COMP 631

Computer Networks

Fall 2008

Logistics

- *Class Timings*: Tue/Thur, 2:00 – 3:15 pm (**subject to change**)
- *Classroom*: FB 008
- *Instructor*: Jasleen Kaur
- *Textbook*: Computer Networks: A Systems Approach (Peterson & Davie)
- *URL*: http://www.cs.unc.edu/~jasleen/Courses/Fall08/
- *Email*: jasleen@cs.unc.edu

Grading

Rough breakdown:

- Assignments: 35-40 %
    - Includes NS assignments:
        - Analysis/understanding is what I'm looking for.
        - Focus on network layer and higher.

- Exam(s): 30%

- Class participation: 10 %

- Project: 20-25%
    - Report and in-class presentation
    - Examples of topic types:
        - Survey of a current research area
        - Experimental/theoretical analysis
        - Design of a new mechanism/protocol

Syllabus

Requirements from a network:

1. **Connectivity**: getting data from one host to another.
   Simplest way: point-to-point links
   Issues: encoding, framing, error detection, error recovery.

2. **Economy**: let a number of users share a common infrastructure.
   Multiple access LANs.
   Main issue: several hosts may transmit at the same time
   - Collision detection, reliable transmission.

   We'll look at 3 main LAN technologies:
   - Ethernet,
   - Token Ring,
   - 802.11 (wireless).

3. **Global Scale**: need to connect hosts located around the world.
   Switched networks
   Main issue:
   - Routing / forwarding: where to send to enable data to ultimately reach its destination.

4. **Reliability and Congestion Control**: need to take care of congestion, node failures, out-of-order delivery
   TCP: detects current level of available capacity and sends at a rate no greater than it.
   We'll look at:
   - TCP reliability and congestion control mechanisms
   - TCP Vegas
   - High-speed TCP

5. **Differentiated Services**: for applications sensitive to timely delivery
   Provide different service to different kinds of applications, depending on their needs.
   We'll look at:
   - Resource scheduling
   - Buffer management

6. **Privacy and Security**: (if time permits)

7. **New paradigms in information sharing/distribution**:
   a. Peer-to-peer infrastructures.
   b. Content Distribution Networks.

List of some specific topics to be covered:

Error Detection, Media Access Control (Ethernet, Token Ring, 802.11), Forwarding, LAN Switching, ATM, IP, ARP, DHCP, Routing Protocols, Mobile IP, Addressing, BGP, Multicast, TCP (reliability, congestion control, high-speed variants), AQM, QoS, DNS, Peer-to-peer Infrastructures, Security.

Focus of projects: mostly on network and transport layer (topics 3 – 5).

Note: Are there other topics you'd like to be covered? Let me know soon!