

Gesellschaft für Informatik e.V. (GI)

publishes this series in order to make available to a broad public recent findings in informatics (i.e. computer science and information systems), to document conferences that are organized in cooperation with GI and to publish the annual GI Award dissertation.

Broken down into

- seminars
- proceedings
- dissertations
- thematics

current topics are dealt with from the vantage point of research and development, teaching and further training in theory and practice. The Editorial Committee uses an intensive review process in order to ensure high quality contributions.

The volumes are published in German or English.

Information: <http://www.gi.de/service/publikationen/lni/>

ISSN 1617-5468

ISBN 978-3-88579-658-9

Open standards and interfaces as well as open source technologies play a central role in the current identity management landscape as well as in emerging future scenarios such as Internet of Things enabled healthcare and global infrastructures for trust management. While there are already plenty of successful applications in which those techniques are used to safeguard the authenticity, integrity and confidentiality, there are still many closely related areas which demand further research. The aim of the "Open Identity Summit 2016" is to link practical experiences with academic innovations. Focus areas of this event are research and applications in the area of Identity Management, Policy Implementation, Privacy by Design, Trust Services, and Mobile ID.



D. Hühnlein, H. Roßnagel, C.H. Schunck, M. Talamo (Eds.): Open Identity Summit 2016

GI-Edition

Lecture Notes in Informatics

**Detlef Hühnlein, Heiko Roßnagel,
Christian H. Schunck, Maurizio Talamo (Eds.)**

Open Identity Summit 2016

der Gesellschaft für Informatik e.V. (GI)

**13.-14. October 2016
Rome, Italy**

Proceedings



Detlef Hühnlein, Heiko Roßnagel,
Christian H. Schunck, Maurizio Talamo (Eds.)

Open Identity Summit 2016

13. - 14.10.2016
Rome, Italy

Gesellschaft für Informatik e.V. (GI)

Lecture Notes in Informatics (LNI) - Proceedings

Series of the Gesellschaft für Informatik (GI)

Volume P-264

ISBN 978-3-88579-658-9

ISSN 1617-5468

Volume Editors

Detlef Hühnlein

ecsec GmbH

Sudetenstr. 16, D-96247 Michelau, Germany

detlef.huehnlein@ecsec.de

Heiko Roßnagel

Fraunhofer Institute for Industrial Engineering IAO

Nobelstr. 12, D-70569 Stuttgart, Germany

heiko.rossnagel@iao.fraunhofer.de

Christian H. Schunck | Maurizio Talamo

Fondazione Universitaria INUIT – Tor Vergata

Via Orazio Raimondo 18, 00173 Rome, Italy

{christian.schunck|maurizio.talamo}@inuitroma2.it

Series Editorial Board

Heinrich C. Mayr, Alpen-Adria-Universität Klagenfurt, Austria

(Chairman, mayr@ifit.uni-klu.ac.at)

Dieter Fellner, Technische Universität Darmstadt, Germany

Ulrich Flegel, Infineon, Germany

Ulrich Frank, Universität Duisburg-Essen, Germany

Johann-Christoph Freytag, Humboldt-Universität zu Berlin, Germany

Michael Goedicke, Universität Duisburg-Essen, Germany

Ralf Hofestädt, Universität Bielefeld, Germany

Michael Koch, Universität der Bundeswehr München, Germany

Axel Lehmann, Universität der Bundeswehr München, Germany

Thomas Roth-Berghofer, University of West London, Great Britain

Peter Sanders, Karlsruher Institut für Technologie (KIT), Germany

Sigrid Schubert, Universität Siegen, Germany

Ingo Timm, Universität Trier, Germany

Karin Vosseberg, Hochschule Bremerhaven, Germany

Maria Wimmer, Universität Koblenz-Landau, Germany

Dissertations

Steffen Hölldobler, Technische Universität Dresden, Germany

Seminars

Reinhard Wilhelm, Universität des Saarlandes, Germany

Thematics

Andreas Oberweis, Karlsruher Institut für Technologie (KIT), Germany

© Gesellschaft für Informatik, Bonn 2016
printed by Köllen Druck+Verlag GmbH, Bonn



This book is licensed under a Creative Commons Attribution-NonCommercial 3.0 License.

