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

Session called to order at 10:02 am ET (all times ET), 12 Aug 2021

Meeting called to order by John D'Ambrosia, who chaired the meeting.

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_08/agenda_b400g_b_210812.pdf

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

Minutes –

- July 2021 Session - https://www.ieee802.org/3/B400G/public/21_07/minutes_b400G_2107_unapproved.pdf

Chair asked if there were any other corrections, there were none. 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 Copyright Policy
- IEEE SA Participation Policy

Chair asked if anyone needed to review the policies at that time – there were no requests to do so.
Chair asked if anyone needed any of these policies reviewed in-depth. There were no requests.

Chair presented the (See Slide #23) of the IEEE SA Pre-PAR Patent Policy slides.

Chair presented the second slide (See Slide #25) of the IEEE SA Copyright Policy slides. Chair noted – "By participating in this activity, you agree to comply with the IEEE Code of Ethics, all applicable laws, and all IEEE policies and procedures including, but not limited to, the IEEE SA Copyright Policy."

Chair presented the second slide (See Slide #28) of the IEEE SA Participation Policy slides. Chair noted – "Participants in the IEEE-SA "individual process" shall act independently of others, including employers. By participating in standards activities using the "individual process", you are deemed to accept these requirements; if you are unable to satisfy these requirements then you shall immediately cease any participation."

Chair reviewed voting in Study Group Sessions (See Slide #5), and noted that any motions that did not have unanimous consent would be done via a role call vote using the Zoom tool, and votes would be recorded in the minutes.

Chair reviewed goals for this meeting. See Slide #6.
Chair reviewed timeline for the Study Group. See Slide #8.

Liaisons
There were no liaisons to consider.

Presentation #2	**Technical feasibility of the "10km @ 800Gb/s" objective**
Presenter	Tingting Zhang
URL	https://www.ieee802.org/3/B400G/public/21_08/zhang_b400g_01_0812.pdf

There was general discussion about the presentation.

Presentation #3	**Support for 800GbE over 8lanes (8x100G) Copper Cables**
Presenter	Samuel Kocsis
URL	https://www.ieee802.org/3/B400G/public/21_08/kocsis_b400g_01a_0812.pdf

There was general discussion about the presentation.

Straw Poll #1 - 800 Gb/s CR

I would support adopting the following objective: • Define a physical layer specification that supports 800 Gb/s operation over eight lanes of twin axial copper cables with a reach up to at least 2 meters	Results
a) Yes	70
b) No	3
c) Need more information	3
d) Abstain	12

Straw Poll #2 - 800 Gb/s KR

I would support adopting the following objective: • Define a physical layer specification that supports 800 Gb/s operation over eight lanes over electrical backplanes supporting an insertion loss <= 28dB at 26.56GHz	Results
a) Yes	60
b) No	1
c) Need more information	3
d) Abstain	22

Motion #1 - 800 Gb/s CR

Motion	Move to adopt the following objective: • Define a physical layer specification that supports 800 Gb/s operation over eight lanes of twin axial copper cables with a reach up to at least 2 meters
M:	Sam Kocsis
S:	Jim Weaver
Technical (>=75%)	
All (y/n/a)	Approved by unanimous consent
Results	Motion passes

Motion #2 - 800 Gb/s KR

Motion	Move to adopt the following objective: • Define a physical layer specification that supports 800 Gb/s operation over eight lanes over electrical backplanes supporting an insertion loss <= 28dB at 26.56GHz
M:	Sam Kocsis
S:	Jim Weaver
Technical (>=75%)	
All (y/n/a)	Approved by unanimous consent
Results	Motion passes

Chair reviewed the future meetings.

Chair reminded everyone of next week's meeting.

Session broke at 11:32 am

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

Session reconvened at 10:02 am ET (all times ET), 19 Aug 2021

Meeting called to order by John D'Ambrosia, who chaired the meeting.

