

Unconfirmed Meeting Minutes: IEEE 802.3 NGEABT Study Group
January 14-15, 2015
Atlanta, GA, USA

Prepared by Jon Lewis

IEEE 802.3 Next Generation Enterprise Access BASE-T (NGEABT) Study Group meeting convened at 1:12 PM, Wednesday, January 14, 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 study group Chair, and the study group would confirm the appointment. Mr. Law then reminded the group that he had announced his intention to appoint David Chalupsky Study Group Chair at the November Closing Plenary, and he then appointed David Chalupsky Study Group Chair.

Motion #1: To confirm David Chalupsky as the 802.3 Next Generation Enterprise Access BASE-T Study Group Chair

M: Alan Flatman S: George Zimmerman

Y: 34 , N: 0, A: 1

MOTION PASSES (>= 75%)

Mr. Law turned the meeting over to Study Group Chair David Chalupsky.

Presentation: [agenda_ngeabt_01b_0115.pdf](#)

Presenter: Dave Chalupsky, Chair.

The Chair called for introductions and affiliations, the participants introduced themselves, and the Chair then proceeded with the agenda.

The Chair reviewed the agenda. Mr. Chalupsky turned to presentation agenda_ngeabt_01b_0115.pdf and reviewed the schedule of presentations for the meeting.

The Chair asked if there was any objection to hearing a late presentation from Jon Lewis of Dell. No objections.

Motion #2: Approve the agenda from agenda_ngeabt_01b_0115.pdf

M: Pete Cibula S: George Zimmerman

Approved by voice vote without objection (Procedural > 50%)

The Chair then resumed the review of presentation agenda_ngeabt_01_0115.pdf:

- Mr. Chalupsky asked if anyone was attending from the press including those who would run a public blog on this meeting – there were no indications from the group, although Mr. Chalupsky himself indicated that he occasionally writes/blogs about the state of BASE-T, but would not provide ‘blow-by-blow’ descriptions of the meeting.
- Mr. Chalupsky noted that there should be no recording or photography without permission.

Mr. Chalupsky then continued review of the presentation, Big Ticket items for this meeting, to develop PAR, 5 Criteria, and Objectives for Next Generation Enterprise Access BASE-T.

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

Guidelines for IEEE-SA Meetings, Mr. Chalupsky read aloud the policy from agenda_ngeabt_01b_0115.pdf, page entitled “Guidelines for IEEE-SA Meetings” (1:35pm).

Mr. Chalupsky reviewed the standards development process for IEEE found in the agenda presentation.

Mr. Chalupsky reviewed the WG motion from the November plenary meeting of the 802.3 WG to establish the Study Group.

LIAISONS

The Chair moved to liaisons, and noted that there were no liaisons for the Study Group at this time.

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.

The Chair completed review of the presentation.

PRESENTATIONS

The Chair then moved to the presentations for the meeting.

Title: Architecture Ad Hoc Proposed PAR ([jones_ngeabt_01a_0115.pdf](#))
Abstract: The presenter outlined the proposed PAR resulting from work in the Architecture Ad Hoc
Presenter: Peter Jones, Cisco, Chair, Architecture Ad Hoc
Discussion: Mr. Chalupsky asked if there were any objections to using the PAR information shown in the presentation in updating the PAR tool. No objections. Mr. Chalupsky will update the PAR tool accordingly.

Title: Architecture Ad Hoc Proposed CSD ([jones_ngeabt_02a_0115.pdf](#))
Abstract: The presenter outlined the proposed CSD resulting from work in the Architecture Ad Hoc
Presenter: Peter Jones, Cisco, Chair, Architecture Ad Hoc
Discussion: Questions were asked and answered clarifying the CSD aspects.

Title: Architecture Ad Hoc Proposed Objectives ([jones_ngeabt_03a_0115.pdf](#))
Abstract: The presenter outlined the proposed objectives resulting from work in the Architecture Ad Hoc, including areas where consensus had yet to be reached.
Presenter: Peter Jones, Cisco, Chair, Architecture Ad Hoc
Discussion: Questions were asked and answered concerning the proposed rate and reach objectives.

