Speaker: Dr. Grace Lewis, Principal Researcher at the Software Engineering Institute at Carnegie Mellon University

Day: Monday 15 April, 2019 at 14:00-15:00

Room: WN-P647, VU Campus

Title: Two Perspectives on IoT Security at the Edge: Standards and Runtime Enforcement

Abstract: Internet of Things (IoT) devices are increasingly being used to support operations in edge environments, such as those experienced by first responders, military, medics, and other field personnel. However, current IoT security efforts are mainly targeted at stable and connected environments such as home and industry, which are very different from edge environments. This presentation will discuss two perspectives on IoT security at the edge: standards and runtime enforcement. The standards perspective will present a software architecture and implementation for authentication and authorization of IoT devices in edge environments, based on an IETF proposal for authentication and authorization in resource-constrained environments (ACE). The runtime enforcement perspective will present the use of software-defined networking, combined with a framework for the construction of secure software stacks, to create an IoT security infrastructure that is provably resilient to a collection of prescribed threats. The software engineering process followed to create these two systems will highlight the use of threat modeling for developing secure software systems.

Audience: Areas covered by this presentation include software architecture, threat modeling, IoT, and security. The presentation is targeted at a beginner to intermediate audience.

Bio: Grace Lewis is Principal Researcher and Lead of the Tactical Technologies Group (TTG) initiative at the Software Engineering Institute (SEI) at Carnegie Mellon University (CMU). Grace is the principal investigator for the “Authentication and Authorization of IoT Devices in Edge Environments” and “High Assurance Software-Defined IoT Security” research projects. She also leads the Tactical Cloudlets work. Her current interests and projects are in edge computing, cloud computing, IoT security, software architecture, and emerging technologies. She has a B.Sc. in Software Systems Engineering and a Specialization in Administration from Icesi University in Colombia; a Master in Software Engineering from Carnegie Mellon University; and a Ph.D. in Computer Science from Vrije Universiteit Amsterdam. She is Executive Vice Chair for the IEEE Technical Council on Software Engineering, as well the Treasurer for the IEEE Computer Society Technical & Conference Activities Board (T&C).

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