10/29/2020

Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures
Call for Proposal of Joint Research Projects in Fiscal Year 2021

The Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures (JHPCN) calls for joint research projects for fiscal year 2021. The JHPCN is a "Network-Type" Joint Usage/Research Center, certified by the Ministry of Education, Culture, Sports, Science and Technology, and comprises eight super-computer-equipped centers affiliated with Hokkaido University, Tohoku University, University of Tokyo, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University, and Kyushu University, among which the Information Technology Center at the University of Tokyo is functioning as the core institution of JHPCN. Each JHPCN member institution will provide its research resources for joint research projects.

The aim of JHPCN is to contribute to advancement and permanent development of the academic and research infrastructure of Japan by implementing joint research projects that require large-scale information infrastructures and that address Grand Challenge-type problems in general information science, thus far considered extremely difficult to solve.

Researchers of awarded joint research projects can use provided computer research resources, including supercomputers, storages, visualization devices, with free of charge. Joint research projects that aim only to build a joint research team involving researchers at the JHPCN member institutions without using computer resources is also possible. In addition, expenses for overseas travels or publication of research results can be supported in some cases. The research team has to consists of members of multiple research fields. Some of the computer resources can be connected to facilities inside and outside of JHPCN member institutions via high-speed networks for the purposes of exchange, accumulation, and processing of data. It is also possible to connect research resources of the JHPCN member institutions with SINET5 L2VPN.

JHPCN Joint Research has been run in conjunction with the HPCI. The computer resources available for the joint research includes some of the resources JHPCN has supplied to the HPCI.

Since the JHPCN member institutions have enrolled leading researchers, acceleration of joint research projects is anticipated through collaboration with these researchers. You can get an introduction to the researchers of JHPCN member institutions for research team building, so in case you hope to, please contact the JHPCN office or the member institutions in advance of the application. These joint research projects for the fiscal year 2021 will be implemented from April 2021 to March 2022. The web application deadline is 5 PM (JST), 6 January, 2021. We expect and appreciate as many applications as possible.

0. What's new in this call

Conditions of the acceptable research projects (1.) and the maximum quantity of research resources when using multiple kind of resources (6.) are clarified in this call.

1. Joint Research Areas

This call for joint research projects requires interdisciplinary research projects in the four areas: very large-scale numerical computation, very large-scale data processing, very large-capacity network technology, and very large-scale information systems. Approximately 60 joint research projects will be awarded.

(1) Very large-scale numerical computation
This includes scientific and technological simulations in scientific/engineering fields such as Earth environment, energy, and materials, as well as modeling, numerical analysis algorithms, visualization techniques, information infrastructure, etc., to support these simulations.

(2) Very large-scale data processing
This includes processing of genomic information, web data (including data from *Wikipedia*, as well as news sites and blogs), academic information contents, time-series data from sensor networks, high-level multimedia information processing needed for streaming data for video footage, program analysis, access and search, information extraction, statistical and semantic analysis, data-mining, machine learning, etc.

(3) Very large-capacity network technology
This includes control and assurance of network quality for very large-scale data sharing, monitoring and management required for construction and operation of very large capacity-networks, assessment and maintenance of the safety of such networks, a large-scale stream processing framework taking advantage of very large-capacity networks, large-scale visualization, security, as well as development of various technologies for support of research. Research dealing with large-scale data processing using a large-capacity network is classified in this area.

(4) Very large-scale information technology research systems
The exascale computer architectures, software for high-performance computing infrastructures, grids computing, virtualization technology, cloud computing and so on. .

Following research proposals are expected by JHPCN program committee.

(A) We will only be accepting interdisciplinary joint research proposals that will involve cooperation among researchers from a wide range of disciplines. For example, we presume

that a research team in the “very large-scale numerical computation” area will consist of researchers from computer and computational sciences who work together in a cooperative and complementary manner. It is not mandatory to use the HPCI-JHPCN system or other research resources provided by JHPCN member institutions. In other words, a joint research project that aims only to build a joint research team without using computer resources is acceptable.

(B) JHPCN will be accepting proposals which mainly aim to perform the research activity. In other words, proposals that just attempt to use the provided computer resources, so called “product run projects’, are not acceptable.

JHPCN will not be accepting virtually the same projects proposed as the different proposals. For example, proposals that share nearly the same themes and members and so on are not acceptable.

JHPCN particularly appreciate joint research projects in the following two categories.

(A) Research projects in close cooperation with multiple JHPCN member institutions

Taking advantage of the “network” of JHPCN, projects in this category should use research resources and/or involve researchers from multiple JHPCN member institutions. For example, relevant research topics may include, but are not limited to, large-scale and geographically distributed information systems and multi-platform implementations of applications using research resources provided by multiple JHPCN member institutions.

(B) Research projects using both large-scale data and large-capacity networks

Available research resources include those that can be directly connected to a very wide-bandwidth network provided by SINET5, including L2VPN, in cooperation with the National Institute of Informatics. Therefore, research that depends upon a very wide-bandwidth network can be conducted. Projects in this category should require massive data transfer, using a very wide-bandwidth network, between research facilities located at the working places of the involved researchers and at JHPCN member institutions or between research facilities at JHPCN member institutions. Please refer to Attachment 2 for possible examples of research topics in this category.

2. Types of Joint Research Projects

Under the premise of the interdisciplinary joint research project structure mentioned above, joint research projects to be invited are as follows:

(1) **General Joint Research Projects (approximately 80% of the total number of accepted projects will be of this type)**

(2) **International Joint Research Projects (approximately 10% of the total number of accepted projects will be of this type)**

International joint research projects are conducted in conjunction with foreign researchers to address challenging problems that may not be resolved or clarified only with the help of researchers within Japan. For such research projects, there will be a certain amount of subsidies paid to cover travel expenses necessary for holding meetings with foreign joint researchers. For details, please contact our office after your research project has been accepted.

(3) **Industrial Joint Research Project (approximately 10% of the total number of accepted projects will be of this category)**

Industrial joint research projects are interdisciplinary projects focused on industrial applications.

A research proposal submitted as (2) International Joint Research Project or (3) Industrial Joint Research Project might be selected as (1) General Joint Research Project in some cases. JHPCN offers to subsidize travel expenses for international conferences, article publication charges, and venue usage fees on research meetings including workshops for all the type of the above-mentioned projects (1)(2)(3).

3. Application Requirements

Research members, including Project Representative, Deputy Representative, and joint researcher, must meet the following conditions.

(1) The Project Representative must be affiliated with an institution in Japan (university, national laboratory, private enterprise, and so on.)

(2) For acceleration of interdisciplinary research, Deputy Representative must be a researcher in a different academic field from that of the Project Representative.

(3) Graduate students can participate in the project as joint researchers, but undergraduate students cannot. Graduate students cannot participate as Project Representative or Deputy Representative. If a non-resident member, defined by the Foreign Exchange and Foreign Trade Act, intends to use computers, a researcher affiliated with the JHPCN member institutions equipped with these computers must participate as a joint researcher.

International joint research projects must, in addition to the above-mentioned (1) – (3), fulfill the following conditions ((4) and (5)).

(4) At least one researcher affiliated with a research institution outside Japan must be named as a Deputy Representative. Furthermore, an application must be made using the English Application Form.

(5) A researcher affiliated with the JHPCN member institutions that you designate to “Desired University for Joint Research” must participate as a joint researcher.

Industry joint research projects must, in addition to the above-mentioned (1) – (3), fulfill the following conditions ((6) and (7)).

(6) The Project Representative must be affiliated with a private enterprise, excluding universities and national laboratories.

(7) At least one researcher affiliated with the JHPCN member institutions that you designate to “Desired University for Joint Research” must be named as a Deputy Project Representative.

4. Joint Research Period

April 1, 2021 to March 31, 2022.

Depending on conditions for preparing computer accounts, the commencement of computer use may be delayed.

5. Facility Use Fees

The research resources listed in Attachment 1 can be used as much as permitted free of charge.

6. Research Project Screening

Screening of the submitted proposals will be conducted by the Joint Research Project Screening Committee, which comprises faculty members affiliated with JHPCN member institutions as well as external members, which the JHPCN establishes, and the HPCI Project Screening Committee, which comprises industry, academic, and government experts. Research project proposals will be reviewed from both general and technical perspectives for their scientific and technological validity, their facility/equipment requirements, their potential for development, and their compatibility with the research topics and themes presented in 1. Joint Research Area. The feasibility of resource requirements at and cooperation/collaboration with the JHPCN member institutions that you designate to “Desired University for Joint Research” will also be subject to the review. In addition, the degree of conformity of the proposal to its type of joint research projects will be considered.

Each resource provided by the JHPCN institutions has maximum usage amount for one project as shown in Attachment 1, which is the limitation in cases when a single resource of a JHPCN institution is used. In case using multiple resources of a JHPCN institution, the total amount of (desired usage / maximum) of each resource is restricted up to 1. In case using resources of multiple JHPCN institutions, the above-mentioned total is restricted up to 1.2.

Furthermore, usage amounts may be reduced considering screening results and the whole budget.

Moreover, for projects continuing from the previous fiscal year and projects determined to have

continuity in their essence, the previous year's interim report and the previous usage of computer resources may be considered during the screening process. The amount may be reduced when there is no, or only small, use of the resources during the previous joint research period.

7. Application Process

7.1 Summary

Please note that there is two different application procedures presented in 7.2 according to your project whether your project is a "Research project that uses the HPCI-JHPCN system" or a "Research project that does not use the HPCI-JHPCN system.

The main difference between the two procedures is in what documents to be submitted. For application of projects that use the HPCI-JHPCN system, it is necessary to submit two documents; JHPCN application form which is to be submitted on JHPCN website and HPCI application form which is to be fulfilled on the HCPI application webpage and to be submitted on the website and by post. In turn, for projects that do not use the HPCI-JHPCN system, it is necessary to submit one document, JHPCN application form which is to be submitted on JHPCN website.

