IEEE 802.3 Beyond 400 Gb/s Ethernet (B400G) Study Group, April 2021 Electronic Interim Series
Unapproved Meeting Minutes, Prepared by Tom Issenhuth, John D'Ambrosia

Meeting called to order at 10:02 am ET (all times ET), 01 Apr 2021

Meeting called to order by John D'Ambrosia, SG Chair.

Chair showed IMAT information and asked everyone to sign-in as meeting attendance would be taken from IMAT.

**Presentation #1**      **Agenda and General Information**
Presenter:              John D'Ambrosia
URL:                    https://www.ieee802.org/3/B400G/public/21_04/agenda_b400g_210401.pdf

Chair asked if there were any objections to the agenda, there were none, and the agenda (Slide #2) was considered approved.

Minutes - https://www.ieee802.org/3/B400G/public/21_03/minutes_b400g_a_2103_unapproved.pdf

Chair asked if there were any other corrections, there were none.
Chair asked if there were any objections to approving the minutes.  One correction was noted, the file name wang_b400g_01a_210301 was changed to wang_b400g_01b_210301.  No further corrections were noted and, and the minutes were considered approved.

Chair noted that the information regarding the procedures had been sent out, and requested that individuals review the following IEEE SA policies prior to the interim meeting –

- IEEE SA Pre-PAR Patent Policy
- IEEE SA Participation Policy
- IEEE SA Copyright Policy

Chair showed the IEEE SA Pre-PAR Patent Policy slides.
Chair showed the IEEE SA Participation Policy slides.
Chair showed the IEEE SA Copyright Policy slides.

Chair asked if anyone needed to review the policies at that time – there were no requests to do so.

**Presentation #2**      **Motions and Straw Polls**
Presenter:              John D'Ambrosia
URL:                    https://www.ieee802.org/3/B400G/public/21_04/motions_b400g_a_2104.pdf

Straw poll #1

| I would support adopting the following objective: | Results |
| --- | --- |
| a) Support a MAC data rate of 800 Gb/s | 13 |
| b) Support a MAC data rate of 1.6  Tb/s | 1 |
| c) Support a MAC data rate of 800 Gb/s and 1.6 Tb/s | 50 |
| d) Need more information | 17 |
| e) Abstain | 4 |

Straw poll #2

| I would support adopting the following objective:<br>• Support a MAC data rate of 800 Gb/s | Results |
| --- | --- |
| a) Yes | 73 |
| b) No | 5 |
| c) Need more information | 4 |
| d) Abstain | 4 |

Straw poll #3

| I would support adopting the following objective:<br>• Support a MAC data rate of 1.6 Tb/s | Results |
| --- | --- |
| a) Yes | 35 |
| b) No | 9 |
| c) Need more information | 41 |
| d) Abstain | 6 |

Motion #1

| Motion | **Move to adopt the following objective:**<br>• Support a MAC data rate of 800 Gb/s |
|---|---|
| M: | Matt Brown |
| S: | Kent Lusted |
| Technical (>=75%) | |
| All (y/n/a) | 85 / 2 / 4 |
| Results | Motion passes |

Motion #2

| Motion | **Move to adopt the following objectives**:<br>• Support full-duplex operation only<br>• Preserve the Ethernet frame format utilizing the Ethernet MAC<br>• Preserve minimum and maximum FrameSize of current IEEE 802.3 standard |
|---|---|
| M: | Kent Lusted |
| S: | Jim Weaver |
| Technical (>=75%) | |
| All (y/n/a) | 81 / 2 / 7 |
| Results | Motion passes |

Straw poll #4

| For the following proposed objective in support of 800 Gb/s operation, I would support the following –<br><br>• Support a BER of better than or equal to _____ at the MAC/PLS service interface (or the frame loss ratio equivalent) | Results |
|---|---|
| a) $10^{-13}$ | 42 |
| b) $10^{-14}$ | 26 |
| c) $10^{-15}$ | 4 |
| d) Better than $10^{-15}$ | 2 |
| e) Need more information | 10 |
| f) Abstain | 7 |

