

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

Alfred Kobsa

University of California, Irvine, CA, 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

TU Dortmund University, Germany

Madhu Sudan

Microsoft Research, Cambridge, MA, USA

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Gerhard Weikum

Max Planck Institute for Informatics, Saarbruecken, Germany

Karl Michael Göschka Seif Haridi (Eds.)

Distributed Applications and Interoperable Systems

12th IFIP WG 6.1 International Conference, DAIS 2012
Stockholm, Sweden, June 13-16, 2012
Proceedings

Volume Editors

Karl Michael Göschka
Vienna University of Technology
Institute of Information Systems
Argentinierstrasse 8/184-1, 1040 Vienna, Austria
E-mail: karl.goeschka@tuwien.ac.at

Seif Haridi
Swedish Institute of Computer Science
Isafjordsgatan 22, 164 29 Kista, Sweden
E-mail: seif@sics.se

ISSN 0302-9743 e-ISSN 1611-3349
ISBN 978-3-642-30822-2 e-ISBN 978-3-642-30823-9
DOI 10.1007/978-3-642-30823-9
Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2012938861

CR Subject Classification (1998): C.2, D.2, H.4, H.5, H.3, C.4

LNCS Sublibrary: SL 5 – Computer Communication Networks and Telecommunications

© IFIP International Federation for Information Processing 2012

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.

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

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

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Foreword

In 2012, the 7th International Federated Conferences on Distributed Computing Techniques (DisCoTec) took place in Stockholm, Sweden, during June 13–16. It was hosted and organized by KTH Royal Institute of Technology. The DisCoTec 2012 federated conference was one of the major events sponsored by the International Federation for Information Processing (IFIP) and it acted as an umbrella event for the following conferences:

- The 14th International Conference on Coordination Models and Languages (Coordination)
- The 12th IFIP International Conference on Distributed Applications and Interoperable Systems (DAIS)
- The 14th Formal Methods for Open Object-Based Distributed Systems and 32nd Formal Techniques for Networked and Distributed Systems (FMOODS/FORTE)

Together, these conferences cover the complete spectrum of distributed computing subjects ranging from theoretical foundations to formal specification techniques to systems research issues.

At a plenary session of the conferences, Schahram Dustdar of Vienna University of Technology and Bengt Jonsson of Uppsala University gave invited talks. There was also a poster session, and a session of invited talks from Swedish companies involved in distributed computing: Spotify, Peerialism, and several-nines.com. In addition to this, there were three workshops:

- The Third International Workshop on Interactions between Computer Science and Biology (CS2BIO) with keynote talks by Jane Hillston (University of Edinburgh, UK) and Gianluigi Zavattaro (University of Bologna, Italy)
- The 5th Workshop on Interaction and Concurrency Experience (ICE) with keynote lectures by Marcello Bonsague (Leiden University, The Netherlands) and Ichiro Hasuo (Tokyo University, Japan)
- The 7th International Workshop on Automated Specification and Verification of Web Systems (WWV) with a keynote talk by José Luiz Fiadeiro (University of Leicester, UK)

I would like to thank the Program Committee Chairs of each conference and workshop for their effort. The organization of DisCoTec 2012 was only possible thanks to the dedicated work of the Publicity Chair Ivana Dusparic (Trinity College Dublin, Ireland), the Workshop Chair Rui Oliveira (Universidade do Minho, Portugal), the Poster Chair Sarunas Girdzijauskas (Swedish Institute of Computer Science, Sweden), the Industry-Track Chair György Dán (KTH Royal College of Technology, Sweden), and the members of the Organizing Committee from KTH Royal Institute of Technology and the Swedish Institute of Computer

Science: Amir H. Payberah, Fatemeh Rahimian, Niklas Ekström, Ahmad Al-Shishtawy, Martin Neumann, and Alex Averbuch. To conclude I want to thank the sponsorship of the International Federation for Information Processing (IFIP) and KTH Royal Institute of Technology.

June 2012

Jim Dowling

Preface

This volume contains the proceedings of DAIS 2012, the 12th IFIP International Conference on Distributed Applications and Interoperable Systems, sponsored by IFIP (International Federation for Information Processing) and organized by IFIP Working Group 6.1.

The conference was held in Stockholm, Sweden, during June 13–16, 2012, as part of the DisCoTec (Distributed Computing Techniques) federated conference, together with the International Conference on Formal Techniques for Distributed Systems (FMOODS & FORTE) and the International Conference on Coordination Models and Languages (COORDINATION).

