

Unapproved Minutes
IEEE P802.3AP - Backplane Ethernet
November 16 - 18, 2004
San Antonio, Tx

Prepared by: John D'Ambrosia

Meeting convened at 8:35 am, November 16, 2004.

Agenda / Housekeeping Issues

- Introductions
- Agenda (agenda_01_1104)
 - Approved by voice vote without objection
 - Schelto van Doorn – moved
 - Dimitry Taich - seconded
- Review of Minutes from September meeting
 - Correction to Minutes
 - Per John D'Ambrosia - Approval of previous meeting minutes needs corrected from "May" to "July"
 - Motion to approve minutes from September meeting with stated correction above
 - Moved by Fulvio Spagna
 - Seconded by Charles Moore
 - Minutes were Approved by voice vote without objection
- Goals for meeting discussed
 - Development of Draft 1.0
 - Presentations
 - Formalize points of agreement with motions
- IEEE rules read to the body by Chair
- IEEE Patent policy read to the body by Chair
- Inappropriate Topics for IEEE meetings read to the body by Chair
- IEEE Project Flow Discussed
- Project Details
 - Approved PAR - <http://standards.ieee.org/board/nes/projects/802-3ap.pdf>
 - 5 Criteria - http://ieee802.org/3/ap/802_3_ap_5criteria.pdf
 - Objectives - http://ieee802.org/3/ap/802_3_ap_objectives.pdf
- Review of September meeting
- Project schedule discussed
 - See agenda_1_1104 for Project Timeline
- Chair requested
 - All questions on presentation be held to end
 - All questions relevant to content and clarification of content
 - If an individual knows that they will be making a motion, please have wording of motion to secretary by 3pm on Wednesday.

Presentation #1

Title – OIF Report
By – Tom Palkert, Xilinx
See – palkert_01_1104.pdf

Discussion

- The OIF document for CEI 6G-LR, 6G-SR, and 11G-SR has been liaised to the IEEE 802.3ap, but is copy-right protected, so it will be uploaded to private area
- OIF Documents have been liaised to PICMG, but no formal liaison has been formed between the two bodies.

Presentation #2

Title – T11.2 and SFF Report to IEEE 802.3ap
By – Schelto van Doorn, Intel
See – IEEE 802.3 Plenary Minutes

Presentation #3

Title – Editor's Report
By – Schelto van Doorn, Intel
See – vandoorn_01_1104.pdf

Discussion

- No real feedback on 5 clause approach, but it appears to be realized 5 clauses as opposed to a single clause will be necessary
- Location of channel model in document will pend future decisions by the group

Presentation #4

Title – Channel Model Ad Hoc Report
By – Adam Healey, Agere
See – healey_01_1104.pdf

Discussion

- The use of “current practices” in relation to ATCA was questioned, since it was questioned whether there is a large established base of ATCA backplanes. It was then pointed out that there has been a large development effort over the last two years for backplanes that are based on “current practices” that are unlikely to be changed.

Presentation #5

Title – Current Practices Channel Model Anatomy
By – Aniruddha Kundu, Intel
See – kundu_01_1104.pdf

Discussion

- Counterboring is case specific, and the user needs to look at various issues in determining what the minimum amount of stub will be.

- Use of materials in relation to system length in relation to market segment in determining the channel model
- There is a system trade-off that needs to happen, and power needs to be considered

Break 10:20

Reconvened at 10:38

Presentation #6

Title – Channel Design Parameter Impact on the SDD21 and Pulse
By – Richard Mellitz, Intel
See melitz_01_1104.pdf

Presentation #7

Title – Short Backplanes and the effect of Reflections
By – Fulvio Spagna, Intel
See spagna_01_1104.pdf

Discussion

- The current model needs to be augmented. Pulse response information or in frequency domain specify ripple and notches.
- Use of frequency or time domain specifications or both becomes a practical issue.
- From a measurement perspective – pulse responses have been extracted from frequency response data, but there are issues with it.

Presentation #8

Title – Ripple Effect in S21
By – Jeff Cain, Cisco
See cain_01_1104.pdf

Discussion

- Discussion of synergy between presentations and opportunity to work together on creating some sort of envelope
- Need to consider entire channel as well.