Straw poll #5

| For the following proposed objective in support of 1.6 Tb/s operation, I would support the following –<br><br>• Support a BER of better than or equal to _____ at the MAC/PLS service interface (or the frame loss ratio equivalent) | Results |
|---|---|
| a) $10^{-13}$ | 13 |
| b) $10^{-14}$ | 26 |
| c) $10^{-15}$ | 2 |
| d) Better than $10^{-15}$ | 0 |
| e) Need more information | 38 |
| f) Abstain | 6 |

Straw poll #6

| I would support adopting the following: <br> • Provide appropriate support for OTN | Results |
|---|---|
| a) Yes | 49 |
| b) No | 10 |
| c) Need more information | 17 |
| d) Abstain | 14 |

Chair called a break at 12:11.

Meeting restarted at 12:16.

Motion #3

| **Motion** | **Move to adopt the following objective:** <br> • Provide appropriate support for OTN |
|---|---|
| M: | Steve Trowbridge |
| S: | Ted Sprague |
| Technical (>=75%) | |
| All (y/n/a) | 37 / 23 / 12 |
| Results | Motion Fails |

Meeting recessed at 1:00pm

Meeting reconvened at 10:02 am ET (all times ET), 05 Apr 2021

Meeting called to order by John D'Ambrosia, SG Chair.

Chair showed IMAT information and asked everyone to sign-in as meeting attendance would be taken from IMAT.

Chair did a recap of the activities from the last session.

Chair noted that the information regarding the procedures had been sent out, and requested that individuals review the following IEEE SA policies prior to the interim meeting –

- IEEE SA Pre-PAR Patent Policy
- IEEE SA Participation Policy
- IEEE SA Copyright Policy

Chair asked if anyone needed to review the policies at that time – there were no requests to do so.

Chair noted that a series of straw polls targeting potential optical physical layer specifications had been prepared, based on presentations received to date. Chair noted that the strawpolls had been prepared on reach.

Chair noted that an updated motions and strawpolls presentation would be available as version "a ".

https://www.ieee802.org/3/B400G/public/21_04/agenda_b400g_a_210401.pdf

Chair asked if there were any objections to taking both MM straw polls at the same time and there were none.


Straw poll #7

| I would support adopting the following objective:<br><br>• Define a physical layer specification that supports 800 Gb/s operation over 8 pairs of MMF with lengths up to at least 50 m | Results |
|---|---|
| Yes | 64 |
| No | 3 |
| Need more information | 12 |
| Abstain | 11 |

Straw poll #8

| I would support adopting the following objective:<br><br>• Define a physical layer specification that supports 800 Gb/s operation over 8 pairs of MMF with lengths up to at least 50 m | Results |
|---|---|
| Yes | 59 |
| No | 6 |
| Need more information | 14 |
| Abstain | 11 |

Motion #4

| Motion | Move to adopt the following objectives:<br><br>• Define a physical layer specification that supports 800 Gb/s operation over 8 pairs of MMF with lengths up to at least 50 m<br>• Define a physical layer specification that supports 800 Gb/s operation over 8 pairs of MMF with lengths up to at least 100 m |
|---|---|
| M: | Robert Lingle |
| S: | Ramana Murty |
| Technical (>=75%) | |
| All (y/n/a) | 61 / 13 / 18 |
| Results | Motion passes |

Chair asked if there were any objections to taking all three SM straw polls at the same time and there were none.

Straw poll #9

| I would support adopting the following objective:<br><br>• Define a physical layer specification that supports 800 Gb/s operation over 8 pairs of SMF with lengths up to at least 500 m | Results |
|---|---|
| Yes | 80 |
| No | 7 |
| Need more information | 0 |
| Abstain | 5 |

Straw poll #10

| I would support adopting the following objective: | Results |
|---|---|
| • Define a physical layer specification that supports 800 Gb/s operation over 4 pairs of SMF with lengths up to at least 500 m | |
| Yes | 79 |
| No | 0 |
| Need more information | 5 |
| Abstain | 8 |

Straw poll #11

| I would support adopting the following objective: | Results |
|---|---|
| • Define a physical layer specification that supports 800 Gb/s operation over 4 pairs of SMF with lengths up to at least 2 km | |
| Yes | 59 |
| No | 8 |
| Need more information | 14 |
| Abstain | 11 |

Chair noted that the complete text of the motion was not visible in the Zoom polling window but the full text was still visible in the presentation slide that was visible.  en.  Chair asked if there any concerns proceeding with the polling tool and there were none.

