CS 856 - Internet Transport Performance

Course Offering: Spring 2004, Martin Karsten (m karsten@u waterloo.ca)

Seminar Style
• introductory lectures
• individual student projects, for example:
  • literature surveys
  • analysis of recent research proposals
  • implementation/experiment projects
  • etc.
• written reports
• student presentations

Further Info (under construction)

http://www.u waterloo.ca/~m karsten/cs856/
Scope

Internet hourglass model

L5: application
- web, email, phone, video, etc.

L4: transport
- TCP, UDP, SCTP, RTP, etc.

L3: network
- IP

L2: link
- Ethernet, PPP, CSMA/CA, etc.

L1: physical
- copper, fiber, radio, etc.

L4: addressing, congestion control, end2end packet loss/error correction
L3: addressing, best-effort routing and forwarding
?: predictable transport performance and reliability
Contents (Sample)

Routing (Addressing)
• inter-domain: business & policy flexibility vs. stability & complexity
• intra-domain: load control & efficiency vs. stability & complexity

Congestion Control
• convergence & fairness
• short-lived flows
• high bandwidth-delay products (e.g. inter-planetary communication)

Performance Guarantees & Quality of Service
• packet scheduling
• end-to-end scope

Resilience & Restoration
• failure resilience
• path restoration
• multi-path routing

Internet Architecture
• new addressing models
• mobility
  • device mobility vs. user mobility vs. process mobility