17th GI/ITG Conference on Communication in Distributed Systems (KiVS'11)

17. GI/ITG Fachtagung *Kommunikation in Verteilten Systemen*, March 8–11, 2011, Kiel, Germany

Edited by

Norbert Luttenberger Hagen Peters



Editors

Norbert Luttenberger, Hagen Peters Institut für Informatik Christian-Albrechts-Universität zu Kiel {nl|hap}informatik.uni-kiel.de

ACM Classification 1998 C.2.4 Distributed Systems

ISBN 978-3-939897-27-9

Published online and open access by

Schloss Dagstuhl – Leibniz–Zentrum für Informatik gGmbH, Dagstuhl Publishing, Saarbrücken/Wadern, Germany.

Publication date March, 2011.

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.d-nb.de.

License



This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported license: http://creativecommons.org/licenses/by-nc-nd/3.0/legalcode.

In brief, this license authorizes each and everybody to share (to copy, distribute and transmit) the work under the following conditions, without impairing or restricting the author's moral rights:

- Attribution: The work must be attributed to its authors.
- Noncommercial: The work may not be used for commercial purposes.
- No derivation: It is not allowed to alter or transform this work.

The copyright is retained by the corresponding authors.

Digital Object Identifier: 10.4230/OASIcs.KiVS.2011.i

ISBN 978-3-939897-27-9

ISSN 2190-6807

http://www.dagstuhl.de/oasics

OASIcs - OpenAccess Series in Informatics

OASIcs aims at a suitable publication venue to publish peer-reviewed collections of papers emerging from a scientific event. OASIcs volumes are published according to the principle of Open Access, i.e., they are available online and free of charge.

Editorial Board

Dorothea Wagner (Karlsruhe Institute of Technology)

ISSN 2190-6807

www.dagstuhl.de/oasics

Preface

Our world is in its public and private spheres, and equally in its economic, political and cultural domains more and more affected and influenced by the permanent availability of a huge variety of different kinds of information. It seems natural that in this world communication itself, communication in all its facets (i.e. from bearer networks over endsystems to information syntax and semantics) is undergoing a fundamental process of change—a process of change that, though being a constant, is only seldom of such fundamental depth as can be observed today in the networking and communications arena.

Network providers around the world have started to consolidate their infrastructure into All-IP networks. The well-beloved Plain Old Telephone System is going to vanish in the next 10 to 15 years, and its successor is not the long believed-in global ATM network with its controllable QoS, but it is ... plain old IP! (Is POIP being the new abbreviation that we have to teach to our students?) This process is as ambitious as chancy, but seems to be inevitable when regarding the ever increasing data streams that cross the Internet.

Present-day mobile endsystems incorporate capabilities that until yesterday have been reserved to devices that find themselves on desks, but not in pockets. Smart environments hosting ubiquitous computing devices let people experience the world as both a real and a virtual "thing" at the same time. And no doubt: It is the virtual side that today fascinates most people! The emphatic acceptance of the new species of devices lets us easily speculate on even faster, more powerful devices tomorrow.

Upper layers functions (Yes—the authors of these lines are strong followers of ISO's OSI reference model!), though never fully spelt out in the Internet world, are re-animated and augmented in new shape, being called the Semantic Web Layer Cake, where the somewhat disrespectful "cake" seems to reflect the wish for a less bureaucratic kind of architecture definition, something more homebrew. Related efforts strive to bring "better" information to people and even let machines do the information provisioning work. The goal is still very far, but semantic technologies are available today that provide a sound base to build upon.

Only the ongoing security and privacy problems seem to be a permanent companion on the path to a new communications world. He/she changes face, but we seem unable to get rid of this nasty free rider . . .

KiVS'11 reflects several aspects of these world trends, and KiVS'11 does it on a high-quality level. From 55 submissions, the program committee accepted 14 papers as full papers, 5 as short papers, and 4 as industry papers. This careful selection ensures that KiVS is going to stay the most important conference on all kinds of communication-related matters in the German-speaking countries.

