200A.3 Extensions to Nx25G-EPON Multipoint MAC Control (clause 144) for Super-PON

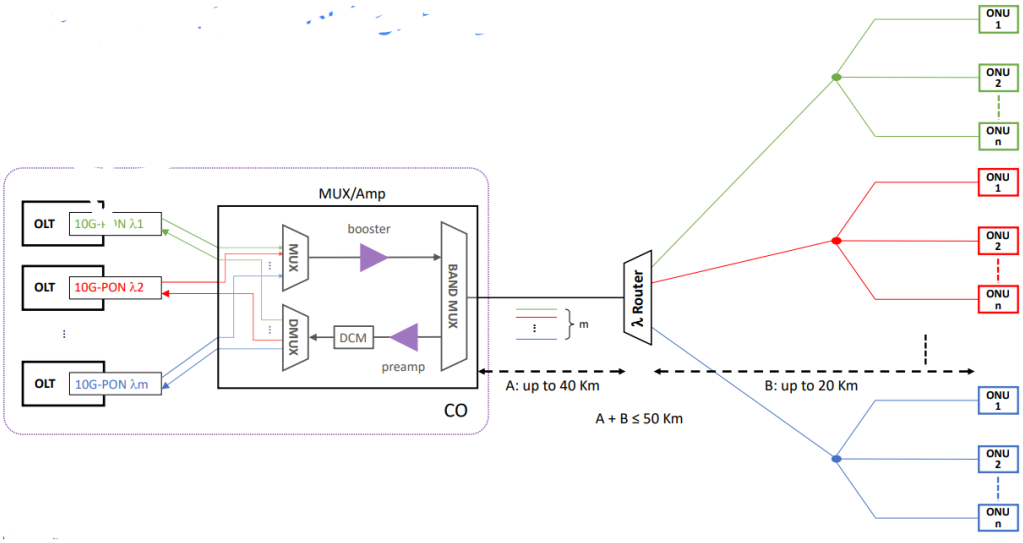
200A.3.1 Overview

This clause defines the mechanisms and control protocols required in order to reconcile the Super-PON into the Ethernet framework. A Super-PON is an optical network with no active elements in the signal's path from source to destination. The only interior elements used in a PON are passive optical components, such as optical fiber, splices, and splitters.

The Multipoint MAC Control (MPMC) sublayer defined in this clause includes Multipoint Control Protocol (MPCP) responsible for arbitration of TDM-based access to the point-to-multipoint (P2MP) medium. Principles of point-to-multipoint operation are outlined in 144.1.1. The MPMC functionality shall be implemented for subscriber access devices containing point-to-multipoint (P2MP) Physical Layer devices defined in Clause 200.

