# Medium Loss 200G/lane C2M AUI Specification Proposal Thoughts

Kent Lusted, Intel
Matt Brown, Huawei
Chris Cole, Quintessent
Ali Ghiasi, Ghiasi Quantum / Marvell
Davide Tonietto, Huawei

# Recap from Oct 2022 Session

- Strong interest in two sets of AUI C2M specifications

## Straw Poll #1

For the front panel pluggable use case, I am interested in 200 Gbps/lane AUI C2M specifications for:

A. medium loss only (e.g. up to ~22 dB IL die-die per lusted_3df_01_220927)
B. higher loss only (e.g. up to ~36 dB IL die-die per lusted_3df_01_220927)
C. both medium and higher loss
D. need more information

pick one

Results: A: 17, B: 11, C: 49, D: 12

https://www.ieee802.org/3/df/public/22_10/motions_3df_221004.pdf

# General Direction

- This presentation is for the medium loss specification direction
- Supports NPO and front panel pluggable constrained loss host and module connector applications

## Straw Poll #1

For the front panel pluggable use case, I am interested in 200 Gbps/lane AUI C2M specifications for:

A. medium loss only (e.g. up to ~22 dB IL die-die per lusted_3df_01_220927)
B. higher loss only (e.g. up to ~36 dB IL die-die per lusted_3df_01_220927)
C. both medium and higher loss
D. need more information

