

# Will CPO optical modules be replaced by copper cables



## Overview

CPO's impact on pluggable optics will be nonexistent at first, as initial applications will replace copper and not fiber. From Jensen Huang showcasing CPO switches at GTC 2025 to a wide range of vendors demonstrating optical engines integrated inside ASIC packages at OFC 2025, CPOs are everywhere. However, it's worth noting that Andy Bechtolsheim, co-founder of Arista and a long-standing visionary in data centre. Marvell is partnering with equipment manufacturers, cable specialists, interconnect companies and others to ensure the infrastructure for delivering CPO will be ready when customers are ready to adopt it. The Trends Driving CPO AI's insatiable appetite for bandwidth and the physical limitations of. While copper still dominates ultra-short reach connectivity within racks, and pluggable optics remain the workhorse of scale-out data center fabrics, the panelists agreed that CPO represents the future of high-performance interconnect—particularly for scale-up GPU clusters where traditional modules. Scale-up is where there is pain (bandwidth, density, power), but that network is currently served by copper, which beats optics in power and cost and will therefore be hard to dislodge. Scale-out is already 100% optical and looks like a good place to initiate CPO deployments, but there are existing. Inside an AI server today, the GPUs talk to each other through copper cables and small pluggable optical modules. Starting in the second half of 2026, that wiring gets replaced by lasers built directly into the chip package (CPO). Goldman thinks the market for that goes from roughly 0 to \$91. The Bernstein report points out that copper and optical solutions in AI data centers are not mutually exclusive but will coexist in the long term across two major scenarios: Scale-up and Scale-out.

## Article Content

Dec 16, 2025

Co-packaged optics (CPO): status, challenges, and

From then on, active optical cables (AOC) and optical transceivers have gradually completely replaced copper cables in intra/inter-rack interconnects

May 10, 2026

Inside Nvidia's \$4B Optical Strategy—and Why CPO Changes

This has led to optical transceivers becoming a key solution. Optical transceivers take electrical signals sent through copper traces in ASIC switches and convert them into optical signals.

Dec 17, 2025

The Rise of Co-Packaged Optics

In this scenario, Co-Packaged Optics (CPO) is now gaining momentum, emerging mainly as an alternative to the pluggable optical modules

May 05, 2026

Optica Executive Forum: Copper vs. Optical

- CPO (Co-Packaged Optics): Optical engines integrated with the host ASIC or switch, eliminating long copper traces and faceplate modules for better

Feb 10, 2026

Development trend of optical

In switch network scenarios, the focus of chip-to-chip optical interconnects is on Co-Packaged Optics (CPO) technology, aiming to replace pluggable optical modules.

Jan 07, 2026

What is Co-Packaged Optics? | CPO Technology is the

The optical-to-electrical conversion that is performed by the optical transceiver is still needed in a CPO system, but it moves from a pluggable

Oct 12, 2025

Optical-First Data Centers: CPO vs NPO vs XPO in 2026 · KAD

As of April 20, 2026, the data center industry has crossed a critical threshold: the transition from copper-first to optical-first connectivity is no longer theoretical—it is operational reality.

Mar 15, 2026

Active Optical Cables Break the AI Compute Bottleneck: 100m High

Painless Speed Upgrades : The AOC's endpoints are decoupled from the optical modules. When upgrading from 400G to 800G or 1.6T, only the interface modules need to be replaced — no need to

Nov 23, 2025

Corning Up Over Fivefold This Year. Single-Day 12% Surge Hits

By deeply integrating Corning's fiber technology into the CPO ecosystem, the goal is ultimately to replace copper cabling in Nvidia's AI rack systems with glass fiber, completing a full-link

Dec 03, 2025

Marvell Unveils CPO Innovations Prepared for XPU

Marvell spotlights how the incorporation of its CPO portfolio capabilities can accelerate XPU architecture innovation.

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400G, 800G, and Terabit Pluggable Optics:

Full range of 400G / 800G pluggable modules Copper cables Multimode Fiber - 100m Single Mode Fiber inside DC - 500m & 2km Single Mode Fiber Campus - 10 km

Oct 08, 2025

NVIDIA Pulls In Co-Packaged Optics by 5 Years: How Japanese

GPU-to-GPU optical interconnects were forecast to arrive around 2033. NVIDIA just pulled them in by five years, announcing they will ship in the 2028 Feynman GPU generation. As Co

Aug 23, 2025

Co-Packaged Optics (CPOs)

From Jensen Huang showcasing CPO switches at GTC 2025 to a wide range of vendors demonstrating optical engines integrated inside ASIC packages

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What is co-packaged optics? A solution for surging

What is co-packaged optics? Traditionally, data center switches connected to a copper network cable via a network interface card.

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## POET Technologies and Lumilens Secure \$50M Deal to Replace Copper

Under the deal, the two companies will co-develop wafer-level photonic modules that replace electrical signals with light, promising lower power draw and higher bandwidth density for the AI ...

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## CPO & Silicon Photonics: AI's Interconnect Bottleneck and Who Profits

2026 is the inflection point where co-packaged optics (CPO) moves from concept to volume production. The market routinely conflates two very different paths. One is "optical

May 29, 2026

## Co-Packaged Optics — a deep dive | APNIC Blog

A failure in an optical engine might require replacing an entire CPO switch line card or server board rather than just swapping a pluggable module. Developing robust testing, diagnostics,

Jun 02, 2026

## Co-Packaged Optics - End of Pluggables? What It Is,

Like many technologies before it, CPO could redefine infrastructure or it could remain specialized, depending on how technical and economic

Jul 25, 2025

## Where co-packaged optics (CPO) technology stands in

Find out CPO's 2025 scorecard and what lies ahead for this optical interconnect technology in 2026 and beyond.

Nov 19, 2025

## Co-packaged Optics: Powering the Next Wave of AI

AI's insatiable appetite for bandwidth and the physical limitations of copper are driving demand for CPO. Network bandwidth doubles every two to

Oct 23, 2025

## Co Packaged Optics (CPO) - Scaling with Light for the

Co-Packaged Optics (CPO) has long promised to transform datacenter connectivity, but it has taken a long time for the technology to come to market,

Jan 11, 2026

## Transforming Interconnects in AI Systems: The Role of

Looking ahead, it is expected that copper interconnects will be replaced by Co-Packaged Optics (CPO), enabling direct connections between compute

Feb 14, 2026

The Rise of Co-Packaged Optics: A Deep Dive into CPO

A CPO optical module integrates optical and electronic components to boost data center speed, efficiency, and bandwidth while reducing power use.

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Co-Packaged Optics: Market and Technology Update

CPO's impact on pluggable optics will be nonexistent at first, as initial applications will replace copper and not fiber.

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The Battle for AI Data Center Connectivity: Is Copper Out and Fiber In ...

The Bernstein report points out that copper and optical solutions in AI data centers are not mutually exclusive but will coexist in the long term across two major scenarios: Scale-up and Scale

Apr 20, 2026

Inside an AI server today, the GPUs talk to each other through copper ...

Inside an AI server today, the GPUs talk to each other through copper cables and small pluggable optical modules. Starting in the second half of 2026, that wiring gets replaced by lasers

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