EPLCA Service Client layering diagram

an eplca differential service client layering proposal based on 802.3 TSSI reference model (DRAFT)

802.3 Plenary, November 2026

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Why is CL90 TSSI Relevant to ePLCA work?

- Time Synchronizaiton Service Interface (TSSI) was 802.3's response to 802.1AS (an 802 profile of IEEE 1588) request to support time stamping of 802.3AS sync frames as close to physical layer as possible, such that upper layer time sensitive applications to make use of that information (in rea- time).
- Observe that timestamp is done in gRS (where PLCA also resides) for the benefit of 802.1AS gPTP. Besides the providing the wall clock, gPTP may be used for a transmit selection (such as Time Aware Shaper (802.1Qbv), or Cyclic Queuing (802.1Qch & 802.1Qdv) and others).

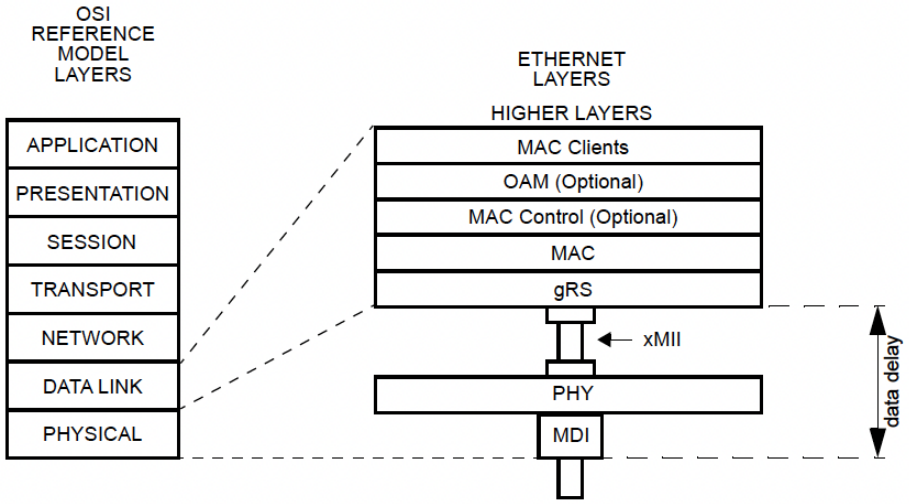


Figure 90–3—Data delay measurement

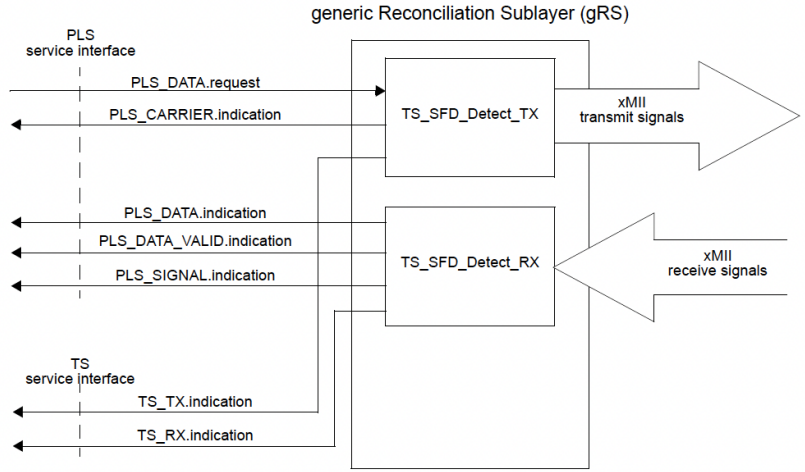


Figure 90–2—TS_SFD_Detect_TX and TS_SFD_Detect_RX functions within the generic Reconciliation Sublayer (gRS)

802.1AS TimeSync Services Client & TSSI

1. TimeSync Client needs to know precise time when a packet TX and RX event occurs at a given reference point (i.e. at SFD).
2. 802.3 TSSI provides this timestamp from RS directly to the TimeSync Client via TS_TX.indication and TS_RX.indication.
3. Time Sync Client, in IEEE 802 case, is 802.1AS.

Note: No other layering nor function definition are needed to achieve TSSI to upper layer signaling.

A reasonable parallel may be drawn from this to ePLCA differential services indications.

90.4.1.1 Interlayer service interfaces

Figure 90–1 depicts the TimeSync Client and the RS interlayer service interfaces.

