WiFi access point pricing as a dynamic game

John Musacchio

Electrical Engineering & Computer Sciences
UC Berkeley
211 Cory Hall #1772
Berkeley, CA 94720, USA

Abstract

We study the economic interests of a wireless access point owner and his paying client, and model their interaction as a dynamic game. The key feature of this game is that the players have asymmetric information—the client knows more than the access provider. We find that if a client has a web browser utility function (a temporal utility function that grows linearly), it is a Nash equilibrium for the provider to charge the client a constant price per unit time. On the other hand, if the client has a file transferor utility function (a utility function that is a step function), the client would be unwilling to pay until the final time slot of the file transfer. We also study an expanded game where an access point sells to a reseller, which in turn sells to a mobile client and show that if the client has a web browser utility function, that constant price is a Nash equilibrium of the three player game. Finally, we study a two player game in which the access point does not know whether he faces a web browser or file transferor type client, and show conditions for which it is not a Nash equilibrium for the access point to maintain a constant price.

Joint work with Jean Walrand. (University of California, Berkeley).