Preface

Welcome to the "Open Identity Summit 2016" (OID2016), which has been jointly organized by the special interest groups BIOSIG within the German Informatics Society (Gesellschaft für Informatik e.V. (GI)), the EU-funded FutureID project, the Open eCard project, the SSEDIC.2020 initiative, the PICASO project, the LIGHTTest project, the FutureTrust Project, and last but not least by Fondazione Universitaria INUIT Tor Vergata.

The international program committee performed a strong review process according to the LNI guidelines. At least three reviews per paper and 47 percent accepted papers of the 21 submitted papers as full scientific papers guarantee the high quality of presentations. These proceedings cover the topics of ecosystems and architectures for digital identity, mobile electronic identity, trust services, open source, and cloud and data management.

Furthermore, the program committee has created a program including selected contributions of strong interest (further conference contributions) for the outlined scope of this conference.

We would like to thank all authors for their contributions and the numerous reviewers for their work in the program committee.

Rome, October 2016

Detlef Hühnlein
ecsec GmbH

Heiko Roßnagel
Fraunhofer IAO

Christian H. Schunck
Fondazione INUIT

Maurizio Talamo
Fondazione INUIT

Conference Chairs

Detlef Hühnlein, ecsec GmbH

Heiko Roßnagel, Fraunhofer Institute for Industrial Engineering IAO

Christian H. Schunck, Fondazione Universitaria INUIT Tor Vergata

Maurizio Talamo, Fondazione Universitaria INUIT Tor Vergata

International Program Committee

Franco Arcieri, Italy

Moez Ben MBarka, France

Arslan Broemme, Germany

Bud Brügger, Germany

Christoph Busch, Germany

Victor-Philipp Busch, Germany

Andrea Caccia, Italy

Jörg Caumanns, Germany

Juan Carlos Cruellas, Spain

Roger Dean, United Kingdom

Jos Dumortier, Belgium

Simone Fischer-Hübner, Germany

Lothar Fritsch, Germany

Jens Fromm, Germany

Walter Fumy, Germany

Igor Furgel, Germany

Robert Garskamp, Netherlands

Ulrich Greveler, Germany

Thomas Gross, United Kingdom

Marit Hansen, Germany

Olaf Herden, Germany

Oliver Hinz, Germany

Gerrit Hornung, Germany

Moritz Horsch, Germany

Detlef Houdeau, Germany

Detlef Hühnlein, Germany

Tina Hühnlein, Germany

Klaus Junker-Schilling, Germany

Jan Jürjens, Germany

Ulrike Korte, Germany

Michael Kubach, Germany

Andreas Kuckartz, Germany

Raik Kuhlisch, Germany

Andreas Kühne, Germany

Sebastian Kurowski, Germany

Herbert Leitold, Germany

Peter Lipp, Austria

Luigi Lo Iacono, Germany

Johannes Loxen, Germany

Milan Markovic, Serbia

Tarvi Martens, Estonia

Gisela Meister, Germany

Daniela Merella, Italy

Axel Nennker, Germany

Alexander Nouak, Germany

Sebastian Pape, Germany

Sachar Paulus, Germany

René Peinl, Germany

Henrich Pöhls, Germany

Kai Rannenber, Germany

Alexander Rossnagel, Germany

Heiko Roßnagel, Germany

Carlos Sanchez, United Kingdom

Aleksandr Sazonov, Russia

Ivonne Scherfenberg, Germany

Christian H. Schunck, Italy

Steffen Schwalm, Germany

Jörg Schwenk, Germany

Jon Shamah, United Kingdom

David Simonsen, Denmark

Maurizio Talamo, Italy

Don Thibeau, United States

Thomas Uhl, Germany

Tobias Wich, Germany

Thomas Wieland, Germany

Alex Wiesmaier, Germany

Jan Zibuschka, Germany

Jan Ziesing, Germany

Frank Zimmermann, Switzerland

Invited Speakers

Robin Wilton, United Kingdom

Partners

BIOSIG – Biometrics and Electronic Signatures (<http://www.biosig.org/>)

The special interest group “Biometrics and Electronic Signatures” (BIOSIG) within GI e.V. is dedicated to the fundamentals, methods, techniques, processes and implementations used to guarantee the authenticity and integrity of entities.

