Unconfirmed Meeting Minutes: IEEE P802.3bz 2.5G/5GBASE-T Task Force

May 19-20, 2015
Pittsburgh, PA

Prepared by Jon Lewis

IEEE P802.3bz 2.5G/5GBASE-T Task Force meeting convened at 1:00PM, Tuesday, May 19, 2015 by David Law, 802.3 Working Group chair.

Attendance is listed in Appendix A

Administrative Matters

Mr. Law appointed Jon Lewis as recording secretary for this session

Mr. Law explained that the Working Group chair appoints the Task Force Chair, and the Task Force would confirm the appointment. Mr. Law then reminded the group that he had announced his intention to appoint David Chalupsky Task Force Chair at the March 2015 Plenary and he then appointed Mr. Chalupsky as the Task Force Chair.

Motion #1: To confirm the appointment of David Chalupsky as P802.3bz Task Force Chair. (>=75% per IEEE)

M: Jon Lewis S: George Zimmerman
Y: 39 N: 0 A: 0
MOTION PASSES at 1:09PM

Mr. Law then turned the meeting over to Task Force Chair, David Chalupsky.

David Chalupsky displayed the agenda in agenda_3bz_01a_0515.pdf.

The Task Force Chair called for introductions and affiliations.

David Chalupsky reviewed the agenda in agenda_3bz_01a_0515.pdf.

Motion #2: To approve the agenda as shown in agenda_3bz_01_0515.pdf

M: Pete Cibula S: Peter Jones
Approved by voice without opposition (Procedural > 50%)

The Chair then asked for comments or corrections to the minutes of the last meeting. No responses were heard.

Motion #3: To approve the minutes for the March, 2015 NGEABT SG meeting (joint meeting with P802.3bq TF and 25GBASE-T SG).
M: George Zimmerman S: Jon Lewis
Approved by voice without opposition (Procedural > 50%)

The Chair then resumed the review of presentation agenda_3bz_01_0515.pdf.

- Mr. Chalupsky asked if anyone was attending from the press including those who would run a public blog on this meeting. David Chalupsky, Task Force Chair, and Peter Jones, Cisco, indicated that they occasionally blog information that is limited to high level details available from published meeting material.
- Mr. Chalupsky noted that there should be no recording or photography without permission.

Chair appointed Jon Lewis as the recording secretary for the Task Force, until further notice (covering future meetings).

Chair reviewed the adopted P802.3bz Objectives.

Chair reviewed the goals for the meeting, access to the reflector and website, and ground rules for the meeting.

Attendance, Mr. Chalupsky advised the group of the IEEE meeting attendance tool and procedures, including both the attendance book and the web attendance tracking tool.

IEEE Patent Policy, at **1:33 PM**, Mr. Chalupsky showed slides 0 through 4 patent policy from agenda_3bz_01_0515.pdf. Mr. Chalupsky showed slide 0 and read aloud slides 1 through 4. Mr. Chalupsky made the call for potentially essential patents at **1:35 PM**, and none responded. Mr. Chalupsky then completed the reading of slide #4

LIAISONS
The Chair noted that no liaisons were received.

PRESENTATIONS

The Chair then moved to the presentations for the meeting.

Title: Architecture ad hoc report (jones_3bz_01a_0515.pdf)
Presenter: Peter Jones, Cisco Systems
Abstract: Review status of 802.3bz Architecture Ad Hoc including

- Charter, scope/deliverables, location
- Activity since Berlin
- Ongoing work

Discussion:

- No comments.

Title: NGEAB-T Use Case ad hoc (diminico_3bz_01_0515.pdf)
Presenter: Chris Diminico, MC Communications/Panduit
Abstract: Use case ad hoc report
Discussion:

- Clarifications around ad hoc timeline were asked and answered.

Title: ENUCA ad hoc report (feyh_3bz_02_0515.pdf)
Presenter: German Feyh, Broadcom Corp.
Abstract: The presenter described the status and next steps for the Enterprise Noise and Use Case Analysis Ad Hoc (ENUCA). The ad hoc had held three telephonic meeting since the March Study Group meeting.
Discussion:

- No comments.

Title: External Noise Event Study (Feyh_3bz_01_0515.pdf)
Presenter: German Feyh, Broadcom Corp.
Abstract: Evaluation of the DSQ128 scheme under different external noise cases considering both the LDPC protection and Euclidean distance protection. In realistic noise environments and simulating the magnetic high pass filter as well as the analog front end, the LDPC protection is slightly weaker than the Euclidean distance protection.
Discussion:

- Comments concerning the event lengths presented.
- Applicability of using 10GBT phys as the basis for the analysis was discussed.

