Approved Minutes

IEEE 802.3 Beyond 10 km Optical PHYs Study Group
Interim Meeting

Jan 24 - 25, 2018
Geneva, CH
Prepared by Kent Lusted, John D'Ambrosia

All times
Location: ITU-T, CICG Building, Geneva, CH..

David Law, IEEE 802.3 WG Chair called IEEE 802.3 Beyond 10 km Optical PHYs Study Group to order at 1.05 pm, Wednesday, January, 24, 2018.

Chair appointed Kent Lusted to be a Recording Secretary for the meeting.

Motion #1: Confirm John D'Ambrosia as the IEEE 802.3 Beyond 10 km Optical PHYs Study Group Chair
Moved by: Thananya Baldwin
Second by: Jeff Maki
Results: Y: 36 N: 0 A: 0
Motion passed 1:08 p.m.

D'Ambrosia took over as chair of the meeting.

Attendees introduced themselves.

Kent Lusted gave a brief overview of the operation of the audio system in the room.

Chair welcomed attendees to the new study group. The new study group has an expiration date 1 year from its formation date.

Chair asked attendees to sign in the attendance sheet and to IMAT.

Presentation #1 – Agenda and General Information
Presenter: John D'Ambrosia, Futurewei, Subsidiary of Huawei
URL: http://www.ieee802.org/3/B10K/public/18_01/agenda_b10k_01a_0118.pdf

Everyone in the room introduced themselves.

Chair noted that presentation updates by Xu and Yamamoto plus additional data had been submitted by Wang. Chair also noted new presentation by Chair to lead Thursday conversation. There was no opposition to hearing the new presentations / data.

Chair reviewed the agenda

Motion #2: Move to approve the agenda
Moved by: Mark Nowell
Second by: Thananya Baldwin
Results: Passed by voice without opposition

Chair reminded participants to sign into the IEEE meeting attendance tool.

Chair noted the new decorum slide (slide 4). Chair asked if there were any reporters in the room. Nobody identified themselves as representing the press.

Chair reviewed Study Group information, and reminded individuals to sign up for the reflector.

Chair showed IEEE802 Meetings Participation slide. Chair asked if there were questions on the participation agreement. No one responded.

Chair reviewed the attendance procedures.

Chair reviewed the Study Group meeting minutes. Nov 2017, dec 12 2017 ad hoc, Dec 14 40km Obj 5C ad hoc. Chair asked if there were corrections, no one responded

Motion #3: Approval of Noted Minutes
Moved by: Thananya Baldwin
Second by: David Lewis
Results: Passed by voice vote without opposition

Chair displayed the Pre-PAR Patent Policy for IEEE-SA meetings. Chair asked if anyone was unfamiliar with the patent policy. No one responded.

Chair reviewed the role of the Chair in the Study Group.

Chair continued with the introductory presentation IEEE Structure, Bylaws & Rules.

Chair reviewed the overview of the IEEE 802.3 Standards Process.

Chair reviewed Study Group Chartering Motion –

> Move that the IEEE 802.3 Ethernet Working Group authorizes the formation of a study group to develop a Project Authorization Request (PAR) and Criteria for Standards Development (CSD) responses for "Beyond 10km Optical PHYs for 50 Gb/s, 100 Gb/s, 200 Gb/s, and 400 Gb/s Ethernet"

Chair reviewed goals for week –
- Consensus building on PAR, CSD, objectives
- Technical presentations
- Terminology discussion
- Respond to liaisons

Chair reviewed liaisons and took the following actions.

> OIF: Chair deferred action on the response until the March Plenary meeting with a full update on the progress of the Study Group. Steve Trowbridge, liaison to OIF, indicated that a response after March would be acceptable. Chair appointed David Ofelt to lead ad hoc to draft a proposed response to the liaison for review by the participants.

Chair reviewed the recent ad hoc meetings and the details. (see slide 22 of http://www.ieee802.org/3/B10K/public/18_01/agenda_b10k_01a_0118.pdf).

David Lewis provided an overview of his ad hoc activity.

Time: 1:40 pm
Presentation # 2 - 50 GbE 40km Objective 5C Ad Hoc Report
Presenter: David Lewis, Lumentum
URL: http://www.ieee802.org/3/B10K/public/18_01/lewis_b10k_01_0118.pdf

General Discussion

It was noted that under the second response for "Compatibillity" it should be suggested that the PMA is dependent on the PCS, so the response should reflect that the PCS / PMA" may be leveraged.

The chair noted the expectation that a 50G 40km objective would be adopted at this meeting, based on straw polls from November. Based on that expectation the output of the ad hoc would be made part of a draft CSD to address the 50GbE 40 km objective, which would be revisited, based on other adopted objectives.

