Proposal for Timestamping with AM, CWM, and Idle Rate Adaptation

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Proposal

- Agree on solution to deal with PHY data delay variations due to AM and CWM insertion/removal and corresponding Idle rate adaptation
- Make text agnostic to what we will choose as the message timestamp point (start of SFD or start of symbol after SFD)
  - Decision on what to use as the message timestamp point still needs to be made by the 802.3cx task force
  - Definition of message timestamp point to be added to clause 90

Summary: AM/CWM and Idle insert/delete Soln

Proposed Solution	Pros	Cons	Comments
PHY data delay is adjusted to account for AM/CWM insertion/removal and its corresponding Idle rate adaption copied from tse_3cx_01_0720.pdf	Literally consistent with IEEE 1588 timestamping Compatible with many existing implementations		There seems to be general agreement on this solution. • http://www.ieee802.org/3/maint/public/gorshe_1_0119.pdf • http://www.ieee802.org/3/ad_hoc/ngrates/public/calls/19_0416/nicholl_nea_01_190416.pdf • http://www.ieee802.org/3/ITSA/public/jan20/parkholm_itsa_01_0120.pdf • http://www.ieee802.org/3/ITSA/public/jan20/tse_itsa_02_0120.pdf • http://www.ieee802.org/3/cx/public/april20/bordogna_3cx_01_0420.pdf

- No opposing contributions have been received for this issue
- Several contributions for normative text have been received.

Proposed Text

- **Add the text after paragraph 2 of Clause 90.7**
- **Text is based on proposals listed on the previous page:**

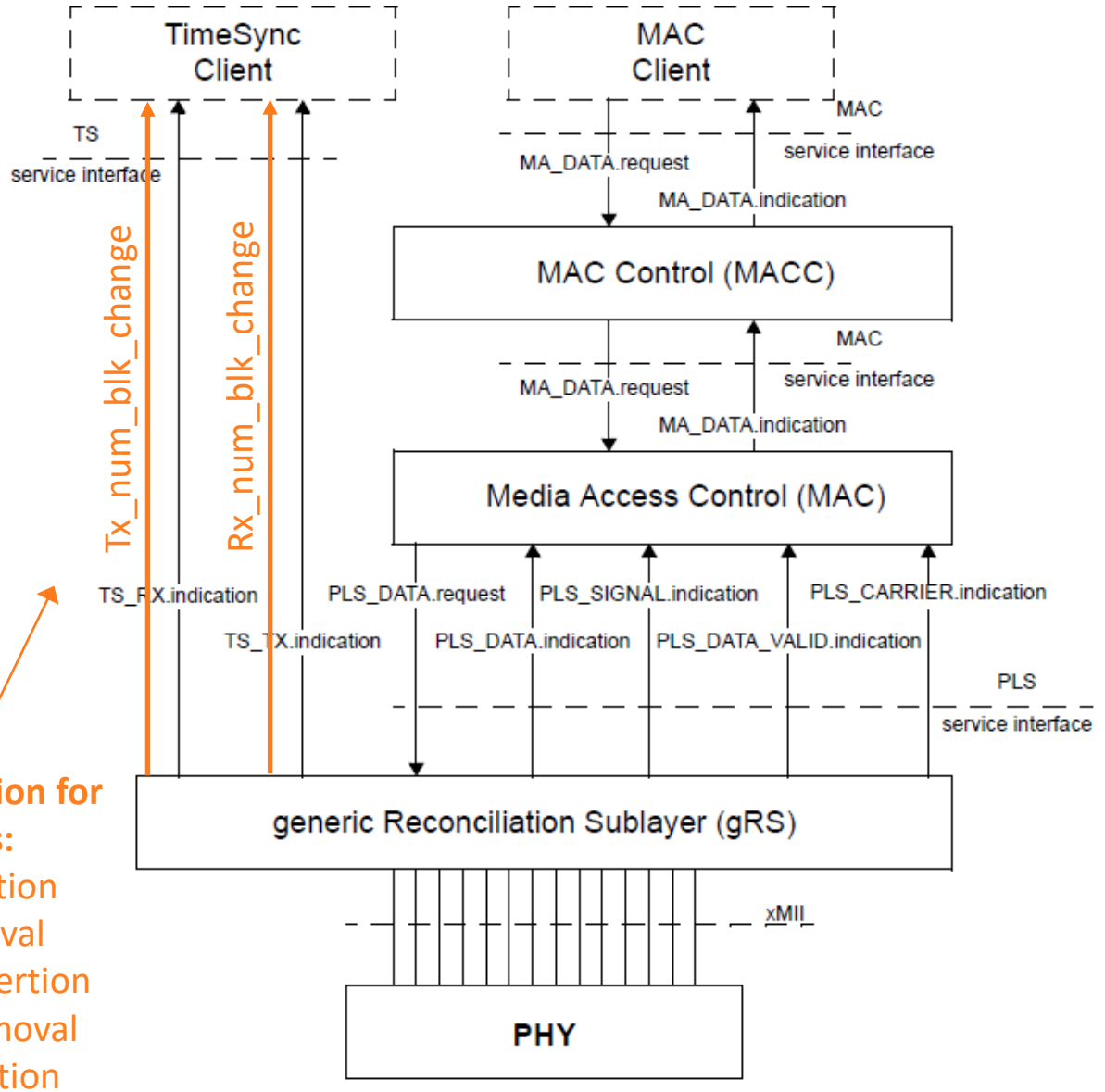
  For a PHY that inserts alignment markers or codeword markers and performs rate adaptation (e.g. removes Idles) to accommodate the AM or CWM insertion, the transmit path data delay measurement starting point (the PTP message timestamp point at the xMII input) should be adjusted to account for the AM or CWM insertion and the corresponding rate adaptation that occurs in the PHY (between the xMII input and the MDI output). Based on this adjustment, the result is a transmit path data delay measurement that appears as if the AM or CWM insertion and the corresponding rate adaptation had been performed before the Tx xMII.

