2021/12/03

Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures
Call for Proposal of Joint Research Projects in Fiscal Year 2022

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Outline

The Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures (JHPCN) calls for joint research projects for fiscal year 2022.

The JHPCN is a “network of institutions with central roles”, certified by the Ministry of Education, Culture, Sports, Science and Technology, and comprises eight super-computer-equipped institutions (hereafter called member institutions) affiliated with Hokkaido University, Tohoku University, University of Tokyo, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University, and Kyushu University. Each member institution will provide its research resources for joint research projects. This call is the first call to offer "mdx" as a computational resource for joint research projects, in addition to the resources of the member institutions. “mdx” is an information infrastructure created mainly to accumulate and utilize knowledge related to date science, which is co-managed by the National Institute of Informatics, the National Institute of Advanced Industrial Science and Technology, and the Center for Artificial Intelligence Research, University of Tsukuba.

Since the member institutions have enrolled leading researchers, acceleration of joint research projects is possible through collaboration with these researchers. You can get introductions to the researchers of the member institutions for building research team, so if you hope to, please contact the JHPCN office or the member institutions in advance of application. These joint research projects for the fiscal year 2022 will be implemented from April 2022 to March 2023. The web application deadline is 5 PM (JST), 6 January, 2022. We expect and appreciate as many applications as possible.

0. What’s New in This Call

Creation of Theme Areas into which research projects must be separated:

From this call, research projects for Data science/data usage area are eagerly accepted, as well as those for computer and computational sciences solicited in the previous calls. The two types of the areas called "Data science/data usage area" and "Large-scale computational science area". Proposals will be reviewed in an independent reviewing track, into which proposals are separated taking into account the features of their research. The applicants are required to choose an area for their research projects.

Note that the area has to be chosen based on what kind of research the projects aim at, independently of which resources, that is HPCI resources or non-HPCI resources, are used. Which means, proposals in Large-scale computational science area (only) with non-HPCI resources or those in Data science/data usage area (only) with HPCI resources are acceptable.

Renaming of the provided computational resources:
The computational resources provided by the member institutions are divided into the HPCI resources, which are provided in the HPCI-JHPCN system, and the non-HPCI resources. Please refer to Appendix 1(1) for the detailed list of the HPCI resources and Appendix 1(2) for the non-HPCI resources. Each type of resources requires distinct application process. For more information, please see art. 7.

Abolishment of official seal requirement for proposals with the HPCI resources use:
The institutional head of each applicant needs to confirm the HPCI application form on the application system instead of officially sealing paper formats from this call. For more information, please see art. 11.

1. Theme Areas and Research We Value

1.1. Theme Areas

This Joint Research Project calls for interdisciplinary Joint Usage/Research themes in the new two areas: (1) Large-scale computational science area and (2) Data science/data usage area. Applicants are required to choose appropriate one of the areas in accordance with their research themes. The areas are independent of what resources are used, so please choose it based on the research theme.

Theme Area (1): Large-scale computational science area
What this area expects are projects making active use of and mutually connecting the large-scale information infrastructures, especially supercomputers and large storages, provided by the member institutions, or those in which the research teams made up of leading researchers from diverse areas implement large-scale studies on computing science. This area is almost equivalent to the Joint Usage/Research areas called for before 2021. The titles or reports of the projects in the previous calls can be found on the website of the JHPCN.

Theme Area (2): Data science/data usage area
What this area expects are diverse projects on data science/data usage making use of computational resources full of features prepared by each member institution, such as the data science platform “mdx” comanaged by 11 organizations including the member institutions. Research themes are welcome on a wide range of areas and with different methods, which can go beyond the work the JHPCN has tackled, such as collection and arrangement of data of both science and the humanities, data sharing or development of platforms among research

communities, and data analysis based on leading methods of data science like machine learning.

1.2. Research we value

We will pay more attention to, and value more highly research that has the following features. Please clearly show in the application forms if the project applicants are proposing has any of the features.

Interdisciplinary organization:

JHPCN promotes interdisciplinary joint research projects on many kinds of themes that are done by researchers who specialize in the area of informatics, which include computer science and data science, and of its application. For this purpose, those projects are valued highly which have an interdisciplinary research team.

Promotion of usage of the software and data:

We value highly those projects that aim to make the software developed or the database constructed as a result of the projects more accessible for as many people as possible. The research teams are required not just to open those software and databases to public, but also to make them recognizable to be actively used.

Development of IT infrastructure technology:

We value highly those projects that lead to infrastructural studies of IT, such as architecture, system software, and security. The projects can also be implemented in collaboration with researchers of the member institutions specializing in IT infrastructure technology.

Research projects in close cooperation with multiple JHPCN member institutions:

Taking advantage of features of JHPCN as a “Network-type” center, projects in this category should use research resources and/or employ researchers from multiple member institutions. For example, research topics include, but are not limited to, large-scale and geographically distributed information systems and implementations of multi-platform for applications using research resources provided by multiple member institutions.

Research projects using both large-scale data and large-capacity networks:

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 the JHPCN member institutions or between research facilities at the JHPCN member institutions. 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. What is specifically intended here is shown in Appendix 2.

In evaluation of the Theme Area (1) “Large-scale computational science area”, the following point is emphasized and valued.

Proposals which mainly aim to perform research activities are accepted. In other words, proposals that just attempt to use the provided computer resources, so called “product run projects’, are not acceptable.

In evaluation of the Theme Area (2) “Data science/data usage area”, the following points are emphasized and valued.

Impacts on the everyday world:

Proposals that will lead to solution of significant but hard to solve problems in the everyday world are valued highly, including realization of Society 5.0 or accomplishment of the SDGs, by applying data.

Promotion of data usage:

Proposals which attempt to promote data usage in research areas where data have not been widespread and sufficiently used yet are valued highly, as well as proposals that make use of different research data, including books and articles, to integrating them and give it sophisticated analysis in order to bring about new discoveries.

