OTN reference point considerations

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Comment #48
OTN reference point needs more discussion

- Text in 172.2.4.1 of 802.3df D1.0 indicates that the OTN mapping reference for 800GBASE-R is 66b blocks:
  - NOTE—The stream of 66-bit blocks generated by this process, together with the FEC_degraded_SER and rx_local_degraded bits should be used as the reference signal for mapping to OTN.
- This seems like a logical extension of 400GBASE-R, but it would be more desirable to map 257b blocks to OTN
  - All Ethernet PHYs 200G and faster are transmitted as 257b blocks
  - Using 66b blocks as the reference format for mapping to OTN creates a larger than necessary difference in bit rate between OTN and Ethernet signals
  - As bit rates go up, this makes it more difficult to use the same pluggable modules for both Ethernet and OTN signals, which has been an important capability for all rates since 10GBASE-R
  - There is market interest in “Ethernet-optimized” OTN rates

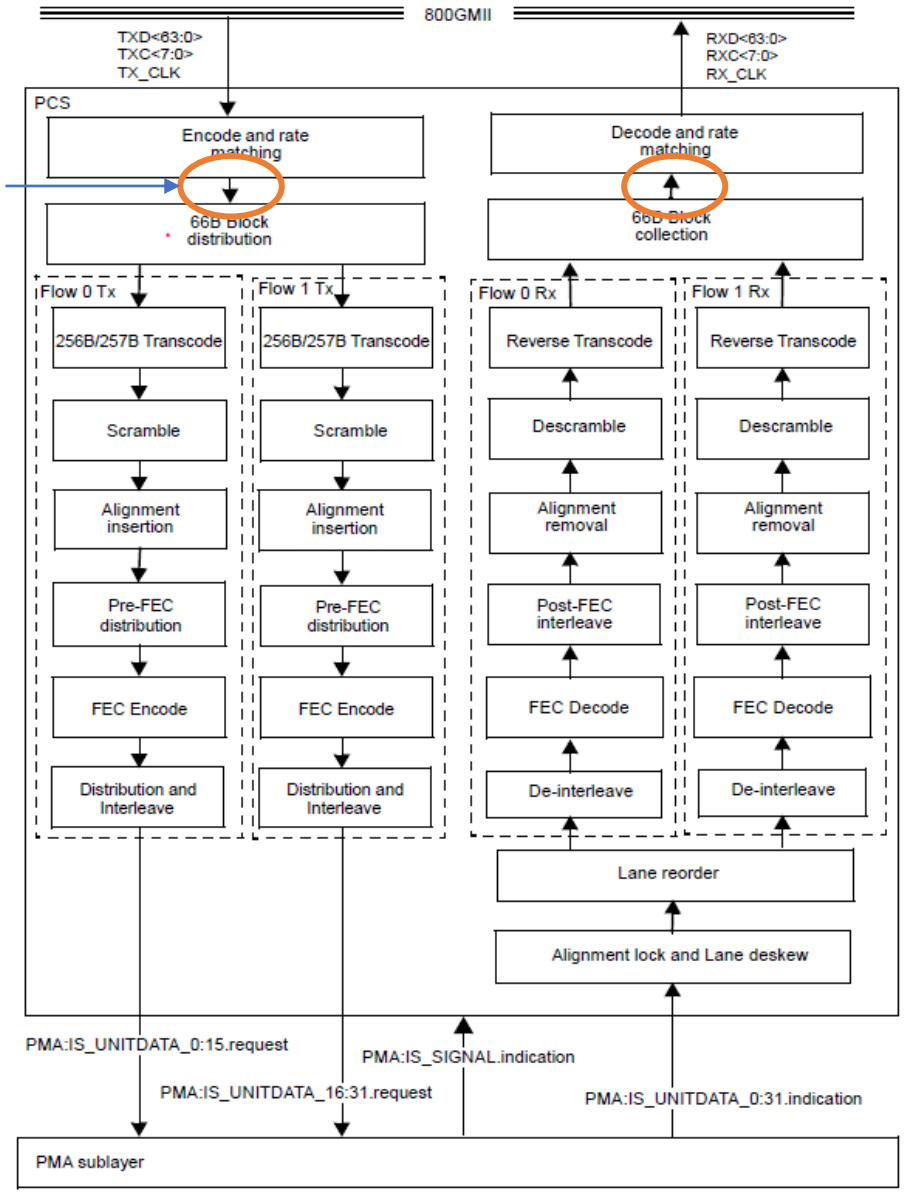
Purpose of the OTN mapping reference point

