

“FugakuNEXT”

—Pioneering the Future with AI and Simulation—



III The Role of the New Flagship Supercomputer, “FugakuNEXT”

In recent years, demand for computational resources has surged due to advances in simulation and data science, alongside the rapid rise of generative AI. At the same time, the needs for computational resources are becoming increasingly diverse, driven by the growing importance of new scientific research that integrates AI, simulation, automated experimentation, and real-time data. Given this background, the new flagship supercomputer, “FugakuNEXT” is expected not only to further advance the simulation capabilities of conventional supercomputers but also achieve world-leading performance in AI. Its mission is to serve as a next-generation AI-HPC platform where AI and HPC work seamlessly together.

“FugakuNEXT” Development Policy

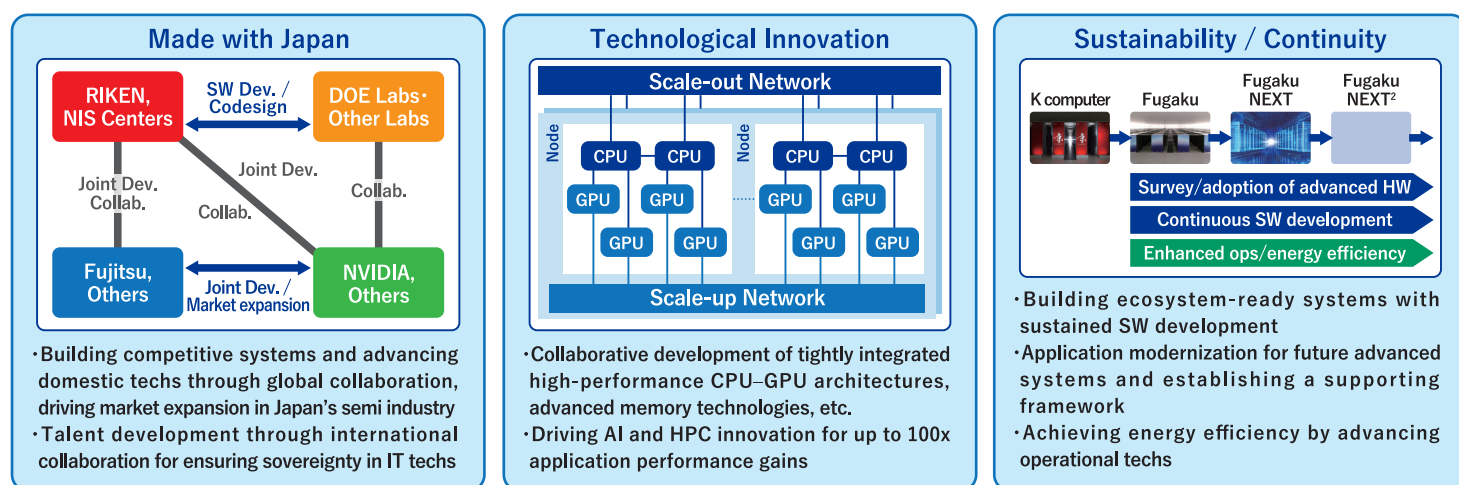
The development of “FugakuNEXT” will be conducted by the three pillars of strategies: **Made with Japan**, **Technological Innovation**, and **Sustainability/Continuity**. These principles are based on the findings of the “Final Report on Next-Generation Computing Infrastructure”^{*1} and the “Research Study on Next-Generation Computing Infrastructure”^{*2}, as well as the experience and lessons learned from the development and operation of supercomputer “Fugaku”.

Development Structure for “FugakuNEXT”

To achieve world-leading performance in both AI and simulation, the development of “FugakuNEXT” will proceed through a three-party collaboration led by RIKEN, working together with Fujitsu and NVIDIA. This partnership brings together Fujitsu's expertise in high-performance ARM-based CPU and system integration, and NVIDIA's GPU technology and global ecosystem with the highest global market share in AI/HPC GPUs. In addition, software development, including system software, will be conducted through an open framework involving international collaboration, complementing the tripartite partnership. These combined efforts aim to deliver a competitive system achieving the world's first zetta-scale performance in AI (FP8) and to build a global ecosystem through worldwide deployment.



Based on these development principles, we will expand the frontiers of computation through a next-generation AI-HPC platform, create new science through “AI for Science”^{*3}, secure Japan's leadership in advanced AI technology and computational infrastructure, and advance sustained R&D based on semiconductor and computational resource roadmaps. This will build a global “FugakuNEXT” ecosystem and further strengthen Japan's semiconductor industry and information infrastructure.



^{*1} “Report on Next-Generation Computing Infrastructure: Final Summary”

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

^{*2} “Research Project on Next-Generation Computing”

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

^{*3} “AI for Science”

An initiative to accelerate research processes by leveraging AI in science and technology, combining AI with simulation and diverse data. This is expected to bring about groundbreaking scientific and technological innovation across various fields.

III Operational Policy

“FugakuNEXT” will be deployed adjacent to the RIKEN Kobe site, with operations targeted to begin around 2030. We will establish an operational environment that minimizes any period of unavailability of computational resources during the system migration from “Fugaku”, aiming to continuously provide world-class computational performance and resources in a stable manner. Furthermore, the system will pursue energy efficiency and low

carbonization by combining operational technologies that promote the adoption of advanced cooling techniques and the use of renewable energy source. In addition, we plan to further evolve AI-driven operations and user support to ensure the sustainability and efficiency of the computational infrastructure, while expanding into new computational domains through integration with quantum computers, thereby providing a research environment accessible to all.



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