



## Scalable Computing Software Laboratory Technical Report

Department of Computer Science

Illinois Institute of Technology

### Scalable Computing in the Multicore Era

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## Abstract

*Multicore architecture has become the trend of high-performance processors. While it is generally accepted that we have entered the multicore era, concerns exist on scaling multicore processors. Technology is available, but major vendors are hesitant in entering the multicore market with processors that have large number of cores, citing Amdahl's law. This is a very interesting phenomenon, where history seems to repeat itself on the scalability debate of parallel processing occurred 20 years ago. Following the scalable computing concept, especially the fixed-time and memory-bounded speedup metrics, in this study, we argue that the scalability of multicores is not limited by Amdahl's law. We study two speedup models of multicore architecture from the scalable computing point of view. These two models reflect the inherent scalability constraint of multicore architecture. They show that multicores have a good scalability and add a new dimension of scalable computing.*

**Keywords:** scalability, multicore architecture, scalable computing