Preface

Security issues in distributed systems and network systems become extremely important. This edited book provides a comprehensive treatment for security issues in these systems ranging from attacks to all kinds of solutions from prevention approaches to detection approaches. The books will include security studies in a large range of systems including distributed systems, Internet, pervasive computing, sensor networks, ad hoc networks, wireless networks, etc. Security issues in these systems include (but not limited to), attacks, malicious node detection, access control, authentication, intrusion detection, privacy and anonymity, security architectures and protocols, security theory and tools, secrecy and integrity, trust models. The goals of this edited book Is to provide an excellent reference for students, faculty, researchers, and people in the industry related to these fields.

This edited book contains articles written by experts on a wide range of topics that are associated with novel methods, techniques and applications of security in distributed and networking systems. It can serve as a useful reference for researchers, educators, graduate students, and practitioners in the fields of security in distributed systems, Internet, pervasive computing, sensor networks, ad hoc networks, wireless networks, etc.

The book contains 18 chapters from prominent researchers working in these areas around the world. It is organized along six themes (parts) in security issues for distributed systems, Internet, pervasive computing, sensor networks, ad hoc networks, wireless networks.

Part I: Security in Internet

Chapter 1 by Mateti introduces security issues in TCP/IP suite from a practical perspective. Chapter 2, by Wu et al. discusses two trends of potentially unwanted technologies in Internet (spam e-mails and spyware), and practical solutions. Chapter 3 by Oehler presents an overview of Secure Real-time Transport Protocol.

Part II: Security in Distributed Systems

Chapter 4 by Ling et al. surveys some mathematical results on cover-free families and present several interesting applications to topics in secure networks and distributed systems. Chapter 5 by Wang et al. proposes an ID-based Hierarchical Key Graph Scheme to manage multi-privileged group communications. Chapter 6, by Huai et al. introduces an access control policy negotiation solution on remote hot-deployment for grid services.

Part III: Security in Pervasive Computing

Chapter 7 by Xiao et al. discusses security issues in RFID systems and solution and enhancements. Chapter 8 by Misic analyzes performance of the 802.15.4 cluster in beacon enabled mode under the presence of key exchange protocol. Chapter 9 by Corbett et al. presents statistical and spectral analysis techniques to identify the type of wireless network interface cards being used on a network.

Part IV: Security in Sensor Networks

Chapter 10 by Hu et al. analyzes the time synchronization protocols in wireless sensor networks as well as potential network attacks and some efficient countermeasures. Chapter 11 by Kwok provides a detailed survey of sensor key management techniques. Chapter 12 by Dimitriou et al. shows how one can secure these protocols by adding source authentication to ensure that the program image originates from the base station.

Part V: Security in Ad Hoc Networks

Chapter 13 by Hoeper et al. introduces two full functional identity-based authentication and key exchange schemes for mobile ad hoc networks. Chapter 14 by Jiang et al. proposes a key distribution scheme with time-limited node revocation for secure group communications in wireless sensor networks. Chapter 15 by Xu et al. introduces an efficient ID-based online/offline scheme for authentication in AODV and then provides a formal transformation to convert the scheme to an ID-based online/offline multi-signature scheme.

Part VI: Security in Wireless Networks

Chapter 16 by Pervaiz et al. surveys wireless LANs security attacks and alternative security mechanisms. Chapter 17 by Shidhani et al. surveys authentication, authorization and accounting protocols and highlights their importance in securing heterogeneous wireless networks. Chapter 18 by Li et al. provides a survey of authentication mechanisms for wireless cellular networks.

Although the covered topics may not be an exhaustive representation of all the security issues in distributed systems, Internet, pervasive computing, sensor networks, ad hoc networks, and wireless networks, they do represent a rich and useful sample of the strategies and contents.

This book has been made possible by the great efforts and contributions of many people. First of all, we would like to thank all the contributors for putting together excellent chapters that are very comprehensive and informative. Second, we would like to thank the staff members, especially Dr Chunguang Sun, from World Scientific Publishing Co., for putting this book together. Finally, we would like to dedicate this book to our families.

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