Scientific Seminar

"Securing Manufacturing Systems"

Dr. John Jeffery Prevost Prof., University of Texas at San Antonio, USA

October 11th, 2023 | 2:00 PM
Seminar Room
LIRMM UMR 5506 - Bâtiment 4
161 rue Ada - 34095 Montpellier

Abstract of the Seminar

As the executive director for the Open Cloud Institute (OCI), and the vice-president for secure cloud architecture for the Cyber Manufacturing Innovation Institute (CyManII), my research focuses on challenges related to cloud and edge computing and the Internet of Things. A recent thrust is in how to leverage advanced analytics to assist manufacturers without creating new attack vectors which could be exploited by bad actors. Often, the platforms used in manufacturing were created before security became a motivating force. These systems provide many pathways for an adversary to perform an exploit, resulting in manufacturing downtime or theft of intellectual property. The Cloud Lab for Engineering Application Research (CLEAR), a part of the OCI, performs research to assist CyManII in understanding fundamental properties of cloud and edge computing that lead to implementations that can be tested in facilities such as OakRidge National Lab's Manufacturing Demonstration Facility. The goal is to provide a commercial pathway to move the research out of the lab and into the manufacturing plant as quickly as possible. We will be presenting two research activities in this area. The first is the evolution of an acoustic analysis framework that can 'listen' to the manufacturing activity for anomalous activity (eg. Denial of service, GCode replacement and direct register over right attack). We will then turn our attention to device level attacks on FPGA boards. FPGA's are commonly used in manufacturing to provide for real-time control of the manufacturing process and are often unsecured. We will show our research in how we are using a side-channel attack pattern to determine cryptographic keys in an isolated block of the FPGA. This has applications to services such as cloud-hosted FPGAs being currently offered by companies such as Intel.

Bio

Dr. John Jeffery Prevost attended Texas A&M University and received an undergraduate degree. At the University of Texas at San Antonio he completed his masters and Ph.D. He began his career in the tech industry, working for 15 years before pursuing an academic career. During his industry career, he worked in many different positions, serving in roles such as a chief consultant, Director of Information Systems, Director of Product Development, and Chief Technical Officer. He began his professional academic journey in 2013 as a professor of research. In 2015, he co-founded and became the Chief Research Officer and Assistant Director of the Open Cloud Institute, where he currently serves as its Executive Director. In 2016, after serving as a professor of research, he received his appointment as an Assistant Professor. He currently serves as the Cloud Technology Endowed Associate Professor in the Electrical and Computer Engineering Department at UTSA. He currently also serves as the VP for Secure Cloud Architecture for the Cyber Manufacturing Innovation Institute (CyManII). At CyManII, he is co-lead for the Shared Research and Development Infrastructure foundational team. Working with on behalf of the needs of his industry connections, he established the Graduate Certificate in Cloud Computing, which officially began in 2017. Again, working with local tech leaders he created the Catalyst Lab, an internship program for Graduate Students at UTSA. He remains an active consultant in areas of complex systems and cloud computing and continues to maintain strong ties with industry leaders. He is a member of Tau Beta Pi, Phi Kappa Phi and Eta Kappa Nu Honor Societies, and is a Senior Member of IEEE. His current research interests include secure and scalable real-time IoT, applied machine learning and applications of quantum algorithms.

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"Securing Manufacturing Systems"

Dr. John Jeffery Prevost
Prof. University of Texas at San Antonio, USA

October 13th, 2023 | 10 AM - 12 PM
U3 - UPSSITECH - Amphi DAURAT
Université Paul Sabatier Toulouse III

Abstract

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