Sequoia is ranked the world's fastest supercomputer

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The Sequoia supercomputer.

Photo by Bob Hirschfeld/LLNL

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The Lab's Sequoia supercomputer is the world's fastest high performance computing system on the international ranking announced earlier today at the International Supercomputing Conference (ISC) in Hamburg, Germany.

Clocking in at 16.32 sustained petaflops (quadrillion floating point operations per second), Sequoia earned the number one ranking on the industry standard Top500 list of the world's fastest supercomputers. For the first time since November 2009, a U.S. supercomputer tops the ranking. The Top500 is released twice a year in June and November.

A 96-rack IBM Blue Gene/Q system, Sequoia will enable simulations that explore phenomena at a level of detail never before possible. Sequoia is dedicated to NNSA's Advanced Simulation and Computing (ASC) program for stewardship of the nation's nuclear weapons stockpile, a joint effort by Lawrence Livermore, Los Alamos and Sandia national laboratories.

"The quantitative leap forward in computational power Sequoia represents will have a huge qualitative impact on the nuclear weapons calculations we will be able to conduct for stockpile stewardship. This capability is critical to the program to extend the life of such aging weapons systems as the B61 and W78 and will help to accelerate other NNSA research efforts such as fusion experiments at the National Ignition Facility," said Bruce Goodwin, principal associate director for Weapons and Complex Integration. "Sequoia also is a fine example of a national lab and industry working together to continue American leadership in HPC -- leadership that is vital to the nation's defense and economic security."

On the latest Top500 list, Japan's "K Computer" at the RIKEN Advanced Institute for Computational Science, is now the no. 2 system on the list with 10.5 petaflops. The K Computer had held the top ranking on the previous two lists.

From left, Horst Simon, deputy director of Lawrence Berkeley National Laboratory; Brian Connors, vice president of High Performance Computing, IBM; Kim Cups, leader of the LLNL Livermore Computing Division.

Photo by Tom Spelce/LLNL

High Resolution Image

Argonne National Laboratory's new Mira BlueGene/Q system makes its debut at no. 3 on the list with a performance of 8.15 petaflops on the industry-standard Linpack benchmark. The other U.S. system in the Top 10 is Jaguar at Oak Ridge National Laboratory in Tennessee, which was the top U.S. system on the previous list and now clocks in at No. 6.

Other systems in the top 10 include: SuperMUC, an IBM iDataplex system installed at Leibniz Rechenzentrum in Germany, at no. 4; China's Tianhe-1A, no. 5; Italy's IBM Bluegene/Q system installed at CINECA, no. 7; Germany's JuQUEEN BlueGene/Q, no. 8; France's Bull supercomputer, no. 9; and China's Nebulae, no. 10.

"This latest Top500 list underscores that the importance of high performance computing to scientific research, national defense and economic competitiveness is internationally recognized," said Michel McCoy, head of the ASC program at LLNL. "Competition in HPC is global and American leadership is being challenged as never before. We are -- in my view at least -- about to deliver a balanced and capable system, but this is happening because of ten years of consistent investment and effort, an enduring partnership with IBM and Argonne and focus on success. Similarly, continued American leadership will not happen by default or through any sense of exceptionalism. It requires a ten year plan, similar to what we did with Blue Gene, but obviously more costly. Leadership in computing is essential to continued national security capability and to credible deterrence. We will only lose if we choose to lose."

For more information, see NNSA's Sequoia press release.