# IFIP Advances in Information and Communication Technology

300

#### IFIP - The International Federation for Information Processing

IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within its member countries and to encourage technology transfer to developing nations. As its mission statement clearly states,

IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- The IFIP World Computer Congress, held every second year;
- Open conferences;
- Working conferences.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is small and by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is less rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

Any national society whose primary activity is in information may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly, National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.

Elena Ferrari Ninghui Li Elisa Bertino Yuecel Karabulut (Eds.)

## Trust Management III

Third IFIP WG 11.11 International Conference, IFIPTM 2009 West Lafayette, IN, USA, June 15-19, 2009 Proceedings



#### Volume Editors

Elena Ferrari

University of Insubria, Department of Computer Science and Communication

Via Mazzini, 5, 21100 Varese, Italy E-mail: elena.ferrari@uninsubria.it

Ninghui Li Elisa Bertino

Purdue University, Department of Computer Science

305 N. University Street, West Lafayette, IN 47907-2107, USA

E-mail: {ninghui, bertino}@cs.purdue.edu

Yuecel Karabulut SAP's Office of the CTO 3412 Hillview Avenue, Palo Alto, CA 94304, USA E-mail: yuecel.karabulut@sap.com

Library of Congress Control Number: Applied for

CR Subject Classification (1998): D.4.6, K.6.5, C.2, K.4.4, E.3

ISSN 1868-4238

ISBN-10 3-642-02055-0 Springer Berlin Heidelberg New York ISBN-13 978-3-642-02055-1 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.com

© International Federation for Information Processing 2009 Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India Printed on acid-free paper SPIN: 12689507 06/3180 5 4 3 2 1 0

#### Preface

This volume contains the proceedings of IFIPTM 2009, the Third IFIP WG 11.11 International Conference on Trust Management, held at Purdue University in West Lafayette, Indiana, USA during June 15–19, 2009.

IFIPTM 2009 provided a truly global platform for the reporting of research, development, policy and practice in the interdependent areas of privacy, security, and trust. Building on the traditions inherited from the highly successful iTrust conference series, the IFIPTM 2007 conference in Moncton, New Brunswick, Canada, and the IFIPTM 2008 conference in Trondheim, Norway, IFIPTM 2009 focused on trust, privacy and security from multidisciplinary perspectives. The conference is an arena for discussion about relevant problems from both research and practice in the areas of academia, business, and government.

IFIPTM 2009 was an open IFIP conference. The program of the conference featured both theoretical research papers and reports of real-world case studies. IFIPTM 2009 received 44 submissions. The Program Committee selected 17 papers for presentation and inclusion in the proceedings. In addition, the program and the proceedings include one invited paper and five demo descriptions. The highlights of IFIPTM 2009 included invited talks and tutorials by academic and governmental experts in the fields of trust management, privacy and security, including Eugene Spafford, Marianne Winslett, and Michael Novak.

Running an international conference requires an immense effort from all parties involved. We would like to thank the Program Committee members and external referees for having provided timely and in-depth reviews of the submitted papers. We would also like to thank the Workshop, Tutorial, Demonstration, Local Arrangements, and Website Chairs, for having provided great help organizing the conference.

In addition, we appreciate the logistics support provided by the Center for Education and Research in Information Security and Assurance (CERIAS) at Purdue University. We are also grateful to the SAP Office of the CTO for their financial support for IFIPTM 2009.

We hope you enjoy the proceedings.

June 2009

Elena Ferrari Ninghui Li Elisa Bertino Yuecel Karabulut

## Organization

#### **General Chairs**

Elisa Bertino Purdue University, USA

Yuecel Karabulut SAP's Office of the CTO, USA

#### **Program Chairs**

Elena Ferrari University of Insubria, Italy Ninghui Li Purdue University, USA

#### Workshop Chair

Anupam Datta Carnegie Mellon University, USA

#### **Tutorial Chair**

Yuko Muayama Iwate Prefectural University, Japan

#### **Demonstration Chair**

Theo Dimitrakos Centre for Information and Security Systems

Research, BT Innovate, UK

## Local Arrangements Chairs

Randy Bond CERIAS, Purdue University, USA Lori Floyd CERIAS, Purdue University, USA

#### Website Chair

Qun Ni Purdue University, USA

### **Program Committee**

Tuomas Aura Microsoft Research, UK

L. Jean Camp Indiana University at Bloominton, USA

Licia Capra University College London, UK

Christian

Damsgaard Jensen Technical University of Denmark, Denmark

Anupam Datta Carnegie Mellon University, USA

Theo Dimitrakos BT Innovate, UK

Naranker Dulay Imperial College London, UK

Sandro Etalle T.U. Eindhoven and University of Twente,

The Netherlands

Rino Falcone Institute of Cognitive Sciences and

Technologies of CNR Rome, Italy

Giusella Finocchiaro University of Bologna, Italy

Ehud Gudes Ben Gurion University of the Negev, Israel Peter Herrmann The Norwegian University of Science and

