

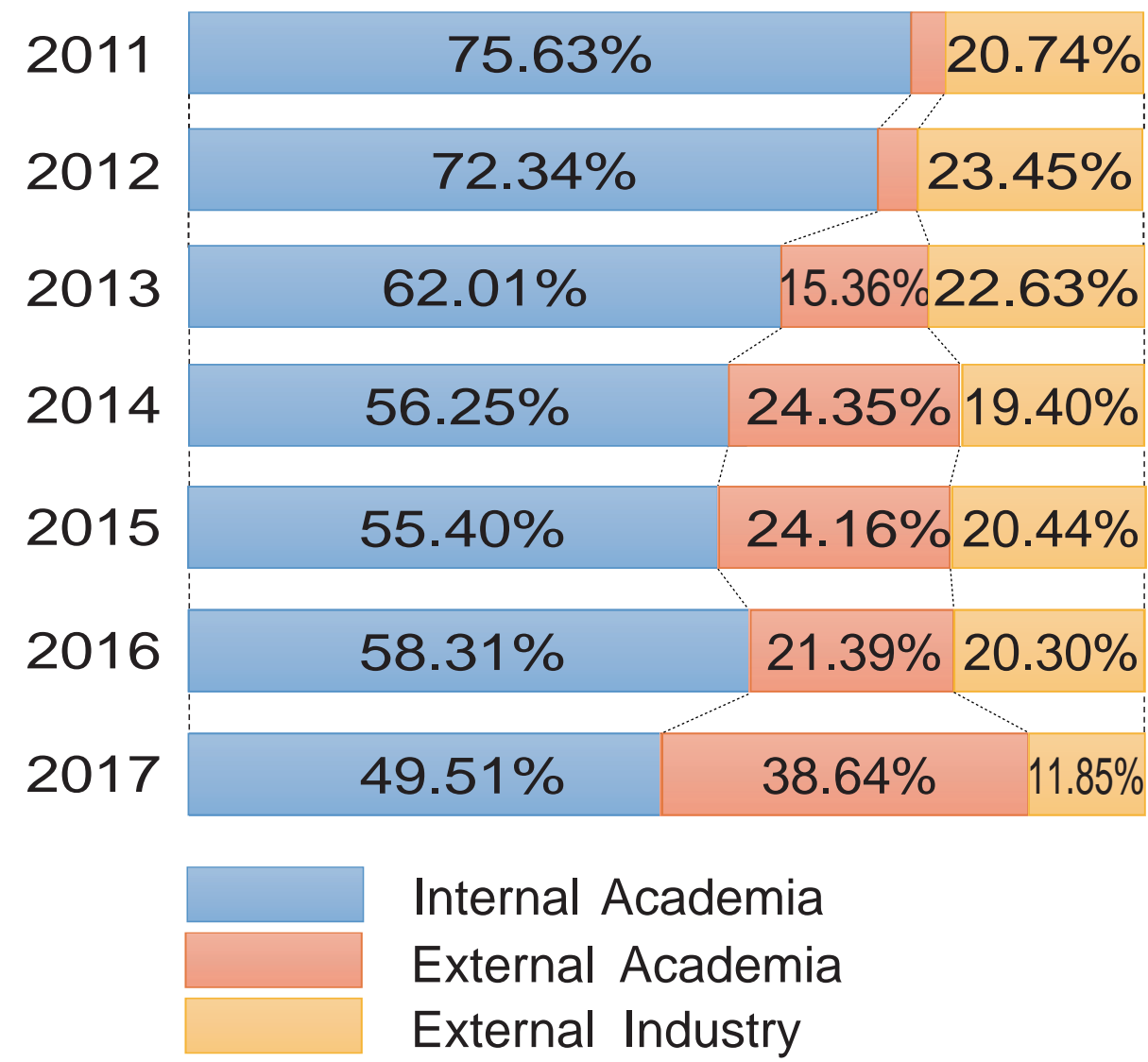


Joint Usage of TSUBAME3.0 Partnership Resource Allocations

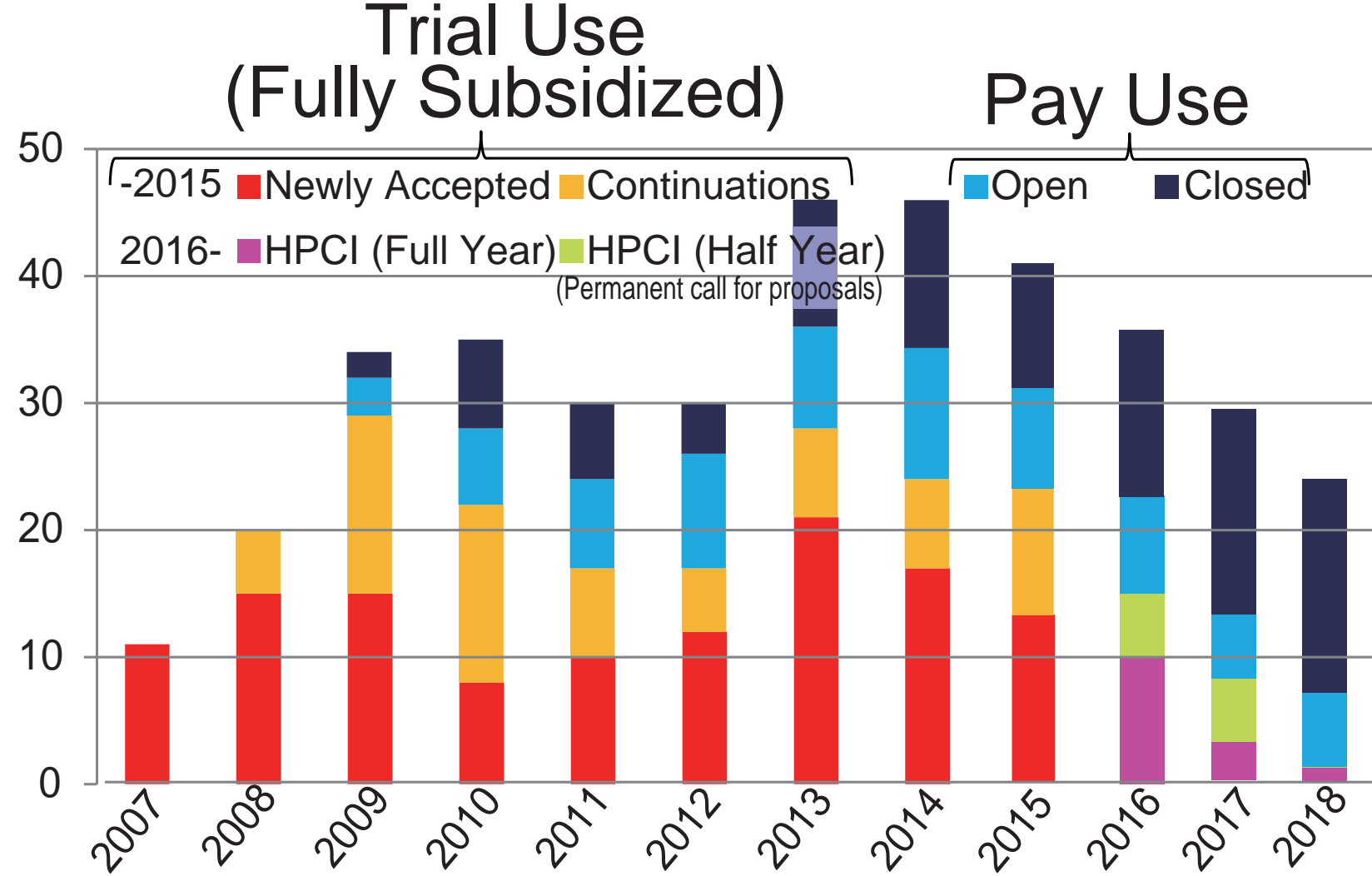
TSUBAME Industrial Use -Statistical Information-

TSUBAME is open to academia and industries. Industrial use started in FY2007.

TSUBAME Usage Profile



The Number of Industrial Projects



How to Use TSUBAME?

