Outline of DMT draft
-DMT Baseline proposal-

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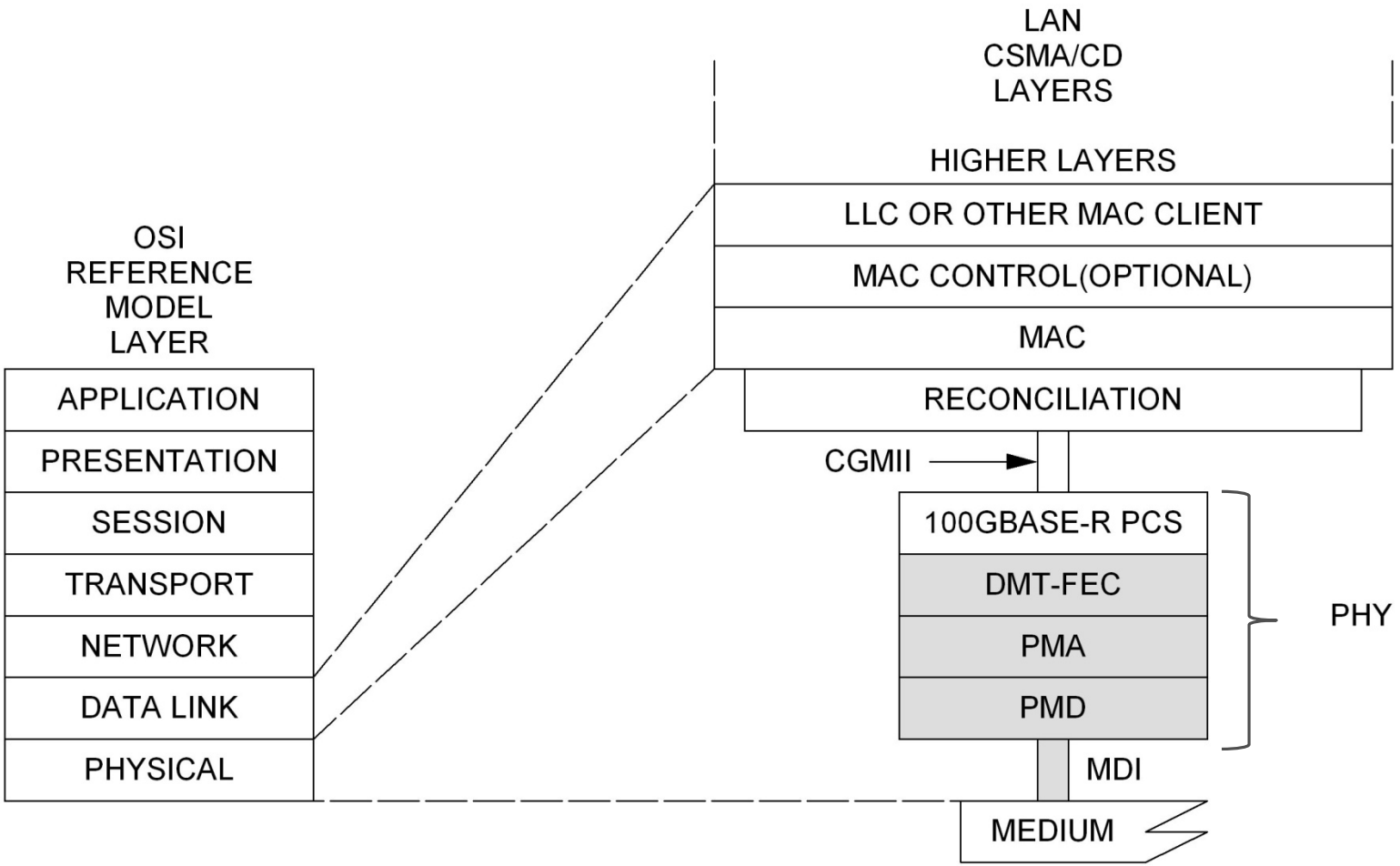
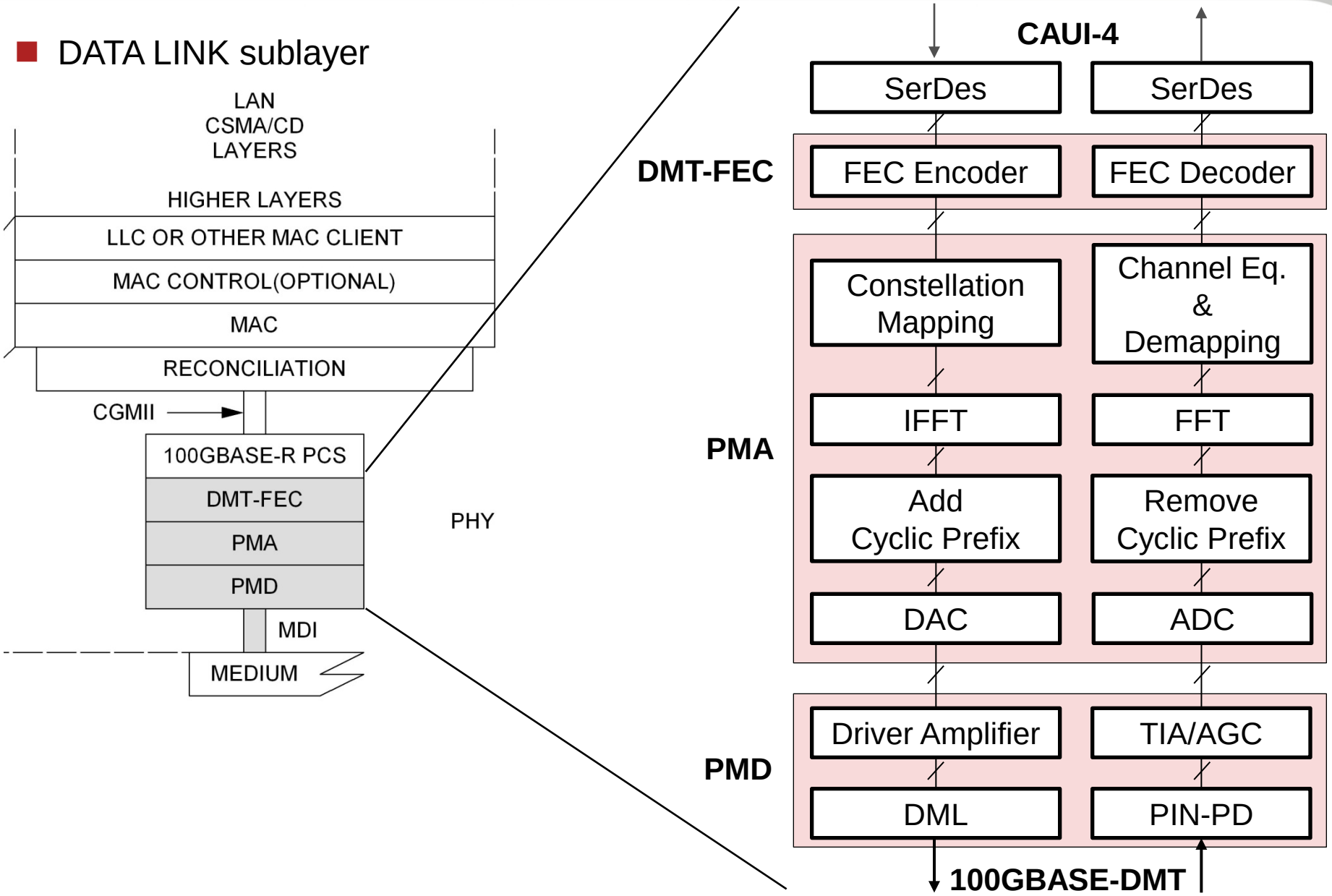
Overview