SSEDIC.2020 (<http://www.ssedic2020.com/>)

The objective of SSEDIC.2020 is to provide a platform for all the stakeholders of eID (electronic identity) to work together and collaborate. SSEDIC.2020 builds on the success of the EU funded SSEDIC thematic network.

FutureID Project (<http://www.futureid.eu/>)

The EU-funded FutureID project builds a comprehensive, flexible, privacy-aware and ubiquitously usable identity management infra-structure for Europe, which integrates existing eID technology and trust infrastructures, emerging federated identity management services and modern credential technologies to provide a user-centric system for the trustworthy and accountable management of identity claims.

Open eCard Team (<http://www.openecard.org/>)

The Open eCard Team is an open community, which aims at providing an open source and cross platform implementation of the eCard-API-Framework (BSI-TR-03112) and related international standards such as ISO/IEC 24727 and OASIS DSS through which arbitrary applications can utilize authentication and signatures with arbitrary smart cards.

PICASO Project – (<http://www.picaso-project.eu>)

The PICASO project aims to develop an ICT platform which will support the coordination of care plans across different sectors for people diagnosed with co-occurring chronic diseases. The PICASO platform is a service oriented, ICT based integration platform based on dynamic and personalized orchestration of care services. The method for sharing patient information between all relevant formal and informal care providers is by using a unique, trust federated solution, thereby overcoming the problem of data privacy in cloud based health systems.

LIGHTest Project – (http://cordis.europa.eu/project/rcn/203437_en.html)

The objective of LIGHTest is to create a global cross-domain trust infrastructure that renders it transparent and easy for verifiers to evaluate electronic transactions. By querying different trust authorities world-wide and combining trust aspects related to identity, business, reputation etc. it will become possible to conduct domain-specific trust decisions. This is achieved by reusing existing governance, organization, infrastructure,

standards, software, community, and know-how of the existing Domain Name System, combined with new innovative building blocks.

FutureTrust Project – (<http://www.futuretrust.eu/>)

Against the background of the regulation 2014/910/EU on electronic identification (eID) and trusted services for electronic transactions in the internal market (eIDAS), the FutureTrust project aims at supporting the practical implementation of the regulation in Europe and beyond. For this purpose, FutureTrust will address the need for globally interoperable solutions through basic research with respect to the foundations of trust and trustworthiness, actively support the standardisation process in relevant areas, and provide Open Source software components and trustworthy services which will ease the use of eID and electronic signature technology in real world applications.

Cooperation

Supported by

Gesellschaft für Informatik e.V.
<http://www.gi.de/>



Table of Contents

Open Identity Summit 2016 – Regular Research Papers

Bud P. Bruegger and Peter Lipp

LIGHTest – A Lightweight Infrastructure for Global Heterogeneous Trust Management.....15

Detlef Hühnlein, Tilman Frosch, Joerg Schwenk, Carl-Markus Piswanger, Marc Sel, Tina Hühnlein, Tobias Wich, Daniel Nemmert, René Lottes, Juraj Somorovsky, Vladislav Mladenov, Cristina Condovici, Herbert Leitold, Sophie Stalla-Bourdillon, Niko Tsakalakis, Jan Eichholz, Frank-Michael Kamm, Andreas Kühne, Damian Wabisch, Roger Dean, Jon Shamah, Mikheil Kapanadze, Nuno Ponte, Jose Martins, Renato Portela, Çağatay Karabat, Snežana Stojičić, Slobodan Nedeljkovic, Vincent Bouckaert, Alexandre Defays, Bruce Anderson, Michael Jonas, Christina Hermanns, Thomas Schubert, Dirk Wegener, and Alexander Sazonov

FutureTrust – Future Trust Services for Trustworthy Global Transactions.....27

Oliver Terbu, Stefan Vogl and Sebastian Zehetbauer

One mobile ID to secure physical and digital identity.....43

Bud P. Bruegger and Heiko Roßnagel

Towards a Decentralized Identity Management Ecosystem for Europe and Beyond.....55

