

Guest Editorial: Advances in Applied Security

Edgar R. Weippl and A Min Tjoa

Vienna University of Technology, A-1040 Vienna, Austria
EWeippl@sba-research.org and amin@ifs.tuwien.ac.at

Günther Pernul

Department of Information Systems
University of Regensburg, Germany
Guenther.Pernul@wiwi.uni-r.de

In this special issue, we have selected five papers from the 6th International Conference on Availability, Reliability and Security (ARES 2011)¹ and its workshops to show the breadth of research. The ARES conference brings together researchers and practitioners in the area of security. ARES highlights the various aspects of security—with special focus on the crucial linkage between availability, reliability, dependability and security.

In security research seeing different research areas helps researchers to draw from experiences in other domains. In many cases, excellent research papers are a combination of previously known weaknesses that have been transferred to a new application domain such as mobile devices. Applied security is different to other research domains since the generalization of a specific research question is in many cases not the challenge. Deriving the special case from general case is not straightforward and people often make mistakes in this process, for instance when implementing file synchronization[1] or mobile text chats[2]. Insecurity comes from details that people get wrong. We do not want to dismiss the results of theoretical research; however, there are already many journals and conferences publish this sort of research as Gollmann et. al. have pointed out in their editorial in the very first issue of Springer's International Journal of Information Security [3].

In this issue, the first and second papers address organizational security and network security respectively, while the third and fourth ones focus on digital forensics, and the last studies system security. The authors of the paper titled “SPRINT- Responsibilities: Design and Development of Security Policies in Process-aware Information Systems” describe how to separate security policies and process logic in Process-Aware Information Systems [4]. This is essential since sensitive information is accessed by different systems. The authors describe a data model to represent arbitrary process related security policies and show how to map these security policies to actual processes and process instances. Anonymity solutions such as mix nets are well established. The second paper titled “Doubly-Anonymous Crowds: Using Secret-Sharing to achieve Sender- and Receiver-Anonymity” [5] extends the existing Crowd-approach by providing sender and adjustable receiver anonymity. The authors show that a certain level of anonymity can be given in finitely large networks and fully controlled by the sender. Digital forensics is a topic of increasing importance. The authors of the paper titled “Advanced File Carving Approaches for Multimedia Files” specifically focus on file fragments [6]. Unlike signature-based approaches, the statistical methods used by the authors, allow findings sets of blocks which are likely to be part of files that are the same type (e.g. JPG images). The authors then try reassemble the block in the correct order and use several heuristics to judge how reliable a reassembly option is. The fourth paper titled “Hiding Information into OOXML Documents: New Steganographic Perspectives” [7] provides a look at digital forensics from another perspective: Steganography can be seen as essentially one form of Anti-Forensics. A lot of information can be hidden OOXML files by for instance the choice of compression algorithms or by inserting zero-sized images. In the last paper titled “A virtualized usage control bus system” [8], the authors show how usage control can be enforced across layers to control the flow of information across multiple layers of abstraction. Especially, they introduce a bus system to support system-wide usage control enforcement, and then evaluate its security and performance.

Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications, volume: 2, number: 4, pp. 1-3

¹ARES 2011 was held in Vienna, Austria from August 22nd – 26th, 2011, <http://www.ares-conference.eu/ares2011/>

Finally, with Dr. Ilsun You, the Editor-in-Chief of *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications*, we would like to express our special thanks to the authors and reviewers for their valuable contribution and dedication to this special issue.

