Approved Minutes

IEEE P802.3cm 400 Gb/s over Multimode Fiber Task Force

During IEEE 802.3 Interim Meeting Week
January 17-18, 2019
Long Beach, CA, US
Prepared by Mabud Choudhury

Group Name: IEEE P802.3cm 400 Gb/s over Multimode Fiber Task Force
Date/Location: Thursday, January 17, 2019 and Friday, January 18, 2019. Long Beach, CA, US
Chair: Robert Lingle, Jr.
Editor: Jonathan Ingham
Editor: Jonathan King (on leave)
Recording Secretary: Mabud Choudhury
Meeting Participants: Attendance is listed in Appendix A (participants)

Call to order:
IEEE P802.3cm 400 Gb/s over Multimode Fiber (400G over MMF) Task Force (TF) meeting was convened at 1:00 pm Pacific Standard Time/PST (UTC -8), Thursday, January 17, 2019 by Robert Lingle, Jr., 802.3cm Task Force Chair.

Mr. Lingle welcomed attendees to the IEEE P802.3cm 400G over MMF TF meeting and requested meeting participants to introduce themselves.

The Chair then proceeded with the agenda.

Presentation #1:
Title: "IEEE P802.3cm 400G over MMF Task Force Agenda and General Information"
Presenter: Robert Lingle, Jr., Chair
http://www.ieee802.org/3/cm/public/January19/agenda_3cm_01_0119.pdf
Chair reviewed Agenda.

Motion #1:
Move to approve the Agenda, Slide 2 of
http://www.ieee802.org/3/cm/public/January19/agenda_3cm_01_0119.pdf

- Moved by Vipul Bhatt
- Seconded by Earl Parsons
- Motion approved by voice vote without objection. (Procedural > 50%)

Motion #2:
Move to approve meeting minutes, previously posted, from September 10, 2018 Spokane Interim IEEE P802.3cm Task Force meeting:
http://www.ieee802.org/3/cm/public/November18/unapproved_meeting_minutes_3cm_01_1118.pdf

- Moved by Ken Jackson
- Seconded by Steve Trowbridge
- Motion approved by voice vote without objection. (Procedural > 50%)

Chair read aloud and reviewed IEEE-SA Meeting Guidelines, including patent policy, and IEEE 802 Participation Policy. There were no questions from group based on guidelines and policy review.

Mr. Lingle provided Task Force information, access to the home page and reflector.
Chair noted Task Force Editors: Jonathan Ingham, affiliated with FIT and Jonathan King (on leave), affiliated with Finisar; Recording Secretary: Mabud Choudhury, affiliated with OFS.

Chair provided P802.3cm 400G over MMF Task Force Private Area information: http://www.ieee802.org/3/cm/private/index.html Username and Password were provided. Draft versions of the standard are posted in the Private Area.

Mr. Lingle reminded everyone to sign-in via IMAT on-line attendance and to sign-in on Attendance Book. Chair provided Interim Session password for IMAT.

Chair reviewed ground rules, role of the Chair, overall IEEE structure, important bylaws, rules, and associated references links, overall IEEE 802.3 standards process focusing in on Task Force phase. Mr. Lingle reviewed the timeline goals, of authorizing D1.2 by this meeting, authorizing D3.0 by July 2019 and completing standard by December 2019. Chair reviewed adopted timeline from September Spokane meeting and indicated that timeline would have to be updated since D1.2 was not in original TF adopted timeline, but will now be required since earliest possible authorization of WG ballot draft, D2.0, is now March, 2019 (instead of originally planned January, 2019 authorization of D2.0).

Mr. Lingle reviewed approved PAR for the "400G over MMF Task Force" and the key Objectives approved by the 802.3 Working Group.

Mr. Lingle provided Ad Hoc report, summarizing 2 web/teleconference meetings since November Plenary.