Technology, Norway

Valerie Issarny INRIA, France

Audun Jøsang University of Oslo, Norway James Joshi University of Pittsburgh, USA

Günter Karjoth IBM Zurich Research Laboratory, Switzerland Larry Koved IBM T.J. Watson Research Center, USA

Mark Kramer MITRE, USA

Adam J. Lee University of Pittsburgh, USA Javier Lopez University of Malaga, Spain Stéphane Lo Presti Brunel University, UK Stephen Marsh NRC Canada, Canada

Fabio Martinelli IIT-CNR, Italy

Fabio Massacci University of Trento, Italy

Yuko Murayama Iwate Prefectural University, Japan

Babak Sadighi Axiomatics AB, Sweden

Kent Seamons Brigham Young University, USA
Jean-Marc Seigneur University of Geneva, Switzerland
Mark Ryan University of Birmingham, UK

Simon Shiu HP Labs, UK Jessica Staddon PARC, USA

Ketil Stølen SINTEF and University of Oslo, Norway

Vipin Swarup MITRE, USA

Sotirios Terzis University of Strathclyde, UK

Bhavani

Thuraisingham University of Texas at Dallas, USA
Mahesh Tripunitara University of Waterloo, Canada

William H.

Winsborough University of Texas at San Antonio, USA
Marianne Winslett University of Illinois at Urbana-Champaign,

USA

Danfeng Yao Rutgers University, New Brunswick, USA

#### **External Reviewers**

Isaac Agudo
Sruthi Bandhakavi
Roberto Speicys Cardoso
Piotr Cofta
Heidi Dahl
Tien Tuan Anh Dinh
Nicola Dragoni
Carmen Fernandez-Gago
Nurit Galoz
Ragib Hasan

Aliksandr Lazouski
Pierre De Leusse
Thomas Martin
Ruben Rios
Fredrik Seehusen
Tamas Visegrady
Mozhgan Tavakolifard
Emmanuele Zambon
Nicola Zannone
Charles Zhang

## **Sponsoring Institutions**

SAP Office of the CTO

Tormod Havaldsrud

## **Table of Contents**

Social Aspects and Usability	
Spiral of Hatred: Social Effects in Buyer-Seller Cross-Comments Left on Internet Auctions	1
Radoslaw Nielek, Aleksander Wawer, and Adam Wierzbicki	
Graphical Passwords as Browser Extension: Implementation and Usability Study	15
Kemal Bicakci, Mustafa Yuceel, Burak Erdeniz, Hakan Gurbaslar, and Nart Bedin Atalay	
Trust Reasoning and Processing	
Trust-Enhanced Recommender Systems for Efficient On-Line	
Collaboration	30
Towards Understanding the Requirements and Limitations of	
Reputation-Based Systems	47
Elimination of Subjectivity from Trust Recommendation	65
Data Security	
Security in Wiki-Style Authoring Systems	81
On Usage Control in Data Grids	99
Detection and Prevention of Insider Threats in Database Driven Web Services	117
Tzvi Chumash and Danfeng Yao	111
Enhancements to Subjective Logic	
Inferring Trust Based on Similarity with TILLIT	133
Analogical Trust Reasoning	149

## **Information Sharing**

TIUPAM: A Framework for Trustworthiness-Centric Information	
Sharing	164
TrustBuilder2: A Reconfigurable Framework for Trust Negotiation	176
A Relational Wrapper for RDF Reification	196
Risk Assessment	
Employing Key Indicators to Provide a Dynamic Risk Picture with a Notion of Confidence	215
A Risk Based Approach to Limit the Effects of Covert Channels for Internet Sensor Data Aggregators for Sensor Privacy	234
Simulation of Trust and Reputation Systems	
An Experimental Testbed for Evaluation of Trust and Reputation Systems	252
Evaluating the STORE Reputation System in Multi-Agent Simulations	267
Comparison of the Beta and the Hidden Markov Models of Trust in Dynamic Environments	283
Demonstration Abstracts	
WRS: The Wikipedia Recommender System	298
Distributed Systems Security Governance, a SOA Based Approach Pierre de Leusse and David Brossard	302

Table of Contents	XIII
Security and Trust Management for Virtual Organisations: GridTrust Approach	306
Common Capabilities for Trust and Security in Service Oriented Infrastructures	310
A Virtual Hosting Environment for Distributed Online Gaming David Brossard and Juan Luis Prieto Martinez	314
Author Index	319