# 400 Gbps per lane PHYs and Interfaces

Call for Interest (CFI) Closing Report

Kent Lusted, Synopsys

March 2026 Plenary Meeting, Vancouver, BC, Canada

# Two Efforts Forming In the Pipeline

## Moving Forward in IEEE 802.3

NEA (E4AI Assessment) – Consensus / Incubation - Ongoing stakeholder input

**Focus of this CFI**

Effort #1

| SG | Baseline Adoption | TF Draft |

Effort #2

4 – 8 mos

| SG | Baseline Adoption | TF Draft |

\>= 3.2 Tb Ethernet and PHYs not in Effort #1

\* Each new project will potentially build on the previous project(s). 802.3 has the "Ethernet for AI" NEA effort which will sustain incubation across many of these distinct Task Force projects to encourage a fast-follow cadence.

Additional Efforts

18

https://www.ieee802.org/3/ad_hoc/E4AI/public/25_0819/dambrosia_e4ai_01_250819.pdf

# Overview

To keep pace with the technology demands necessary to support the projected growth in AI Infrastructure, 400 Gbps/lane data rate PHYs need to be defined in IEEE 802.3

# Motivation

- The enormous growth of AI/ML is placing unprecedented **demand on system interconnects and on scaling the bandwidth**, specifically xPU-to-xPU (via switches)

- Ethernet is uniquely positioned to be the building block of choice for AI/ML system interconnects

- The scale of the deployments requires a robust ecosystem to support the volumes.

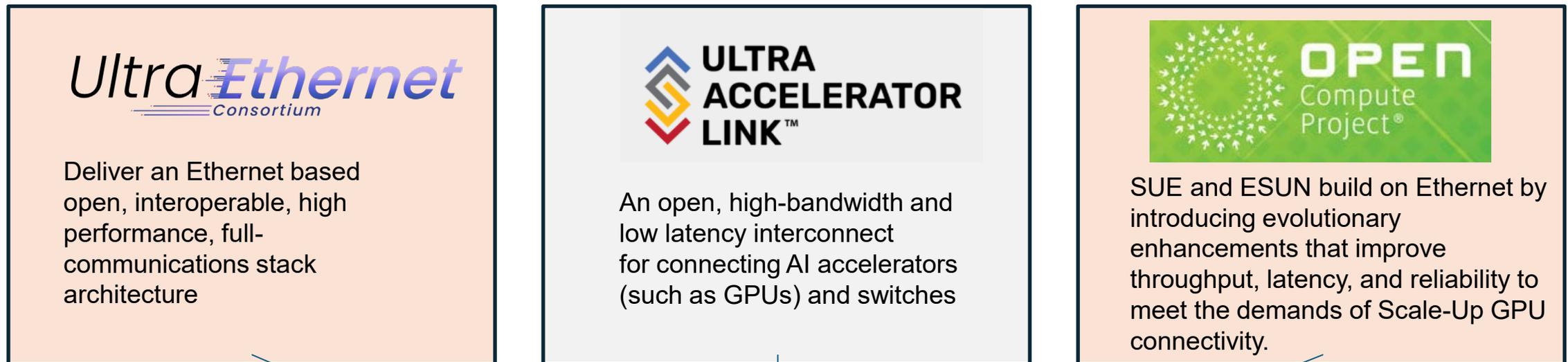- In networking, Ethernet wins due to its robust ecosystem and supply chain
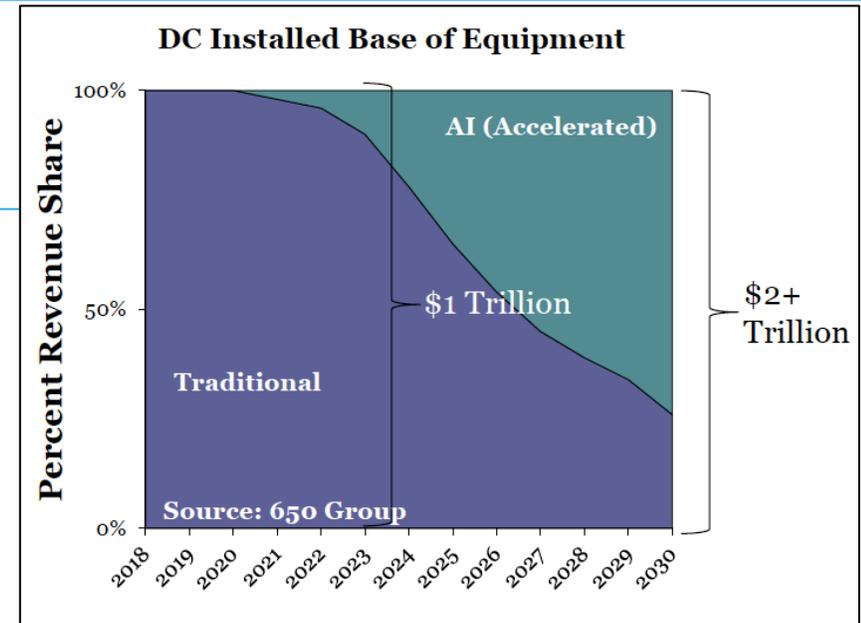


