Approved Minutes
IEEE P802.3bj 100 Gb/s Backplane and Copper Cable Task Force
Interim Meeting
May 17-18, 2012
Minneapolis, Minnesota, USA

Prepared by David Chalupsky

IEEE P802.3bj Interim meeting convened at 8:45am, Thursday, May 17, 2012 by John D'Ambrosia, 802.3bj Chair.

Agenda & General Information
By – John D'Ambrosia
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/agenda_01a_0512.pdf

Chair outlined the agenda for the meeting.
- Introductions – Everyone introduced themselves and stated their affiliation.
- Chair reviewed the agenda.

Motion #1: Motion to approve the agenda
- Moved by Steve Trowbridge
- Second by Pete Anslow
- Approved by voice vote without opposition.

Motion #2: Motion to approve the March 2012 minutes.
- Moved by Pete Anslow
- Second by Steve Trowbridge
- Approved by voice vote without opposition.

Chair continued with his introductory presentation
- Chair asked if there were any reporters in the room. No one responded.
- Chair reminded everyone that photographs or recordings are not allowed without permission.
- Goals for the meeting: hear technical presentations / last proposals and approve generation of D1.0
- Ground Rules
- IEEE Structure, Bylaws & Rules
    - Chair read the Guidelines for IEEE-SA meetings

IEEE Patent Policy: Chair reads aloud the patent policy text contained in the agenda.
Chair calls for potentially essential patents. No response.

- Chair gives overview of the 802.3 Standards Process. Reviews the project objectives and adopted timeline.
- Chair gives instructions for recording attendance
- Review of Action Items from March'12 meeting. The two recorded action items were completed.

Presentation #1
Title – Thoughts on Naming New PMDs for IEEE P802.3bj
By – John D'Ambrosia
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/dambrosia_01_0512.pdf
Discussion – Clarifying questions were discussed regarding the material. Discussion on multiple options for naming of the backplane port types. ACTION ITEM: Presenter to host call(s) to build consensus on nomenclature. (Action item overtaken by events, as nomenclature adopted by close of meeting.)

Presentation #2
Title – Editor's Report
By – Adam Healey
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/healey_01_0512.pdf
Discussion – Clarifying questions were discussed regarding the material. Speaker thanks and acknowledges the editorial team for their good work in generating D0.1.

Break at 9:52am, reconvened at 10:15am.

Presentation #3
Title – Introduction to Draft IEEE 802.3bj
By – Adam Healey
See – draft D0.1
Discussion – Chief Editor walks through the D0.1 draft explaining the content and pausing for questions along the way. Specific discussion on whether EEE should be defined for 100GBASE-CR10 and/or 40GBASE-CR4. Current direction is to include CR10 as it is 100Gb, but not 40GBASE-CR4. Noted that Editor's Notes in the draft are not part of the standard and will be removed as noted items are addressed. Noted that FEC generator polynomial was not defined in baseline. Multiple action items recorded by the Editor in the draft.

Break for lunch at noon, resumed at 1:20pm

Presentation #4
Title – 100G Backplane PAM4 PHY FEC/PMA Encoding Enhancements
By – Matt Brown
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/brown_01a_0512.pdf
Discussion – none

Presentation #5
Title – Alignment marker scrambling for PAM4
By – Pete Anslow
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/anslow_01a_0512.pdf
Discussion – none

Presentation #6
Title – Alignment Marker Lock State Machine for NRZ 100G-KR
By – Zhongfeng Wang
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/wang_01_0512.pdf
Discussion – Clarifying questions were discussed regarding the material.

Presentation #7
Title – 100G Link Training Proposal
By – Kent Lusted
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/lusted_01a_0512.pdf
Discussion – Speaker notes that presentation is updated with new data. Chair asks if there is any objection to accepting the new version – none. Clarifying questions were discussed regarding the material. ACTION ITEM: send updated presentation file. DONE

Break at 2:50pm to 3:10pm

Presentation #8
Title – 100GBASE-CR4 Specifications
By – Chris Di Minico
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/diminico_01a_0512.pdf
Discussion – Clarifying questions were discussed regarding the material. ACTION ITEM: send updated presentation file. DONE.

