PCS Clause Need to Document Separate and Integrated PCS

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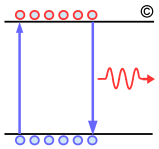

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IEEE 802.3cd Task Force Meeting

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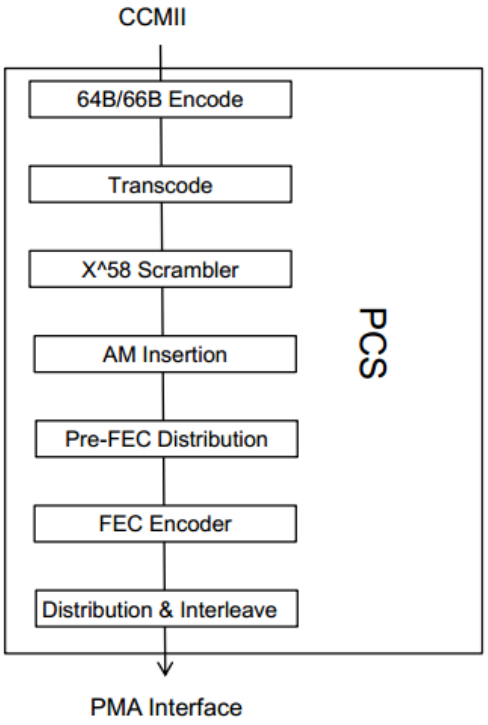
Background

- Baseline PCS/FEC proposal states
  - http://www.ieee802.org/3/cd/public/July16/nicholl_3cd_01a_0716.pdf
  - Re-use existing 100 GbE clause 82 PCS – no changed proposed
  - FEC based on 802.3bj RS(544,514) clause 91 – modify the AM to allow bit mux
- Baseline proposal shows the full clause 82 PCS with addition of RS(544,514) FEC block where each block could be separated by an AUI or MII – a valid use case
- A more common implementation will be integration of PCS with FEC where number of PCS blocks could be eliminated – also a valid use case
- Statement such as “clause 82 PCS with not change” and with addition of mandatory PICS could force the implementers keeping unnecessary blocks
- It would not be the first to document optional/informative material in 802.3!

Integrated PCS/FEC Architecture



PCS/FEC integrated architecture on Tx side, refer to 802.3bs logic baseline proposal

