IEEE P802.3cg 10 Mb/s Single Twisted Pair Ethernet Task Force
Opening Report

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IEEE P802.3cg 10 Mb/s Single Twisted Pair Ethernet Task Force

Project information

Task Force Organization

George Zimmerman, IEEE P802.3cg Task Force Chair

Jon Lewis, IEEE P802.3cg Task Force Secretary

Peter Jones, Architecture Ad Hoc Chair

Valerie Maguire, IEEE P802.3cg Chief Editor

Task force web and reflector information

Reflector information: http://www.ieee802.org/3/cg/reflector.html

Home page: http://ieee802.org/3/cg/index.html

PAR: http://www.ieee802.org/3/cg/IEEE_P802_3cg_PAR_071216.pdf

CSD: https://mentor.ieee.org/802-ec/dcn/16/ec-16-0216-00-ACSD-802-3cg.pdf

Objectives: http://www.ieee802.org/3/cg/objectives_10SPE_111016.pdf

Approved timeline:
http://www.ieee802.org/3/cg/adopted_802d3cg_timeline_0517.pdf

Private area: http://ieee802.org/3/cg/private/index.html

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Activities since November 2017 plenary

- Initiated Task Force Review after November 2017 meeting with D 1.0
- Met during the January 2018 interim meeting series
  - Major items discussed, decisions made and actions
    - Reviewed and resolved 372 comments on draft 1.0
      - Refined specifications for long-reach PHY
      - Adopted PMA electrical specifications, and refined specifications including state diagrams for short-reach PHY
      - Refined optional multidrop performance improvement method
      - Discussed multi-drop powering issues
    - Chartered and held review of draft 1.1
    - Approved rewording objectives to better reflect project goals (and support addition of 10BPE SG)
  - Held 2 ad hoc calls hearing contributions related to short-reach PHY EMC characteristics and multidrop performance improvement
  - Current status
    - Resolve 193 comments on draft 1.1, charter and initiate draft 1.2
    - Concentrate on filling in remaining pieces for technical completeness
    - Continue Architecture Ad hoc calls

IEEE P802.3cg Adopted Objectives Approved by 802.3 11/10/16 (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

IEEE P802.3cg Adopted Objectives Approved by 802.3 11/10/16 (2)

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

Modified Objectives approved by Task Force, not yet by 802.3 (1 of 3)

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 **single-pair Ethernet** operation in automotive environments (e.g. EMC, temperature).
8. Support 10 Mb/s **single-pair Ethernet** operation in industrial environments (e.g. EMC, temperature).
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

Key: Black text is existing, text in **bold shadow red** accommodates 10BPE, text in ***red bold italics*** clarifies 802.3cg PHY types and purpose, including multidrop

Modified Objectives approved by Task Force, not yet by 802.3 (2 of 3)

11. Define performance characteristics of the following:

a. A link segment with a **single balanced pair of conductors** supporting up to 4 inline connectors for up to at least 15 m reach

b. A mixing segment with a single balanced pair of conductors supporting up to at least 8 nodes, for up to at least 25 m reach

c. A link segment with a **single balanced pair of conductors** supporting up to 10 inline connectors for up to at least 1 km reach

12. Define a PHY:

a. Supporting point-to-point half-duplex operation over the 15 m link segment

b. Optionally supporting full-duplex operation over the 15 m link segment

c. Optionally supporting half-duplex multi-drop operation over the 25 m mixing segment

13. Define a PHY:

a. Supporting point-to-point full-duplex operation over the 1 km link segment

Modified Objectives approved by Task Force, not yet by 802.3 (3 of 3)

14. 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
15. Maintain a bit error ratio (BER) at the MAC/PLS service interface of less than or equal to:
    a. 10^{-10} on link segments up to at least 15m
    b. 10^{-10} on mixing segments up to at least 25m
    c. 10^{-9} on link segments up to at least 1000m
16. Specify one or more optional power distribution techniques for use in conjunction with 10 Mb/s single-pair Ethernet PHYs over one or more of the single-pair segments

IEEE P802.3cg 10 Mb/s Single Twisted Pair Ethernet Adopted timeline

- ✓ January 2017 – First Task Force meeting
- ✓ July 2017 – Objectives Finalized, Draft 0.1 (skeleton), all baselines presented
- ✓ September 2017 – Baselines selected, draft 0.9 for Task Force Review
- ✓ **November 2017 –Last features selected - Task Force Review D1.0**

  Nov:D1.0, Jan:D1.1, ~~*possible Feb 2018 extra off-cycle interim, D1.2*~~

  March 2018 – Complete Task Force Review(D1.2~~/1.3~~)

  May 2018 – Draft 2.0, enter working group ballot (2 recircs: July:D2.1, Sept:D2.2) *[Probably at least July]*

  Nov 2018 – D3.0 – enter Sponsor ballot (2 recircs Jan'19:D3.1, Mar'19:D3.2)

  June 2019 Standards Board approval

[NOTE: only 1 meeting cycle slack spread between WG ballot and Sponsor Ballot]

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Meeting week plan

Goals for the meeting:

- Comment review on draft 1.1
- Produce Draft 1.2
- Progress to technical completeness
  - Refine short reach & multi-drop PHY
  - Refine powering
  - Hear and respond if necessary to liaisons

Big ticket items

- Progress draft to technical completeness
  - Identify remaining TBDs and missing pieces and work to fill in
  - Short reach: operational modes and mixing segment specification
- PLCA: refine specification

Questions?

Thank you!