Approved Minutes
IEEE 802.3 100Gb/s Backplane and Copper Cable Study Group
Interim Meeting
May 24 - 25, 2011
Incline Village, Nevada

Prepared by: David Chalupsky

Meeting convened at 9:04 am, Tuesday, May 24, 2011.

Agenda & General Information
By – John D'Ambrosia
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/agenda_01a_0511.pdf

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

Motion #1: Motion to approve the agenda

- Moved by Hugh Barrass
- Second by Tom Palkert
- Meeting agenda was approved by voice vote without objection.

Motion #2: Motion to approve the March 2011 minutes with noted changes by Pete Anslow

- Moved by Pete Anslow
- Second by Mike Li
- March minutes as modified by Pete Anslow approved by voice vote without objection.

- 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.
- Chair asked if there were any objections to his taking pictures of the Study Group. No objection.
- Chair went through his introduction presentation "agenda_01a_0511.pdf"
- Goals for the week
    - Hear presentations related to Objectives and 5 Criteria
    - Consensus on objectives, PAR, 5 Criteria
    - Approve requesting IEEE 802.3WG submit project documentation
    - Lay groundwork for next meeting
- Ground Rules
- IEEE Structure, Bylaws & Rules
    - Chair displays the Guidelines for IEEE-SA meetings and asks the audience to read them.

Presentation #1
Title – System Vendors View on 100 Gb/s Backplane and Copper Study Group Issues
By – Mark Gustlin
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/gustlin_01_0511.pdf

Discussion - none

Presentation #2
Title – Circuit Board Technology: An Introduction to Fabrication Issues in High Speed Channels
By – Joel Goergen
See http://www.ieee802.org/3/100GCU/public/mar11/goergen_02a_0311.pdf
Discussion – Several questions on technology trends in PCB fabrication were discussed.

Break called at 10:18am
Reconvene at 10:43am

Presentation #3
Title – An EEE802.3ap History of FR-4 Material Definition
By – Joel Goergen
See http://grouper.ieee.org/groups/802/3/100GCU/public/may11/goergen_01_0511.pdf
Discussion – Clarifying questions were asked & answered regarding the material. Chair reminds Study Group about directing efforts for our Objectives.

The Chair thanks NEC for hosting the meeting.

Presentation #4
Title – Rough channel targets for 4 x 25 Gb/s operation on existing backplanes
By – Howard Frazier for Vasu Parthasarathy
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/parthasarathy_02_0511.pdf
Discussion - Clarifying questions were asked & answered regarding the material. Additional data may be gleaned from the database with further analysis, such as ILD, RL, and electrical length.

11:57am Break for lunch.
1:06pm: resume.

Presentation #5
Title – Evaluation of Various channels Using a Method proposed by Healey and Moore
By – Charles Moore
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/moore_01_0511.pdf
Discussion – Clarifying questions were asked & answered regarding the material. Action Item: Update .pdf and .csv file to correct channel length error (page 5), and pass/fail keying on TEC channels

Presentation #6
Title – 4x 25Gb/s 100GBE Backplane Links
By – Mounir Meghelli
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/meghelli_01a_0511.pdf
Discussion – Clarifying questions were asked & answered regarding the material.

Presentation #7
Title – Time-domain SNR Analysis for Contributed Channels
By – Adee Ran
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/ran_01_0511.pdf
Discussion – Clarifying questions were asked & answered regarding the material.

Presentation #8
Title – Feasibility of 100 Gb/s operation on installed backplane channels
By – Vasu Parthasarathy
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/parthasarathy_01_0511.pdf
Discussion – Clarifying questions were asked & answered regarding the material. Action: send updated .pdf indicating additional support of Matt Brown.

Break at 3:05pm
Resume at 3:20pm

Presentation #9
Title – A Study of 25 Gbps Signaling Over Complied 10G-KR Channels
By –Mike Li
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/li_01_0511.pdf
Discussion – Clarifying questions were asked & answered regarding the material. Action: send updated presentation

Presentation #10
Title – FEC Striping Options for 100 Gb/s Backplane and Copper Study Group
By – Mark Gustlin
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/gustlin_02a_0511.pdf
Discussion – Clarifying questions were asked & answered regarding the material.

Presentation #11
Title – Feasibility Of 100G-KR FEC
By – Zhongfeng Wang
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/wang_01_0511.pdf
Discussion – None

4:00pm: scheduled presentations for the day are concluded.

The Chair summarizes progress for the day and returns to the proposed objectives for discussion.