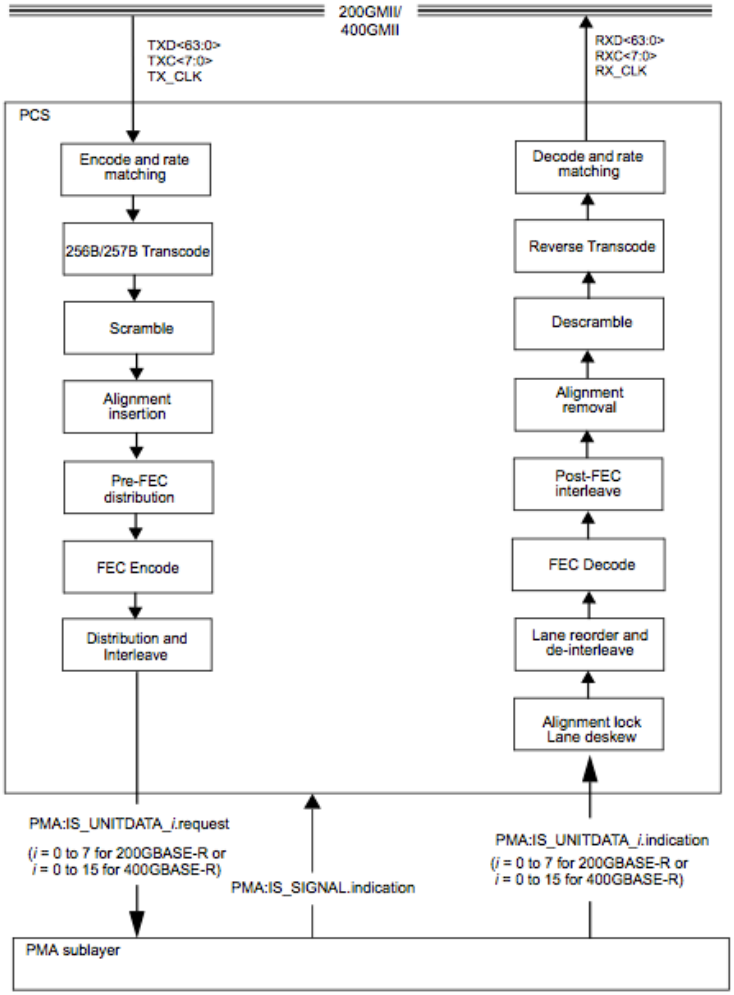


Figure 119–2—Functional block diagram

PCS/FEC integrated design, refer to 802.3bs D2.0

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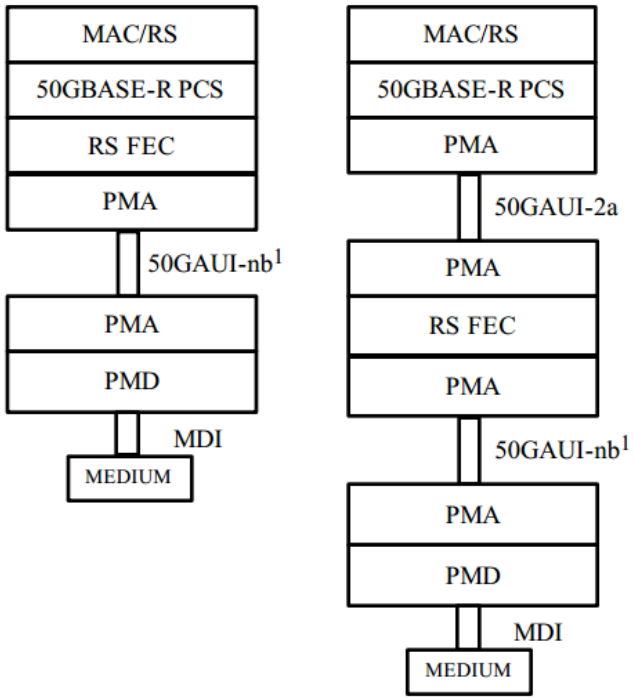
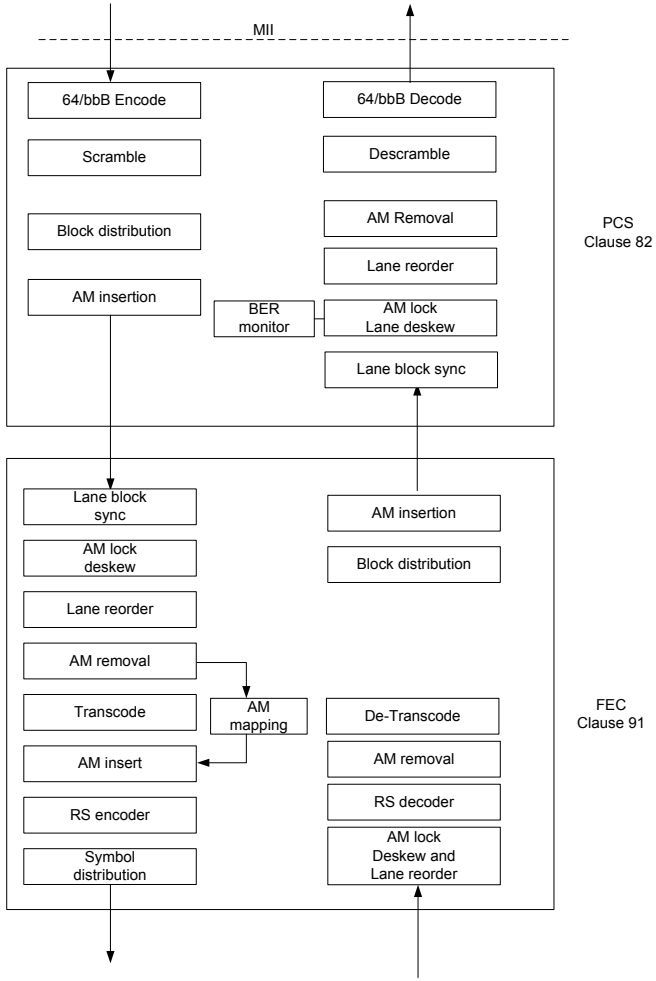
Separate PCS/FEC Architecture



