

GENCI's new 147 TF SGI / Intel processor based supercomputer boost CERFACS researchers study on large scale LES CFD simulations

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GENCI (Grand Equipement National de Calcul Intensif), the French national high-performance computing (HPC) agency, is expanding France's computing and storage capabilities with solutions from SGI. The new supercomputer called Jade has been installed during this summer at CINES, France's National Computer Center for Higher Education and Research in Montpellier. This SGI system ranked #14 in the latest top500 (and #2 in Europe) will be used by French researchers in areas ranging from climatology and sustainable development to space and aeronautical research, energy, and life and materials sciences.

GENCI purchased for CINES an SGI Altix ICE 8200 system capable of operating at 147 trillion operations per second, or Teraflops with 3,057 Quad Core Intel® Xeon® processors for a total of 12,288 processor cores. The new HPC deployment features close to 50 Terabytes (TB) of distributed memory and half a Petabyte of attached storage (via a 500TB SGI InfiniteStorage system).

During the installation phase a set of Grand Challenges coming from various scientific domains has been conducted in order to validate the system in operations and to allow researchers to achieve major scientific advances.

In Computational Fluid Dynamics (CFD) the AVBP code developed by CERFACS has been selected for a Grand Challenge in the domain of large eddy simulations (LES) applied to gas turbines for predicting thermo-dynamics instabilities and to piston engines for studying combustion cyclic variability.

AVBP has been also selected on the extended list of PRACE (Partnership for Advanced Computing in Europe) applications, works on AVBP profiling and application requirement performance have also been conducted during the summer by CINES and CERFACS on this system.

“The new SGI Altix ICE 8200 system from GENCI allowed CERFACS to perform leadership class calculations tackling new challenges in the domain of engine efficiency for both aeronautical and automobile applications.

It also allowed for a breath taking 96% strong scaling performance on more than 7000 cores for the Large Eddy Simulation code AVBP on this general purpose HPC architecture” said Jean Claude André head of CERFACS.

“We are most satisfied with the results of the Grand Challenges computations conducted this summer on Jade on various scientific domains including plasma fusion, geophysics, biology, astrophysics, climatology and computational fluid dynamics.

This demonstrates that this architecture is ideally suited for tackling the scientific challenges of the French academic and industrial communities. The very high level of parallelism achieved in this CFD simulation shows also great potential for achieving outstanding results on the PRACE European research infrastructure,” says Catherine Riviere GENCI CEO.

"Silicon Graphics is very pleased that the new ALTIX Ice 8200 system that GENCI sponsored has been able to help both CINES and now CERFACS solve problems that are at the leading edge of technology. The scaling and efficiency of our systems running large combustion simulations is clearly at the state of the art,” says Silicon Graphics CEO Robert "Bo" Ewald.

"We are extremely pleased to support French and European research with our latest technologies and thrilled it allows GENCI and CERFACS to address new challenges with their new Intel Quad Core Xeon processor based Jade supercomputer," says Gordon Graylish, Vice President of Intel for Europe, Middle East and Africa.

About CERFACS

CERFACS is a research organization that aims to develop advanced methods for the numerical simulation and the algorithmic solution of large scientific and technological problems of interest for research as well as industry, and that requires access to the most powerful computers presently available.

CERFACS has seven shareholders (CNES, the French Space Agency; EADS France, European Aeronautic and Defense Space Company; EDF, Electricité de France; Météo-France, the French meteorological service; ONERA, the French Aerospace Laboratory; SNECMA, Société Nationale d'Etude et de Construction de Moteurs d'Aviation; and TOTAL).

CERFACS hosts interdisciplinary teams, both for research and advanced training that are comprised of: physicists, applied mathematicians, numerical analysts and software engineers.

Approximately 100 people work at CERFACS, including about 90 researchers and engineers, coming from 10 different countries. They work on specific projects in six main research areas: parallel algorithms, aerodynamics, combustion, climate and environment, data assimilation and electromagnetism.

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About GENCI

GENCI, Grand Equipement National de Calcul Intensif, is a legal entity taking the form of a «société civile» under French law, owned for 50 % by the French State represented by the Ministry for Higher Education and Research, for 20 % by the CEA, 20 % by the CNRS et 10 % by the Universities.

Created in January 2007, GENCI has the following missions: □

- To promote simulation and high performance computing in academic and industrial research; □
- To promote the organisation of a European high performance computing area and to participate in its achievements (GENCI is the French representative in the PRACE project);
- To implement and ensure the coordination of the major equipment of the national HPC centres, by providing financing and by assuming ownership;
- To perform all research work required for the development and optimisation its computing systems;
- To open its equipment to all interested scientific communities, academic or industrial, national, European or international.

For more information:

- About GENCI : contact@genci.fr and www.genci.fr
- About PRACE : Please visit our booth at SC 08 (number 2921)
 - prace-coordinator@fz-juelich.de
 - www.prace-project.eu

About CINES

CINES (National Computer Centre for Higher Education and Research), based in Montpellier, France, provides the scientific community with the powerful means to pursue public research. It is a national public institution under the authority of the Minister of Research.

- CINES offer laboratories the opportunity to exploit their codes on parallel supercomputing computing resources. Many scientific disciplines (such as fluid mechanics, chemistry, materials chemistry, physics, astrophysics, bioinformatics) use the Centre's equipment to solve problems that require extreme computing power and large amounts of memory.. Via its scientific visualization service, CINES offers its users the opportunity to visualize the results of their calculations.
- Through projects driven by the Directorate of Higher Education's Library and Information Science group, CINES helps research bodies and public institutions by offering network-based database support and services.
- In partnership with the Bibliographic Agency for Higher Education (ABES) and other groups, CINES hosts and operates Sudoc, a university documentation system. The center also archives digitized texts, images, and videos, and provides access to them over the Internet.
- CINES is connected to the Internet by RENATER (National Network for Technology, Education and Research) through a 1Gb per second connection. CINES collaborates with IPTF RENATER, which organizes training under CiRen (CINES-RENATER).

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About SGI

SGI (NASDAQ: SGIC) is a leader in high-performance computing. SGI delivers a complete range of high-performance server, storage and visualization solutions along with industry-leading professional services and support that enable its customers to overcome the challenges of complex data-intensive workflows and accelerate breakthrough discoveries, innovation and information transformation.

More information about SGI is available at www.sgi.com

About INTEL

Intel (NASDAQ: INTC), the world leader in silicon innovation develops technologies, products and initiatives to continually advance how people work and live. Additional information about Intel is available at www.intel.com/pressroom and blogs.intel.com.