In addition, on application of projects that use the HPCI-JHPCN system, please note that an official seal of the institutional head of the researcher in charge being affixed on the printed application form is necessary and the Project Representative (and the Deputy Representative who will submit the proposal or who will be in charge of the HPCI face-to-face identity vetting on behalf of the Project Representative) and all joint researchers that will use the HPCI-JHPCN system must have obtained their HPCI-ID prior to application.

For application of international joint research projects, the English application form must be completed.

7.2 Application Procedure

Please see the website and the "JHPCN application guide" for the detail of the application. details.

I: For "Research Projects that use the HPCI-JHPCN system"

(1) Download the JHPCN application form from the JHPCN website and complete it. In parallel, the Project Representative (and the Deputy Representative who will submit the proposal or who will be in charge of the HPCI face-to-face identity vetting on behalf of the Project Representative) and all joint researchers who will use the HPCI-JHPCN system must obtain their HPCI-IDs, unless they already have the IDs. It is necessary to register the HPCI-IDs of the Project Representative, the Deputy Representative acting on behalf of Project Representative, and all joint researchers who will use the HPCI-JHPCN system at step (2). Researchers who are not registered at this stage will not be issued with computer user

accounts (HPCI account, local account) and thus will not be able to use the HPCI-JHPCN system.

(2)

Visit the JHPCN application website. When you choose “use HPCI-JHPCN system” automatically you will jump to the application page of HPCI. Complete the web-form of HPCI and upload the JHPCN application form you complete at step (1)

- Please note that you do not use the application system prepared by the JHPCN website for “Research Projects that use the HPCI-JHPCN system”

Print the HPCI application form you complete at step (2) and affix an official seal of the director of the Project Representative’s institute on it, and mail this form to the JHPCN office shown in 10. Contact Information.

- If your project is accepted, please follow the “Procedures after the awarding of the proposal” stipulated by the HPCI. In particular, the face-to-face identity vetting must be provided responsibly by the Project Representative or a Deputy Representative, who may have to bring copies of photographic identifications of all joint researchers who will use the HPCI-JHPCN system.

II: For “Research Projects that do not use the HPCI-JHPCN system”

(1) Download the "JHPCN application form” from the JHPCN website and complete it.

(2) Visit the JHPCN application website. When you choose “do not use HPCI-JHPCN system", you will automatically move to the application page of the JHPCN. Complete the web-form and upload the JHPCN application form in pdf format. A notice of receiving will be sent to the e-mail address registered at the application webpage.

- Please note that you do not use the HPCI website for “Research Projects that do not use the HPCI-JHPCN system”. Also, the HPCI-ID is not necessary

7.3 Points to remember when filling out the Research Project Proposal Application Form

A) Research resources must be only used for the purpose of the awarded research project.

B) The proposal must be for peaceful purposes.

C) Human rights and profit must be protected.

D) The proposal must comply with the Ministry of Education, Culture, Sports, Science and Technology’s “Approach to Bioethics and Safety”.

E) The proposal must comply with the Ministry of Health, Labour and Welfare’s “Guidelines on Medical and Health Research”.

F) The proposal must comply with the Ministry of Economy, Trade and Industry’s “Concerning Security Trade Management”.

8. Important dates

1) For proposing

- Web application deadline: 5PM (JST), 6 January, 2021
- Submission of a printed HPCI application form via mail deadline: 15 January, 2021 (For HPCI-JHPCN system projects)

In principle, application forms with an official seal for the “Research Projects that use the HPCI-JHPCN system” must arrive until the deadline. In case you cannot send the form until the deadline, please contact the JHPCN office in advance.

- Screening result announcement: JHPCN is planning to announce the result until mid-March, 2021.

2) For research

- Joint research commencement: 1 April, 2021
- 13th JHPCN symposium: Early July, 2021
- Progress report deadline: Mid-October, 2021
- End of research period: 31 March, 2022
- Final report deadline: Mid-May, 2022
- 14th JHPCN symposium: Early July, 2022

9. Other Important notices after your project gets accepted

(1) Submission of a written oath

Research groups whose research projects are awarded will be expected to submit a written oath pledging adherence to the contents of the above-mentioned “(3) Points to remember when filling out the Research Project Proposal Application Form” of Section 7 “Application Process”. The specific process of submission will be provided if your project gets awarded. A sample of the process is provided on the website so please check it out in advance.

(2) Regulations for use of the facilities

While using the facilities, you are expected to follow the regulations for use pertaining to the research resources stipulated by the JHPCN member institutions with which you will work.

(3) Submission of reports and presentation at the JHPCN symposiums

A) Reports:

Both progress and final reports must be submitted in the middle and after the end of the research

period, respectively. The final report will be published on the JHPCN website in principle. If these reports will not be submitted, then the Project Representative may be prohibited from applying to and participating in new projects. The report of international projects must be written in English.

B) Symposium:

The JHPCN office expects each project to present progress and acquired results of ongoing and finished projects respectively at the JHPCN symposium, which will be held in mid-July of 2021. Both oral and poster presentations are necessary. For the finished projects, the presentations may be used for the final evaluation. In principle, the presentations are expected to be performed by the Project Representative or a Deputy Project Representative. If neither of them can present, other joint researchers can attend instead. The travel expense will be paid by the JHPCN office. All pdf files of the poster presentation will be accumulated before the symposium and will be published on the JHPCN website.

At the symposium, not only to report the progress and results of projects, but also it aims to set up a community which can contribute to build a wide range of informatics research. The JHPCN office expects active participation and discussion at the symposiums.

Furthermore, the symposiums may be held by on-line or on-line off-line hybrid according to situation of COVID-19. For example, the symposium in 2020 was held on-line.

(4) Disclaimer

Each JHPCN member institution assumes no responsibility for any inconveniences that affect applicants as consequence of joint research projects.

(5) Handling of intellectual property rights

In principle, every intellectual property that arises as results of a research project will belong to the research groups involved. However, it is presumed that recognition will be provided to the inventors in accordance with each institution’s policy concerning intellectual property rights. Please contact each JHPCN member institution for details and handling of other exceptional matters.

(6) RCR training

Every joint researcher, including the Project Representative and the Deputy Representatives of an accepted project (excluding students), must be confirmed to have completed a program pertaining to RCR or equivalent (for example, eligibility for the Japanese Grant-in-Aid for Scientific Research that is awarded by the Ministry of Education, Culture, Sports, Science and Technology, or the Japan Society for the Promotion of Science or proof of acquisition of a research fund which qualifies only those who have finished PCR training.

Those who have not completed such program need to take an e-Learning or a workshop which their institutes carry out, including the e-Learning program of The Association for the Promotion of Research Integrity. In case there are not any workshop taking place at your institution, please consult with the JHPCN office. Researchers with eligibility for the Japanese Grant-in-Aid for Scientific Research that is awarded by the Ministry of Education, Culture, Sports, Science and Technology or the Japan Society for the Promotion of Science will be considered as qualified by writing their “Kakenhi” Researcher Code, and those who have acquired a research fund which qualifies only those who have finished PCR training will be by presenting the proof. If the confirmation is not possible within three months of the start of the joint research period, the joint researchers must be deleted from the list.

(7) Abuse of research ethics

If the institute of participating research member(s) admits that the member(s) have violated research ethics in any research activity, including projects other than that of JHPCN, , the JHPCN may take the following actions: removal of the member from the project, ending of the offending project, and disqualification for application of new projects.

(8) Acknowledgements in presentations and publications

Upon publication of results of an accepted project, the author(s) should indicate in the Acknowledgements that the project was supported by JHPCN (see the JHPCN website for an example sentence).

(9) Others

A) Personal information provided in the proposal shall only be used for screening research projects and providing system access.

B) After the acceptance of a research project, however, the project name and the name/affiliation of the Project Representative will be disclosed.

C) After the acceptance of a research project, changes cannot be made to the JHPCN member institutions you desire to work with or the computers you will use.

D) If you wish to discuss your application, please contact us at the e-mail address listed in Section 10. (Please note in advance that we are not able to respond to telephone-based inquiries.)

10. Contact information (for inquiries about application, etc.)

– For inquiries about application

Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures Office

E-mail address: jhpcn.adm@gs.mail.u-tokyo.ac.jp

– For available resources, how to use resources, details of eligibility, faculty members who can participate in joint research projects, and the handling of intellectual property of each institution, please feel free to directly contact the following.

JHPCN member institutions	e-mail address
Information Initiative Center, Hokkaido University	kyodo@oicte.hokudai.ac.jp
Cyberscience Center, Tohoku University	joint_research@cc.tohoku.ac.jp
Information Technology Center, The University of Tokyo	jhpcn.adm@gs.mail.u-tokyo.ac.jp
Global Scientific Information and Computing Center, Tokyo Institute of Technology	jhpcn-kyoten@gsic.titech.ac.jp
Information Technology Center, Nagoya University	kyodo@itc.nagoya-u.ac.jp
Academic Center for Computing and Media Studies, Kyoto University	kyoten-8gm@media.kyoto-u.ac.jp
Cybermedia Center, Osaka University	system@cmc.osaka-u.ac.jp
Research Institute for Information Technology, Kyushu University	zenkoku-kyodo@iii.kyushu-u.ac.jp

– Mailing address for the Research Project Proposal Application Form

2-11-16 Yayoi, Bunkyo-ku, Tokyo 113-8658

Information Technology Center, The University of Tokyo

Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures Office

(You may use the abbreviations Information Technology Center Office or JHPCN Office.)

Attachment 1

List of research resources available at the JHPCN member institutions for the Joint Research Projects

The research resources that can be directly connected via SINET5 L2VPN provided by National Institute of Informatics is annotated as “L2VPN ready.”

