Our Path Forward Optically

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IEEE P802.3bs 400 GbE Task Force

Ad Hoc Teleconference , June 4, 2014

Instructions for the WG Chair

The IEEE-SA strongly recommends that at each WG meeting the chair or a designee:

- **Show slides #1 through #4 of this presentation**
- **Advise the WG attendees that:**
  - The IEEE's patent policy is described in Clause 6 of the *IEEE-SA Standards Board Bylaws*;
  - Early identification of patent claims which may be essential for the use of standards under development is strongly encouraged;
  - There may be Essential Patent Claims of which the IEEE is not aware. Additionally, neither the IEEE, the WG, nor the WG chair can ensure the accuracy or completeness of any assurance or whether any such assurance is, in fact, of a Patent Claim that is essential for the use of the standard under development.

- **Instruct the WG Secretary to record in the minutes of the relevant WG meeting:**
  - That the foregoing information was provided and that slides 1 through 4 (and this slide 0, if applicable) were shown;
  - That the chair or designee provided an opportunity for participants to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) of which the participant is personally aware and that may be essential for the use of that standard
  - Any responses that were given, specifically the patent claim(s)/patent application claim(s) and/or the holder of the patent claim(s)/patent application claim(s) that were identified (if any) and by whom.

- The WG Chair shall ensure that a request is made to any identified holders of potential essential patent claim(s) to complete and submit a Letter of Assurance.
- It is recommended that the WG chair review the guidance in *IEEE-SA Standards Board Operations Manual* 6.3.5 and in FAQs 12 and 12a on inclusion of potential Essential Patent Claims by incorporation or by reference.

  Note: **WG** includes Working Groups, Task Groups, and other standards-developing committees with a PAR approved by the IEEE-SA Standards Board.

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(Optional to be shown)

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**

25 March 2008 (updated January 2012)

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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

25 March 2008 (updated January 2012)

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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

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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.

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Charting Our Path Forward

* Some consensus observed in May Straw Polls (next slide)
    * 500m could use parallel SMF fiber
    * 2km – duplex SMF fiber
    * 10km - duplex SMF fiber
* Optical Lane Rates – primary interest in 50G / 100G
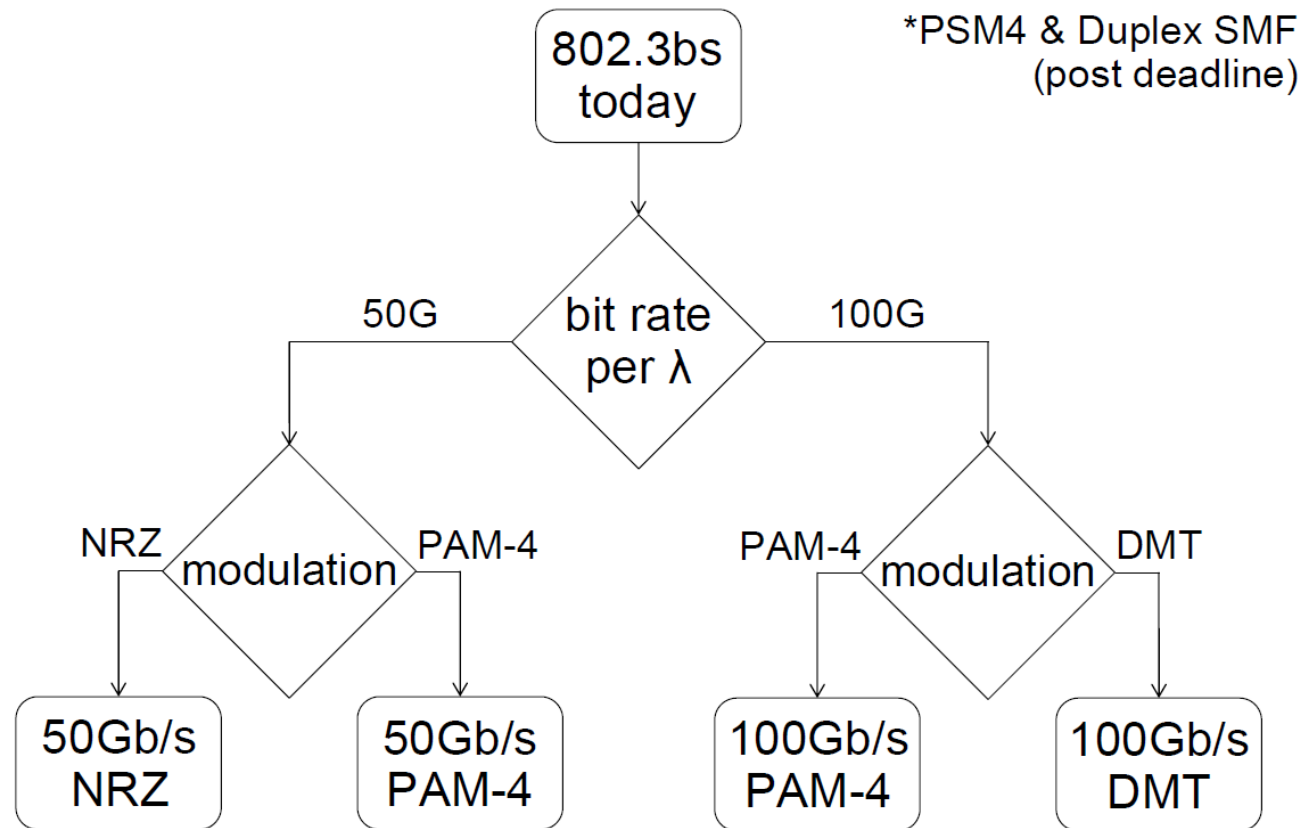* Modulation – Options available – how do we decide?