Time: 1:50 pm
Presentation # 3 – Broad Marketing Potential of 50/200/400GbE Beyond 10Km in Mobile Backhaul Application
Presenter: Xinyuan Wang, Huawei
URL: http://www.ieee802.org/3/B10K/public/18_01/wang_b10k_01b_0118.pdf

General Discussion occurred.

Chair asked Xinyuan to modify Slide #7 of the presentation to remove the Huawei logo off the equipment. (Updated presentation noted above).

Time: 2:20pm
Presentation # 4 - Technical Feasibility to Support 200GE 40km Objective
Presenter: Helen Yu, Huawei
URL: http://www.ieee802.org/3/B10K/public/18_01/xu_b10k_01a_0118.pdf

General Discussion regarding reach distributions, latency, and impact of FEC.

Time: 2:35 pm
Presentation # 5 - Investigation of the technical feasibility for 200G/400G beyond 10km optical PHYs using high-power TOSA and APD
Presenter: Shuto Yamamoto
URL: http://www.ieee802.org/3/B10K/public/18_01/yamamoto_b10k_01a_0118.pdf

General Discussion

There was a question about laser aging – no data available.

It was noted that the budget should include Tx penalties.

Question about FEC

Time: ≈ 3pm
Chair asked Mark Nowell to chair meeting while he presented the following presentation.

Presentation # 6 - Terminology
Presenter: John D'Ambrosia, Futurewei (Subsidiary of Huawei)
URL: http://www.ieee802.org/3/B10K/public/18_01/dambrosia_b10k_01a_0118.pdf

General Discussion

Discussion about terminology. It was noted that the focus of the Study Group's effort should be in relation to its scope, and not general industry terms, which would be an issue for the Working Group. It was also noted that suggestion of a DWDM related objective was bringing the focus on the communications between individuals with an IEEE and ITU-T background.

D'Ambrosia noted it was his intent as Study Group Chair to form an ad hoc out of this meeting to provide terminology / guidance where appropriate as to what was meant by the different terms to facilitate clear communication on the discussion of Study Group objectives going into the March Plenary.

Proposed list of terms was reviewed and modified by Study Group Discussion.

D'Ambrosia noted that definition of these terms would be for the Study Group to use but would not be formally approved until balloted through whatever draft might use them.

Time: 3:37pm
Presentation # 7 - Standardized optical link types
Presenter: Pete Anslow, Ciena
URL: http://www.ieee802.org/3/B10K/public/18_01/anslow_b10k_01_0118.pdf

General Discussion
Discussion about using "Optical Link" types in objectives – or approach to communicate those link types with standard langage.
Adding an "Optical Link" to address multiple λ across multiple fibers was suggested.
Multiple members expressed gratitude to Mr. Anslow for his presentation and thought this presentation was very useful to the group, and potentially to other groups.

Break : 4:12pm
Reconvened at 4:45pm

Time: 4:45 pm
Presentation # 8 - Further considerations on objectives for PHYs running over point-to-point DWDM systems
Presenter: Peter Stassar, Huawei
URL: http://www.ieee802.org/3/B10K/public/18_01/stassar_b10k_01_0118.pdf

General Discussion

Time: 5:23 pm
Presentation # 9 – Considerations on objectives for Beyond 10km Ethernet Optical PHYs running over a point-to-point DWDM system
Presenter: Gary Nicholl, Cisco
URL: http://www.ieee802.org/3/B10K/public/18_01/nicholl_b10k_01a_0118.pdf

Nichol requested to present an update to a slide in presentation, and Chair permitted channel. Nichol to provide update (noted URL above to update)

General Discussion

Time: 5:50pm
Presentation # 10 - Beyond 10km PHYs MSO Reference Channels
Presenter: Curtis Knittle, CableLabs
URL: http://www.ieee802.org/3/B10K/public/18_01/knittle_b10k_01_0118.pdf

General Discussion

Time: 6:32 pm
Presentation # 11 - Technical Feasibility to Support 40km Objective
Presenter: Curtis Knittle, CableLabs
URL: http://www.ieee802.org/3/B10K/public/18_01/knittle_b10k_02_0118.pdf

General Discussion

Meeting broke for the day at ≈ 6:55 pm

Meeting reconvened on Thursday, January 25 @ 8:40am

D'Ambrosia showed Pre-PAR Patent Policy Slide

Chair noted ad hocs – Chair will announce meetings
- OIF Liaison Response (Chair – David Ofelt)
- Terminology (to be chaired by D'Ambrosia)

Presentation # 12 - Objectives
Presenter: John D'Ambrosia, Futurewei, Subsidiary of Huawei
URL: http://www.ieee802.org/3/B10K/public/18_01/dambrosia_b10k_02_0118.pdf