Edgar R. Weippl, A Min Tjoa, and Günther Pernul
Guest Editor
December, 2011

References

- [1] S. Schrittwieser, P. Fruehwirt, P. Kieseberg, M. Leithner, M. Mulazzani, M. Huber, and E. Weippl, "Guess who is texting you? evaluating the security of smartphone messaging applications," in *Proc. of the 19th Annual Network & Distributed System Security Symposium (NDSS'12)*, San Diego, California, USA, February 2012.
- [2] M. Mulazzani, S. Schrittwieser, M. Leithner, M. Huber, and E. Weippl, "Dark clouds on the horizon: Using cloud storage as attack vector and online slack space," in *Proc. of the 20th USENIX Security*, San Francisco, California, USA, August 2011.
- [3] E. Okamoto, D. Gollmann, and J. Lopez, "Editorial," *International Journal of Information Security*, vol. 1, no. 1, pp. 1–3, September 2001.
- [4] M. Leitner, J. Mangler, and S. Rinderle-Ma, "SPRINT - Responsibilities: Design and Development of Security Policies in Process-aware Information Systems," *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications*, vol. 2, no. 4, pp. 4–26, December 2011.
- [5] S. Rass, R. Wigoutschnigg, and P. Schartner, "Doubly-Anonymous Crowds: Using Secret-Sharing to achieve Sender- and Receiver-Anonymity," *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications*, vol. 2, no. 4, pp. 27–41, December 2011.
- [6] R. Poisel, S. Tjoa, and P. Tavalato, "Advanced File Carving Approaches for Multimedia Files," *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications*, vol. 2, no. 4, pp. 42–58, December 2011.
- [7] A. Castiglione, B. D'Alessio, A. D. Santis, and F. Palmieri, "Hiding Information into OOXML Documents: New Steganographic Perspectives," *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications*, vol. 2, no. 4, pp. 59–83, December 2011.
- [8] C. Moucha, E. Lovat, and A. Pretschner, "A virtualized usage control bus system," *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications*, vol. 2, no. 4, pp. 84–101, December 2011.



Edgar R. Weippl is Research Director of SBA Research and Associate Professor (Privatdozent) at the Vienna University of Technology. His research focuses on applied concepts of IT-security and e-learning. Edgar is member of the editorial board of Computers & Security (COSE) and organizes the ARES conference. After graduating with a Ph.D. from the Vienna University of Technology, Edgar worked for two years in a research startup. He then spent one year teaching as an assistant professor at Beloit College, WI. From 2002 to 2004, while with the software vendor, he worked as a consultant in New York, NY and Albany, NY, and in Frankfurt, Germany. In 2004 he joined the Vienna University of Technology and founded together with A Min Tjoa and Markus Klemen the research center SBA Research.



A Min Tjoa is a full professor and director of the Institute of Software Technology and Interactive Systems at the Vienna University of Technology. He is currently also chairman of the Austrian National Competence Center for Security Research (COMET - SBA). He was visiting professor at the Universities of Zurich, Kyushu and Wroclaw (Poland), National Institute of Informatics (NII, Japan) and at the Technical Universities of Prague and Lausanne (Switzerland). From 1999 to 2003, he was the president of the Austrian Computer Society. He is vice-chairperson of the IFIP Technical Committee for Information Systems and vice-chairperson of the IFIP Working Group on Enterprise Information Systems (WG 8.9). In 2011 he received the Honorary Doctorate degree of the Czech Technical University in Prague and a Honorary Professor degree from the University of Hue (Vietnam). His current research focus areas are data warehousing, grid computing, semantic web, security, and personal information management systems. He has published more than 150 peer reviewed articles in journals and conferences. He is author and editor of more than 20 books.



Günther Pernul received both the diploma degree in 1985 and the doctorate degree (with honours) in 1989 from the University of Vienna, Austria. Currently he is full professor at the Department of Information Systems at the University of Regensburg, Germany. Prior to that he held a similar position with the University of Essen, Germany, and a research assistant position with the Department of Applied Computer Sciences at the University of Vienna, Austria. During 1990 and 1991 he was post doctoral scholar at the Database Systems Research and Development Centre at the University of Florida, Gainesville FL, as well as at the College of Computing at the Georgia Institute of Technology, Atlanta, GA. He also worked as a consultant for Database- and Information Systems for Wang Austria and the United Nations Organization in Vienna. His research interests are web-based information systems, new media, information systems security, advanced database applications, and applied cryptography. Günther Pernul is co-author of a database text book, has edited or co-edited more than ten books, published more than 100 papers in scientific journals and conference proceedings on various information systems topics and has participated in European funded research under ESPRIT, ACTS and IST frameworks. He is a member of the Association for Computing Machinery (ACM), the Association of Information Systems (AIS), the IEEE Computer Society, the German Gesellschaft für Informatik (GI), the Austrian Computer Society (OCG), member of the IFIP WG 11.3 (Database Security) and observer of the IFIP WG 11.8 (Security Education). He serves on the steering board of the Communications and Multimedia Security conference series and is founding editor of the conference series Electronic Commerce and Web Technologies (EC-Web, since 2000) and Trust and Privacy in Digital Business (Trustbus, since 2004).