

Approved Minutes  
**IEEE P802.3cm 400 Gb/s over Multimode Fiber Task Force Meetings**  
Co-Located Interim and during IEEE 802.3 Plenary Meeting Week  
March 11, 2019  
Vancouver, BC, Canada  
Prepared by Mabud Choudhury

**Group Name:** IEEE P802.3cm 400 Gb/s over Multimode Fiber Task Force  
**Meeting:** Co-Located Interim  
**Date/Location:** Monday, March 11, 2019. Vancouver, BC, Canada  
**Chair:** Robert Lingle, Jr.  
**Chief Editor:** Jonathan Ingham  
**Editor:** Jonathan King  
**Recording Secretary:** Mabud Choudhury  
**Meeting Participants:** Attendance is listed in Appendix A (40 attendees)

**Call to order:**

IEEE P802.3cm 400 Gb/s over Multimode Fiber (400G over MMF) Task Force (TF) Co-Located Interim meeting was convened at 8:00 am Pacific Daylight Time/PDT (UTC -7), Monday, March 11, 2019 by Robert Lingle, Jr., 802.3cm Task Force Chair.

Mr. Lingle welcomed attendees to the IEEE P802.3cm 400G over MMF TF co-located interim 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/March19/agenda\\_3cm\\_01\\_0319.pdf](http://www.ieee802.org/3/cm/public/March19/agenda_3cm_01_0319.pdf)

Chair reviewed Agenda.

**Motion #1:**

Move to approve the Agenda, Slide 2 of

[http://www.ieee802.org/3/cm/public/March19/agenda\\_3cm\\_01\\_0319.pdf](http://www.ieee802.org/3/cm/public/March19/agenda_3cm_01_0319.pdf)

- Moved by Paul Neveux
- Seconded by Paul Kolesar
- Motion approved by voice vote without objection. (Procedural > 50%)

**Motion #2:**

Move to approve meeting minutes, previously posted, from Long Beach Interim IEEE P802.3cm Task Force meeting:

[http://www.ieee802.org/3/cm/public/January19/unapproved\\_meeting\\_minutes\\_3cm\\_01\\_0119.pdf](http://www.ieee802.org/3/cm/public/January19/unapproved_meeting_minutes_3cm_01_0119.pdf)

- Moved by Mike Dudek
- Seconded by Pete Anslow
- 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, 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 requested everyone to sign-in on Attendance Book.

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 D2.0 by this meeting and requesting that IEEE 802.3 WG progress the Draft to WG Ballot, authorizing D3.0 by July 2019 and completing standard by December 2019. Chair reviewed adopted timeline from January Long Beach Interim.

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

Chair provided Ad Hoc report, summarizing 1 web/teleconference meetings since January Interim.

Chair then covered:

- Goals for meeting:
  - Do the work necessary to authorize editors to generate D2.0
- Big Ticket Items:
  - Draft D1.2
    - Comment resolution, discussion, next steps
      - Modal noise (MN) penalty

Schedules for co-located interim TF meeting on Monday, March 11, and plenary TF meeting on Monday, March 11 and Tuesday, March 12 were reviewed. Chair indicated that meeting on Tuesday, March 12 may not be necessary based on progress of agenda.

Chair reminded everyone to check online schedule for latest room assignments.

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\\_0319.pdf](http://www.ieee802.org/3/cm/public/January19/ingham_3cm_01_0319.pdf)

Mr. Lingle acknowledged and thanked Pete Anslow for providing continued support and guidance to the editorial team. Chair acknowledged and thanked Chief Editor Jonathan Ingham and welcomed back Editor Jonathan King. Then Jonathan Ingham presented key dates associated with Draft 1.2, comments

received, D1.2 comments received statistics, along with D1.0 and D1.1 comments received statistics, meeting goals related to comment resolution, list of comments to be resolved (14 comments total, with 2 associated hyperlinked presentations for 2 of the comments) by Task Force during this meeting.