Title: Testing Impulse Noise Tolerance (cohen_3bz_01a_0515.pdf)
Presenter: Larry Cohen, Aquantia
Abstract: Bringing together the impulse noise measurements and methods of common mode / differential mode noise injection toward a compliance testing procedure
Discussion:

- Clarification on the calibration for 1000BASET.
- Considerations for using this as a “black-box” tester, Pros and Cons.
- Possibility of developing a model-type waveform for noise injection.
- Discussion on the applicability of common mode noise versus differential mode noise.

Title: Cable Clamp Injection of Impulse Noise (cibula_3bz_01_0515.pdf)
Presenter: Pete Cibula, Intel
Abstract: The contribution presents an initial assessment of the cable clamp as a method of injecting impulse noise into twisted-pair cabling. Results show that the EM clamp setup described in Cohen_3bz_01a_0515.pdf appears to be a valid method for introducing impulse impairments to twisted-pair cabling. Further work required to confirm the methodology is outlined.
Discussion:

- No Comments

THE GROUP BROKE FOR SNACKS AT 3:10PM, TO RESUME AT 3:30PM

THE GROUP RESUMED at 3:29PM..

Title: A Quick Draft to 802.3bz: Editorial Considerations, Standards Dependencies, and Potential Timeline (zimmerman_3bz_02a_0515.pdf)
Presenter: George Zimmerman, CME Consulting/Aquantia & Commscope.
Abstract: The presenter will discuss relations between Clause 45 and work in 802.3bq and work to produce an 802.3bz draft, necessary focus on other sections of the 802.3bq draft for 802.3bz, dependencies with cabling standards reports, big ticket items to be resolved, as well as a potential timeline for resolving them and producing a draft for the 802.3bz project.
Discussion:

- Comments concerning defining multiple phys in a single clause.
- Noted that the channel needs to be defined before much else can be completed.

Title: Link Segment Specifications (zimmerman_3bz_01_0515.pdf)
Presenter: George Zimmerman, CME Consulting
Abstract: The presenter will present strawman link segment transmission based on existing cabling specifications, frequency extensions, and length scaling for 2.5GBASE-T and 5GBASE-T.
Discussion:

- Discussion concerning the cabling standard and applicability for 802.3bz.

Title: Cat 6 Alien Crosstalk and Related System Margins (vanderlaan_3bz_01a_0515.pdf)
Presenter: Paul Vanderlaan, Berk-Tek LLC
Abstract: The contribution presented 5Gbps system margins of various bundled UTP category 6 channels. The channels were 100m in length and varied across cable and connectivity manufacturer as well as the length of the bundled segment. These variables were examined with respect to their impact to alien crosstalk and the resultant to the system margins.
Discussion:

- Comments concerning the physical characteristics in older cable versus newer cable and the potential differences in temperature tolerance.
- It was noted that PBO was not enabled.
- Suggestion made to further study the cable in unbundled configurations.
- Data to be posted on the IEEE P802.3bz TF website.

Title: Alien crosstalk and 2.5 G (Schicketanz_3bz_01a_0515.pdf)
Presenter: Dieter Schicketanz, Leoni-Kerpan
Abstract: There have been presentations on measurements of installed base alien crosstalk noise. Using the results for cat5e an analysis, especially short disturbers will be

presented showing differences to 10G. This leads to the conclusion that it would be beneficial for 2.5 G not to apply power back off techniques as in 10G. Differences for 5G are mentioned.

Discussion:

- No discussion

Title: PCS/PMA Proposal (Souvignier_3bz_01_0515.pdf)
Presenter: Tom Souvignier, Broadcom Corp.
Abstract: A PCS/PMA proposal was presented, which includes motivation for leveraging 10GBASE-T's modulation and coding. Nothing fundamental in terms of noise or use case has changed since IEEE decided on this solution for 10G. Therefore IEEE should simply scale this proven and successful technology. It was shown that this solution provides error-free operation over 100m of Cat5e & Cat6 at 2.5Gb/s & 5Gb/s. Tom also stated this proposal is robust against alien noise sources as well as against external noise sources.

