

Chapter 47

A Credible Cloud Service Model Based on Behavior Graphs and Tripartite Decision-Making Mechanism

Junfeng Tian

Hebei University, China

He Zhang

Hebei University, China

ABSTRACT

The credibility of cloud service is the key to the success of the application of cloud services. The dual servers of master server and backup server are applied to cloud services, which can improve the availability of cloud services. In the past, the failures between master server and backup server could be detected by heartbeat algorithm. Because of lacking cloud user's evaluation, the authors put forward a credible cloud service model based on behavior Graphs and tripartite decision-making mechanism. By the quantitative of cloud users' behaviors evidences, the construction of behavior Graphs and the judgment of behavior, they select the most credible cloud user. They combine the master server, the backup server and the selected credible cloud user to determine the credibility of cloud service by the tripartite decision-making mechanism. Finally, according to the result of credible judgment, the authors could decide whether it will be switched from the master server to the backup server.

1. INTRODUCTION

With the high-speed development of cloud computing (Udoh and Hsu, 2013), the emerging cloud services, underlying supported by cloud platform, and the use of convenience provided by cloud computing face a variety of new security threats at the same time. The credible cloud service becomes an important object of study for cloud computing (Wang et al., 2015). Chief officer of RSA said that, in the process of enterprise's apply migration to a third party cloud, Credibility is the first thing to consider. Cloud ser-

DOI: 10.4018/978-1-5225-8176-5.ch047

vices can be smoothly promotion depends on the credibility of cloud service (Xu et al., 2012). Formerly, the credibility of cloud service often is stiffly divided into two aspects, respectively, to be studied: (1) Cloud server's credibility: a large number of important sensitive information are stored in the cloud, so it is important of the cloud server's credibility (Srinivisan 2012). A cloud service based on cloudy or cooperation between cloud and cloud is proposed by scholars, that cloudy collaboration (multi-clouds cooperation) (Alzain et al., 2012); Compared with the single server nodes of cloud service, multiple cloud server could be obtained by the information interaction between their respective credible judgment, which effectively reduces the cloud user's security problems (Trostle 2006), in this model, the access to multiple cloud servers' information are delayed and difficult. (2) The credibility of users that enjoy the cloud service: The Distributed Denial of Service attacks (DDoS), the traditional way of security attacks, has become a new threat of cloud services. The malicious users consume resources, makes the cloud service unavailable to other legitimate users. malicious users fake credible users to hide their identity, they didn't give a reliable judgment, which causes an incredibility Cloud Service. One will ensure that the cloud user's identity authenticity and credibility behavior, the technology of identity authentication is mature, but that doesn't prevent the identity authentication failure or malicious cloud users' behavior on the system of legal status, so behavior of analysis and effective control is another research focus on the current cloud computing (Chen et al., 2011). The credibility of the judge in cloud services that is combined with credible cloud user and the cloud servers.

2. THE RELATED WORK

At present, the comprehensive cloud user behavior and cloud server's credibility evaluation research is still rare, but respectively from the aspects of cloud users and cloud server's credible study have been made.

2.1. The Credibility of Cloud User Behavior

Lv Yanxia et al. (2013) proposed a credible evaluation and control of the user behavior analysis based on cloud environment FANP. Zhang kai et al. (2014) for the current role in cloud computing access control's changing over time, the dynamic problems, presented a cloud computing access control model based on user behavior trust. Jiang Ze et al. (2011) used multidimensional decision attribute to measuring the user behaviors' credibility. Elaine et al. (2011) put forward a kind of implicit authentication of user identity based on user behavior method, this method utilized mobile devices to collect user behavior information, simulated user behavior, implicitly authenticated user. Khazzar and Savage (2010) used psychology to study the credibility of the user behavior authentication system, by the user in response to user behavior information of 3 D maze, authenticated the user identity. Accuracy is 88.33%. Almenarez et al. (2004) proposed the PTM (pervasive trust management model base d on D - S theory) model to define the dynamic trust model based on universal between the domain of environment, with the improved evidence theory (d - S theory) method to model, the trust evaluation using probability weighted average method. Brosso et al. (2010) proposed a theory based on user behavior analysis of continuous certification system, in the environmental information to extract a cloud user behavior evidence, the user is divided into different levels of trust, in the process of fuzzification based on related rules to determine the weight of each parameter, through a neural fuzzy logic, we continuously updated database of user behavior, keep the user behavior credible.

18 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/a-credible-cloud-service-model-based-on-behavior-graphs-and-tripartite-decision-making-mechanism/224613

Related Content

5G: An Expressway to IoT and Tactile Internet

Nidhi Sharma and Rajeev Mohan Sharma (2019). *Handbook of Research on the IoT, Cloud Computing, and Wireless Network Optimization* (pp. 519-543).

www.irma-international.org/chapter/5g/225732

Fog Computing Quality of Experience: Review and Open Challenges

William Tichaona Vambe (2023). *International Journal of Fog Computing* (pp. 1-16).

www.irma-international.org/article/fog-computing-quality-of-experience/317110

Strategies for Evaluating Cloud System Providers during the Transformation of Businesses

Mohamed Fazil Mohamed Firdhous (2015). *Business Transformation and Sustainability through Cloud System Implementation* (pp. 58-77).

www.irma-international.org/chapter/strategies-for-evaluating-cloud-system-providers-during-the-transformation-of-businesses/129705

Impact of Artificial Intelligence and Machine Learning in Cloud Security

I. Eugene Berna, K. Vijay, S. Gnanaveland J. Jeyalakshmi (2024). *Improving Security, Privacy, and Trust in Cloud Computing* (pp. 34-58).

www.irma-international.org/chapter/impact-of-artificial-intelligence-and-machine-learning-in-cloud-security/338348

Multi-Layer Token Based Authentication Through Honey Password in Fog Computing

Praveen Kumar Rayani, Bharath Bhushan and Vaishali Ravindra Thakare (2018). *International Journal of Fog Computing* (pp. 50-62).

www.irma-international.org/article/multi-layer-token-based-authentication-through-honey-password-in-fog-computing/198412