

Welcome to the first edition of PSC User News! In this and future issues, we will provide you with timely updates regarding machines, software, workshops, research breakthroughs, PSC events, and more.



### COMPLETING BRIDGES

PSC is completing the acquisition of Bridges with its Phase 2 Technical Upgrade, which introduces new CPU and GPU technologies, additional large- and extreme-memory nodes, and additional storage capacity. The upgrade consists of the following enhancements, which amplify Bridges' potential across HPC, machine learning, and Big Data applications.

**NVIDIA P100 GPUs** appear in 32 additional RSM GPU nodes HPE Apollo 2000 servers, each of which has two NVIDIA Tesla P100 GPUs (16GB), two Intel Xeon E5-2683 v4 CPUs (16 cores, 2.1 GHz base frequency), and 128GB of DDR4-2400 RAM, and local disk. Each of the 64 new NVIDIA Tesla P100 GPUs offers exceptional performance of up to 4.7, 9.3, and 18.7 Tflap/s, respectively, at 64-bit, 32-bit, and 16-bit precision. The newly-introduced 16-bit precision can accelerate deep learning and mixed-precision applications, and the faster 32- and 64-bit precisions accelerate all GPU applications.

The upgrade greatly expands Bridges' large-memory capacity through the addition of **2 ESM nodes, each with 12TB of RAM, and 34 LSM nodes, each with 3 TB of RAM.** The Phase 2 LSM nodes are HPE ProLiant DL580 servers, each with 4 Intel Xeon E7-8870 v4 CPUs (20 cores, 2.1 GHz base frequency), 3 TB of DDR4-2400 RAM, and local disk. The Phase 2 ESM nodes are HPE Integrity Superdome X servers, each with 16 Intel Xeon E7-8880 v4 CPUs (22 cores, 2.2 GHz base frequency), 12 TB of DDR4-2400 RAM, and local disk. Bridges' Phase 2 LSM and ESM provide significantly more computing capacity for genome sequence assembly (e.g., Trinity), large-memory MATLAB, R, Java (e.g., MALLETT, for document classification), and Python applications, and HPC applications written in OpenMP or Pthreads.

Bridges' Phase 2 Technical Upgrade also **quadruples the capacity of its Pylon storage system**, increasing usable capacity from 2.5 PB to 10 PB. The additional capacity will be divided between Bridges' /pylon1 (Lustre) and /pylon2 (SLASH2) file systems. With the greater capacity comes commensurately greater aggregate bandwidth.

Bridges' new LSM, ESM, and GPU nodes will be accessed as new partitions. Please see the Bridges User Guide at <http://psc.edu/bridges> for complete information

### Update on Anton 2

As you know, PSC received a \$1.8 million grant from the National Institutes of Health to make a next-generation Anton 2 supercomputer, developed by D. E. Shaw, available to the biomedical research community. A specialized system for modeling the function and dynamics of biomolecules, the Anton 2 machine will be the only one of its kind publicly available to U. S. scientists.

We are currently in the process of building Anton 2. We expect that results of the proposal review meeting will be sent out to PIs at the end of this month, and allocations on the machine are scheduled to begin in late November.

### XSEDE HPC Monthly Workshop Schedule

The following workshops have been scheduled for the remainder of the year:

**November 1** - Big Data  
**December 6** - GPU Programming Using OpenACC

Go to:

<https://portal.xsede.org/course-calendar>

### Proposal Submissions for XSEDE Allocation Resources

The submission period for XSEDE Research Allocation Requests for the allocation period January 1, 2017 to December 31, 2017 ended October 15. The next submission period is December 15, 2016 to January 15, 2017 for a beginning date of April 1, 2017.

Go to:

[www.xsede.org/allocations](http://www.xsede.org/allocations) for more information.

### SC16 International Conference for High Performance Computing, Networking, Storage and Analysis

If you are attending SC16 (November 13-18, Salt Lake City, Utah) this year, please stop by our booth (#1201) to hear our talks and watch our demos.

 [www.psc.edu](http://www.psc.edu)

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