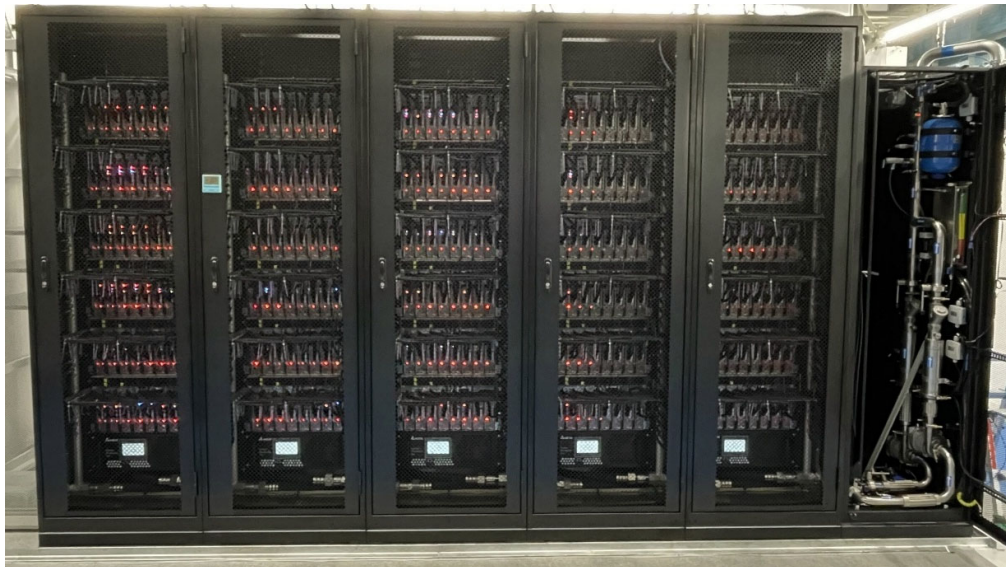


PFN, IIJ and JAIST Start Pilot Testing Liquid-Cooled High-Density AI Servers and Hybrid-Cooled Data Centers for Ultra-High-Efficiency AI Computing Infrastructure

TOKYO and NOMI, Japan – September 11, 2025 – Preferred Networks, Inc. (PFN), Internet Initiative Japan Inc. (IIJ) and Japan Advanced Institute of Science and Technology (JAIST) started pilot testing their ultra-high-efficiency AI accelerator system in IIJ's Matsue Data Center Park (DCP) and JAIST's Ishikawa Campus in July 2025, as part of the [Research and Development Project of the Enhanced Infrastructures for Post-5G Information and Communication Systems/Development of Post-5G Information and Communication Systems \(Commission\)](#) funded by Japan's New Energy and Industrial Technology Development Organization (NEDO).



30 nodes of MN-Core 2 server with a direct liquid cooling system in Matsue DCP

With the rapid demand growth for computing power due to the rise of generative AI, it is increasingly essential to establish ultra-high-efficiency AI computing infrastructure technology that can efficiently manage the substantial heat generated by highly dense and miniaturized processors during operation.

In a bid to secure the much-needed computing power from the next-generation MN-Core series of AI processors, PFN has adopted the direct liquid cooling system for the first time instead of the conventional, less heat-efficient air-cooling system. Since July 2025, PFN has been operating testbeds of PFN-developed high-density servers equipped with a direct liquid cooling system that allows eight MN-Core 2 boards to be accommodated in a single node. Currently, 30 nodes (total 240 MN-Core 2 boards) in Matsue DCP and 2 nodes (total 16 MN-Core 2 boards) in the JAIST Ishikawa campus are being tested.

This pilot test involves a joint effort between IIJ and PFN to install a liquid-cooled high-density AI server within an air-cooled data center, and to evaluate countermeasures against challenges that are specific to liquid cooling. JAIST and PFN are also conducting joint research on improving data center efficiency through coordinated operation between water cooling and liquid cooling systems in a software-defined liquid cooling facility. Additionally, PFN, IIJ and JAIST will jointly conduct tests for liquid cooling technologies and high-density

integration of PFN's next generation of AI processors in the MN-Core series.

In this project, IIJ is developing a liquid cooling modular data center architecture compatible with direct water cooling to address unique challenges inherent to liquid cooling systems, such as plumbing and water leakage issues. As part of this effort, IIJ has introduced AALC (Air-Assisted Liquid Cooling) technology, which can be quickly implemented in an existing air-cooled server room, at its Matsue DCP, creating a hybrid cooling environment that combines air and liquid cooling systems. IIJ plans to utilize the outcomes of this testing and the development project to offer solutions supporting AI infrastructure deployment.

Items to be evaluated during the test operations:

- PFN: Efficiency and operational feasibility of liquid-cooled servers as a component of the AI computing infrastructure powered by the next generation of MN-Core series
- IIJ and PFN: Countermeasures against challenges inherent to liquid cooling, interoperability between modules
- JAIST and PFN: Experiments for enhancement of data center efficiency in a software-defined liquid cooling facility

Beginning in April 2026, PFN, IIJ and JAIST plan to run actual AI workloads on the testbed to conduct joint research and development for optimized resource allocation and efficiency through coordinated control of AI computing infrastructure, with the goal of realizing ultra-high-efficiency AI computing systems.

About Preferred Networks

Preferred Networks (PFN)'s mission is to make the real world computable. PFN develops advanced software and hardware technologies in a vertically integrated approach, covering the entire AI value chain from chips, supercomputers, generative AI foundation models to solutions and products for a range of industries. Founded in 2014 in Tokyo, PFN currently develops MN-Core™ series of highly energy-efficient AI processors, PFCP™ cloud service for AI computing, Japan-made large language model PLaMo™ and more. <https://www.preferred.jp/en/>

About IIJ

Founded in 1992, IIJ is one of Japan's leading Internet-access and comprehensive network solutions providers. IIJ and its group companies provide total network solutions that mainly cater to high-end corporate customers. IIJ's services include high-quality Internet connectivity services, systems integration, cloud computing services, security services and mobile services. Moreover, IIJ has built one of the largest Internet backbone networks in Japan that is connected to the United States, the United Kingdom and Asia. IIJ was listed on the Prime Market of the Tokyo Stock Exchange in 2022.

For more information about IIJ, visit the IIJ website at <https://www.ij.ad.jp/en/>.

About JAIST

Founded in 1990 in Ishikawa prefecture, the Japan Advanced Institute of Science and Technology (JAIST) was the first independent national graduate university that has its own campus in Japan. After 30 years of steady progress, JAIST has become one of Japan's top-ranking universities. JAIST strives to foster capable leaders with a state-of-the-art education system where diversity is key; about 40% of its alumni are international students. The university has a unique style of graduate education based on a carefully designed coursework-oriented curriculum to ensure that its students have a solid foundation to conduct cutting-edge research. JAIST also works closely both with local and overseas communities by promoting industry-academia collaborative research. Website: <https://www.jaist.ac.jp/english/>

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