

2011 Sixth International Conference on Availability, Reliability and Security

(ARES 2011)

**Vienna, Austria
22 – 26 August 2011**



**IEEE Catalog Number: CFP1139A-PRT
ISBN: 978-1-4577-0979-1**

2011 Sixth International Conference on Availability, Reliability and Security

ARES 2011

Table of Contents

Message from the ARES 2011 General Co-Chairs, Program Committee Co-Chairs, and Keynote Chairs.....	xv
Message from the ARES 2011 Workshop Co-Chairs	xvii
Message from the FARES 2011 Workshop Co-chairs.....	xviii
Message from the DYADEM-FTS 2011 Workshop Organizers.....	xix
Message from the PBD 2011 Workshop Organizers.....	xx
Message from the RISI 2011 Workshop Organizers.....	xxi
Message from the SAPAIS 2011 Workshop Organizers.....	xxii
Message from the SECSE 2011 Workshop Organizers.....	xxiii
Message from the WSDF 2011 Workshop Organizers.....	xxiv
Message from the OSA 2011 Workshop Organizers.....	xxv

The Sixth International Conference on Availability, Reliability and Security (ARES 2011)

ARES F1 – Access Control

An Approach to Access Control under Uncertainty	1
<i>Farzad Salim, Jason Reid, Ed Dawson, and Uwe Dulleck</i>	
Support Access to Distributed EPRs with Three Levels of Identity Privacy Preservation	9
<i>Rima Addas and Ning Zhang</i>	
Smatch Model: Extending RBAC Sessions in Virtualization Environment	17
<i>Nora Cuppens-Boulahia, Frédéric Cuppens, and Marie Nuadi</i>	

ARES F2 - Identity Management and Access Control

AW-RBAC: Access Control in Adaptive Workflow Systems	27
<i>Maria Leitner, Stefanie Rinderle-Ma, and Jürgen Mangler</i>	
The Role Mining Process Model - Underlining the Need for a Comprehensive Research Perspective	35
<i>Ludwig Fuchs and Stefan Meier</i>	

Biometric Authentication as a Service for Enterprise Identity Management Deployment: A Data Protection Perspective	43
<i>Christian Senk and Florian Dotzler</i>	
ARES F3 – Software	
An Obfuscation-Based Approach against Injection Attacks	51
<i>Fabrizio Baiardi and Daniele Sgandurra</i>	
Using CVSS in Attack Graphs	59
<i>Laurent Gallon and Jean Jacques Bascou</i>	
Selecting Software Packages for Secure Database Installations	67
<i>Afonso Araújo Neto and Marco Vieira</i>	
ARES F4 – Dependable Systems	
Probabilistic Fault-tolerance of Distributed Services: A Paradigm for Dependable Applications	75
<i>Kaliappa Ravindran</i>	
Proactive Failure Management by Integrated Unsupervised and Semi-Supervised Learning for Dependable Cloud Systems	83
<i>Qiang Guan, Ziming Zhang, and Song Fu</i>	
ARES F5 – Cryptography	
A Novel Phase Coding Technique for Steganography in Auditive Media	91
<i>Marcus Nutzinger and Jüergen Wurzer</i>	
ESPOON: Enforcing Encrypted Security Policies in Outsourced Environments	99
<i>Muhammad Rizwan Asghar, Mihaela Ion, Giovanni Russello, and Bruno Crispo</i>	
A Robust Anti-tamper Protection Scheme	109
<i>Hing-Chung Tsang, Moon-Chuen Lee, and Chi-Man Pun</i>	
ARES F6 – Cryptography & Electronic Voting	
Formalization of Receipt-Freeness in the Context of Electronic Voting	119
<i>Katharina Braunlich and Rüdiger Grimm</i>	
Introducing Verifiability in the POLYAS Remote Electronic Voting System	127
<i>Maina M. Olembo, Patrick Schmidt, and Melanie Volkamer</i>	
Non-Parallelizable and Non-Interactive Client Puzzles from Modular Square Roots	135
<i>Yves Igor Jerschow and Martin Mauve</i>	
ARES F7 – Network and Data Security	
Declassification Policy Management in Dynamic Information Systems	143
<i>Julien A. Thomas, Nora Cuppens-Bouahia, and Frédéric Cuppens</i>	