Source: Alan Weckel, EA's TEF 2025, "Setting the stage for networking in an AI world"
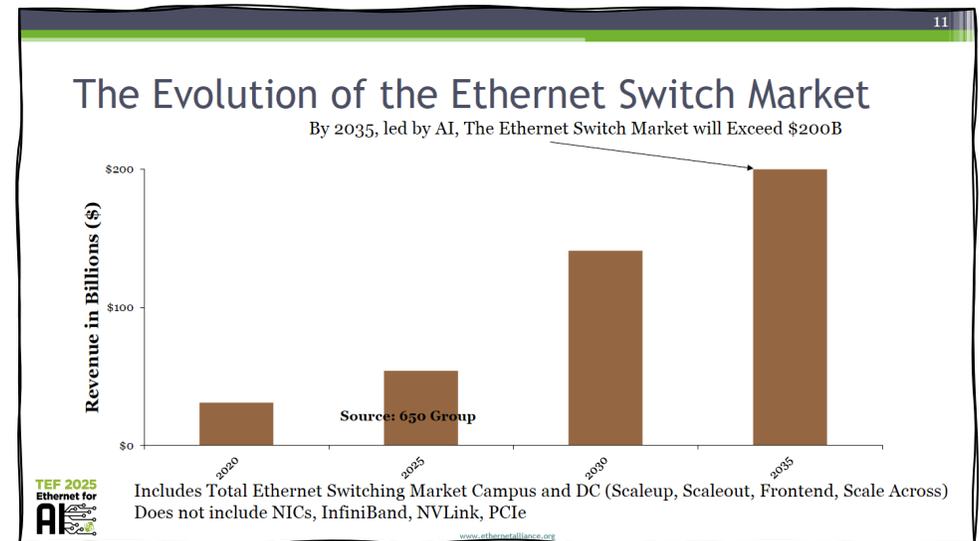


Source: Alan Weckel, EA's TEF 2025, "Setting the stage for networking in an AI world"

# Many Consortia are Relying on Ethernet

To support the breadth of AI applications, multiple organizations exist:



Deliver an Ethernet based open, interoperable, high performance, full-communications stack architecture



An open, high-bandwidth and low latency interconnect for connecting AI accelerators (such as GPUs) and switches



SUE and ESUN build on Ethernet by introducing evolutionary enhancements that improve throughput, latency, and reliability to meet the demands of Scale-Up GPU connectivity.

All are looking for IEEE 802.3 to define the
Ethernet Physical Layer Specifications
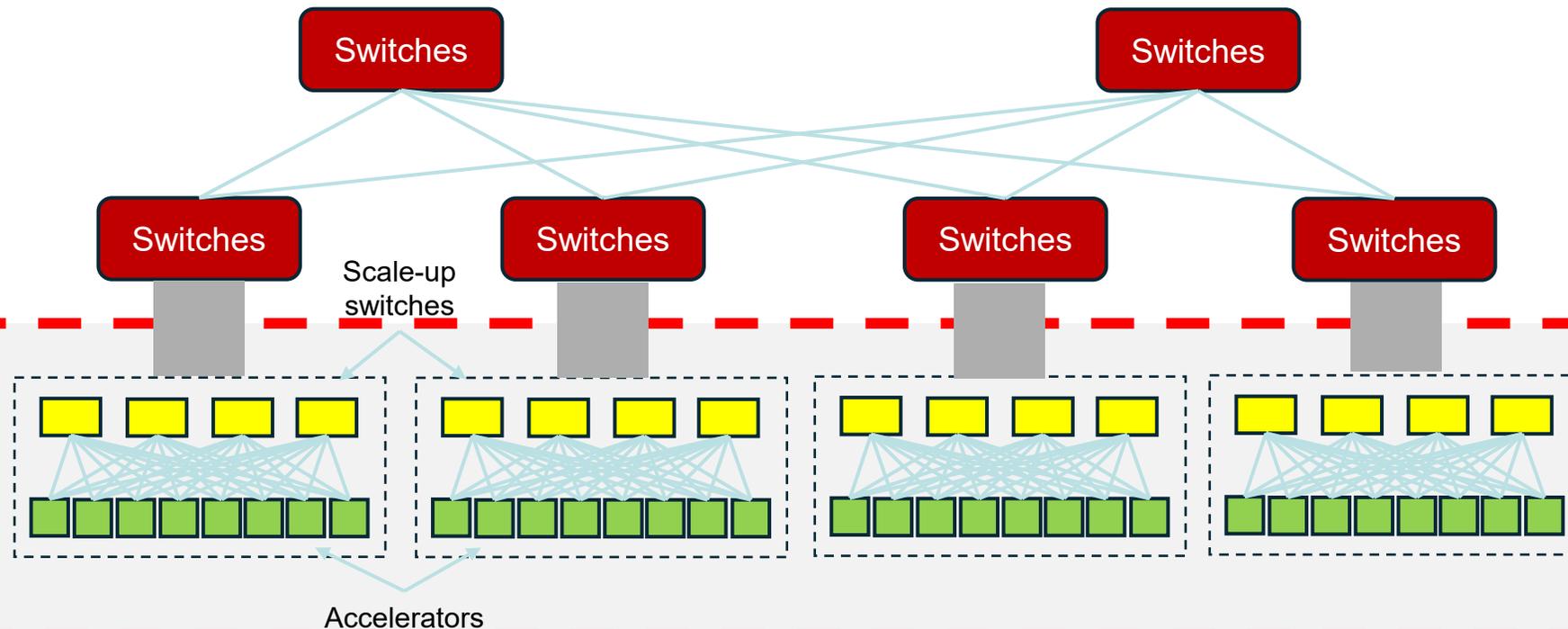
# Looking Closer at the Backend Network