Security and personal data protection:

Those proposals are valued highly which create brand new worth making use of socially significant data, such as those on medical and health matters, education, and economy, or which promote development and popularization of techniques on secure use of those data, like techniques on personal data protection. Please consult with the member institutions which provide the resources you plan to use and confirm if the resources meet the requirements of your project. If you are going to use medical information, whether or not your project follows the Act on the Protection of Personal Information and/or the three guidelines set by Ministry of Health, Labour and Welfare, Ministry of Public Management, Home Affairs, and Ministry of Economy, Trade and Industry has to be made sure of in addition to the function and capacity of the available hardware and software.

2. Types of Joint Research Projects

Independently of the joint research areas introduced in art. 1, proposals are also accepted as one of the three types below. Please select an appropriate type at application. A research proposal submitted as (2) International Joint Research Project or (3) Industrial Joint Research Project can be selected as (1) General Joint Research Project in some cases.

(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. For application requirements, see art.3.

(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. For application requirements see art.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. 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)).

(3) 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.

(4) 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)).

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

(6) 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, 2022 to March 31, 2023.

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

5. Facility Use Fees

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

6. Research Project Screening and Maximum Usage Amount for One Project

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 Appendix 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

7.1Outline and matters to be attended

Please note that you have to take one of the two kinds of application procedures shown in section. 7.2 depending on whether your proposal uses HPCI resources (Category A) or not (Category B). The HCPI resources are listed in Appendix 1(1).

Category A projects: Projects that only use HPCI resources, or that use both HPCI and non-HPCI resources.

Category B projects: Projects that only use non-HPCI resources, or that do not use computational resources.

For application of international joint research projects, the English application forms must be completed and submitted.

7.2 Application Procedure

Category A: Application procedure of "Research projects with the use of HPCI resources", including those projects that also make use of non-HPCI resources

*For the detailed procedure, please refer to the Beginner's Guide on the JHPCN website (https://jhpcn-kyoten.itc.u-tokyo.ac.jp/ja/cfp).

What to prepare (two kinds of documents):

JHPCN application forms (After download, fill them out. They are downloadable on JHPCN website, https://jhpcn-kyoten.itc.u-tokyo.ac.jp/ja/cfp.)

HPCI application form (Fill it out on the HPCI website, https://www.hpci-office.jp/entry/)

Where to submit: The HPCI website.

(1) Download the application forms 1 and 2 on the JHPCN website and fill them out. In parallel, the Research 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 resources have to get their HPCI-IDs, unless they already have one.

(2) Visit the JHPCN website. When you choose “use HPCI resources” on the application page, you automatically jump to the application system of HPCI. Complete the HPCI application from on the website and upload the JHPCN application forms you complete at step (1).

Because an e-mail is sent to your institutional head to ask to confirm the information submitted at this procedure as step (3), an available email address for the confirmation is necessary. By institutional head are meant heads of department, such as Deans or Directors of institutions, for applicants who belong to universities, and their equivalents for applicants who belongs to National institutes or private companies. The address you propose has to be the one provided to the post in principle, but in case an administrative office has to be in charge of the contact, an email address of the office is also permitted. If any address is not provided to the post of your institutional head, submit an address of an administrative officer or a secretary in addition to a personal address of the institutional head. Concrete procedure is provided in section.11(2).

When apply for “Research projects with the use of HPCI resources”, it is also necessary to choose an area most relevant to the project from the following categories.

(1) Very large-scale numerical computation
(2) Very large-scale data processing
(3) Very large-capacity network technology
(4) Very large-scale information technology research systems

(3) Because an e-mail is sent to your institutional head to ask to confirm the information submitted at step (2), get the permission of the institutional head on the project in advance.

When the proposal is accepted, follow the guideline for procedures after acceptance set by HPCI. In particular, the Project Representative or the Deputy Representative has to take responsibility to complete the HPCI face-to-face identity vetting. In this process, there could be a case where the copies of ID cards with photo of all the joint researchers who use the resources are required. If the HPCI face-to-face identity vetting is necessary, please consult with HPCI after making sure if the center you are going to go is in charge of it.

You can check a list of the centers on the HPCI website (https://www.hpci-office.jp/pages/nearcenter).

Category B: Application procedure of “Research projects with the use of non-HPCI resources”

*For procedure of those with the use of HPCI resources, see Category A.

What to prepare (one kind of documents):

JHPCN application forms (After download, fill them out. They are downloadable on the JHPCN website, https://jhpcn-kyoten.itc.u-tokyo.ac.jp/ja/cfp.)

Where to submit: The JHPCN website.

(1) Download the application forms 1 and 2 on the JHPCN website and fill them out.

(2) First go to the application page of the JHPCN website. From there you can go to the application page for Research projects with the use of non-HPCI resources. Enter the required information and upload the PDF files of the application forms you prepared at step (1). An acceptance notice will be sent to the email address you submitted on the application webpage.

*Please note that you do not use the application system of HPCI when applying for the “Research projects with the use of non-HPCI resources”. The HPCI ID is also not necessary in this case.

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

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

B) The proposal must be for peaceful purposes.

C) Human rights and profit must be protected. Please consult with the member institutions which provide the resources you plan to use and confirm if the resources meet the requirements of your project. If you are going to use medical information, whether or not your project follows the Act on the Protection of Personal Information and/or the three guidelines set by Ministry of Health, Labour and Welfare, Ministry of Public Management, Home Affairs, and Ministry of Economy, Trade and Industry has to be made sure of in addition to the function and capacity of the available hardware and software.

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”.

G) Projects seemingly identical with other proposed projects does not get accepted, for example, projects, the organizations or themes of which are substantially same, and projects that just the research objects are different.

