

Competitive resource sharing by Internet Service Providers

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We look at non-cooperative resource sharing (a generalization of paid peering) among Internet Service Providers (ISPs), where individually rational providers who not only compete for customers but also participate in resource sharing, in order to utilize underlying complementarities in cost structures. In particular, we are interested in the following question: would simple, easy-to-implement access pricing mechanisms guarantee *ex-ante participation* in resource sharing even by providers who, subsequent to deciding participation, engage in competition for customers, set access prices and make routing decisions? We first show that, in presence of linear access pricing, participation in the sharing arrangement is possible, but not guaranteed. We then show that a two-part tariff guarantees participation in the sharing agreement—this is not obvious given that resource sharing alters customer bases. We also show that our mechanism is robust to providers mis-reporting their types. Next, we show that, though both providers choose strictly positive customer bases, one of the them has no incentive to utilize the resources of the other and effectively acts as a resource supplier, whereas the other provider utilizes both resources. Finally, we show the robustness of our results to different cost structure and game forms, and provide some policy implications. Our results have significant implications not only for policy design since they suggest that paid peering should be encouraged but also for design of realistic traffic engineering protocols.

*To read the Full paper, please contact Arun_Kumar@isb.edu