Minutes IEEE 802.3cg AdHoc meeting FEBRUARY 22, 2017

Prepared by George Zimmerman

Proposed Agenda:

1. Agenda/Admin George Zimmerman, CME Consulting/ADI, Aquantia, BMW, Commscope, LTC – Acting Ad hoc Chair, Chair IEEE 802.3cg Task Force
2. Details for MDI discussion, Matthias Fritsche, Harting Technology Group
3. First considerations for the 10Mbps@15m channel, Kirsten Matheus, Michael Kaindl, BMW
4. First considerations for the 10Mbps@15m multidrop, Kirsten Matheus, Michael Kaindl, BMW

Presentations posted at:

http://grouper.ieee.org/groups/802/3/cg/public/adhoc/index.html

Agenda/Admin George Zimmerman:

Meeting began at 7:00am PT.

1. Reviewed the task force web and reflector information related to the ad hoc.
2. Displayed and read the patent policy deck – at 7:11 AM the chair issued the call for patents. No participants responded.
3. Reminded participants to indicate full names and employer/affiliation correctly for the meeting minutes.
4. Presented the proposed agenda – no objection.

Presentations/Discussion.

Chair's Comments & Discussion George Zimmerman CME, TF Chair

- Areas of work to move along.
    - Moving along – use “champions” or “shepherds” to collate major areas
        - Need initial baseline proposals – see Diminico presentation for an example
        - Don’t have to be complete at initial postings
    - PHY characteristics - Claude
    - Link Segments – Chris
    - Noise – need to begin to gather measurements – Steffen is starting this, you might talk with him
    - Powering – needs shepherd

Presentation: Details for MDI discussion: Matthias Fritsche

The presenter described connector project in IEC working group SC48B with various interface configurations for industrial environments as well as less harsh environments. Examples of the proposed connector configurations were presented.

Questions/Discussion:

- One participant asked about the status of the project – the standard is in the 'proposals' phase, not defined yet, but has been ongoing for some time now. The presenter expected that the project would complete around the end of 2018 or early 2019.
- Another participant stated that for MDI connectors, multi-connector physical considerations (e.g., "harmonica connectors") was important, and that it would be good if the group took that into consideration. Further questions delved into the construction of the connector in a waterproof-protected multi-connector configuration.
- Liaison with SC48B was discussed in the discussion, and the presenter agreed to check with the IEC working group leader as to the status of an official liaison.
- Another participant asked about the use of different connector form factors for different size cabling, shown in the slides. There was a desire to minimize the number of sizes and types of connectors.
- Another participant asked whether the presenters intent was that 802.3cg would adopt the entire family of connectors from IEC. The presenter answered that IEEE might specify the basic (IP20) version, but that the other interfaces would be interoperable similarly to RJ45 today. Further discussion clarified that 802.3cg might specify a single MDI which would be compatible with specialized connectors for other environment.
- Another participant remarked that the connector must have appropriate test considerations and should be useful for higher data rates.

Presentation: First considerations for the 10Mbps@15m channel: Michael Kaindl

The presenter described considerations for the 15m channel in the automotive environment. Channel configurations were based on point-to-point transmission, additional considerations for multidrop were in the following presentation. During the presentation, the presenter described a preference for using the same cable as 100BASE-T1 for 10BASE-T1 in his applications. He compared specifications and provided measurement data for cabling at lower frequencies, down to 300 kHz, and saw no unusual effects deviating from a straightforward extrapolation of the cabling model. An OPEN alliance specification was used for measuring the cabling characteristics, the OPEN alliance specifications are available by request at http://www.opensig.org/about/specifications/ . Additionally, the presenter addressed power over data lines, and suggested that PHY signaling begin above 1MHz to allow sufficient low frequency for a low-complexity PoDL coupling network.

In discussion that followed:

- The 802.3 Working Group chair reminded all participants that we are to operate as individuals within IEEE 802 standards groups, and should act and consider views as those of individuals, not companies.
- The presenter confirmed that the relative cost of optimizing cabling for the application between flexray and 100BASE-T1 was about 5%, and therefore, the cost of maintaining a separate cabling did not seem worthwhile.
- The presenter confirmed that while measurements went down to 300kHz, the test equipment was capable of lower, and he did see any issues extending to 100kHz.
- The presenter noted that while slide 7 said "no nonlinear effects" what was meant was "no unexpected effects" from extending the model. Nonlinearities such as square-law or third harmonics was not intended or measured.
- The presenter noted that the environment that 10SPE might go into in a car contained crosstalkers from various technologies, including CAN and Flexray. These should be considered.