8. Important Dates

1) Application

- Web application deadline: 5PM (JST), 6 January 2022
- Confirmation by the institutional head (necessary only in applications for “Research projects with the use of HPCI resources”): After the deadline, we ask applicants’ institutional heads to confirm applicants’ proposal. Applicants need to explain their projects to their institutional head and make sure that they check our email.
- Screening result announcement: The JHPCN is planning to announce the result until mid-March 2023.

2) Research-related events

- Joint research commencement: 1 April 2022
- 14th JHPCN symposium (Introduction of research): Early July 2022
- Progress report deadline: Mid-October 2022
- End of the research period: 31 March 2023
- Final report deadline: Mid-May 2023
- 15th JHPCN symposium (Report of research results): Early July 2023

9. Other Important Notices After Your Proposal Gets Accepted

(1) Submission of a written oath

Research groups whose research projects are accepted 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 accepted. 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) Symposiums:

The JHPCN holds JHPCN symposiums in July every year, so that we can create research communities which aim at development of interdisciplinary research on computational science, data science, and computer science. We ask each research team of this Joint Research Project to give presentations about their research projects carried out in the previous year of each symposium and those in progress. The presentations have to be given by the Project Representatives or the Deputy Representatives in principle, but in case either of them cannot join the symposium, one of the joint researchers can instead. The presentations on the research projects in the previous year can be used when evaluating the projects. The travel expense will be borne by the JHPCN office. All the pdf files of poster presentations are required to submit before the symposium and are published on the JHPCN website.

The symposiums can be held online or in a hybrid way of online and onsite participation. It will be decided taking into account the situation of COVID-19. The symposiums in 2020 and 2021 were held online.

(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 accepted 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 accepted 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

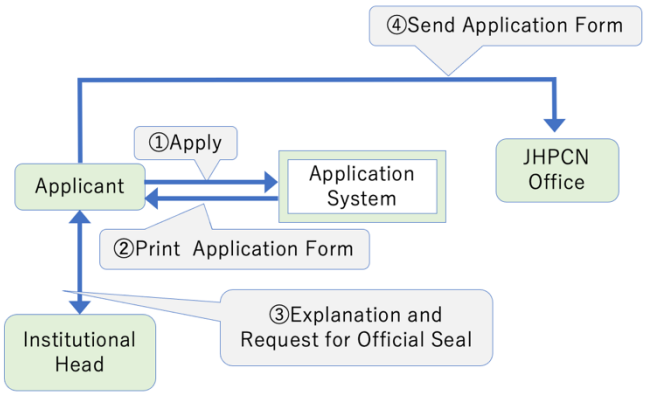
- For available resources, how to use resources, details of eligibility, faculty members who can participate in joint research projects, and the handling of intellectual property of each institution, please feel free to directly contact the following.

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
mdx (Comanaged by all the member institutions)	mdx-help@mdx.jp

11. Additional Explanation on How to Get Confirmation of Institutional Heads

(1) In the FY2021 call

1. Old flow



①Applicant applies on the application system.

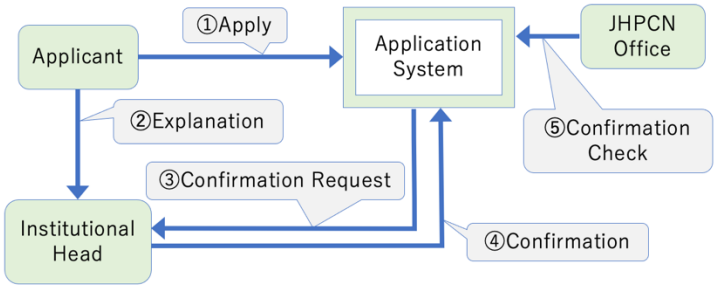
②Applicant prints out the application forms after the application is done.

③Applicant explains his/her project to his/her institutional head and get the application forms officially sealed.

④Applicant sends the sealed application forms to the JHPCN office.

(2) In the FY2022 call

2. New flow



①Applicant applies on the application system.

②Applicant explains his/her project to his/her institutional head and ask him/her to respond to a confirmation request described in ③ after the application is done.

③The request to confirm the project proposed is sent to each institutional head by email, and a notice of the request to the Project Representative, the Deputy Representative and the researcher in charge of administrative procedure.

④The institutional head confirms the projects. When confirmation is done, a notice is sent to the

Project Representative, the Deputy Representative and the researcher in charge of administrative procedure.

⑤The JHPCN office makes sure that the projects have got confirmed.

Appendix 1: List of the research resources available at the JHPCN member institutions for the Joint Research Project

- The research resources that can be directly connected via SINET5 L2VPN provided by National Institute of Informatics are annotated as “L2VPN ready.”
- In filling in the section for the plan of resource usage of application forms, please consult the JHPCN about whether the quantity of resources you desire to use is acceptable and confirm it if needed.

Appendix 1(1): List of the HPCI resources available at the JHPCN member institutions for the Joint Research Project

(The resources provided as “HPCI-JHPCN system”)

JHPCN Institution	Computational Resources, Type of Use (The underline parts are resource names)	Estimated number of Projects accepted
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	1.+2. : 8 3. : 4

	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, 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 (negotiable)	
Cyberscience Center, Tohoku University	1. Supercomputer AOBA Subsystem AOBA-A(72nodes) **[Hardware resources]** 3.3 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, ABINIT-MP 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 Compiler(Fortran, C, C++) Libraries : AMD uProf, AMD Optimizing CPU Libraries, Open MPI Application software : Gaussian16, MATLAB, VASP, Quantum ESPRESSO, OpenFOAM, BINIT-MP, PHASE/0, GENESIS, MODYLAS, NTChem, SALMON, HΦ, OpenMX, SMASH, FrontFlow/blue, FrontISTR Container virtualization: Singularity(Docker image supported)	1.+2. : 20

