

**MINUTES of the IEEE P802.3an Task Force Meeting  
San Antonio, TX, November 16-18, 2004**

**Tuesday, November 16, 2004**

The meeting was convened by Chair Brad Booth at 8:30AM on Tuesday, 16 November 2004.

George Eisler volunteered to serve as recording secretary for the meeting.

The Chair presented the proposed agenda (agenda\_1\_1104), and accepted a motion to approve the agenda with the addition of a comment resolution item.

Moved: H. Scull      Second: A. Flatman      Approved unanimously by voice

After a round of introductions, the Chair called for approval of the minutes of previous meetings. It was noted that the minutes for the meeting held during the plenary in July 13-15, 2004 in Portland, OR were not previously approved.

Motion for the approval of the July, 2004 minutes;

M: S. Kasturia      S: J. Tellado      Approved unanimously by voice

Motion for the approval of the September 29,30/October 1, 2004 minutes;

M: G. Zimmerman      S: J. Tellado      Approved unanimously by voice

The Chair reviewed the goals for the meeting, with emphasis on the resolution of comments, which was to be carried out in conjunction with relevant presentations.

The Chair reviewed the operating rules of the Task Force.

At 8:55AM, the Chair read the IEEE SA Standards Board Bylaws on Patents in Standards as follows:

6. Patents

IEEE standards may include the known use of essential patents and patent applications provided the IEEE receives assurance from the patent holder or applicant with respect to patents whose infringement is, or in the case of patent applications, potential future infringement the applicant asserts will be, unavoidable in a compliant implementation of either mandatory or optional portions of the standard [essential patents]. This assurance shall be provided without coercion and prior to approval of the standard (or reaffirmation when a patent or patent application becomes known after initial approval of the standard). This assurance shall be a letter that is in the form of either:

a) A general disclaimer to the effect that the patentee will not enforce any of its present or future patent(s) whose use would be required to implement either mandatory or

optional portions of the proposed IEEE standard against any person or entity complying with the standard; or

b) A statement that a license for such implementation will be made available without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination.

This assurance shall apply, at a minimum, from the date of the standard's approval to the date of the standard's withdrawal and is irrevocable during that period.

The Chair next reviewed topics inappropriate for discussion during IEEE meetings, as follows:

Don't discuss licensing terms or conditions

Don't discuss product pricing, territorial restrictions or market share

Don't discuss ongoing litigation or threatened litigation

Don't be silent if inappropriate topics are discussed .... Do formally object

The Chair then reviewed the standards development process and noted the progress of the Task Force on the projected time-line.

The Objectives of the 802.3an project are incorporated hereby for reference, as follows:

- Preserve the 802.3/Ethernet frame format at the MAC Client service interface
- Preserve min. and max. frame size of current 802.3 Std.
- Support full duplex operation only
- Support star-wired local area networks using point-to-point links and structured cabling topologies
- Support a speed of 10.000 Gb/s at the MAC/PLS service interface
- 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
- Support Clause 28 auto-negotiation
- Support coexistence with 802.3af
- To not support 802.3ah (EFM) OAM unidirectional operation
- Meet CISPR/FCC Class A
- Support operation over 4-connector structured 4-pair, twisted-pair copper cabling for all supported distances and Classes
- Define a single 10 Gb/s PHY that would support links of:
  - At least 100 m on four-pair Class F balanced copper cabling
  - At least 55 m to 100 m on four-pair Class E balanced copper cabling
- Support a BER of  $10^{-12}$  on all supported distances and Classes

## Liaisons

A liaison from TIA TR-42 was presented by V. Rybinski. Included are draft documents under preparation which address legacy and augmented Cat 6 Cabling. The need for further consideration of AFEXT performance in conjunction with power back-off was noted.

A. Flatman (liaison to ISO/IEC JTC 1/SC 25/WG 3) informed the Task Force of two new work items proposed covering characterization of the installed base and of new cabling with extended performance. A very recent vote reportedly indicated that these items will go ahead.

After a break, S. Kasturia, Editor-in-Chief, reported on the current status of Draft 1.1, and summarized the areas that require urgent resolution.

Comment resolution commenced, led by the Chair and the Editor, beginning with auto-negotiation (Clause 28) items.

The meeting broke for lunch.

Comment resolution resumed after lunch.

S. Powell presented On Loop Timing (powell\_1\_1104) in conjunction with comment #86. After discussion, a motion was made to accept the comment.

M: G. Zimmerman    S: S. Rao                    Y: 35 N: 0 A: 11    Technical    Passes

S. Rao presented 800 Ms/s PHY for 10GBASE-T (rao\_1\_1104) in conjunction with comment #120. 10GBT Modulation and Coding, Set of Fixed Precoders was presented by G. Ungerboeck (ungerboeck\_1\_1104). The power back-off and start-up portions of ungerboeck\_1\_1104 were postponed until those topics were to be specifically considered.

