NEWSletter

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PRACE is Ready for the Implementation Phase

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PRACE, the Partnership for Advanced Computing in Europe, prepares the creation of a persistent, sustainable pan-European HPC (High Performance Computing) service. It will deploy several world-class systems at different European sites to enable world-class science. Six PRACE partners have evaluated prototypes of promising architectures from different vendors to port, optimize and petascale key application in preparation for production in 2010.

The work of PRACE, the Partnership for Advanced Computing in Europe, is organised into eight work packages. In this article **Riccardo Murri**, from CSCS - Swiss National Centre for Supercomputing, introduces us to PRACE work package 4 (WP4) the "Distributed system management", which he leads.

Interoperation of the PRACE Infrastructure

Riccardo Murri, what are the most important results from WP4?

"The main task of WP4 has been defining the distributed systems management software and services, i.e., tools for connecting all PRACE systems in a coherent whole, for example, providing uniform interfaces for job submission and data transfer", he explains.

"Another main task for WP4 has been the smooth interoperation of the PRACE infrastructure with the national HPC services. In particular, the WP4 middleware stacks comprises software for remote job submission and control, resource monitoring, and secure access to the PRACE systems. There are also provisions for PRACE-wide management of the user database, and accounting of the computational hours consumed by users on the PRACE prototypes. Since the size of data processed by top HPC users is ever increasing, a service for reliable and unattended transfer of massive amounts of data has also been deployed."

"Care has been taken, to be fully compatible with the software stack currently used in DEISA (Distributed European Infrastructure for Supercomputing Applications), so that users already experienced with the DEISA systems can find a familiar environment in PRACE."

The middleware stack has been defined in a release-based process: the last and final release is currently being deployed on the PRACE prototypes", Murri continues.

Getting ready for Production

PRACE is a preparatory phase project. It commenced in the beginning of 2008 and will finish at the end of this year. After that, PRACE will move on to the implementation phase.

What are the main objectives for WP4 until the end of the PRACE project?

Riccardo Murri from CSCS leads Work Package 4 the "Distributed system management"

"We are currently working on the final deployment and setup of the distributed systems management services, to have them ready for the start of production operations in PRACE", Murri explains.

Has WP4 faced any specific challenges?

"The software stack has the objective of providing seamless access for users to the PRACE infrastructure, yet it should allow users to take advantage of the diversity of PRACE systems: do not make all machines look equal, as they have different characteristics which can be successfully exploited by computational jobs. These are two opposing characteristics that should be carefully balanced. Also, many systems management services have an impact on systems security: discussion on these topics has sometimes been tough, but I think we have learned much from these exchanges", Murri tells.

How has it been to lead this work package?

"It's been a privilege to work with experts from major HPC centres all around Europe. Many colleagues are also working in DEISA and have brought to WP4 the experience of running a production distributed HPC infrastructure: I think we have achieved a good degree of collaboration between two important European HPC projects", Murri concludes.

Contents

More information:

All PRACE newsletters are available on:
www.prace-project.eu/documents

PRACE is Ready for the Next Phase

PRACE is eligible to apply for a grant under the European Union's 7th Framework Programme to start the implementation phase.

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PRACE representatives from 19 European countries met in September 2009 at the Second Industry Seminar in Toulouse, France.

In October 2009 PRACE demonstrated to a panel of external experts and the European Commission that the project made "satisfactory progress in all areas" and "that PRACE has the potential to have real impact on the future of European HPC, and the quality and outcome of European research that depends on HPC services". Two months before the end of the project it met the eligibility to apply for a grant of 20 million Euros for the implementation phase of the permanent PRACE Research Infrastructure.

The future PRACE Research Infrastructure (RI) will consist of several world-class top-tier centers, managed as a single European entity. The infrastructure to be created by PRACE will form the top level of the European HPC ecosystem. It will offer competent support and a spectrum of system architectures to meet the requirements of different scientific domains and applications. It is expected that the PRACE RI will provide European scientists and technologists with world-class leadership supercomputers with capabilities equal to or better than those available in the USA, Japan, China, India and elsewhere in the world, in order to stay at the forefront of research.

