ABSTRACT

My habilitation thesis presents my main achievements in the scientific, didactic and professional activity, realized after dec. 1998, when I obtained my PhD in Computer Science, at the "POLITEHNICA" University of Timisoara, Faculty of Automation and Computer Science. The doctoral thesis was conducted under the guidance of Prof.dr.ing. Mircea Vladutiu, and the thesis was defended at "POLITEHNICA" University of Timisoara.

After obtaining my PhD, I was promoted on a competitive basis to the position of associate professor (in 1999) and then to the position of university professor (in 2003). During this periode I participated in a series of research grants, at three of them I was a director. In this periode I was author or co-author of 8 books and 3 practical guides, 2 book chapters at an international publishing house and some additional media supports for practical activities, available on my personal website and on the website of the University of Oradea. I also was author or co-author of 25 papers indexed in the ISI-Web of Science database, 11 of them being articles in journals, with impact factor, as well as more than 20 papers indexed in international databases.

During the years 2010-2013 I was involved in the Erasmus LLP-IP (Long Life Learning – Intensive Programme), "Mobile and Web Development Technologies", in which, as a teacher, I taught course modules on “Mobile Cloud Computing” at Universitat Politechnica de Valencia (Alcoi Campus- Spain), Lahti University (Finland) and University of Oradea (Romania).

In this period I also was reviewer at several prestigious journals and conferences (as International Journal of Advanced Intelligence Paradigms ISSN online: 1755-0394, Future Technologies Conference (FTC) 2016). I was also expert CNCSIS (2004-2005), expert ARACIS (2015) and in 2016-2017 Expert to the European Commission on the H2020-SESAR-2016 call.

The habilitation thesis is structured on 7 chapters, divided in 3 main parts namely: the first part has 6 chapters and is dedicated to scientific achievements; the second part is dedicated to professional and academic achievements and plans of carrier evolution and development, after the habilitation attainment; the final part represents a references list, including the personal scientific achievements.

In Chapter 2, "Cloud Computing Security", I have presented the general problems of Cloud Computing security. I started from defining the Cloud Computing model, the security issues associated with it, and I presented how cloud security should be managed. The vulnerabilities, threats and risks associated with Cloud Computing are also presented in this chapter.

Chapter 3 is the most comprehensive and consistent chapter of the first part and shows some solutions that are required to provide the three cloud security factors: identity security, information security, and infrastructure security.

Regarding identity security, I approached Identity Access Management (IAM), and made a brief presentation of the involved protocols, existing federation standards, and existing IAM solutions. These were published as a Springer book chapter. For Authentication, an original Hybrid Authentication solution based on text / image usage is presented. For ensuring information security one of the solutions is steganography, which provides the ability to secure confidentiality of data in cloud (by hiding). The combination of cryptography and steganography is Is prefigured as perspective for

ensuring security in the field. Starting from this point of view, lately I was concerned about the performance of the solutions that can be obtained by using steganography and I have had some scientific contributions in this regard that I present in this chapter.

In the section: Cloud Security Architectures, starting with an architectural security solution based on 4 layers of security, an architectural 5-layer security solution is developed. This ensures confidentiality by hiding data stored in the cloud, and aims to increase the confidence of customers in securing confidentiality of cloud data. This 5th level (additional) is based on the use of steganography techniques with image coverage support.

Also in Chapter 3, I present a solution for detecting DDoS attacks in a cloud environment based on the Intrusion Detection System and Dempster Schefer theory. The solution presented was published, and it was physically implemented, and the experimental results proved the effectiveness of the solution.

Chapter 4 is a chapter on how to optimize resource allocation in the cloud to ensure a higher availability of cloud data. I present an allocation solution based on a model that identifies the resources involved in delivering services, and an optimization solution for the availability of files in a P2P network based on the use of genetic algorithms.

The delicate issue of cloud data migration for SMEs is addressed in Chapter 5. It presents the entire process that a business must consider to successfully and efficiently achieve such migration in a hybrid cloud environment. As an implementation solution for the private cloud, the Eucalyptus open-source platform is used, and platform management is based on the associated management interfaces that are presented together with an evaluation of the benefits and disadvantages offered by each one. The basic elements of cloud security management are also presented in Chapter 5. At the end of the chapter is presented a solution for a cloud management cluster innovation system that was published in an ISI article

Chapter 6 presents the professional and academic achievements as well as the career development and career development plan envisaged after obtaining the right to conduct doctoral work

Chapter 7 presents a list of bibliographical references, including my scientific achievements.