IEEE P802.3an Task Force
Closing Plenary Meeting Report

Portland, OR
July 15, 2004

Brad Booth, Chair
bbooth@ieee.org
**Progress This Week**

- Reviewed 15 presentations
- Draft D1.0
  - Adopted baseline for auto-negotiation and MDIO
  - Adopted PAM modulation
  - Adopted Tomlinson-Harashima precoding
  - Adopted LDPC coding
  - Adopted TIA TSB-155 NEXT, PSNEXT and Return Loss
  - Adopted upper frequency of 500 MHz
  - Adopt definitions of channel diagnostic functions
  - Investigate only PAM8 and PAM12
  - Adopt max. diff. p-p transmit voltage
  - Adopt part of the distortion methodology
  - Adopted ANEXT and IL values for augmented Class E/Cat 6
- Tasked editor with the creation and circulation of draft D1.0 for Task Force review
eMotions

- Adopted baseline for auto-negotiation and MDIO
  - Passed (47, 7, 27)

- Adopted PAM modulation
  - Passed (unanimous)

- Adopted Tomlinson-Harashima precoding
  - Passed (unanimous)

- Adopted LDPC coding
  - Passed (78, 0, 11)

- Adopted TIA TSB-155 NEXT, PSNEXT and Return Loss
  - Passed (46, 11, 25)

- Adopted upper frequency of 500 MHz
  - Passed (67, 0, 12)

- Adopt MDI & environmental specifications
  - Failed (24, 11, 35)
eMotions (cont.)

• Adopt definitions of channel diagnostic functions
  – Passed (50, 6, 20)

• Investigate only PAM8 and PAM12
  – Passed (unanimous)

• Adopt PAM12 proposal
  – Failed (54, 20, 14)

• Adopt max. diff. p-p transmit voltage
  – Passed (unanimous)

• Adopt filter assumptions
  – Failed (21, 21, 17)

• Adopt part of the distortion methodology
  – Passed (unanimous)

• Adopt part of the common mode rejection methodology
  – Failed (25, 9, 24)
eMotions (cont.)

• Adopted ANEXT and IL values for augmented Class E/Cat 6
  – Passed (unanimous)
• Adopt Class E parameters based on ISO/IEC letter
  – Failed (31, 19, 14)
Motion: Auto-negotiation

- Move that the Task Force adopt lysnkey_1_0704.pdf as the basis for auto-negotiation and MDIO for D1.0.

  - M: E. Lynskey
  - S: H. Barrass
  - TF: Y: 49 N: 7 A: 27
  - 802.3: Y: 35 N: 4 A: 11
  - Technical (75%)
  - PASS
  - Motion to postpone until September interim meeting. (K. Brown, P. Thaler) 50%
Motion: Modulation Code

• 10GBASE-T adopt single tone, baseband PAM as the modulation strategy
  – Moved by: L. Harrison
  – Seconded by: S. Rao

• TF Members: Y: unanimous N: A:
• IEEE Voters: Y: N: A:
Motion: Channel Equalization Approach

- 10GBASE-T adopt programmable Tomlinson-Harashima precoding as part of the channel equalization strategy
  - Moved by: Scott Powell
  - Seconded by: J. Jover

- Task Force Members:  Y: unanimous   N:  A:
- IEEE Voters:  Y:   N:  A:
Motion: Channel Coding Approach

• 10GBASE-T adopt systematic Low Density Parity Check (LDPC) coding as the channel coding approach
  – Moved by: Vivek Telang
  – Seconded by: S. Rao

• Task Force Members: Y: 78  N: 0  A: 11
• IEEE Voters: Y: by voice  N:  A: 
Motion: TSB-155

Move that 802.3an Task Force adopt the D1.0 TSB-155 NEXT loss, Power sum NEXT and Return Loss channel equations for the Draft 1.0 Clause 55 Link Segment NEXT, Power sum NEXT Loss and Return Loss.

