JÜLICH
FORSCHUNGSZENTRUM

JSCNews
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Centre

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First Petaflop System in Europe: Installation Started

Forschungszentrum Jülich proudly announces the procurement of the first supercomputer in Europe capable of one petaflop or one thousand trillion operations per second. The installation of the IBM Blue Gene/P system has already started and will be completed in the first half of this year.

"Supercomputers of this performance level are universal key technology instruments for solving the most complex and urgent scientific problems in many areas," commented Professor Achim Bachem, Chairman of the Board of Directors of Forschungszentrum Jülich. "Scientists of all disciplines use supercomputers to identify climate change, conduct research about protein folding in cells, discover how semiconductors work or how fuel cells can be improved."

"With speeds of over a petaflop, this new supercomputer provides the processing ability of more than 200,000 standard desktop computers," explained Professor Thomas Lippert, director of the Jülich Supercomputing Centre. "In addition to raw power, this new system will be among the most energy-efficient in the world."

This new system will help to ensure that Forschungszentrum Jülich continues to play a leading role in the global high-performance computing research community. It is the first German supercomputer system that was selected and purchased in the context of the Gauss Centre for Supercomputing (GCS) and is funded by the German Federal Ministry of Education and Research (BMBF) and the Ministry for Innovation of North Rhine-Westphalia.

The system is an extension of the existing JUGENE machine and will have the following physical characteristics:

Type:	IBM Blue Gene/P 72 racks
Peak performance:	1 petaflop/s
Processors:	294,912 (PowerPC at 850 MHz)
Compute node:	4-way SMP (2 GB memory)
Processor memory:	144 TB
Network latency:	160 ns
Disk capacity:	5 PB
Energy consumption:	2.5 MW

Currently, it is planned to enter production mode with the full system at the end of June 2009. With this computer Forschungszentrum Jülich will keep its European pole position in the Top 500 list of supercomputer sites, a position which it has held since November 2007.
(Contact: Klaus Wolkersdorfer, ext. 6579)

Guest Student Programme 2009

During summer 2009, JSC once again has a guest student programme. As part of this programme, students from the natural and engineering sciences, computer science or mathematics will have the opportunity to familiarize themselves with different aspects of scientific computing. Together with JSC scientists, the participants will work on various topics of current interest in research and development.

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Depending on the participants' previous knowledge and present interests, the projects can be chosen from different areas: mathematics, physics, chemistry, software development tools, visualization, grid computing, operating systems and communication systems with a special emphasis on the use of supercomputers.

The programme will last ten weeks and will take place from 3 August to 9 October 2009. Students with knowledge and experience in the computer-oriented branches of their subjects are encouraged to apply. The participants must either have passed their intermediate diploma or have a bachelor's degree. They must not have already completed a diploma or master's degree. Additionally, a letter of recommendation from a university lecturer or professor is required. Candidates should apply for the programme in writing. The closing date for applications is 30 April 2009. Further information can be found on the web at
http://www.fz-juelich.de/jsc/gaststudenten/.
(Contact: Robert Speck, ext. 8715)

SILC Project Started in January

The SILC project (scalable infrastructure for the automatic performance analysis of parallel codes), funded under the BMBF call "HPC-Software für skalierbare Parallelrechner", will reinforce JSC performance analysis activities centring on Scalasca during the next three years. The project aims to design and implement a common scalable performance measurement infrastructure for the tools Periscope, Scalasca, and Vampir, preparing these tools for the upcoming peta-scale era. Project partners are TU Dresden (coordinator), RWTH Aachen University, TU Munich, GNS mbH, the latter is a private company that specializes in services such as mesh generation for complex structures and finite element analyses, and – as an associate partner – GWT-TUD GmbH. Besides tuning applications from the Gauss Alliance, the extended tool suite will be employed to optimize the metal-forming simulation code INDEED from GNS.
(Contact: Prof. Dr. Felix Wolf, ext. 1583)

Kickoff Meeting of ScaFaCoS

The joint project ScaFaCoS (Scalable Fast Coulomb Solver), coordinated by JSC, organized its kickoff meeting for a successful project start. Within the project, – also funded by BMBF under the call "HPC-Software für skalierbare Parallelrechner" until December 2011 – physics, mathematics and computer science groups of the German universities of Bonn, Chemnitz, Stuttgart, Wuppertal, and the research institutions SCAI at St. Augustin and Max Planck Institute in Mainz, as well as the industrial partners BASF, Cognis and IBM, are working together to develop a highly scalable parallel library of fast solvers for Coulomb problems. Methods like the fast multipole method, Barnes-Hut tree method, particle-mesh Ewald methods or multigrid methods will be efficiently parallelized and optimized to scale up to thousands of processors. A first implementation of a multigrid method, developed at JSC, proved able to scale up to the current BlueGene/P capacity, i.e. 65536 compute cores. The resulting OpenSource library will be made available to users of parallel computers to solve electrostatic or gravitational problems most efficiently.
(Contact: Dr. Godehard Sutmann, ext. 6746)

New Infrastructure for the Machine Room

Signs of future developments: Those of you who take a look at our machine room will see a lot of busy reconstruction work inside and outside. When the room was planned in 2002, it was designed for air-cooled computers with a total energy consumption of 1.6 MW. The new supercomputers JUROPA-JSC and HPC-FF will be water-cooled, and also the cooling technology of JUGENE is being changed from air to water cooling. Furthermore, the total energy consumption of all the new computers will be 5.3 MW.

Therefore, great efforts are being made to upgrade the connection to the water mains and to extend the electrical power systems. The water pipes that will pump cold water at 6 °C to the building from the central cold water supply in a closed loop have already been laid underground. Three water circuits in the basement will provide cold water at three different inlet temperatures, one for each supercomputer. A new transformer house with six transformers has been set up close to the machine room and the connecting cables buried. New power distribution panels with more than 1200 fuses have been installed. It is estimated that about 50 km of new cables will be needed from the power substation to the supercomputers. The storage system JUST has already been shifted and has found a new site in the centre of the machine room. Next, 780 cut-outs will be made in the floor for pipes and cables. The room therefore looks different every day.

Up to now, everything has been going according to plan. Keep your fingers crossed that the installation of the infrastructure and the supercomputers will continue to make good progress.

Events

UNICORE and Supercomputing Workshop 2009
Date: 18 March 2009
Venue: Deutscher Wetterdienst DWD, Offenbach
Application: *http://www.unicore.eu/events/supercomputing-workshop-2009/*

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