

Pricing of Risk for Loss Guaranteed Intra-domain Internet Service
Contracts

Aparna Gupta, Lingyi Zhang
Decision Sciences & Engineering Systems

&

Shivkumar Kalyanaraman,
Electrical, Computer & Systems Engineering
Rensselaer Polytechnic Institute
Troy, NY 12180, U.S.A.

Abstract

The Internet today offers primarily a best-effort service. Research and technology development efforts are currently underway to allow provisioning of better than best-effort Quality of Service (QoS) assurances. In this article, we develop a spot pricing framework for intra-domain expected bandwidth contracts with loss based QoS guarantees. The framework builds on a nonlinear pricing scheme for cost recovery from earlier work. A utility based options pricing approach is developed to account for the uncertainties in delivering loss guarantees. Application of options pricing techniques in Internet services provides a mechanism for fair risk sharing between the provider and the customer, and may be extended to price other uncertainties in QoS guarantees.