IEEE 802.3 Ethernet Working Group Liaison Communication

Source: IEEE 802.3 Working Group[1]

To: Lyndon Ong, OIF Technical Committee Chair (lyong@ciena.com)

CC: Paul Nikolich, Chair, IEEE 802 LMSC (p.nikolich@ieee.org)
Wael Diab, Vice-Chair, IEEE P802.3 Working Group (wdiab@broadcom.com)
Adam Healey, Secretary, IEEE 802.3 Ethernet Working Group (adam.healey@lsi.com)
John D'Ambrosia, Chair, IEEE 802.3 OIFCEI-28G-VSR Ad hoc (jdambrosia@ieee.org)

Subject: Follow-on Liaison to OIF regarding OIF CEI-28G-VSR Liaisons (dated Feb 12, 2010 and March 15, 2010) from IEEE 802.3,

From: David Law – Chair, IEEE 802.3 Ethernet Working Group (David_Law@3Com.com)

Approval: Agreed to at IEEE 802.3 Plenary meeting, San Diego, CA, USA, 2010

Dear Lyndon,

As noted in our previous liaison, the IEEE 802.3 Working Group formed an ad hoc to provide a more detailed response to the liaison that had been sent by the Optical Internetworking Forum in March of this year. It should be noted that while this ad hoc is compromised of interested individuals in the OIF CEI-28G-VSR effort, there is no project currently underway within the IEEE 802.3 Working Group where an electrical interface based on 25 Gb/s signaling is being discussed and analyzed. Therefore, in drafting this response, the experience and insight gained in the development of the IEEE 802.3ba-2010 standard was leveraged.

The technical points raised in oif2010.092.03 highlight the challenge in defining the application space that the CEI-28G-VSR interface will serve, which is key to driving technical decisions regarding the underlying passive channel. This is similar to the challenges that were faced during the IEEE 802.3ba project, where it was recognized that there were implementations that would utilize a retimed interface and others where a non-retimed interface would be used. As the underlying philosophy in the development of an Ethernet standard is to enable as many applications as possible, it was decided that both types of interfaces needed to be specified. Therefore, it is suggested that the OIF should consider defining a retimed interface and a non-retimed or partial retimed interface for 25 Gb/s electrical signaling.

The retimed interface should address channels with larger insertion loss budgets. Once a total budget is established, the budget can be re-partitioned to address chip-to-module applications. It is anticipated that a non-retimed or partial retimed interface to address shorter reach / lower insertion loss applications will also become necessary. As a point of reference, for chip-to-chip applications CAUI was designed to support channels approximately 250mm in length, which when applied to chip-to-module applications results in support of host traces approximately 200mm in length. The CPPI interface was designed to support channel lengths approximately

[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.

100mm in length. (Use of better materials to achieve longer-reach channels at the same loss budget is understood.) Specific length recommendations cannot be provided beyond these guidelines, as the final lengths supported will be dependent on subsequent analysis that must be completed to determine what loss budgets can be supported. Furthermore, any 25 Gb/s electrical signaling specification must be able to support implementations that can meet the optical transmitter and receiver characteristics defined for 100GBASE-LR4 and 100GBASE-ER4.

This analysis is also necessary to validate the ability of any connector to support the 25Gb/s based interface. However, without a clear definition of the channel to be supported, as well as whether the interface is retimed or not, it is impossible to undertake a meaningful analysis. The IEEE 802.3WG recognizes the state of flux that the industry is in, and is encouraged by the improvement in connector performance that was observed in a number of presentations received that addressed the ability of various connectors to handle 25Gb/s. Furthermore, while there is a desire to re-use the QSFP interface if possible, the ability of the interface to support 25 Gb/s must be validated. Also, it was noted during the review of oif2010.092.03 is that while a connector crosstalk target was provided, no statements regarding the transmit characteristics were included.

Comments regarding passive direct-attach copper cabling were also made in oif2010.092.03. While IEEE 802.3ba-2010 does include the 100GBASE-CR10 specification, there are no projects currently underway for defining an electrical 4x25 physical layer specification for 100GbE. Furthermore, there is no input at this time regarding a common port for electrical and optical physical layer specifications, which would have subsequent channel implications.

Please note that all presentations given to the IEEE 802.3 WG ad hoc are available at http://www.ieee802.org/3/ad_hoc/OIF_VSR_liaison/public/index.html.

We encourage the OIF to continue its development efforts on the CEI-28G-VSR project and look forward to future communications.

Sincerely,

David J. Law
Chair, IEEE 802.3 Ethernet Working Group
David_Law@3Com.com