

Singapore researchers granted regular access to reigning world's top supercomputer in first-of-its-kind arrangement with Japan

A new agreement between Japan's Research Organization for Information Science and Technology (RIST) and National Supercomputing Centre (NSCC) Singapore opens the path for Singapore researchers to regularly access and request for supercomputing resources from the world's most powerful supercomputer, Japan's Fugaku system. In the first such arrangement of its kind outside of Japan, Singapore researchers can now apply for available resources through an annual Call for Projects to Fugaku, which will be coordinated by NSCC and RIST.

Singapore, 19 November 2021 – Singapore researchers will be amongst the first in the world to be granted regular access to Japan's *Fugaku* supercomputer through an annual Call for Projects to *Fugaku* dedicated to them, which is facilitated by NSCC in partnership with RIST. RIST is the general incorporated foundation that is responsible for the promotion of the shared use of Japan's collective supercomputing resources across the entire country, including those of the supercomputer *Fugaku*.

The agreement which was signed between RIST and NSCC is a milestone for both organisations. The agreement builds on an earlier Memorandum of Understanding on Information Exchange Concerning Promotion of Supercomputer Utilization between RIST and NSCC.

Since its debut in June 2020, *Fugaku* has retained its ranking as the reigning top supercomputer in the world in the latest November 2021 issue of the global TOP500 supercomputer list. With an amazing 442 PFLOPS of compute power, *Fugaku* is about three times more powerful than its closest competitor.

The annual Call for Projects to *Fugaku* via NSCC and RIST will be in addition to NSCC's national Call for Projects, which are already held every six months for all Singapore-based research projects. The additional access to *Fugaku* will give Singapore researchers more options for resources to meet their high-performance computing (HPC) needs. Singapore researchers will also have upgraded national HPC resources to tap on when Singapore's newest supercomputer system, with an aggregated raw compute power of up to 10 PFLOPS, comes online in the first half of 2022.

"The trial access to *Fugaku* last year garnered keen interest from Singapore research teams," said Associate Professor Tan Tin Wee, Chief Executive of NSCC explaining that a total of eight research teams had applied for resources via the *Fugaku* Preliminary Use Projects, out of which six projects were approved for resources. The approved Singapore projects covered COVID-related biomedical research, cancer research and materials science research. "NSCC's new partnership with RIST will ensure that Singapore researchers have a regular path to access

Fugaku's ARM chip-based architecture and compute power. Tapping on such resources helps broaden the experience of the Singapore HPC community by getting access to CPU and interconnect technologies which are not available in Singapore. This collaboration between the HPC organisations of Singapore and Japan further cements our already established links and contributes to the development of the high-performance computing field in both countries."

"Singapore is placed as one of the leading countries in the HPC field in Asia Oceania," said Dr Hideyuki Takatsu, Managing Director of RIST, adding that RIST has enjoyed close cooperation with NSCC since its inception. "Our agreement with NSCC, which allows Singapore researchers to apply for accessible *Fugaku* resources through NSCC and RIST, is a new step to expanding international *Fugaku* utilization. I believe that this will promote international cooperative research and world-wide dissemination of Japanese application software and *Fugaku*'s ARM chip-based architecture."

"We have been collaborating with NSCC for some time formulating a relationship as national supercomputing centers of respective nations," said Prof Satoshi Matsuoka, Director of RIKEN Center for Computational Science (R-CCS). "We are delighted with this new MoU agreement between NSCC and RIST, in that we can further extend this now trilateral collaboration to bring forth unprecedented supercomputing capabilities to the researchers in Singapore."

The new Call for Projects to *Fugaku* will be launched in Singapore in December 2021. Upon approval, the first projects can expect to start using the *Fugaku* system from April 2022. The maximum amount of *Fugaku* resources available to Singapore researchers annually will be capped at 1M Node Hours (NH), or about 5 research projects, with a maximum duration of one year for each project to use the approved resources. The Call for Projects will be regularly published on NSCC's websites at www.nscg.sg and <https://help.nscg.sg/project-calls>.