User types	Programs	Remarks column
Tokyo Tech Students and Professors		All Students have TSUBAME accounts.
Non-Tokyo Tech Users	Partnership Resource Allocations HPCI/JHPCN	Academic and Industrial Use Academic and Industrial Use Supported by MEXT
Industrial Users	Project for Creation of Research Platforms and Sharing of Advanced Research Infrastructure (-2015) HPCI/JHPCN (2016-)	Industrial Use Supported by MEXT
Foreign Researchers	International Collaboration	
Collaborators with Tokyo Tech Professors	Research Collaboration based on Research Fund or Industrial Contracts	

TSUBAME Services

Menu	Publicity	Price	Remarks
Trial Use	Open	Free	Supported by MEXT
Pay Use	Open	\$0.88/NodeH	
	Closed	\$1.76/NodeH	

Exchange rate is calculated with \$1 = ¥113.
Intellectual properties are reserved completely by the users and are not required to be shared with Tokyo Tech. "NodeH" is the unit for pricing. 1 NodeH is equivalent to 1 node for 1 hour.
For example, if you pay \$88, you can use 100 nodes for 1 hour, or 1 node for 100 hours.
Each node has 2 Intel Xeon processors (28 cores) and 4 NVIDIA Tesla P100 GPUs, with 256GB Memory.
"Publicity: Open" requires company name, division, purpose to use and the report of result to be published.
"Publicity: Closed" only requires company name to be published.

Distributed Computing for Machine Learning on Large-Scale Image Dataset

Ikuro Sato*, Ryutarō Watanabe*, Hiroki Nishimura**, Akihiro Nomura***, Satoshi Matsuoka*** (*DENSO IT LABORATORY, INC., **DENSO CORPORATION, ***Tokyo Institute of Technology)
(This article is extracted from TSUBAME e-Science Journal Vol 14.)

Intensive researches have been revealing that machine-learning methods known as Deep Neural Networks (DNNs) show great classification capabilities through supervised training on massive datasets. This research aims to quantify a condition that primarily controls classification capabilities, and generate a high-performing ensemble classifier consisting of plural DNN models. As for the training, we used node-distributed machine-learning program that we developed from scratch. As many as 96 GPUs are used to train a single DNN model. Most models are trained during the TSUBAME Ground Challenge, using 1146 GPUs simultaneously at peak, reaching about 1 TFLOPS (single) per GPU in the cost derivative parts.



Figure 2. Validation images falsely classified by our model. (a) Arabian camel, (b) triceratops.