ASPF: Adaptive anti-SPIT Policy-based Framework	153
<i>Yannis Soupionis and Dimitris Gritzalis</i>	
Modeling and Analyzing Server System with Rejuvenation through SysML and Stochastic Reward Nets	161
<i>Ermeson C. Andrade, Fumio Machida, Dong-Seong Kim, and Kishor S. Trivedi</i>	
The Sixth International Conference on Availability, Reliability and Security - Short Papers (ARES Short 2011)	
ARES S1 – Network and Software Security 1	
Early Detection of Security Misconfiguration Vulnerabilities in Web Applications	169
<i>Birhanu Eshete, Adolfo Villafiorita, and Komminist Weldemariam</i>	
Implicit Buffer Overflow Protection Using Memory Segregation	175
<i>Brent G. Roth and Eugene H. Spafford</i>	
Recovery of Pidgin Chat Communication Artefacts from Physical Memory: A Pilot Test to Determine Feasibility	183
<i>Matthew Phillip Simon and Jill Slay</i>	
ARES S2 – Network and Software Security 2	
Accurate Adware Detection Using Opcode Sequence Extraction	189
<i>Raja Khurram Shahzad, Niklas Lavesson, and Henric Johnson</i>	
Digital Forensics Infovis: An Implementation of a Process for Visualisation of Digital Evidence	196
<i>Grant Osborne and Jill Slay</i>	
Security SLAs for Federated Cloud Services	202
<i>Karin Bernsmed, Martin Gilje Jaatun, Per Håkon Meland, and Astrid Undheim</i>	
ARES S3 – Network and Software Security 3	
Parametric Differences between a Real-world Distributed Denial-of-Service Attack and a Flash Event	210
<i>Sajal Bhatia, George Mohay, Alan Tickle, and Ejaz Ahmed</i>	
Observer-based Testing of Distributed Protocols Designed for Harsh Environments	218
<i>Kaliappa Ravindran and Gwangyu Ding</i>	
Trustworthiness Benchmarking of Web Applications Using Static Code Analysis	224
<i>Afonso Araújo Neto and Marco Vieira</i>	
ARES S4 - Access Control & Security Modeling 1	
A Trustworthy Usage Control Enforcement Framework	230
<i>Ricardo Neisse, Alexander Pretschner, and Valentina Di Giacomo</i>	
An Attribute Based Framework for Risk-Adaptive Access Control Models	236
<i>Savith Kandala, Ravi Sandhu, and Venkata Bhamidipati</i>	

ACON: Activity-Centric Access Control for Social Computing	242
<i>Jaehong Park, Ravi Sandhu, and Yuan Cheng</i>	
ARES S5 - Access Control & Security Modeling 2	
Dynamic Responsibilities Assignment in Critical Electronic Institutions - A Context-Aware Solution for in Crisis Access Right Management	248
<i>Cédric Bonhomme, Christophe Feltus, and Michaël Petit</i>	
A Hypervisor-Based Bus System for Usage Control	254
<i>Cornelius Moucha, Enrico Lovat, and Alexander Pretschner</i>	
An Approach to Model-based Development of Secure and Reliable Systems	260
<i>Eduardo B. Fernandez, Hironori Washizaki, Nobukazu Yoshioka, and Michael VanHilst</i>	
ARES S6 - Access Control & Security Modeling 3	
Techniques for Automating Policy Specification for Application-oriented Access Controls	266
<i>Z. Cliffe Schreuders, Christian Payne, and Tanya McGill</i>	
Model-Based Security Verification and Testing for Smart-cards	272
<i>Elizabetha Fourneret, Martín Ochoa, Fabrice Bouquet, Julien Botella, Jan Jürjens, and Parvaneh Yousefi</i>	
Information Security Automation: How Far Can We Go?	280
<i>Raydel Montesino and Stefan Fenz</i>	
ARES S7 – Theory	
An Epistemic Logic Based Framework for Reasoning about Information Hiding	286
<i>I. Goriac</i>	
Bulletin Boards in Voting Systems: Modelling and Measuring Privacy	294
<i>Hugo Jonker and Jun Pang</i>	
System State Discovery Via Information Content Clustering of System Logs	301
<i>Adetokunbo Makanju, A. Nur Zincir-Heywood, and Evangelos E. Milios</i>	
File Block Classification by Support Vector Machine	307
<i>Luigi Sportiello and Stefano Zanero</i>	
ARES S8 – Organizational Security	
Security and Privacy in Companies: State-of-the-art and Qualitative Analysis	313
<i>Barbara Krumay and Marie Caroline Oetzel</i>	
Hidden Price of User Authentication: Cost Analysis and Stakeholder Motivation	321
<i>Ludwig Meyer, Martin Auer, Markus Klemen, and Stefan Biffel</i>	
Pattern-Based Support for Context Establishment and Asset Identification of the ISO 27000 in the Field of Cloud Computing	327
<i>Kristian Beckers, Holger Schmidt, Jan-Christoph Küster, and Stephan Faßbender</i>	