Presentation #9
Title – Connector Performance for IEEE802.3bj MDI and Future Multi-hundred Gb/s System
By – Takeshi Nishimura
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/nishimura_01a_0512.pdf
Discussion – Clarifying questions were discussed regarding the material.

Presentation #10
Title – 802.3bj 2nd MDI Proposal
By – Chris Cole
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/cole_01a_0512.pdf
Discussion – Clarifying questions were discussed regarding the material. CFP4 still in development; connectors/cables do not exist yet. ACTION ITEM: provide CFP4 cable assemblies from which channel data may be measured. Compliance boards will be available. Question whether connector needs an EIA spec number: Preferred, but not currently a hard requirement according to the 802.3 WG Chair.

Presentation #11
Title – AC cap location and Test Points
By – Beth Kochuparambil
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/goergen_01a_0512.pdf
Discussion – Clarifying questions were discussed regarding the material.

Chair asks the room if there is any objection to hearing a late presentation from Martin Langhammer. No objection.

Presentation #12
Title – FEC Polynomials (Clause 91)
By – Martin Langhammer
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/langhammer_01_0512.pdf
Discussion – none

Straw Poll #1
Do you support asymmetric FEC operation for 100GBASE-KR4 (NRZ) and 100GBASE-CR4?
- Yes: 27
- No: 3

Room count: 76

Straw Poll #2
For 100GBASE-KR4 (NRZ) and 100GBASE-CR4, do you support moving the FEC decision to the PMD with the option to force a specific decision?
- Yes: 12
- No: 7
- Abstain: 51

Straw Poll #3
To what level would you support the inclusion of an informative impact table as a part of the standard/appendix?

A) Support and willing to contribute data: 3
B) Support the inclusion in the specification –not likely to contribute: 14
C) Support concept, but not in specification: 33
D) Do not support the impact table concept for AC cap implementation: 2

Straw Poll #4
I support the use of "100GBASE-CR4" for our copper cable nomenclature
- Yes: 60
- No: 1
- Abstain: 10

Straw Poll #5
For the 100G NRZ backplane PHY I support the following nomenclature:

A) 100GBASE-KR4: 54
B) 100GBASE-KR4-2: 7
C) Undecided: 8

Straw Poll #6
For the 100G PAM4 backplane PHY I support the following nomenclature

A) 100GBASE-KRM4: 6
B) 100GBASE-KR4-4: 13
C) 100GBASE-KP4: 39
D) Undecided: 7

Presentation #13
Title – Tutorial - Comment Tool
By – Wael Diab
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/diab_01_0512.pdf
Discussion – Clarifying questions were discussed regarding the material.

Break for the day at 6:50pm, to resume at 9am.

Friday, May 18, 2012

802.3bj interim meeting reconvened at 9:02am by John D'Ambrosia, IEEE P802.3bj Chair.

Agenda & General Information
By – John D'Ambrosia
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/agenda_01a_0512.pdf
IEEE Patent Policy: Chair displayed the patent policy text contained in the agenda. Asked if anyone has *not* seen the patent policy this week: no one responded. Made the call for potentially essential patents: No one responded.

- Chair reviews attendance recording procedures, agenda, and plan for the day.
- Recap of topic from yesterday: is EEE for 10GBASE-CR10 in scope? No, since PAR refers to 4-lane 100G PHYs. Need to consider purposeful adopt or not approach for the future.

Presentation #13
Title – Gaps in D. 0.9 for EEE
By – Hugh Barrass
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/barrass_01_0512.pdf
Discussion – Clarifying questions were discussed regarding the material. ACTION ITEM -Speaker to host conference calls to continue the discussion on EEE.

