

# High-precision optical switches for intelligent computing centers



## Overview

This article provides an overview of optical switch architectures for next-generation data center and high-performance computing (HPC) networks. Recent techniques related to the optical switching, and main challenges limiting the practical deployments of optical switches in data. Valencia, Spain – March 31, 2025 – iPronics, a leader in software-defined photonics, today launched its Optical Networking Engine, ONE-32, the world's first Optical Circuit Switch (OCS) product based on silicon photonics. Tailored for AI workloads and energy-efficient cloud infrastructure, the. Giannis Patronas, Nikos Terzenidis, Prethvi Kashinkunti, Eitan Zahavi, Dimitris Syrivelis, Louis Capps, Zsolt-Alon Wertheimer, Nikos Argyris, Athanasios Fevgas, Craig Thompson, Avraham Ganor, Julie Bernauer, Elad Mentovich, and Paraskevas Bakopoulos Giannis Patronas, Nikos Terzenidis, Prethvi. Optical switch technology offers a promising solution to these challenges by providing high-bandwidth, low-latency, and energy-efficient switching. We. FEC (Forward Error Correction), DSP (Digital Signal Processing), CDR (Clock and Data Recovery), DRV (Driver), TIA (Trans-Impedance Amplifier), TOSA (Transmitter Optical Sub-Assembly), and ROSA (Receiver Optical Sub-Assembly). ChatGPT started the revolution.

## Article Content

### High-Performance Optical Interconnect for AI Computing Centers

China Telecom has developed the world's first end-to-end high-performance optical interconnect system for AI computing data centers (DCs), enabling geographically distributed clusters to operate as one ...

### Optical Circuit Switching for AI Data Centers | Molex

AI training clusters require optical circuit switching beyond the 300-port limit. Learn how Molex's 544x544 OCS addresses insertion loss, reliability, and hyperscale scale.

### Optical Switching Data Center Networks: Understanding ...

In this paper, we present a review of optical switching techniques capable of meeting the requirements of the next generation of large-scale data center networks.

### In-Depth Analysis of OCS: Optical-Layer Direct-Connect Switching ...

In-depth analysis of OCS (Optical Circuit Switching) in AI training and high-performance computing (HPC) data centers, exploring its optical-layer direct-connect architecture, low-latency and ...

### OPTICAL CIRCUIT SWITCHING FOR AI AND

Optical Circuit Switching (OCS) has emerged as a critical technology for next-generation Artificial Intelligence (AI) and hyperscale data-center networks.

### Optical Circuit Switch for Data Centers

Coherent will hold a first-of-its-kind demo at OFC 2024 of a 300x300-port optical circuit switch, revolutionizing data center networks for AI deployments.

### Ultrafast optical circuit switching for data centers using integrated ...

Optical technologies could enable fast and power-efficient networks for data centers. Here, the authors report Si<sub>3</sub>N<sub>4</sub> microcomb based ultrafast photonic switching to provide enhanced...

### Optical switching will innovate intra data center networks [Invited ...

Optical switches are expected to break these barriers, and indeed their introduction has recently commenced in data centers. This paper discusses how optical switching technologies can innovate ...

### iPronics Unveils World's First Silicon Photonics Optical ...

The company presents the first Optical Circuit Switch able to offer low latency, low cost and low power to accelerate optical transformation of AI cluster ...

### Optical Switches for Next Generation Data Center | FiberMall

This article provides an overview of optical switch architectures for next-generation data center and high-performance computing (HPC) networks. We will present key performance metric, ...

All AI Data Center Interconnects Will Be Optical Within 5 Years

It developed its own OCS and deployed it in all of its data centers at the top of the switching hierarchy to replace traditional electric switches, achieve lower latency, reduce power 40%, ...

Optical switching for data centers and advanced computing systems ...

We explore optical switching to extend network programmability to the physical layer and discuss applications of a Layer-1 software-defined network (SDN) in AI/HPC clusters.

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iPronics Unveils World's First Silicon Photonics Optical Circuit Switch ...

The company presents the first Optical Circuit Switch able to offer low latency, low cost and low power to accelerate optical transformation of AI cluster communications and future-proofing ...

## Contact Us

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