Approved Minutes

IEEE P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force Telephonic Interim Meeting, November 5, 2020 Interim

WebEx Meeting
November 5, 2020
Prepared by Mabud Choudhury

Group Name: IEEE P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force
Date/Location: Thursday, November 5, 2020. Telephonic meeting.
Chair: Robert Lingle, Jr, affiliated with OFS
Recording Secretary: Mabud Choudhury, affiliated with OFS
Meeting Participants: Attendance is listed in Appendix A (45 attendees – based on official IMAT attendance list – plus presenters; 55 Webex attendees)

Call to order:
IEEE P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force (TF) Telephonic Interim meeting was convened at 12:01 PM Eastern Daylight Time (EST/ UTC -5), Thursday, November 5, 2020 by Robert Lingle, Jr., TF Chair.

Mr. Lingle welcomed attendees. He requested that each attendee indicate their first name, last name, and affiliation via Webex name displayed (preferred) or via chat to everyone.

Chair's Presentation:
Title: "Agenda and General Information"
Presenter: Robert Lingle, Jr. (OFS)
agenda_3db_01_110520.pdf

Mr. Lingle then proceeded with reviewing the **Agenda** and asked if there any modifications, additions, or deletions? There were none

- Welcome
- Approve agenda
- Attendance
- Approve meeting minutes for October Interim Teleconference
- Reflector and web
- Policies

Call for Patents. IEEE Patent Policy reminder: http://www.ieee802.org/3/patent.html
IEEE Copyright reminder: https://standards.ieee.org/ipr/index.html
IEEE Participant reminder: http://www.ieee802.org/devdocs.shtml

- Contributions

"Applications of MM Technology in Alibaba DC Networks" - Chongjin Xie (affiliated with Alibaba Group)
"Fiber to machine" - Zuowei Shen (affiliated with Google)

- Chair's discussion & straw polls
- Future meetings
- Adjourn

Motion #1:
Move to approve the Agenda for Interim TF Teleconference,
Slide 3 of agenda_3db_01_110520.pdf

- M: Kent Lusted
- S: John Abbott
- Approved by unanimous consent. (Procedural > 50%)

Agenda approved at 12:05 PM

Attendance: Chair requested that everyone log in to http://imat.ieee.org/
to officially record their attendance. Session code was provided.

Approve Meeting Minutes for October 29 Telephonic Interim. Mr. Lingle asked if there were any corrections/updates to the posted unapproved meeting minutes. There were none.

Motion #2:
Move to approve meeting minutes for October 29, 2020 IEEE P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force Telephonic Plenary meeting:
unapproved_meeting_minutes_3db_01_1020.pdf

- M: John Abbott
- S: Earl Parsons
- Approved by unanimous consent. (Procedural > 50%)

Reflector and Web: Chair showed the links to the IEEE 802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force page, and the email reflector.

Chair reviewed:

IEEE SA Patent Policy: Mr. Lingle provided overview of slides 8-9 of agenda_3db_01_110520.pdf.
Chair made **call of essential patents** at 12:08 PM. No one indicated any essential patents.

IEEE SA Copyright Policy: Mr. Lingle showed slide 10 of agenda_3db_01_110520.pdf entitled "IEEE SA Copyright Policy" overview

IEEE SA Participation Policy: Mr. Lingle showed the participation policy overview slide 11 of agenda_3db_01_110520.pdf .

Contribution #1:
Title: "Applications of MM Technology in Alibaba DC Networks"
Presenter: Chongjin Xie (affiliated with Alibaba Group)
xie_3db_01_110520.pdf

- Presentation provided

    - Overview and of Alibaba DC networks - Server – TOR, TOR – Aggregation, Aggregation – Core - MM links for 100G (4 x 25G), 200G (4 x 50G) & 400G (8 x 50G), and 400G (4 x 100G) networks.
    - MM link needs for Alibaba 400G (4 x 100G) networks:
        - If MM reaches 30 m
            - Can be used as AOC (server – TOR)
        - If MM reaches 50 m
            - Can be used TOR – Aggregation
        - If reaches 80 m
            - Can be used within a building
        - If reaches 100 m
            - Can be used the same way as 100G networks
    - That for 40G networks, 90% MM. For 100G networks, 67% MM. Expect to use MM for next generation networks. Most 100G and beyond data centers are greenfield.
- Technical discussion followed.
- Topics discussed included: For 400G networks, 50 m MMF reach supports 50% of links. 80 m MMF reach supports same as 50 m reach. 100 m supports 67% of links. For Server – TOR, AOC used; would consider pluggable transceiver if cost effective relative to AOC. Different needs require different solutions. Not wanting to qualify products for Server – TOR pluggable transceivers. In the past, China DCs usually leased. Now building own DCs, own servers – 20 year DC lifespan.
- Clarifying questions asked and answered.
- Author welcomed feedback from the group.

