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Ketil Stølen
William H. Winsborough
Fabio Martinelli
Fabio Massacci (Eds.)

Trust Management

4th International Conference, iTrust 2006
Pisa, Italy, May 2006
Proceedings



itrust



Springer

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Proceedings



Springer

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Ketil Stølen
SINTEF ICT
P.O. Box 124, Blindern, 0314 Oslo, Norway
E-mail: Ketil.Stolen@sintef.no

William H. Winsborough
University of Texas at San Antonio
Dept. of Computer Science, One UTSA Circle
San Antonio, TX 78249-1644, USA
E-mail: wwinsborough@acm.org

Fabio Martinelli
Istituto di Informatica e Telematica - IIT
National Research Council - C.N.R., Pisa Research Area
Via G. Moruzzi 1, Pisa, Italy
E-mail: fabio.martinelli@iit.cnr.it

Fabio Massacci
Università di Trento
Facoltà di Ingegneria
Via Mesiano 77, Trento, Italy
E-mail: fabio.massacci@unitn.it

Library of Congress Control Number: 2006925250

CR Subject Classification (1998): H.4, H.3, H.5.3, C.2.4, I.2.11, K.4.3-2, K.5

LNCS Sublibrary: SL 3 – Information Systems and Application, incl. Internet/Web and HCI

ISSN	0302-9743
ISBN-10	3-540-34295-8 Springer Berlin Heidelberg New York
ISBN-13	978-3-540-34295-3 Springer Berlin Heidelberg New York

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Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 11755593 06/3142 5 4 3 2 1 0

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Preface

This volume constitutes the proceedings of the 4th International Conference on Trust Management, held in Pisa, Italy during 16–19 May 2006. The conference followed successful International Conferences in Crete in 2003, Oxford in 2004 and Paris in 2005. The first three conferences were organized by iTrust, which was a working group funded as a thematic network by the Future and Emerging Technologies (FET) unit of the Information Society Technologies (IST) program of the European Union.

The purpose of the iTrust working group was to provide a forum for cross-disciplinary investigation of the applications of trust as a means of increasing security, building confidence and facilitating collaboration in dynamic open systems.

The aim of the iTrust conference series is to provide a common forum, bringing together researchers from different academic branches, such as the technology-oriented disciplines, law, social sciences and philosophy, in order to develop a deeper and more fundamental understanding of the issues and challenges in the area of trust management in dynamic open systems.

The response to this conference was excellent; from the 88 papers submitted to the conference, we selected 30 full papers for presentation. The program also included one keynote address, given by Cristiano Castelfranchi; an industrial panel; 7 technology demonstrations; and a full day of tutorials.

The running of an international conference requires an immense effort from all parties involved. We would like to thank the people who served on the Program Committee and the Organizing Committee for their hard work. In particular, we would like to thank the people at the Institute for Informatics and Telematics at the Italian National Research Council (IIT-CNR) for handling the logistics for the conference. We wish to thank also the IIT-CNR, University of Trento and ERCIM STM WG for the financial support for iTrust 2006.

May 2006

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Why We Need a Non-reductionist Approach to Trust

Cristiano Castelfranchi

Institute of Cognitive Sciences and Technologies, National Research Council,
via San Martino della Battaglia 44, 00185 - Roma Italy,
69042 Heidelberg, Germany
cristiano.castelfranchi@istc.cnr.it

Abstract. I will underline the real complexity of trust (not for mere theoretical purposes but for advanced applications), and I will criticize some of those reductionist view of Trust. I will illustrate: how trust can be a disposition, but also is an 'evaluation', and also a 'prediction' or better an 'expectation'; and how it is a 'decision' and an 'action', and 'counting on' (relying) and 'depending on' somebody; and which is the link with uncertainty and risk taking (fear and hope); how it creates social relationships; how it is a dynamic phenomenon with loop-effects; how it derives from several sources.

1 Introduction

Trust is a major problem in IT:

- in HCI and especially in computer-mediated interaction on the web (for in searching for reliable information, in e-commerce, e-communities, virtual organizations, e-democracy,...);
- in human-autonomous-agents interaction, both with software agents (personal assistants, mediating agents,...) and with robots;
- in Agent-Agent interaction and in MAS, in particular in partner selection and in negotiation and commitment.

