

BSC's proposal for handling data dependences in task based programming models integrated into OpenMP 4.0

The integration recognizes BSC's efforts and tradition to innovate in programming models for parallel architectures

Barcelona, 14 August 2013.- Barcelona Supercomputing Center's (BSC) proposal for handling data dependences in task based programming models has definitively influenced OpenMP 4.0, released last July. Task-to-task synchronization in OpenMP is now supported through the specification of task dependencies.

This feature is already available in the open source OmpSs programming model, developed and distributed by the Barcelona Supercomputing Center (<http://pm.bsc.es/ompss>). OmpSs has been demonstrated in real applications such as those used in European projects like Mont-Blanc, DEEP, TEXT and in the Intel-BSC Exascale Lab collaboration.

Its integration in the OpenMP standard - the most used programming model for shared memory in High Performance Computing- is recognition of BSC's innovative work in programming models for parallel architectures. BSC has more than 15 years' experience in proposing and implementing parallel programming models. Its researchers have been involved in OpenMP since the beginning, through cOMPunity, participating in the definition of the tasking model. Lately, with the inclusion of task dependences, BSC became an auxiliary member of the OpenMP consortium.



Image: Rosa M. Badia, BSC Team leader of the Computer Sciences Dept., giving a programming models demo at SC12, (USA)

Jesus Labarta, Director of BSC Computer Science's department says, "BSC proposals for expressing data flow and dependences between tasks allow unprecedented amounts of parallelism to be exposed and exploited under very asynchronous execution models. We are committed to programming models and intelligent runtimes research that is a key factor for future Exascale systems".

BSC's research and development in programming models is performed by a team of more than 20 researchers and students. The topics covered by the team include compiler support, support for heterogeneous architectures, including GPUs and Intel MIC, support for distributed architectures or energy efficiency in Exascale platforms.

About Barcelona Supercomputing Center

Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC) hosts the supercomputer MareNostrum. It also has well-known supercomputing research groups that develop tools for academia and industry. BSC focuses its research areas in Computer Sciences, Life and Earth Sciences and Computer Applications in Science and Engineering. In the context of this multi-disciplinary

approach, BSC has more than 350 researchers and experts in HPC (High Performing Computing) and 100 of those are from outside Spain. BSC was constituted as a public consortium formed by the current Spanish Ministry of Economy and Competitiveness (Ministerio de Economía y Competitividad), the Department of Economy and Knowledge of the Catalan Government and the Technical University of Catalonia. Barcelona Tech (UPC), and is headed by Professor Mateo Valero. In 2011, the BSC-CNS was recognized as a “Severo Ochoa Centre of Excellence” for its contributions and research agenda in the area of computing and applications. In the first edition of the Severo Ochoa programme, the Ministry of Science and Innovation selected 8 research centres and units in Spain to be among the best in the world in their respective fields. More information: www.bsc.es.

About OpenMP

The OpenMP Application Program Interface (API) is a multi-platform shared-memory parallel programming model for the C, C++ and Fortran programming languages. It is a portable, scalable model that gives shared-memory parallel programmers a simple and flexible interface for developing parallel applications for platforms ranging from multicore systems and SMPs, to embedded systems.

Incorporated in 1997, the OpenMP ARB is the non-profit corporation that oversees the OpenMP specification and produces and approves new versions of the specification. Further information can be found at www.openmp.org.