1.6TbE PCS FEC Codeword Examples and Vector Files for Clause 175 and Annex 175A, in support of D1.0 comments #453 and #455

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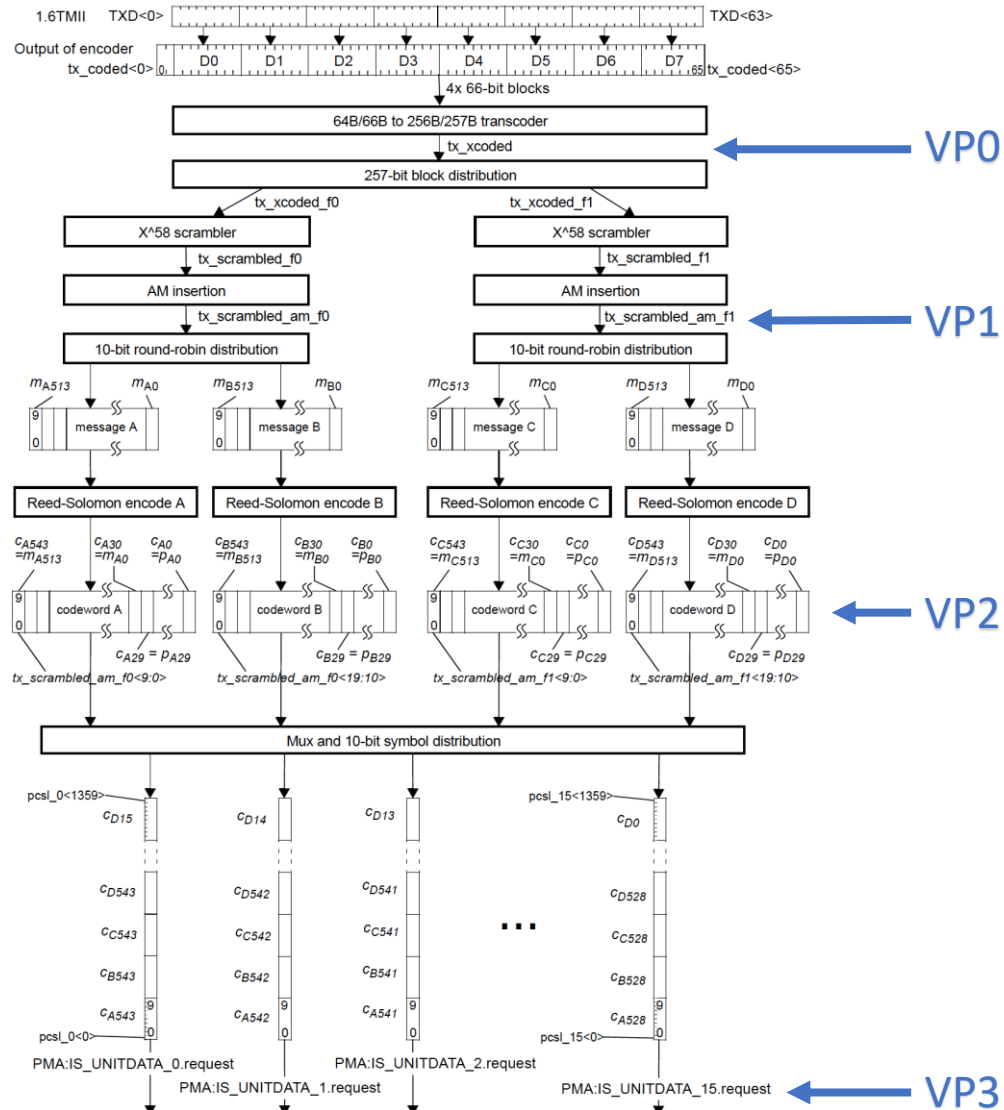Zvi Rechtman, Nvidia

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Background

- Previous projects for 200/400/800GbE have RS-FEC codeword examples.
  - Annex 119A: 200GbE and 400GbE PCS codeword example tables
    - See: 802.3-2022, Annex 119A and dillard_3bs_01_0516.pdf
  - Annex 172A: 800GbE PCS codeword examples and associated text files
    - See: 802.3df-2024, Annex 172A and: [he_3df_01_2311.pdf](he_3df_01_2311.pdf)
    - And text files: [he_3df_02_2311.txt](he_3df_02_2311.txt) and [he_3df_03_2311.txt](he_3df_03_2311.txt)
- These annexes contain intermediate outputs and codewords in table format:
  - Transcoded block of idle control characters
  - tx_scrambled_am data – data after scrambling and AM insertion
  - RS-FEC codewords A and B after RS-FEC encoding for each flow

1.6TbE PCS Examples

- 802.3dj, Draft1.0, Annex 175A has example codewords for 1.6TbE PCS
  - Inputs are similar to Annexes 119A and 172A
    - Idle data blocks, scrambler seeds, and tx_am_sf values.
  - Annex 175A includes tabular data for intermediate outputs:
    - tx_scrambled_am_f0 and tx_scrambled_am_f1
    - Codewords A, B, C, and D
  - New additional output in 175A:
    - Tabular data for all 16 PCSL after codeword interleaving

- But Draft 1.0 has no reference text files
  - Annex 172A includes machine-readable text file to make conformance testing easier.
  - A reference text file with 1.6TbE PCS test vectors has been submitted with this presentation.
  - Data in Annex 175A and the associated text file has been verified by the co-authors.

1.6TbE PCS Test Vector Points

Figure 175–7—1.6TBASE-R PCS transmit data distribution and bit ordering

- Vector test points (VPx) in the 1.6TbE PCS example in Annex 175A:
  - VP0: tx_xcoded
  - VP1: tx_scrambled_am_f0 and tx_scrambled_am_f1
  - VP2: RS-FEC codewords A, B, C, D
  - VP3: PCSL_[0..15]

1.6TbE Alignment Markers

- 802.3df-2024, CL172 also includes:
  - A reference to a text file with the 800GbE Alignment Marker values
- 802.3dj, Draft1.0 does not have an AM text file reference
  - A reference text file with the 1.6TbE alignment marker values has also been submitted with this presentation.

Summary

- Two machine readable text files have been submitted and described in this presentation for the 1.6TbE PCS Alignment Markers and PCS test vectors.

- Suggested updates to 802.3dj, D1.0:
    - In CL 175: Add a reference to the submitted text file with the 1.6TbE alignment marker values. (comment #453)
    - In Annex 175A: Add a reference to the submitted text file with PCS test vector data values. (comment #455)
    - The output PCS lane data can be used as an input to the PMA symbol muxing examples in Clause 176 as suggested in lowenthal_3dj_optx_01a_240425.pdf

Thank You