	3. Supercomputer AOBA Subsystem AOBA-C(tentative name) (2022.10-2023.03) **[Hardware resources]** (undecided) **[Software resources]** (undecided)	
Information Technology Center, the University of Tokyo	1. **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,** Acceptable Job: up to 256 nodes, 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) 2. **Wisteria/BDEC-01(Odyssey)**: Supercomputer System for Integration of "Simulation+Data+Learning", Simulation Nodes, 7,680 nodes of Fujitsu A64FX **[Hardware resources]** Maximum tokens for each project: 40 node x 1 year, Storage 80TB (345,600 node-hour, **2TB/(node*year., 8,640 node-hour)**, Acceptable Job: up to 2,304 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) 3. **Wisteria/BDEC-01(Aquarius: Shared Use)**: Supercomputer System for Integration of "Simulation+Data+Learning", Data/Learning Nodes, 45 nodes of (Intel Xeon Platinum 8360Y + NVIDIA A100 Tensorcore) (8 GPU's/node, Total 360 GPU's) **[Hardware resources]** Maximum tokens for each project: 16 GPU x year, Storage 96TB (138,240 GPU-hour, **6TB/(GPU*year., 8,640 GPU-hour)**, Acceptable Job: up to 8 nodes (64 GPU's) **[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 (Some of them don't work on	1: 5 2: 10 3+4: 8

	GPU) Container: singularity (docker image possible) 4. **Wisteria/BDEC-01(Aquarius: Occupied Use)**: Supercomputer System for Integration of "Simulation+Data+Learning", Data/Learning Nodes, 45 nodes of (Intel Xeon Platinum 8360Y + NVIDIA A100 Tensorcore) (8 GPU's/node, Total 360 GPU's) **[Hardware resources]** Maximum tokens for each project: 8 GPU x year, Storage 48 TB (69,120 GPU-hour, **6TB/(GPU*year., 8,640 GPU-hour). Options for occupying "1, 2, 4 or 8" GPU's are available Please specify number of GPU's which you want to "occupy" in the application. If occupation for 8 GPU's is accepted, you can bring customized login node. Please contact uketsuke@cc.u-tokyo.ac.jp if you plan to apply to "Aquarius: Occupied Use".** **[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 (Some of them don't work on GPU) Container: singularity (docker image possible) **Attention!! If you want to use both of "Odyssey" and "Aquarius", please apply for 2 and 3 or 4. You can apply for all of 2, 3 and 4. Please feel free to contact uketsuke@cc.u-tokyo.ac.jp if you have any questions.**	
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), NVIDIA HPC SDK (successor of PGI compiler), 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	14

	Linux container: Docker (Available images: sles12sp2-latest, centos7-latest), Singularity Application software : Gaussian, Gauss View, AMBER (only for academic users), Caffe, Chainer, TensorFlow, Alphafold, 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	
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]** 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: 10 units ✧ 1 units = 16,000 node hour (equivalent to 320 thousand yen charge) ➢ Type II: 10 units ✧ 1 unit = 1,500 node hour (equivalent to 300 thousand yen charge) ● Each project can use up to total 10 units. ● All resources are shared with general users. ● When using large-scale storage, convert to 10TB: 1500 node hour	15

	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 July 2022 **[Hardware resources]** 1.1. 128 nodes, 8,704 cores, 390.4 TFLOPS x 4 months (From April 1, 2022 to the end of July 2022, maximum 48 nodes per project x 4 months) 1.2. 128 nodes, 8,704 cores, 390.4 TFLOPS x 8 weeks (maximum 128 nodes per project x 4 weeks) (Available amount of resources is adjusted 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. SQUID **[Hardware resources]** - Resource per project: General purpose CPU nodes: up to 152 node years GPU nodes: up to 3 node years Vector nodes: up to 2.5 node years Storages: up to HDD 500 TB, SSD 10TB - Computational node: General purpose CPU nodes: 1,520 nodes (380 TB memory) will be provided up to 304 node years in shared use and dedicated use. GPU nodes: 42 nodes (21 TB memory, 8 NVIDIA A100 per 1 node) will be provided up to 6 node years in shared use. Vector nodes: 36 nodes (4.5 TB memory, 8 SX-Aurora TSUBASA Type 20A per 1 node) will be provided up to 5 node years in shared use. Storages: Lustre 20.0 PB (HDD) + 1.2 PB (NVMe). In the case of SSD, specify it in the application form. **[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,	1.+2.: 10

	Anaconda, VisIt, HΦ, 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] Intel MPI, 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) [Until February 2023] **[Hardware Resources]** 1.1 (Nearly dedicated-use) The maximum resources allocated for 1 project are 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) [Until February 2023] **[Hardware Resources]** (Nearly dedicated-use) The maximum resources allocated for 1 project are	1.

	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) [Until February 2023] **[Hardware Resources]** 3.1 Standard Frontend: 1 node (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 node (36 cores), CPU 2.64TFLOPS, Memory 384GiB, GPU(NVIDIA Quadro P4000), available anytime As of details of Fixed-node, confirm our center in advance. 3.3 Large Frontend: 1 node(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: 2 1.2: 8 2.:3 3. 3.1: 4 3.2: 4 3.3: 1

Appendix 1(2): List of the non-HPCI resources available at the JHPCN member institutions for the Joint Research Project

mdx is comanaged by multiple institutions including the member institutions, and it is treated here as an independent institution.

JHPCN Institution	Computational Resources, Type of Use (The underline parts are resource names)	Estimated number of Projects accepted
mdx	**Please see Japanese version for details.**	
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		
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.) https://www.icts.nagoya-u.ac.jp/en/sc/ **[Usage]** L2VPN Ready	
Academic Center for Computing and Media	**1. Virtual Server Hosting** The access to the supercomputer system will be unavailable from late July to the end of September according to the renewal of the supercomputer system.	

