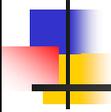


個人通訊系統 PCS (Personal Communication System)

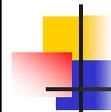


Prof. **Yuh-Shyan Chen**
Department of Computer Science and
Information Engineering
National Taipei University
Sep. 2006

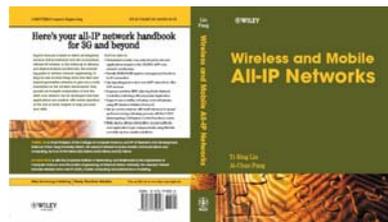
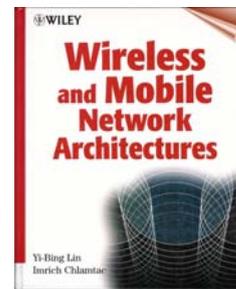


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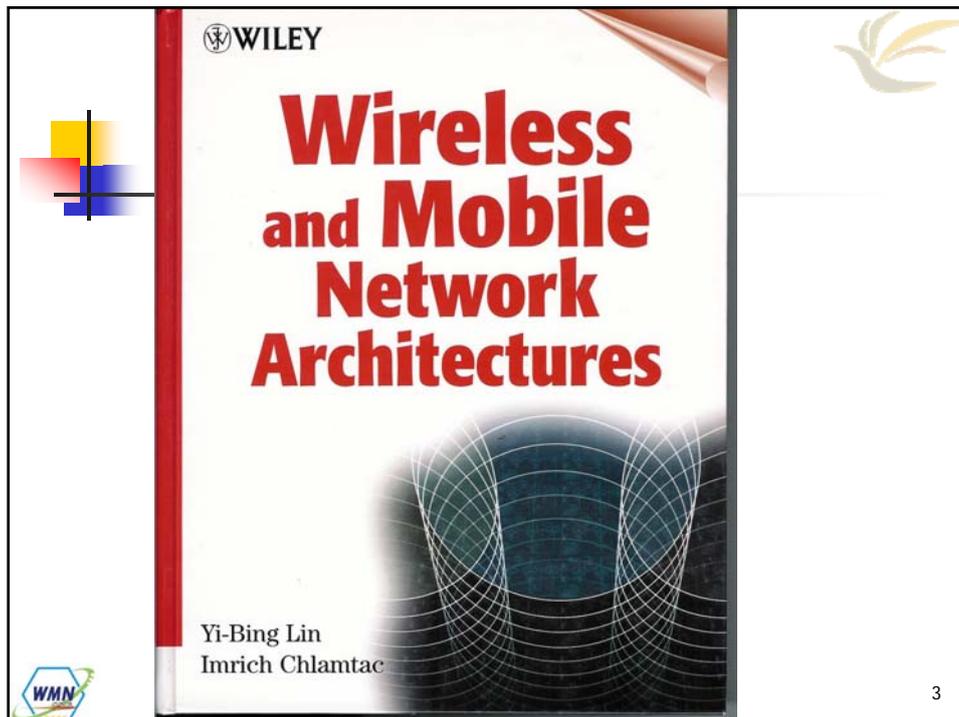
PCS (Personal Communication System)



- **Wireless and Mobile Network Architecture**
 - Yi-Bing Lin and Imrich Chlamtac
- **Wireless and Mobile ALL-IP Networks**
 - Yi-Bing Lin and Ai-Chun Pang



2

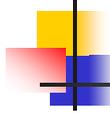


Preface

- The evolution of radio and mobile core network technologies over the last two decades has enabled the development of ubiquitous **personal communications services (PCS)**
 - which can provide the mobile user with voice, data, and multimedia services at any time, any place, and in any format.