Motion #5

| Motion | Move to adopt the following objectives: |
|---|---|
| | • Define a physical layer specification that supports 800 Gb/s operation over 8 pairs of SMF with lengths up to at least 500 m<br>• Define a physical layer specification that supports 800 Gb/s operation over 4 pairs of SMF with lengths up to at least 500 m<br>• Define a physical layer specification that supports 800 Gb/s operation over 4 pairs of SMF with lengths up to at least 2 km |
| M: | Brian Welch |
| S: | Ilya Lyubomirsky |
| Technical (>=75%) | |
| All (y/n/a) | 76 / 8 / 6 |
| Results | Motion passes |

Straw poll #12

| I would support adopting the following objective:<br>• Define a physical layer specification that supports 800 Gb/s operation over 8 wavelengths <u>over a single SMF in each direction</u> with lengths up to at least 2 km | Results |
|---|---|
| Yes | 48 |
| No | 13 |
| Need more information | 12 |
| Abstain | 9 |

Straw poll #13

| I would support adopting the following objective:<br>• Define a physical layer specification that supports 800 Gb/s operation over 4 wavelengths <u>over a single SMF in each direction</u> with lengths up to at least 2 km | Results |
|---|---|
| Yes | 62 |
| No | 2 |
| Need more information | 11 |
| Abstain | 7 |

Chair called a break at 11:42

Meeting restarted at 11:50.

Motion #6

| Motion | Move to adopt the following objective:<br>• Define a physical layer specification that supports 800 Gb/s operation over 4 wavelengths <u>over a single SMF in each direction</u> with lengths up to at least 2 km |
|---|---|
| M: | Brian Welch |
| S: | Ilya Lyubomirsky |
| Technical (>=75%) | |
| All (y/n/a) | 61 / 1 / 9 |
| Results | Motion passes |

Straw poll #14

| I would support adopting the following objective:<br>• Define a physical layer specification that supports 800 Gb/s operation <u>over a SMF in each direction</u> with lengths up to at least 4 km | Results |
|---|---|
| Yes | 13 |
| No | 21 |
| Need more information | 28 |
| Abstain | 6 |

Straw poll #15

| I would support adopting the following objective:<br>• Define a physical layer specification that supports 800 Gb/s operation <u>over a SMF in each direction</u> with lengths up to at least 6 km | Results |
|---|---|
| Yes | 26 |
| No | 8 |
| Need more information | 27 |
| Abstain | 7 |

Straw poll #16

| I would support adopting the following objective:<br>• Define a physical layer specification that supports 800 Gb/s operation <u>over a SMF in each direction</u> with lengths up to at least 10 km | Results |
|---|---|
| Yes | 44 |
| No | 0 |
| Need more information | 12 |
| Abstain | 7 |

Straw poll #17

| I would support adopting the following objective:<br>• Define a physical layer specification that supports 800 Gb/s operation <u>over a SMF in each direction</u> with lengths up to at least 40 km | Results |
|---|---|
| Yes | 42 |
| No | 0 |
| Need more information | 13 |
| Abstain | 8 |

Motion #7

| Motion | **Move to adopt the following objectives:** |
|---|---|
| | • Define a physical layer specification that supports 800 Gb/s operation <u>over a SMF in each direction</u> with lengths up to at least 10 km |
| | • Define a physical layer specification that supports 800 Gb/s operation <u>over a SMF in each direction</u> with lengths up to at least 40 km |
| M: | Peter Stassar |
| S: | Ray Nering |
| Technical (>=75%) | |
| All (y/n/a) | 44 / 9 / 14 |
| Results | Motion passes |

Straw poll # 18 (Chicago Rules)

| I would support an objective(s) targeting the development of optional inter-sub layer physical instantiations of interfaces for 800 Gb/s Ethernet based on: | Results |
|---|---|
| a) 100 Gb/s per lane | 45 |
| b) 200 Gb/s per lane | 44 |
| c) Non-rate specific per lane | 24 |
| d) Need more information | 8 |
| e) Abstain | 4 |

Chair reminded group of the deadline for presentation requests for the May session, and noted everyone should review the agenda deck for full details.

