Simulation & Analysis of a Mean Response Time Upper-bound for Homogeneous Fork/Join Queues

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Abstract:
In this paper, we study general K-queue first-in-first-out homogeneous fork/join queueing (HFJ) systems for any K ≥ 2. We simulate and analyze an upper-bound for the mean response time that we denote by T[K]. The upper-bound uses a relatively tiny-scale system to predict the performance of a huge-scale system. It is evaluated for 10-million queues on a regular HP-PC with Intel i7-860 for three different HFJ cases. The maximum time is 16 minutes, which is only about 0.01% of the full system simulation time. We show that it is fast, close, economical and consistent by comparison and analysis.

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