400GPL Proposed AUI Objectives

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rev 4

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Overview

- This presentation is focused on the approach to AUI electrical interface objectives for consideration by the IEEE 802.3 400G/s per Lane Study Group.

- The Attachment Unit Interface (AUI) objective language has been intentionally left flexible, for the Task Force to choose a solution.

Example: 200G/Lane AUI Objective Form

- Support optional single-lane 200 Gb/s attachment unit interfaces for chip-to-module and chip-to-chip applications
- Support optional two-lane 400 Gb/s attachment unit interfaces for chip-to-module and chip-to-chip applications
- Support optional four-lane 800 Gb/s attachment unit interfaces for chip-to-module and chip-to-chip applications
- Support optional eight-lane 1.6 Tb/s attachment unit interfaces for chip-to-module and chip-to-chip applications

AUI C2M (Chip-to-Module)

Traditional Front Panel Pluggable (FPP) Example

P802.3dj - Annex 176D:

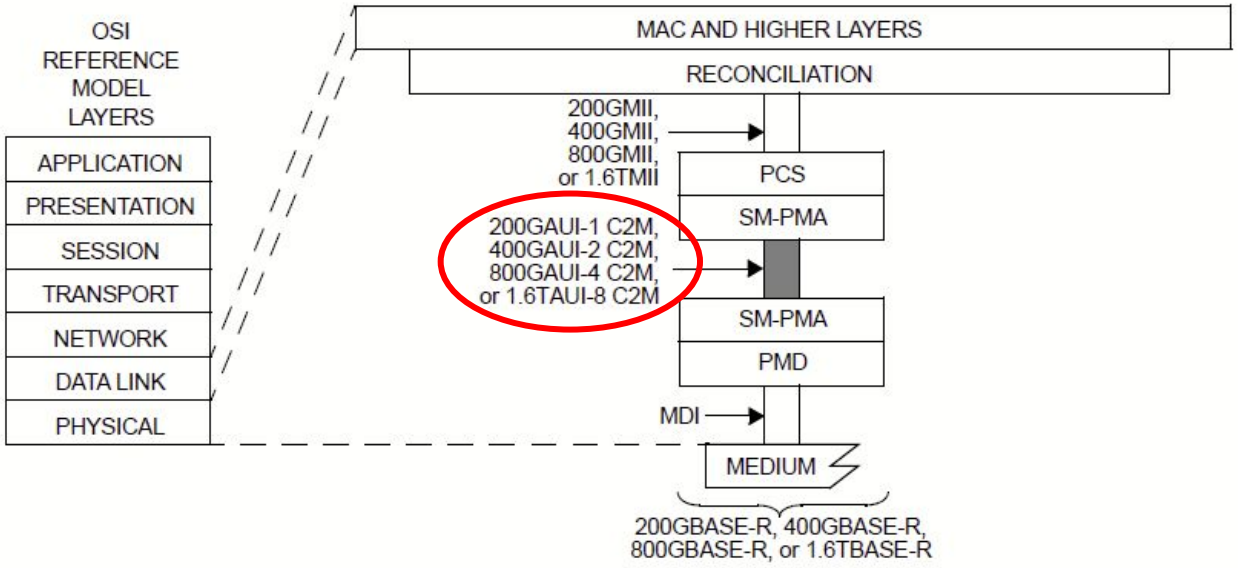
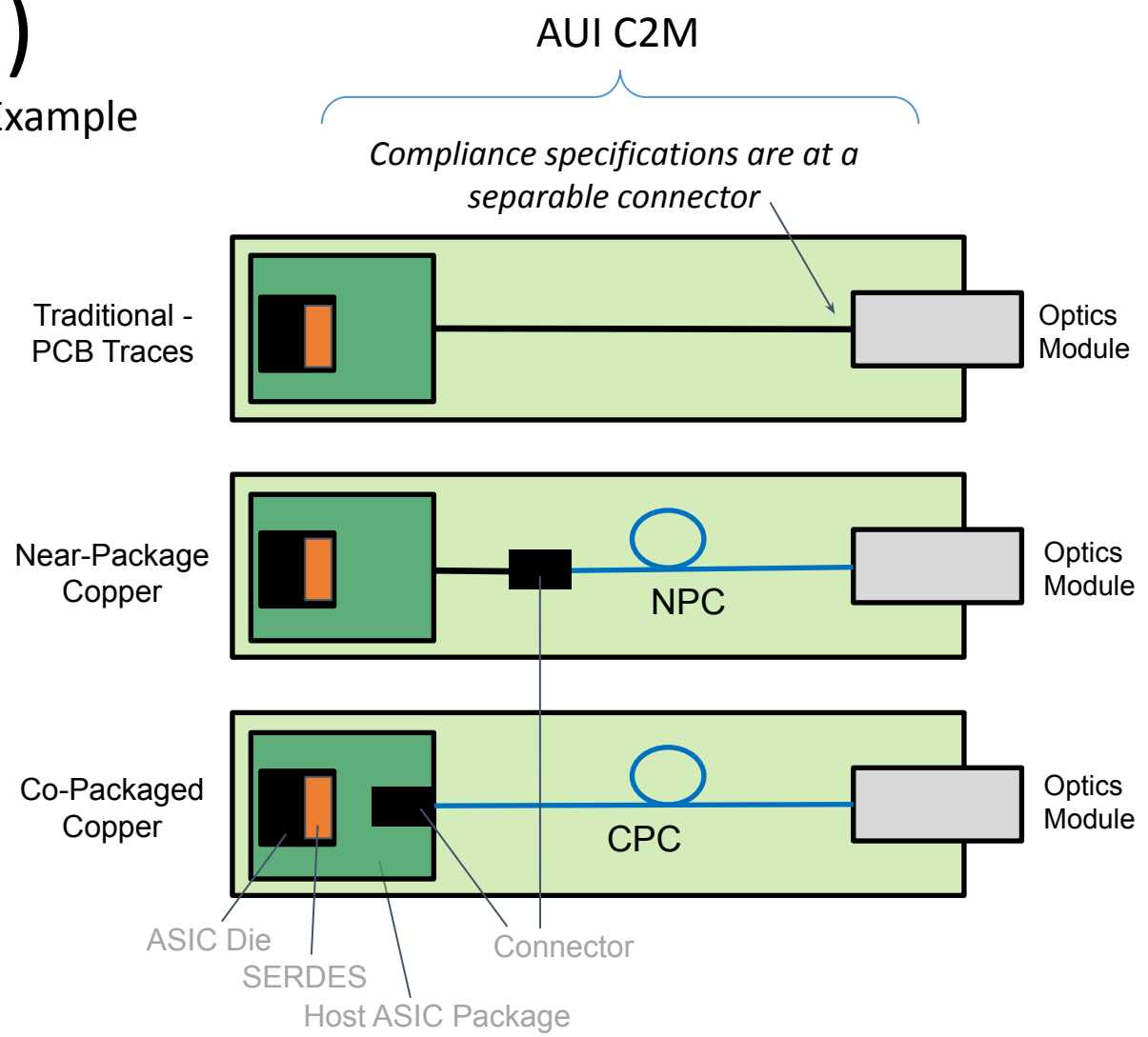


