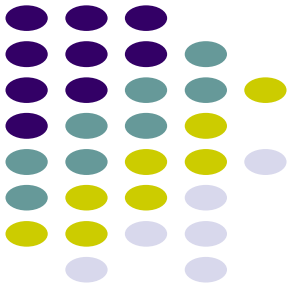
Introducing ….

Computer Networks:
An Open Source Approach

Ying-Dar Lin (NCTU)
Ren-Hung Hwang (CCU)
Fred Baker (Cisco)

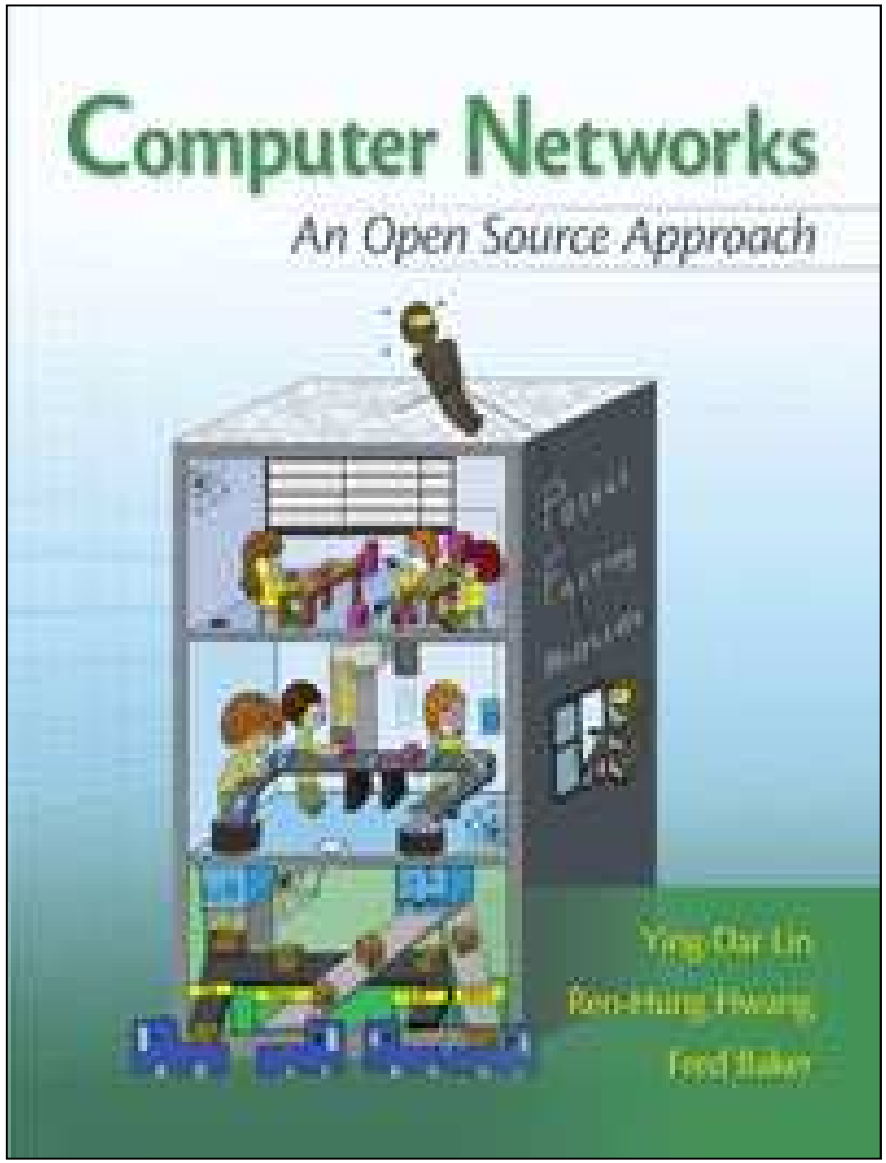


McGraw-Hill, Feb 2011

Biography of Ying-Dar Lin 林盈達

- B.S., NTU-CSIE, 1988; Ph.D., UCLA-CS, 1993
- Associate Professor/Professor, NCTU-CS, 1993~, 1999~
- Founder and Director, III-NCTU *Embedded Benchmarking Lab* (*EBL*; www.ebl.org.tw), 2011~
- Founder and Director, ITRI-NCTU *Network Benchmarking Lab* (*NBL*; www.nbl.org.tw), 2002~
- Editorial Boards: IEEE Transactions on Computers (2011~), IEEE Computer (2012~), IEEE Network (2011~), Network Testing Series of IEEE Communications Magazine (2010~), IEEE Communications Letters (2010~), Computer Communications (2010~), Computer Networks (2010~) , IEEE Communications Surveys and Tutorials (2008~), IEICE Transactions on Information and Systems (11/2011~), IEICE Transactions on Communications (5/2012~), IEEE Communications Magazine (2008~2010)
- CEO, *Telecom Technology Center* (www.ttc.org.tw), 7/2010~5/2011
- Director, *Computer and Network Center*, NCTU, 2007~2010
- Consultant, *ICL/ITRI*, 2002~2010
- Visiting Scholar, *Cisco*, San Jose, 7/2007-7/2008
- Director, *Institute of Network Engineering*, NCTU, 2005~2007
- Co-Founder, *L7 Networks Inc.* (www.L7.com.tw), 2002

- Areas of research interests
  - Deep Packet Inspection
    - Attack, virus, spam, porno, P2P
    - Software, algorithm, hardware, SoC
    - Real traffic, beta site, botnet
  - Internet security and QoS
  - Wireless mesh networking
  - Test technologies of switch, router, WLAN, security, VoIP, 4G/LTE and embedded systems
- Publications
  - International journals: 80
  - International conferences: 45
  - IETF Internet Draft: 1
  - Industrial articles: 153
  - Textbooks: 2 (Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, *Computer Networks: An Open Source Approach, McGraw-Hill, Feb 2011*)
  - Patents: 25
  - Tech transfers: 8
  - Well-cited paper: Multihop Cellular: A New Architecture for Wireless Communications, INFOCOM 2000, YD Lin and YC Hsu; #citations: 511



Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, Computer Networks: An Open Source Approach, McGraw-Hill, Feb 2011.
www.mhhe.com/lin; available now at amazon.com
Facebook Q&A Communit: www.facebook.com/CNFBs
ISBN: 0-07-337624-8 / 978-007-337624-0

Computer Networks: An Open Source Approach considers *why* a protocol, designed a specific way, is more important than *how* a protocol works. Key concepts and underlying principles are conveyed while explaining protocol behaviors. To further bridge the long-existing gap between design and implementation, it illustrates *where* and *how* protocol designs are implemented in Linux-based systems. A comprehensive set of fifty-six *live* open source implementations spanning across hardware (8B/10B, OFDM, CRC32, CSMA/CD, and crypto), driver (Ethernet and PPP), kernel (longest prefix matching, checksum, NAT, TCP traffic control, socket, shaper, scheduler, firewall, and VPN), and daemon (RIP/OSPF/BGP, DNS, FTP, SMTP/POP3/IMAP4, HTTP, SNMP, SIP, streaming, and P2P) are *interleaved* with the text.

Key features

- **Logically reasoned *why*, *where*, and *how* of protocol designs and implementations.**
- **Fifty-six explicitly numbered open source implementations for key protocols and mechanisms.**
- **Four appendices on Internet and open source communities, Linux kernel overview, development tools, and network utilities.**
- **"A Packet's Life" to illustrate the book roadmap and packet flows.**
- **Sixty-nine sidebars of Historical Evolution (33), Principle in Action (26), and Performance Matters (10).**
- **End-of-chapter FAQs and "Common Pitfalls."**
- **Class support materials including PowerPoint lecture slides and solutions manual available via the textbook website www.mhhe.com/lin.**

Quotes from Reviewers:

- **"The exposure to real life implementation details in this book is phenomenal...Definitely one of the better books written in the area of Computer Networks." – Mahasweta Sarkar, San Diego State University**

