

Minutes of the Power via the MDI Task Force
New Orleans, LA
September 12-13
Recording Secretary - Ralph Andersson

Day 1, Tuesday September 12th

Agenda for the meeting was presented:

- Welcome and Introductions
- Select Recording Secretary
- Review / Approve Agenda
- Document Distribution
- E-mail Reflector, Web Site, and Miscellaneous Information
- Objectives for This Week
 - Refine proposals
 - Consensus!
- Call for Patents
- Presentations related to Objectives
- Motions related to Objectives
- Other Presentations - Web Site: Rick Brooks - Nortel
 - White Paper on the subject of the AC coupled diode discovery method
 - Two Stage Discovery and Power Processes - Verilog Code
 - AC Coupled Diode Category 3 Cable Tests
 - AC Coupled Diode Discovery Prototype Bandwidth Measurements
- Long Term Time-line
- New Business
- Plans for January Interim Meeting
- Approve Minutes of La Jolla Meeting
- Review New Action Items
- Adjourn

Introductions were made; about 30% of the people in the room were new, with approximately 45 attending. Ralph Andersson was nominated to be secretary for this meeting.

802.3af PAR was approved by NesCom 1/30/2000

- P802.3af (C/LM) Standard for Information Technology - Telecommunications and Information Exchange Between Systems - Local & Metropolitan Area Networks - Specific Requirements - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications - Data Terminal Equipment (DTE) Power via Media Dependent Interface (MDI)

The IEEE has set up a reflector for this study group: stds-802-3-pwrviandi@mail.ieee.org

- The reflector can be used for announcements, comments, discussions, or dissemination of information related to the work of this study group. The reflector should not be used for recruiting, advertising, soliciting, flaming, whining, subscribing, or unsubscribing
- To be added to the reflector, send an E-mail containing the following line:
subscribe stds-802-3-pwrviandi <your E-mail address>
to majordomo@mail.ieee.org
- To send a message to the DTE Power reflector use the E-mail address:
stds-802-3-pwrviandi@ieee.org
- Subscriptions are on an individual basis only
- No proxy requests or reflectors will be subscribed

IEEE Web Site was described:

- Typical Plenary Meeting Plan (DTE Power via MDI will meet during “Task Force” slots):
<http://grouper.ieee.org/groups/802/3/plenary.html>
- 802.3af 5 Criteria:
http://grouper.ieee.org/groups/802/3/power_study/public/nov99/802.3af_5criteria.pdf
- 802.3af PAR:
http://grouper.ieee.org/groups/802/3/power_study/public/nov99/802.3af_PAR.pdf
- 802.3 Voting Rules
<http://grouper.ieee.org/groups/802/3/rules/member.html>
- 802.3 Patent Policy
<http://grouper.ieee.org/groups/802/3/patent.html>

IEEE 802.3 requirements for Working group membership was discussed:

- If you wish to vote on 802.3 standards at the Working Group Ballot stage you need to become a voting member of Working Group 802.3.
- Membership is by individual, not company.
- To become a voter:
 - Attend and sign the attendance book at least 75% of the sessions of two Working Group 802.3 Plenary meetings (within the last four).
 - Full attendance at a two day or more duly constituted Working Group 802.3 Interim meeting can be substituted for attendance at one plenary.
 - Have complete and current contact information recorded in the Working Group 802.3 database.
 - Request to become a voter during a Working Group 802.3 opening or closing plenary meeting when additions to the voter list are solicited by the chair from the “Potential Voter” list.
- To remain a voter you must:
 - Maintain current contact information in the Working Group 802.3 database.
 - Have 75% attendance during at least two of the last four plenaries (Attendance at an interim can substitute for attendance at no more than 1 plenary).
 - Participate in Working Group ballots. You can be dropped for not returning or abstaining in two of the last three ballots.

