

Minutes for the IEEE P802.3an Interim Task force meeting, Feb. 23-24, 2005

1. February 23 A.M.

The Chair called the meeting to order at 8:37a.m. on Feb. 23.

Sailesh Rao was volunteered as recording secretary.

The task force accepted the proposed agenda (slide 3 of agenda_1_0205.pdf) for the meeting by unanimous voice vote.

At 8:44a.m. on Feb. 23, the Chair informed the task force members of the IEEE-SA Standards Board Bylaws for Patents in Standards.

At 8:46a.m. on Feb. 23, Kevin Brown informed the task force that Broadcom Corporation has submitted a letter of assurance to the IEEE regarding patents that may impact the IEEE 802.3an standard. If anyone has any questions regarding these patents, they can contact Kevin Brown (kbrown@broadcom.com).

Alan Flatman presented the Liaison letter from ISO/IEC/JTC 1/SC 25/WG 3 (3n739B.pdf).

Paul Kish presented the Liaison letter from the TIA TR-42. He pointed out an error on slide 7 of the online presentation (Feb 2005 TIA Liaison Presentation). The bullet item “Use panels with improved **PSNEXT** margin” should be changed to “Use panels with improved **PSANEXT** margin”.

Sanjay Kasturia presented the editor’s report (editorial_1_0205.pdf) on Draft D1.3. After the summary presentation, the editor opened the comment database on Draft D1.3 and began addressing the comments.

The TR comments #1,2,3 from Alan Flatman were accepted in principle and the editor will make the appropriate references to ISO/IEC documents.

The THP Comment #106 was presented by Jose Tellado (tellado_1_0205.pdf):

- Discussion on the comment centered on the fact that the frequency characteristics of the alien noise environment is dynamic – it changes depending on whether 10GBASE-T alien NEXT or alien FEXT or 1000BASE-T alien NEXT or alien FEXT dominates. Tellado responded that there is one set of IIR coefficients and two sets of FIR coefficients open in his proposal, for which the coefficients have not been decided. Only one set of IIR/FIR coefficients have been provisionally agreed upon in the proposed resolution, and this was generated assuming 10GBASE-T alien NEXT was the dominant noise source. In discussion it was pointed out that the expected variation with additional noise sources was small. He stated that task force members are free to propose additional IIR and FIR THP coefficients that address the other types of dominant noise sources. One set of IIR/FIR THP coefficients has a null at

Fs/2 and one set does not have such a null and these two sets are currently optimized for 10GBASE-T alien NEXT dominant noise environments. This leaves one set of FIR THP coefficients open for optimizing for the other types of noise sources.

- Motion to accept proposal in tellado_1_0205.pdf with modifications passed as shown in comment #106 response in comments_2_0205.pdf.

The PSAELFEXT comments #31 and #32 were presented by Scott Powell (first part of powell_2_0205.pdf).

- Powell clarified that the time varying characteristics of the traffic referred to in Slide 3 implied that the Alien sources in the bundle could change over time from 10GBASE-T to 1000BASE-T or be turned off.
- Discussion ensued about the use worst-case scenarios and the use of Class E and Class F in the subclause 55.1. The task force decided to modify the wording in this section to reflect that in 802.3REVam Clause 40, which removes the cabling type information and instead points to subclause 55.7 which is more complete.

2. February 23 P.M.

The task force reconvened at 1:30p.m. and started addressing comments concerning the transmitter linearity specifications. Sanjay Kasturia editorialized that the linearity specifications in the two comments (#113 and #119) can be combined to a common equation:

- $\text{SNDR}(f) \geq \min(X, 58 - 20\log_{10}(f/25\text{MHz}))$ dBs, where X is 48dB in Comment #113 and X is 52dB in Comment# 119.
- Comment #113 was presented by Chris Pagnanelli (pagnanelli_1_0205.pdf).
- Comment #119 was presented by Bijit Halder (halder_2_0205.pdf).
- Albert Vareljian presented an alternative SNDR specification approach using System Identification techniques (vareljian_1_0205.pdf).
- There were lots of discussions on the transmitter noise sources shown in Albert's presentation. Specifically, he showed several non-Gaussian noise sources (nonlinear distortion and clock jitter), which contradicted the previously stated opinions of some task force members who had said that non-Gaussian noise sources do not exist in well designed 10GBASE-T systems. In addition, Vareljian's presentation showed numerous noise samples in excess of 20mV, which vastly exceeded the magnitudes at which intra-subset errors occur in the 128-DSQ line coding scheme used in D1.3.

A motion was taken to accept the resolution to Comment #91 that specifies the tones of the two-tone test. The motion passed.

A motion was taken to accept additional tones for the single-tone test (Comment #90). The motion failed.