The conference program presented state-of-the-art research results and case studies in the area of distributed applications and interoperable systems. In general, DAIS topics include:

- Novel and innovative applications and systems: mobile and context-aware applications, ubiquitous and pervasive computing, Internet of services, Internet of things, service-oriented computing, autonomous and self-adaptive systems, cloud computing, peer-to-peer systems, sensor and ad-hoc networks, systems of systems, collaborative intelligent devices, social networks, apps for smartphones and pad-computers
- Architectures, architectural styles, middleware, platforms, distributed computing infrastructures, application level protocols, and devices (e.g., smartphones) supporting distributed applications
- Properties and design goals: Security, trust, privacy, dependability, resilience, safety, performance, scalability, usability, efficiency, sustainability, green computing, interoperability, autonomy, self-* properties
- Engineering and tools: modeling, model-driven architecture, domain-specific languages, design, patterns, development, deployment, validation, testing, benchmarking, operation, management, adaptation, evolution
- Challenges: change, evolution, complexity, large and ultra-large scale, dynamism, mobility, heterogeneity

This year in particular, the conference program comprised five sessions, and the papers in this volume have been ordered accordingly:

1. Peer-to-peer and large-scale systems, with a focus on gossip protocols, replication, and publish/subscribe with four full papers
2. Security and reliability in Web, cloud, p2p, and mobile systems with two full and two short papers
3. Wireless, mobile, and pervasive systems, including context and situation awareness, with three full and two short papers
4. Multidisciplinary approaches and case studies, ranging from GRID and parallel computing to multimedia and socio-technical systems, with one full and four short papers

5. Service-oriented computing and e-commerce with two full and one short paper

Overall, 12 full and 9 short papers were accepted from 58 submissions, which yields an acceptance rate of 21% for full research papers. Thirty-four Program Committee (PC) members and 27 external reviewers provided 3.8 reviews per submission on average, with most submissions receiving four reviews. After initial reviews were posted, a set of candidate papers were selected and discussed among the reviewers and PC Chairs to resolve differing viewpoints.

Finally, we would like to take this opportunity to thank the numerous people whose work made this conference possible. We wish to express our deepest gratitude to the authors of submitted papers, to all PC members for their active participation in the paper review process, and to all external reviewers for their help in evaluating submissions. We would also like to thank the Publicity Chairs, as well as Matti Hiltunen, Etienne Rivière, Antonio Casimiro, and Lea Kutvonen for their help in disseminating the call for papers. Further thanks go to EasyChair, which was indeed a helpful tool, to the Royal Institute of Technology (KTH) for hosting the event in Stockholm, to the DAIS Steering Committee for their advice, to the past DAIS Chairs Romain Rouvoy and Pascal Felber for many useful hints, and to Jim Dowling for acting as a General Chair of the joint event.

June 2012

Karl M. Göschka
Seif Haridi

Organization

Program Committee

Yolande Berbers	Katholieke Universiteit Leuven, Belgium
Antoine Beugnard	Telecom Bretagne, France
Gordon Blair	Lancaster University, UK
António Casimiro	University of Lisbon, Portugal
Felicita Di Giandomenico	ISTI-CNR, Italy
Ada Diaconescu	Telecom ParisTech, CNRS LTCI, France
Frank Eliassen	University of Oslo, Norway
Lorenz Frohofer	A1 Telekom Austria
Kurt Geihs	Universität Kassel, Germany
Nikolaos Georgantas	INRIA, France
Karl M. Göschka	Vienna University of Technology, Austria
Svein Hallsteinsen	SINTEF, Norway
Seif Haridi	Swedish Institute of Computer Science, Sweden
Peter Herrmann	NTNU Trondheim, Norway
Matti Hiltunen	AT&T Labs Research
Jadwiga Indulska	The University of Queensland, Australia
Hans-Arno Jacobsen	University of Toronto, Canada
Rüdiger Kapitza	TU Braunschweig
Lea Kutvonen	University of Helsinki, Finland
René Meier	Trinity College Dublin, Ireland
Alberto Montresor	University of Trento, Italy
Hausi A. Müller	University of Victoria, Australia
Elie Najm	ENST, France
José Pereira	University of Minho, Portugal
Guillaume Pierre	VU University Amsterdam, The Netherlands
Peter Pietzuch	Imperial College, UK
Etienne Rivière	University of Neuchatel, Switzerland
Florian Rosenberg	IBM T.J. Watson Research Center, USA
Giovanni Russo	Create-Net, Italy
Nicolas Schiper	University of Lugano, Switzerland
Douglas Schmidt	Vanderbilt University, USA
François Taïani	Lancaster University, UK
Sotirios Terzis	University of Strathclyde, UK
Gaël Thomas	Regal/Lip6/INRIA, France
Vladimir Tosic	NICTA, Australia
Eddy Truyen	Katholieke Universiteit Leuven, Belgium