Discussion:

- No comments

Title: 10GBASE-T Uncoded Bit Error Challenges & Ramifications (Farjadrad_3bz_01_0515.pdf)
Presenter: Ramin Farjad, Aquantia
Abstract: This presentation discusses the challenges Ethernet networking industry had to provide a 10GBASE-T solution at low cost and complexity to the market in a timely manner. One of the main challenges that caused the late adoption of 10GBASE-T products was the complex requirements of the AFE mostly dictated by large echo power and even larger echo peaks. Linear filters could cancel the linear portion of echo signal, but not the echo caused by transmit driver nonlinear components. The nonlinear echo components could add up to form large enough to corrupt a single symbol, whose uncoded bits could not be recovered. A fully coded constellation, could significantly relax the AFE as well as system requirements (e.g. magnetics, board, connectors) leading to a lower cost and faster time to market solution

Discussion:

- No comments

Title: PMA/PCS Considerations for 2.5G and 5G (Shirani_3bz_01a_0515.pdf)
Presenter: Ramin Shirani, Aquantia
Abstract: Given the various noise considerations, what are the learnings toward PMA/PCS design of a 2.5G/5G system?

Discussion:

- No comments

Title: Scaling the MAC and XGMII for 2.5/5GBASE-T (frazier_3bz_0515.pdf)
Presenter: Howard Frazier, Broadcom
Abstract: Proposal for scaling the full duplex MAC and XGMII for operation at 2.5 Gb/s and 5 Gb/s

Discussion:

- Comments about additional work required.

Title: PHY/MAC Interface (bains_3bz_01b_0515.pdf)
Presenter: Amrik Bains, Cisco Systems
Abstract: The presenter will present IEEE xMII logical interfaces and current/future Physical MAC/PHY implementations as SERDES technology evolves.
Discussion:

- It was noted that XGMII is a physical specification currently.

The Chair stated that the start time for the conclusion of P802.3bz would be 9:00AM Wednesday, May 20, 2015.

The meeting was recessed for the day at 6:06PM, Tuesday, May 19, 2015.

The meeting was resumed at 9:02AM, Wednesday, May 20, 2015.

Mr. Chalupsky inquired if there was anyone new in the room. Seeing none Mr. Chalupsky reminded the attendees of the patent policy.

Joseph Byrne, Freescale Semiconductor, indicated that he blogs publically for both NBASE-T and MGBASE-T and also other unspecified outlets. The Chair reminded Joseph that the information should be limited to publically available information.

The Chair reviewed the agenda: agenda_3bz_01_0515.pdf.

Title: Mechanisms Influencing BASE-T 1Gb/10Gb Time-To-Link (cibula_3bz_02_0515.pdf)
Presenter: Pete Cibula, Intel
Abstract: The contribution reviews autonegotiation and training mechanisms associated with achieving a 1000BASE-T or 10GBASE-T link. As a follow-up to related P802.3bq and P802.3bz task force and ad hoc work, the contribution identifies state transitions and associated transition times that a BASE-T PHY uses to achieve a link state. Results are intended to be used as a starting point for future discussions on improving TTL for 2.5G/5GBASE-T PHYs, including improving autonegotiation and startup times.
Discussion:

- It was noted by the presenter that the states listed on page 8 were obtained using a phy vendor script.
- Discussion on if cable diagnostics would add additional delay to these times.

Title: xGBASE-T Auto-Negotiation Proposal (Lo_3bq_01a_0515.pdf)
Presenter: William Lo, Marvell Semiconductor
Abstract: A method for exchanging fast retrain and EEE bits in InfoField during training instead of Auto-Negotiation is presented.
Discussion:

- No Discussion

Title: 802.3bz Layers - Auto-negotiation Proposal (Kim_3bz_02_0515.pdf)
Presenter: Yong Kim, Broadcom Corporation
Abstract: CL 28 and other BASE-T auto-negotiations, and proposal for 802.3bz auto-negotiation.
Discussion:

- No Discussion

Title: Supporting Materials for 802.3bz Layers - Auto-negotiation Proposal (Kim_3bz_03_0515.pdf)
Presenter: Yong Kim, Broadcom Corporation
Abstract: Analysis and consequences of the auto-negotiation proposal and exploring other options, such as re-purposing AN base-page encodings, LLDP, etc, that may be used now or in the future.
Discussion:

- Discussion on the additional time to send XNP during repeated AN for multi-rate phys.

Title: 802.3bz Layers - CL45 Management Proposal (Kim_3bz_01_0515.pdf)
Presenter: Yong Kim, Broadcom Corporation
Abstract: Anticipated changes to CL45 Management in support of 802.3bz project.
Discussion:

- It was noted that additional review of this area would be beneficial to the Task Force.

