HIGH PERFORMANCE GENERAL FINITE QUEUEING NETWORKS

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ABSTRACT

We aim at developing a new methodology that allows automated determination of high performance configurations for general finite queueing networks These are models that arise in many important real-life applications, such as health systems, internet, production systems, and traffic in congested urban areas. Since the queues considered are finite (that is, they have finite buffer spaces), very difficult and open problems arise as to approximately estimate common performance measures, such as the blocking probabilities (i.e., the probability of the system being full), the service rates (average number of served users per time unit), work-in-process (that is, the expected overall number of users in the system, including the ones in service and those in queue), and the time cycle (average total time in the system, including the service time and the waiting time), among others also of importance. Simulation techniques are used as well as approximate closed-form expressions especially developed for the problem. Encouraging preliminary numerical results are presented.

KEYWORDS: Queues, Networks, Performance evaluation, Optimization.

Main area: Probabilistic models