Comment resolution began

**Presentation #3:**

**Title:** “Modal noise measurements relevant to 400G-SR4.2. Re: Comment IDs 1 and 7 against D1.2”

**Presenter:** Earl Parsons

[http://www.ieee802.org/3/cm/public/March19/sun\\_3cm\\_01a\\_0319.pdf](http://www.ieee802.org/3/cm/public/March19/sun_3cm_01a_0319.pdf) (Note: link is for updated version of presentation, 01a, posted after the meeting to add Slide 2 with supporter and to correct Slide 13, removing last bullet).

Study to measure penalties due to modal noise, using real parts, in back-to-back (BtB) and long length regimes was presented. As update to presentation from last ad hoc meeting, based on feedback during ad hoc meeting, authors provided encircled flux results for transmitters,  $T_x$  SECQ with long fibers and offset jumpers with and without shaker. Technical discussion followed. Clarifying questions were asked and answered. Feedback was provided on additional measurements.

**Motion #3:**

Move to Adjourn Co-Located Interim Meeting:

- Moved by: Paul Neveux
- Seconded by: Paul Kolesar
- Approved by voice vote without objection. (Procedural > 50%)

The Co-Located Interim Meeting was adjourned at 9:55 am, PDT (UTC -7), Monday, March 11, 2019.

**Appendix A: Attendees at the IEEE 802.3 400 Gb/s over Multimode Fiber Task Force Co-Located Interim Meeting, 11 March, 2019.**

40 individuals signed in on Monday, 11 March, 8:00 am – 9:55 am PDT (UTC -7)

	Last Name	First Name	Employer	Affiliation	11-Mar
1	Abbott	John	Corning	Corning	x
2	Andrä	Stefan	SEI ANTech-Europe GmbH	SEI ANTech-Europe GmbH	x
3	Anslow	Pete	Ciena	Ciena	x
4	Baca	Rich	Microsoft	Microsoft	x
5	Chang	Frank	Source Photonics	Source Photonics	x
6	Choudhury	Mabud	OFS	OFS	x
7	Dawe	Piers	Mellanox	Mellanox	x
8	DeAndrea	John	Finisar	Finisar	x
9	Dudek	Mike	Marvell	Marvell	x
10	Hasharoni	Kobi	DustPhotonics	DustPhotonics	x
11	He	Xiang	Huawei	Huawei	x
12	Hopkinson	Wayne	CommScope	CommScope	x
13	Ingham	Jonathan	Foxconn Interconnect Technology	Foxconn Interconnect Technology	x

14	Ishibe	Kazuhiko	Anritsu	Anritsu	x
15	Jackson	Ken	Sumitomo	Sumitomo	x
16	King	Jonathan	Finisar	Finisar	x
17	Kolesar	Paul	CME Consulting	CommScope	x
18	Le Cheminant	Greg	Keysight Technologies	Keysight Technologies	x
19	Lingle Jr	Robert	OFS	OFS	x
20	Lu	Yuchun	Huawei	Huawei	x
21	Malicoat	David	Malicoat Networking Solutions	SENKO/Aquantia	x
22	Marques	Flavio	Furukawa Electric LatAm	Furukawa Electric LatAm	x
23	Murphy	Sean	Texas Instruments	Texas Instruments	x
24	Neveux	Paul	Superior Essex	Superior Essex	x
25	Parsons	Earl	CommScope	CommScope	x
26	Piehler	David	Dell EMC	Dell EMC	x
27	Pham	Phong	US Conec	US Conec	x
28	Raju	Parthasarathy	Tektronix	Tektronix	x
29	Sekel	Steve	Keysight Technologies	Keysight Technologies	x
30	Shiino	Masato	Furukawa Electric	Furukawa Electric	x
31	Shuai	Jialong	Huawei	Huawei	x
32	Stassar	Peter	Huawei	Huawei	x
33	Swanson	Steve	Corning	Corning	x
34	Takahashi	Tadashi	Nitto Denko Corp.	Nitto Denko Corp.	x
35	Takayama	Kazuya	Nitto Denko Corp.	Nitto Denko Corp.	x
36	Trowbridge	Steve	Nokia	Nokia	x
37	Withey	James	Fluke Networks	Fluke Networks	x
38	Xu	Yu	Huawei	Huawei	x
39	Young	Adrian	Leviton Mfg.	Leviton Mfg.	x
40	Young	Jim	CommScope	CommScope	x