Chair adjourned the session at 1:04 pm, 05 Apr 2021.

## Attendees Per IMAT

| Name | Employer | Affiliation | 4/1/21 | 4/5/21 |
|------|----------|-------------|--------|--------|
| Abbott, John | Corning Incorporated | Corning Incorporated | | 1 |
| Baldwin, Thananya | Keysight Technologies | #NAME? | 1 | |
| Bechtolsheim, Andreas | | Arista Networks Inc. | | 1 |
| Bhatt, Vipul | II-VI Incorporated | II-VI Incorporated | 1 | 1 |
| Bliss, Will | Broadcom Corporation | Broadcom Corporation | 1 | |
| Bois, Karl | | TE Connectivity | 1 | |
| Brown, Matthew | Huawei Technologies Canada | Huawei Technologies Canada | 1 | 1 |
| Bruckman, Leon | Huawei Technologies Co., Ltd | Huawei Technologies Co., Ltd | 1 | 1 |
| Calvin, John | Keysight Technologies | Keysight Technologies | 1 | 1 |
| Chang, Yongmao | Inphi Corporation | Source Photonics | 1 | |
| Chen, Chan | Applied Optoelectronics, Inc. | Applied Optoelectronics, Inc. | 1 | 1 |
| Cole, Christopher R | Finisar Corporation | Finisar Corporation | 1 | |
| D'Ambrosia, John | Futurewei Technologies | Futurewei Technologies, U.S. Subsidiary of Huawei | 1 | 1 |
| Dawe, Piers J G | NVIDIA | Nvidia | 1 | |
| Ewen, John | Marvell | Marvell | 1 | 1 |
| Ferretti, Vincent | Corning Incorporated | Corning Incorporated | 1 | 1 |
| Geng, Limin | Huawei Technologies Co., Ltd | Huawei Technologies Co., Ltd | 1 | 1 |
| Ghiasi, Ali | Ghiasi Quantum LLC | Ghiasi Quantum LLC, Inphi | 1 | 1 |
| Gorshe, Steven Scott | Microchip Technology, Inc. | Microchip Technology, Inc. | 1 | |
| Gustlin, Mark | Cisco Systems, Inc. | Cisco Systems, Inc. | 1 | 1 |
| Harstead, Ed | Nokia | Nokia | 1 | |
| Haser, Alexandra | Molex Incorporated | Molex Incorporated | | 1 |
| He, Xiang | Huawei Technologies Co., Ltd | Huawei Technologies Co., Ltd | 1 | 1 |
| Healey, Adam | Broadcom Inc. | Broadcom Inc. | 1 | 1 |
| Heck, Howard | Intel Corporation | Intel Corporation | | 1 |
| Hidaka, Yasuo | Credo Semiconductor | Credo Semiconductor | 1 | 1 |
| HUANG, QINHUI | | Huawei Technologies Co., Ltd | 1 | |
| Huber, Thomas | Nokia | Nokia | 1 | 1 |
| Isono, Hideki | Fujitsu Optical Components Limited | Fujitsu Optical Components Limited | 1 | 1 |
| Issenhuth, Tom | Issenhuth Consulting, LLC | Huawei Technologies Co., Ltd | 1 | 1 |
| Jackson, Kenneth | Sumitomo Electric Device Innovations, USA | Sumitomo Electric Industries, LTD | 1 | 1 |
| Jimenez, Andrew | Anixter Inc. | Anixter Inc. | | 1 |
| Johnson, John | Broadcom Corporation | Broadcom Corporation | 1 | 1 |
| Kabra, Lokesh | Synopsys, Inc. | Synopsys, Inc. | | 1 |
| Kao, Chienping | Intel Corporation | Cornelis Networks | 1 | 1 |
| Kim, Inho | MaxLinear | MaxLinear | 1 | 1 |

