

Approved Minutes

IEEE P802.3ck 100 Gb/s, 200 Gb/s and 400 Gb/s Electrical Interfaces

Task Force

Interim Meeting
May 24, 2018
Pittsburgh, PA, USA

Prepared by Kent Lusted

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IEEE P802.3 100 Gb/s Electrical Lane Study Group – May 24, 2018

Prepared by Kent Lusted

IEEE P802.3ck 100 Gb/s, 200 Gb/s and 400 Gb/s Electrical Interfaces Task Force meeting convened at ~8:30 a.m., by David Law, IEEE 802.3 Working Group Chair.

Mr. Law appointed Kent Lusted as the Recording Secretary.

Mr. Law welcomed attendees.

Motion #1:

Move to :

- Confirm Beth Kochuparambil as the IEEE P802.3ck 100 Gb/s, 200 Gb/s and 400 Gb/s Electrical Interfaces Task Force Chair

M: Steve Trowbridge

S: Pete Anslow

Y: 59 N: 0 A: 0

Motion passes!

Beth Kochuparambil appoints Kent Lusted to be the Vice Chair of the IEEE P802.3ck 100 Gb/s, 200 Gb/s and 400 Gb/s Electrical Interfaces Task Force.

Introductions were made.

Chair reviewed agenda in agenda_3ck_01b_0518.pdf

Several editorial errors were caught while presenting, Chair will make edits and update presentation to http://www.ieee802.org/3/ck/public/18_05/agenda_3ck_01c_0518.pdf

Motion #2:

Move to approve the agenda:

- Moved by: Rita Horner
- Second by: Rich Mellitz
- Passed by voice without opposition

Chair noted that the March minutes were posted shortly after the meeting. Recording Secretary noted that he received no requests for corrections or modifications to the posted minutes. Chair asked if there were any other comments on the minutes. No one responded.

Motion #3:

Move to approved the March 2018 meeting minutes

- Moved by: Jeff Slavick
- Second by: Mike Dudek
- Passed by voice without opposition

Chair reminded participants to observe meeting decorum. Called for members of the press. No one indicated. Photography and recording are not permitted.

Chair reviewed the ground rules for the meeting.

Chair reviewed the IEEE structure.

Chair reviewed the Bylaws and Rules slides in

http://www.ieee802.org/3/ck/public/18_05/agenda_3ck_01c_0518.pdf

Chair asked if there was anyone unfamiliar with the Bylaws or Rules. No one responded.

IEEE Patent Policy: Chair reviewed the Patent related slides on the 4 slides contained in the agenda. Chair calls for potentially essential patents. No one responded. Chair read the Guidelines for IEEE WG meetings. No one responded.

Chair advised the WG attendees that:

- The IEEE's patent policy is described in Clause 6 of the *IEEE-SA Standards Board Bylaws*;
- Early identification of patent claims which may be essential for the use of standards under development is strongly encouraged;
- There may be Essential Patent Claims of which the IEEE is not aware. Additionally, the IEEE, the WG, nor the WG chair can ensure the accuracy or completeness of any assurance or whether any such assurance is, in fact, of a Patent Claim that is essential for the use of the standard under development.

No one responded.

Chair noted that there was a slide with a statement on the participation in IEEE 802 Meetings. Chair noted that by participating in the IEEE 802 meeting, that participants accept these requirements. Chair asked if there were questions about the participation requirements. No one responded.

Reviewed the reflector and web information for the Task Force in the agenda deck.

Chair reviewed the attendance procedures. Chair reminded participants to sign into the IEEE Meeting Attendance Tool and sign the attendance book.

Chair provided a summary of the Task Force status.

Chair reviewed the IEEE 802.3 Standards Process.

Chair reviewed the adopted objectives.

Goals for the meeting:

- Enable technical discussions that were held back during the study group phase
- Understand a direction for study needed to get to baseline

Chair noted that no liaisons were received.

