Pricing in the Internet

Scott Jordan

Department of EECS

University of California, Irvine

544D Engineering Tower

Irvine, CA 92697-2625, USA

Abstract

The Internet will provide different qualities of service (`QoS`) to different applications. Priority service will be offered through Differentiated Services (`DiffServ`), while guaranteed performance will be offered through Integrated Services (`IntServ`). Our premise is that it is not sufficient to introduce `DiffServ` into the Internet without also considering how much traffic is labelled with each priority class. Only by having information about the performance achieved by each priority class can users (or user agents) decide how to label traffic. Similarly, in `IntServ` there must be a mechanism to for a user to map buffer and bandwidth into `QoS` and for the network to determine resource allocation among traffic classes.

Our approach is to introduce the notion of pricing. Users (or their agents) and the network negotiate for resource usage by exchanging price and demand information. The prices indicate the optimal benefit gained by bandwidth and buffer usage on each link and route, based on current demand. Prices may either be used purely as internal network indicators of congestion or as real charges to each user. By distributing the resource allocation process using pricing, we aim to combine existing research results on priority service and resource reservations with results on traffic models, `QoS` metrics, resource management architectures, statistical multiplexing, and connection admission control to provide a complete connection establishment process for the Internet.