Though KiVS' focus is clearly on contributions from these countries, it takes another step to becoming more international: The conference proceedings are published in Open Access format for the first time, which makes them easily accessible via the Internet, and English is the only accepted language for the proceedings.

KiVS'11 for the first time hosts an Industry Track. This is to show the close intertwining between academic and industrial research. The publishers think that this track should also enhance further KiVS conferences.

We thank all authors for their efforts in providing their input and hope that both scientific and personal discussions during the conference are rewarding for all participants.

Contents

Full Papers

The Scope of the IBGP Routing Anomaly Problem Uli Bornhauser, Peter Martini, and Martin Horneffer	2
A Reputation-Based Approach to Self-Adaptive Service Selection Jan Sudeikat, Wolfgang Renz, Ante Vilenica, and Winfried Lamersdorf	14
A Service-Oriented Operating System and an Application Development Infrastructure for Distributed Embedded Systems Martin Lipphardt, Nils Glombitza, Jana Neumann, Christian Werner, and Stefan Fischer	e 26
An adaptive protocol for distributed beamforming Stephan Sigg and Michael Beigl	38
Web Workload Generation According to the UniLoG Approach Andrey W. Kolesnikov and Bernd E. Wolfinger	49
Improving Markov-based TCP Traffic Classification Gerhard Münz, Stephan Heckmüller, Lothar Braun, and Georg Carle	61
IT Management Using a Heavyweight CIM Ontology Andreas Textor, Jeanne Stynes, and Reinhold Kroeger	73
TOGBAD-LQ - Using Challenge-Response to Detect Fake Link Qualities Elmar Gerhards-Padilla, Nils Aschenbruck, and Peter Martini	85
Avoiding Publication and Privatization Problems on Software Transactional Memory *Holger Machens and Volker Turau**	97
A Resilient and Energy-saving Incentive System for Resource Sharing in MANETs Holger Teske, Jochen Furthmüller, and Oliver P. Waldhorst	109
Supporting Cooperative Traffic Information Systems through Street-Graph-based Peer-to-Peer Networks Jedrzej Rybicki, Benjamin Pesch, Martin Mauve, and Björn Scheuermann	121
Distributed Probabilistic Network Traffic Measurements Alexander Marold, Peter Lieven, and Björn Scheuermann	133
A Feasibility Check for Geographical Cluster Based Routing under Inaccurate Node Localization in Wireless Sensor Networks Hannes Frey and Ranjith Pillay	145
An Arbitrary 2D Structured Replica Control Protocol Robert Basmadjian and Hermann de Meer	157
Short Papers	
Resolving Conflicts in Highly Reactive Teams Hendrik Skubch, Daniel Saur, and Kurt Geihs	170
17th GI/ITG Conference on Communication in Distributed Systems (KiVS'11). Editors: Norbert Luttenberger, Hagen Peters OpenAccess Series in Informatics OASICS Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany	

