Transmission line-code mapping into LDPC

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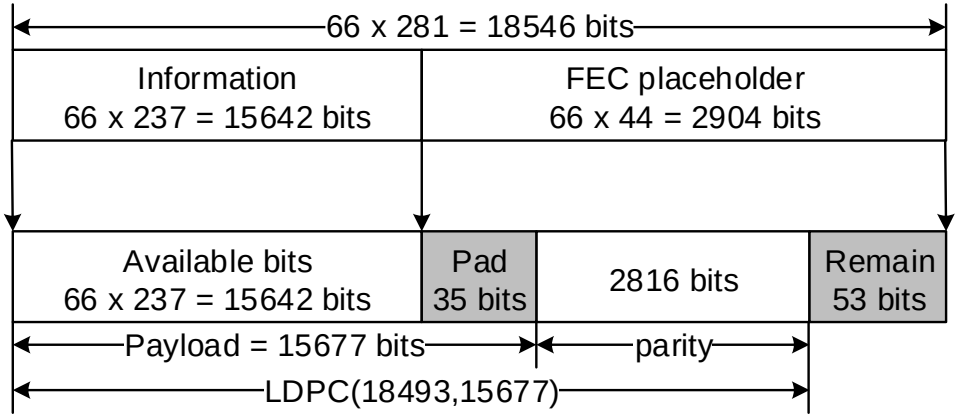
Background

- LDPC(18493,15677) has been motioned as FEC for downstream channels at Orlando meeting
  - Transmission line-code selection should consider mapping into FEC

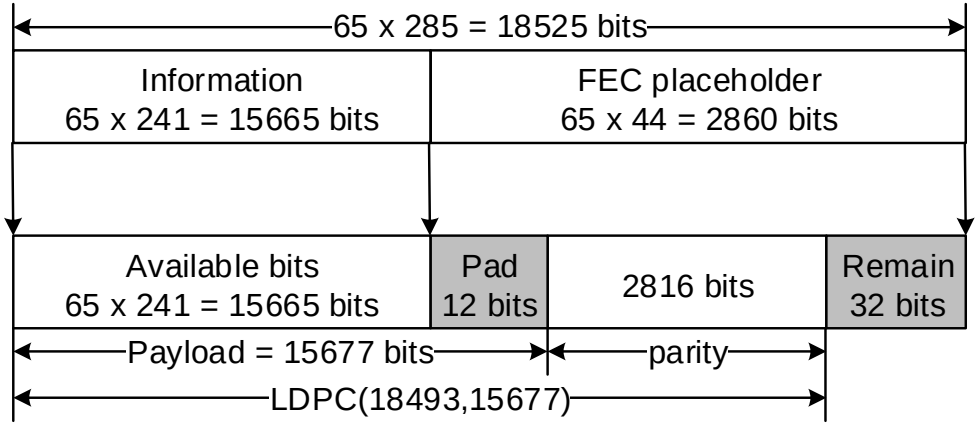
- This presentation summarizes various potential transmission line-codes and how well they map into LDPC(18493,15677)
  - 64B/66B in IEEE802.3 Clause 49.2.4
  - 64B/65B in IEEE802.3 Clause 55.3.2.2.5
  - 128B/129B mentioned in remein_3ca_1_0117.pdf
  - 256B/257B transcode from 64B/66B in IEEE802.3 Clause 91.5.2.5

64B/66B vs 64B/65B into LDPC

- 237 66B blocks constitute payload of LDPC
- 44 66B blocks generated by MPRS Input SD provide enough space for parity of LDPC
- Eff = (64*237)/18546 = 81.8%

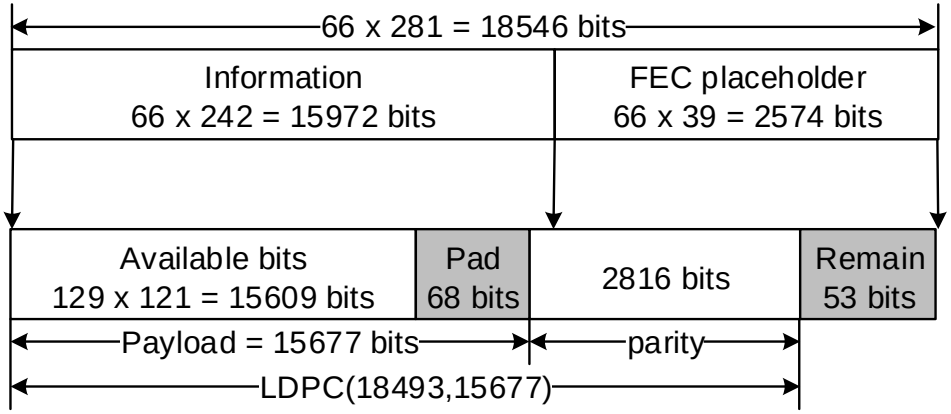


- 241 65B blocks constitute payload of LDPC
- 44 65B blocks generated by MPRS Input SD provide enough space for parity of LDPC
- Eff = (64*241)/18525 = 83.3%

