Approved Minutes

IEEE P802.3bs 400GbE Task Force
Plenary Meeting

July 15 - 17, 2014
San Diego, CA, USA
Prepared by Peter Stassar

Meeting called to order at 10:30AM, Tuesday July 15, 2014.

Chair appointed Peter Stassar to be a Recording Secretary for the meeting.

Presenter	John D'Ambrosia, Dell
Title	Agenda and General Information
File	agenda_3bs_01_0714.pdf

Chair noted that three presentations were submitted after the deadline (Booth, Shirao, Nicholl), and asked if the group wished to hear these presentations, pending time availability. There were no objections to add these to the agenda after the presentations that were submitted on time.

Motion #1: Move to approve the agenda
Moved by: Steve Trowbridge
Second by: Paul Kolesar.
Results: The motion passed by voice without opposition

The May 2014 meeting minutes had been posted. Chair noted no comments were received.

Motion # 2: Move to approve the May 2014 Minutes
Moved by: Peter Anslow.
Second by: Mark Gustlin.
Results: The motion passed by voice without opposition

Chair asked if there were any reporters in the room. John D'Ambrosia noted he talks with press but will only disclose high level details available from published meeting material.

Chair showed the Patent Policy for IEEE-SA meetings.

Advise 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, neither 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.

The Chair made a call for potentially essential patents. No one responded to the call for patents.

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

Chair further noted that reports from several ad-hoc meetings were available and posted on the BS website, but that they would not be presented to save meeting time.

Liaisons

Presentation #	1
Presenter	Nathan Tracy
Title	OIF to IEEE P802.3bs on CEI 56G Projects
File	OIF_to_IEEE_P802d3bs_May_2014.pdf

Chair showed summary slide of ad hoc reports, and asked if there were any questions. Chair noted that he was appointing Gary Nicholl to chair the Use Case Ad Hoc.

Presentation #	2
Presenter	Mark Gustlin
Title	A 400GbE Architectural Option
File	gustlin_3bs_02_0714.pdf

Presentation #	3
Presenter	Mark Gustlin
Title	400GbE MII Baseline Proposal
File	gustlin_3bs_03_0714.pdf

Presentation # 4

Presenter Mark Gustlin

Title 400GbE PCS Options

File gustlin_3bs_04_0714.pdf

Presentation # 5

Presenter Tongtong Wang

Title BER/FLR Calculation Result for Multiplexing in PMA

File wang_t_3bs_01_0714.pdf

Break for lunch @ 11:55AM

Reconvened@ 1:00PM

Presentation # 6

Presenter Pete Anslow

Title FEC performance on multi-part links

File anslow_3bs_02_0714.pdf

Presentation # 7

Presenter Xinyuan Wang

Title FOM Bit mux, Architecture, Challenge and Solution

File wang_x_3bs_01_0714.pdf

Presentation # 8

Presenter Steve Trowbridge

Title OTN Support Update

File trowbridge_3bs_01_0714.pdf

Presentation #	9
Presenter	Pete Anslow
Title	PAM4 test pattern characteristics
File	anslow_3bs_03_0714.pdf

Presentation #	10
Presenter	Haoli Qian
Title	56Gb/s NRZ Electrical Interface Signaling
File	qian_3bs_01_0714.pdf

Break @ 3:11PM

Reconvened @ 3:27PM

Presentation #	11
Presenter	Yuval Domb
Title	Feasibility study of 50G PAM4 Serdes for the chip-to-module interface
File	domb_3bs_01_0714.pdf

Presentation #	12
Presenter	Mike Li
Title	A CDAUI-16 Chip-to-Chip (c2c) and Chip-to-Module (c2m) Specification Proposal
File	li_3bs_01a_0714.pdf,

Presentation #	13
Presenter	Rich Mellitz
Title	CDAUI-8 50Gb/s Mezzanine Chip to Chip Channels
File	mellitz_3bs_01_0714.pdf

Presentation #	14
Presenter	Brian Welch
Title	400G-PSM4, Options for 500m Reach Interconnects
File	welch_3bs_01a_0714.pdf

Presentation #	15
Presenter	Ali Ghiasi
Title	Path to consensus on 400 GbE PMDs
File	ghiasi_3bs_01_0714.pdf

Break for Day @ 5:34PM

Reconvened Wednesday, July 16, 8:17AM

The Chair showed patent policy slides.

The Chair made a call for potentially essential patents. No one responded to the call for patents.