THE GROUP TOOK A SHORT BREAK AT 10:34AM, TO RESUME AT 10:55AM

THE GROUP RESUMED at 11:03AM.

Title: PMA/PCS Consensus Baseline Proposal (Shirani_3bz_02_0515.pdf)
Presenter: Ramin Shirani, Aquantia; Yong Kim, Broadcom; William Lo, Marvell Semiconductor
Abstract: Proposal for baseline text to include in initial draft.
Discussion:

- No Comments

Mr. Chalupsky appointed George Zimmerman as the Chief Editor for 802.3bz.

Motion #4: Move to: adopt PMA/PCS Consensus Baseline Proposal as defined in Shirani_3bz_02_0515.pdf pages 3 to 5 as the basis of PMA / PCS for 802.3bz draft
M: R. Shirani S: Ron Cates
(Technical >=75%)
Y: 49 N: 0 A: 1
MOTION PASSES at 11:19AM

<u>Motion #5:</u> Move to adopt Auto-Negotiation / InfoField exchange as defined in Lo_3bq_01a_0515.pdf slides 7 to 11 except bit U25 and U26 shown in slide 11 shall be reserved for other uses.

M: William Lo S: Yong Kim
(Technical >=75%)
Y: 49 N: 0 A: 2
MOTION PASSES at 11:23AM

Mr. Chalupsky resumed administrative business to allow others to complete motions.

OTHER ADMINISTRATIVE BUSINESS

Attendance, Mr. Chalupsky advised the group of the IEEE meeting attendance tool and procedures, including both the attendance book and the web attendance tracking tool.

George Zimmerman, Chief Editor, introduced the volunteers for the editorial team and the need for additional volunteers.

The Chair turned back to the agenda slides and reviewed upcoming IEEE 802.3 meetings.

Straw Poll #1:
Will you attend the July, 2015 Plenary meeting in Waikoloa, HI, USA?
Yes: 38
Maybe: 4
No: 4

Straw Poll #2:
Will you attend the September, 2015 Interim meeting in Bonita Springs, FL, USA?
Yes: 36
Maybe: 12
No: 1

Administrative business was recessed and motions resumed.

<u>Motion #6:</u> Move to adopt Scaling the MAC and XGMII for 2.5/5GBASE-T, as presented in Frazier_3bz_0515.pdf, with supporting materials in PHY/MAC Interface, bains_3bz_01b_0515.pdf, as the basis for 802.3bz draft generation.

M: Yong KimS: George Zimmerman
(Technical >=75%)
Y: 47 N: 0 A: 1
MOTION PASSES at 11:37AM

<u>Motion #7:</u> Move to adopt 802.3bz Layers – CL45 Management Proposal as presented in Kim_3bz_01_0515.pdf, as the basis for 802.3bz draft generation, with necessary alignments to 802.3bq D2.1, with editorial license to align.

M: Yong Kim S: Peter Jones
(Technical >=75%)
Y: 47 N: 0 A: 2
MOTION PASSES at 11:41AM

Mr. Chalupsky requested further business for 802.3bz. The Chair indicated that he would be requesting the specific clause number for 802.3bz.

<u>Motion #8:</u> Move to accept slides 3, 4 and the propagation delay from slide 5 of Zimmerman_3bz_01_0515.pdf to generate the 802.3bz draft, omitting the bullet: "Don't need pair-to-pair specifications – constrained by PS" on slide 4.

M: Chris Diminico S: George Zimmerman
(all in the room) (Technical >=75%)
Y: 46 N: 0 A: 3
MOTION PASSES at 11:50AM

<u>Motion #9:</u> Instruct the editor to create draft 0.1 of 802.3bz based on the text of draft 2.1 of IEEE 802.3bq, the revision draft of IEEE 802.3 in process and the motions adopted at this meeting.
M: Chris Diminico S: Jon Lewis
Y: 49 N: 0 A: 2
MOTION PASSES at 11:54AM

ADMINISTRATIVE BUSINESS RESUMED at 11:55AM

Adjournment

<u>Motion #10:</u> To adjourn the meeting.
M: Pete Cibula S: Clark Carty
MOTION PASSES by voice without opposition
The Meeting was adjourned at 11:56AM

Appendix A: Attendees at the IEEE P802.3bz 2.5G/5GBASE-T Task Force Meeting, May 16-17, 2015