- OTN is used to extend the reach of Ethernet PCS beyond what 802.3 PHYs support and provide Ethernet services over multi-service transport networks
- The OTN mapping reference point provides a canonical format for mapping all PHYs that have the same MAC rate to OTN containers in a PCS-transparent manner
  - Enables OTN to preserve Ethernet timing and link fault signaling
  - Enables use of different Ethernet PHYs at the two ends of an OTN link
- For 100GBASE-R, the mapping reference was chosen to be 66b blocks
  - Since not all 100G PHYs use FEC, this is the only PCS format that is common to all 100G PHYs
- For 200GBASE-R and 400GBASE-R, the same reference point was chosen
  - Since all PHYs at these rates do use FEC, choosing 66b blocks was not strictly necessary, but it was convenient for OTN implementations since the same mapping principles could be used
  - The additional bit rate expansion from mapping 66b blocks rather than 257b blocks was not thought to be a problem at the time, but market reality is that many 200G and 400G Ethernet modules are not tested at the “OTN bit rate”

800G PCS structure in P802.3df D1.0

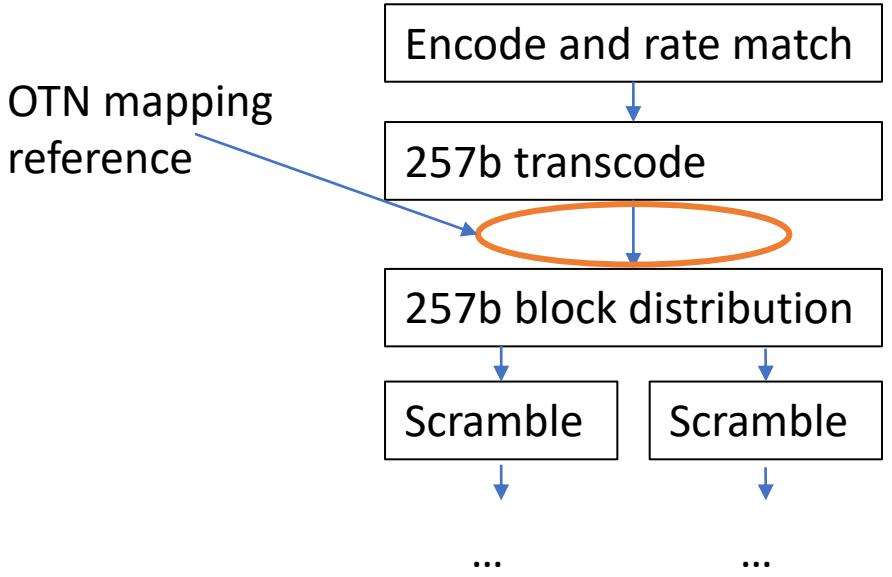
- OTN reference point is between the encode/decode and distribution/collection processes at the top
- It is more desirable (from OTN perspective) to map 257b blocks rather than 66b blocks, but there are two flows of 257b blocks in the PCS

OTN mapping reference per 802.3df D1.0



Alternatives to consider for 800GBASE-R - #1

- Change the PCS to have a single transcoding process immediately after 66b encoding/decoding, and distribute 257b blocks to the two 400G flows
- Move the note from 172.2.4.1 to 172.2.4.2, and change the text:
  - NOTE—The stream of 257-bit blocks generated by this process, together with the FEC_degraded_SER and rx_local_degraded bits should be used as the reference signal for mapping to OTN.
- OTN reference point is independent of the two 400G flows (OTN mapper doesn't have to know about them)
- However, this would not interwork with ETC-800G-R since the association of 66b blocks to 257b blocks is different