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

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 Copyright Policy
- IEEE SA Participation Policy

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

Chair asked if anyone needed any of these policies reviewed in-depth. There were no requests.

Chair presented the (See Slide #22) of the IEEE SA Pre-PAR Patent Policy slides (See Slide #22).

Chair presented the second slide (See Slide #25) of the IEEE SA Copyright Policy slides. Chair noted – "By participating in this activity, you agree to comply with the IEEE Code of Ethics, all applicable laws, and all IEEE policies and procedures including, but not limited to, the IEEE SA Copyright Policy."

Chair presented the second slide (See Slide #28) of the IEEE SA Participation Policy slides. Chair noted – "Participants in the IEEE-SA "individual process" shall act independently of others, including employers. By participating in standards activities using the "individual process", you are deemed to accept these requirements; if you are unable to satisfy these requirements then you shall immediately cease any participation."

Chair reviewed voting in Study Group Sessions (See Slide #5), and noted that any motions that did not have unanimous consent would be done via a role call vote using the Zoom tool, and votes would be recorded.

Presentation #4	**Feasibility of 800G Long Reach and Extended Reach with IMDD Options**
Presenter	Rang-Chen Yu
URL	https://www.ieee802.org/3/B400G/public/21_08/yu_b400g_01a_210819.pdf

An updated presentation will be provided correcting a misspelled name of a supporter.
There was general discussion about the presentation.

Presentation #5	**Draft Project Documentation**
Presenter	John D'Ambrosia
URL	https://www.ieee802.org/3/B400G/public/21_08/dambrosia_b400g_01_210819.pdf

There was general discussion about the presentation. Discussion by the Study group was used to update the draft project document - https://www.ieee802.org/3/B400G/public/21_08/draft_projdoc_21_0819.pdf

Highlighted text will be reviewed.

Break was called at 11:40.
Break ended at 11:45

Discussion of the project documentation continued.

Session broke at 12:59 pm

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

Session reconvened at 10:02 am ET (all times ET), 26 Aug 2021

Meeting called to order by John D'Ambrosia, who chaired the meeting.

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

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 Copyright Policy
- IEEE SA Participation Policy

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

Chair asked if anyone needed any of these policies reviewed in-depth. There were no requests.

Chair presented the (See Slide #22) of the IEEE SA Pre-PAR Patent Policy slides (See Slide #22).

Chair presented the second slide (See Slide #25) of the IEEE SA Copyright Policy slides. Chair noted – "By participating in this activity, you agree to comply with the IEEE Code of Ethics, all applicable laws, and all IEEE policies and procedures including, but not limited to, the IEEE SA Copyright Policy."

Chair presented the second slide (See Slide #28) of the IEEE SA Participation Policy slides. Chair noted – "Participants in the IEEE-SA "individual process" shall act independently of others, including employers. By participating in standards activities using the "individual process", you are deemed to accept these requirements; if you are unable to satisfy these requirements then you shall immediately cease any participation."

Chair reviewed voting in Study Group Sessions (See Slide #5), and noted that any motions that did not have unanimous consent would be done via a role call vote using the Zoom tool, and votes would be recorded

Presentation #6	**Further Consideration on 200G per lane KR/CR electrical links**
Presenter	Lu Yuchun
URL	https://www.ieee802.org/3/B400G/public/21_08/lu_b400g_01a_210826.pdf

There was general discussion about the presentation.

Presentation #7	**Addressing possible 800G copper cable objective**
Presenter	Adee Ran
URL	https://www.ieee802.org/3/B400G/public/21_08/ran_b400g_01a_210826.pdf

An updated presentation will be provided with additional supporters and editorial updates. (Noted above)
There was general discussion about the presentation.

Presentation #8	**Broadened Consensus for a 200GEL Copper Cable Objective**
Presenter	Nathan Tracy/Samuel Kocsis
URL	https://www.ieee802.org/3/B400G/public/21_08/kocsis_b400g_01a_210826.pdf

There was general discussion about the presentation.