viii Contents

A Privacy-Preserving Social P2P Infrastructure for People-Centric Sensing Michael Dürr and Kevin Wiesner	176
Optimization-based Secure Multi-hop Localization in Wireless Ad Hoc Networks Sander Wozniak, Tobias Gerlach, and Guenter Schaefer	182
Efficient Distributed Intrusion Detection applying Multi Step Signatures Michael Vogel and Sebastian Schmerl	188
Node Degree based Improved Hop Count Weighted Centroid Localization Algorithm $Rico\ Radeke\ and\ Stefan\ T\"urk \$	194
Industry Papers	
Automated generic integration of flight logbook data into aircraft maintenance systems Oliver Hunte, Carsten Kleiner, Uwe Koch, Arne Koschel, Björn Koschel, and Stefan Nitz	
Alister 2.0 - Programmable Logic Controllers in Railway Interlocking Systems for Regional Lines of the DB Netze AG Reiner Saykowski, Elferik Schultz, and Joachim Bleidiessel	205
Browser as a Service (BaaS): Security and Performance Enhancements for the Rich We Nils Gruschka and Luigi Lo Iacono	
Model Driven Development of Distributed Business Applications Wolfgang Goerigk	211
Summaries of Prize-Winning Theses	
A Mobility Model for the Realistic Simulation of Social Context Daniel Fischer	215
Anonymous Communication in the Digital World Andriy Panchenko	221
Optimized DTN-Routing for Urban Public Transport Systems Tobias Pögel	227
A Novel Algorithm for Distributed Dynamic Interference Coordination in Cellular Networks Marc C. Necker	233
Does Proactive Secret Sharing Perform in Peer-to-Peer Systems? Nicolas C. Liebau, Andreas U. Mauthe, Vasilios Darlagiannis, and Ralf Steinmetz	239

List of Authors

Nils Aschenbruck

University of Bonn - Institute of Computer Science 4, Germany

Robert Basmadjian

University of Passau, Department of Computer Network and Communication, Germany

Michael Beigl

TecO, Chair for Pervasive Computing Systems, Karlsruhe Institute of Technology (KIT), Germany

Joachim Bleidiessel

Funkwerk Information Technologies GmbH, Germany

Uli Bornhauser

University of Bonn – Institute of Computer Science 4, Germany

Lothar Braun

Network Architectures and Services, Technische Universität München, Germany

Georg Carle

Network Architectures and Services, Technische Universität München, Germany

Vasilios Darlagiannis

Informatics and Telematics Institute, Centre for Research and Technology Hellas, Greece

Michael Dürr

Mobile and Distributed Systems Group, Institute for Informatics,

Ludwig-Maximilians-Universität, Germany

Stefan Fischer

Institute of Telematics, University of Lübeck, Germany

Daniel Fischer SAP AG, Germany

Hannes Frey

University of Paderborn, Germany

Jochen Furthmüller

Institute of Telematics, Karlsruhe Institute of Technology, Germany

Kurt Geihs

Distributed Systems, Universität Kassel, Germany

Elmar Gerhards-Padilla

University of Bonn - Institute of Computer Science 4. Germany

Tobias Gerlach

Operations Research and Stochastics Research Group, Ilmenau University of Technology, Germany

Nils Glombitza

Institute of Telematics, University of Lübeck, Germany

Wolfgang Goerigk

b+m Informatik AG, Germany

Nils Gruschka

NEC Laboratories Europe, Germany

Stephan Heckmüller

Telecommunications and Computer Networks, Universität Hamburg, Germany

Martin Horneffer

Deutsche Telekom AG – Technical Engineering Center, Germany

Oliver Hunte

Fachhochschule Hannover, Fakultät IV (Wirtschaft und Informatik), Germany

Luigi Lo Iacono

European University of Applied Sciences (EUFH), Germany

Carsten Kleiner

Fachhochschule Hannover, Fakultät IV (Wirtschaft und Informatik), Germany

Uwe Koch

Fachhochschule Hannover, Fakultät IV (Wirtschaft und Informatik), Germany

Andrey W. Kolesnikov

University of Hamburg, Department of Informatics, Germany

17th GI/ITG Conference on Communication in Distributed Systems (KiVS'11). Editors: Norbert Luttenberger, Hagen Peters

OpenAccess Series in Informatics

OASICS Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany

x Authors

Björn Koschel

edatasystems GmbH, Germany

Arne Koschel

Fachhochschule Hannover, Fakultät IV (Wirtschaft und Informatik), Germany

Reinhold Kroeger

RheinMain University of Applied Sciences, Distributed Systems Lab, Germany

Winfried Lamersdorf

Distributed Systems and Information Systems, Computer Science Department, University of Hamburg, Germany

