Press release: Architectures of future PRACE Petascale systems are taking shape
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PRACE is working towards a pan-European HPC infrastructure with a number of tier-0 Petascale systems, running from 2010 onwards and providing the computational resources for the major challenges for computational scientists.

An important step towards that goal is the definition of the main macro characteristics of the systems to be installed in 2009/2010, in order to achieve the performance required from grand challenge computational applications. This has now been done by mapping user requirements derived from computational application classes to architecture specifications.

The user requirements were derived from fourteen applications from the DEISA benchmark suite that have been analysed initially at an earlier stage of the PRACE project. Computational disciplines use traditionally specific and representative application codes that are well known to the scientific communities. These applications have specific requirements in terms of architectures to meet the needs of European scientists.

The user requirements were analysed and different architectures were characterised in order to obtain a mapping between the user requirements and the architectural classes.

The characterised architectures were: MPP (Massively Parallel Processing (or Processor)), thin-node systems, fat-node systems, vector and hybrid systems.

Hybrid systems are a quite new approach compared to other type of technologies and it is not surprising that the considered applications are not prepared for their immediate exploitation. However as PRACE is also looking into potential future types of architectures they should not be discarded.

Vector and fat-node architectures are suitable for several application codes, but two categories, MPP and thin-node systems, were clear priorities for the selection of prototypes to be procured by PRACE by mid-2008.

The analysis of applications shows that there is no single architecture that is perfectly suited for all classes of applications. These results must be seen as preliminary and they would require further investigation and quantification.

More information:

PRACE Work Package 7 leader François Robin, GENCI, francois.robin@genci.fr and Giovanni Erbacci, CINECA, Giovanni.Erbacci@cineca.it

www.prace-project.eu

Contact:
PRACE Work Package 7 leader
François Robin, GENCI,
francois.robin@genci.fr
Giovanni Erbacci, CINECA
Giovanni.Erbacci@cineca.it

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.

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Contact
PRACE Work Package 7 leader
François Robin, GENCI,
francois.robin@genci.fr
Giovanni Erbacci, CINECA
Giovanni.Erbacci@cineca.it