143.4.4 Asymmetric rate operation

The 25/10G-EPON and 50/10G-EPON systems are characterized by channel rate asymmetry. In such systems, downstream transmission uses one or two channels operating at 25 Gb/s, while the upstream transmission uses a single channel operating at 10 Gb/s.

Figure 143-xx illustrates the layering diagram of 25/10G-EPON OLT and ONU. In the OLT, the MCRS sublayer serves MAC entities supporting the transmit data rate of 25 Gb/s and the receive data rate of 10 Gb/s. In turn, the MCRS sublayer is connected to the transmit path of 25GMII and the receive path of XGMII. In the ONU, the MCRS sublayer serves MAC entities supporting the transmit data rate of 10 Gb/s and the receive data rate of 25 Gb/s. The MCRS sublayer is connected to the transmit path of XGMII and the receive path of 25GMII.

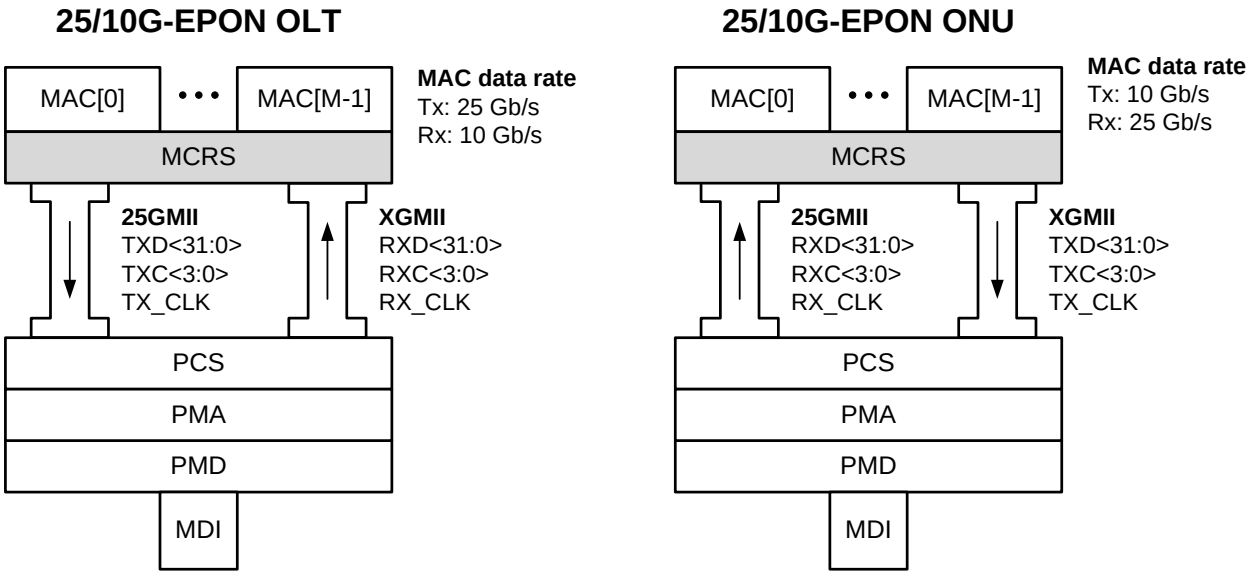

Figure 143-xx – 25G/10G-EPON OLT and ONU layering diagram

Because of the required close coupling between the MCRS clock (*InClk*, see 143.3.3.4 and *OutClk*, see 143.3.4.3) and MPCP clock (*LocalTime*, see 144.2.1.2), the MCRS buffer read pointers advance by one every EQT, i.e., both downstream and upstream channels within MCRS operate at a nominal data rate of 25 Gb/s. To adapt the MCRS channel rate to the MAC data rate of 10 Gb/s, the MCRS channel is throttled by inserting a placeholder EQ at the rate of 3 placeholder EQs per every 5 EQTs. The transfer of information through the 10 Gb/s MCRS channel is illustrated in Figure 143-yy.