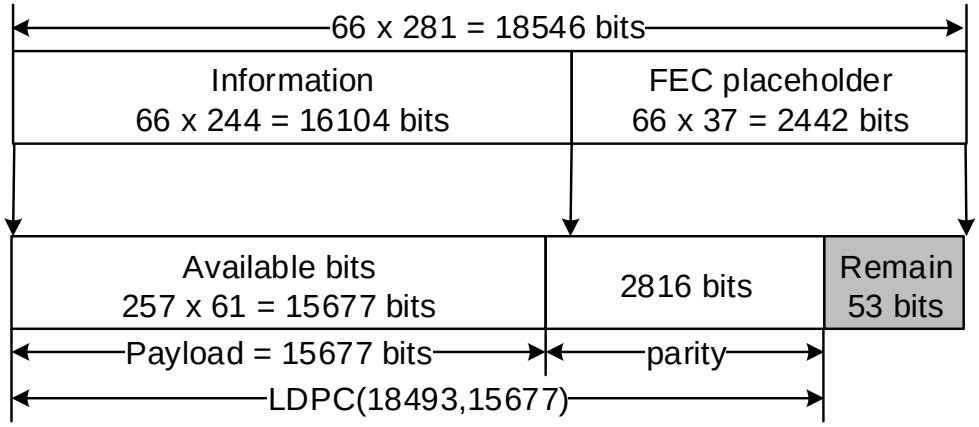


128B/129B vs 256B/257B into LDPC

- 242 66B blocks constitute payload of LDPC and part of parity of LDPC
- 39 66B blocks generated by MPRS Input SD provide enough space for rest of parity of LDPC
- Eff = (64*242)/18546) = 83.5%



- 244 66B blocks constitute payload of LDPC and part of parity of LDPC
- 37 66B blocks generated by input SD provide enough space for rest of parity of LDPC
- Eff = (64*244)/18546) = 84.2%



Summary

Transmission code	Info Blocks	FEC placeholder Blocks	Pad bits	Remain bits	Eff
64B/66B	237	44	35	53	81.8%
64B/65B	241	44	12	32	83.3%
64B/66B to 128B/129B transcoder	242	39	68	53	83.5%
64B/66B to 256B/257B transcoder	244	37	0	53	84.2%

- Above table lists results of various transmission line-code mappings into LDPC
- 256B/257B shows the best efficiency
- We can use remaining bits or padding bits for synchronization