Motion #4

- Move that the Beyond 10km Optical PHYs Study Group adopt the following objectives:
    - Support full-duplex operation only
    - Preserve the Ethernet frame format utilizing the Ethernet MAC
    - Preserve minimum and maximum FrameSize of current Ethernet standard
    - Provide appropriate support for OTN
- M: Brad Booth
- S: Steve Trowbridge
- Technical (>75%)
- Results Motion passes by voice vote without opposition

Strawpoll #1
- I would be interested in the following objective:
    - Specify optional Energy Efficient Ethernet (EEE) capability
    - Yes - 1
    - No - 4
    - Need more information – 28

Motion #5
- Move that the Beyond 10km Optical PHYs Study Group adopt the following objectives:
    - Support a MAC data rate of 50 Gb/s
    - Support a BER of better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent) for 50 Gb/s
    - Provide physical layer specifications which support 50 Gb/s operation over at least 40 km of SMF
- M: Helen Xu
- S: David Ofelt
- Technical (>= 75%)
- Results
    - Y : 45
    - N : 0
    - A: 4
- Motion Passes

Chair invited David Lewis to the front, so the Study Group could review the proposed responses of the ad hoc.

Presentation # 13 – 50 GbE 40km Objective 5C Study Group Discussion
Presenter: David Lewis, Lumentum
URL: http://www.ieee802.org/3/B10K/public/18_01/lewis_b10k_02_0118.pdf

Strawpoll #2

- I am interested in a 100 Gb/s 40km Objective, based on PAM4
- Results
    - Yes   0
    - No   14
    - Abstain 22
    - Need more information: 15

:

Strawpoll #3

- I believe a PAM4 approach, based on 50 Gb/s PAM4, targeting 40km would be technically feasible at
    - 200 Gb/s   Yes   22   No   1   Need more info   9
    - 400 Gb/s   Yes   4   No   4   Need more info   30

Strawpoll #4
- I would support the following objective
    - Provide physical layer specifications which support 200 Gb/s operation over 4 optical λ's for at least 40 km of SMF
- Results
    - Yes   20
    - No   3
    - Abstain   19
    - Need More Information 8

Strawpoll #5
- I would support adopting the following objective
    - Provide physical layer specifications which support 400 Gb/s operation over 8 optical λ's for at least 40 km of SMF
- Results
    - Yes   0
    - No   9
    - Abstain 15
    - Need More Information 23

Strawpoll #6
- I need more information on coherent and / or DWDM technologies and the targeted applications before adopting potential related objectives
- Yes   14 + 21 = 35
- No   3 + 2 = 5

Break @ 10:36 am
Reconvened at 11:00am

Attendance Strawpolls

- **Attend March 2018 802 Rosemont, IL plenary:**
- Y: 49 N: 2 M: 6

- **Attend May 2018 interim, Pittsburgh, PA, USA:**
- Y: 26 N: 6   M: 14

Chair reviewed future meetings.

- See: http://www.ieee802.org/3/interims/index.html
- Mar 2018
    - Week of Mar 5, 2018
    - Hyatt Regency O'Hare
    - Rosemont, IL, USA
- May 2018
    - Week of May 21,2018
    - Omni William Penn Hotel
    - Pittsburgh, PA, USA
- July 2018
    - Week of July 9, 2018
    - Manchester Grand Hyatt
    - San Diego, CA, USA
- Sept 2018
    - Week of Sept 10, 2018
- Nov 2018
    - Week of Nov 12
    - Bangkok, Thailand

Discussion about process for proposed CSD

Motion #6
Motion to adjourn
M: Mark Nowell
S: Brad Booth
Results: Passed by voice vote without objection

