

NATIONAL UNIVERSITY OF SINGAPORE

School of Computing

C S S E M I N A R

Title: Modelling the Propagation of Malware and Rumours in Networks

Speaker: Professor Wanlei Zhou
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 School of Information Technology
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Date/Time: 9 September 2015, Wednesday, 04:00 PM to 05:30 PM

Venue: SR@LT19

Chaired by: Dr Chang Ee Chien, Associate Professor, School of Computing
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Abstract:

Malware and rumours pose a critical security threats to the Internet. Modelling the propagation dynamics of malware and rumours becomes a fundamental technique for predicting their potential damages and developing effective countermeasures. In this talk we first present the modelling and analysis of propagation dynamics for a number of malware, in particular both scanning worms and topological worms. Our proposed models are different from traditional methods as we examine deep inside the propagation procedure among nodes and users in networks by concentrating on the propagation probability and time delay described by a complex matrix. The inside understanding of malware and rumours propagation also provides us with better ideas for designing defence strategies to thwart their propagation. Finally, we also describe our most recent work on the propagation studies on both truths and rumours in online social networks. This talk will be based on the following papers:

1. Sheng Wen, Wei Zhou, Jun Zhang, Yang Xiang, Wanlei Zhou, and Weijia Jia, "Modeling Propagation Dynamics of Social Network Worms", IEEE Transactions on Parallel and Distributed Systems, vol. 24, no. 8, pp. 1633-1643, Aug. 2013.
2. Yini Wang, Sheng Wen, Yang Xiang, and Wanlei Zhou, "Modeling the Propagation of Worms in Networks: A Survey", IEEE Communications Surveys and Tutorials, Volume:16, Issue:2, pp 942-960, 2014.
3. Sheng Wen, Wei Zhou, Jun Zhang, Yang Xiang, Wanlei Zhou, Weijia Jia, and Cliff C.Zou "Modeling and Analysis on the Propagation Dynamics of Modern Email Malware", IEEE Transactions on Dependable and Secure Computing, VOL. 11, NO. 4, pp. 361-374, JULY/AUGUST 2014.
4. Sheng Wen, Jiaojiao Jiang, Yang Xiang, Shui Yu, and Wanlei Zhou, "Are the Popular

Users Always Important for the Information Dissemination in Online Social Networks?" IEEE Network, pp. 64-67, September/October 2014.

5. Sheng Wen, Jiaojiao Jiang, Yang Xiang, Shui Yu, Wanlei Zhou, Weijia Jia, "To Shut Them Up or to Clarify: Restraining the Spread of Rumours in Online Social Networks?", IEEE Transactions on Parallel and Distributed Systems, vol. 25, No. 12, pp. 3306-3316, 2014.

6. Sheng Wen, Mohammad Sayad Haghghi, Chao Chen, Yang Xiang, Wanlei Zhou, and Weijia Jia, "A Sword with Two Edges: Propagation Studies on Both Positive and Negative Information in Online Social Networks", IEEE Transactions on Computers, Vol. 64, No. 3, pp. 640-653, March 2015.

Biodata:

Professor Wanlei Zhou received the B.Eng and M.Eng degrees from Harbin Institute of Technology, Harbin, China in 1982 and 1984, respectively, and the PhD degree from The Australian National University, Canberra, Australia, in 1991, all in Computer Science and Engineering. He also received a DSc degree (a higher Doctorate degree) from Deakin University in 2002. He is currently the Visiting Professor in School of Computing, National University of Singapore and 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 has been the Head of School of Information Technology twice (Jan 2002-Apr 2006 and Jan 2009-Jan 2015) and Associate Dean of Faculty of Science and Technology in Deakin University (May 2006-Dec 2008). 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, Melbourne, 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.