IEEE 802.11b Ad Hoc Networks: Performance Measurements

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Abstract. In this paper we investigate the performance of IEEE 802.11b ad hoc networks by means of an experimental study. An extensive literature, based on simulation studies, there exists on the performance of IEEE 802.11 ad hoc networks. Our analysis reveals several aspects that are usually neglected in previous simulation studies. Firstly, since different transmission rates are used for control and data frames, different transmission ranges and carrier-sensing ranges may exist at the same time in the network. In addition, the transmission ranges are in practice much shorter than usually assumed in simulation analysis, not constant but highly variable (even in the same session) and depends on several factors. Finally, the results presented in this paper indicate that for correctly understanding the behavior of an 802.11b network operating in ad hoc mode, several different ranges must be considered. In addition to the transmission range, the physical carrier sensing range is very important. The transmission range is highly dependent on the data rate and is up to 100 m, while the physical carrier sensing range is almost independent from the data rate and is approximately 200 m. Furthermore, even though stations are outside from their respective physical carrier sensing range, they may still interfere if their distance is lower than 350 m.

1   Introduction

The IEEE 802.11 technology [IEE02] is a good platform to implement single-hop ad hoc networks because of its extreme simplicity. Single-hop means that stations must be within the same transmission radium (say 100-200 meters) to be able to communicate. This limitation can be overcome by multi-hop ad hoc networking. This requires the addition of routing mechanisms at stations so that they can forward packets towards the intended destination, thus extending the range of the ad hoc network beyond the transmission radium of the source station. Routing solutions designed for wired networks (e.g., the Internet) are not suitable for the ad hoc environment, primarily due to the dynamic topology of ad hoc networks. Even though large-scale multi-hop ad hoc networks will not be available in the near future, on smaller scales, mobile ad hoc networks are starting to appear thus extending the range of the IEEE 802.11 technology over multiple radio hops.

Ieee 802 11 Ad Hoc Networks Performance Measurements

Teresa Vazão,Mário M. Freire,Ilyoung Chong

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   Parallel and Distributed Processing and Applications Yi Pan,2005-10-21 This book constitutes the refereed proceedings of the Third International Symposium on Parallel and Distributed Processing and Applications ISPA 2005 held in Nanjing China in November 2005 The 90 revised full papers and 19 revised short papers presented together with 3 keynote speeches and 2 tutorials were carefully reviewed and selected from 645 submissions The papers are organized in topical sections on cluster systems and applications performance evaluation and measurements distributed algorithms and systems fault tolerance and reliability high performance computing and architecture parallel algorithms and systems network routing and communication algorithms security algorithms and systems grid applications and systems database applications and data mining distributed processing and architecture sensor networks and protocols peer to peer algorithms and systems internet computing and Web technologies network protocols and switching and ad hoc and wireless networks   **Quality of Service Architectures for Wireless Networks: Performance Metrics and Management** Adibi, Sasan,Jain, Raj,Parekh, Shyam,Tofighbakhsh, Mostafa,2010-01-31 This book further explores various issues and proposed solutions for the provision of Quality of Service QoS on the wireless networks Provided by publisher   **Handbook of Algorithms for Wireless Networking and Mobile Computing** Azzedine Boukerche,2005-11-28 The Handbook of Algorithms for Wireless Networking and Mobile Computing focuses on several aspects of mobile computing particularly algorithmic methods and distributed computing with mobile communications capability It provides the topics that are crucial for building the foundation for the design and construction of future generations of mobile and wireless networks including cellular wireless ad hoc sensor and ubiquitous networks Following an analysis of fundamental algorithms and protocols the book offers a basic overview of wireless technologies and networks Other topics include issues related to mobility aspects of QoS provisioning in wireless networks future applications and much more   Vehicular Ad-hoc Networks for Smart Cities Anis Laouiti,Amir Qayyum,Mohamad Naufal Mohamad Saad,2014-09-08 Vehicular communication is a key technology in intelligent transportation systems For many years now the academic and industrial research communities have been investigating these communications in order to improve efficiency and safety of future transportation Vehicular networking offers a wide variety of applications including safety applications as well as infotainment applications This book highlights the recent developments in vehicular networking technologies and their interaction with future smart cities in order to promote further research activities and challenges SAADI BOUDJIT University of Paris 13 France HAKIMA CHAOUCHI Telecom SudParis France YACINE GHAMRI University La Rochelle France HALABI HASBULLAH Universiti Teknologi Petronas Malaysia ANIS LAOUITI Telecom SudParis France SAOUCENE MAHFOUDH Jeddah Saudi Arabia PAUL MUHLETHALER INRIA France AMIR QAYYUM Mohamad Ali Jinnah University Pakistan NAUFAL SAAD Universiti Teknologi Petronas Malaysia AHMED SOUA NIST USA HAJIME TAZAKI University of Tokyo Japan APINUN TUNPAN Aintec Thailand WEI WEI Xi an University