Chair reviewed the tentative presentation schedule. The agenda estimated that the meeting would end Friday, mid-morning.

Chair reviewed the future meeting dates.

Future Meetings:

- July 2018 Plenary
 - Week of July 8, 2018 – San Diego, CA, USA
- September 2018 Interim
 - Week of September 9, 2018 -- Spokane, WA, USA

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

Chair thanked Ethernet Alliance for hosting the May interim!

Chair announced that there will be hoc meetings before the July meeting. Tentatively announced the week of June 18th.

Presentation #1:

“Next Steps towards Baselines”, Kent Lusted

See: http://www.ieee802.org/3/ck/public/18_05/lusted_3ck_01a_0518.pdf

Presentation #2:

“Channel Specifications for 802.3ck - Challenges and Possible Paths”, Adee Ran

See: http://www.ieee802.org/3/ck/public/18_05/ran_3ck_01_0518.pdf

- The 3dB COM margin is a margin for the receiver.

- Discussed the potential transition of receivers from long DFE based to long FFE based and how to specify these architectures, if necessary.

Presentation #3:

“Short Host Channel System Implications”, Rob Stone

See: http://www.ieee802.org/3/ck/public/18_05/stone_3ck_01a_0518.pdf

- Assumption on slide 4 uses 800G optical modules. Power is the limit for that form factor.
- Discussed the power apportionment in the system for a retimer.
- On slide 6, “TOR/Fixed” is a single ASIC box. “Modular/Chassis” is a multi-ASIC box.

Break at ~10:30 a.m. Resumed at ~10:50 a.m.

Presentation #4:

“C2M AUI and Cu MDI Options”, Ali Ghiasi

See: http://www.ieee802.org/3/ck/public/18_05/ghiasi_3ck_01a_0518.pdf

- Discussed the need for the different port types outlined on port 15.
- Discussed some of the issues with connecting two port types that have a larger host loss.
- Author proposed two port types: one for copper cables and optics, other is optics only.
- Discussed that the loss budgets are tight for 100Gbps/lane serdes technologies.

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

Presentation #5:

“100GEL C2M Channel Reach Options & System Design Impacts”, Jane Lim

See: http://www.ieee802.org/3/ck/public/18_05/lim_3ck_01a_0518.pdf

- Updated version ‘01a’ with changes to the supporters
- Discussed the need to extend the loss budgets to real routing lengths
- Discussed the estimated power impact of SERDES in an MR-like module
- Discussed the assumptions for loss on slide 6. It was noted that different connector types could have loss impact on the host physical reach.

Break for lunch at ~12:25 p.m. Resumed at ~1:30 p.m.

Presentation #6:

“Copper cabling requirements for 100 Gb/s lane”, David Malicoat

See: http://www.ieee802.org/3/ck/public/18_05/malicoat_3ck_01a_0518.pdf

- Updated version '01a' with editorial changes.
- The presentation estimate for cable use does not factor in spine-spine switch connections.

Chair reminded participants to wear their name badges.

Presentation #7:

“Test Results for Balanced Equalization Architectures”, Jeff Twombly

See: http://www.ieee802.org/3/ck/public/18_05/sun_3ck_01a_0518.pdf

- Chair noted that the presentation is listed under Phil Sun but was submitted by Jeff Twombly; hence, the naming error.
- Updated version '01a' with editorial changes. Chair asked if there was opposition to seeing the updated version. No one responded.
- There was some concern about validating a transmitter with a large # of TXFFE taps.
- The eye opening on slide 4 was taken at a board connector near the RX.
- There was a request for additional information on the channel and the device.

