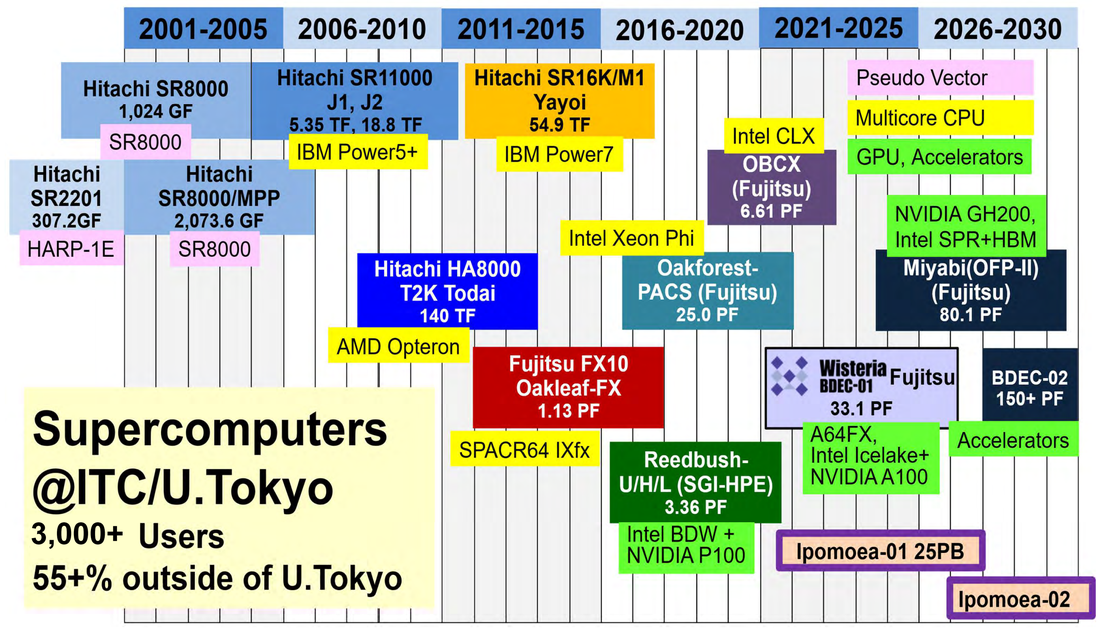
Supercomputing Research Division, Information Technology Center, The University of Tokyo

Supercomputing Research Division, Information Technology Center (SCD/ITC/UTokyo)

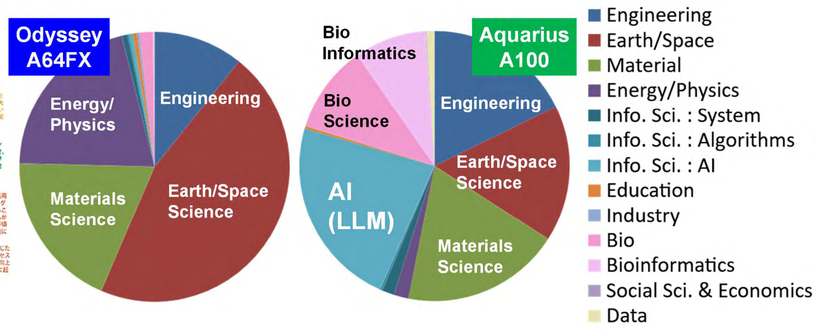
- The Information Technology Center (ITC/UTokyo) was organized in 1999, and it consists of 5 research divisions (Campus-wide Computing, Data Science, Network, Supercomputing, and Interdisciplinary Information Science). ITC/UTokyo is also a core organization of the **"Joint Usage/Research Center for Interdisciplinary Large-Scale Information Infrastructures (JHPCN),"** and a part of **HPCI (the High-Performance Computing Infrastructure)** operated by MEXT.
- The Supercomputing Research Division, ITC/UTokyo was originally established as the Supercomputing Center of the University of Tokyo in 1965, making it the oldest academic supercomputer center in Japan. **The systems operated by SCD/ITC contain 3,000+ users in total; 55+% of these users are from outside the university.** Up to 10% of the total computational resources of each system are open to users from the industry.



