Minutes IEEE 802.3 Multigig Automotive Ethernet PHY SG AdHoc meeting February 1, 2017

Prepared by George Zimmerman

Proposed Agenda:

1. Agenda/Admin: George Zimmerman, agenda_3NGAUTOah_01_020117.pdf
2. SG Chair's comments: Steve Carlson, chair_3NGAUTOch_01_020117.pdf
3. NGAUTO – Objectives Uses Cases + speedgrades, Helge Zinner, Continental, zinner_NGAUTO_01a_0217.pdf
4. MGbps Link Segment open questions, Kirsten Matheus, BMW, matheus_NGAUTO_01_0201.pdf -
5. NGAUTO – Objectives Uses cases, need of different speedgrades, Olaf Grau, Bosch, grau_NGAUTO_01a_0217.pdf
6. NGAUTO – Objectives Uses Cases + speedgrades/ link length / EMC, Stefan Buntz, Daimler, buntz_NGAUTO_01a_0217.pdf
7. Possible Objective Text, George Zimmerman, CME Consulting, zimmerman_3NGAUTOah_01_020117.pdf
8. Next steps

Presentations were not sent to NGAUTO reflector in advance, but were posted to the adhoc webpage the evening before

Agenda/Admin George Zimmerman:

Meeting began at7:02am PT.

Introductions & Affiliations.

Presented file: agenda_3NGAUTOah_01_020117.pdf

1. Reviewed the Attendance information related to the ad hoc.
2. Displayed pre-par patent slide deck, and reviewed it.
3. Reminded participants to indicate full names and employer/affiliation for the meeting minutes.

The reflector and website are now up, and we are now using the NGAUTO reflector. Instructions for subscribing to the reflector may be found at http://www.ieee802.org/3/NGAUTO/reflector.html. If you cannot subscribe to the reflector for some reason, and need additional assistance please contact the study group chair.

Presentations/Discussion:

Chair's Comments & Discussion Steve Carlson, Chair, Multigig Automotive Ethernet PHY Study Group: chair_3NGAUTOch_01_020117.pdf

- Steve noted the guidelines for electronic attendance at meetings, that these were for the progressing of the group's work, not the convenience of presenters. The four presenters from today have requested to present electronically. See the presentation for detail.

Presentation: NGAUTO – Objectives Uses Cases + speedgrades, Helge Zinner, Continental, zinner_NGAUTO_01a_0217.pdf

The presenter discussed use cases for video and showed examples of use cases for 2.5Gbps, 5Gbps and 10Gbps.

Presentation: MGbps Link Segment open questions, Kirsten Matheus, BMW, matheus_NGAUTO_01_0201.pdf. (updated file during presentation)

The presenter discussed various cabling options with various relative costs. The initial presentation mentioned "different price points", and Mr. Thompson raised an objection, and the presenter clarified that relative cost was meant. This resulted in the revised slide deck posted and referenced. There were several questions requiring clarification of the various acronyms used for cabling, so the meanings are repeated here:

UTP: unshielded twisted pair (in automotive generally without a jacket)

UTP jacket: unshielded twisted pair with a thermoplastic jacket

STP: shielded twisted pair – twisted pair with a foil or metal braid shield

STQ: star quad cabling – 4 conductors twisted as a quad

SPP: shielded parallel pair – a pair of conductors, untwisted, surrounded by a foil or metal shield

2xSPP: two shielded parallel pairs – 4 conductors, untwisted, surrounded by a foil of metal shield, as 2 independent pairs.

GOF: glass optical fiber – either single mode or multi-mode

POF: plastic optical fiber – see 802.3bv

Presentation: NGAUTO – Objectives Uses cases, need of different speedgrades, Olaf Grau, Bosch, grau_NGAUTO_01a_0217.pdf

The presenter discussed various advantages for having speeds between 1 Gbps and 10Gbps to match the applications. Sensitivity to thermal dissipation was a high level concern, so saving power dissipation was important.

Presentation: NGAUTO – Objectives Uses Cases + speedgrades/ link length / EMC, Stefan Buntz, Daimler, buntz_NGAUTO_01a_0217.pdf

The presenter discussed several use cases, different sensor requirements for different data rates, and presented some possible objectives. There was discussion of matching the rates to the needs, including asymmetric rates or asymmetric EEE for making efficient solutions.

Discussion of the suggested deletion of the full duplex objective clarified that the full duplex objective means that the Ethernet is capable of bi-directional transmission without pausing for the other direction to transmit. Asymmetic data rates would generally be full duplex, as could asymmetric EEE solutions. A CSMA/CD system which only transmitted in one direction at a time would not be full duplex.

Presentation: Possible Objective Text, George Zimmerman, CME Consulting, zimmerman_3NGAUTOah_01a_020117.pdf

The presenter discussed possible objective text reflecting the previous presentations and the study group's work. The presentation offered objective language for consideration at the interim, and the presenter asked participants to review and consider whether we had consensus to adopt in Warren, MI.

