The stationary distribution of a Markovian process arising in the theory of multiserver retrial queueing systems.

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The stationary distribution of a markovian process arising in the theory of multiserver retrial queueing systems ☆ ☆☆

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Abstract

In this paper, we introduce a bivariate Markov process $\{X(t), t \geq 0\} = \{(C(t), Q(t)), t \geq 0\}$ whose state space is a lattice semistrip $E = \{0,1,2,3\} \times Z_+$. The process $\{X(t), t \geq 0\}$ can be seen as the joint process of the number of servers and waiting positions occupied, and the number of customers in orbit of a generalized Markovian multiserver queue with repeated attempts and state dependent intensities. Using a simple approach, we derive closed form expressions for the stationary distribution of $\{X(t), t \geq 0\}$ when a sufficient condition is satisfied. The stationary analysis of the $M/M/2/2 + 1$ and $M/M/3/3$ queues with linear retrial rates is studied as a particular case in this process.

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