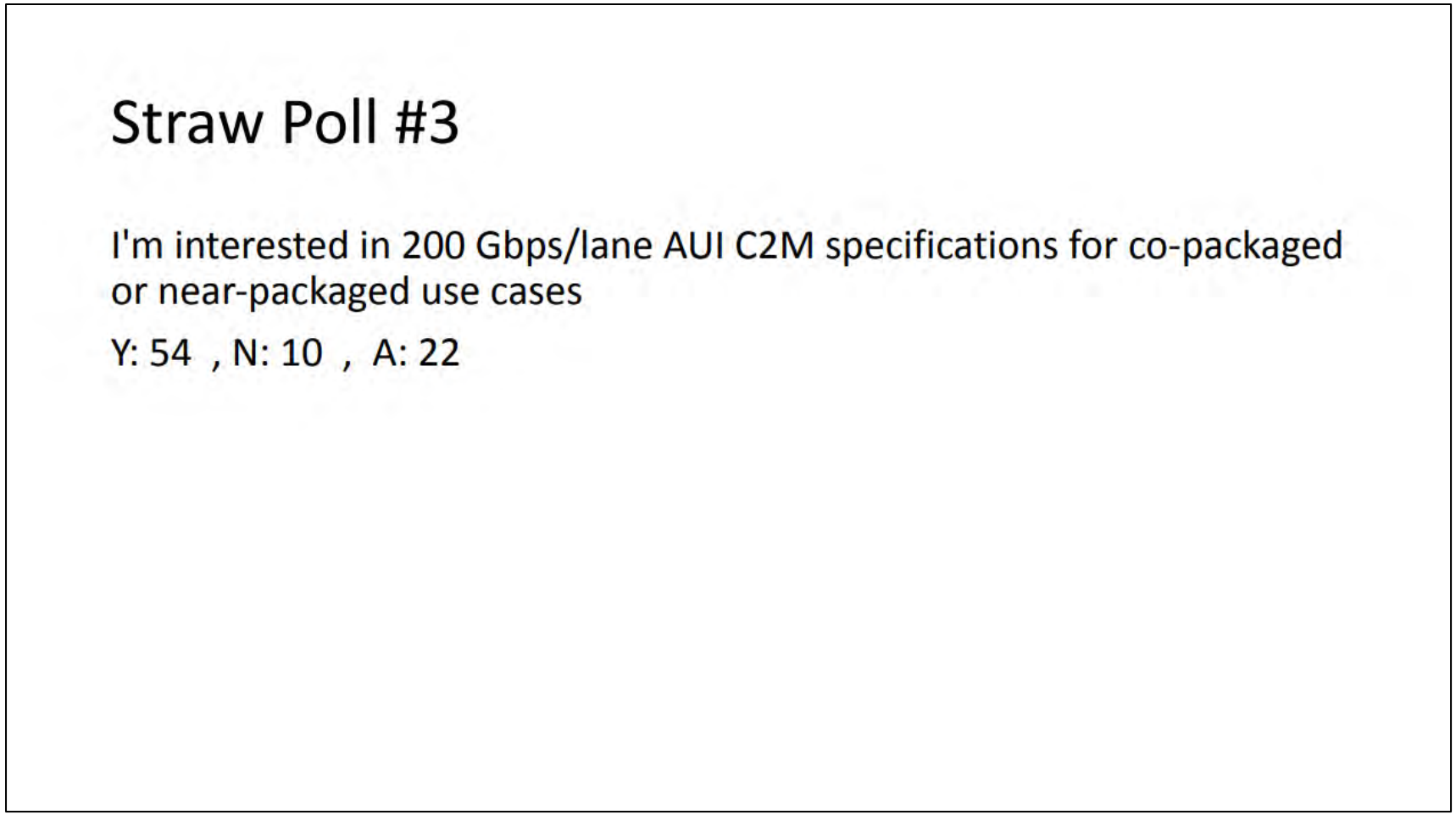
pick one

Results: A: 17, B: 11, C: 49, D: 12

https://www.ieee802.org/3/df/public/22_10/motions_3df_221004.pdf

# Consideration for NPO/CPO Form Factor

- Addresses NPO form factor interest




https://www.ieee802.org/3/df/public/22_10/motions_3df_221004.pdf

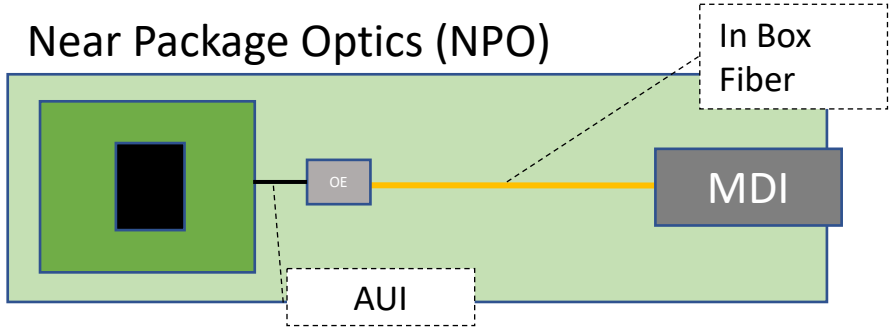
# Introduction

- The goal is to set a direction for the medium loss 200 Gbps/lane AUI C2M; it is not a baseline proposal
- Medium loss is a different optimization point than a higher loss (e.g. ~36 dB) 200 Gbps/lane AUI C2M
  - Channels or hosts needing more equalization capabilities should use the higher loss AUI C2M specification
- Near Package Optics (NPO) form factor support
  - CPO not being considered at this time
  - Does not support passive copper cable
- In-box cable interconnect architectures to front panel pluggable modules are possible
  - Constrained loss PCB host
- Applies to 200GAUI-1, 400GAUI-2, 800GAUI-4, 1.6TAUI-8

