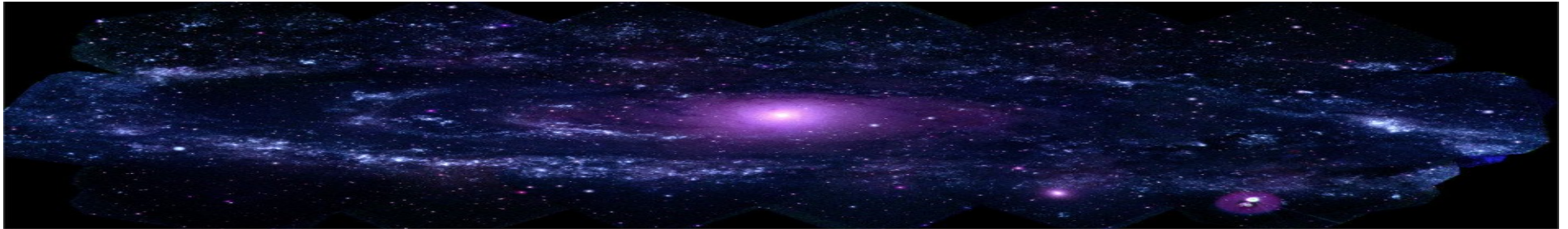




# GEPOF Reference Models and Project Scope



**Eugene (Yuxin) DAI PhD, Cox  
Communications**

IEEE 802.3 Interim Meeting

Gigabit Ethernet over POF Study Group

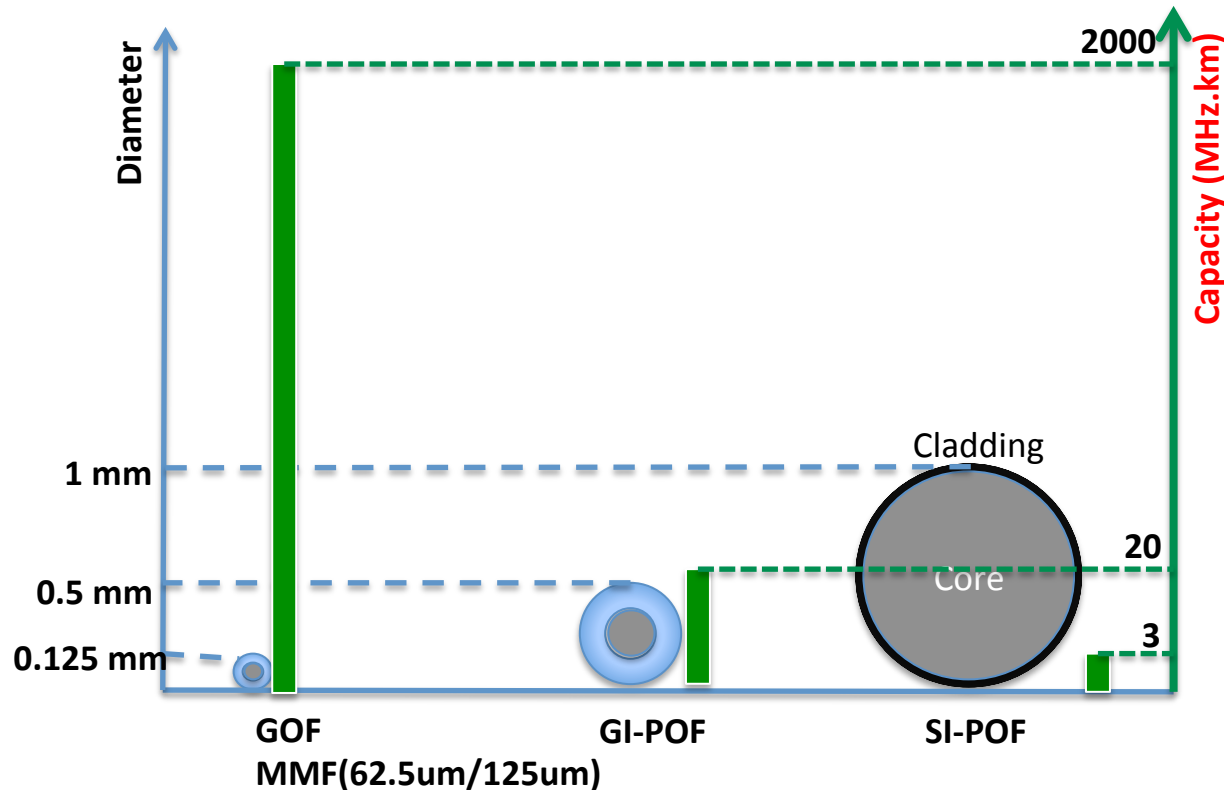
September 8 -12, 2014

Ottawa, Canada

# OUTLINE

- Introduce Plastic Optical Fiber
- GEPOF reference models
- GEPOF network reference models

