Performance Prediction of Parallel Applications with Parallel Patterns using Stochastic Methods

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Abstract

One of the main problems in the high performance computing area is to find the best strategy to parallelize an application. In this context, the use of analytical methods to evaluate the performance behavior before the real implementation of such applications seems to be an interesting alternative and can help to identify better directions for the implementation strategies. In this work, the Stochastic Automata Network (SAN) formalism is adopted to model and evaluate the performance of parallel applications. The methodology used is based on the construction of generic SAN models to describe classical parallel programming patterns, like Master/Slave, Pipeline and Divide and Conquer. Those models are adapted to represent cases of a real application through the definition of input parameters values. Finally, we present a comparison between the results of the SAN models and a real application, aiming at verifying the accuracy of the adopted technique.

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