Lunch

Break at 12:00

Reconvene at 1:18pm

Presentation #9

Title – Specifying Channels
By – Charles Moore, Agilent
See moore_01_1104.pdf

Presentation #10

Title – Proposal to modify OIF Stat Eye Methodology for 802.3ap Signaling Evaluation and Channel Compliance
By – Mike Lerer, Rapid Prototypes
See lerer_01_1104.pdf

Discussion

- StatEye is not a real world predictor of performance, but a worst case approach.
- Mike Lerer's proposal would be for the IEEE to build on the OIF StatEye (which could probably be liaisoned to the IEEE if sufficient interest) to make it specific to IEEE project
- Many versions of stateye which is a problem, divergent from open-source website
- Question regarding how IEEE would perceive the group specifying StatEye into the standard
 - It could be perceived as tool development
 - Concern - Developing a compliance tool that has to be written into the specification in an independent manner
 - Would have to be a well developed tool, which is scary in terms of efforts to develop it.
 - There are precedents for software use in specifications, but nothing of this magnitude.
 - Could be used as internal tool that doesn't get written into the specification

Presentation #11

Title – Transceiver Friendly Auto-Negotiation for 802.3ap
By – Pat Thaler, Agilent
See thaler_01_1104.pdf

Discussion

- Discussion of whether training should be included in auto-negotiation. There are vendors who do and vendors who don't want to do that.
- This approach might be better than SSP approach from an EMI perspective.
- One opinion - There may be enough transitions to maintain lock, but not be enough transitions to acquire lock
- Not a suggestion to changing Clause 28, but create models based on Clause 28 State Machine.

Presentation #12

Title – XAUI with Equalization Over Backplane
By – Dong Zheng, Intersil
See zheng_01_1104.pdf

Meeting break 3:05 pm
Break at 3:24 pm

Presentation #13

Title – Selecting optimal pre-emphasis level for 4-lanes 10G transmission -
Experimental Data
By – Dimitry Taich, Mysticom
See taich_01_1104.pdf

Discussion

- Debate over whether tx pre-emphasis should be fixed to an amount or adjustable

Presentation #14

Title – Signaling Ad Hoc Report
By – Mike Altmann, Intel
See altmann_01_1104.pdf

Presentation #15

Title – Signaling Comparison Spreadsheet Proposal
By – Mike Altmann, Intel
See altmann_03_1104.pdf

Discussion

- People doing proposals should be filling in this chart in a centralized location for the task force.
- Concern regarding condensing data from different vendors for similar / same proposal
- Input assumptions be proposed and documented
- Channels listed in worksheet currently are not exclusive
- Add *s4p file name description to worksheet

Presentation #16

Title – What Channels Should be considered by the IEEE 802.3ap Signaling Ad Hoc
By – John D'Ambrosia, Tyco Electronics
See dambrosia_01_1104.pdf

Discussion

- Re-iterated problems discussed throughout other presentations
 - Power
 - Range of stated power requirements from different vendors
 - Channel trade offs

- Channel ripple
- Nulls / notches
- complexity
- Need for standardized inputs and outputs

Presentation #17

Title – Stat Eye Analyses of Tyco Channels / Agreement with IBM
 By – Stephen Anderson, Xilinx
 See anderson_01_1104.pdf

Discussion

- Differences in results between StatEye and IBM may be due to where number of eye opening is being reported, i.e. before or after the CDR.

Break for Day at 5:27pm

Meeting Reconvened
 November 17, 8:36am

Presentation #18

Title – Comparison of NRZ and Duo-Binary Receivers With and Without Precoding
 By – Apoorv Srivastava, Vitesse
 See srivastava_01_1104.pdf

Presentation #19

Title – Duobinary Transmission over ATCA Backplanes
 By – Majid Barazande-Pour, Vitesse
 See barazande-pour_01_1104.pdf

Discussion

- Questions regarding BER calculations
- No bandwidth limitations assumed on the variable gain amplifier
- Added complexity for fractional taps running at higher frequencies
- Some concerns regarding margins as there are items missing from simulations
 - Speaker – 1st order approximation
 - Margins reported are standard deviations – not absolute
- Crosstalk
 - Needs to be included for all simulations
 - Current Intel data does not include crosstalk

