

Oak Ridge 'Jaguar' Supercomputer is World's Fastest

Six-core upgrade has 70 percent more computational muscle than last year's quad-core



Washington, DC ([DOE](#) [1]) —An upgrade to a Cray XT5 high-performance computing system deployed by the Department of Energy has made the “Jaguar” supercomputer the world’s fastest. Located at Oak Ridge National Laboratory, Jaguar is the scientific research community’s most powerful computational tool for exploring solutions to some of today’s most difficult problems. The upgrade, funded with \$19.9 million under the Recovery Act, will enable scientific simulations for exploring solutions to climate change and the development of new energy technologies.

“Supercomputer modeling and simulation is changing the face of science and sharpening America’s competitive edge,” said Secretary Chu. “Oak Ridge and other DOE national laboratories are helping address major energy and climate challenges and lead America toward a clean energy future.”

To net the number-one spot on the TOP500 list of the world’s fastest supercomputers, Jaguar’s Cray XT5 component was upgraded this fall from four-core to six-core processors and ran a benchmark program called High-Performance Linpack (HPL) at a speed of 1.759 petaflop/s. The rankings were posted early today on [Top500.org](#) [2], a supercomputing tracking website.

Jaguar began service in 2005 with a peak speed of 26-teraflop/s. The upgrade of Jaguar XT5 to 37,376 six-core AMD Istanbul processors in 2009 increased performance 70 percent over that of its quad-core predecessor. Researchers anticipate that this unprecedented growth in computing capacity may help facilitate improved climate predictions, fuel-efficient engine designs, and the creation of advanced materials for energy production, transmission, and storage.

About “Jaguar”:

- **Cray XT computer system**

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- **Top500 rank: 1st for XT5 component and 16th for XT4 component**
- **2.595 petaflop/s peak theoretical performance for the combined system (2.332 petaflop/s from XT5 and 0.263 petaflops from XT4)**
- **Superlative speed: 1.759 petaflop/s actual performance for the XT5 and 0.205 petaflop/s for the XT4 on HPL benchmark program**
- **255,584 processing cores**
- **XT5: 37,376 AMD six-core Istanbul Opteron™ 2.6 gigahertz processors (224,256 compute cores)**
- **XT4: 7,832 AMD four-core Budapest Opteron™ 2.1 gigahertz processors (31,328 compute cores)**
- **InfiniBand network connects XT5 and XT4 components**
- **Cray SeaStar network interface and router**
- **System memory: 362 terabytes (almost three times that of the second largest system)**
- **Unmatched input/output bandwidth to read and write files: 284 gigabytes per second**
- **Sizable storage: Spider, a 10-petabyte Lustre-based shared file system**
- **Speedy Internet connections enable users to access Jaguar from around the world.**
- **High-end visualization helps users make sense of the data flood Jaguar generates.**

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[1] <http://www.energy.gov/>

[2] <http://www.top500.org/>