

FEC Architecture Discussion

IEEE P802.3bs 400GbE Task Force
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Discussion

- From July 14 Plenary

- **Strawpoll #1: I support FEC for optical PMDs:**

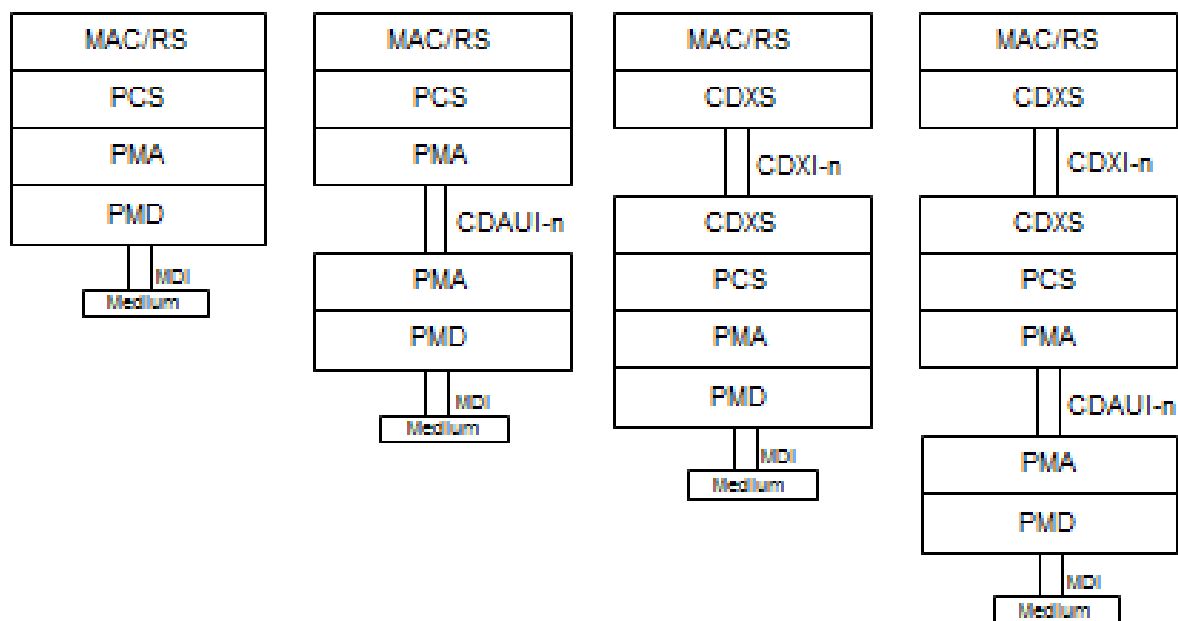
- a) FEC Mandatory 69
 - b) FEC optional 7
 - c) Some PMDs may not need FEC 0
 - d) Mandatory for some / optional for others 10
 - e) Need more information 10

- **Strawpoll #8: I support**

- a) Using end-to-end FEC wherever possible. 49
 - b) Using segment-by-segment FEC always. 6
 - c) Using encapsulated FEC's 2
 - d) Need additional information 40

