

Electrical Interface Ad-hoc Meeting

IEEE P802.3bs 400Gb/s Ethernet Task Force
9 Oct 2014 Version r1

Opening

The stated charter is: Work on technical proposals related to the 400GbE Electrical Interfaces.

Any changes to the meeting minutes from the last meeting 12 Sept 2014?

Participants, Patents, and Duty to Inform

All participants in this meeting have certain obligations under the IEEE-SA Patent Policy.

- **Participants [Note: Quoted text excerpted from IEEE-SA Standards Board Bylaws subclause 6.2]:**
 - **“Shall inform the IEEE (or cause the IEEE to be informed)” of the identity of each “holder of any potential Essential Patent Claims of which they are personally aware” if the claims are owned or controlled by the participant or the entity the participant is from, employed by, or otherwise represents**
 - **“Personal awareness” means that the participant “is personally aware that the holder may have a potential Essential Patent Claim,” even if the participant is not personally aware of the specific patents or patent claims**
 - **“Should inform the IEEE (or cause the IEEE to be informed)” of the identity of “any other holders of such potential Essential Patent Claims” (that is, third parties that are not affiliated with the participant, with the participant’s employer, or with anyone else that the participant is from or otherwise represents)**
- **The above does not apply if the patent claim is already the subject of an Accepted Letter of Assurance that applies to the proposed standard(s) under consideration by this group**
- **Early identification of holders of potential Essential Patent Claims is strongly encouraged**
- **No duty to perform a patent search**

Patent Related Links

All participants should be familiar with their obligations under the IEEE-SA Policies & Procedures for standards development.

Patent Policy is stated in these sources:

IEEE-SA Standards Boards Bylaws

<http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6>

IEEE-SA Standards Board Operations Manual

<http://standards.ieee.org/develop/policies/opman/sect6.html#6.3>

Material about the patent policy is available at

<http://standards.ieee.org/about/sasb/patcom/materials.html>

If you have questions, contact the IEEE-SA Standards Board Patent Committee Administrator at patcom@ieee.org or visit <http://standards.ieee.org/about/sasb/patcom/index.html>

This slide set is available at <https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.ppt>

IEEE P802.3bs 400Gb/s Electrical Interface Ad-hoc – 9 Oct Conference Call

Call for Potentially Essential Patents

- If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance:
 - Either speak up now or
 - Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible or
 - Cause an LOA to be submitted

Other Guidelines for IEEE WG Meetings

- **All IEEE-SA standards meetings shall be conducted in compliance with all applicable laws, including antitrust and competition laws.**
 - **Don't discuss the interpretation, validity, or essentiality of patents/patent claims.**
 - **Don't discuss specific license rates, terms, or conditions.**
 - Relative costs, including licensing costs of essential patent claims, of different technical approaches may be discussed in standards development meetings.
 - Technical considerations remain primary focus
 - **Don't discuss or engage in the fixing of product prices, allocation of customers, or division of sales markets.**
 - **Don't discuss the status or substance of ongoing or threatened litigation.**
 - **Don't be silent if inappropriate topics are discussed ... do formally object.**

See *IEEE-SA Standards Board Operations Manual*, clause 5.3.10 and “Promoting Competition and Innovation: What You Need to Know about the IEEE Standards Association’s Antitrust and Competition Policy” for more details.

IEEE P802.3bs Electrical Interface Ad-hoc Meeting

Build Consensus towards a presentation or adoption covering interface type, rate, modulation, and loss – we need proposals

Offer lots of constructive comments to converge quickly

Please mute your phone

Request Presentation Time Often

There are some things discussed that are outside the scope of the project, but are necessary to complete the system level discussion and drive the best Electrical Interface possible. Please clearly identify those parts in your discussions and contributions.

The Process Steps

The following simplified process steps are used to build consensus:

- Defining / Discussing Reach
- System Architecture
- Channel Loss – WE ARE HERE
- Modulation
- Equalization
- Error Correction
- Power

From Sept 2014 Unapproved Minutes

Motion 4 (as modified by motion #5):

Move to adopt 16 x 25Gb/s and 8 x 50Gb/s as the basis for the lane rates for any optional C2C and C2M electrical interfaces

- - M: J. Goergen
- - S: V. Parthasarathy
- - Technical ($\geq 75\%$),
- - Y:102 ,N:0 ,A:4

Motion #6:

Move to adopt the P802.3bm C2C and C2M specifications with current values (except that the BER requirement is TBD) as a baseline draft for the 16 x 25Gb/s electrical interfaces

- - M: J. Goergen
- - S: V. Parthasarathy
- - Technical ($\geq 75\%$),
- - Y:78 ,N:0 ,A:18

Confirming Action Item from Sept 2014 Meeting

Length, Loss & Application: Technologies for 50Gb/s

These Values are under discussion

Application	Length	Loss	Modulation	pJ/bit	DFE?	FEC?
C2EO (XSR)	< 2in	<4dB@14GHz	PAM-4	TBD	TBD	TBD
		<8dB@28GHz	NRZ	TBD	TBD	TBD
C2M (VSR)	2-8in	4-10dB@14GHz	PAM-4	TBD	TBD	TBD
		8-20dB@28GHz	NRZ	TBD	TBD	TBD
C2C (MR)	8-20in	10-20dB@14GHz	PAM-4	TBD	TBD	TBD
		20-40dB@28GHz	NRZ	TBD	TBD	TBD

Knowing the reach definition allows us to begin understanding the next steps in the consensus building process

- System Architecture
- Channel Loss
- Modulation
- Equalization
- Error Correction
- Power

Next Steps to Nov 2014 IEEE Meeting

Yes – this slide is early but didn't want to miss

- Use the C2C and C2M channels submitted to the P802.3bs and provide a modulation scheme.
- Reach consensus on which channel groupings (LR/MR-C2C/VSR-C2M/XSR/USR) make sense from power/performance tradeoffs based on simulations

Agenda

ADHOC Agenda

Joel Goergen – Cisco / Vasu Parthasarathy – Broadcom goergen_01_1014_elect

Medium Reach C2C Channel

Nathan Tracy – TE / Megha Shanbhag – TEshanbhag_02_1014_elect

VSR C2M Channels

Nathan Tracy – TE / Megha Shanbhag – TEshanbhag_01_1014_elect

Pondering 50Gb/s Channel Design

Richard Mellitz – Intel

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Thoughts on 50G C2M Channels

David Brown – Semtech

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Channels for 50G

Andrew Zambell – FCI

Zambell_01_1014_elect



Thank you!

From:

Vasu Parthasarathy

Beth Kochuparambil

Vivek Telang

Joel Goergen