PCS and PMA baseline proposal

Rubén Pérez-Aranda, KDPOF

Introduction

- In [1] close collaboration between .3cz and .3dh was proposed:

  - To void re-inventing the wheel in many common topics

  - To reduce as much as possible market fragmentation

- In [1] was suggested that .3cz PCS and PMA sublayers as well as PMD TX specifications can be 100% leveraged for GI-POF, and only the specifications that depend on optical fiber need to be developed (e.g. RX sensitivity OMA, min AOP, link power budget, optical fiber cable, insertion loss, etc)

- .3cz BASE-U PCS and PMA sublayers provide:

  - Best receiver sensitivity for GI-POF (lower BW and higher attenuation than OM3)

  - Best performance and yield in varying automotive conditions

  - OAM channel, which is an specific automotive requirement

  - Optional EEE

Introduction
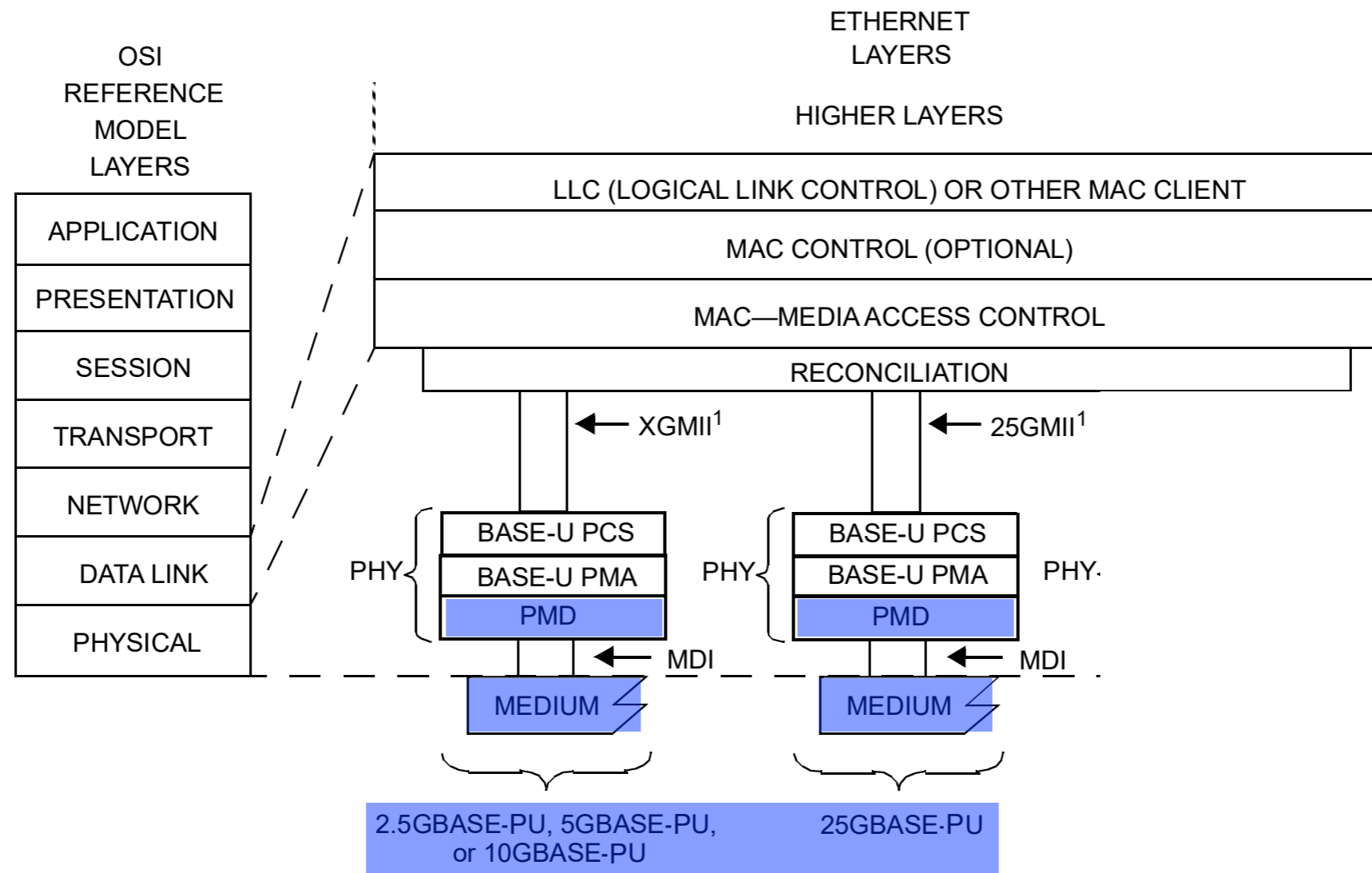
MDI = MEDIUM DEPENDENT INTERFACE
XGMII = 10 GIGABIT MEDIA INDEPENDENT INTERFACE

NOTE—XGMII, 25GMII and 50GMII are optional

PCS = PHYSICAL CODING SUBLAYER
PMA = PHYSICAL MEDIUM ATTACHMENT
PMD = PHYSICAL MEDIUM DEPENDENT
PHY = PHYSICAL LAYER DEVICE

Work scope suggested in [1]

Introduction

- In [2] simulations results of transmission based on .3cz PCS, PMA and PMD-TX of 2.5, 5, 10 and 25 Gb/s over GI-POF were presented

- Characteristics of GI-POF (attenuation and EMB) used for simulations and link budget analysis were pessimistic compared with reported ones
  - Revision of IEC 60793-2-40 needs to be completed to have final GI-POF characteristics, therefore for PMD characteristics

- Cable attenuation aging, inline connectors insertion loss, macro-bending insertion loss, allocation for modal noise and implementation penalties were consistent with .3cz and automotive application

- **Simulation results demonstrated that project's objectives are met**

PCS and PMA baseline proposal

- Proposal is to adopt the P802.3cz PCS and PMA for P802.3dh, because:

  - BASE-U PCS/PMA meet the P802.3dh project's objectives

  - BASE-U PCS/PMA are technically complete and mature (P802.3cz is in third WG ballot recirculation, very close to SA ballot)

  - BASE-U PCS/PMA meet automotive requirements: support all the targeted data-rates, support optional OAM channel and optional EEE

  - Selection of BASE-U PCS/PMA will minimize automotive market fragmentation, e.g. same PHYs can be used for OM3 and GI-POF

  - BASE-U PCS/PMA provide the best receiver sensitivity for GI-POF, which has lower BW and higher attenuation than OM3

  - BASE-U PCS/PMA provide the best performance and yield in varying automotive condition

References

- [1] R. Pérez-Aranda, "Collaboration between .3cz and .3dh Specifications to leverage and work to do," July 2022, [Online], Available: https://www.ieee802.org/3/dh/public/July_2022/Perez-Aranda_3dh_01_2207.pdf

- [2] R. Pérez-Aranda, "RX characteristics and link budget," July 2022, [Online], Available: https://www.ieee802.org/3/dh/public/Ad%20Hoc%20July%2027%202022/Perez-Aranda_3dh_01_220727.pdf

Thank you