Responsibility-driven Design and Development of Process-aware Security Policies	334
<i>Maria Leitner, Stefanie Rinderle-Ma, and Juergen Mangler</i>	

ARES S9 – Cryptography

Fast Implementation of the Advanced Encryption Standard Using Atmega1281	342
<i>Kasumi Toriumi, Yoshio Kakizaki, and Keiichi Iwamura</i>	

Optimization of Privacy Preserving Mechanisms in Homogeneous Collaborative Association Rules Mining	347
<i>Marcin Gorawski and Zacheusz Siedlecki</i>	

CDRAS: An Approach to Dealing with Man-in-the-Middle Attacks in the Context of Voice over IP	353
<i>Stefan Hofbauer, Gerald Quirchmayr, and Christopher C. Wills</i>	

Crowds Based on Secret-Sharing	359
<i>Stefan Rass, Raphael Wigoutschnigg, and Peter Schartner</i>	

ARES S10 – Dependability

A Gate Level Analysis of Transient Faults Effects on Dual-Core Chip-Multi Processors	365
<i>Moslem Didehban, Ario Sadafi, Sajjad Salehi, and Mohammad Bagher Chami</i>	

Secure Broadcast with One-Time Signatures in Controller Area Networks	371
<i>Bogdan Groza and Stefan Murvay</i>	

Performance Evaluation of ID-based Group Key Agreement Protocols	377
<i>Elisavet Konstantinou, Eleni Klaoudatou, and Pavlos Kampampakis</i>	

ARES Industrial Track (Industrial Track)

Industrial Track 1

Preliminary Thoughts on Cost-based Investment Decisions in IT: A Problem Analysis	385
<i>Ralf Gitzel, Christian Cuske, and Carsten Münch</i>	

On the Context-aware, Personalized Delivery of Process Information: Viewpoints, Problems, and Requirements	390
<i>Markus Hipp, Bela Mutschler, and Manfred Reichert</i>	

Industrial Track 2

Study of Countermeasures for Content Leaks by Video Recording	398
<i>Masaki Fujikawa, Junki Akimoto, Fumihiko Oda, Kengo Moriyasu, Shingo Fuchi, and Yoshikazu Takeda</i>	

Product Line Engineering in Large-Scale Lean and Agile Software Product Development Environments - Towards a Hybrid Approach to Decentral Control and Managed Reuse	404
<i>Benjamin Blau and Tobias Hildenbrand</i>	

Seamless Fusion of Secure Software and Trusted USB Token for Protecting Enterprise & Government Data	409
<i>Asad M. Ali</i>	

Dynamic Aspects in Dependability Models for Fault-Tolerant Systems (DYADEM-FTS 2011)

DYADEM-FTS 1

Considering Dependent Components in the Terminal Pair Reliability Problem	415
<i>Minh Lê and Max Walter</i>	
Cyber-Physical Systems Based Modeling of Dependability of Complex Network Systems	423
<i>Kaliappa Ravindran</i>	
Compositional Synthesis of Temporal Fault Trees from State Machines	429
<i>Nidhal Mahmud, Martin Walker, and Yiannis Papadopoulos</i>	
Stepwise Refinement of Complex Dependability Models Using LARES+	436
<i>Max Walter</i>	

Sixth International Workshop on Frontiers in Availability, Reliability and Security (FARES 2011)

Software, Network Security and Cryptography 1

Privacy Frost: A User-Oriented Data Anonymization Tool	442
<i>Shinsaku Kiyomoto, Yutaka Miyake, and Toshiaki Tanaka</i>	
Key Management Scheme Applicable to Various Topologies of Sensor Networks	448
<i>Hidetoshi Yukimaru, Yoshio Kakizaki, and Keiichi Iwamura</i>	
An Inductive Approach to Provable Anonymity	454
<i>Yongjian Li and Jun Pang</i>	

