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Introduction

Chapter 1



Wireless Comes of Age

- Guglielmo Marconi invented the wireless telegraph in 1896
 - Communication by encoding alphanumeric characters in analog signal
 - Sent telegraphic signals across the Atlantic Ocean
- Communications satellites launched in 1960s
- Advances in wireless technology
 - Radio, television, mobile telephone, communication satellites
- More recently
 - Satellite communications, wireless networking, cellular technology

Broadband Wireless Technology

- Higher data rates obtainable with broadband wireless technology
 - Graphics, video, audio
- Shares same advantages of all wireless services: convenience and reduced cost
 - Service can be deployed faster than fixed service
 - No cost of cable plant
 - Service is mobile, deployed almost anywhere

Limitations and Difficulties of Wireless Technologies

- Wireless is convenient and less expensive
- Limitations and political and technical difficulties inhibit wireless technologies
- Lack of an industry-wide standard
- Device limitations
 - E.g., small LCD on a mobile telephone can only displaying a few lines of text
 - E.g., browsers of most mobile wireless devices use wireless markup language (WML) instead of HTML



Part One: Background

- Provides preview and context for rest of book
- Covers basic topics
 - Data Communications
 - TCP/IP

er 2: Transmission

Fundamentals

- Basic overview of transmission topics
- Data communications concepts
 - Includes techniques of analog and digital data transmission
- Channel capacity
- Transmission media
- Multiplexing

er 3: Communication Networks

- Comparison of basic communication network technologies
 - Circuit switching
 - Packet switching
 - Frame relay
 - ATM

er 4: Protocols and the TCP/IP Protocol Suite

- Protocol architecture
- Overview of TCP/IP
- Open systems interconnection (OSI) reference model
- Internetworking

Communication Technology

- Underlying technology of wireless transmission
- Encoding of analog and digital data for wireless transmission

er 5: Antennas and Propagation

- Principles of radio and microwave
 - Antenna performance
 - Wireless transmission modes
 - Fading

Chapter 6: Signal Encoding Techniques

- Wireless transmission
 - Analog and digital data
 - Analog and digital signals



Chapter 7: Spread Spectrum

- Frequency hopping
- Direct sequence spread spectrum
- Code division multiple access (CDMA)

er 8: Coding and Error

Control

- Forward error correction (FEC)
- Using redundancy for error detection
- Automatic repeat request (ARQ) techniques

Part Three: Wireless Networking

- Examines major types of networks
 - Satellite-based networks
 - Cellular networks
 - Cordless systems
 - Fixed wireless access schemes
- Use of mobile IP and Wireless Access Protocol (WAP) to provide Internet and Web access

Chapter 9: Satellite Communications

- Geostationary satellites (GEOS)
- Low-earth orbiting satellites (LEOS)
- Medium-earth orbiting satellites (MEOS)
- Capacity allocation

Chapter 10: Cellular Wireless Networks

- Cellular wireless network design issues
- First generation analog (traditional mobile telephony service)
- Second generation digital cellular networks
 - Time-division multiple access (TDMA)
 - Code-division multiple access (CDMA)
- Third generation networks

Chapter 11: Cordless Systems and Wireless Local Loop

- Cordless systems
- Wireless local loop (WLL)
 - Sometimes called radio in the loop (RITL) or fixed wireless access (FWA)

Chapter 12: Mobile IP and Wireless Access Protocol

- Modifications to IP protocol to accommodate wireless access to Internet
- Wireless Application Protocol (WAP)
 - Provides mobile users access to telephony and information services including Internet and Web
 - Includes wireless phones, pagers and personal digital assistants (PDAs)

our: Wireless Local Area Networks

- Examines underlying wireless LAN technology
- Examines standardized approaches to local wireless networking

Chapter 13: Wireless LAN Technology

- Overview of LANs and wireless LAN technology and applications
- Transmission techniques of wireless LANs
 - Spread spectrum
 - Narrowband microwave
 - Infrared

Wireless LAN Standard

- Wireless LAN standards defined by IEEE 802.11 committee



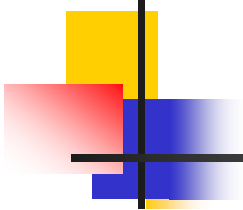
Chapter 15: Bluetooth

- Bluetooth is an open specification for wireless communication and networking
 - Personal computers
 - Mobile phones
 - Other wireless devices



Internet and Web Resources

- Web page for this book
 - WilliamStallings.com/Wireless1e.html
 - Useful web sites, errata sheet, figures, tables, slides, internet mailing list, wireless courses
- Computer Science Student Support Site
 - WilliamStallings.com/StudentSupport.html
- Newsgroups
 - comp.std.wireless
 - comp.dcom.*



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