Moved By: Chris DiMinico
Seconded By: Larry Cohen
TF: Y: 46 N: 11 A: 25
802.3: Y: 28 N: 7 A: 14
Technical: 75% PASS

• Amendment “for models 2, 3 & 4 “: T. Cobb, T. Boucino (75%)

• TF: Y: 17 N: 22 A: 37 FAIL

• Calling the question: Y: 33 N: 11 PASS
Motion: Upper frequency

Move that 802.3an Task Force adopt 500 MHz as an upper frequency for the Clause 55 link segment specifications.

Moved By: Chris Di Minico
Seconded By: Paul Kish
TF:   Y: 67  N: 0   A: 12
802.3: Y: 36  N: 0   A: 7
Technical: 75%
PASS
Motion: MDI and environment

The 802.3an task force adopt the baseline text as defined in the presentation cobb_1_0704, with the addition of immunity to the electromagnetic emissions, for the MDI specifications and Environmental specifications in Draft 1.0.

M: T. Cobb
S: S. AbuGhazaleh

Technical: 75%

Task Force Y: 24 N: 11 A: 35
802.3 Voters Y: 15 N: 9 A: 15

FAILS
Motion: cable diags

- Move that the Task Force adopt into the baseline a definition of some channel diagnostic functions (the TF will investigate the inherent capabilities of the PHY to support these functions).

- M: H. Barrass
- S: D. Dove
- 802.3: Y: 26  N: 2  A: 9
- Technical (75%)
- PASS
- H. Barrass to sponsor an ad hoc teleconference during the week of 7/26 to discuss the PHY capabilities and prepare draft text.
Motion: Architecture Downselect

• Task force narrow consideration of 10GBASE-T baseline approach to the PAM8 and PAM12 proposals described in rao_1_0704.pdf and powell_1_0704.pdf.

  – Moved by: Kevin Brown
  – Seconded by: J. Babanezhad

• Task Force Members: Y: by voice N: A:
• IEEE Voters: Y: N: A:
• PASS
Motion: 10GBASE-T Baseline Approach

- Task force adopt the multi-phy vendor proposal described in powell_1_0704.pdf as the baseline approach for 10GBASE-T. The main elements include: PAM-12, systematic LDPC coding, programmable Tomlinson-Harashima precoding, and clause 49-type framing modified for 64B/65B. All TBD and asterisked items (and dependents) to be determined prior to completion of Draft 1.  

  – Moved by: Scott Powell
  – Seconded by: F. McCarthy

- Technical (75%)
  - TF: Y: 54 N: 20 A: 14
  - 802.3: Y: 33 N: 9 A: 9
  - FAILS

- Motion to postpone until September interim meeting. (J. Jover, D. Dove)
  - TF: Y: 28 N: 49 A: 12
  - FAILS
Motion

• Adopt the maximum peak to peak differential transmitted voltage of 2-2.5V at the MDI for the 10GBASE-T transmitter as summarized in slide #3, (exclusive of baseline wander) of the presentation gupta_1_0704.pdf and use that as the baseline for defining various transmitter test modes for Draft 1.0

• Motion Type: Technical (75% required)
• Moved By: Sandeep Gupta
• Seconded by: J. Babanezhad
• TF Voters Y: by acclimation N: A:
• 802.3 Voters: Y: N: A
• Results:
Motion

• Adopt the filter assumptions in slide 6 of the presentation gupta_1_0704.pdf for the purpose of defining transmit waveform templates. This is summarized as “At least two pole continuous time low pass filter with upper -3dB frequency varying from fs/2 to TBD, and a single pole continuous time high pass filter with pole \( \leq 100\text{kHz} \)

• Motion Type: Technical (75% required)
• Moved By: Sandeep Gupta
• Seconded by: V. Telang
• TF Voters Y: 21 N: 21 A: 17
• 802.3 Voters: Y: N: A
• Results: FAILS
Motion

• Adopt a part of the distortion methodology as specified in the slide 17 gupta_1_0704.pdf summarized as follows: “A normative spec is specified for the transmit distortion required for the interoperability of the far end device, and a recommended, though not normative, number provided for the local device to maintain link performance as a baseline for Draft 1.0”

