

Communications
in Computer and Information Science

1

Vladimir Gorodetsky Igor Kotenko
Victor A. Skormin (Eds.)

Computer Network Security

Fourth International Conference
on Mathematical Methods, Models, and Architectures
for Computer Network Security, MMM-ACNS 2007
St. Petersburg, Russia, September 13-15, 2007
Proceedings

 Springer

Volume Editors

Vladimir Gorodetsky

Igor Kotenko

St. Petersburg Institute for Informatics and Automation

39, 14th Liniya, St. Petersburg, 199178, Russia

E-mail: {gor, ivkote}@mail.iias.spb.su

Victor A. Skormin

US Air Force, Binghamton University (SUNY)

Binghamton, NY 13902, USA

E-mail: vskormin@binghamton.edu

Library of Congress Control Number: 2007933896

CR Subject Classification (1998): C.2, D.4.6, K.4.4, H.2.8

ISSN 1865-0929

ISBN-10 3-540-73985-8 Springer Berlin Heidelberg New York

ISBN-13 978-3-540-73985-2 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: 12101467 06/3180 5 4 3 2 1 0

Preface

This volume contains papers presented at the Fourth International Workshop on Mathematical Methods, Models and Architectures for Computer Network Security (MMM-ACNS 2007) held in St. Petersburg, Russia, during September 13–15, 2007. The workshop was organized by the St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences (SPIIRAS) in cooperation with Binghamton University (SUNY, USA).

The organizers are proud that the MMM-ACNS workshops hosted by the St. Petersburg Institute for Informatics and Automation in 2001, 2003 and 2005 evolved into a bi-annual series recognized in the professional community. These events not only demonstrated the keen interest of the participating researchers in the subject matter and the opportunity to present and disseminate individual achievements, but also promoted the spirit of cooperation, camaraderie, free exchange of ideas, and intellectually stimulating interaction between colleagues.

Again, MMM-ACNS 2007 provided an international forum for sharing original research results among specialists in fundamental and applied problems of computer network security. An important distinction of the conference was its focus on mathematical aspects of information and computer network security addressing the ever-increasing demands for secure computing and highly dependable computer networks.

A total of 56 papers from 18 countries related to significant aspects of both theory and applications of computer network and information security were submitted to MMM-ACNS 2007. In total, 18 papers were selected for regular presentations and 12 for short presentations (32 % of acceptance for full papers and 53 % for all papers).

The MMM-ACNS 2007 program was enriched by invited papers presented by six distinguished invited speakers: Christian Collberg (University of Arizona, USA), Angelos D. Keromytis (Columbia University, USA), Paulo Verissimo (University of Lisbon, Portugal), Jean-Daniel Aussel (Gemalto, France), Mauricio Sanchez (ProCurve Networking, HP, USA) and Victor Serdiouk (DialogueScience, Inc., Russia) addressing important theoretical aspects and advanced applications.

The success of the workshop was assured by the team efforts of sponsors, organizers, reviewers and participants. We would like to acknowledge the contributions of the individual Program Committee members and thank the paper reviewers.

Our sincere gratitude goes to the participants of the workshop and all authors of the submitted papers. We are grateful to our sponsors: European Office of Aerospace Research and Development (EOARD) of the U.S. Air Force and the U.S. Office of Naval Research Global (ONRGlobal) for their generous support.

We also wish to express our gratitude to the Springer LNCS team managed by Alfred Hofmann for their help and cooperation.

September 2007

Vladimir Gorodetsky
Igor Kotenko
Victor Skormin

Organization

Workshop Chairmen

General Chairs

Rafael M. Yusupov	St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences (SPIIRAS), Russia
Robert L. Herklotz	US Air Force Office of Scientific Research, USA

Program Committee Co-chairs

Vladimir Gorodetsky	St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences (SPIIRAS), Russia
Igor Kotenko	St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences (SPIIRAS), Russia
Victor Skormin	Binghamton University, State University of New York; National Research Council's Senior Research Associate with the Air Force, USA

Program Committee

Julien Bourgeois	University of Franche-Comte, France
David Chadwick	University of Kent, UK
Shiu-Kai Chin	Syracuse University, USA
Howard Chivers	Cranfield University, UK
Christian Collberg	University of Arizona, USA
Dipankar Dasgupta	University of Memphis, USA
Naranker Dulay	Imperial College London, UK
Dieter Gollmann	Hamburg University of Technology, Germany
Dimitris Gritzalis	Athens University of Economics and Business, Greece
Stefanos Gritzalis	University of the Aegean, Greece
Alexander Grusho	Moscow State University, Russia
Ming-Yuh Huang	The Boeing Company, USA
Sushil Jajodia	George Mason University, USA
Angelos Keromytis	Columbia University, USA
Victor Korneev	Federal Enterprise "R&D Institute "Kvant", Russia
Klaus-Peter Kossakowski	Presecure Consulting GmbH, Germany

