Preamble Replacement

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Pending Issue to be resolved

How does PCS handle the case when the MAC asserts tx_en on the PCS odd byte boundary?

- **The PCS sends two character idle ordered sets, the first character on an even byte boundary.**
- **Over the GMII, tx_en can arrive on an even or odd byte boundary.**
- **If tx_en arrives on an odd byte boundary, PCS must first finish sending the idle before it sends the Start of Frame.**
- **Packet data can be delayed by one cycle or the preamble can be reduced by one cycle.**

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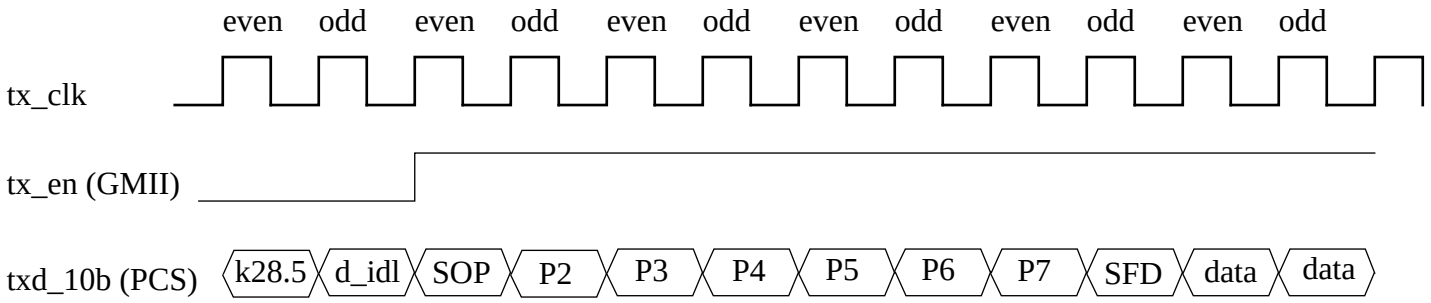
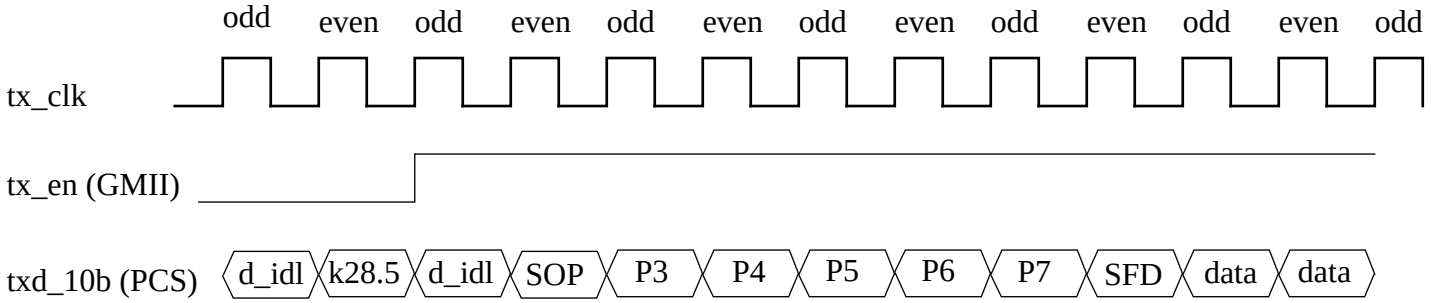
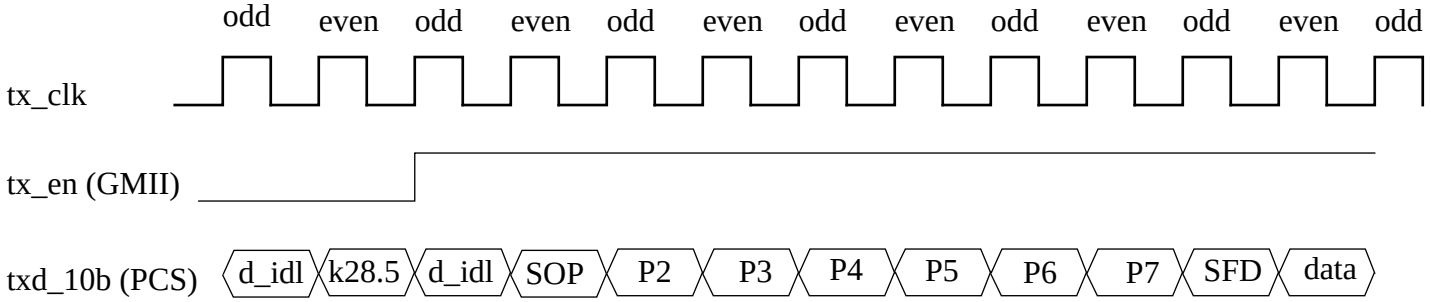
EVEN BOUNDARY CASE - same for Solution 1 and Solution 2



ODD BOUNDARY CASE - Solution 1



ODD BOUNDARY CASE - Solution 2



Legend

***d_idl** = D16.2*
***SOP** = K27.7*
***P2-P7** = preamble*
***SFD** = encoded start of frame delimiter*
***data** = encoded packet data*

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Tradeoffs

- **Solution 1**
  - **▲ does not delay packet data (+)**
  - **▲ does not affect bit budget (+)**
- **Solution 2**
  - **▲ data will be aligned on even boundaries which allows 16 bit implementations to cut corners (+)**
  - **▲ packet data is delayed one cycle (-)**
  - **▲ adds to the Tx PCS complexity for 8 bit solutions (-)**
  - **▲ negatively affects big budget by one byte (-)**

Recommendation : Solution 1

Concluding Remarks

- **In general, receivers should be made flexible rather than putting restrictions on transmitters to format data on even boundaries. (e.g. SERDES which do word synchronization on positive comma only may not have a market in Gbit Ethernet)**
- **Flexibility allows for more elegant solutions for future proposals. (e.g. packet bursting)**
- **16 bit solutions will migrate to 8 bit solutions in order to reduce gate count in the future. Solution 1 is the better choice for future.**