Break was called at 12:35pm

Meeting reconvened at 12:39pm

Straw Poll #3 - 800 Gb/s CR Length

I would support adopting an objective:	Results y/n/a
a) for a physical layer specification that defines 800 Gb/s operation over 4 pairs of copper twin-axial cables in each direction with a reach of 1.0 m.	44/5/10
b) for a physical layer specification that defines 800 Gb/s operation over 4 pairs of copper twin-axial cables in each direction with a reach of 1.25 m.	21/23/15
c) for a physical layer specification that defines 800 Gb/s operation over 4 pairs of copper twin-axial cables in each direction with a reach of 1.5 m.	14/28/17

Motion #3 - CR

Motion	Move to adopt the following objectives: • Define a physical layer specification that supports 800 Gb/s operation over 4 pairs of copper twin-axial cables in each direction with a reach of up to at least 1.0 meter. • Define a physical layer specification that supports 1.6 Tb/s operation over 8 pairs of copper twin-axial cables in each direction with a reach of up to at least 1.0 meter. • Define a physical layer specification that supports 200 Gb/s operation over 1 pair of copper twin-axial cables in each direction with a reach of up to at least 1.0 meter. • Define a physical layer specification that supports 400 Gb/s operation over 2 pairs of copper twin-axial cables in each direction with a reach of up to at least 1.0 meter.
M:	Nathan Tracy
S:	Adee Ran
Technical (>=75%)	
All (y / n / a)	Motion approved by unanimous consent
Results	Motion Passed

Chair reviewed the upcoming meetings for the Sept 2021 session.

Session broke at 12:56 pm

Attendees

Name	Employer	Affiliation	8/12/21	8/19/21	8/26/21
BakroNagy, Istvan	EFFECT Photonics	Effect Photonics	1		
Bernier, Eric		Huawei Technologies Canada; Huawei Technologies Co., Ltd	1	1	1
Bernstein, Gary	Leviton Manufacturing Co.	The Siemon Company		1	
Bhatt, Vipul	II-VI Incorporated	II-VI Incorporated		1	
Bois, Karl	TE Connectivity	TE Connectivity	1	1	1
Brown, Matthew	Huawei Technologies Canada	Huawei Technologies Canada	1	1	
Bruckman, Leon	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	1	1	1
Calvin, John	Keysight Technologies	Keysight Technologies		1	1
Carty, Clark	Cisco Systems, Inc.	Cisco Systems, Inc.			1
Casher, Patrick		Foxconn Interconnect Technologies (FIT)	1		
Cassan, Dave	Alphawave	Alphawave	1	1	1
Chang, Yongmao	Inphi Corporation	Source Photonics		1	1
Chen, Chan	Applied Optoelectronics, Inc.	Applied Optoelectronics, Inc.			1
cheng, weiqiang		China Mobile Communications Corporation (CMCC)	1	1	
D'Ambrosia, John	Futurewei Technologies	Futurewei Technologies, U.S. Subsidiary of Huawei	1	1	1
Dawe, Piers J G	NVIDIA	Nvidia			1
Dudek, Michael	Marvell	Marvell	1		
Ellison, Jason	Amphenol Corporation	The Siemon Company			1
Ewen, John	Marvell	Marvell	1	1	1
Ferretti, Vincent	Corning Incorporated	Corning Incorporated	1	1	1
Geng, Limin	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	1	1	
Ghiasi, Ali	Ghiasi Quantum LLC	Ghiasi Quantum LLC, Marvell	1	1	1