• Motion Type: Technical (75% required)
• Moved By: Sandeep Gupta
• Seconded by: J. Tellado
• TF Voters Y: by acclimation N: A:
• 802.3 Voters: Y: N: A
• Results: PASS
Motion

- Adopt a part of the common mode rejection methodology as specified in the slide 21 of the presentation gupta_1_0704.pdf summarized as follows: “The common mode rejection spec of the receiver widened up-to 500MHz such that the common mode output signal that the transceiver has to tolerate while maintaining 10G link performance, should be $\leq 2.8V$ for $f \in (1, f_1]$ MHz, and $\leq 2.8 * f_1/f$ for $f \in (f_1, 500]$ MHz, parameter $f_1$ subject to further investigation, (initial value for $f_1$ = 80MHz) based on real environment conditions.”

- Motion Type: Technical (75% required)
- Moved By: Sandeep Gupta
- Seconded by: J. Babanezhad
- TF Voters Y: 25 N: 9 A: 24
- 802.3 Voters: Y: N: A
- Results: FAILS
Motion: ANEXT and IL for augmented Class E/Cat 6

Move that 802.3an Task Force adopt Ed2:2002 Class F insertion loss and ANEXT for augmented Category 6 (proposed Class E ed2.1) Cabling as per June 11, 2004 TR42 Liaison response to IEEE 802.3 on Augmented Category 6 Cabling and the 802.3an augmented Class E objective.

1. Augmented Category 6 (proposed Class E ed2.1) Channel Insertion Loss (IL) shall meet ISO/IEC11801 Ed2:2002 Class F channel specification

2. Augmented Category 6 (proposed Class E ed2.1) Channel Power Sum Alien Near End Crosstalk (PSANEXT) shall meet:
   $\text{PSANEXT} \geq 60 - 10\log(f), \ 1 \leq f \leq 100 \text{ MHz}$
   $\text{PSANEXT} \geq 60 - 15\log(f), \ 100 < f \leq 625 \text{ MHz}$

Moved By: Paul Kish
Seconded By: Paul Vanderlaan
Y: by acclimation N:   Abstain:   Technical: 75%
Motion: Class E parameters

- Accept the cabling parameters for Class E cabling from the ISO liaison letter shown below.
- The changes are in bold red.

<table>
<thead>
<tr>
<th></th>
<th>Existing cabling</th>
<th>New cabling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return loss</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-10 MHz: 19 dB</td>
<td></td>
<td>1-10 MHz: 19 dB</td>
</tr>
<tr>
<td>10-40 MHz: 24-5log(f) dB</td>
<td></td>
<td>10-40 MHz: 24-5log(f) dB</td>
</tr>
<tr>
<td>40-400 MHz: 32-10log(f) dB</td>
<td></td>
<td>40-250 MHz: 32-10log(f) dB</td>
</tr>
<tr>
<td>400-625 MHz: 6 dB</td>
<td>250-625 MHz: 8 dB</td>
<td></td>
</tr>
</tbody>
</table>

| Insertion loss |                  |
| (L/100)(1.05)(1.82sqrt(f)+2.0169f+0.25/sqrt(f)+4x.02sqrt(f)) | 1.05(1.8sqrt(f)+.01f+.2/sqrt(f)+4x.02sqrt(f)) |

| NEXT |
| 1-330 MHz: |
| - 20log[(1.928 * 10^-4 * f^0.75) + (3.991 * 10^-5 * f)] |
| 330-625 MHz: 31-50log(f/330) |

- Motioned: W. Larsen
- Seconded: T. Cobb
- Technical (75%) Results: FAIL
- Task Force: Yes: 31 No: 19 Abstain: 14
- 802.3 members: Yes: Abstain:
802.3 Motion: Liaison Letters

• Move that 802.3 approve and forward the two liaison letters, with appropriate edits by the Chair, to TIA TR-42 and ISO/IEC 11801 JTC 1/SC 25/WG 3.
  – TIA TR42: tia_1_0704.pdf
  – ISO/IEC: iso_1_0704.pdf

• M: B. Booth
• S: P. Vanderlaan
• Technical (>75%)
• 802.3 Voters: Y: 44  N: 6  A:17
• PASSES
Thank You!