Special Issue: Selected Best Papers of International Symposium on Electronic Commerce and Security 2008 (ISECS 2008) Track on Communications

Editorial

This special issue comprises seven selected papers from the International Symposium on Electronic Commerce Security (ISECS 2008), held in Guangzhou, China, 3-5 August 2008. A total of 643 contributions were submitted to this Conference, of which 227 were selected for presentation after a rigorous review process. From these 227 research papers, the guest editors selected seven as the best papers on the communications track of the Conference. The authors of these selected papers produced extended versions of their conference papers, which were further developed through two rounds of reviewing.

"A Node Encoding of Torus Topology and Its Improved Routing Algorithm", by Xiaoqiang Yang, Junmin Li, Huimin Du, and Jungang Han, analyzes the topology and the node code of Network-on-Chip (NoC), and proposes a two-dimensional code based on Johnson Code, which implies the relation between neighbouring nodes and their links and the global information of routing. Two methods for code compressing are also presented to reduce the storage space of node address and increase. The improved algorithm for X-Y routing is described and implemented with three or six logic operations in middle nodes, and the node structure of NoC is designed.

"An Effective Approach for Live Media Streaming Based on BitTorrent", by Qingchao Cai and Xuejie Zhang, proposes a solution that incorporates BitTorrent Mechanism into P2P Streaming. The paper gives a simple description of BitTorrent protocol and analyzes the problems encountered while importing it into P2P streaming. To address the problems, the authors propose some modifications to BitTorrent protocol, including to prioritize the pieces based on their playback deadline, to redefining source behavior, and to import block-level tit-for-tat policy and periodical examination of active neighbors to avoid low start.

In the paper "A Hexagon-based Key Pre-distribution Scheme for Large Scale Static Wireless Sensor Networks", Xuanxia Yao, Xuefeng Zheng, and Tao Wu address the problem of improving the secure connectivity and expansibility of static wireless sensor networks, to decrease the memory costs of sensor nodes. They propose an efficient hexagon-based key pre-distribution scheme, by employing the ideas of the grouping key management and secret binding. In this scheme, the process of establishing pair-wise keys for neighboring nodes in the network is limited in the beginning of the network deployment, and when adding new sensor nodes into the network, the pair-wise key establishment for the new nodes and their neighbors needs to be verified by the base-station. In addition, the most appropriate value of the cell's radius is found in the paper, which can optimize the proposed schemes in terms of secure connectivity and memory costs.

"An Energy Optimization Protocol Based on Cross-Layer for Wireless Sensor Networks", by Yuebin Bai, Shujuan Liu, Mo Sha, Yang Lu, and Cong Xu, proposes for wireless sensor networks a cross-layer based Energy Optimization Approach (EOA) that considers the joint optimal design of the physical, medium access control (MAC), and routing layer. The focus of EOA is on the computation of optimal transmission power, routing, and duty-cycle schedule. EOA is validated on a Crossbow's MicaZ mote platform, and evaluated using the TOSSIM simulator.

In "In-Field Attack Proof of Injected False Data in Sensor Networks", Zheng Wang, Xiaodong Lee, Xinchang Zhang, and Baoping Yan address the problem of detecting false sensing reports that can be injected by compromised nodes in a wireless sensor network. They present an in-field attack proof (IAP) mechanism that exploits the sheer scale and dense deployment of large sensor networks and the shape of signal strength field formed by detecting nodes. To prevent any in-field compromised node from breaking down the entire system, IAP carefully designs the MAC routing mechanism so that the report generated by the node can be detected and dropped en-route.

"A Cooperative Secure Routing Protocol based on Reputation System for Ad Hoc Networks", by Yihui Zhang, Li Xu, and Xiaoding Wang, proposes a cooperative secure routing protocol to prevent and detect malicious attacks and selfish behaviors. It adopts a robust and efficient reputation system to help enforce the security and cooperation of the routing protocol. The protocol is based on ARAN, but it is proven to be more efficient and more secure than normal ARAN secure routing protocol in defending against both malicious and authenticated selfish nodes.