- PMA and PMD relation ship to the OSI reference model and IEEE 802.3 CSMA/CD LAN model



Function Diagram of DMT

- DATA LINK sublayer



DMT-FEC and PMA Functional Specifications

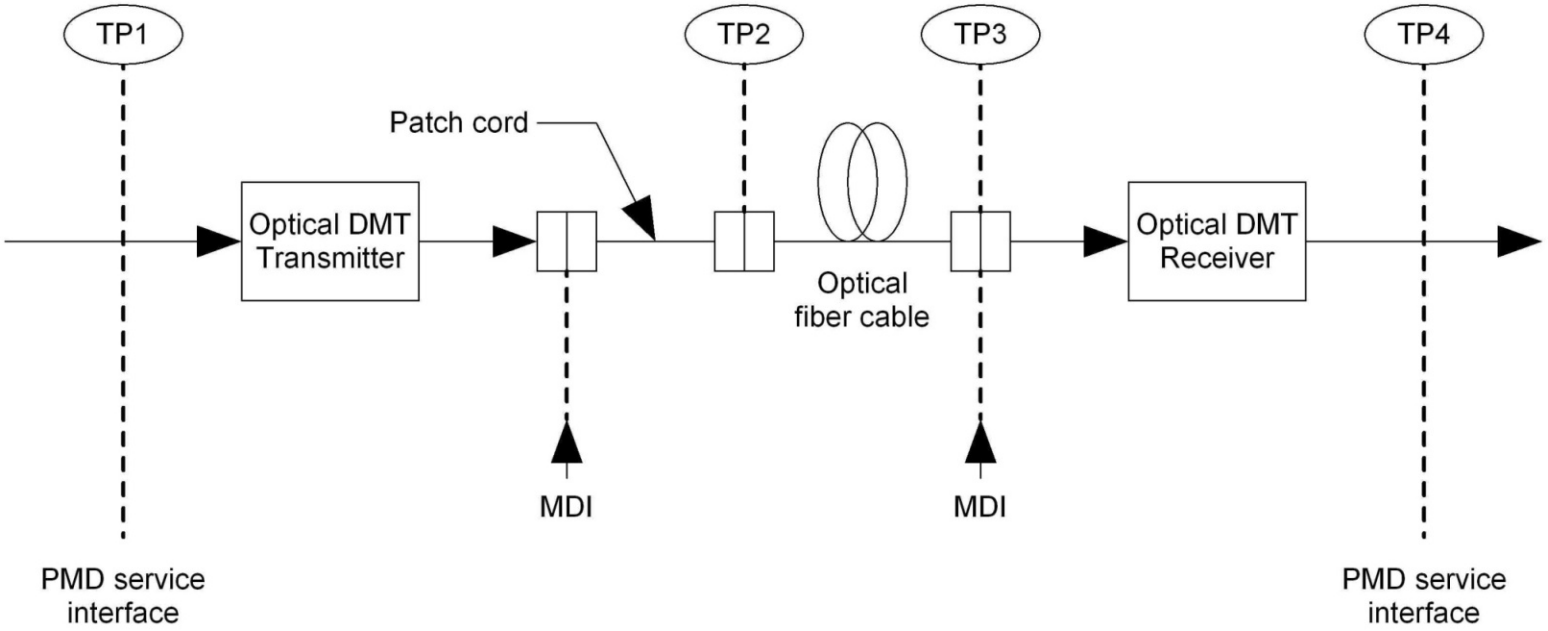
- Main parameter for DMT-FEC（Related to “FEC sublayer of DMT”）

Parameter	Value
FEC code	BCH (TBR)
FEC target input BER for 10^{-12} output BER	10^{-3}
Latency target	< 100 ns
Coding Overhead	12.5%

- Main parameter for PMA for DMT (Related to “PMA sublayer”)

Parameter	Value
Subcarrier number	256
Cyclic prefix	32
Modulation format	Adapting bit and power allocation on each subcarrier through the initializing process
FFT size	512
Sampling rate	64 GS/s (TBR)