**Group Name:** IEEE P802.3cm 400 Gb/s over Multimode Fiber Task Force  
**Meeting:** TF meeting during IEEE 802.3 Vancouver Plenary  
**Date/Location:** Monday, March 11, 2019. Vancouver, BC, Canada  
**Chair:** Robert Lingle, Jr.  
**Chief Editor:** Jonathan Ingham  
**Editor:** Jonathan King  
**Recording Secretary:** Mabud Choudhury  
**Meeting Participants:** Attendance is listed in Appendix B (23 attendees)

**Call to order:**

IEEE P802.3cm 400 Gb/s over Multimode Fiber (400G over MMF) Task Force (TF) meeting during Vancouver IEEE 802.3 Plenary was convened at 1:11 pm Pacific Daylight Time/PDT (UTC -7), Monday, March 11, 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.

Chair highlighted the IEEE 802 Participation policy and the IEEE-SA Patent policy for those who were not in the Co-located Interim session.

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/March19/agenda\\_3cm\\_01\\_0319.pdf](http://www.ieee802.org/3/cm/public/March19/agenda_3cm_01_0319.pdf)

Chair reviewed Agenda.

**Motion #4:**

Move to approve the Agenda for Plenary TF Meeting, Slide 2 of

[http://www.ieee802.org/3/cm/public/March19/agenda\\_3cm\\_01\\_0319.pdf](http://www.ieee802.org/3/cm/public/March19/agenda_3cm_01_0319.pdf)

- Moved by Jonathan King
- Seconded by Paul Kolesar
- Motion approved by voice vote without objection. (Procedural > 50%)

Mr. Lingle requested that everyone to sign-in on Attendance Book (IMAT on-line attendance was open only for 802.3 Working Group Opening Plenary).

Comment resolution resumed (from prior Co-Located Interim Meeting)

**Presentation #2:**

**Title:** "Modal noise update. Re: Comment IDs 1 and 7 against D1.2"

**Presenter:** Jonathan King

[http://www.ieee802.org/3/cm/public/March19/king\\_3cm\\_01\\_0319.pdf](http://www.ieee802.org/3/cm/public/March19/king_3cm_01_0319.pdf)

Presentation provided background on, analysis of and summary of modal noise (MN), FEC, NRZ vs. PAM4, connection loss, mode selective loss (MSL), and basis for allocation of MN and MPN penalties for 400G-SR8. Technical discussion followed. Clarifying questions were asked and answered. Request was made to obtain data from Pepeljugin for MN penalty vs. MSL for  $k_{MPN} = 0.1$  only (referencing Slide 6) as follow-up.

**Straw Poll #1:**

- For Comment ID 11, see [http://www.ieee802.org/3/cm/comments/P802p3cm\\_D1p2\\_comments\\_final\\_by\\_ID.pdf](http://www.ieee802.org/3/cm/comments/P802p3cm_D1p2_comments_final_by_ID.pdf)
- Do you support (Chicago rules):
  - A: The commenter's Suggested Remedy:
  - B: The commenter's Suggested Remedy modified to include the fiber type of OM4?
  - C: No change?
- A: 3                      B: 9                      C:7

Comment resolution concluded.

**Motion #5:**

Move to:

- Generate Draft 2.0 from Draft 1.2 and closed comments
- Request that IEEE 802.3 WG progress the Draft to WG Ballot

Moved by: Earl Parsons                      2nd: Paul Neveux

- Technical : >= 75%
- Results: Yes: 15                      No: 0                      Abstain: 0
- Motion Passes!