(1) List of the HPCI-JHPCN system resources available for Joint Research Projects

JHPCN Institution	Computational Resources, Type of Use (The underline parts are resource names)	Estimated number of Projects adopted
Information Initiative Center, Hokkaido University	1. Supercomputer Grand Chariot(Subsystem A) **[Hardware resources]** (Max 8 node years per 1 project, Storage:Max 30TB,3TB unit (common to system A and B)) 1,004 nodes, 40,160 physical cores, Total main memory capacity 386TB, 3.1 PFLOPS (Shared with general user,) **[Software resources]** Compilers : Intel Compiler(Fortran/C/C++), GNU Compiler, Java, Python Libraries : ARPACK, EigenExa, FFTW, HDF5, Intel MKL, Intel MPI, NetCDF, OpenCV, PETSc, PLASMA, SALS, SLEPc, SuperLU, PARPACK, Trilinos, z-Pares Application software : ABINIT-MP, BLAST, Chainer, FrontFlow/blue, FrontFlow/red, FrontISTR, GAMESS, Gaussian, GENESIS, Gfarm, Ghostscript, GIMP, Globus Toolkit, Gnuplot, GROMACS, HΦ, Intel Vtune Amplifier, Meep, MODYLAS, NAMD, NTChem, OpenFOAM, OpenMX, ParaView, PHASE, PHASE/0, R, SALMON, SMASH, TensorFlow, VisIT, WRF, Xcrypt, Arm DDT, V-FaSTAR, MyPresto, Caffe, Intel DAAL 2. Supercomputer Polaire(Subsystem B) **[Hardware resources]** (Max. 9 node years per 1 project, Storage:Max 30TB,3TB unit(common to system A and B)) About 288 nodes, 19,584 physical cores, Total main memory capacity 28TB, 877TFLOPS (Shared with general user) **[Software resources]** Compilers : @Intel Compiler(Fortran/C/C++), GNU Compiler, Java, Python Libraries : @ARPACK, EigenExa, FFTW, HDF5, Intel MKL, Intel MPI, NetCDF, OpenCV, PETSc, PLASMA, SALS, SLEPc, SuperLU, PARPACK, Trilinos, z-Pares Application software : @ABINIT-MP, BLAST, Chainer, FrontFlow/red, GAMESS, Gfarm, Ghostscript, GIMP, Globus Toolkit, Gnuplot, GROMACS, Intel Vtune Amplifier, Meep, NAMD, OpenFOAM,	1.+2. : 8 3. : 4

	ParaView, PHASE, R, TensorFlow, VisIT, WRF, Xcrypt, Arm DDT, MyPresto, Caffe, Intel DAAL 3. Inter Cloud System **[Hardware resources]** 1) Physical server 5 nodes (Core:20x2, Memory:256GB, DISK:2TB) Additional storage (per 1TB possible to add) 2) Intercloud package 1 set (Physical servers each of which is installed at Hokkaido University, University of Tokyo, Osaka University, and Kyushu University, connected via SINET VPN) 3) Virtual server 8 nodes (Core:10 Memory:60GB, DISK:500GB) Additional storage (per 1TB possible to add) **[Usage]** L2VPN Ready	
Cyberscience Center, Tohoku University	1. Supercomputer AOBA Subsystem AOBA-A(72nodes) **[Hardware resources]** 3 node years / project About 1.48PFLOPS(DP), Main memory 45TB, Maximum number of nodes 32, Shared use Storage : 20TB / project(per 1TB possible to add), common to Subsystem AOBA-A, AOBA-B(Maximum storage capacity : negotiable) **[Software resources]** Compilers : Fortran Compiler, C/C++ Compiler Libraries : NEC MPI, NEC Numeric Library Collection(including BLAS, FFTW, LAPACK, ScaLAPACK) , Ftrace Viewer, PROGINF/FTRACE Application software : VASP, Quantum ESPRESSO 2. Supercomputer AOBA Subsystem AOBA-B(68nodes) **[Hardware resources]** 15 node years / project About 278.5TFLOPS(DP), Main memory 17TB, Maximum number of nodes 16, Shared use Storage : 20TB / project(per 1TB possible to add), common to Subsystem AOBA-A, AOBA-B(Maximum storage capacity : negotiable) **[Software resources]** Compilers : AOCC (AMD Optimizing C/C++ Compiler), GNU Compiler Collection(Fortran, C/C++), Intel Parallel Studio XE Cluster Edition Libraries : AMD uProf, AMD Optimizing CPU Libraries, Open MPI Application software : Gaussian16, VASP, Quantum ESPRESSO, OpenFOAM	1.+2. : 20
Information Technology Center, the University of Tokyo	1. Reedbush-H (Intel Broadwell-EP+NVIDIA Tesla P100 (Pascal) cluster (2 GPU per node), High-speed file cache system (DDN IME)) (**available until the end of October 2021, It is recommended to apply for use of Data/Learning Nodes of BDEC system at the same time, which is available after October 1, 2021**) **[Hardware resources]** Maximum tokens for each project: 8 node x 7months, Storage 32TB (40,320 node-hour, **4TB/(node x 7mo., 5,040 node-hour)**) **[Software resources]** Compilers: Intel Fortran, C, C++, PGI Fortran, C, C++ (with Accelerator support), CUDA Fortran, CUDA C	1.+2. : 6 3.+4. + 5. : 12

	Libraries: GPUDirect for RDMA: Open MPI, MVAPICH2-GDR, cuBLAS, cuSPARSE, cuFFT, MAGMA, OpenCV, ITK, Theano, Anaconda, ROOT, TensorFlow Application software: Torch, Caffe, Chainer, GEANT4 2. Reedbush-L (Intel Broadwell-EP+NVIDIA Tesla P100 (Pascal) cluster (4 GPU per node), High-speed file cache system (DDN IME)) (**available until the end of October 2021, It is recommended to apply for use of Data/Learning Nodes of BDEC system at the same time, which is available after October 1, 2021**) **[Hardware resources]** Maximum tokens for each project: 4 node x 7months, Storage 16TB (20,160 node-hour, **4TB/(node x 7mo., 5,040 node-hour)**) Options: node occupied service, customized login nodes, L2VPN Ready (negotiable) **[Software resources]** Same as Reedbush-H 3. Oakforest-PACS (Intel Xeon Phi 7250 (Knights Landing)) **[Hardware resources]** Maximum tokens for each project: 64 node-year, Storage 64TB (552,960 node-hour, **1TB/node-year**) **[Software resources]** Compilers: Intel Fortran, C, C++ Libraries: MPI, BLAS, LAPACK/ScaLAPACK, FFTW, PETSc, METIS/ParMETIS,, SuperLU/SuperLU_DIST Application software: OpenFOAM, ABINIT-MP, PHASE, FrontFlow/Blue, FrontISTR, REVOCAP, ppOpen-HPC Container: singularity (docker image possible) 4. Oakbridge-CX (Intel Platinum 8280 (Cascade Lake), 128 of total 1,368 nodes are equipped with fast SSD's. 16 of 128 are "External Nodes" connected to external network directly) [Hardware resources] Maximum tokens for each project: 16 node-year, Storage 64TB (138,240 node-hour, **4TB/node-year,** L2VPN Ready (negotiable), Only One "External Node" can be available for each project, **Please contact uketsuke@cc.u-tokyo.ac.jp if you plan to use "External Node"** Options: node occupied service, customized login nodes) [Software resources] Compilers: Fortran, C, C++ Libraries: MPI, BLAS, LAPACK/ScaLAPACK, FFTW, PETSc, METIS/ParMETIS Application software: OpenFOAM, ABINIT-MP, PHASE, FrontFlow/Blue, FrontISTR, REVOCAP, ppOpen-HPC Container: singularity (docker image possible) 5. BDEC (Big Data & Extreme Computing) (Simulation Nodes with General Purpose CPU's, and Data/Learning (D/L) Nodes with GPU clusters, Aggregated Peak Performance with 30PF (plan), Part of D/L nodes are connected to the external network directly, each D/L node is equipped with 4 GPU's or 8 GPU's) (under procurement, **available AFTER October 1, 2021**) [Hardware resources] Maximum tokens for each project: 40 node x 6 month (based on tokens on Simulation Nodes, Coefficient of node-hours for 1GPU on D/L node is 2.50), Storage 80TB (172,800 node-hour, **2TB/(node x 6mo., 4,320 node-**	

	hour) [Software resources] Compilers: Fortran, C, C++ Libraries: MPI, BLAS, LAPACK/ScaLAPACK, FFTW, PETSc, METIS/ParMETIS Application software: OpenFOAM, ABINIT-MP, PHASE, FrontFlow/Blue, FrontISTR, REVOCAP, ppOpen-HPC Container: singularity (docker image possible)	
Global Scientific Information and Computing Center, Tokyo Institute of Technology	1. Cloudy, Big-Data and Green Supercomputer "TSUBAME3.0" **[Hardware resources]** TSUBAME3.0 system includes 540 compute nodes, which provides 12.15PF performance (CPU 15,120 cores, 0.70PF + GPU 2,160 slots, 11.45PF) in total. Maximum system available at a time is 50% of full-system. (Shared use) Total provided resource is 230 units for a year (= 230,000 node-hour, 1 unit = 1,000 node-hour, and included 40 units for the 4th quarter). 27 units (= 3.125 node-year) for a year are maximum resources for each project. 4 units for the 4th quarter are maximum resources for each project. Please specify not only total amount of resources but also quarterly amounts of resources. Maximum storage is 300TB for each project. Ensuring 1TB of storage for one year requires 120 node-hour of resource. Resources should be requested accordingly. **[Software resources]** OS : SUSE Linux Enterprise Server Language Compiler : Intel Compiler (C/C++/Fortran), PGI Compiler (C/C++/Fortran, OpenACC, CUDA Fortran), Arm FORGE, GNU C, GNU Fortran, CUDA, Python, Java SDK, R Libraries : OpenMP, MPI (Intel MPI, OpenMPI, SGI MPT), BLAS, LAPACK, CuDNN, NCCL, PETSc, fftw, PAPI Linux container : Docker (Available images: sles12sp2-latest, centos7-latest), Singularity Application software : Gaussian, Gauss View, AMBER (only for academic users), Caffe, Chainer, TensorFlow, Apache Hadoop, ParaView, POV-Ray, VisIt, GAMESS, CP2K, GROMACS, LAMMPS, NAMD, Tinker, OpenFOAM, ABINIT-MP, HΦ, MODYLAS, NTCHEM2013, OpenMX, SALMON, SMASH, FrontFlow/blue, FrontISTR, GENESIS, PHASE/0	14
Information Technology Center, Nagoya University	1. Supercomputer "Flow" Type I subsystem FX1000 **[Hardware resources]** 7.782 PFLOPS (2,304 nodes, 110,592 cores (+4,800 assistant cores), 72TiB memory) **[Software resources]** OS : Red Hat Enterprise Linux 8 Development Environment: Fujitsu Technical Computing Suite Libraries: BLAS, LAPACK, ScaLAPACK, FFTW, SuperLU, SuperLU M, SuperLU DIST, METIS, MT-METIS, ParMETIS, Scotch, PT-Scotch, PETSc, MUMPUS, Xabclib, ppOpen-APPL, ppOpen-AT, ppOpen-MATH, LINSYS_V, DHPMM_F Application software: NetCDF, Parallel netCDF, HDF5, JHPCN-DF, OpenCV, Geant4, Caffe, Chainer, Keras, PyTorch, TensorFlow, Theano, Mxnet, ONNX, conda, Numpy, Scipy, scikit-image, pillow, matplotlib, jupyterlab, OpenFOAM, FrontISTR, AMBER, Gaussian, Gromacs, LAMMPS, NAMD, Modylas 2. Supercomputer "Flow" Type II subsystem CX2570 **[Hardware resources]**	15

