Unapproved Minutes

IEEE P802.3cu 100 Gb/s and 400 Gb/s over SMF at 100 Gb/s per Wavelength Task Force

Plenary Meeting

July 15, 2019

Vienna, Austria

Prepared by Kenneth Jackson and Mark Nowell

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IEEE P802.3cu 100 Gb/s and 400 Gb/s over SMF at 100 Gb/s per Wavelength Task Force – July 15, 2019

Prepared by Kenneth Jackson

Note: The P802.3cu Task Force met from 8-10am and from 1-6pm. The 8-10am session was before the 802.3 Working Group Opening Plenary which means that officially this was a co-located interim. For the sake of readability, these minutes consider the earlier session as an extension of the regular plenary sessions.

Meeting convened at 8:10am

Chaired Kenneth Jackson *(Substituting for Mark Nowell who was delayed due to travel reasons)*

Chair reviewed Task Force Organization
Chair reminded participants to observe meeting decorum.

Chair reviewed the reflector and web information.

Chair reviewed the ground rules for the meeting.

Photography and recording are not permitted.

Chair reviewed the attendance procedures.

Chair reminded participants to sign into the IEEE Attendance Tool and to sign the book.

Chair reviewed the IEEE structure.

Chair reviewed the Bylaws and Rules slides in -

http://www.ieee802.org/3/cu/public/July19/agenda_3cu_01a_0719.pdf

Chair read the Guidelines for IEEE-SA Working Group meetings and Patent Policy.

Chair requested a call for patents. None were raised.

Chair reviewed participation in IEEE 802 Meetings.

Chair reviewed the IEEE 802.3 Standards Process---Task Force phase.

No liaisons or communications

Chair mentioned the possibility of Ad Hocs.

Task Force documentation, PAR CSD & objectives

Draft timeline presented

Chair reviewed Goals for This Meeting

- Review technical contributions
- Adopt remaining baseline if consensus exists
- Depending on progress, initiate working document (D1.0?) for task force review

Chair reviewed meeting logistics and meeting schedule for the day and Tuesday.
http://www.ieee802.org/3/cu/public/July19/agenda_3cu_01a_0719.pdf

Chair noted that there is an IEEE 802.3 Working Group meeting beginning at 10am (we will stop at 9:45 am)

Future Meetings:

- September 2019 Interim
    - Week of September 9, 2019 – Indianapolis, IN USA
- November 2019 Plenary
    - Week of November 11, 2019 – Waikoloa Village, HI USA
- January 2020 Interim
    - Week of January 20, 2020 -- Geneva, Switzerland

Anyone interested in hosting a meeting should contact the Chair or Steve Carlson.

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Introductions were made.

Chair reviewed agenda in http://www.ieee802.org/3/cu/public/July19/agenda_3cu_01a_0719.pdf

Motion #1: Move to approve the agenda:

- Moved by: Stephen Trowbridge
- Second by: Dave Lewis
- Passed by voice without opposition

Minutes were posted shortly after the May 2019 Task Force Group meeting. Chair asked if there were any comments on the posted minutes. No one responded.

Motion #2:

Move to approve May 2019 interim meeting minutes:

- Moved by: Stephen Trowbridge
- Seconded by: Pete Anslow
- Passed by voice without opposition

Editorial Update: See http://www.ieee802.org/3/cu/public/July19/nicholl_3cu_01_0719.pdf

- Gary Nichol (Chief Editor)
- David Lewis (Editor for optical clauses)
- Mark Kimber (Advisor and reviewer for optical clauses)

Presentation #1: "PMD Naming Proposal", Chris Cole (Finisar) {*Given by KPJackson*}
See http://www.ieee802.org/3/cu/public/July19/cole_3cu_01_0719.pdf

- Proposed consideration for changing the following names:
    - Change from 100GBASE-FR to 100GBASE-FR1
    - Change from 100GBASE-LR to 100GBASE-LR1
- Presenter brought information from major hyper-scale operators on the use of "1" to differentiate single lane from multi-lane 100G PMDs and from generic 100G PMD of any lane count.
- Presenter indicated that consistency between other recent IEEE projects (P802.3ck 100GBASE-KR1) would be preferred.
- Chair indicated that a motion would be made later

