AN AGGREGATION METHOD FOR THE TANDEM THRESHOLD QUEUE

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We consider a tandem system of 2 queues with finite buffer where service rates are controlled by a threshold policy. Customers arrive to the first queue according to a Poisson process with rate λ and require an exponential amount of service at each queue i, $i = 1, 2$. Each queue i has an upper threshold U_i, a lower threshold L_i, a high service rate μ_i and a low service rate ν_i. When the queue length in queue i reaches U_i, the service rate changes from μ_i to ν_i. The service rate switches back from ν_i to μ_i when the queue length decreases to L_i. We present an aggregation algorithm based on Matrix Analytic Methods allowing us to obtain the stationary queue length distribution. Furthermore, we show that even though the aggregation algorithm is designed for finite buffers, it is not necessary for the second queue to be finite.