Lecture Notes in Computer Science 7201

Commenced Publication in 1973
Founding and Former Series Editors:
Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Jens B. Schmitt (Ed.)

Measurement, Modelling, and Evaluation of Computing Systems *and* Dependability and Fault Tolerance

16th International GI/ITG Conference
MMB & DFT 2012
Kaiserslautern, Germany, March 19-21, 2012
Proceedings

Springer

Volume Editor

Jens B. Schmitt
University of Kaiserslautern
disco - Distributed Computer Systems Lab
Computer Science Department
Building 36, P.O. Box 3049
67663 Kaiserslautern, Germany
E-mail: jschmitt@cs.uni-kl.de

ISSN 0302-9743 e-ISSN 1611-3349
ISBN 978-3-642-28539-4 e-ISBN 978-3-642-28540-0
DOI 10.1007/978-3-642-28540-0
Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2012932064

CR Subject Classification (1998): C.2, C.4, C.1, D.2.8, D.2, D.4.8, D.4

LNCS Sublibrary: SL 2 – Programming and Software Engineering

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)

Preface

This volume contains a selection of the papers presented at the 16th International GI/ITG Conference on Measurement, Modelling and Evaluation of Computing Systems and Dependability and Fault Tolerance (MMB & DFT 2012) held during March 19–21, 2012 in Kaiserslautern, hosted by the University of Kaiserslautern. MMB & DFT 2012 covered diverse aspects of performance and dependability evaluation of systems including networks, computer architectures, distributed systems, software, fault-tolerant and secure systems. This biennial conference has a long tradition starting as early as in 1981.

Besides its main scientific program, MMB & DFT 2012 comprised two keynotes, two tutorials from academic and industrial experts, several tool presentations as well as three workshops. Specifically, we were very happy to have the keynote talks by Anja Feldmann (TU Berlin / Deutsche Telekom Laboratories) on "Internet Architecture Trends" and by Lothar Thiele (ETH Zürich) on "Modeling and Evaluation of Thermal System Properties." In this edition of MMB & DFT, we had the speciality of integrated workshops featuring certain topics (with their own call for papers):

- Workshop on Network Calculus (WoNeCa), organized by Anne Bouillard (ENS, France), Markus Fidler (Leibniz University of Hannover), and Florin Ciucu (TU Berlin / Deutsche Telekom Laboratories)
- Workshop on Modeling and Analysis of Complex Reaction Networks (MACoRN), organized by Werner Sandmann (TU Clausthal) and Verena Wolf (Saarland University)
- Workshop on Physically Augmented Security for Wireless Networks (PILATES), organized by Matthias Hollick (TU Darmstadt), Ivan Martinovic (University of Oxford), and Dirk Westhoff (HAW Hamburg)

Overall we received 54 submissions, 36 to the main conference (including 6 tool papers) and 18 to the workshops, by authors from 17 different countries. Each submission was reviewed by at least 3, and on average 3.9, Program Committee members. In a physical TPC meeting with further technical discussions, 26 of these submissions were selected for inclusion in this volume.

On behalf of the TPC, we would like to thank all authors who submitted their work to MMB & DFT 2012. We hope that all authors appreciate the hard work of the TPC members, and found their feedback and suggestions valuable. We would like to express our debt and gratitude to all the members of the TPC, and the external reviewers, for being so responsive and for their timely and valuable reviews.

We are grateful to everyone involved in the organization of the MMB & DFT 2012 conference, as well as to the speakers and the attendees of the conference. We also appreciate the excellent support of EasyChair in managing the processes of submission, reviewing, and preparing the final version of the proceedings.

January 2012 Jens B. Schmitt

Organization

MMB & DFT 2012 was organized by the Distributed Computer Systems Lab, University of Kaiserslautern, Germany.

Organizing Committee

General and Program Chair	Jens Schmitt
Local Organization Chairs	Steffen Bondorf
	Steffen Reithermann
	Carolin Reffert-Schmitt
Tools Chair	Hao Wang
Submission Chair	Matthias Wilhelm
Publication Chair	Michael Beck
Web Chair	Adam Bachorek
Publicity Chair	Wint Yi Poe

Program Committee

Lothar Breuer	University of Kent, UK
Peter Buchholz	TU Dortmund, Germany
Joachim Charzinski	Hochschule der Medien Stuttgart, Germany
Hans Daduna	Universität Hamburg, Germany
Klaus Echtle	Universität Duisburg-Essen, Germany
Bernhard Fechner	Universität Augsburg, Germany
Markus Fidler	Leibniz Universität Hannover, Germany
Reinhard German	Universität Erlangen-Nürnberg, Germany
Boudewijn Haverkort	University of Twente, The Netherlands
Gerhard Haßlinger	Deutsche Telekom, Germany
Holger Hermanns	Universität des Saarlandes, Germany
Joost-Pieter Katoen	RWTH Aachen, Germany
Jörg Keller	FernUniversität in Hagen, Germany
Peter Kemper	The College of William and Mary, USA
Udo Krieger	Otto-Friedrich-Universität Bamberg, Germany
Wolfram Lautenschläger	Alcatel-Lucent, USA
Axel Lehmann	Universität der Bundeswehr München, Germany
Ralf Lehnert	TU Dresden, Germany
Erik Maehle	Universität zu Lübeck, Germany
Michael Menth	Universität Tübingen, Germany
Bruno Müller-Clostermann	Universität Duisburg-Essen, Germany