Note 1: n = 1 or 2 lanes

PCS/FEC separate architecture , refer to 802.3cd baseline proposal



PCS/FEC separate architecture , for 802.3cd with redundant function blocks

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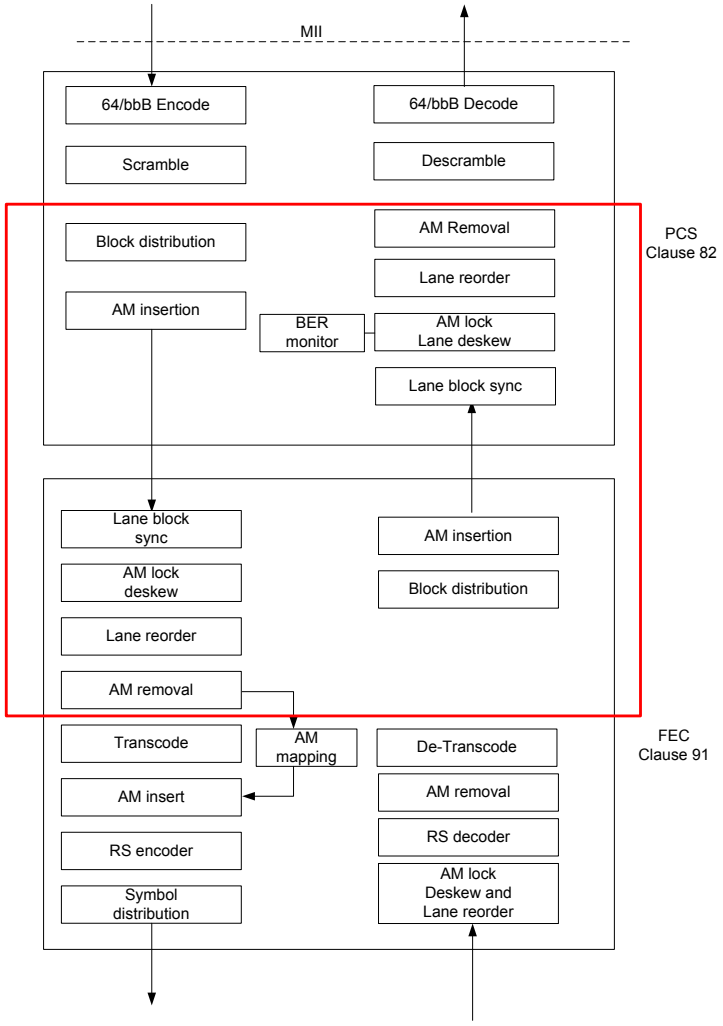
Optional PCS functions in integrated solutions

- As described in July meeting presentation , part of PCS/FEC function blocks are redundant in integrated PCS/ FEC architecture, like in 802.3bs.
  - *Marked in red rectangle.*
- Skipping these blocks in real implementation save power and latency, and thus preferable.
- This contribution aims to provide some options how to write the PCS clause when PCS and FEC are separated as well as when PCS and FEC are integrated.



Functional Blocks that can be skipped

Optional blocks on Tx / Rx for Integrated PCS/FEC
PCS block distribution
PCS AM insertion
PCS block sync
PCS AM deskew
PCS Lane reorder
PCS AM removal

These function blocks are symmetric on Tx and Rx side;
They are needed only when PCS and FEC are separate.