| | | | | |
|---|---|---|---|---|
| Kim, Kihong/Joshua | Hirose Electric (USA), Inc. | Hirose Electric (USA), Inc. | 1 | 1 |
| Kimber, Eric | Semtech Ltd | Semtech Ltd | 1 | |
| Klempa, Michael | University of New Hampshire InterOperability Laboratory (UNH-IOL) | Amphenol Corporation | | 1 |
| Kochuparambil, Elizabeth | Cisco Systems, Inc. | Cisco Systems, Inc. | 1 | |
| Kocsis, Sam | Amphenol Corporation | Amphenol Corporation | 1 | 1 |
| Koleva, Vera | | Finisar Corporation | | 1 |
| Kuschnerov, Maxim | | Huawei Technologies Duesseldorf GmbH | 1 | |
| Lam, Cedric | | Google | 1 | 1 |
| Le Cheminant, Greg | Keysight Technologies | Keysight Technologies | 1 | 1 |
| Levin, Itamar | | Intel Corporation | | 1 |
| Lewis, David | Lumentum Inc. | Lumentum Inc. | 1 | 1 |
| Lim, Jane | Cisco Systems, Inc. | Cisco Systems, Inc. | 1 | 1 |
| Lingle, Robert | OFS | OFS | 1 | |
| Liu, Karen | Lightwave Logic | Lightwave Logic | | 1 |
| Lusted, Kent | Intel Corporation | Intel Corporation | 1 | 1 |
| Lyubomirsky, Ilya | Inphi Corporation | Inphi Corporation | 1 | 1 |
| Mak, Gary | Inphi Corporation | inphi | 1 | 1 |
| Malicoat, David | Malicoat Networking Solutions | Malicoat Networking Solutions; SENKO Advanced Components | | 1 |
| Maniloff, Eric | Ciena Corporation | Ciena Corporation | 1 | 1 |
| mi, guangcan | Huawei Technologies Co., Ltd | Huawei Technologies Co., Ltd | 1 | 1 |
| Milicevic, Mario | MaxLinear | MaxLinear | | 1 |
| Montreuil, Leo | Broadcom Corporation | Broadcom Corporation | 1 | |
| Moorwood, Charles | Keysight Technologies | Keysight Technologies | 1 | 1 |
| Mu, Jianwei | | Hisense | 1 | 1 |
| Muller, Shimon | Axalume, Inc. | Axalume, Inc. | 1 | 1 |
| Murty, Ramana | Broadcom Inc. | Broadcom Corporation | 1 | 1 |
| Nering, Raymond | Cisco Systems, Inc. | Cisco Systems, Inc. | 1 | 1 |
| Nicholl, Shawn | Xilinx | Xilinx | 1 | 1 |
| Nowell, Mark | Cisco Systems, Inc. | Cisco Systems, Inc. | 1 | 1 |
| Ofelt, David | Juniper Networks, Inc. | Juniper Networks, Inc. | 1 | 1 |
| Omori, Kumi | NEC Corporation | NEC Corporation | 1 | 1 |
| Palkert, Thomas | Macom, Samtec | Samtec-Macom | 1 | 1 |
| PARK, CHUL SOO | Juniper Networks Inc. | Juniper Networks, Inc. | 1 | 1 |
| Parthasarathy, Vasu | Broadcom Corporation | Broadcom Corporation | 1 | |
| Pepper, Gerald | Keysight Technologies | Keysight Technologies | 1 | |
| Piehler, David | Dell Technologies | Dell | | 1 |
| Pimpinella, Rick | Panduit Corp. | Panduit Corp. | | 1 |
| Pitwon, Richard | Resolute Photonics | AIO Core | 1 | |

