BenchIT - Performance Measurment and Comparison for Scientific Applications

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Abstract

"Contrary to common belief, performance evaluation is an art. "With an increasing variety of operation felds from once applications to data-massive, high-performance computing with very different user demands, the programmer's know-how of program optimization, the choice of the compiler version, and the usage of the compiler options have an important infuence on the runtime. Current and future microprocessors offer a variety of different levels of parallel processing in combination with an increasing number of intelligently organized functional units and a deeply staged memory hierarchy. Traditional benchmarks highlight only a few aspects of the performance behavior. Often computer architects, system designers, software developers and decisionmakers want to have more detailed information about the performance of the whole system than only one or a few values of a performance metric. This paper introduces BenchIT { a tool created by the Center for High Performance Computing Dresden to accompany the performance evaluator.

This "art" of performance evaluation actually contains two steps: Performance measurement as well as data validation and comparison. BenchIT's modular design, therefore, consists of three layers: The measuring kernels, a main program for the measuremeasurements, and a web based graphing engine to plot and compare the gathered data. The unique step in this project is the concept of splitting the evaluation into exactly the two steps mentioned above and thus being so exible to be used for any kind of performance measurement. The Center for High Performance Computing Dresden presents the established infrastructure for this project, which is designed to allow the HPC community easy access to a variety of performance measurements, easily extendable by own measurements and even, but especially, own measuring kernels.