

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Switzerland

John C. Mitchell

Stanford University, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz

University of Bern, Switzerland

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

University of Dortmund, Germany

Madhu Sudan

Massachusetts Institute of Technology, MA, USA

Demetri Terzopoulos

New York University, NY, USA

Doug Tygar

University of California, Berkeley, CA, USA

Moshe Y. Vardi

Rice University, Houston, TX, USA

Gerhard Weikum

Max-Planck Institute of Computer Science, Saarbruecken, Germany

Torsten Braun Georg Carle
Yevgeni Koucheryavy Vassilis Tsaoussidis (Eds.)

Wired/Wireless Internet Communications

Third International Conference, WWIC 2005
Xanthi, Greece, May 11-13, 2005
Proceedings



Springer

Volume Editors

Torsten Braun

University of Bern, Institute of Computer Science and Applied Mathematics

3012 Bern, Switzerland

E-mail: braun@iam.unibe.ch

Georg Carle

University of Tübingen, Department of Computer Networks and Internet

Auf der Morgenstelle 10 C, 72076 Tübingen, Germany

E-mail: carle@fokus.gmd.de

Yevgeni Koucheryavy

Tampere University of Technology, Institute of Communication Engineering

Tampere, Finland

E-mail: yk@cs.tut.fi

Vassilis Tsaoussidis

Demokritos University of Thrace

Department of Electrical and Computer Engineering

12 Vas. Sofias Str., 671 00 Xanthi, Greece

E-mail: vtsaousi@ee.duth.gr

Library of Congress Control Number: 2005925605

CR Subject Classification (1998): C.2, H.4, D.2, D.4.4, K.8

ISSN 0302-9743

ISBN-10 3-540-25899-X Springer Berlin Heidelberg New York

ISBN-13 978-3-540-25899-5 Springer Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

Springer is a part of Springer Science+Business Media

springeronline.com

© Springer-Verlag Berlin Heidelberg 2005

Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper SPIN: 11424505 06/3142 5 4 3 2 1 0

Preface

Welcome to the 3rd International Conference on Wired/Wireless Internet Communications (WWIC). After a successful start in Las Vegas and a selective conference in Germany, this year's WWIC demonstrated the event's maturity. The conference was supported by several sponsors, both international and local, and became the official venue for COST Action 290. That said, WWIC has now been established as a top-quality conference to promote research on the convergence of wired and wireless networks.

This year we received 117 submissions, which allowed us to organize an exciting program with excellent research results, but required more effort from the 54 members of the international Program Committee and the 51 additional reviewers. For each of the 117 submitted papers we asked three independent reviewers to provide their evaluation. Based on an online ballot phase and a TPC meeting organized in Colmar (France), we selected 34 high-quality papers for presentation at the conference. Thus, the acceptance rate for this year was 29%.

The selected papers were organized into 9 sessions:

1. Mobility Management
2. Transport Protocols and Congestion Control
3. QoS and Routing
4. Quality of service
5. Wireless Multi-hop Networks and Cellular Networks
6. Traffic Characterization and Modeling
7. Ad Hoc Networks
8. IEEE 802.11 and Other Wireless MAC Protocols
9. Energy Efficiency and Resource Optimization

We would like to thank the authors for choosing to submit their results to WWIC 2005. We would also like to thank all the members of the Technical Program Committee, the members of the Organizing Committee, as well as all the additional reviewers for their effort in providing detailed and constructive reviews. We are grateful to the two keynote speakers, Ian Akyildiz and Michael Smirnoff, for accepting our invitation; and to Springer LNCS for supporting us again this year.

We hope that all participants enjoyed the technical and social conference program, the hospitality of our Greek hosts and the beauty of the conference location. Next year's conference will take place in Bern, Switzerland. We hope to see you there again.