WMN

4

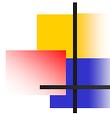


Preface

- PCS Network Management
- IS-41 Mobile Systems
- **GSM** Systems
- The Wireless Internet
- Other PCS Technologies



5

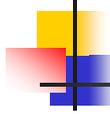


PCS Network Management

- **Chapter 1**
 - describes the **PCS** technologies and their histories
 - AMPS, GSM, DAMPS, and IS-95 CDMA, and coreless/lower PCS systems
- **Chapter 2**
 - describes two aspects of **mobility** in a mobile telephony network
 - Handoff and roaming



6

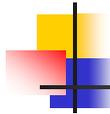


Cont.

- **Chapters 3 and 4**
 - Details of **handoff** procedure



7

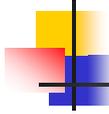


IS-41 Mobile Systems

- Chapters 5 to 8 emphasize **IS-41**-based mobile systems
- IS-41 is an interim standard that allows **handoff** between BSs under control of different MSCs and allows roaming of a MS outside its home system



8



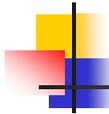
Cont.

- **Chapter 5**

- describes the interactions between a mobile network and **public-switched telephone network**
 - Interface
 - Message routing
 - Mobility management
 - Call control



9



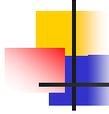
Cont.

- **Chapter 6**

- discussed **two applications** of IS-41
 - **Intersystem handoff**
 - **Authentication**



10



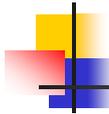
Cont.

- **Chapter 7**

- Describes network signaling for PACS, a **lower-tier PCS system** that utilize IS-41-like network management protocols
 - Basic call control, roaming, and handoff management



11



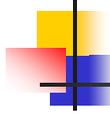
Cont.

- **Chapter 8**

- describes the Cellular Digital Packet Data (**CDPD**) architecture/protocols
 - Some major features of the CDPD medium access control layer, mobile data link protocol layer, and network layer



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GSM Systems

■ Chapter 9

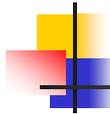
- provides an overview to the **GSM** system
 - Describing the GSM architecture, the location tracking, and call setup procedures, security, and data services.

■ Chapter 10

- addresses the software platform for GSM network signaling
 - Describe **GSM MAP** (Mobile Application Part) service framework and the MAP protocol



13



Cont.

■ Chapter 11

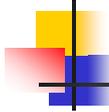
- describes **GSM mobility management**
 - Basic location update, call origination, and call termination procedure

■ Chapter 12

- describes the point-to-point **short message service**



14



Cont.

- **Chapter 13**

- describes the **international roaming** in GSM

- **Chapter 14**

- describes operations, administration, and maintenance (OA&M) aspects of GSM
 - Using call recording and HLR management as examples to illustrate GSM OA&M



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Cont.

- **Chapter 15**

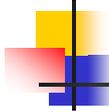
- describes the **number portability**
 - A network function that allows a mobile subscriber to keep a “**unique**” telephone number when the person switches the mobile service provider

- **Chapter 16**

- Elaborates on integration of voice over IP (**VoIP**) and GSM
 - iGSM (integrated system)



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Cont.

■ Chapter 17

- discusses the **prepaid** service
 - Wireless intelligent network, service node, hot billing, and handset-based approached are selected to be their prepaid service platforms

■ Chapter 18

- introduce the General Packet Radio Service (**GPRS**)
 - GPRS reuses the existing GSM infrastructure to provide end-to-end packet-switched services
 - Industrial solutions of the GPRS network components
 - GPRS charging
 - Development efforts from GSM to GPRS



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The Wireless Internet

■ Chapter 19

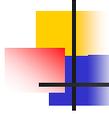
- describes the **WAP**
 - The tool for the convergence of wireless data and the Internet

■ Chapter 20

- describes various types of PCS system **integration**
 - Discusses the implementation issues involved in the integration of PCS systems



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Cont.

