

ON VACATION MODELS WITH FINITE CAPACITY

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Contrary to what is asserted in Frey and Takahashi [1], these authors were not the first to consider the departure epochs imbedded Markov chain for vacation models with finite capacity. In our paper [2], which deals with a general vacation policy, we express the stationary queue length distribution immediately after a departure in terms of the corresponding distribution in the model without vacations.

In [2], we also express the stationary queue length distribution at an arbitrary epoch in terms of the corresponding distribution in the model with vacations. From these two relations, one can easily derive (see [3]) the expression of the stationary queue length distribution at an arbitrary epoch in terms of the stationary queue length distribution immediately after a departure. With the notations used in [2], this expression is:

$$p_{v,\nu}^L(j) = \prod_{v,\nu}^L(j) \frac{\lambda^{-1}}{E(S) + d_{v,\nu}^L \prod_{v,\nu}^L(\nu)} \quad (j = \nu, \dots, L-1)$$
$$p_{v,\nu}^L(L) = 1 - \frac{\lambda^{-1}}{E(S) + d_{v,\nu}^L \prod_{v,\nu}^L(\nu)}.$$

This result contains as a particular case, the expression for the stationary queue length distribution at an arbitrary epoch given in [1], for the exhaustive service multiple vacation policy.

References

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