Studies, Kyoto University	**[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 L2VPN is available	
Cybermedia Center, Osaka University	**1. ONION (object storage)** **Object storage that can be linked with large-scale computer systems, cloud storage, etc. via S3 API.** **[Hardware resources]** **Cloudian HyperStore** **up to HDD 80TB per project**	
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	

Appendix 2: Outline of mdx and possible examples of "Research projects using both large-scale data and large capacity networks"

mdx:

Applying virtualization methods, mdx provides multiple projects with information processing environments (tenants) that consist of separate networks, computers, and storages. It makes use of SINET to assign tenants covering a variety of areas, which are composed of wide networks, computers, storages, and other resources, to projects within a short time. Each project can use mdx as if its infrastructure is arranged exclusively for the purpose of the project. The tenants can be rapidly constructed without hardware changing its composition, which makes it possible to conduct a quick PoC (Proof of Concept) on high performance infrastructure in diverse data uses.

Available resources

[Hardware resource]

mdx

[Software resources]

Refer to Appendix 1(2)

How to use

Users require necessary computational resources, storage resources, and construction of network by the portal when they use mdx.

Email address for inquiring about resource usage and joint research

mdx-help@mdx.jp

Details of the service

https://mdx.jp/

Information Initiative Center, Hokkaido University

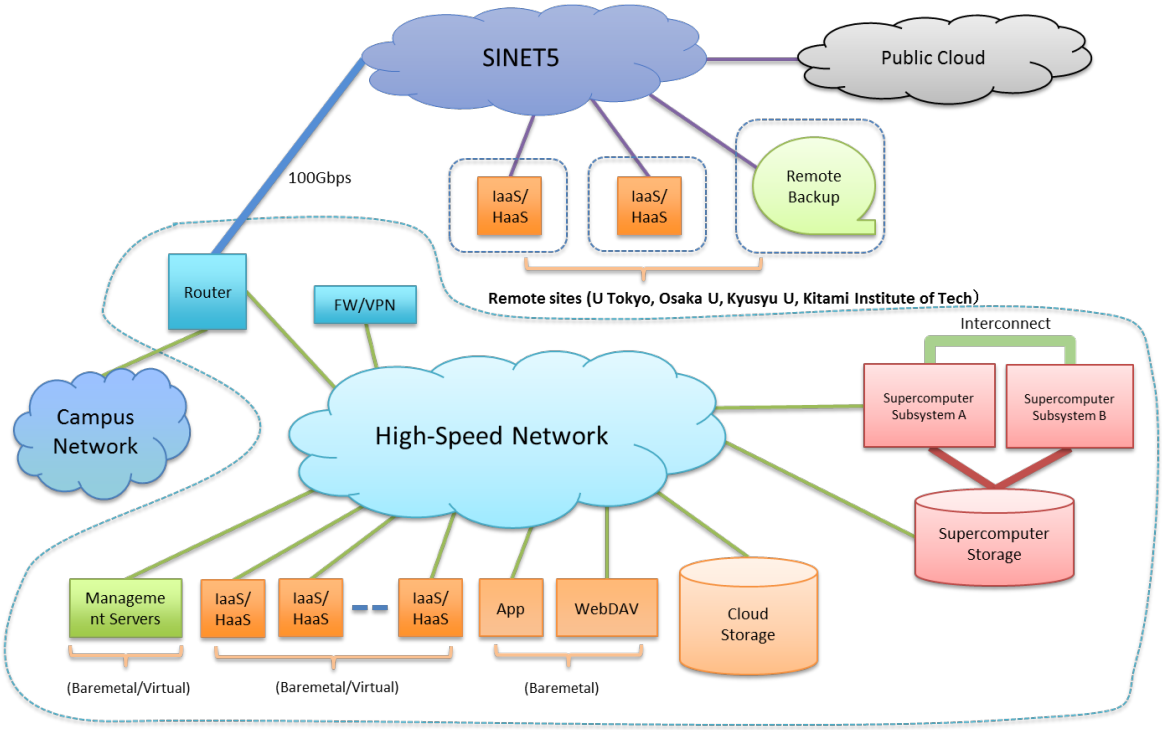
High performance virtual private cloud systems (isolated system for research project) can be deployed using physical and virtual machines in the intercloud system. Also, nation-wide scale distributed systems can be easily deployed by using the intercloud packages.

Available resources

Supercomputer system, Intercloud system (cf. Appendix 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

