400GbE Architecture Baseline Proposal

IEEE P802.3bs 400 Gb/s Ethernet Task Force

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TBD

Agenda

- Proposed 400G architecture

What Needs to be Supported in the Architecture?

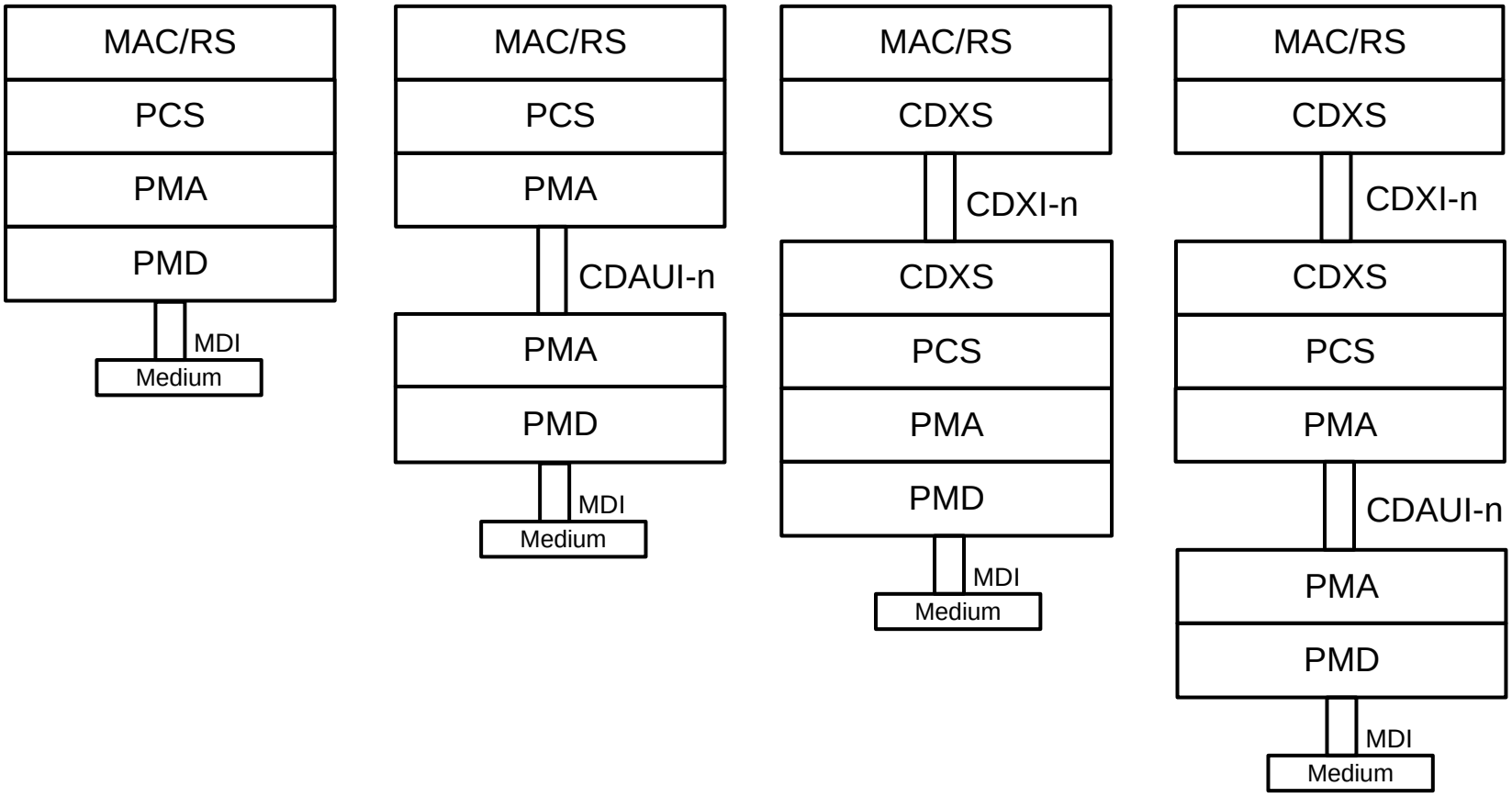
- The coding needs of the electrical interface may vary independently from the PMD interface
- The requirements for each interface can be different, both the FEC, modulation and number of lanes can change over time for each interface
- We need a single high level architecture which can support the evolving requirements of the interfaces over time
  - This does not mean it is requires a complicated implementation

Names & definitions

- … the naming of things

Item	Name Used Temporarily	Function/definition
Extender sublayer	CDXS	Extends xMII (recovers raw 400G datastream) – used whenever a different coding or FEC is required further out in the PHY. Includes line code, FEC & timing required for extender interface.
Extender interface	CDXI-n	Interface between two CDXS, may be various widths
PMA interface	CDAUI-n	Physical instantiation of PMA service interface (similar to CAUI)

A Possible 400G Architecture



The PCS can be unique for each PMD!
Though we strive for commonalty where possible