	7.489 PFLOPS (221 nodes, 8,840 CPU cores+2,263,040 FP64 GPU cores) **[Software resources]** OS: CentOS 7.7 Development Environment, Libraries: Intel Compiler, PGI Compiler, Arm Forge Proffesional, NVIDIA CUDA SDK, Singularity, FFTW, SuperLU, SuperLU MT, SuperLU DIST, METIS, MT-METIS, ParMETIS, Scotch, PT-Scotch, PETSc, MUMPUS, Xabclib, ppOpen-APPL, ppOpen-AT, ppOpen-MATH, LINSYS_V, DHPMM_F Application software: NetCDF, Parallel netCDF, HDF5, JHPCN-DF, OpenCV, Geant4, Caffe, Chainer, Keras, PyTorch, TensorFlow, Theano, Mxnet, ONNX, Conda, Numpy, Scipy, scikit-image, pillow, matplotlib, jupyterlab, OpenFOAM, LS-Dyna, FrontISTR, AMBER, Gaussian, Gamess, Gromacs, LAMMPS, NAMD, Modylas, HyperWorks ● Maximum resource allocation to one project ➢ Type I 4 units: 115 node year ✧ 1 units = 16,000 node hour (equivalent to 320 thousand yen charge) ➢ Type II 4 units: 11 node year ✧ 1 unit = 1,500 node hour (equivalent to 150 thousand yen charge) ● Each project can use up to total 8 units. ● All resources are shared with general users. ● When using large-scale storage, convert to 10TB: 1500 node time product (Type I conversion). When using 3D visualization system, 10 thousand yen per research project is required. (Equivalent to basic fee.)	
Academic Center for Computing and Media Studies, Kyoto University	1. Cray XC40(Camphor 2:Xeon Phi KNL/node) Camphor2 will end at the end of February, 2022 **[Hardware resources]** 1.1. 128 nodes, 8,704 cores, 390.4 TFLOPS x 11 months (From April 1, 2021 to February 28, 2022, maximum 48 nodes per project x 11 months) 1.2. 128 nodes, 8,704 cores, 390.4 TFLOPS x 20 weeks (maximum 128 nodes per project x 4 weeks) (Available resources are adjusted according to the project contents) **[Software resources]** Compilers : Fortran2003 / C99 / C ++ 03 (Cray, Intel, PGI, GNU) Libraries : Cray MPI, Intel MKL, Cray LibSci(BLAS, BLACS,LAPACK, ScaLAPACK, FFT) Application Software : Gaussian16, ABINIT-MP, OpenMX,GENESYS,HΦ, GROMACS, MODYLAS, NTChem, PHASE/0, SALMON, FlontFlow/blue, FrontISTR	5
Cybermedia Center, Osaka University	1. Supercomputer system for HPC & HPDA (tentative name*) * This system will be provided from May 2021. **[Hardware resources]** - Resource per project: General purpose CPU nodes: up to 152 node years GPU nodes: up to 4.5 node years Vector nodes: up to 4 node years Storages: up to 500 TB - Computational node: General purpose CPU nodes: 1,520 nodes (380 TB memory) will be provided up to 304 node years in shared use.	1.+2.: 10

	GPU nodes: 42 nodes (21 TB memory, 8 NVIDIA A100 per 1 node) will be provided up to 9 node years in shared use. Vector nodes: 36 nodes (4.5 TB memory, 8 SX-Aurora TSUBASA 20A per 1 node) will be provided up to 8 node years in shared use. Storages: Lustre 20.0 PB (HDD) + 1.2 PB (NVMe) **[Software resources]** [Development environment] Intel Compiler(FORTRAN, C, C++), NEC SDK for VE(FORTRAN, C, C++),GNU Compiler(FORTRAN, C, C++), NVIDIA HPC SDK, OpenJDK, Intel Parallel Studio XE, NEC Parallel Debugger, Arm Forge, Python, R, Julia, Octave, CUDA, XcalableMP, Jupyter notebook [MPI Library] Intel MPI, OpenMPI, NEC MPI [Library] NEC Numeric Library Collection(BLAS, LAPACK, ScaLAPACK, FFT, etc),Intel Math Kernel Library, GNU Scientific Library, NetCDF, Parallel netcdf, HDF5 [Application software] TensorFlow, Keras, PyTorch, pbdR, Gaussian, MATLAB, VASP, IDL, Paraview, Gnuplot, ImageMagik, NcView, AVS/Express, GROMACS, OpenFOAM, LAMMPS, GAMESS, ABINIT-MP, Relion, ADIOS, Anaconda, VisIt, H-phi, MODYLAS, NTChem, OpenMX, SALMON, SMASH 2. OCTOPUS **[Hardware resources]** - Resource per project: General purpose CPU nodes: up to 18 node years GPU nodes: up to 3 node years Xeon Phi nodes: up to 3 node years Large-scale shared-memory nodes: up to 0.3 node years Storage: up to 20 TB - Computational node: General purpose CPU nodes: 236 nodes (CPU: 471.2 TFLOPS) will be provided up to 35 node years in shared use. Because processors on these nodes are the same as that of GPU nodes, users can use 273 nodes for a job. GPU nodes: 37 nodes (CPU: 73.9 TFLOPS, GPU: 784.4 TFLOPS) will be provided up to 5 node years in shared use. Xeon Phi nodes: 44 nodes (CPU: 117.1 TFLOPS) will be provided up to 6 node years in shared use. Large-scale shared-memory nodes: 2 nodes (CPU: 16.4 TFLOPS, memory: 12TB) will be provided up to 0.3 node years in shared use. Storages: Lustre 3.1 PB **[Software resources]** [Compilers] Intel Compiler (FORTRAN, C, C++), GNU Compiler (FORTRAN, C, C++), PGI Compiler (FORTRAN, C, C++), Python 2.7/3.5, R 3.3, Julia, Octave, CUDA, XcalableMP, Gnuplot [Library] IntelMPI, OpenMPI, MVAPICH2, BLAS, LAPACK, FFTW, GNU Scientific Library, NetCDF 4.4.1, Parallel netcdf 1.8.1, HDF5 1.10.0 [Application software] Gaussian16, GROMACS, OpenFOAM, LAMMPS, Caffe, Theano, Chainer, TensorFlow, Torch, GAMESS, Relion, Anaconda, VisIt,	

	NcView, HΦ, MODYLAS, NTChem, OpenMX, SALMON, SMASH, ABINIT-MP, FrontFlow/blue, FrontISTR, GENESIS, PHASE/0	
Research Institute for Information Technology, Kyushu University	1. ITO Subsystem A (Fujitsu PRIMERGY) **[Hardware Resources]** 1.1 (Nearly dedicated-use) The Maximum resources allocated for 1 project is 32 nodes for a year. Most of resources are dedicated to the project. 32 nodes(1,152 cores), 110.59 TFLOPS 1.2 (Shared-use) Up to 64 nodes can be used at the same time per project. It is shared with general users. 64 nodes(2,304 cores), 221.18 TFLOPS **[Software Resources]** Compilers : Intel Cluster Studio XE(Fortran, C, C++), Fujitsu Compiler 2. ITO Subsystem B (Fujitsu PRIMERGY) **[Hardware Resources]** (Nearly dedicated-use) The maximum resource allocated for 1 project is 16 nodes for 10 months. Most of resources are dedicated to the project. 16 nodes(576 cores), CPU 42.39TFLOPS + GPU 339.2TFLOPS, including SSD **[Software Resources]** Compilers : Intel Cluster Studio XE(Fortran, C, C++), Fujitsu Compiler, CUDA 3. ITO Frontend (Virtual server / Physical server) **[Hardware Resources]** 3.1 Standard Frontend : 1 nodes(36 cores), CPU 2.64TFLOPS, Memory 384GiB, GPU(NVIDIA Quadro P4000), 864 core-hour(36 cores X 24 hours) reservation possible 3.2 Standard Frontend(Fixed-node): 1 nodes(36 cores), CPU 2.64TFLOPS, Memory 384GiB, GPU(NVIDIA Quadro P4000), available anytime 3.3 Large Frontend : 1 nodes(352 cores), CPU 12.39TFLOPS, Shared memory 12TiB, GPU(NVIDIA Quadro M4000), 8,448 core-hour(352 cores X 24 hours) reservation possible **[Software Resources]** Compilers : Intel Cluster Studio XE(Fortran, C, C++), CUDA Storages per project: 10 TByte, (possible to add Max 100TB) If you intend to use multiple resource, please contact us before applying, because the resource limit of one project may be reached	1. 1.1: 2 1.2: 8 2.:3 3. 3.1: 4 3.2: 4 3.3: 1

(2) Other facilities/resources available for Joint Research Projects

The following facilities/resources, despite not being part of the HPCI-JHPCN system, are available for Joint Research Projects.

