

12/18/17 NGMMF Study Group Ad Hoc Teleconference Meeting Notes

Group Name: IEEE 802.3 Next-generation 200 Gb/s and 400 Gb/s MMF PHYs Study Group Ad Hoc

Date/Location: Monday, December 18, 2017. Teleconference

Chair: Robert Lingle, Jr., Acting Chair NGMMF SG

Recording Secretary: Mabud Choudhury

Meeting Participants:

| | Name | Employer | Affiliation |
|----|------------------|--|-----------------------------------|
| 1 | Adrian Young | Leviton | Leviton |
| 2 | Ali Ghiasi | Ghiasi Quantum | Ghiasi Quantum and Huawei |
| 3 | Brett Lane | Panduit Corp. | Panduit Corp. |
| 4 | Bruce Chow | Corning Inc | Corning Inc |
| 5 | Darryl Heckle | Corning Inc | Corning Inc |
| 6 | David Law | HPE | HPE |
| 7 | David Piehler | Dell EMC | Dell EMC |
| 8 | Earl Parsons | CommScope | CommScope |
| 9 | Frank Chang | Inphi | Inphi |
| 10 | George Zimmerman | CME Consulting | CommScope |
| 11 | John Abbott | Corning Inc | Corning Inc |
| 12 | John Johnson | Broadcom Ltd | Broadcom Ltd |
| 13 | John Kamino | OFS | OFS |
| 14 | Jonas Li | ? | ? |
| 15 | Jonathan Ingham | Foxconn Interconnect Technology | Foxconn Interconnect Technology |
| 16 | Jose Castro | Panduit Corp. | Panduit Corp. |
| 17 | Kenneth Jackson | Sumitomo Electric Device Innovations USA | Sumitomo Electric Industries, LTD |
| 18 | Mabud Choudhury | OFS | OFS |
| 19 | Mark Gustlin | Xilinx | Xilinx |
| 20 | Mike Dudek | Cavium | Cavium |
| 21 | Paul Kolesar | CommScope | CommScope |
| 22 | Paul Neveux | Superior Essex | Superior Essex |
| 23 | Peter Pondillo | Corning Inc | Corning Inc |
| 24 | Piers Dawe | Mellanox | Mellanox |
| 25 | Rakesh Sambaraju | Nexans | Nexans |
| 26 | Rick Pimpinella | Panduit Corp. | Panduit Corp. |
| 27 | Robert Lingle | OFS | OFS |
| 28 | Steve Swanson | Corning Inc | Corning Inc |
| 29 | Sunny Xu | CommScope | CommScope |
| 30 | Zhaoping Yi | New H3C? | New H3C? |
| 31 | Zuowei Shen | Google | Google |

31 attendees participated in the 12/18/17 call. If you participated in the meeting but are not listed or if you attended and company employer/affiliation is incorrect, please email Mabud Choudhury, mchoudhury@ofsoptics.com with a correction.

Call to order/Meeting Start Time: 11:04 am Eastern Standard Time (US)

Chair's remarks:

Reminder for participants to record their attendance along with employer/affiliation to Mabud Choudhury at mchoudhury@ofsoptics.com

Reviewed Agenda, posted on:

http://www.ieee802.org/3/NGMMF/public/adhoc/lingle_ngmmf_01a_121817.pdf

Participation in IEEE 802 Meetings and Guidelines for IEEE-SA Meetings, including Patent Policy, reviewed (included with Agenda slides). No one indicated being unfamiliar with these policy slides.

Approval of minutes of previous meeting: minutes of previous meeting were posted prior to meeting, and were approved.

Approval of agenda: Agenda was approved.

Technical Topics:

1. Cost discussions with Q&A - David Law, Chair of 802.3:

David Law provided his perspective on 2012 slide deck "Presentation on Cost Discussions to IEEE 802.3 Working Group" by Michael A. Lindsay, Dorsey & Whitney LLP:

http://www.ieee802.org/3/NGMMF/public/adhoc/lindsay_01_0512_optx.pdf

Slide 2:

From IEEE-SA Standards Meetings Guidelines: "Relative costs, including licensing costs of essential patent claims, of different technical approaches may be discussed in standards development meetings."

Slide 4:

No survey should be performed without review from IEEE legal. If considering a survey, contact David Law first.

Slides 5 & 6:

Risks of cost discussions and why cost is so sensitive reviewed.

Slide 7:

Discussion of relative costs ok when comparing different technical approaches. Technical considerations should be the main focus of discussions.

Slide 8:

Permit sufficient discussion to enable participants to understand the relative cost differentials.

Slide 10:

Make clear what is being stated. Goal is to reach consensus.

Slides 11, 12, 13, 14:

Examples along with specific questions related to NGMMF SG reviewed and extensively discussed.

Recommendations:

- Review contributions that include relative cost comparisons with sub-Group Chair, SG Chair in this case.
- Review IEEE Standards Antitrust and Competition Policy
<http://standards.ieee.org/develop/policies/antitrust.pdf>

Action Item: if there are best practices or good benchmarks for contributions with relative cost comparisons as part of evaluating technical approaches, they will be posted on reflector.

2. Preparation for Geneva Interim – Robert Lingle:

Reviewed Chair's slides 9-13 from

http://www.ieee802.org/3/NGMMF/public/adhoc/lingle_ngmmf_01a_121817.pdf

Slide 9:

Possible boilerplate objectives reviewed and discussed.

Slide 11:

Possible objective that states the PMDs defined in the project will be able to use previously defined PCS & FEC from 802.3bs. See "400/200GbE PCS Overview" presentation summary below.

Slide 13:

Summarizes and lists key contributions needed and/or anticipated for Geneva SG meeting.

3. 400/200GbE PCS Overview – Mark Gustlin, Xilinx:

http://www.ieee802.org/3/NGMMF/public/adhoc/gustlin_ngmmf_01a_121817.pdf

Early draft of contribution reviewed and discussed.

Slide 3:

PMA reference will be added to possible implementation diagrams.

Slide 4:

802.3bs PCS processing flow was shown and reviewed.

Slide 5:

802.3bs PMA reviewed.

Slide 6:

Example of 400GBASE-SR4.2 reviewed, PCS lanes are 2:1 multiplexed onto each electrical and optical 'lane', BER budget is split out across AUI interfaces and the PMD budget matching the error rates and statistics utilized in 802.3bs, then the PCS and FEC from 802.3bs is directly applicable to NGMMF project. However, if there are contributions that require different FEC or latency, then PCS will need to be open. 100 Gb/s PAM4, VCSEL would not drive new FEC or PCS.

Meeting closed: 1:01 pm Eastern Standard Time.

Next Meeting: Thursday, January 11, 2018, 11am – 1pm Eastern Standard Time (US). Teleconference