Press release: First candidate applications to use PRACE Petaflop/s systems
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First Candidate Applications for PRACE Petaflop/s Systems Identified

PRACE, Partnership for Advanced Computing in Europe, has recently conducted a major survey of the utilisation of HPC (High Performance Computing) resources across Europe. The objective of the survey was to understand the existing key applications in Europe and to identify likely applications that may be used on future Petaflop/s systems.

The survey data was used to produce an overall utilisation matrix characterised by scientific area and algorithm. The result of this is a core list of nine applications which are representative of the overall utilisation matrix, plus a set of ten possible extensions.

The surveyed scientific areas were based on the existing DEISA benchmark list (http://www.deisa.eu/science/benchmarking) and were: Astronomy and Cosmology, Computational Chemistry, Computational Engineering, Computational Fluid Dynamics, Condensed Matter Physics, Earth and Climate Science, Life Science, Particle Physics, and Plasma Physics.

Particle physics may well be the main scientific area on a future Petaflop/s system, alongside materials science and computational chemistry. Programming multi-core architectures is seen as a major challenge alongside parallel I/O and techniques for scaling applications to thousands of cores.

The survey was conducted in 14 PRACE partner sites from 12 countries. It covered the major HPC systems and their key applications. Each partner was asked to complete an applications survey for each application on their system that accounted for more than 5 per cent of the utilisation, and optionally for any other application which was considered to be particularly important for the future. The outcome was over 100 surveys collected from 24 systems. These represented almost 70 applications.

This survey represents one of the best snapshots of European HPC utilisation ever produced, and could be an invaluable basis to predict the likely utilisation of future European Petaflop/s systems. The results are being used to guide the selection of applications for inclusion in the representative PRACE benchmark suite.

More information: This survey was a key part of PRACE work package 6, which is led by EPCC at the University of Edinburgh. This work package is focused on applications software for future Petaflop/s systems. The survey contributors Dr Alan. D. Simpson (a.simpson@epcc.ed.ac.uk), Dr Mark Bull (m.bull@epcc.ed.ac.uk) and Dr Jon Hill (j.hill@epcc.ed.ac.uk) are able to give further information about the survey on request. The deliverable will be on the PRACE website when it becomes public.

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About PRACE: The Partnership for Advanced Computing in Europe (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 is a project funded in part by the EU's 7th Framework Programme. The PRACE project receives funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° RI-211528.

Notes for editors: In scientific computing flop/s is an acronym meaning FLoating point OPerations per Second. The flop/s is a measure of a computer's performance. One Petaflop/s means computer performance of 10^15 flops.

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