There are natural tendencies to reduce the theory and the implementation of trust to the specific practical aspects needed in each application, without a real perception of the complexity of the phenomenon. On the contrary:

- Trust is a very complex construct, with many interdependent dimensions; and
- too simplified approaches will not be really adequate for building and managing trust in virtual social reality and with artificial intelligences.

I will underline the real complexity of trust (not for mere theoretical purposes but for advanced applications), and I will criticize some of those reductionist view of Trust.

I will illustrate: how trust can be a disposition, but also is an 'evaluation', and also a 'prediction' or better an 'expectation'; and how it is a 'decision' and an 'action', and 'counting on' (relying) and 'depending on' somebody; and which is the link with uncertainty and risk taking (fear and hope); how it creates social relationships; how it is a dynamic phenomenon with loop-effects; how it derives from several sources.

Then I will argue:

- why trust built on a theory of Dependence and of Autonomy, and which is the relationship between (bilaterally adjustable) autonomy and the degrees of trust;
- why trust cannot be reduced to the frequency of a given behavior and requires 'causal attribution' and a model of the 'kripta' (hidden, mental) feature determining the certainty and the quality of the expected behavior;
- why trust cannot be just reduced to subjective probability; and why a simple 'number' is not enough for managing trust;
- why trust cannot just be based on 'norms' and and their respect;
- why it is not true that where there are contracts and laws there is no longer trust;
- why trust has not (only) to do with cooperation (as economists assume);
- why we need a non simplistic theory of Trust 'transmission' beyond its pseudo-transitivity;
- why failure and disappointment do not necessarily decrease trust;
- why trust has to do with knowledge sharing and management;
- why we have to build trust on various sources not only on direct experience and reputation;
- why we cannot reduce trust to safety and security, since on the one side what matters is first of all the 'perceived' safety, and, on the other side, building a trust environment and atmosphere and trustworthy agents is one basis for safety.

Dynamic Trust Federation in Grids

Mehran Ahsant¹, Mike Surridge², Thomas Leonard²,
Ananth Krishna², and Olle Mulmo¹

¹ Center for Parallel Computers, Royal Institute of Technology, Stockholm, Sweden
`{mehrana, mulmo}@pdc.kth.se`

² IT-Innovation Center, University of Southampton, Southampton, UK
`{ms, tal, ak}@it-innovation.soton.ac.uk`

Abstract. Grids are becoming economically viable and productive tools. They provide a way of utilizing a vast array of linked resources such as computing systems, databases and services online within Virtual Organizations (VO). However, today's Grid architectures are not capable of supporting dynamic, agile federation across multiple administrative domains and the main barrier, which hinders dynamic federation over short time scales is security. Federating security and trust is one of the most significant architectural issues in Grids. Existing relevant standards and specifications can be used to federate security services, but do not directly address the dynamic extension of business trust relationships into the digital domain. In this paper we describe an experiment which highlights those challenging architectural issues and forms the basis of an approach that combines a dynamic trust federation and a dynamic authorization mechanism for addressing dynamic security trust federation in Grids. The experiment made with the prototype described in this paper is used in the NextGRID¹ project to define the requirements of next generation Grid architectures adapted to business application needs.

1 Introduction

A Grid is a form of distributed computing infrastructure that involves coordinating and sharing resources across Virtual Organizations that may be dynamic and geographically distributed[20]. The long-term future of the Grid will be to provide dynamic aggregations of resources, provided as services between businesses, which can be exploited by end-users and application developers to solve complex, multi-faceted problems across virtual organizations and business communities. To fulfill this vision, we need architectures and detailed mechanisms for bringing together arbitrary Grid-based resources, along with other resources such as conventional web-services, web-based information sources and people, in a highly dynamic yet manageable way. At present, this is not possible: it takes a lot of time and effort to implement such a collaboration using current technology.

¹ The work presented in this paper has been supported by NextGRID project, a project funded by the European Commission's IST programme of the 6th Framework Programme (contract number 511563).