Presentation #8:

“Consideration on 100Gb/s C2M SerDes Equalizer”, Toshiaki Sakai

See: http://www.ieee802.org/3/ck/public/18_05/sakai_3ck_01a_0518.pdf

- Updated version '01a' with additional channel information. Chair asked if there was objection to seeing the updated version. No one responded.
- The model on channel 12 does not currently include vias or package footprint; author intends to include it in a future contribution.
- On slide 6, the Rj is Sigma Rj.
- On slide 18, the package material is GZ41.
- On slide 15, it was noted that the return loss of ~8dB at 28GHz was due to the PCB footprint in the channel contribution.

Presentation #9:

“A possible receiver architecture and preliminary COM Analysis with 802.3 100GEL Channels”, Adee Ran

See: http://www.ieee802.org/3/ck/public/18_05/ran_3ck_02_0518.pdf

- The receiver model includes a T-coil.
- On slide 12, the FFE tap length is not an exhaustive search.
- It was noted that the COM reference receiver should be generic enough to allow many different receiver architectures.
- There was a request to check the crosstalk in the channels because it doesn't match the reference provided with the original channels

- Howard Heck noted that his channel contributions that were referenced in the presentation were not optimized for crosstalk and were expected to have poor performance. He plans to bring more channel contributions with crosstalk improvements.

Break at ~3:20 p.m. Resumed at ~3:40 p.m.

Presentation #10:

“100GEL C2M Flyover Host (TP0 to TP2) Channels”, Rich Mellitz

See: http://www.ieee802.org/3/ck/public/18_05/mellitz_3ck_02_0518.pdf

- Channel contributions associated with the presentation are located at: <http://www.ieee802.org/3/ck/public/tools/index.html>

Chair asked if there was objection to moving Mark Gustlin’s presentation to be next on the agenda. No one responded.

Presentation #11:

“PCS, FEC, and PMA Sublayer Baseline Proposal”, Mark Gustlin

See: http://www.ieee802.org/3/ck/public/18_05/gustlin_3ck_01_0518.pdf

- Eric Baden offered his support the presentation.
- It was noted that if the existing PCS/FEC is insufficient, alternatives would need to be investigated.
- One of the changes proposed is to add precoding that would change the existing PMA.

Straw Poll #1:

At this point, I would support the PCS/FEC/PMA as presented in gustlin_3ck_01_0518 slide 12 for:

- A. C2M Y: 33 Need More Info: 15
- B. C2C Y: 33 Need More Info: 15
- C. Backplane Y: 28 Need More Info: 19
- D. Copper Cable Y: 28 Need More Info: 18

Room count: 69

Presentation #12:

“A correlation study between COM reference Pkg and physical PKG”, Liav Ben-Artzi

See: http://www.ieee802.org/3/ck/public/18_05/benartsi_3ck_01_0518.pdf

- Slide 3 does not include the device capacitance.

Chair outlined the plans for Friday: straw polls and discussion.

Chair asked for a show of hands for interest in studying real vs. COM package model. Chair noted that most of the room indicated. Chair asked for a show of hands of people that want to work with Liav. Several in the room indicated.

Presentation #13:

“Using Chiplets to Lower Package Loss”, Brian Holden

See: http://www.ieee802.org/3/ck/public/18_05/holden_3ck_01_0518.pdf

- The package substrate assumption is 6-2-6 stackup.
- Additional clarifying questions were asked and answered.

Chair noted that the agenda was complete.

Chair noted that the Task Force does not need to meet on Friday.

Chair asked those participants who this was their first time signing into IMAT to see her after the meeting in the hallway.

Motion #4:

Move to adjourn.

M: Mark Gustlin

S: David Malicoat

Procedural (>50%)

Passes by voice without opposition

Meeting ended at ~5:00 p.m.

