

Multigig Automotive Objectives: How to move forwards

IEEE 802.3 Multigig Automotive Ethernet PHY
Study Group

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As amended during presentation

Acknowledgments

- Highly leveraged from
 - zimmerman_3NGAUTO_01_0117.pptx
 - carlson_3NGAUTO_01_0117.pptx

Short term goals

- At this meeting
 - Become a Task Force to begin addressing the dominant market segment identified in the CFI deck and the SG motion.
- This needs (at least):
 - PAR and CSD adopted by SG
 - “Basic” set of objectives adopted by SG to indicate that we know what we are doing.
- Between now and Vancouver
 - Consensus building in AdHoc on any additional objectives.
- At Vancouver
 - PAR & CSD comments addressed and accepted in WG and EC
 - Initial Task Force objectives adopted by SG then **WG**.

Classes of Objectives

Presenters opinion

- I hear multiple classes being discussed.
 - “*Non-controversial*” Objectives
 - Other
- Under Other 😊
 - Objectives with broad consensus and appropriate levels of data presented.
 - Objectives with some interest, some level of data/understanding, but no consensus at present.
 - Objectives that are out of scope per SG chair.

Actions for Objectives

- “Non-controversial” Objectives
 - Adopt at this meeting (after PAR/CSD)
- Objectives with broad consensus and appropriate levels of data presented.
 - Adopt at this meeting if at all possible.
 - Validate within PAR/CSD scope.

Actions for Objectives(cont.)

- Objectives with some interest, some level of data/understanding, but no consensus at present.
 - Check if permitted by PAR/CSD scope.
 - YES: Use AdHocs to build consensus
 - Adopt in Vancouver if possible
 - Else address this in TF
 - NO: Should PAR/CSD be tweaked to enable?
- Objectives that are out of scope per SG chair.
 - Stop discussing these.

“Non-controversial” Objectives

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Non-controversial Objectives

- Preserve the IEEE 802.3/Ethernet frame format at the MAC client service interface.
- Preserve minimum and maximum frame size of the current IEEE 802.3 standard.
- Support full duplex operation only.
- Support a speed of X Gb/s at the MAC/PLS service interface.
- Support X Gb/s operation in automotive environments (e.g. EMC, temperature).
- Define optional startup procedure which enables the time from power_on=FALSE to valid data to be less than 100ms
- Support optional single-pair auto-negotiation mechanism
- Define optional Energy-Efficient Ethernet

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Replace X by 10, Adopt at this meeting (after PAR/CSD)

“Non-controversial” Objectives (cont.)

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Objectives for Adoption

- Preserve the IEEE 802.3/Ethernet frame format at the MAC client service interface.
- Preserve minimum and maximum frame size of the current IEEE 802.3 standard.
- Support full duplex operation only.
- Define optional startup procedure which enables the time from power_on=FALSE to valid data to be less than 100 ms.

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Adopt at this meeting (after PAR/CSD)

OTHER STUFF 😊

BROAD CONSENSUS

BER Objective

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BER Objective

- All 2.5Gbps/5Gbps/10Gbps BASE-T PHYs share the same BER objectives: 10^{-12}
- Propose objective:
 - Support a BER better than or equal to 10^{-12} at the MAC/PLS service interface

Broad support - Adopt at this meeting (after PAR/CSD)

10Gbps over 15m STP

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Proposed PHY Objectives

1. Define the performance characteristics of a link segment and a PHY to support 10 Gbps operation over this link segment with a single twisted-pair supporting up to four inline connectors using shielded balanced copper cabling for up to at least 15 m reach
2. Support operation at 10Gbps in automotive environments (e.g., EMC, temperature) over single-twisted-pair shielded balanced copper cabling.

Broad support - Adopt at this meeting (after PAR/CSD)

Other PHY Objectives

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1. Support optional single pair Auto-Negotiation
2. Support point-to-point topologies
3. Do not preclude meeting FCC and CISPR EMC requirements
- ~~4. **Specify an optional power distribution technique to be used with the 10Gbps 15m STP PHY**~~

Note: based on discussion during the presentation, it became clear to the presenter that item 4 does not have consensus, and needs to be re-classified to “some interest - no consensus ”

Broad support - Adopt at this meeting (after PAR/CSD)

OTHER STUFF 😊
SOME INTEREST - NO CONSENSUS

Other rates - e.g., 2.5Gbps and 5Gbps

- Interest expressed in other slower rates, but no consensus.
- Data shows that 10Gbps has broad support, but 2.5Gbps/5Gbps may not. (Wienckowski_NGAUTO_01_0117.pdf)
- If 10Gbps is technically feasible, then 2.5/5Gbps are technically feasible, but we have no data showing that's its a good system cost/volume/performance tradeoff.
- Instinct says that 2.5/5Gbps will be useful, but it's up to the advocates to build the case.

Validate in-scope, build consensus

Other Media - e.g., Fiber, UTP, extended reach

- Interest expressed in other media, but no consensus.
- Instinct says that other media will be useful, but it's up to the advocates to build the case.
- As an expansion of the market/work required, the case needs to be made that this work can proceed along with the main effort without “significant” additional delay for the main, established use case,

Validate in-scope, build consensus

RECOMMENDATION

To progress

- Adopt a basic set of objectives that would deliver a viable project for the dominant market and are within PAR/CSD scope.
- Work on additional objectives before, during and after March plenary.

THANK YOU!