Predicting the Performance of Reconfigurable Interconnects in Shared-Memory Systems
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Supervisor(s): Jan Van Campenhout

Predicting the Performance of Reconfigurable Interconnects in Shared-Memory Systems New advances in reconfigurable optical interconnect technologies will allow the fabrication of low-cost, fast and run-time adaptable networks for connecting processors and memory modules in large distributed shared-memory multiprocessor machines. Since the switching times of these components are typically high compared to the memory access time, reconfiguration exploits low frequency dynamics in the network traffic patterns. These are however not easily reproduced using statistical traffic generation, a tool commonly used when doing a fast design space exploration. We present a technique that can predict network performance, based on the traffic patterns obtained from simulating the execution of real benchmark applications, but without the need to perform these slow full-system simulations for every parameter set of interest. This again allows a quick comparison of different network implementations with good relative accuracy, narrowing down the design space for more detailed examination.

Micromobility Support and Resource Reservations in IP-based Access Networks
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The popularity of the Internet and multimedia applications is increasing tremendously. As the mobile terminal is the most popular one, people use mobile phones no longer only for voice communications, but more frequently to access the Internet. In order to enable a seamless integration between wired and wireless technologies, wireless networks evolve towards IP-based infrastructures. As IP was initially designed in the assumption of fixed hosts, this evolution is very challenging. Another trend is driven by the increasing bandwidth requirements of mobile hosts: access technologies evolve towards higher bandwidth and cells evolve towards smaller cell sizes. This requires an efficient support of mobility and Quality of Service. This paper considers IP-based access networks and investigates the support of paths with resource reservations for mobile hosts. A framework is presented which defines the functionality of the different access network elements to support path changes and to avoid router inconsistencies.
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