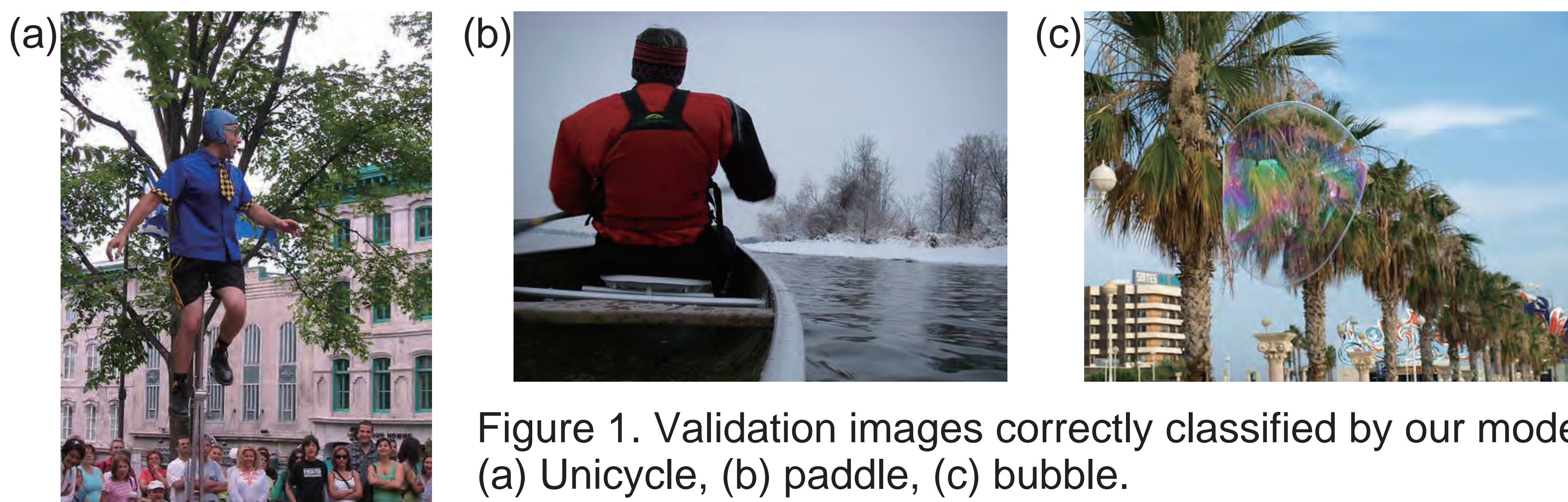


Figure 1. Validation images correctly classified by our model. (a) Unicycle, (b) paddle, (c) bubble.

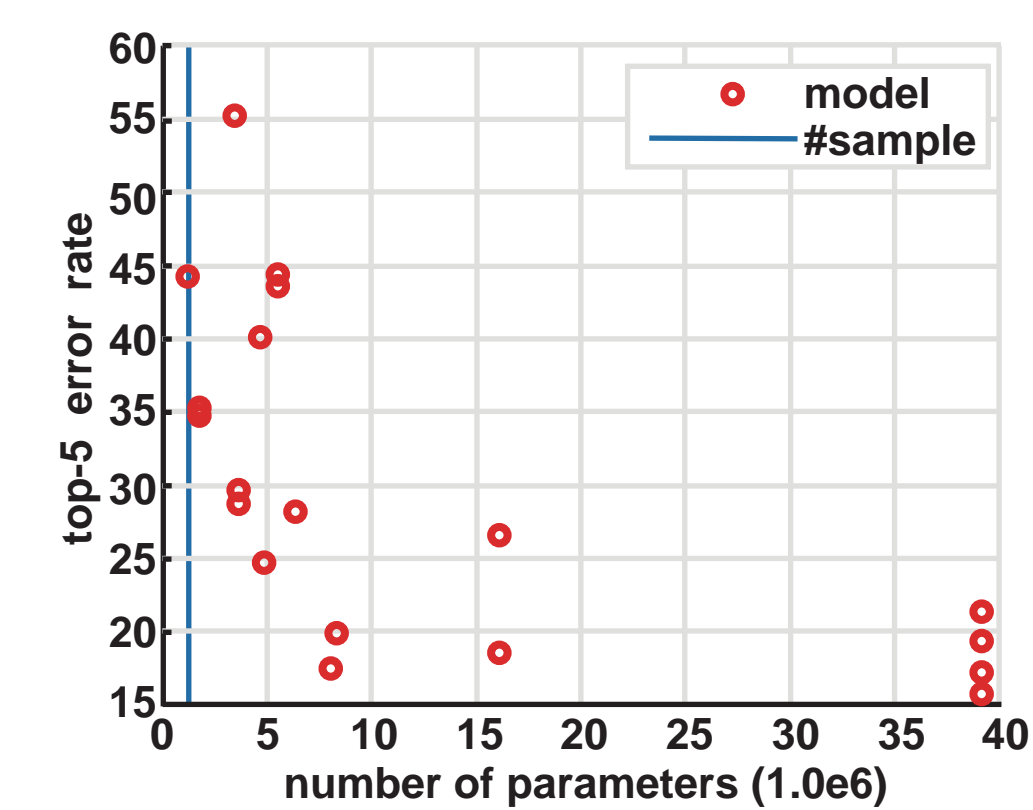


Figure 3. The relationship between the classification accuracy and the number of training parameters. The blue line indicates the number of training samples.

HPCI Confederation

HPCI : High Performance Computing Infrastructure

- National grid infrastructure for HPC research

Resources

- 11 supercomputers in Japan, including TSUBAME3.0
- 100PB global shared storage to share data