VIII Organization

Christopher Kruegel	Technical University of Vienna, Austria
Antonio Lioy	Politecnico di Torino, Italy
Javier Lopez	University of Malaga, Spain
Fabio Martinelli	CNR/IIT, Italy
Catherine Meadows	Naval Research Laboratory, USA
Nasir Memon	Polytechnic University Brooklyn, USA
Ann Miller	University of Missouri - Rolla, USA
Nikolay Moldovyan	Specialized Center of Program Systems “SPECTR”, Russia
Wojciech Molisz	Gdansk University of Technology, Poland
David Nicol	University of Illinois at Urbana-Champaign, USA
Yoram Ofek	University of Trento, Italy
Monika Oit	Cybernetica, Estonia
Udo Prayer	IAIK, Austria
Bart Preneel	Katholieke Universiteit Leuven, Belgium
Roland Rieke	Fraunhofer Institute for Secure Information Technology SIT, Germany
Andrei Sabelfeld	Chalmers University of Technology, Sweden)
Ravi Sandhu	George Mason University and NSD Security, USA
Antonio Gomez Skarmeta	University of Murcia, Spain
Anatol Slissenko	University Paris-12, France
Michael Smirnov	Fraunhofer-Gesellschaft Institute FOKUS, Germany
Igor Sokolov	The Institute of Informatics Problems of the Russian Academy of Sciences, Russia
Douglas Summerville	Binghamton University, USA
Shambhu Upadhyaya	University at Buffalo, USA
Alfonso Valdes	SRI International, USA
Vijay Varadharajaran	Macquarie University, Australia
Valery Vasenin	Moscow State University, Russia
Paulo Verissimo	University of Lisbon, Portugal
Diego Zamboni	IBM, Switzerland
Peter Zegzhda	St. Petersburg Polytechnical University, Russia

Reviewers

Elli Androulaki	Columbia University, USA
Daniele Beauquier	University Paris-12, France
Julien Bourgeois	University of Franche-Comte, France
David Chadwick	University of Kent, UK
Nikolaos Chatzis	Fraunhofer-Gesellschaft Institute FOKUS, Germany
Shiu-Kai Chin	Syracuse University, USA
Howard Chivers	Cranfield University, UK
Christian Collberg	University of Arizona, USA

Dipankar Dasgupta	University of Memphis, USA
Catalin Dima	University Paris-12, France
Naranker Dulay	Imperial College London, UK
Dieter Gollmann	Hamburg University of Technology, Germany
Vladimir Gorodetsky	St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences, Russia
Dimitris Gritzalis	Athens University of Economics and Business, Greece
Stefanos Gritzalis	University of the Aegean, Greece
Alexander Grusho	Moscow State University, Russia
Thomas Hirsch	Fraunhofer-Gesellschaft Institute FOKUS, Germany
Ming-Yuh Huang	The Boeing Company, USA
Sushil Jajodia	George Mason University, USA
Angelos Keromytis	Columbia University, USA
Victor Korneev	Federal Enterprise "R&D Institute "Kvant", Russia
Klaus-Peter Kossakowski	Presecure Consulting GmbH, Germany
Igor Kotenko	St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences, Russia
Christopher Kruegel	Technical University of Vienna, Austria
Regine Laleau	University Paris-12, France
Wei-Jen Li	Columbia University, USA
Antonio Lioy	Politecnico di Torino, Italy
Javier Lopez	University of Malaga, Spain
Fabio Martinelli	CNR/IIT, Italy
Catherine Meadows	Naval Research Laboratory, USA
Nasir Memon	Polytechnic University Brooklyn, USA
Ann Miller	University of Missouri - Rolla, USA
Nikolay Moldovyan	Specialized Center of Program Systems "SPECTR", Russia
Wojciech Molisz	Gdansk University of Technology, Poland
David Nicol	University of Illinois at Urbana-Champaign, USA
Peter Ochenschleger	Fraunhofer Institute for Secure Information Technology SIT, Germany
Yoram Ofek	University of Trento, Italy
Monika Oit	Cybernetica, Estonia
Carla Piazza	University of Udine, Italy
Udo Prayer	IAIK, Austria
Bart Preneel	Katholieke Universiteit Leuven, Belgium
Roland Rieke	Fraunhofer Institute for Secure Information Technology SIT, Germany

Carsten Rudolph	Fraunhofer-Gesellschaft Institute FOKUS, Germany
Alejandro Russo	Chalmers University of Technology, Sweden
Andrei Sabelfeld	Chalmers University of Technology, Sweden
Antonio Gomez Skarmeta	University of Murcia, Spain
Anatol Slissenko	University Paris-12, France
Dieter Gollmann	Hamburg University of Technology, Germany
Michael Smirnov	Fraunhofer-Gesellschaft Institute FOKUS, Germany
Yingbo Song	Columbia University, USA
Douglas Summerville	Binghamton University, USA
Shambhu Upadhyaya	University at Buffalo, USA
Alfonso Valdes	SRI International, USA
Vijay Varadharajaran	Macquarie University, Australia
Frederik Vercauteren	Katholieke Universiteit Leuven, Belgium
Paulo Verissimo	University of Lisbon, Portugal
Diego Zamboni	IBM, Switzerland
Peter Zegzhda	St. Petersburg Polytechnical University, Russia
Hang Zhao	Columbia University, USA