  For a PHY that removes alignment markers or codeword markers and performs rate adaptation (e.g. adds Idles) to accommodate the AM or CWM removal, the receive path data delay measurement ending point (the PTP message timestamp point at the xMII output) should be adjusted to account for AM or CWM removal and the corresponding rate adaptation that occurs in the PHY (between the MDI input and xMII output). Based on this adjustment, the result is a receive path data delay measurement that appears as if the AM or CWM removal and the corresponding rate adaptation had been performed after the Rx xMII.

  The dynamic delay variance of AM or CWM insertion or removal or that of the corresponding rate adaptation is not to be included in the TimeSync PCS transmit path data delay or the TimeSync PCS receive path data delay registers

Proposed Figures

- **Update Figure 90-1**
  - Add signals that allow the Time Sync Client to adjust its timestamps for AM or CWM insertion/removal and the corresponding Idle removal/insertion
  - For TS_TX indications, the signal indicates how many blocks will be removed (Idles) or inserted (AM, CWM) and affect the transit delay of PTP message timestamp points through the Tx PHY
  - For TS_RX indications, the signal indicates how many blocks were removed (AM, CWM) or inserted (Idles) and affected the transit delay of PTP message timestamp points through the Rx PHY



Another option for these signals:

- AM insertion
- AM removal
- CWM insertion
- CWM removal
- Idle insertion
- Idle removal

Figure 90–1—Relationship of the TimeSync Client, TSSI and gRS sublayer relative to MAC and MAC Client and associated interfaces