Adjourned 11:10am

Attendees: IEEE 802.3 Beyond 10km Optical PHYs Study Group				1/24	1/25
Last Name	First Name	Employer	Affiliation	Wed	Thurs
Abbott	John	Corning	Corning		
Anslow	Pete	Ciena Corporation	Ciena Corporation	x	
Baldwin	Thananya	Ixia	Ixia	x	
Bhatt	Vipul	Finisar	Finisar	x	x
Booth	Brad	Microsoft	Microsoft		x
Braun	Ralf-Peter	Deutsche Telekom	Deutsche Telekom	x	x
Brown	Matt	Macom	Macom		x
Calvin	John	VTM	VTM	x	x
Chang	Frank	Inphi	Inphi	x	x
Chang	Xin	Huawei	Huawei	x	x
Chen	David	AOI	AOI	x	x
Chengbin	Wu	ZTE	TE		X
Choudhury	Mabud	OFS	OFS		x
Cole	Chris	Finisar	Finisar	x	
D'Ambrosia	John	Futurewei, subsidiary of Huawei	Futurewei, subsidiary of Huawei	x	x
Dawe	Piers	Mellanox	Mellanox	x	
Dudek	Mike	Cavium	Cavium	x	
Estes	Dave	Spirent Communications	Spirent Communications	x	x
Ghiasi	Ali	Ghiasi Quantum, Ghiasi Quantum / Huawei	Ghiasi Quantum, Ghiasi Quantum / Huawei	x	x
Gorshe	Steve	Microsemi	Microsemi	x	x
Gray	Eric	Ericsson AB	Ericsson AB		x
Grillaert	Joost	Nexans	Nexans	x	x
Gustlin	Mark	Xilinx	Xilinx	x	x
Ham	Ruibo	CMCC	CMCC	x	
Harwood	Mike	HSZ Consulting	HSZ Consulting	x	
Hayakawa	Akinori	Fujitsu Laboratories	Fujitsu Laboratories	x	x
Hegde	Raj	Broadcom	Broadcom	x	
Huang	Xi	Huawei	Huawei	x	x
Ingham	Jonathan	Foxconn Interconnect Technology	Foxconn Interconnect Technology		x
Isono	Hideki	Fujitsu Optical Components	Fujitsu Optical Components	x	x
Issenhuth	Tom	Issenhuth Consulting	Issenhuth Consulting, Huawei	x	x
Jackson	Kenneth	Sumitomo	Sumitomo	x	x
Kimber	Mark	Semtech	Semtech	x	x
Kolesar	Paul	CommScope	CommScope	x	x
Laubach	Mark	Broadcom	Broadcom	x	
LeCheminant	Greg	Keysight Technologies	Keysight Technologies	x	x
Lewis	David	Lumentum	Lumentum	x	
Li	Mike	Intel	Intel	x	

Lim	Jane	Cisco	Cisco		x
Lingle, Jr.	Robert	OFS	OFS	x	
Liu	Karen	Kaiam Corp	Kaiam Corp	x	
Lusted	Kent	Intel	Intel	x	
Maki	Jeffery	Juniper Networks	Juniper Networks	x	x
McSorley	Greg	Amphenol	Amphenol		x
Nakamoto	Edward	Spirent Communications	Spirent Communications	x	x
Nicholl	Gary	Cisco	Cisco	x	
Nikolich	Paul	Self	Self		x
Nowell	Mark	Cisco	Cisco	x	x
Ofelt	David	Juniper Networks	Juniper Networks	x	x
Palkert	Tom	Molex / Macom	Molex / Macom	x	x
Parsons	Earl	Commscope	Commscope	x	x
Parthasarathay	Vasudevan	Broadcom	Broadcom	x	
Pepper	Gerald	Ixia	Ixia	x	
Remein	Duane	Huawei	Huawei	x	
Rossbach	Maitiu	Nexans	Nexans	x	
Ruibo	Hai	China Mobile	China Mobile		x
Schube	Scott	Intel	Intel	x	x
Shen	Zuowei	Google	Google	x	
Shirao	Mizuki	Mitsubishi Electric	Mitsubishi Electric	x	x
Sommers	Scott	Molex	Molex		x
Sprague	Ted	Infinera	Infinera	x	x
Sreekarth	P.V.	Railtel	Railtel, Indian Railways	x	x
Stassar	Peter	Huawei	Huawei	x	
Szczepanek	Andre	HSZ Consulting	HSZ Consulting	x	
Tailor	Bharat	Semtech Corp	Semtech Corp		x
Takahara	Tomoo	Fujitsu Laboratories	Fujitsu Laboratories	x	x
Tamura	Kohichi	Oclaro Japan	Oclaro Japan	x	x
Tracy	Nathan	TE Connectivity	TE Connectivity		x
Trowbridge	Steve	Nokia	Nokia	x	
Umnov	Alexander	Corning	Corning	x	x
Villarruel	Fernando	Cisco	Cisco	x	x
Vitali	Marco	Sicoya	Sicoya	x	x
Wang	Roy	Hewlett Packard Enterprise	Hewlett Packard Enterprise	x	x
Wang	Xinyuan	Huawei	Huawei	x	x
Weber	Markus	Acacia Communications	Acacia Acomunications	x	x
Wu	Chengbin	ZTE	ZTE	x	
Xu	Yu	Huawei	Huawei	x	x
Yamamoto	Shuto	NTT	NTT	x	x
Young	James	Commscope	Commscope	x	x
Zhang	Yuanbin	ZTE	ZTE		x
Zhuang	Yan	Huawei	Huawei	x	x

| Zivny | Pavel | Tektronix | Tektronix | x | x |