Figure 176D–1—200 Gb/s per lane AUI-C2M relationship to the ISO/IEC Open System Interconnection (OSI) reference model and the IEEE 802.3 Ethernet model

Figure above is an example architectural diagram of existing chip-to-module electrical interfaces and is not intended to represent the direction this group must take.



AUI C2C (Chip-to-Chip)

Example of traditional retimer, when needed for FPP reach

P802.3dj - Annex 176C:

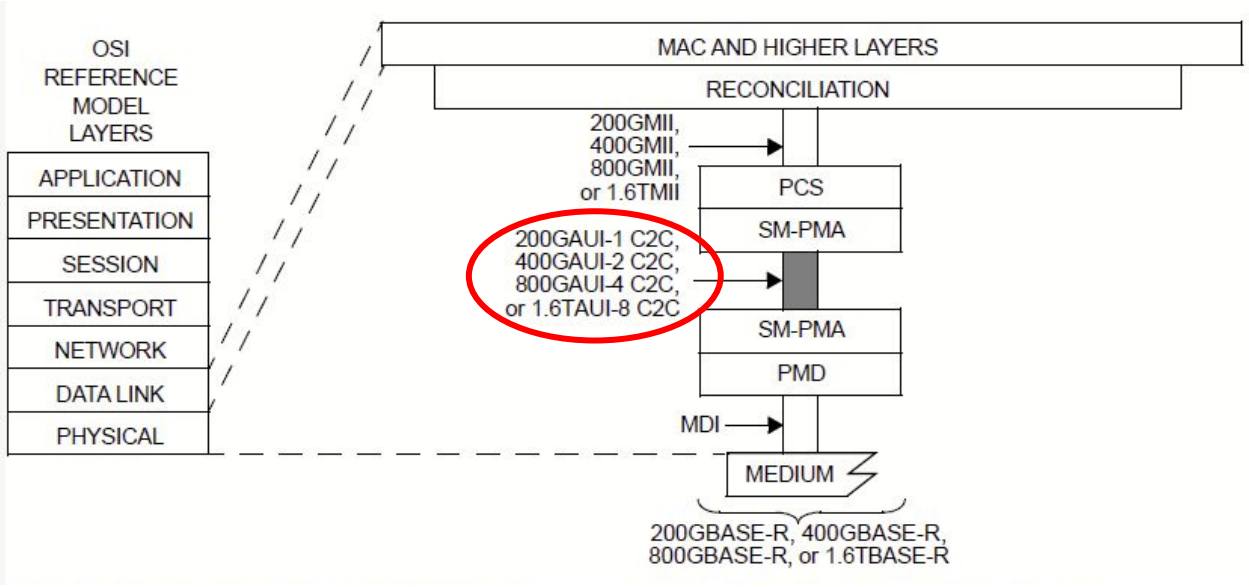
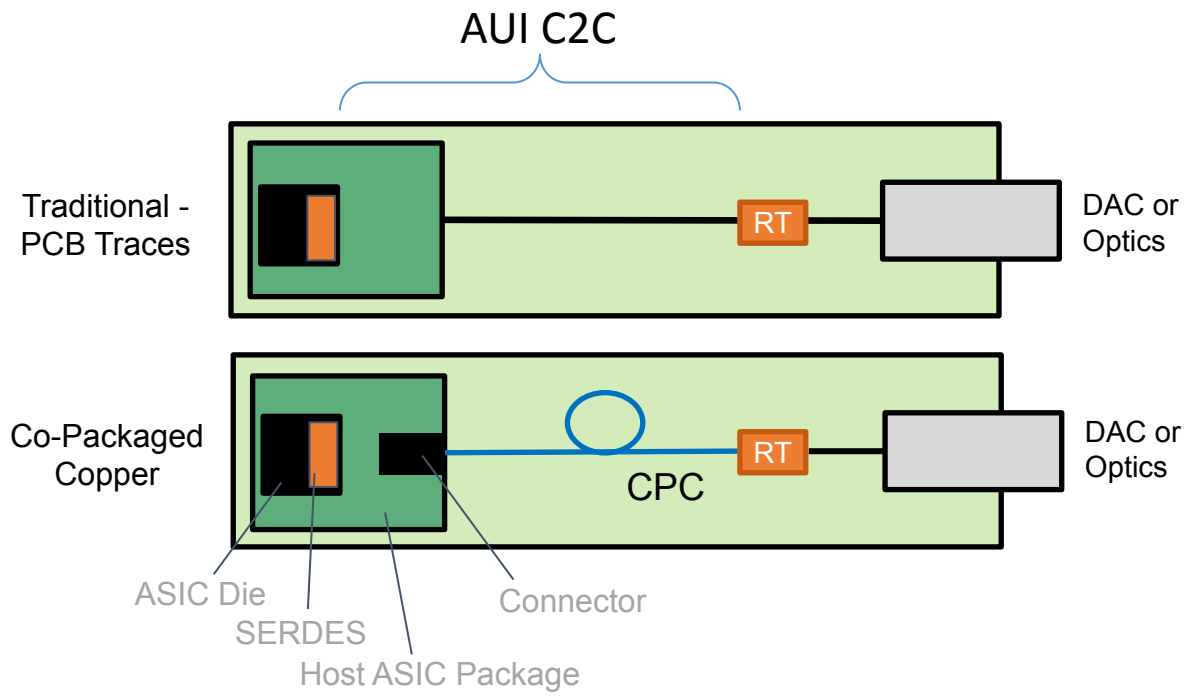


