Choosing Clouds for an Enterprise: Modeling and Evaluation

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ABSTRACT

The development of cloud computing has advanced rapidly over the past few years. Benefiting from the dynamic characteristics of cloud computing, enterprises can purchase cloud services based on different aspects in order to save operating expenses. Many companies have seen the opportunities and changes in either cloud service providers or cloud service consumers. For the latter, with so many cloud providers to choose from, there is a need for an evaluation of standards to help find the most suitable service provider. In this paper, the essential factors of enterprise clouds are discussed. An evaluation model is defined, and a web-based enterprise cloud selection application is implemented.

Keywords: Cloud Computing, Cloud Selection, Cloud Services, Enterprise Cloud, Evaluation of Standards, Web-Based Enterprise

INTRODUCTION

Cloud computing has become the most discussed topic in many areas. Scientists have focused on cloud computing in order to produce better performance, lower energy consumptions or improve security and reliability. Enterprises see the great advantage that cloud computing can produce. One of the advantages of the enterprise cloud is to save money for the company by renting computing resources rather than buying them.

According to Forrester Research (Larry, 2013), the global cloud computing market has reached $40.7 billion in 2011 and will grow to $241 billion in 2020. SaaS (Software as a Service) is currently dominating the cloud computing market and will likely continue into the future. With such a quantity of potential market growth, more and more enterprises will play the
role of cloud service providers. Newly formed small enterprises will wish to embrace cloud services to rent computing resources and save human resources. Cloud computing will reduce the deployment time of the company’s computing environment. The computing resources in cloud services are ready for any service consumer. Large enterprises which already have their own server in an office building, they can benefit from cloud service by adding this service as an extension of their computing resources. For example, a large web store will commonly have a huge amount of Internet traffic is steady and relatively less. In this case, the enterprise can use their server for Internet traffic during weekdays. As for the extra traffic at Christmas time, the cloud service allows the enterprise to rent extra computing resources to maintain the quality of their web store service.

With such the cloud service market on such a large scale, there are countless cloud service providers for an enterprise to choose from. There is obviously a need for an evaluation standard to help enterprises find the most suitable cloud service provider. To define our evaluation model, first we need to discuss the essential factors of an enterprise cloud. Based on the essential factors of an enterprise cloud, a more detailed evaluation model for an enterprise cloud is defined. After that, we create a web-based enterprise cloud selection application ECSS (Enterprise Cloud Selection System) to test the accuracy and reliability of our enterprise cloud evaluation model.

RELATED WORKS

What is cloud computing? There are numeros ways to describe this new technology. We can think of cloud computing as a way to deliver computing as a resource to required users over a network, which is usually the Internet. Computing resources, information and fundamental hardware can be shared to users with devices that have access to the network. For an enterprise, cloud computing can be seen as a way to improve the robustness of their company. In Armbrust et al. (2009), a detailed view of cloud computing is presented. The cost of moving into cloud computing is discussed and the cost of maintaining traditional computing resources and renting cloud computing resources are compared. Some of the essential features of cloud computing are briefly discussed in Xu (2012). In Lombardi (2011), the security issues of cloud computing are discussed and a solution is proposed. In Paquette (2010), Cody (2008), Subashini (2011), and Zissis (2012), more information is discussed with regard to the security issues of cloud computing. Information related to the contractual and legal issues of cloud services are mentioned in Parrilli (2010). In Khajeh-Hosseini (2010), the cost of cloud computing is discussed from the cloud service provider’s and cloud service consumer’s perspective. The strength, weaknesses, opportunities and threats of cloud computing are identified in Marston (2011). The advantages for enterprises to embrace cloud computing are discussed in Rosenthal (2010), Sultan (2011). More advantages of cloud computing are written about in Sultan (2010).

In Rimal (2011), they have proposed a new classified model about end-users and enterprise requirements. There are three perspectives including service providers, enterprise, and end-users in this model. That is to say, the paper discusses requirements of three parties. From the provider’s view, the high efficiency of the service is very important. If the service has low efficiency, it means the service cannot load balancing and data management. Therefore, load balancing and data management mechanism are the key features when enterprises want to change to Cloud providers. In here, providers offer three types of service model as factors as selected Cloud service. From the enterprise’s view, they may provide many different kinds of services to general customers, so there is many users’ privacy information or company’s confidential data. Enterprises must ensure user’s service level agreement and adapt to different situation that is why security, scalability, and QoS must be given priority. From the
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