Chapter 1
Security Issues in Cloud Computing

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ABSTRACT

Cloud computing is a computing style in which scalable and flexible IT functionalities are delivered as a service to external customers using Internet technologies. As cloud computing continues to gain more momentum in the IT industry, more issues and challenges are being reported by academics and practitioners. Cloud computing is not a revolutionary idea; Instead, it is an evolutionary concept that integrates various existing technologies to offer a useful new IT provisioning tool. In this chapter, security risks are discussed on adoption to cloud computing, the risks related to privacy, trust, control, data ownership, data location, audits and reviews, business continuity and disaster recovery, legal, regulatory and compliance, security policy and emerging security threats and attacks.

INTRODUCTION

Recently Cloud computing has emerged as an obliging paradigm for delivering and managing services over the internet. The boom of Cloud computing is quickly changing the concept of information technology, and utility computing exists into a reality by ultimately turning the long-held promise. It realizing the utility computing model since it is heavily driven by industry vendors. It drew attention of business owners with its ability to reduced overhead of provisioning plan, and its low cost service provisioning facilities. It allows enterprises to start with small scale and dynamically increases their resources simultaneously with the increase of their service demand. Cloud computing promises to deliver reliable services through next-generation datacenters built on virtualized compute and storage technologies. Users will be able to access applications and data from a

Cloud anywhere in the world following the pay-as you-go financial model (Shawish & Salama, 2014). A Cloud is datacenter hardware and software that the vendors use to offer the computing resources and services. It represents both the cloud & the provided services. With such speedy progressing of the Cloud Computing and emerging in most of the enterprise business and scientific research areas, it becomes crucial to understand all aspects about this technology. The aim of this chapter is to provide a complete overview on the Cloud Computing through a comprehensive descriptions and discussion of all aspects of this technology and respective risks.

The security of the data across the Cloud is gaining a great interest due to its sensitivity. Similarly the Service Level Agreement that drives the relation between the provider and the consumer becomes also of a great significance. This chapter discusses the Cloud security related aspects in terms of the Service Level Agreements, service cost, service pricing, and security issue and challenges facing the new paradigm also; such as security, availability and resources management; should be carefully considered in future research in order to guarantee the long-term success of Cloud Computing.

BACKGROUND

Cloud Computing has accelerated business and technological initiatives that promise to provide services at comparably low infrastructure and operating costs. The rapid growth of cloud computing is a good example (Onwubiko, 2010). The popularity of Cloud services has increased immensely over the past few years. Cloud computing is a large-scale distributed computing paradigm that is driven by economies of scale, in which a pool of abstracted, virtualized, dynamically-scalable, managed computing power, storage, platforms, and services are delivered on demand to external customers over the Internet (Giordanelli &

Mastroianni, 2010). It's a set of approaches that can help organizations quickly, effectively add and subtract resources in almost real time. It has a revolution in the way it will change the way we deploy technology and how we think about the economics of computing (Irakoze, 2013). It is an Internet-based computing solution where shared resources/services are provided like electricity distributed on the electrical grid. It is a computing model providing web-based software, middleware and computing resources on demand, in which services, resources, and applications are provided on metered basis over the Internet (Patel, Umrao, & Singh, 2012). Cloud applications extend their accessibility through the Internet by using large data centers' and powerful servers that host web applications and services. Anyone with a suitable Internet connection and a standard Internet browser can access a cloud application (Hung & Lin, 2013). Rapid evolution of cloud computing technologies can easily confuse its definition perceived by the public. Yet, there are five key attributes to distinguish cloud computing from its conventional counterpart as shown in figure 1:

- Service-based
- Scalable and elastic
- Shared
- Metered by usage
- Uses Internet technologies

Services and Deployment Models of Cloud Computing

The cloud computing provide basically three type of services as shown in figure 1.

Software as a service (SaaS) in which the cloud service provider provides applications and software over a network. SaaS uses the Web to deliver applications that are managed by a third-party vendor and whose interface is accessed on the clients' side. Most SaaS applications can be run directly from a Web browser, without any downloads or installations required Google Docs,

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