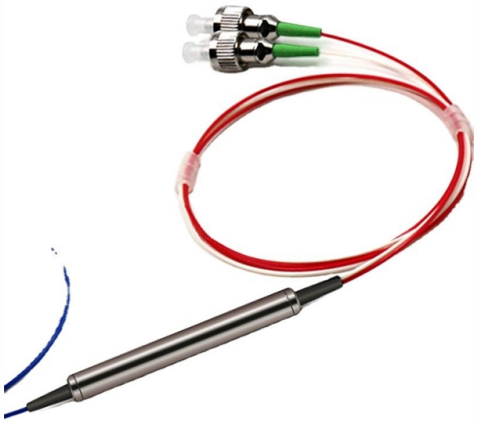
Energy-efficient air-cooled switches for campus networks



Overview

New Innovations in Power & Cooling SystemsPower Efficiency LPO optics eliminate the need for digital signal processing (DSP) on both the transmit and recei.

Key Takeaways

Air-cooled switches with optimized airflow and fan-assisted channels can significantly reduce energy consumption while maintaining reliable campus network performance.

Airflow Optimization for Campus Switches

Efficient air-cooled switches rely on hot aisle-cold aisle configurations to direct cool air to switch intakes and prevent hot exhaust recirculation. Solutions like Vertiv's SwitchAir use embedded fans and air channels to funnel cooled air directly to switch inlets, ensuring consistent thermal management without conditioning the entire rack space.

Switch

Air models are often space-neutral, fitting within standard rack units, and can be customized for side-breathing or larger core switches, enhancing airflow efficiency in campus environments. Energy Efficiency ConsiderationsAir-cooled switches designed for energy efficiency reduce operational costs and carbon footprint. By focusing cooling only where needed, these systems minimize fan power usage and prevent overheating, which can otherwise shorten switch lifespan.

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Some modern campus switches, such as Huawei's CloudEngine S-Series, integrate low-carbon PoE and simplified architectures, enabling 24/7 operation with reduced energy consumption and lower carbon emissions. Optimized airflow and fan-assisted cooling can achieve substantial energy savings compared to conventional air cooling, particularly in dense campus deployments. Vendor SolutionsVertiv/Geist SwitchAir: Provides active and passive airflow channels, fan-assisted cooling, and accessory kits for cord management and airflow maximization.

Supports over 350 switch models, including Cisco Catalyst series, and can be configured for side or top intakes.

Huawei Cloud

Engine S-

Series: Offers low-carbon campus switches with optical-electrical PoE, simplified architecture, and energy-efficient operation suitable for office and educational networks.

Cisco Catalyst Air-

Cooled Switches: While Cisco is developing liquid-cooled solutions for high-density AI deployments, current air-cooled Catalyst switches can be paired with airflow management systems like SwitchAir to maintain efficiency in campus networks.

Best Practices

Implement hot aisle-cold aisle layouts to direct airflow efficiently. Use fan-assisted air channels to ensure consistent cooling to switch inlets. Select low-power PoE switches to reduce energy draw in campus environments.

Monitor thermal performance to prevent hotspots and optimize fan speeds. Plan for scalability by choosing switches that maintain efficiency as port density increases. By combining airflow-optimized chassis, fan-assisted channels, and low-power switch designs, campus networks can achieve reliable, energy-efficient operation while reducing cooling costs and carbon footprint.

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Article Content

New Innovations in Power & Cooling Systems

Power Efficiency LPO optics eliminate the need for digital signal processing (DSP) on both the transmit and receive sides, demonstrating 500w power reduction in a 51.2Tb switch

Solutions

High-radix, liquid-cooled fabrics are poised to interconnect future GPU and accelerator clusters at massive scale, unbound by heat limits. Facility designs that anticipate and accommodate

CloudEngine S-Series Switches: A Low-Carbon Future

As a new addition to Huawei''s CloudCampus 3.0, this powerful solution redefines campus switches and reshapes enterprise campus networks

Campus Switches

Featuring elastic scalability, the S Series uses a highly efficient converged service platform, convenient Operations and Maintenance (O&M) technology, and

Switchair Passive

Mounted vertically on the rack, it passively guides the warm air emitted by the switches from the side of the rack directly to the warm aisle and prevents hot and cold air from mixing in the air

Arista Platforms 400GbE

Arista delivers the most efficient, reliable and high performance Universal Cloud Network architectures based on 10G, 25G, 40G, 50G, 100G and 400G platforms delivered with an extensible operating

Cooling the Network Revolution: Edgecore''s Liquid and Immersion ...

Traditional air cooling has served data centers for decades, but today''s networking and computing demands are pushing it to its limits. High-speed 800G Ethernet switches and AI/ML

Network Switch Cooling Solutions

This allows cool air from the cold aisle to be directed to the air intakes of the network switch, usually at the rear, side or front of the switch. EDP supplies solutions

H3C Data Center Switches Green Energy-Efficient Technologies

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In an air cooling system, the design of air aisles determines the cooling effect. An excellent air aisle design can not only save energy, but also reduce the device failure rate.

How SwitchAir Channels Cool Air Through Top-of-Rack (TORS)

The SwitchAir Finder, available on Vertiv , is a comprehensive resource with over 350 unique switch part numbers to match the right SwitchAir with your network switch model(s).

Japan Data Center Market Investment Analysis Report 2026-2031:

The trend of liquid cooling in Japanese data centers is growing due to the increasing demand for High-Performance Computing (HPC), AI workloads, and energy efficiency. Liquid cooling

Top 10: Liquid Cooling Companies | Data Centre Magazine

Discover the leading liquid cooling companies transforming data centre infrastructure with sustainable, high-performance thermal management solutions

Data Center Direct to Chip Cooling Market

Operators are using direct-to-chip cooling systems to achieve energy-efficient thermal management that protects system performance while supporting next

RG-S2915-24GT4MS-P-L 24-Port 1GE RJ45 Layer 2+ Managed PoE+ Switch

Yes. The RG-S2915-24GT4MS-L switch adopts a fanless design and dissipates heat in a natural manner without noise. Even if your office is near the equipment room, you are free of worries about

Press | Company | Siemens

The company''s purpose is to create technology to transform the everyday, for everyone. By combining the real and the digital worlds, Siemens empowers customers to accelerate their digital

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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

New Energy Outlook 2026

The New Energy Outlook is BNEF''s annual report focused on long-term energy and climate scenarios for the energy transition.

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

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Exploring the Future of AI Networking: Liquid-Cooled Switches on the Horizon Imagine a data center where even the most powerful switches run cool and stable— without noise, thermal throttling, or

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