

# Unapproved Minutes

## IEEE P802.3bs 400GbE Task Force

### Interim Meeting

May 12-14, 2014

Norfolk, VA, USA

Prepared by Peter Stassar

David Law, IEEE 802.3 WG Chair called IEEE P802.3 400 GbE Task Force to order at 9.00 am, Monday, May 12, 2014

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

**Motion #1:** Move to confirm John D'Ambrosia as Chair of IEEE P802.3bs 400GbE Task Force

Moved by: Steven Carlson

Second by: Dan Dove

Results: Motion passed with Yes=64 and No=0 votes

<b>Presenter</b>	John D'Ambrosia, Dell
<b>Title</b>	Agenda and General Information
<b>File</b>	agenda_3bs_01a_0514.pdf

**Motion #2:** Move to approve the agenda

Moved by: Steve Trowbridge

Second by: Thananya Baldwin

Results: The motion passed by voice without opposition

The March 2014 meeting minutes have been posted. Chair noted no comments were received.

**Motion # 3:** Move to approve the modified Mar 2014 Minutes

Moved by: Pete Anslow

Second by: Thananya Baldwin

Results: The motion passed by voice without opposition

Chair asked if there were any reporters in the room. John D'Ambrosia and Dale Murray noted that they talk with press but that they will only disclose high level details available from publicly available material.

The Chair further thanked the Ethernet Alliance and Lynn Kennedy for making all the arrangements for this meeting including the social event on Wednesday May 14.

### Patent Policy

Chair read the Patent Policy for IEEE-SA meetings.

The Chair noted 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.

The Chair noted that the Task Force has an approved PAR, which unfortunately was not the latest version of the PAR approved by IEEE 802.3 at its March 2014 meeting in Beijing. Mr. David Law has initiated a modified PAR. The Chair further noted that the CSD and Objectives are still the same.

## **Liaisons**

The meeting agreed to submit an informal communication to the OIF as an input to at their May 2014 meeting in Berlin. Mr. Steve Trowbridge was invited to prepare a draft informal communication to be reviewed on Wednesday May 14. It was considered not necessary to submit a communication to the ITU because their next meeting would be during the last week of August, so that it would be better to generate one during the San Diego meeting in July.

## **Ad Hoc Area**

The Chair noted that he had created an Ad Hoc Area at <http://www.ieee802.org/3/bs/public/adhoc/index.shtml>

<b>Presentation #</b>	1
<b>Presenter</b>	Mark Gustlin, Xilinx
<b>Title</b>	Logic Adhoc
<b>File</b>	gustlin_3bs_01_0514.pdf

## **Chief Editor**

The chair announced that he had the intent to appoint Pete Anslow as Chief Editor of the task force, pending the completion of the 802.3bm project.

For the following presentation the Chair asked Pete Anslow to chair the meeting while he was presenting it.

**Presentation #** 2  
**Presenter** John D'Ambrosia, Dell  
**Title** The 400 GbE Project: An Overview  
**File** dambrosia\_3bs\_01\_0514.pdf

**Presentation #** 3  
**Presenter** Pete Anslow, Ciena  
**Title** The Road to a Completed Standard  
**File** anslow\_3bs\_01\_0514.pdf

Break @ 10:32am

Reconvened @ 10:50am

**Presentation #** 4  
**Presenter** Mark Gustlin, Xilinx  
**Title** A 400GbE Architecture  
**File** gustlin\_3bs\_02\_0514.pdf

**Presentation #** 5  
**Presenter** Steve Trowbridge, Alcatel-Lucent  
**Title** Initial thoughts on EEE for 400 GbE  
**File** trowbridge\_3bs\_01\_0514.pdf

Break for lunch @ 12:02pm

Reconvened @ 1:27pm

**Presentation #** 6  
**Presenter** Xinyuan Wang, Huawei  
**Title** Update of Bit multiplexing in 400GbE PMA  
**File** wang\_x\_3bs\_01\_0514.pdf

**Presentation #** 7  
**Presenter** Steve Trowbridge, Alcatel-Lucent  
**Title** Initial thoughts on EEE for 400 GbE  
**File** trowbridge\_3bs\_02\_0514.pdf

**Presentation #** 8  
**Presenter** Tongtong Wang, Huawei  
**Title** Evaluation of FEC Performance with Symbol and Bit Muxing Scenarios  
**File** wang\_t\_3bs\_01\_0514.pdf

Break @ 2:53pm

Reconvened @ 3:15pm

**Presentation #** 9  
**Presenter** Hugh Barrass, Cisco  
**Title** Architecture: Configurations and use cases (corollary to gustlin\_3bs\_02\_0514)  
**File** barrass\_3bs\_01\_0514.pdf

**Discussion**

It was agreed to assign an action item to Mr. Barrass to prepare a follow-up presentation for the next meeting in San Diego in July to be used as a non restricting living document with use cases. Other participants were invited to prepare suggestions for additional use cases. The Chair further appointed Mr. Barrass as Chair for a use case Ad Hoc.