D. Dabiri and B. McClellan presented PAM12 LDPC-CRC Framing (dabiri\_1\_1104) as the third contribution relating to the framing subject.

Substantial debate ensued, including the origin and specific numerical value required for the MTTFFPA (Mean Time To False Packet Acceptance) criteria. No agreement was reached.

Debate continued until the meeting was recessed for the day at 6:30PM.

## Wednesday, November 17, 2004

The meeting reconvened at 8:00AM with further comment resolution. Comment #120 from S. Rao led to a motion:

Motion to accept proposed remedy of comment #120.

M: J. Jover                      S: S. Rao                      Y: 9 N: 23 A: 22      Technical      Fails

Comment #89 by Ungerboeck led to a motion to accept the constellation, LDPC code and framing of ungerboeck\_1\_1104.pdf.

M: S. Powell                      S: BZ Shen                      Y: 10 N: 17 A: 22      Technical      Fails

Review of comment #101 led to a motion to accept framing, LDPC & mapping as per dabiri\_1\_1104.

M: B. McClellan                  S: D. Dabiri                      Y: 20 N: 18 A: 11      Technical      Fails

Comment resolution then continued.

10GBT Tx PSD Mask, pagnanelli\_2\_1004, was presented in conjunction with comment #122. Motion to accept the suggested remedy with the page number reference changed to be page 4.

M: G. Zimmerman                  S: A. Vareljian                      Y: 27 N: 3 A: 20      Technical      Passes

System SNR vs Pre-Coder Choice (vareljian\_1\_1104) was presented, followed by Performance of N=4 THPs with Power Backoff (golden\_1\_1104).

Meeting recessed for lunch and reconvened at 1:45PM.

A motion was made to reconsider the motion on comment #89.

M: G. Eisler                      S: B. McClellan                      Y: 25 N: 0 A: 8      Procedural      Passes

Move to accept the response to comment #89.

M: S. Powell                      S: BZ Shen                      Y: 33 N: 4 A: 9      Technical      Passes

Startup Protocol for 10GBT (seki\_1\_1104) was presented in conjunction with comments #67, 69, 70 and 71. This was followed by PAM2 Training Frame Alignment Proposal (mcclellan\_1\_1104) and the relevant start-up related portion of 10GBT Modulation & Coding, Set of Fixed Precoders and Start-up (ungerboeck\_1\_1104). Further action on startup was postponed.

Comment resolution resumed. The Chair directed that the Editor insert editorial notes in the PMA Electrical section of the next revision of the draft so that the reader be able to discern which sections have been approved and which have not.

Method of Transmitter Characterization for 800MBaud 12PAM System (takatori\_1\_1104) was presented in conjunction with comment #138. Further action on the presentation was postponed.

Motion to adopt the following remedy for comment #138:

The PHY can generate a TBD pattern at the output of TX path. This way by either measuring the harmonic or intermodulation contents at the TX output one can reliably measure the linearity (i.e. distortion) of TX.

M: J. Babanezhad S: B. Halder Y: 8 N: 1 A: (many) Technical Passes

In conjunction with comment #59, booth\_1\_1104 was presented. Comment #59 was accepted in principle and a motion was made that the editor work with the commenter to generate a single worst case link segment in the next draft.

M: A. Flatman S: M. McConnell Y: 14 N: 3 A: 5 Technical Passes

The meeting was recessed at 6:30PM

### **Thursday, November 18, 2004**

The meeting reconvened at 8:30AM.

Editorial comments were resolved with the following motion after the Chair asked if anyone wanted to review any of the editorial comments.

Motion: TF grants the Editor license to resolve editorial comments as he sees fit.

M: A. Flatman S: J. Babanezhad Unanimously approved by voice

The Chair reviewed the timeline for achieving Working Group Ballot at the March 2005 Plenary.

Future Meetings:

Interim: Week of 24<sup>th</sup> January, 2005 in Vancouver, BC

Plenary: Week of 14<sup>th</sup> March, 2005 in Atlanta, GA

Move to maintain time domain transmitter pulse template specification in the draft.

M: G. Zimmerman S: G. Eisler

TF: Y: 10 N: 15 A: 19

802.3: Y: 4 N: 12 A: 12

Technical Fails

Editor presented a list of major areas of focus for completion of draft.

Motion on TX Power Levels:

10GBASE-T adopt 8 TX Power Levels: PTmax, PTmax -2dB, PTmax -4dB, PTmax -6dB, PTmax -8dB, PTmax -10dB, PTmax -12dB, PTmax -14dB. With method of selection to be specified.