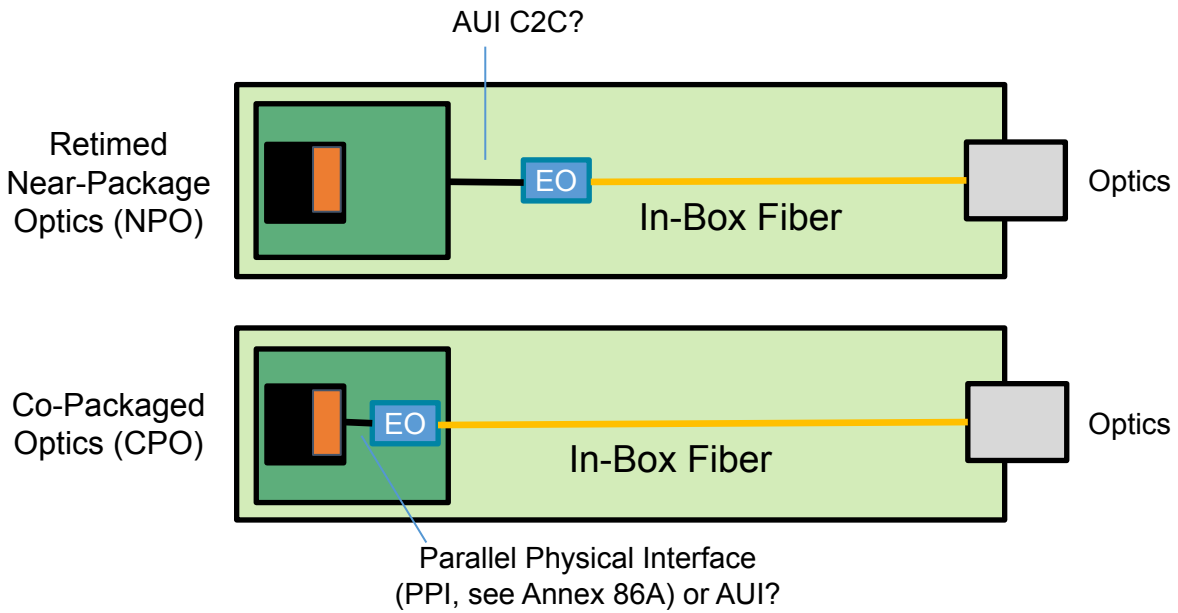
Figure 176C–1—200 Gb/s per lane AUI-C2C relationship to the ISO/IEC Open System Interconnection (OSI) reference model and the IEEE 802.3 Ethernet model

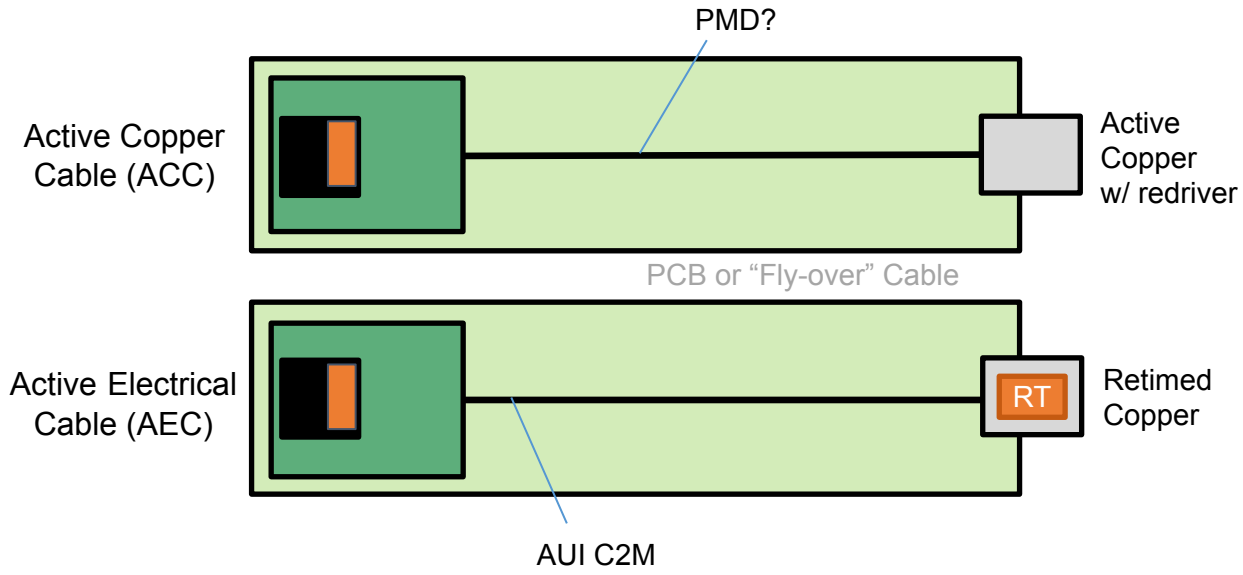
Figures above are example architectural diagrams of existing chip-to-chip electrical interfaces and are not intended to represent the direction this group must take.

