Guest Editorial

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# Recent Development on Security and Privacy in Modern Communication Environments

Nowadays, many emerging technologies have constructed modern communication systems, such as the internet, wired/wireless networks, sensor networks, RFID systems, cloud services and machine-to-machine interfaces. Modern communication allows billions of objects in the physical world as well as virtual environments to exchange data with each other in an autonomous way so as to create smart environments for transportation, healthcare, logistics, environmental monitoring, and many others. However, modern communication also introduces new challenges for the security of systems and processes and the privacy of individuals. Protecting information in modern communication environments is a complex and difficult task. Modern communication environments usually offer global connectivity and accessibility, which means anytime and anyway access and results in that the number of attack vectors available to malicious attackers might become incredibly large. Moreover, the inherent complexity of modern communication environments, where multiple heterogeneous entities located in different contexts can exchange information with each other, further complicates the design and deployment of efficient, interoperable, and scalable security mechanisms. The ubiquitous and cloud computing also makes the problem of privacy leakage serious. As a result, there is an increasing demand for developing new security and privacy approaches to guarantee the security, privacy, integrity, and availability of resources in modern communication environments.

This special issue includes six articles and can be categorised in 3 themes:

The first theme is review. The paper by YANG Mengmeng, ZHU Tianqing, ZHOU Wanlei, and XIANG Yang presents a literature survey on the attack models and countermeasures for privacy-preserving in social networks.

The second theme is secure applications. The paper by Faizal Riaz-ud-Din and Robin Doss presents a verification scheme for existential substring searches on text files stored on untrusted clouds to satisfy the desired properties of authenticity, completeness, and freshness. The paper by LEI Ao, Chibueze Ogah, Philip Asuquo, Haitham Cruickshank, and SUN Zhili presents a framework for providing secure key management within heterogeneous vehicular communication systems. Besides, the paper by LI Shancang and Imed Romdhani shows how to substantially improve the strength of passwords based on the analysis of text-password entropy.

The third theme is security and privacy for Android devices. The paper by CHEN Kuan-Lin and YANG Chung-Huang presents a privacy impact assessment framework for Android mobile devices to manage user privacy risks. The paper by DONG Zhenjiang, WANG Wei, LI Hui, et al. presents a security enhancement system with online authentication for android APK to improve the security level of the APK and it ensures a good balance between security and usability.

We hope this special issue will benefit the research and development community towards identifying challenges and disseminating the latest methodologies and solutions to security and privacy issues in modern communication environments. We sincerely thank all the authors who have submitted their valuable manuscripts to this special issue and all the reviewers who spent their precious time going through and commenting on the submitted manuscripts.

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ZHOU Wanlei received the BEng and MEng degrees from Harbin Institute of Technology, China in 1982 and 1984 and the PhD degree from The Australian National University, Australia in 1991, all in computer science and engineering. He also received a DSc degree (a higher Doctorate degree) from Deakin University, Australia in 2002. He is currently the Alfred Deakin Professor (the highest honour the University can bestow on a member of academic staff) and Chair Professor in Information Technology, School of Information Technology, Deakin University. Professor Zhou was the head of School of Information Technology twice and associate dean of Faculty of Science and Technology in Deakin University. Before joining Deakin University, Professor Zhou served as a lecturer in University of Electronic Science and Technology of China, a system programmer in HP at Massachusetts, USA, a lecturer in Monash University, Australia, and a lecturer in National University of Singapore, Singapore. His research interests include distributed systems, network security, bioinformatics, and e-learning. Professor Zhou has published more than 300 papers in refereed international journals and refereed international conferences proceedings. He has also chaired many international conferences. Prof Zhou is a senior member of the IEEE.

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