Advanced Computer Networks

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February 16, 2009

1. Goals

The area of computer networks is exhibiting an extremely rapid growth, which has been impacted by both technology and application domains. Teaching computer networks is an interesting challenge for the instructor because the field is in constant flux. “What then should be taught to prepare students for what lies ahead?” “What information will remain important over the technical career of a student, and what information will soon become obsolete, of historical interest only?” This course stresses the design ideas embodied in many networks and the techniques for evaluating these ideas. The ideas and the evaluation techniques are the principles that will survive.

This course is intended to give students deep, broad, and up-to-date knowledge in the area of computer networks. Topics are selected to reflect current trends and interests. Each one is treated from both theoretical and practical points of view. The course concentrates on fundamental concepts and design issues of QoS and mobile technologies (e.g., resource management, traffic control and integrated services network for the next generation Internet). Important network applications such as multimedia and VoIP will be used as examples to illustrate the important design and management issues in the future communication networks.

2. Topics

Next Generation Internet – Wired and Wireless – QoS and Mobility

(1) Resource Management and Traffic Control (leaky bucket, admission control, scheduling)

(2) Integrated Services and Quality of Service QoS - Integrated Services, Differentiated Services, RSVP resource reservation protocol

(3) Congestion control

(4) Wireless LAN (802.11, 802.11e)

(5) Mobile IP and Mobility Management

(6) Multimedia communications and VoIP services
3. References

- Paper readings

4. Grading

- Homework (8%)
- Midterm (32%)
- Paper Survey Report (10%) (due on 5/1/2009)

5. Important Dates

- Midterm: 4/13 2:20pm-5:20pm