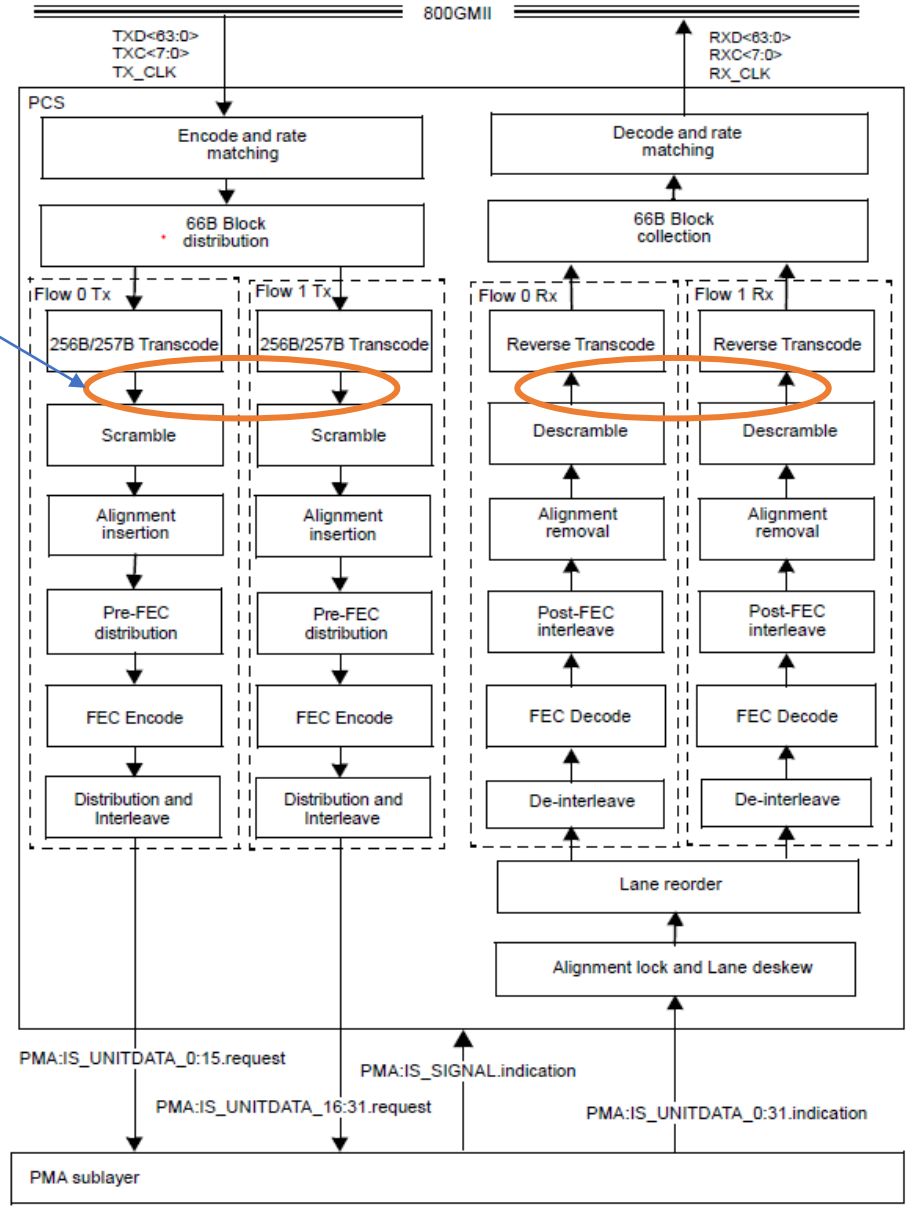


Alternatives to consider for 800GBASE-R - #2

- Put the OTN mapping reference point after the 257b transcoding in each of the two flows
- Move the note from 172.2.4.1 to 172.2.4.2 and change the text:
  - NOTE—The two streams of 257-bit blocks generated by this process, together with the FEC_degraded_SER and rx_local_degraded bits, should be used as the reference signal for mapping to OTN. The details of how to combine the two streams of 257-bit blocks into a single stream are outside the scope of this document.

- Aligns well with what OIF is doing in 800ZR to create a single stream of 257b blocks to be mapped into the 800ZR frame
- Maintains interworking between 800GBASE-R and ETC-800G-R
- However, this exposes the two 400G flows in the description of the OTN mapping

OTN mapping reference



Proposal

- Adopt 257b blocks as the format at the OTN mapping reference point
- Discuss and select between alternatives 1 and 2 for defining the OTN mapping reference point
  - The tradeoff is technical purity vs. interoperating with ETC-800G-R
  - The pragmatic solution would seem to be alternative #2

- Regardless of what decisions are taken, send a liaison to Q11/15 regarding the intended OTN mapping reference point for 800GBASE-R interfaces
  - Q11/15 next meets the week of 13 February, so this could come from the January 802.3 interim meeting