Chair then covered:

- Goals for meeting:
    - Do the work necessary to authorize editors to generate D1.2
- Big Ticket Items:
    - Draft D1.1
        - Comment resolution, discussion, next steps
            - Modal noise (MN) penalty
            - Mode Partition Noise (MPN) penalty
            - RMS spectral width for 910nm wavelength

Schedules for Thursday, January 17 and Friday, January 18 were reviewed.

Chair reminded everyone to check online schedule http://schedule.802world.com/schedule/schedule/show for latest room assignment for Friday's meeting.

Future meeting dates and locations were reviewed.

Presentation #2:
Title: "Editorial report and comment agenda"
Presenter: Jonathan Ingham
http://www.ieee802.org/3/cm/public/January19/ingham_3cm_01_0119.pdf
Chair indicated that Editor Jonathan King was on leave. Mr. Lingle acknowledged and thanked Pete Anslow for providing support and guidance to the editorial team. Chair acknowledged and thanked Jonathan Ingham for taking on the full responsibilities of Editor in Jonathan King's absence. Then Jonathan Ingham presented key dates associated with Draft 1.1, comments received, D1.1 comments received statistics, meeting goals related to comment resolution, list of comments to be resolved (27 comments total, with 6 associated hyperlinked presentations for 7 of the comments) by Task Force during this meeting.

Comment resolution began
Presentation #3:
Title: "MMF TDECQ / SECQ discrepancies and corner cases"
Presenter: Piers Dawe
http://www.ieee802.org/3/cm/public/January19/dawe_3cm_01a_0119.pdf
Updated version of http://www.ieee802.org/3/cm/public/November18/dawe_3cm_01_1118.pdf
TDECQ map comparing MMF TDECQ/SECQ with that for SMF – nominal and actual was presented. New material about transition time on slides 6 and 7 (D1.1 comments 8 and 9). New material about over-emphasis on slides 6 and 8 (D1.1 comments 5 and 6). Technical discussion followed. Clarifying questions were asked and answered.

Presentation #4:
Title: "Modal Noise Measurements with 25G VCSELs. Re: Comment IDs 4 and 10 against D1.1"
Presenter: Rick Pimpinella
http://www.ieee802.org/3/cm/public/January19/castro_3cm_01_0119.pdf
Updated version of http://www.ieee802.org/3/cm/public/November18/castro_3cm_01_1118.pdf based on feedback from Ad Hoc meetings. Presentation addressed D1.1 comments 4 and 10. Presenter showed an experimental method and updated data - new experiments using a set of spliced fiber patch cords with specific losses - for estimating the magnitude of noise produced by lateral misalignment of fibers. Presentation indicates values for (σ1+σ0)/OMA around 0.03 to 0.04 producing a MN penalty range between of 0.23 dB to 0.45 dB for PAM-4 when all three eyes are including in the analysis. Technical discussion followed. Clarifying questions were asked and answered.

Presentation #5:
Title: "25 Gbaud PAM-4 transmission and modal noise. RE: comments 4 & 10 against D1.1"
Presenter: Earl Parsons
http://www.ieee802.org/3/cm/public/January19/sun_3cm_01a_0119.pdf (Note: link is for updated version of presentation, 01a, posted after the meeting to correct Slide 4, "EMBc" to "EMB" and Slide 11, correcting mislabeling of patch-cords used in 150m).
A study – claiming to be highly relevant but not necessarily thorough - of modal noise (MN) with 25 Gbaud PAM-4 VCSELs was presented to resolve D1.1 comments 4 and 10. Authors recommended further study of MN in the presence of longer lengths of fiber. Technical discussion followed. Clarifying questions were asked and answered.

Presentation #6:
Title: "PAM4 Transmission and MPN. Re: Comment IDs 4 and 10 against D1.1"
Presenter: Earl Parsons
http://www.ieee802.org/3/cm/public/January19/parsons_3cm_01_0119.pdf
Presentation compared measured total transmission penalty to MPN penalty predicted by model with 4th power dependence on product of spectral width and fiber length to address D1.1 comments 4 and 10. Presentation concluded that PAM4 transmission experiments indicate that MPN penalty is lower than predicted at high predicted values of MPN. Technical discussion followed. Clarifying questions were asked and answered.