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Key Principals of Organisations Involved



A/Prof Tan Tin Wee
Chief Executive
National Supercomputing Centre
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Dr Hideyuki Takatsu
Managing Director
Research Organization for
Information Science and
Technology (RIST)



Prof Satoshi Matsuoka
Director
RIKEN Center for Computational
Science (R-CCS)

About Supercomputers

Supercomputers have been instrumental in most of the world's major scientific advancements. These include enabling complex computational and data-intensive tasks to be completed much more quickly in fields as diverse as advanced scientific modelling & simulations, artificial intelligence, weather forecasting, climate research, oil and gas exploration, chemical and biomolecular modelling, and quantum computing. The research has led to modern scientific achievements like deciphering the human genome, enhanced air travel, space exploration, biomedicine, unravelling the secrets of the universe and even research on solutions for pandemics like COVID-19.

About Supercomputer *Fugaku*

The supercomputer *Fugaku* was co-developed by RIKEN and Fujitsu under the project for the development of the innovative High-Performance Computing Infrastructure (HPCI) promoted by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT). *Fugaku* is the successor of K computer. *Fugaku* takes first place on four supercomputer rankings from June 2020 through November 2021, and is proven to have the world's top-class performance. For more details, please refer to RIKEN R-CCS's website: <https://www.r-ccs.riken.jp/en/>

Glossary

- **PFLOPS** - Floating-point operations per second (FLOPS) is the measurement of the processing speed of supercomputers with Peta, or one quadrillion, referring to scale, or the number of calculations that can be performed in one second.
- **Node Hour** - A node-hour is a unit of computational resources which corresponds to using 1 compute node of a system for 1 hour. A compute node is a server which forms a building block of a supercomputer. Depending on the system, supercomputers could have between hundreds to hundreds of thousands of computer nodes working in parallel.

Chinese Translations

- National Supercomputing Centre (NSCC) Singapore - 新加坡国立超级电脑中心

About the National Supercomputing Centre (NSCC) Singapore

The National Supercomputing Centre (NSCC) Singapore was established in 2015 to manage Singapore's national petascale facilities and high-performance computing (HPC) resources. As a National Research Infrastructure funded by the National Research Foundation (NRF), the HPC resources that we provide helps support the research needs of the public and private sectors, including research institutes, institutes of higher learning, government agencies and companies. With the support of our stakeholders, for example, the Agency for Science Technology and Research (A*STAR), Nanyang Technological University (NTU), National University of Singapore (NUS), Singapore University of Technology and Design (SUTD), National Environment Agency (NEA) and Technology Centre for Offshore and Marine, Singapore (TCOMS), NSCC catalyses national research and development initiatives, attracts industrial research collaborations and enhances Singapore's research capabilities. For more information, please visit <https://www.nscg.sg/>.

About Research Organization for Information Science and Technology (RIST)

Research Organization for Information Science and Technology (RIST) is a general incorporated foundation. Since FY 2012, RIST has been carrying out the usage promotion service of the "Specific High-speed Computer Facilities" (then the K computer, now the supercomputer Fugaku since FY 2020), as the "Registered Institution for Facilities Use Promotion" based on the "Act on the Promotion of the Public Utilization of the Specific Advanced Large Research Facilities", and has also been in charge of the usage promotion services, which are part of the management of the "innovative High Performance Computing Infrastructure (HPCI)". The "innovative HPCI" is a publicly-called project commissioned by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). For more information, please visit <https://www.rist.or.jp/ehome.html>.

About RIKEN Center for Computational Science (R-CCS)

As the leadership center of high-performance computing, we explore "the science of computing, the science by computing, and the science for computing." We at the RIKEN Center for

Computational Science (R-CCS) will carry out the following mission:

- Operate the supercomputer Fugaku efficiently and effectively to serve as a core of high-performance computing research, and further expand the number of users, improve the ease-of-use, and promote educational activities.
- Facilitate leading edge infrastructures for research based on Fugaku, and moreover conduct translational research to advance the operational technologies for large-scale computing facilities to world-leading levels.
- Conduct cutting-edge research on high performance computing, and promote the results through open-source software, allowing our achievements to create new values in world's technological developments based on high-performance computing.