Rules for signing attendance books was presented. (Will not reprint these)

Future meetings were discussed:

- Plenary: November 6-10, Hyatt Regency Tampa, FL. Book your reservations immediately; this is filling up fast
- Interim January 2001, Irvine (?) Broadcom
- Other Plenary meetings can be found in:
<http://grouper.ieee.org/groups/802/meeting/future.pdf>

Objectives for this meeting was presented:

- “Discovery” shoot-out
- Analyze data on mid-span, create issues list
- Analyze data on power on signal pairs, create issues list
- Examine 1st. Draft
- Re-visit voltage and current in light of new information

Presentation guidelines were presented:

- Requests for presentation time should be scheduled with the chair one week prior to the meeting
- Presentations should be supplied via e-mail as a PDF file one week before the meeting
- Avoid fussy backgrounds or other decorative graphics
- No animations, video clips, etc.

- Goal: to keep the PDF small enough to fit on a single floppy disk

Short term schedule was presented:

- March Plenary, Albuquerque
 - First official meeting of the Task Force
- May Interim, Ottawa
 - Last new proposal accepted
- July Plenary
 - 1st. Draft
- September Interim
 - Last new feature

Power over DTE objectives list was presented:

- (1) Economically provide power over a twisted- pair link segment to a single Ethernet device. To be included:
 - 10BASE- T,
 - 100BASE- TX.
 To be considered:
 - 1000BASE- T.
- (2) Select one power distribution technique for world- wide use
- (3) Not cause damage and inter-operate with compliant RJ- 45 MDI Ethernet devices including:
 - a. Switch- to- switch connections (both supplying power)
 - b. Cross- over cables
 - c. Common mode termination implementations
 - d. Shorted conductors, pairs or loop-back plug
- (4) Define a capability detection function that works with a powered and an un-powered device
- (5) Select the voltage, minimum and maximum current and wattage to be supplied
- (6) Add appropriate management objects for power capability and status
- (7) Support current standard, 4-pair, horizontal cabling infrastructure for installed Cat 3 and Cat 5 cabling
- (8) Preserve the signal transmission and isolation characteristics of existing equipment and cabling
- (9) Maintain normal functionality of Link Integrity Test function in legacy and new devices
- (10) Consider mid-span power insertion, powering over the signal pairs, and interaction with other RJ- 45 interfaces: Token Ring, ATM, FDDI TP- PMD, 1000BASE- T, ISDN, networking test equipment, PBX, IEEE 1394, devices listed in ISO/ IEC 11801: 1995 Annex G

The decision list that has been compiled by 802.3af was presented:

- Maximum voltage (objective 5)
- Maximum and minimum current (objective 5)
- Are classifications required, and (if so) how many (objective 6)
- Detection to be made on same pair as power
- Which pair(s)? (objective 7)
- What level of support for 2-pair legacy systems (objective 7)
- Level of support for 1000BASE-T (objectives 1 & 9)
- Determine fault behavior
- Determine type of discovery mechanism
- Single or multi-tiered discovery mechanism
- Of the known RJ-45 devices can we determine which can we live with?
- Should we define a standard means to provide optional visual indications of the ability to supply power from a connector and/or is it currently providing power?
- Maximum voltage not to exceed SELV IEC 950

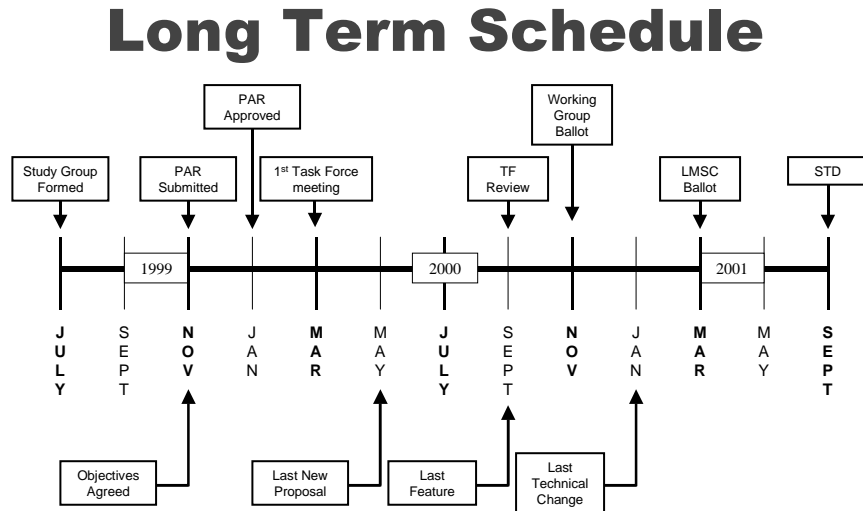
The requirements list defined by the 802.3af task force was presented:

