



Exploiting Multi-core Systems for Parallel Network Simulation

By Georg Johannes Kunz

Shaker Verlag Apr 2013, 2013. Taschenbuch. Condition: Neu. Neuware - Discrete event simulation constitutes a fundamental methodology in the design, development, and evaluation process of communication systems. Despite their abstract nature, simulation models often exhibit considerable computational complexity, resulting in extensive simulation runtimes. To counteract the runtime demand of complex simulation models, parallel discrete event simulation distributes the workload of a simulation model across multiple processing units. Traditionally, parallel discrete event simulation focused on investigating large scale system models utilizing distributed computing clusters. In the last decade, however, two developments have fundamentally changed the established state-of-the-art in parallel discrete event simulation. First, multi-core systems have become the de facto standard hardware platform for desktop and server computers. In contrast to distributed computing clusters, multi-core systems provide different hardware characteristics, notably shared memory. Second, the focus of interest in the research community shifted from wired to wireless communication systems. Contrary to wired networks the simulated network entities are tightly coupled due to detailed modeling of physical layer and wireless channel effects, thereby hindering efficient parallelization. This thesis addresses the challenges resulting from these two developments by designing algorithms and tools to enable and support efficient parallel simulation of tightly coupled systems...



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