

# Logic Ad Hoc Report and Big Ticket Items

**IEEE P802.3bs 400 Gb/s Ethernet Task Force**

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# 400GbE Logic Report

- The stated charter is: **Work on technical proposals related to the 400GbE Architecture**
- Dates of future logic ad hoc meetings will be announced via the reflector
- The 400 Gb/s Ethernet Task Force Logic Ad Hoc held one meeting on February 17<sup>th</sup>
  - 1st one scheduled for February 3rd was cancelled for lack of presentations

# 400GbE Logic Ad Hoc Presentations (2/17)

- **Logic Big Ticket Items – Mark Gustlin**
- **Proposal for 400GbE FEC Architecture – Xinyuan Wang**

# PCS Big Ticket Items

- Slide 11 per gustlin\_3bs\_02 are work items
  - What FEC will be used, or even possibly multiple FECs
  - 4x100G vs. 1x400G FEC
  - What do AMs look like
  - Details of the scrambling process, exactly what is scrambled and how
  - What muxing is used for each PMA instance
  - ~~Details around EEE operation~~
    - Adopted EEE baseline in January
  
- PMD selections will influence the PCS and FEC
- Need burst error nature to select PCS and FEC
- Error model by PMD type?
  - See later slide

# FEC Big Ticket Items

- PMD selection impacts BERin requirements for the FEC
- Try to eliminate unacceptable FEC options (e.g. in wang\_x\_3bs\_01)
- 4x100G or 1x400G FEC striping
- Impact of overspeed on PMD error rates
  
- Status
  - At this point we are creating a logic structure around KP4 FEC, can adapt if needed as PMDs are chosen
  - Discussing 4x100G vs. 1x400G structure, no conclusions yet, some dependence on CDAUI-8 choices

# PMA Big Ticket Items

- PMD selection and electrical interfaces will impact Muxing scheme
- Status:
  - Have polled PMD and electrical interface proponents for error models, see later slide
  - Have had some discussions around the extra termination bits that are in the 100G KP4 PAM4 interface, consensus so far is that we do not need to add additional bits in the PMA given the loss budgets we are dealing with if PAM4 is chosen for the electrical interface

# PMA Continued

- So far at least, all PMD types are claiming random error models, so for these bit muxing should work fine
- Both C2C interface choices can have correlated errors
- Adopting the CDAUI-8 interface will let us focus on one problem and define the muxing strategy

# Error Models so Far

Distance	Name	Presentation	BERin	FEC Need*	Error Model for PMD?	Notes
C2M	CDAUI-16 NRZ 16x25G	li_3bs_01a_0714.pdf	1x10 <sup>-15</sup>	KR4	Random Errors	CTLE only
C2C	CDAUI-16 NRZ 16x25G	li_3bs_01a_0714.pdf	1x10 <sup>-15</sup>	KR4	Correlated errors	DFE
C2M	CDAUI-8 PAM4 8x50G	brown_3bs_01a_0115.pdf	1x10 <sup>-6</sup>	KR4	Random Errors? CTLE only	CTLE only
C2M	CDAUI-8 NRZ 8x50G	dawe_3bs_01_0115.pdf	1x10 <sup>-6</sup>	KR4	Correlated errors	1 tap DFE
C2C	CDAUI-8 PAM4 8x50G	li_3bs_01a_0115.pdf	1x10 <sup>-6</sup>	KR4	Correlated errors	DFE
C2C	CDAUI-8 NRZ 8x50G	dawe_3bs_01_0115.pdf	1x10 <sup>-6</sup>	KR4	Correlated errors	5 tap DFE
100m	SR16	king_3bs_02a_1114.pdf	5x10 <sup>-5</sup>	KR4	Random Errors (Jonathan)	
500m	PSM4 (4 fibers x 2λ X 50G NRZ)	cole_3bs_03a_1114.pdf	2x10 <sup>-4</sup>	KP4	Random Errors (Jonathan)	
500m	PSM4 (4 fibers x 2λ X 50G PAM4)	cole_3bs_04a_1114.pdf	2x10 <sup>-4</sup>	KP4	Random Errors (Jonathan)	
500m	PSM4 (4 fibers x 1λ X100G PAM-4)	welch_3bs_01_0115.pdf	2.1x10 <sup>-5</sup>	KR4	Random Errors (Brian)	
500m	PSM4 (4 fibers x 1λ X100G DMT)	lewis_3bs_01a_1114.pdf	3.3x10 <sup>-3</sup>	> KP4	BCH FEC in the module, so not a concern to the base PCS/XS	
2km	8λ x 50G NRZ	cole_3bs_01_0115.pdf	2x10 <sup>-4</sup>	KP4	Random Errors (Jonathan)	
2km	8λ x 50G NRZ	kojima_3bs_01_0115.pdf	2x10 <sup>-4</sup>	KP4	Random Errors (Jonathan)	
2km	8λ x 50G PAM4	cole_3bs_02_0115.pdf	2x10 <sup>-4</sup>	KP4	Random Errors (Jonathan)	
2km	4λ x 100G PAM4	lewis_3bs_01_0115.pdf	2.1x10 <sup>-4</sup>	KP4	Random Errors (Gary)	
2km	4λ x 100G DMT	lewis_3bs_01a_1114.pdf	3.3x10 <sup>-3</sup>	> KP4	BCH FEC in the module, so not a concern to the base PCS/XS	
10km	8λ x 50G NRZ	cole_3bs_01_0115.pdf	2x10 <sup>-4</sup>	KP4	Random Errors (Jonathan)	
10km	8λ x 50G NRZ	kojima_3bs_01_0115.pdf	2x10 <sup>-4</sup>	KP4	Random Errors (Jonathan)	
10km	8λ x 50G PAM4	cole_3bs_02_0115.pdf	2x10 <sup>-4</sup>	KP4	Random Errors (Jonathan)	
10km	4λ x 100G DMT	takahara_3bs_01_1114.pdf	3.3x10 <sup>-3</sup>	> KP4	BCH FEC in the module, so not a concern to the base PCS/XS	



**Thanks!**