Intelligent Routing Network (IRoNet)

Results Seminar
08.01.2004
Otaniemi, TUAS House

IRoNet Objectives

• To advance state-of-the-art in QoS for the Internet using methods from mathematical modeling and simulations to measurements and prototyping.

• Focus on
  – End-to-end modeling, packet scheduling and queueing mechanisms, traffic classification, policy based networking, QoS Routing and Network Economics.
Components of the solution

Traffic and packet classification → Packet forwarding → Routing protocols and algorithms

- Traffic and packet classification
- Packet forwarding
- Routing protocols and algorithms
- Class based and SPF routing

Major Achievements

- Strengthening the team and contact network
  - New professor on Network Business 1/2003
  - International recruitment for Ph.D study
  - Memberships in E-Next and EuroNGI Networks of Excellence
  - Cooperation with FUNET/CSC
  - Closer cooperation between network theory and practice
  - Will initiate a Graduate School on “Networks for Information Society”

- Technology
  - Prototype on Policy based networking runs on Free-BSD and off-the-shelf PC hardware
  - Measurements in FUNET on 2.5 Gbit/s
  - Expansions to QoS Routing Simulator

- Theory
  - Methodology of traffic classification
  - Analytical Modelling of TCP behaviour backed up by simulations
IRoNet is on Schedule

- Budget: Slow first year (2002), will catch up during 2003
- Publications …
- Network Business launched according to plan, Measurements in FUNET progress positively

Intellectual contribution

- We understand the problem of QoS routing more clearly
  - Usefulness= a) performance and scalability of the routing schema+algorithms and b) time-variability in directionality of traffic
  - a) is addressed by prototyping, simulations and analysis and b) by measurements in FUNET
- More evidence found supporting the idea that only similar traffic should be classified to a class. Dissimilar traffic in one class lowers network utility and makes service less manageable
- Traffic classification can be a multi-purpose tool for network management
- A business game can be useful tool for learning and discussing the business logic
Broader Impact of the project

- Commercial
  - Nokia, Tellabs, Finnish Defence Forces and NECSOM have formed a consortia supporting IRoNet.
  - Sonera, Elisa and CSC/FUNET are advisory members in the Steering Group
  - CSC/FUNET cooperation established for traffic measurements
  - Hope to contribute to more efficient market rules in Mobile Data
    (Mobile Business Game)
- Scientific
  - Hope to make a wider impact in classification.
- Educational
  - 7 PhD students and 10 M.Sc students work for IRoNet
  - Contribution for courses: Quality of Service in the Internet,
    Seminar on Networking business