

IEEE 802.3 Ethernet Working Group Liaison Communication

Source: IEEE 802.3 Working Group¹

To: Steve Trowbridge Chair, ITU-T SG15
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From: David Law Chair, IEEE 802.3 Ethernet Working Group

Subject: Liaison letter to ITU-T SG15 on Beyond 10km Optical PHYs

Approval: Agreed to at IEEE 802.3 interim meeting, Pittsburgh, PA, USA, 24th May 2018

Dear Mr. Trowbridge and members of ITU-T SG15,

We are pleased to inform you that the IEEE 802.3 Beyond 10km Optical PHYs Study Group has adopted project objectives and prepared project documentation that will be considered by the IEEE 802.3 Working Group at the July 2018 plenary for the creation of a new project for the specification of new optical PHYs with rates of operation of 50 Gb/s, 100 Gb/s, 200 Gb/s, and 400 Gb/s and a reach of greater than 10 km.

Optical PHYs for 40 km reach over a duplex fiber pair between the Tx and Rx will be specified for rates of operation of 50 Gb/s, 200 Gb/s, and 400 Gb/s. Feasibility has been demonstrated to use similar approaches for these PHYs as those in the IEEE P802.3cd and IEEE P802.3bs projects, extending the reach with technologies such as APD Rx and/or higher power Tx. Optical PHYs for 80 km reach over a DWDM system will be specified for rates of operation of 100 Gb/s and 400 Gb/s.

The adopted objectives are:

- Support full-duplex operation only
- Preserve the Ethernet frame format utilizing the Ethernet MAC
- Preserve the minimum and maximum FrameSize of current Ethernet standard
- Provide appropriate support for OTN

50 Gb/s Ethernet

- Support a MAC data rate of 50 Gb/s
- Support a BER of better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent) for 50 Gb/s

¹ This document solely represents the views of the IEEE 802.3 Working Group, and does not necessarily represent a position of the IEEE, the IEEE Standards Association, or IEEE 802.

- Provide a physical layer specification which supports 50 Gb/s operation over at least 40 km of SMF

100 Gb/s Ethernet

- Support a MAC data rate of 100 Gb/s
- Support a BER of better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent) for 100 Gb/s
- Provide a physical layer specification supporting 100 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system

200 Gb/s Ethernet

- Support a MAC data rate of 200 Gb/s
- Support a BER of better than or equal to 10^{-13} at the MAC/PLS service interface (or the frame loss ratio equivalent) for 200 Gb/s
- Provide a physical layer specification supporting 200 Gb/s operation over four wavelengths capable of at least 40 km of SMF

400 Gb/s Ethernet

- Support a MAC data rate of 400 Gb/s
- Support a BER of better than or equal to 10^{-13} at the MAC/PLS service interface (or the frame loss ratio equivalent) for 400 Gb/s
- Provide a physical layer specification supporting 400 Gb/s operation over eight wavelengths capable of at least 40 km of SMF
- Provide a physical layer specification supporting 400 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system

The draft [PAR](#) and [CSD](#) for this project are at the indicated links.

We would call your attention to Section 7 of the draft PAR form where it is asked to identify any standard(s) or project(s) of similar scope(s), both within or outside of the IEEE, and explain the need for an additional standard in this area. Regarding the 100 Gb/s DWDM objective, we have identified a project of similar scope to be the 80 km, 100 Gb/s application code currently under development in ITU-T SG15 in revised Recommendation G.698.2. Regarding the 400 Gb/s DWDM objective, we have identified a project of similar scope to be the OIF 400ZR project. The PAR form indicates “Stakeholders have expressed a desire to see an IEEE 802.3 standard address 100 Gb/s Ethernet and 400 Gb/s Ethernet over DWDM systems. Where appropriate, existing standards will be referenced, rather than duplicated.”

We recognize that the objectives for operation over 40 km of SMF utilize technologies similar to those of previous IEEE 802.3 projects over familiar media with a dedicated fiber pair per Ethernet link, while objectives relating to operation over DWDM systems, intending to use coherent modulation for operation over a DWDM system is new for IEEE 802.3. We hope that we can rely on the prior work and experience of ITU-T Q6/15 and continue correspondence and consultation as we move into this new area.

Sincerely,

David Law

Chair, IEEE 802.3 Ethernet Working Group