

Performance and scalability prediction in HPC systems

Emilio Luque
Universidad Autónoma de Barcelona

Facultad de Informática
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Resumen:

Predicting the performance and scalability of parallel scientific applications on a large number of resources in an efficient way, is becoming increasingly complex. Our goal was to characterize the behavior of message-passing applications on different target machines. To achieve this goal, we have developed a method called Parallel Application Signature for Performance Prediction (PAS2P), which strives to describe an application based on its behavior. Based on the application's message-passing activity, we identify and extract representative phases, with which we create a parallel application signature that enable us to predict the application's performance. PAS2P is able to predict execution times with an average accuracy greater than 97 percent and P3S is able to predict the application scalability with an average accuracy greater than 95 percent using a reduced set of resources.

Sobre Emilio Luque:

Emilio Luque received the Master and PhD degrees, both in Physics, from the University Complutense (UC) of Madrid in 1968 and 1973. From 1976 full professor at the Computer Architecture and Operating System Department at University Autonoma of Barcelona (UAB), Spain, where he is leading the HPC4EAS research group.. He has been invited professor in different universities in USA, Asia, Europe and South America, key note speaker in Computer Science Conferences, leader in several research projects founded by the European Union (EU), the Spanish government and different companies and member of the Editorial Board of various Technical Journals. Research recognitions: Best Paper Award at the Seventh International Conference on Advances in System Simulation. (SIMUL 2015), Best Paper Award at the International Conference on Computational Science (ICCS 2012); Outstanding Paper Award at the International Conference on Computational Science (ICCS 2011) and Distinguished Paper at the European Conference on Parallel Processing (Euro-Par 2006). Doctor Honoris Causa by the National University of La Plata (UNLP) Argentina.