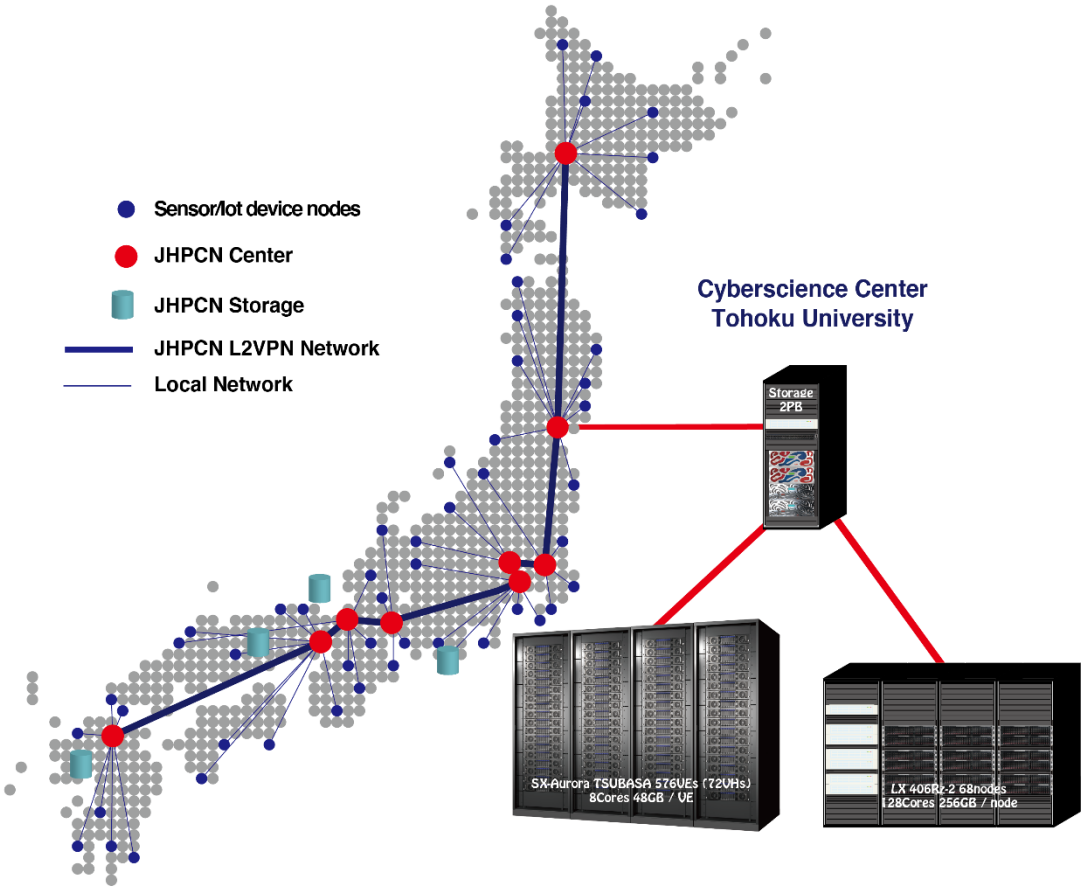
kyodo@oicte.hokudai.ac.jp

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 SINET5 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

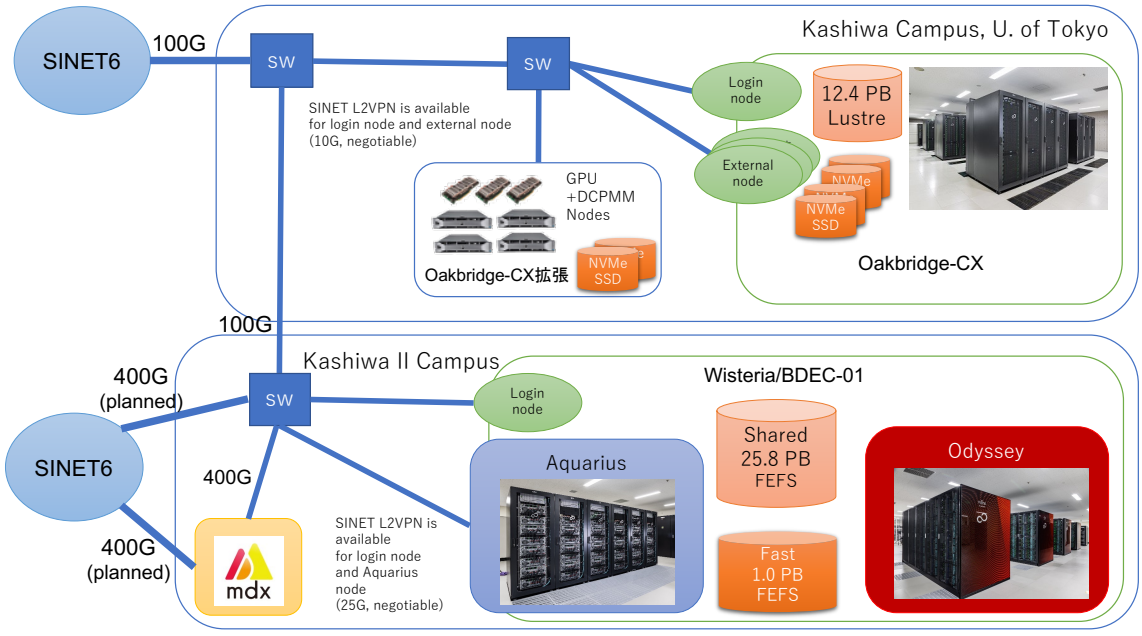
Email address for inquiring about resource usage and joint research

joint_research@cc.tohoku.ac.jp

Details of anticipated projects (in Japanese)

http://www.ss.cc.tohoku.ac.jp/jhpcn_network/

Information Technology Center, the University of Tokyo



Available resources and Connectivity to SINET6

(1) Oakbridge-CX

Oakbridge-CX (OBCX) is available for big-data analyses using SSD nodes with high-speed NVMe-SSD. A single file-system can be constructed on-demand by “BeeGFS on Demand

(BeeOND)". In addition, the external nodes can access the external resources, such as storage, servers, database, and sensor networks. SINET5 L2VPN is available at login-nodes and external nodes of OBCX (Please feel free to contact uketsuke@cc.u-tokyo.ac.jp for the use of external nodes and detailed configuration of L2VPN).

Available Resources

[Hardware resources]

Oakbridge-CX

[Software resources]

Refer to description of Oakbridge-CX in Appendix 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 resources in real time at external node (negotiable)
- You can directly access to login node and external nodes via SINET5 L2VPN (negotiable).

(2) Wisteria/BDEC-01

Wisteria/BDEC-01 consist of "Odyssey (Simulation Nodes)" and "Aquarius (Data/Learning Nodes)", and it is available for big-data analyses using the fast-file system. Each node of Aquarius can access the external resources, such as storage, servers, database, and sensor networks. Workloads for integration of "Simulation+Data+Learning" is possible by using both of Odyssey and Aquarius. Software for integration of Odyssey and Aquarius will be available in FY.2022. If you want to use both of Odyssey and Aquarius, please apply for each of these. SINET5 L2VPN is available at login-nodes and Aquarius (Please feel free to contact uketsuke@cc.u-tokyo.ac.jp for the use of external nodes, detailed configuration of L2VPN, and integration of Odyssey and Aquarius).

