90. Ethernet Support for Time Synchronization Protocols

Changed to subclause 90.6 amd 90.7 are marked in red

90.6 Overview of Managment Features

Clause 30 describes the management functions for any of the IEEE Std 802.3 compliant PHYs. Objects defined in Clause 30 for the support of TimeSync capability are summarized below:

— oTimeSync managed object class, as defined in 30.12.1

— aTimeSyncCapabilityTX and aTimeSyncCapabilityRX managed objects, reflecting the status of a series of MDIO capability registers (1.1800, 2.1800, 3.1800, 4.1800, 5.1800, and 6.1800), as defined in 30.12.1.1 and 30.12.1.2, respectively

— aTimeSyncDelayTXmax and aTimeSyncDelayTXmin managed objects, representing the aggregate value of the series of transmit path data delay registers present in the instantiated MDIO registers (for each MMD, in case of multiple instances) 1.1801 through 1.1804, 2.1801 through 2.1804, 3.1801 through 3.1804, 4.1801 through 4.1804, 5.1801 through 5.1804, and 6.1801 through 6.1804, as defined in 30.12.1.3 and 30.12.1.4, respectively

— aTimeSyncDelayRXmax and aTimeSyncDelayRXmin managed objects, representing the aggregate value of the series of transmit path data delay registers present in the instantiated MDIO registers (for each MMD, in case of multiple instances) 1.1805 through 1.1808, 2.1805 through 2.1808, 3.1805 through 3.1808, 4.1805 through 4.1808, 5.1805 through 5.1808, and 6.1805 through 6.1808, as defined in 30.12.1.5 and 30.12.1.6, respectively

The Management Data Input/Output (MDIO) capability described in Clause 45 defines several variables that provide TimeSync status information for the PMD, as shown in Table 90–1:

Table 90–1—Summary of TimeSync features in Clause 45

Register	Name	Reference
1.1800	TimeSync PMA/PMD capability register	45.2.1.99a
1.1801 through 1.1804	TimeSync PMA/PMD transmit path data delay	45.2.1.99b
1.1805 through 1.1808	TimeSync PMA/PMD receive path data delay	45.2.1.99c
2.1800	TimeSync WIS capability register	45.2.2.19a
2.1801 through 2.1804	TimeSync WIS transmit path data delay	45.2.2.19b
2.1805 through 2.1808	TimeSync WIS receive path data delay	45.2.2.19c
3.1800	TimeSync PCS capability register	45.2.3.39a
3.1801 through 3.1804	TimeSync PCS transmit path data delay	45.2.3.39b

Table 90–1—Summary of TimeSync features in Clause 45

Register	Name	Reference
3.1805 through 3.1808	TimeSync PCS receive path data delay	45.2.3.39c
4.1800	TimeSync PHY XS capability register	45.2.4.9a
4.1801 through 4.1804	TimeSync PHY XS transmit path data delay	45.2.4.9b
4.1805 through 4.1808	TimeSync PHY XS receive path data delay	45.2.4.9c
5.1800	TimeSync DTE XS capability register	45.2.5.9a
5.1801 through 5.1804	TimeSync DTE XS transmit path data delay	45.2.5.9b
5.1805 through 5.1808	TimeSync DTE XS receive path data delay	45.2.5.9c
6.1800	TimeSync TC capability register	45.2.6.13a
6.1801 through 6.1804	TimeSync TC transmit path data delay	45.2.6.13b
6.1805 through 6.1808	TimeSync TC receive path data delay	45.2.6.13c

90.7 PHY latency measurement

The optional TimeSync capability requires measurement of data delay in the transmit and receive paths, as shown in Figure 90–3. The transmit path data delay is measured from the input of the beginning of the SFD at the xMII to its presentation by the PHY to the MDI. The receive path data delay is measured from the input of the beginning of the SFD at the MDI to its presentation by the PHY to the xMII.

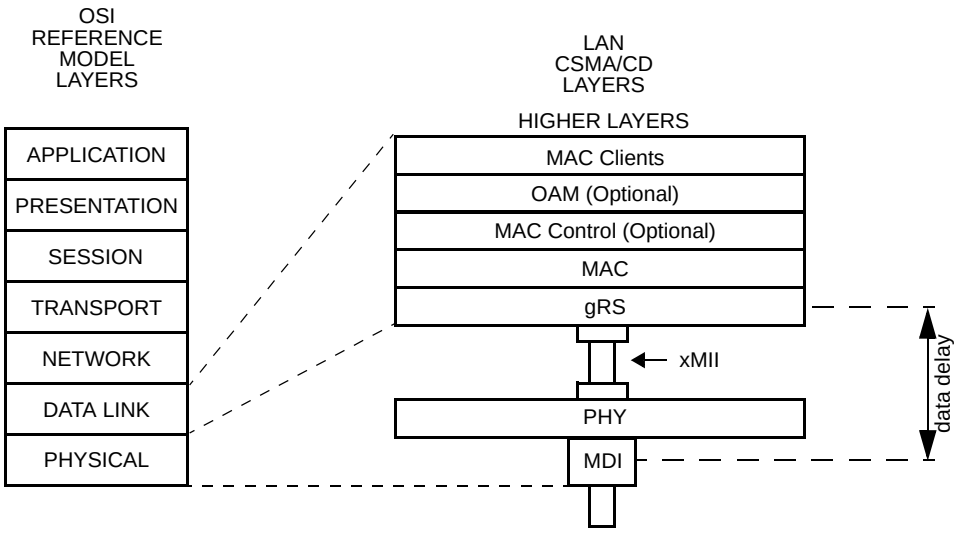

Figure 90–3—PHY latency measurement points

NOTE-the measured data delay in either the transmit or receive path should not include delay resulting from any length of the medium, regardless of the type of the medium used by the given PHY. It is observed however that even if any medium-imposed delay is included in the measured data delay, it does not affect the operation of the TimeSync functions and only shifts the timing reference point farther from the MDI.

The obtained data delay measurement shall be reported in the form of a quartet of values; the maximum transmit data delay, the minimum transmit data delay, the maximum receive data delay, and the minimum receive data delay, as defined for the oTimeSync managed object class (30.12.1).