Introduction to Networks and the Internet

CMPE 80N
Fall 2003

Instructor:
Dr. Roberto Manduchi

Important Information

• Meeting time:
  – Monday/Wednesday/Friday 3:30 - 4:40pm
  – Kresge Clrm 321
• Class Web Site:
  – http://www.cse.ucsc.edu/classes/cmpe080n/Fall03
• Instructor:
  – Dr. Roberto Manduchi
  – 309B Baskin Engineering
  – Office hours: Wed 10:30am - 12:30pm
  – manduchi@soe.ucsc.edu
Important Information

- Teaching Assistant
  - Debasree Banerjee, Deboja Das
  - Office hours, location: TBA
- Required reading:
  - Class notes (posted on the class’ website)
  - No required textbook
- Suggested reading
  - D.E. Comer, “Computer Networks and Internets”, Prentice Hall
  - F.J. Derfler, L. Freed, “How Networks Work”, QUE
  - P. Gralla, “How the Internet Works”, QUE

CMPE80N - Assumptions

- Our assumptions about you:
  - No prior Internet/networking/engineering experience
  - CATS account
  - Access to a computer
**CMPE80N Course Objective**

- To understand both the “What” and the “Why” of networks in general and the Internet specifically.
- This course is not specific to CE/CS/EE majors. It is intended for a wide audience with little or no prior experience with the Internet, or networks in general.
- If you already took CMPE 150, you *should not* be taking this class.

**CE80N Assignments**

- Quizzes (40%)
- Final Exam (40%)
  - December 11, 8:00-11:00 am
- Project (20%)
**Academic Honesty**

- **Academic Integrity** will be strictly enforced
  - [http://www.ucsc.edu/academics/academic_integrity/policy.html](http://www.ucsc.edu/academics/academic_integrity/policy.html)

**Before the Internet**

- **Postal service**
  - Can send all sort of information all around the world
  - Relatively cheap
  - **High delay**
    - Does not allow for interaction
- **Telephone**
  - Built for speech, can be used for digital data
  - Low delay
The Telephone Network

- Telephone was patented by G. Bell in 1876
- For one telephone to be able to talk with another telephone, a direct connection between the two telephones was needed
  - Within one year, cities were covered with a wild jumble of wires!
The Telephone Network (cont’d)

• In 1878, the Bell Telephone company opened its first switching office (in New Haven, CT)
• Each user would connect to the local switching office
  – When a user wanted to make a call, s/he rang to the office, and would be manually connected.

The Telephone Network (cont’d)

• To allow for long-distance calls, switching offices (switches) were connected

• Several connections can go through inter-switch trunks simultaneously
• At some point, there were too many connections between switching offices!
The Telephone Network (cont’d)

- Thus, a second-level hierarchy was added.

- The current telephone system has five levels of hierarchy.

POTS or PSTN

- For over 100 years, the POTS (Plain Old Telephone System) a.k.a. PSTN (Public Switched Telephone Network) has been the primary focus of conventional voice-band communications.
- POTS network is well designed and engineered for the transmission and switching of voice
  - Real-time
  - Low-latency
  - High-reliability
  - Moderate-fidelity
Evolution of Comm. Networks

- POTS network is not designed for other forms of communications (audio, video, and data)
- About 30 years ago, a second communications network was created with the goal of providing a better transport mechanism for data networking
- The resulting network is called a packet network because data is transmitted and routed along the network in the form of units of information
- In this class, we will study the technology underpinning packet networks