Presentation #2: "Application Information for Optical Module at Data Center", Xinyuan Wang (Huawei)
See http://www.ieee802.org/3/cu/public/July19/wang_3cu_01_0719.pdf

- Presented some information from a recent LightCounting report
- (Chair's note: Copyright release to IEEE was made available)

Presentation #3: "400GBASE-LR4 - Module and Market Considerations for CWDM4 based solutions", Brian Welch (Cisco/Luxtera)
See http://www.ieee802.org/3/cu/public/July19/welch_3cu_03_0719.pdf

- Presented considerations in favor of adopting a CWDM based baseline
- Presented that eliminating tight wavelength control and compatibility with higher volume FR4 designs would provide optimized cost benefits
- Questions asked and answered

Motion #3:
Move to adjourn co-located interim meeting

- Moved by Stephen Trowbridge
- Seconded by John DeAndre
- Passed by voice without opposition

Co-located Interim meeting adjourned.

P802.3cu Task Force Plenary session convenes at 1:00 PM

Mark Nowell resumed chair role.
Chair stated that we will be dealing with the nomenclature straw poll and/or motion as the last work item in the meeting.

Presentation #4: “Feasibility Data for 400G LR4 Baseline Consideration”, Ryo Okabe (Fujitsu Optical Components)
See http://www.ieee802.org/3/cu/public/July19/okabe_3cu_01_0719.pdf

- Indicated support of CWDM based baseline for 400GBASE-LR4
- Presented experimental results showing receiver performance
- Presenter proposed to consider shift overall link budget down by 0.8dB due to overload considerations

Presentation #5: “802.3cu: 400GBASE-LR4 fiber propagation penalty”, Brian Welch (Cisco)
See http://www.ieee802.org/3/cu/public/July19/welch_3cu_01_0719.pdf

- Presented experimental results on a technique to mitigate dispersion penalty
- Presenter identified that pre-equalization of transmitter can offset the impact of dispersion.
- Presenter showed that in experimental result at negative dispersion, CD was observed to close the top eye more than the bottom eye, so “bottom eye compression” pre-equalization was shown to reduce the TDECQ value.
- Presenter suggested technique not limited to SiPhotonics but only SiPhotonics results presented at this time
- Presenter indicated that there was no impact to current proposed IEEE transmitter specifications and measurement methodology

Presentation #6: “Proposal for DGDmax for 100GBASE-FR and 400GBASE-FR4”, Dave Lewis (Lumentum)
See http://www.ieee802.org/3/cu/public/July19/lewis_3cu_02_0719.pdf

- Building on previous contributions looking at DGD penalty for 10km PMDs, propose to use 2.3 ps for 2km reach PMDs (100GBASE-FR and 400GBASE-FR4).
- Presenter indicated that this results in negligible penalty---no change to adopted baseline optical link budgets.

Presentation #7: “TDECQ Measurements for 400GBASE-LR4”, Yu Xu (Huawei)
See http://www.ieee802.org/3/cu/public/July19/yu_3cu_01_0719.pdf

- Presented updated EML based experiments on 10km transmission

- Presenter shared measurements that show that worst-case dispersion results in TDECQ values that exceed the proposed 3.9dB limit.
- Presenter proposed work-arounds.

Presentation #8: "Proposed Revisions to 100GBASE-LR Baseline Proposal", Brian Welch (Cisco)
See http://www.ieee802.org/3/cu/public/July19/welch_3cu_02_0719.pdf

- Building on previous contributions looking at DGD penalty for 400G 10km PMDs, author proposed modifications to the adopted 100G 10km specification tables to accommodate an additional 0.25dB of link penalty due to DGD.
- Presenter indicated that additional penalty was placed on the transmitter. No adjustment to receiver sensitivity.

