Lecture Notes in Computer Science

3325

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

New York University, NY, 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

Chae Hoon Lim Moti Yung (Eds.)

Information Security Applications

5th International Workshop, WISA 2004 Jeju Island, Korea, August 23-25, 2004 Revised Selected Papers



Volume Editors

Chae Hoon Lim
Sejong University
Department of Internet Engineering
98 Gunja-Dong, Kwangjin-Gu, Seoul, 143-747, Korea
E-mail: chlim@sejong.ac.kr

Moti Yung Columbia University Department of Computer Science S. W. Mudd Building, New York, NY 10027, USA E-mail: moti@cs.columbia.edu

Library of Congress Control Number: 2005920313

CR Subject Classification (1998): E.3, D.4.6, F.2.1, C.2, J.1, C.3, K.6.5

ISSN 0302-9743 ISBN 3-540-24015-2 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

springeronline.com

© Springer-Verlag Berlin Heidelberg 2005 Printed in Germany

Typesetting: Camera-ready by author, data conversion by Olgun Computergrafik Printed on acid-free paper SPIN: 11352440 06/3142 5 4 3 2 1 0

Preface

The 5th International Workshop on Information Security Applications (WISA 2004) was held in Jeju Island, Korea during August 23-25, 2004. The workshop was sponsored by the Korea Institute of Information Security and Cryptology (KIISC), the Electronics and Telecommunications Research Institute (ETRI) and the Ministry of Information and Communication (MIC).

The aim of the workshop is to serve as a forum for new conceptual and experimental research results in the area of information security applications from the academic community as well as from the industry. The workshop program covers a wide range of security aspects including cryptography, cryptanalysis, network/system security and implementation aspects.

The program committee received 169 papers from 22 countries, and accepted 37 papers for a full presentation track and 30 papers for a short presentation track. Each paper was carefully evaluated through peer-review by at least three members of the program committee. This volume contains revised versions of 36 papers accepted and presented in the full presentation track. Short papers were only published in the WISA 2004 pre-proceedings as preliminary versions and are allowed to be published elsewhere as extended versions.

In addition to the contributed papers, Professors Gene Tsudik and Ross Anderson gave invited talks, entitled Security in Outsourced Databases and What does 'Security' mean for Ubiquitous Applications?, respectively.

Many people have helped and worked hard to make WISA 2004 successful. We would like to thank all the people involved in the technical program and in organizing the workshop. We are very grateful to the program committee members and the external referees for their time and efforts in reviewing the submissions and selecting the accepted papers. We also express our special thanks to the organizing committee members for making the workshop possible. Finally, we would like to thank all the authors of the submitted papers and the invited speakers for enabling an interesting workshop program.

December 2004

Chae Hoon Lim Moti Yung

Organization

Advisory Committee

Man Young Rhee Seoul National Univ., Korea

Hideki Imai Tokyo Univ., Japan Chu-Hwan Yim ETRI, Korea

Bart Preneel Katholieke Universiteit Leuven, Belgium

General Co-Chairs

Pil Joong Lee POSTECH/KT, Korea

Sung Won Sohn ETRI, Korea

Steering Committee

Kil-Hyun Nam Korea National Defense Univ., Korea Sang Jae Moon Kyungpook National Univ., Korea Dong Ho Won Sungkyunkwan Univ., Korea

Sehun Kim KAIST, Korea

Organization Committee

Chair: Kyo Il Chung ETRI, Korea

Finance: Im Yeong Lee SoonChunHyang Univ., Korea Publication: Ji Young Lim Korean Bible Univ., Korea

Publicity: Hyung Woo Lee Hansin Univ., Korea Registration Jae Cheol Ha Korea Nazarene Univ., Korea

Treasurer: Hyungon Kim ETRI, Korea

Sang Choon Kim Samchok National Univ., Korea

Local Arrangement: Jae Kwang Lee Hannam Univ., Korea

Khi Jung Ahn Cheju National Univ., Korea

Program Committee

Co-Chairs: Chae Hoon Lim Sejong Univ., Korea

Moti Yung Columbia Univ., USA

Members: Giuseppe Ateniese Johns Hopkins Univ., USA Tuomas Aura Microsoft Research, UK