| | | | | |
|---|---|---|---|---|
| Rabinovich, Rick | Keysight Technologies | Keysight Technologies | 1 | 1 |
| Radhamohan, Rajeshmohan | MAXLINEAR INC | Broadcom Corporation | 1 | 1 |
| Ramesh, Sridhar | MaxLinear | MAXLINEAR INC | | 1 |
| Rannow, R K | silverdraft supercomputing | Silverdraft Supercomputing | 1 | 1 |
| Rechtman, Zvi | Mellanox Technologies | NVIDIA Corporation | 1 | 1 |
| Ren, Hao | Huawei Technologies Co., Ltd | Huawei Technologies Co., Ltd | 1 | |
| Sakai, Toshiaki | Socionext Inc. | socionext | 1 | 1 |
| Sambasivan, Sam | AT&T | AT&T | 1 | 1 |
| Sarlet, Gert | II-VI Incorporated | II-VI Incorporated | 1 | |
| Savi, Olindo | Hubbell Incorporated | Hubbell Incorporated | 1 | 1 |
| She, Qingya | Fujitsu Network Communications | Fujitsu Network Communications | 1 | 1 |
| Son, Yung Sung | Optomind Inc | Optomind Inc | 1 | |
| Sone, Yoshiaki | NTT | Nippon Telegraph and Telephone Corporation (NTT) | 1 | 1 |
| Sorbara, Massimo | GLOBALFOUNDRIES | GLOBALFOUNDIRES | 1 | 1 |
| Sprague, Edward | Infinera Corporation | Infinera Corporation | 1 | 1 |
| Stassar, Peter | Huawei Technologies Co., Ltd | Huawei Technologies Co., Ltd | 1 | 1 |
| Stone, Robert | Broadcom Corporation | Facebook | 1 | |
| Sun, Junqing | Credo Semiconductor | Credo Semiconductor | 1 | 1 |
| Sun, Yi | | OFS | 1 | 1 |
| Tailor, Bharat | Semtech Canada Corporation | Semtech Canada Corporation | 1 | 1 |
| TAKAHARA, TOMOO | FUJITSU LABORATORIES LIMITED | FUJITSU LIMITED | 1 | 1 |
| Terada, Masaru | FURUKAWA ELECTRIC | FURUKAWA ELECTRIC | 1 | 1 |
| Theodoras, James | HG Genuine | HG Genuine | 1 | 1 |
| Tooyserkani, Pirooz | Cisco Systems, Inc. | Cisco Systems, Inc. | | 1 |
| Tracy, Nathan | TE Connectivity | TE Connectivity | 1 | 1 |
| Tran, Viet | Keysight Technologies | Keysight Technologies | 1 | 1 |
| Trowbridge, Stephen | Nokia | Nokia | 1 | 1 |
| Ulrichs, Ed | Intel | Intel | | 1 |
| Walker, Clinton | Alphawave IP | Alphawave IP | 1 | 1 |
| Wang, Haojie | China Mobile Communications Corporation (CMCC) | China Mobile Communications Corporation (CMCC) | 1 | 1 |
| Wang, Ruoxu | Huawei Technologies Co., Ltd | Huawei Technologies Co., Ltd | 1 | 1 |
| Wang, Xinyuan | Huawei Technologies Co., Ltd | Huawei Technologies Co., Ltd | 1 | 1 |
| Weaver, James | Arista Networks | Arista Networks | 1 | 1 |
| Weber, Markus | socionext | Acacia Communications | 1 | |
| Welch, Brian | Cisco Systems, Inc. | Luxtera | 1 | 1 |
| Williams, Tom | Acacia Communications | Acacia Communications | 1 | 1 |
| Wu, Mau-Lin | MediaTek Inc. | MediaTek Inc. | 1 | 1 |
| Xu, Yu | Huawei Technologies Co., Ltd | Huawei Technologies Co., Ltd | | 1 |

| Young, James | CommScope, Inc. | CommScope | 1 | |
|---|---|---|---|---|
| Zhang, Bo | Inphi Corporation | Inphi Corporation | 1 | 1 |
| Zhiwei, Yang | ZTE Corporation | ZTE Corporation | 1 | |