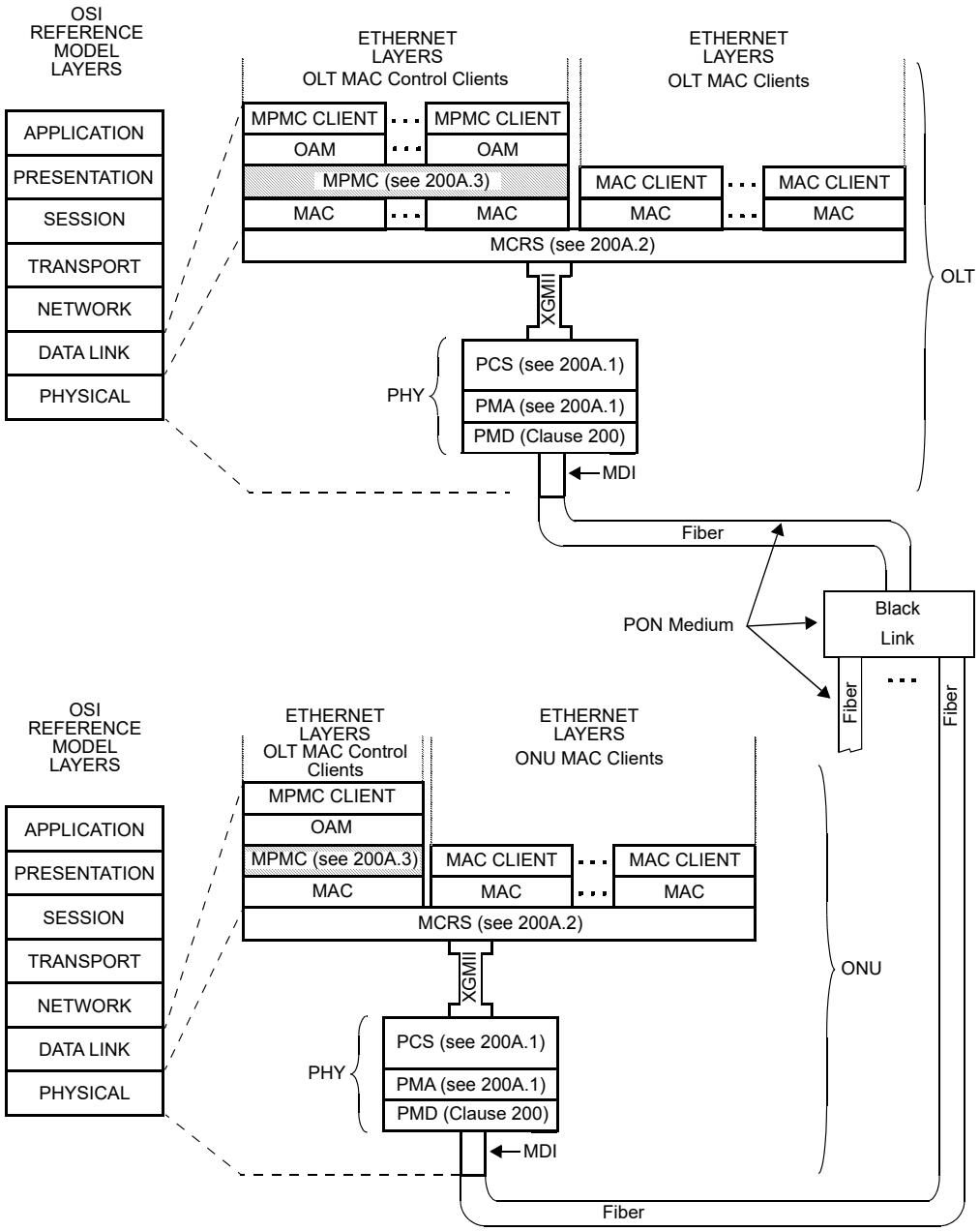
200A.3.1.1 The concept of Super-PON

Describe what Super-PON is. Add a figure



200A.3.1.2 Super-PON Layering Diagram

The layering diagram of Super-PON OLT and ONUs is shown in Figure 200A-5. OLT and ONU devices instantiate multiple MAC instances. P2MP architectures are best viewed as a collection of logical point-to-point and/or P2MP links. The concept of a logical link is described in 144.1.1.2.



MPMC described in this subclause

XGMII= 10 GIGABIT MEDIA INDEPENDENT INTERFACE
MDI = MEDIUM DEPENDENT INTERFACE
OAM = OPERATIONS, ADMINISTRATION & MAINTENANCE
OLT = OPTICAL LINE TERMINAL
MCRS= MULTI-CHANNEL RECONCILIATION SUBLAYER
MPMC= MULTI-POINT MAC CONTROL
ONU = OPTICAL NETWORK UNIT
PCS = PHYSICAL CODING SUBLAYER
PHY = PHYSICAL LAYER DEVICE
PMA = PHYSICAL MEDIUM ATTACHMENT
PMD = PHYSICAL MEDIUM DEPENDENT

Figure 200A–5—Relationship of EPON P2MP PMD to the ISO/IEC OSI reference model and the IEEE 802.3 Ethernet model

200A.3.2 MPMC Protocol-independent operation

200A.2.1 Control Parser and Control Multiplexer

The Control Parser is responsible for opcode-independent parsing of MAC frames and forwarding these frames to other processes for opcode-specific operations. The Control Parser also extracts the value of the *Timestamp* field from all MPCPDUs that contain this field and checks whether the timestamp drift value is within the acceptable range. There are no interfaces connecting the Control Parser to MAC Clients.

The Control Multiplexer is responsible for forwarding frames received from multiple opcode-specific processes to the underlying MAC sublayer. The Control Multiplexer inserts the timestamp value into all MPCPDUs that carry the *Timestamp* field. There are no interfaces connecting the Control Multiplexer to MAC Clients.

200A.2.1.1 Constants

DRIFT_THOLD

Type: Integer

Description: This constant holds the maximum amount of drift allowed before a timestamp drift error is declared. Exceeding this drift causes ONU deregistration (either self-deregistration or deregistration by the OLT).

Value: 2 (for the receive channels operating at 10 Gb/s) or 3 (for the receive channels operating at 2.5 Gb/s)

Unit: EQT

Other constants shall be as defined in 144.2.1.1.

200A.2.1.2 Counters

LocalTime

Type: 32-bit unsigned

Description: This variable holds the value of the local timer used to control MPCP operation. This variable is advanced by a timer at 156.25 MHz, and is equivalent to one EQT. At the OLT the counter shall track the XGMII transmit clock, while at the ONU the counter shall track the XGMII receive clock. For accuracy of the receive clock, see 200A.1.8. In the ONU, this variable is updated with the received timestamp value by the Control Parser Process (see 144.2.1.5).

Other counters shall be as defined in 144.2.1.2.

200A.2.1.3 Variables

Variables shall be as defined in 144.2.1.3.

200A.2.1.4 Functions

Functions shall be as defined in 144.2.1.4.

200A.2.1.5 Control Parser state diagram

The OLT and ONU shall implement the Control Parser state diagram shown in Figure 144–5.

200A.2.1.6 Control Multiplexer state diagram

The OLT and ONU shall implement the Control Multiplexer state diagram shown in Figure 144–6.