Contribution #2:
Title: "Fiber to machine"
Presenter: Zuowei Shen (affiliated with Google)
shen_3db_01_110520.pdf

- Presentation provided:
    - Objective: provide application need for 400G SR4 over 50m OM4 MMF to connect machines to stage 1 switches.
    - Overview:
        - Passive copper cable reach is <2m at 100Gb/s per lane.
        - Optics enables networking disaggregation from machine racks: remote TOR.
        - 50m is sufficient for stage 1 switch to machine, with flexibility in rack placement.
        - Lower cost, lower power consumption and lower latency can be achieved by limiting fiber reach to 50m.
    - Moving TOR to the middle of rack (MOR) issues. Need for remote TOR.
    - Motivation for and broad market potential of Fiber to Machines - compute/storage/ML racks.
    - SMF vs MMF comparison for ultra short reach.
    - Success metrics:
        - Reach: 30m OM3, 50m OM4 for fiber to machines
        - Cost effective and multiple VCSEL sources
        - Low power
        - Low latency FEC – nice to have
        - Connectors: MPO8_APC. SN connectors for breakout applications.

- Technical discussion followed.
- Topics discussed included: Machine defined as server, storage, accelerators. Need up to 50 m reach. Quantifying cost-effectiveness, power-efficiency. Latency based on standard Ethernet switch. Time of market urgency. Bandwidth allocation. APC vs. UPC. Advantages of APC. APC requirement for 100G MPO. APC need for SN connector – single lane – being different. No specific guidance for low latency FEC – nice to have opportunity. AOC for remote TOR not considered, will be pluggable transceiver only – deployment velocity. For standard TOR, would employ AOC or DAC.
- Clarifying questions asked and answered.
- Author welcomed feedback from the group.

Chair's discussion about next steps:

- Today's input from hyperscale & big cloud market
  - 30m over OM3 & 50m over OM4 are good targets for fiber to the server/machine
  - Having multiple suppliers of practical parts is a key to early success for fiber-to-the-server/machine
  - Do not overburden optics for fiber-to-the-server with *yield hit* or higher relative cost to achieve 100m reach
  - Reach of 80m to 100m is useful to some Big Cloud datacenter architectures
- We know that the traditional users of SR & SR4 have large embedded base of MMF cabling for 100m reach over OM4

Time Horizon	Likely Application	Reach Requirement	Need
Early Adopter	Hyperscale fiber-to-machine, server attachment, TOR elimination	30 to 50m	Tx specs which promote higher yield & low cost in Year One
Second	Big Cloud in China	80 to 100m	Cost effectiveness
Longer-term	Large Enterprise DCs	100m	Meet traditional reach targets used in brownfield cable infrastructures

Straw polls on reach objectives & linear interface:

Straw Poll #1 (reach objectives):

- I believe the IEEE P802.3db Task Force should:
  A. Keep the current 50 m reach objectives over MMF (customarily assumed to be OM4, which would equate to ~30m over OM3) as the only reach choice.
  B. Add a second set of objectives aiming at reach of about 100m over OM4 MMF to support the China hyperscale DC market and traditional Large Enterprise applications.
  C. Abstain
- A: 15 B: 24 C: 9

Straw Poll #1 (reach objectives) Roll Call Vote:

