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Steady-State Queue Length Analysis of a Batch Arrival Queue under N-Policy with Single Vacation and Setup Times

Author(s)

Zhong Yu, Mingwu Liu, Yongkai Ma

ABSTRACT

This paper investigates the steady state property of queue length for a batch arrival queue under N-policy with single vacation and setup times. When the system becomes empty, the server is turned off at once and takes a single vacation of random length . When he returns, if the queue length reaches or exceeds threshold , the server is immediately turned on but is temporarily unavailable due to a random setup time before offering service. If not, the server stays in the system until the queue length at least being . We derive the system size distribution and confirm the stochastic decomposition property. We also derive the recursion expressions of queue length distribution and other performance measures. Finally, we present some numerical examples to show the analytical results obtained. Sensitivity analysis is also performed.

KEYWORDS

Queue Length, Recursion Expressions, N Policy, Setup

Cite this paper

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