**Presentation #** 10  
**Presenter** Jeff Maki, Juniper  
**Title** BER Targets  
**File** maki\_3bs\_02a\_0514.pdf (updated file with supporter listed below)

**Discussion**

Charles Moore (Avago) expressed to be listed as a supporter to this presentation.

**Presentation #** 11  
**Presenter** Joel Goergen, Cisco  
**Title** 400GE Electrical Interconnect Thoughts  
**File** goergen\_3bs\_01\_0514.pdf

**Presentation #** 12  
**Presenter** Tom Palkert, Molex  
**Title** CDAUI-16 vs CAUI-4 comparison  
**File** palkert\_3bs\_01\_0514.pdf

**Presentation #** 13  
**Presenter** Jeff Maki, Juniper  
**Title** Pivotal Issues for 400 Gb/s Ethernet  
**File** maki\_3bs\_01\_0514.pdf

**Presentation #** 14  
**Presenter** Brian Welch, Luxtera  
**Title** 400G Optics – Technologies, Timing, and Transceivers  
**File** welch\_3bs\_01\_0514.pdf

**Presentation #** 15  
**Presenter** Brian Teipen, ADVA  
**Title** Considerations on Baud Rate and Lane Number for 400 Gigabit Ethernet Optical Interfaces  
**File** teipen\_3bs\_01\_0514.pdf

## Discussion and Straw Polls

<b>Straw Poll #</b>	<b>1</b>
<b>Title</b>	I would support the timeline indicated on slide # 7 of dambrosia_3bs_01a_0514.pdf
<b>Result</b>	Yes: 66 No: 6

Break for Day @ 6:40pm

Reconvened Tuesday, May 13, 9:00am

The Chair showed patent policy slides.

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

A dedication was made to the late Brian Misek.

<b>Presentation #</b>	16
<b>Presenter</b>	Paul Kolesar, CommScope
<b>Title</b>	SMF Loss Budgets
<b>File</b>	kolesar_3bs_01_0514.pdf

<b>Presentation #</b>	17
<b>Presenter</b>	Ali Ghiasi, Ghiasi Quantum LLC
<b>Title</b>	Path to Consensus on 400 GbE PMDs
<b>File</b>	ghiasi_3bs_02_0514.pdf

The Chair announced the upload of revised material to the BS webpage, to which there were no objections.

<b>Presentation #</b>	18
<b>Presenter</b>	Gary Nicholl, Cisco
<b>Title</b>	Thoughts on 400GbE PMDs
<b>File</b>	nicholl_3bs_01_0514.pdf

Break @ 10:34am

Reconvened @ 10:54am

After the morning break Mr. Steve Carlson chaired the meeting.

**Presentation #** 19  
**Presenter** Sudeep Bhoja, Inphi  
**Title** PAM Modulation for 400G SMF  
**File** bhoja\_3bs\_01\_0514.pdf

Break for lunch @ 12:07pm

Reconvened @ approximately 1:25pm

Mr. D'Ambrosia resuming chairing the meeting at approximately 1:30pm.

**Presentation #** 20  
**Presenter** Xiaolu Song, Huawei  
**Title** Investigation of a 4x112Gbps PAM4 configuration for the 2km SMF PMD  
**File** song\_3bs\_01a\_0514.pdf

**Presentation #** 21  
**Presenter** Winston Way, NeoPhotonics  
**Title** Technical study of 56Gb/s and 112Gb/s PAM-4 transmission  
**File** way\_3bs\_01a\_0514.pdf

**Presentation #** 22  
**Presenter** Yu Xu, Huawei  
**Title** Test Result of 8 \* 56G PAM4 Transmission  
**File** xu\_3bs\_01a\_0514.pdf