- **"I have never seen a book giving such details on explaining the design and implementation of such practical systems...Those open source implementations are excellent demonstrations for practical networking systems." – Fang Liu, University of Texas-Pan American**

- **"This is a solid textbook with strong emphasis on technical (implementation) details of computer network protocols." – Oge Marques, Florida Atlantic University**

- **"Written by RFC and open source contributors, this book definitely is an authentic guide for network engineers." – Wen Chen, Cisco Fellow**

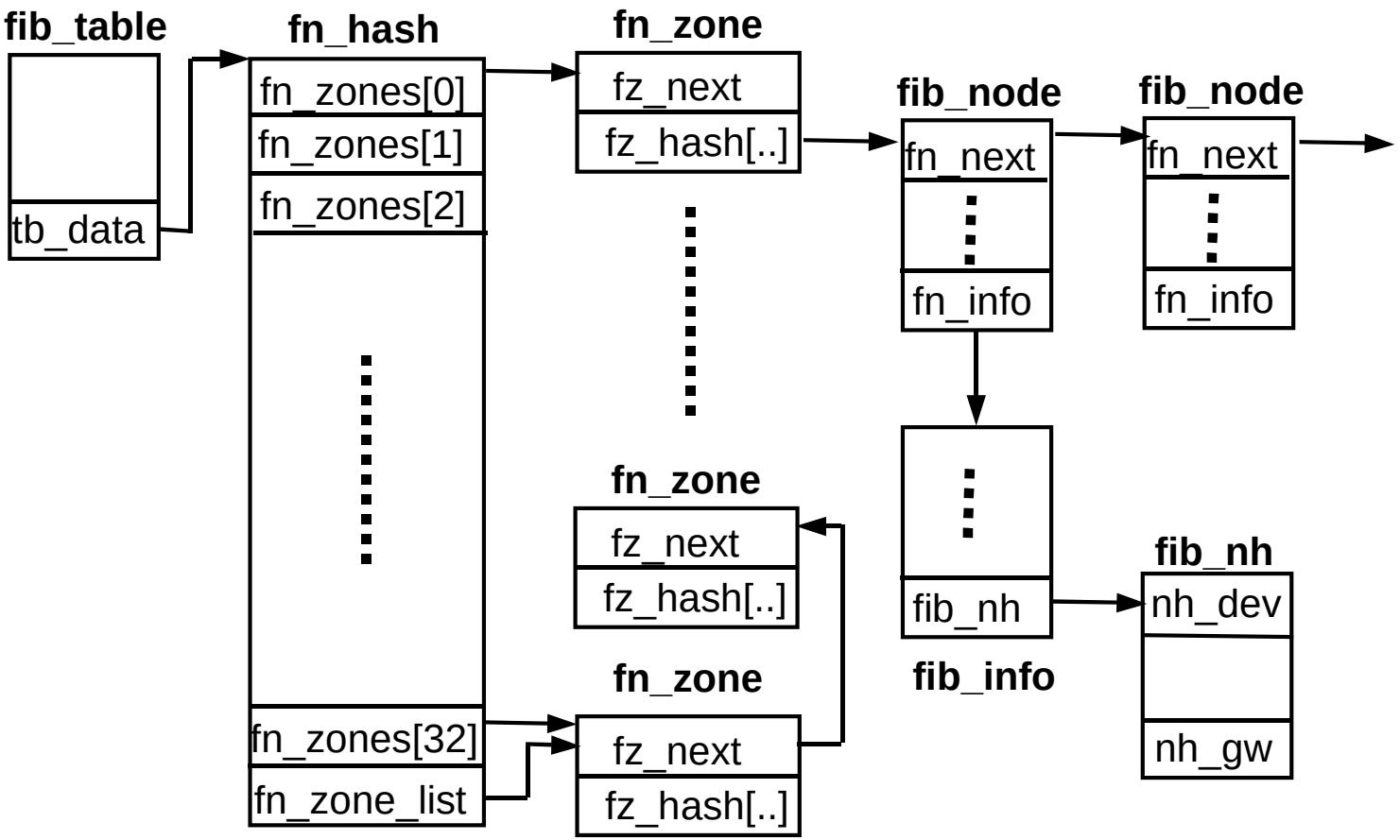
- **"Interleaving designs and implementations into the same book bridges the long-existing gap and makes this an ideal text to teach from." – Mario Gerla, University of California, Los Angeles**

