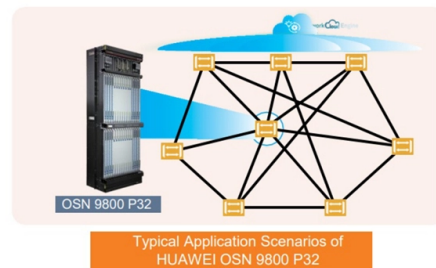


Comparison of Silicon Photonics Technology and CPO Principle



AI Overview

Silicon photonics is a platform for integrating optical components on silicon, while CPO is an architecture that places optical engines directly next to switch ASICs to maximize bandwidth and energy efficiency.

Overview	Silicon Photonics (SiPh)	Co-Packaged Optics (CPO)
Purpose	leverages CMOS semiconductor processes to fabricate photonic devices on silicon or silicon-based substrates, including modulators, photodetectors, waveguides, and light emitters. It enables high-speed optical signal generation, processing, and transmission, improving data transfer rates and reducing signal loss compared to traditional electrical interconnects .	an architectural approach that places optical engines in close proximity to the switch ASIC, often within the same package or substrate. By reducing the electrical interconnect distance from centimeters to millimeters, CPO minimizes signal loss, lowers power consumption, and increases bandwidth density .
Platform	CMOS-based, can integrate modulators, detectors, waveguides	Optical engines integrated directly with ASICs, often using SiPh
Bandwidth Density	Moderate, scalable with integration	Extremely high, optimized by proximity to ASIC
Power Efficiency	Reduces optical loss, but requires external lasers	Reduces electrical power consumption by shortening interconnects
Deployment	Can be used i...	

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CPO addresses this directly by replacing long electrical paths with optical ones inside the package. In doing so, photonic devices are integrated

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Given this technology uses multimode fiber, the coupling tolerance is expanded significantly compared to using single mode fiber. This simplifies installation, thereby further reducing costs. So, why the

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

In this section, we will mainly discuss the fabrication technology of silicon photonic chips for CPO applications. Moore's Law is a well-known

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