GETWORKS DRIVES FORWARD THE CUTTING-EDGE LIQUID COOLING DATA CENTER FOR AI/HPC, COLLABORATING WITH SUPERMICRO

Liquid Cooling for Data Centers is Crucial for Enabling the Next Generation of AI and HPC Workloads and Is Simplified with the Supermicro Liquid Cooling Tower

INDUSTRY

Data Center and Cloud Service Provider

Introduction

At the Yuzawa GX Data Center in Niigata Prefecture in Japan, Getworks has deployed Supermicro's world-leading liquid-cooled solutions, in collaboration with GX Technology Inc., to deliver next-generation AI-ready data centers. This deployment showcases the efficiency, modularity, and sustainability of liquid cooling, setting a new benchmark for AI and HPC infrastructure.

Supermicro is driving the future of AI infrastructure with high-efficiency liquid cooling solutions, enabling scalable, energy-efficient, and high-performance data centers. By integrating Supermicro's liquid cooling technology, including the CDU, Getworks Inc. has enhanced the

cooling efficiency of its containerized AI data centers, reducing power consumption while ensuring optimal uptime for AI workloads.

Challenges

CHALLENGES

- Respond to the latest Liquid Cooled GPU server
- Water leakage and redundancy of the cooling mechanism.
- How to use limited resources efficiently.
- Using a huge amount of electricity to cool the liquid.
- Wasting unlimited water resources.

A liquid-cooled data center reduces operating costs compared to air-cooled data centers. Combined with less power use (and potential carbon emissions), a liquid-cooled data center also enables more compute power per square foot or meter within the data center. In addition, liquid cooling enables data centers to fit in under the allocated amounts of power that a local utility may be willing to provide. Simulations show that the power reduction can be as much as 40% when comparing a liquid-cooled data center to an air-cooled one.

Introducing liquid cooling solutions to data centers presents various challenges, including concerns about water leakage and the redundancy of the cooling mechanism. The primary issue is how to utilize limited resources efficiently. While liquid cooling can lower the power consumption of servers and cooling equipment, excessive electricity use to cool the liquid and squandering unlimited water resources cannot be labeled sustainable business practices. Getworks must create a liquid cooling environment built on the principle of resource reuse.

Getworks strongly felt that AI services were evolving into required services for enterprises. Still, at the same time, the challenge of not being able to install, operate, and manage expensive, advanced GPU servers with high computing power in-house was a major bottleneck in building an AI/HPC infrastructure.

The lead time to acquire a complete liquid-cooling solution is also challenging for many data center operators. A complete solution is comprised of many items, from the servers, racks, plumbing, and cooling technology. Waiting months for a cooling system to be installed may result in a longer time-to-productivity for a data center. With the Supermicro liquid cooling tower, months are reduced to weeks, enabling a faster time for a data center to become productive.

Solution

Getworks selected Yuzawa Town in Niigata Prefecture as the location for its data center because it has abundant energy and reusable resources, including water sources and a cool climate, and is easily accessible from the Kanto region, where many end users are based.

The target users are enterprises, universities, or research institutes. Still, by providing an environment that can be easy to use the GPU cloud service with GPU virtualization, Getworks expects to increase the number of users and use it as a stepping-stone to the introduction of servers that can specialize in AI and high-performance computing.

Getworks decided to use Supermicro servers and their recently announced liquid-cooling tower. The Supermicro solution, from cold plates to an external tower, is supplied entirely by a single vendor, with supervisors sent on-site to ensure correct installation and delivery. The full-service solution from Supermicro enables Getworks to become productive sooner.

SOLUTION

Supermicro HGX H100 8-GPU Liquid Cooled Server

AS -4125GS-TNHR2-LCC

Supermicro Liquid Cooling Total Solution

- DLC GPU server
- CDU, CDM, Hose, Connector
- Cooling Tower
- Management Tools

GPU server configuration:

GPU server	**Supermicro A+ GPU Server (4U)**
Product name	AS -4125GS-TNHR2-LCC
Cooling method	Direct-to-chip Liquid Cooling, In-rack CDU
CPU (Dual Socket)	AMD EPYC™ 9654 Processors, 96C/192T, 2.4G
GPU	NVIDIA® HGX™ H100 8-GPU 8 NVMe for NVIDIA GPUDirect Storage 8 NIC for NVIDIA GPUDirect RDMA (1:1 GPU Ratio) Highest GPU communication using NVIDIA® NVLink®
Memory	2.3TB, DDR5-4800
Storage	7.68TB x 4
Network	400G InfiniBand NDR (NVIDIA® ConnectX®-7) 200G Ethernet, Infiniband HDR (NVIDIA® ConnectX®-6) 10G Ethernet (AOC)
OS, Framework, Tools	Supermicro SuperCloud Composer (Management Tool) Ubuntu22.04 LTS Kubernetes / Docker (GPU Container based Orchestration) LLM (Meta llama or other various language models) Stable diffusion or other various generative AI can be used for images and movies.
Cooling Tower	**Supermicro LCS-SCLT-010C1001**