Presentation #20

Title – Scalability of Duobinary Signaling to 25 Gb/s for 100 GbE Applications
By – Andrew Adamiecki, Lucent
See adamiecki_01_1104.pdf

Discussion

- Concern regarding IC complexity for techniques being shown in duobinary presentations
- Presentation is feasibility only, this group is not defining 25 Gb/s
- Complexity needs to be captured in spread sheet being proposed in Signaling Ad Hoc
- Scalability to 25 Gb/s per IEEE history is not necessarily an influence on this project, as re-use of existing technology is used when possible, but the body will use something new if necessary

Meeting Break at 10:06

Reconvened at 10:30

Presentation #21

Title – Proposal for 10G Serial PMD using Unified Signaling
By – Justin Gaither, Xilinx
See gaither_01_1104.pdf

Discussion

- Auto-negotiation – disagreement as to whether it is mandatory or optional
- Jitter tolerance on closed eye systems needs to be examined
- Discussion regarding use of initial setting to help reduce training time
- Each link would get trained individually and come up together
- Rx has burden of dealing with channel variation due to environmental variation
- Per presentation – training would be optional
- Per presenter – allows re-use of existing technology to bring product to market quicker
- Documentation question - Training location – subclause inside of auto negotiation. This means it could span across PMDs.

Presentation #22

Title – Unified Signaling Considerations
By – Brian Seemann, Xilinx
See seemann_01_1104.pdf

Discussion

- Interpretation of requirements of project
- Discussion of channel requirements / flexibility of Unified Signaling approach / interoperability

Lunch Break at 12:15 pm
Reconvened at 1:35 pm

Presentation #23

Title – Link Initialization Protocol
By – Rob Brink, Agere
See brink_01_1104.pdf

Presentation #24

Title – Adaptive Tx Equalization
By – Mike Altmann, Intel
See altmann_02_1104.pdf

Chair asked group for approval to amend the agenda to hear presentation on modifications to channel model. Approved via voice vote without objection.

Presentation #25

Title – Modification proposed SDD21 Channel Model
By – Rich Mellitz, Intel
See melitz_02_1104.pdf

Discussion

- Proposed scheme uses limits that are dependent on channel data
- This is a proposed methodology with TBD which will come from input to the signaling ad hoc
- Leverage off VNA spacings that have been specified in channel ad hoc group
- Opinions – looks good for informative model
 - Gives board designer guidelines to work with.
 - StatEye approach will give a more representative picture of the system

Break at 3:15 pm
Reconvened 3:38 pm

Discussion

- Channel Model Specifications

Straw Poll #1 Chicago Rules
Description: Normative channel specification method [Chicag]:

Frequency-Domain - 35
Pulse Response - 19
Statistical eye - 20

Straw Poll #1A System Vendors Only (1 vote per company) – Chicago Rules
Description: System Vendors Only:

Frequency-Domain - 5
Pulse Response - 2
Statistical eye - 3

Straw Poll #2
Description: Normative statistical eye and informative frequency-domain:

Yes – 22 No - 17

Straw Poll #3
Description: Normative frequency-domain

Yes – 28 No – 13

- Auto Negotiation Signaling

Straw Poll #4
Description Interested in exploring Differential Manchester encoding for AN signaling?

Yes – 31 No – 0

Straw Poll #5
Description Explore run-of-zeros delimiting?

Yes – 6 No – 0 Abstain - 40

- Training Protocol

Straw Poll #6

Description Adaptive transmitter and training protocol is part of the 10GBASE-KR PMD.