- **"The sidebars of Historical Evolution and Principle in Action make the reading more enjoyable, while Performance Matters treat computer networking quantitatively." – H. T. Kung, Harvard University**

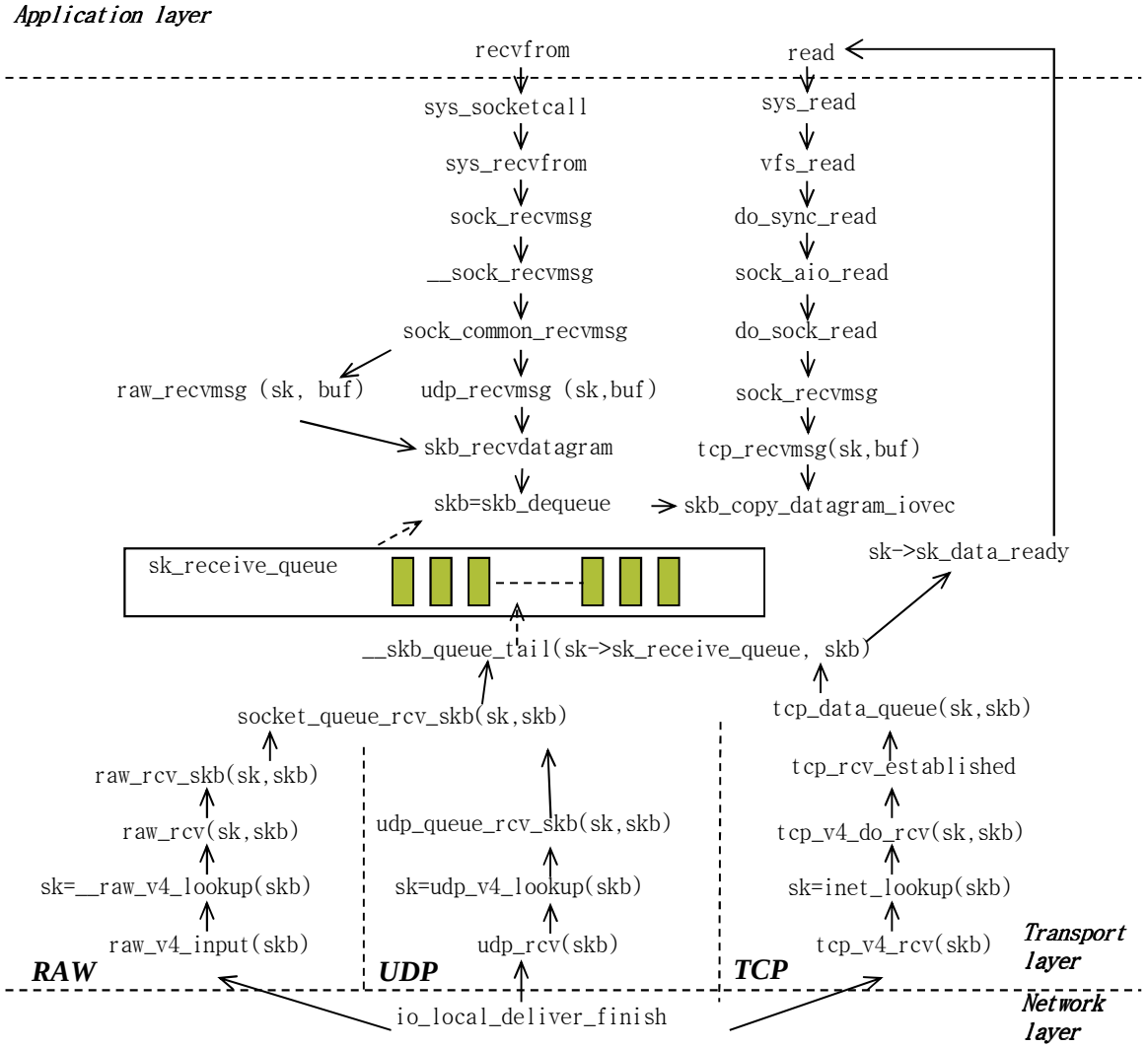
Book web sites

- McGraw-Hill
  - www.mhhe.com/lin
- Facebook Q&A Community
  - www.facebook.com/CNFBs
- My course homepage with lecture video
  - http://speed.cis.nctu.edu.tw/~ydlin/course/cn/mcn.html

