POLITECNICO DI TORINO

III School of Engineering
Master of Science in Computer Engineering

Thesis

A Security System for Deployment of Mobile Agents

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Summary

Research on Mobile Agent technologies is experiencing a constant uniform growth, first of all because of their flexibility and new capabilities they offer. Indeed, since Mobile Agents can autonomously migrate from location to location keeping their code and their internal state, they can accomplish more easily and efficiently tasks that otherwise could turn out tough [3] [4].

As a matter of fact, security-related issues in this technology and security concerns of its potential users are the main reasons that slow down Mobile Agents' wide adoption as commercial solutions in real environments [14]. Current research in the area of Mobile Agents' security mainly deals with the runtime issues of agents and agents' platform protection. Mobile Agents systems do not provide any extensive secure methodology for agent life cycle, from the agent creation to its deployment and execution.

A comprehensive security system for Mobile Agent deployment is proposed. The system provides the prevalent methodology that spans on number of phases, starting from agent publication and ending to agent execution phase. It goes through discovery, adoption, authentication and authorization.

The strong pursuit of new security solutions to face peculiar threats and issues introduced by Web services technologies and the intrinsic distributed nature of Web services make Web service security domain a suitable research ground to find innovative solutions meeting Mobile Agent security requirements.

Keywords: Mobile Agent, Deployment, Web Service Security, MagicNET, XACML, SAML, RBAC

This thesis has been written in cooperation with the Department of Systems Sciences (DSV), Kungliga Tekniska Högskolan (KTH), Stockholm, Sweden.

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Based on the System Architecture presented in this document, a regular paper with the title *"MagicNET: A Security System for Deployment of Mobile Agents"* has been accepted for publication (IEEE Computer Society Proceedings) in the 3^{rd} International Conference on Network and System Security, 2009, Australia [1].

The Security Policies definition presented in this document conveyed to achievement of a Regular Paper with the title *"MagicNET: XACML Authorization Policies for Mobile Agents"*, which has been accepted for publication (IEEE Computer Society Proceedings) in the 4^{th} International Conference for Internet Technology and Secured Transactions, United Kingdom [2].