JHPCN Institution	Computational Resources, Type of Use (The underline parts are resource names)	Estimated number of Projects adopted
Information Initiative Center, Hokkaido University	**1. Large-format printer** **[Hardware resources]** Large-format printer **[Software resources]** **[Usage]**	12
Cyberscience Center, Tohoku University	**1. Large-format printer** **[Hardware resources]** Large-format printer **[Software resources]** **[Usage]**	10
Information Technology Center, the University of Tokyo	**1. FENNEL (Real-time Data Analysis Nodes)** **[Hardware resources]** FENNEL (Real-time Data Analysis Nodes) x 4 At maximum four dedicated VMs or one dedicated bare metal server are provided to each group. GPGPU (Nvidia Tesla M60) is available on request. GPU is available on VM or bare metal server. 10GbE network access **[Software resources]** OS : Ubuntu 16.04, Ubuntu 18.04, CentOS 7.4 Programming Language : Python, Java, R Application Software : Apache Hadoop, Apache Spark, Apache Hive, Facebook Presto, Elastic Search, Chainer, Tensor Flow **[Usage]** SINET L2VPN ready You can directly login to the nodes from remote network with SSH. You can also mount NAS as native file system. 2. **Network Attached Storage (NAS)** **[Hardware resources]** Network Attached Storage (NAS) 150 TB 10Gbps Network Access **[Usage]** SINET L2VPN ready You can mount storage volumes with iSCSI, NFS and/or CIFS protocol via SINET L2VPN. **3. Housing services** **[Other Options]** 20U Rack-Space (Arm-Type Racking) Network Connectivity (Network Bandwidth: 10Gbps, (consultation is necessary)	3 or 4

	SINET L2VPN Ready Power: (AC100V/15A)	
Global Scientific Information and Computing Center, Tokyo Institute of Technology	**1. Remote GUI environment:** **[Hardware resources]** The VDI (Virtual Desktop Infrastructure) system If you are planning to use the VDI system, please contact us in advance. **[Software resources]** **[Usage]**	
Information Technology Center, Nagoya University	1. Visualization system [Hardware Resources] 185-inch 8K tiled display, 180-inch 3D visualization system, Domed display system, Image Processing client and Onsite client of Supercomputer "Flow" (Remote visualization using NICE DCV is available.) http://www.icts.nagoya-u.ac.jp/en/sc/ [Usage] L2VPN Ready	
Academic Center for Computing and Media Studies, Kyoto University	**1. Virtual Server Hosting** The Virtual infrastructure will be updated in August 2021. In addition, the service will be terminated on February 28, 2022. **[Hardware resources]** Standard configuration: CPU 2 cores, memory 8GB, disk 500TB Resource increase: CPU is up to 8 cores in 2 cores units. Memory is up to 64GB in 4GB units. Disks is up to 1TB in 100GB units. Total resources provided: CPU 32 cores, memory 256GB, disk 8TB **[Software resources]** Hypervisor : VMware OS : CentOS7 (CentOS8 is negotiable) **[Usage]** SINET L2 VPN is available	
Cybermedia Center, Osaka University		
Research Institute for Information Technology, Kyushu University	**1. Tiled Display Wall system** **[Hardware resources]** ・Tiled Display Walls system consists of 4K Monitor x 12 displays（4 x 3） ・Panel Driver PC x 4 ・Server PC x 1 **[Software resources]** The ChOWDER System* for Tiled Display Walls system * https://github.com/SIPupstreamDesign/ChOWDER **[Usage]** L2VPN Ready	

Attachment 2

The following are possible examples of “Research projects using both large-scale data and large capacity networks” described in "1. Joint Research Areas" in the call for proposals. The purposes of this attachment are to present, by example, how research resources provided by JHPCN member institutions may be used. We appreciate proposals of joint research projects using both large-scale data and large capacity networks, not limited to those examples.

Information Initiative Center, Hokkaido University

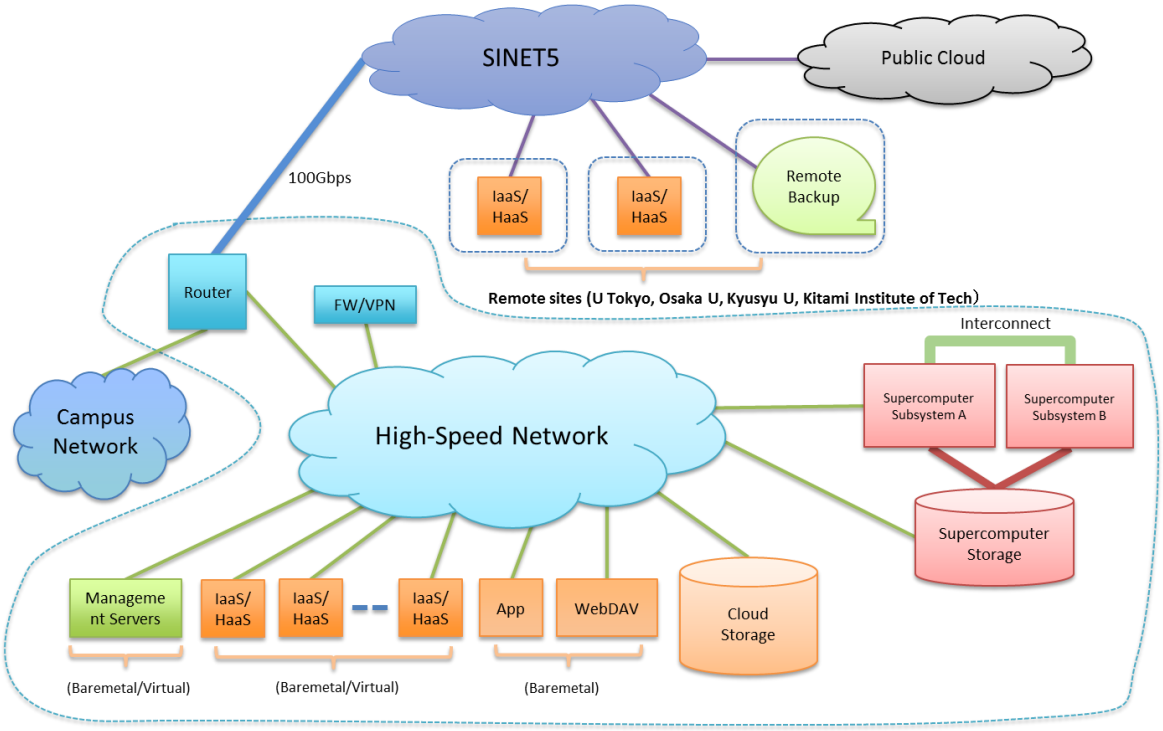
High performance virtual private cloud systems (isolated system for research project) can be deployed using physical and virtual machines in the intercloud system. Also, nation-wide scale distributed systems can be easily deployed by using the intercloud packages.

Available resources

Supercomputer system, Intercloud system (c.f. Attachment 1.)

How to use

Dedicated systems can be developed for the collaborative research projects employing physical and virtual machines as dedicated virtual private clouds. Distributed systems can also be developed by using intercloud packages consisting of physical servers in Hokkaido University, University of Tokyo, Osaka University and Kyushu University connected by SINET L2VPN. The users can access the systems not only via ssh/scp but also with virtual console, which provided by Cloud Middleware, through web browsers and with RESTful web service APIs.



Overview of “Hokkaido University High-performance Intercloud”

