



# Ad Hoc Mobile Wireless Networks: Principles, Protocols and Applications

By Subir Kumar Sarkar, T.G. Basavaraju, C. Puttamadappa



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Ad hoc mobile wireless networks have seen increased adaptation in a variety of disciplines because they can be deployed with simple infrastructures and virtually no central administration. In particular, the development of ad hoc wireless and sensor networks provides tremendous opportunities in areas including disaster recovery, defense, health care, and industrial environments. **Ad Hoc Mobile Wireless Networks: Principles, Protocols and Applications** explains the concepts, mechanisms, design, and performance of these systems. It presents in-depth explanations of the latest wireless technologies, including Bluetooth, IrDA, HomeRF, WiFi, WiMAX, wireless Internet, and the mobile IP.

The book begins with a focus on ad hoc wireless networks and MAC protocols, discussing the issues of collision resolution, multiple channels, and the use of directional antennas. It continues with a preview of the numerous practical applications of mobile ad hoc networks (MANETs) and describes how these applications involve different scenarios dependent on the environment and nature of participant interactions. The authors address the trials of bringing Quality of Service (QoS) support to MANETs and the common difficulties associated with that task, which include mobility, limited bandwidth, and power consumption. Every chapter provides relevant examples and problems to illustrate each concept.

Communication between various devices makes it possible to provide unique and innovative services. Although ad hoc systems are very powerful mechanisms, they are also quite complex. This masterful resource demystifies these complexities with detailed accounts of the technologies, applications, and challenges related to this influential technology.

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### Editorial Review

#### About the Author

**Mark Wuthnow** is a part of AT&T's architecture and planning organization and brings over 20 years of telecommunications experience to this work. He started his career at AT&T Bell Laboratories where he led the systems engineering teams responsible for the first three development releases of the ISDN Primary Rate Interface (PRI) for the 5ESS® switch. He later joined Southwestern Bell Technology Resources Inc. (now AT&T Laboratories) where he has been working in the wireless arena for over 15 years now. Mark has held various positions and has contributed to the various wireless subsidiaries of AT&T throughout their multiple mergers (including Southwestern Bell Mobile Systems, Cingular Wireless, and AT&T Mobility). In addition, he holds 12 patents and is also a senior member of IEEE.

**Jerry Shih** is currently part of AT&T's architecture and planning organization. He has been in chair and vice-chair positions in international SDOs in the past, mostly related to messaging service development. He has been involved in OMA service enablers' development since 2003 and is currently active in OMA converged IP messaging and converged address book service enablers' development. Jerry Shih started his telecom career at AT&T Bell Laboratories (now Alcatel-Lucent Bell Laboratories) where he worked on digital PBX call processing software development. In his 20-plus years' telecom career, he has worked for AT&T Bell Laboratories, BellSouth, Southwestern Bell Mobile System, Cingular Wireless, and AT&T Mobility in different capacities. He has been part of the major telecom evolutions, from ISDN to Intelligent Network to IMS.

**Matthew Stafford** began his telecommunications career in 1996 with SBC Technology Resources Inc. He worked on ATM and Quality of Service in IP networks. Matthew later moved to Cingular Wireless and then to AT&T as a result of its merger with Cingular Wireless. After working on various softswitch projects, Matthew wrote *Signaling and Switching for Packet Telephony* (Artech House, 2004). From 2004 to 2007, he served as vice chair of numbering for GSM North America. The numbering group's main task was to develop ENUM recommendations. Matthew is currently a member of AT&T's architecture and planning organization. Matthew is a member of IEEE.

**Bill Rosenberg** (Chapter 9 author) is a principal technical architect in AT&T's architecture and planning organization. He has over 20 years of experience in terrestrial and satellite communications. Bill's career began at TRW Space & Electronics (now Northrop Grumman Space Technology) where he was a systems engineer on satellite communication payloads. He later worked for Arrowsmith Technologies designing wireless communication systems for the company's fleet management product. Bill joined Southwestern Bell Technology Resources (now AT&T Labs) and continued with SBC's wireless division through its various incarnations, including Cingular Wireless and AT&T Mobility. Bill is supporting AT&T's wireless business by developing new technologies and services. He currently develops new messaging, cell broadcast, and IMS services for GSM and UMTS designs, and contributes to industry standards. Bill played a key role in the development and launch of Video Share, which was AT&T Mobility's first IMS-based service.

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