PRACE Prototype the Greenest Supercomputer on Earth

eQPACE, one of the advanced prototypes evaluated by PRACE, ranked at number 1 on the new Green500 list published at the Supercomputing09 conference in Portland, OR.

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The new Green500 list was published during the Supercomputing09 conference.

The purpose of the Green500 list is to provide a ranking of the most energy-efficient supercomputers in the world and serves as a complementary view to the conventional Top500 list.

eQPACE is a power efficient special-purpose architecture for lattice Quantum Chromodynamics (QCD) that has been developed in a collaborative effort between several academic institutions and the IBM development laboratory in Böblingen, Germany. The eQPACE prototype rack is embedded in a 4-rack system situated at Forschungszentrum Jülich, Germany. The new architecture features 25.6 TFlop/s peak performance per rack and is based on IBM PowerXCell 8i processors and a custom 3d-torus interconnect implemented within FPGAs supporting presently only nearest-neighbor communication. One of the main goals of the prototype is to extend the concept to general all-to-all communication.

The prototype is one of the PRACE prototypes dedicated to evaluate promising technologies for future Petaflop/s systems beyond 2010.

The Green500 list raises awareness to other performance metrics of interest, e.g., performance per watt and energy efficiency for improved reliability contrary to the conventional Top500 list which is focused on speed (as measured in flop/s, short for floating-point operations per second).

More information:

www.prace-project.eu, www.green500.org

Italy became a PRACE Principal Partner

PRACE got a new Principal Partner in its recent meeting as Italy became one of the PRACE Principal Partners. The representative PRACE partner site from Italy is CINECA (Consorzio Interuniversitario).

PRACE prepares the creation of a persistent pan-European HPC service, consisting of several Tier-0 centres providing European researchers with access to capability computers and forming the top level of the European HPC ecosystem. PRACE Principal Partners are those PRACE partners which are willing to host and fund one of the Tier-0 centres.

"CINECA is very proud to announce that Italy has confirmed willingness to play an important role in European scenario of computational sciences. The participation of CINECA to the PRACE Principal Partners, under the sponsorship of the Italian Ministry of Research, represents a great opportunity to maintain and promote CINECA as one of the major supercomputing centers available in Europe. CINECA is highly interested in the objectives of PRACE and strongly wants to collaborate with the other high performance centers involved in PRACE to reach important goals at European level", said **Sanzio Bassini**, Director of Systems and Technologies Department at CINECA.

The six current Principal Partners are: Germany (project coordinator), France, Italy, The Netherlands, Spain and the UK.

Currently PRACE has a total of 20 partners consisting of Principal Partners, General Partners and Additional Partners of the PRACE Initiative.

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Sanzio Bassini, Director of Systems and Technologies Department at CINECA

PRACE at SC09

PRACE had joint booth with DEISA (Distributed European Infrastructure for Supercomputing Applications) at SC09 in Portland, Oregon in November 2009.

PRACE also arranged a Birds-of-a-Feather (BoF) session "European HPC and Grid Infrastructures" together with DEISA and EGI.

eQPACE's (a PRACE prototype) number one ranking on the Green500 list was also taken into account at the PRACE booth.

Also, the PRACE treasure hunt was a success for second year in a row. PRACE is looking forward to SC10.

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PRACE booth at SC09 was arranged this year jointly with DEISA.

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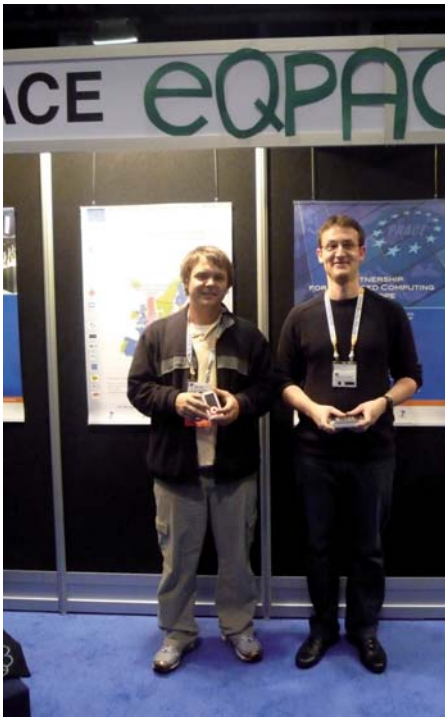

PRACE arranged a treasure hunt at SC09. The lucky winners: Christof Klausecker (1st price, right) and Michael Wleklinski (2nd price, left) received an iPod Touch and an iPod Nano.

