INTRODUCTION TO UNIX/LINUX NETWORK PROGRAMMING (CS515)

SPRING 2016

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Course Objectives

- Gain hands-on experience in developing UNIX/ Linux network applications
- Master socket programming interfaces
- Learn various client-server design techniques
- Improve C programming skill

Course Prerequisites

- Mandatory
  - Network Engineering and Management (CS470)
- Highly recommended
  - Advanced UNIX/Linux Programming (CS510)
  - Operating System Design (CS506 or CS380)

About Me

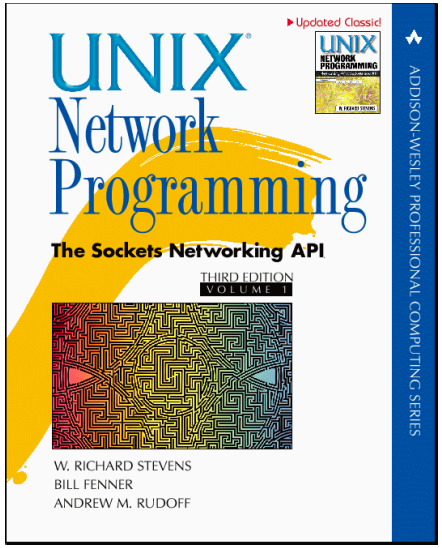
- Email: binzhang@mail.npu.edu
- Expertise
  - Language: C, C++, assembly, Python, Java
  - OS: UNIX/Linux, Windows, DOS
  - Networking: TCP/IP, Ethernet, wireless, security
- Education
  - DCE: NPU
  - ABD: University of Alberta
  - MSCS: Fudan University
  - BSCS: Fudan University

About You

- Complete the student survey form here
  - This is mandatory
    - It helps me to learn your readiness for this class
    - It helps me to build a class mailing list
  - If the link above does not work for you, please cut-n-paste http://goo.gl/forms/ARZTSx5737

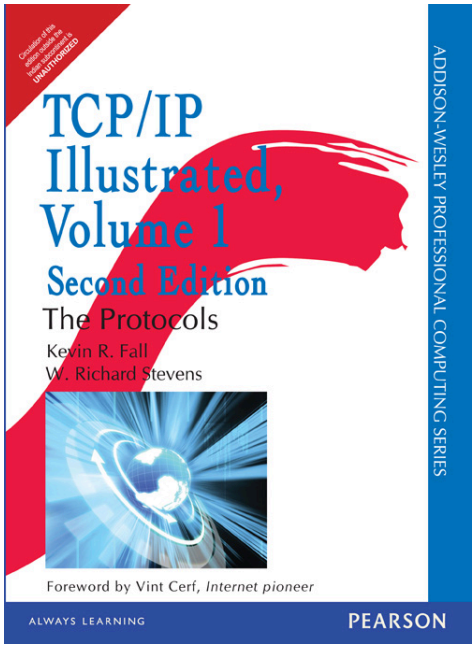
Text

- UNIX Network Programming, Volume 1 – The Sockets Networking API (3rd ed.), By W. Richard Stevens, Bill Fenner, and Andrew M. Rudoff
  - One of the best computer science text books ever written. Please *read* the book



Reference

- Reference
  - TCP/IP Illustrated, Volume 1 – The protocol (2nd ed.), By Kevin R. Fall and W. Richard Stevens
  - The best book on the Internet protocol



Resources

- TA
  - TBD
- NPU online for CS515
  - Slides and materials
  - Grades
  - Code examples
    - ~bzhang/class/cs515
      - Accessible from any NPU Linux server (e.g., npu20)

Useful Links

Links	Description
http://www.unpbook.com/	Download code examples
http://www.kohala.com/start/	Author's web site; find other good books by Stevens
http://linux.die.net/man/	Linux manual page

Course Schedule

Week	Date	Topic	Homework, Project, Exam	Reading
1	1/12	Introduction to the course and UNP	homework 1	Ch 1
2	1/19	TCP socket I	homework 1 due; homework 2	Ch 2, 3 & 4
3	1/26	Transport layer		Ch 2
4	2/2	TCP socket II	quiz 1; homework 2 due; homework 3	Ch 3 & 11
5	2/9	TCP socket III		Ch 5 & 6
6	2/16	Advanced IO	homework 3 due	Ch 14, 16 & 25
7	2/23	UDP socket	homework 4	Ch 8
8	3/1	Coding discussion and Midterm	Midterm,	
9	3/8	DNS and Term Project	homework 4 due; Project kick-off	Ch 11
10	3/15	SCTP socket		Ch 9 & 10
11	3/22	Threads	homework 5; Project checkpoint	Ch 26
12	3/29	Socket options	?	Ch 7
13	4/5	Client server design	homework 5 due	Ch 30
14	4/12	Daemon	Selective project check-off	Ch 13
15	4/19	Final exam	Final	

Homework Policy

- Homework Submission
  - Submit homework and project **online**
    - No paper version of the homework accepted
    - No email version of the homework accepted
  - The content of your homework should be a zipped file if there are more than one files
    - Your answer : a document
      - The document type can be Word, PDF, text or pic
    - Your code
      - Source file (including Makefile if any)
      - Screen shot of your program output
- Late Policy
  - No late homework is accepted

Grade

- Homework (5-5-5-5-5)
- Quiz (5)
- Term project (20)
- Midterm (20)
- Final (25)
- Participation (5)