China RACHID ZAGROUBA ENSI Tunisia *Encyclopedia on Ad Hoc and Ubiquitous Computing* Dharma P. Agrawal,Dr. Bin Xie,2010 Ad hoc and ubiquitous computing technologies have received extensive attention in both the academia and industry with the explosive growth of wireless communication devices These technologies are beneficial for many applications such as offering futuristic high bandwidth access for users and are expected to offer more exciting and efficient services anytime and anywhere In order to satisfy these diverse applications the design issues of various wireless networks such as ad hoc sensor and mesh networks are extremely complicated and there are a number of technique challenges that need to be explored involving every layer of the OSI protocol stack This book aims to provide a complete understanding of these networks by investigating the evolution of ad hoc sensor and mesh networking technologies from theoretic concept to implementation protocols from fundamentals to real applications It provides the necessary background material needed to go deeper into the subject and explore the research literature The explanation in the book is therefore sufficiently detailed to serve as a comprehensive reference for students instructors researchers engineers and other professionals building their understanding of these networks Sample Chapter s Chapter 1 Survey on Link Quality Models in Wireless Ad Hoc Networks 235 KB Contents Mobile Ad Hoc Networks Survey on Link Quality Models in Wireless Ad Hoc Networks M Lu Scalable Multicast Routing in Mobile Ad Hoc Networks R Menchaca Mendez TCP Congestion and Admission Control Protocols in Ad Hoc Networks A Mishra et al Wireless Ad Hoc Networks with Directional Antennas B Alawieh et al Peer to Peer and Content Sharing in Vehicular Ad Hoc Networks M Abuelela Properties of the Vehicle to Vehicle Channel for Dedicated Short Range Communications L Cheng et al Radio Resource Management in Cellular Relay Networks K D Lee Game Theoretic Tools Applied to Wireless Networks H Liu et al Wireless Sensor Networks Wireless Sensor Networks OCo Routing Protocols A Jamalipour Handling QoS Traffic in Wireless Sensor Networks M Younis et al Mobility in Wireless Sensor Networks A Asok et al Delay Tolerant Mobile Sensor Networks Y Wang Integration of RFID and Wireless Sensor Networks H Liu et al Integrating Sensor Networks with the Semantic Web Y Pei Effective Multiuser Broadcast Authentication in Wireless Sensor Networks K Ren et al Security Attacks and Challenges in Wireless Sensor Networks A S K Pathan Information Security in Wireless Sensor Networks A Ouadjaout et al Wireless Mesh Networks Network Architecture and Flow Control in Multi Hop Wireless Mesh Networks D Nandiraju et al Multi Hop MAC IEEE 802 11s Wireless Mesh Networks R C Carrano et al Channel Assignment in Wireless Mesh Networks W Fu et al Multi Hop Multi Path and Load Balanced Routing in Wireless Mesh Networks S Mishra Mobility Management in Wireless Mesh Networks P Wu et al Selfishness and Security Schemes for Wireless Mesh Network L Santhanam et al Readership Advanced undergraduates and graduate students in computer engineering instructors researchers engineers and other professionals   *Measurement, Modelling, and Evaluation of Computing Systems and Dependability in Fault Tolerance* Erwin Rathgeb,Klaus Echtle,Bruno Müller-Clostermann,2010-05-28 This book constitutes the refereed proceedings of the 15th International GI ITG Conference on Measurement Modelling and Evaluation of