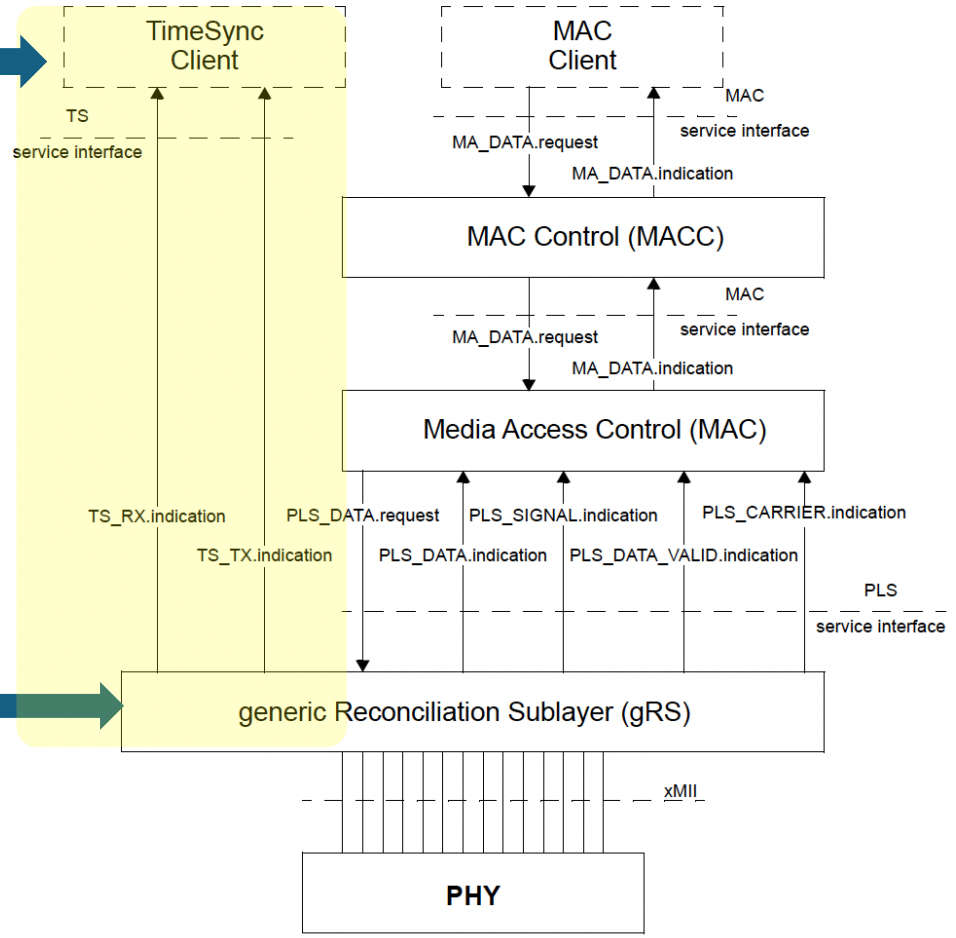


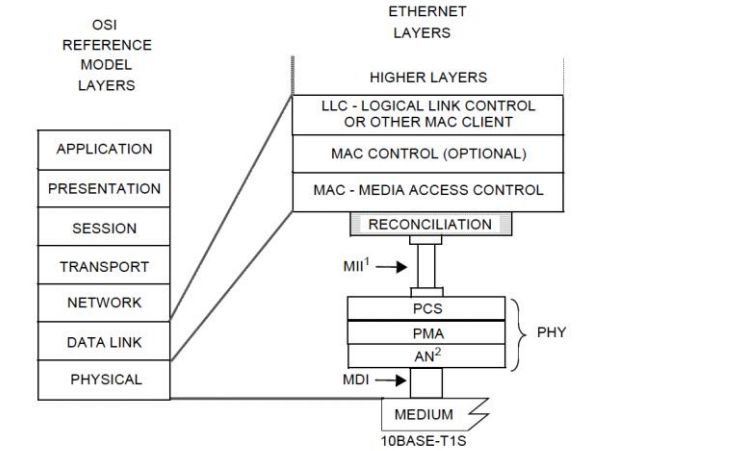
Figure 90–1—Relationship of the TimeSync Client, TSSI and gRS sublayer relative to MAC and MAC Client and associated interfaces

NOTE 1—In this figure, the xMII is used as a generic term for the Media Independent Interfaces for implementations of 10BASE-T1L, 10BASE-T1S, and 100 Mb/s and above. For example: for 100 Mb/s implementations this interface is called MII; for 1 Gb/s implementations, it is called GMII; for 10 Gb/s implementations, it is called XGMII; etc.