Total attended:	68		Daily # attended:	66	55
P802.3bz May'15				**5/19/15 pm**	**5/20/15**
Last Name	**First Name**	**Employer**	**Affiliation**	**Tues pm 802.3bz**	**Weds 802.3bz**
Abughazaleh	Shadi	Hubbell	Hubbell	x	x
Amason	Dale	Freescale	Freescale	x	
Bains	Amrik	Cisco	Cisco	x	x
Belopolsky	Yakov	Bel Stewart	Bel Stewart	x	x
Brillart	Theo	Fluke Electronics	Fluke Electronics	x	
Byrne	Joseph	Freescale	Freescale	x	x
Carty	Clark	Cisco	Cisco	x	x
Cates	Ron	Marvell	Marvell	x	x
Chacon Simon	Geoffrey	HP	HP	x	x
Chalupsky	David	Intel	Intel	x	x
Chuang	Keng Hua	HP	HP	x	x
Cibula	Pete	Intel	Intel	x	x
Cohen	Larry	Aquantia	Aquantia	x	x
Dalmia	Kamal	Aquantia	Aquantia	x	x
DiMinico	Christopher	MC Communications	Panduit	x	x
Dinh	Thuyen	Pulse Electronics	Pulse Electronics	x	x
Dwer	Nick	General Cable	General Cable	x	
Estes	Dave	Spirent	Spirent	x	x
Farjad	Ramin	Aquantia	Aquantia	x	x
Feyh	German	Broadcom	Broadcom	x	x
Flatman	Alan	LAN Technologies	LAN Technologies	x	x
Frazier	Howard	Broadcom	Broadcom	x	
Freeburn	Paul	Avaya	Avaya	x	x
Graba	Jim	Broadcom	Broadcom	x	x
Hajduczenia	Marek	Bright House Networks	Bright House Networks	x	
Hamidy	Farid	Pulse	Pulse	x	x
Hammond	Bernard	TE Connectivity	TE Connectivity	x	x
Hess	Dave	Cord Data	Cord Data	x	x
Hess	John	Bel Stewart	Bel Stewart	x	x
Horrmeyer	Bernd	Phoenix Contact	Phoenix Contact	x	x
Jones	Peter	Cisco	Cisco	x	x
Kim	Yong	Broadcom	Broadcom	x	

Kipp	Scott	Brocade	Brocade	x	
Klempa	Mike	UNH-IOL	UNH-IOL	x	
Knittle	Curtis	Cable Labs	Cable Labs	x	
Lau	Evan	General Cable	General Cable		x
Lee	Arthur	Mediatek	Mediatek	x	
Lewis	Jon	Dell	Dell	x	x
Lo	William	Marvell	Marvell	x	x
Maguire	Valerie	Siemon	Siemon	x	x
Mallette	Edwin	Bright House Networks	Bright House Networks	x	
Maynes	Curt	3M	3M	x	x
Mei	Richard	Commscope	Commscope	x	x
Moffitt	Bryan	Commscope	Commscope	x	x
Neveux	Paul	Superior Essex	Superior Essex	x	x
Nielsen	Allan	TE Connectivity	TE Connectivity	x	x
Noll	Kevin	Time Warner Cable	Time Warner Cable	x	x
Porach	Stephen	Optical Cable Corp	Optical Cable Corp	x	x
Rabinovich	Rick	Alcatel-Lucent	Alcatel-Lucent	x	
Renteria	Victor	Belfuse Inc	Belfuse Inc	x	x
Rossbach	Martin	Nexans	Nexans	x	x
Schicketanz	Dieter	Consultant	Leoni-Kerpen	x	x
Sedarat	Hossein	Aquantia	Aquantia	x	x
Sedio	Steve	Foxconn	Foxconn	x	x
Shariff	Masood	Commscope	Commscope	x	x
Shirani	Ramin	Aquantia	Aquantia	x	x
Souvignier	Tom	Broadcom	Broadcom	x	x
Sparrowhawk	Bryan	Leviton	Leviton	x	x
Su	Ching-Yao	Realtek	Realtek	x	x
Tu	Mike	Broadcom	Broadcom		x
Vaden	Sterling	Vaden Enterprises	Vaden Enterprises	x	x
Vanderlaan	Paul	Berk-Tek LLC	Berk-Tek LLC	x	x
Wagner	Bob	Panduit Corp.	Panduit Corp.	x	x
Wahn	Hazfez	Huawei	Huawei	x	
Wang	Xiaofeng	Qualcomm	Qualcomm	x	x
Wang	Roy	Hewlett-Packard	Hewlett-Packard	x	x
Wu	Peter	Marvell	Marvell	x	x
Zimmerman	George	CME	Commscope, Aquantia	x	x