Title: Cabling Installed Base Update ([jones_ngeabt_04c_0115.pdf](#))
Abstract: The presentation describes the results of a global cabling survey performed by BSRIA to estimate the global installed base of category cabling, by category.
Presenter: Peter Jones, Cisco
Discussion: Discussion on the difference in the data to that previously shown and the methodology used in this study.

Title: Why 2.5/5G Data Rates ([bains_ngeabt_01d_0115.pdf](#))
Abstract: The presentation describes technical advantages in implementation of 2.5Gb/s and 5Gb/s.
Presenter: Amrik Bains, Cisco
Discussion: Questions clarifying if SGMII should be replaced by GMII on slide 4.

Title: PoE Objective for Next-Gen Enterprise Access BASE-T ([zimmerman_ngeabt_01a_0115.pdf](#))
Abstract: The presentation provides support for technical feasibility of PoE in Next-Gen Enterprise Access BASE-T.
Presenter: George Zimmerman, CME Consulting/Aquantia, Commscope & Linear Tech Corp
Discussion: Questions were asked and answered about the feasibility of supporting PoE on the current MDI.

Title: BER Objective for Next-Gen Enterprise Access BASE-T ([zimmerman_ngeabt_02_0115.pdf](#))
Abstract: The presentation provides support for choosing the BER objective in Next-Gen Enterprise Access BASE-T.
Presenter: George Zimmerman, CME Consulting/Aquantia & Commscope
Discussion: No Discussion

Break at 1:57pm. Resumed at 3:26pm.

Title: Call for New Connectors in BASE-T Ethernet ([dalmia_ngeabt_01_0115.pdf](#))
Abstract: The presentation proposes a need for new, smaller form factor connectors for end stations in BASE-T Ethernet.
Presenter: Kamal Dalmia, Aquantia

Discussion: Vigorous discussion on the applicability of this presentation to the current study group. Recommendations for a separate CFI at the 802.3 WG were made.

Title: NGEABT Testing Challenges for the Installed Cabling Base –T
([brillhart_ngeabt_01a_0115.pdf](#))

Abstract: This contribution is an attempt to define the problem space for qualification testing of the installed base of Cat5e/6 structured cabling for suitability to carry newly proposed BASE-T applications. It should serve as a 'jumping off point' for prioritizing the most sensitive parameters, design of experiments to identify practical test methods, and any data gathering needed to further the test definitions.

Presenter: Theo Brillhart, Fluke Networks

Discussion: Questions were asked and answered about replacing alien crosstalk parameters. It was stated that alien crosstalk was not a required parameter on either CAT5e or CAT6. Additional questions were asked and answered about the responsibility for writing test specifications for the proposed NGEABT operating modes.

Title: Channel Characterization ([feyh_3bq_ngeabt_0115.pdf](#))

Abstract: The presentation provides measurements of channel characteristics, including noise levels for Cat 5e and Cat 6 cabling.

Presenter: German Feyh, Broadcom

Discussion: Questions were asked and answered on the physical routing during the measurements. Clarifications were asked and given concerning the rate reduction and the suggested operation of that reduction. Clarification was requested and provided on the driver bandwidth, SNR margins and applicability of alien crosstalk to NGEABT.

Title: Cat5e Alien Crosstalk Measurements ([wagner_ngeabt_01a_0115.pdf](#))

Abstract: The presentation provides measurements of channel characteristics for Cat 5e, including alien crosstalk transfer functions.

Presenter: Bob Wagner, Panduit and Chris DiMinico, MC Communications/Panduit

Discussion: No Discussion

Title: Investigations of Category 5e Cabling for 2.5 and 5Gbps PAM Transmission using 10GBASE-T derived Technology
([mei_ngeabt_01b_0115.pdf](#))

Abstract: The presentation provides measurements of channel characteristics for Cat 5e, including alien crosstalk transfer functions in various bundling configurations. Additionally it provides estimates for feasibility of 2.5 and 5Gbps PAM transmission using 10GBASE-T derived technology on these channels.