- Without specifying the two and only two pairs to be utilized for DTE power, DTE power shall utilize two pair powering where each wire in the pair is at the same nominal potential and the power supply potential is between the two pairs selected. - January 2000 Interim
- Regardless of the detection scheme adopted and the power feed scheme adopted, the power detection and power feed shall operate on the same set of pairs. - January 2000 Interim
- Regardless of the final voltage selected, the DTE power max voltage shall not exceed the limits of SELV per IEC 950. - January 2000 Interim
- In order to progress we accept that there are two isolation requirements of 802.3, environment A and B per 802.3 section 27.5.3 et al, and that for the purposes of this committee we will treat as a priority for consideration environment B without precluding environment A. - March 2000 Plenary
- For DC systems the minimum output voltage of the source equipment power supply shall be at least 40VDC. - March 2000 Plenary
- For DC systems, the source device shall be capable of supplying a minimum current of at least 300mA per port. - March 2000 Plenary
- The solution for DTE Powering shall support mid-span insertion of the power source. - March 2000 Plenary
- 802.3af systems shall distribute DC Power - May 2000 Interim
- If both pair sets may be used for powering, mid-span shall supply power on 45,78 - Supplying power on pins 12,36 from the mid-span is for a later revision of the standard. - May 2000 Interim
- 802.3af proceed with the development of a low frequency, low energy common mode detection method. - May 2000 Interim
- That it be an objective of the 802.3af task force to determine the optimal method to apply power at the “mid-span” and “DCE end” to minimize data-path impairments at a reasonable cost. -May 2000 Interim
- We accept the powering of the DTE via either sets of wire pairs (1-2, 3-6 and 4-5, 7-8), in anticipation the detailed technical and economic feasibility of each having been shown prior to the Working Group Ballot. - May 2000 Interim

The list of presentations that would be made at this interim was shown:

- “AC Coupled Diode Discovery Technical Feasibility”, Rick Brooks, Larry Miller, Paul Moore - Nortel
- “Diode Discovery Process Economic Feasibility”, Robert Muir - Intel
- “Diode Discovery Process Lab Testing Results”, Robert Muir - Intel
- “Analysis and Implementation of Coupled Diode Detection”, Amir Lehr, Yair Darshan, Avinoam Levy, Ilan Atias, David Pincu, Ronen Heldman - PowerDsine
- “Diode Discovery Matrix Evaluation”, Nick Stapleton, 3Com
- “IEEE 802.3 DTE Power via MDI Resistive Detection and Signature Protocol Follow-Up”, Robert Leonowich, et. al, - Lucent
- “IEEE 802.3AF PSE Controller”, David Schie, Brian Hedayati - Supertex
- “DTE Power via MDI Discovery Process”, Gérard Vergnaud, Raymond Gass, Rémy Jaeger - Alcatel
- “Feature Request for Power Management”, Karl Nakamura, Cisco
- “Link Performance”, Terry R. Cobb - Lucent
- “Passive Performance Requirements for Mid-span Power Insertion Device”, Sterling Vaden - Superior Modular Products
- “Standard Compliant Mid Span Solution”, Amir Lehr, David Pincu - PowerDsine
- “Spare Pairs Feeding Lab Test Results”, Nadav Barnea, David Pincu - PowerDsine
- “ESD & Safety Requirements for Power via MDI”, Avinoam Levy, Rick Frosch - PowerDsine
- “DTE Power via MDI DC Feeding Voltage”, Rémy Jaeger, M. Medlicot, Gérard Vergnaud
- “Power on the Signal Pairs”, Robert Muir - Intel

Long term schedule was shown:



Inspection shows, and Steve Carlson iterated: "We are behind".

