Partnership for Advanced Computing in Europe
PRACE, the Partnership for Advanced Computing in Europe, is building a persistent pan-European Research Infrastructure (RI) for providing leading High Performance Computing (HPC) services. This infrastructure will enable world-class science and engineering for European academia and industry. The PRACE RI is built and operated in collaboration with national and regional HPC centers and governed by representatives of partner governments. Access to the PRACE RI is open to all European researchers affiliated with recognized European academic institutions and industries. Project proposals are selected by a Scientific Steering Committee of European leading scientists and engineers.

www.prace-ri.eu
The PRACE RI

- The PRACE RI is governed by an international non-profit association with its seat in Brussels.

- Twenty countries are presently members of the association ‘Partnership for Advanced Computing in Europe AISBL’.

- PRACE is building a pan-European HPC service with world class systems (Tier-0) well integrated into the European HPC ecosystem.

- Initial PRACE RI systems have a capability to carry out computations at a rate of one or more Petaflops/s (one quadrillion operations per second). To keep pace with the needs of the user communities and technical developments, systems within the PRACE RI are expected to reach capabilities of at least one Exaflops/s (one quintillion) in less than a decade.

- Presently, PRACE has two Tier-0 systems: The 1 Petaflop/s IBM BlueGene/P (JUGENE) of the Gauss Center for Supercomputing hosted by FZJ, Jülich, Germany. The 1.6 Petaflop/s Bull Bullx cluster (CURIE), funded by GENCI and installed at CEA, Bruyères-le-Châtel, France is installed in two phases and will reach its full performance in the second half of 2011. PRACE has announced the third Tier-0 system, a 3 Petaflop/s IBM (SuperMUC) at LRZ which will be available for European scientists starting in mid 2012. This system is funded jointly by the State of Bavaria and Germany. Find more information about applying for resources at: www.prace-ri.eu/hpc-access

- Access for European researchers and their collaborators is determined based on proposals submitted in response to Calls for Proposals. These are issued twice a year and are evaluated by leading scientists and engineers in a peer-review process governed by a PRACE Scientific Steering Committee.

- PRACE has an extensive education and training effort for effective use of the RI through seasonal schools, workshops and scientific and industrial seminars throughout Europe. Education and training material and documents related to the RI are available on the PRACE website as is schedule of events.

Achievements of the preceding PRACE preparatory phase project

- Agreements from 20 partner governments to establish and sustain a pan-European Research Infrastructure for world class computational and data resources and services.

- Establishment of an international association for governing the RI and its operation and a Council of representatives of partner governments to govern the association.

- Establishment of a peer-review process for RI access proposals governed by a Scientific Steering Committee.

- Secured funding for the RI and its operations of 400 million Euros from four partner governments (France, Germany, Italy and Spain) through 2014. Significant additional commitments are expected by other partner governments. In addition, the European Commission is planning to support the RI and its successful use with 70 million Euros of funding.

- Analysed, ported, and scaled key scientific applications.

- Assessed hardware and software components for future multi-Petaflop/s systems.

- Carried out education and training events through Europe.

- Created a benchmark suite with the following 22 scientific applications:
  
  - QCD, particle physics
  - Quantum Espresso, computational chemistry
  - NAMD, computational chemistry
  - CPMD, computational chemistry
  - Code_Saturne, computational fluid dynamics
  - GADGET, astronomy and cosmology
  - TORB/EUTERPE, plasma physics
  - WRF, atmospheric modelling
  - NEMO, ocean modelling
  - CP2K, computational chemistry
  - GROMACS, computational chemistry
  - NS3D, computational fluid dynamics
  - AVBP, computational fluid dynamics
  - HELIUM, computational physics
  - TRIPOLI-4, computational engineering
  - PEPC, plasma physics
  - GPAW, computational chemistry
  - ALYA, computational mechanics
  - OCTOPUS, computational chemistry
  - BSIT, computational geophysics
  - ELMER, computational engineering
  - SPECFEM3D, computational geophysics

- STRATOS, the PRACE advisory group on Strategic Technologies, was created to foster collaboration with industry on hardware and software components for future multi-Petaflop/s systems.

- European Commission complements the funding for PRACE with up to 70 million Euros. Part of the EC funds are intended for the PRACE First Implementation Phase project, PRACE-1IP to accelerate the implementation of the PRACE RI.

PRACE-1IP facts

- Project started on July 1, 2010

- Duration: two years

- Budget 28M € with 20M € EC contribution

- All twenty members of the RI partner in the project
Members of the Partnership for Advanced Computing in Europe AISBL (PRACE)

Austria: JKU – Universität Linz, Datenverarbeitung der Johannes Kepler Universität
www.gup.uni-linz.ac.at

Bulgaria: NCSA – Executive agency
“Electronic communication networks and information systems”
www.bgsc.acad.bg

Cyprus: CaSToRC – Computation-based Science and Technology Research Center, The Cyprus Institute
http://castorc.cyi.ac.cy

Czech Republic: VŠB – Technical University of Ostrava
http://en.vsb.cz

Finland: CSC – IT Center for Science Ltd.
www.csc.fi

France: GÉNIE – Grand Equipement National de Calcul Intensif
www.genci.fr

Germany: GCS – GAUSS Centre for Supercomputing e.V.
www.gauss-centre.de

Greece: GRNET – Greek Research and Technology Network S.A.
www.grnet.gr

Ireland: ICHEC – Irish Centre for High-End Computing
www.ichec.ie

Italy: CINECA – Consorzio Interuniversitario
www.cineca.it

The Netherlands: NCF – Stichting Nationale Computerfaciliteiten – Netherlands Computing Facilities Foundation
www.nwo.nl/ncf

Norway: SIGMA – UNINETT Sigma AS – The Norwegian Metacenter for Computational Science
http://sigma.uninett.no

Poland: PSNC – Instytut Chemii Bioorganicznej Pan – Institute of Bioorganic Chemistry – Poznan Supercomputing and Networking Center
www.psnc.pl

Portugal: FCTUC – Faculdade Ciencias e Tecnologia da Universidade de Coimbra
www.fct.uc.pt

Serbia: IPB – Institute of Physics Belgrade
www.ipb.ac.rs

Spain: BSC – Barcelona Supercomputing Center – Centro Nacional de Supercomputación
www.bsc.es

Switzerland: ETH – Eidgenössische Technische Hochschule Zürich – Swiss Federal Institute of Technology, Zürich
www.cscs.ch

Sweden: SNIC – Vetenskapsradet – Swedish Research Council
www.snic.nr.se

Turkey: UYBHM – Ulusal Yüksek Başarım Hesaplama Merkezi, Istanbul Technical University – National Center for High Performance Computing
www.uybhm.itu.edu.tr

UK: EPSRC – The Engineering and Physical Sciences Research Council
www.epsrc.ac.uk

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