Thoughts on Naming New PMDs for IEEE P802.3bj

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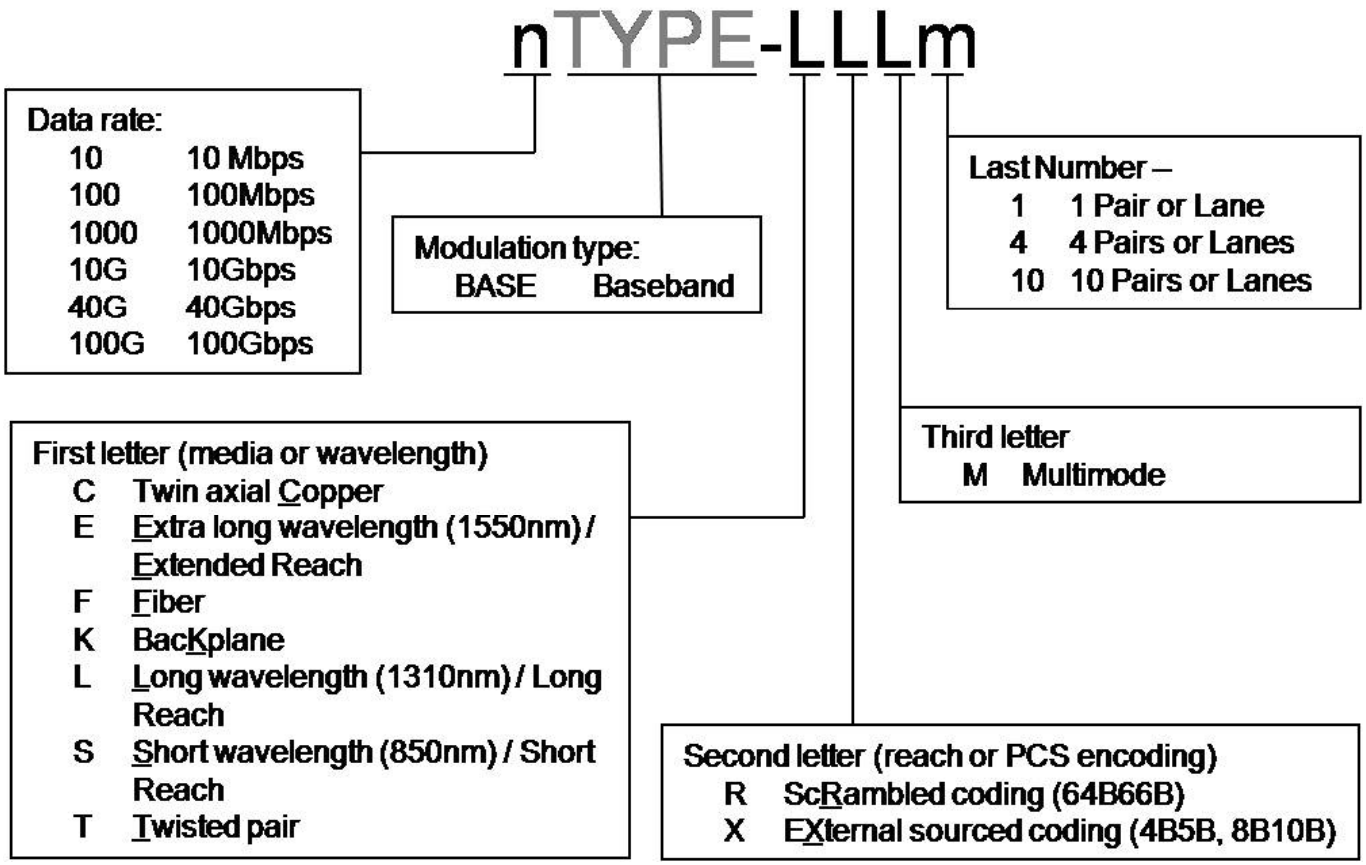
Introduction

- PMD naming is always fun…. NOT
- Observations
  - Per IEEE 802.3 –
    - The PMD strings have meaning
    - Individual letters don't have meaning
  - Efforts have been made in development of IEEE 802.3 to try and be consistent
  - But.. naming has evolved