Presentation #14
Title – MTTFPA for Uncorrected Transcoded FEC Blocks
By – Roy Cideciyan
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/cideciyan_01_0512.pdf
Discussion – Clarifying questions were discussed regarding the material. Further work needed in the area, ACTION ITEM: Mark Gustlin volunteers to host call on the topic. Question: does 40GBASE-KR4 have a problem? No. Comment: need to find another solution besides always using FEC.

Break at 10:00am, resumed at 10:15am

Presentation #14
Title – Transmitter and Receiver Architecture Without Self-Synchronizing Rx Scrambler
By – Roy Cideciyan
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/cideciyan_02_0512.pdf
Discussion – Clarifying questions were discussed regarding the material. Further work needed in the area, ACTION ITEM: Mark Gustlin volunteers to host call on the topic (scrambler).

Next presenter has an updated presentation. Chair asks if there is any objection to accepting the update: None.

Presentation #15

Title – Low-Frequency Effects of AC Coupling Capacitor
By – Yasuo Hidaka
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/hidaka_01a_0512.pdf
Discussion – Clarifying questions were discussed regarding the material.

Presentation #16

Title – Consensus Group Report Channel Analysis Method for 802.3bj Qualification and Specification
By – Chris Di Minico
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/diminico_02a_0512.pdf
Discussion – Clarifying questions were discussed regarding the material. Noted that references presentations shared with consensus group are posted on the website for this meeting. ACTION ITEM: Chris DiMinico volunteers to send note to reflector to announce continued calls on the topic
Concern over Matlab code being stable long term for a normative reference. Request to ensure that code runs on Octave as well (open source).

Presentation #17

Title – S-parameter to Single Bit Response (SBR) Transformation and Convergence
By – Mike Li
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/li_01_0512.pdf
Discussion – Clarifying questions were discussed regarding the material. Related also to prior presentation: suggestion that any code such as Matlab should be informative, and the equations be normative.

Chair discusses agenda for the afternoon.
Break at noon, resumed at 1:10pm

Presentation #18

Title – Case Study: Gaussian Channel Crosstalk versus Realistic Statistical Crosstalk
By – Rich Mellitz
See - http://grouper.ieee.org/groups/802/3/bj/public/may12/mellitz_01_0512.pdf
Discussion – none

Presentation #19

Title – Further work on S/N Budget Channel specification
By – Charles Moore
See – http://grouper.ieee.org/groups/802/3/bj/public/may12/moore_01_0512.pdf
Discussion – Clarifying questions were discussed regarding the material. ACTION ITEM: Send updated presentation

MOTIONS & STRAW POLLs

Motion #3

- Adopt the following nomenclature:

100GBASE-KR4 for 100Gb/s 4 lane NRZ Backplane PHY
100GBASE-KP4 for 100Gb/s 4 lane PAM-4 Backplane PHY
100GBASE-CR4 for 100Gb/s 4 lane Copper Cable PHY

- Technical >=75%
- M: Charles Moore
- 2nd Ilango Ganga
- Yes: 58 No: 0 Abstain : 7

Motion #4

Move to adopt P802d3bj_D0p1.pdf as modified by the comments contained in healey_02_0512.pdf as the basis for Draft 1.0.

- Technical >=75%
- M: Adam Healey
- 2nd Hugh Barrass
- Yes: 59 No: 1 Abstain : 5

Motion #5

Move to adopt changes noted in Slide 19 of anslow_01a_0512.pdf for implementation into Draft 1.0.

- Technical >=75%
- M: Matt Brown
- 2nd Mark Gustlin
- Yes: 56 No: 0 Abstain : 13

Motion #6

Move to adopt polynomial description noted in Slide 3 of langhammer_01_0512.pdf for implementation into Draft 1.0.

- Technical >=75%
- M: Martin Langhammer
- 2nd Mark Gustlin
- Yes: 56 No: 0 Abstain : 8

Chair (and others) present birthday cake and card to Mr. Healey.
Chair asks if there is any objection to taking pictures. None.

