

# PERFECT SAMPLING FOR INFINITE SERVER AND LOSS SYSTEMS

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We present the first class of perfect sampling (also known as exact simulation) algorithms for the steady-state distribution of non-Markovian loss networks. We use a variation of Dominated Coupling From The Past for which we simulate a stationary infinite server queue backwards in time and analyze the running time in heavy traffic. We use the infinite server queue as an upper bound process to simulate loss systems. The running time analysis of our perfect sampling algorithm for loss systems is performed in the Quality-Driven (QD) and the Quality-and-Efficiency-Driven regimes. In both cases, we show that our algorithm achieves sub-exponential complexity as both the number of servers and the arrival rate increase. Moreover, in the QD regime, our algorithm achieves a nearly optimal rate of convergence.