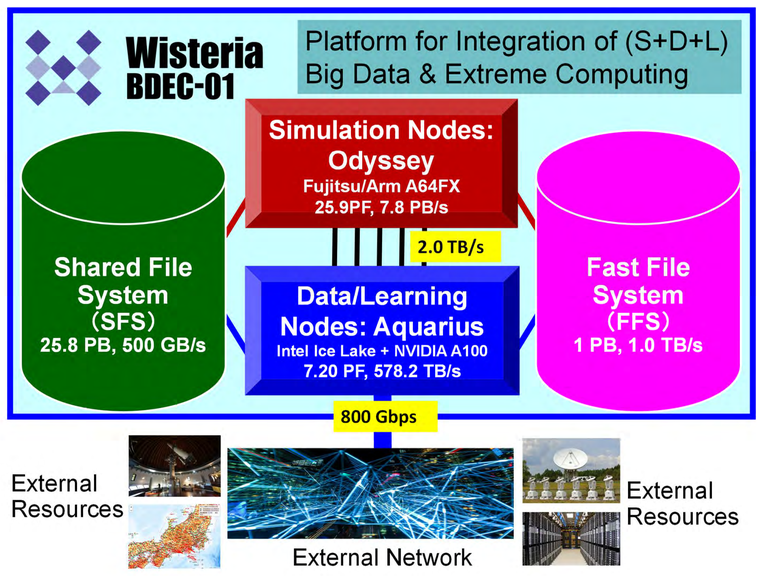
Wisteria/BDEC-01/h3-Open-BDEC for Integration of (S+D+L)

- Integration/convergence of Simulation/Data/Learning (S+D+L) is important towards Society 5.0 proposed by Japanese Government, which is a human-centered, safe and secure society by integration of cyber space & physical space.
- In 2015, we started the BDEC project (Big Data & Extreme Computing) for development of supercomputers and software for integration of (S+D+L).
- In May 2021, we started operation of the Wisteria/BDEC-01, the first BDEC system, which consists of computing nodes for computational science and engineering with A64FX (Odyssey), and those for Data Analytics/AI with NVIDIA A100 GPU's (Aquarius).
- We also develop a software platform "h3-Open-BDEC" for integration of (S+D+L) on the Wisteria/BDEC-01, focusing on (1) Innovative method for numerical analysis with high-performance/high-reliability/power-saving based on the new principle of computing by adaptive precision, accuracy verification and automatic tuning, (2) Data driven approach by integration of ML & CSE, and (3) System software/utilities on heterogenous systems, such as the Wisteria/BDEC-01.
- Integration of (S+D+L) by h3-Open-BDEC enables much more efficient computing, compared to those by conventional simulations.

[c/o KEIDANREN]



Research Area based on Machine Hours (FY.2024) ■CPU, ■GPU (Wisteria/BDEC-01)



