Analysis of an $M^X/G/1$ Retrial Queue with Two Phases of Service, Balking, Feedback and K Optional Vacations

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Abstract

A batch arrival queueing system with two phases of service, balking, feedback, and K optional vacations under a classical retrial policy is discussed in the paper. At the arrival epoch, if the server is busy, the whole batch joins the orbit or balks the system. Whereas, if the server is free, then one of the arriving jobs starts its service immediately and the rest join the retrial group or balk the system. For each job, the server provides two phases of service. After the completion of the two phases of service, the job may rejoin the orbit as feedback for another regular service or leave the system forever. If the system is empty, then the server becomes inactive and begins its first vacation. After completion of the first essential vacation, the server may either wait for a job or may take one of `K' additional vacations.

Keywords: Retrial queue, two phases of service, balking, bernoulli feedback, optional vacation.