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Future Data and Security Engineering

Second International Conference, FDSE 2015
Ho Chi Minh City, Vietnam, November 23–25, 2015
Proceedings

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Preface

In this volume we present the accepted contributions for the Second International Conference on Future Data and Security Engineering (FDSE 2015). The conference took place during November 23–25, 2015, in Ho Chi Minh City, Vietnam, at HCMC University of Technology, among the most famous and prestigious universities in Vietnam.

The annual FDSE conference is a premier forum designed for researchers, scientists, and practitioners interested in state-of-the-art and state-of-the-practice activities in data, information, knowledge, and security engineering to explore cutting-edge ideas, present and exchange their research results and advanced data-intensive applications, as well as to discuss emerging issues on data, information, knowledge, and security engineering.

The call for papers resulted in the submission of 88 papers. A rigorous and peer-review process was applied to all of them. This resulted in 20 full (including keynote speeches) and three short accepted papers (acceptance rate: 26.1 %), which were presented at the conference. Every paper was reviewed by at least three members of the international Program Committee, who were carefully chosen based on their knowledge and competence. This careful process resulted in the high quality of the contributions published in this volume. The accepted papers were grouped into the following sessions:

- Big data analytics and massive dataset mining
- Security and privacy engineering
- Crowdsourcing and social network data analytics
- Sensor databases and applications in smart home and city
- Emerging data management systems and applications
- Context-based data analysis and applications
- Data models and advances in query processing

In addition to the papers selected by the Program Committee, three internationally recognized scholars delivered keynote speeches: “An Empirical Study of the Attack Potential of Vulnerabilities,” presented by Professor Fabio Massacci from University of Trento, Italy; “The Asymmetric Architecture: A Privacy by Design Distributed Computing Architecture,” presented by Professor Benjamin Nguyen from INSA Centre Val de Loire, France; and “Modelling Sensible Business Processes,” presented by Associate Professor Pedro Antunes from Victoria University of Wellington, New Zealand.

In the first keynote speech, Professor Massacci talked about the attack potential of vulnerabilities and introduced a new estimator used as an aid for vulnerability prioritization. The abstract of the speech is briefly summarized as follows: “Vulnerability exploitation is reportedly one of the main attack vectors against computer systems. Characterization and assessment of vulnerabilities is therefore central to any IT security management activity. In particular, identifying *ex-ante* which vulnerabilities are most likely to be exploited (i.e., represent higher risk) is an open issue. In this talk, we identify trends in the volume of attacks in terms of the impact of vulnerability and complexity. As a result, we derive two possible ‘organizing principles’ for vulnerability

assessment and characterization that may prove useful to be integrated in current security management protocols and best practices. Over this notion we introduce an ‘attack potential’ estimator that reliably estimates the potential volume of attacks the vulnerability may receive in the wild. Our estimator can be used as an aid for vulnerability prioritization when deciding which vulnerability to fix first”.

In the second keynote speech, Professor Nguyen discussed important issues relevant to privacy in distributed computing architecture. The main contents of the speech are summarized as follows: “Today, there is a wide consensus that individuals should have increased control on how their personal data are collected, managed, and shared. Yet there is no appropriate technical solution to implement such personal data services: centralized solutions sacrifice security for innovative applications, while decentralized solutions sacrifice innovative applications for security. In previous works, we argued that the advent of secure hardware in all personal IT devices, on the edges of the Internet, could trigger a sea change, called the Trusted Cells paradigm: personal data servers running on secure smart phones, set-top boxes, secure portable tokens or smart cards to form a global, decentralized data platform that both provides security and encourages innovative applications. In this talk, we describe how to run distributed computing on an infrastructure composed of a vast set of low-powered, highly secure Trusted Cells, and an untrusted Supporting Server Infrastructure. We call this infrastructure the Asymmetric Architecture. The results include computing SQL Group By queries, anonymization algorithms, or even Map/Reduce on this architecture”.

In the last talk Associate Professor Antunes presented a brand-new concept of sensible business process, which balances the level of control between machines and humans within the BPM systems. The abstract of this work is as follows: “In this talk, we develop the concept of sensible business process, which appears in opposition to the more traditional concept of mechanistic business process that is currently supported by most business process modelling languages and tools. A sensible business process is founded on a rich model and affords predominant human control. Having previously developed a modelling tool supporting this concept, in this talk we report on a set of experiments with the tool. The results obtained show that the approach (1) captures richer information about business processes; (2) contributes to knowledge sharing in organizations; and (3) generates better process models.”

The success of FDSE 2015 was the result of the efforts of many people, to whom we would like to express our gratitude. First, we would like to thank all authors who submitted papers to FDSE 2015, especially the invited speakers. We would also like to thank the members of the committees and external reviewers for their timely reviewing and lively participation in the subsequent discussion in order to select such high-quality papers published in this volume. Last but not least, we thank the Faculty of Computer Science and Engineering, HCMC University of Technology, for hosting FDSE 2015.

November 2015

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