

## IEEE 802.3 Ethernet Working Group Liaison Communication

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Source: IEEE 802.3 Working Group<sup>1</sup>

Subject: Follow-on Liaison to OIF regarding OIF CEI-28G-VSR Liaison (dated March 18, 2010) from IEEE 802.3

Date: 15th July 2010

From: David Law, Chair, IEEE 802.3 Ethernet Working Group <[dlaw@hp.com](mailto:dlaw@hp.com)>

Approval: Agreed to at IEEE 802.3 Plenary meeting, San Diego, CA, USA, 15<sup>th</sup> July 2010

Dear Lyndon,

As noted in our previous liaison, dated March 18, 2010, 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 comprised of individuals interested in the OIF CEI-28G-VSR liaison, 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 and completion of IEEE Std 802.3ba<sup>TM</sup>-2010 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 IEEE 802.3ba was to enable as many applications as possible, it was decided that both types of interfaces needed to be specified. Looking forward, the IEEE 802.3 Working Group recognizes the need for both types of interfaces, but also recognizes the interaction between a non-retimed electrical interface and the physical layer specification implemented by a module. If the OIF considers the development of a non-retimed or partially retimed interface, then a total end-to-end link budget

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<sup>1</sup> 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.

should be considered. Therefore, it is recommended that the OIF initially focus on the development of a retimed interface.

During IEEE 802.3ba, the Task Force utilized a retimed interface, instead of a non-retimed interface, to address host trace channels that had a larger insertion loss. As a point of reference, for chip-to-chip applications, the retimed 100G Attachment Unit Interface (CAUI) was designed to support channels approximately 250mm in length, which when applied to chip-to-module applications resulted in support of host traces approximately 200mm in length. The non-retimed 100G Parallel Physical Interface (CPPI) was designed to support host channel lengths approximately 100mm in length.

Specific length recommendations cannot be provided beyond these historical references, as the final lengths supported will be dependent on subsequent analysis to determine what loss budgets can be supported. Therefore, any 25 Gb/s electrical signaling specification that is adopted by the IEEE 802.3 Working Group would need to support implementations that could meet the optical transmitter and receiver characteristics defined for 100GBASE-LR4 and 100GBASE-ER4.

To address the OIF's question regarding connectors, while use of a QSFP compatible connector is desirable for backward compatibility, its ability to support 25 Gb/s needs to be validated. Analysis is also necessary to validate the ability of any connector to support the 25 Gb/s based interface. However, without a clear definition of the channel to be supported, as well as whether the interface is retimed or not, a meaningful analysis is difficult. The IEEE 802.3 Working Group is encouraged by the improvement in connector performance that was observed in a number of presentations that addressed the ability of various connectors to handle 25 Gb/s.

In addition, during the review of oif2010.092.03 it was noted that while a connector crosstalk target was provided, no statements regarding the transmit characteristics were included.

In regards to comments about passive direct-attach copper cabling made in oif2010.092.03, IEEE Std 802.3ba-2010 includes the 100GBASE-CR10 specification, but there are no projects currently underway for defining an electrical 4x25 Gb/s copper cable physical layer specification for 100 Gb/s Ethernet. Discussions also occurred regarding the use of a common interface to support both electrical and optical physical layer specifications. Such a requirement would have subsequent implications on channel development, and therefore we suggest the OIF explore this requirement with its membership.

Please note that all presentations given to the IEEE 802.3 Working Group OIF CEI-28G-VSR Response ad hoc are available at [http://www.ieee802.org/3/ad\\_hoc/OIF\\_VSR\\_liaison/public/index.html](http://www.ieee802.org/3/ad_hoc/OIF_VSR_liaison/public/index.html).

The IEEE 802.3 Working Group encourages the OIF to continue its development efforts on the CEI-28G-VSR project and looks forward to future communications.

Sincerely,

David J. Law  
Chair, IEEE 802.3 Ethernet Working Group