Historical Perspective



- Based on Law - http://www.ieee802.org/3/ba/public/jul09/law_01_0709.pdf, as modified by D'Ambrosia, Kipp, Law

IEEE P802.3ba Nomenclature (Table 80-1)

Name	Description
40GBASE-KR4	40 Gb/s PHY using 40GBASE-R encoding over four lanes of an electrical backplane, with reach up to at least 1 m (See Clause 84)
40GBASE-CR4	40 Gb/s PHY using 40GBASE-R encoding over four lanes of shielded balanced copper cabling, with reach up to at least 7 m (See Clause 85)
40GBASE-SR4	40 Gb/s PHY using 40GBASE-R encoding over four lanes of multimode fiber, with reach up to at least 100 m (See Clause 86)
40GBASE-LR4	40 Gb/s PHY using 40GBASE-R encoding over four WDM lanes on single-mode fiber, with reach up to at least 10 km (See Clause 87)
100GBASE-CR10	100 Gb/s PHY using 100GBASE-R encoding over ten lanes of shielded balanced copper cabling, with reach up to at least 7 m (See Clause 85)
100GBASE-SR10	100 Gb/s PHY using 100GBASE-R encoding over ten lanes of multimode fiber, with reach up to at least 100 m (See Clause 86)
100GBASE-LR4	100 Gb/s PHY using 100GBASE-R encoding over four WDM lanes on single-mode fiber, with reach up to at least 10 km (See Clause 88)
100GBASE-ER4	100 Gb/s PHY using 100GBASE-R encoding over four WDM lanes on single-mode fiber, with reach up to at least 40 km (See Clause 88)

IEEE P802.3ba Nomenclature (Table 80-2)

Table 80–2—Nomenclature and clause correlation

Nomenclature	Clause[a]																				
	73	74	81			82		83		83A		83B		84	85		86		86A		87	88	
	Auto-Negotiation	BASE-R FEC	RS	XLGMII	CGMII	40GBASE-R PCS	100GBASE-R PCS	40GBASE-R PMA	100GBASE-R PMA	XLAUI	CAUI	XLAUI	CAUI	40GBASE-KR4 PMD	40GBASE-CR4 PMD	100GBASE-CR10 PMD	40GBASE-SR4 PMD	100GBASE-SR10 PMD	XLPPI	CPPI	40GBASE-LR4 PMD	100GBASE-LR4 PMD	100GBASE-ER4 PMD
40GBASE-KR4	M	O	M	O		M		M		O				M									
40GBASE-CR4	M	O	M	O		M		M		O					M								
40GBASE-SR4			M	O		M		M		O		O					M		O				
40GBASE-LR4			M	O		M		M		O		O							O		M		
100GBASE-CR10	M	O	M		O		M		M		O					M							
100GBASE-SR10			M		O		M		M		O		O					M		O			
100GBASE-LR4			M		O		M		M		O		O									M	
100GBASE-ER4			M		O		M		M		O		O										M

[a]O = Optional, M = Mandatory.

IEEE P802.3bj Nomenclature Needs

- Names for two new FEC sublayers
  - BASE-R FEC
  - #1 TBD: PAM-2 FEC
  - #2 TBD: PAM-4 FEC
- Name for new PAM-2 Backplane PMD
- Name for new PAM-4 Backplane PMD
- Name for new Cu Cable PMD

Suggestion #1

nTYPE-LLLm

- n : 100G
- Type: BASE
- L (1st letter)
  - “k”: backplane
  - “c”: copper cable
- L (2nd letter) : r
- L (3rd letter) : modulation
  - Leave blank: PAM-2
  - “m”: PAM-4
- m: 4 pairs

- Suggested PMD Names
  - 100GBASE-KR4
  - 100GBASE-KRM4
  - 100GBASE-CR4

Suggestion #2

nTYPE-LLm-x

- n: 100G
- Type: BASE
- L (1st letter)
  - “k”: backplane
  - “c”: copper cable
- L (2nd letter) : r
- m: 4
- x: number of signaling levels

- Suggested PMD Names
  - 100GBASE-KR4-4
  - 100GBASE-KR4-2
  - 100GBASE-CR4-2

- Question: But will we later create additional PHYs for the same application (i.e. rate, medium, lane count) with a different number of levels?
- Answer: Unlikely