

IEEE 802.3
100GbE
Beyond 10km Optical PHYs
Call For Interest

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CFI Request

The ongoing growth in network bandwidths continues to push in all application areas. Like core networks, distribution, metro and mobile networks require higher interface speeds in order to keep up with bandwidth requirements.

Many of these networks are also migrating to Ethernet solutions in an effort to minimize cost and maximize architecture and deployment flexibility. Applications such as cable/MSO, Service Provider metro and mobile backhaul all require solutions for reaches greater than 10km over single-mode fiber.

Newly adopted Ethernet technologies such as forward error correction, higher speed electrical SERDES or higher speed optical modulation offer the potential to be leveraged for new solutions or lower cost solutions compared to the existing solutions available today.

It is requested that 802.3 form a study group to investigate potential 100 Gb/s Ethernet solutions for beyond 10km SMF reaches to address these application spaces.

Background

It is expected that, if successful, this CFI will expand the scope of the current “Beyond 10km Optical PHYs for 50 Gb/s, 200 Gb/s, and 400 Gb/s Ethernet” (B10k) Study Group (<http://www.ieee802.org/3/B10K/index.html>)

A straw poll will be requested in the B10k study group this week to assess support from those participants to accept the increased scope if the CFI is successful.

Until then, we can only state we are requesting a new Study Group

We anticipate that this would result in an expanded scope of: “Beyond 10km Optical PHYs for 50 Gb/s, **100 Gb/s**, 200 Gb/s, and 400 Gb/s Ethernet”

This CFI is focused only on the inclusion of the additional data rate into the B10k discussions

Therefore technology feasibility is discussed, but technology choices and trade-offs remain the domain of the Study Group, not the CFI

Overview: Motivation

Applications have been identified that are looking for new Ethernet SMF optical solutions at reaches greater than 10 km at 100 Gb/s

- Cable/MSO distribution networks
- Mobile backhaul aggregation networks

The existing “Beyond 10km Optical PHYs” Study Group has significant participation and energy around the already identified market applications @ 50 Gb/s, 200 Gb/s and 400 Gb/s.

This CFI’s aim is to include 100 Gb/s into that effort

Today's Point-to-Point SMF Ethernet Family

	Lanes	500m	2km	10km	20km	40km	Up to 80km
1000BASE-	1		LX	LX10 / LH		EX	ZX
10GBASE-	1			LR		ER	ZR
25GBASE-	1			LR		ER	
40GBASE-	4	PSM4		LR4		ER4	
	1		FR				
50GBASE-	1		FR	LR	[Addressed in Beyond 10km Study Group]		
100GBASE-	10		10X10				
	4	PSM4	CWDM4 / CLR4	LR4 / WDM4-10	WDM4-20	ER4 / WDM4-40	[Longer Reach Opportunity]
	<4	DR			[Addressed in Beyond 10km Study Group]		
200GBASE-	4		FR4	LR4	[Addressed in Beyond 10km Study Group]		
400GBASE-	8		FR8	LR8	[Addressed in Beyond 10km Study Group]		
	4	DR4			[Addressed in Beyond 10km Study Group]		
	1				[Addressed in Beyond 10km Study Group]		

