Performance Analysis 12: RCAT

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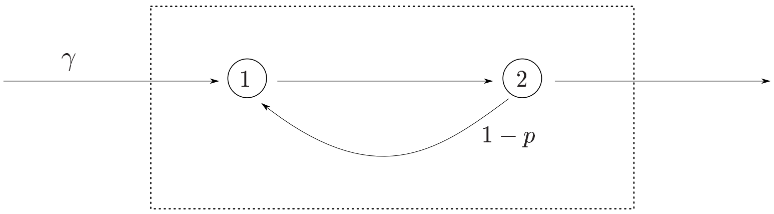

Figure 1: Tandem queue with feedback

A tandem queue with feedback has two M/M/1 queueing nodes with a proportion of the output from queue 1 becoming the input to queue 2. The output from queue 2 is either routed with probability $(1-p)$ back to the input of queue 1 or with probability p exits the network. There is an external input at rate γ into queue 1.

1. Construct a PEPA model of a tandem queue with feedback. Base your model on the tandem queue in the notes and introduce a new action f to represent feedback from node 2 to node 1. [Note: routeing probabilities can be aggregated into the service rate for the different routing actions from node 2.]

2. Use RCAT to construct a product form formula for the steady state distribution of the tandem queueing network with feedback