Proposed Objectives

IEEE 802.3

10 Mbps Single Pair Ethernet Study Group

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Adopted Objectives (Sept Interim)

1. Preserve the IEEE 802.3/Ethernet frame format at the MAC client service interface.
2. Preserve minimum and maximum frame size of the current IEEE 802.3 standard.
3. Support a speed of 10 Mb/s at the MAC/PLS service interface.
4. Do not preclude meeting FCC and CISPR EMC requirements
5. Support for optional single-pair Auto-Negotiation
6. Support optional Energy Efficient Ethernet
7. Support 10 Mb/s operation in automotive environments (e.g. EMC, temperature) over single balanced twisted-pair cabling.
8. Support 10 Mb/s operation in industrial environments (e.g. EMC, temperature) over single balanced twisted-pair cabling.

Objectives for consideration – compilation, general consensus from ad hoc

9. Define the performance characteristics of a link segment and at least one PHY to support operation over this link segment with single twisted pair supporting up to four inline connectors using balanced cabling for at least 15 m reach.
10. Define the performance characteristics of a link segment and a PHY to support point-to-point operation over this link segment with single twisted pair supporting up to 10 inline connectors using balanced cabling for at least 1 km reach
11. Do not preclude working within an Intrinsically Safe device and system as defined in IEC 60079
12. Do not preclude the ability to survive automotive and industrial fault conditions (e.g. shorts, over voltage, EMC, ISO16750).
13. Support fast-startup operation using predetermined configurations which enables the time from power_on**=FALSE to a state capable of transmitting and receiving valid data to be less than 100ms.
14. Support voltage and current levels for the automotive and industrial environments.

Objective #1 needing work - BER

- Maintain a bit error ratio (BER) at the MAC/PLS service interface of less than or equal to:
  - 10^-10 on link segments up to at least 15m, and
  - 10^-9 on ~~all~~ link segments up to at least 1km

  - Do we have consensus?

Objectives needing work - startup

- Support optional operation with run-time configuration, that specifies a maximum allowable time from power_on **=FALSE to a state capable of transmitting and receiving valid data.
  - This seems to need some clarity as to how it differs from objective #13, fast startup in predetermined configurations.

Objectives needing work – Impulse tolerance

- Maintain link in the presence of nonrepetitive impulse events lasting up to at least 50 msec
  - Possibly substitute “transient” for “nonrepetitive”
  - It is not clear this really needs to be an objective, but if it is, it needs to be defined clearly without having to assume technical decisions in the Study Group. It is arguably already encompassed by the “industrial environment” objective.

Objectives needing work - Power

- Specify ~~an~~ one or more optional power distribution techniques for use over the 10 Mb/s single balanced twisted-pair link segments in conjunction with 10 Mb/s single balanced twisted-pair PHYs
  - It seems we have consensus on this part, the question is, do we go further at all
  - There has been some controversy around support / augmentation of PoDL, and the following could still allow us to make another powering spec, particularly for the long reach:
- Optionally support Clause 104 power distribution, with possible augmentation, on at least the 15m link segment

About Multi-drop PHYs

- With our current wording, Multi-drop is within the scope and intent of our PAR and CSDs
  - Both target markets use some multi-drop
  - None of the PAR and CSD language limits to point-to-point
- Multi-drop (shared-media) PHYs need to be considered in the context of a media access protocol
- To meet the “802.3 MAC” objective, we don’t just need examples, need to make a technical decision on the media access method.
  - Study Groups do NOT make technical decisions

Therefore, we SHOULD NOT add a multi-drop PHY objective in Study Group, and, we MAY add one in Task Force, with additional specificity to align it to the 802.3 MAC