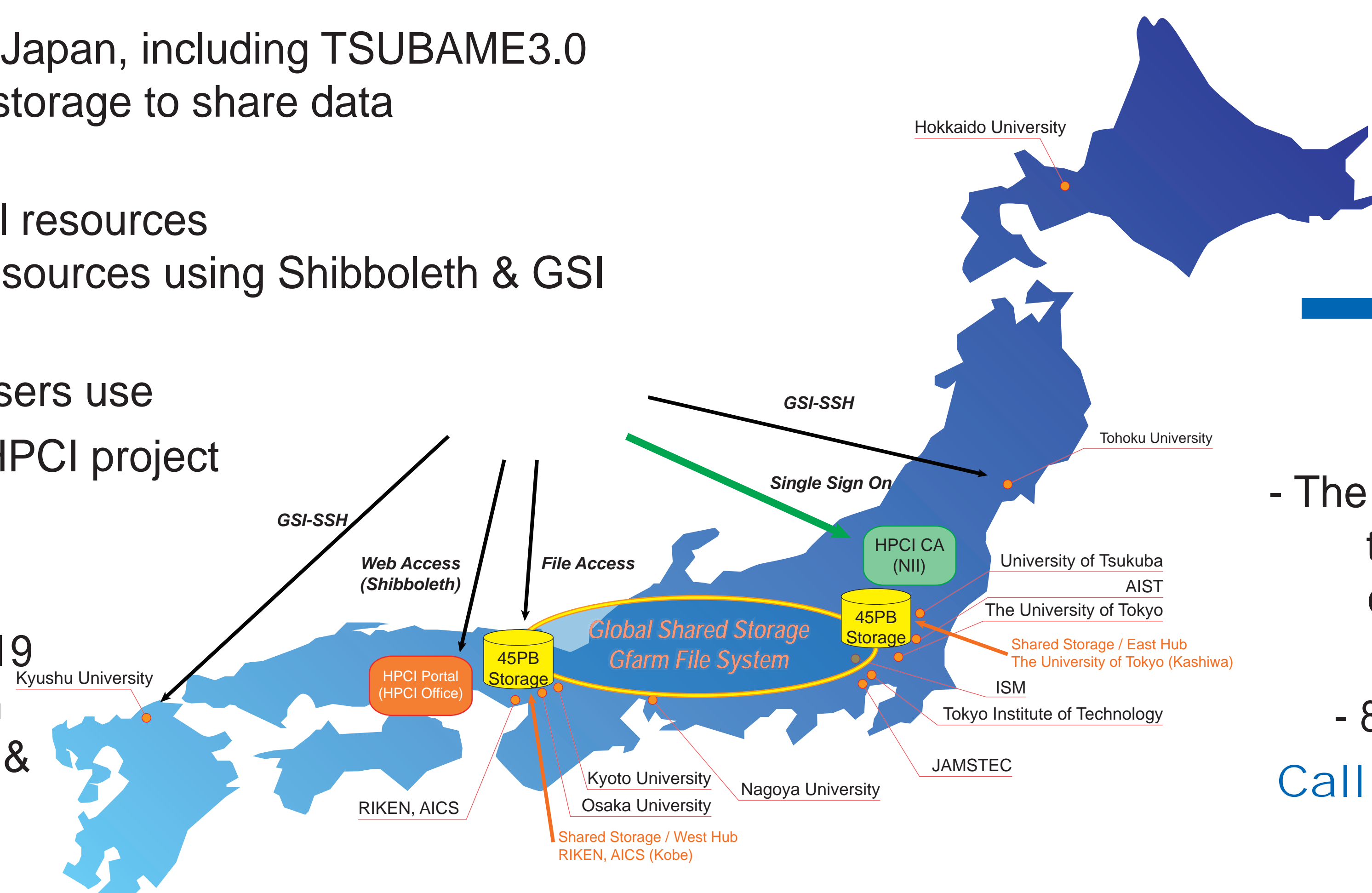
Services

- One-stop sign up to all resources
- Single sign on to all resources using Shibboleth & GSI

Status

- 13 projects and 144 users use TSUBAME3.0 for the HPCI project on FY2018

For more details, please go to booth #1419 "Research Organization for Information Science & Technology (RIST)"



JHPCN

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

- The Network-Type Research Center aims to contribute to the advancement and permanent development of the academic and research infrastructure of Japan

Resources Provider

- 8 supercomputer centers in Japan, including TSUBAME3.0

Call for Proposals of Joint Research Projects

- Approximately 60 research projects in each year, including international & Industry joint research projects

Status

- 16 projects uses TSUBAME3.0, and total 52 projects are adopted as JHPCN projects on FY2018