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Guest Editor's Preface

On July 11–13, 2011, the 25th Annual WG 11.3 Conference on Data and Applications Security and Privacy (DBSec 2011) was held in Richmond, VA, USA, in which I served as program chair. Celebrating on its 25th anniversary, DBSec provided a forum for presenting original unpublished research results, practical experiences and innovative ideas in data and applications security and privacy. The conference was an overwhelming success, with four invited talks, fourteen regular papers and nine short papers being included in the conference program.

After the conference, four high-quality papers were selected from the conference program and included in this Special Issue in *Journal of Computer Security* after significant extensions and rigorous reviews. These four papers reflect different aspects of data and applications security and privacy, ranging from algorithms of enforcing confidentiality and visibility constraints in data publishing, protocol of adapting confidentiality policy for inference control of queries to a propositional information system, architectures for processing multilevel secure continuous queries in data stream management systems, and protocols of solving distributed linear programming problems in a secure and efficient manner.

In private data publication, certain data fragments must be protected to meet confidentiality constraints, while other fragments can be released due to visibility requirements. The paper "An OBDD approach to enforce confidentiality and visibility constraints in data publishing", by Valentina Ciriani, Sabrina De Capitani di Vimercati, Sara Foresti, Giovanni Livraga and Pierangela Samarati, addresses a challenging problem of computing a fragmentation composed of the minimum number fragments in private data publication. The key idea in their work is to translate the problem into the problem of computing a maximum weighted clique over a fragmentation graph, which can be computed using ordered binary decision diagrams (OBDDs) that satisfy all the confidentiality constraints and a subset of the visibility constraints defined in the system. An efficient heuristic algorithm is proposed to solve this translated problem.

"Dynamic policy adaptation for inference control of queries to a propositional information system", by Joachim Biskup, provides an alternative option to represent the history of queries in policy-based inference control by suitably adapting inference control policy after returning an answer to a query. A comprehensive protocol is proposed for policy adaptation. A formal proof is provided to show that the policy adaption approach is equivalent to traditional inference control approaches. The efficiency of the proposed approach is discussed in special cases under dedicated data structures.

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In data stream management systems (DSMS), high-speed stream data should be processed in real time. Motivated by an observation that not much previous work in this area is suitable for highly sensitive applications such as battlefield monitoring, Raman Adaikkalavan, Xing Xie and Indrakshi Ray, in "Multilevel secure data stream processing: architecture and implementation", design various DSMS architectures to ensure the absence of illegal information flow in DSMS. Efficient implementation is detailed on how to process continuous queries in one of the designed architectures.

Yuan Hong, Jaideep Vaidya and Haibing Lu, in "Secure and efficient distributed linear programming", address the problem of solving linear programming by collaborative agents with local and global constraints. The challenge is to solve the problem without revealing each agent's private information, including its variables, local constraints, share of global constraints, and share of objective vector. The authors propose secure and efficient solutions to this problem under two adversary models, semi-honest model and malicious model.

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