yet and could be anywhere between -2 and -1.6? If so, it should be a TBD and so should OMA (min) and average launch power (min).

ACCEPT IN PRINCIPLE

It was agreed that the range of values for the stressed receiver sensitivity (SRS) would be shown in the Table 167-8, and the parameters that depend on the SRS would be indicated in the footnotes in Tables 167-7 and 167-8.

Add “Editors’ note” and put footnote in italics.

David Lewis

2. The aggressor lanes for the SRS test are set to the max OMA of 3.5 dBm which could be as much as 5.5 dB higher than the victim lane under test. Some other PMDs limit the difference in OMA between lanes at the Tx so that crosstalk at the receiver is minimized. Has this been done before for parallel MMF PMDs? I'm not sure but it could be helpful.

DISCUSS

Examples of PMDs where OMA_{outer} of the aggressor lanes is set to the maximum OMA_{outer} value

200GBASE-SR4	802.3cd
400GBASE-DR4	802.3cn

Example of PMDs where OMA_{outer} of the aggressor lanes is lower than maximum OMA_{outer} value.
These PMDs also specify a limit on the difference in the launch OMA_{outer} between two lanes.

400GBASE-FR4	802.3cu
400GBASE-ER8	802.3cn

Decision: No change. Keep OMA_{outer} of the aggressor lane at the maximum OMA_{outer} value.

David Lewis

3. The TECQ test was added in to 802.3cu as an alternative for links without significant dispersion (shorter fiber) where the power budget was used for additional connectors. I don't think that applies in the case of MMF links and we should consider removing the parameter.

WITHDRAWN

The waveform collected for TECQ will be used for overshoot/undershoot and Tx excursion measurements.
For the SR links, TECQ will be measured against the VR value for TECQ and using the reference equalizer defined in VR.

David Lewis

4. The transmitter power excursion limit was added in 802.3cu to limit receiver overshoot saturation when a short link was used. The overshoot limit of ~20% could cause that problem if there was too little attenuation. Since our maximum loss is only 1.8 dB, we might want to rationalize those two parameters into a single one (power excursion) to simplify the list of parameters.

WITHDRAWN

Keep both the Tx power excursion and overshoot/undershoot measurements because they represent two different limits of the Rx.

Greg Le Cheminant

We currently point to 121.8.5 for the TDECQ computation. I think the latest update for that came through the .cn project and currently is:

121.8.5.3 TDECQ measurement method

*P*th1, *P*th2, and *P*th3 are varied from their nominal values by up to ±1% of OMAouter in order to optimize TDECQ. The same three thresholds are used for both the left and the right histogram. When the larger of *SERL* and *SERR* is equal to the target SER of 4.8 × 10–4, and the value of σ_G cannot be increased by further optimization of the equalizer tap coefficients or the sub-eye threshold levels, then TDECQ is calculated.

Going back to my Dec 16 presentation
https://grouper.ieee.org/groups/802/3/db/public/adhoc/presentations/le_cheminant_3db_adhoc_01_121720.pdf, slide 11,
I would propose a change as follows:

121.8.5.3 TDECQ measurement method

Pth1, Pth2, and Pth3 are varied from their nominal values by up to ±1% of OMAouter in order to minimize the closure of each eye using a minimum mean squared error optimization . The same three thresholds are used for both the left and the right histogram.
When the larger of SERL and SERR is equal to the target SER of 4.8 × 10–4, and the value of σ_G cannot be increased by further reduction of eye closure through optimization of the equalizer tap coefficients or the sub-eye threshold levels, then TDECQ is calculated.

REVISED
No change to description of TDECQ measurement method.
Add editors' note. Use of minimum mean squared error optimization in place of optimization of TDECQ has been proposed.

Greg Le Cheminant

I think it is good to leverage the overshoot and undershoot methods from clause 140. However I think it is important to note that the test method and the spec limits were determined experimentally on physical .cu systems, rather than some sort of analysis to determine impact on the link. https://grouper.ieee.org/groups/802/3/cu/public/cu_adhoc/cu_archive/rodes_3cu_adhoc_030520_v2.pdf The spec limit was determined in the first round of experiments, and we actually developed an improved test method and setup and aligned it to agree with the spec that had been adopted. Expect that this project will need to do experimentation, as the system is different than that used in .cu. Specifically, the 1e-2 hit ratio as well as the spec limit are two knobs we can turn to limit transmitter performance. Hence the hit ratio for the test probably should also be TBD rather than 1e-2.

ACCEPT IN PRINCIPLE
Change hit ratio specification to 1E-2 TBC.

“Bucket” type comments from the editors

- **Overall**
  - Highlight external cross references in green
  - Change copyright year to 2021 in all footers
  - Sometimes the header is wrong (i.e. page 46)
  - Double check all cross references
- **Front matter**
  - Oxford comma in first sentence
  - Non-breaking space, second sentence
- **Introduction**
  - .3cr and .3cu have dates, add them to page 11
- **Clause 1**
  - Remove section 1.3 if we aren’t adding anything
- **Clause 30**
  - Page 8 looks like it’s extra
- **Clause 78**
  - Page 34 is extra. Page numbering seems off
- **Clause 91**
  - 91.7.3 last line in each table should be LR1 not FR1
- **Clause 116**
  - Table 116-4 resize columns
- **Clause 167**
  - 167.1 2nd paragraph cross ref Clause 45, later Clause 116 and 116.2,
  - Table 167-1 and 167-2: some clauses have periods
  - 167.1.1 Cross references in first two paragraphs
  - 167.5.1 Call out VR and SR in text for Fig 167.2, change label to include BASE
  - 167.5.4 cross references
  - 167.7 Cross reference to table 167-6
  - Add (in 802.3cu) when referencing 140.7.5b

Proposed next steps

- Motion to authorize creation of Draft 1.0
- Incorporate comments on Draft 0.2 into Draft 1.0
- Include Clause 45 in Draft 1.0
- Post Draft 1.0 by Wednesday April 21st
- Accept comments though comment tool through Wednesday May 5th
- Begin to review comments during interim meeting on May 13th