Compliance specifications are on components (via test fixtures for Tx/Rx) prior to assembly into a fixed configuration (on which compliance tests can no longer be performed)



Other System Architectures

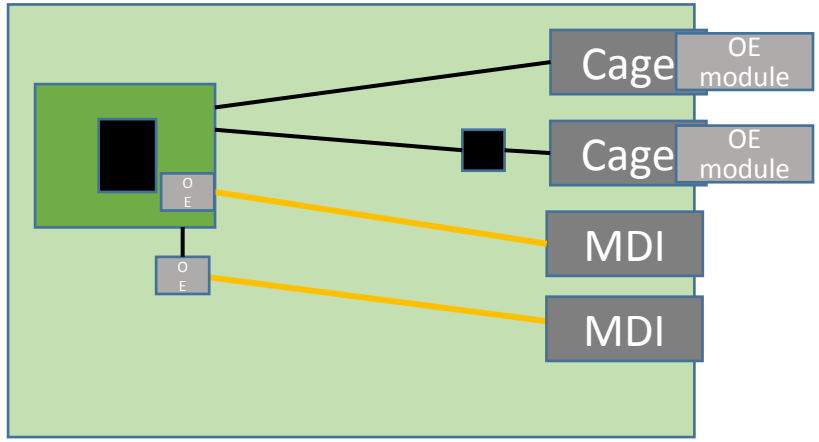




- Such instantiations *may* map to "traditional" AUI C2C and C2M compliance test models
- May warrant specialized AUI C2C and C2M variants optimized for given reach/loss or TX/RX

Summary

- Objectives for both chip-to-module (C2M) and chip-to-chip (C2C) AUIs are necessary to address the “traditional” use cases
- CPO, NPO, AEC use cases contain possible AUIs
  - CPO and OBO are different physical realizations of the “traditional” use case
  - IEEE hasn’t typically defined C2C inside the package, a broad objective would allow it
- Linear interfaces are not included at this time
- Recommend adopting AUI Objectives



Proposed Objectives For Adoption

- Support optional single-lane 400 Gb/s attachment unit interfaces for chip-to-module and chip-to-chip applications
- Support optional two-lane 800 Gb/s attachment unit interfaces for chip-to-module and chip-to-chip applications
- Support optional four-lane 1.6 Tb/s attachment unit interfaces for chip-to-module and chip-to-chip applications

Thanks!

AUI C2C onto Daughter Board

P802.3dj - Annex 176C:

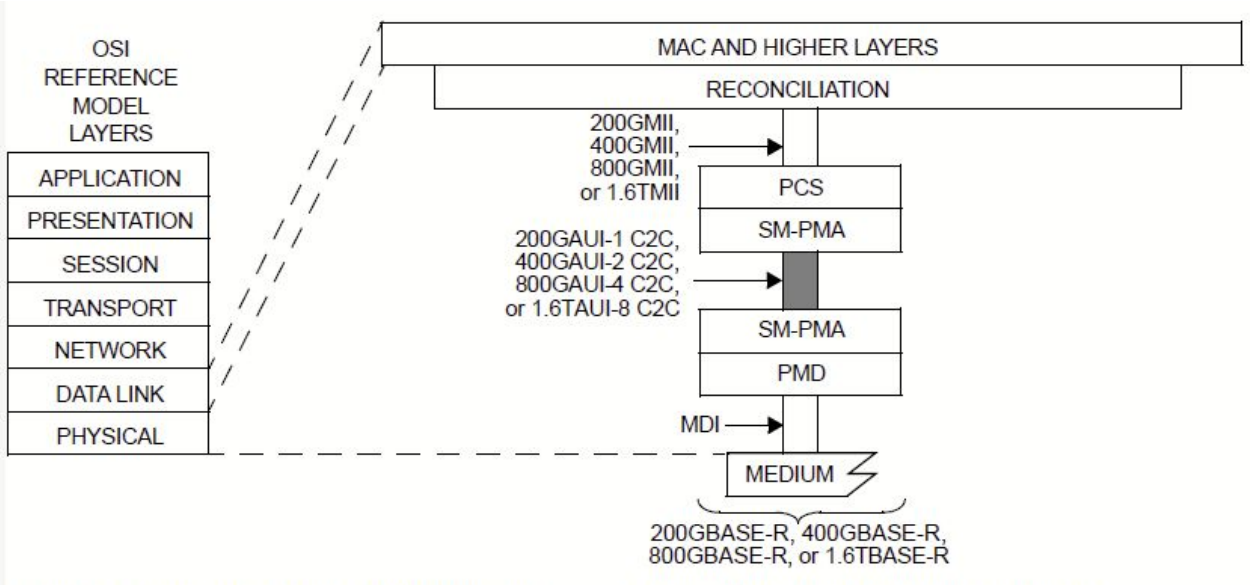
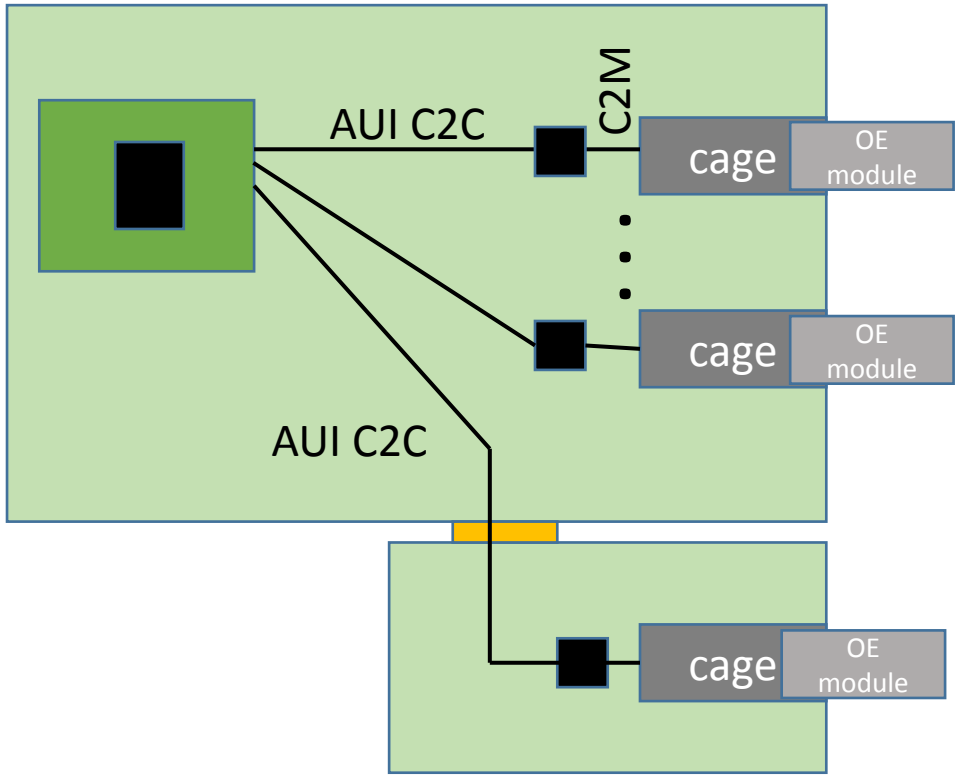


Figure 176C–1—200 Gb/s per lane AUI-C2C relationship to the ISO/IEC Open System Interconnection (OSI) reference model and the IEEE 802.3 Ethernet model

Traditional Examples



Historical Look at Electrical Interface Objectives

- The approaches in the past have been inconsistent.
- IEEE P802.3bs defined a “high level” objective for the AUIs:
  - “Support optional Attachment Unit Interfaces for chip-to-chip and chip-to-module applications” (see 3bs archive)
- IEEE P802.3cd did not have any AUI objectives (see 3cd archive)
  - Defined 10 AUIs even though there were no AUI objectives
- IEEE P802.3ck defines detailed objectives for the AUIs:
  - “Define a single-lane 100 Gb/s Attachment Unit interface (AUI) for chip-to-module applications, compatible with PMDs based on 100 Gb/s per lane optical signaling”
  - “Define a single-lane 100 Gb/s Attachment Unit Interface (AUI) for chip-to-chip applications”
  - Similarly for two-lane 200 Gb/s AUIs and four-lane 400 Gb/s AUIs
- IEEE P802.3dj defines detailed objectives for the AUIs:
  - “Support optional single-lane 200 Gb/s attachment unit interfaces for chip-to-module and chip-to-chip applications”
  - Similarly for two-lane, four-lane, eight-lane, and sixteen-lane AUIs