PMD Block Diagram



Wavelength Assignment and Operating Range

- Wavelength assignment

Nominal wavelength	Wavelength range
1310 nm	1260 – 1355 nm

- Operating range

PMD-type	Minimum operating range
100GBASE-??(DMT)	2 m to 500 m

Transmit Optical Specifications

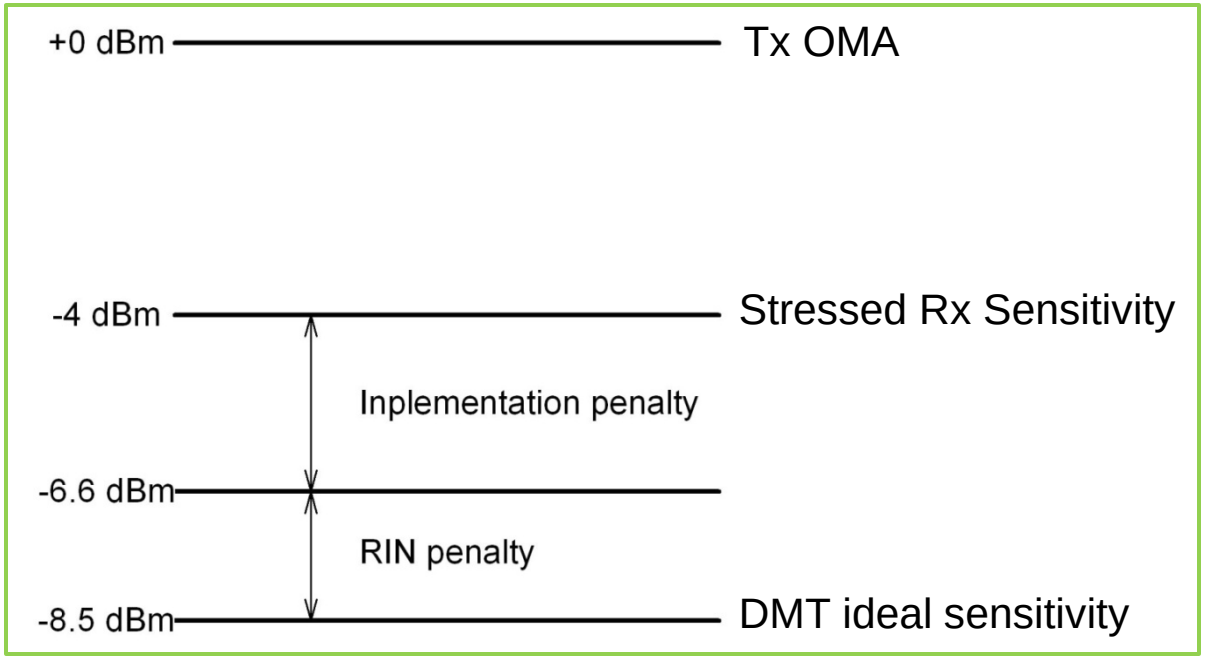
Description	Value	Unit	Note
Input signaling rate, each lane (range)	25.78125±100 ppm	Gbps	
Output signaling rate	116.015625	Gbps	
Wavelength	1260 - 1355	nm	
Average launch power (max.)	3.0	dBm	
Average launch power (min.)	0	dBm	
Transmitter and dispersion penalty (max.)	0.2	dB	
RIN	-140	dB/Hz	
Optical return loss tolerance (max.)	TBD	dB	
Transmitter reflectance(max)	-35	dB	
Crest factor	TBD		
Transmitter 3dB electrical upper cutoff frequency (min.)	14	GHz	informative
Total harmonic distortion	5	%	informative
Effective number of bit for DAC	5 (TBR)	bit	informative

Receive Optical Specifications

Description	Value	Unit	Note
Input signaling rate	116.015625	Gbps	
Output signaling rate, each lane (range)	25.78125±100 ppm	Gbps	
Wavelength	1260 - 1355	nm	
Damage threshold	5.0	dBm	
Average receive power (max.)	3.0	dBm	
Average receive power (min.)	-4.0	dBm	
Receiver reflectance (max.)	TBD	dB	
Stressed receiver sensitivity (max.)	-4.0	dBm	
Receiver 3 dB electrical upper cutoff frequency (min.)	18	GHz	informative
Total harmonic distortion	3	%	informative
Effective number of bit for ADC	5 (TBR)	bit	informative

