ASSIGNING MULTIPLE JOB TYPES TO PARALLEL SPECIALIZED SERVERS BY MIXING DECISION RULES

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We investigate methods of mixing decision rules for the so-called multiple job type assignment problem with specialized servers (MJTAPSS). MJTAPSS is an assignment problem for which it is considered to be difficult to obtain and implement an optimal policy. Decision rules corresponding to optimal Markov decision policies have in general a complicated structure not facilitating a smooth implementation. On the other hand optimization over the subclass of static policies is known to be tractable. For a static policy the assignment of an arriving job may depend on the type of the arriving job, but not on dynamics like numbers and types of jobs present in the queues at the moment of arrival. For various system parameters and corresponding traffic intensities a suitable static decision rule is mixed with some selected dynamic decision rules. The dynamic decision rules which are used in the mixing have the property that they are relatively easy to describe and implement. Some mixing methods are discussed and optimization is performed over corresponding classes of mixing policies. The considered mixing methods maintain the property that obtained mixing policies are relatively easy to describe and implement compared to overall optimal Markov decision policies. Moreover, implementation and simulation of mixing policies for MJTAPSS show that optimized mixing policies perform substantially better than the optimal performance among all static policies.