In the last paper "Cover-Free Family based Efficient Group Key Management Strategy in Wireless Sensor Network", Li Xu, Jianwei Chen, and Xiaoding Wang address the problem of secure group re-keying for wireless sensor networks. They presented PDGRS, a new t-packing design based group re-keying scheme for sensor networks, which focuses on key distribution and update for secure group communication. They use Latin squares to construct orthogonal arrays in key pre-distribution phase in order to quickly obtain t-packing designs. Then the pre-deployed keys are used for implementing secure channels between members for group key distribution.

In closing, we would like to take this opportunity to thank the authors for the efforts they put in the preparation of the manuscripts and in keeping the deadlines set by editorial requirements. We wish to express our deepest thanks to the program committee members for their help in selecting papers for this issue and especially the referees of the extended versions of the selected papers for their thorough reviews under a tight time schedule. We also acknowledge the

exceptional effort by the Editorial Board of the Journal of Communications throughout this process. We hope that you will enjoy reading this special issue as much as we did putting it together.

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Fei Yu was born in Ningxiang, China, on February 06, 1973. Before Studying in Peoples' Friendship University of Russia, Russia, He joined and worked in Hunan University, Zhejiang University, Hunan Agricultural University, China. He has wide research interests, mainly information technology. In these areas he has published above 50 papers in journals or conference proceedings and a book has published by Science Press, China (Fei Yu, Miaoliang Zhu, Cheng Xu, et al. Computer Network Security, 2003). Above 30 papers are indexed by SCI, EI. He has won various awards in the past. He served as many workshop chair, advisory committee or program committee member of various international ACM/IEEE conferences, and chaired a number of international conferences such as IITA'07, WKDD'2008,ISIP'08, ISECS'08 ISIP'09,ISECS'09 and ISISE'08. He have taken as a guest researcher in State Key Laboratory of Information Security, Graduate School of Chinese Academy of Sciences, Guangdong Province Key Lab of Electronic Commerce Market Application Technology, Jiangsu Provincial Key Lab of Image Processing and Jiangsu Provincial Key Laboratory of Computer Information Processing Technology.

Chin-Chen Chang was born in Taichung, Taiwan on Nov. 12th, 1954. He obtained his Ph.D. degree in computer engineering from National Chiao Tung University. He's first degree is Bachelor of Science in Applied Mathematics and master degree is Master of Science in computer and decision sciences. Both were awarded in National Tsing Hua University. Dr. Chang served in National Chung Cheng University from 1989 to 2005. His current title is Chair Professor in Department of Information Engineering and Computer Science, Feng Chia University, from Feb. 2005.

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Professor Chang has won many research awards and honorary positions by and in prestigious organizations both nationally and internationally. He is currently a Fellow of IEEE and a Fellow of IEE, UK.

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Wen Chen was born in 1967 in Anhui, China. He received his PhD from the University of Electro-Communications, Tokyo, Japan in 1999. He was a researcher with Japan Society for the Promotion of Sciences from 1999 through 2001. Then he joined University of Alberta, Canada, starting as a post-doctoral fellow in Information Research Lab and continuing as a research associate in Department of Electrical and Computer Engineering. Since 2006, he has been a full professor in Department of Electronic Engineering, Shanghai Jiaotong University, China, where he is also the director of Institute for Signal Processing and Systems. Dr. Chen was awarded the Ariyama Memorial Research Prize in 1997, the PIMS Post-Doctoral Fellowship in 2001. He received the honors of "New Century Excellent Young Researcher in China" in 2006 and "The Pujiang Excellent Investigator in Shanghai" in 2007. He is elected the vice general secretary of Shanghai Institute of Electronics in 2008. He is in the editorial board of the "International Journal of Wireless Communications and Networking", and serves IEEE Communications Society as a Technical Committee member of Communication Theory. He is the TPC chair for IEEE-ICCSC2008 and a special session chair for IEEE-SIPS2007. He has published more than 30 papers in IEEE journals and conferences. His interests cover cooperative communications and networks.