IEEE P802.3bj Task Force
Informal Communication

Source: IEEE P802.3bj 100 Gb/s Backplane and Copper Cable Task Force[1]

To: ITU-T Study Group 15
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Subject: Informal Communication to ITU-T Study Group 15

From: Adam Healey – Chair, IEEE P802.3bj 100 Gb/s Backplane and Copper Cable Task Force (adam.healey@lsi.com)

Approval: Agreed to by IEEE P802.3bj Task Force at its interim meeting, Victoria, BC, Canada 16 May 2013

Dear Mr. Trowbridge and members of ITU-T Study Group 15,

The IEEE P802.3bj Task Force is developing three new Physical Media Dependent (PMD) sub-layers for 100 Gb/s operation over 4-lane backplane and copper cable media, and specifying optional Energy Efficient Ethernet (EEE) operation over new and existing 40 Gb/s and 100 Gb/s electrical PMDs. We wish to call your attention to two new aspects that may affect the OTN mapping for 40 Gb/s and 100 Gb/s Ethernet interfaces:

- The three new PMDs use 256B/257B transcoding and a Reed-Solomon Forward Error Correcting code. This may require additional processing before mapping these PMDs transparently over OTN, which we understand is based on the mapping of Clause 82 PCS lanes as described in IEEE Std 802.3-2012. We call your attention to Figure 91-2 of the attached draft which illustrates the processing required for conversion between these PMD lane formats and Clause 82 PCS lanes.
- The optional EEE capability includes two modes of operation:
    - "Deep Sleep" is a mode applicable only to backplane and copper cable interfaces that involves turning off the transmitter during the quiet state. A periodic refresh signal and a link wake operation rely on a mechanism referred to as rapid alignment markers (RAMs). It is believed to be unlikely that this mode would work over a transparently mapped OTN signal due to the need for separate and cascaded lane alignment recovery at the OTN ingress and OTN egress which is unlikely to meet required wake times.
    - "Fast Wake" is a mode which will be supported by all EEE-capable backplane and copper cable interfaces at rates of 40 Gb/s and 100 Gb/s, and may be supported by future EEE-capable optical interfaces being specified by the IEEE P802.3bm task force. This mode does not turn off the transmitter during the quiet period, and involves sending repeated Low Power Idle (LPI) control

[1] This document solely represents the views of the IEEE P802.3bj Task Force, and does not necessarily represent a position of the IEEE, the IEEE Standards Association, IEEE 802 or the IEEE 802.3 Working Group.

characters while maintaining 66-bit framing and lane alignment. It is hoped that this mode could be used over a transparently mapped 40 Gb/s or 100 Gb/s Ethernet signal over OTN.

There are two mechanisms used to negotiate EEE capabilities and exchange relevant EEE parameters between link partners: Auto-negotiation (AN) is used to indicate Deep-Sleep and Fast-Wake capability across a backplane or copper cable PHY, and additional capability and parameter exchange is performed using Link Layer Discovery Protocol (LLDP) TLVs above the MAC sublayer. Assuming we are correct in our assessment that the Deep-Sleep mode of operation should not be used across OTN, we suggest that any backplane or electrical cable PMD at 40 Gb/s or 100 Gb/s that is transparently mapped over OTN should not advertise capability via AN for either the Deep-Sleep or Fast-Wake mode of operation from an Ethernet interface on the OTN equipment. Note that exchange of LLDP TLVs above the MAC may override the results of AN by agreeing to use the Fast-Wake mode of operation only when both link partners are capable. So this approach should ensure that Fast-Wake will only be used if the Ethernet equipment at the OTN ingress and egress are both capable of the Fast-Wake mode of EEE operation.

The current draft of IEEE P802.3bj is attached for your reference and to allow you begin developing any necessary extensions to the OTN mapping. Please note that the attached draft is work in progress and subject to revision based on subsequent ballots. We understand that this draft will be made available only to ITU-T Study Group 15 membership.

Sincerely,

Adam Healey
Chair, IEEE P802.3bj 100 Gb/s Backplane and Copper Cable Task Force
Attachment: P802.3bj D2.1 (watermarked)