

News Release

FOR IMMEDIATE RELEASE

Hitachi Launches Cloud Service for Quantum Inspired Computer "CMOS Annealing"

Providing Not Only High-Speed Machine But Also Applications as a Package, Easily and Quickly Applicable to Actual Business Without Advanced Specialized Knowledge

Tokyo, October 3, 2022 – Hitachi, Ltd. (TSE: 6501) today announced that the launch of a new cloud service*¹ with CMOS Annealing*², which is Hitachi's proprietary technology and can solve large-scale combinatorial optimization problems at high speed. In addition to the computational performance of CMOS Annealing itself, Hitachi provides applications as a package, allowing for easy and quick application in actual business across a wide range of industries and business categories, contributing to customers' DX by reducing costs and improving profits.

*¹ This service provides an execution environment including applications, so it is not a cloud service that provides only CMOS Annealing calculations and infrastructure environments.

*² CMOS Annealing: A new type of computer, known as a quantum inspired computer, developed by Hitachi to solve combinatorial optimization problems using the Ising model, devised to explain the properties of magnetic materials. Unlike quantum computers, it does not require a cooling mechanism, operates at room temperature, and can easily handle large-scale computing.

CMOS Annealing is a new computer technology that simulates the mechanisms of quantum annealing, a type of quantum computer, on semiconductors. It can search for optimal solutions from huge and complex patterns while having the convenience of ease of use. It is expected to find application in actual work to solve various social issues that could not be solved using conventional computers.

In addition to CMOS Annealing's calculation functions, this service provides a suite of applications immediately suitable for work to deal with various combinatorial optimization problems in business, such as financial portfolio optimization, work-shift organization for big call centers, traffic congestion avoidance by optimizing travel routes, and optimization of planning for production, logistics, delivery, inventory, and so forth. The number of applications will be gradually expanded. Since it is provided as a cloud service that can be easily used, it does not require a high level of expertise and can be operated by the relevant business department and shorten the lead time to introduction. If necessary, Hitachi provides consulting services by a specialist team familiar with the customer's business and CMOS Annealing, so that it can be quickly applied to the work tasks.

Background

In recent years, expectations for quantum computers have been rising to address problems in society by solving complex and large-scale combinatorial optimization problems. On the other hand, the application of quantum technology to actual work tasks requires a high level of specialized knowledge and technical capabilities, so social implementation has to date made only limited progress.

Since the development of CMOS Annealing in 2015, Hitachi has accumulated knowledge through the provision of applications to a range of work tasks, such as work shift optimization and insurance portfolio optimization.

In the past, Hitachi used CMOS Annealing to offer calculation results to customers in the form of reports according to their requests. In order to further promote its use, Hitachi has combined a system environment for large-scale optimization calculations and application functions to launch an easy-to-use SaaS that makes it possible to utilize CMOS Annealing on the customer side.

Features of the service

1. SaaS-type service delivery solves combinatorial optimization problems in real work tasks quickly and cost-effectively

Hitachi provides a platform as a monthly cloud service that includes everything from hardware to software and applications required to use CMOS Annealing. Since it is not necessary to build and maintain development environments and applications, the introduction period and cost can be greatly reduced. This allows it to be used quickly without physical and mathematical expertise in advanced quantum technologies such as Ising models or technology such as tuning formulas to obtain optimal solutions.

By adopting Red Hat OpenShift*3, the industry-leading enterprise Kubernetes platform, and supporting the introduction of cloud-native systems, this service can optimize resources within the platform with more flexible and security-oriented functions.

*3 Red Hat OpenShift® is an enterprise-supporting Kubernetes container platform built for open hybrid cloud strategy.

2. Available for actual work tasks in a wide range of industries with an array of applications

This service is equipped with many applications that can be used in industries such as finance, manufacturing, logistics, and transportation. For example, you can simply select an application from a web browser and enter the required items to obtain an optimal solution calculated by CMOS Annealing. Each application is designed in advance to incorporate common cases in each industry and business based on the know-how Hitachi has cultivated through demonstration experiments and actual introduction. Therefore, it enables quick introduction and easy use. If necessary, you can also develop and customize company-specific items.

Starting with applications for financial portfolio optimization and work shift optimization, Hitachi will continue to expand the application lineup through continuous collaborative creation and trials with customers.

3. Hitachi's dedicated team provides strong support for resolving actual work challenges

Hitachi experts with extensive experience in combinatorial optimization problems support the resolution of actual work challenges from both operational and technical viewpoints. With the cooperation of Hitachi's sales and SEs, who have familiarity with work tasks, and a team specializing in CMOS Annealing, actual work challenges will be translated into mathematical formula and it will be implemented in CMOS Annealing. Even in case of individual development, Hitachi supports it seamlessly, so there is no requirement for mathematical expertise or technology.

Future development

In the future, Hitachi will promote in-house development and collaborative creation with partners in order to expand the work applications of this service, including inventory management and traffic congestion relief. Hitachi will continue to expand its Lumada*4 solutions that utilize quantum technology, AI, and other digital technologies to contribute to customers' DX by improving operations and increasing profits.

*4 Lumada: The name of Hitachi's advanced digital solutions and services for turning data into insights that drive digital transformation of social infrastructure.

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About Hitachi, Ltd.

Hitachi drives Social Innovation Business, creating a sustainable society with data and technology. We will solve customers' and society's challenges with Lumada solutions leveraging IT, OT (Operational Technology) and products, under the business structure of

Digital Systems & Services, Green Energy & Mobility, Connective Industries and Automotive Systems. Driven by green, digital, and innovation, we aim for growth through collaboration with our customers. The company's consolidated revenues for fiscal year 2021 (ended March 31, 2022) totaled 10,264.6 billion yen (\$84,136 million USD), with 853 consolidated subsidiaries and approximately 370,000 employees worldwide. For more information on Hitachi, please visit the company's website at <https://www.hitachi.com>.

Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
