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ITEA Gold Award for ParMA

JSC is happy to announce that the European ITEA2 research project ParMA (Parallel Programming for Multicore Architectures) received the "ITEA Achievement Award 2010 in Gold". With this award, ITEA rewards high-level technical contributions based on European collaborations providing significant results while promoting ITEA and its aims. The ITEA2 Board was impressed by the innovation and fast exploitation in ParMA which developed advanced technologies to exploit multicore architectures for high-performance computing. An important contribution to the project was the UNITE development tool package designed and implemented by JSC which includes a full set of interoperable tools for advanced debugging and performance analysis including the JSC tool Scalasca.
(Contact: Dr. Bernd Mohr, ext. 3218)

The LinkSCEEM-2 Project

Since 2007, JSC has provided increasing support for the establishment of a high-performance computing ecosystem in the Eastern Mediterranean region. These activities are coordinated by the Computation-based Science and Technology Research Center (CaSToRC) of the Cyprus Institute in Nicosia. They are co-funded by the recently launched EU FP7 research infrastructure project LinkSCEEM-2 (Linking Scientific Computing in Europe and the Eastern Mediterranean – Implementation Phase) for four years. The project's mission is to enable computational scientific research by engaging and supporting research communities in the fields of climate change, digital cultural heritage and synchrotron applications. Thus, it will provide user support and training, targeted networking activities, and develop and implement a well-structured, high-performance computing resource allocation mechanism. JSC, a major partner in LinkSCEEM-2 together with NCSA (Urbana-Champaign, USA), will provide its expertise in peer review processes, user support and PRACE practices, and will contribute to the training and research activities.
(Contact: Dr. Norbert Attig, ext. 4416)

Leaky Light Sail Route to High-Quality Proton Beams

High-power lasers can produce electric fields one million times stronger than in conventional accelerator structures, such as the LHC, and could soon lead to compact GeV particle sources, which can fit into a university lab or hospital facility. A recent theoretical breakthrough in laser-based ion acceleration has been made by Dr. Bin Qiao, a Humboldt Scholar at JSC over the past year. During his stay, he studied a form of radiation pressure acceleration, in which a short, circularly polarized laser pulse is used to accelerate a nanometre-thick foil close to the speed of light. Using an extensive series of high-resolution particle-in-cell simulations on JUROPA, Dr. Qiao was able to demonstrate the feasibility of a new variation of this scheme – the 'Leaky Light Sail' – which is capable of producing stable

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100 MeV proton beams with lasers 100 times less powerful than previously thought necessary. Further reading:
http://prl.aps.org/abstract/PRL/v105/i15/e155002
(Contact: Dr. Paul Gibbon, ext. 1499)

PRACE Awards New Research Projects

Since 1 August 2010, PRACE has been providing supercomputer resources on the highest level (Tier-0) to European researchers. Jülich is dedicating a 35% share of the IBM Blue Gene/P system JUGENE to PRACE.

The first regular allocation period started on 1 November 2010. The comparative international peer reviewing process was headed by Prof. Richard Kenway, EPCC. After scientific evaluation and prioritization, nine of the 59 proposals were accepted in this highly competitive process: Two each from Germany and Spain, and one each from France, Hungary, the Netherlands, Portugal, and the United Kingdom. These projects, four from the field of Engineering and Energy, three from Fundamental Physics, and one each from the fields of Chemistry and Materials and from Medicine and Life Sciences, were awarded a total of about 360 million compute core hours. More details on these projects can be found at the PRACE homepage:
http://www.prace-project.eu/hpc-access/page-11/.
(Contact: Dr. Walter Nadler, ext. 2324)

Next PRACE Call

The next PRACE call for Tier-0 computing time grants was issued on 1 November 2010 with a deadline of 11 January 2011. It offers, in addition to the 360 million compute core hours on JUGENE, 40 million compute core hours on Curie, the new cluster from Bull funded by GENCI and hosted by CEA. Allocations will be for one year starting from 1 May 2011. For details see:
http://www.prace-project.eu/hpc-access
(Contact: Dr. Walter Nadler, ext. 2324)

SmartLM Final Review

The final review of the SmartLM project took place on 17 September 2010 in Santiago de Compostela, Spain. The project dealt with intelligent licence management for location-independent application execution.

One of the drawbacks in contemporary licenced applications is the tight coupling of the right of execution to local domains or even specific physical nodes. SmartLM allows the flexible use of licences not only at the local site, but also in distributed Grid and Cloud environments. Licences are bound to the actual execution of a job, that can potentially run anywhere. The job is executed without needing an online connection to a licence server with free licences, which is another limitation of current licence mechanisms. Independent software vendors participated in the project and aided in developing new business models along with the technical solution, because the provision of such flexible licencing mechanisms requires support in licence contracts.

Demonstrations of the SmartLM solution were given during the review, showing that users can execute applications of the participating software vendors on different compute sites in Europe using the UNICORE Grid middleware.

The project outcome is a product supported by three of the project partners, which is expected to be marketed next year.
(Contact: Björn Hagemeier, ext. 1584)

Breakthrough in Grid Computing: Radio Pulsar Discovered Using D-Grid Clusters

In July, a radio pulsar was discovered in data recorded at the Arecibo Observatory in Puerto Rico by means of the Einstein@Home project. This project is based on distributed computing. About 250,000 voluntary participants from 192 countries contribute to Einstein@Home using their home or office computers. In addition to these private PCs, computations are performed on the compute resources of the German Grid infrastructure D-Grid. The analysis carried out on the D-Grid infrastructure formed the largest contribution to the worldwide analysis. The data analysis of Einstein@Home is the most successful scientific application of D-Grid to date.

The D-Grid compute resources comprise clusters located at about 30 sites with approximately 30,000 CPU cores and 5 PByte of memory. One of the largest clusters in this infrastructure is the JUGGLE cluster at JSC. The main user community on JUGGLE is the D-Grid community "AstroGrid-D", which adapted the Einstein@Home analysis software to Grid usage.
(Contact: Dr. Thomas Fieseler, ext. 1602)

Events

Introduction to the programming and usage of the supercomputer resources in Jülich
Speakers: Representatives of IBM, Intel and ParTec, JSC staff members
Date: 25 - 26 November 2010, starting at 13:00 on 25 November 2010
Venue: Hörsaal, Jülich Supercomputing Centre
Registration: *E.Bielitza@fz-juelich.de*, ext. 5642

Einführung in die parallele Programmierung mit MPI und OpenMP
Speaker: Dr. Rolf Rabenseifner, HLRS Stuttgart
Date: 29 November - 1 December 2010, 8:30 - 18:00
Venue: Ausbildungsraum 1, Jülich Supercomputing Centre
This course is already fully booked.

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