Straw Poll #1
- I would support N=12 for the BER objective exponent:
- Yes: 67 No: 7 Abstain: 9
- May 24, 2011… ~4:30pm

Straw Poll #2

I would support :

- Define a 4-lane 100 Gb/s backplane PHY for operation over links consistent with copper traces on “improved FR-4” (as defined by IEEE P802.3ap) or better with lengths up to at least 1m.
- All in the room:
- Yes: 53 No: 14 Abstain: 16
- 802.3 Voters:
- Yes: 37 No: 6 Abstain: 3
- Taken May 24, 2011 5:22pm

Adjourn for the day at 5:30pm

Meeting reconvened at 9:08am, Wednesday, May 25, 2011.

- Happy Birthday John!
- The Chair reviews the agenda for the day “agenda_01_0511.pdf” and attendance procedures.
- IEEE Structure, Bylaws & Rules
    - Chair displays the Guidelines for IEEE-SA meetings and asks the audience to read them.

Continuing with scheduled presentations.

Presentation #12
Title – *SNR Budget Analysis for 25Gb/s over Backplane Channels*
By – Ziad Hatab
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/hatab_01_0511.pdf
Discussion - Clarifying questions were asked & answered regarding the material.

Presentation #13
Title – IEEE 802.3 Electrical Backplane/Twinax Cu Cable SG Objectives
By – Chris Di Minico
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/diminico_01_0511.pdf
Discussion - Clarifying questions were asked & answered regarding the material. Request for analysis of AWG vs. length for both potential modulation schemes.

Break at 10:17am. Resume at 10:33am.

Presentation #14
Title – 100Gbps Copper Cable Assemblies
By – Mark Bugg
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/bugg_01_0511.pdf
Discussion – none

Presentation #15
Title – 100GbE Front Panel Ports Based on 4 Lanes
By – Ali Ghiasi

See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/ghiasi_01_0511.pdf
Discussion - Clarifying questions were asked & answered regarding the material. Action Item: Ali to provide updated presentation file.

Presentation #16
Title – Proposed Responses to PAR Questions
By – John D'Ambrosia
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/dambrosia_01_0511.pdf
Discussion - Clarifying questions were asked & answered regarding the material.

Presentation #17
Title – Proposed Responses: 100Gb/s backplane and copper cable 5 criteria
By – Howard Frazier
See – http://grouper.ieee.org/groups/802/3/100GCU/public/may11/frazier_01_0511.pdf
Discussion - Clarifying questions were asked & answered regarding the material.

Scheduled presentations for the meeting are concluded.
11:30am – Break for lunch
Reconvene at 1:11pm
Chair reviews the afternoon agenda.

Motion #3:
Adopt the following objective:
- Support a BER of better than or equal to 10^{-12} at the MAC/PLS service interface
- Moved by Charles Moore 2nd : Mike Li

(technical; 75%)
Results:
All in the room
- Yes: 68 No: 0 Abstain: 3

Motion #4
Adopt the following objective:
- Define a 4-lane 100 Gb/s backplane PHY for operation over links consistent with copper traces on "improved FR-4" (as defined by IEEE P802.3ap) or better with lengths up to at least 1m.
- Moved By: Joel Goergen 2nd: Greg McSorley
- Technical≥75%
- All in the room:
- Yes: 60 No: 10 Abstain: 15
- 802.3 Voters:
- Yes: 38 No: 5 Abstain: 1

Note on Motion #4: Baseline definition of "improved FR-4" recorded in goergen_01_0511.pdf, slide 23. Note to Chair: include reference in backup slides to Objectives presentation for closing report at July Plenary. J. Goergen to review his presentation files from yesterday to make sure that the term "FR-4" appears in the titles for easy search.

Motion #5
Adopt the following objective:

- Define a 4-lane 100 Gb/s PHY for operation over links consistent with copper twin-axial cables with lengths up to at least 5m.
- Moved by Chris DiMinico 2nd by Alan Flatman
- Technical≥75%
- All in the room:
- Yes: 75 No: 0 Abstain: 8

David Law reviewed PAR responses as proposed in damrosia_01_0511.pdf. Edits made with inputs from the room, to be posted as dambrosia_01a_0511.pdf. Mr. Law to load into MyProject PAR form today for review by Study Group.

Howard Frazier leads a review of 5 Criteria responses based upon frazier_01_0511.pdf and makes changes based upon input from the room. Updated version is frazier_01a_0511.pdf.