Based on AI Datacenters and their Diverse Network Requirements, Ram Huggahalli (Microsoft), Ethernet Alliance TEF 2024, Oct 2024.

# Why Now?

- 400 Gbps/lane development is already underway, but no IEEE 802.3 standard exists, creating urgency to align industry investment and avoid fragmentation

- AI network architectures require 400 Gbps/lane to enable high-radix systems — demand is immediate and growing

- Standardization now ensures multi-vendor interoperability and leverages Ethernet's broad ecosystem for faster, lower-cost deployment of next-generation technologies

# CFI Consensus Presentation

- A consensus building presentation was held during the IEEE 802.3 March 2026 Plenary meeting:
  - Tuesday, 10 March 2026  18:30-1945 PDT (UTC-7)

- Straw Poll Summary:
  - Should a study group be formed to develop a PAR, CSD responses, and objectives for "400 Gbps per lane Signaling PHYs and Interfaces"?
  - Y: 122, N: 0, A: 1

  - If formed, will you participate in this Study Group?  111

  - Unique affiliations for those who indicated they'd participate (post-processed) 54

# Supporters (1/2)

- Osorio, Luz - Nokia
- Ghiasi, Ali - Ghiasi Quantum, Marvell
- Ofelt, Dave - HPE
- Choudhury, Mabud - Genuine Optics
- El-Chayeb, Ahmad - Keysight Technologies
- Nicholl, Gary - Cisco
- Zimmerman, George - CME Consulting/Cisco, Eliyan
- Mascitto, Marco - Nokia
- Galan, Jose - Maxlinear
- Stephens, Jeremy - AMD
- Weaver, Jim - Arista
- Goergen, Joel - Cisco
- D'Ambrosia, John - FutureWei, US subsdiary of Huawei
- Calvin, John - Keysight Technologies

- Moorwood, Andy - Keysight Technologies
- Rabinovich, Rick - Keysight Technologies
- Sun, Junqing (Phil) - Credo
- Ramesh, Sridhar - Maxlinear
- Estes, Dave - Viavi
- Brooks, Paul - Viavi
- Nakamoto, Ed - Viavi
- Lewis, Jon - Dell Technologies
- Stone, Rob - Meta
- Zhang, Geoff - AMD
- Li, Tobey - MediaTek
- Wu, Mau-Lin - MediaTek
- Nicholl, Shawn - AMD
- Klempa, Michael - Qualcomm
- Brown, Matt - Qualcomm
- Vidal, Or - Qualcomm

- Bowman, Kurtis - AMD/UALink
- Akinwale, Femi - Intel
- Johnson, John - Broadcom
- Parthasarathy, Vasudevan - Broadcom
- Muth, Karl - Broadcom
- Liu, Cathy - Broadcom
- Mellitz, Rich - Samtec
- Gore, Brandon - Samtec
- Cirit, Halil - Meta
- Opsasnick , Eugene - Broadcom
- Simms, Bill - nvidia
- Tooyserkani, Pirooz - Cisco
- Kabra, Lokesh - Synopsys
- Bhatt, Vipul - Coherent
- Cole, Chris - Coherent
- Rodes, Roberto - Coherent
- Biederman, Dan - Eridu AI