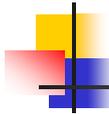
■ Chapter 21

■ explores the development of third-generation (3G) mobile networks

- Discuss the paradigm shifts in 3G networks
- The two major 3G radio proposals
 - WCDMA and cdma2000
- Improvement efforts on 3G core network
- Quality-of-service issues
- 3G handset issues
- Several 3G trial systems



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Other PCS Technologies

■ Chapter 22

- introduce the **paging** systems

■ Chapter 23

- introduce the **wireless local loop** (WLL)

■ Chapter 24

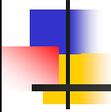
- describes how mobile communication affects **enterprise** telephony



20



Wireless and Mobile ALL-IP Networks



Prof. **Yuh-Shyan Chen**
Department of Computer Science and
Information Engineering
National Taipei University
Sep. 2006



Text Book

COMPUTERS/Computer Engineering

\$75.00 USA/\$67.99 CAN/\$50.00 UK

Lin Pang

WILEY

Here's your all-IP network handbook for 3G and beyond

Experts forecast a future in which all telephone services will be delivered over the economical, efficient IP network. In this follow-up to *Wireless and Mobile Network Architecture*, the bestselling guide to wireless network engineering, Yi-Bing Lin and Ai-Chun Pang drive into third and beyond generation networks to give you a solid foundation for the 3G/3.5G environment. They provide an in-depth examination of how the all-IP core network can be developed and how applications are created, with review questions at the end of every chapter to help you hone your skills.

- You'll be able to:
- Understand mobile core network protocols and applications based on the 3G/3.5G all-IP core network architecture
 - Handle SSN/GSN session management functions for IP connections
 - Use signaling protocols in non-IP networks to offer VoIP services
 - Engineer real-time SRNC (dormant Radio Network Controller) switching without packet duplication
 - Support user mobility call setup, and call release using SIP (Session Initiation Protocol)
 - Set up cookie schemes with fault tolerance to speed up the incoming call setup process with the I-CSCF (Interrogating Call Session Control Function) cookie
 - Write device drivers, information access methods, and application logic independently using M-Media, a mobile service creation platform.

YI-BING LIN is Chair Professor of the College of Computer Science, and VP of Research and Development, National Chiao Tung University, Taiwan. His research interest includes mobile communications and computing. He is an ACM Fellow, IEEE Fellow, AAAI Fellow, and ICFP Fellow.

AI-CHUN PANG is with the Graduate Institute of Networking and Multimedia in the Department of Computer Science and Information Engineering of National Tsing Hua University. Her research interest includes wireless voice over IP (VoIP), mobile computing and performance modeling.

Wireless and Mobile All-IP Networks

Wireless and Mobile All-IP Networks

Yi-Bing Lin
Ai-Chun Pang

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Content

- **Chapter 1**
 - Short Message Service and IP Network Integration
- **Chapter 2**
 - Mobility Management for GPRS and UMTS
- **Chapter 3**
 - Session Management for Serving GPRS Support Node
- **Chapter 4**
 - Session Management for Gateway GPRS Support Node
- **Chapter 5**
 - Serving Radio Network Controller Relocation for UMTS



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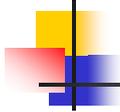


Cont.

- **Chapter 6**
 - UMTS and cdma2000 Mobile Core Networks
- **Chapter 7**
 - UMTS Charging Protocol
- **Chapter 8**
 - Mobile All-IP Network Signaling
- **Chapter 9**
 - UMTS Security and Availability Issues



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Cont.

- **Chapter 10**
 - VoIP for the Non-All-IP Mobile Networks
- **Chapter 11**
 - Multicast for Mobile Multimedia Messaging Service
- **Chapter 12**
 - Session Initiation Protocol
- **Chapter 13**
 - Mobile Number Portability



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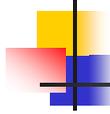


Cont.

- **Chapter 14**
 - Integration and WLAN and Cellular Networks
- **Chapter 15**
 - UMTS All-IP Network
- **Chapter 16**
 - Issues on IP Multimedia Core Network Subsystem
- **Chapter 17**
 - A Proxy-based Mobile Service Platform



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Score

- Each student has one oral presentation
 - **10%**
- Homeworks
 - **20%**
- Midterm and Final examinations
 - **35%** and **35%**