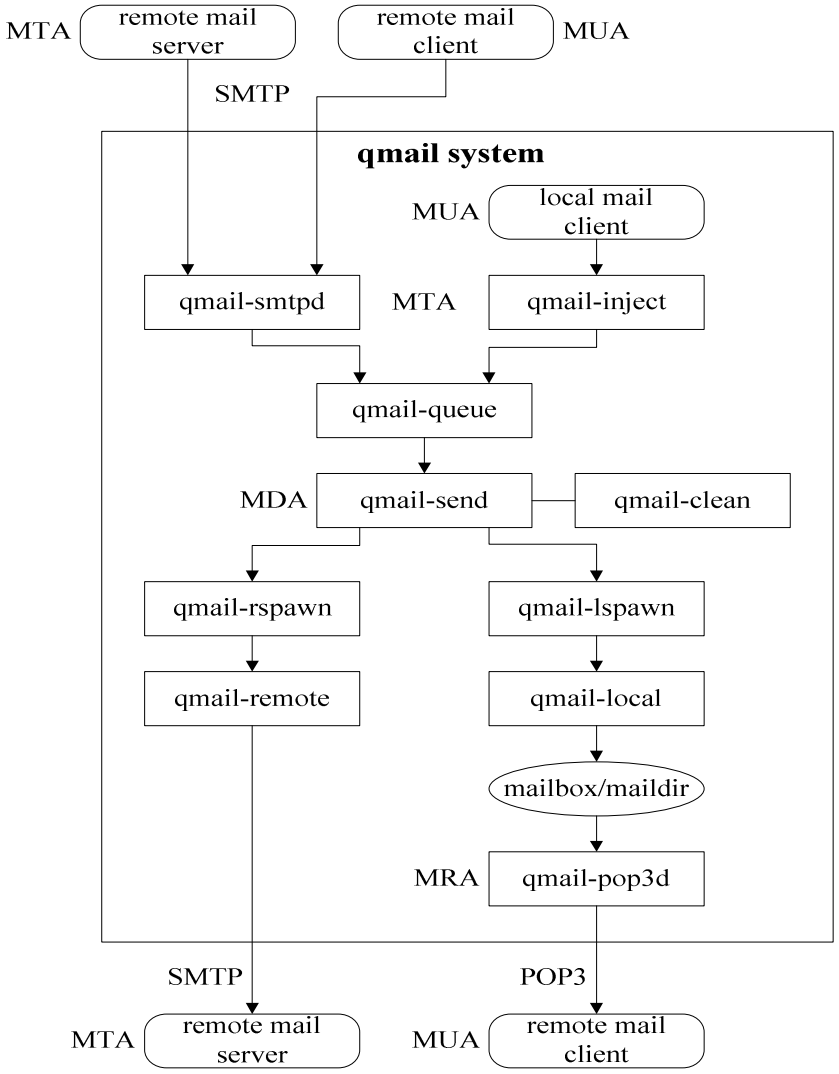
Open Source Implementation 4.2: (cont)
Routing Table (FIB)



Open Source Implementation 5.1:
an incoming packet in the transport layer



Open Source Implementation 6.2: qmail



Q&A

- Why is *interleaving* design and implementation a better approach than a *separate* approach (say two volumes)?
- Where is TCP/IP implemented in a Linux system? How about route computation?
  - Kernel, driver, daemon, or hardware?
- Why do we use Facebook to support Q&A? Why not just a bulletin board or email list?
- What pedagogical materials are need for a modern textbook?
  - Slides, solutions, and what else?