Odyssey: A64FX

Aquazrius: A100+Icelake

Wisteria BDEC-01

Hierarchical, Hybrid, Heterogeneous h3-Open-BDEC Big Data & Extreme Computing

JCAHPC: Joint Center for Advanced HPC

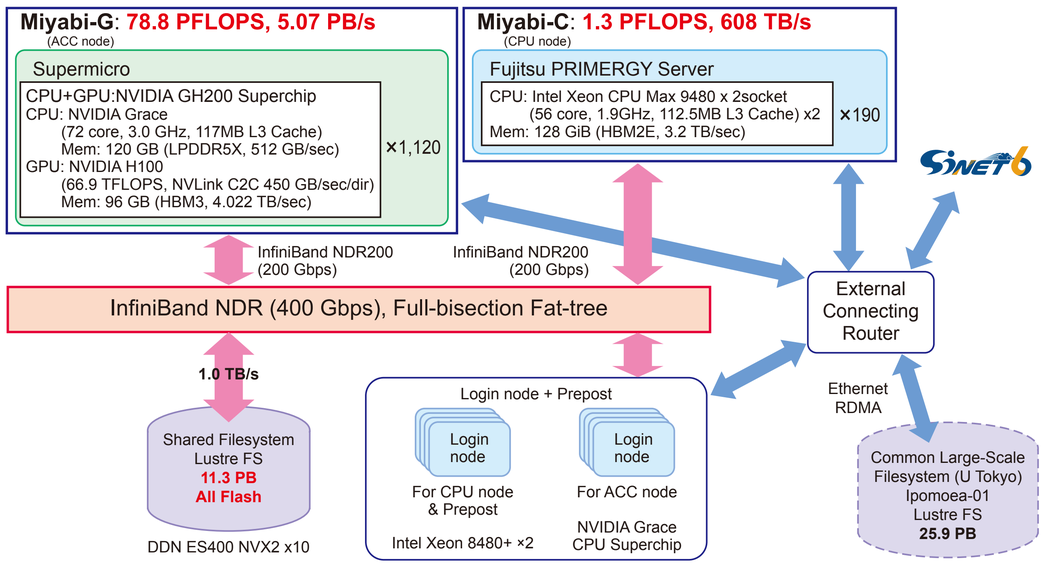
- In 2013, CCS/U.Tsukuba and ITC/UTokyo agreed to establish the Joint Center for Advanced High-Performance Computing (JCAHPC). JCAHPC comprises more than 20 faculty and staff members from both institutes.
- The primary mission of JCAHPC is designing, installing, and operating the **Oakforest-PACS system (OFP) (2016-2022, 8,208 nodes of Intel Xeon/Phi, 25PF, 6th in the 48th TOP500 (November 2016))**. OFP has contributed significantly to the development of computational science in Japan and around the world, especially after shutdown of the K computer in August 2019.
- After retirement of OFP in March 2022. JCAHPC had been introduced Miyabi (OFP-II) system, which started operation in January 2025.

JCAHPC

Miyabi: New Supercomputer System of JCAHPC with 80 PFLOPS

- Miyabi, installed at the UTokyo's Kashiwa campus, comprises 1,120 accelerator nodes using NVIDIA GH200 Grace Hopper Superchips (Arm Neoverse V2 cores with GPU coherence), 190 general-purpose CPU nodes with dual Intel Xeon CPU Max sockets, 11.3 PB of all-flash DDN Lustre storage, and NVIDIA InfiniBand NDR200 for high-performance interconnect.
- It also integrates "Ipomoea-01" as an external large-scale filesystem.
- Continuing OFP's philosophy, Miyabi promotes advanced computational science and AI-driven methods, including AI for Science, supporting Society 5.0 through simulation, data analysis, and machine learning.
- The platform serves researchers in Japan and international collaborators via programs such as HPCI, JHPCN, and institutional initiatives, enabling large-scale applications and fostering innovation in next-generation HPC and AI research.

miyabi



HAIRDESC: Advanced HPC-AI R&D Support Center

- HAIRDESC, launched at RIST in Fall 2025 under MEXT's initiative, provides technical support for next-generation HPC and AI development, and ITC/UTokyo serves as a core hub of HAIRDESC, together with University of Tsukuba and Science Tokyo.
- It addresses established HPCI applications and emerging domains like AI for Science, anticipating the Fugaku NEXT era.
- HAIRDESC collaborates with CPU/GPU vendors on GPU adaptation, advanced technologies, and talent development, and
- Missions of ITC/UTokyo in HAIRDESC include GPU acceleration for applications in computational science, AI for Science, and portable GPU programming environments.

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