Presentations:

- Presentation #1 Paul Moore, Nortel: "AC Coupled Diode Discovery Technical Feasibility".
- Presentation #2 Robert Muir, Intel: "Diode Discovery Process Economic Feasibility"

Mike McCormack, the 802.3af editor, went up to the podium to talk about the work of the three ad hocs that have been set up within 802.3af. He admonished these groups for not getting him the information that he needs. "It is important that we get these things moving."

Presentations continued:

- Presentation #3 Robert Muir, Intel: "Diode Discovery Process Lab Testing Results"
- Presentation #4 Yair Darshan, PowerDsine: "Analysis and Implementation of Coupled Diode Detection"
- Presentation #5 Nick Stapleton, 3Com: "Diode Discovery Matrix Evaluation",

It was announced that DTE power will meet at 8:00a.m. with 10Gig in Regency E to decide on future Interim sites: Prospective locations and the associated dates include:

- Jan 2001 Irvine Broadcom
- May 2001 York 3Com
- September 2001 Copenhagen Giga

Only one of the European sites will be allowed.

Presentations continued:

- Presentation #6 Gérard Vergnaud, Alcatel: "DTE Power via MDI Discovery Process"
- Presentation #7 Robert Leonowich, Lucent: "IEEE 802.3 DTE Power via MDI Resistive Detection and Signature Protocol Follow-Up"
- Presentation #8 Brian Hedayati, Supertex: "IEEE 802.3AF PSE Controller"

This represented the end of the discovery proposals.

Steve Carlson queried: "As per La Jolla we need to come up with an answer; which one should we do?" Steve Carlson first off thanked everyone for all the hard work that has been done. "Now we need to get groups together to come to a consensus".

A Straw Poll was taken:

Straw Poll

Which of the three proposals do the representative audience of 802.3af favor. Voting rules: Can vote for only two of the three.

	802.3 voters	everyone
Resistance:	17	46
Diode:	14	31
Big Cap:	1	3

It was suggested that maybe we should generate a matrix describing the relative benefits

Bob Love came up with a proposal: Suggested process for evening discussion on choosing detection method:

- List the special capabilities (unique advantages) that each scheme believes it is offering.
- List the perceived advantages seen in any of the schemes
- Look for a way of incorporating the best features of each and eliminating any perceived disadvantages into a single or multiple solutions
- If multiple solutions exist, decide which is best

Objective: come to a consensus on a proposal among the camps

Discussion ensued on why people voted the way they did on the Straw Poll. How they felt.

Discussion for a breakout discussion in the evening

Presentations continued:

- Presentation #9 Karl Nakamura, Cisco: "Feature Request for Power Management",

Robert Love came up to the podium and addressed the following (not 100% verbatim):

- A presentation was made that included handouts of a marketing nature. These slides are inappropriate. All of these slides have been collected and have been destroyed. This is inappropriate in 802.3 meetings. It has been brought to Geoff's attention.

Geoff Thompson advised Steve Carlson to make the following rule:

- Nobody who is not an established attendee may make a presentation without the chair first receiving the presentation and it being posted on the reflector for review.

Patents and confidential information was next addressed by Steve Carlson:

- No E-mail should be sent with any trailer saying confidential. Anyone who sends this out to the reflector will be pulled off of the reflector. All communications within the context of IEEE should be not considered confidential or proprietary.

Geoff described IEEE's policy on patents.

Bob Muir stated that Intel has had its lawyers perform a patent search for the diode discovery proposal. They have found nothing and they are not in the process of filing for any patents

Bob Love suggested that there should be some pointer to the operating rules on the reflector that people can easily find.

Motion made:

Motion

Motion to adjourn for the night

Moved by: Mike McCormack

Seconded by: Arlan Anderson

Approved by affirmation

Day 2, Wednesday September 13th

Bob Love gets up to talk about the transactions of the consensus building meeting yesterday evening:

- There was not a bunch of differences between the proposals
- The real uncertainty was fear, uncertainty, and doubt.
- We should choose the resistor approach as this presents a high input source impedance and this is an extra level of assurance that the other proposal did not present

Motion made:

Motion

Approve the discovery method based on the current sensing resistance based signature (as originally presented by Bob Leonowich) be adopted by 802.3af pending confirmation by the November plenary meeting that there are no issues that would prevent the use of this method or significantly increase its implementation costs

