

DISI – UNIVERSITY OF TRENTO

Master in Computer Science AA 2014/2015

Simulation and Performance Evaluation

Simulation of a simple queuing network

Configuration for Jasmine Mair

We have here a queuing system with two classes of customers, and we are interested in estimating not only the overall performance of the system, but also the performance per class of customers.

Arrival Process

Customers arrive in pairs, one of class $C1$ and one of class $C2$, the pairs arrive following a Poisson distribution with $\lambda = 1.0$. The customer of class $C1$ always enters the queue before the customer of class $C2$ that arrives together.

Stations

QS1: $-/G/1/10/FIFO$; The service rate is a bimodal constant, i.e., there are two possible service times, which are associated to the two different classes of customers, $C1$ and $C2$. The service time for $C1$ is $T_1 = 0.5$. The service time for $C2$ is $T_2 = 1.0$. The customers always arrive in pairs, but the customer of class $C1$ is serviced first as stated.

QS2: $-/G/5/5/FIFO$; the service time is uniformly distributed between 1 and 7. Here we are also interested in knowing how many servers are idle.

QS3: $-/M/1/LIFO$; average service rate $\mu = 10.0$.

Routing probabilities

$p_{i,j}$ is the probability that a customer services in queue i goes to queue j .

		j		
		1	2	3
i	1	0.0	1.0	0.0
	2	0.1	0.0	0.9
	3	0.0	0.5	0.0
		p_{ij}		