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Director of the Information  
Technology Center

The Information Technology Center, as part of the Information & Communications, Nagoya University, cooperates with the Information Strategy Office, Information Security Office and the Information Promotion Department in order to take responsibility for the development and stable operation of the information infrastructure, including supercomputers and networks for education and research at Nagoya University. The Information Technology Center also plays a role in the research and development of High Performance Computing technology in Japan as part of the Joint Use/Research Center for Interdisciplinary Large-Scale Information Infrastructures which consists of eight facilities, including the Information Technology Centers of seven largest national universities in Japan and the Tokyo Institute of Technology Global Scientific Information and Computing Center. They were originally National Joint-Use Facilities, became Joint Use/Research Centers during the last fiscal year and they provide not only support for users, but also engage in joint national research in cooperation with the Information Technology Centers of the eight universities.

## Activities on Joint Usage / Research Center



### JHPCN

The Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures is made up of eight centers equipped with supercomputers. These centers are the Information Initiative Center of Hokkaido University, the Cyberscience Center of Tohoku University, the Information Technology Center of the University of Tokyo, the Global Scientific Information and Computing Center of the Tokyo Institute of Technology, the Information Technology Center of Nagoya University, the Academic Center for Computing and Media Studies of Kyoto University, the Cybermedia Center of Osaka University, and the Research Institute for Information Technology of Kyushu University. This is a network-type joint usage and collaborative research center, and its core institution is the Information Technology Center of the University of Tokyo. The Center began as a program of the Japanese Ministry of Education, Culture, Sports, Science & Technology (MEXT) in April 2010.

### HPCI

To provide a framework and structure so that users of High Performance Computing (HPC) who tend to be isolated locally can efficiently utilize the nation wide high performance computing resources.

To accelerated the wide range of HPC utilization from the exploratory researches to the large scale and industrial research, to enlarge and foster computational science community and to best utilize the achievements for the society by matching the needs and available resource on a nation wide scale.

# Information Technology Center



## Supercomputer Systems

The Information Technology Center at Nagoya University began with the general purpose computer Fujitsu FACOM230-60 in 1971. A supercomputer was first installed in 1987 and has since been used by a number of researchers in the field of scientific computing. We installed the new-system Supercomputer "Flow" and started computing services in July 2020. We support academic research at a wide range of universities and other institutes by supplying services such as computing that accommodates researcher demand for large-scale computing, "Post Processing" to enable visualization, computer statistics, big data mining, "Data Intensive Computing" to provide new services in distributed data processing, distributed databases, and small virtual computers for laboratories. As a partner institute in the Joint Usage/Research Center (JHPCN) in Japan since 2010, we have played a role in the research and development of high-performance computing technology.

Furthermore, since 2010, we have participated in a joint research project in cooperation with the Institute for Space-Earth Environmental Research (ISEE) at Nagoya University to promote academic research and advanced technology in high-performance computing in fluid, plasma, machine learning, and general computational science. Moreover, since 2012, we have worked as resource providers for the High Performance Computing Infrastructure (HPCI) in Japan, helping to accelerate a wide range of HPC utilization from exploratory research to large-scale and industrial research, to enlarge and foster the computational science community, and to utilize the best achievements for the good of society by matching needs and available resources on a nationwide scale.

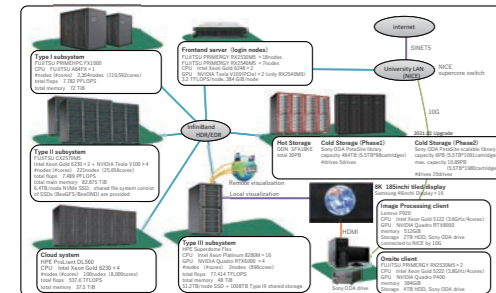


Fig.1 Overview of Supercomputer "Flow"

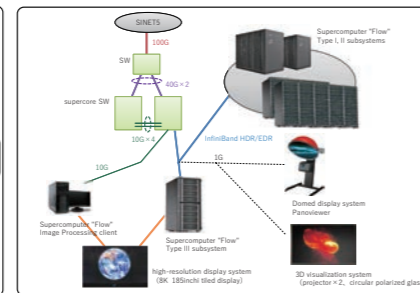


Fig.2 Visualization System

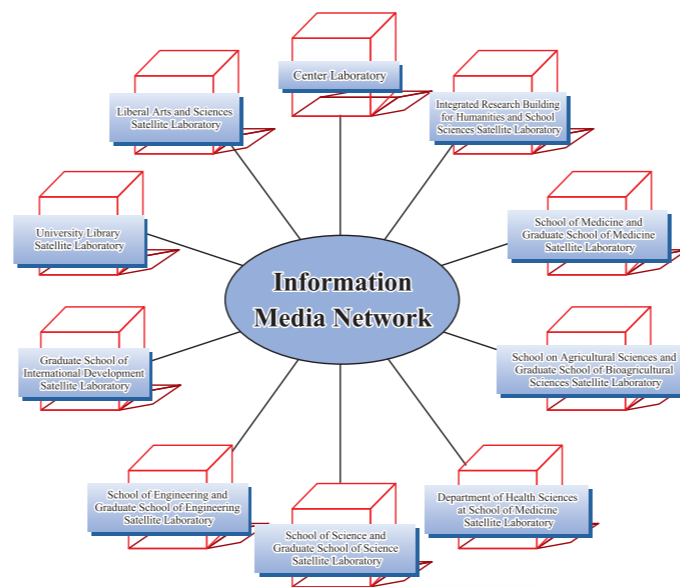
## Information Media Studies System

The Information & Communications, Nagoya University started the current Information Media Studies System on October, 2019.

