Internet Pricing and Network Management

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Outline

■ Summary of Ex-Post Charging Findings
■ Extensions to Analytical Modeling
■ Empirical Research on Internet Pricing
■ Optical Network Design
■ Status of Research Papers
Objectives of Internet Pricing

- Create a link between network management and pricing
- Understand different models of charging that affect incentives for network management
- Extend this research to new technology areas for an analysis of new business models
Summary of Ex-Post Charging Findings

- Charging at a relatively high level has many advantages
  - Combine congestion costs of utilization and burstiness into one charge
  - Able to determine charge with little overhead
- Creation of an incentive mechanism
  - Better choice of buffer sizes
  - Incentives for network monitoring and filtering
Extensions of Analytical Modeling

- Negotiation between ISP and user to maximize utility
- Understanding of “filtered” traffic flows
- Examine the positive externality affect and switching behavior of other users
Empirical Analysis on Internet Pricing

- Analysis of different markets
  - ISPs in the United States
  - Internet2
  - Global Internet
- Current findings indicate that there is a fair amount of consolidation in this industry with greater emphasis on price discrimination
Integrated Logical Topology Design for WDM Optical Networks

- Optical Networks prevalent. Several issues in optical network design. Lightpath topology design (embedded on a physical network). Routing and wavelength assignment of traffic. Problems are related.

- We wish to develop optimization techniques that solve the integrated problem.

- Summary of research so far.
  - Literature review.
  - Integer Programming Formulations.
  - Too difficult to solve (using CPLEX) with more than 10 nodes.
  - Instead can use our formulations as a heuristic/approximation (i.e., choose subset of possible lightpaths and find optimal).
  - Focus of our future research.
Research Publications