Performance is Also a Matter of Where You Live

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ABSTRACT

Nowadays, a plethora of techniques and methods are available to optimize the runtime behavior of complex applications, ranging from modeling/prediction tools to the employment of recognized patterns and/or knowledge-bases on the expected performance under specific workloads. However, in common scenarios, the ultimate applications' behavior may depend on features that are scarcely predictable or difficult to be taken into account when designing the applications and their own runtime optimizers. Among them, we mention the actual structure of the underlying hardware and/or virtualized platforms, as well as specific runtime dynamics such as thread correlation on data and synchronization---not much the average behavior, rather punctual effects. We believe that the environment where applications live, like operating systems and user-space runtime libraries, play a central role in coping with these features. We similarly believe that such environments must be re-staged so as to be actually effective in pursuing the performance optimization goal. In this talk, we discuss specific guidelines to re-stage the environments, based on a real experience, and we point as well to challenges that are still untackled and deserve attention by the research community.

CCS Concepts/ACM Classifiers

• **Software and its engineering~Operating systems** • **Software and its engineering~Software performance**

Author Keywords

Software Environments, Operating Systems, Performance and Energy Efficiency

BIOGRAPHY

Francesco Quaglia received the Laurea degree (MS level) in Electronic Engineering in 1995 and the PhD degree in Computer Engineering in 1999 from the University of Rome "La Sapienza.". From summer 1999 to summer 2000 he held an appointment as a Researcher at the Italian National Research Council (CNR).

Since January 2005 he works as an Associate Professor at the School of Engineering of the University of Rome "La Sapienza," where he has previously worked as an Assistant Professor since September 2000 to December 2004. His main research interests are in the areas of high performance computing, dependable computing, transactional systems, operating systems, automatic code parallelization, performance analysis and optimization. Currently, he is the director of the HPDCS (High Performance and Dependable Computing Systems) Research Lab at the University of Rome "La Sapienza.".