3:06pm break, resume at 3:14

Motion #6

Move that the Study Group adopt the Broad Market Potential response in slide 2 of frazier_01a_0511.pdf

- Moved by Howard Frazier
- 2nd by Adee Ran
- Technical≥75%
- All in the room:
- Yes: 51 No: 0 Abstain: 3

Motion #7

Move that the Study Group adopt the Compatibility response in slide 3 of frazier_01a_0511.pdf

- Moved by Howard Frazier
- 2nd by Tom Palkert
- Technical≥75%
- All in the room:
- Yes: 64 No: 0 Abstain: 1

Motion #8

Move that the Study Group adopt the Distinct Identity response in slide 4 of frazier_01a_0511.pdf

- Moved by Howard Frazier
- 2nd by Adee Ran
- Technical≥75%
- All in the room:
- Yes: 62 No: 0 Abstain: 1

Motion #9

Move that the Study Group adopt the Technical Feasibility response in slide 5 of frazier_01a_0511.pdf

- Moved by Howard Frazier
- 2nd by Steve Carlson

- Technical≥75%
- All in the room:
- Yes: 66 No: 0 Abstain: 1

Motion #10

Move that the Study Group adopt the Economic Feasibility response in slide 6 of frazier_01a_0511.pdf

- Moved by Howard Frazier
- 2nd by Hugh Barrass
- Technical≥75%
- All in the room:
- Yes: 66 No: 0 Abstain: 1

David Law reviews the PAR responses now entered online in MyProject. Project will be 802.3bj Output file is par_0511.pdf

Motion #11

Move that the Study Group adopt the PAR Question Responses in par_0511.pdf

- Moved by Howard Frazier
- 2nd by Adam Healey
- Technical≥75%
- All in the room:
- Yes: 76 No: 0 Abstain: 0

Motion #12

Move that the Study Group:

- Submit the project documentation to the 802.3 Working Group for approval.
- Request that the 802.3 Working Group chair pre-submit the PAR and 5 criteria responses to the 802 Executive Committee for consideration at the July 2011 Plenary Session. Should the IEEE 802.3 Working Group not approve the submission at its July 2011 meeting, it will be removed from the IEEE 802 Executive Committee agenda.
- M: Hugh Barrass S: Mike Bennett
- Technical≥75%
- All in the room:
- Y: 74 N: 0 A: 0

Chair reviews upcoming meeting schedule and plans for next meeting.

Summary of Actions items:

Volunteer	Action	Date Assigned	Status As of 5/24
Adam Healey	Create spreadsheet related to simulation details	Mar-15-11	pending
Megha Shanbhag	Provide channel data related to presentation shanbhag_01_0311.pdf	Mar-15-11	Done
Megha Shanbhag	Provide channel data related to presentation tracy_01_0311.pdf	Mar-15-11	pending
Charles Moore	Update moore_01_0511.pdf and .csv file to correct channel length error (page 5), and pass/fail color coding on TEC channels.	May 24-11	
Vasu Parthasarathy	send updated .pdf indicating additional support of Matt Brown.	May 24-11	
Mike Li	Send updated version of li_01_0511.pdf presentation	May 24-11	
Ali Ghiasi	Send updated version of ghiasi_01_0511.pdf presentation	May 25-11	Done May 25-11
Joel Goergen	Review his presentation files from May 24 to make sure that the term “FR-4” appears in the titles for easy search.	May 25-11	

Motion to adjourn by Mike Dudek, 2nd by Steve Trowbridge
Meeting adjourned at 3:56pm.

Attendee List

IEEE 802.3 BACU SG Attendees - Interim Meeting, May 24-25, 2011			5/24/2011	5/25/2011
Last Name	First Name	Affiliation	Tues	Weds
Amleshi	Peerouz	Molex	x	x
Anderson	Jon	Opnext	x	x
Anslow	Pete	Ciena Corporation	x	x
Balasubramanian	Vittal	FCI	x	x
Balasubramonian	Venugopal	Cortina Systems	x	x
Balocating	Ed	Bourns	x	
Barnett	Barry	IBM	x	x
Barrass	Hugh	Cisco	x	x
Bennett	Mike	LBNL	x	x
Bhatt	Vipul	Lightwire	x	x