Additional Reviewers

Bessani, Alysson	Li, Jim Zhanwen
Brattaas, Gunnar	Lonetti, Francesca
Chiaradonna, Silvano	Lu, Qinghua
Comes, Diana	Marchetti, Eda
Dagnat, Fabien	Michaux, Jonathan
Dar, Kashif Sana	Morandat, Floreal
De Angelis, Guglielmo	Niemczyk, Stefan
Evers, Christoph	Provensi, Lucas Luiz
Guabtni, Adnene	Robinson, Ricky
Ha Duong, Hoa	Salem, Maher
Jergler, Martin	Schiavoni, Valerio
Jiang, Shanshan	Taherkordi, Amirhosein
Kraemer, Frank Alexander	Xu, Quanqing
Lee, Kevin	

Table of Contents

Sleed: Low-Memory, Steady Distributed Systems Slicing	1
<i>Francisco Maia, Miguel Matos, Etienne Rivière, and Rui Oliveira</i>	
Dissemination of Reconfiguration Policies on Mesh Networks	16
<i>François Fouquet, Erwan Daubert, Noël Plouzeau, Olivier Barais, Johann Bourcier, and Jean-Marc Jézéquel</i>	
Scalability of Replicated Metadata Services in Distributed File Systems	31
<i>Dimokritos Stamatakis, Nikos Tsikoudis, Ourania Smyrnaki, and Kostas Magoutis</i>	
Locality-Awareness in a Peer-to-Peer Publish/Subscribe Network	45
<i>Fatemeh Rahimian, Thinh Le Nguyen Huu, and Sarunas Girdzijauskas</i>	
SERENE: Self-Reliant Client-Side Protection against Session Fixation . . .	59
<i>Philippe De Ryck, Nick Nikiforakis, Lieven Desmet, Frank Piessens, and Wouter Joosen</i>	
Behavioral Singletons to Consistently Handle Global States of Security Patterns	73
<i>Linda Ariani Gunawan, Frank Alexander Kraemer, and Peter Herrmann</i>	
A Trustworthy and Resilient Event Broker for Monitoring Cloud Infrastructures	87
<i>Diego Kreutz, António Casimiro, and Marcelo Pasin</i>	
<i>Spectra</i> : Robust Estimation of Distribution Functions in Networks	96
<i>Miguel Borges, Paulo Jesus, Carlos Baquero, and Paulo Sérgio Almeida</i>	
FAMoS: A Flexible Active Monitoring Service for Wireless Sensor Networks	104
<i>Jef Maerien, Pieter Agten, Christophe Huygens, and Wouter Joosen</i>	

A Message Service for Opportunistic Computing in Disconnected MANETs	118
<i>Abdulkader Benchi, Frédéric Guidec, and Pascale Launay</i>	
Flexub: Dynamic Subscriptions for Publish/Subscribe Systems in MANETs	132
<i>Engineer Bainomugisha, Koosha Paridel, Jorge Vallejos, Yolande Berbers, and Wolfgang De Meuter</i>	
On the Design and Development of <i>webinos</i> : A Distributed Mobile Application Middleware.....	140
<i>John Lyle, Shamal Faily, Ivan Fléchaïs, André Paul, Ayşe Göker, Hans Myrhaug, Heiko Desruelle, and Andrew Martin</i>	
A Middleware for Pervasive Situation-Awareness	148
<i>Graham Thomson and Sotirios Terzis</i>	
Stroll: A Universal Filesystem-Based Interface for Seamless Task Deployment in Grid Computing.....	162
<i>Abdulrahman Azab and Hein Meling</i>	
Scheduling of Compute-Intensive Code Generated from Event-B Models: An Empirical Efficiency Study	177
<i>Fredrik Degerlund</i>	
Reliability Modeling and Analysis of Modern Distributed Interactive Multimedia Applications: A Case Study of a Distributed Opera Performance.....	185
<i>Narasimha Raghavan Veeraragavan, Roman Vitenberg, and Hein Meling</i>	
Designing Socio-technical Applications for Ubiquitous Computing: Results from a Multidisciplinary Case Study.....	194
<i>Diana Elena Comes, Christoph Evers, Kurt Geihs, Axel Hoffmann, Romy Kniewel, Jan Marco Leimeister, Stefan Niemczyk, Alexander Roßnagel, Ludger Schmidt, Thomas Schulz, Matthias Söllner, and Andreas Witsch</i>	
Something Old Is New Again: Reimagining the Oldest Social Networking Platform	202
<i>Ivan Voras, Marin Orlić, and Mario Žagar</i>	
ZigZag: A Middleware for Service Discovery in Future Internet.....	208
<i>Preston Rodrigues, Yérom-David Bromberg, Laurent Réveillère, and Daniel Négru</i>	

BPRules and the BPR-Framework: Comprehensive Support for Managing QoS in Web Service Compositions	222
<i>Diana Elena Comes, Harun Baraki, Roland Reichle, and Kurt Geihs</i>	
Connecting Your Mobile Shopping Cart to the Internet-of-Things	236
<i>Nicolas Petitprez, Romain Rouvoy, and Laurence Duchien</i>	
Author Index	245