Goodwill, Dominic		Huawei Technologies Canada; Huawei Technologies Co., Ltd	1	1	1
Gore, Brandon	Samtec, Inc.	Samtec, Inc.	1		1
Gorshe, Steven Scott	Microchip Technology, Inc.	Microchip Technology, Inc.	1	1	1
Gustlin, Mark	Cisco Systems, Inc.	Cisco Systems, Inc.	1	1	1
Harstead, Ed	Nokia	Nokia	1		
Haser, Alexandra	Molex Incorporated	Molex Incorporated	1		1
He, Xiang	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	1	1	1
Healey, Adam	Broadcom Inc.	Broadcom Inc.	1		1
Heck, Howard	Intel Corporation	Intel Corporation	1	1	1
Hidaka, Yasuo	Credo Semiconductor	Credo Semiconductor	1		1
Huang, Kechao		Huawei Technologies Co., Ltd	1	1	1
HUANG, QINHUI	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	1	1	1
Huber, Thomas	Nokia	Nokia	1	1	1
Hutchins, Jeff	Ranovus	Ranovus	1	1	1
Isono, Hideki	Fujitsu Optical Components Limited	Fujitsu Optical Components Limited	1	1	1
Issenhuth, Tom	Issenhuth Consulting, LLC	Huawei Technologies Co., Ltd	1	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	
Kabra, Lokesh	Synopsys, Inc.	Synopsys, Inc.	1		
Kamino, John	OFS	OFS			1
Kao, Chienping	Intel Corporation	Cornelis Networks	1	1	1
Kareti, Upen	Cisco Systems, Inc.	Cisco Systems, Inc.			1
Kim, Kihong/Joshua	Hirose Electric (USA), Inc.	Hirose Electric (USA), Inc.	1		1
Kimber, Eric	Semtech Ltd	Semtech Ltd	1	1	

Klingensmith, William		DoD	1	1	1
Kochuparambil, Elizabeth	Cisco Systems, Inc.	Cisco Systems, Inc.			1
Kocsis, Sam	Amphenol Corporation	Amphenol Corporation	1	1	1
Kuschnerov, Maxim	Huawei Technologies Duesseldorf GmbH	Huawei Technologies Duesseldorf GmbH	1		
Lam, Cedric		Google		1	1
Lawson, Matthew	Cisco Systems, Inc.	Cisco Systems, Inc.	1	1	1
Le Cheminant, Greg	Keysight Technologies	Keysight Technologies	1	1	1
Levin, Itamar		Intel Corporation	1	1	1
Lewis, David	Lumentum Inc.	Lumentum Inc.	1		
Li, Mike-Peng	Intel Corporation	Intel Corporation			1
Little, Terrance		Foxconn Electronics Inc.			1
Liu, Karen	Nubis Communications	Nubis Communications			1
Lu, Yuchun	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	1		1
Lusted, Kent	Intel Corporation	Intel Corporation			1
Mak, Gary	Inphi Corporation	inphi	1	1	1
Maki, Jeffery	Juniper Networks, Inc.	Juniper Networks, Inc.		1	1
Malicoat, David	Malicoat Networking Solutions	Malicoat Networking Solutions; SENKO Advanced Components	1	1	1
Maniloff, Eric	Ciena Corporation	Ciena Corporation			1
Marques, Flavio	FURUKAWA ELECTRIC	FURUKAWA ELECTRIC		1	
Mellitz, Richard	Samtec, Inc.	Samtec, Inc.	1	1	1
mi, guangcan	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	1	1	1
Milicevic, Mario	MaxLinear	MaxLinear	1	1	1
Moorwood, Charles	Keysight Technologies	Keysight Technologies	1	1	1
Mu, Jianwei		Hisense	1	1	1
Mueller, Thomas	Rosenberger	Rosenberger		1	
Muller, Shimon	Enfabrica Corp.	Enfabrica Corp.	1	1	1