Presenter: Richard Mei/Commscope, co-authors: Benji Boban/Commscope, George Zimmerman, CME Consulting/Commscope

Discussion: Clarifications were requested and provided on the usage of previously measured data acquired during 10GBASE-T. Questions were asked and answered concerning the need for use cases to help define the worst case operating channel.

THE MEETING RECESSED FOR THE DAY AT 5:57PM, TO RECONVENE THURSDAY AT 9:00AM

THE MEETING RECONVENED THURSDAY AT 9:03AM

The Chair called for introductions and affiliations, the participants introduced themselves, and the Chair then proceeded with the agenda.

The Chair reviewed the agenda presentation, agenda_ngeabt_01b_0115.pdf

- Reviewed the schedule of presentations for the meeting.
- Mr. Chalupsky asked if anyone was attending from the press including those who would run a public blog on this meeting – there were no indications from the group, although Mr. Chalupsky himself indicated that he occasionally blogs about the state of BASE-T, but would not provide ‘blow-by-blow’ descriptions of the meeting.
- Mr. Chalupsky noted that there should be no recording or photography without permission.

Guidelines for IEEE-SA Meetings, Mr. Chalupsky read aloud the policy from agenda_ngeabt_01b_0115.pdf, page entitled “Guidelines for IEEE-SA Meetings” (9:21am).

Mr. Chalupsky reviewed the goals for the meeting, access to the reflector and website, and ground rules, including the WG motion from the November plenary meeting of the 802.3 WG to establish the Study Group.

Mr. Chalupsky then continued review of the presentation, Big Ticket items for this meeting, to develop PAR, 5 Criteria, and Objectives for Next Generation Enterprise Access BASE-T.

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.

The Chair completed review of the presentation.

Title: 5G Operation over Cat 6 and Cat5e ([farjad_ngeabt_01b_0115.pdf](#))

Abstract: An examination of some 5G over enterprise cabling results.

Presenter: Ramin Farjad/Aquantia, co-author: Amrik Bains, Cisco

Discussion: Questions were asked and answered concerning details of the test setup including measurement locations, temperature/voltage variations in the test environment and the worst case aggressor for the test setup.

Title: Impulse Noise Impact on 2.5Gb/s, 5Gb/s Operation in Enterprise Environment ([shirani_ngeabt_01a_0115.pdf](#))

Abstract: The enterprise environment is significantly different than the datacenter environment and contains different noise sources that must be properly characterized in order design a robust transmission scheme

Presenter: Ramin Shirani/Aquantia, co-author: Larry Cohen, Consultant / Aquantia

Discussion: A suggestion was made to consider work already done by the 1000BASE-T1 group concerning impulse noise. Questions were asked and answered concerning the worst case noise in an enterprise environment. It was suggested that an ad hoc committee should be formed to further this investigation.

Mr. Cibula assumed duties of secretary so Mr. Lewis could present and resolve discussion items.

Title: 5Gb/s over CAT5e for NGEABT ([lewis_ngeabt_01b_0115.pdf](#))

Abstract: Contains summary of data on the installed base of category cabling previously heard in jones_ngeabt_04c_0115.pdf. Based upon that data, this speaker proposes that the NGEABT PHY Study Group should include 5Gb/s over CAT5e as part of the project.

Presenter: Jon Lewis, Dell Inc.

Discussion: Participant noted that the percentage of Cat5e deployed specifically for wireless access points may be smaller. One also observed that the difference is likely small, and although AP's were noted as the lead use case in the CFI, the project should not preclude other applications. Discussion of need for future work on electrical specifications if the PHY relies on parameters outside if the Cat5e specification.

Mr. Lewis resumed duties of secretary.

DISCUSSION, MOTIONS & STRAW POLLS

Having concluded the presentations for the meeting, the Chair then moved to discussion, motions and (additional) straw polls.

Discussion concerning potential wording for rate-reach objectives, potential PAR modifications and cabling and augmentation for rate and reach objectives.

Break at 11:43am. Resumed at 1:47pm.