Proposed Figures

- **Update Figure 90-2**
  - Add the same signals to the gRS figure

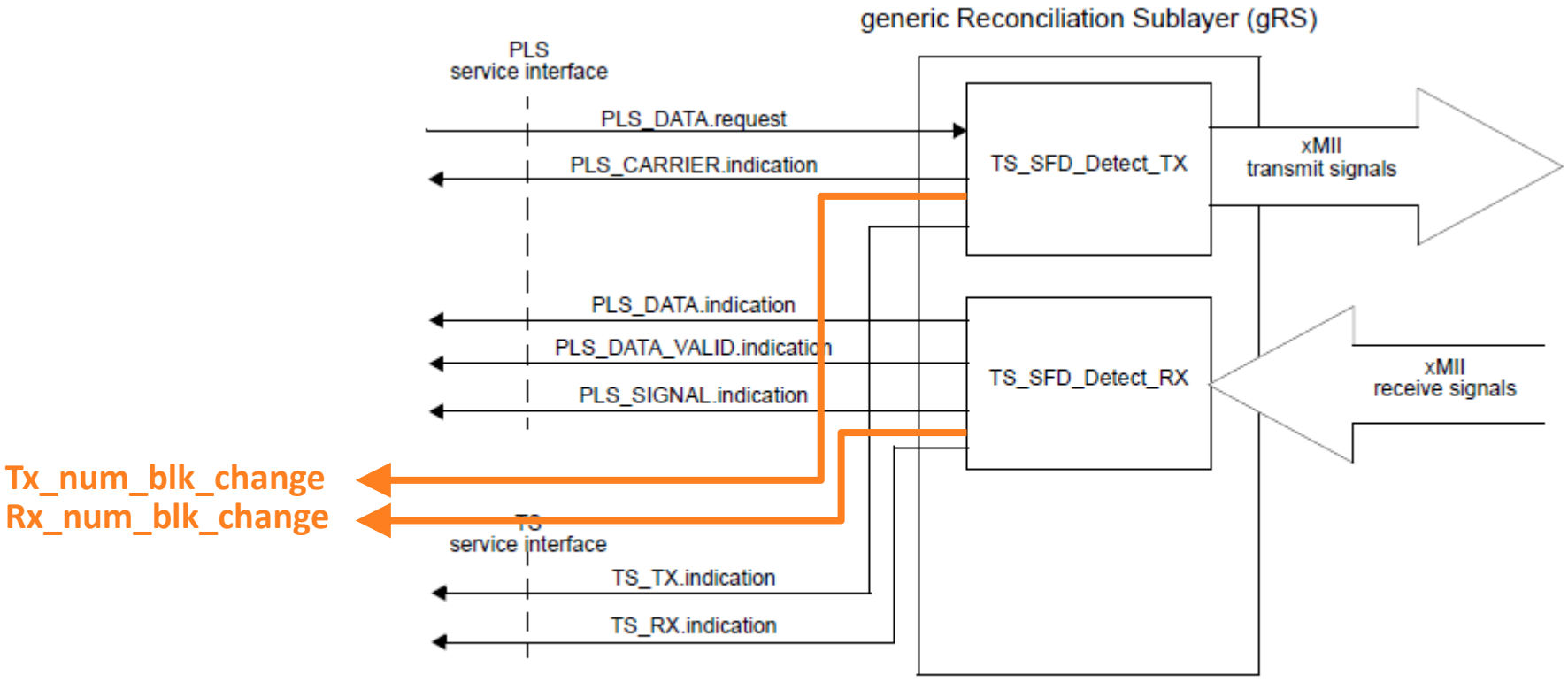


Figure 90–2—TS_SFD_Detect_TX and TS_SFD_Detect_RX functions within the generic Reconciliation Sublayer (gRS)

Proposed Text

- **Add definitions for the signals**

Tx_num_blk_change

- Indicates how many blocks of delay change will be performed in the Tx PHY (e.g., for AM insertion, CWM insertion, or Idle rate adaptation removal).
  This value is a signed integer

Rx_num_blk_change

- Indicates how many blocks of delay change were performed in the Rx PHY (e.g., for AM removal, CWM removal, or Idle rate adaptation insertion).
  This value is a signed integer

Questions?

Thanks!