**Presentation #** 23  
**Presenter** Jiangwei Man, Huawei  
**Title** Investigation of 56Gbps PAM4 based bi-directional architecture for 400GbE  
**File** man\_3bs\_01\_0514.pdf

**Presentation #** 24  
**Presenter** Riu Hirai, Hitachi  
**Title** 400GE 2-km and 10-km SMF PMD Proposals and Experimental Verification with Nyquist Modulation  
**File** hirai\_3bs\_01\_0514.pdf

Break @ 2:56pm

Reconvened @ 3:20pm

**Presentation #** 25  
**Presenter** Fei Zhu, Huawei  
**Title** Technical feasibility of Single Wavelength 400GbE 2km and 10km PMD  
**File** zhu\_3bs\_01a\_0514.pdf

**Presentation #** 26  
**Presenter** David Lewis, JDSU  
**Title** 400G DMT PMD for 2km SMF  
**File** lewis\_3bs\_01\_0514.pdf

**Presentation #** 27  
**Presenter** Hideki Isono, Fujitsu  
**Title** Discrete Multi-Tone for 400GbE 10km reach  
**File** isono\_3bs\_01\_0514.pdf



**Presentation #** 28  
**Presenter** Hideki Isono, Fujitsu  
**Title** DMT relative cost consideration  
**File** isono\_3bs\_02\_0514.pdf

**Presentation #** 29  
**Presenter** Toshiki Tanaka, Fujitsu  
**Title** Dependency of Transmission Parameters for 400GbE DMT 10km Transceiver  
**File** tanaka\_3bs\_01\_0514.pdf

### Discussion and Straw Polls

**Straw Poll #** 2

**Title** IEEE 802.3bs should target the initial 400GbE electrical chip-to-chip interface to be based on bit-rate per lane of:

a) 25G	64
b) 40G	0
c) 50G	31
d) 100G	0

**Result**

**Straw Poll #** 3

**Title** IEEE 802.3bs should target the initial 400GbE electrical chip-to-module interface to be based on bit-rate per lane of:

a) 25G	49
b) 40G	0
c) 50G	16
d) 25 & 50G	24

**Result**

<b>Straw Poll #</b>	<b>4A/B</b>	
<b>Title</b>	A. I believe that 2km 400GbE SMF PMD will use a duplex fiber solution	
<b>Result</b>	Yes	70
	No	6
<b>Title</b>	B.I believe that 10km 400GbE SMF PMD will use a duplex fiber solution	
<b>Result</b>	Yes	85
	No	0

<b>Straw Poll #</b>	<b>5 (Chicago Rules)</b>	
<b>Title</b>	For 2km duplex SMF 400GbE PMD, I believe the TF should select a proposal based on an effective bit rate per wavelength per direction of:	
<b>Result</b>	a) 25G	5
	b) 50G	51
	c) 100G	77
	d) 400G	10

<b>Straw Poll #</b>	<b>6 (Chicago Rules)</b>	
<b>Title</b>	For 10km duplex SMF 400GbE PMD, I believe the TF should select a proposal based on an effective bit rate per wavelength per direction of	
<b>Result</b>	a) 25G	5
	b) 50G	53
	c) 100G	74
	d) 400G	11

Break for Day @ 6:10pm

Reconvened Tuesday, May 14, 8:35am

The Chair showed patent policy slides.

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

The Chair announced the upload of revised material to the BS webpage, to which there were no objections.

**Presentation #** 30  
**Presenter** Ali Ghiasi, Ghiasi Quantum LLC  
**Title** Overview of Largest Data Centers  
**File** ghiasi\_3bs\_01b\_0514.pdf

**Presentation #** 31  
**Presenter** Chris Cole, Finisar  
**Title** 400Gb/s 500m PMD Alternatives  
**File** cole\_3bs\_01a\_0514.pdf

**Presentation #** 32  
**Presenter** Jonathan King, Finisar  
**Title** 16 x 25G per lane optical PMD for MMF, re-using 100GBASE-SR4 technology and spec's.  
**File** king\_3bs\_01a\_0514.pdf

**Presentation #** 33  
**Presenter** Nathan Tracy, TE Connectivity  
**Title** Proposal for a PMD for 400GBASE-SR16  
**File** tracy\_3bs\_01a\_0514.pdf

Break @ 10:30am

Reconvened @ 10:58am

## Discussion, Straw Polls and Motions

<b>Straw Poll #</b>	<b>7</b>	
<b>Title</b>	I believe that a 500m SMF PMD could use parallel fiber solutions:	
<b>Result</b>	Yes	77
	No	0