Daniel Nemmert, Detlef Hühnlein, Tobias Wich and Tina Hühnlein

Architecture for Controlled Credential issuance Enhanced with Single Sign-On (ACCESSO).....67

Teemu Rissanen

Public Online Services at the Age of MyData: a New Approach to Personal Data Management in Finland.....81

Denis Pinkas

An eID mechanism built along Privacy by Design principles using secure elements, pseudonyms and attributes.....93

Michael Kubach, Caterina Görwitz and Gerrit Hornung

*Non-technical Challenges of Building Ecosystems for Trustable Smart Assistants in the Internet of Things: A Socioeconomic and Legal Perspective.....*105

Sebastian Kurowski

*Risk-centred role engineering within identity data audits – Continuous improvement of the rights structure and possible risk accumulations.....*117

Moritz Horsch, Mario Schlipf, Stefan Haas, Johannes Braun and Johannes Buchmann

*Password Policy Markup Language.....*135

Open Identity Summit 2016 – Further Conference Contributions

Robin Wilton

Ethical Data Handling – beyond risk and compliance.....151

Janina Hofer and Rachelle Sellung

An interdisciplinary approach to develop secure, usable and economically successful software.....153

Hermann Strack and Sandro Wefel

Challenging eID & eIDAS at University Management.....159

Niko Tsakalakis, Sophie Stalla-Bourdillon and Kieron O'Hara

What's in a name: the conflicting views of pseudonymisation under eIDAS and the General Data Protection Regulation.....167

Costantina Caruso, Andrea Dimitri and Massimo Mecella

Identity Mining vs Identity Discovering: a new approach.....175

Raik Kuhlisch and Sören Bittins

Aligning ABAC Policies with Information Security Policies using Controlled Vocabulary.....181

Open Identity Summit 2016

Regular Research Papers

LIGHT^{est} -- A Lightweight Infrastructure for Global Heterogeneous Trust Management

Bud P. Bruegger¹, Peter Lipp²

Abstract: LIGHT^{est} is a project that is partially funded by the European Commission as an Innovation Action as part of the Horizon2020 program under grant agreement number 700321. LIGHT^{est}'s objective is to create a Lightweight Infrastructure for Global Heterogeneous Trust management in support of an open Ecosystem of Stakeholders and Trust schemes. We show supported scenarios, motivate the necessity for global trust management and discuss related work. Then we present how LIGHT^{est} addresses the challenges of global trust management, its reference architecture and the pilot applications.

Keywords: trust management, trust decisions, trusted lists, global trust infrastructure

1 On Trust and Trust Decisions

There are many possible definitions of trust [Gefen]. In LIGHT^{est}, a trust decision determines whether a verifier should act on an electronically received transaction. This is illustrated in Figure 1a.

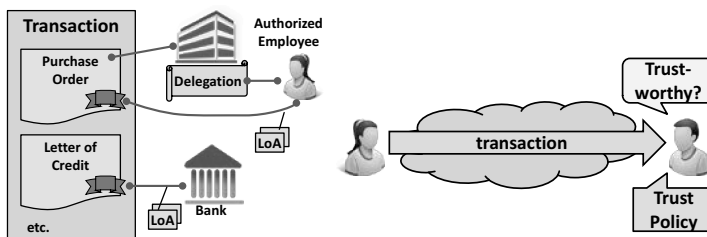


Figure 1: (a) The evaluation of trustworthiness of a transaction based on a trust policy, and (b) a prototypical transaction consisting of multiple parts and involving delegation.

A trust decision depends on the verifier's perception of risk, i.e. the probability and extent of possible damage and the availability of mitigation measures such as legal enforceability or insurance. This can be expressed in the verifier's trust policy.

Since verifiers often lack direct acquaintance of the partners involved in the transaction, they rely on authorities asserting their electronic identities as well as other trust-relevant

¹ Fraunhofer IAO, Identity Management, Nobelstr. 12, 70569 Stuttgart, bud.bruegger@iao.fraunhofer.de

² Technische Universität Graz, Institut für Angewandte Informationsverarbeitung und Kommunikationstechnologie, Inffeldgasse 16a, 8010 Graz, peter.lipp@iaik.tugraz.at