Attendees

P802.3ck 100GEL Task Force, May 2018			24-May-18
Last Name	First Name	Affiliation	Thursday
Abbott	John	Corning	x
Anslow	Pete	Ciena Corporation	x
Baca	Rich	Microsoft	x
Baden	Eric	Broadcom	x
Ben Artsi	Liav	Marvell Semiconductor	x
Best	Burrell	Samtec	x
Braun	Ralf-Peter	Deutsche Telekom	x
Brooks	Paul	Viavi Solutions	x
Brown	Matt	MACOM	x
Burns	Matthew	Samtec	x
Butter	Adrian	Global Foundries	x
Calvin	John	VTM	x
Carlson	Craig	Cavium	x
Chalupsky	David	Intel	x
Chen	C. C. David	Applied Optoelectronics	x

Choudhury	G. Mabud	OFS	x
Dawe	Piers	Mellanox	x
Dudek	Mike	Cavium	x
Estes	Dave	Spirent Communications	x
Ewen	John	Global Foundries	x
Gafni	Barak	mellanox	x
Ghiasi	Ali	Ghiasi Quantum, Huawei	x
Gilb	James	GA-ASI, USD, Gilb Consulting	x
Gong	Zhigang	O-net	x
Gopalakrishnan	Karthik	Inphi	x
Gustlin	Mark	Xilinx	x
Healey	Adam	Broadcom Limited	x
Heck	Howard	Intel	x
Henry	Jerome	Cisco	x
Holden	Brian	Kandou Bus	x
Horner	Rita	Synopsys	x
Isono	Hideki	Fujitsu Optical Components	x
Issenhuth	Tom	Huawei	x

Jackson	Ken	Sumitomo	x
Kao	Chien-Ping	Intel	x
Kareti	Upen Reddy	Cisco	x
Kimber	Mark	Semtech	x
Klempa	Mike	UNH-IOL	x
Kochuparambil	Beth	Cisco	x
Kolesar	Paul	CommScope	x
Kukita	Hiroaki	Yamaichi Electronics	x
Lambrecht	Frank	Gigamon Inc	x
Law	David	HPE	x
LeCheminant	Greg	Keysight Technologies	x
Lim	Jane	Cisco	x
Liu	Hai-Feng	Intel	x
Liu	Karen	Kaiam	x
Lusted	Kent	Intel	x
Maki	Jeffery	Juniper Networks	x
Malicoat	David	Senko/Aquantia	x
Marris	Arthur	Cadence	x
Matoglu	Erdem	Amphenol	x

Mellitz	Richard	Samtec	x
Nicholl	Gary	Cisco	x
Nolan	John	QLogic	x
Ofelt	David	Juniper Networks	x
Pachon	Arturo	TE	x
Palkert	Tom	Molex - MACOM	x
Pham	Phong	US Conec	x
Piehler	David	Dell EMC	x
Pozzebon	Dino	microsemi	x
Rabinovich	Rick	Keysight Technologies	x
Ran	Adee	Intel	x
Rotolo	Salvatore	ST Microelectronics	x
Rysin	Alexander	Mellanox	x
Sakai	Toshiaki	Socionext	x
Sayre	Edward	Samtec	x
Sekel	Steve	Keysight Technologies	x
Shrikhande	Kapil	Innovium	x
Slavick	Jeff	Broadcom Limited	x
Sommers	Scott	Molex	x

Stassar	Peter	Huawei	x
Stone	Rob	Broadcom	x
Sun	Phil	Credo	x
Swanson	Steve	Corning	x
Takahara	Tomoo	Fujitsu Laboratories	x
Tamura	Kohichi	Oclaro	x
Tien	George	AOI	x
Tooyserkani	Pirooz	Cisco	x
Tournier	Hugues	Ciena	x
Tracy	Nathan	TE Connectivity	x
Trowbridge	Steve	Nokia	x
Twombly	Jeff	Credo	x
Ulrichs	Ed	Source Photonics	x
Vanderlaan	Paul	Berk-Tek LLC	x
Welch	Brian	Luxtera	x
White	Martin	Cavium	x
Willis	Paul	UNH-IOL	x
Zambell	Andrew	Amphenol	x
Zhang	Geoffrey	Xilinx	x
Zhuang	Yan	Huawei	x

