Chapter 26
Security Challenges for Cloud Computing Development Framework in Saudi Arabia

Lawan A. Mohammed
King Fahd University of Petroleum and Minerals, Saudi Arabia

Kashif Munir
King Fahd University of Petroleum and Minerals, Saudi Arabia

ABSTRACT

In recent years, cloud computing or on-demand computing technologies and applications have become ubiquitous, permeating every aspect of our personal and professional lives. Governments and enterprises are now adopting cloud technologies for numerous applications to increase their operational efficiency, improve their responsiveness and competitiveness. For these reasons, the requirements for developing cloud applications have increased. Despite having many advantages for IT organizations, cloud has some issues that must be consider during its deployment. The main concerns are security, privacy and trust. These issues arise during the deployment of mostly public cloud infrastructure. In this chapter, security, privacy and trust issues of cloud computing deployment in Saudi Arabia were identified and the solutions to overcome these problems were discussed.

1. INTRODUCTION

Cloud computing is a new paradigm in the world of Information Technology Advancement. Considerable amount of cloud computing technology is already being used and developed in various flavors. Cloud Computing provides efficient network login to an appropriate pool of computing resources which can be provided and released with just nominal assiduity and service providers reciprocity as reported in Armbrust et al. (2009) and Toby et al. (2009). The resources can be network servers, applications, platforms, infrastructure segments and services. Cloud computing delivers services autonomously based on demand and provides sufficient network access, data resource environment and effectual flexibility. This technology is used for more efficient and cost-effective computing by centralizing storage, memory,

computing capacity of PC's and servers. Industry experts believe that this trend will only continue to grow and develop even further in the coming few years. Thus, cloud computing affects people, process and technology of the enterprise. In spite of having benefits with Cloud computing paradigm such as efficiency, flexibility, easy set up and overall reduction in IT cost (Sultan, 2010), cloud computing paradigm could raise privacy and confidentiality risks. "Not all types of cloud computing raise the same privacy and confidentiality risks. Some believe that much of the computing activity occurring today entirely on computers owned and controlled locally by users will shift to the cloud in the future" (Gellman, 2009). In Cloud computing, users connect to the CLOUD, which appears as a single entity as opposed to the traditional way of connecting to multiple servers located on company premises. Public Private Partnership these days is a usually adopted pattern of governance to meet the diverse needs of their citizens with confidence and providing quality of these services. Cloud Computing Technology can also act as a facilitator between public and private partnership. In such cases there is a possibility that an external party can be involved in providing Cloud Services having partial control over the data storage, processing and transmission of data and privacy regulations become relevant (Ruiter & Warnier, 2011). Cloud computing has significant implications for the privacy of personal information as well as for the confidentiality of business and governmental information. A survey by EDUCAUSE involving 372 of its member institutions revealed that a great proportion of the respondents with use cases that involved cloud-based services reported that data privacy risks and data security risks were among their top barriers to overcome.

In this chapter, we study how cloud computing can benefit governments and enterprises in KSA. We discuss the cloud computing environment and explore how enterprises may take advantage of clouds not only in terms of cost but also in terms of efficiency, reliability, portability, flexibility, and security. We also discuss challenges including risks and problems associated with cloud computing. The rest of this chapter is organized as follows: In next section, we give a brief overview on cloud computing models, in section 3 we explore the benefits of cloud computing in KSA (Kingdom of Saudi Arabia). Section 4 presents security challenges associated with cloud computing and some counter measures to be taken. It include a simple survey to assess the perception of secure cloud computing environment by some selected IT related organizations in KSA. Section 5 provides some general recommendations, Finally, section 6 concludes the chapter.

2. CLOUD COMPUTING MODELS

Various efforts were made in order to find an appropriate definition for cloud computing.

For instance, Hays defined it as on-demand computing, software as services or the Internet as a platform (Hayes, 2008). However, this definition seems to be general and does not give a comprehensive technical view. In an effort to give a more descriptive definition, Armbrust and colleagues defined cloud computing as applications that deliver services over the Internet where the hardware and software systems in the datacenter provide these services (Armbrust et al., 2009). In this definition, cloud refers to the hardware and software in the datacenters, and the applications can be defined as software as a service (SAAS). Based on these definitions, it can be noticed that cloud computing helps in adopting IT services without considering the infrastructure and hardware required running these services. In terms of classification, cloud computing systems are classified as public cloud, private cloud, community cloud and hybrid cloud as described in: Dimitrios & Dimitrios (2012), Subashini & Kavitha (2011), and

14 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/security-challenges-for-cloud-computing-development-framework-in-saudi-arabia/203520

Related Content

Best Practices Guidelines for Agile Requirements Engineering Practices
Chetankumar Pateland Muthu Ramachandran (2012). *Computer Engineering: Concepts, Methodologies, Tools and Applications (pp. 1403-1416).*
www.irma-international.org/chapter/best-practices-guidelines-agile-requirements/62519

Landcover Change Detection Using PSO-Evaluated Quantum CA Approach on Multi-Temporal Remote-Sensing Watershed Images
Kalyan Mahata, Rajib Das, Subhasish Dasand Anasua Sarkar (2018). *Quantum-Inspired Intelligent Systems for Multimedia Data Analysis (pp. 178-212).*
www.irma-international.org/chapter/landcover-change-detection-using-pso-evaluated-quantum-ca-approach-on-multi-temporal-remote-sensing-watershed-images/202548

Service Composition Based Software Solution Design: A Case Study in Automobile Supply Chain
Tong Mo, Jingmin Xu, Zhongjie Wang, Yufei Ma, Heyuan Huang, Yuan Wang, Ying Liu, Jun Zhuand Xiaofei Xu (2012). *Computer Engineering: Concepts, Methodologies, Tools and Applications (pp. 266-277).*
www.irma-international.org/chapter/service-composition-based-software-solution/62447

Ontology-Based Software Component Aggregation
Gilbert Paquetteand Anis Masmoudi (2012). *Computer Engineering: Concepts, Methodologies, Tools and Applications (pp. 223-237).*
www.irma-international.org/chapter/ontology-based-software-component-aggregation/62444

Semi-E-Preinvex Functions
Yu-Ru Syauand E. Stanley Lee (2012). *Computer Engineering: Concepts, Methodologies, Tools and Applications (pp. 677-683).*
www.irma-international.org/chapter/semi-preinvex-functions/62471