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

Mr. Chalupsky proposed a flow for the afternoon discussion and invited participants to bring forward motions to the NGEABT group that would advance the study group progress. (1:48pm)

Mr. Chalupsky reviewed the PAR from [NGEABT PAR DRAFT 15-Jan-15.pdf](#). Should this go forward NGEABT shall be 802.3bz. Comments were made that a small change in the PAR was necessary. Mr. Chalupsky will update the PAR tool accordingly.

Peter Jones, architecture ad hoc chair, indicated that he would like to bring forward motions as discussed in his opening presentations.

Motion #3:

- Move to adopt the “CSD Managed Objects” response, as per [jones_ngeabt_02a_0115.pdf](#)

M: Peter Jones S: Yong Kim
Y: 48 N: 0 A: 1 Technical (>= 75%)

Motion Passes

Motion #4 : Motion to reconsider Motion 3

M: David Law S: Pete Cibula
(procedural)

Motion passes by voice vote without objection

Motion #5: Move to Amend Motion 3.

Change filename to latest revision: [jones_ngeabt_02b_0115.pdf](#)
(procedural)

M: David Law S: Peter Jones

Motion passes by voice vote without objection

Motion #6: Amended motion CSD Managed Objects

- Move to adopt the “CSD Managed Objects” response, as per [jones_ngeabt_02b_0115.pdf](#)

M: Peter Jones S: Yong Kim
Y: 50 N: 0 A: 1 Technical (>= 75%)

Motion Passes

Motion #7:

- Move to adopt the “CSD Coexistence” response, as per [jones_ngeabt_02b_0115.pdf](#)

M: Peter Jones S: Yong Kim
Y: 49 N: 0 A: 1 Technical (>= 75%)

Motion Passes

Motion #8:

- Move to adopt the “CSD Broad Market Potential” response, as per [jones_ngeabt_02b_0115.pdf](#)

M: Peter Jones S: Yong Kim
Y: 48 N: 0 A: 1 Technical (>= 75%)

Motion Passes

Motion #9:

- Move to adopt the “CSD Compatibility” response, as per [jones_ngeabt_02b_0115.pdf](#)

M: Peter Jones S: Yong Kim
Y: 48 N: 0 A: 1 Technical (>= 75%)

Motion Passes

Motion #10:

- Move to adopt the “CSD Distinct Identity” response, as below:
 - The proposed amendment will define IEEE 802.3 standard operating at 2.5 Gb/s and 5 Gb/s MAC rates. There are no existing standards, or projects developing standards, addressing the specification of Ethernet PHY operation over Cat 5e and Cat 6 balanced unshielded twisted pair cables at 2.5 Gb/s and 5 Gb/s speeds.

M: Peter Jones S: Yong Kim
 Y: 46 N: 0 A: 1 Technical (>= 75%)

Motion Passes

Motion #11:

- Move to adopt the “CSD Technical Feasibility” response, as per [jones_ngeabt_02b_0115.pdf](#)

M: Peter Jones S: Yong Kim
 Y: 45 N: 0 A: 1 Technical (>= 75%)

Motion Passes

Motion #12:

- Move to adopt the “CSD Economic Feasibility” response, as per [jones_ngeabt_02b_0115.pdf](#)

M: Peter Jones S: Yong Kim
 Y: 47 N: 1 A: 1 Technical (>= 75%)

Motion Passes

Motion #13:

- Move to accept the objectives as presented in slide 3 of [jones_ngeabt_03a_0115.pdf](#)

M: Peter Jones S: George Zimmerman
 Y: 43 N: 0 A: 1 Technical (>= 75%)

Motion Passes

Motion #14:

- Move to accept the following three objectives as presented in slide 4 of [jones_ngeabt_03a_0115.pdf](#)
 - Support MAC data rates of 2.5 Gb/s and 5 Gb/s
 - Support a BER better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent)
 - Select copper media from ISO/IEC 11801:2002, with any appropriate augmentation to be developed through work of 802.3 in conjunction with SC25/WG3 and TIA TR42

M: Peter Jones S: George Zimmerman
 Y: 45 N: 0 A: 1 Technical (>= 75%)

Motion Passes

Motion #15:

- Move to adopt the PAR text , as per [NGEABT_PAR_DRAFTa_15-Jan-15.pdf](#)

M: Peter Jones S: Jon Lewis
 Y: 45 N: 0 A: 2 Technical (>= 75%)

Motion Passes

Break at 2:53am. Resumed at 3:27pm.

