ICT Virtual Organization of ASEAN Institutes and NICT
ASEAN IVO Forum 2016
Call for Presentations

Submission and Registration Form

I. Title—Title of presentation:

A Security Framework for IoT Networks

II. Author(s)—Full name (First name family name):
Assoc. Prof.Dr.-habil.Dr.-Ing. Hoang Dang Hai
(Members of other universities in Vietnam and other ASEAN institutions will be invited).

III. Organization(s):
Post and Telecommunications Institute of Technology (PTIT).
(Other universities in Vietnam and other Japan-ASEAN institutions will be invited).

IV. Topic selection:
Cyber-Security and its applications

IV. Abstract:
Today, the convergence of technologies and smart applications is the driving key for the development of the Internet of Things (IoT). IoT can be identified as networks of independent systems operating with their own infrastructure which are partly based on existing Internet. The IoT therefore builds on communication between things (things-to-things or machine-to-machine). Given the growing complexity of connected environments, there is a strong demand for a comprehensive security framework for IoT networks.
In comparison with the traditional Internet, security issues for IoT networks are increasingly complex and sophisticated with the adoption of new technologies and smart applications. Cyber-attacks in IoT networks are becoming more difficult to detect. The valid paradigm of Internet security is no longer effective for IoT networks, calling for developing new paradigm.
The purpose of this research is to study the issues of monitoring/detecting cyber-attacks on IoT networks and to develop a new comprehensive security framework for IoT networks. This framework will address different layers of network security for IoT environments. The other purpose of this research is to create an open forum, a research collaboration for researchers of various institutions from Japan and ASEAN-IVO members. The concrete objectives of this research are: 1) Proposal of a quick and effective monitoring/detection system for IoT networks; 2) Proposal of a comprehensive security framework for IoT networks including solutions for secure IoT infrastructure, secure data acquisition and data transfer system based on concrete applications with mobile devices and wireless sensor networks; 3) Developing a dataset for cyber-attacks on IoT networks. Until now, there are three popular datasets including KDD-CUP99 (1999), NSL-KDD (2009) and Kyoto Honeypot (2006). These datasets have some limitations calling for developing a new one, especially for IoT.

The idea of this new research proposal comes from our past research projects:
- The project with ASEAN-Japan "Strengthening Information Security in Business sector" (ERIA, 2008-2009).
- The national project KC.01.09/06-10: "Building a centralized security monitoring system for the national Internet" (2008-2010).
- The project with TU Darmstadt (Germany) sponsored by the Alexander von Humbold Foundation: "Smart Sensor Network for Online Monitoring of Traffic-generated Pollution Data in Hanoi City" (2012-2014).
The project team has gathered experiences from several other collaborative research works on: Monitoring system based on IoT, Wireless Sensor Networks, Pervasive and Secure Information Service Infrastructure for IoT, Establishing Sustainable Structures in Next Generation Network Infrastructure and Future Internet Technology, Communication Protocol for Target Tracking and reliable Data Transfer in Wireless Sensor Networks, Detection of Network Traffic Anomaly in the Internet, Developing a Netflow Dataset for Intrusion Detection and Applications.

This research proposal will be separated into three sub-contents corresponding to three research team works: 1) Developing a security monitoring/detection system for IoT networks; 2) Developing a comprehensive security framework for IoT networks based on a concrete application with mobile devices and wireless sensor networks; 3) Developing a dataset for intrusion detection on IoT networks.

Expected results/outcomes of this research will be:
- A security monitoring/detection system for IoT networks with new solutions for traffic anomaly detection, concept for quick and effective attack detection, solution for visualizing results using different techniques.
- A dataset for intrusion detection on IoT networks. This dataset can be useful for further research works on IoT Security, and can share with other institutions.
- A comprehensive security framework for IoT networks, which can be applied for different applications. A concrete application for traffic-generated pollution monitoring based on IoT/Wireless Sensor Network will be presented.

V. Speaker information:

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VI. Support for speaker—circle or underline any that you wish to request:

- Round trip fare at discount economy class: No
- Accommodation: No