May 2005

Torsten Braun
Georg Carle
Yevgeni Koucheryavy
Vassilis Tsaoussidis

Organization

Steering Committee

Torsten Braun	University of Bern, Switzerland
Ibrahim Matta	Boston University, USA
Nitin Vaidya	University of Illinois at Urbana-Champaign, USA
Vassilis Tsaoussidis	Demokritos University, Greece

Executive Committee

General Chairs:	Yevgeni Koucheryavy (Tampere University of Technology, Finland) Vassilis Tsaoussidis (Demokritos University, Greece)
TPC Co-chairs	Torsten Braun (University of Bern, Switzer- land) Georg Carle (University of Tübingen, Germany)

Technical Program Committee

Ozgur B. Akan	Middle East Technical University (Turkey)
Bengt Ahlgren	SICS (Sweden)
Manuel Alvarez-Campana	Universidad Politecnica de Madrid (Spain)
Farooq Anjum	Telcordia Technologies (USA)
Harmen R. van As	TU Wien (Austria)
Hans van den Berg	TNO TELECOM-University of Twente (Netherlands)
Chris Blondia	University of Antwerp (Belgium)
Torsten Braun	University of Bern (Switzerland)
Andrew Campbell	Columbia University (USA)
Xiuzhen Cheng	George Washington University (USA)
Jon Crowcroft	University of Cambridge (UK)
Klaus David	University of Kassel (Germany)
Piet Demeester	Ghent University (Belgium)
Sonia Fahmy	Purdue University (USA)
Giambene Giovanni	Universita degli Studi di Siena (Italy)
Andrei Gurtov	University of Helsinki (Finland)
Peder Johannes	Norwegian University (Norway)
Daniel Kofman	ENST (France)
Yevgeni Koucheryavy	Tampere University (Finland)

VIII Organization

Rolf Kraemer	IHP Microelectronics (Germany)
Adrian Lahanas	University of Cyprus (Cyprus)
Peter Langendoerfer	IHP Microelectronics (Germany)
Ben Liang	University of Toronto (Canada)
Pascal Lorenz	University of Haute Alsace (France)
Petri Maehoenen	University Oulu (Finland)
Christian Maihoefer	Daimler Chrysler (Germany)
Saverio Mascolo	Politecnico di Bari (Italy)
Ibrahim Matta	Boston University (USA)
Ingrid Moerman	Univ. of Gent (Belgium)
Edmundo Monteiro	University of Coimbra (Portugal)
Ioanis Nikolaidis	University of Alberta (Canada)
Guevara Noubir	Northeastern University (USA)
Fotini-Niovi Pavlidou	Aristotle University of Thessaloniki (Greece)
George Pavlou	University of Surrey (UK)
George Polyzos	AUEB (Greece)
Theodoros Salonidis	Rice University (USA)
Jochen Schiller	FU Berlin (Germany)
Andrew Scott	Lancaster University (UK)
Dimitris Serpanos	University of Patras (Greece)
Sherman Shen	University of Waterloo (Canada)
Vasilios A. Siris	University of Crete and ICS-FORTH (Greece)
Roshni Srinivasan	University of Maryland (USA)
Burkhard Stiller	ETH Zurich (Switzerland)
Ivan Stojmenovic	University of Ottawa (Canada)
Phuoc Tran-Gia	University of Wuerzburg (Germany)
Vassilis Tsaoussidis	Demokritos University (Greece)
Thierry Turetletti	INRIA, Sophia-Antipolis (France)
Lars Wolf	Braunschweig University (Germany)
Adam Wolisz	Technical University of Berlin (Germany)
Miki Yamamoto	Osaka University (Japan)
Chi Zhang	Florida International University (USA)
Martina Zitterbart	TU Karlsruhe (Germany)
Michele Zorzi	University of Ferrara (Italy)

Organizing Committee

Sotirios Kontogiannis	Demokritos University (Greece)
Lefteris Mamatas	Demokritos University (Greece)
Ieremias Ntoupakis	Demokritos University (Greece)
Ruy de Oliveira	University of Bern (Switzerland)
Panagiotis Papadimitriou	Demokritos University (Greece)
Ioannis Psaras	Demokritos University (Greece)
Christos Samaras	Demokritos University (Greece)
Ageliki Tsioliaridou	Demokritos University (Greece)