Email address for inquiring about resource usage and joint research

kyodo@oicte.hokudai.ac.jp

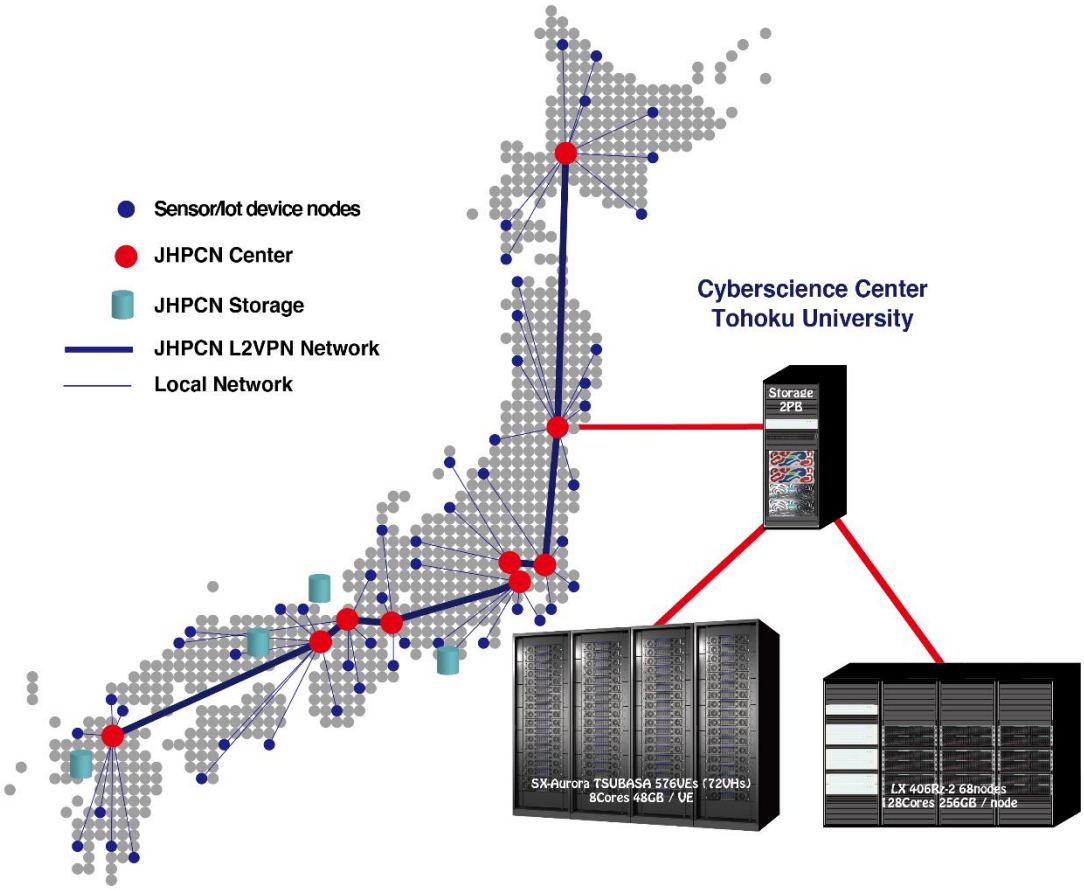
Details of anticipated projects

- Experiment data analysis platform in the intercloud environment: constructing a data store, analysis, and sharing infrastructure employing virtual/real machines and storages of the intercloud system of Hokkaido University connected to computational resources of the other universities via SINET L2VPN.
- Building nation-wide large-scale distributed systems over the SINET5 ultra high speed network: their performance evaluations using real intercloud environment. We are planning to collaborate with mobile networks using SINET wide-area data collection environment.
- Development of a large-scale pre/post-processing environment federating supercomputers and intercloud systems: developing a large-scale distributed processing environment such as performing analysis of big data generated by supercomputers using Hadoop clusters to visualize at the other universities’ remote systems.
- An always-on platform to support network-oriented research projects: development of a nation-wide distributed high-speed networking platform employing the cloud system / data science cloud system of Hokkaido University and private clouds of the other universities

connected via SINTE5 L2VPN.

Cyberscience Center, Tohoku University

Cyberscience Center provides vector parallel and scalar parallel supercomputers, a distributed data sharing environment through on-demand L2VPN. These environments allow users to share and analyze vast amounts of observed data obtained by sensors or IoT devices. We strongly invite proposals that try to exploit the potential of these environments. For example, joint research regarding the real-time analytics using supercomputers, and storage/network architectures for a large-scale distributed data sharing.



Available resources

[Hardware resources]

Storage (500TB / project)

Supercomputer AOBA(Subsystem AOBA-A, AOBA-B)

On-demand L2VPN

[Software resources]

OS : Cent OS

Programing languages :

AOBA-B：Fortran, C, C++

AOBA-B：Fortran, C, C++, Ruby, Python, java, etc.

Application software :

Basic applications provided by Cyberscinece Center and original codes developed by users. We also support installing/migrating required software to our system. (Please contact us in advance.)

How to use

Supercomputers (AOBA-A, AOBA-B)

log in to the compute nodes using ssh

transfer files to the node using the scp / sftp

Network

Possible to build L2VPN on SINET5

Storage

Possible to use remote mount by NFS through L2VPN

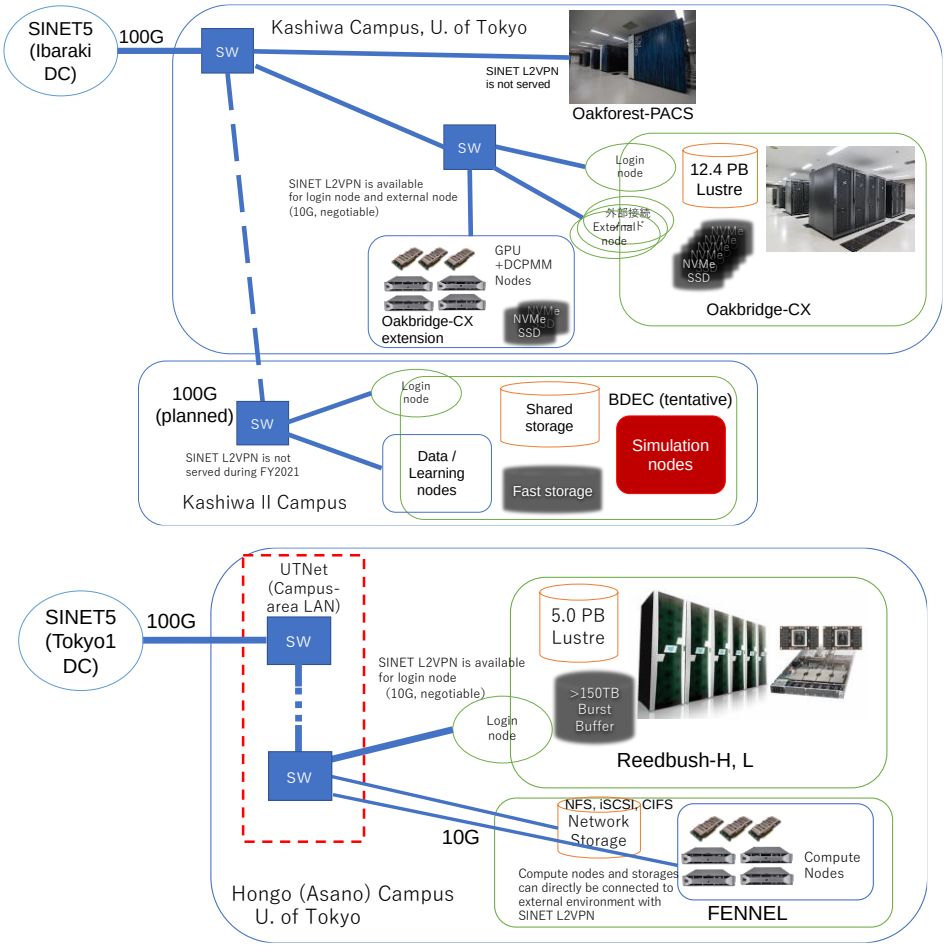
Email address for inquiring about resource usage and joint research

joint_research@cc.tohoku.ac.jp

Details of anticipated projects (in Japanese)

http://www.ss.cc.tohoku.ac.jp/collabo/net/

Information Technology Center, the University of Tokyo



Available resources and Connectivity to SINET5

(1) Reedbush System

We would like to offer Reedbush-H, and L systems for Big-Data analyses using Burst Buffer (DDN IME) which incorporates high-speed and high-capacity SSD storages. In addition, we will offer the direct connection via SINET5 L2VPN for login-node of Reedbush-L (Please ask us for detailed configuration).

Available Resources

[Hardware resources]

Reedbush-H, L System

[Software resources]

Refer to description of Reedbush-H, L System in Attachment 1.

How to use

- You can directly login to the nodes via remote network with SSH.

- You can transfer data via remote network with SCP / SFTP.
- You can directly access to login node via SINET5 L2VPN (negotiable for Reedbush-L).

(2) Oakbridge-CX System

We would like to offer Oakbridge-CX (OBCX) systems for Big-Data analyses using SSD node with high-speed NVMe-SSD and single shared filesystem on demand by BeeGFS on Demand (BeeOND). In addition, we will offer the external nodes for accessing to the external database and acquiring sensor data, and the direct connection via SINET5 L2VPN for login-node and external nodes (Please ask us for the use of external nodes and detailed configuration of L2VPN).

Available Resources

[Hardware resources]

Oakbridge-CX System

[Software resources]

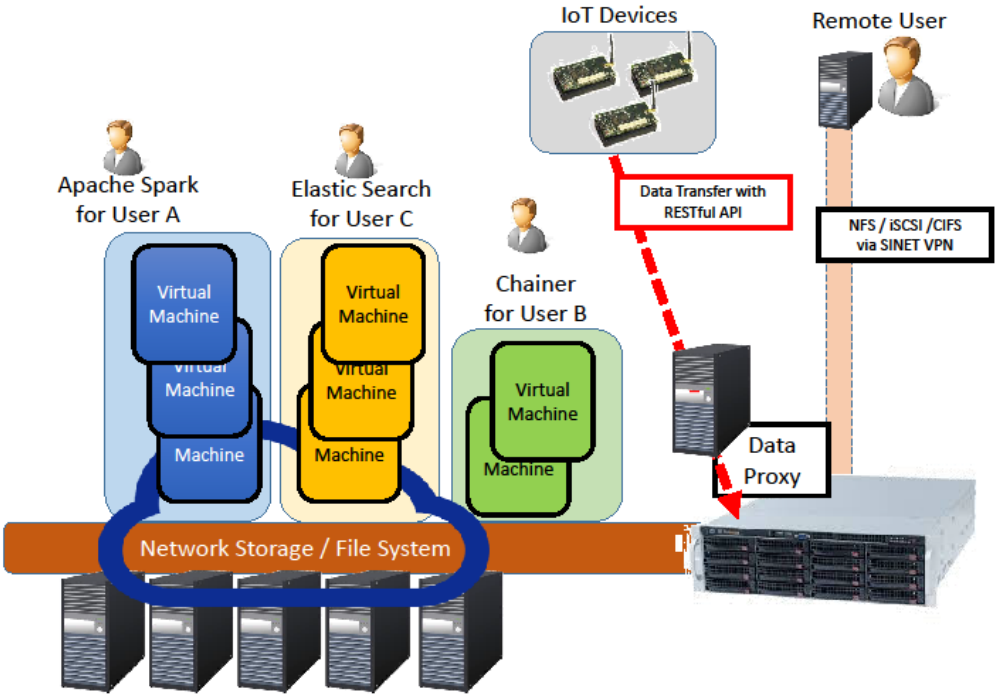
Refer to description of Oakbridge-CX System in Attachment 1.

How to use

- You can directly login to the nodes via remote network with SSH.
- You can transfer data via remote network with SCP / SFTP.
- You can directly access external data in real time on external node (negotiable)
- You can directly access to login node and external nodes via SINET5 L2VPN (negotiable).

