

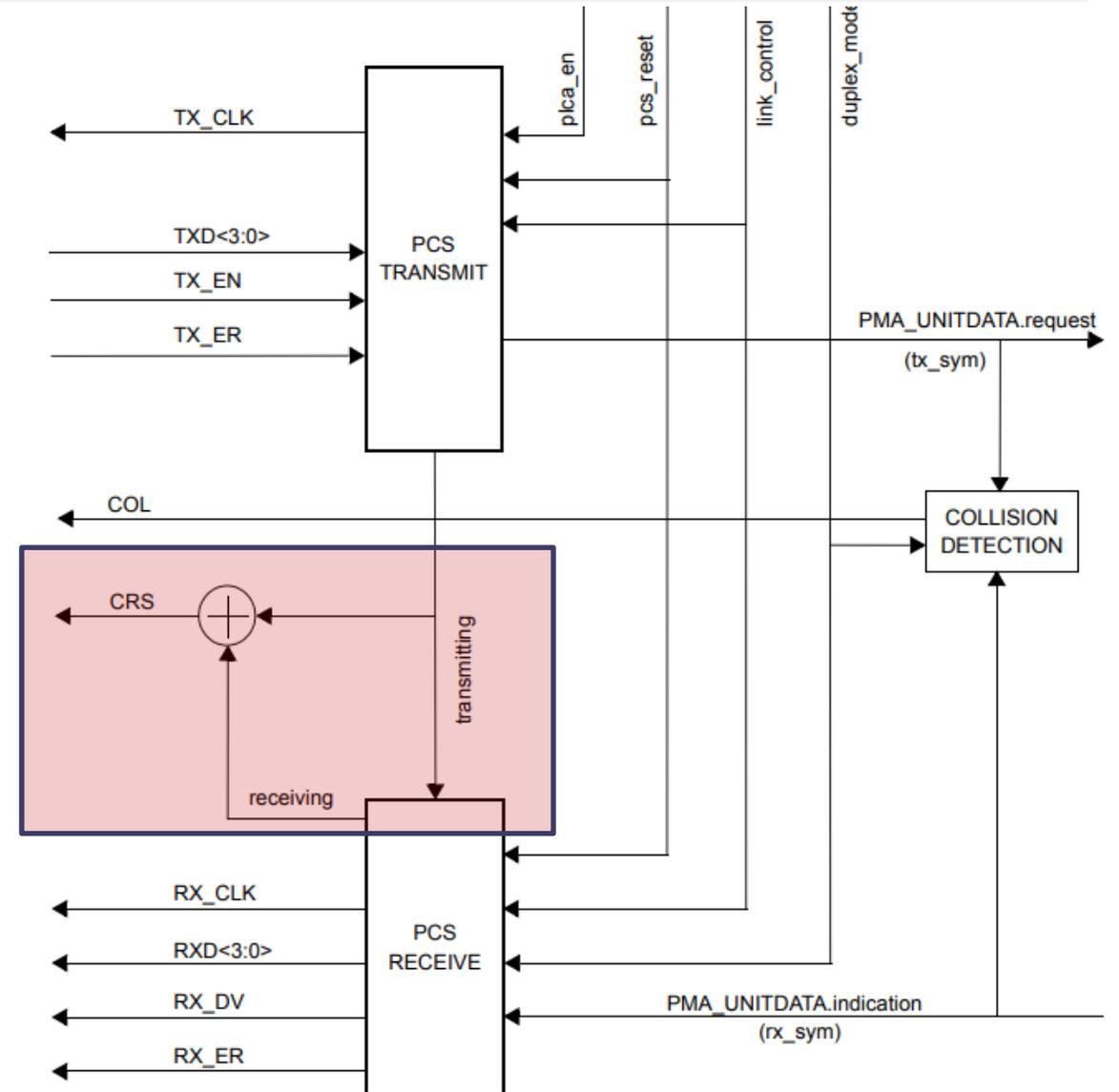


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IEEE 802.3cg
PLCA CRS generation
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- 10BASE-T1S PHY generates CRS as the logical OR of 'transmitting' and 'receiving' PCS variables
 - asserted when a COMMIT or packet preamble is detected
- According to comment #649 this way of generating CRS, although used in other standards (e.g. 100BASE-X), is not suitable for an half-duplex multidrop PHY
 - CRS should be generated based on energy detection instead





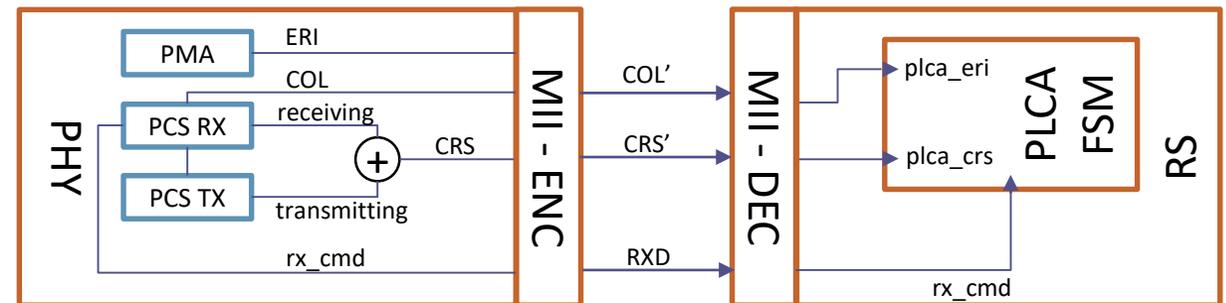
- PLCA RS logically relies on two information from the PHY
 - `plca_eri` (Early Receive Indication)
 - Asserted when the PHY detects activity on the line
 - `plca_crs`
 - Asserted when a COMMIT or valid packet is being decoded from the line
- These two information are encoded on MII signals and conveyed to PLCA
 - COMMIT and BEACON are also conveyed via MII, encoded on RXD and decoded to `rx_cmd`
- **CRS generation has an impact on PLCA**