Additional Reviewers

Evangelos Aggelakis	Verena Kahmann	Ioannis Psaras
Marc Bechler	Stelios Karapantazis	Wei Qian
Fernando Boavida	Sotiris Kontogiannis	Niky Riga
Thomas Bohnert	Teemu Koponen	Oriol Sallent
Laila Daniel	Øivind Kure	Sergei Semenov
Roman Dunaytsev	Benoit Latre	Siva Sivavakeesar
Elias Efstathiou	Tom Van Leeuwen	Dirk Staehle
Peder J. Emstad	Tim Leinmüller	Apostolos Traganitis
Stelios Georgoulas	Lefteris Mamatas	Despoina Triantafyllidou
Xiaoyuan Gu	Paulo Marques	Orestis Tsigas
Jarmo Harju	Michael Methfessel	Ageliki Tsioliariidou
Dan He	Dmitri Moltchanov	Christopher Ververidis
Jeroen Hoebeke	John Murphy	Vasilis Vogkas
Roy Ho	Philippe De Neve	Ning Wang
Michael Howarth	Geir Øien	Oliver Wellnitz
Sven Jaap	P. Papadimitriou	
Riku Jäntti	Thanasis Papaioannou	
Yuming Jiang	Liesbeth Peters	

Table of Contents

Session : Mobility Management

Impact of Link State Changes and Inaccurate Link State Information on Mobility Support and Resource Reservations <i>Liesbeth Peters, Ingrid Moerman, Bart Dhoedt, Piet Demeester</i>	1
Comparison of Signaling and Packet Forwarding Overhead for HMIP and MIFA <i>Ali Diab, Andreas Mitschele-Thiel, René Böringer</i>	12
Pro le System for Management of Mobility Context Information for Access Network Selection and Transport Service Provision in 4G Networks <i>Ivan Armuelles Voinov, Jorge E. López de Vergara, Tomás Robles Valladares, David Fernández Cambronero</i>	22
Replic8: Location-Aware Data Replication for High Availability in Ubiquitous Environments <i>Evangelos Kotsovinos, Douglas McIlwraith</i>	32

Session : Transport Protocols and Congestion Control

Refined PFTK-Model of TCP Reno Throughput in the Presence of Correlated Losses <i>Roman Dunaytsev, Yevgeni Koucheryavy, Jarmo Harju</i>	42
Examining TCP Parallelization Related Methods for Various Packet Losses <i>Qiang Fu, Jadwiga Indulska</i>	54
The Interaction Between Window Adjustment Strategies and Queue Management Schemes <i>Chi Zhang, Lefteris Mamatas</i>	65
A Novel TCP Congestion Control (TCP-CC) Algorithm for Future Internet Applications and Services <i>Haiguang Wang, Winston Khoon Guan Seah</i>	75

Performance Evaluation of τ -AIM over Wireless Asynchronous Networks

Adrian Lahanas, Vassilis Tsaoussidis 86

Session : QoS and Routing

Rate Allocation and Buffer Management for Proportional Service Differentiation in Location-Aided Ad Hoc Networks

Sivapathalingham Sivavakeesar, George Pavlou 97

Multiservice Communications over T-MA/T-Wireless LANs

Francisco M. Delicado, Pedro Cuenca, Luis Orozco-Barbosa 107

Interference-Based Routing in Multi-hop Wireless Infrastructures

Geert Heijenk, Fei Liu 117

Session : Quality of Service

A Probabilistic Transmission Slot Selection Scheme for MC-C-MA Systems using QoS History and Delay Bound

Jibum Kim, Kyungho Sohn, Chungha Koh, Youngyong Kim 128

Evaluation of QoS Provisioning Capabilities of IEEE 802.11E Wireless LANs

Frank Roijers, Hans van den Berg, Xiang Fan, Maria Fleuren 138

Content-Aware Packet-Level Interleaving Method for Video Transmission over Wireless Networks

