A two-class queueing model with class clustering and global FCFS service discipline

Willem Mélange, Herwig Bruneel, Bart Steyaert, Joris Walraevens

Department of Telecommunications and Information Processing
Ghent University - UGent
E-mail: {wmelange,hb,bs,jw}@telin.UGent.be

Abstract

This paper considers a continuous-time queueing model with two types (classes) of customers each having their own dedicated server with exponential service times. The system adopts a "global FCFS" service discipline, i.e., all arriving customers are accommodated in one single FCFS queue, regardless of their types. "Class clustering" ,i.e., customers of any given type may (or may not) have a tendency to "arrive back-to-back", is a concept that we believe is often neglected in literature, but as it is clear that customers of different types hinder each other more as they tend to arrive in the system more clustered according to class in our system, the major aim of this paper is to estimate the impact of the degree of class clustering in our system. The motivation of our work are systems where this kind of blocking is encountered, such as input-queueing network switches or road splits.