- Patra, Lenin - Marvell
- Kochuparambil, Beth - Cisco
- Tang, Yi - Cisco
- Noujeim, Leesa - Google
- Kareti, Upen Reddy - Cisco
- Ben-Artsi, Liav - Marvell
- Williams, Tom - Cisco
- Welch, Brian - Cisco
- Dudek, Mike - Marvell
- Kimber, Mark - Semtech
- Ran, Adee - Cisco
- Kutscher, Noam - Marvell
- He, Xiang - Huawei
- Mi, Guangcan - Huawei
- Sommers, Scott - Molex

# Supporters (2/2)

- Marshall, John - AMD
- Li, Mike - AMD
- Issenhuth, Tom - Huawei
- Chen, David CC - AOI
- Tracy, Nathan - TE
- Heck, Howard - TE
- Huggahalli, Ram - Microsoft
- Maniloff, Eric - Ciena
- Wingrove, Mike - Ciena
- Yu, Rangchen Ryan - Terahop
- Huber, Tom  - Nokia
- Bruckman, Leon - nvidia
- Marques, Flavio - Lightera
- Palkert, Tom - Samtec
- Wang, Sharon - TE Connectivity
- Parsons, Earl - CommScope Amphenol
- He, Michael - Terahop
- Pepper, Jerry - Keysight
- Bernier, Eric - Huawei

- Slavick, Jeff - Broadcom
- Kocsis, Sam - Amphenol
- D'Silva, Hansel - Amphenol
- Shakiba, Hossein - Huawei
- Jackson, Kenneth - Sumitomo
- Zivny, Pavel - Multilane
- Muhigana, Ernest - Macom
- Landry, Gary - Texas Instruments
- Tartaglia, Antonio - Ericsson
- Parkholm, Ulf - Ericsson
- Lessard, Stephane - Ericsson
- Chan, Jason - Arista
- Yu, Xu Helen - Huawei
- Healey, Adam - Broadcom
- Tran, Viet - Keysight Technologies
- Donahue, Curtis - Rohde & Schwartz
- Ninomiya, Tiger - Accelink
- Maki, Jeff - Hewlett Packard Enterprise

- Sakai, Toshiaki - Socionext
- Theodoras, Jim  - SCINTIL Photonics
- Jones, Chad - Cisco
- Jones, Peter - Cisco
- Sekel, Steve  - Wilder Technologies
- DeKoos, Andras - Microchip
- Mammenga, Kevin - Wilder Technologies
- Chang, Frank - Source Photonics
- Shrikhande, Kapil - Upscale AI
- Potterf, Jason  - Cisco
- Phadke, Rohan - Arista
- Nowroozi, Bijan - Lightmatter
- Nering, Ray - Cisco
- Murthy, Ramana - Broadcom

# Call For Interest

With the rapid adoption of Artificial Intelligence (AI) tools and technology, there is a desire to use Ethernet in high-bandwidth, high-growth AI cluster networks, as well as traditional front-end networks for server and switch attachment. The Ethernet community must quickly respond to support the AI network time-to-market requirements and use cases. A number of technology improvements should be investigated to increase the per-lane signaling rate of electrical and optical Ethernet interconnects for the radix-optimized connectivity essential for communication between the high-performance compute devices and intermediate network switch devices.

This call for interest is to initiate a Study Group to develop a Project Authorization Request (PAR) and Criteria for Standards Development (CSD) for Physical Layer specifications supporting existing Ethernet rates using 400 Gbps-per-lane signaling for electrical interconnects as well as optical interconnects with reaches of up to 500 meters.

https://ieee802.org/3/cfi/request_0326_1.html

# Working Group Motion

- Move that the IEEE 802.3 Working Group request the formation of a Study Group to develop a Project Authorization Request (PAR) and Criteria for Standards Development (CSD) for Physical Layer specifications supporting existing Ethernet rates using 400 Gbps-per-lane signaling for electrical interconnects as well as SMF optical interconnects with reaches of up to 500 meters
  - M:  Kent Lusted
  - S:  Mark Nowell
  - >50% by Rule
  - 802.3 Voters:    Y:      N:    A:

# Working Group Motion

- Move that the IEEE 802.3 Working Group approve IEEE_802d3_to_UEC_OIF_UALink_ITU_INCITS_OCP_400GL_0326_draft_Redacted.pdf with editorial license granted to the Chair (or his appointed agent) as liaison communications from the IEEE 802.3 Working Group to UEC, OIF, UALink, ITU, INCITS, OCP
  - M:  Kent Lusted
  - S:  Mark Nowell
  - Technical (>=75%)
  - 802.3 Voters:    Y:    N:    A:

# THANK YOU!