

We present some results about the general matching model. In a matching model, items of different classes arrive and are stored in some queues until they match other items. Compatibility constraints between items are described by an indirect graph on the classes. A node represents a class while an edge (i,j) models a feasible matching of items of class i with items of class j . Once they are matched, both items disappear instantaneously. The general matching model is a new generalization of bipartite matching model where we only assume that the matching graph is connected. We also assume that the arrivals follow independent Poisson processes. We illustrate the models with some examples to show that the states of the Markov chain are associated with independent sets of the matching graph. We give some necessary condition of stability and we show that the steady-state distribution has a product form distribution. Then we show that such a model may exhibit a performance paradox when we use the First Come First Match discipline: adding a new edge in the graph may lead to a larger total number of items. We provide a small example of such a behavior and we give a sufficient condition for such a paradox to occur. We also give conditions to avoid such a problem. These conditions are based on a notion of bottleneck and on a heavy traffic assumption. We also show that the paradox arises even for large graphs. Finally we further extend the model to deal with matching graphs having loops on all nodes. The associated Markov chain is now finite and we prove that the steady state distribution still has a product form.