Presentation #	16
Presenter	Ali Ghiasi
Title	Tool for simulating 400 GbE Optical PMDs
File	ghiasi_3bs_02_0714.pdf

Presentation #	17
Presenter	Will Bliss
Title	Channel Characterization for Evaluating Advanced Modulation Systems
File	bliss_3bs_01_0714.pdf

Presentation # 18

Presenter Dan Dove

Title Proliferation and Consolidation

File dove_3bs_01_0714.pdf

Presentation # 19

Presenter Riu Hirai

Title Proposal Updates of Nyquist Modulation

File hirai_3bs_01a_0714.pdf

Break @ 9:53AM

Reconvened @ 10:12AM

Presentation # 20

Presenter Toshiki Tanaka

Title 400G Discrete Multi-Tone PMD for 10 km SMF

File tanaka_3bs_01a_0714.pdf

Presentation # 21

Presenter Greg LeCheminant

Title DMT Measurement Considerations

File lecheminant_3bs_01_0714

Presentation # 22

Presenter Yoshiaki Sone

Title Issues for fair comparison of PAM4 and DMT.

File sone_3bs_01_0714.pdf

Presentation #	23
Presenter	David Lewis
Title	400G DMT PMD for 2km SMF
File	lewis_3bs_01_0714.pdf

Break for lunch @ 11:50AM

Reconvened@ 1:04PM

Presentation #	24
Presenter	Ian Dedic
Title	Implementation of DMT transceiver for 400GbE 2km and 10km PMD using 4 wavelengths
File	dedic_3bs_01a_0714.pdf

Presentation #	25
Presenter	Fei Zhu
Title	Component BW requirement of 56Gbaud Modulations for 400GbE 2 & 10km PMD
File	zhu_3bs_01_0714.pdf

Presentation #	26
Presenter	Xu Yu
Title	Further analyze of 8*50G PAM4 for 10km transmission
File	yu_3bs_01_0714.pdf

Presentation #	27
Presenter	Vipul Bhatt
Title	Four-wavelength 400G on Duplex SMF
File	bhatt_3bs_01a_0714.pdf

Break @ 3:07PM

Reconvened @ 3:27PM

Presentation #	28
Presenter	Peter Stassar
Title	Updated Considerations on a 4x112Gb/s PAM4 Configuration for the 2km SMF PMD
File	stassar_3bs_01_0714.pdf

Presentation #	29
Presenter	Chris Cole
Title	400G & 4x100G SMF PMD Alternatives Study
File	cole_3bs_01a_0714.pdf

Presentation #	30
Presenter	Chris Cole
Title	50G/λ vs.100G/λ SMF PMD Alternatives Study
File	cole_3bs_02a_0714.pdf

Presentation #	31
Presenter	Ayla Chang
Title	10km PMD-a must for carrier network
File	chang_3bs_01_0714.pdf

Presentation #	32
Presenter	Lu Huang
Title	Application requirement for 400GE in 10km and above distance
File	huang_3bs_01_0714.pdf

Break for Day @ 5:36PM

Reconvened Thursday, July 17, 8:30AM

The Chair showed patent policy slides.

The Chair made a call for potentially essential patents. No one responded to the call for patents.

Late Presentations were heard.

Presentation #	33
Presenter	Brad Booth
Title	Interface Considerations
File	booth_3bs_01a_0714.pdf

Presentation #	34
Presenter	Mizuki Shirao
Title	Experimental Demonstration of 56Gb/s NRZ for 400GbE PMD
File	shirao_3bs_01a_0714.pdf

Presentation #	35
Presenter	Gary Nicholl
Title	400G SMF PMD Approaches - A System Vendor’s perspective
File	nicholl_3bs_02_0714.pdf

Discussion, Straw Polls and Motions

Motions:

Motion #3: Move to adopt the baseline for the CDMII logical interface as shown in slide 5 of gustlin_3bs_03_0714.pdf.

Moved by: Mark Gustlin

Second by: Pete Anslow

Technical (>=75%)

Yes (all): 97

No (all): 0

Abstain (all): 12

Result: The motion passed

Motion #4: Move that 10km 400GbE SMF PMD will use a duplex fiber solution.

Moved by: Peter Stassar

Second by: Steve Trowbridge

Technical (>=75%)

Yes (all): 96

No (all): 1

Abstain (all): 15

Result: The motion passed

Motion #5: Move that 2km 400GbE SMF PMD will use a duplex fiber solution.

