

Many to Many Matching and  
the case of Pricing and Efficiency  
in the Market for IP Addresses

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**ABSTRACT**

The market for IP addresses can be viewed as a many to many market with externalities. We consider market rules for the transfer of IP addresses, numeric identifiers required by all computers connected to the Internet. Excessive fragmentation of IP address blocks causes growth in the Internet's routing table, which is socially costly, so an IP address market should discourage subdividing IP address blocks more than necessary. Yet IP address transfer rules also need to facilitate purchase by the networks that need the addresses most, from the networks who value them least. We propose a market rule that avoids excessive fragmentation while almost achieving social efficiency and we argue that implementation of this rule is feasible despite the limited powers of central authorities. We also offer a framework for the price trajectory of IPv4 addresses. In a world without uncertainty, the unit price of IPv4 is constant before the first time when all blocks of IPv4 addresses are in use and decreasing after that time. With uncertainty, the price before that time is a martingale, and the price trajectory afterwards is a supermartingale.