InstaGuard: Instantly Deployable Hot-patches for Vulnerable System Programs on Android

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The Hong Kong Polytechnic University

Abstract
Hot-patches, easier to develop and faster to deploy than permanent patches, are used to timely (and temporarily) block exploits of newly discovered vulnerabilities while permanent patches are being developed and tested. However, existing hot-patching techniques, though widely used in conventional computers, are rarely adopted by Android OS or device vendors in reality. In this talk, I'll present InstaGuard, a new approach to hot-patch for mobile devices that allows for instant deployment of patches and fast patch development for device vendors. Unlike existing hot-patching techniques, InstaGuard avoids injecting new code to programs being patched (i.e., non-intrusive). Instead, it enforces instantly updatable rules that contain no executable code to block exploits of unpatched vulnerabilities in a timely fashion. We designed a new language for hot-patches and an enforcement mechanism based on the basic debugging primitives supported by ARM CPUs. We also built RuleMaker, a tool for automatically generating rules for InstaGuard based on high-level, easy-to-write vulnerability descriptions. InstaGuard is now being adopted by a major smartphone vendor.

About the Speaker
Dr Long Lu is an Assistant Professor in the College of Computer and Information Science at Northeastern University. He is the director of the RiS3 Lab. Long’s research spans the broad area of systems and software security. His recent work focuses on application and operating system security for emerging platforms, such as mobile and IoT/CPS devices. He constantly publishes in the top-tier computer security conferences and is frequently invited to serve on their program committees. His research outcomes have been adopted by IBM, Microsoft, NEC, and Samsung. His work is currently funded by NSF, ONR, ARO, and AFRL. Prior to joining Northeastern, Long was an Assistant Professor of Computer Science at Stony Brook University. He holds a Ph.D. in Computer Science from Georgia Tech. Long is a recipient of the NSF CAREER Award and the US Air Force Faculty Fellowship.

All are welcome!

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