Jeong-Yong Choi, Jitae Shin 149

A Performance Model for Admission Control in IEEE 802.16

Eunhyun Kwon, Jaeyong Lee, Kyunghun Jung, Shihoon Ryu 159

Session : Wireless Multi-hop Networks and Cellular Networks

Comparison of Incentive-Based Cooperation Strategies for Hybrid Networks

Attila Weyland, Thomas Staub, Torsten Braun 169

Analysis of Decentralized Resource and Service Discovery Mechanisms in Wireless Multi-hop Networks

Jeroen Hoebeke, Ingrid Moerman, Bart Dhoedt, Piet Demeester 181

Location Assisted Fast Vertical Handover for MTS/WLAN Overlay Networks	
<i>Tom Van Leeuwen, Ingrid Moerman, Bart Dhoedt, Piet Demeester . . .</i>	192

Session : Traffic Characterization and Modeling

A Methodology for Implementing a Stress Workload Generator for the GTP-Plane	
<i>David Navratil, Nikolay Trifonov, Simo Juvaste</i>	203
Traffic Characteristics Based Performance Analysis Model for Efficient Random Access in OFDMA-PHY System	
<i>Hyun-Hwa Seo, Byung-Han Ryu, Choong-Ho Cho, Hyong-Woo Lee . . .</i>	213
Collision Reduction Random Access using m -Ary Split Algorithm in Wireless Access Network	
<i>You-Chang Ko, Eui-Seok Hwang, Jeong-Jae Won, Hyong-Woo Lee, Choong-Ho Cho</i>	223
Simple, Accurate and Computationally Efficient Wireless Channel Modeling Algorithm	
<i>Dmitri Moltchanov, Yevgeni Koucheryavy, Jarmo Harju</i>	234

Session : Ad hoc Networks

Efficient Multicast Trees with Local Knowledge on Wireless Ad Hoc Networks	
<i>Tansel Kaya, Philip J. Lin, Guevara Noubir, Wei Qian</i>	246
Limiting Control Overheads Based on Link Stability for Improved Performance in Mobile Ad Hoc Networks	
<i>Hwee Xian Tan, Winston K.G. Seah</i>	258
Performance Analysis of Secure Multipath Routing Protocols for Mobile Ad Hoc Networks	
<i>Rosa Mavropodi, Panayiotis Kotzanikolaou, Christos Douligeris</i>	269

Session : IEEE 802.15.4 and Other Wireless MAC Protocols

Lecture Notes in Computer Science: Packet Error Rate Analysis of IEEE 802.15.4 under IEEE 802.11b Interference	
<i>Soo Young Shin, Sunghyun Choi, Hong Seong Park, Wook Hyun Kwon . . .</i>	279

On the Service Differentiation Capabilities of EY-NPMA and 802.11 CF	
<i>Orestis Tsigkas, Fotini-Niovi Pavlidou, Gerasimos Dimitriadis</i>	289
Mitigating Interference Between IEEE 802.16 Systems Operating in License-Exempt Mode	
<i>Omar Ashagi, Seán Murphy, Liam Murphy</i>	300
ECN Marking for Congestion Control in Multihop Wireless Networks	
<i>Vasilios A. Siris, Despina Triantafyllidou</i>	312
 Session : Energy Efficiency and Resource Optimization	
Providing Delay Guarantees and Power Saving in IEEE 802.11e Network	
<i>G. Boggia, P. Camarda, F.A. Favia, L.A. Grieco, S. Mascolo</i>	323
Measuring Transport Protocol Potential for Energy Efficiency	
<i>S. Kontogiannis, L. Mamatas, I. Psaras, V. Tsaoussidis</i>	333
STC-Based Cooperative Relaying System with Adaptive Power Allocation	
<i>Jingmei Zhang, Ying Wang, Ping Zhang</i>	343
Reducing Memory Fragmentation with Performance-Optimized Dynamic Memory Allocators in Network Applications	
<i>Stylianos Mamagkakis, Christos Baloukas, David Atienza, Francky Catthoor, Dimitrios Soudris, José Manuel Mendias, Antonios Thanailakis</i>	354
Author Index	365