Link Power Budget

Description	Value	Unit
Power budget	8.5	dB
Operating distance	500	m
Channel insertion loss	4	dB
Allocation for RIN penalty	1.9	dB
Allocation for penalties	2.6	dB
Additional insertion loss allowed	0	dB



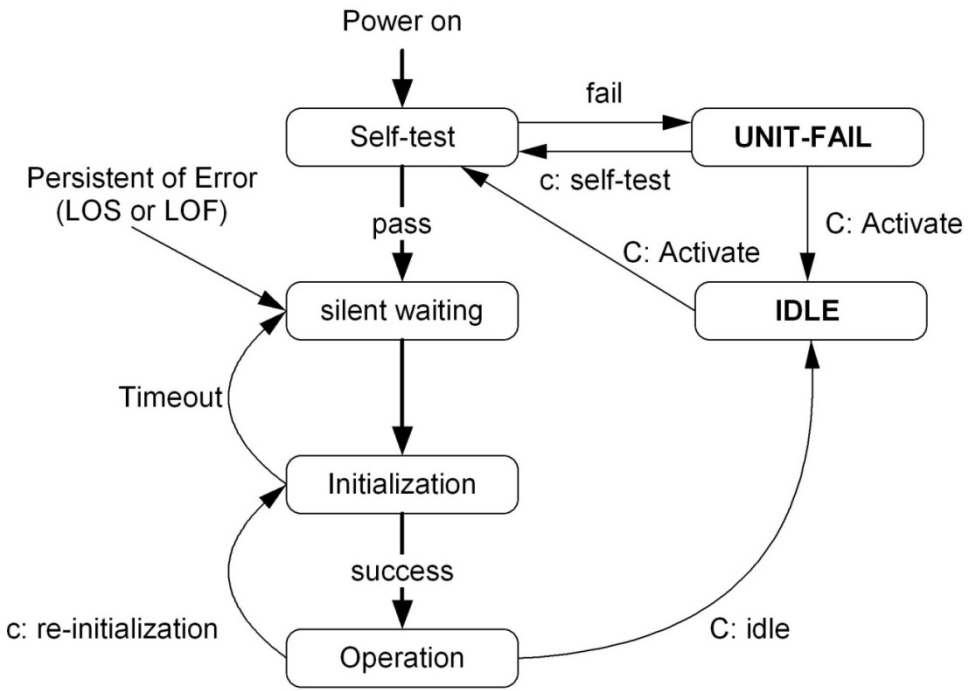
Initialization

- Basic functions initialization
  - An DMT transceiver initialization is required in order for a physical connected transceiver pair to establish a communication link with information exchange about bit/power allocation.

Handshake procedures	Transceiver training	Operation

Time

- Handshake procedures



C: host controller command

Transceiver Training at Initialization

DMT requires information exchange between transmitter and receivers at the initialization stage to adapt the bit and power allocation on each subcarrier. Transceiver training process is shown below.

1. The master transceiver transmits the probing signal to the slave transceiver.
   - The probing signal is uniformly modulated QPSK signal on each subcarrier with constant power allocation and known bit sequence.
2. Concurrently the slave transceiver transmits the probing signal to the master transceiver.
3. The Error Vector Magnitude (EVM, which is similar to SNR) is calculated on each subcarrier at both the master and slave transceiver.
4. Bit and power allocation is decided on each subcarrier from the EVM at both the master and slave transceiver.
5. Information exchange about bit and power allocation is implemented between the master and slave transceiver after the probing sequence.

Summary

- We explained the main point of DMT draft including the DMT baseline proposal.
  - Overview
  - Function diagram of DMT
  - Main parameter in FEC sublayer
  - Main parameter in PMA sublayer
  - Main parameter in PMD sublayer
    - Block diagram
    - Wavelength assignment and operating range
    - Transmit optical specification
    - Receive optical specification
    - Link power budget
  - Initialization process for adapting bit and power allocation on each subcarrier

Thank you