SEVENTH FRAMEWORK PROGRAMME
Marie Curie Actions
International Research Staff Exchange Scheme

High Performance Computing for Geophysics Applications
Information Science and Engineering
Grant Agreement Numer: IRSES-GA-2011-295217

Workshop on Runtimes for new HPC Platforms
July 2-6, 2012
Porto Alegre, Brazil

Nowadays High Performance Computing platforms are based on hybrid architectures that expose a heterogeneous set of processing units (e.g. CPU, GPU and SPU) accessing a more and more complex memory hierarchy. To exploit these machines at their full potential, parallel programmers need help from the runtime systems to schedule their jobs efficiently on any of these processing units, from low-power multicore processors to GPU accelerators, and to efficiently distribute the associated data on the underlying architecture. The first goal of this workshop is to present the features provided by current middleware and runtime systems. The second goal of this workshop is to describe the requirements of geophysics applications.

Day 1 (July 2, 2012): Tutorial and Practical Exercises

9h00-13h00 *hwloc : A Generic Framework for Managing Hardware Affinities in HPC Applications* S. Thibault (Bordeaux)

14h00-16h00 *CUDA Tutorial: Programming GPUs for HPC* O. Aumage (Bordeaux)

16h00-18h00 OpenCL *: An Open Standard for parallel Programming of Heterogeneous Architectures* B. Videau (Grenoble)

Day 2 (July 3, 2012) Tutorial and Practical Exercises

9h00-13h00 *Runtime-level Approaches to improve the performance of OpenMP for multicore architectures* F. Broquedis (Bordeaux, Grenoble)

14h00-17h00 *Minas: A Memory Affinity Management for Hierarchical Shared Memory Memory Multicore platforms* L. Pilla (UFRGS, Grenoble), C. Pousa (Grenoble and Zurich)

Day 3 (July 4, 2012) Tutorial and Practical Exercises

9h00-13h00 *StarPU : Exploiting Heterogeneous Architectures Through Task-Based Programming* O. Aumage (Bordeaux)

14h00-15h30 *Online Scheduling of Parallel Programs on Hybrid Architectures* N. Maillard (UFRGS)

16h00-18h00 *IO Issues and Optimizations* F. Boiton, R. Kassick (UFRGS, Grenoble)

Day 4 (July 5, 2012) Tutorial and Practical Exercises

WP3 Session

9h00-10h00 *SPECFEM3D and experimental results with a low-power cluster of ARM processors* J. Diaz (Pau), D. Michea (BRGM), B. Videau (Grenoble)

10h00- 10h30 *Ondes3D: Simulation of Seismic Wave Propagation* F. Dupros (BRGM), D. Michea (BRGM)

10h30-13h00 *Ondes3D and GPU programming* (D. Michea, S. Thibault, O. Aumage, B. Videau)

10h30-13h00 Onde3D and thread scheduling with memory affinity (F. Dupros, L. Pilla, M. Castro, E. Francesquini, F. Broquedis)

WP2 Session

14h00-14h30 *Explicit hp-adaptive Scheme for the Wave Equation* J. Diaz (Pau)

14h30-15h00 *Equivalent Conditions for an Elasto-Acoustic Problem with thin Layer* V. Peron (Pau)

15h00-15h45 *Artificial Boundary Conditions for Wave Propagation* Manuela Longoni de Castro (UFRGS)

Day 5 (July 6, 2012): Open Topics

9h00-10h00 Transactional Memory: State of the Art and Trends M. Castro (PUCRS, Grenoble)

10h00-11h00 Parallel Programming with Erlang E. Francesquini (University of Sao Paulo, Grenoble)

11h00-12h00 *Modelling the fluid-solid interaction in global seismic wave propagation* Leandro Farina (UFRGS/Maths)