Moved by: Pete Anslow

Second by: Brian Holden

Technical (>=75%)

Result: The motion was withdrawn by mover/second after a long discussion regarding the use of duplex or PSM fiber solutions to address 2km. The chair expressed reservations about potential distinct identity issue if 2km solutions based on duplex and PSM fiber solutions were developed, and wanted to consult with the working group chair.

Break @ 9:48AM

Reconvened @ 10:15AM

Strawpolls

Strawpoll #1: I support FEC for optical PMDs:

a. FEC Mandatory	69
b. FEC optional	7
c. Some PMDs may not need FEC	0
d. Mandatory for some / optional for others	10
e. Need more information	10

Strawpoll #2: For **Chip-to-Module interconnect**: I support the following chip-to-module ELECTRICAL interconnect for 400GbE:

a. 8 lane by 50Gb/s only	7
b. 16 lane by 25Gb/s only	33
c. Both 8 lane by 50Gb/s and 16 lane by 25Gb/s	67
d. ALL 3 options [4 lane by 100Gb/s, 8 lane by 50Gb/s and 16 lane by 25Gb/s]	2
e. Some other interconnect rate or lane combination than listed	0

Strawpoll #3: For **Chip-to-Module interconnect**: I support the following chip-to module ELECTRICAL interconnect modulation for 400GbE: **Chicago Rules**

a. NRZ for 25Gb/s	84
b. PAM4 for 25Gb/s	4
c. NRZ for 50Gb/s	34
d. PAM4 for 50Gb/s	66

Strawpoll #4: For **Chip-to-Module interconnect**: I support FEC for the chip-to-module ELECTRICAL interconnect:

a. FEC Mandatory for 50Gb/s	62
b. FEC optional for 50Gb/s	16
c. NO FEC needed for 50Gb/s	0
d. Need more information	17

Strawpoll #5: For **Chip-to-chip interconnect**: I support the following chip-to-chip ELECTRICAL interconnect for 400GbE:

a. 8 lane by 50Gb/s only	9
b. 16 lane by 25Gb/s only	22
c. Both 8 lane by 50Gb/s and 16 lane by 25Gb/s	56
d. ALL 3 options [4 lane by 100Gb/s, 8 lane by 50Gb/s and 16 lane by 25Gb/s]	1
e. Some other interconnect rate or lane combination than listed	0

Strawpoll #6: For **Chip-to-chip interconnect**: I support the following chip-to-chip ELECTRICAL interconnect modulation for 400GbE: **Chicago Rules**

a. NRZ for 25Gb/s	75
b. PAM4 for 25Gb/s	3
c. NRZ for 50Gb/s	30
d. PAM4 for 50Gb/s	64

Strawpoll #7: For **Chip-to-chip interconnect**: I support FEC for the chip-to-chip ELECTRICAL interconnect:

a. FEC Mandatory for 50Gb/s	20
b. FEC optional for 50Gb/s	21
c. NO FEC needed for 50Gb/s	0
d. Need more information	46

Strawpoll #8: I support:

a. Using end-to-end FEC wherever possible.	49
b. Using segment-by-segment FEC always.	6
c. Using encapsulated FEC's	2
d. Need additional information	40

Strawpoll #9: If all PMDs developed in P802.3bs include mandatory FEC and FEC error statistics are available, do we also require BIP?:

Yes:.	4
No:	24
Abstain:	69

Strawpoll #10: If BIP is required, should it be implemented::

a. Segment by segment (optimized for fault isolation)	2
b. End-to-end (optimized for service assurance).	6
c. Need more information	35
d. Not required / don't care	33

Strawpoll #11: I would support a baseline proposal for the 100m MMF objective based on a 16 fiber (each direction), 25Gb/s per fiber solution:

Yes:.	42
No:	18
Need Additional Information:	26

Finally the Chair showed the list of future meetings.

Strawpoll #12:For Sept Interim:

- I will attend 802.3bs 65
- I may attend 802.3bs 24
- I may not attend 802.3bs 5
- I will not attend 802.3bs 10
- I will attend tentative 25GbE SG 33
- I may attend tentative 25GbE SG 26
- I may not attend tentative 25GbE SG 9
- I will not attend tentative 25GbE SG 15

Strawpoll #13:For Nov Plenary:

- I will attend 802.3bs 71
- I may attend 802.3bs 20
- I may not attend 802.3bs 2
- I will not attend 802.3bs 3
- I will attend tentative 25GbE SG 31
- I may attend tentative 25GbE SG 26
- I may not attend tentative 25GbE SG 5
- I will not attend tentative 25GbE SG 12

Motion #6: Move to adjourn.
Moved by: Brad Booth
Second by: David Ofelt
Procedural (>50%)
Result: The motion passed by voice without opposition

Adjourned @ 11:59AM.

