

学术报告会

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IEEE ComSoc Distinguished Lecturer's Talk

Real-Time Intrusion Detection for Multimedia

Applications over Wireless Networks

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Abstract:

With the increasing coverage of the IEEE 802.11 based wireless networks, the voice/video multimedia applications over wireless networks are drawing more interest in both academia and industry. Due to the openness and distributed nature of the protocols utilized by the technologies, it becomes easy for malicious users on the networks to achieve their own gain or disrupt the service by deviating from the normal protocol behaviors. The stringent QoS requirements of the multimedia applications require us to detect the malicious behavior in real time after it occurs. In this talk, we present our recent studies on real-time intrusion detection techniques that can quickly track down the malicious behaviors which take advantage of vulnerabilities from either upper-layer signaling protocols or the underlying 802.11 protocols. While existing detection schemes mainly depend on heuristic parameter configuration and experimental performance evaluation, which largely limits the flexibility and robustness of those schemes, we develop an analytical model to theoretically study the performance of our detection scheme and guide the detection system configuration for guaranteed performance.

Biography:

Yu Cheng received the B.E. and M.E. degrees in Electronic Engineering from Tsinghua University, Beijing, China, in 1995 and 1998, respectively, and the Ph.D. degree in Electrical and Computer Engineering from the University of Waterloo, Waterloo, Ontario, Canada, in 2003. From September 2004 to July 2006, he was a postdoctoral research fellow in the Department of Electrical and Computer Engineering, University of Toronto, Ontario, Canada. Since August 2006, he has been with the Department of Electrical and Computer Engineering, Illinois Institute of Technology, Chicago, Illinois, USA, and he is now an Associate Professor. His research interests include next-generation Internet architectures and management, wireless network performance analysis, network security, and wireless/wireline interworking. He received a Postdoctoral Fellowship Award from the Natural Sciences and Engineering Research Council of Canada (NSERC) in 2004, a Best Paper Award from the conferences QShine 2007 and ICC 2011, and Best Paper Runner-up award from ACM MobiHoc 2014. He received the National Science Foundation (NSF) CAREER AWARD in 2011 and IIT Sigma Xi Research Award in the junior faculty division in 2013. He served as symposium co-chairs in GLOBECOM 2011 and 2013, and ICC 2009, 2012, and 2016. He served as a Technical Program Committee (TPC) Co-Chair for WASA 2011, ICNC 2015, and IEEE/CIC ICC 2015. He is a founding Vice Chair of the IEEE ComSoc Technical Subcommittee on Green Communications and Computing. He is an Associated Editor for IEEE Transactions on Vehicular Technology and the New Books & Multimedia Column Editor for IEEE Network. He is an IEEE ComSoc Distinguished Lecturer.