COMPUTER AND COMMUNICATION SYSTEMS PERFORMANCE MODELLING

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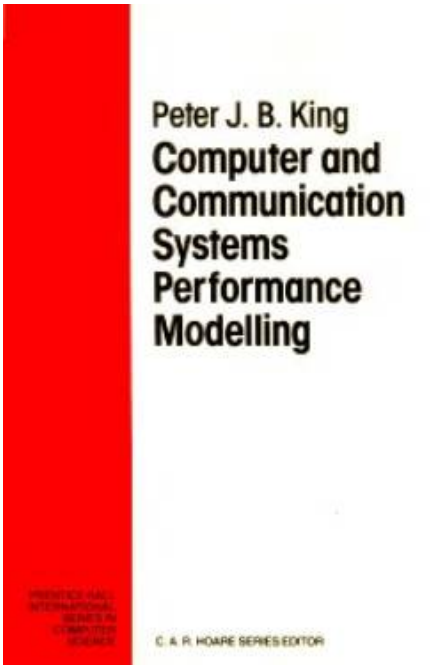

SUMMARY

Computer and Communication Systems Performance Modelling provide an introduction to the field of quantitative analysis of computer and communication system performance. The book introduces some of the most powerful mathematical tools for analysing queueing systems and applies them to realistic examples.

Readers will find detailed considerations of Little's theorem and its consequences, analyses of M/M/1, M/G/1 and discrete time queues showing ail steps of analysis. There is also extensive coverage of BLMP networks and algorithms for their analysis. A unique feature is the treatment of numerical methods for queueing system solution. Each chapter has a bibliography and most contain exercises.

This text is suitable for students of Computer Science as well as practising Communications Engineers.

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Computer systems design is full of conundrums: Given a choice between a single machine with speed s, or n machines each with speed s/n, which should we choose? If both the arrival rate and service rate double, will the mean response time stay the same? Should systems really aim to balance load, or is this a convenient myth? If a scheduling policy favors one set of jobs, does it necessarily hurt some other jobs, or are these "conservation laws" being misinterpreted? Do greedy, shortest-delay, routing strategies make sense in a server farm, or is what's good for the individual dis

As complexity of computer and communication systems increases, it becomes hard to analyze the system via analytic models. Measurement based system evaluation may be too expensive. In this tutorial, discrete event simulation as a model based technique is introduced. This is widely used for the performance/availability assessment of complex stochastic systems. Importance of applying a systematic methodology for building correct, problem dependent, and credible simulation models is discussed. These will be made evident by relevant experiments for different real-life problems and interpreting thei System models for distributed systems. INF5040/9040 autumn 2011. lecturer: Frank Eliassen.Â Â§ Physical models: capture the hardware composition of a system in terms of computers and other devices and their interconnecting network; Â§ Architecture models: define the main components of the system, what their roles are and how they interact (software architecture), and how they are deployed in a underlying network of computers (system architecture)Â Clock Performance Performance. Process Process Channel. Processâ€™s local clock exceeds the bounds on its rate of drift from real time Process exceeds the bounds on the interval between two processing steps A messageâ€™s transmission takes longer than the stated bounds. Keywords: Computer networks, performance, modeling, simulation, verification. 1. Introduction. Computer networks are an inherent substrate in many daily tasks such as business, e-commerceÂ Modeling a system involves the abstraction of its features and properties, focusing exclusively on those. that are of interest to the study [Garzia et. al., 1990]. As a result, a model can be understood as the.Â voice communication services on the market. Voice traffic models should consider components both at. user and packet levels. Analytical Modeling for Computer Systems But it does not have to be this way! These same systems designers could mathematically model the system, stochastically characterize the workloads and performance goals, and then analytically derive the performance of the system as a function of workload and input parameters. The fields of analytical modeling and stochastic processes have existed for close to a century, and they can be used to save systems designers huge numbers of hours in trial and error while improving performance. Analytical modeling can also be used in conjunction with simulation t