# GOF and POF - size and capacity

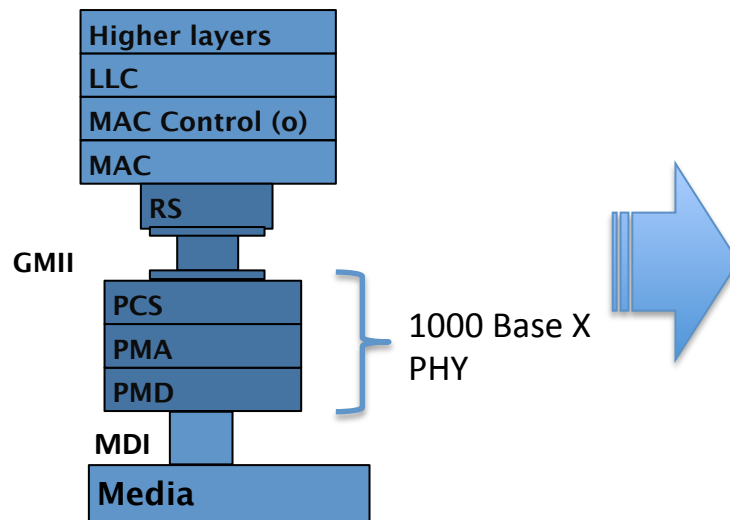


- **Size:** The diameter of SI-POF is about 10 times bigger than MMF
- **Capacity:** The MHz-km capacity POF is much lower than GOF

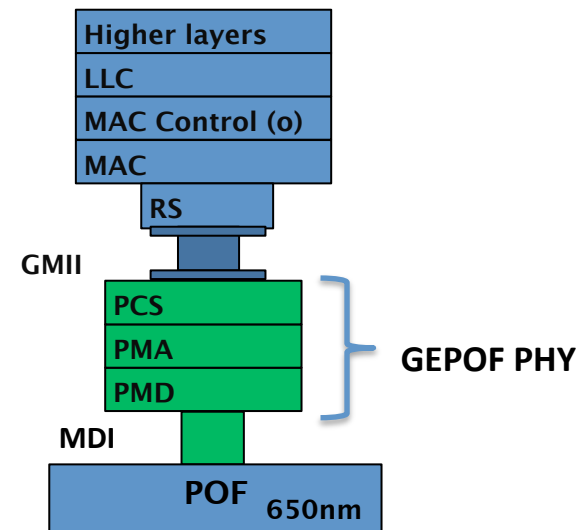
- POF has Large core area - Much lower cost of fiber connection and termination
- POF has Lower MHz-km capacity – advanced modulations are needed to achieve Gigabit rate

# 802.3 GEPOF reference model 1

Gigabit Ethernet reference model



GEPOF reference model 1



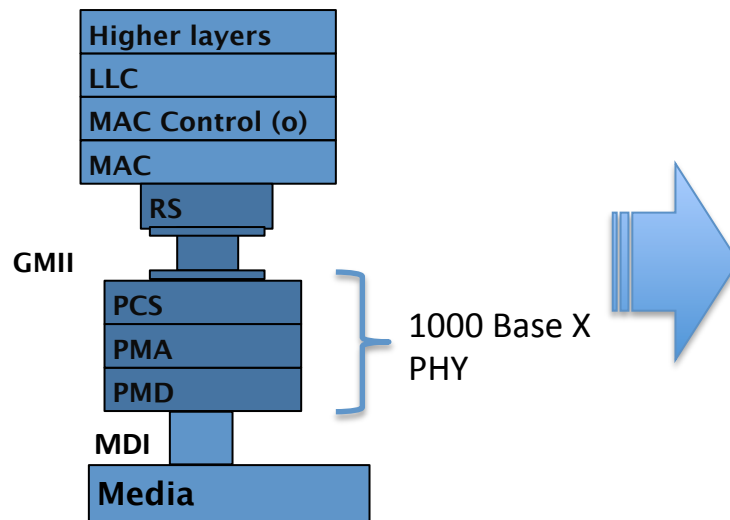
- **No changes to GMII and above layers**
  - Reuse Clause 35, RS, GMII
- **A new POF PHY with**
  - New PCS, PMA and PMD
  - Change Clause 46

