Impact of retrial distribution in stationary and time-dependent queues

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Queueing systems are used in various service systems, such as repair facilities, health care, and call centers. In many of these service systems, customers leave the queue before being served due to a lack of patience. However, these customers may re-enter the system after some time as retrials. This research project focuses on the stationary and time-dependent performance evaluation of multi-server queueing systems with retrials, and the impact of distribution of retrial time, i.e., the time after a customer returns to the system.

We analyze empirical data on the retrial behaviour of customers from several large call center. Novel stationary approaches to approximate main performance measures are developed. A comparison against simulation demonstrates the accuracy of the approaches. Moreover, analytical results and numerical insights demonstrate the impact of the retrial time distribution based on the empirical analysis.

Key words: retrials; time-dependent queues; call centers