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Quantitative
Modeling
In
Parallel
Systems

Tandem Queues with Deterministic Service Times

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Abstract In this paper we consider a tandem queueing model for a sequence of multiplexers at the edge of an ATM network. All queues of the tandem queueing model have unit service times. Each successive queue receives the output of the previous queue plus some external arrivals. For the case of two queues in series, we study the end-to-end delay of a cell (customer) arriving at the first queue, and the covariance of its delays at both queues. The joint queue length process at all queues is studied in detail for the 2–queue and 3–queue cases, and we outline an approach to the case of an arbitrary number of queues in series.

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