The M/M/Infinity Service System with Ranked Servers in Heavy Traffic

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We consider an M/M/Infinity service system in which an arriving customer is served by the first idle server in an infinite sequence S_1, S_2, ... of servers. We determine the first two terms in the asymptotic expansions of the moments of L as lambda tends to infinity, where L is the index of the server S_L serving a newly arriving customer in equilibrium, and lambda is the ratio of the arrival rate to the service rate. The leading terms of the moments show that L/lambda tends to a uniform distribution on [0,1].

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