Software, Network Security and Cryptography 2

Information Security for Service Oriented Computing: Ally or Antagonist	460
<i>Jacqui Chetty and Marijke Coetzee</i>	
Van Wijngaarden Grammars and Metamorphism	466
<i>Gueguen Geoffroy</i>	
PUF Based Scalable Private RFID Authentication	473
<i>Mete Akgün and M. Ufuk Çağlayan</i>	

Software, Network Security and Cryptography 3

Practitioners' Perspectives on Security in Agile Development	479
<i>Steffen Bartsch</i>	
Security Issues in a Synchronous e-Training Platform	485
<i>Juan C. Granda, Pelayo Nuño, Daniel F. García, and Francisco J. Suárez</i>	

Some Security Issues in SCALANCE Wireless Industrial Networks	493
<i>Marius Cristea, Bogdan Groza, and Mihai Iacob</i>	
Software Security 1	
Development and Trial Application of Prototype Program for “Social-MRC”: Social Consensus Formation Support System Concerning IT Risk Countermeasures	499
<i>Ryoichi Sasaki, Kazushige Takakusaki, Masaru Ohkawara, Hiroshi Yajima, Hidetaka Masuda, and Tetsuro Kobayashi</i>	
Experimental Comparison of Misuse Case Maps with Misuse Cases and System Architecture Diagrams for Eliciting Security Vulnerabilities and Mitigations	507
<i>Peter Karpati, Andreas L. Opdahl, and Guttorm Sindre</i>	
Proactive Detection of Kernel-Mode Rootkits	515
<i>Pablo Bravo and Daniel F. Garcia</i>	
Software Security 2	
Service Security Requirement Profiles for Telecom: How Software Engineers May Tackle Security	521
<i>Albin Zuccato, Nils Daniels, and Cheeverat Jampathom</i>	
Effective Security Impact Analysis with Patterns for Software Enhancement	527
<i>Takao Okubo, Haruhiko Kaiya, and Nobukazu Yoshioka</i>	
Web Services Security Policy Assertion Trade-offs	535
<i>Tristan Lavarack and Marijke Coetzee</i>	
Software Security and Access Control	
Federated Authentication and Authorisation in the Social Science Domain	541
<i>John Watt, Richard O. Sinnott, George Inman, and David Chadwick</i>	
A Proposed Web Access Control System Request Policy Framework for Cooperation of DNS and a Web Browser	549
<i>Takashi Uemura, Shota Takagi, Yusuke Kosuda, and Ryoichi Sasaki</i>	
An Identity-Centric Internet: Identity in the Cloud, Identity as a Service and Other Delights	555
<i>Mikael Ates, Serge Ravet, Abakar Mohamat Ahmat, and Jacques Fayolle</i>	
Attacks and Security Modeling	
Wormhole Attacks Mitigation in Ad Hoc Networks	561
<i>Mariannne A. Azer</i>	
A Distributed Intrusion Detection Model Based on a Society of Intelligent Mobile Agents for Ad Hoc Network	569
<i>Ghenima Bourkache, Mohamed Mezghiche, and Karim Tamine</i>	

The Limes Security Model for Information Flow Control573
Eckehard Hermann

Tag Impersonation Attack on Two RFID Mutual Authentication Protocols581
Masoumeh Safkhani, Nasour Bagheri, Majid Naderi, Yiyuan Luo, and Qi Chai

The Third International Workshop on Organizational Security Aspects (OSA 2011)

Information Security Integral Engineering Technique and its Application in ISMS
Design585
Alexander Lyubimov, Dmitry Cheremushkin, Natalia Andreeva, and Sergey Shustikov

Optimal Budget Allocation in Budget-based Access Control591
Farzad Salim, Uwe Dulleck, Jason Reid, and Ed Dawson

A Study of Prevention for Social Engineering Attacks Using Real/Fake Organization's
Uniforms: Application of Radio and Intra-Body Communication Technologies597
Masaki Fujikawa and Masakatsu Nishigaki

First International Workshop on Privacy by Design (PBD 2011)

Session 1

LiDSec- A Lightweight Pseudonymization Approach for Privacy-Preserving
Publishing of Textual Personal Information603
Reza Rawassizadeh, Johannes Heurix, Soheil Khosravipour, and A. Min Tjoa

A Server-side Approach to Privacy Policy Matching609
Åsmund Ahlmann Nyre, Karin Bernsmed, Solvår Bø, and Stian Pedersen