Peter Reichl	Forschungszentrum Telekommunikation Wien, Austria
Anne Remke	University of Twente, The Netherlands
Johannes Riedl	Siemens AG, Germany
Francesca Saglietti	Universität Erlangen-Nürnberg, Germany
Werner Sandmann	TU Clausthal, Germany
Jens Schmitt	TU Kaiserslautern, Germany
Markus Siegle	Universität der Bundeswehr München, Germany
Helena Szczerbicka	Leibniz Universität Hannover, Germany
Aad Van Moorsel	Newcastle University, UK
Oliver Waldhorst	Karlsruher Institut für Technologie, Germany
Max Walter	TU München, Germany
Verena Wolf	Universität des Saarlandes, Germany
Bernd Wolfinger	Universität Hamburg, Germany
Katinka Wolter	FU Berlin, Germany
Armin Zimmermann	TU Ilmenau, Germany

Additional Reviewers

Hernán Baró Graf	Universität des Saarlandes, Germany
Matthias Becker	Leibniz Universität Hannover, Germany
Martin Drozda	Leibniz Universität Hannover, Germany
Christian Eisentraut	Universität des Saarlandes, Germany
Philipp Eittenberger	Otto-Friedrich-Universität Bamberg, Germany
Luis María Ferrer Fioriti	Universität des Saarlandes, Germany
Klaus-Dieter Heidtmann	Universität Hamburg, Germany
Michael Hoefling	Universität Tübingen, Germany
Oliver Hohlfeld	TU Berlin, Germany
Andrey Kolesnikov	Universität Hamburg, Germany
Minh Lê	TU München, Germany
Alfons Martin	Universität Tübingen, Germany
Linar Mikeev	Universität des Saarlandes, Germany
Jorge Perez-Hidalgo	TU Dresden, Germany
Martin Riedl	Universität der Bundeswehr München, Germany
Johann Schuster	Universität der Bundeswehr München, Germany
Falak Sher	RWTH Aachen, Germany
David Spieler	Universität des Saarlandes, Germany
Mark Timmer	University of Twente, The Netherlands
Sebastian Vastag	TU Dortmund, Germany
Hannes Weisgrab	Forschungszentrum Telekommunikation Wien, Austria

Keynote Talks at MMB & DFT 2012

Modeling and Evaluation of Thermal System Properties

Lothar Thiele, ETH Zurich
thiele@ethz.ch

Power density has been continuously increasing in modern processors, leading to high on-chip temperatures. A system could fail if the operating temperature exceeds a certain threshold, leading to low reliability and even chip burnout. There have been many results in recent years about thermal management, including (1) thermal-constrained scheduling to maximize performance or determine the schedulability of real-time systems under given temperature constraints, (2) peak temperature reduction to meet performance constraints, and (3) thermal control by applying control theory for system adaption. The presentation will cover challenges, problems and approaches to real-time scheduling under temperature constraints for single- as well as multi-processors.

Internet Architecture Trends

Anja Feldmann, TU Berlin / T-Labs
anja@net.t-labs.tuberlin.de

The ever growing demand for information of Internet users is putting a significant burden on the current Internet infrastructure who's architecture has been more or less unchanged over the last 30 years. Indeed, rather than adjusting the architecture small fixes, e.g., MPLS, have been deployed within the core network.

Today, new technical abilities enable us to rethink the Internet architecture. In this talk we first highlight how Internet usage has changed in the area of user generated context. Then we explore two technology trends: Cloud networks and open hardware/software interfaces.

Virtualization, a main motor for innovation, decouples services from the underlying infrastructure and allows for resource sharing while ensuring performance guarantees. Server virtualization is widely used, e.g., in the clouds. However, cloud virtualization alone is meaningless without taking into account the network needed to access the cloud resources and data: cloud networks.

Current infrastructures are limited to use the tools provided by the hardware vendors as there are hardly any open software stacks available for network devices in the core. This hurts innovation. However, novel programing interfaces for network devices, e.g., OpenFlow, provide open hardware/software interfaces and may enable us to build a network OS with novel features. We outline initial work in this area.

Table of Contents

Full Papers

Tool Papers

Selected Workshop Papers