Counting 1, 2, 3 . . .

Using synchronization instructions such as compare-and-swap while implementing concurrent algorithms can adversely affect the actual performance, even though the asymptotic performance indicates otherwise. Consider the simple task of implementing a counter that is shared amongst several processes.

One can implement this in $O(n)$ time per process without using compare-and-swap or in $O(\log n)$ time per process using compare-and-swap. However, this asymptotic difference in performance might not present the true picture due to the costly compare-and-swap instruction. In this thesis we want to start with measuring the performance of these algorithms on a multi-processor system. The goal is to model the underlying synchronization mechanism of a typical multi-processor so as to explain the observed performance, and possibly, suggest improvements to the synchronization mechanism.

Requirements: Interest in designing, implementing and analyzing concurrent algorithms.

Interested? Just drop by for a chat!

Contacts

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