Cheeha Kim (Ed.)

Information Networking

Convergence in Broadband and Mobile Networking

LNCS 3391

International Conference, ICOIN 2005
Jeju Island, Korea, January/February 2005
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Volume Editor

Cheeha Kim
Pohang University of Science and Technology
San 31 Hyoja-Dong, Nam-Gu, Pohang, Gyungbuk 790-784, Korea
E-mail: chkim@postech.ac.kr

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Preface

Welcome to ICOIN 2005, the International Conference on Information Networking, held at Ramada Plaza Jeju Hotel, Jeju Island, Korea during January 31–February 2, 2005. ICOIN 2005 followed the success of previous conferences. Since 1986, the conference has provided a technical forum for various issues in information networking. The theme of each conference reflects the historic events in the computer communication industry. (Please refer to www.icoin2005.or.kr for details.) The theme of ICOIN 2004, "Convergence in Broadband and Mobile Networking," was used again for ICOIN 2005 since we believed it was ongoing.

This year we received 427 submissions in total, which came from 22 countries. Upon submission, authors were asked to select one of the categories listed in the Call for Papers. The most popular category chosen was network security, followed by mobile networks and wireless LANs. Other areas with strong showings included QoS and resource management, ad hoc and sensor networks, and wireless multimedia systems. From the outset, we could see where recent research interest lay and could make sure that the theme was still going in the right direction.

The Technical Program Committee members were pleased to work together to present an outstanding program of technical papers. All submissions to ICOIN 2005 underwent a rigorous review process by the TPC members and external reviewers. Each paper was sent to three reviewers and judged based on its originality, significance, contribution, and presentation. The TPC of 37 people and 154 external reviewers was involved in reviewing them. The review process culminated in the meeting at Ewha Womans University, Korea on October 29, 2004, and ended at the meeting at Seoul National University, Korea on November 23, 2004, where the TPC finally accepted 96 papers (an acceptance ratio of 22%) for a three-day technical program.

We thank all the authors who submitted papers to ICOIN 2005. We also thank the external reviewers for their time, effort and timely response. They contributed their expertise a lot to the conference throughout the review process. Their names are provided in the proceedings. We wish to thank the TPC members for the fabulous job they did, especially Profs. Chong-kwon Kim (Seoul National University, Korea) and Sunyoung Han (Konkuk University, Korea) for their devotion to the conference as Vice Chairs of the TPC, and Mr. Ki Yong Park (Konkuk University, Korea) who was in charge of running the system used for submission and review. We extend our sincere thanks to Profs. Pascal Lorenz (Université de Haute Alsace, France) and Nitin Vaidya (UIUC, USA) for their strong support to the TPC.

We wish to express our special thanks to General Chair Prof. Sunshin Ahn (Korea University, Korea) for his advice on all aspects of the conference. We are deeply grateful to all the Organizing Committee members. As the Organizing Committee chair, Prof. Kijoon Chae (Ewha Womans University, Korea) pro-

vided wonderful administration support and ensured the smooth operation of the conference.

Thank you also to the attendees for joining us at ICOIN 2005.

November 2004

Cheeha Kim
TPC Chair
ICOIN 2005

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Numerical Analysis of IEEE 802.11 Broadcast Scheme in Multihop Wireless Ad Hoc Networks*

Jong-Mu Choi[1], Jungmin So[2], and Young-Bae Ko[1]

[1] School of Information and Computer Engineering
Ajou University, Republic of Korea
{jmc,jso1}@uiuc.edu
[2] Coordinated Science Lab. and Dept. of Computer Science Engineering
University of Illinois at Urbana-Champaign, USA
youngko@ajou.ac.kr

Abstract. In this paper, we study the performance of IEEE 802.11 broadcast scheme in multihop wireless networks using an analytical model. Previous works have evaluated the performance of IEEE 802.11 protocol assuming unicast communication, but there has not been an analysis considering broadcast communication. Analyzing performance of broadcast communication is important because multicast communication is gaining attention in wireless networks with numerous potential applications. Broadcast in IEEE 802.11 does not use virtual carrier sensing and thus only relies on physical carrier sensing to reduce collision. For this study, we define a successful broadcast transmission to be the case when all of the sender's neighbors receive the broadcast frame correctly, and calculate the achievable throughput.

1 Introduction

The IEEE 802.11 standard [3] is widely deployed and used in wireless systems today. Its de facto medium access control (MAC) protocol, called Distributed Coordination Function (DCF) allows multiple nodes to share the wireless medium without any central coordinator. Although IEEE 802.11 DCF was designed for a wireless LAN, it is also used in multihop wireless networks because of its distributed nature.

The major goal of a MAC protocol is to have only a single node in a broadcast domain transmit at a given time. If two nodes that are nearby each other transmit frames at the same time, the frames collide and the channel bandwidth is wasted. To achieve this goal, IEEE 802.11 DCF uses a technology called Carrier Sensing Multiple Access with Collision Avoidance (CSMA/CA). In CSMA/CA, whenever a node has a data frame to transmit, it listens on the channel for a duration of time. This duration of time is called *slot time*. If the channel is sensed

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