Final responses to comments were posted after the meeting:

[http://www.ieee802.org/3/cm/comments/P802p3cm\\_D1p2\\_comments\\_final\\_by\\_clause.pdf](http://www.ieee802.org/3/cm/comments/P802p3cm_D1p2_comments_final_by_clause.pdf)

[http://www.ieee802.org/3/cm/comments/P802p3cm\\_D1p2\\_comments\\_final\\_by\\_ID.pdf](http://www.ieee802.org/3/cm/comments/P802p3cm_D1p2_comments_final_by_ID.pdf)

**Straw Poll on Attendance:**

Attend 802.3 interim, May 2019 Salt Lake City, UT, USA:

– Y: 10                      N: 1                      M: 5

Attend 802.3 plenary, July 2019 Vienna, Austria:

– Y: 7                      N: 4                      M: 3

3:32 pm PDT (UTC -7) break. Resumed meeting at 3:54 pm PDT.

**Presentation #4:**

**Title:** “Proposed modification to clause 150.5.1 PMD block diagram Figure 200-2-Block diagram for 400GBASE-SR4.2 transmit/receive paths”

**Presenter:** Rick Pimpinella

[http://www.ieee802.org/3/cm/public/March19/pimpinella\\_3cm\\_01\\_0319.pdf](http://www.ieee802.org/3/cm/public/March19/pimpinella_3cm_01_0319.pdf)

Presentation on proposal to modify clause 150.5.1 PMD block diagram Figure 200-2.

Technical discussion followed. Clarifying questions were asked and answered. Suggestions to change labeling for wavelengths,  $\lambda$ , and lanes, L for proposal.

Chair announced TF Ad Hoc web/telecom meetings on April 4, 2019, April 25, 2019 and May 9, 2019 from Noon to 2pm Eastern Standard Time/ EDT (UTC -4) Thursdays.

**Motion #6:**

Move to Adjourn Plenary TF Meeting:

- Moved by: Paul Neveux
- Seconded by: Paul Kolesar
- Approved by voice vote without objection. (Procedural > 50%)

The Meeting was adjourned at 4:24 pm, PDT (UTC -7), Monday, March 11, 2019.

**Next Meeting:**Next in-person IEEE 802.3cm Task Force meeting is scheduled for week of May 20<sup>th</sup>, 2019 for IEEE 802.3 Interim, Salt Lake City, UT, USA.**Appendix B: Attendees at the IEEE 802.3 400 Gb/s over Multimode Fiber Task Force Meeting During Vancouver Plenary, 11 March, 2019.**

40 individuals signed in on Monday, 11 March, 1:11 pm – 4:24 am PDT (UTC -7)

	Last Name	First Name	Employer	Affiliation	11-Mar
1	Abbott	John	Corning	Corning	x
2	Anderson	Ben	U.S. Federal Government	U.S. Federal Government	x
3	Bernstein	Gary	Leviton	Leviton	x
4	Choudhury	Mabud	OFS	OFS	x
5	Dawe	Piers	MellanoX	MellanoX	x
6	Dudek	Mike	Marvell	Marvell	x
7	Hasharoni	Kobi	DustPhotonics	DustPhotonics	x
8	Horner	Rita	Synopsys	Synopsys	x
9	Ingham	Jonathan	Foxconn Interconnect Technology	Foxconn Interconnect Technology	x
10	King	Jonathan	Finisar	Finisar	x
11	Kolesar	Paul	CME Consulting	CommScope	x
12	Lambrecht	Frank	Gigamon	Gigamon	x
13	Lingle Jr	Robert	OFS	OFS	x
14	Marques	Flavio	Furukawa Electric LatAm	Furukawa Electric LatAm	x
15	Neveux	Paul	Superior Essex	Superior Essex	x
16	Ogawa	Daisuke	NTT Electronics	NTT Electronics	x
17	Palkert	Tom	Macom	Macom	x
18	Parsons	Earl	CommScope	CommScope	x
19	Pimpinella	Rick	Panduit	Panduit	x
20	Sayre	Ed	Samtec	Samtec	x
21	Swanson	Steve	Corning	Corning	x
22	Young	Adrian	Leviton Mfg.	Leviton Mfg.	x
23	Young	Jim	CommScope	CommScope	x