Attendees:

IEEE P802.3bs 400GbE Task Force			7/15/2014	7/16/2014	7/17/2014
Last Name	First Name	Employer / Affiliation	Tues	Wed	Thurs
Abbott	John	Corning	x	x	x
Amezcua	Adrian	Prysmian Group	x	x	x
Anslow	Pete	Ciena Corporation	x	x	x
Bacasubramonian	Venu	Marvell		x	
Baden	Eric	Broadcom	x	x	x
Baldwin	Thananya	Ixia	x	x	x
Bhatt	Vipul	Inphi	x	x	x
Bliss	Will	Broadcom	x	x	
Booth	Brad	Microsoft	x	x	x
Bouda	Martin	Fujitsu	x	x	x
Braun	Ralf-Peter	Deutsche Telekom	x	x	x
Brennan	Bill	Credo Semiconductor		x	
Brooks	Pam	JDSU	x		
Brooks	Paul	JDSU		x	
Brown	David	Semtech	x	x	x
Brown	Matt	Applied Micro		x	
Bugg	Mark	Molex		x	
Calderon	Juan-Carlos	Cortina Systems		x	x
Chang	Xin	Huawei	x	x	x
Chen	Henry	Broadcom	x	x	
Choudhury	Mabud	CommScope	x	x	
Cole	Chris	Finisar	x	x	
D'Ambrosia	John	Dell	x	x	x
Dawe	Piers	Mellanox	x	x	x
Decker	Patrick	Oracle	x	x	
Dedic	Ian	Fujitsu Semiconductors	x	x	
Domb	Yuval	Broadcom		x	
Dove	Dan	Dove Networking Solutions (DNS)	x	x	x
Dudek	Mike	QLogic	x	x	x
Ewen	John	IBM	x	x	x
Feller	Scott	Cortina Systems	x	x	x
Filip	Jan	Maxim Integrated Products Inc.	x		
Frazier	Howard	Broadcom	x		
Fu	Zhiming	ZTE		x	
Furlong	Michael	Clariphy Communications	x	x	x
Ghiasi	Ali	Ghiasi Quantum	x	x	x
Goell	James	Nano Precision Prod	x	x	x
Goergen	Joel	Cisco		x	x
Gong	Zhigang	D-Net	x	x	x
Gorshe	Steve	PMC_Sierra	x		
Guckenberger	Drew	Molex		x	
Gustlin	Mark	Xilinx	x	x	
Healey	Adam	Avago Technologies	x	x	x
Hendel	Ariel	Broadcom	x		
Hidaka	Yasuo	Fujitsu Laboratories of America	x	x	x
Hirai	Riu	Hitachi	x	x	x
Holden	Brian	Kandou Bus	x	x	x
Huang	Xi	Huawei	x	x	

