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Tail probability of low-priority queue length in a discrete-time priority BMAP/PH/1 queue.

(English) Zbl 1069.60085
Stoch. Models 21, No. 2-3, 799-820 (2005).

Summary: We investigate the tail probability of the queue length of low-priority class for a discrete-time priority BMAP/PH/1 queue that consists of two priority classes, with BMAP (batch Markovian arrival process) arrivals of high-priority class and MAP (Markovian arrival process) arrivals of low-priority class. A sufficient condition under which this tail probability has the asymptotically geometric property is derived. A method is designed to compute the asymptotic decay rate if the asymptotically geometric property holds. For the case when the BMAP for high-priority class is the superposition of a number of MAP's, though the parameter matrices representing the BMAP are huge in dimension, a sufficient condition is numerically easy to verify and the asymptotic decay rate can be computed efficiently.

MSC:

60K25 Queueing theory (aspects of probability theory)
90B22 Queues and service in operations research

Keywords:

asymptotic decay rate; batch Markovian arrival process; discrete-time queues; phase-type distribution

Full Text: DOI

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