Motion: Bob Leonowich

Second: Sterling Vaden

Time 9:00

Discussion

Move to Table until 3:00: Mike McCormack

Second Hank Heinrich

Technical 802.3 only: Y14 N4 A3

Presentations continued:

- Presentation #10 Terry R. Cobb, Lucent: "Link Performance"
- Presentation #11 Sterling Vaden, Superior Modular Products: "Passive Performance Requirements for Mid-span Power Insertion Device"
- Presentation #12 David Pincu, PowerDsine: "Standard Compliant Mid Span Solution"
- Presentation #13 David Pincu, PowerDsine: "Spare Pairs Feeding Lab Test Results"
- Presentation #14 Avinoam Levy, PowerDsine: "Can Electronic Components Survive the High Voltages Associated with Safety and ESD Immunity Tests?"
- Presentation #15 Rémy Jaeger, M. Medlicot, Gérard Vergnaud: "DTE Power via MDI DC Feeding Voltage"
- Presentation #16 Robert Muir, Intel: "Power on the Signal Pairs",

Motion made 2:30 p.m.:

Motion

The 802.3af task force affirms that the technical and economic feasibility of delivering power over the wire pair sets 1-2, 3-6 has been established, and that the technical and economic feasibility of delivering power over the wire pair sets 4-5, 7-8 has also been established

Moved by: Bob Muir

Seconded by: Amir Lehr

Technical Motion 75% required

802.3voters: Yes 21 No 1 Abstain 1 Motion carries

All present: Yes 50 No 1 Abstain 2

Motion made 3:00 p.m.:

Motion

Approve the Discovery method based on the current-sensing Resistance-based Signature (presented by Bob Leonowich at this meeting) be adopted by 802.3af pending confirmation by the November plenary meeting that there are no issues that would prevent the use of this method or significantly increase its implementation costs.

Moved by: Bob Leonowich

Seconded by: Sterling Vaden

Technical 75% required

802.3 voters Yes 11 No 9 abstain 2

everyone Yes 27 No 13 Abstain 13 Fails here too

Discussion of what still needs to be done to make a choice. Steve queried: "What is the thing that moves us forward? Start thinking of stuff other than the detection method."

Arlan Anderson stated that there will be a spec out on the power supply specification out by the November plenary.

Steve Carlson talks on consensus based standards work. "Now is the time to shoulder the burden... "Would like to remind everybody that we need to split the work up to get it done".

Motion made to approve the minutes from the July meeting:

Motion

Motion to approve the minutes from the July meeting

Moved by: Hank Hinrich

Seconded by: Bill Quackenbush

Approved by affirmation

Motion on mid-span 3:30:

Motion

The 802.3af task force affirms that the technical and economic feasibility of delivering power from the mid-span has been established.

Moved by: Amir Lehr

Seconded by: Mike McCormack

Technical 75% required

802.3 voters: Yes 18 No 0 Abstain 1

Everyone: Yes 48 No 0 Abstain 2

Discussion:

- Should we set a limit on the power?
- We need to set up a list of what needs to be done

Developed an action spreadsheet outlining the tasks at hand:

Item	EDC	Status	Action
discovery			
Test list document	9/20/00		First Draft
Test list document	9/30/00		feedback and revisions
Both proposals tested against test list	11/1/00		Mike McCormack, Paul Moore(Nortel), Bob Leonowich(Lucent), Robert Muir(Intel)
high level state machine adhoc	11/1/00		Mike McCormack
power supply adhoc	11/1/00		Arlan Anderson(Nortel), Amir Lehr(PowerDsine), Scott Burton(Mitel) First Draft
midspan adhoc		done	Bob Love First Draft
management	11/1/00		Nick Stapleton, David Law, Karl Nakamura Straw-Man proposal/Team to interface w/ David Law
link profile	11/1/00		Sterling Vaden, David Pincu, Hank Heinrich, Martin Wagner
environmental specification annex (derating calcs)			Definition of channel topology
PICS Proforma			
systems consideration Draft 1.1	11/3/00		Mike McCormack

Motion to adjourn:

Motion

Motion to adjourn

Moved by: Mike McCormack

Seconded by Robert Muir

Approved by affirmation