

Baseline proposal for 1.6TAUI-16 using 100 Gbps/lane signaling

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v1p0

Contributors & Supporters

Contributors

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Adopted Physical Layer Objectives

This Presentation's Focus

Technology Reuse

Ethernet Rate	Assumed Signaling Rate	AUI	BP	Cu Cable	MMF 50m	MMF 100m	SMF 500m	SMF 2km	SMF 10km	SMF 40km
200 Gb/s	200 Gb/s	Over 1 lane		Over 1 pair			Over 1 Pair	Over 1 Pair		
400 Gb/s	200 Gb/s	Over 2 lanes		Over 2 pairs			Over 2 Pair			
800 Gb/s	100 Gb/s	Over 8 lanes	Over 8 lanes	Over 8 pairs	Over 8 pairs	Over 8 pairs	Over 8 pairs	Over 8 pairs		
	200 Gb/s	Over 4 lanes		Over 4 pairs			Over 4 pairs	1) Over 4 pairs 2) Over 4 λ 's		
	TBD								Over single SMF in each direction	Over single SMF in each direction
1.6 Tb/s	100 Gb/s	Over 16 lanes								
	200 Gb/s	Over 8 lanes		Over 8 pairs			Over 8 pairs	Over 8 pairs		

Leverage existing or work-in-progress 100 Gb/s per lane (e.g. 3cu, 3ck, 3db) to higher lane counts

Develop 200 Gb/s per lane electrical signaling for 1/2/4/8 lane variants of AUIs and electrical PMDs

Develop 200 Gb/s per optical fiber for 1/2/4/8 fiber based optical PMDs and 4 lambda WDM optical PMD

Potential for either direct detect and / or coherent signaling technology

Making it all work together

https://www.ieee802.org/3/B400G/public/21_1028/B400G_overview_c_211028.pdf

Key Points

- At the November 2022 Plenary, in the P802.3df Task Force:
 - Motion #3 adopted RS(544) as the FEC encoding for 200G/lane AUIs
 - https://www.ieee802.org/3/df/public/22_11/minutes_3df_2211_approved.pdf#page=16
 - Motion #4 adopted differential PAM4 signaling as the basis for all the 200 Gb/s per lane AUIs (C2M and C2C)
 - https://www.ieee802.org/3/df/public/22_11/minutes_3df_2211_approved.pdf#page=17
- The two motions above are anticipated to be reaffirmed by the P802.3dj Task Force
- The path for a sixteen-lane 1.6TAUI-16 is well defined now

Establishing the 1.6TAUI-16

- Although the 1.6T PCS has not been adopted yet, we know that due to the “over 16 lanes” objective, there will be a 16x100G version
- The adopted RS544 FEC encoding (implicitly including the same transcoding used in previous PCSs) determines the overhead precisely, and based on having 16 physical lanes, the data rate is 106.25 Gb/s per physical lane
- The differential PAM4 signaling determines the signaling rate of 53.125 GBd, per-lane identical to 800GAUI-8
- The per-lane electrical characteristics of 1.6TAUI-16 can thus be based on 800GAUI-8
- Based on the electrical characteristics, the BER limit can be identical to that of 800GAUI-8

1.6TAUI-16 (16x100) - AUI

- AUI C2M
 - Align to the latest version of 800GAUI-8 from IEEE P802.3df Annex 120G
 - With editorial license, create text, figures and tables to reflect 1.6TAUI-16 C2M (n=16, where applicable). Update footnotes on Tables if needed
- AUI C2C
 - Align to the latest version of 800GAUI-8 from IEEE P802.3df Annex 120F
 - With editorial license, create text, figures and tables to reflect 1.6TAUI-16 C2C (n=16, where applicable). Update footnotes on Tables if needed

Proposed Straw Poll

- I support adopting lusted_3dj_01_2301xx.pdf slide 6 as the baseline for the 16-lane 1.6TAUI-16 C2M and C2C
- Y, N, A

- Possible motion to follow, pending straw poll results

Thanks!