More pictures:
www.prace-project.eu

PRACE Award 2010: Call for Papers has Started

The call for papers for the PRACE Award 2009 has begun. It will be the third time the PRACE Award will be presented at the ISC (International Supercomputing Conference) Opening Session.

PRACE will award a prize to the best scientific paper by a European student or young scientist in one of the following areas:

- Algorithms or implementations that can expose scalability on many thousands of processors
- A breakthrough in science achieved with massively parallel high performance or hybrid computing resources
- Novel approaches to evaluate the performance of applications on massively parallel or hybrid architectures

The winner chosen by the ISC Award Committee will receive a PRACE sponsorship for the participation in a training event or a conference relevant to petascale computing.

The author of the PRACE Award winning paper will have the opportunity to give a keynote talk on the work during the ISC'10 Scientific Sessions on Monday, May 31, 2010.

Full papers of not more than eight pages should be submitted to submit.paper(at)supercomp.de by January 11, 2010. Papers are accepted only in pdf format, and the language has to be English.

Please indicate in your accompanying email the name and address of the corresponding author and the topic area (also please mention that you wish for your paper to be considered for the PRACE Award).

Papers will be peer-reviewed by three reviewers and will be evaluated based on their novelty, fundamental insights and potential for long-term contribution. By submitting a paper, you agree to present the paper at ISC'10 in Hamburg, Germany; presenters need to be registered ISC'10 participants.

More information:

http://www.supercomp.de/isc10/Participate/Call-for-Papers

Principal Partners

- France: GENCI – Grand Equipement National de Calcul Intensif www.genci.fr
- Germany: GCS – GAUSS Centre for Supercomputing www.gauss-centre.de
- Italy: CINECA – Consorzio Interuniversitario www.cineca.it
- The Netherlands: NCF – Netherlands Computing Facilities Foundation www.nwo.nl/ncf
- Spain: BSC – Barcelona Supercomputing Center – Centro Nacional de Supercomputación www.bsc.es
- UK: EPSRC – Engineering and Physical Sciences Research Council www.epsrc.ac.uk

General Partners

- Austria: GUP – Institut für Graphische und Parallele Datenverarbeitung der Johannes Kepler Universität www.gup.uni-linz.ac.at
- Finland: CSC – IT Center for Science Ltd. www.csc.fi
- Greece: GRNET – Greek Research and Technology Network www.grnet.gr
- Norway: UNINETT Sigma AS – UNINETT Sigma AS – The Norwegian Metacenter for Computational Science sigma.uninett.no
- Poland: PSNC – Poznan Supercomputing and Networking Center www.psnc.pl
- Portugal: FCTUC – Faculdade Ciencias e Tecnologia da Universidade de Coimbra www.fct.uc.pt
- Sweden: SNIC – Swedish National Infrastructure for Computing www.snic.vr.se
- Switzerland: ETH Zurich / CSCS – Swiss Federal Institute of Technology Zurich / Swiss National Supercomputing Centre www.ethz.ch / www.cscs.ch

Additional General Partners of the PRACE Initiative

- Bulgaria: BGSC – Bulgarian National Supercomputing Centre www.bgsc.acad.bg
- Czech Republic: VŠB – Technical University of Ostrava www.vsb.cz
- Cyprus: CSTRC – The Computation-based Science and Research Center cstrc.cyi.ac.cy
- Ireland: ICHEC – Irish Centre for High-End Computing www.ichec.ie
- Serbia: IP – The Institute of Physics, Belgrade www.phy.bg.ac.yu
- Turkey: UYBHM – National Center for High Performance Computing – Ulusal Yuksek Basarimli Hesaplama Merkezi www.uybhm.itu.edu.tr

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