Nicolas C. Liebau

Multimedia Communications Lab, Technische Universität Darmstadt, Germany

Peter Lieven

Heinrich Heine University Düsseldorf, Mobile and Decentralized Networks Group, Germany

Martin Lipphardt

Institute of Telematics, University of Lübeck, Germany

Holger Machens

Hamburg University of Technology, Institute of Telematics, Germany

Alexander Marold

University of Duisburg-Essen, Institute for Experimental Mathematics, Germany

Peter Martini

University of Bonn – Institute of Computer Science 4, Germany

Andreas U. Mauthe

Computing Department, Lancaster University, United Kingdom

Martin Mauve

Institute of Computer Science, Heinrich Heine University Düsseldorf, Germany

Hermann de Meer

University of Passau, Department of Computer Network and Communication, Germany Gerhard Münz

Network Architectures and Services, Technische Universität München, Germany

Marc C. Necker

Institute of Communication Networks and Computer Engineering, University of Stuttgart, Germany

Jana Neumann

Institute of Information Systems, University of Lübeck, Germany

Stefan Nitz

Fachhochschule Hannover, Fakultät IV (Wirtschaft und Informatik), Germany

Andriy Panchenko

Interdisciplinary Centre for Security, Reliability and Trust, University of Luxembourg, Luxembourg

Benjamin Pesch

Institute of Computer Science, Heinrich Heine University Düsseldorf, Germany

Ranjith Pillay

Amrita Vishwa Vidyapeetham, India

Tobias Pögel

Institute of Operating Systems and Computer Networks, Technische Universität Braunschweig, Germany

Rico Radeke

Technische Universität Dresden, Chair for Telecommunications, Germany

Wolfgang Renz

Multimedia Systems Laboratory, Hamburg University of Applied Sciences, Germany

Jedrzej Rybicki

Institute of Computer Science, Heinrich Heine University Düsseldorf, Germany

Daniel Saur

Distributed Systems, Universität Kassel, Germany

Reiner Savkowski

Funkwerk Information Technologies GmbH,

Germany

Authors

Guenter Schaefer

Telematics and Computer Networks Research Group, Ilmenau University of Technology, Germany

Björn Scheuermann

Heinrich Heine University Düsseldorf, Mobile and Decentralized Networks Group, Germany

Sebastian Schmerl

Brandenburg University of Technology, Germany

Elferik Schultz

Funkwerk Information Technologies GmbH, Germany

Stephan Sigg

TecO, Chair for Pervasive Computing Systems, Karlsruhe Institute of Technology (KIT), Germany

Hendrik Skubch

Distributed Systems, Universität Kassel, Germany

Ralf Steinmetz

Multimedia Communications Lab, Technische Universität Darmstadt, Germany

Jeanne Stynes

Cork Institute of Technology, Department of Computing, Ireland

Jan Sudeikat

Multimedia Systems Laboratory, Hamburg University of Applied Sciences, Germany

Holger Teske

Institute of Telematics, Karlsruhe Institute of Technology, Germany

Andreas Textor

RheinMain University of Applied Sciences, Distributed Systems Lab, Germany

Volker Turau

Hamburg University of Technology, Institute of Telematics, Germany

Stefan Türk

Technische Universität Dresden, Chair for Telecommunications, Germany

Ante Vilenica

Distributed Systems and Information Systems, Computer Science Department, University of Hamburg, Germany

Michael Vogel

Brandenburg University of Technology, Germany

Oliver P. Waldhorst

Institute of Telematics, Karlsruhe Institute of Technology, Germany

Christian Werner

Institute of Telematics, University of Lübeck, Germany

Kevin Wiesner

Mobile and Distributed Systems Group, Institute for Informatics, Ludwig-Maximilians-Universität, Germany

Bernd E. Wolfinger

University of Hamburg, Department of Informatics, Germany

Sander Wozniak

Telematics and Computer Networks Research Group, Ilmenau University of Technology, Germany