Available Resources

[Hardware resources]

Wisteria/BDEC-01

[Software resources]

Refer to description of Wisteria/BDEC-01 in Appendix 1.

How to use

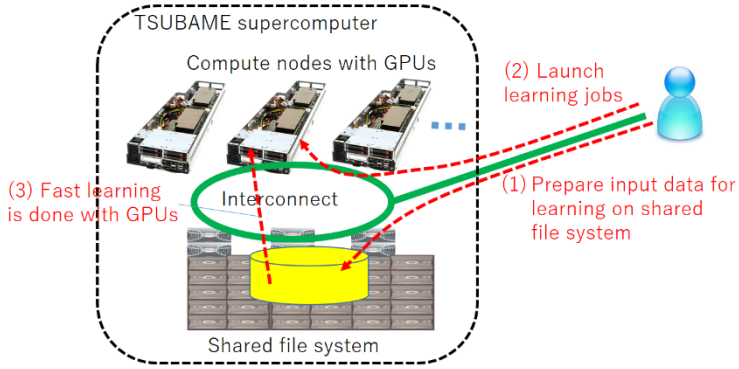
- You can directly login to the nodes via remote network with SSH.
- You can transfer data via remote network with SCP / SFTP.
- You can directly access external resources in real time at Aquarius (negotiable)
- You can directly access to login node and Aquarius via SINET5 L2VPN

(negotiable).

- You can conduct workloads for integration of “Simulation+Data+Learning” by using both of Odyssey and Aquarius (negotiable).

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

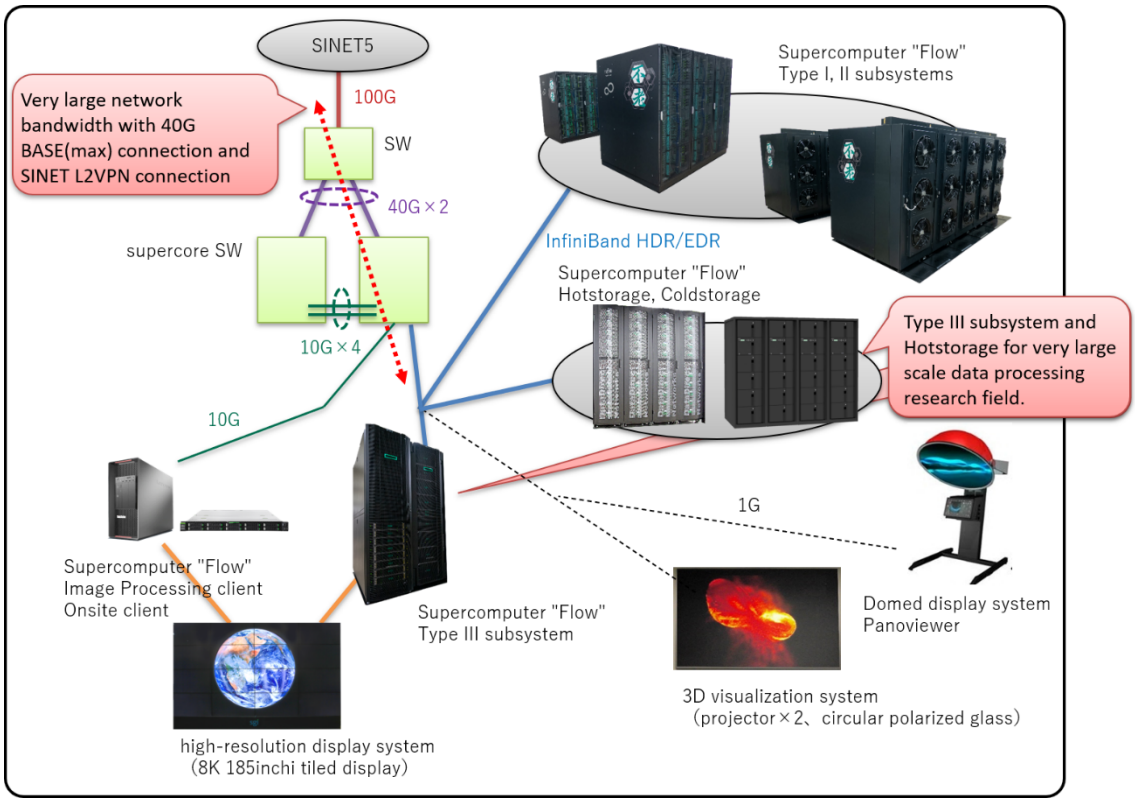
Details of anticipated projects

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

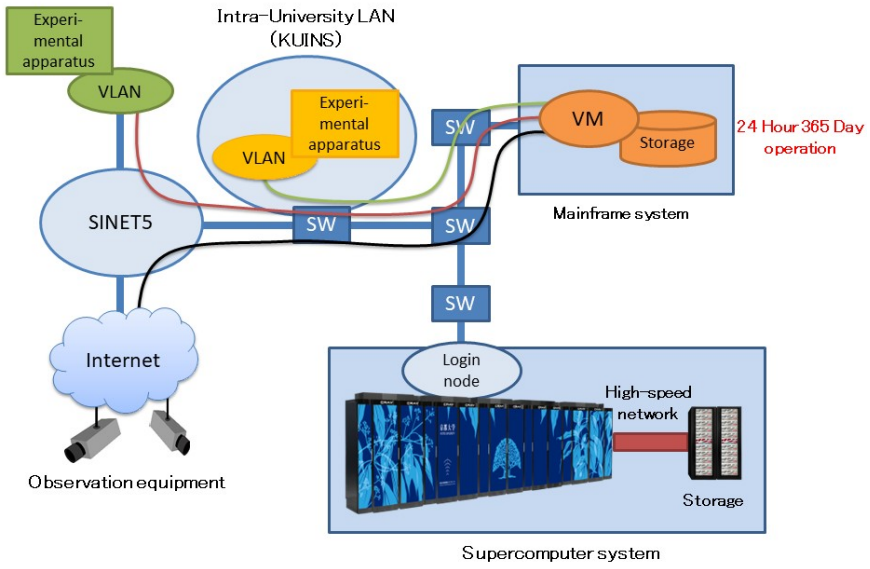
kyodo@itc.nagoya-u.ac.jp

- Details of anticipated projects

https://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 (Until late July)

  Cray XC40 (Camphor 2: Xeon Phi KNL/node). Maximum 48 nodes per project x 4 months

  DDN ExaScaler (SFA14K) Maximum 288 TB per project (If you need more, please contact us.)

