

Brainstorm About Computer Networks

- Take 3-4 minutes to write
 - Include your name (I'll collect and read, but not grade)
- What are some network applications?
- What are some network protocols?
- What do users care about for good network performance?
- Trade write-ups with another student (introduce yourselves!)
- What do we have?



CS 3516

Computer Networks

Mark Claypool



Outline

- Background
- Course Materials
- Topics
- Motivation



Professor Background (Who am I?)

- Dr. Mark Claypool ("professor", "Mark")
 - Computer Science
 - Operating Systems, Distributed Computer Systems, Multimedia, **Networks**
 - Director of the IMGD program
 - The Game Development Process, Technical Game Development II
- Research interests
 - **Networks**, Multimedia, **Network games**, Performance evaluation



Teaching Assistants Background (Who are they?)

- **Choong-Soo Lee**
 - Ph.D. student
 - "*CHAP - Credit-based Home Access Point for Overall Application QoS Improvement*"
- **Thangam Vedagiri Seenivasan**
 - M.S. student
 - "*CStream: Neighborhood Bandwidth Aggregation for Better Video Streaming*"
- Both are excellent resources for help!
 - See them early!
 - See them often!



Student Background (Who Are You?)

- Year
 - sophomore, junior, ...
- Major
 - **CS**, **IMGD**, **RBE**, **ECE**, ...
- Programming Language of choice
 - **Java**, **C++**, **Python**, ...
- Programmer:
 - (noob) 1 to 5 (**guru/hacker**)
- Network application written? Sockets?
- Other ...



Syllabus Stuff

<http://www.cs.wpi.edu/~claypool/courses/3516-B09/>

- Office hours:
 - TBA (about 3 per week each)
 - See Web page
- Email:
 - {claypool, cleee01, thangam} @ cs.wpi.edu
 - cs3516-staff @ cs.wpi.edu
 - cs3516-all at @ cs.wpi.edu



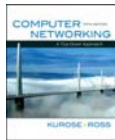
Course Materials

- Slides
 - On the Web
 - PPTX and PDF
 - Caution! Don't rely upon the slides alone! Use them as supplementary material
 - (come to class)
- Timeline
 - Tentative planning
- Assignments
- Samples
 - Network code, links



Text Book

- *Computer Networking - A Top-Down Approach*
 - James F. Kurose and Keith W. Ross
- 5th edition!
- Copyright Pearson, 2010
- Unique in the presentation of networks from the user (top) down to the bottom (physical medium)
- Homework from book
- Includes registration to access Web materials



Course Structure

- Recommended background
 - CS2303 or CS2301
 - (Systems programming)
 - In-Class
 - Lecture
 - Discussion
 - Exams
 - Out-of-Class
 - Reading
 - Projects
 - Labs
 - Homework
 - Grading
 - Exams (40%)
 - Projects (20%)
 - Homework (20%)
 - Labs (20%)
 - Only 1 day late allowed!
- (More on Exams, Labs, Homework and Projects, next)



Exams

- 2 exams
 - mid-term and final
- 40% of grade
- Non-cumulative
- Closed
 - closed-note, closed-paper, closed-friend
- Sample your knowledge of class material
- 2-hour time slot, so hopefully not time-pressured



Homework

- Written questions (and answers) pertaining to class material
- Verify that you truly understand lecture material
 - And can apply it!
- Designed to get you ready for exams
- 4 total
 - 2 before mid-term, 2 before final
- 20% of your grade



Labs

- Designed to let you learn by “seeing” actual network data
- Capture data with “sniffer” and analyze
- 4 labs
- Note, exact dates on timeline most likely to change
 - Depends upon when course material
 - 20% of your grade(More on lab 1 shortly)



Projects

- Programming part of the course
- 2 significant projects
 - One before mid-term, one after
- Using sockets
- Done individually
- Can be done in either C++ or Java
- Must run on CCC machines!
 - (Linux)
- 20% of your grade



Outline

- Background (done)
- Course Materials (done)
- Topics (next)
- Motivation



Topics

- Network protocols
- Internet traffic
- Local area networks
- Wide area networks
- Switches and routing
- Congestion
- Physical layer issues
- Wireless networks
- Security



Why Computer Networks?


- The Network is the Computer
- Most applications today are connected
 - Games, Social Networking, Streaming Video ...
- Many devices are connected
 - PCs, Game consoles, Set-top boxes, Mobile devices...
- Tools to hook up, but *how* and *why* not so clear
- In order to design and build the next generation of devices and applications, you must have at *least* a basic understanding of computer networks
- Many should take more networks!



Why This Class?

- No longer 1 course (*cs4514*), but two (*cs3516*, *cs4516*)
 - Lots of material in Networks!
- This course → learn computer networking concepts in a broad way
 - Less programming
 - Still hands-on
- CS4516 is Advanced Computer Networks
 - In-depth, more programming
 - Most should take that, too!





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