The editor clarified that the 48dB number in Chris Pagnanelli's comment was an SNDR specification, whereas the 52dB number in Bijit Halder's comment was an SFDR specification. Response to the two comments is contained in Halder's comment #119.

- Straw poll for 52dB SFDR: 20

- Straw poll for 48dB SNDR: 11
- A motion was taken to accept 52dB SFDR limit as the specification to be used in the draft. The motion failed (20Y, 11N).
- A motion was taken to accept 48dB SNDR limit as the specification to be used in the draft. The motion failed (20Y, 11N).

A motion was taken to accept an equation of the form as the method for specifying the transmitter linearity, per George Zimmerman's comment #7:

- $\text{SNDR}(f) \text{ or } \text{SFDR}(f) \geq \min(A, B + 20\log_{10}(f/25\text{MHz})) \text{ dBs}$
- The motion passed (23Y, 4N).

George Zimmerman moved to reconsider the motion to accept the 52dB SFDR limit (comment #119).

- The motion to reconsider passed (32Y, 4N).
- The reconsidered motion to accept the 52dB SFDR limit passed (29Y, 4N).

A motion was taken to accept the removal of a peak-to-peak transmit voltage specification in the draft. Motion passes (31Y, 9N).

- Jose Tellado withdrew his two comments on the peak-to-peak transmit voltage specification in the draft.

Halder withdrew his comment (#118) regarding the low cutoff of the lower mask of the transmit PSD.

Chris Pagnanelli presented the proposed resolution of his comment (#115) regarding the specification of the slave transmitter jitter specification (pagnanelli_2_0205.pdf). The proposed resolution was accepted by voice vote.

- In light of above, the specification of the test channel for the jitter measurements was removed (Comment #93).

The three scrambler comments, Comment #98, Comment #39, Comment #91, were all accepted in principle.

Resolution of comments on the scrambler and auto-negotiation sections of the draft were accepted with no opposition.

The editor reported that of the 93 Technical and Technical Required comments that were received on Draft D1.3, 43 had been processed during the day. The meeting recessed for the day at 5:55p.m.

3. February 24 A.M.

The meeting reconvened at 8:40a.m. on February 24. The editor reported that some of the withdrawn technical comments were not marked as processed in the comment database and therefore, there are now only 48 (or 49) Technical and Technical Required comments still to be processed on D1.3.

Technical comments concerning the cabling section were processed.

There were plenty of discussions on George Eisler's comments (#9 and #10) regarding the recommendation cabling testing in the field before the installation of 10GBASE-T equipment. Some task force members were skeptical that field testing is practical for the Alien NEXT and Alien FEXT requirements. Cabling vendors stated that the cabling bodies are endeavoring to provide the necessary specifications for the end users.

- Motion to accept the proposed response for Eisler's comments failed (25Y, 15N). The proposed response stated "It is recommended that the guidelines proposed in ANSI/TIA TSB 155 and ANSI/TIA TSB 568-B.2-10 be considered before the installation of 10GBASE-T equipment for any cabling system"
- Hugh Barass proposed to modify the response to read, "It is recommended that the guidelines proposed in ANSI/TIA TSB 155 and ANSI/TIA TSB 568-B.2-10 and ISO/IEC 11801 Edition 2.1 be considered before the installation of 10GBASE-T equipment for any cabling system." This modification was accepted without opposition.

Technical comments concerning the test pattern generators and the info field parameters were addressed.

Technical comments concerning the 4dB AFEXT reduction and the 3.5dB ANEXT reduction in the system models were addressed.

- Scott Powell presented results on the limitations of the implicit "dB averaging" claims made regarding the SNR variations across the 4 wire pairs in the footnote on the AFEXT specifications of draft D1.3 (powell_1_0205.pdf).
- In response to Powell's comment, the task force agreed to remove the footnote from this section of the draft.

Comments on the startup were addressed.

- A combined suggested remedy for all the startup comments was presented by Brett McClellan (mcclellan_2_0205.pdf).
- This modified state machine was accepted without objection.

Comment #85 regarding the Link Monitor state machine was addressed. The accepted resolution was to change the value of the link_fail_inhibit_timer in Clause 28 for 10GBASE-T.

Some technical comments concerning Auto-Negotiation were addressed prior to the lunch break.

4. February 24 P.M.

The task force reconvened after lunch at 1:19p.m. Technical comments on the PMA and Auto-Negotiation section were addressed.

George Zimmerman presented his comment #8 on Power Backoff (zimmerman_1_0205.pdf).