The Supermicro cooling tower is customizable for different environmental conditions related to the local climate. For Getworks, the liquid chosen is Glycol, which has a lower freezing point than water since the local temperatures get below freezing during the winter. In addition, a basin heater was engineered into the cooling tower to keep the water inside warmer.

The cooling tower power box, signal box, and sensor are the control systems that our cooling tower can monitor and control the whole tower operation from a single screen.

BENEFITS

- NVIDIA GPUs have excellent performance, convenience for development such as recognition, and ease of use.
- Supermicro's liquid-cooling total solution is integrated with CDU, racks, servers, or other liquid-cooling components.
- Supermicro provides comprehensive support for liquid-cooled environments.

Supermicro Cooling Tower has a higher cooling capacity, minimizing the footprint, and comprehensive management software.

Benefits and Advantages

The reason for selecting Supermicro servers with NVIDIA GPUs was that the benchmark tests focused on measuring performance and convenience for development, including recognition and ease of use. Ultimately, NVIDIA GPUs were chosen as the primary option for AI/HPC data center services.

A major reason for choosing Supermicro was its liquid-cooling GPU server solution, which integrates seamlessly with the CDU, racks, servers, and other liquid-cooling components. Additionally, Supermicro offers comprehensive support for liquid-cooled environments, which are often considered challenging to manage. In the unlikely event of an issue, isolating the cause and reaching out to separate support desks for each component can lead to a significant decrease in uptime. Getworks relied on Supermicro's ability to provide end-to-end support for issues the data center cannot handle, which is a considerable advantage. Getworks selected Supermicro Cooling Towers because they deliver higher cooling capacity while minimizing the footprint compared to other solutions, and the embedded software for control and integrated monitoring has proven to be very beneficial. The Supermicro cooling towers also require minimum power usage as well.

Summary

Getworks has been developing, designing, and building containerized data centers for some time. As the amount of heat generated by GPU servers has increased significantly, an efficient liquid-cooled environment for liquid-cooled servers is essential. However, existing building-type data centers have many issues, such as how to draw in cooling water, so we have a track record of introducing various liquid-cooling solutions into containerized data centers. Introducing a liquid-cooled environment in a containerized data center will significantly contribute to the development of AI/HPC.

Getworks aims to create facilities that are compatible with various technologies, with the greatest advantage being consistently providing different models and generations to suit our customers' needs.

“We will expand to accelerate the installation and implementation of water-cooled servers and contribute to improving the operating rate of water-cooled servers, which is lagging in Japan. Our container data center accepts individual customization and can be built following customer requests, such as a cluster configuration that connects multiple containers or a mix of air-cooled and water-cooled servers.” – Getworks CEO Hidenori Nakazawa

For More Information:

Getworks Container Data Center: https://www.getworks.co.jp/data-center/
Getworks Yuzawa GX Data Center: https://www.getworks.co.jp/yuzawa-gx-datacenter/
Supermicro GPU Server: https://www.supermicro.com/en/products/gpu
Supermicro Liquid Cooling Solutions: https://www.supermicro.com/en/solutions/liquid-cooling

SUPERMICRO

Supermicro is a global leader in high performance, green computing server technology and innovation. We provide our global customers with application-optimized servers and workstations customized with blade, storage, and GPU solutions. Our products offer proven reliability, superior design, and one of the industry's broadest array of product configurations, to fit all computational need.

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GETWORKS

Getworks co.,ltd. is a provider the container-type data center. We had its 1st data center in 2013, and we have continued to develop by conducting a wide variety of proof of concept. Our purposes and themes are data center construction, energy saving, and the use of renewable energy, and the company is working on utilizing various renewable energies (snow, water, or outside air). In addition, to respond to the increasing needs for AI and high-performance computing, the company boasts a track record of installing and operating over 3,000 servers and over 10,000 GPUs. With complete in-house design and domestic produce, we can provide our solutions with short delivery times, reduced costs, rapid delivery, and operation, it can be started in as little as 10 days after application.

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