# Reference model 1 – PROs and CONs

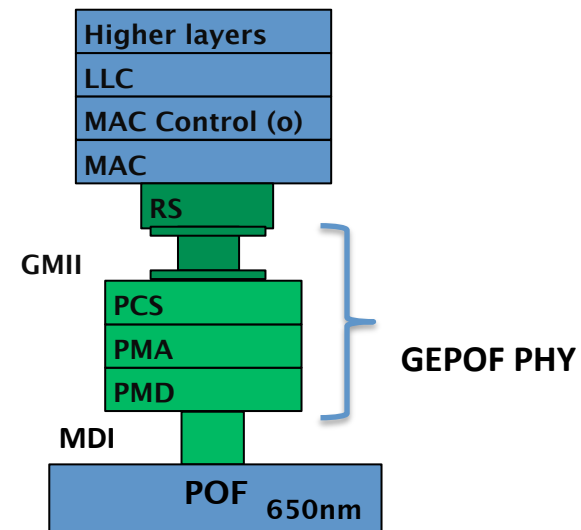
- **Pros**
  - **The PCS, PMA layers can be optimized**
    - Advanced modulation such as M-PAM, QPSK, OFDM etc., can be used to achieve higher data rate
  - **Optimize FEC**
    - LDPC can be considered
      - Higher coding gain, low overhead
  - **Options on line code**
    - Replace 8B/10B with 64/66B, reduce ~25% overhead
    - Change Clause 46
- **Cons**
  - **Ethernet preambles can not be removed (for efficiency)**

# 802.3 GEPOF reference model 2

Gigabit Ethernet reference model



GE POF reference model 2



- No changes to MAC and above layers
- A new POF PHY with
  - New PCS, PMA and PMD
- Changes could be made at RS layer

# PROs and CONs for reference model 2

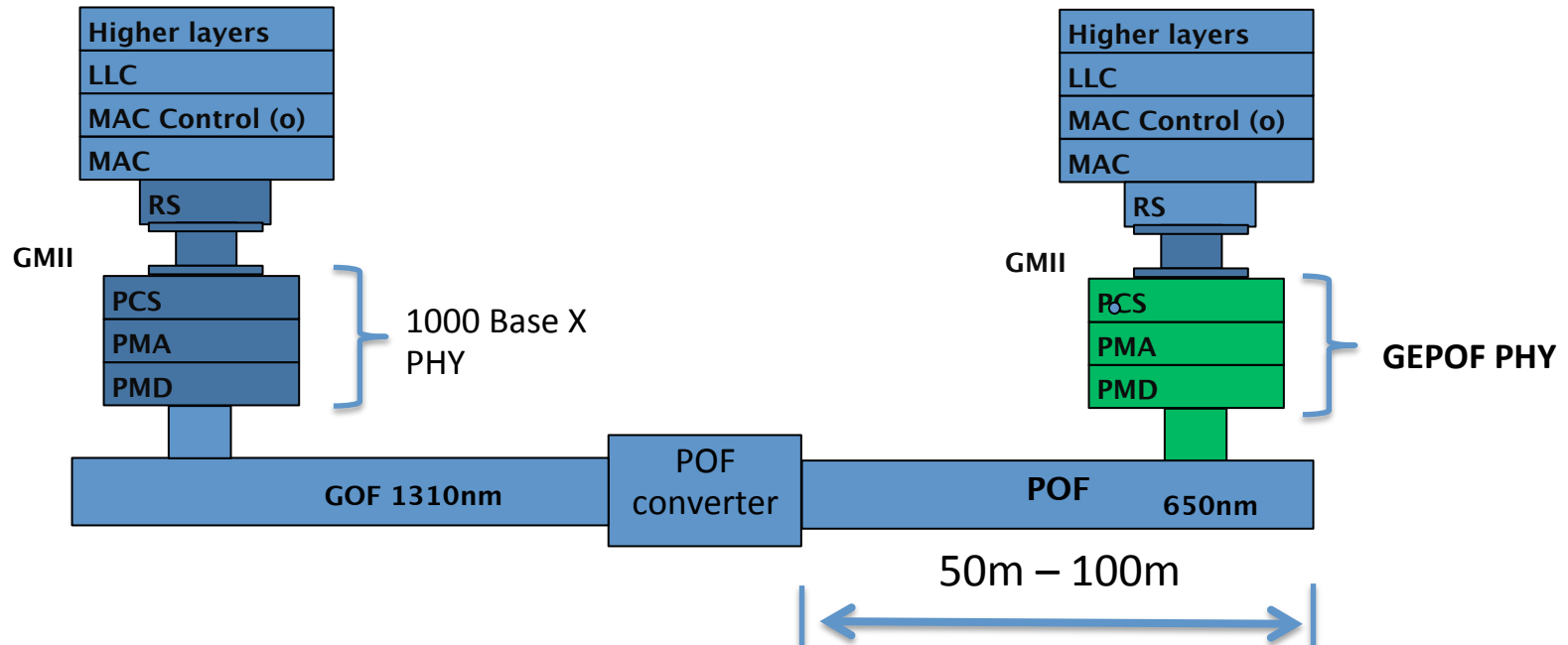
- Pros
  - Optimize PCS, PMA
    - Advanced modulation such as M-PAM, QPSK, OFDM etc., can be used to achieve higher data rate
  - Optimize FEC
  - Options on line code
  - **Ethernet preambles can be removed for efficiency**
- Cons: Not a clean PHY solution (PHY+?)

