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Abstract

Performance is a critical issue in computer system design, implementation, procurement and usage. Common performance evaluation tasks include comparative evaluation, system tuning, bottleneck analysis, performance forecasting, capacity planning and capacity management. The notion of system refers here to a collection of hardware and software components providing specific services to the user. The common basis in almost all relevant methodologies is the concept of modeling which refers to the development of - more or less- abstract representations of system behaviour. During the last decades a large repository of knowledge and experience regarding computer system performance evaluation has become available. Computer system performance analysis techniques can be assigned to three generic categories:

analytic modeling, simulation and measurement. Accordingly, this book examines queueing network models (product-form queueing networks, operational and mean-value analysis, approximation techniques, bounds on performance, hierarchical modeling), simulation (program construction, random number generation, transient removal, statistical analysis of simulation results), measurement techniques and tools (workload characterization, benchmarks, system monitoring and management, design and analysis of experiments, experimental errors, confidence intervals). To ensure self-sufficiency of content, background material in probabilities and statistics is included. The book contains numerous examples and follows a balanced approach as far as mathematical rigor and practical aspects are concerned.