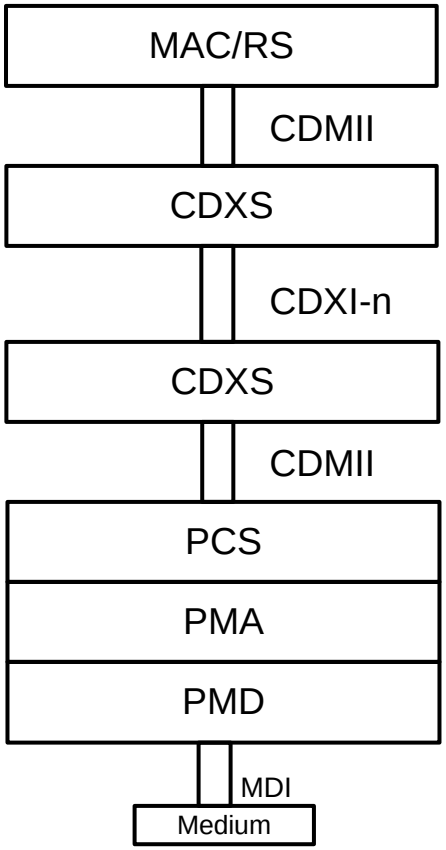
Sublayer Functions (at a high level)

Sublayer	10GbE	100GbE	400GbE (proposed)
MAC	Framing, addressing, error detection	Framing, addressing, error detection	Framing, addressing, error detection
Extender	PCS + PMA	N/A	PCS + PMA + FEC
PCS	Coding (8B/10B, 64B/66B), lane distribution, EEE	Coding (64B/66B), lane distribution, EEE	Coding, lane distribution, EEE, FEC
FEC	FEC, transcoding	FEC, transcoding, align and deskew	N/A?
PMA	Serialization, clock and data recovery	Muxing, clock and data recovery, HOM	Muxing, clock and data recovery, HOM??
PMD	Physical interface driver	Physical interface driver	Physical interface driver

Note that there are variations with a single speed, not all are captured in this table

A Possible 400G Architecture

- The interface between the CDXS and the MAC or PCS sublayer is always a CDMII



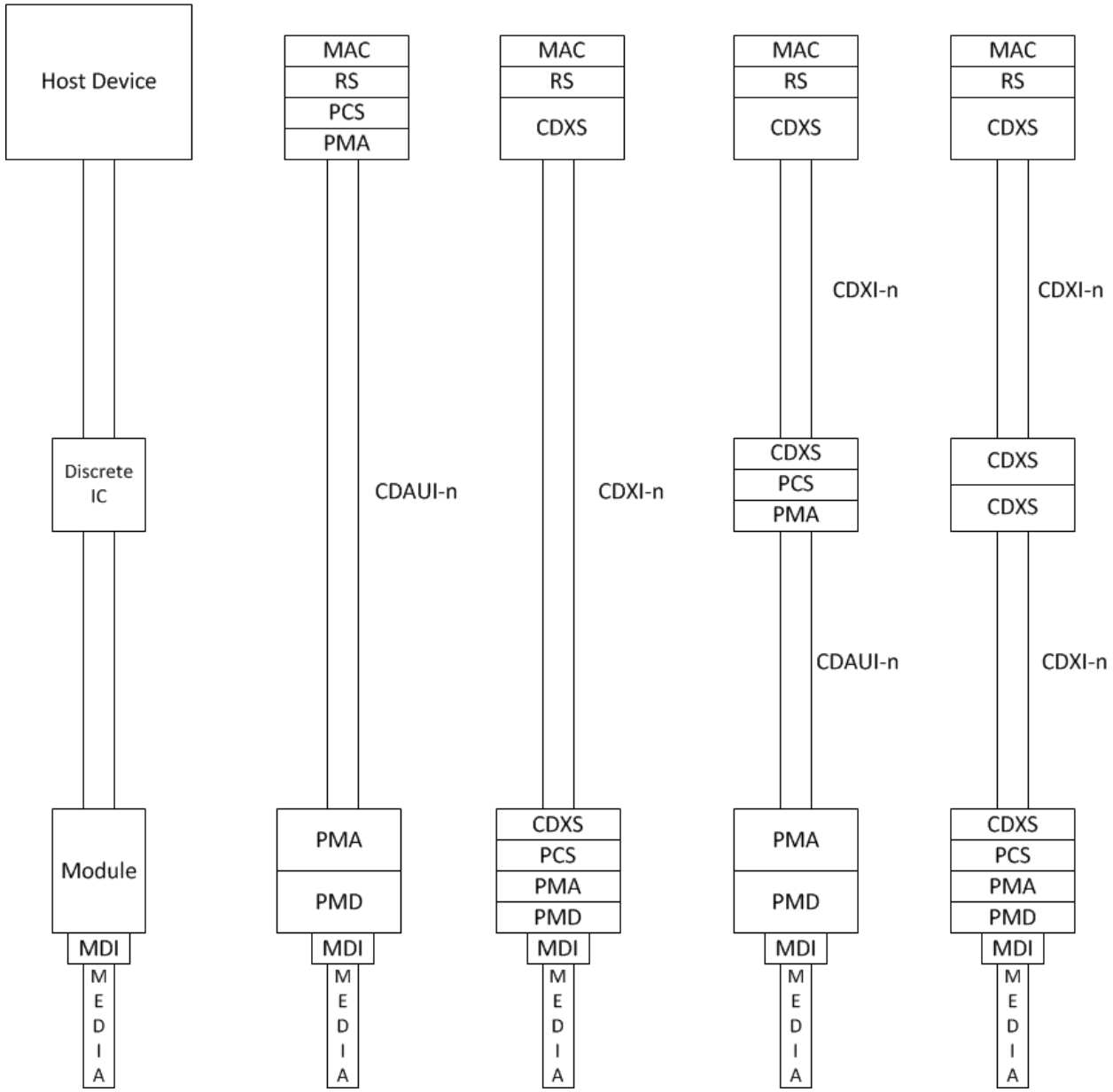
Line Encoding/FEC + PMA

Line Encoding/FEC + PMA

Line Encoding/FEC

Muxing, CDR, HOM

400GbE Example Implementations



Thanks!