3:05 pm PST (UTC -8) break. Resumed meeting at 3:37 pm PST.

Comment resolution continued

Presentation #7:
Title: "25 Gbaud PAM-4 transmission and mode partition noise. RE: comments 4 & 10 against D1.1"
Presenter: Robert Lingle, Jr.
http://www.ieee802.org/3/cm/public/January19/lingle_3cm_01a_0119.pdf (Note: link is for updated version of presentation, 01a, posted after the meeting to correct Slide 4, "EMBc" to "EMB" and Slide 9, correcting slide title and mislabeling of patch-cords used in 150m).
This study – claiming to be highly relevant but not necessarily thorough - of mode partition noise (MPN) with 25 Gbaud PAM-4 VCSELs presented experimental data regarding D1.1 comments 4 and 10. Based on experimental data and comparison to calculated Ogawa-Agrawal MPN penalties, authors concluded that it is not clear that there is any reason to increase the MPN penalty allocation for SR4.2 budget. Technical discussion followed. Clarifying questions were asked and answered.

Presentation #8:
Title: "RMS Spectral Width. Re: Comment ID 24 against D1.1"
Presenter: Ramana Murty
http://www.ieee802.org/3/cm/public/January19/murty_3cm_01_0119.pdf
Updated version of http://www.ieee802.org/3/cm/public/November18/murty_3cm_01_1118.pdf
Proposal to change maximum RMS spectral width on the 900 – 918 nm channel from 0.60 to 0.65 nm; technical contribution is in support of D1.1 comment 24. Technical discussion followed. Clarifying questions were asked and answered. TF group consensus is to make proposed change of maximum RMS spectral width on the 900 – 918 nm channel from 0.60 to 0.65 nm and to change the TDECQ reference response bandwidth from 9 GHz to 8.96 GHz.

Straw Poll #1:
Straw poll to assess consensus during comment resolution.

- For Comment ID 27, see http://www.ieee802.org/3/cm/comments/P802p3cm_D1p1_comments_final_by_ID.pdf
- Do you support the proposed change in the commenter's suggested remedy?
    - Y: 3 N: 12

Meeting broke for day at 6:00 pm PST (UTC -8).

Friday, January 18, 2019

Meeting reconvened at 8:02 am PST (UTC -8).

Comment resolution resumed

Comment resolution concluded.

Motion #3:
Move to:

- Generate Draft 1.2 for Task Force recirculation from Draft 1.1 and the closed comments
- At the chair's discretion, pre-submit Draft 1.2 to IEEE 802.3 in anticipation of requesting moving to WG Ballot in March 2019

Moved by: Pete Anslow 2nd: Mike Dudek

- Technical : >= 75%
- Results: Yes: 18 No: 1 Abstain: 1
- Motion Passes!

Final responses to comments were posted after the meeting:
http://www.ieee802.org/3/cm/comments/P802p3cm_D1p1_comments_final_by_clause.pdf
http://www.ieee802.org/3/cm/comments/P802p3cm_D1p1_comments_final_by_ID.pdf

Presentation #9:
Title: "Updated Timeline"
Presenter: Mabud Choudhury
http://www.ieee802.org/3/cm/public/January19/timeline_3cm_01_0119.pdf
Presented proposed updated timeline – moves WG ballot D2.0 authorization from January 2019 (per original timeline adopted by TF in September 2018) to March 2019, and eliminates D2.2 (timeline adopted in September had 3 WG ballot drafts, D2.0, D2.1 and D2.2, while proposed updated timeline has 2 WG ballot drafts, D2.0 and D2.1), maintains standard completion date of December 2019. Discussion followed.

Motion #4:
Move to adopt the P802.3cm proposed updated timeline in slide 3 of
http://www.ieee802.org/3/cm/public/January19/timeline_3cm_01_0119.pdf

Moved by: Mike Dudek 2nd: Vipul Bhatt

- Technical : >= 75%
- Results: Yes: 22 No: 0 Abstain: 0
- Motion Passes!