gustlin_3bs_02_0714.pdf

A Possible 400G Architecture



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

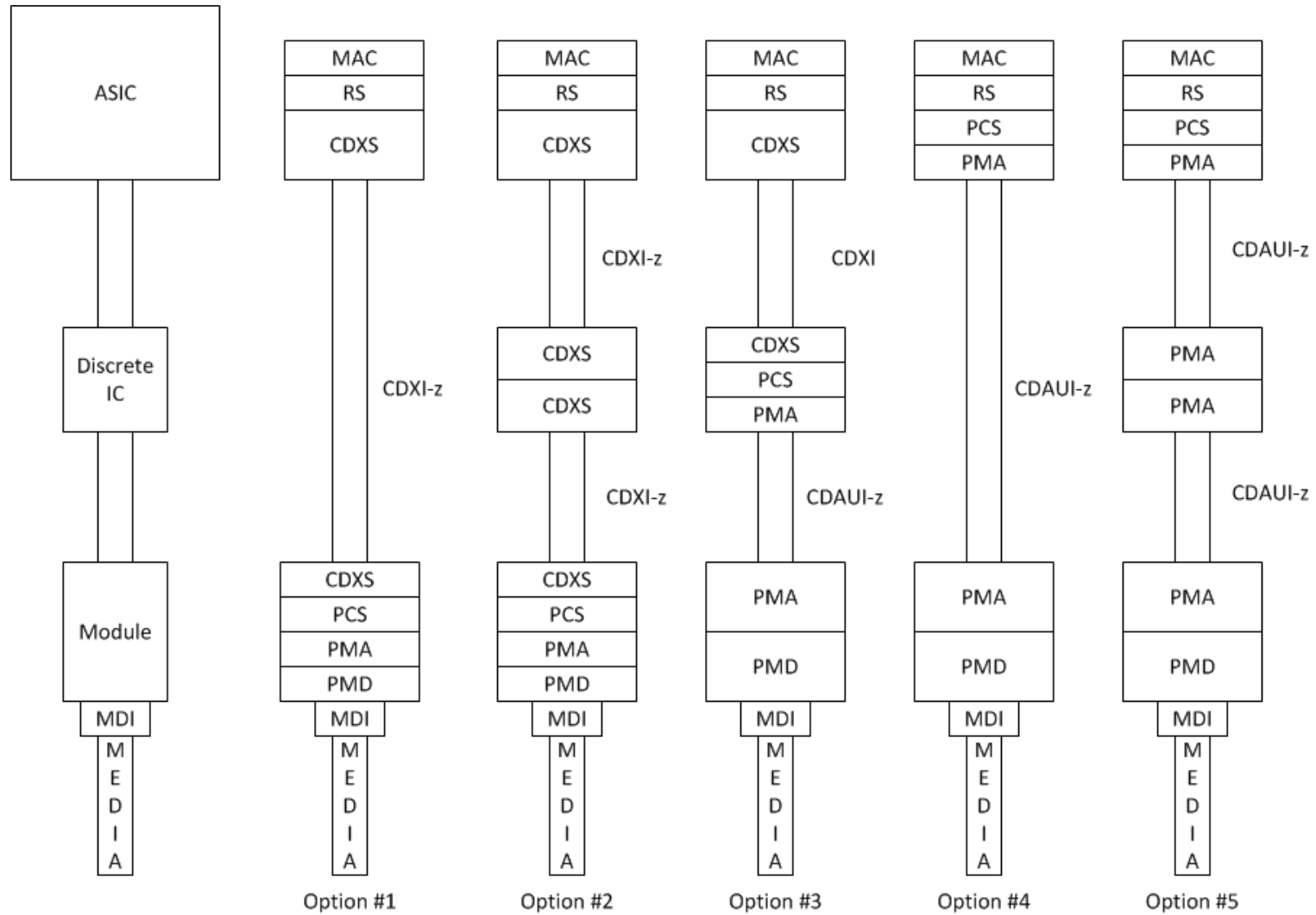
gustlin_3bs_02_0714.pdf

Names & definitions

► ... the naming of things

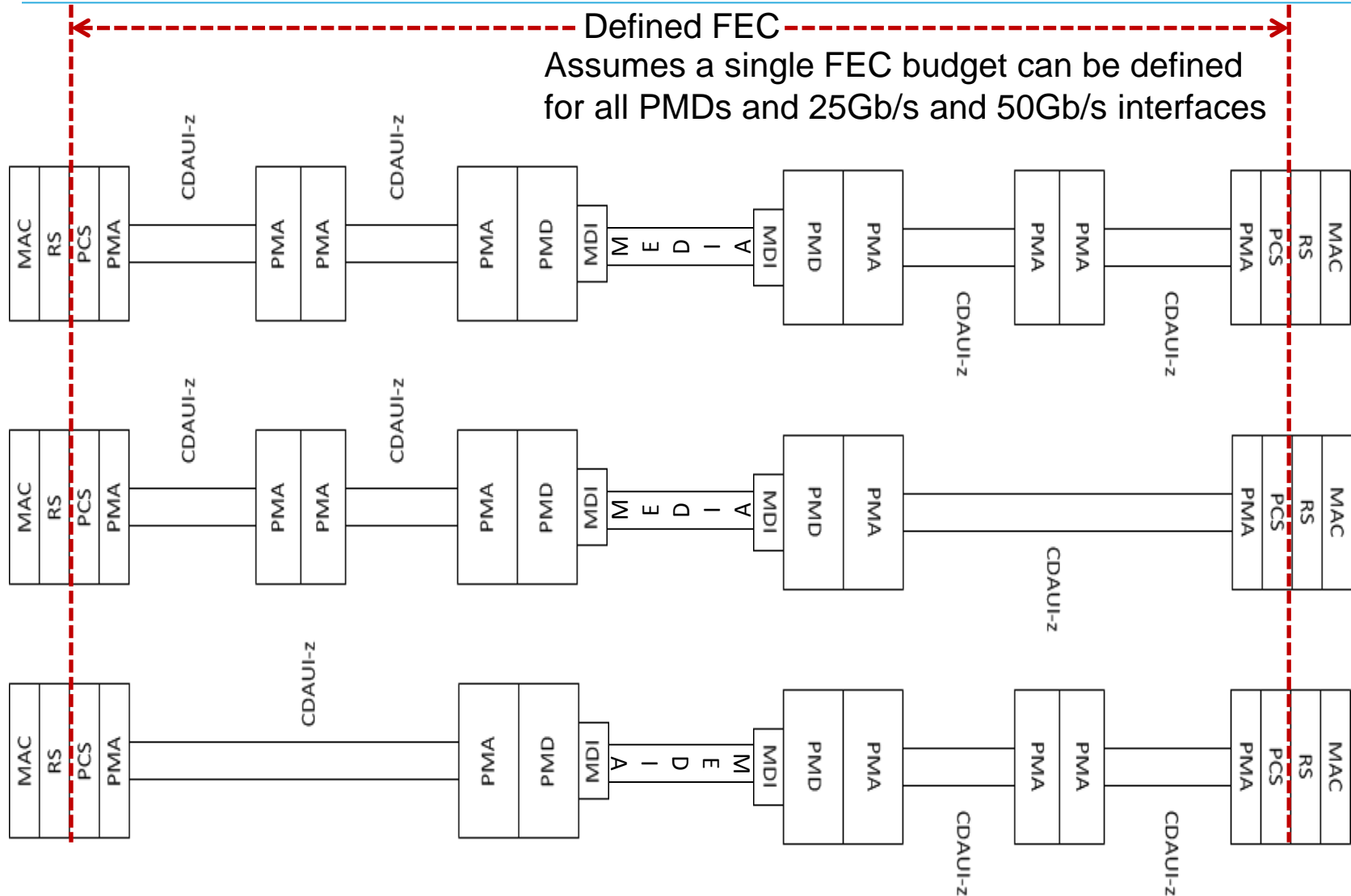
Item	Name Used Temporarily	Function/definition
Extender sublayer	CDXS	Extends xMII (recovers raw 400G datastream) – used whenever a different coding or FEC is required further out in the PHY. Includes line code, FEC & timing required for extender interface.
Extender interface	CDXI-n	Interface between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

Different Options



Note* - all options may not support all proposed solutions as shown.

