AI Liquid Cooling Server Huawei



Overview

Liquid cooling is essential for AI-driven data centres, efficiently managing the extreme heat generated by high-density AI server racks.

Key Takeaways

Huawei's AI servers use full liquid cooling to efficiently manage extreme heat, reduce energy consumption, and enable high-density AI workloads.

Overview of Huawei Liquid Cooling

Huawei has developed a full liquid cooling solution for AI servers and high-performance computing racks, addressing the extreme heat generated by modern GPUs and AI chips. In a closed liquid-cooled cabinet, all heat is dissipated directly into liquid rather than air, which allows for dramatic reductions in power consumption—up to 96% compared to conventional air cooling—and lowers the Power Usage Effectiveness (PUE) from 2.2 to 1.1. For a 50 kW cabinet, this translates to annual energy savings of approximately 500,000 kWh and a reduction of around 237.5 tons of CO_2.

Why Liquid Cooling is Essential for AI ServersAI workloads drive high-density server racks, often exceeding 40 kW per rack and reaching up to 120 kW in modern data centers. Traditional air cooling is insufficient for these power levels because air is a poor conductor of heat, leading to potential thermal throttling or hardware failure. Huawei's liquid cooling directly addresses this by circulating coolant through cold plates or closed-loop systems, efficiently transferring heat away from CPUs and GPUs.

This enables higher server density, extended hardware lifespan, and reduced space and maintenance requirements.

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Energy Efficiency and Environmental Impact

Liquid cooling not only improves performance but also reduces operational costs. By lowering PUE and cutting energy consumption, Huawei's solution makes AI data centers more sustainable. However, it is important to note that liquid cooling increases water usage, as heat is often dissipated through cooling towers, which can strain local water resources.

This is a growing consideration as AI data centers scale globally. Implementation and BenefitsClosed-loop liquid cooling: Heat is absorbed by liquid in direct contact with processors and circulated away efficiently. Supports high-power GPUs: Handles modern GPUs consuming up to 1,200 W per chip and prepares for future 5 kW chips.

Cost-effectiveness: While upfront investment is higher, liquid cooling becomes economical for racks above 40 kW due to energy savings and reduced maintenance. Sustainability: Reduces electricity consumption and CO_2 emissions, contributing to greener AI operations. Huawei's liquid cooling technology is now considered industry-standard for AI-driven data centers, enabling the next generation of high-performance AI workloads while maintaining operational efficiency and sustainability.

Article Content

Full Liquid Cooling Makes Data Centers More Energy

To address this challenge, Huawei developed a full liquid cooling solution. In a closed liquid-cooled cabinet, all heat is dissipated in liquid, reducing the power

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AI Server Boom: Huawei Atlas 950, Dell PowerEdge, HPE ProLiant,

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Huawei Atlas 950, Dell PowerEdge, HPE ProLiant, and NVIDIA Vera Rubin all feature full liquid-cooling design, reducing PUE below 1.1, increasing computing density by 3–5 times, and

Navigating Liquid Cooling Architectures for Data Centers with AI

Liquid cooling servers offer benefits including improved accelera-tor reliability & performance, increased energy efficiency, reduced water usage, and reduced sound level.2 There are two main categories of

Hotter Than a Hot Tub: The 45°C Breakthrough to Cool AI''s Biggest ...

NVIDIA''s latest AI servers can run on coolant warmer than a hot tub — and that counterintuitive choice is one of the biggest efficiency leaps in data center history.

Liquid cooling heat exchanger units

To address this challenge, liquid cooling has emerged as the preferred solution, using circulating fluids to dissipate heat and prevent overheating to ensure efficient operation of AI hardware. At Microsoft,

Data Center Liquid Cooling: The AI Heat Solution

In two-phase immersion cooling, a server is dunked into a vat of liquid. The liquid actively boils next to the heat-producing components, cooling

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

AI factory liquid cooling & power infrastructure

End-to-end solutions for integrated direct-to-chip liquid cooling, CDUs, and power infrastructure for AI factories—optimized for GPU densities above 100

Liquid-Cooled AI Infrastructure: Powering Scalable Enterprise ...

XA NR1I-E12L / E12LR – Hybrid and full liquid-cooled options, balancing D2C GPU cooling with air-cooled CPUs for seamless infrastructure transitions. HGX Rubin server series, XA

The Heat Beneath the Intelligence & the Global Race to Stay Cool

The liquid cooling market is the most visible expression of this reality. But behind it are deeper questions about how societies want to manage the environmental footprint of AI infrastructure

The data center cooling state of play (2025) — Liquid

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By 2024, liquid-based cooling had conquered 46% of the entire data center cooling market, but air cooling retained 54% of the market, according to

China''s data centers are pushing cooling to the limit

To fuel the AI race, China is building massive data centers. But keeping them cool is becoming the country''s biggest engineering challenge.

Why Is Liquid Cooling Now Mandatory for AI Server Racks?

Liquid cooling has become a mandatory standard for AI servers because modern high-density GPU racks exceed 35–40 kW per rack—far beyond air cooling''s physical limit of ~50 W/cm² heat flux.

Why Liquid Cooling For AI Data Centers Is Harder Than It Looks

Liquid cooling is essential for AI data centers—but deploying it at scale requires advanced design, smart vendors and AI-powered operations to avoid costly downtime.

China moves deeper into liquid cooling as AI data centres push their ...

Chinese manufacturers are moving aggressively into liquid-cooling technologies as hyperscalers expand data-centre infrastructure.

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