UNIVERSITY OF SOUTH FLORIDA

Defense of a Doctoral Dissertation

A Secure Computing Platform for Building Automation Using Microkernel-based Operating Systems

by

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For the Ph.D. degree in Computer Science & Engineering

Through increasing industrial and technological advances, the control components of BAS are becoming increasingly interconnected. Along with potential benefits, the integration also introduces new attack vectors, which tremendous increase safety and security risks in the control system. This work focuses on the system level in the effort to provide a reliable computing foundation for the devices and controllers. Leverage on the preferred security features such as, robust modular design, small privilege code, and formal verifiability of microkernel architecture, this work describes a security enhanced operating system with built-in mandatory access control and proxy-based communication framework for building automation controllers.

Examining Committee

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Publications

(1) Secure RTOS Architecture for Building Automation. **Xiaolong Wang**, Masaaki Mizuno, Mitch Neilsen, Xinming Ou, S. Raj Rajagopalan, Will G. Baldwin, Bryan Phillips. In ACM CCS 2015 Workshop on Cyber-Physical Systems Security and Privacy (CPS-SPC 2015), Denver, CO, USA, Oct 16, 2015.

(2) Enhanced Security of Building Automation Systems Through Microkernel-Based Controller Platforms. **Xiaolong Wang**, Richard Habeeb, Xinming Ou, Siddharth Amaravadi, John Hatcliff, Masaaki Mizuno, Mitchell Neilsen, S. Raj Rajagopalan, Srivatsan Varadarajan. The second IEEE International workshop on Communication, Computing, and Networking in Cyber Physical Systems (CCNCPS 2017), Atlanta, GA, USA, 2017.

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