There were a few key points to be resolved: (see below and closing business discussion)

- 2 or 4 connectors for the link segment – request was made to OEMs to discuss the benefit tradeoff going to 2 connectors from 4, request was made to participants knowledgeable about cabling to show the difference in transmission characteristics of 2 connector vs 4 connector channels, all other things being equal.
- Do we have a 5Gb/s objective? – we need to figure this out. Presenter suggested that we probably should have a 5 Gb/s objective based on past experience and the various presentations showing the importance of matching the rate well to the application. Applications tend to emerge in the future, and it is more efficient to work the standard now, with the others.
- Asymmetric rates – no objective language relating to this was offered now, that is something that would require further thought and work.

Closing Business: George Zimmerman, CME Consulting

Follow up items, items to resolve:

Supporters of the presentations today are encouraged to contact the presenters and ask to add their names added as "supporters" with their employer/affiliation.

It seems we have proposals offering 2.5Gb/s as another objective rate, and some consensus around 15m link objective, possibly including unshielded twisted pair for 2.5Gb/s.

We need to build consensus on whether or not we have a 5Gb/s objective.

We need to build consensus on whether 4 connectors need to be accounted for in the link segment model. A participant voiced a need for the flexibility in installation that 4 connectors offered. ***Further presentation or reflector discussion on the impact of the additional connector on transmission parameters is encouraged.***

We need to determine whether we have consensus on a 10Gb/s media/phy objective. ***Please review the offered objective language and consider whether we need to change it.***

We had discussion of asymmetric rate needs, which might be answered in a variety of ways – asymmetric EEE (which is normal for 802.3), asymmetric PHY transmission rates, or even half-duplex operation (or some

combination of the three). ***Presentations are encouraged for the next ad hoc to try to define if and whether additional objectives are needed.***

Future Meetings

The next ad hoc meeting will be held on February 15 at the same time (7-9am pacific time). Webex information was already sent to the NGAUTO (study group) reflector on Wednesday January 18 –

See the email reflector archive at: http://www.ieee802.org/3/NGAUTO/email/thrd1.html

Specifically message: http://www.ieee802.org/3/NGAUTO/email/msg00035.html

Presentation requests for the February 15 ad hoc are due Monday February 13, by 5PM Pacific Time. If no requests are received, the meeting will be cancelled – and this will be announced on the NGAUTO reflector.

Information on the interim may be found at http://www.ieee802.org/3/interims/index.html . Please email Steve Carlson & Natalie W. if you plan to attend. Remote presentations will be allowed, but remote discussion will be limited to the presentation given. See the Chair's guidelines given this meeting.

Please notify Steve & Natalie W as to whether you will be attending the interim in Warren, MI on Feb 21-22. She needs first a count for the room, so if you are unsure, please let her know. Closer to the meeting she will need the actual names of attendees. Watch the reflector for details!

Meeting closed –9:07 am PT

Attendees (from Webex + emails)

First Name	Last Name	Affiliation
Shogo	Akasaki	Denso
Amir	Bar-Niv	Aquantia
Tobias	Belitz	Renesas
Rich	Boyer	Delphi
David	Brandt	Rockwell Automation
Stefan	Buntz	Daimler
Christian	Burmann	Microchip
Steve	Carlson	High Speed Design
Mabud	Choudhury	OFS
Eric	DiBiaso	TE
Alexander	Felgenhauer	Yazaki
Mike	Gardner	Molex
Olaf	Grau	Bosch
Craig	Gunther	Harman
Ajeya	Gupta	Ford

Kurt	Herrmann	Gebauer & Griller Kabelwerke GmbH
Yasuhiro	Hyakutake	Adamant Co., Ltd.
Matthias	Jaenecke	Yazaki
Chad	Jones	Cisco
Peter	Jones	Cisco
Larry	Kim	Yazaki
David	Law	HPE
Michael	Leung	Marvell
Alex	Lin	MediaTek
Tzahi	Madgar	Valens
Kirsten	Matheus	BMW
Larry	Matola	Delphi
Brett	McClellan	Marvell
Greg	McSorley	Amphenol
Richard	Mellitz	Samtec
Alan	Miller	Delphi
Wes	Mir	Delphi
Thomas	Mueller	Rosenberger
Doug	Oliver	Ford
Sujan	Pandey	NXP
Vimali	Raman	Yazaki
Laura	Schweitz	Turck
Masood	Shariff	Commscope
Mehmet	Tazebay	Broadcom, Ltd
Geoff	Thompson	GraCaSi / Independent
Kikuta	Tomohiro	Adamant
Johann	Tost	Rohde & Schwarz
Alexander	Umnov	Corning
Natalie	Wienckowski	General Motors
Peter	Wu	Marvell
Sung	Yoo	Molex
John	Yurtin	Delphi
George	Zimmerman	CME Consulting / BMW, Aquantia, Commscope & LTC
Helge	Zinner	Continental