Acting Chair's Comments

(as updated during presentation)

IEEE 802.3 Study Group

10Mb/s Single Twisted Pair Ethernet (10SPE)

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Study Group (SG) Scope / Authorizing Motion

- Move that the IEEE 802.3 Working Group request the formation of a Study Group to develop a Project Authorization Request (PAR) and Criteria for Standards Development (CSD) responses for 10Mb/s Single Twisted Pair Ethernet including optional power.
  - Source: Unconfirmed minutes, 802.3 July 2016 Closing Plenary, Motion 22

- Take aways (my interpretation):
  - Only 10 Mbps on 1 twisted pair is in scope for the SG
  - Powering is IN scope, but not required, and should be optional
- Generally the group will determine the scope within this
  - Study Groups develop documents for the Working Group
  - Agreements in the SG need to pass the 802.3 Working Group and EC

The Goal: Get to Task Force

- We are not convened to generically "Study" the problem
  - We study in a 'structured' fashion
- Nominally – this means write a PAR and CSDs which the 802.3 WG and the 802 EC, etc. can pass.
  - Templates available in 802.3 "tools" page, see any 802.3 project for examples of finished product
- Practically – Get agreement on what problem or problems we want to solve and make the case that they are solvable and worthwhile
  - If we don't do this, we will have trouble
  - If we do this, and document it, the PAR and CSDs will write themselves
  - Generally, we do this through 'Objectives', and align with the CSDs and PAR

DONE! (almost)

Adopted Objectives (1)

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.
9. Do not preclude the ability to survive automotive and industrial fault conditions (e.g. shorts, over voltage, EMC, ISO16750)
10. Do not preclude working within an Intrinsically Safe device and system as defined in IEC 60079

Adopted Objectives (2) (802.3 changes shown)

11. Define the performance characteristics of a link segment and a PHY to support operation over this link segment with single twisted pair supporting up to four inline connectors using balanced cabling for up to at least 15 m reach
12. 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 up to at least
    1 km reach
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. 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 link segments up to at least 1km
15. Specify 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, in the automotive and industrial environments

PAR/CSDs

- Approved by 802 EC
  - CSD is done
- Revised PAR forwarded to NESCOM
  - NESCOM meets Dec 6, recommends to Stds Board Dec 7
- Expect to be a Task Force in January

- Until then, work to get ready

Possible Timeline (aggressive)

- November 2016 – adopted objectives and responses to CSDs, Submitted PAR to become a TF
- January 2017 – first TF meeting. Technical depth on any new objectives. Hear contributions on link segment models, PHY characteristics, depth on powering use cases, begin hearing proposals
- March 2017 –More detail on PHY proposals, begin powering proposals, recruit Editorial team, outline document, refine baseline proposals
- May 2017 – Draft 0.1 produced for review, reduce baselines if needed
- July 2017 – major baselines selected, draft 0.9 produced for commenting in Task Force Review
- September 2017 – draft 1.0 produced, commenting, technical features refined
- November 2017 - last technical feature introduced (draft 1.1)
- January 2018 – (Draft 1.2) – aim for technically complete – consider off-cycle interim if necessary.
- February 2018 – possible off-cycle interim to complete draft for WG ballot presubmittal
- March 2018 – Draft 2.0 produced, draft technically complete for working group ballot
- May 2018 - Draft 2.1 produced for working group ballot recirculation
- July 2018 – Draft 2.2 produced for working group ballot recirculation
- September 2018 – Draft 3.0 produced, proceed to Sponsor ballot
- November 2018 – Draft 3.1 produced for Sponsor Ballot recirculation
- January 2019 – Draft 3.2 produced for Sponsor Ballot recirculation
- March 2019 –IEEE-SA standards board meetings (attendance not required)

Things to move our work along

- PHY characteristics list - Claude
  - Basic performance (reach, margin)
  - Things we will see in the spec
  - Characteristics we want to see (e.g., diagnostics, latency)
- Link segments – Chris
  - Need to define use cases:
    - Industrial, automotive, building automation (are there others)
  - Scalable models for IL, RL
  - Noise models (alien crosstalk, impulsive)
- Powering - ? Need champion
  - Power levels
  - Use cases – specific current & voltage limits, relation to cabling

Potential issues to think about

- Industrial/Automotive groups where an industry operates outside the group and enters thinking it is OK to 'declare' that they have 'decided'….
  - Better to come in with "a bunch of us have an idea..." – and why
  - Good to exchange ideas early and openly, but you want to be inclusive to build consensus
  - Recommend better use of reflector
  - If we need more ad hocs, to bring this discussion in, let us know
- Various use models in powering – also, this is a different discipline
  - I will try to manage this more like PHY projects than like PoE.
  - Consensus is not unanimity, and no-one gets a veto
- Perhaps integrating some older 'DSL' folks, while hopefully avoiding the distasteful and problematic elements that made EFM so painful.
- Navigating the 'multi-drop' issue.
  - Personally, I think there's a pretty high burden of proof on taking wired Ethernet back to the shared-medium model – particularly in a control environment. (e.g., support TSN if required)
  - If the value is only cost, that's a hard one to prove – laden with assumptions
  - Need architectures proposed and discussed to make progress
- Cabling issues (normal)…. Legacy installed vs. specified cabling, etc.
  - (TIA TR42, ISO/IEC JTC1 SC25 WG3, IEC 65C JWG 10 have related projects we can use)
  - Multi-drop could affect this

THANK YOU!

We’ve made great progress!

Now the hard work starts.