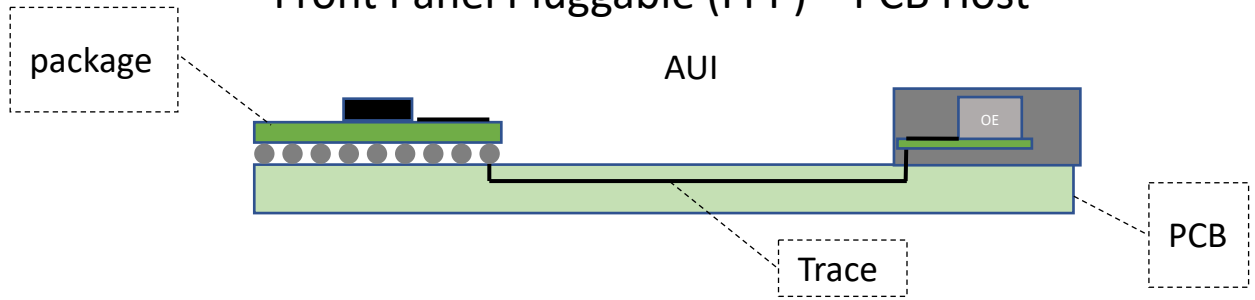
# Example Topologies

Front panel pluggable constrained loss host and module connector applications

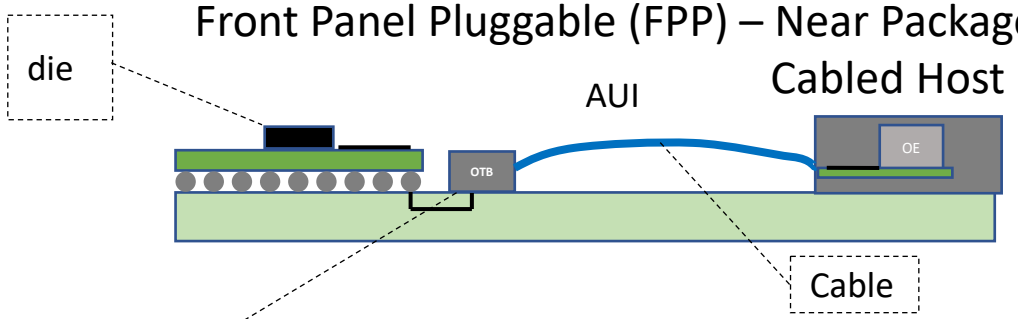
Near Package Optics (NPO)