How to document optional PCS features in 802.3cd

- Simplest solution would be to add some general statement regarding optional blocks in integrated design
  - Without some clarifying text stating optional block it could end up to be very confusing with “mandatory” PICS
- It was stated during the meeting what matters is the output bit stream and not the implementation
  - The third option wound not to show any implementation just output bit stream which could also end up rather confusing
- A better alternative and less confusing is to show two diagrams each having their own PICS
  - PCS separated from the FEC
  - Integrated design of PCS+FEC (can also go into informative annex).

Thank you

Backup slide - Integrated PCS/FEC vs. Separate PCS/FEC

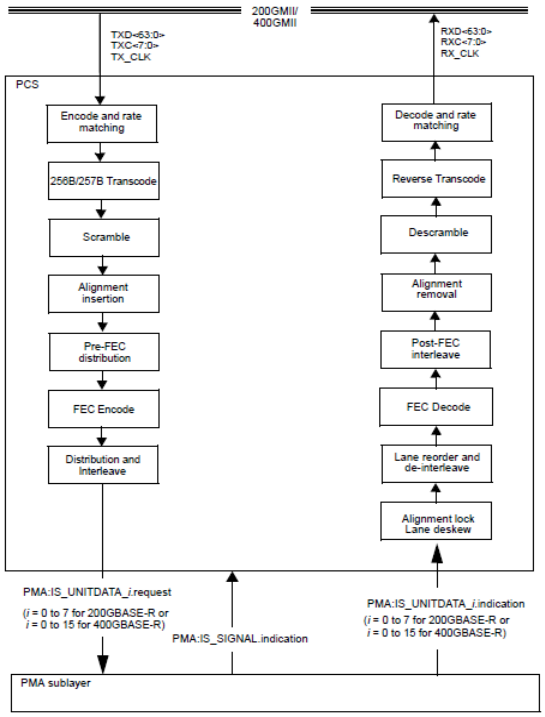
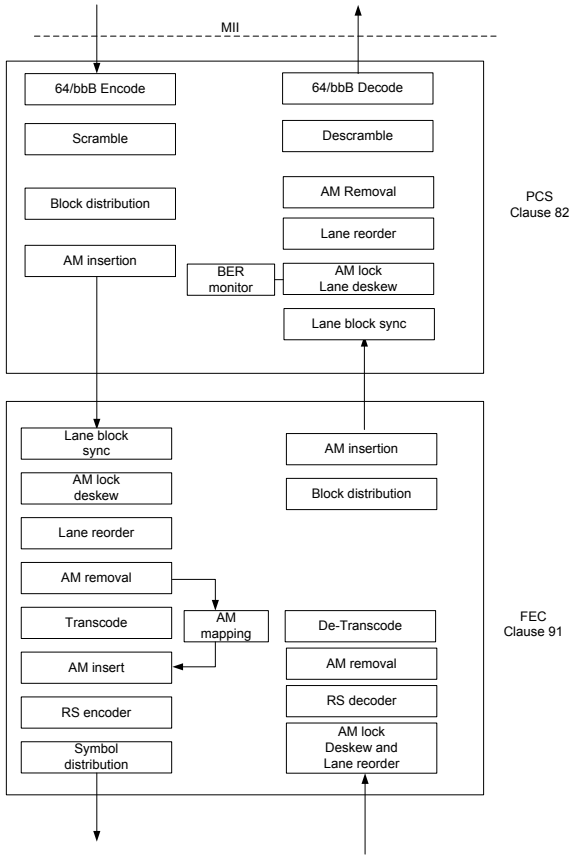


Figure 119–2—Functional block diagram

PCS/FEC integrated architecture , refer to 802.3bs D2.0



PCS/FEC separate architecture , refer to 802.3cd baseline proposal