Los Alamos' Trinity Supercomputer lands on two top-10 lists

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Trinity is the seventh fastest supercomputer in the world

LOS ALAMOS, N.M., Nov. 16, 2017—The Trinity Supercomputer at Los Alamos National Laboratory was recently named as a top 10 supercomputer on two lists: it made number three on the High Performance Conjugate Gradients (HPCG) Benchmark project, and is number seven on the TOP500 list.

"Trinity has already made unique contributions to important national security challenges, and we look forward to Trinity having a long tenure as one of the most powerful supercomputers in the world." said John Sarrao, associate director for Theory, Simulation and Computation at Los Alamos.

Trinity, a Cray XC40 supercomputer at the Laboratory, was recently upgraded with Intel “Knights Landing” Xeon Phi processors, which propelled it from 8.10 petaflops six months ago to 14.14 petaflops.

The Trinity Supercomputer Phase II project was completed during the summer of 2017, and the computer became fully operational during an unclassified “open science” run; it has now transitioned to classified mode. Trinity is designed to provide increased computational capability for the National Nuclear Security Agency in support of increasing geometric and physics fidelities in nuclear weapons simulation codes, while maintaining expectations for total time to solution.

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Trinity Supercomputer now fully operational

The capabilities of Trinity are required for supporting the NNSA Stockpile Stewardship program’s certification and assessments to ensure that the nation’s nuclear stockpile is safe, secure and effective.

The Trinity project is managed and operated by Los Alamos National Laboratory and Sandia National Laboratories under the Alliance for Computing at Extreme Scale (ACES) partnership. The system is located at the Nicholas Metropolis Center for Modeling and Simulation at Los Alamos and covers approximately 5,200 square feet of floor space.

About the TOP500

The TOP500 approach does not define “supercomputer” as such, but uses a benchmark to rank systems and to decide on whether or not they qualify for the TOP500 list. The benchmark they use is Linpack, which means that systems are ranked only by their ability to solve a set of linear equations. Therefore, any supercomputer – no matter what its architecture is – can make it into the TOP500 list, as long as it is able to solve a set of linear equations using floating point arithmetic.

About the HPCG project

The High Performance Conjugate Gradients Benchmark project is an effort to create a new metric for ranking HPC systems; HPCG is intended as a complement to the High Performance LINPACK (HPL) benchmark, currently used to rank the TOP500 computing systems. The computational and data access patterns of HPL are still representative of some important scalable applications, but not all. The HPCG benchmark is designed to exercise computational and data access patterns that more

closely match a different and broad set of important applications, and to give incentive to computer system designers to invest in capabilities that will have impact on the collective performance of these applications.