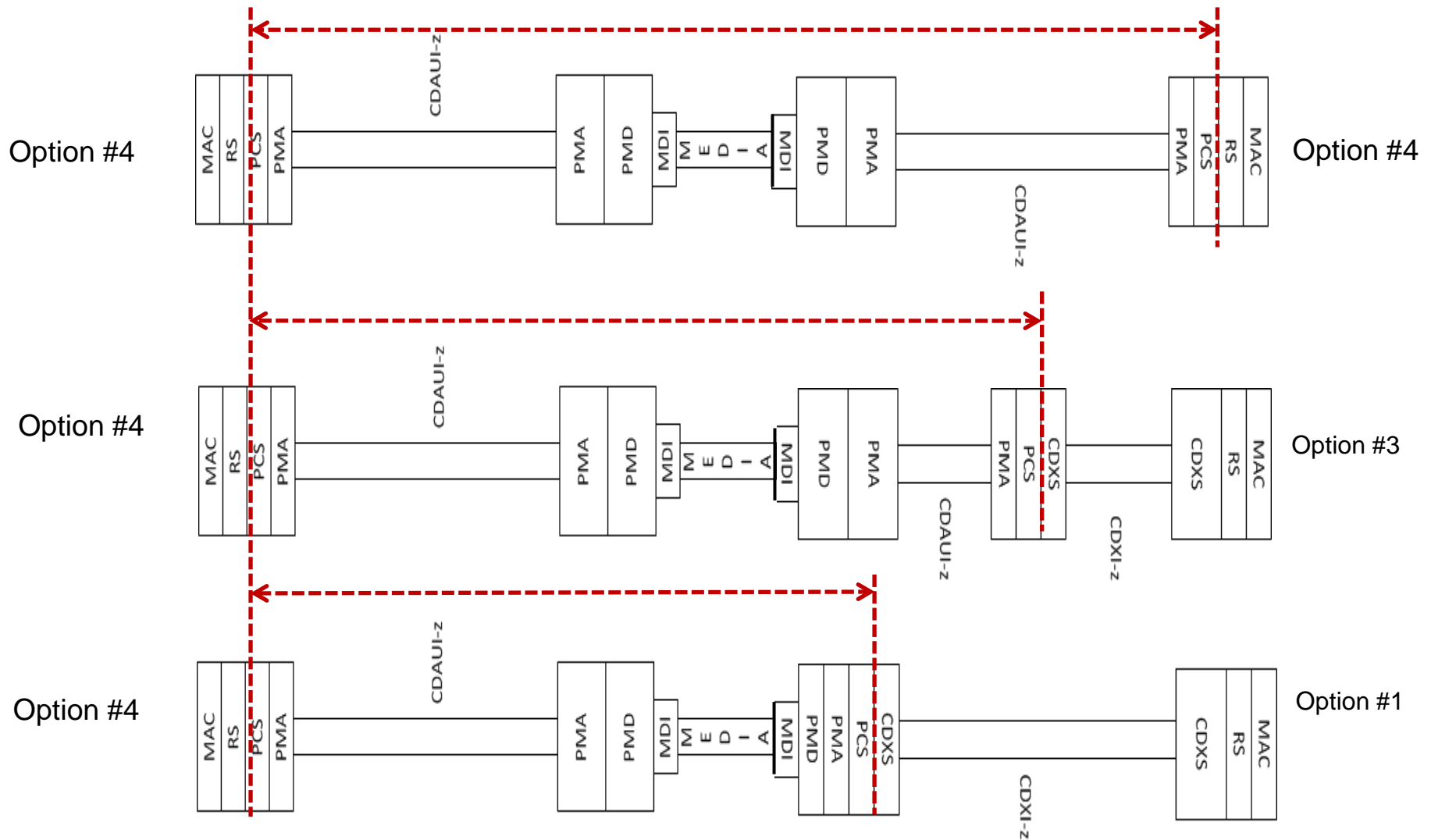
End-to-end FEC



Technology Evolution Needs Flexibility

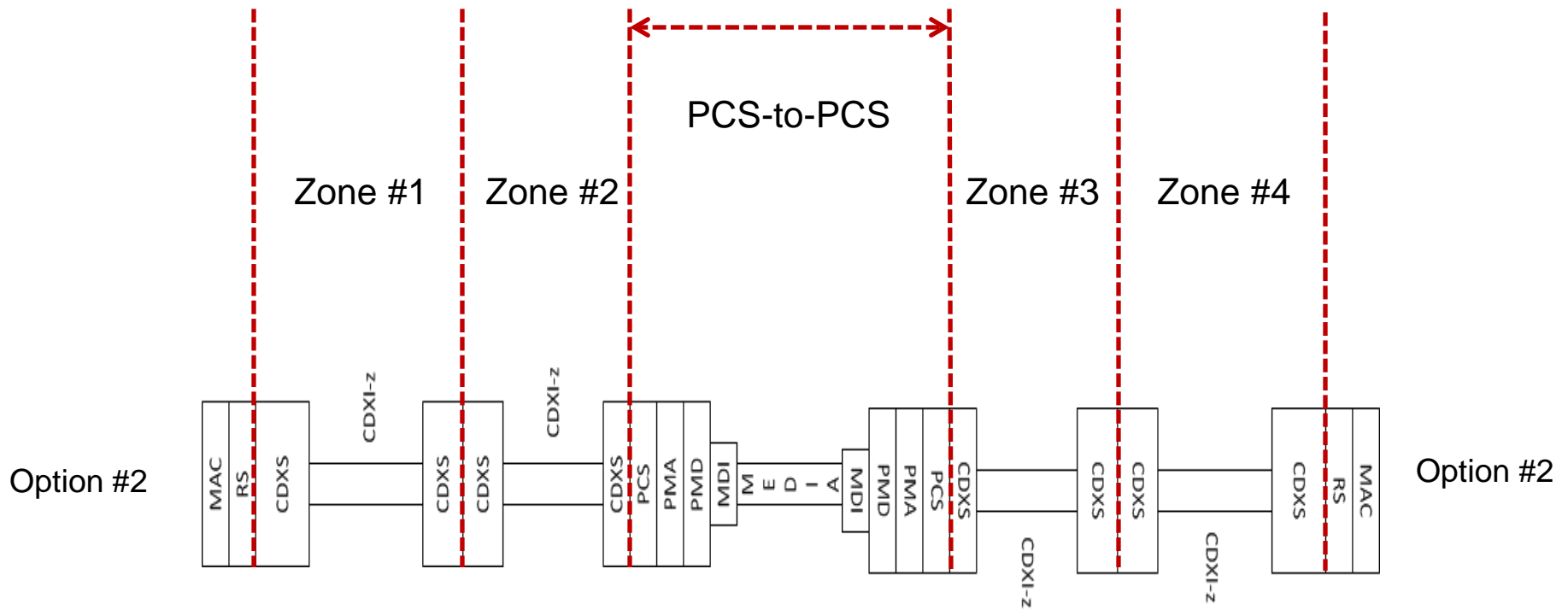
- Architecture needs to be flexible for future evolution
 - New PMD type that needs more coding gain
 - New electrical interface (>50Gb/s?) that can't meet some target (BER = 10^{-x})

Leveraging the Proposed Architecture



Note* - illustrates PCS-to-PCS moving, but not all configurations..

Maximum # of Coding Changes



Observations

- If we change thinking from “end-to-end” to “PCS-to-PCS” current architecture (gustlin_3bs_02_0714) works and provides flexibility for future
 - Development of new electrical interface speeds
 - Development of new PMDs needing more FEC
- CDXS can contain PCS, PMA and FEC functions by definition.
- CDXI / CDAUI lane implementations need to be same
- Need to review all potential option configurations.
- Consider addressing potential for varying latency at far-end card, which is dependent on implementation of far-card population.

Thank You!