(3) FENNEL and Network Access Storage

We, Information Technology Center in the University of Tokyo, would like to offer a Big-Data analysis infrastructure in which a researcher can take sole usage of its resources. The key design concept of the infrastructure is to facilitate real-time analysis and accumulating intermittently generated data. Further, we will also offer an environment which can connect both your own resources and our resources with SINET L2VPN service. The anticipated issues for this resources are IoT Big-Data analysis, SNS message analysis, anomaly detection of network traffic, and etc.



Overview of FENNEL

Available Resources

[Hardware resources]

FENNEL (Real-Time Dana Analysis Nodes) x 4 nodes

At maximum four VMs or one bare metal server are provided to each group.

The provided VMs or a bare metal server are dedicated to the group.

GPGPU (Nvidia Tesla M60) is available on request.

Network Access Storage (150TB)

10GbE Network Access

Rack Space (with our Housing Service: You can bring your own devices into our datacenter and connect to the network)

[Software resources]

OS : Ubuntu 16.04, Ubuntu 18.04, CentOS 7.4

Programming languages : Python, Java, R

Application software : Apache Hadoop, Apache Spark, Apache Hive, Apache Impala, Presto, Elastic Search, Chainer, Tensor Flow

How to use

FENNEL (Dedicated and Real-Time Data Analysis Nodes)

- You can directly login to the nodes via remote network with SSH.
- You can transfer data via remote network with SCP / SFTP.
- You can use GPGPU on VM if you want.

Network Access Storage (NAS)

- You can mount with iSCSI, NFS and/or CIFS protocol via SINET5 L2VPN.
- You can use data proxy to store your own data that you obtain form your own sensor devices.
- The volumes provided by the storage can be mounted on VMs as native filesystem.

Email address for inquiring about resource usage and joint research

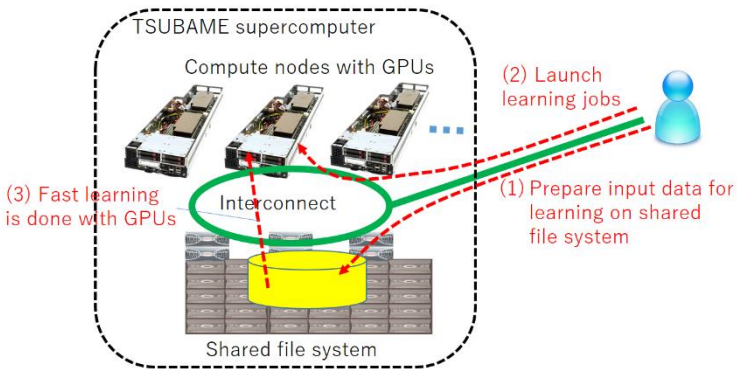
jhpcn.adm@gs.mail.u-tokyo.ac.jp

Details of anticipated projects

https://www.itc.u-tokyo.ac.jp/iiccs/supplement2018-en

GSIC, Tokyo Institute of Technology

Machine learning jobs, especially in deep learning which recently attracts great attention, require both storage resources for storing large scale I/O data and high performance computation resources. For these jobs, we provide environment for large-scale high-performance machine learning by using lots of GPUs (>2,000 in the whole system) and large storage (up to 300TB per user group) equipped by the TSUBAME3.0 supercomputer. By using pre-installed frameworks that harnesses GPUs, acceleration of research projects of large scale machine learning is expected.



Available Resources

[Hardware resources]

Refer to description of TSUBAME3.0 in Appendix 1. Especially, 4 Tesla P100 GPUs per node are available.

[Software resources]

Refer to description of TSUBAME3.0 in Appendix 1. The followings are highly related items to this page:

- OS: SUSE Linux Enterprise Server
- Programming Languages: Python, Java SDK, R

Application software: Caffe, Chainer, TensorFlow

How to use

TSUBAME3.0

Same as regular usage.

Email address for inquiring about resource usage and joint research

jhpcn-kyoten@gsic.titech.ac.jp

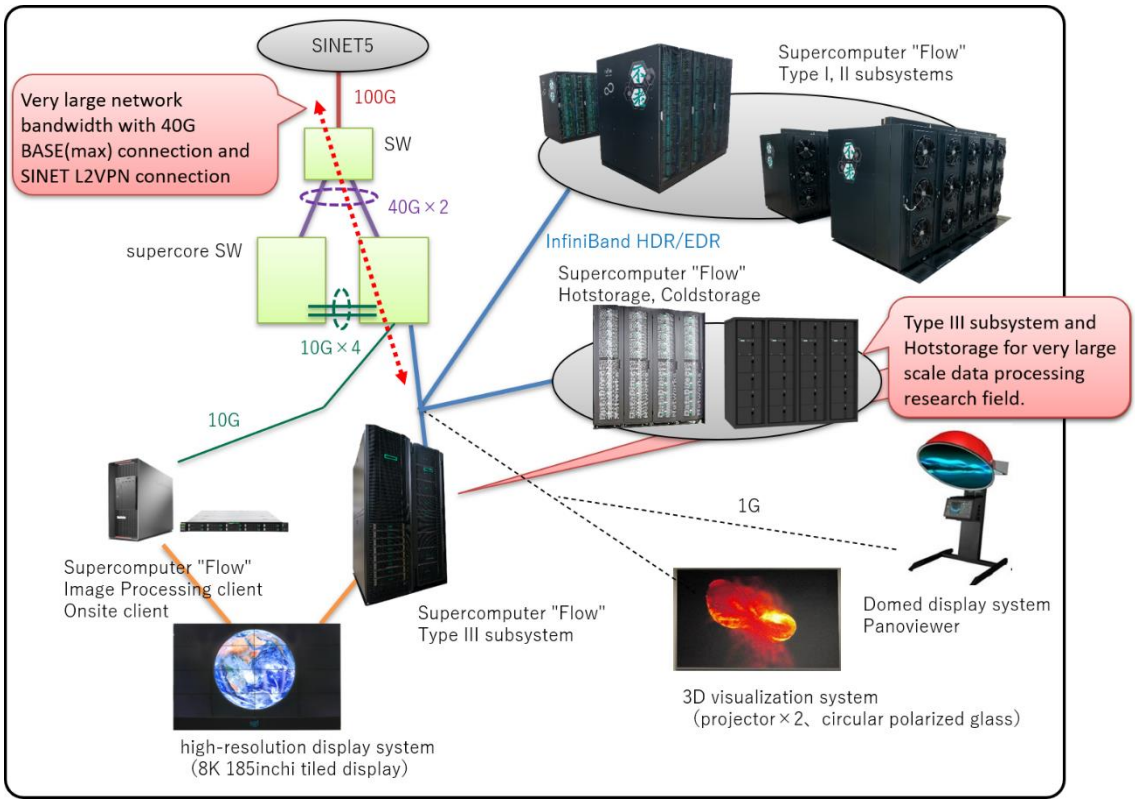
Details of anticipated projects

http://www.gsic.titech.ac.jp/en/jhpcn/dl-en

Information Technology Center, Nagoya University

We provide Hotstorage system and visualization system of Supercomputer "Flow" for very large scale data processing research field. Type III subsystem of "Flow" is available for visual processing. Type III subsystem consists of interactive (visualization) node connected to visualization system and batch node. Each node has 24 TB large scale shared memory and connected to Hotstorage system like as other subsystems. Additionally, interactive node equips 100TB NVMe SSD. Type III subsystem is also suitable for visualization of the calculation result of Type I and Type II subsystems. It is not assumed to calculate large scale computation on Type III subsystem.

We provide up to 40GBASE network connection for very large bandwidth network technology research field. You can use login node of Supercomputer "Flow" and create very large bandwidth network experiment environment by creating L2 flat network via SINET L2VPN for external university and internal university VLAN.



Available Resources

《Hardware resources》

1. Supercomputer "Flow" Type III subsystem: HPE Superdome Flex (Intel Xeon Platinum 8280M 28 cores x 16 sockets, 24TiB shared memory, NVIDIA Quadro RTX6000x4, 500TB external local storage) x 2 nodes, Interactive node equips 104TB NVMe SSD
2. Visualization subsystem: high-resolution display system (185inch 8K tiled display), 180inch 3D visualization system, Domed display system, Image Processing client and Onsite client of Supercomputer "Flow"
3. Network connection up to 40GBASE (with internal university VLAN and SINET L2VPN configuration)

《Software resources》

1. Supercomputer "Flow" Type III subsystem

【OS】Red Hat Enterprise Linux 7.7

【Development Environment】Intel Parallel Studio XE 2019, CUDA 10.2, etc.

【Application software】OpenFOAM, FrontFlow blue/red, FrontISTR, Pointwise, NICE DCV, FieldView, AVS/Express, Paraview, POV-Ray, VMD, 3D AVS Player, ffmpeg, ffplay, IDL, ENVI , etc.

2. Visualization system

【Visualization software】NICE DCV, FieldView, AVS/Express, Paraview, POV-Ray, VMD, 3D AVS Player, ffmpeg, ffplay, IDL, ENVI, etc.

How to use

- Remote login with ssh through login node.
- File transfer with scp / sftp through login node.