Enhance Data Privacy in Service Compositions through a Privacy Proxy615
Zhendong Ma, Jürgen Manglery, Christian Wagner, and Thomas Bleier

Session 2

Learning Privacy Preferences621
Inger Anne Tøndel, Åsmund Ahlmann Nyre, and Karin Bernsmed

Privacy Verification Using Ontologies627
Martin Kost, Johann-Christoph Freytag, Frank Kargl, and Antonio Kung

A Survey on Saving Personal Data in the Mobile Phone633
Iosif Androulidakis and Gorazd Kandus

Workshop on Resilience and IT-Risk in Social Infrastructures (RISI 2011)

Session 1

Gaining Flexibility and Compliance in Rescue Processes with BPM639
Kai Kittel and Stefan Sackmann

Using Generalization Patterns for Fingerprinting Sets of Partially Anonymized Microdata in the Course of Disasters	645
<i>Sebastian Schrittwieser, Peter Kieseberg, Isao Echizen, Sven Wohlgemuth, and Noboru Sonehara</i>	
Improving Resilience with Community Cloud Computing	650
<i>Gerard Garlick</i>	
Session 2	
A Visualization Method for Helping Children Assess the Risk of Websites	656
<i>Tomoko Kajiyama</i>	
Testbed for Mobile Telephony Networks	661
<i>Konrad Meier, Dennis Wehrle, Klaus Rechert, and Dirk von Suchodoletz</i>	
International Workshop on Security Aspects of Process-aware Information Systems (SAPAIS 2011)	
Deriving Current State RBAC Models from Event Logs	667
<i>Anne Baumgrass</i>	
Integrity and Confidentiality Annotations for Service Interfaces in SoaML Models	673
<i>Bernhard Hoisl and Stefan Sobernig</i>	
Consistency Checks for Duties in Extended UML2 Activity Models	680
<i>Sigrid Schefer</i>	
Security Policies in Adaptive Process-Aware Information Systems: Existing Approaches and Challenges	686
<i>Maria Leitner</i>	
SWAT: A Security Workflow Analysis Toolkit for Reliably Secure Process-aware Information Systems	692
<i>Rafael Accorsi, Claus Wonnemann, and Sebastian Dochow</i>	
Fifth International Workshop on Secure Software Engineering (SecSE 2011)	
SecSE 1	
Security Evaluation of Service-oriented Systems with an Extensible Knowledge Base	698
<i>Christian Jung, Manuel Rudolph, and Reinhard Schwarz</i>	
Security in Model Driven Development: A Survey	704
<i>Jostein Jensen and Martin Gilje Jaatun</i>	
Characterising and Analysing Security Requirements Modelling Initiatives	710
<i>Peter Karpati, Guttorm Sindre, and Andreas L. Opdahl</i>	
SecSE 2	
User-Centered Information Security Policy Development in a Post-Stuxnet World	716
<i>Shamal Faily and Ivan Fléchaïs</i>	

Here's Johnny: A Methodology for Developing Attacker Personas	722
<i>Andrea Atzeni, Cesare Cameroni, Shamal Faily, John Lyle, and Ivan Flechais</i>	
Enhancing Fuzzing Technique for OKL4 Syscalls Testing	728
<i>Amaury Gauthier, Clément Mazin, Julien Iguchi-Cartigny, and Jean-Louis Lanet</i>	
SecSE 3	
Evaluating RBAC Supported Techniques and their Validation and Verification	734
<i>Nafees Qamar, Yves Ledru, and Akram Idani</i>	
Optimising CAPTCHA Generation	740
<i>Suliman A. Alsuhibany</i>	
The Java SPI Framework for Security Protocol Implementation	746
<i>Matteo Avalle, Alfredo Pironti, Riccardo Sisto, and Davide Pozza</i>	
The Fourth International Workshop on Digital Forensics (WSDF 2011)	
Roadmap to Approaches for Carving of Fragmented Multimedia Files	752
<i>Rainer Poisel and Simon Tjoa</i>	
A Discussion of Visualization Techniques for the Analysis of Digital Evidence	758
<i>Gerald Schrenk and Rainer Poisel</i>	
A Complexity Based Forensic Analysis of the Trojan Horse Defence	764
<i>Richard E. Overill and Jantje A.M. Silomon</i>	
Author Index	769