

An Analysis of a Queueing System with Heterogeneous Servers Subject to Catastrophes

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Abstract : This study analyzed a queueing system with blocking and no waiting line. The customers arrive according to a Poisson process and the service times follow exponential distribution. There are two non-identical servers in the system. The queue discipline is FCFS, and the customers select the servers on fastest server first (FSF) basis. The service times are exponentially distributed with parameters μ_1 and μ_2 at servers I and II, respectively. Besides, the catastrophes occur in a Poisson manner with rate γ in the system. When server I is busy or blocked, the customer who arrives in the system leaves the system without being served. Such customers are called lost customers. The probability of losing a customer was computed for the system. The explicit time dependent probabilities of system size are obtained and a numerical example is presented in order to show the managerial insights of the model. Finally, the probability that arriving customer finds system busy and average number of server busy in steady state are obtained numerically.

Keywords : queueing system, blocking, poisson process, heterogeneous servers, queue discipline FCFS, busy period

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