Monitoring IoT devices for SAP Enterprise Threat Detection

Opportunity for a 6 months internship

at SAP Product Security Research - SAP Labs France

Nice-Sophia Antipolis

SAP Product Security Research is part of the global Products & Innovation – Global Security unit of SAP and is addressing the major security and trust challenges in the context of highly dynamic service-oriented architecture such as automated management of security certification for software service, Business-driven approaches to the specification and enforcement of security and dependability requirements, Trust and data protection infrastructure for managing & assessing the risks associated with identity authentication and the trustworthiness of actors and Technology for the formal specification and automated validation of Trust and Security of service-oriented architectures.

Product Security Research proposes a 6-month internship in its Sophia-Antipolis office (Nice, France).

INTERNSHIP TOPIC

Internet of Things (IoT) is an internetwork of uniquely identifiable embedded computing devices (e.g., smartphone, smart watch, sensors, refrigerators, TVs, Cars, SCADA systems etc.). With the increasing digitization of the society and industry, IoT realm is expected to grow to 50 billion by the year 2020 [4]. While IoT brings tremendous values to business and daily life there are security concerns it brings along. Recognizing this issue, recent efforts have been made, for instance, of OWASP Internet of Things [1] and Internet of Things, world forum [3]. SAP's information security threat monitoring tool called SAP Enterprise Threat Detection [6] is an application level intrusion detection system [9] to monitor user activities and application interactions in order to detect hacking attempts, anomalous actions and perform appropriate mitigations thereby. Monitoring IoT devices for analyzing malicious scenarios and activities in SAP ETD would be a valuable approach to investigate. In this spirit the goal of the internship is the following:

1. State of the art analysis of IoT related threats and vulnerabilities and related community driven activities.
2. Propose techniques and approaches to monitor IoT device related activities for SAP ETD
3. Develop a simplistic proof of concept demonstrating the approach.

The candidate must have good experience of mobile and/or web application development and should have handful experiences in SQL, Java, JavaScript, HTML5 and Eclipse. Knowledge of exploit development [8] and SAP technology [6, 7] is a plus. He/she must be familiar with the basic security concepts like authentication, integrity, confidentiality, authorizations, access control, certificates etc.

We expect that 30% of time will be dedicated to research activities, and 70% to software development.

CANDIDATE PROFILE

- University Level: Last year of MSc in Computer Science or beyond
- Experience in Java, SQL (expert)
- Experience in IoT programming (desired)
- XML and XML Schema (understand and extend the existing schemas)
- Fluency in English (working language)
- Abilities in organizing meeting and contacting people
- Good oral and written communication skills in English, ability to synthesize

REFERENCES

[1] https://www.owasp.org/index.php/owasp_internet_of_things_project#tab=top_iot_vulnerabilities

[2] https://www.rsaconference.com/events/us15/agenda/sessions/1847/securing-the-internet-of-things-mapping-iot-attack

[3] Internet of Things, world forumwww.iotinternetofthingsconference.com/ SAP HANA

[4] http://go.sap.com/solution/internet-of-things.html

[5] SAP ENTERPRISE THREAT DETECTION http://scn.sap.com/docs/doc-58501

[6] SAP HANA http://www.saphana.com/

[7] SAP UI5 http://scn.sap.com/community/developer-center/front-end

[8] Exploit Development http://www.offensive-security.com/metasploit-unleashed/exploit_development

[9]Guide to Intrusion Detection and Prevention Systems http://csrc.nist.gov/publications/nistpubs/800-94/SP800-94.pdf

INTERNSHIP CONTEXT

SAP
As the world's leading provider of business software, SAP delivers products and services that help accelerate business innovation for our customers. We believe that doing so, will unleash growth and create significant new value – for our customers, SAP, and ultimately, entire industries and the economy at large. Today, more than 248500 customers in more than 188 countries run SAP applications – from distinct solutions addressing the needs of small businesses and midsize companies to suite offerings for global organizations.

SAP Products and Innovation – SAP Global Security
SAP Product Security Research is part of the SAP Global Security unit. SAP Global Security unit is responsible for SAP Product Security, to optimize the way SAP creates and manages architecture, the consistent communication of this architecture to internal and external target groups and to develop and roll-out modern education programs for software developers and architects in and outside the company.
Product security and data privacy are often seen as a threat only and as a burden for development. The vast majority of the world's business transactions run on SAP – we have the obligation to excel in this field. Our team will drive product security across SAP with the support of all development leads and will aim to make Security a key differentiator for SAP.

SAP Product Security Research in Sophia Antipolis
SAP Product Security Research Sophia-Antipolis is located in one of the most important scientific parks in France, and worldwide. A high concentration of IT and telecommunication industries within walking distance, proximity to research centres (INRIA, CNRS, etc.), as well as universities and engineering schools (Polytech Nice, Eurecom, etc.) provide an ideal working environment. Based at SAP Labs France, SAP Product Security Research Sophia-Antipolis addresses the upcoming security needs, focusing on increased automation of the security life cycle and on providing innovative solutions for the security challenges in networked businesses, including cloud, services and mobile.

STANDARD INTERNSHIP PACKAGE

- *Salary*: depending on the length of the internship and your diploma.
- *Lunch*: SAP Labs France has a local cafeteria; interns contribute 2,23 Euro/lunch, like other SAP employees.
- *Holidays*: French Bank Holidays
  - January 1st; April 21st, May 1st, May 8th, May 29th, June 8th, July 14th; August 15th , Nov 1st and 11th; December 25th
- *Travel*: no trip will be paid by SAP.
- *Accommodation*: SAP can propose an accommodation for the duration of your internship. The accommodation is subsidized by SAP: the intern pays a reduced rate of 375 €

CONTACTS AND PROCEDURE

Please send **in English** your CV, a cover letter and any relevant documents to the following persons stating the title of the Internship in the subject: [Internship Application] Monitoring IoT devices for SAP Enterprise Threat Detection.

Supervisor	**Administrative point of contact**
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