Straw Poll on Attendance:

Attend 802.3 plenary, March 2019 Vancouver, BC Canada:
– Y: 16 N: 0 M: 9

Attend 802 interim, May 2019 Salt Lake City, UT, USA:
– Y: 15 N: 1 M: 9

Chair announced TF Ad Hoc web/telecom meetings on 2/7, 2/14 and 2/28 from Noon to 2pm Eastern Standard Time/ EST (UTC -5) Thursdays.

Motion #5:
Move to Adjourn:

- Moved by: Earl Parson
- Seconded by: Peter Stassar
- Approved by voice vote without objection. (Procedural > 50%)

The Meeting was adjourned at 9:40 am, PST (UTC -8), Friday, January 18, 2019.

Next Meeting:
Next in-person IEEE 802.3cm Task Force meeting is scheduled for week of March 11th, 2019 for IEEE 802.3 Plenary, Vancouver, BC Canada.

Appendix A: Attendees at the IEEE 802.3 400 Gb/s over Multimode Fiber Task Force, 17-18 January, 2019.

33 individuals signed in on Thursday, 17 January.
25 individuals signed in on Friday, 18 January.

	Last Name	First Name	Employer	Affiliation	17-Jan	18 Jan
1	Afshar	Alex	DustPhotonics	DustPhotonics	x	x
2	Anslow	Pete	CIENA	CIENA	x	x
3	Baca	Rich	Microsoft	Microsoft	x	
4	Bhatt	Vipul	Finisar	Finisar	x	x
5	Chen	David	AOI	AOI	x	
6	Chen	Henry	Broadcom	Broadcom	x	
7	Choudhury	Mabud	OFS	OFS	x	x
8	Dawe	Piers	Mellanox	Mellanox	x	x
9	Dudek	Mike	Marvell	Marvell	x	x
10	Hasharoni	Kobi	DustPhotonics	DustPhotonics	x	x
11	Ingham	Jonathan	Foxconn Interconnect Technology	Foxconn Interconnect Technology	x	x
12	Jackson	Ken	Sumitomo	Sumitomo	x	x
13	Johnson	John	Broadcom	Broadcom	x	
14	Le Cheminant	Greg	Keysight Technologies	Keysight Technologies	x	x
15	Lewis	Dave	Lumentum	Lumentum	x	
16	Lingle Jr	Robert	OFS	OFS	x	x
17	Maki	Jeff	Juniper Networks	Juniper Networks	x	
18	Masuda	Takeo	OITDA/PETRA	OITDA/PETRA	x	x
19	Murty	Ramana	Broadcom	Broadcom	x	x
20	Nakamoto	Edward	Spirent Communications	Spirent Communications		x
21	Parsons	Earl	CommScope	CommScope	x	x
22	Piehler	David	Dell EMC	Dell EMC	x	

23	Pham	Phong	US Conec	US Conec	x	
24	Pimpinella	Rick	Panduit	Panduit	x	
25	Remein	Duane	Huawei	Huawei	x	
26	Sambaraju	Rakesh	Nexans	Nexans	x	x
27	Sekel	Steve	Keysight Technologies	Keysight Technologies		x
28	Shuai	Jialong	Huawei	Huawei	x	x
29	Stassar	Peter	Huawei	Huawei	x	x
30	Swanson	Steve	Corning	Corning	x	x
31	Takahashi	Tadashi	Nitto Denko Corp.	Nitto Denko Corp.	x	x
32	Takayama	Kazuya	Nitto Denko Corp.	Nitto Denko Corp.	x	x
33	Terada	Masaru	OFS	OFS	x	
34	Trowbridge	Steve	Nokia	Nokia	x	
35	Wu	Mardin	MediaTek	MediaTek		x
36	Young	Adrian	Leviton Mfg.	Leviton Mfg.	x	x
37	Zhuang	Yan	Huawei	Huawei		x