SECURE CLOUD: A SECURITY FRAMEWORK FOR ORGANIZATIONS IN IMPLEMENTING SYSTEMS ON THE CLOUD

K.N.T. De Abrew

088356

Thesis submitted in partial fulfillment of the requirements for the degree Master of Science in Telecommunications

Department of Electronic and Telecommunication Engineering

University of Moratuwa

Sri Lanka

January 2013

DECLARATION

"I declare that this is my own work and this thesis/dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

Also, I hereby grant to University of Moratuwa the non-exclusive right to reproduce and distribute my thesis/dissertation, in whole or in part in print, electronic or other medium. I retain the right to use this content in whole or part in future works (such as articles or books).

UOM Verified Signature

Signature: Date: 30/05/2014

The above candidate has carried out research for the Masters thesis under my supervision.

UOM Verified Signature

Signature of the supervisor: Date 03/07/2014

ABSTRACT

Secure Cloud: A Security Framework for organizations in implementing systems on the cloud

Nalin de Abrew, Dept. of Electronic and Telecommunication Engineering

Supervisor: Dr. Ajith Pasqual

Keywords: Cloud computing, Security, Virtualiazation, Multi-tenanat, Software, Framework,

Over the last decade the cloud has created a major impact on the global IT ecosystem. Due to positive characteristics such as fast deployment, scalability, cost effectiveness and many more, cloud implementations are growing by the day. However security remains the number one barrier in cloud adoption for CIOs as per several surveys conducted on cloud adoption.

When considering the research done on cloud security, most have focused on the security dependency according to the cloud service model (IaaS, PaaS, SaaS), and the cloud deployment models(Public, Private, Hybrid, Community). Research has also been done on security issues inherent to cloud deployments and how to overcome them. The Cloud Security Alliance (CSA), one of the leading organizations on cloud security together with the IEEE as presented 12 domains of cloud security that should be focused on, six of the domains would be considered as the base guidelines.

The motivation behind this research was to provide a set of security guidelines and processes for local IT firms to adhere to when migrating to the cloud, in order to improve cloud adoption. The research was based on six domains of security provided by the CSA and security guidelines were developed along with the input of additional resources and security incidents.

A step by step process for security assessment and implementation are presented along with security risk assessment matrix that will aid an organization to decide which resources are to be migrated to the cloud. The main contribution from

this work is the development of the security matrix which will clear the doubts of many prospective cloud migrants.

DEDICATION

To all who encouraged me to pursue my higher studies.

ACKNOWLEDGEMENTS

I express my gratitude to my supervisor Dr. Ajith Pasqual who guided me through the research and put me on the right track.

I sincerely thank the lecturers of Moratuwa, especially Mr. Kithsiri Samarasinghe, Prof. Dileeka Dias and Dr. Chandika Wavegedera.

I am thankful to my fellow colleagues in the MSc batch who extended their support in many ways.

A special thank goes out to Anjula De Silva, who always open doors when I needed it the most.

And finally I wish to thank my family who has always been behind me throughout my higher studies.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES