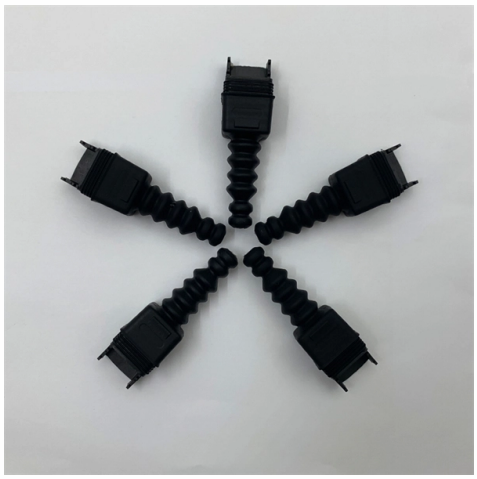
BlazingFast Photonics

Quantum Communication Liquid-Cooled Switch Anti-Electro-Tracking



Overview

The Quantum-X Photonics switches provide 144 ports of 800Gb/s InfiniBand based on 200Gb/s SerDes and use a liquid-cooled design. Quantum-X Photonics switches offer 2x faster speeds and 5x higher scalability for AI compute fabrics compared with the previous. NVIDIA's co-packaged optics (CPO) switches with integrated silicon photonics are the world's most advanced networking solution for the era of agentic AI. Replacing pluggable transceivers with silicon photonics on the same package as the ASIC, NVIDIA CPO innovations provide 5x better power. Imagine a data center where even the most powerful switches run cool and stable— without noise, thermal throttling, or energy waste. Cisco is actively innovating in direct-to-chip liquid cooling for high-performance switches, laying the groundwork for solutions that will enable seamless and. By replacing traditional pluggable transceivers with co-packaged optical devices (CPO), it enables direct connection between fiber optic cables and switch chips, reducing power consumption in data centers by approximately 40 megawatts while significantly improving network transmission efficiency. NVIDIA unveiled its next-generation silicon photonics switches— Spectrum-X Photonics Ethernet and Quantum-X Photonics InfiniBand —designed to scale AI factories to connect millions of GPUs while cutting energy consumption and improving performance. Compared to undisclosed 'traditional methods,' the company promises 3. 5x more power efficiency, 63x greater signal integrity, 10x better.

Article Content

Experimental Quantum Communication Overcomes the Rate-loss

Secure key rate (SKR) of point-point quantum key distribution (QKD) is fundamentally bounded by the rate-loss limit. Recent breakthrough of twin-field (TF) QKD can overcome this limit

Design and construction of the BESIII detector

Fifteen layers of super insulation films separate the liquid nitrogen thermal shield and the liquid helium cooled cold mass. The thermal shield is isolated from the vacuum vessel by another fifty

Quantum Covert Communication under Extreme Adversarial Control

It can even ban classical public key cryptography and post-quantum public key cryptography, leaving only quantum cryptography and post-quantum symmetric key cryptography as

Recent advancements in electro-thermal anti-/de-icing materials

Furthermore, advances in the application of electro-thermal anti-/de-icing materials in aircraft, electric transmission-lines, wind power generation equipment and others are provided. To

Towards Quantum-Native Communication Systems: State-of-the-Art,

The associated research gaps and future directions are identified, including extending the entangle-ment coherence time, developing THz quantum communications devices, addressing challenges in

New Protocol Kills Dead Air For Quantum Communication

Quantum communication transmission rates have long been limited by the “dead time” inherent to the single-photon detectors used in the field.

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Nvidia unveils silicon photonics networking switches to reduce data ...

The Quantum-X Photonics switches provide 144 ports of 800Gb/s InfiniBand based on 200Gb/s SerDes and use a liquid-cooled design. Quantum-X Photonics switches offer 2x faster

Silicon Photonics Networking for Agentic AI | NVIDIA

This groundbreaking switch leverages a liquid-cooled design to efficiently cool the onboard silicon photonics. The NVIDIA Quantum-X InfiniBand Photonics switch

Dive into the Quantum Realm: Promise of Quantum

Buckle up for a journey into the future of secure data transmission! In this month''s article Qammer H. Abbasi, Martin Weides, Chong Li, and

Advances in space quantum communications

The important challenges in space quantum technologies that must be overcome and recent efforts to mitigate their effects are summarised. A

Experimental Quantum Communication Overcomes the Rate-Loss

Recent breakthrough of twin-field (TF) QKD can overcome this limit and enables long distance quantum communication, but its implementation necessitates complex global phase

Recent progress in quantum photonic chips for quantum

Here, we provide an overview of the advances in quantum photonic chips for quantum communication, beginning with a summary of the prevalent photonic integrated fabrication platforms

Exploring the Future of AI Networking: Liquid-Cooled Switches on the ...

Imagine a data center where even the most powerful switches run cool and stable—without noise, thermal throttling, or energy waste. Cisco is actively innovating in directto-chip

QSA Drives Breakthroughs with Superconducting Qubits – QSA

QSA''s teams working on superconducting qubit platforms enable the simulation of complex phenomena and pave the way for versatile quantum systems. Their collaborative efforts are

A novel fixed-grid interface-tracking algorithm for rapid ...

In this study, we present a novel fixed-grid interface-tracking method using finite volume method to simulate multidimensional rapid solidification (RS) of under-cooled pure metal.

Exploring the Future of AI Networking: Liquid-Cooled Switches on the ...

Cisco is actively innovating in direct-to-chip liquid cooling for high-performance switches, laying the groundwork for solutions that will enable seamless and scalable AI at unprecedented

A Quick Guide to Quantum Communication

Abstract—This article provides a quick overview of quantum communication, bringing together several innovative aspects of quantum enabled transmission. We first take a neutral look at the role of

Spectrum-X Photonics and Quantum-X Photonics Switches

Designed to support AI factories at unprecedented scale, these co-packaged optics networking switches enable seamless connectivity across

A new way for quantum computing systems to keep their

A new wireless terahertz communication system enables a super-cold quantum computer to send and receive data without generating too much error

NVIDIA Commercializes Silicon Photonics with

NVIDIA has developed co-packaged optics (CPO) technology with TSMC for its upcoming Quantum-X InfiniBand and Spectrum-X Ethernet

Implementation of Anti-quantum Communication System using

In recent years, the rapid development of quantum computer has posed great challenges in the security of traditional wireless communication. This paper proposes a future-oriented high security anti

What Are Next-Generation Liquid-cooled Switches Like?

In 2024, NVIDIA released the NVL72/NVL36 solution, which increased the demand for the construction of fully liquid-cooled data centers.

Scaling AI Factories with NVIDIA''s Silicon Photonics CPO Switches

The Quantum-X Photonics Q3450 liquid-cooled switch system features four Quantum-X chips, providing 115.2Tbps full-duplex bandwidth across 144 ports, with a maximum single-port rate of 800Gbps,

Quantum Series: Quantum Communications and Networking

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Explore the magic of quantum levitation and superconductivity: Unlocking the secrets of frictionless transport, energy efficiency, and future tech.

Fast Polarization Switch for Polarization-based Quantum

Simplified setup for on-time polarization tracking in wavelength multiplexed optical quantum channels. Block diagram of the FPGA''s internal

NVIDIA Debuts Spectrum-X and Quantum-X Photonics

These photonic switches integrate optical components directly into switch silicon, reducing the need for external lasers and delivering significant

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: https://www.blazingfast.co.za
Email: info@blazingfast.co.za
Phone: +27 83 416 7295
Address: Plot 45, Silicon Savannah Road, Tatu City, Kiambu 00900, Kenya

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