Break at 2:40pm, resume at 3:00pm.

Motion #7

Change Draft 1.0 as required to implement the following changes as presented in brown_01a_0512:

In Clause 91:

- The 100GBASE-KR4p FEC codeword is RS(544,514).
- For 100GBASE-KR4p, the mapping of 256B/257B blocks to the FEC codeword information field is identical to that for 100GBASE-KR4n.

In Clause 94:

- The termination block is 46 bits in length.
- The overhead frame is composed of 40 overhead bits and bits from 23 consecutive FEC codewords.
- The PMD symbol rate is 13.59375 Gbaud.

Moved by: Matt Brown
Seconded by: Zhongfeng Wang
- Technical >=75%
- Yes: 35 No: 0 Abstain : 17

(Note: “KR4p” refers to 100GBASE-KP4. Nomenclature had not been adopted when motion was written.)

Motion #8
Move that
- CFP4, per cole_01a_0512.pdf, be adopted as a second type of MDI for 100GBASE-CR4.
- Adopt text in cole_02a_0512.pdf for implementation into Draft 1.0.
- Technical >=75%
- M: Chris Cole
- 2nd Adee Ran
- Yes: 22 No: 11 Abstain : 25
- Motion fails

Motion #9
Move to adopt transmitter and receiver differential printed circuit board trace loss equation described on slide 15 diminico_01a_0512.pdf for implementation in Draft 1.0.
- Technical >=75%
- M: Chris DiMinico
- 2nd Mike Dudek
- Yes: 35 No: 0 Abstain : 19

Motion #10
Move to adopt the cable assembly total integrated crosstalk RMS noise voltage equation described on slide 10 of diminico_01a_0512.pdf for implementation in Draft 1.0.
- Technical >=75%
- M: Chris DiMinico
- 2nd Rick Rabinovich
- Yes: 8 No: 15 Abstain : 29

Motion fails

Motion #11
Move to add editor’s note to D1.0 (cable assembly ICN subclause) to state that equation described on slide 10 of diminico_01a_0512.pdf has been proposed but not accepted.
- Technical >=75%
- M: Chris DiMinico
- 2nd Rick Rabinovich
- After discussion, MOTION IS WITHDRAWN by mover.

Straw Poll #7
I support adding EEE functionality for 100GBASE-CR10
- Yes 25
- No 2
- Abstain 23

Straw Poll #8
I support adding EEE functionality for 40GBASE-CR4

- Yes 25
- No 0
- Abstain 25

Straw Poll #9
I support adding EEE functionality for 40GBASE-KR4

- Yes 26
- No 1
- Abstain 22

Straw Poll #10
Will you attend the **July 16 – 19, 2012** Plenary in San Diego, CA, USA?

- TF name: 802.3bj
- Yes: 48
- Probably yes: 6
- Probably no: 2
- No: 0

Chief Editor reports intended schedule:
D1.0 release May 31st, comments due June 29th.
Chair discusses future work plan and future meeting schedule.

Motion to adjourn by Elizabeth Kochuparambil, second by Adee Ran. Approved by voice without opposition
Meeting adjourned at 3:52pm May 18th.

Action Items:

Volunteer	**Action**	**Date Assigned**	**Status**
New Action Items, November 2011			
John D'Ambrosia	Reach out to test & measurement vendors for contributions on measurement techniques	11/7/2011	Done
John D'Ambrosia	Post updated version of dambrosia_02_1111.pdf	11/8/2011	Done
Mounir Meghelli	Provide update/correction to PAM 4 crosstalk in beukema_01_1111.pdf.	11/9/2011	Done Mar'12
Mounir Meghelli	Post channel data used in beukema_01_1111.pdf	11/9/2011	Done Mar'12
Roy Cideciyan	Send updated version of cediciyan_01a_1111.pdf	11/9/2011	Done Jan'12
Beth Kochuparambil	Provide updated tool with surface roughness, provide recommendation for benchmark loss/unit length metric based upon the adopted definition of improved FR-4; hold conference call	11/10/2011	DONE
New Action Items January 2012		Date	**Status**

