Oakforest-PACS ranks #1 in storage performance

The Joint Center for Advanced High Performance Computing (JCAHPC) announced that the storage performance of the Oakforest-PACS supercomputer has ranked #1 in the first IO-500 list released in November 2017.   The IO-500 is a world ranking list of storage performance, which is evaluated by the IO-500 benchmark that measures the storage performance using read/write bandwidth for large files and read/write/listing performance for small files.   Storage performance in supercomputers is critical for large-scale simulation, big data analysis, and artificial intelligence. The IO-500 list facilitates to improve the storage performance that greatly helps to improve the CPU performance.

A storage system of the Oakforest-PACS supercomputer comprises a parallel file system (DataDirect Networks ES14KX) and a file cache system (Infinite Memory Engine).   The file cache system is introduced to improve the storage performance.   The IO-500 benchmark for the file cache system achieves 742 GiB/s[1] for file per process write access that parallel processes access their own file, and 600 GiB/s for single shared file write access that parallel processes access a single shared file but a different position, which is typical access patterns in high performance computing.

Supporting Resources

- More on the Joint Center for Advanced High Performance Computing (JCAHPC) – http://jcahpc.jp/eng/
- More on the Information Technology Center, the University of Tokyo – https://www.itc.u-tokyo.ac.jp/en/
- More on the Center for Computational Sciences, the University of Tsukuba – https://www.ccs.tsukuba.ac.jp/eng/
- More on IO-500 benchmark and list – http://io500.org/

About JCAHPC

JCAHPC is a world-leading supercomputer center jointly established by the Information Technology Center at the University of Tokyo and the Center for Computational Sciences at the University of Tsukuba.   It operates the Oakforest-PACS supercomputer built by Fujitsu to rapidly promote research and development in science and technology since December 2016.   The Oakforest-PACS supercomputer is provided as a shared resource for computational science research under programs of the High Performance Computing Infrastructure (HPCI) and each university.   The Information Technology Center at the University of Tokyo and the Center for Computational Sciences at the University of Tsukuba contribute further progress of computational sciences, big

data analysis and artificial intelligence by operating the Oakforest-PACS supercomputer.

Media Contact

JCAHPC

jcahpc-pr [at] jcahpc.jp

Note that [at] should be replaced with @.

Notes

[1] GiB/s – the unit of file access performance, which accesses 1 GiByte data per second.   1 GiByte is 1024^3 Byte that means 1,073,741,824 Byte.

Appendix

The Oakforest-PACS supercomputer

The file cache system