Straw poll

- I would prefer to use transmission line-code

  64B/65B _____

  64B/66B _____

  128B/129B _____

  256B/257B _____

  Don't care: _____

Straw poll

- I agree to use remaining bits or padding bits for synchronization

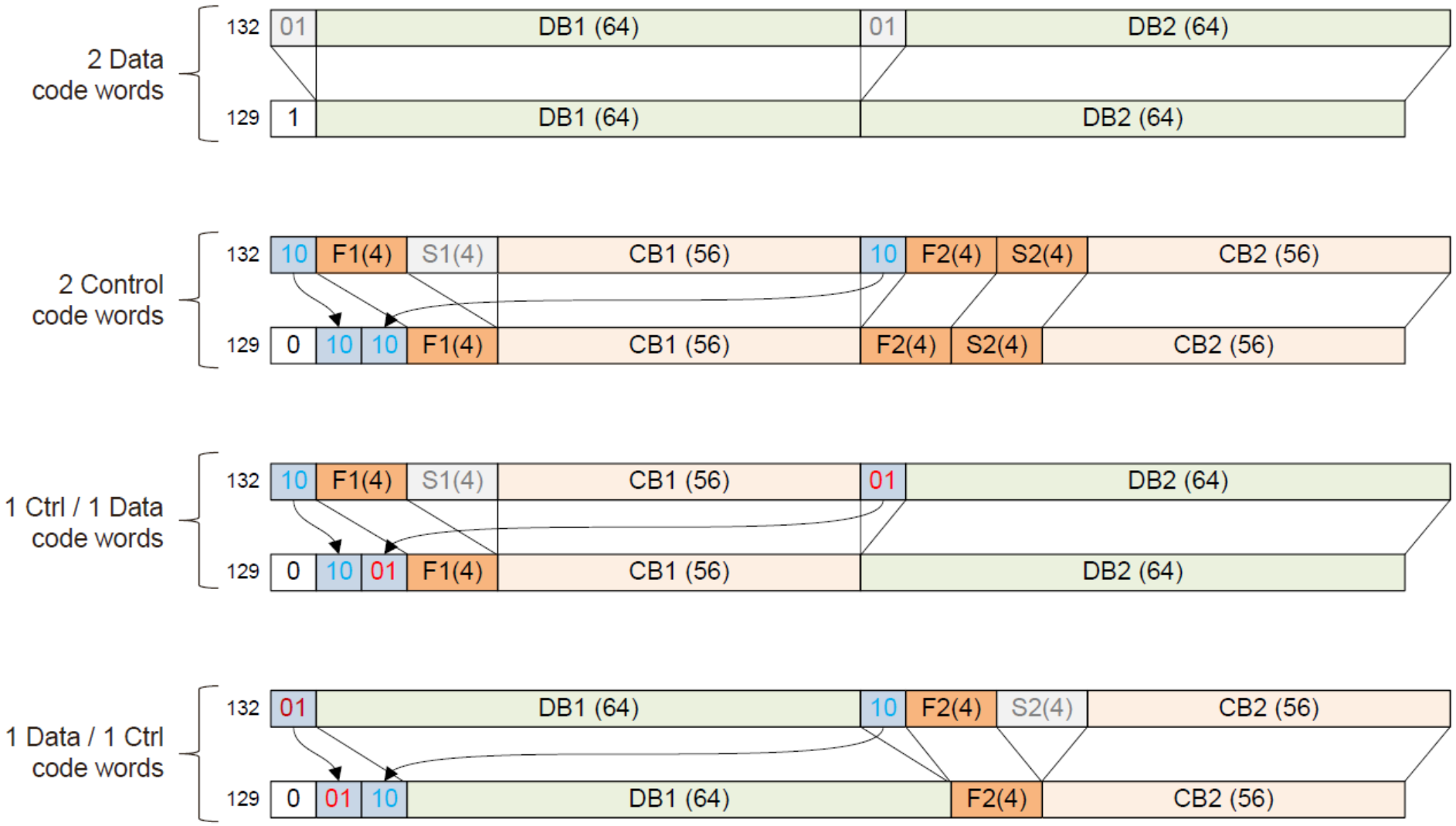
  Yes: _____

  No: _____

  Don’t care: _____

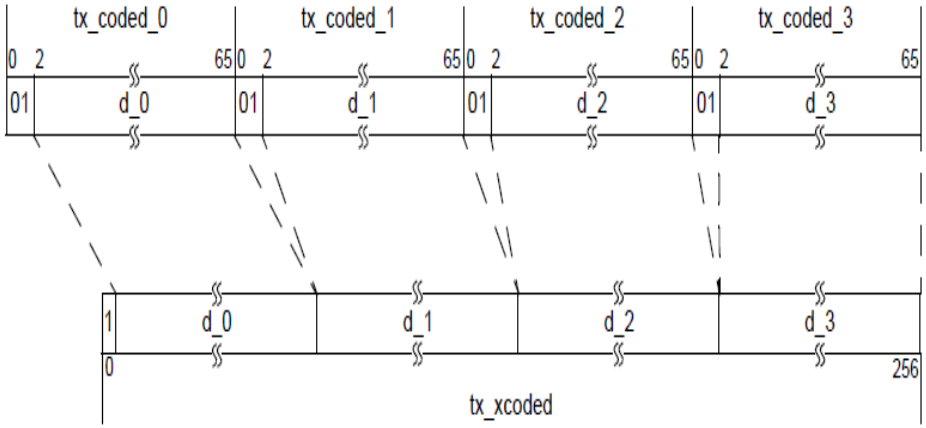
Thank You

64B/66B to 128B/129B transcoder

