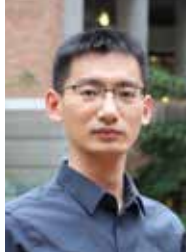




Mobile App Assisted Security Assessment of Applied IoT Systems



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► Abstract

Appified IoT systems have been widely used in our daily life, and they collect information through sensors and receive commands from the apps running on smartphones. They become the new lucrative and profitable targets for attackers because the compromised IoT devices will pose severe threats to security and privacy. This problem becomes worse on appified bare-metal IoT systems because the tradeoff among price, functionality, performance, and energy efficiency usually results in insufficient security protection. Such appified IoT devices are usually controlled by the companion mobile apps, such as device firmware update, configurations, and data uploading, through the wireless communication channel. Unfortunately, there lacks a systematic study on the firmware update security of appified bare-metal IoT devices although recent studies reported the vulnerabilities in many appified IoT devices. To address this issue, we propose a mobile app assisted approach to assess the security of bare-metal IoT devices. By applying it to various types of commercial appified bare-metal IoT devices, we discover various exploitable vulnerabilities and successfully launch PoC firmware modification attacks against them by exploiting the detected vulnerabilities. The vendors have acknowledged our findings and fixed the vulnerabilities.

► About the Speaker

Dr Lei Xue is a research assistant professor in the Department of Computing at The Hong Kong Polytechnic University. He also earned the Ph.D. degree in Computer Science from The Hong Kong Polytechnic University (PolyU). He is widely interested in designing and implementing efficient and practical security systems, with a particular focus on applying program analysis methodology to addressing the challenging security issues and detecting vulnerabilities in mobile and network systems. He has published several papers in top conferences including USENIX Security, ICSE, and INFOCOM, and high-impact journals like TIFS and TSE. He also served as a reviewer for many conferences and journals, such as TIFS, TDSC, TSE, and TMC. Currently, his research topics include mobile system security, IoT security, and telematics security.

ALL are welcome!

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