

Combinatorial Auction Design for Bandwidth Trading: An Experimental Study

Charis Kaskiris
kaskiris@sims.berkeley.edu
School of Information Management & Systems
University of California, Berkeley

Rahul Jain, Ram Rajagopal, Pravin Varaiya
{rjain, ramr, varaiya}@eecs.berkeley.edu
Electrical Engineering and Computer Science
University of California, Berkeley

Abstract

We experimentally investigate a combinatorial double-sided auction mechanism for allocation of bandwidth between buyers and sellers. The purpose of the experiment is to investigate the efficiency of the mechanism proposed in Jain & Varaiya (2004a) as well as the bidder behavior. We have implemented the mechanism in a combinatorial auction experimental platform which was used for this investigation. We performed experiments utilizing a simplified version of the theory using two different network structures, one with full valuations over every link and another with valuations only on specific combinations with restricted supply. Experimental results show that the mechanism gets close but not achieve competitive equilibrium. The market conditions also affect the efficiency of the mechanism. In cases where the supply was restricted and the demand was on packages rather than single links, has disciplined sellers to overbid less and the buyers to underbid less. Experience from both buyers and sellers let to more efficient results. Observed prices were closer to competitive equilibrium prices under the constrained market conditions.