Bhoja	Sudeep	Broadcom	x	x
Bliss	Will	Broadcom	x	x
Braun	Ralf-Peter	Deutsche Telekom, T-Systems	x	x
Brown	Matt	Applied Micro	x	x
Buckmeier	Brian	Belfuse	x	
Bugg	Mark	Molex	x	x
Chalupsky	David	Intel	x	x
Chen	Chung-Jue	Broadcom	x	x
Choudhury	G. Mabud	Commscope	x	x
Coenen	Robert	Reflex Photonics	x	
Cole	Chris	Finisar	x	x
Cui	Kai	Huawei	x	x
D'Ambrosia	John	Force 10 Networks	x	x
Diab	Wael	Broadcom	x	x
DiMinico	Christopher	MC Communications/LEONI	x	x
Dove	Dan	HP	x	x
Dudek	Mike	QLogic	x	x
Dupuis	Mark	Madison Cable	x	x
Ewen	John	IBM	x	x
Flatman	Alan	LAN Technologies	x	x
Forbes	Harry	Nexans		x
Foster	Guy	Tektronics, Inc.	x	x
Frazier	Howard	Broadcom	x	x
Fu	Hong Yan	Huawei	x	x
Ghiasi	Ali	Broadcom	x	x
Giannakopoulos	Dimitris	Applied Micro	x	x
Goergen	Joel	Cisco	x	x
Grow	Bob	Intel	x	x
Gustlin	Mark	Cisco	x	x
Hajduczenia	Marek	ZTE	x	x
Hamano	Hiroshi	Fujitsu Labs	x	x
Hammond	Bernard	TE Connectivity	x	x
Hatab	Ziad	Vitesse		x
Healey	Adam	LSI	x	x
Hidaka	Yasuo	Fujitsu Lab of America	x	x
Huang	Xi	Huawei	x	x
Iwadate	Hirotake	Sumitomo Electric	x	x
Jiang	Hongtao	Broadcom	x	x
Kimmitt	Myles	Emulex	x	x
King	Jonathan	Finisar Corp.	x	
Kipp	Scott	Brocade	x	x
Kodama	Satoshi	NTT	x	x
Kolesar	Paul	CommScope	x	x

Kono	Masashi	Hitachi	x	x
Kring	Jeff	Belfuse	x	
Larsen	Wayne	Commscope	x	x
Latchman	Ryan	Mindspeed	x	x
Laubach	Mark	Broadcom	x	x
Law	David	HP	x	x
Lawson	Matthew Todd	Cisco	x	x
LeCheminant	Greg	Agilent Technologies	x	x
Li	Mike	Altera	x	x
Lingle, Jr.	Robert	OFS	x	x
Lusted	Kent	Intel	x	x
Machhi	Khushrov	Broadcom	x	
Maguire	Valerie	Siemon, TIA	x	x
Maki	Jeffery	Juniper Networks	x	x
Marris	Arthur	Cadence	x	x
McDonough	John	NEC America	x	x
McNarney	Martin	Broadcom	x	x
McSorley	Greg	Amphenol	x	x
Meghelli	Mounir	IBM	x	x
Moeller	Merrick	Amphenol	x	
Momtaz	Afshin	Broadcom	x	
Moore	Charles	Avago Technologies	x	x
Muller	Shimon	Oracle	x	
Nakamoto	Edward	Spirent Communications	x	x
Noh	George	Vitesse Semiconductors	x	x
Nordin	Ron	Panduit Corp.	x	x
Oulundsen	George	OFS	x	x
Palkert	Tom	Xilinx, Luxtera	x	
Parthasarathay	Vasudevan	Broadcom	x	x
Patel	Arvind	Psiber Data	x	
Patel	Pravin	IBM	x	x
Pearson	Karen	Leviton	x	x
Pickles	Tim	Surtec America	x	
Powell	Scott	Broadcom	x	x
Ran	Adee	Intel	x	x
Rateg	Hamid	Inphi	x	
Ressl	Michael	Hitachi Cable America	x	
Riani	Jamal	Marvell	x	x
Sambasivan	Sam	AT&T	x	
Searles	Shawn	Advanced Micro Devices	x	x
Seth	Siddharth	Inphi	x	x
Shanbhag	Megha	TE Connectivity	x	x
Shang	Song	Semtech	x	x

Shrikhande	Kapil	Force 10 Networks	x	x
Sommers	Scott	Molex	x	x
Sparrowhawk	Bryan	Leviton	x	x
Sprague	Ted	Infinera	x	x
Stassar	Peter	Huawei	x	x
Stauffer	David	IBM	x	x
Tazebay	Mehmet	Broadcom	x	x
Torza	Anthony	Xilinx	x	
Tracy	Nathan	Tyco Electronics	x	
Trowbridge	Steve	Alcatel-Lucent	x	x
Vaden	Sterling	Optical Cable Corp.	x	x
Vanderlaan	Paul	Nexans	x	x
Wang	Zhongfeng	Broadcom	x	x
Wong	Henry	Gennum	x	x
Zeng	Li	Huawei	x	
Zhao	Wenyu	CATR China	x	