Myopic and MaxWeight Policies for Stochastic Networks
by
Sean Meyn (U. Illinois)

It is shown that stability of the celebrated MaxWeight or back pressure policies is a consequence of the following interpretation: either policy is myopic with respect to a surrogate value function of a very special form, in which the "marginal disutility" at a buffer vanishes for vanishingly small buffer population. This observation motivates the h-MaxWeight policy, defined for a wide class of functions h. These policies that share many of the attractive properties of the MaxWeight policy:

1. The policy does not require arrival rate data.

2. It is stabilizing when h is a perturbation of a monotone linear function, or a monotone Lyapunov function for the fluid model.

3. A perturbation of the relative value function for a workload relaxation gives rise to a myopic policy that is approximately average-cost optimal in heavy traffic, with logarithmic regret.

The first results are obtained for a completely general stochastic network model. Asymptotic optimality is established for the general scheduling model with a single bottleneck.
    http://black.csl.uiuc.edu/~meyn/pages/publistNetworks.html.