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

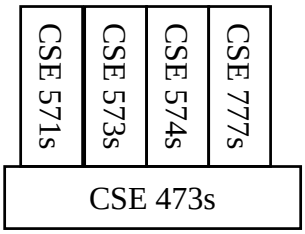
- First course in networking
- Fundamentals
- Broad coverage of key areas of networking
- Networking background for networking applications in other areas of computing
- This is a course on Networking Architecture
- This is not a course on network building or usage
- You will be able to understand protocols
- 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



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

- J.F. Kurose and K.W. Ross, "Computer Networking" 5th Edition, Addison-Wesley, 2009, ISBN:0136079679. Required. Get the latest edition. Do not use older editions.
- 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)

Tentative Schedule

Date	Topic	Chp
8/26/09	Course Overview	
8/31/09	Internet: Core and Edge, History	1
9/2/09	Protocol Layers	1
9/7/09	*Labor Day Holiday*	
9/9/09	Application Layer: HTTP, FTP, SMTP	2
9/14/09	Domain Name System (DNS)	2
9/16/09	Peer to Peer (P2P) Networking	2
9/21/09	Transport Layer: TCP	3
9/23/09	Universal Datagram Protocol (UDP)	3
9/28/09	**Mid-Term 1**	

Tentative Schedule (Cont)

Date	Topic	Chp
9/30/09	Network Layer: IPv4, ICMP, IPv6	4
10/5/09	Routing Algorithms	4
10/7/09	Routing Protocols: OSPF, RIP, BGP	4
10/12/09	Broadcast and Multicast Routing	4
10/14/09	Link Layer: Error correction, Addressing	5
10/19/09	Ethernet	5
10/21/09	Point-to-Point Protocol (PPP)	5
10/26/09	Wireless and Mobile Networks: WiFi	6
10/28/09	Cellular Networks	6
11/2/09	**Mid-Term 2**	

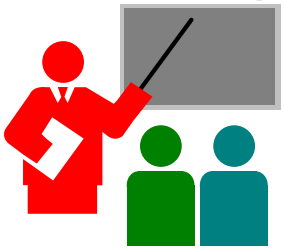
Tentative Schedule (Cont)

Date	Topic	Chp
11/4/09	Mobile IP	6
11/9/09	Multimedia Networking: RTP	7
11/11/09	QoS: DiffServ, MPLS	7
11/16/09	Security in Networks:Cryptography	8
11/18/09	IPSec	8
11/23/09	Wireless Security	8
11/25/09	*Thanksgiving Holiday*	
11/30/09	Network Management	9
12/2/09	TBD	
12/7/09	**Final Exam**	

Office Hours

- Monday: 11:00AM to 12:00 noon
  Wednesday: 11:00AM to 12:00noon
- Office: Bryan 523
- Graders:
  - Chakchai So-in, cse473s@gmail.com Jolly 507

Summary



- 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 ($2\pi ft+ \phi$), 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:
  _____
  _____
  _____
  _____