

March 16 – 17, 2005

Minutes of the IEEE PoE Plus Study Group meetings during the IEEE 802 March 2005 Plenary week.

March 16 AM:

Presentation by Mike McCormack (See Presentation agenda_0305.pdf):

- Introductory Material and Ground Rules
- Read Bylaws on Patents in Standards Verbatim (Clause 6)
- Study Group output: PAR, 5 Criteria, Objectives
- http://www.ieee802.org/3/poep_study/index.html
- <http://www.ieee802.org/meeting/index.html>
- Official Rules
- PAR – Goes to Nescom
- 5 Criteria
- Objectives
- Presentations
- Introductions

Presentation Hank Hinrichs (hinrichs_1_0305):

- Thermal effects of dc current in data transformers
- I^2R losses are the major constraint
- Xfmr secondary 0.8 – 1 Ω
- Shunt Inductor Insertion – 1200 μ H
- Shunt Inductor not a good solution for PoEPlus
- Application of potentials to transformers can cause surges to the Phy – known to industry and suppression measures can be taken
- ANSI 368 TPPMD controls inductance, also Clause 40, gigabit ethernet
- Experience shows modern PHYs can run to 200 μ H and some to 120 μ H Shunt inductance
 - This is due to dc baseline correction algorithms
- 4k Perm magnetic materials for LAN applications
- RJ-45 modules are space constrained to about the current sized cores
- External / Discrete solutions are viable but require board space
- Common mode chokes (4 wire) has no inductance requirement
 - Single component takes 2 times transformer loss
- Integrated Jacks would have to grow 1.2x volume
 - Based on shunt choke growing 3x
- Current wire gauges are 39 or 40 AWG, Summary assumes 37 AWG

Presentation Ron Nordin (Nordin_2_0305.pdf)

- Temperature rise in cable experimental results
- Setup is the same as used for 10GbaseT
- 7 wire bundle – drive current in each pair
- Air and conduit results

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- Use resistance to give temperature
- Resulting Curves Presented

Presentation Chad Jones (jones_1_0305.pdf)

- New class method – call to action
- PD “ic” needs to support backwards compatibility
- Against any common mode signaling
- Discussion on cost issues between 2 pair and 4 pair
 - Variety of opinion
 - 2 Pair pros and cons

Presentation Yair Darshan (Darshan_1_0305.pdf)

- Economic analysis presentation
 - AC adapter vs. PoE costs
- New efficiency rules preclude linear adapters
- Discussion of slide concerning penalty of 2 pair over 4 pair
 - Different opinions concerning assumptions in slides
 - Integrated magnetics feasibility 2 vs. 4
 - Discrete initial implementations vs. Integrated
 - Concerns of ability to meet other 802.3 specs.
- Discussion about results showing k1 values for PD vendor
 - k1 does not include installation costs
- Discussion of approach in standard
 - maximum power allowed by infrastructure
 - economically feasible standard, don't push limits

Break for Lunch

March 16 PM

Presentation Ron Nordin (Nordin_1_0305.pdf)

- Presentation to demonstrate 1000baseT transmission in the presence of midspan PSE
- Topology, Test setup, Procedure
- Results: Appears feasible
 - Fully compliant solution requires more work
- Common Mode Performance needs investigation

Presentation Joe Dupuis (dupuis_1_0305.pdf)

- Feasibility of 4 pair 1000baseT
- Conclusion: Appears feasible

Presentation Yair Darshan (Darshan_2_0305.pdf)

- Presentation on power management reducing system costs

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- Conclusion: Power management can yield >37% savings of bulk power plant over a 100% power configured system
- Statistical analysis brings this to 50%
- Same ratiometric improvements apply to existing standard
- Discussion: More granularity in classification gives asymptotic improvements
 - Granularity at low end has more benefit

Presentation Alan Flatman (no file)

- IEC liaison presentation
- Liaison letter exists stating that IEC ad-hoc group of cable experts is willing to assist/help us
- Encouraged us to leverage this resource

Presentation Yair Darshan (Darshan_3_0305.pdf)

- Presentation: Power Feeding Methods
- 2P & 4P solutions discussion
- Discussion about changing detection impedance
- Discussion about 2 pair vs. 4 pair classification

Presentation Tom Diamond (diamond_1_0305.pdf)

- Presentation about Specifying Wide PSE output voltage
- Direct battery backup vs. regulated supply

Presentation Steve Ellsworth (ellsworth_1_0305.pdf)

- Presentation on DC current imbalance
- Hardest spec. to meet currently is 1000baseT return loss at 40MHz
- Recommends 4 pair
- Existing IEEE802.3af solutions are marginal with worst case xfmr and cable imbalance at short loop
- Solutions for more current are better matched xfmr wire, larger core, larger wire diameter
- Suggestion that we should study at some lower current like 500mA – 600mA range
- Discussion about changing the minimum transformer inductance under dc offset

Presentation by Arkady Peker deferred as he could not be here (peker_1_0305)

End of presentations

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- Review of study group goals and interoperation
- Explanation of power forwarding
- Should vote on straw-man objectives tomorrow
- Review of 11 objectives (agenda_0305.pdf)

Objective 10 reworded:

Was: Research the operation of midspan PSEs for 1000BASE-T.

Is: PoE Plus will support the operation of midspan PSEs for 1000BASE-T.

Objective 4 reworded:

Was: The PSE shall operate all modes of IEEE STD 802.3af as well as enhanced modes.

Is: The PoE Plus PSE shall operate in modes compatible with the existing requirements of IEEE STD 802.3af as well as enhanced modes.

A motion to approve the objectives per the file “Objectives.pdf” as recorded by Mike McCormack and amendments as above was made by Martin Patoka. The motion was seconded by Daniel Feldman.

All present vote:

For – 24

Against – 0

Abstain - 1

IEEE voters present:

For – 6

Against – 0

Abstain – 1

A motion to adjourn was made by Hank Hinrichs. The motion was approved.

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- Introductory Comments
 - Explanation of Plenary and voting rights
- Introductions
- Examples of 5 Criteria
 - <http://www.ieee802.org/3/af/criteria.pdf>
- 5 Criteria were written as a group - to be published by M. McCormack
- Motions to Extend the committee were made. Recorded by M. McCormack
Move that the chair bring forward the following motion in the closing plenary
“Request that the IEEE 802.3 WG extend the POEP Study Group to the next Plenary meeting.”
Moved H Barras, Seconded D Koonce
Technical 75%

All – Yes:	26	No:	0	Abstain:	0
.3 – Yes:	11	No:	0	Abstain:	0

- A Straw poll on the subject of internet access fees was conducted:
IEEE 802 and 802.3 meeting planners should attempt to ensure attendees staying in the meeting hotel(s) receive broadband services in their rooms for no separate fee; or, if such agreement exists, explain how members can enforce the agreement.

All – Agree:	28	Disagree:	0	Abstain:	1
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- Hank Hinrichs made a motion to adjourn, seconded by Hugh Barras.

These minutes recorded and respectfully submitted by Martin Patoka.