$$COL' = COL + (ERI * !RX_DV * !TX_EN)$$

$$CRS' = CRS + (ERI * !RX_DV * !TX_EN)$$

$$plca_crs \Leftarrow \begin{cases} TRUE & \text{if } TX_EN = TRUE \text{ or } RX_DV = TRUE \\ FALSE & \text{else if } COL' = TRUE \\ CRS' & \text{else} \end{cases}$$

$$plca_eri \Leftarrow CRS'$$



current draft 2.0



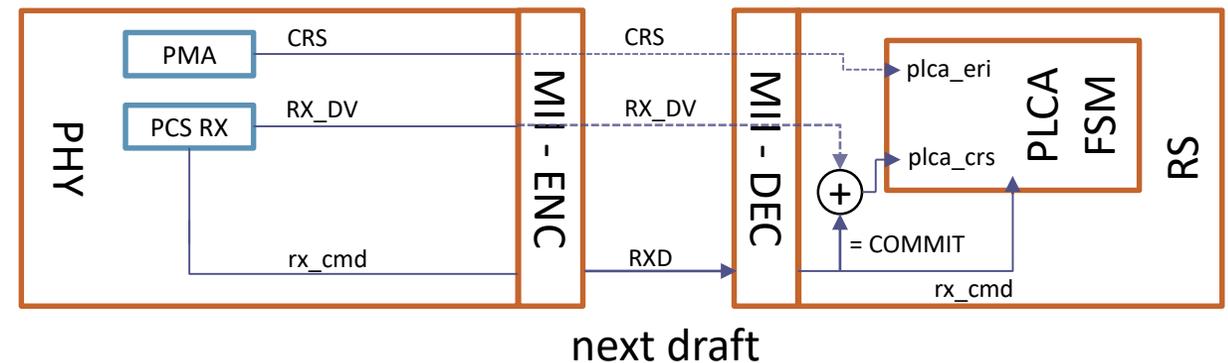
- CRS generation does not change at all the way PLCA works
 - the information PLCA needs is still available, it just need to be encoded differently
- This can be done with a simple variable substitution
 - $plca_eri \leftarrow CRS$
 - CRS being asserted on energy detection is ERI by definition!
 - $plca_crs \leftarrow RX_DV + (rx_cmd = COMMIT)$
 - $plca_crs$ can be deduced from RX_DV (valid packet) or when receiving a $COMMIT$, by definition

$plca_eri$ is now generated from CRS directly

$plca_crs$ is now decoded in the RS from RX_DV and rx_cmd

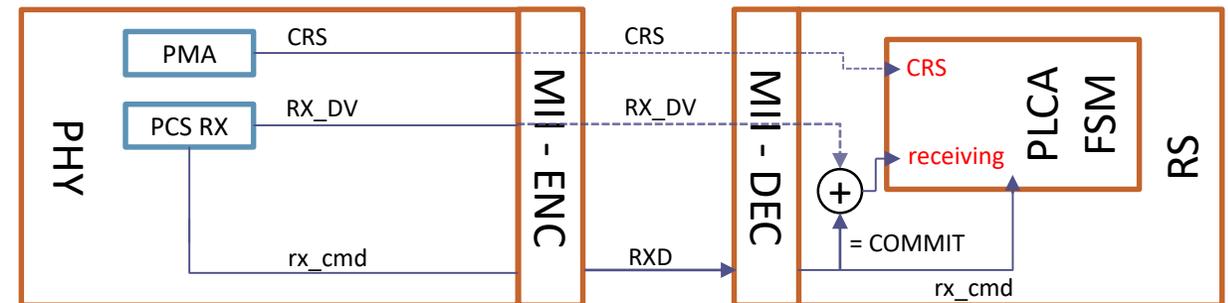
RX_DV is generated by PCS RX and forwarded as-is via MII, as in current draft

rx_cmd is generated by PCS RX and encoded on top of RXD as in current draft





- plca_eri renamed to “CRS”, to avoid confusion
- plca_crs renamed to “receiving” to avoid confusion
- Proposed text changes can be found in the following documents, marked with #649
 - http://www.ieee802.org/3/cg/public/Sept2018/beruto_04_CI_148_d2p0_proposed.pdf
 - http://www.ieee802.org/3/cg/public/Sept2018/beruto_03_CI_147_d2p0_proposed.pdf
 - http://www.ieee802.org/3/cg/public/Sept2018/beruto_01_CI_22_d2p0_proposed.pdf



next draft

THANK YOU!