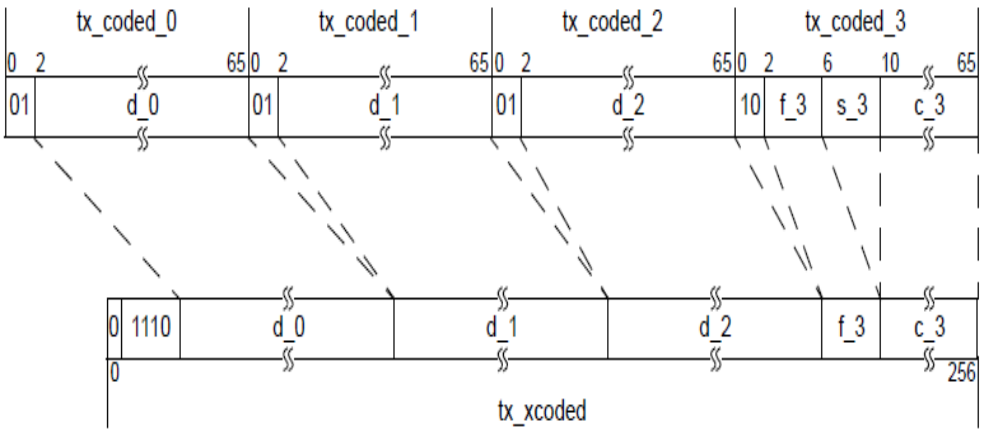


remein_3ca_1_0117.pdf

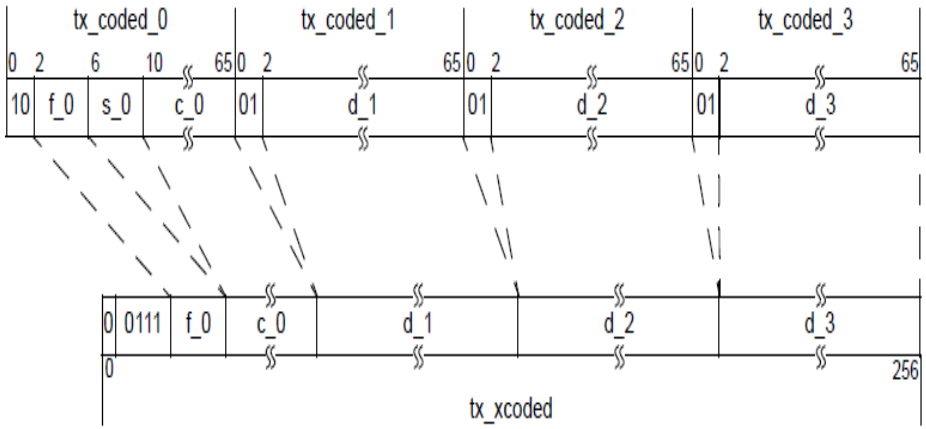
64B/66B to 256B/257B transcoder



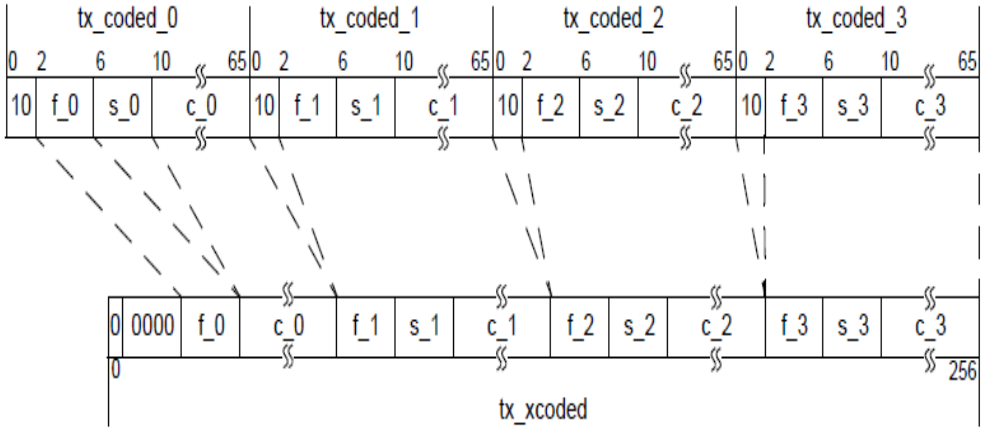
Example 1: All data blocks



Example 3: Three data blocks followed by a control block



Example 2: Control block followed by three data blocks



Example 4: All control blocks

IEEE802.3 Clause 91.5.2.5