IEEE 802.3 Ethernet Working Group
Liaison Communication

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From:	David Law	Chair, IEEE 802.3 Ethernet Working Group

Subject: Liaison to ITU-T SG15 regarding 1.6T OTN mapping reference (reply to SG15-LS6)

Approval: Agreed at IEEE 802.3 plenary meeting, Atlanta, GA, USA, 13 March 2025

Dear Mr Parsons and members of ITU-T SG15,

Thank you for your liaison (SG15-LS6) confirming the definition of a FlexO payload type for use with 800GBASE-ER1 and 800GBASE-ER1-20. Following our January interim meeting, we have incorporated this payload type into IEEE P802.3dj D1.4, which was previously shared with you. We would also note that the architecture of the 800GBASE-ER1 PHY changed significantly between D1.3 and D1.4. We have discussed the question you raised about the potential for 1.6 Tb/s PHYs with similar PTP accuracy issues to 800GBASE-ER1 and the potential value of changing the OTN mapping reference point for 1.6TBASE-R to include alignment markers as a way to mitigate those issues.

A key aspect of the OTN mapping reference is that it is common to all PHYs at a specific rate; the currently selected point within the 1.6TBASE-R PCS has that property. Moving the OTN reference point to include alignment markers would presume that all future 1.6T PHYs

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would use the same type of alignment markers. We do not want to constrain future task forces by making such an assumption.

We also note that the location of the OTN mapping reference point for 800GBASE-R was not the cause of the issue with PTP accuracy we encountered in our work on 800GBASE-ER1. The issue was indeed related to the removal and re-insertion of alignment markers, as you noted, but the OTN mapping reference point does not factor into those functions since we are not defining a mapping into OTN from an architecture perspective. We would call your attention to Clause 186 of IEEE P802.3dj D1.4, which explains the architecture of the 800GBASE-ER1 PHY in detail. The 800GBASE-R PCS is common to all 800 Gb/s PHYs. In the transmit direction, the PCS encodes the MAC frames to 66b blocks, transcodes to 257b blocks, adds RS FEC, and adds alignment markers. The ER1 FEC sublayer decodes the RS FEC, removes the alignment markers, serializes the signal, maps the stream of 257b blocks into the ER1 frame, and adds ER1 FEC. The opposite functions are performed in the receive direction. The removal and insertion of alignment markers is occurring in the 800GBASE-ER1 FEC sublayer, whereas the OTN mapping reference point is in the 800GBASE-R PCS. Changing the location of the OTN mapping reference in the PCS to include alignment markers would not impact the functions in the FEC sublayer. We would also note that the solution we adopted in 800GBASE-ER1 to mitigate the PTP impairments would be equally viable for any future 1.6 Tb/s PHY that uses the same mapping to FlexO.

Given the above, we don't think there is a compelling reason to change the OTN mapping reference point for 1.6 Tb/s PHYs.

The next meeting of the IEEE P802.3dj task force is the week of 12 May 2025. We very much appreciate the ability to work collaboratively with ITU-T SG15 on this and other matters of common interest.

Sincerely,
David Law
Chair, IEEE 802.3 Ethernet Working Group