

Overview


JCAHPC (Joint Center for Advanced HPC), which is a cooperative organization by the University of Tokyo and University of Tsukuba for joint procurement and operation of the largest scale of supercomputer in Japan, introduced a new supercomputer system "Oakforest-PACS" with **25 PFLOPS** peak performance and started its operation from December 1st, 2016. The Oakforest-PACS system is ranked at #6 in TOP500 List of November 2016 with 13.55 PFLOPS of Linpack performance, and also recognized as Japan's fastest supercomputer. The system is installed at the Kashiwa Research Complex II building in the Kashiwa-no-Ha campus, the University of Tokyo.

The Oakforest-PACS system has 8,208 compute nodes, each of which consists of the latest version of Intel Xeon Phi processor (code name: Knights Landing), and Intel Omni-Path Architecture as the high performance interconnect. The Oakforest-PACS system is the largest cluster solution with Knights Landing processor as well as also the largest configuration with Omni-Path Architecture in the world. The system is integrated by Fujitsu Co. Ltd, and its PRIMERGY server is employed as each of compute node. Additionally, the system employs the Lustre shared files system (capacity: 26 PB), and IME (fast file cache system, 940 TB), both of which are provided by DataDirect Network (DDN).

All the computation nodes and servers including login nodes, Lustre servers and IME servers are connected by a full bisection bandwidth of Fat-Tree interconnection network with Intel Omni-Path Architecture to provide highly flexible job allocation over the nodes and high performance file access.

Top 500 #6 (#1 in Japan), HPCG #3 (#2), Green 500 #6 (#2)
 @Nov. 2016
 IO 500 #1 @ Nov. 2017, 2018
 IO-500 BW #1 @Jun. 2019

Computer Nodes: 25 PFlops

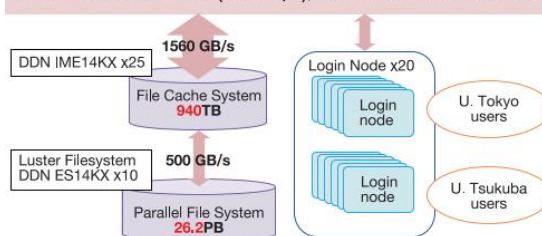


Fujitsu PRIMERGY CX1640 M1
 x 8 node inside CX600 M1 (2U)

x8,208

CPU: Intel Xeon Phi 7250 (KNL 68 core, 1.4 GHz)
 Mem: 16 GB (MCDRAM, 490 GB/sec, effective)
 +96 GB (DDR4-2400, 115.2 GB/sec)

Omni-Path Architecture (100 Gbps), Full-bisection BW Fat-tree

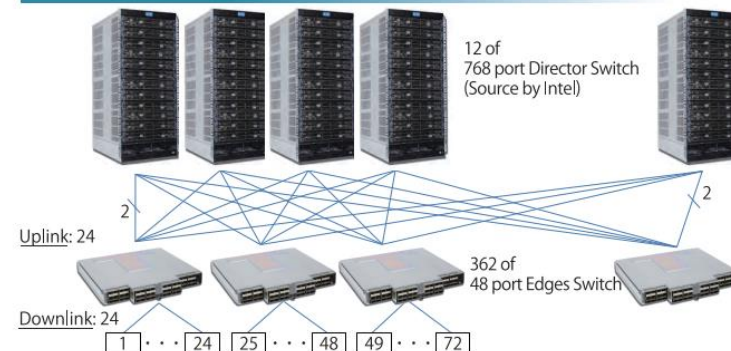


Research & Education

The Oakforest-PACS is offered to researchers in Japan and their international collaborators through various types of programs operated by HPCI under MEXT, and by original supercomputer resource sharing programs by two universities.

It is expected to contribute to dramatic development of new frontiers of various field of studies. The Oakforest-PACS will be also utilized for education and training of students and young researchers. We will continue to make further social contributions through operations of the Oakforest-PACS.

System Configuration



Total peak performance		25 PFLOPS	
Total number of compute nodes		8,208	
Power consumption		4.2 MW (including cooling)	
# of racks		102	
Cooling system	Compute Node	Type	Warm-water cooling Direct cooling (CPU) Rear door cooling (except CPU)
		Facility	Cooling tower & Chiller
	Others	Type	Air cooling
		Facility	PAC

