PROPER 2012: Fifth Workshop on Productivity and Performance – Tools for HPC Application Development

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Using simulation codes in science and engineering has become commonplace. Writing such code and ensuring that it runs correctly and efficiently also on large numbers of processors and cores is, however, still challenging. Software tools can assist developers of parallel applications in their often tedious tasks of debugging, correctness checking, measuring and analyzing performance. Thus, such tools can help accelerate the development process of complex simulation codes considerably.

The PROPER workshop series seeks contributions on the development of debugging and performance tools and their integration in the software stack comprising the operating system, compilers, runtime environments, libraries, middleware, other tools, and applications. It also encourages tools developers and application developers, likewise, to report about approaches and success stories of how improvements in application performance, scalability, reliability, or productivity can be achieved using tools.

This year's workshop – already the fifth edition of the PROPER series – has received thirteen paper submissions in total, of which six were selected for presentation and publication. Each paper was evaluated by three reviewers.

The workshop was organized in three sessions. The first session featured the invited talk by Georg Hager on *Performance Engineering: From Numbers to Insight*, presenting a process of performance modelling, application monitoring and benchmarking to gain insight into the interaction between hardware and software.

Different instrumentation techniques were presented in the second session with three papers describing their respective approaches.

- *Runtime function instrumentation with EZTrace*, by Charles Aulagnon, Damien Martin-Guillerez, François Rué and François Trahay: this implementation permits to collect data at the entry and the exit of a function.
- *Compiler Help for Binary Manipulation Tools*, by Tugrul Ince and Jeffrey K. Hollingsworth: augmenting assembly files with information about basic blocks and their connections can speed up binary parsing considerably.
- *On the Instrumentation of OpenMP and OmpSs Tasking Constructs*, by Harald Servat, Xavier Teruel, Germán Llort, Alejandro Duran, Judit Giménez, Xavier Martorell, Eduard Ayguadé and Jesús Labarta: instrumenting task-based programs and displaying traces is enabled by close interaction between compiler, parallel runtime, and performance extraction library.

I. Caragiannis et al. (Eds.): Euro-Par 2012 Workshops, LNCS 7640, pp. 391–392, 2013.

Finally, the third session addressed performance measurement and analysis tools and practices for performance tuning.

- *Strategies for Real-Time Event Reduction*, by Michael Wagner and Wolfgang E. Nagel: this paper explores different approaches towards complete in-memory event tracing.
- *A Scalable InfiniBand Network Topology-Aware Performance Analysis Tool for MPI*, by Hari Subramoni, Jerome Vienne and Dhabaleswar K. (DK) Panda: the INTAP-MPI tool allows users to analyze and visualize the communication pattern of HPC applications on any InfiniBand network.
- *Performance patterns and hardware metrics on modern multicore processors: Best practices for performance engineering*, by Jan Treibig, Georg Hager and Gerhard Wellein: the authors define typical performance patterns and their metrics signatures and demonstrate their generic concepts with real-world usecases.

The workshop proceedings include an abstract of the invited talk and the six contributed papers in order of their presentation. The actual presentations are available for download at the workshop website[1].

As Workshop Chair, I wish to acknowledge all those contributing to the success of this workshop, in particular, the authors of all submitted papers, the members of the Steering and Programme Committees and all the reviewers, the organizers of Euro-Par 2012 and, last not least, the speakers and the attendees of the workshop.

The PROPER workshop series was founded and is being supported by the *Virtual Institute - High Productivity Supercomputing (VI-HPS)*, an initiative to promote the development and use of HPC programming tools. Having received so much positive feedback for this workshop series so far, it is planned to organize the next PROPER workshop again in conjunction with Euro-Par 2013.

[1] `http://www.vi-hps.org/proper2012ws/`