Joint queue length distribution of multi-class, single-server queues with preemptive priorities

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Abstract

In this paper we analyze an $M_N/M_N/1$ queueing system with $N$ customer classes and preemptive priorities between classes, by using matrix-analytic techniques. This leads to an exact method for the computation of the steady state joint queue length distribution. We also indicate how the method can be extended to models with multiple servers and other priority rules.

Keywords: priority queues; preemptive priority; $M_N/M_N/1$ queueing systems; matrix-analytic method; joint queue length distribution

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