		Assigned	
Chris Di Minico	Provide updated slides as presented	1/26/2012	Done
Joe Beers	Add credit reference to page 3 (content from Kochuparambil) and provide updated presentation	1/26/2012	Done
Mike Dudek	Provide graph for insertion loss (in addition to the equation) for dudek_01 prior to motion for baseline adoption.	1/26/2012	Done- sent CEI-25G-LR IL plot
Dariush Dabiri	Add labels to x axis of graphs (dB of what?) and send updated file.	1/26/2012	Done
Adee Ran	Provide updated slides as presented	1/26/2012	Done
Adee Ran	Correlate results with Patel/IBM reference, work with NRZ contributors to close the gaps.	1/26/2012	In process
Howard Frazier	Provide updated slides as presented	1/26/2012	Done
Mark Nowell	Provide updated slides as presented	1/26/2012	Done
Oren Sela	Provide updated slides as presented	1/27/2012	Done
Pete Anslow	Send updated slides with your name included	1/27/2012	Done
Hugh Barrass	Send updated slides with typo corrected	1/27/2012	Done
Charles Moore	Provide updated slides as presented	1/27/2012	Done
New Action Items March'12		**Date Assigned**	**Status**
Charles Moore	Provide tool discussed in moore_01_312.pdf	3/15/2012	Done
Joel Goergen	Lead consensus building activity on backplane test points	3/15/2012	Done
New Action Items May'12		**Date Assigned**	**Status**
Chris Cole	Identify source of CFP4 cable assemblies for 100GBASE-CR4 from which channel data may be measured.	5/17/2012	
Hugh Barrass	Notify reflector and lead consensus-building conference calls to address EEE issues raised in barrass_01_0512.	5/18/2012	
Mark Gustlin	Notify reflector and lead consensus -building conference calls to address MTTFPA issues raised in cideciyan_01_0512.	5/18/2012	
Mark Gustlin	Notify reflector and lead consensus-building conference calls to address scrambler issues raised in cideciyan_02_0512.	5/18/2012	
Chris Di Minico	Notify reflector and continue consensus-building conference calls on channel qualification issues raised in diminico_02a_0512.	5/18/2012	
Charles Moore	Send updated presentation (moore_01)	5/18/2012	

Attendee List

		# attended:	99	86
IEEE 802.3bj 100Gb/s Cu & BP TF, May 2012 Interim			**5/17/2012**	**5/18/2012**
Last Name	**First Name**	**Affiliation**	**Thursday**	**Friday**
Amleshi	Peerouz	Molex	x	x
Anslow	Pete	Ciena Corporation	x	x
Balasubramonian	Venugopal	Cortina Systems	x	
Barnett	Barry	IBM	x	x
Barrass	Hugh	Cisco	x	x
Bates	Stephen	PMC Sierra	x	x
Ben-Artsi	Liav	Marvell	x	x
Bliss	Will	Broadcom	x	x
Breuer	Dirk	Deutsche Telekom		x
Brown	Matt	Applied Micro	x	x
Chalupsky	David	Intel	x	x
Chen	Jianyao	Gigoptix	x	x
Chen	Qi	Lorom Group	x	x
Cheng	Wheling	Juniper Networks	x	x
Choudhury	G. Mabud	Commscope	x	
Cideciyan	Roy	IBM	x	x
Cole	Chris	Finisar	x	x
Cui	Kai	Huawei	x	x
Dabiri	Dariush	Applied Micro	x	x
D'Ambrosia	John	Dell	x	x
Dawe	Piers	IPtronics	x	x
DiMinico	Christopher	MC Communications/Leoni	x	x
Dove	Dan	Applied Micro	x	x
Dudek	Mike	QLogic	x	x
Dupuis	Mark	Madison Cable	x	
Ewen	John	IBM	x	x
Farhoodfar	Arash	Cortina Systems	x	x
Flatman	Alan	LAN Technologies	x	x
Ganga	Ilango	Intel	x	x
Ghiasi	Ali	Broadcom	x	x
Goell	Jim	Nano Precision Products	x	x
Gustlin	Mark	Xilinx	x	x
Hamano	Hiroshi	Fujitsu Labs	x	x
Healey	Adam	LSI	x	x
Hidaka	Yasuo	Fujitsu Lab of America	x	x
Huang	Xi	Huawei	x	x
Irwin	Scott	MoSys Inc.	x	x
Isono	Hideki	Fujitsu Optical Components	x	x
Jacobcon	Scott	Cadence Design	x	x

