DIFFUSION SCALE TIGHTNESS OF INVARIANT DISTRIBUTIONS OF A LARGE-SCALE FLEXIBLE SERVICE SYSTEM

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The model is a flexible service system with multiple customer classes, multiple server pools; mean service time of a customer by a server depends on both the customer class and the server pool. We study a *Leaf Activity Priority* scheduling/routing policy, and consider the many-servers asymptotic regime: the customer arrival rates and the number of servers in each pool tend to infinity in proportion to a scaling parameter r, while the overall system load remains strictly subcritical. Indexing the systems by r, we prove that the family of invariant distributions is tight on the diffusion, i.e. $r^{1/2}$, scale. Namely, the sequence of invariant distributions, centered at the equilibrium point and scaled down by $r^{-1/2}$, is tight. (This strengthens an earlier result, showing $r^{1/2+\epsilon}$-scale tightness for any $\epsilon > 0$.) This, in particular, implies a limit interchange: the limit of diffusion-scaled invariant distributions is equal to the invariant distribution of the limiting diffusion process.