Attendees	A	B	C
YI SUN - OFS		X	
Flavio Marques / Furukawa Electric	X		
Mabud Choudhury OFS		X	
Earl Parsons [CommScope]		X	
Kenneth Jackson Sumitomo			X
Rick Pimpinella - Panduit Corp.		X	
Vipul Bhatt [II-VI]		X	
Ramana Murty [Broadcom]		X	
John S Abbott Corning		X	
Stephen Didde - Keysight Technologies			
Lance Thompson - II-VI		X	
Ilya Lyubomirsky Inphi Corp.	X		
Ryan Latchman MACOM		X	
Enis Akbaba @ Maxim Integrated	X		
Piers Dawe [Nvidia]		X	
Vince Ferretti - Corning		X	
Steven E Swanson - Corning			X
Qingya She Fujitsu		X	
Inho Kim - MaxLinear	X		
Tom Palkert - Samtec		X	
David Piehler [Dell]		X	
Vera Koleva II-VI		X	
Jose Castro - Panduit		X	
Roman Shubochkin - OFS		X	
Mark Nowell - Cisco	X		
James Young Commscope	X		
Nathan Tracy TE			X
Leon Bruckman Huawei	X		
Mirko Hoser II-VI		X	
Xiang He Huawei	X		
Guangcan/huawei	X		
Rajesh Radhamohan Broadcom		X	
Kangmin Hu [Innogrit]		X	
Chan Chih David Chen [AOI]			X
BRIAN WELCH - Cisco	X		
Mark Gustlin - Cisco	X		
Jane Lim - Cisco	X		
Kent Lusted [Intel]			X
Matt Bolig - Inphi			X
David Malicoat - Senko Advanced Components	X		
Raymond Nering - Cisco	X		

Zuowei Shen - Google		X	
Greg D Le Cheminant Keysight Technogies			X
Ali Ghiasi - Ghiasi Quantum LLC, Inphi		X	
Phil Sun - Credo			
Bo Zhang - Inphi			X
Pirooz Tooyserkani - Cisco	X		
Ed Ulrichs - Source Photonics			
Chongjin Xie - Alibaba Group		X	
John Kamino - OFS		X	
Adam Healey [Broadcom]			X

Straw Poll #2 (linear interface):

- Do you support adding an objective for an un-retimed, linear electrical interface in the IEEE P802.3db project?
    A. Yes
    B. No
    C. Abstain
    D. Need more information
- A: 13 B: 25 C: 4 D: 6

Straw Poll #2 (linear interface) Roll Call Vote:

YI SUN - OFS		X		
Flavio Marques / Furukawa Electric		X		
Mabud Choudhury OFS		X		
Earl Parsons [CommScope]	X			
Kenneth Jackson Sumitomo		X		
Rick Pimpinella - Panduit Corp.				X
Vipul Bhatt [II-VI]	X			
Ramana Murty [Broadcom]		X		
John S Abbott Corning	X			
Stephen Didde - Keysight Technologies				
Lance Thompson - II-VI	X			
Ilya Lyubomirsky Inphi Corp.		X		
Ryan Latchman MACOM	X			
Enis Akbaba @ Maxim Integrated	X			
Piers Dawe [Nvidia]	X			
Vince Ferretti - Corning				X
Steven E Swanson - Corning	X			
Qingya She Fujitsu	X			
Inho Kim - MaxLinear		X		
Tom Palkert - Samtec	X			
David Piehler [Dell]	X			
Vera Koleva - II-VI	X			

Jose Castro - Panduit			X	
Roman Shubochkin - OFS				X
Mark Nowell - Cisco		X		
James Young Commscope		X		
Nathan Tracy TE		X		
Yasuo Hidaka [Credo]		X		
Leon Bruckman Huawei			X	
Mirko Hoser - II-VI		X		
Xiang He Huawei			X	
Guangcan/huawei				
Rajesh Radhamohan Broadcom		X		
Kangmin Hu [Innogrit]				X
Chan Chih David Chen [AOI]		X		
BRIAN WELCH - Cisco		X		
Mark Gustlin - Cisco		X		
Jane Lim - Cisco		X		
Kent Lusted [Intel]		X		
Matt Bolig - Inphi		X		
David Malicoat - Senko Advanced Components			X	
Raymond Nering - Cisco		X		
Zuowei Shen - Google				X
Greg D Le Cheminant Keysight Technologies	X			
Ali Ghiasi - Ghiasi Quantum LLC, Inphi		X		
Phil Sun - Credo		X		
Bo Zhang - Inphi				
Pirooz Tooyserkani - Cisco		X		
Ed Ulrichs - Source Photonics				
Chongjin Xie - Alibaba Group		X		
John Kamino - OFS				X
Adam Healey [Broadcom]		X		

Future Meetings:

- See: http://ieee802.org/3/calendar.html and http://ieee802.org/3/interims/index.html
- P802.3db TF Ad Hoc Teleconferences are currently scheduled:

Biweekly on Thursdays at 12 Noon to 2 pm Eastern US (EST/UTC -5):
http://www.ieee802.org/3/db/public/adhoc/index.html

- P802.3db TF Plenary Teleconferences:

Tuesday, November 10, 12 Noon to 2 pm Eastern US (EST/UTC -5) [next meeting]

- Available to forge consensus based on results of straw polls

Thursday, November 12, 12 Noon to 2 pm Eastern US (EST/UTC -5)

- Any additions to objectives should be made here

Motion #3:

Move to Adjourn TF Telephonic Interim Meeting

- M: Ali Ghiasi

- S: Lance Thompson
- Approved by unanimous consent. (Procedural > 50%)

The Task Force Telephonic Interim meeting was adjourned at 2:05 PM EST/ UTC -5, Thursday, November 5, 2020.