Yes - 35 No - 4 Abstain - 13

Straw Poll #7

Description Chicago Rules
Auto-negotiation [Chicago]:

Must implement, can turn off - 38
Must implement, cannot turn off - 5
Do not need to implement - 13

Straw Poll #8

Description Chicago Rules
Training for 10GBASE-KR [Chicago]:

Must implement, can turn off - 36
Must implement, cannot turn off - 6
Do not need to implement - 10

Straw Poll #9

Description Chicago Rules
Training for 10GBASE-KX4 [Chicago]:

Must implement, can turn off - 11
Must implement, cannot turn off - 0
Do not need to implement - 37

Straw Poll #10

Description Training Protocol Approach:

:
AN-based signaling (gaither_01_1104) - 13
LIP (brink_01_1104) - 11
Don't care – 24

Straw Poll #11

Description Set 10GBASE-KR PMD baud rate = 10.3125 Gbaud (1 bit / symbol) at this time:

Yes - 24 Not at this time - 27 Prefer another rate - 0

:

- Signaling Ad Hoc

Straw Poll #12

Description Use signaling spreadsheet (table_01_1104.xls with amendment) as a tool for selecting signaling for 10GBASE-KR PMD

Yes - 46 No - 0 Abstain – 2

- Channel Revisited

Straw Poll #13

Description Augment proposed Informative channel SDD21 (goergen_03_0904, page 11) per mellitz_02_1104

Yes - 42 No - 1 Abstain – 1

- Other

Straw Poll #14

Description Acceptable to include programmable Cd tap in the transmitter as functionally described in gaither_01_1104:

Yes - 34 No - 1 Abstain – 6

Straw Poll #15

Description Should 10GBASE-KR support “current practices” (per healey_01_1104)?

Yes - 19 No - 18 Abstain – 8

Straw Poll #15A System Vendor Only

Description System vendors

Yes - 4 No - 1 Abstain – 1

Break for Day at 5:15pm

Thursday, July 15, 2004
Meeting reconvened at 8:44am

Motion # 1 General Session Motion
Description: Move that the Task Force adopt as a baseline for a signaling comparison tool, the spreadsheet in table_01_1104.xls) as reviewed in altmann_03_1104.pdf.
Motion Type: Technical 75 % required
Moved By: Mike Altmann
Seconded By: John D'Ambrosia
Results: All Yes – 46 No – 0 Abstain – 2
P/F **Motion Passes**

Motion # 2 General Session Motion
Description: Adopt mellitz_02_1104, (augmentation of proposed Informative channel SDD21 per goergen_03_0904) as the template for the informative SDD21 channel model.
Motion Type: Technical 75 % required
Moved By: John D'Ambrosia
Seconded By: Rich Mellitz
Results: All Yes – 30 No – 12 Abstain – 11
 802.3 Yes - 13 No - 7 Abstain - 9
P/F **Motion Fails**

Discussion

- Concern regarding whether it is premature to put this model in, i.e. too many tbd's, not enough comparison data.
- Concern regarding delay to other aspects of task force if a decision regarding channel model is not made

Motion # 3 General Session Motion
Description: Direct editor to create Draft 0.7 based on adopted baseline proposals and submit to the Task Force for review.
Motion Type: Procedural, 50% required
Moved By: Mike Lerer
Seconded By: John D'Ambrosia
Results: All Yes – 57 No – 0 Abstain – 0
P/F **Motion Passes**

Signaling Ad Hoc Time Line

- Spreadsheet input to Signal Ad Hoc via reflector
 - Nov. 30 - Specific parameters for extension to spreadsheet
 - Dec. 10 - Specific values for all parameters in spreadsheet
- Dates for Signal Ad Hoc
 - Dec. 3 – Define specific parameters, TP4 – TP5, packaging effects
 - Dec. 17 – Define specific values

- Dec. 10 – provide complete test case channel data – all data means through and crosstalk
- Jan. 19 – simulation results for spreadsheet are submitted

Channel development Time line

- Specification template
 - Frequency, pulse, or StatEye
 - Address forward, return loss, crosstalk
 - Specify values for template
 - Compare to actual channel data
 - Compare to signal ad hoc for feasibility
- December 10 – Template
 - Review frequency domain template approach
- January 11 – Finish filling in template values
- Try to develop a tool to upload to the reflector

Schelto to organize conference call to address 1000BASE-KX, 10GBASE-KX4

Future Meetings

- January 2005 Interim
 - Date – January 24- 28 , 2005
 - Location – Vancouver, BC
- March 2005 Plenary
 - Date – March 13 – 18, 2005
 - Location, Atlanta, GA

Motion to adjourn approved via voice vote without objection.

Meeting adjourned at 10:14am.