STEADY-STATE ANALYSIS OF $M|M|c|c+m$ - TYPE RETRIAL QUEUEING SYSTEMS WITH CONSTANT RETRIAL RATE

Eugene Lebedev

National Taras Shevchenko University of Kyiv
Applied Statistics Department, Faculty of Computer Science and Cybernetics
Volodymyrska str., 64, 01061, Kyiv, Ukraine

The presentation deals with a research of bivariate Markov process $\{X(t), t \geq 0\}$ whose state space is a lattice semistrip $S(X) = \{0,1,...,c+m\} \times Z_+$. The process $\{X(t), t \geq 0\}$ describes the service policy of a multi-server retrial queue with c servers and m waiting positions in which the rate of repeated flow does not depend on the number of sources of retrial calls.

First, for these models the ergodicity conditions were studied. Then, a vector-matrix representation of steady-state distribution was obtained in the class of queues. This representation allows to write down the stationary probabilities through the model parameters in closed form and to propose the closed formulas of its main performance measures.

The investigative techniques use models and results for the QBD processes together with approximation of the initial model by means of the truncated one. As well as we discuss an application of the developed approach to study retrial queues with the controlled parameters and to solve optimization problems for the model.