CSE 473s
Introduction to Computer Networks

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Audio/Video recordings of this lecture are available on-line at:
http://www.cse.wustl.edu/~jain/cse473-09/
Overview

- Why Study Computer Networking?
- Goal of This Course
- Instructor
- Grading
- Contents of the course
- Tentative Schedule
Why Study Computer Networking?

- Networking is the “plumbing” of computing
- Almost all areas of computing are network-based.
  - Distributed computing
  - Distributed databases
  - Distributed storage
- Fast growing field
Goal of This Course

- First course in networking
- Fundamentals
- Broad coverage of key areas of networking
- Networking background for networking applications in other areas of computing
- This is a course on Networking Architecture
- This is not a course on network building or usage
- You will be able to understand protocols
- An example of the difference between architecture and implementation is the computer architecture course and a course on Intel Pentium Chip.
Goals of This Course (Continued)

- You will learn about networking concepts that will help you understand networking jargon:
  - TCP/IP
  - Window Flow Control
  - Cyclic Redundancy Check
  - Parity
  - Start and Stop Bits
  - Baud, Hertz, and Bits/sec
  - Algorithms for determining packet routes

- This is the first course on networking.
- Basis for more advanced networking courses
# Networking Courses at WUSTL

- CSE 473s: Introduction to Computer Networks
- CSE 571s: Network Security
- CSE 573s: Protocols for Computer Networks
- CSE 574s: Wireless and Mobile Networking
- CSE 777s: Research Seminar in Networking

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Grading

- Mid-Term Exams (Best of 2) 30%
- Final Exam 30%
- Class participation 5%
- Homeworks 20%
- Labs 15%

Note: Labs require programming in C

Academic integrity is expected in homeworks
Frequently Asked Questions

- Every class will have one or more homeworks.
- All homeworks are due at the beginning of the next Monday class.
- All late submissions must be preapproved and have penalty.
- All exams are 1 hour long. One notes sheet of 8.5”x11” (both sides) is allowed along with a simple calculator.
- Exams consist of numerical as well as multiple-choice (true-false) questions.
- There is a negative grading on incorrect multiple-choice questions. Grade: +1 for correct. -1/(n-1) for incorrect.
- Everyone including the graduating seniors are graded the same way.
- I use “curve”. Your grade depends upon the performance of the rest of the class.
Textbook

- It is recommended that you read the relevant chapter of the book chapter before coming to the class ⇒ Class time will be used for discussing and clarifying key concepts.
- Only key concepts will be covered in the class. You are expected to read the rest from the book.
- Feel free to ask questions in the next class about any concepts that are not clear to you.
- Material covered in the class will include some concepts from other textbooks. Please pay attention to the class discussion and lecture.
Prerequisite

- General knowledge of computer systems organization
  - Memory
  - System bus
  - Interrupt
  - CPU
  - Binary, decimal, hexadecimal representations
  - Bits, bytes
  - Storage: Memory and disk

- CSE 131: Computer Science I or equivalent
- CSE 241: Algorithms and Data Structures (not required)
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<tr>
<td>8/26/09</td>
<td>Course Overview</td>
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<tr>
<td>8/31/09</td>
<td>Internet: Core and Edge, History</td>
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<td>Protocol Layers</td>
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<td><strong>Labor Day Holiday</strong></td>
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<tr>
<td>9/9/09</td>
<td>Application Layer: HTTP, FTP, SMTP</td>
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<td>9/14/09</td>
<td>Domain Name System (DNS)</td>
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<td>Peer to Peer (P2P) Networking</td>
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<td>9/21/09</td>
<td>Transport Layer: TCP</td>
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<tr>
<td>9/23/09</td>
<td>Universal Datagram Protocol (UDP)</td>
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<td>9/28/09</td>
<td><strong>Mid-Term 1</strong></td>
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<td>9/28/09</td>
<td>Mid-Term 1</td>
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## Tentative Schedule (Cont)

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<td>Network Layer: IPv4, ICMP, IPv6</td>
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<td>10/5/09</td>
<td>Routing Algorithms</td>
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<td>10/7/09</td>
<td>Routing Protocols: OSPF, RIP, BGP</td>
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<td>10/12/09</td>
<td>Broadcast and Multicast Routing</td>
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<td>10/14/09</td>
<td>Link Layer: Error correction, Addressing</td>
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<tr>
<td>10/19/09</td>
<td>Ethernet</td>
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<td>10/21/09</td>
<td>Point-to-Point Protocol (PPP)</td>
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<td>10/26/09</td>
<td>Wireless and Mobile Networks: WiFi</td>
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<tr>
<td>11/2/09</td>
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Mid-Term 2
### Tentative Schedule (Cont)

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<td>Mobile IP</td>
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<td>Multimedia Networking: RTP</td>
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<td>11/11/09</td>
<td>QoS: DiffServ, MPLS</td>
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<td>12/2/09</td>
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<tr>
<td>12/7/09</td>
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Office Hours

- Monday: 11:00AM to 12:00 noon
  Wednesday: 11:00AM to 12:00 noon
- Office: Bryan 523
- Graders:
  - Chakchai So-in, cse473s@gmail.com Jolly 507
Computer networking is important for all areas of computing

First course in computer networking

Goal: To prepare you for a career in networking

Get ready to work hard
Quiz 0: Prerequisites

True or False?

T  F

1. A byte is equal to 8-bits
2. A system with 32kB memory can hold only 16000 ASCII characters
3. A system with 2GB memory is same as that with 2GB disk.
4. Interrupts are used by CPU to stop an ongoing I/O.
5. Binary representation of 10 is 1010
6. 0A in Hexadecimal is 11 in decimal system.
7. For I = A Sin (2πft + φ), the frequency is f.
8. 5 modulo 2 is 1
9. Two entries “P” and “Q” are pushed sequentially on a stack. A “pop” operation on the stack will produce P.
10. If x is 0, then after x++, x will be 1.

Marks = Correct Answers _____ - Incorrect Answers _____ = ______
Student Questionnaire

- Name: ___________________________________
- Major: ___________________________________
- Email: ___________________________________
- Degree/Expected Year: ________________________
- Operating Systems/Architecture course taken: _______________________________________
- Computer networking courses taken: _____________________________________________
- What do you expect to learn from this course: __________________________________________________________________________