Comment on Clause 68.2

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Comment

- Unlike other optical PMDs, LRM is signal processing intensive, and should allow more latency to widen the implementation space available to vendors
  - The current delay limit (512 bit times, roughly 50 nsec) overconstrains solutions, excluding potential solution implementations
  - While most solutions today are analog, designers will want the flexibility of going to digital designs in the future, which will likely require more latency for pipelining and parallelism
  - In light of current performance challenges, room should be left in standard to explore other solutions that can improve performance
- Suggested Remedy: Propose changing PMA plus PMD delay limit from 512 bits to 6656 bits
  - Specific change: Change Clause 68.2 "not more than 512 bit times, or 1 pause_quanta" to "not more than 6656 bit times, or 13 pause_quanta"

Background & Context

- Background
  - Clause 68.2 limits PMA plus PMD delay to 512 bits (roughly 50 nsec)
  - 10GBASE-R PCS delay is limited to 3584 bit times
  - New proposed limit of 6656 bit times allows maximum delay for the PCS/PMA/PMD of 10240 bit periods (roughly 1 microsecond)
- Context
  - 300m MMF has roughly 1.500 microsec delay
  - 10km SMF has roughly 50 microsec delay
    - Used with LX-4, LR, and supported by the same MAC implementations
  - 10GBASE-T draft currently has limit of 100,352 bit times (roughly 10 microsec) for PCS/PMA
    - Advocates of lower latency asked for 2 microsec

Delay values w/ Media

10GBASE-T	Approx bit times		Comment
PCS-PMA		100352	
MDI		5000	100 meters
		105352	
10GBASE-X			
PCS-PMA	2048		
PMD	512		
MDI	15000	500000	300m LX4, 10 km LX4
	17560	**500000**	
10GBASE-R			
PCS	3584		
PMA-PMD	512		
MDI	15000	500000	300m SR, 10 km LR
	19096	**500000**	
10GBASE-LRM			
PCS		3584	
PMA-PMD		6656	**Proposed**
MDI		15000	300 m
		25240	