# Lecture Notes in Computer Science

4657

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

University of California, Los Angeles, CA, 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

Costas Lambrinoudakis Günther Pernul A Min Tjoa (Eds.)

# Trust, Privacy and Security in Digital Business

4th International Conference, TrustBus 2007 Regensburg, Germany, September 4-6, 2007 Proceedings



#### Volume Editors

Costas Lambrinoudakis

Department of Information and Communication Systems Engineering

University of the Aegean

Karlovasi, 83200 Samos, Greece

E-mail: clam@aegean.gr

Günther Pernul

Department of Information Systems

University of Regensburg

Universitätsstrasse 31

D-93053 Regensburg, Germany

E-mail: guenther.pernul@wiwi.uni-regensburg.de

A Min Tioa

Institute for Software Technology and Interactive Systems

Favoritenstrasse 9-11/188

Vienna University of Technology

A-1040 Vienna, Austria

E-mail: amin@ifs.tuwien.ac.at

Library of Congress Control Number: 2007933177

CR Subject Classification (1998): K.4.4, K.4, K.6, E.3, C.2, D.4.6, J.1

LNCS Sublibrary: SL 4 – Security and Cryptology

ISSN 0302-9743

ISBN-10 3-540-74408-8 Springer Berlin Heidelberg New York ISBN-13 978-3-540-74408-5 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

springer.com

© Springer-Verlag Berlin Heidelberg 2007

Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India Printed on acid-free paper SPIN: 12112197 06/3180 5 4 3 2 1 0

## **Preface**

This book presents the proceedings of the 4th International Conference on Trust, Privacy and Security in Digital Business (TrustBus 2007), held in Regensburg, Germany September 4–6, 2007. The conference continued from previous events held in Zaragoza (2004), Copenhagen (2005) and Krakow (2006), and maintained the aim of bringing together academic researchers and industry developers to discuss the state of the art in technology for establishing trust, privacy and security in digital business. We thank the attendees for coming to Regensburg to participate and debate the new emerging advances in this area.

The conference program included one keynote presentation, one panel session and eight technical papers sessions. The keynote speech was delivered by Alfred Kobsa from the University of California, Irvine (USA), on the topic of "Privacy-Enhanced Personalization." The subject of the panel discussion was "Managing Digital Identities—Challenges and Opportunities." The participants were Marco Casassa Mont (Hewlett-Packard Laboratories, UK), Eduardo B. Fernandez (Florida Atlantic University, USA), Socratis Katsikas (University of Piraeus, Greece), Alfred Kobsa (University of California, Irvine, USA), and Rolf Oppliger (Informatikstrategieorgan Bund, ISB, Switzerland). The panel was chaired by Günther Pernul (University of Regensburg, Germany). The reviewed paper sessions covered a broad range of topics, from access control models to security and risk management, and from privacy and identity management to security protocols. The conference attracted 80 submissions, each of which was assigned to four referees for review. The Program Committee ultimately accepted 28 papers for inclusion in the proceedings.

We would like to express our thanks to the various people who assisted us in organizing the event and formulating the program. We are very grateful to the Program Committee members and the external reviewers, for their timely and rigorous reviews of the papers. Thanks are also due to the DEXA Organizing Committee for supporting our event, and in particular to Gabriela Wagner for her help with the administrative aspects.

Finally, we would like to thank all of the authors that submitted papers for the event, and contributed to an interesting set of conference proceedings.

September 2007

Costas Lambrinoudakis Günther Pernul A Min Tjoa

# **Program Committee**

#### General Chair

Gligor, Virgil D.

Günther Pernul University of Regensburg, Germany

## **Program Committee Co-chairs**

Costas Lambrinoudakis University of the Aegean, Greece

A Min Tjoa Vienna University of Technology, Austria

## **International Program Committee**

Acquisti, Alessandro Carnegie Mellon University (USA)

Atluri, Vijay

Casassa Mont, Marco

Chadwick, David

Clarke, Nathan

Clayton, Richard

Cuppens, Frederic

Rutgers University (USA)

HP Labs Bristol (UK)

University of Kent (UK)

University of Plymouth (UK)

University of Cambridge (UK)

Damiani, Ernesto Università degli Studi di Milano (Italy)

Dawson, Ed Queensland University of Technology (Australia)