Presentation #9: "Updated 400GBASE-LR4 Baseline Proposal", Peter Stassar (Huawei)
See http://www.ieee802.org/3/cu/public/July19/stassar_3cu_01_0719.pdf

- Presented updated 800 GHz grid based baseline proposal for 400G 10km objective
- Presenter recommended to adopt as the baseline specification for 400GBASE-LR4

Presentation #10: "400GBASE-LR4 Baseline Proposal", Dave Lewis (Lumentum)
See http://www.ieee802.org/3/cu/public/July19/lewis_3cu_01_0719.pdf

- Presented updated CWDM baseline proposal for 400G 10km objective
- Presenter indicated that the proposal includes updated fiber references ITU-T G.652 category B/D and G.657 Category A B/ single-mode fiber.
- Presenter recommended to adopt as the baseline specification for 400GBASE-LR4

Straw Poll #1:
I support the following baseline for the "four-wavelength" 400 Gb/s PHY for operation over SMF with lengths up to at least 10 km" objective based on the proposal in:

A) LWDM (800GHz) (per stassar_3cu_01_0719.pdf)
B) CWDM (per lewis_3cu_01_0719.pdf)
C) Need more information

Results: A: 20 B: 15 C: 23

Break

Straw Poll #2:

I would be open to considering the following options as a way to close the 400G 10km baseline:

A. Further technical analysis to select a single CDWM or LAN-WDM based baseline
B. CWDM baseline using a restricted fiber approach for 10km and a reduced reach for worst case fiber.
C. Additional objective so both a CWDM and LAN-WDM baselines can be adopted
D. Modify 10km objective to shorter reach or to be based on loss budget
E. Remove 400G 10km objective

Chicago Rules
Results: A) 47 B) 10 C) 10 D) 27 E) 5

Straw Poll #3:
If further technical analysis doesn't resolve option A, I would prefer the following option as a way to close the 400G 10km baseline: [A: Further technical analysis to select a single CWDM or LAN-WDM based baseline]

B. CWDM baseline using a restricted fiber approach for 10km and a reduced reach for worst case fiber.
C. Additional objective so both a CWDM and LAN-WDM baselines can be adopted
D. Modify 10km objective to shorter reach or to be based on loss budget
E. Remove 400G 10km objective

Vote for one
Results: B) 3 C) 7 D) 33 E) 0

Room Count: 61

Motion #4:
Move to update the baseline for the "single-wavelength 100 Gb/s PHY for operation over SMF with lengths up to at least 10 km" objective based on the proposal in welch_3cu_02_0719.pdf

- Moved by: Brian Welch
- Seconded by: Pavel Zivny
- Technical (>= 75%)
- Y: 39 N: 0 Abstain: 5
- Motion Passes

Motion #5:
Move to update the baselines with the DGDmax for the "single-wavelength 100 Gb/s PHY for operation over SMF with lengths up to at least 2 km" and "four-wavelength 400 Gb/s PHY for operation over SMF with lengths up to at least 2 km" objectives with a value of 2.3 psec.

- Moved by: David Lewis
- Seconded by: Pavel Zivny
- Technical (>= 75%)
- Y: 41 N: 0 Abstain: 3
- Motion Passes

Presentation Update: "PMD Naming Proposal Update", Chris Cole (Finisar)

See: http://www.ieee802.org/3/cu/public/July19/cole_3cu_01a_0719.pdf

- Presented additional information on how to get back to naming consistency between 100GBASE-DR and 100GBASE-FR1 and 100GBASE-LR1 if adopted
- Use maintenance process to modify 100GBASE-DR naming if the other PMDS namings are changed in this Task Force

Straw Poll #4:
I support modifying the nomenclature for both the two single lane PMDs to include the lane-count digit (i.e 100GBASE-FR1 instead of 100GBASE-FR, 100GBASE-LR1 instead of 100GBASE-LR)

- Y: 34 N: 7 Abstain: 11

Motion #6:
Move to modify to the following nomenclature:

100GBASE-FR1	100 Gb/s operation on a single wavelength capable of at least 2 km of SMF
100GBASE-LR1	100 Gb/s operation on a single wavelength capable of at least 10 km of SMF

- Moved by: Chris Cole
- Seconded by: Kenneth Jackson
- Technical (>= 75%)
- Y: 36 N: 7 Abstain: 8
- Motion Passes

Chair announced a pre-1.0 draft of the document will be generated for review and placed in the private area. Comments are appreciated---do not use the comment tool

Attendance Straw Polls

- I will be attending in September in Indianapolis -- 30
- I may be attending in September in Indianapolis -- 17
- I will be attending in November in Hawaii -- 28
- I may be attending in November in Hawaii -- 15

Motion #7: Move to adjourn:

- Moved by: Mike Dudek
- Second by: Peter Stassar
- Passed by voice without opposition

Meeting adjourned ~ 5:15pm

Attendees

P802.3cu Task Force				15-Jul-19
Last Name	First Name	Employer	Affiliation	Monday
Anslow	Pete	Ciena Corporation	Ciena Corporation	x
Beecraft	Jon	Cray Inc	Cray Inc	x
Braun	Ralf-Peter	Deutsche Telekom	Deutsche Telekom	x
Brooks	Paul	Viavi Solutions	Viavi Solutions	x
Butter	Adrian	Avera Semi	Avera Semi	x
Chang	Frank	Source Photonics	Source Photonics	x
Chengbin	Wu	ZTE	ZTE	x
Choudhury	G. Mabud	OFS	OFS	x
Coffey	Joseph	Commscope	Commscope	x
Cole	Chris	Finisar	Finisar	x
D'Ambrosia	John	FutureWei, US Subsidiary of Huawei	FutureWei, US Subsidiary of Huawei	x
Dawe	Piers	Mellanox	Mellanox	x
DeAndrea	John	Finisar	Finisar	x
Du	Liang	Google	Google	x
Dudek	Mike	Marvell Technologies	Marvell Technologies	x
Estes	Dave	Spirent Communications	Spirent Communications	x
Fah	Dawei	Huawei	Huawei	x
Frlan	Edward	Semtech	Semtech	x
Ghiasi	Ali	Ghiasi Quantum	Ghiasi Quantum	x
Gorshe	Steve	microchip	microchip	x

Gustlin	Mark	Cisco	Cisco	x
Healey	Adam	Broadcom Inc.	Broadcom Inc.	x
Isono	Hideki	Fujitsu Optical Components	Fujitsu Optical Components	x
Issenhuth	Tom	Huawei	Huawei	x
Jackson	Ken	Sumitomo	Sumitomo	x
Johnson	John	Broadcom	Broadcom	x
Kareti	Upen Reddy	Cisco	Cisco	x
Kimber	Mark	Semtech	Semtech	x
Klempa	Mike	UNH-IOL	UNH-IOL	x
Kurata	Kazohiko	AIO Core	AIO Core	x
Lambrecht	Frank	Gigamon Inc	Gigamon Inc	x
LeChemina nt	Greg	Keysight Technologies	Keysight Technologies	x
Lewis	Dave	Lumentum	Lumentum	x
Li	Mike	Intel	Intel	x
Lim	Jane	Cisco	Cisco	x
Lu	Yuchun	Huawei	Huawei	x
Maki	Jeffery	Juniper Networks	Juniper Networks	x
Maniloff	Eric	Ciena	Ciena	x
Mi	Guancan	Huawei	Huawei	x
Muller	Shimon	Axalume	Axalume	x
Nakamoto	Edward	Spirent Communications	Spirent Communications	x
Nicholl	Gary	Cisco	Cisco	x
Nicholl	Shawn	Xilinx	Xilinx	x

Nowell	Mark	Cisco	Cisco	x
Ogawa	Daisuke	NTT Electronics	NTT Electronics	x
Pham	Phong	US Conec	US Conec	x
Pitwon	Richard	AIO Core	AIO Core	x
Pozzebon	Dino	microsemi	microsemi	x
Ryo	Okabe	Fujitsu Optical Components	Fujitsu Optical Components	x
Shuai	Jia Long	Huawei	Huawei	x
Song	Chen	ZTE	ZTE	x
Sprague	Ted	Infinera	Infinera	x
Stassar	Peter	Huawei	Huawei	x
Sun	Phil	Credo	Credo	x
Takahara	Tomoo	Fujitsu	Fujitsu	x
Takefman	Michael	Inphi	Inphi	x
Tooyserkani	Pirooz	Cisco	Cisco	x
Tracy	Nathan	TE Connectivity	TE Connectivity	x
Trowbridge	Steve	Nokia	Nokia	x
Ulrichs	Ed	Source Photonics	Source Photonics	x
Xu	Yu	Huawei	Huawei	x
Yam	Julius	Semtech Corp	Semtech Corp	x
Yamamoto	Shuto	NTT	NTT	x
Young	James	Commscope	Commscope	x
Zivny	Pavel	Tektronix	Tektronix	x