



A contribution to the Automated validation of trust and security of SOA: SAML 2.0 SSO

Opportunity for a 6 months internship (MSc)

at SAP Research - SAP Labs France

Cote d'Azur, FRANCE

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The internship will be executed in the context of the EU-sponsored AVANTSSAR project (www.avantssar.eu). AVANTSSAR proposes a rigorous technology for the formal specification and Automated VALIDation of Trust and Security of Service-oriented Architectures (SOA). This technology will be automated into an integrated toolset tuned on relevant industrial case studies. The AVISPA Tool – developed in the context of the EU Project AVISPA «Automated Validation of Internet Security Protocols and Applications», nominated for the «2006 Descartes prize for Research», see [here](#) for more details –provides one of the stepping stones for the AVANTSSAR project.

More in details the AVANTSSAR project will develop: (i) ASLan, the first formal language for specifying trust and security properties of services, their associated policies, and their composition into service architectures; (ii) automated techniques to reason about ASLan specifications; (iii) the AVANTSSAR Validation Platform, an automated toolset for validating trust and security aspects of SOA; and (iv) a library of validated composed services proving that our technology scales to envisaged applications. Last but not least AVANTSSAR will migrate the project results to industry and will thereby speed up the development of new network and SOA, enhance their security and robustness, and increase the public acceptance of emerging ICT systems and applications based on them.

SAP Research has a strong involvement in the project with more emphases on (a) defining and formalizing industrial problem cases of interest for SAP, (b) defining and developing ASLan and the AVANTSSAR Validation Platform by making them suited for SAP relevant case studies; and (c) migrating the project outcomes to the SAP development environment and to standardization bodies.

AVANTSSAR recently discovered a serious vulnerability of the SAML-based Single Sign-On (SSO) service for Google Apps and promptly informed Google that patched the issue. (See [here](#) for the details). In developing its SSO service, Google tried to follow the guidelines of the emerging SAML 2.0 SSO standard by OASIS, but clearly something went wrong. Perhaps more preciseness in the standard guidelines might mitigate mistakes of this kind. The aim of this internship is to investigate in that direction with the ultimate goal of mapping the SAML 2.0 SSO standard into formal specifications suited for automated validation. The internship student will contribute to:

- Understand deeply the SAML 2.0 SSO standard
- Implement a GUI capturing the SAML 2.0 SSO standard and from which to generate formal specifications
- Undertake a deep analysis of the generated specifications to detect vulnerable combinations of the SAML 2.0 SSO standard's optional fields (if any)

Besides working in the international environment of an EU project involving 10 partners from industry and academy, the student will get in touch with an industrial research surround offering concrete possibilities of migrating research outcomes into real industrial products. Estimated effort is 6 months. The ratio between software development and research related activities is expected to be around 50% development and 50% research.

Candidate Profile

- University Level: Last year of MSc and behind
- Good skills in modelling, analysis and programming (Java, J2EE, ABAP is a plus)
- Fluency in English (working languages)
- Good oral and written communication skills
- Willingness and ability to work in an international environment are required

The position is to be filled by October 2008 or as soon after as possible.

Internship Context

SAP - Founded in 1972, SAP is the recognized leader in providing business solutions for all types of industries and for every major market. With 12 million users, 96,400 installations, and more than 1,500 partners, SAP is the world's largest inter-enterprise software company and the world's third-largest independent software supplier. SAP has a rich tradition of innovation and growth that has made it a true industry leader. Today, SAP employs more than 39,300 people in more than 50 countries all across the globe. SAP is headquartered in Walldorf, Germany.

SAP has leveraged its extensive experience to deliver a comprehensive range of solutions to empower every aspect of business operations. By using SAP solutions, organizations of all sizes -- including small business solutions and solutions for midsize companies -- can reduce costs, improve performance, and gain the agility to respond to changing business needs.

SAP Research –*Systematic Thought Leadership for Innovative Business*–is the technology research department of SAP and as an integral part of SAP's R&D activities, SAP Research is responsible for identifying, researching, understanding, developing and evaluating new and emerging technologies, processes and solutions that strategically influence the future of SAP business applications. SAP Research is following a cooperative approach to innovation, maintaining a rich partner network with academia, industry and customers.

SAP Research operates in Research Centers around the globe (11 sites across 4 continents) set up to implement its research strategy in collaboration with local technology partners, partner universities or SAP development locations. SAP Research has identified six long-term research programs, including **Security & Trust**, which is lead out of the **SAP Research Center Sophia-Antipolis**.

The **SAP Research Center Sophia Antipolis**, is located at SAP Labs France, focusing its research activities on Security & Trust and Public Security. Being located in Europe's foremost science and technology park, SAP Labs France enjoy the inspirational atmosphere and innovative drive offered through Sophia Antipolis' 1300+ companies and academic institutions (including University of Nice – Sophia Antipolis, Eurécom Institute and INRIA) and its 26000+ employees.

SAP Research Sophia Antipolis employs 17 researchers (out of 180+ employees at SAP Labs France).

Standard Internship Package

- **working hours**: 9am to 5pm is the minimum. Other than that we are flexible.
- **lunch**: SAP Labs France has a local cafeteria; interns contribute 2,1 Euros/lunch, like other SAP employees.
- **vacation**: at the discretion of your manager (usually 1 worked/day per month).
- **holidays**: based on french holidays (April 17th; May 1st, 8th, 25th; July 14th; Aug 15th; Nov 1st, 11th; Dec 25th are French holidays).
- **travel**: no personal travel (your trip to and from Nice) will be paid by SAP.
- **accommodation**: we can propose to you an accommodation for the duration of your internship. If you accept SAP will take care of the rent but 250 Euros will be deducted from your monthly salary. Otherwise you are on your own.

If you have any question, do not hesitate to contact us.

Contacts and Procedure

Please send your CV and any relevant documents to the following persons stating the title of the Internship in the Subject [Internship Application] A contribution to the Automated validation of trust and security of SOA: SAML 2.0 SSO

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