- Academic Cloud 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 (Until late July)

  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

- Academic Research Cloud System Virtual Server Hosting

  Standard OS: CentOS7 (CentOS8 is negotiable)

How to use

- Supercomputer system

  Login with SSH (Key authentication)

- Academic Research Cloud System Virtual Server 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

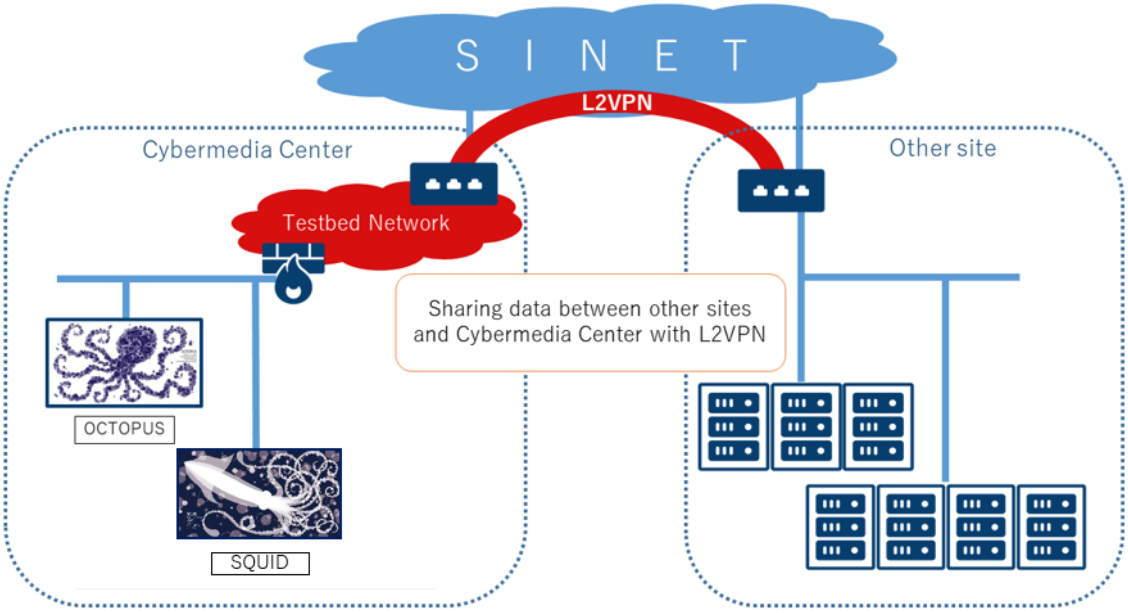
  SINET5 L2VPN can be housed directly in VM

Email address for inquiring about resource usage and joint research

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

Cybermedia Center, Osaka University

Our center provides L2VPN 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

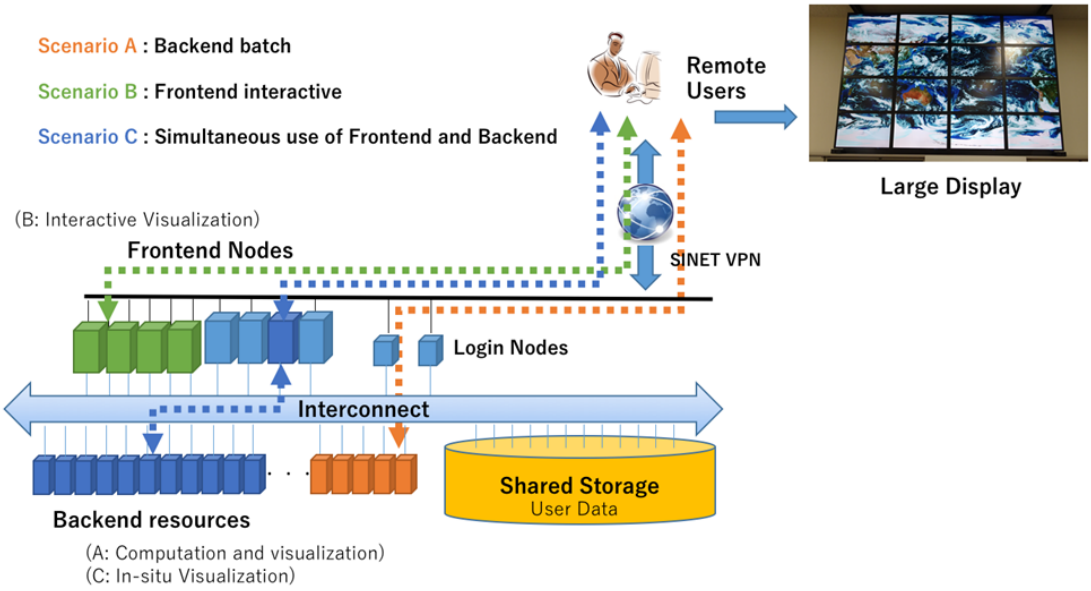
http://www.hpc.cmc.osaka-u.ac.jp/en/for_jhpcn/

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

ITO Subsystem A, ITO Subsystem B, Standard Frontend (c.f. Appendix 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)