

802.3 SMF PMD Nomenclature Proposal with Application to 400GBASE-LR4

P802.3cu 100 Gb/s and 400 Gb/s over SMF at
100 Gb/s per Wavelength Task Force Ad Hoc

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Introduction

- 802.3cu adopted 6km 400GBASE-LR4 PMD baseline
- 802.3cn considered a 30km 400GBASE-ER4 PMD spec.
- Creating a new letter for every new reach is unmanageable
- Single letter has never meant a single reach in any standard
http://www.ieee802.org/3/cu/public/Sept19/cole_3cu_01b_0919.pdf#page=6
- Industry uses ad-hoc suffixes for non-standard reaches:
 - lite
 - extended
 - +
- There is a clear need for a nomenclature convention to differentiate between reaches within a PMD type
- Fortunately, this problem is solved by ITU-T and MSAs

ITU-T and MSA Reach Suffix Nomenclature

- ITU-T G.693 application code reaches
 - VSR600: 0.6km
 - VSR1000: 1.0km
 - VSR2000: 2.0km
 - Separately, there are 4, 6, 12, 16dB loss categories
- 4WDM MSA 100G specifications
 - 4WDM-10: 10km CWDM4
(vs. CWDM4 MSA 2km default)
 - 4WDM-20: 20km LWDM4
 - 4WDM-40: 40km LWDM4
 - Logo:



Nomenclature Proposal

- DR max reach: 999m
- FR max reach: 3km
- LR max reach: 20km
- ER max reach: 40km
- DR, FR, LR, ER -reach suffix examples:
 - DRn: 500m default, -500 not required, OK to use
 - DRn-300: 300m
 - FRn: 2km default, -2 not required, OK to use
 - FRn-1: 1km
 - LRn: 10km default, -10 not required, OK to use
 - LRn-6: 6km
 - ERn: 40m default, -40 not required, OK to use
 - ERn-30: 30km

Nomenclature Proposal Examples

■ 802.3cu:

- 400GBASE-LR4-6: 6km CWDM4

http://www.ieee802.org/3/cu/public/Sept19/cole_3cu_01b_0919.pdf#page=5

- 400GBASE-LR4-15: 15km LWDM4 (if feasible)

■ 802.3bs follow-on:

- 400GBASE-LR8-20: 20km LWDM8

http://www.ieee802.org/3/B10K/public/18_07/cole_b10k_01_0718.pdf

■ 802.3cn follow-on:

- 400GBASE-ER8-30: 30km LWDM8

http://www.ieee802.org/3/cn/public/tf_interim/19_0924/cole_3cn_01a_190924.pdf#page=14

http://www.ieee802.org/3/cn/public/19_05/chang_3cn_02_0519.pdf#page=7

Complete Nomenclature Proposal Example

- 400GBASE-PSM4.2 introduced in 802.3bs TF
http://www.ieee802.org/3/bs/public/14_05/cole_3bs_01a_0514.pdf#page=4
- 400GBASE-PSM4 eventually adopted by 802.3bs TF
http://www.ieee802.org/3/bs/public/14_05/cole_3bs_01a_0514.pdf#page=5
- 400GBASE-DR4 name adopted instead of MSA PSM4
- 400GBASE-SR4.2: 1st fiber.λ number suffix use in 802.3cm
- Future 802.3 800Gb/s Ethernet Project may use the fiber.λ suffix for 1st 4x 200Gb/s PSM4 PMD
 - 4x 100Gb/s λs CWDM2/fiber pair (i.e. PSM4.2 as above)
 - Leverages then mature 100Gb/s PAM4 technology
 - Avoids specifying 200Gb/s λs prematurely
 - 800GBASE-DR4.2: 500m PSM4 default reach
 - 800GBASE-DR4.2-300: 300m PSM4 reduced reach

802.3 SMF PMD Nomenclature Proposal

Thank You