# Choices of reference models

- For P2P Ethernet, preserving Ethernet preamble or not at POF conversion point does not affect interoperability
  - Can be left as an implementation choice
- In some system, management and/or control information are embedded in Ethernet preambles
  - EPON LLID is embedded in the preambles
- Model 1 is a clean PHY solution
  - Leave treatment of Ethernet preambles as an implementation choice

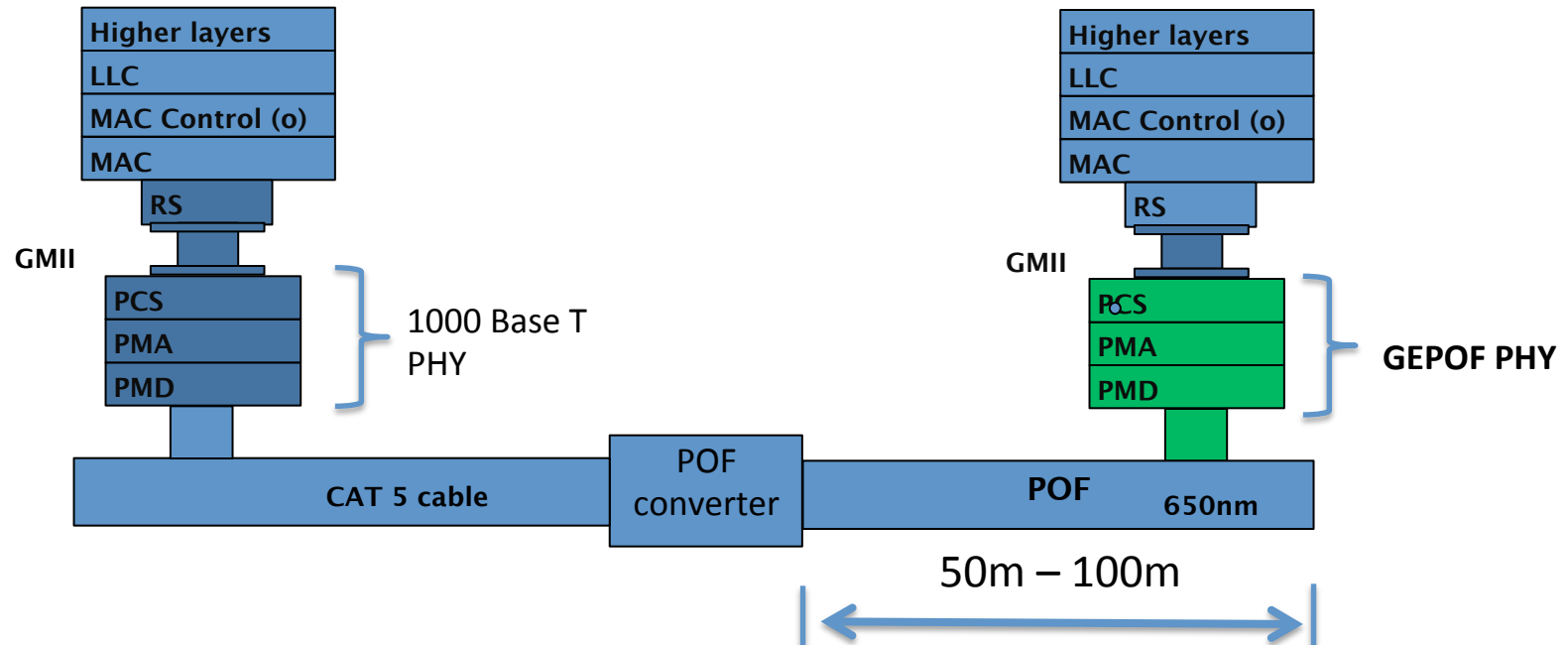


# GEPOF Network Reference Model 1



- **POF network reference models are implementation models**
- **1000BASE X to GEPOF medium converter**
  - 1000BASE-LX MMF 550 m
  - 1000BASE-LX SMF 5 km
  - 1000BASE-LX10 SMF 10 km

# GEPOF Network Reference Model 2



- Is an implementation model
- 1000BASE-T to GEPOF medium converter
  - 1000BASE-T CAT 5, CAT 6 cable

# Summary

- Two GEPOF reference models are discussed
  - Reference model 1 is a clean PHY solution
- GEPOF project scopes are proposed
- Two GEPOF network reference models are discussed for implementations
  - 1000BASE X fiber interface to GEPOF convertor
  - 1000BASE-T copper interface to GEPOF convertor

# Motion #

- Adopt Reference Model 1 on page 4 as GEPOF reference model and project scope

**Technical**

**Yes:**

**No:**

**Abstain:**

# Thanks

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