De Capitani di Vimercati, Sabrina University of Milan (Italy)
De Meer, Hermann University of Passau (Germany)

Eckert, Claudia
Technical University Darmstadt (Germany)
Federrath, Hannes
University of Regensburg (Germany)
Fernandez, Eduardo B.
Florida Atlantic University (USA)
Ferrari, Elena
University of Insubria (Italy)
Fischer-Huebner, Simone
University of Karlstad (Sweden)
Flavian, Carlos
University of Zaragoza (Spain)
Furnell, Steven
University of Plymouth (UK)

Gonzalez-Nieto, Juan M. Queensland University of Technology (Australia)

University of Maryland (USA)

Grimm, Rüdiger University of Koblenz (Germany)

Gritzalis, Dimitris Athens University of Economics and Business

(Greece)

Gritzalis, Stefanos University of the Aegean (Greece)
Gudes, Ehud Ben-Gurion University (Israel)

Gürgens, Sigrid Fraunhofer Institute for Secure Information

Technology (Germany)

Hansen, Marit Independent Center for Privacy Protection

(Germany)

Jøsang, Audun Queensland University of Technology (Australia)

Karygiannis, Tom NIST (USA)

Katsikas, Sokratis University of Piraeus (Greece)
Kesdogan, Dogan NTNU Trondheim (Norway)
Kikuchi, Hiroaki Tokai University (Japan)

Kokolakis, Spyros University of the Aegean (Greece)

Kursawe, Klaus Philips Research, Eindhoven (The Netherlands)

Lilien, Leszek Western Michigan University (USA)

Lioy, Antonio Politecnico di Torino (Italy) Lopez, Javier University of Malaga (Spain)

Lory, Peter University of Regensburg (Germany)

Mana Gomez, Antonio University of Malaga (Spain)

Markowitch, Olivier Universite Libre de Bruxelles (Belgium)

Martinelli, Fabio CNR (Italy)

Mueller, GuenterUniversity of Freiburg (Germany)Okamoto, EijiUniversity of Tsukuba (Japan)Olivier, Martin S.University of Pretoria (South Africa)Oppliger, RolfeSecurity Technologies (Switzerland)

Papadaki, Maria University of Plymouth (UK)
Patel, Ahmed Kingston University (UK)

Pfitzmann, Andreas Dresden University of Technology (Germany)
Piattini, Mario University of Castilla-La Mancha (Spain)

Pohl, Hartmut FH Bonn-Rhein-Sieg (Germany)

Posch, Karl University of Technology Graz (Austria)

Priebe, Torsten Capgemini (Austria)

Quirchmayr, Gerald University of Vienna (Austria)

Rannenberg, Kai Goethe University Frankfurt (Germany)

Ruland, Christoph University of Siegen (Germany)
Samarati, Pierangela University of Milan (Italy)

Schunter, Matthias IBM Zurich Research Lab. (Switzerland)

Siponen, Mikko T. University of Oulu (Finland)
Spalka, Adrian University of Bonn (Germany)
Teufel, Stephanie University of Fribourg (Switzerland)

Tomlinson, Allan Royal Holloway, University of London (UK)

Varadharajan, Vijay Macquarie University (Australia)

Zhou, Jianying I2R (Singapore)

#### **External Reviewers**

Andersson, Christer Karlstad University, Sweden

Antonakakis, Manos Georgia Tech, USA

Balopoulos, Theodoros University of the Aegean, Greece University of the Aegean, Greece Belsis, Petros

Dresden University of Technology, Germany Bergmann, Mike

Dritsas, Stelios Athens University of Economics and Business, Greece

Dürbeck, Stefan University of Regensburg, Germany Secure Business Austria, Austria Ekelhart, Andreas Fenz, Stefan Secure Business Austria, Austria

Dresden University of Technology, Germany Franz, Elke

Galoz, Nurit Ben-Gurion University, Israel University of Regensburg, Germany Gilberg, Jörg Secure Business Austria, Austria Goluch, Gernot Grinshpun, Tal Ben-Gurion University, Israel Indrakanti, Sarath Macquarie University, Australia Jakoubi, Stefan Secure Business Austria, Austria University of the Aegean, Greece Kambourakis, George IBM Research, Switzerland Karjoth, Günter University of the Aegean, Greece Karyda, Maria Kolter, Jan University of Regensburg, Germany University of the Aegean, Greece Konstantinou, Elisavet Kumaraguru, Ponnurangam Carnegie Mellon University, USA