NOTE 2—Optional Low Power Idle (LPI) Client service interface not shown.

Objectives -- ePLCA per node and per CoS

- Buffers and Queues near the RS does not and should not exist (also causes additional HoLB, head-of-line blocking).
- Ideally, there should be only one place where transmit selection function resides. Above the MAC Services.



MDI = MEDIUM DEPENDENT INTERFACE
MII = MEDIA INDEPENDENT INTERFACE

NOTE 1—MII is optional
NOTE 2—Auto-Negotiation is optional

PCS = PHYSICAL CODING SUBLAYER
PMA = PHYSICAL MEDIUM ATTACHMENT
PHY = PHYSICAL LAYER DEVICE
AN = AUTO-NEGOTIATION

Figure 148–1—Relationship of PLCA Reconciliation Sublayer to the ISO/IEC OSI reference model and the IEEE 802.3 Ethernet model

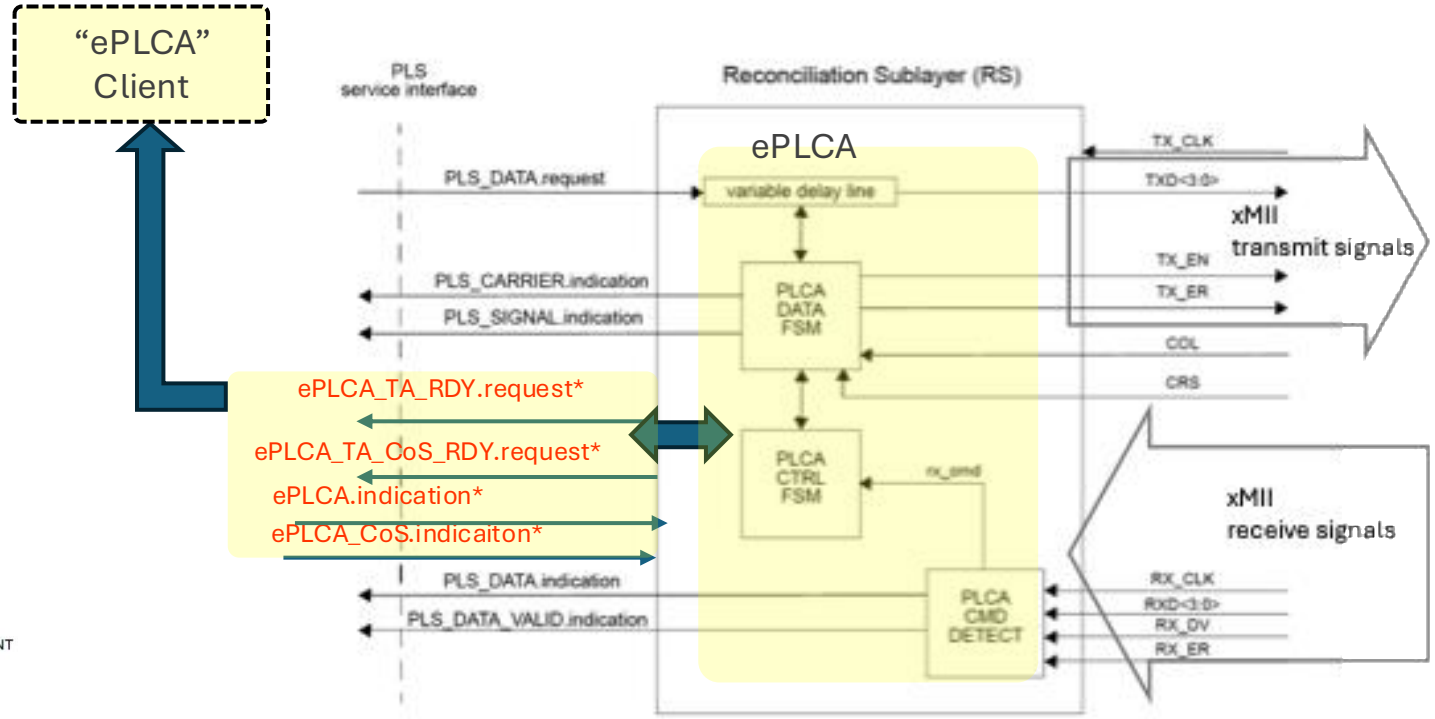


Figure 148–2—PLCA functions within the Reconciliation Sublayer (RS)

802.1 Transmit Selection, “ePLCA” Client & ePLCA

- ePLCA_TA_CoS_RDY.request and ePLCA_TA_RDY.request are place holder signals out of ePLCA RS. Their relationship in PLCA is TBD in the eventual Task Force.
- “ePLCA” Client is whatever function in 802.1 transmit selection function that should be added in support of 802.3 ePLCA RS.

