

A Two Phase Queueing System with Bernoulli Feedback

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Abstract

This paper deals with an $M/G/1$ queue with two phases of heterogeneous services and Bernoulli feedback system, where the server provides first phase of regular service to all the customers. As soon as the first phase of service of a customer is completed, it may leave the system or may immediately go for second phase of optional service in one additional service channel. However, after receiving the first phase or second phase of unsuccessful service by an unit, then it may immediately join the tail of the original queue as feedback customer to have another regular service. In this paper, first we derive the queue size distribution at random epoch and at a service completion epoch. Secondly, we derive the distribution of response time and busy period. Finally, we present some numerical results for mean response time.

Keywords: $M/G/1$ Queue, Bernoulli Feedback, Heterogeneous Service, Response Time.