Computing Systems and Dependability and Fault Tolerance held in Essen Germany in March 2010 The 19 revised full papers presented together with 5 tool papers and 2 invited lectures were carefully reviewed and selected from 42 initial submissions The papers cover all aspects of performance and dependability evaluation of systems including networks computer architectures distributed systems software fault tolerant and secure systems *Ad Hoc Networks* Jun Zheng,Cheng Li,Peter Han Joo Chong,Weixiao Meng,Feng Yan,2020-01-02 This book constitutes the refereed proceedings of the 11th International Conference on Ad Hoc Networks ADHOCNETS 2019 held in Queenstown New Zealand in November 2019 The 28 full papers were selected from 64 submissions and cover a variety of network paradigms including mobile ad hoc networks sensor networks vehicular networks underwater networks airborne networks underground networks personal area networks device to device D2D communications in 5G cellular networks and home networks The papers present a wide range of applications in civilian commercial and military areas *Passive and Active Network Measurement* Steve Uhlig,Konstantina Papagiannaki,Olivier Bonaventure,2007-06-30 This book constitutes the refereed proceedings of the 8th International Conference on Passive and Active Measurement PAM 2007 held in Louvain la Neuve Belgium April 2007 Coverage focuses on research and practical applications of network measurement and analysis techniques detailing interdomain routing P2P wireless 802 11 wireless 3G CDMA Bluetooth infrastructure and services traffic and measurement principles **Personal Wireless Communications** Marco Conti,2003-09-12 This book constitutes the refereed proceedings of the IFIP TC6 8th International Conference on Personal Wireless Communications PWC 2003 held in Venice Italy in September 2003 The 49 revised papers presented together with 6 special track papers 1 invited paper 11 project descriptions 7 work in progress reports and 8 novel ideas reports were carefully reviewed and selected from 115 submissions The papers are organized in topical sections on mobile computing wireless access sensor networks transport protocols performance models WCDMA ad hoc networks wireless and mobile systems cellular networks IPv6 Bluetooth and security and cooperations in ad hoc networks **Mobile Ad-hoc and Sensor Networks** Hongke Zhang,Stephan Olariu,Jiannong Cao,David B. Johnson,2007-11-28 This book constitutes the refereed proceedings of the Third International Conference on Mobile Ad hoc and Sensor Networks MSN 2007 held in Beijing China in December 2007 The papers address all current issues in mobile ad hoc and sensor networks and are organized in topical sections on routing network protocols energy efficiency data processing self organization and synchronization deployment and application as well as security 4g Mobile and Wireless Communications Technologies Sofoklis Kyriazakos,Ioannis Soldatos,George Karetsos,2022-09-01 Mobile and wireless communications are moving towards a new era that will be characterized by the seamless collaboration of heterogeneous systems the need for high speed communications while on the move and for advanced services with quality guarantees Recent market research studies show that most of the traffic in the future wireless networks will be produced by mobile multimedia services which are expected to proliferate by the year 2010 On the other hand mobile and wireless

communications technology is becoming more and more important in developing countries where people demand fast deployment and low cost for broadband wireless internet services The objective of this volume is to gather research and development on topics shaping the fourth generation 4G in mobile and wireless communications and reveal the key trends and enabling technologies for 4G We envisage 4G wireless communication systems as IP based solution providing integrated services voice data multimedia regardless of time and end users location 4G technologies will manifest the benefits of the wireless and wired technologies convergence through enabling a wide range of innovative both indoor and outdoor applications 4G applications will feature premium quality high security and an affordable cost The vision though fantastic is associated with a host of technical and technological challenges A great deal of the latter are discussed in the articles of this volume which aims at providing insights on the research issues and solutions that are directly associated with leading edge 4G technologies and services Taking into account recent developments in the world of wireless communications we have given emphasis to cover all these technologies and aspects that are considered as cornerstones for achieving the goals set for 4G and that will further boost research and development of next generation mobile communications   *Data Science* Qinglei Zhou,Yong Gan,Weipeng Jing,Xianhua Song,Yan Wang,Zeguang Lu,2018-09-10 This two volume set CCIS 901 and 902 constitutes the refereed proceedings of the 4th International Conference of Pioneering Computer Scientists Engineers and Educators ICPCSEE 2018 originally ICYCSEE held in Zhengzhou China in September 2018 The 125 revised full papers presented in these two volumes were carefully reviewed and selected from 1057 submissions The papers cover a wide range of topics related to basic theory and techniques for data science including mathematical issues in data science computational theory for data science big data management and applications data quality and data preparation evaluation and measurement in data science data visualization big data mining and knowledge management infrastructure for data science machine learning for data science data security and privacy applications of data science case study of data science multimedia data management and analysis data driven scientific research data driven bioinformatics data driven healthcare data driven management data driven eGovernment data driven smart city planet data marketing and economics social media and recommendation systems data driven security data driven business model innovation social and or organizational impacts of data science   Computational Science and Its Applications – ICCSA 2009 Osvaldo Gervasi,David Taniar,Beniamino Murgante,Antonio Laganà,Youngsong Mun,2009-07-09 The two volume set LNCS 5592 and 5593 constitutes the refereed proceedings of the International Conference on Computational Science and Its Applications ICCSA 2009 held in Seoul Korea in June July 2009 The two volumes contain papers presenting a wealth of original research results in the field of computational science from foundational issues in computer science and mathematics to advanced applications in virtually all sciences making use of computational techniques The topics of the fully refereed papers are structured according to the five major conference themes computational methods algorithms and scientific applications high

performance technical computing and networks advanced and emerging applications as well as information systems and information technologies Moreover submissions from more than 20 workshops and technical sessions contribute to this publication These cover topics such as geographical analysis urban modeling spatial statistics wireless and ad hoc networking logical scientific and computational aspects of pulse phenomena in transitions high performance computing and information visualization sensor network and its applications molecular simulations structures and processes collective evolutionary systems software engineering processes and applications molecular simulations structures and processes internet communication security security and privacy in pervasive computing environments and mobile communications

