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A Profit Maximization Scheme With Guaranteed Quality Of Service In Cloud Computing

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Abstract:

An effective and efficient way to provide computing resources and services to customers on demand, cloud computing has become more and more popular. From cloud service providers' perspective, profit is one of the most important considerations, and it is mainly determined by the configuration of a cloud service platform under given market demand. However, a single long-term renting scheme is usually adopted to configure a cloud platform, which cannot guarantee the service quality but leads to serious resource waste. In this paper, a double resource renting scheme is designed firstly in which short-term renting and long-term renting are combined aiming at the existing issues. This double renting scheme can effectively guarantee the quality of service of all requests and reduce the resource waste greatly. Secondly, a service system is considered as an M/M/m+D queuing model and the performance indicators that affect the profit of our double renting scheme are analyzed, e.g., the average charge, the ratio of requests that need temporary servers, and so forth. Thirdly, a profit maximization problem is formulated for the double renting scheme and the optimized configuration of a cloud platform is obtained by solving the profit maximization problem. Finally, a series of calculations are conducted to compare the profit of our proposed scheme with that of the single renting scheme. The results show that our scheme can not only guarantee the service quality of all requests, but also obtain more profit than the latter.

1. INTRODUCTION

Cloud computing is quickly becoming an effective and efficient way of computing resources. By centralized management of resources and services, cloud computing delivers

hosted services over the Internet. Cloud computing is able to provide the most cost-effective and energy-efficient way of computing resources management. Cloud computing turn's information technology into ordinary commodities and utilities by using the pay-peruse pricing model. A service provider rents resources from the infrastructure vendors, builds appropriate multi server systems, and provides various services to users. A consumer submits a service request to a service provider, receives the desired result from the service provider with certain service-level agreement. Then pays for the service based on the amount of the service and the quality of the service. A service provider can build different multi server systems for different application domains, such that service requests of different nature are sent to different multi server systems. Owing to redundancy of computer system networks and storage system cloud may not be reliable for data, the security score is concerned. In cloud computing security is tremendously improved because of a superior technology security system, which is now easily available and affordable. Applications no longer run on the desktop Personal Computer but run in the cloud. This means that the PC does not need the processing power or hard disk space as demanded by traditional desktop software. Powerful servers and the like are no longer required. The computing power of the cloud can be used to replace or supplement internal computing resources. Organizations no longer have to purchase computing resources to handle the capacity peaks. Cloud computing is quickly becoming an effective and efficient way of computing resources. By centralized management of resources and services, cloud computing delivers hosted services over the Internet. Cloud computing is able to provide the most cost-effective and energy-efficient way of computing resources management. Cloud computing turn's information technology into ordinary commodities and utilities by using the pay-per-use pricing model. A service provider rents resources from the infrastructure vendors, builds appropriate multi server systems, and provides various services to users. A consumer submits a service request to a service provider, receives the desired result from the service provider with certain service-level agreement. Then pays for the service based on the amount of the service and the quality of the service. A service provider can build different multi server systems for different application domains, such that service requests of different nature are sent to different multi server systems. Owing to redundancy of computer system networks and

storage system cloud may not be reliable for data, the security score is concerned. In cloud computing security is tremendously improved because of a superior security system, which is now easily available and affordable. Applications no longer run on the desktop Personal Computer but run in the cloud. This means that the PC does not need the processing power or hard disk space as demanded by traditional desktop software. Powerful servers and the like are no longer required. The computing power of the cloud can be used to replace or supplement internal computing resources. Organizations no longer have to purchase computing resources to handle the capacity peaks.

2. LITERATURE SURVEY

Existing clouds focus on the provision of web services targeted to developers, such as Amazon Elastic Compute Cloud (EC2) [4], or the deployment of servers, such as Go Grid [1]. Emerging clouds such as the Amazon Simple DB and Simple Storage Service offer data management services. Optimal pricing of cached structures is central to maximizing profit for a cloud that offers data services. Cloud businesses may offer their services for free, such as Google Apps [2] and Microsoft Azure [3] or based on a pricing scheme. Amazon Web Service (AWS) clouds include separate prices for infrastructure elements, i.e. disk space, CPU, I/O and bandwidth. Pricing schemes are static, and give the option for pay as-you-go. Static pricing cannot guarantee cloud profit maximization. The cloud caching service can maximize its profit using an optimal pricing scheme. This work proposes a pricing scheme along the insight that it is sufficient to use a simplified price-demand model which can be re-evaluated in order to adapt to model mismatches, external disturbances and errors, employing feedback from the real system behavior and performing refinement of the optimization procedure. Overall, optimal pricing necessitates an appropriately simplified price-demand model that incorporates the correlations of structures in the cache services