Irwin	Scott	Mosys	x	x	x
Ishibe	Kazuhiko	Anristu	x	x	x
Isono	Hideki	Fujitsu Optical Components	x	x	x
Issenhuth	Tom	Microsoft	x	x	x
Jackson	Kenneth	Sumitomo		x	
Kawatsu	Yasuaki	Hitachi-Metals	x	x	x
Keshavan	Kumar	Cadence Design Systems	x	x	x
King	Jonathan	Finisar Corp.	x	x	x
Kipp	Scott	Brocade		x	
Kojima	Keisuke	Mitsubishi Electric Res. Lab	x	x	x
Kolesar	Paul	CommScope		x	x
Krishnasamy	Kumaran	Broadcom	x	x	x
Kwark	Bongsin	OE Solutions		x	x
Lackner	Hans	QoSCom	x		x
LeCheminant	Greg	Agilent Technologies		x	x
Lee	Arthur	MediaTek Inc	x	x	x
Lewis	Dave	JDSU	x	x	x
Li	Lei	Fujitsu	x	x	x
Li	Mike	Altera	x	x	x
Li	Shaohua	Brocade	x	x	
Little	Paul	Fujitsu Semiconductors	x	x	
Maki	Jeffery	Juniper Networks	x	x	x
Malkman	Yonaton	Mellanox	x	x	x
Marris	Arthur	Cadence	x	x	
Martinez	Joel	Altera	x	x	x
Matoglu	Erdem	Amphenol	x	x	x
McCurdy	Alan	OFS-Fitel	x	x	x
McDermott	Tom	Fujitsu	x	x	x
McDonough	John	NEC America	x	x	x
Mei	Richard	Commscope	x	x	
Mellitz	Richard	Intel	x	x	x
Meyer	Jeffrey	Centellax	x	x	
Mooney	Paul	Spirent Communications	x	x	x
Moore	Charles	Independent	x	x	x
Moorwood	Andy	Infinera Corp	x	x	
Muir	Ron	JAE	x	x	x
Murray	Dale	Light Counting	x	x	x
Nakamoto	Edward	Spirent Communications	x	x	x
Nicholl	Gary	Cisco	x	x	
Nolan	John	QLogic	x	x	x
Nowell	Mark	Cisco	x	x	x
Ofelt	David	Juniper Networks	x	x	x
Ogura	Ichiro	Petra	x	x	x
Palkert	Tom	Luxtera	x	x	x
Parady	Bodo	Pentum Group	x	x	x
Parthasarathay	Vasudevan	Broadcom	x	x	
Pepeljugoski	Petar	IBM		x	x
Petrilla	John	Avago Technologies	x	x	
Pimpinella	Rick	Panduit Corp.	x	x	
Qian	Haoli	Credo Semiconductor	x	x	x
Rabinovich	Rick	Alcatel-Lucent	x	x	
Rajapaksha	Dushmantha	Texas Instruments	x	x	x
Ran	Adee	Intel	x	x	x

Rao	Ram	Oclaro	x	x	x
Ressl	Mike	Hitachi Cable America	x	x	x
Sakamoto	Hisaya	Fujitsu Optical Components	x	x	x
Sasaki	Yasuo	Panduit Corp.	x	x	x
Sayre	Edward	NESA	x	x	x
Scheidt	Paul	Altera	x	x	
Shanbhag	Megha	TE Connectivity	x	x	x
Shigematsu	Masayuki	Sumitomo Electric	x	x	x
Shirao	Mizuki	Mitsubishi Electric	x	x	x
Shrikhande	Kapil	Dell	x	x	x
Slavick	Jeff	Avago Technologies	x	x	x
Sommers	Scott	Molex	x	x	x
Sone	Yoshiaki	NTT	x	x	x
Song	Xiaolu	Huawei	x	x	x
Sparacin	Daniel	Aurrion	x	x	
Sprague	Ted	Infinera	x	x	x
Stassar	Peter	Huawei	x	x	x
Stone	Rob	Broadcom	x	x	x
Swanson	Steve	Corning		x	
Szeto	William	Xtera	x	x	
Tailor	Bharat	Semtech Corp	x	x	x
Tajima	Akio	NEC Corporation	x	x	x
Takahata	Kiyoto	NTT	x	x	x
Takaishi	Toru	Fujitsu Semiconductors	x		
Tanaka	Toshiki	Fujitsu Laboratories	x	x	x
Tangirala	Ravi	Ericsson	x	x	x
Telang	Viviek	Broadcom	x	x	x
Tipper	Alan	Semtech	x	x	x
Tooyserkani	Pirooz	Cisco	x	x	x
Tracy	Nathan	TE Connectivity	x	x	x
Tremblay	Francois	Semtech	x	x	
Trowbridge	Steve	Alcatel-Lucent	x	x	x
Tseng	WenCheng	MediaTek	x	x	x
Ugolini	Alan	US Conec	x	x	x
Ulrichs	Ed	Source Photonics	x	x	x
van Vickle	Patrick	Sumitomo Electric	x	x	x
Wang	Haiming	SEU China		x	
Wang	Tongtong	Huawei	x	x	x
Wang	Xinyuan	Huawei	x	x	x
Wang	Zhongfeng	Broadcom	x	x	x
Way	Winston	NeoPhotonics	x	x	x
Wei	Lin	Huawei		x	
Welch	Brian	Luxtera	x	x	x
Wen	Yangjing	Huawei		x	x
Wertheim	Oded	Mellanox	x	x	x
Xu	Yu	Huawei	x	x	x
Zhenwei	Cui	Huawei	x	x	
Zhu	Fei	Huawei	x	x	x