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Nota di contenuto	Foreword -- Preface -- List of Abbreviations -- 1 The Vision of Personal Networks -- 1.1 Past, Present, and Future Telecommunication -- 1.2 Personal Networks -- 1.3 Some Typical PN Use-Case Scenarios -- 1.4 Federations of Personal Networks -- 1.5 Early Personal Network Implementations -- 1.6 Expected Impact -- 1.7 Summary -- 2 Personal Networks User Requirements -- 2.1 Ubiquitous Networking -- 2.2 Heterogeneous Hardware Constraints -- 2.3 Quality of Service and Reliability -- 2.4 Name, Service, and Content Management -- 2.5 Context Awareness -- 2.6 Being Cognitive -- 2.7 Security and Trust -- 2.8 Privacy -- 2.9 Usability -- 2.10 Other Requirements -- 2.11 Jane Revisited -- 2.12 Summary -- 3 Trends in Personal Networks -- 3.1 Wireless Communications -- 3.2 Ad Hoc Networking -- 3.3 WWRF Book of Visions -- 3.4 Ubiquitous and Pervasive Computing and Communication -- 3.5 Ambient Networks -- 3.6 IST PACWOMAN and SHAMAN -- 3.7 Personal Distributed Environment -- 3.8 MyNet -- 3.9

P2P Universal Computing Consortium -- 3.10 More Trends -- 3.11 Personal Networks and Current Trends -- 3.12 Summary -- 4 The Personal Network Architecture -- 4.1 Terminology -- 4.2 Personal and Foreign Nodes -- 4.3 The Three Level Architecture View -- 4.4 Personalization of Nodes -- 4.5 Cluster Organization -- 4.6 Personal Network Organization -- 4.7 Foreign Communication -- 4.8 Higher Layer Support Systems -- 4.9 Federations of Personal Networks -- 4.10 Discussion -- 4.11 Summary -- 5 Cluster Formation and Routing -- 5.1 What is a Cluster? -- 5.2 Mobile Ad Hoc Network Technologies -- 5.3 Cluster Formation and Maintenance -- 5.4 Intra-Cluster Routing -- 5.5 Summary -- 6 Inter-Cluster Tunneling and Routing -- 6.1 Inter-Cluster Tunneling Requirements -- 6.2 IP Mobility -- 6.3 PN Addressing -- 6.4 Infrastructure Support -- 6.5 Inter-Cluster Tunneling -- 6.6 Inter-Cluster Routing -- 6.7 Summary -- 7 Foreign Communication -- 7.1 Requirements for Foreign Communication -- 7.2 Setting up Communication with Foreign Nodes. 7.3 Bridging Inside and Outside Protocols -- 7.4 Mobility and Gateway Node Handover -- 7.5 Summary -- 8 Personal Network Application Support Systems -- 8.1 Required PN Application Support -- 8.2 Design of a PN Application Support System -- 8.3 Service Discovery and Management Implementation -- 8.4 An Implementation of Context Management -- 8.5 Summary -- 9 Personal Network Security -- 9.1 Device Personalization -- 9.2 Establishment of Secure Communication -- 9.3 Secure Foreign Communication -- 9.4 Anonymity -- 9.5 Summary -- 10 Personal Network Federations -- 10.1 Examples -- 10.2 Types of Federations -- 10.3 Requirements -- 10.4 Architecture of a Federation -- 10.5 Life Cycle of a Federation -- 10.6 Federation Access Control -- 10.7 Federation Implementation Approaches -- 10.8 Security -- 10.9 Summary -- 11 Personal Network Prototypes -- 11.1 The TU Delft Prototype -- 11.2 The PNP2008 Prototypes -- 11.3 The MAGNET Prototype -- 11.4 Summary -- 12 The Future of Personal Networks -- 12.1 Are We There Yet? -- 12.2 Future Directions -- Appendix A Terminology -- A.1 Connectivity Abstraction Level -- A.2 Network Abstraction Level -- A.3 Application and Service Abstraction Level -- A.4 Personal Network Federations -- References -- Related Websites -- Index.

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## Sommario/riassunto

Written by experts in the field, this book describes the Personal Network architecture and its various components. This book focuses on networking and security aspects of Personal Networks (PNs). Given a single user, the authors propose an architecture for PNs in which devices are divided into one of two types of nodes: personal nodes and foreign nodes. Furthermore, the authors demonstrate the ways in which PNs can be formed in a self-organized and secure way, how they can be interconnected using infrastructure networks, how multiple PNs can be connected, and how their services and resources can be shared. In addition, the book shows how security and ease-of-use can be achieved through automatic configuration and how mobility can be supported through adaptability and self-organization. The motivations for the PN concept, the PN architecture, its functionalities and features, as well as future challenges are covered in depth. Finally, the authors consider the potential applications for PNs and briefly discuss additional support systems for PN applications. The latter includes service discovery and context information management among others.

**Key Features:** . Describes the PN network architecture and its various components in-depth. Written by experts who developed this concept. Discusses the newer topic of federations of PNs. Considers potential PN applications, and demonstrates how applications support systems, such as service discovery and context management, can assist the

applications. Provides an insight into the challenges of future personal networking, architectures for PNs, potential and important solutions, and their implications This book will serve as an invaluable reference for researchers, developers, and standardization experts in mobile and wireless communication systems and services. It will also be of interest to postgraduate students in the field of telecommunications.

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