3 PROFIT MAXIMIZATION IN CLOUD COMPUTING

From this Paper We ReferredWe have proposed a pricing model for cloud computing which takes many factors into considerations, such as the requirement r of a service, the workload of an application environment, the configuration (m and s) of a multi-server system, the service level agreement c, the satisfaction (r and s) of a consumer, the quality (W and T) of a service, the

penalty d of a low-quality service, the cost of renting, the cost of energy consumption, and a service provider's margin and profit a. By using an M/M/ m queuing model, we formulated and solved the problem of optimal multiserver configuration for profit maximization in a cloud computing environment. Our discussion can be easily extended to other service charge functions. Our methodology can be applied to other pricing models. At three-tier cloud structure, which consists of infrastructure vendors, service providers and consumers, the latter two parties are particular interest to us. Clearly, scheduling strategies in this scenario should satisfy the objectives of both parties. Our contributions include the development of a pricing model using processor-sharing for clouds, the application of this pricing model to composite services with dependency consideration, and the development of two sets of profit-driven scheduling algorithms. From this Paper We ReferredA pricing model is developed for cloud computing which takes many factors into considerations, such as the requirement r of a service, the workload of an application environment, the configuration (m and s) of a multi-server system, the service level agreement c, the satisfaction (r ands0) of a consumer, the quality (W and T) of a service, the penalty d of a low-quality service, the cost of renting, the cost of energy consumption, and a service provider's margin and profit. And this will schedules the job according to optimization of speed and size of the input hereby maximizing the profit. •

4. PROPOSED MECHANISM

In this section, we first propose the Double-QualityGuaranteed (DQG) resource renting scheme which combines long-term renting with short-term renting. The IJARCCE ISSN (Online) 2278-1021 ISSN (Print) 2319 5940 International Journal of Advanced Research in Computer and Communication Engineering Vol. 4, Issue 12, December 2015 Copyright to IJARCCE DOI 10.17148/IJARCCE.2015.41294 403 main computing capacity is provided by the long-term rented servers due to their low price. The short-term rented servers provide the extra capacity in peak period Advantages: In proposed system we are using the Double-QualityGuaranteed (DQG) renting scheme can achieve more profit than the compared Single-Quality-Unguaranteed (SQU) renting scheme in the premise of guaranteeing the service quality completely. Cloud Computing: Cloud computing describes a type of outsourcing of computer services, similar to the way in which the supply of electricity is outsourced. Users can simply use it. They do not

need to worry where the electricity is from, how it is made, or transported. Every month, they pay for what they consumed. The idea behind cloud computing is similar: The user can simply use storage, computing power, or specially crafted development environments, without having to worry how these work internally. Cloud computing is usually Internet-based computing. The cloud is a metaphor for the Internet based on how the internet is described in computer network diagrams; which means it is an abstraction hiding the complex infrastructure of the internet. It is a style of computing in which IT-related capabilities are provided "as a service", allowing users to access technology-enabled services from the Internet ("in the cloud")without knowledge of, or control over the technologies behind these servers. Queuing model: We consider the cloud service platform as a multiserver system with a service request queue. The clouds provide resources for jobs in the form of virtual machine (VM). In addition, the users submit their jobs to the cloud in which a job queuing system such as SGE, PBS, or Condor is used. All jobs are scheduled by the job scheduler and assigned to different VMs in a centralized way. Hence, we can consider it as a service request queue. For example, Condor is a specialized workload management system for compute intensive jobs and it provides a job queuing mechanism, scheduling policy, priority scheme, resource monitoring, and resource management. Users submit their jobs to Condor, and Condor places them into a queue, chooses when and where to run them based upon a policy. An M/M/m+D queuing model is build for our multiserver system with varying system size. And then, an optimal configuration problem of profit maximization is formulated in which many factors are taken into considerations, such as the market demand, the workload of requests, the server-level agreement, the rental cost of servers, the cost of energy consumption, and so forth. The optimal solutions are solved for two different situations, which are the ideal optimal solutions and the actual optimal solutions. Business Service Providers Module: Service providers pay infrastructure providers for renting their physical resources, and charge customers for processing their service requests, which generates cost and revenue, respectively. The profit is generated from the gap between the revenue and the cost.In this module the service providers considered as cloud brokers because they can play an important role in between cloud customers and infrastructure providers ,and he can establish an indirect connection between cloud customer and infrastructure providers.

Infrastructure Service Provider Module: In the three-tier structure, an infrastructure provider the basic hardware and software facilities. A service provider rents resources from infrastructure providers and prepares, a set of services in the form of virtual machine (VM). Infrastructure providers provide two kinds of resource renting schemes, e.g., long-term renting and short-term renting. In general, the rental price of long-term renting is much cheaper than that of short-term renting. Cloud Customers: A customer submits a service request to a service provider which delivers services on demand. The customer receives the desired result from the service provider with certain service-level agreement, and pays for the service based on the amount of the service and the service quality.

5. CONCLUSION

Maximize the profit of service providers, this paper has proposed a novel Double-Quality-Guaranteed (DQG) renting scheme for service providers. This scheme combines short-term renting with long-term renting, which can reduce the resource waste greatly and adapt to the dynamical demand of computing capacity. An M/M/m+D queuing model is build for our multiserver system with varying system size. And then, an optimal configuration problem of profit maximization is formulated in which many factors are taken into considerations, such as the market demand, the workload of requests, the server- agreement, the rental cost of servers, the cost of energy consumption, and so forth. The optimal solutions are solved for two different situations, which are the ideal optimal solutions and the actual optimal solutions. In addition, a series of calculations are conducted to compare the profit obtained by the DQG renting scheme with the Single-Quality-Unguaranteed (SQU) renting scheme. The results show that our scheme outperforms the SQU scheme in terms of both of service quality and profit.

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