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# Analysis of Insiders Attack Mitigation Strategies

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### Abstract

Insider attacks become a severe threat to organizations. The emergence of Cloud computing that provides computing as a utility has attracted organizations to store their sensitive data remotely by subscribing the virtual storage from Cloud service provider. While data outsourcing relieves the data owners from burden of local data storage maintenance and security, the steps of embracing Cloud storage service has led to security problems. With the services provided by Cloud service provider that can be extended from Cloud user to Private Cloud and expanded to Public Cloud, there are many possibilities that malicious insider attacks may occur to exploit the weaknesses of Cloud systems. Until now there are no perfect mitigation strategies that can be relied on to solve the threats. We describe the Cloud computing and security issues, discuss about malicious insiders attack in Cloud computing and analyses the existing mitigation strategies and techniques to reduce malicious insiders threats in Cloud computing.

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### 1. Introduction

Cloud Computing has gained significant acceptance because of the economic and technical benefits in delivering computing resources. Organizations and businesses can outsource their IT infrastructure into the Cloud and get benefits from rapid provisioning, scalability, and cost advantages. Organizations begin to adopt the advantages of flexibility, scalability, and management provided by Cloud computing

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platforms and services, and often consider security as one of their top concerns in Cloud environments. Although the benefits of Cloud Computing are distinct, security is a major constrain and numerous security risks and challenges have been identified.

A survey conducted by The Computer Security Institute (Richardson, 2008) indicated about 44% of all organisations experienced abuse of computer systems in 2008 which dropped to 30% in 2009; 42% reported loss of laptops both in 2008 as well as 2009; and 17% reported theft of customer data. The 2009 survey (Peter, 2009) also revealed 25% of the respondents felt that 60% of the financial losses were caused by insiders; unauthorised access or privileged access by insiders is 15%; and Internet access and e-mails abuse by insider are the fourth most rampant incident. Both the surveys indicate that insider threats are real and nearly rising to the level of an external threat.

Security is one of the major anxieties when planning to adopt the cloud. Proving the security of data in cloud is important to achieve users' trust on cloud providers. One of the most serious challenges, not only to cloud computing, but to data security in general, is the insider threat. The insider threat is one of the problems that concern organizations and individuals about cloud computing. Moving data to cloud raises the number of insiders, which may expose to insider attack. A malicious insider, such as a cloud administrator, can easily inspect the virtual machines of cloud users and retrieve sensitive information. Insider attacks are always identified as a high-impact risk as malicious insiders can affect the security of many users. Furthermore, this risk of insider attacks will be more serious and damaging when involving private cloud, public cloud and hybrid deployment of both. There will be communications and collaborations taking place between consumers, cloud provider, cloud users and so on that can encourage the collusion of malicious activities to exploit the vulnerabilities to compromise the organization asset.

Cloud computing offers some incredible benefits such as unlimited storage, access to quick processing power and the ability to easily share and process information. However, it does have several issues, and most of them are security related. Cloud systems must overcome many obstacles before it becomes widely accepted and adopted, but it can be utilized right now in the right conditions with some compromises. People can enjoy the full benefits of cloud computing if researcher can address the very real security concerns that appear with storing of sensitive information in databases scattered around the Internet.

The rest of the paper is structured as follows: Section 2.0 discusses the Cloud computing and security issues, Section 3.0 explains about the malicious insiders attack in Cloud computing, Section 4.0 discusses the analysis of existing mitigation strategies and techniques to reduce malicious insiders in the cloud computing, Section 5.0 conclude the discussion

## **2. Cloud Computing and Security Issues**

A Cloud is a type of parallel and distributed system consisting of a collection of inter-connected and virtualized computers that are dynamically provisioned and presented as one or more unified computing resources based on service-level agreements established through negotiation between the service provider and consumers (Buyya, et al., 2009). Cloud computing becomes a new paradigm for hosting and delivering services over the Internet. The benefits of Cloud computing are it enables ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources such as networks, servers, storage, applications, and services that can be rapidly provisioned and released with minimal management effort or service provider interaction. Cloud computing combines many computing

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