Straw Polls

4a	I believe that 2km 400GbE SMF PMD will use a duplex fiber solution	Y/N	70 / 6
4b	I believe that 10km 400GbE SMF PMD will use a duplex fiber solution	Y/N	85 / 0
5	Chicago Rules: For 2km duplex SMF 400GbE PMD, I believe the TF should select a proposal based on an effective bit rate per wavelength per direction of:	25G **50G** **100G** 400G	5 **51** **77** 10
6	Chicago Rules: For 10km duplex SMF 400GbE PMD, I believe the TF should select a proposal based on an effective bit rate per wavelength per direction of:	25G **50G** **100G** 400G	5 **53** **74** 11
7	I believe that a 500m SMF PMD could use parallel fiber solutions:	Y/N	77 / 0
8	Chicago Rules: I believe fiber count for a 500m SMF PMD parallel fiber link solution should be based on (in each direction):	4 fibers 8 fibers 16 fibers	82 28 16
9	Chicago Rules: I believe fiber count for a 100m MMF PMD using a parallel fiber link solution should be (in each direction)	4 fibers 8 fibers 16 fibers Room	29 33 62 118

A Proposed Approach (cole_3bs_01a_0514)

Appx.2: Proposed SMF PMD* Decision Tree

*PSM4 & Duplex SMF (post deadline)

A Good Summary (maki_3bs_01a_0514)

PMD and Media (Other Solutions Possible)

PMD	Media		
	Parallel MMF	**Parallel SMF**	**Duplex SMF**
MMF **(At least 100 m)**	4 x 100GBASE-SR4		
	400GBASE-SR16 (25G-λ: NRZ)		
	400GBASE-SR8 (50G-λ: NRZ or PAM-4)		
SMF **(At least 500 m)**		4 x 100GBASE-LR4	
		400GBASE-PSM16 (25G-λ: NRZ)	16-Ch 25G-λ WDM (NRZ)
		400GBASE-PSM8 (50G-λ: NRZ or PAM-4)	8-Ch 50G-λ WDM (NRZ or PAM-4)
		400GBASE-PSM4 (50G-λ: NRZ or PAM-4)	
		400GBASE-PSM4 (100G-λ: PAM-4 or DMT)	4-Ch 100G-λ WDM (PAM-4 or DMT)
SMF **(At least 2 km)**			8-Ch 50G-λ WDM (NRZ or PAM-4)
			4-Ch 100G-λ WDM (PAM-4 or DMT)
SMF **(At least 10 km)**			8-Ch 50G-λ WDM (NRZ or PAM-4)
			4-Ch 100G-λ WDM (PAM-4 or DMT)

7   IEEE P802.3bs 400GbE Task Force   Norfolk, VA, May 2014

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NETWORKS

Discussion

* Resolution of rate and modulation debates?
  * Ad hoc could "assess" technical & economic feasibility as starting point (similar to 802.3ba Optics ad hoc)
* Ad Hoc Options?
  * One to address all PMDs?
  * One to address MMF and one to address SMF?
* Would like to enable at least one teleconference prior to July for Ad Hoc Plan

* Thanks to Hugh Barrass, Cisco for hosting this webex