ICT and Critical Infrastructure: Proceedings of the 48th Annual Convention of Computer Society of India- Vol I Suresh Chandra Satapathy,P. S. Avadhani,Siba K. Udgata,Sadasivuni Lakshminarayana,2013-10-19 This volume contains 88 papers presented at CSI 2013 48th Annual Convention of Computer Society of India with the theme ICT and Critical Infrastructure The convention was held during 13th 15th December 2013 at Hotel Novotel Varun Beach Visakhapatnam and hosted by Computer Society of India Vishakhapatnam Chapter in association with Vishakhapatnam Steel Plant the flagship company of RINL India This volume contains papers mainly focused on Computational Intelligence and its applications Mobile Communications and social Networking Grid Computing Cloud Computing Virtual and Scalable Applications Project Management and Quality Systems and Emerging Technologies in hardware and Software   **Advances in Information and Communication** Kohei Arai,2024-03-20 The book is a valuable collection of papers presented in the Future of Information and Communications Conference FICC conducted by Science and Information Organization on 4 5 April 2024 in Berlin It received a total of 401 paper submissions out of which 139 are published after careful double blind peer review Renowned and budding scholars academics and distinguished members of the industry assembled under one roof to share their breakthrough research providing answers to many complex problems boggling the world The topics fanned across various fields involving Communication Data Science Ambient Intelligence Networking Computing Security and Privacy

Information Networking. Towards Ubiquitous Networking and Services Teresa Vazão,Mário M. Freire,Ilyoung Chong,2008-11-13 This book constitutes the thoroughly refereed post conference proceedings of the International Conference on Information Networking ICOIN 2007 held in Estoril Portugal in January 2007 The 82 revised full papers included in the volume were carefully selected and improved during two rounds of reviewing and revision from a total of 302 submissions Topics covered include sensor networks ad hoc mobile and wireless networks optical networks peer to peer networks and systems routing transport protocols quality of service network design and capacity planning resource management performance monitoring network management next generation Internet and networked applications and services   *Information Computing and Applications* Chunfeng Liu,Leizhen Wang,Aimin Yang,2012-09-07 This two volume set of CCIS 307 and CCIS 308 constitutes the refereed proceedings of the Third International Conference on Information

Computing and Applications ICICA 2012 held in Chengde China in September 2012 The 330 revised full papers presented in both volumes were carefully reviewed and selected from 1089 submissions The papers are organized in topical sections on internet computing and applications multimedia networking and computing intelligent computing and applications computational statistics and applications knowledge management and applications communication technology and applications information management system control engineering and applications business intelligence and applications cloud and evolutionary computing computational genomics and proteomics engineering management and applications

Wired/Wireless Internet Communications Evgeny Osipov,Andreas J. Kassler,Thomas Michael Bohnert,Xavier Masip-Bruin,2010-05-12 Beginning with the first event in 2002 the International Conference on Wired Wireless Internet Communications WWIC has continuously been established as a highly selective conference focusing on integration and co existence of rapidly dev oping wireless network technologies and their applications related to the Internet To do so WWIC provides an international forum for presenting and discussing cutti edge research in this domain and the 8th edition of WWIC held at Lule University in June 2010 continued this tradition The WWIC 2010 call for papers attracted 45 submissions from more than 25 countries and each contribution was subject to thorough peer review by recognized int national experts that acted as members of the Technical Program Committee The selection process resulted in 16 accepted papers which were thematically grouped into 5 technical sessions The major themes of WWIC 2010 were cooperation management of multimedia traffic advancing IEEE 802 11 cognitive optimization mesh and multi hop networks security signaling control and wireless sensor networks   Wireless Communications and Applications Patrick Sénac,Max Ott,Aruna Seneviratne,2012-03-22 This book constitutes the thoroughly refereed post conference proceedings of the First International ICST Conference on Wireless Communications and Applications ICWCA 2011 held in Sanya China in August 2011 The 43 revised full papers presented were carefully reviewed and selected from around 90 submissions and cover a wide range of topics as mobile ad hoc networks sensor networks network architectural design network protocol design local area networks MAC routing and transport protocols quality of service provisioning reliability and fault tolerance issues resource allocation and management signal processing medical imaging data aggregation techniques security and privacy issues wireless computing and applications for wireless network as smart grid agriculture health care smart home conditional monitoring etc   **Networks 2004** Hermann Kaindl,2004

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