Peter Jones, architecture ad hoc chair, led a discussion on rate and reach objectives, allowing time at the podium for others to speak.

Motion #16:

- Move that the Next Generation Enterprise Access BASE-T PHY Study Group define use cases and deployment configurations for 2.5 and 5 Gb/s PHY operation in the enterprise environment.

M: Chris DiMinico S: George Zimmerman

Y: 37 N: 0 A: 1 Technical ($\geq 75\%$)

Motion Passes

Straw Poll #1:

- I would support a motion to adopt the objectives;
 - Define a 2.5 Gb/s PHY for operation over
 - Up to at least 100m on four-pair Class D (Cat5e) balanced copper cabling on defined use cases and deployment configurations
 - Define a 5 Gb/s PHY for operation over
 - Up to at least 100m on Class E (Cat6) balanced copper cabling on defined use cases and deployment configurations
 - Up to 100m on Class D (Cat5e) balanced copper cabling on defined use cases and deployment configurations

Y: 36 N: 1 A: 2

Straw Poll #2:

- I would support a motion to adopt the objectives;
 - Define a 2.5 Gb/s PHY for operation over
 - Up to at least 100m on four-pair Class D (Cat5e) balanced copper cabling
 - Define a 5 Gb/s PHY for operation over
 - Up to at least 100m on Class E (Cat6) balanced copper cabling
 - Up to 100m on Class D (Cat5e) balanced copper cabling

Y: 4 N: 25 A: 9

Straw Poll #3:

- I would support a motion that the Next Generation Enterprise Access BASE-T PHY Study Group adopt the objectives.
 - Define a 2.5 Gb/s PHY for operation over

- Up to at least 100m on Class E (Cat6) balanced copper cabling on defined use cases and deployment configurations
- Up to at least 100m on four-pair Class D (Cat5e) balanced copper cabling on defined use cases and deployment configurations
- Define a 5 Gb/s PHY for operation over
 - Up to at least 100m on Class E (Cat6) balanced copper cabling on defined use cases and deployment configurations
 - Up to 100m on Class D (Cat5e) balanced copper cabling on defined use cases and deployment configurations

Y: 16 N: 13 A: 6

Motion #17:

- Move that the Next Generation Enterprise Access BASE-T PHY Study Group adopt the objectives.
 - Define a 2.5 Gb/s PHY for operation over
 - Up to at least 100m on four-pair Class D (Cat5e) balanced copper cabling on defined use cases and deployment configurations
 - Define a 5 Gb/s PHY for operation over
 - Up to at least 100m on Class E (Cat6) balanced copper cabling on defined use cases and deployment configurations
 - Up to 100m on Class D (Cat5e) balanced copper cabling on defined use cases and deployment configurations

M: Chris DiMinico S: Richard Mei

Y: 33 N: 1 A: 3 Technical (>= 75%)

Motion Passes

Mr. Chalupsky requested that if anyone had further business to bring it forward at this time. No response.

Mr. Chalupsky announced the formation of the Use Case ad hoc, with the charter of defining use cases and deployment configurations for 2.5 and 5 Gb/s PHY operation in the enterprise environment and has appointed Chris DiMinico as the ad hoc chair.

Mr. Chalupsky announced the formation of the “Impulse noise and use case analysis” ad hoc and has appointed German Feyh as the ad hoc chair. Charter of this ad hoc is to recommend electrical specifications for the project based upon 1) analysis of enterprise noise sources (such as impulse noise) and 2) evaluation of the results of the Use Case ad hoc.

Mr. Chalupsky asked about future business. No business

FUTURE MEETINGS

Mr. Chalupsky reviewed future meetings from the agenda presentation

Straw Poll #4 on future meetings

I will be attending:

March 2015 Plenary Week, Berlin, Germany

Y: 27

N: 3

Maybe: 2

May 2015 Interim, Pittsburg, PA

Y: 30

N: 2

Maybe: 4

No further motions of business were offered.