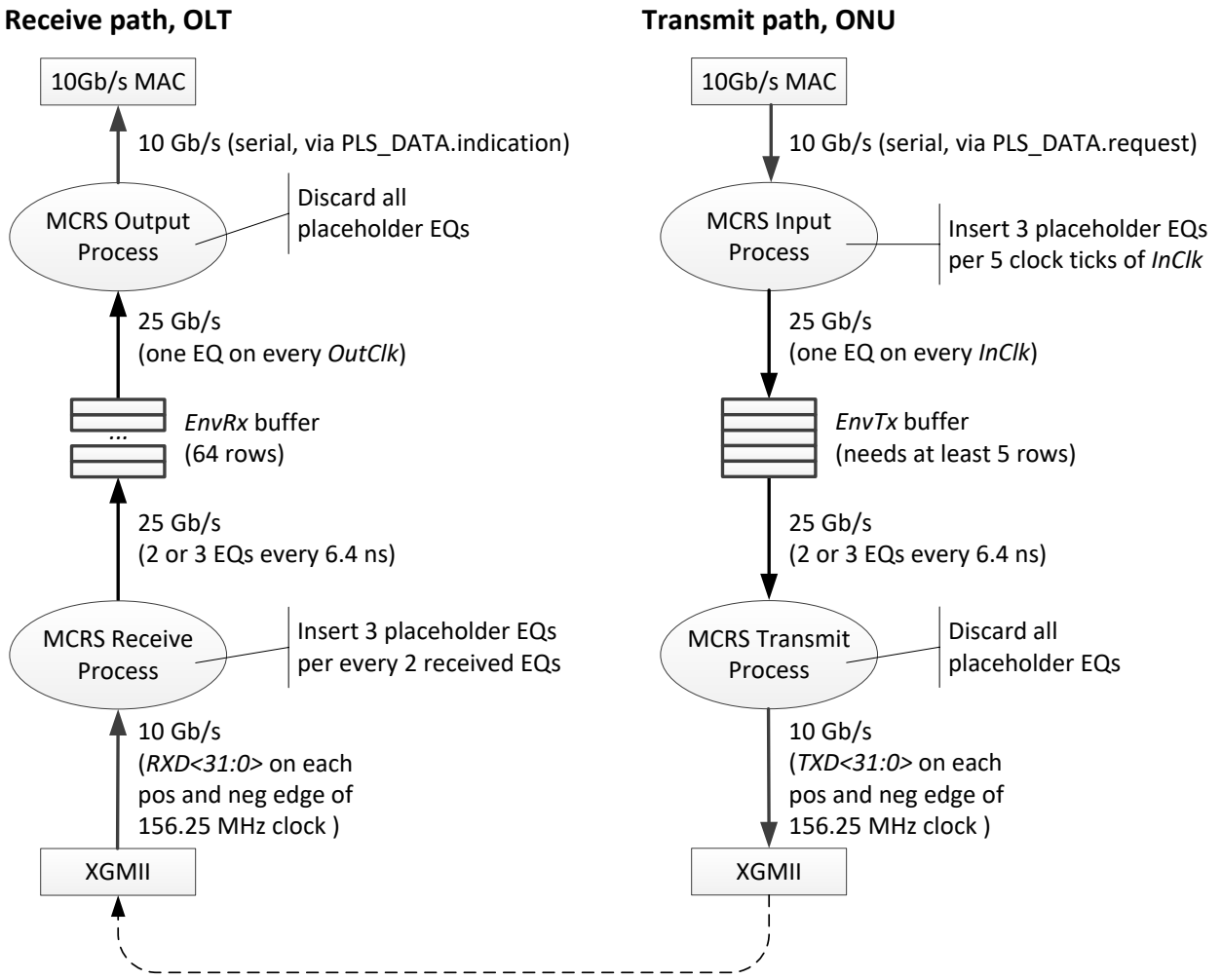

Figure 143-yy – Upstream channel operating at 10 Gb/s

The usage of the placeholder EQs is entirely confined to the MCRS sublayer and does not affect the definition of interfaces to either of the adjacent sublayers. Therefore the definition of the placeholder EQ format and values are left to implementations.