<b>Straw Poll #</b>	<b>8 (Chicago Rules)</b>	
<b>Title</b>	I believe fiber count for a 500m SMF PMD parallel fiber link solution should be based on (in each direction):	
<b>Result</b>	a) 4 fibers	82
	b) 8 fibers	28
	c) 16 fibers	16

<b>Straw Poll #</b>	<b>9 (Chicago Rules)</b>	
<b>Title</b>	I believe fiber count for a 100m MMF PMD using a parallel fiber link solution should be (in each direction):	
<b>Result</b>	a) 4 fibers	29
	b) 8 fibers	33
	c) 16 fibers	62
	Room count:	118

**Motion #4:** Move to adopt the project timeline specified on Slide #7 of dambrosia\_3bs\_01a\_0514.pdf

Moved by: Steve Trowbridge

Second by: Peter Stassar

Technical ( $\geq 75\%$ )

Yes (all): 65

No (all): 11

Abstain (all): 33

Results: The motion passed

**Motion #5:** Move that the IEEE 802.3bs 400 GbE Task Force approve the text in trowbridge\_3bs\_03\_0514.pdf with editorial license granted to the Chair (or his appointed agent) as an informal communication by the Chair to OIF.

Moved by: Steve Trowbridge

Second by: Brian Holden

Procedural (>50%)

Results: The motion passed by voice without opposition

The chair announced that the topic of the use of the BIP should be addressed by the architecture Ad Hoc. The Chair further emphasized that it would be important to get out of Study Group “mode” into Task Force “mode” with more collaboration and consensus building towards proposals for the next meeting in San Diego.

Finally the Chair showed the list of future meetings.

**Motion #6:** Move to adjourn.

Moved by: Mike Dudek

Second by: Steve Trowbridge

Procedural (>50%)

Results: The motion passed by voice without opposition

Adjourned @ 12:01PM.

IEEE P802.3bs 400GbE Task Force			5/12/2014	5/13/2014	5/14/2015
Last Name	First Name	Employer / Affiliation	Mon	Tues	Wed
Abbott	John	Corning	x	x	x
Amezcuca	Adrian	Prysmian Group	x	x	x
Anslow	Pete	Ciena Corporation	x	x	x
Baldwin	Thananya	Ixia	x	x	x
Barnette	Jim	Vitesse	x		x
Bennett	Mike	3MG Consulting	x	x	
Bernstein	Gary	Leviton		x	x
Bhoja	Sudeep	Inphi	x	x	x
Bliss	Will	Broadcom		x	x
Booth	Brad	Microsoft		x	x
Bouda	Martin	Fujitsu	x	x	x
Bower	Patricia	Fujitsu	x	x	x
Brown	David	Semtech	x	x	x
Brown	Matt	Applied Micro	x	x	x
Calderon	Juan-Carlos	Cortina Systems	x	x	
Chalupsky	David	Intel	x		x
Chang	Xin	Huawei	x	x	x
Chen	David	Nokia	x	x	
Choudhury	Mabud	CommScope	x	x	x
Cole	Chris	Finisar	x	x	x
Conroy	Keith	MultiPhy		x	x
Corbeil	Sacha	JDS Uniphase	x	x	x
D'Ambrosia	John	Dell	x	x	x
Dawe	Piers	Mellanox	x	x	x
Dedic	Ian	Fujitsu Semiconductors	x	x	x
Dove	Dan	Dove Networking Solutions (DNS)	x	x	
Dudek	Mike	QLogic	x	x	x
Farhoodfar	Arash	Cortina Systems	x	x	
Furlong	Michael	Clariphy Communications	x	x	x
Ghiasi	Ali	Ghiasi Quantum	x	x	x
Glista	Drew	Nano Precision Prod	x	x	
Glista	Drew	nanoPrecision Products	x	x	x
Goergen	Joel	Cisco	x	x	x
Gong	Zhigang	D-Net	x	x	x
Gorshe	Steve	PMC_Sierra	x	x	x
Gustlin	Mark	Xilinx	x	x	x
Hall	Eric	Aurion	x	x	x
Healey	Adam	Avago Technologies	X	X	X
Hirai	Riu	Hitachi	X	X	X
Holden	Brian	Kandou Bus	X	X	X
Isono	Hideki	Fujitsu Optical Components	X	X	X
Issenhuth	Tom	Microsoft	X	X	X
Jackson	Kenneth	Sumitomo	X	X	X
Jewell	Jack	Independent		X	X
Jiang	Wenbin	Cosemi	X	X	X
Kelsen	Michael	Time Warner Cable	X	X	X
King	Jonathan	Finisar Corp.		X	X
Kipp	Scott	Brocade			X
Kish	Paul	Belden		X	