Presentation: First considerations for the 10Mbps@15m multidrop : Michael Kaindl

The presenter described considerations for the 15m multidrop in the automotive environment. He presented a multidrop model based on the EPON model with a head-end implementing the point to multipoint protocol and client nodes. The presenter considered using CSMA/CD outdated in the protocol. Key features were that he desired the same PHYs which could be used in a point-to-point mode and to minimize stubs (no cable stubs, PCB stubs allowed) to minimize channel impairments. The presenter showed examples of similar CAN and CAN-FD networks with 8 to 16 nodes. Considerations of complexity, relative cost and performance are expected to play a part in the maximum number of nodes to be supported. The presentation raised several questions asking for members of the Task Force to consider and contribute answers:

- Does the addition of a multidrop channel increase the effort in a PHY in comparison to a P2P channel only?
- Can the effect of a "chain node" be compared with the effect of an inline connector? 8 participants ~ 6 inliners?
- Is the effort that the head end must put in for address mapping and bandwidth reservation/allocation reasonable, or will it add significantly to complexity?
- What is the comparison between having a switch with multiple MACs in a point-to-point scenario relative to the MPCP model for EPON?

There was significant discussion of the daisy-chained connectors and how to minimize interaction of nodes on stubs. The presenter discussed concepts for connectors as well as deployment and connection rules (such as minimum wire length between nodes) for the multidrop network. Additional discussion raised other areas for work, Task Force participants are encouraged to contribute:

- We will need to specify transmission channel parameters between transmitters and receivers. Multipoint measurements would need to consider transmission paths from each transmitter to each receiver. One participant noted that there may be lessons from early (coax) Ethernet networks, including how to specify the multidrop network and any deployment or connection rules.
- There was also discussion of whether the bandwidth and 10Mb/s bit rate were shared between the individual nodes. The presenter suggested sharing would be OK, others suggested it might be avoided on this short link, and a presentation on the channelization used in copper epon might be relevant.

Closing

The meeting ended with a reminder that the deadline for presentation requests for the March meeting was coming up in 1 week. Please submit requests to the chair and follow the presentation guidelines. Additionally, the next ad hoc meeting is scheduled for Wednesday, March 8, the week before the Vancouver meeting. That would be an excellent time to preview and refine contributions. Proposals and data to progress the work are encouraged. If additional data is needed, please request it of others early. We need to be moving on to baseline proposals and writing our specification.

The meeting adjourned at – 9:55am PT

Attendees (from Webex + emails)

First Name	Last Name	Employer/Affiliation
Mohammad	Ahmed	TE
Jim	Bauer	Marvell
Tobias	Belitz	Renesas
Victor	Berglund	Microsemi
Mark	Bohm	Microchip
Dale	Borgeson	Emerson
Theo	Brillhart	Fluke Networks
Phillip	Brownlee	TDK
Stefan	Buntz	Daimler
Dick	Caro	CMC Associates?
Eric	DiBiaso	TE
Chris	Diminico	MC Communications / Panduit
Dominik	Dorner	Leoni
Shahar	Feldman	Microsemi
Alexander	Felgenhauer	Yazaki
Brian	Franchuk	Emerson
Matthias	Fritsche	Harting
Steffen	Graber	Pepperl+Fuchs
Dave	Hess	Cord Data
Matthias	Jaenecke	Yazaki

Chad	Jones	Cisco
Michael	Kaindl	BMW
David	Law	HPE
Larry	Matola	Delphi
Brett	McClellan	Marvell
Bryan	Moffitt	Commscope
Ulrich	Nowack	Delphi
Sujan	Pandey	NXP
Jean	Picard	Texas Instruments
Masood	Shariff	Commscope
Ching-Yao	Su	Realtek
Ludwig	Winkel	Siemens
Peter	Wu	Marvell
Markus	Wucher	Endress+Hauser
Dayin	Xu	Rockwell
George	Zimmerman	CME Consulting/ADI, Aquantia, BMW, Commscope, LTC,
Maris	Graber	Relcom
Piergiorgio	Beruto	Canova Tech