Nering, Raymond	Cisco Systems, Inc.	Cisco Systems, Inc.	1	1	1
Nicholl, Gary	Cisco Systems, Inc.	Cisco Systems, Inc.		1	
Nicholl, Shawn	Xilinx	Xilinx	1	1	1
Noujeim, Leesa	Google	Google	1	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	1
Opsasnick, Eugene	Broadcom Inc.	Broadcom Corporation	1	1	1
Palkert, Thomas	Macom, Samtec	Samtec-Macom	1		1
PARK, CHUL SOO	Juniper Networks Inc.	Juniper Networks, Inc.	1	1	1
Parsons, Earl	CommScope, Inc.	CommScope, Inc.	1		1
peng, semmy		Huawei Technologies Co., Ltd	1	1	1
Piehler, David	Dell Technologies	Dell	1		1
Pimpinella, Rick	Panduit Corp.	Panduit Corp.	1	1	1
Pittala, Fabio	Huawei Technologies Duesseldorf GmbH	Huawei Technologies Duesseldorf GmbH	1		
Powell, William	INDEPENDENT	INDEPENDENT		1	
Rabinovich, Rick	Keysight Technologies	Keysight Technologies	1	1	1
Rahn, Jeffrey	Infinera Corporation	Facebook		1	1
Ran, Adee	Cisco Systems, Inc.	Cisco systems	1	1	1
Rannow, R K	silverdraft supercomputing	Silverdraft Supercomputing			1
Ren, Hao	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	1		1
Rodes, Roberto	II-VI	II-VI	1	1	1
Sakai, Toshiaki	Socionext Inc.	socionext	1		1
Sambasivan, Sam	AT&T	AT&T		1	
Savi, Olindo	Hubbell Incorporated	Hubbell Incorporated			1
Shahramian, Shayan		Alphawave	1	1	1
She, Qingya	Fujitsu Network Communications	Fujitsu Network Communications	1	1	1
Shrikhande, Kapil	Innovium Inc.	Innovium			1

Shukla, Priyank	Synopsys, Inc.	Synopsys, Inc.	1		1
Slavick, Jeff	Broadcom Inc	Broadcom Inc		1	
Sommers, Scott	Molex LLC	Molex Incorporated	1	1	1
Son, Yung Sung	Optomind Inc	Optomind Inc	1	1	1
Sone, Yoshiaki	NTT	Nippon Telegraph and Telephone Corporation (NTT)	1	1	1
Sorbara, Massimo	GLOBALFOUNDRIES	GLOBALFOUNDIRES	1	1	1
Sprague, Edward	Infinera Corporation	Infinera Corporation	1	1	1
Stassar, Peter	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	1	1	
Stone, Robert	Broadcom Corporation	Facebook	1	1	1
Sun, Junqing	Credo Semiconductor	Credo Semiconductor		1	1
Tailor, Bharat	Semtech Canada Corporation	Semtech Canada Corporation	1	1	1
TAKAHARA, TOMOO	FUJITSU LABORATORIES LIMITED	FUJITSU LIMITED			1
Terada, Masaru	FURUKAWA ELECTRIC	FURUKAWA ELECTRIC	1	1	
Theodoras, James	HG Genuine	HG Genuine	1	1	1
tomofuji, hiroaki		FUJITSU		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	1
Ulrichs, Ed	Intel Corporation	Intel Corporation		1	1
Villares, Gustavo		Lumiphase			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	1
Wang, Xinyuan	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	1	1	1

Weaver, James	Arista Networks	Arista Networks	1	1	1
Welch, Brian	Cisco Systems, Inc.	Luxtera	1	1	1
Williams, Tom	Cisco Systems, Inc.	Cisco Systems, Inc.		1	1
Wu, Mau-Lin	MediaTek Inc.	MediaTek Inc.	1	1	1
Young, James	CommScope, Inc.	CommScope	1	1	1
Yu, Rang-Chen		SiFotonics Technologies	1		
Zebian, Sara		Google	1		1
Zhang, Bo	Marvell Technology, Inc	Marvell Technology, Inc	1	1	1
Zhang, Sheng		Source Photonics			1
Zhong, Qiwen	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	1		
Zhuang, Yan	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	1	1	1
Zivny, Pavel	Tektronix, Inc.	Tektronix, Inc.	1	1	