M: S. Powell S: J. Tellado

TF: Y: 40 N: 0 A: 9

Technical Passes

Motion to resolve start-up comments:

10GBASE-T adopt:

- Master and Slave training sequences based on polynomials presented in seki\_2\_0904.pdf. Finite segments thereof cyclically repeated, frame length tbd.
- Random seeds for Master and Slave training sequences determined during auto-negotiation
- The training sequences sent over the 4 pairs represent shifts of the base sequences generated by the above polynomial, as in clause 40 and seki\_2\_0904.pdf.
- The training sequence for pair A will every 256th bit flipped aligned with the PHY framing
- Info fields exchanged periodically during start-up to determine power levels and THP coefficient settings, communicate decision SNR, receiver status, and signal transition to data mode.

M: K. Seki                      S: G. Ungerboeck

TF:    Y: 38    N: 0    A: 6

Technical      Passes

T. Dinh gave the Task Force an update on 10GBT magnetics (dinh\_1\_1104).

Move that the Task Force adopt a brickwall exclusion mask in the TX PSD mask from 1 MHz to 330MHz at -82dBm (4 dB below) without power backoff.

M: A. Vareljian              S: H. Scull

TF:    Y:      N:      A:

Technical

Motion to postpone until the next meeting

M: G. Zimmerman          S: T. Cobb

TF:    Y: 27    N: 3    A: 17

Procedural      Passes

Motion is postponed.

Motion to adopt the Measurement Setup (slide 2) of takatori\_1\_1104 as the baseline for transmitter characterization

M: A. Vareljian              S: H. Scull

TF:    Y: 5    N: 16    A: 21

Technical      Fails

Move to remove the separate objective for 100m augmented Cat 6 approved at the September 2004 interim meeting.

M: T. Cobb                      S: A. Flatman

Hostile amendment to add “since it is now incorporated in the present objectives.”

M: L. Adriaenssens          S: T. Cobb

TF:    Y: 17    N: 10    A: 17

Technical      Fails (motion to amend)

TF:    Y: 26    N: 0    A: 19

Technical      Passes (original motion)

Move that the Task Force approve and forward the tia\_1\_1104 liaison letter to 802.3.

M: H. Barrass                    S: A. Flatman

Procedural    Approved unanimously by voice

Move that the Task Force approve and forward the iso\_1\_1104 liaison letter to 802.3.

M: H. Barrass                    S: V. Rybinski

Procedural    Approved unanimously by voice

Move that the Editor generate draft D1.2 for Task Force review.

M: J. Tellado                    S: A. Flatman

Procedural    Approved unanimously by voice.

Motion to adjourn.

M: H. Barrass                    S: J. Tellado

Procedural    Approved unanimously by voice

The meeting was adjourned at 12:17PM

Submitted by George Eisler, Recording secretary for the meeting.

### Attendees

Last name	First Name	Company
Adriaenssens	Luc	Systemax
Babanezhad	Joseph N.	Plato Networks
Barrass	Hugh	Cisco
Belogolovy	Andrey	SUAI
Bennett	Mike	LBL
Booth	Brad	Intel
Bublil	Baruch	Intel
Buckmeier	Brian	Bel Fuse Inc.
Chan	Kevin	Broadcom
Cobb	Terry	Systemax
Cohen	Larry	Independent
Dabiri	Dariussh	Teranetics
Delansay	Phil	Aquantia
DiMinico	Chris	MC Communications
Dinh	Thuyen	Pulse
Dove	Dan	HP
Eilser	George	SolarFlare
Fallahi	Siavash	Broadcom
Flatman	Alan	Independent
Golden	Glenn	Teranetics

Gupta	Sandeep	Teranetics
Halder	Bijit	Plato Networks
Hess	John	Bel Fuse
Hormis	Raju	Columbia University
Injeti	Anand	Krypton Systems
Jimenez	Andy	Anixter Inc.
Jover	Juan	Independent
Kasturia	Sanjay	Teranetics
Kish	Paul	Belden CDT
Lynskey	Eric	UNH IOL
Magram	Luis	Intel
Matsumoto	Tomoyuji	Tokyo Electric Power Co
McClellan	Brett	SolarFlare
McConnell	Mike	KeyEye Communications
Mei	Richard	Avaya
Mezer	Amir	Intel
Nedic	Slobodan	Independent
Powell	Scott	Broadcom
Rabinovich	Rick	Spirent Communications
Rao	Sailesh	Phyten Technologies
Reviriego	Pedro	Agere Systems
Rybinski	Valerie	Siemon
Savi	Olindo	Siemon
Scull	Harvey	KeyEye Communications
Seki	Katsutoshi	NEC
Shen	BZ	Broadcom
Sigmon	Ned	Tyco Electronics
Sparrowhawk	Bryan	Leviton
Tellado	Jose	Teranetics
Ungerboeck	Gottfried	Broadcom
Vaden	Sterling	Superior Modular Products
Valliappan	Magesh	Vitesse
Van Bavel	Nick	Vitesse Semi
Vareljian	Albert	KeyEye Communications
Wang	Hui	Broadcom
Woodruff	Bill	Aquantia
Yagil	Ariel	Texas Instruments
Zimmerman	George	SolarFlare