Next Meeting:
P802.2db TF Plenary Webex meeting for Tuesday, November 10, 2020 at 12:00 noon – 2:00 PM EST/UTC -5.

Appendix A: Attendees at the IEEE P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force Telephonic Interim Meeting, 5 November 2020.

45 individuals signed into IMAT (plus presenters) on Thursday, 5 November 2020, 12:01 PM – 2:05 PM EST/UTC -5

	Name	Employer	Affiliation
1	Abbott, John	Corning Incorporated	Corning Incorporated
2	Akbaba, Enis	Maxim Integrated Products	Maxim Integrated Products
3	Bhatt, Vipul	II-VI	II-VI
4	Bruckman, Leon	HUAWEI	HUAWEI
5	Chang, Yongmao	Inphi Corporation	Source Photonics
6	Chen, Chan	Applied Optoelectronics, Inc.	Applied Optoelectronics, Inc.
7	Choudhury, Mabud	OFS	OFS
8	Dawe, Piers J G	Nvidia	Nvidia
9	Ferretti, Vincent	Corning Incorporated	Corning Incorporated
10	Ghiasi, Ali	Ghiasi Quantum LLC	Ghiasi Quantum LLC, Inphi
11	Gustlin, Mark	Cisco Systems, Inc.	Cisco Systems, Inc.
12	He, Xiang	HUAWEI	HUAWEI
13	Healey, Adam	Broadcom Inc.	Broadcom Inc.
14	Hoser, Mirko	II-VI Incorporated	II-VI Incorporated
15	Hu, Kangmin	Innogrit	Innogrit
16	Jackson, Kenneth	Sumitomo Electric Device Innovations, USA	Sumitomo Electric Industries, LTD
17	Kamino, John	OFS	OFS
18	Kim, Inho	Marvell	MaxLinear
19	Koleva, Vera	II-VI	II-VI
20	Le Cheminant, Greg	Keysight Technologies	Keysight Technologies
21	Lim, Jane	Cisco Systems, Inc.	Cisco Systems, Inc.
22	Lingle, Robert	OFS	OFS
23	Lusted, Kent	Intel Corporation	Intel Corporation
24	Lyubomirsky, Ilya	Inphi Corporation	Inphi Corporation
25	Marques, Flavio	FURUKAWA ELECTRIC	FURUKAWA ELECTRIC
26	Mi, Guangcan	Huawei Technologies Co. Ltd	HUAWEI
27	Murty, Ramana	Broadcom Corporation	Broadcom Corporation
28	Nering, Raymond	Cisco	Cisco Systems, Inc.
29	Nowell, Mark	Cisco Systems, Inc.	Cisco Systems, Inc.

30	Palkert, Thomas	EIC	Samtec-Macom
31	Parsons, Earl	CommScope, Inc.	CommScope, Inc.
32	Pimpinella, Rick	Panduit Corp.	Panduit Corp.
33	Radhamohan, Rajeshmohan	MAXLINEAR INC	MaxLinear Inc
34	Riani, Jamal	Inphi Corporation	Inphi Corporation
35	She, Qingya	Fujitsu Network Communications	Fujitsu Network Communications
36	Shen, Zuowei	Google	Google
37	Shubochkin, Roman	OFS	OFS
38	Sun, Yi	OFS	OFS
39	Swanson, Steven	Corning Incorporated	Corning Incorporated
40	Thompson, lance	II-VI	II-VI
41	Tooyserkani, Pirooz	Cisco Systems, Inc.	Cisco Systems, Inc.
42	Ulrichs, Ed	Source Photonics	Intel
43	Xie, Chongjin	Alibaba Group	Alibaba Group
44	Young, James	CommScope, Inc.	CommScope
45	Zhang, Bo	Inphi Corporation	Inphi Corporation