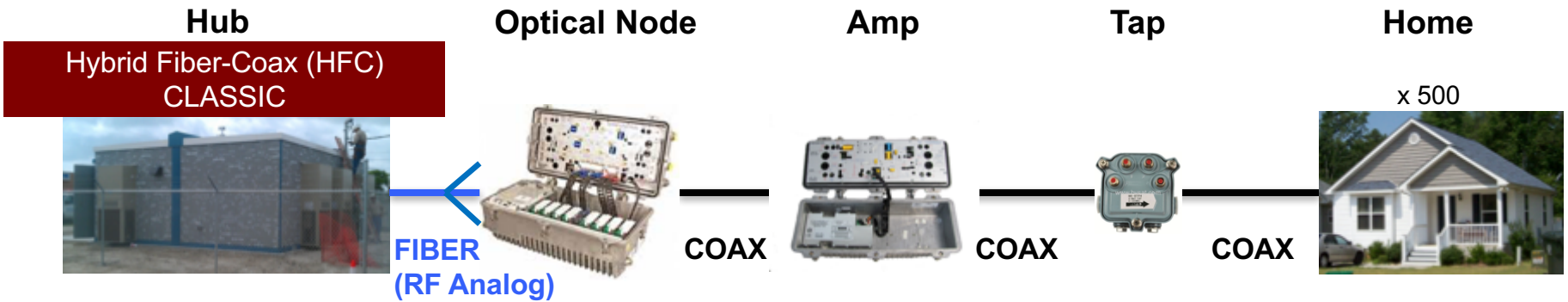
Lane width Opportunity

Longer Reach Opportunity

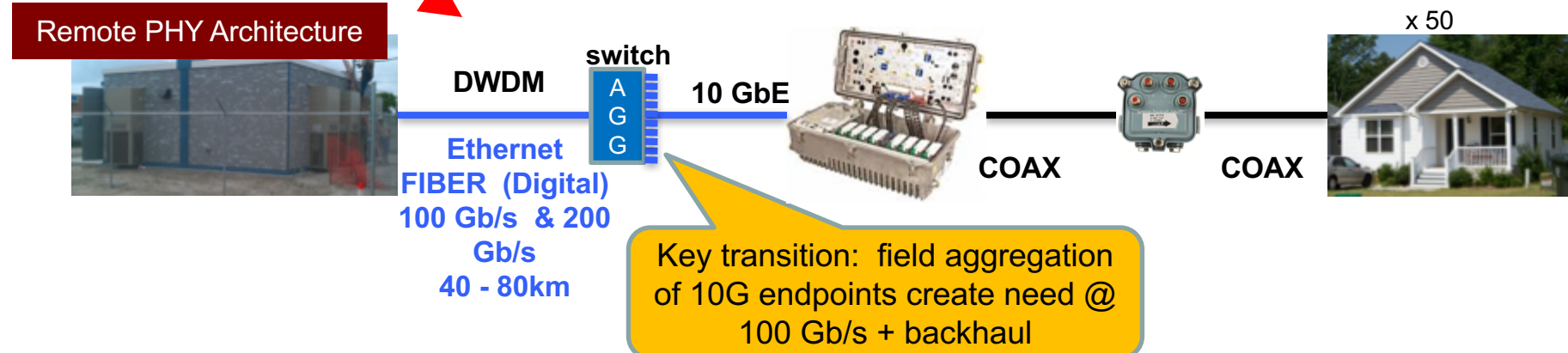
Black Text IEEE Standard
 Red Text In Standardization
 Blue Text Non-IEEE standard but complies to IEEE electrical interfaces

[Dashed Box] Addressed in Beyond 10km Study Group

Example: Cable/MSO Migration Strategy



Driven by the requirement to support higher bandwidths and more endpoints the Cable market is undergoing an architecture migration. Analog optical distribution links are moving to digital @ 100 Gb/s and above to facilitate distribution to 10 Gb/s endpoints. Note, endpoint usage is <10Gbps initially with capacity for growth over lifetime.



Why Now?

- Opportunity to align with the Beyond 10km Study Group effort underway for 50GbE, 200GbE, and 400GbE
- Existing 100 GbE solution for 40km (100GBASE-ER4) does not fully address the market
 - No solution for up to 80km nor compatible with a DWDM deployment
 - Newer technologies available to potentially cost reduce even 40 km solution
- New markets with 100 GbE focus – example MSO
- Numerous applications for > 10km Optical PHYs
 - Everywhere - \approx 3M units shipped annually addressing 40+km
 - Not same volumes as Data Center – but relevant to overall ecosystem
 - 100 GbE is the latest rate growing into this space

Logistics

An overview presentation session will be given to support consensus building:

Date - Tuesday, Nov 10th

Time – 6:45pm

Location – Grand Sierra D

CFI Presentation:

http://www.ieee802.org/3/cfi/1117_2/CFI_02_1117.pdf

Request to form Study Group will occur during closing 802.3 WG Plenary on Thursday

Questions?

Thank you!