Li, Zhuowei Indiana University, USA Liu, Joseph Bristol University, UK

Marias, Giannis Athens University of Economics and Business, Greece

Martucci, Leonardo Karlstad University, Sweden Merten, Patrick

University of Fribourg, Switzerland Oberender, Jens University of Passau, Germany

RWTH Aachen, Germany Panchenko, Andriy

Peng, Kun Queensland University of Technology, Australia

Perego, Andrea University of Insubria, Italy Pham, Vinh D. RWTH Aachen, Germany RWTH Aachen, Germany Pimenidis, Alexis

Goethe University Frankfurt, Germany Pisko, Evgenia

Reid, Jason Queensland University of Technology, Australia

Carnegie Mellon University, USA Romanosky, Sasha Roßnagel, Heiko Goethe University Frankfurt, Germany

Rozenberg, Boris Ben-Gurion University, Israel

Ruan, Chun University of Western Sydney, Australia

Fraunhofer SIT, Germany Rudolph, Carsten

University of Regensburg, Germany Schillinger, Rolf University of Fribourg, Switzerland Schlüter, Jan Steinert, Martin University of Fribourg, Switzerland

Su, Chunhua Kyushu University, Japan

#### X Organization

Theoharidou, Marianthi Athens University of Economics and Business, Greece

Tjoa, Simon Secure Business Austria, Austria Tsohou, Aggeliki University of the Aegean, Greece

Tsoumas, Bill Athens University of Economics and Business, Greece

Tupakula, Uday Macquarie University, Australia
Volkamer, Melanie University of Passau, Germany
Weippl, Edgar Secure Business Austria, Austria
Weiss, Stefan Goethe University Frankfurt, Germany
Woelfl, Thomas University of Regensburg, Germany

# Table of Contents

Trustbus'07 Keynote Talk: Privacy Enhanced Personalization	1
Panel Discussion: Managing Digital Identities – Challenges and Opportunities	2
Session 1: Secure and Trusted Virtual Organisations	
Recognition of Authority in Virtual Organisations  Tuan-Anh Nguyen, David Chadwick, and Bassem Nasser	3
Securing VO Management	14
Addressing Cultural Dissimilarity in the Information Security Management Outsourcing Relationship	24
Specification of the TrustMan System for Assisting Management of VBEs	34
Session 2: Privacy in Digital Business	
A Privacy-Preserving Buyer-Seller Watermarking Protocol with Semi-trust Third Party	44
Towards Automatic Assembly of Privacy-Preserved Intrusion Signatures	54
Privacy Assurance: Bridging the Gap Between Preference and Practice	65
Session 3: Identity Management and Usage Control	
Enhancing Optimistic Access Controls with Usage Control	75

Usage Control in Service-Oriented Architectures	83
On Device-Based Identity Management in Enterprises	94
Analysis-Level Classes from Secure Business Processes Through Model Transformations	104
Session 4: Authentication and Access Control	
A Trust and Context Aware Access Control Model for Web Services  Conversations	115
Design and Implementation of Distributed Access Control Infrastructures for Federations of Autonomous Domains	125
On Device Authentication in Wireless Networks: Present Issues and Future Challenges	135
Session 5: Compliance and User Privacy	
The Meaning of Logs	145
Data Protection and Privacy Laws in the Light of RFID and Emerging Technologies	155
Consistency of User Attribute in Federated Systems	165
Session 6: Policy Management	
Pre-execution Security Policy Assessment of Remotely Defined BPEL-Based Grid Processes	178
Situation-Based Policy Enforcement	190

Table of Contents	ΛIII
Using Purpose Lattices to Facilitate Customisation of Privacy Agreements	201
A Pattern-Driven Framework for Monitoring Security and Dependability	210
Session 7: Security System Management	
Security Aspects for Secure Download of Regulated Software	219
Using the Lens of Circuits of Power in Information Systems Security Management	228
Fuzzy Service Selection and Interaction Review in Distributed Electronic Markets	237
Session 8: Security and Trust	
X316 Security Toolbox for New Generation of Certificate	248
Detecting Malicious SQL	259
Trusted Code Execution in JavaCard	269
How to Use ISO/IEC 24727-3 with Arbitrary Smart Cards	280
Author Index	201