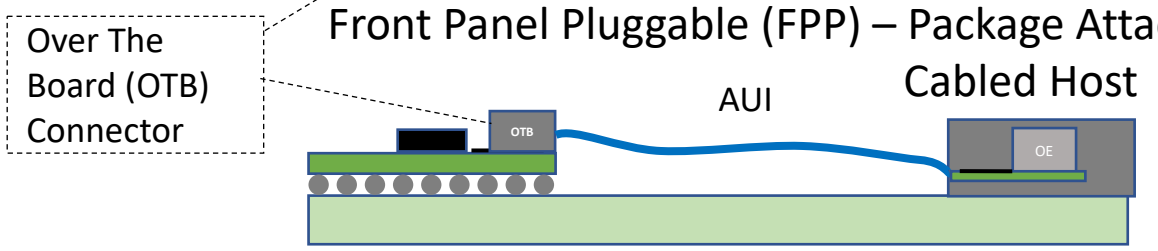

Front Panel Pluggable (FPP) – PCB Host




Front Panel Pluggable (FPP) – Near Package Attach Cabled Host



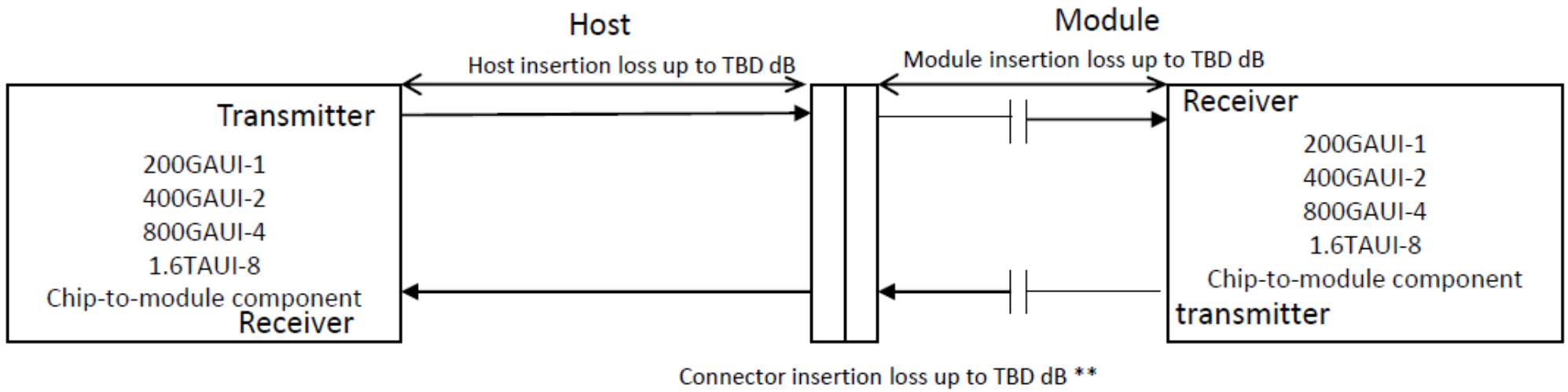

Front Panel Pluggable (FPP) – Package Attach Cabled Host



# Key Points

- Operating BER = 1E-5
- Target ~22 dB IL die-die
- Uses RS(544,514) “KP4” FEC
  - Nominal signaling rate of 106.25 GBd (+/- 50 ppm)
  - PAM4 signaling
- Optimization of transmitter equalization using industry methods (e.g. link training)
  - As an example, CMIS-LT approach in OIF could be a candidate
- The COM reference transmitter and receiver models and parameters are an evolution from 3ck, scaled to the higher signaling rate
- Evolve the test methods and specification parameters based on 3ck
- Supports the end-end or concatenated FEC schemes
  - Could be used in an extender for segmented FEC schemes

# Channel Insertion Loss Allocation




** The host connector mating interface is allocated TBD dB variation allowance, not including via.

# Test Points

- Need to think about how to define the test points and where they are located
  - At the connector?  At the bumps?  Both?
- We propose that the channel be defined die to die now
  - AUI channel includes the host package, host PCB/cable, pluggable connector, and module package

# Summary – Medium Loss AUI C2M

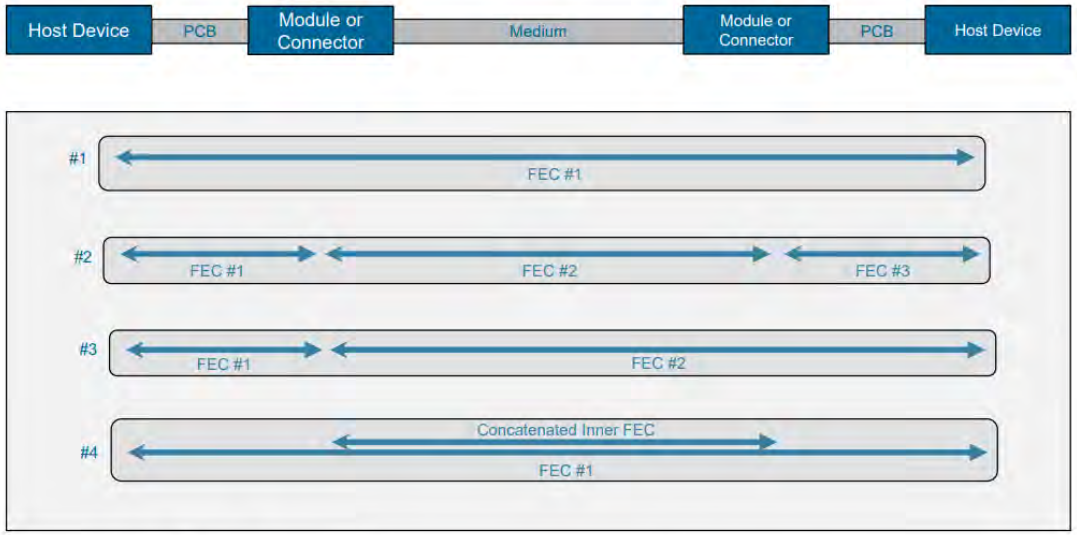
- Proposes a direction for the medium loss 200 Gbps/lane AUI C2M; it is not a baseline proposal
- Operating BER = 1E-5
- Objective is to support NPO and front panel pluggable constrained loss host and module connector applications
- Target ~22 dB IL die-die
- Uses RS(544,514) “KP4” FEC
- More work needed to construct a complete baseline proposal

# Thanks!

# FEC Scheme Reference

## Possible FEC Schemes for 200Gbps/lane

200 Gbps/lane




#1 End to end FEC
#2 Segmented FEC
#3 Mix of #1/2
#4 Concatenated

Is the modulation consistent across the link?

https://www.ieee802.org/3/df/public/22_01/gustlin_3df_01_220118.pdf