- Commended that Terry Cobb's recommendation of a 14dB power backoff range was a good target for 10GBASE-T alien FEXT environments.
- During discussion, the Task Force preference was to base the power backoff on received signal power instead of line length or insertion loss.
- Proposal was to make the received signal power column TBD. Some task force members felt that interval overlapping could be used to accommodate variability in the receiver implementations.

Bijit Halder followed on with his presentation on the effect of Alien FEXT on Power Backoff.

- Showed that the SNR margin with the proposed power backoff drops to slightly over 1dB, assuming infinite length equalizers, while ignoring transformer flat loss, receive filter effects, and assuming a programmable THP.
- Zimmerman stated that the transmit PSD used by Halder was on the edge of compliance and that the residual noise power used in Halder's analysis was too high.

Motion to accept in principle the table shown in zimmerman_1_0205.pdf with suggested modifications passed (26Y, 6N).

The channel diagnostics motion was presented by Mike McConnell as a result of the sub task-force activities.

- There was a lot of discussion on the range of the SNR margin to be reported in the registers.
- Some task force members wanted only positive margins reported, while others felt that negative margin values would add value.
- The task force agreed to change the SNR margin range reported in the register to be from -12.7dB to +12.7dB.
- The motion passed by voice vote.

Paul Kish presented a motion to require the receive signal power during startup to be reported in the Channel Diagnostics registers. The motion passed by voice vote.

The 802.3an editors were authorized by the task force to use their editorial license to resolve the editorial comments as they see fit.

The Editor was authorized to generate Draft D1.4 for Task force review.

A motion to remove the "provisional" nature of the agreement from the FIR THP coefficients as shown in slide 3 of vareljian_1_0105.pdf. The motion passed (Y25, N0).

Terry Cobb initiated a motion to change the equation for PSAELFEXT. The chair considered the motion out of order prior to there being a second because there was no comment or proposal for the task force to review. The motion was graciously withdrawn.

The meeting was adjourned by voice vote at 5:05p.m. on February 24th.

5. Attendees

Last name	First Name	Company
Adriaenssens	Luc	Systemax
Abaye	Ali	Broadcom
Alexander	Jan	Nexans
Andresen	Jack	ETS
Babanezhad	Joseph N.	Plato Networks
Balan	Vishnu	Teranetics
Barrass	Hugh	Cisco
Begur	Sridhar	Teranetics
Bennett	Mike	LBL
Booth	Brad	Intel
Brown	Kevin	Broadcom
Chan	Kevin	Broadcom
Chang	Luke	Intel
Cheong	Kok-Wui	Marvell
Cobb	Terry	Systemax
Dabiri	Darius	Teranetics
Delveaux	Bill	Airespace
DiMinico	Chris	MC Communications
Dinh	Thuyen	Pulse
Dring	John	Teranetics
Dyer	Kenneth	KeyEye Communications
Eisler	George	SolarFlare
Flatman	Alan	Independent
Gintz	William	Seus
Grow	Bob	Intel
Gupta	Sandeep	Teranetics
Halder	Bijit	Plato Networks
Hamidy	Farid	Pulse
He	Runsheng	Marvell
Higuchi	Tetsuya	AIST
Hill	Jeff	Teranetics
Hojabri	Pirooz	Plato Networks
Inerfield	Michael	Teranetics
Jones	William	SolarFlare
Jover	Juan	Phyten Technologies

Kasturia	Sanjay	Teranetics
Kish	Paul	Belden CDT
Kohl	Blaine	Tehuti
Kwentus	Alan	KeyEye Communications
Lapak	Jeff	UNH IOL
Law	David	3Com
Lusky	Itay	Texas Instruments
Lynskey	Eric	UNH IOL
McCarthy	Frank	Teranetics
McClellan	Brett	SolarFlare
McConnell	Mike	KeyEye Communications
Muller	Shimon	Sun
Muth	Jim	Broadcom
Nagahori	Takeshi	NEC Electronics
Narasimha	MJ	Ample Communications
Pagnanelli	Chris	SolarFlare
Powell	Scott	Broadcom
Qian	Haoli	Marvell
Rao	Sailesh	Phyten Technologies
Sakakibara	Hiroshi	NEC Electronics
Savi	Olindo	Siemon
Seki	Katsutoshi	NEC
Sigmon	Ned	Tyco Electronics
Suzuki	Kenji	Cortina Systems
Tamineedi	Anil	Broadcom
Tazebay	Mehmet	Broadcom
Tellado	Jose	Teranetics
Thaler	Pat	Agilent
Thosani	Samir	Plato Networks
Vaden	Sterling	Superior Modular Products
Valliappan	Magesh	Vitesse
Van Bavel	Nick	Vitesse Semi
Vareljian	Albert	KeyEye Communications
Woodruff	Bill	Aquantia
Zimmerman	George	SolarFlare