An E-learning System Based on Secure Data Storage Services in Cloud Computing

R. Gopinath, Department of Computer Science and Engineering, K.S.Rangasamy College of Technology, Tiruchengode, Tamil Nadu, India

B.G. Geetha, Department of Computer Science and Engineering, K.S.Rangasamy College of Technology, Tiruchengode, Tamil Nadu, India

ABSTRACT

Abundant reasonable computers, web resources and education content are identified to transform educational usage on-demand in the field of cloud infrastructure. Therefore, there comes a necessity to redesign the educational system to meet the needs better. The appearance of cloud based services supports the creation of latest generation e-learning systems for storing multimedia data within the cloud; it draws attention for academia and research area, which may be able to use high quality of resources. Even though the merits of cloud service are more attractive, the physical possession of users data is under security risk with respect to data correctness. This poses many new security challenges which have not been well explored. This paper focuses mainly on distributed data storage security for e-learning system, which has always been an important aspect of quality service. To make sure the correctness of users data within the cloud, an adaptable and effective auditing mechanism hitches the challenges and distributes erasure-coded data for e-learning web application. This extensive analysis shows that the auditing result achieves quick data error correction and localization of servers for malicious data modification attacks.

Keywords: Cloud Computing, Data Integrity, Distributed Storage, Error Localization, E-Learning, Security.

1. INTRODUCTION

Cloud computing is a model of computing which provides many opportunities for enterprises by offering a wide range of services to the users using internet technologies. Today, most of the official websites and applications are unavailable because of improper usage of resources and data being lost through various denial of service attacks. To improve better quality and to speed up the server performance, Cloud Service Providers (CSP) like Google, Amazon and Microsoft are working a lot to reduce the risk of malicious attacks by an external user. Considerably building an e-learning cloud based services infrastructure can be equally challenging and highly costlier in nature Cong (Wang, Qian Wang, Kui Ren & Wenjing Lou, 2012; Zhang Guoli & Liu Wanjun, 2010). Designing these cloud services based infrastructure needed an enormous amount of efforts from CSPs to

DOI: 10.4018/jitwe.2013040101

Copyright © 2013, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.
enable its security. From a service perspective, all the cloud servers governed by various vendors will be backed up with an extra server to avoid the denial of service. However, it is efficient to build an infrastructure for the cloud service application and data with the flexibility to adapt processor performance. The cloud service environment is attractive for users and is potential to solve these challenges without breaking the cloud service resources.

In traditional web-based e-learning mode, system construction and maintenance are located in interior of educational institutions or enterprises, which still experiences lot of problems, such as huge investment needed, but without capital gains to return, without development potential and staying power. Cloud computing is becoming an attractive technology due to its dynamic scalability and effective use of the resources; it can be utilized under circumstances where the availability of resources is limited. The introduction of cloud into e-learning emphasis on distance education, information system application, instructional system design, information resource development, online course-building, construction of campus e-learning system, e-learning system based on agent model and e-learning grid and so on. Scholars have done a lot of researches on the aspect of using cloud computing in the field of education (Chengcheng Zhang & Fei Wang, 2010). But until this time, the research applying cloud computing to e-learning is not significantly reported. In this paper, in order to show the whole advantages of cloud computing, cloud computing services were introduced into the e-learning space, build an e-learning cloud, and made an active research and exploration of it. Thus, the e-learning cloud content delivery typically based on one-to-many model which is comprises of single instance and multi-tenant where an application is shared across multiple users. The best use of cloud service might improve the utilization rate of resources on the secure data transmission among the users (Frank Doelitzscher, Anthony Sulistio, Christoph Reich, Hendrik Kuijs & David Wolf, 2011). It also provides a solution to achieve interoperability between the resource sharing and resource auditing in a secured fashion (Zhang Guoli & Liu Wanjun, 2010). Thus, the global growth in development demand will increase the importance for security ideas that enable more rapid development of the higher-quality service education applications in the web.

The e-learning process is based on the desire for individual and community improvement that enables the exchange of information, ideas, opinions among learners, usually occurring through technology with the aim of facilitating learning. The different forms of conveying information required for the users when searching and upload/download for information on the cloud application, which includes defining the query, carrying out the search operation and examining the results. The use of e-learning cloud for learning has been found to have a consistent effect of users commitment to the learning process (Ning Zhang & Hong Bao, 2010). Through this E-learning cloud service, the learning preferences of certain type of learners could be better supported and has consequently improved their learning performance. The vision of the effort is to produce high-quality service with security as the backbone to intellectual work for researchers and that in turn may be intellectually challenged by the learning tasks.

Cloud computing locates the computing and data in a large number of distributed computers, the sea of clouds in tens of thousands of computers is to provide powerful computing power and huge data storage space, put the “cloud” as a service available to users via the internet (Zhang Guoli & Liu Wanjun, 2010). Cloud promises huge cost benefits, agility and scalability to the business. All business data and software are stored on servers at a remote location referred to as data centers. The data center environment allows enterprises to run applications faster, with easier manageability and less maintenance effort, and more rapidly scale resources (e.g. servers, storage, and networking) to meet fluctuating business needs. A data center in a cloud environment holds information that would more traditionally have been stored on...
Related Content

Analysis and Evaluation of the Connector Website
[www.irma-international.org/chapter/analysis-evaluation-connector-website/22014/](www.irma-international.org/chapter/analysis-evaluation-connector-website/22014/)

Object Grouping and Replication on a Distributed Web Server System
[www.irma-international.org/article/object-grouping-replication-distributed-web/2621/](www.irma-international.org/article/object-grouping-replication-distributed-web/2621/)

Modeling Best Practices in Web-Based Academic Development
[www.irma-international.org/chapter/modeling-best-practices-web-based/37705/](www.irma-international.org/chapter/modeling-best-practices-web-based/37705/)

[www.irma-international.org/article/deep-web-information-retrieval-process/41725/](www.irma-international.org/article/deep-web-information-retrieval-process/41725/)

A Conceptual Tool for Usability Problem Identification in Website Development
[www.irma-international.org/chapter/conceptual-tool-usability-problem-identification/53065/](www.irma-international.org/chapter/conceptual-tool-usability-problem-identification/53065/)