Email address for inquiring about resource usage and joint research

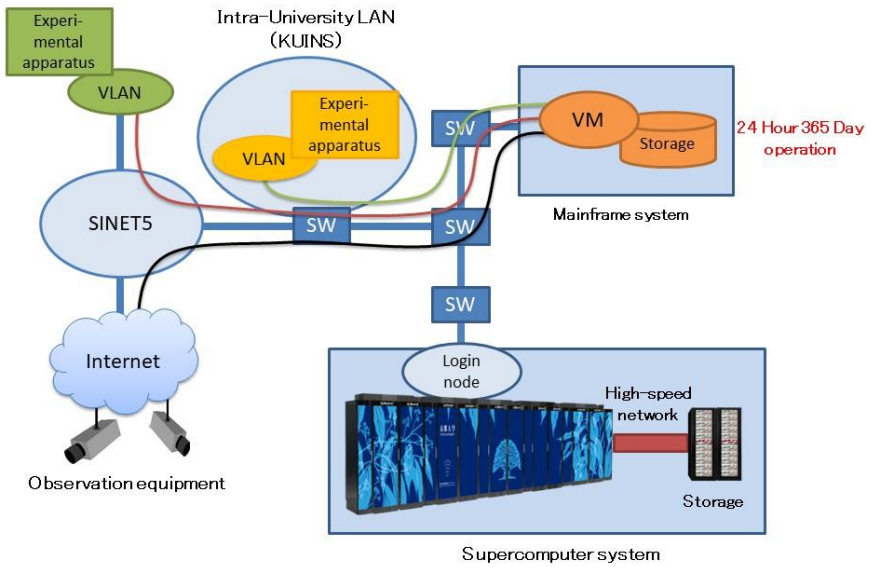
kyodo@itc.nagoya-u.ac.jp

- Details of anticipated projects

http://www.icts.nagoya-u.ac.jp/en/center/jhpcn/suppl/

Academic Center for Computing and Media Studies, Kyoto University

We will provide the infrastructure for collecting large scale data from laboratory equipment and observation equipment possessed by researchers via large capacity network or internet such as Kyoto University internal LAN (KUINS) or SINET5 L2VPN for 24 hours a day, 365 days and analyzing them with a supercomputer system in real time or periodically then offering information of the results on the Web.



Available resources

[Hardware resources]

- Supercomputer system

Cray XC40 (Camphor 2: Xeon Phi KNL/node) Each project is assigned up to 48 nodes x 11 months.

DDN ExaScaler (SFA14K) Each project is assigned up to 288TB

(If you need more, please contact us.)

- Mainframe System Virtual Server Hosting

Virtualized environment: VMware

Standard configuration: CPU 2 cores, memory 8GB, disk 500TB

Resource increase: CPU is up to 8 cores in 2 cores units.

Memory is up to 64GB in 4GB units.

Disks is up to 1TB in 100GB units.

Total resources provided: CPU 32 cores, memory 256GB, disk 8TB

[Software resources]

- Supercomputer system

Compilers : Fortran2003/C99/C++03（Cray, Intel, PGI, GNU）

Libraries : Cray MPI，Intel MKL，Cray LibSci(LAPACK, ScaLAPACK，BLAS，BLACS，FFT)

Application software: Gaussian16, ABINIT-MP, GENESYS, GROMACS, HΦ, MODYLAS, NTChem, OpenMX, PHASE / 0, SALMON, FlontFlow / blue, FrontISTR

- Mainframe System VM Hosting

Standard OS: CentOS7 (CentOS8 is negotiable)

How to use

- Supercomputer system

Login with SSH (Key authentication)

- Mainframe System VM Hosting

Login with SSH (Granting Root authority)

Access by various service port such as HTTP (80/TCP) or HTTPS (443/TCP)

Multiple virtual domains are available

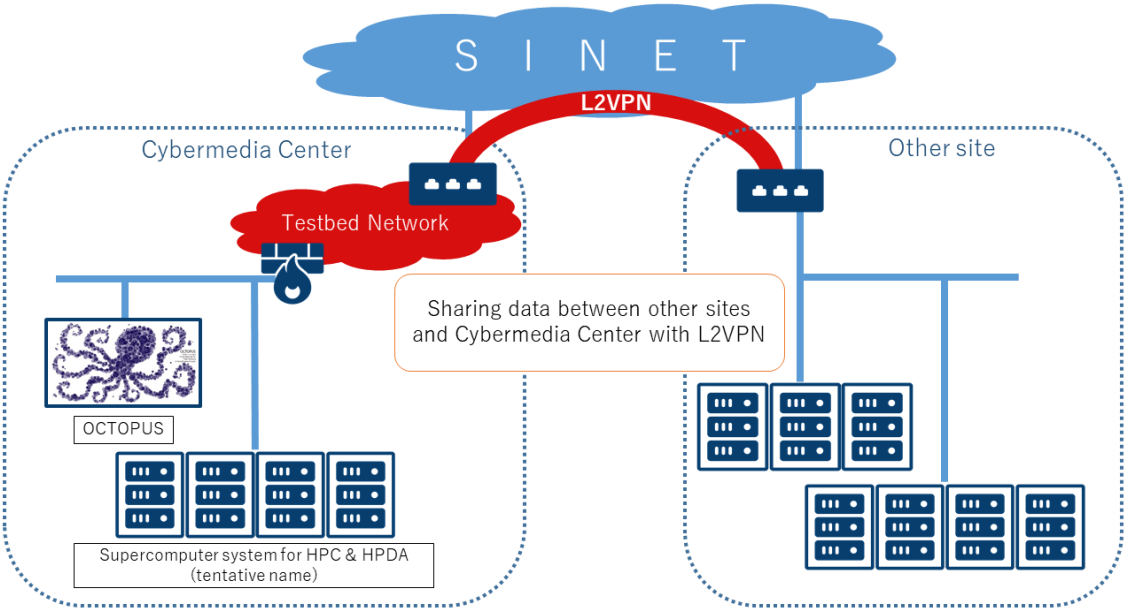
SINET5 L2VPN can be housed directly in VM

Email address for inquiring about resource usage and joint research

kyoten-8gm@media.kyoto-u.ac.jp

Cybermedia Center, Osaka University

Our center provides L2 VPN connection service between other site and Osaka University testbed network through SINET. It aims to construct an environment of sharing data with our systems, devices and storages. Please contact us for detail of our service, usage of our resources or research collaboration.



Email address for inquiring about resource usage and joint research

system@cmc.osaka-u.ac.jp

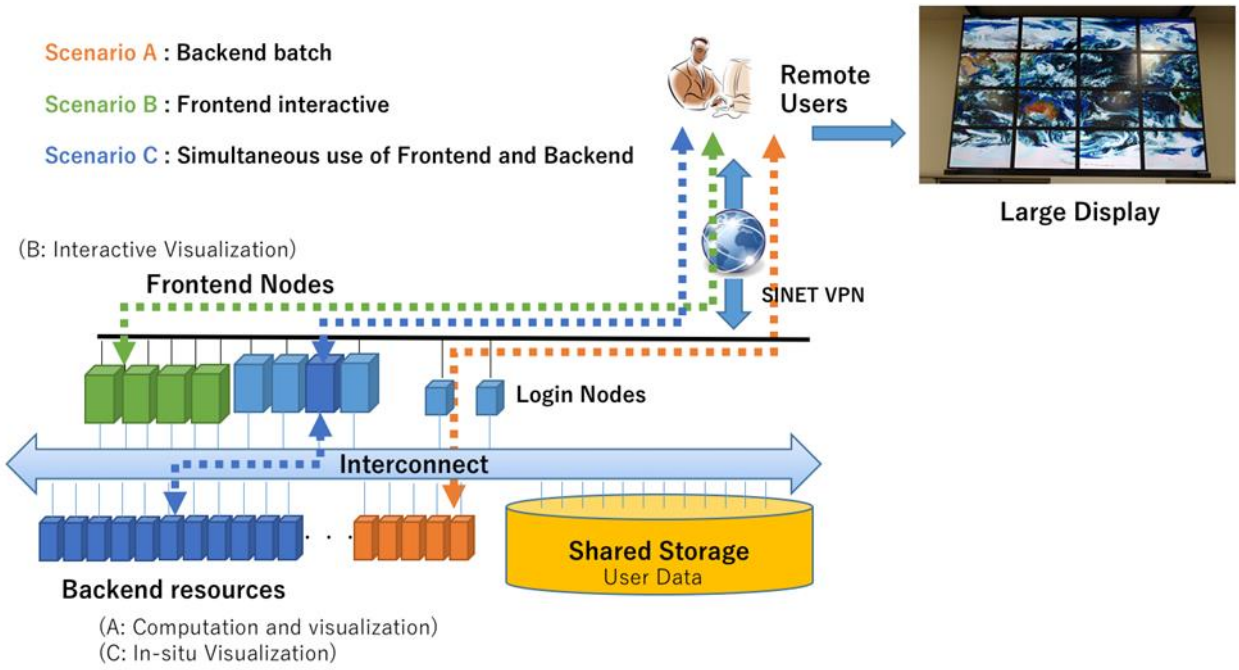
Details of anticipated projects

http://www.hpc.cmc.osaka-u.ac.jp/en/for_jhpcn/

Research Institute for Information Technology, Kyushu University

We provide a remote visualization and data analytic infrastructure that researchers can use from remote sites. The provided system allows us to process generated large-scale data without moving, thus efficient processing is possible. Besides, if available, L2VPN enables the combined usage of resources between end users and bases. The provided resources are assumed to be used for research subjects that visualize and analyze large-scale parallel simulation and/or observation data. Available user scenarios are batch mode (use the back-end nodes), interactive mode (use the front-end nodes), and in-situ mode (use both the front-end and the back-end nodes simultaneously).

If the data you generated does not correspond to the data format of the provided software or the supplied system does not have the analysis function you want, consultation is available.



Available resources

Hardware resources

Subsystem A, Subsystem B, Standard Frontend (c.f. Attachment 1.)

Software resources

OS : Linux

Programming languages : Python, R

Application software : Tensor Flow, OpenFOAM, HIVE(Visualization)

How to use

Batch environment

- Direct login is possible to the node using ssh via the network.
- File transfer is possible to/from the node using scp/sftp via the network.
- Conventional batch usage.

Interactive environment

- Login is possible to the front-end node using ssh.
- Real-time parallel visualization and data analysis are performed using visualization application that runs on the front-end. In the situation where a job is running on the

back-end node, it provides an interactive visualization environment through the file information between the back-end and the front-end. The interactive rate is assumed to be on the order of several to 0.1 fps depending on the communication bandwidth and the amount of transferred data.

Email address for inquiring about resource usage and joint research

zenkoku-kyodo@iii.kyushu-u.ac.jp

Details of anticipated projects

https://www.cc.kyushu-u.ac.jp/scp/service/jhpcn/jhpcn.html (in Japanese)