JSC at SC09 in Portland

Supercomputing 2009, the premier international conference on high-performance computing and networking, took place in Portland, Oregon, from 14 - 20 November 2009. Attendance at this year's event was actually 10% higher than last year's record. JSC participated at the conference for the eleventh time in succession.

The new TOP500 list issued during SC09 again ranked Jülich's petaflop supercomputer JUGENE first in Europe and fourth worldwide. Jülich's general purpose supercomputer JUROPA is ranked third in Europe and thirteenth worldwide.

With a low acceptance rate of 22%, there was strong competition for technical papers. However, all three papers submitted by JSC members were accepted for session talks. In addition, several JSC members contributed actively to the conference's programme, to tutorials and special interest meetings. In particular, Bernd Mohr was a member of the organizing committee and also acted as SC09 Panel Chair as well as SC Ambassador for Europe.

JSC highlighted its role as one of the leading European high-performance computing centres in the exhibition, where a record 123 research institutions and 195 hardware and software companies were represented. At its booth, JSC presented its broad spectrum of activities in the form of displays, movies, animated presentations, live talks, and individual consultations.

Particular emphasis was placed on JSC's community-oriented approach to support for scientific computing, the demonstration of tools developed by JSC for the performance analysis of parallel programs, and the Grid activities. The two latter topics were also presented – together with collaboration partners – in live talk sessions. Furthermore, the JSC booth was host to the German Research School for Simulation Sciences, which took the opportunity to enhance its visibility and attract new students for its master's and doctoral programmes. Finally, the JSC booth also hosted the QPACE project which showcased its Cell-based hardware in live talks and displays. Together with CSC (Finland), JSC also organized the PRACE/DEISA booth.

Further information is available at:
http://www.fz-juelich.de/jsc/news/sc09/
(Contact: Dr. Walter Nadler, ext. 2324).

QPACE – the Most Energy-Efficient Supercomputer Today

QPACE (Quantum Chromodynamics Parallel Computing on the Cell) is a massively parallel and scalable computer architecture optimized for lattice quantum chromodynamics (LQCD). It has been developed in cooperation between several academic institutions (SFB TR 55 under the leadership of the University of Regensburg) and the IBM development laboratory in Böblingen, Germany.

At JSC, a 4-rack QPACE system is installed. The building block is a node card comprising an IBM PowerXCell 8i processor and a custom FPGA-based network processor. 32 node cards are mounted on

a single backplane and eight backplanes are arranged inside one rack, hosting a total of 256 node cards. The closed node card housing, which is connected to a liquid-cooled cold plate, acts as a heat conductor thus making QPACE a highly energy-efficient system. An upper limit for power consumption is about 115 W per node card. To remove the generated heat a cost-efficient liquid cooling system has been developed, which enables high packaging densities. The maximum power consumption of one QPACE rack is about 32 kW.

An efficient implementation of MPI functions for message passing between compute nodes has been developed at JSC in cooperation with IBM in order to extend the range of applications for QPACE beyond LQCD. In particular, the high-performance LINPACK (HPL) benchmark produced excellent results (43.01 Tflop/s on 512 nodes). The 4-rack system in Jülich therefore corresponds to an aggregate peak performance of more than 100 Tflop/s; a similar system is currently running at the University of Wuppertal.

At SC09, QPACE was recognized as the most energy-efficient supercomputer worldwide and is listed top of the Green500 list, see: *http://www.green500.org*.
(Contact: Willi Homberg, ext. 2424)

10th JSC Guest Student Programme

In summer 2009, JSC once again held its traditional 10-week guest student programme. As part of this programme, nine students had the opportunity to familiarize themselves with different aspects of scientific computing. Supervised mainly by JSC staff members, the participants worked on various topics in computational science including mathematics, physics, chemistry, and software development tools. Special emphasis was placed on the use of the newly installed JUGENE and JUROPA supercomputers at JSC, additionally enhancing the attractiveness of the programme this year.

This is now the 10th year running that promising young scientists from European universities have had the chance to participate in ongoing research in scientific computing. A recent survey highlighted the mutual benefits of this programme: professors and participating students alike reported a positive impact on their academic research, while JSC scientists also profit from new insights and collaborations. The results of each project were collected and will be published in a JSC report, which will be also available online at: *http://www.fz-juelich.de/jsc/gsp/*.

JSC would like to thank the Verein der Freunde und Förderer des Forschungszentrums Jülich and IBM for providing financial support. The programme will continue in summer 2010.
(Contact: Robert Speck, ext. 8715).

Awards for Bachelor's and Master's Students

On 27 November 2009, four students from Forschungszentrum Jülich received an award from Aachen University of Applied Sciences (FH Aachen). In a ceremony at Aachen's historical town hall, Prof. Baumann, rector of FH Aachen, honoured Sandra Bergmann, Lukas Breuer and Martin Schober as the best graduates of the bachelor's course Scientific Programming, and Sandra Wienke as the best graduate of the master's course Technomathematics. Sandra Wienke is the first award winner on the new master's course, which has been run jointly by FH Aachen and Forschungszentrum Jülich since 2007.
(Contact: Prof. Dr. Johannes Grotendorst, ext. 6585)

End of Year Colloquium 2009

09:00 Thomas Lippert: Begrüßung
09:15 Wolfgang Gürich: Die vier Elemente zum Supercomputing
09:45 Jutta Docter: JUGENE – die Kunst des Flöhehütens
10:45 Olaf Mextorf, Ulrike Schmidt: Ein Netz für Petaflops und Petabytes
11:30 Ulrich Detert: JUROPA für Europa
12:00 Norbert Eicker: Skalierung von JUROPA
13:45 Wolfgang Frings, Godehard Sutmann: SION und NOIS(E) – zwei Seiten der Skalierbarkeit
14:30 Sebastian Rinke: QPACE – energieeffizientes High Performance Computing
15:00 Thomas Eickermann: Vom PP zum IP – PRACE verpuppt sich
15:30 Thomas Lippert: 10 hoch 18

The talks will be given in German.
Date: Thursday, 17 December 2009, 9:00 - 16:00 h
Venue: Hörsaal, JSC
Programme: *http://www.fz-juelich.de/jsc/events/eyc-2009*

Events

Einführung in die parallele Programmierung mit MPI und OpenMP
Speakers: Marc-Andre Hermanns, Wolfgang Frings, JSC
Date: 11 - 13 January 2010, 8:30 - 18:00
Venue: Ausbildungsraum 1, Jülich Supercomputing Centre
Registration: This course is fully booked.

If you would like to receive regular information on our events, please send an e-mail to *jsc-events-join@fz-juelich.de*.

Further events, talks, and training courses:
JSC: *http://www.fz-juelich.de/jsc/news/calendar*