Bouchentouf, A. A.; **Belarbi, F.**

Performance evaluation of two Markovian retrial queueing model with balking and feedback.
(English) Zbl 1307.60127
Acta Univ. Sapientiae, Math. 5, No. 2, 132-146 (2013).

Summary: In this paper, we consider the performance evaluation of two retrial queueing system. Customers arrive to the system, if upon arrival the queue is full, the new arriving customers either move into one of the orbits, from which they make a new attempts to reach the primary queue, until they find the server idle, or balk and leave the system, these later, and after getting a service may comeback to the system requiring another service. So, we derive for this system the joint distribution of the server state and retrial queue lengths. Then, we give some numerical results that clarify the relationship between the retrials, arrivals, balking rates, and the retrial queue length.

MSC:

60K25 Queueing theory (aspects of probability theory)
90B22 Queues and service in operations research
68M20 Performance evaluation, queueing, and scheduling in the context of computer systems

Keywords:

retrial queues; balking; feedback; joint distribution function; performance evaluation

Full Text: DOI

References:

[1] G. Arfken, Confluent hypergeometric functions in mathematical methods for physicists, 3rd ed. Academic Press, Orlando, (1985), 753-758.

[2] E. Altman, A. A. Borokovoc, On the stability of retrial queues, Queueing Syst., \textbf{26 }(1997), 343-363. · Zbl 0892.90069

[3] K. Avrachenkov, A. Dudin, V. Klimenok, Queueing Model MMAP/M 2/1 with Two Orbits, Lecture Notes in Comput. Sci., \textbf{6235 }(2010), 107-118.

[4] B. D. Choi, Y. C. Kim, The M/M/c Retrial queue with geometric loss and feedback, Comput. Math. Appl., \textbf{36 }(6) (1998), 41-52. · Zbl 0947.90024

[5] N. Ebrahimi, System reliability based on system wear, Stoch. Models, \textbf{22 }(1) (2006), 21-36. · Zbl 1111.62097

[6] G. I. Falin, A survey of retrial queues, Queueing Syst., \textbf{7 }(2) (1990), 127-167. · Zbl 0709.60097

[7] G. I. Falin, J. R. Artalejo, An infinite source retrial queue, European J. Oper. Res., \textbf{108 }(2) (1998), 409. · Zbl 0943.90012

[8] N. Gharbi, M. Ioualalen, GSPN analysis of retrial systems with server breakdowns and repairs, Appl. Math. Comput., \textbf{174 }(2) (2006), 1151-1168. · Zbl 1156.68319

[9] F. A. Haight, Queueing with balking, Biometrika, \textbf{44 }(1957), 360-369. · Zbl 0085.34703

[10] R. Kumar, S. K. Sharma, M/M/1/N Queuing system with retention of reneged customers, Pakistan J. Statist. Oper. Res., \textbf{8 }(2012), 859-866.

[11] R. Kumar, S. K. Sharma, An M/M/1/N Queuing model with retention of reneged customers and Balking, Amer. J. Oper. Res., \textbf{2 }(1) (2012), 1-5.

[12] L. Libman, A. Orda, Optimal retrial and timeout strategies for accessing network resources, IEEE/ACM Trans. on Networking, \textbf{10 }(4) (2002), 551-564.

[13] A. Papoulis, Probability random variables and stochastic processes, 2nd ed., McGraw-Hill, (1983). · Zbl 0191.46704

[14] S. K. Sharma, A Markovian feedback queue with retention of reneged customers and balking, Adv. Model. Optim., \textbf{14 }(3) (2012), 681-688. · Zbl 1332.90080

[15] J. Walrand, Communication networks: a first course, The Aksen Associates Series in Electrical and Computer Engineering, Richard D. Irwin, Inc., and Aksen Associates, Inc., Homewood, IL and Boston,MA.(1991).