Klempa	Mike	UNH-IOL			x
Koehler	Daniel	More than IP	x	x	x
Kolesar	Paul	CommScope	X	X	X
Law	David	HP	X	X	
Lewis	Dave	JDSU	X	X	X
Li	Mike	Altera	X	X	X
Li	Shaohua	Brocade		X	X
Lingle, Jr.	Robert	OFS	X	X	X
Little	Paul	Fujitsu Semiconductors	X	X	X
Lusted	Kent	Intel			X
Maki	Jeffery	Juniper Networks	X	X	X
Malkman	Yonaton	Mellanox	X	X	X
Man	Jingmei	Huawei	x	x	x
Marlett	Mark	Inphi	X	X	X
Martin	Arlon	Mellanox	X	X	X
McDermott	Tom	Fujitsu	X	X	X
McDonough	John	NEC America	X		X
Mei	Richard	Commscope	X		
Mellitz	Richard	Intel	X	X	X
Mitsunori	Hamada	Fujitsu Optical Components	x	x	x
Mooney	Paul	Spirent Communications	X	X	X
Moore	Charles	Avago Technologies	X	X	X
Moorwood	Andy	Infinera Corp	X	X	X
Muir	Ron	JAE	X	X	X
Murray	Dale	Light Counting	X	X	X
Nagarajan	Radha	Inphi	x		
Nicholl	Gary	Cisco	X	X	X
Ofelt	David	Juniper Networks		X	X
Ogura	Ichiro	Petra	X	X	X
Palkert	Tom	Luxtera	X	X	
Paquet	Carl	Teraxion	x	x	x
Park	Moon	OE Solutions	X	X	X
Park	Y.K.	OE Solutions	x	x	x
Parthasarathay	Vasudevan	Broadcom	X	X	
Patel	Pravin	IBM	X	X	X
Pepper	Gerald	Ixia	X	X	X
Petrilla	John	Avago Technologies	X	X	X
Pimpinella	Rick	Panduit Corp.	X	X	X
Rabinovich	Rick	Alcatel-Lucent	X	X	X
Rao	Ram	Oclaro	X	X	X
Rotolo	Salvatore	STM Microelectronics	X	X	X
Sambasivan	Sam	AT&T	X		X
Scheidt	Paul	Altera	x	x	x
Shifletl	Mackie	Y-Connect	x		
Shirao	Mizuki	Mitsubishi Electric	x	x	x
Shrikhande	Kapil	Dell		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	X
Sprague	Ted	Infinera	X	X	X
Stassar	Peter	Huawei	X	X	X

Swanson	Steve	Corning	X	X	X
Szczepanek	Andre	Inphi	X	X	X
Szeto	William	Xtera	X	X	X
Tailor	Bharat	Semtech Corp	X	X	X
Tajima	Akio	NEC Corporation	X	X	X
Takahata	Kiyoto	NTT	X	X	X
Takai	Atsushi	Oclaro	x	x	x
Takatori	Hinoshi	Huawei			x
Tanaka	Toshiki	Fujitsu Laboratories	x	x	x
Teipen	Brian	ADVA Optical Networking	x	x	x
Ten	Sergay	Corning	x	x	x
Ten	Sergey	Corning	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
Ulrichs	Ed	Source Photonics	x	x	x
Vaden	Sterling	Vaden Ent.		x	
van Vickle	Patrick	Sumitomo Electric	x	x	x
Vanderlaan	Paul	Nexans			x
Vitic	Michael	JDS Uniphase	x	x	
Walker	Bill	Fujitsu	x	x	x
Wang	Robert	Intel	x	x	x
Wang	Tongtong	Huawei	x	x	x
Wang	Xinyuan	Huawei	x	x	x
Way	Winston	NeoPhotonics	x	x	x
Weber	Markus	Fujitsu		x	x
Welch	Brian	Luxtera	x	x	x
Wong	Henry	Huawei	x	x	x
Xu	Yu	Huawei	x	x	x
Zivny	Pavel	Tektronix		x	x