The Information Media Studies System provides an educational environment for teaching courses and supporting self-learning using computers, where approximately 1200 personal computers are available as information media terminals. These information media terminals are installed separately in Satellite Laboratories of nine departments as well as in the Main Center Laboratory. The Main Center

and Satellite Laboratories are used for professional education using computers, such as information media literacy education. These laboratories are connected via a high speed network, providing FAT client as well as network boot infrastructure.

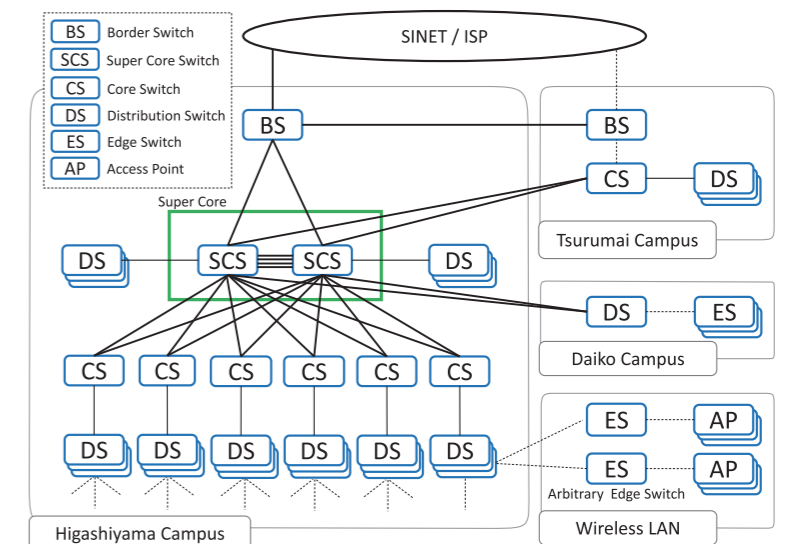
In addition to these services, the Media Studio provides a service for creating online lecture materials, such as a lecture video archive, also providing support for contents production of OCW (Open Course Ware).



## Network Systems

Nagoya university Integrated Communication Environment (NICE) is a campus wide information network of Nagoya University which supports education, research, and administration. NICE covers major campuses such as Higashiyama campus, Tsurumai campus, and Daiko campus, and connects them to the Internet through both SINET (Science Information Network) in Japan and Internet Service Provider. NICE equips UTM (Unified Threat Management), intrusion detection system, and anti-virus/spam-detection system for security measure. Also, to improve availability with

redundancy, NICE places two super core switches in campus and connect individual core switch to both of them. NICE utilizes 40GBASE or 10GBASE connection between distribution switches, core switches, super core switches, and border switch. The border switch connects NICE to SINET with 100GBASE. Furthermore, 802.11n/ac/ax wireless LAN service named Nagoya University Wireless Network are provided in major buildings. It supports authentication based on constituent member ID, eduroam ID, and guest ID.



## Scholarly Information Division

- Developing effective distribution systems for burgeoning scholarly information -

Here at the Scholarly Information Division we carry out research and development on the effective collection, analysis and application of scholarly information, which is rapidly advancing in scale and diversification. We integrate elemental technologies such as databases, information retrieval, knowledge engineering, natural language processing, web information services and digital libraries, and are working toward the development of technologies that will become the basis for next-generation scholarly information services. We also collaborate with various departments within Nagoya University, for example the University Library, to conduct research and development on practical services related to scholarly information. In addition, we promote research activities into the establishment of advanced information technology services at the University.

## High Performance Computing Division

Toward the Development of Accessible HPC Infrastructure

The High Performance Computing Division at the Information Technology Center is researching what kinds of environment and operations can improve supercomputers efficiency and ease of use. We are also conducting research in parallel and distributed computing, focusing on such fields as auto-tuning, GPU computing, big data processing, large-scale machine learning, and numerical simulation of fluid flows, structure, and seismic waves.



Supercomputer "Flow" Type I Subsystem



Supercomputer "Flow" Type II Subsystem



Supercomputer "Flow" Cloud System

## Advanced Networking Division

- Advanced network service as a platform for research and education -

The first task of the Advanced Networking Division is planning, developing, managing and operating the information network infrastructure of Nagoya University. This occupies an important position in the research infrastructure, given that these days it entails a wide-range of services related to the network infrastructure, which include its wired network (named NICE), wireless network (named NUWNET), security, and authentication. The second task of the Advanced Network Division is R&D activities related to the information infrastructure technologies and network services which covers the next-generation campus information network. We also contribute to graduate school education as a part of the Information Network Systems Laboratory of the Department of Information Engineering, Graduate School of Informatics.

## Information Media Division

Research and development of educational learning support using information media

The Information Media Division aims for research and development of information media education infrastructure as well as operational support of its services. The most important missions of the division are as follows: stable management and operation of two education infrastructure systems provided for all university members, "Information Education Infrastructure System" and "Information Media Studio", with the cooperation of Technology Services Department; research and development regarding establishment and utilization of ICT educational environment that contributes to development of human resources with creativity and ability of logical thinking through education that values initiative. Moreover, the division contributes to research and education by providing a part of a course of Media Informatics Unit of Department of Intelligent Systems of Graduate School of Informatics.