Adjournment

Motion #18: To adjourn the meeting.

M: Pete Cibula S: Peter Wu

MOTION PASSES by voice without opposition

The Meeting was adjourned at 5:14PM, Thursday, January 15, 2014.

Appendix A: Attendees at the IEEE P802.3 Next Generation Enterprise Access BASE-T Study Group Meeting, January 14-15, 2015

Total attended:	58		Daily # attended:	48	54
IEEE NGEABT Study Group January'15				1/14/2015	1/15/2015
Last Name	First Name	Employer	Affiliation	WEDS	THU
Abughazaleh	Shadi	Hubbell	Hubbell	x	x
Bains	Amrik	Cisco	Cisco	x	x
Belopolsky	Yakov	Bel Stewart	Bel Stewart	x	
Bourgeois	Stephane	Belden	Belden	x	x
Brillart	Theo	Fluke Electronics	Fluke Electronics	x	x
Bublil	Baruch	Cadence	Cadence		x
Buckmeier	Brian	Belfuse Inc	Belfuse Inc	x	
Byrne	Joseph	Freescale	Freescale		x
Carty	Clark	Cisco	Cisco	x	x
Cates	Ron	Marvell	Marvell	x	x
Chalupsky	David	Intel	Intel	x	x
Chang	Jacky	HP	HP	x	x
Chini	Ahmad	Broadcom	Broadcom		x
Chuang	Ken Hua	HP	HP	x	x
Cibula	Pete	Intel	Intel	x	x
Dai	Shaoan	Marvell	Marvell		x
Dalmia	Kamal	Aquantia	Aquantia	x	x
DiMinico	Christopher	MC Communications	Panduit	x	x
Farjad	Ramin	Aquantia	Aquantia	x	x
Feyh	German	Broadcom	Broadcom	x	x
Flatman	Alan	LAN Technologies	LAN Technologies	x	x
Graba	Jim	Broadcom	Broadcom	x	x
Hammond	Bernard	TE Connectivity	TE Connectivity	x	x
Hayato	Yuki	AutoNetworks	AutoNetworks		x
Hess	Dave	Cord Data	Cord Data	x	x
Hormmeyer	Bernd	Phoenix Contact	Phoenix Contact	x	x
Hui	Pan	Broadcom	Broadcom		x
Jimenez	Andrew	Anixter Inc.	Anixter Inc.	x	
Jones	Peter	Cisco	Cisco	x	x
Kim	Yong	Broadcom	Broadcom	x	x
Kish	Paul	Belden	Belden	x	x
Lapak	Jeff	UNH - IOL	UNH - IOL	x	x
Lau	Evan	General Cable	General Cable	x	x
Law	David	HP	HP	x	x
Lewis	Jon	Dell	Dell	x	x
Lo	William	Marvell	Marvell		x
Mei	Richard	Commscope	Commscope	x	x
Miller	Jonas	Pulse Electronics	Pulse Electronics	x	x

Moffitt	Bryan	Commscope	Commscope	x	x
Penilla	Angelo	HP	HP	x	
Renteria	Victor	Belfuse Inc	Belfuse Inc	x	x
Romascanu	Dan	Avaya	Avaya		x
Sambasivan	Sam	AT&T	AT&T	x	x
Sedarat	Hossein	Aquantia	Aquantia	x	x
Sedio	Steve	Foxconn	Foxconn	x	x
Shrinani	Ramin	Aquantia	Aquantia	x	x
Souvignier	Tom	Broadcom	Broadcom	x	x
Sparrowhawk	Bryan	Leviton	Leviton	x	x
Thomas	Brown	Vitesse	Vitesse	x	x
Tu	Mike	Broadcom	Broadcom		x
Ubelagen	Paul	Avaya	Avaya		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
Wang	Xiaofeng	Qualcomm	Qualcomm	x	x
Withey	James	Fluke Networks	Fluke Networks	x	x
Yu	Jerome	Realtek	Realtek	x	x
Zimmerman	George	CME	Commscope, Aquantia	x	x