Note – An Intro. POPI (802.3dq) is a physical interface spec. Its scope is: 5.2.b Scope of the project: The scope of the project is the specification of additions and modifications to IEEE Std 802.3 to add one or more new interfaces between a MAC and a PHY optimized for exposed interconnects. Each interface supports connections between a single MAC and a single-port PHY or between multiple MACs and a multiport PHY.
e.g. sending metadata (802.3dt), timestamp (TSSI), etc, between MAC and PHY are all in scope pending contributions and its work. ePLCA signals are no exceptions.

90.4.1.1 Interlayer service interfaces

Figure XX-Y depicts the ePLCA Client and the RS interlayer service interfaces.

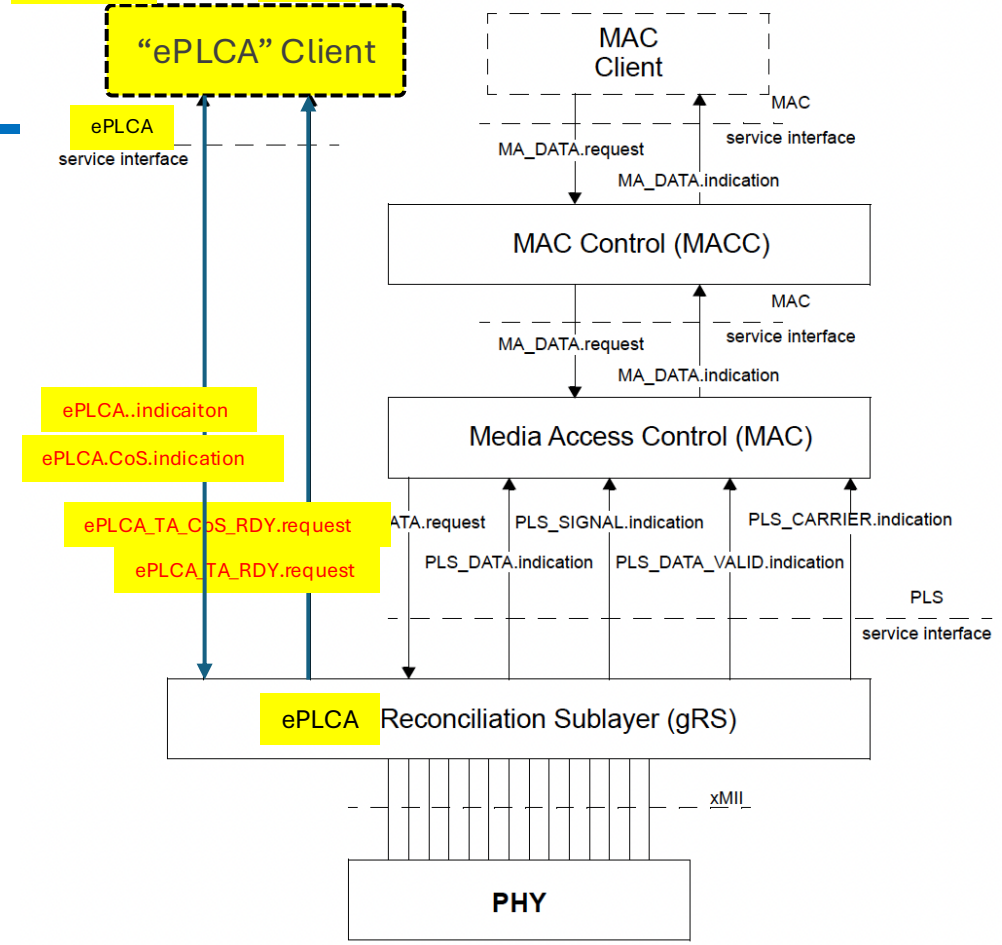


Figure XX-Y – Relationship of ePLCA Client and gRS sublayer relative to MAC and MAC Client and associated interfaces

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NOTE 2—Optional Low Power Idle (LPI) Client service interface not shown.

Thank you