Katz	Walter	Signal Integrity Software	x	x
Keeley	James	LSI	x	x
Kimmitt	Myles	Emulex	x	x
Kipp	Scott	Brocade	x	
Kochuparambil	Elizabeth	Cisco Systems	x	x
Kolze	Tom	Broadcom	x	
Kono	Masashi	Hitachi	x	x
Kvist	Bengt	Ericsson	x	x
Langhammer	Martin	Altera	x	x
Latchman	Ryan	Mindspeed	x	
Law	David	HP	x	x
LeCheminant	Greg	Agilent Technologies	x	x
Li	Mike	Altera	x	x
Lusted	Kent	Intel	x	x
Maguire	Valerie	Siemon, TIA	x	x
Maki	Jeffery	Juniper Networks	x	x
Malkiman	Yonatan	Mellanox	x	x
Marshman	Jarrod	Analog Devices Inc.	x	x
McSorley	Greg	Amphenol	x	x
Mei	Richard	Commscope	x	x
Meier	Wolfgang	Emerson Network Power EC	x	x
Mellitz	Richard	Intel	x	x
Moore	Charles	Avago Technologies	x	x
Moorwood	Andy	Infinera Corp	x	x
Nielsen	Allan	TE Connectivity	x	x
Nishimura	Takeshi	Yamaichi Electronics	x	x
Nolan	John	Qlogic	x	x
Nordin	Ron	Panduit Corp.	x	x
Ofelt	David	Juniper Networks	x	x
O'Hara	Steven	Fluke Networks	x	x
Palkert	Tom	Xilinx, Luxtera, Molex	x	x
Parthasarathy	Vasudevan	Broadcom	x	x
Patel	Pravin	IBM	x	
Petrilla	John	Avago Technologies	x	
Pillar	Velu	Broadcom	x	x
Rabinovich	Rick	Alcatel-Lucent	x	x
Ragavassamy	Vira	Intel	x	
Ran	Adee	Intel	x	x
Remein	Duane	Huawei		x
Sayre	Edward	NESA	x	
Sela	Oren	Mellanox	x	x
Shanbhag	Megha	TE Connectivity	x	x
Shellhammer	Steve	Qualcomm	x	x
Slavick	Jeff	Avago Technologies	x	x
Sommers	Scott	Molex	x	x
Sono	Xiaolu	Huawei	x	x

Stassar	Peter	Huawei	x	x
Stevens	Daniel	Fujitsu Semiconductor	x	x
Svendsen	Justin	Carlisle	x	x
Tawa	Katsuhisa	Sumitomo	x	
Tracy	Nathan	Tyco Electronics	x	x
Tremblay	Francois	Semtech	x	
Trowbridge	Steve	Alcatel-Lucent	x	x
Vaden	Sterling	Optical Cable Corp.	x	x
Valle	Stefano	ST Microelectronics	x	x
Vanderlaan	Paul	Nexans	x	
Wagner	Bob	Panduit Corp.	x	
Wang	Zhongfeng	Broadcom	x	x
Warren	David	HP	x	x
Way	Winston	Neophotonics	x	
Xu	Yu	Huawei	x	x
Zambell	Andrew	FCI	x	x