Feng Bao Institute for Infocomm Research, Singapore

Colin Boyd QUT, Australia Dario Catalano ENS, France

Kijoon Chae Ewha Womans Univ., Korea

Gene Itkis Boston Univ., USA

Jong Soo Jang ETRI, Korea

Yonghee Jeon Catholic Univ. of Daegu, Korea

Jonathan Katz Univ. of Maryland, USA Angelos Keromytis Columbia Univ., USA Seungjoo Kim Sungkyunkwan Univ., Korea

Yongdae Kim Univ. of Minnesota at Twin Cities, USA

Klaus Kursawe KU Keuven, Belgium Taekyoung Kwon Sejong Univ., Korea

Chi Sung Laih National Cheng Kung Univ., Taiwan

Kwok-Yan Lam Tsinghua Univ., China Chae Ho Lim Securitymap, Korea Kanta Matsuura Tokyo Univ., Japan Refik Molva Institut Eurecom, France

Pascal Paillier Gemplus, France

Josef Pieprzyk Macquarie Univ., Australia

Zulfikar Ramzan Docomo Labs, USA Pankaj Rohatgi IBM Research, USA

Bimal Roy Indian Statistical Institute, India Jaechul Ryu Chungnam National Univ., Korea

Kouichi Sakurai Kyushu Univ., Japan

Diana Smetters Palo Alto Research Center, USA
Bulent Yener Rensselaer Polytechnic Institute, USA

Okyeon Yi Kookmin Univ., Korea

Heungyoul Youm SoonChunHyang Univ., Korea

Avishai Wool Tel-Aviv Univ., Israel

S.Felix Wu UC Davis, USA

Table of Contents

Network/Computer Security
Impacts of Security Protocols on Real-Time Multimedia Communications
An Improvement on Privacy and Authentication in GSM
Encrypted Watermarks and Linux Laptop Security
Inconsistency Detection of Authorization Policies in Distributed Component Environment
Public Key Schemes I
Custodian-Hiding Verifiable Encryption
Proving Key Usage
Public Key Encryption with Conjunctive Field Keyword Search
Intrusion Detection I
A Probabilistic Method for Detecting Anomalous Program Behavior 87 Kohei Tatara, Toshihiro Tabata, and Kouichi Sakurai
Service Discrimination and Audit File Reduction for Effective Intrusion Detection
IDS False Alarm Filtering Using KNN Classifier
Watermarking/Anti-spamming
Content-Based Synchronization Using the Local Invariant Feature for Robust Watermarking

Practical Pay-TV Scheme Using Traitor Tracing Scheme

Chong Hee Kim, Yong Ho Hwang, and Pil Joong Lee

e-Commerce Security
Vulnerability of a Mobile Payment System Proposed at WISA 2002 278 Sang Cheol Hwang, Dong Hoon Lee, Daewan Han, and Jae-Cheol Ryou
Fair Offline Payment Using Verifiable Encryption
A Limited-Use Key Generation Scheme for Internet Transactions 302 Supakorn Kungpisdan, Phu Dung Le, and Bala Srinivasan
Efficient Implementation
Efficient Representation and Software Implementation of Resilient Maiorana-McFarland S-boxes
Signed Digit Representation with NAF and Balanced Ternary Form and Efficient Exponentiation in $GF(q^n)$ Using a Gaussian Normal Basis of Type II
Novel Efficient Implementations of Hyperelliptic Curve Cryptosystems Using Degenerate Divisors
Hyperelliptic Curve Coprocessors on a FPGA
Anonymous Communication
Key-Exchange Protocol Using Pre-agreed Session-ID
A New k -Anonymous Message Transmission Protocol
Onions Based on Universal Re-encryption – Anonymous Communication Immune Against Repetitive Attack
Side-Channel Attacks
Side Channel Cryptanalysis on SEED

XII Table of Contents

Secure and Efficient AES Software Implementation for Smart Cards Elena Trichina and Lesya Korkishko	425
Practical Template Attacks	440
Evaluation and Improvement of the Tempest Fonts	457
Author Index	471