

Selection Guide for Air-Cooled Switches for Intelligent Computing Centers DML



AI Overview

Selecting air-cooled switches for intelligent computing centers requires balancing thermal performance, energy efficiency, and compliance with ASHRAE environmental guidelines. Key Considerations for Air-Cooled Switch Selection

- 1. Thermal and Environmental Guidelines** Air-cooled switches must operate within the inlet temperature and humidity ranges defined by ASHRAE TC9.9. The Fifth Edition of the Thermal Guidelines recommends specific environmental envelopes for IT equipment (ITE) inlet conditions, which differ from room or discharge air conditions. For new data centers, CFD modeling is recommended to estimate accurate ITE inlet conditions, while existing facilities can rely on measured temperature and humidity data to ensure compliance and reliability.
- 2. Energy Efficiency Features** Modern switches often include Energy Efficient Ethernet (EEE) and auto power-down capabilities. EEE dynamically adjusts power on copper interfaces based on traffic, reducing energy consumption during idle periods. Auto power-down ensures that inactive ports enter a low-power state, extending device lifetime and reducing operational costs.
- 3. Airflow and Cooling Architecture** Air-cooled switches should be integrated with hot aisle/cold aisle configurations to optimize airflow and heat dissipation. Proper placement within racks and alignment with computer room air handlers (CRAHs) or fan coil walls ensures uniform cooling and prevents hotspots. High-density deployments may require bifurcated loops or elevated condenser temperatures to maintain efficiency while supporting next-generation GPUs.
- 4. Reliability and Future-Proofing** Switches should be selected with thermal flexibility in mind, supporting high-temperature TCS loops and scalable deployment for future AI workloads. Consideration of pollutant tolerance (e.g., SO₂, NO₂, O₃, H₂S, Cl₂) and relative humidity ranges ensures long...

Article Content

Intelligent Computing Technical Insights | Why Do We

Take hardware equipment as an example, intelligent computing centers often incorporate cutting-edge hardware such as high-performance

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 direct-to-chip

Energy-efficient thermal management of air-liquid-cooled data centers ...

Abstract Data center cooling has become one of the primary contributors to overall energy consumption, especially under high-density computing scenarios. The improved thermal handling

A Guide to Data Center Liquid Cooling

Explore data center liquid cooling as the solution to manage heat in high-density computing environments. Discover its efficiency today.

Data Center Cooling: Air vs. Liquid

The future of data center cooling hinges on efficiency, sustainability, and adaptability to high-performance workloads. Liquid-cooled solutions are

A review of the immersion liquid cooling technology for high ...

Traditional air cooling, with its limited efficiency, is increasingly inadequate to meet current demands. Immersion liquid cooling (ILC) has thus emerged as a critical research focus in data center

Liquid Cooling Integration and Logistics White Paper

Liquid cooling using cold plates cooling technologies has been the focus of many technology papers and industry guidelines. It is known that liquid cooling is an efficient and effective cooling fluid for high

Navigating Liquid Cooling Architectures for Data Centers with AI

Depending on the scale of liquid-cooled server deployments, a data center can be cooled through existing or dedicated heat rejection systems. The terminology, architectures, and factors in

Dell Technologies Solutions for Data Center Cooling

In these circumstances, data center cooling is required to maintain optimal environmental conditions for the IT equipment. Because if servers and other equipment aren't kept cool, they can suffer reduced

IIR publishes a new Technical Brief: Cooling... | 2025/01/28

Authored by leading IIR experts in energy and power engineering, this publication offers a comprehensive exploration of innovative cooling solutions designed to meet the escalating demands

Data Center Power and Cooling Solutions | Dell USA

Lower the temperature in your data center with efficient air and liquid cooling solutions that improve workload performance.

H3C Data Center Switches Green Energy-Efficient Technologies

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.

Towards energy-efficient data centers: A comprehensive review of ...

Abstract With the rapid growth of cloud computing, the number of data centers (DCs) continuously increases, leading to a high-energy consumption dilemma. Cooling, apart from IT

A Review on efficient thermal management of air

Depending on the type of cooling system, air-cooled or liquid-cooled, this inefficiency can be significantly improved upon by utilizing various thermal management and efficiency enhancement

Best Practices Guide for Energy-Efficient Data Center Design

This guide provides an overview of best practices for energy-efficient data center design which spans the categories of information technology (IT) systems and their environmental conditions, data center

Deploying liquid cooling in the data center

Adopting Liquid Cooling at Existing Data Centers The future of IT thermal management has arrived, and it's a hybrid of air and liquid cooling technologies. Enterprises are adopting high-performance

How to choose air cooled chillers for data centers: 17

As air-cooled chillers are used to cool data centers, it is recommended to assess the corrosive potential of the environment in which they

Cisco Announces Silicon One G300, Advanced Systems and Optics

"Cisco's Silicon One-powered Nexus switches N9364E-SP2R-X (P200) and N9364F-SG3 (G300) switches redefine what's possible in the modern AI data center, delivering an

“How-to” Guide for Transitioning from Air to Liquid-Cooled High ...

This guide is intended for people who are responsible for operating data centers that contain high-performance computing equipment and have not yet transitioned from air to liquid cooling. It gives

When air isn't enough: The liquid cooling revolution in

Why liquid cooling for data centers is essential for AI growth—cutting energy use, boosting efficiency, and enabling sustainable, high-density compute at scale.

Dell PowerEdge Server Cooling: Choose the Cooling Options That

By choosing new Dell PowerEdge™ servers powered by AMD EPYC™ processors, you also access unique innovations in air cooling and liquid cooling, with the option to configure the right

Advanced Data Center Cooling Solutions for AI & Supercomputing ...

Air, liquid, or immersion – the data center cooling solution designed for your AI strategy. Maximize performance, reduce carbon footprint, and optimize TCO.

Liquid cooling best practices for AI data centers

Discover liquid cooling best practices for AI data centers, including design, deployment, maintenance, and sustainability benefits.

The Importance of Thermal Design and Analysis:

As AI-driven data centers and high-density computing systems power today's technological advancements, the demand for efficient data center

Trane's Thermal Management Overhaul: Modular Cooling Platforms

This modular approach allows data center operators to right-size deployments while preparing for future thermal loads from GPU-rich AI workloads. A critical piece of this effort is Trane's

Towards energy-efficient data centers: A comprehensive review of ...

This paper provides an overview and guide to DC energy-consumption issues, emphasizes the importance of implementing passive and active design strategies to reduce DC

Air vs. liquid cooling: Pick the right strategy for AI data

Explore air vs. liquid cooling for AI data centers. Learn how hybrid cooling strategies support high-density racks and optimize energy efficiency.

Optimizing AI Performance with Immersion Cooled Data Centers

The Cisco-GRC partnership enables organizations to dramatically reduce environmental impact while supporting demanding AI and high-performance workloads from enterprise data centers to edge

Data Center Switches

Newly launched fixed switches tailored for the AI era, providing ultra-high-density port options ranging from 100GE to 400GE, supporting enterprises in building ultra-large-scale intelligent computing clusters.

Intel and Dell: Better Air Cooling for Data Centers

Thanks to the innovations of both Intel and Dell Technologies, these air-cooled options can still enable significant energy savings and greater

Direct Liquid Cooling System Challenges in Data Centers

L-A CDUs are the easiest to add to conventional air-cooled data centers. This is because the heat removed from the IT equipment is released to the air in the white space for the air-based cooling

Contact Us

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