ISSN: 2278 – 7798
International Journal of Science, Engineering and Technology Research (IJSETR)
Volume 5, Issue 6, June 2016

# Integration of Multi-Server for Profit Maximization with Guaranteed QoS in Cloud Computing

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*Abstract*— **To maximize profits, a service provider must include both the services and costs of enterprises, and how they are determined by the characteristics of the application and configuration of a system of multiple servers. implemented pricing model takes such factors into considerations such as the amount of a service, the configuration of a system of multiple servers, the workload of an application environment, the service-level agreement, consumer satisfaction, the quality of service, the penalty of a low quality service, the operating cost, the cost of energy consumption, and the margin and the benefit of a service provider. The approach is to treat a system of multiple servers as a queuing model, so that the optimization problem can be formulated and solved analytically. Two models of server speed and power consumption are considered, namely, the model idle speed and model constant speed. The payload is expected to a service request is calculated. Business net income is expected in a time unit is obtained. Numerical calculations on the optimal size of the server and the optimal server speed are apparent.**

***Index Terms— Multi-server framework, queuing model, optimal size, optimal server speed, service-level agreement (SLA).***

## I. INTRODUCTION

As an effective and efficient way to consolidate computing resources and IT services way, cloud computing has become more and more popular. Cloud computing becomes in information technology goods and ordinary public services and the pricing model pay per use. In an environment of cloud computing, there are always three levels, ie, infrastructure providers, service providers and customers. An infrastructure provider maintains the basic hardware and software services. A service provider rents resources infrastructure providers and provides services to customers. A client sends a request to a service provider and pay for it based on the quantity and quality of service.

Cloud computing is a large-scale distributed computing paradigm in which a pool of computing resources is available to users via the Internet. Computing resources, e.g., processing control, storage, software, and network bandwidth, are represent to cloud consumers as the accessible public utility services. Infrastructure- as-a-Service is a computational service model widely applied in the cloud computing theory. In the model, virtualization technology can be used to provide resources to cloud consumers. The consumers can identify the required software load, e.g., operating systems and applications; then package them all together into virtual machines. The hardware requirement of VMs can also be adjusted by the consumers. The VMs will be outsourced to host in computing environments operated by third-party sites owned by cloud providers. A cloud provider is responsible for guarantee the Quality of Services for running the VMs. Since the computing resources are maintain by the donor, the total cost of ownership to the consumers can be bargain. In cloud computing, a resource provisioning mechanism is required to supply cloud consumers a set of computing resources for processing the jobs and storing the data. Cloud provider can offer cloud consumers two resource provisioning plans, namely short-range on-demand and long-term reservation plans. Amazon EC2 and GoGrid are, for instance, cloud providers which offer IaaS services with both plans. In general, pricing in

ISSN: 2278 – 7798
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on-demand plan is charged by pay-per-use basis. Then, purchasing this on-demand plan, the consumers can dynamically provision resources at the moment when the resources are needed to fit the fluctuated and changeable demands. For reservation plan, pricing is charged by a onetime fee typically before the computing resource will be utilized by cloud consumer. With the reservation plan, the cost to utilize resources is cheaper than that of the on-demand plan. In this way, the consumer can decrease the cost of computing resource provisioning by using the reservation plan. For example, the reservation plan accessible by Amazon EC2 can reduce the total provisioning cost up to 49 percent when the reserved resource is fully utilized.

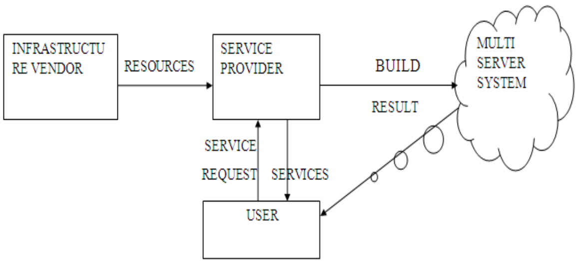


**Figure 1: Amazon EC2 Service Provider**

## II. 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.

## III. Proposed System

The Double-Quality-Guaranteed (DQG) is a renting scheme which combines the long-term renting with short-term renting scheme. The computing capacity is provided by the long-term rented servers because of their low price. The short-term rented servers provide the extra capacity in peak period.

In proposed system we are using the Double-Quality-Guaranteed (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.

### *Advantages of proposed system*

In proposed system we are using the Double-Quality-Guaranteed (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.

## IV. Architecture

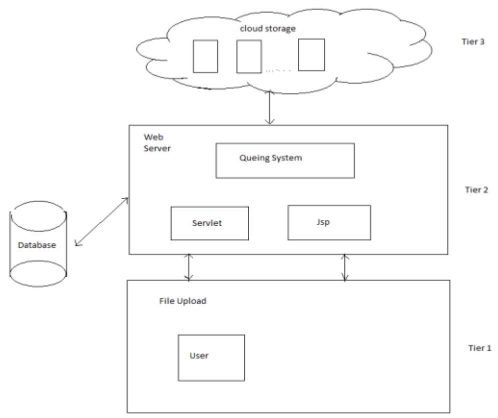


**Figure 2: Cloud Architecture**

## V. Implementation of Modules

### *A. A Multiserver Model*

### *B. Power Consumption Model*

➢ **Server Configuration**

- **Task scheduling**

### *A. A Multiserver Model*

They have proposed a pricing model for cloud computing which takes many factors into considerations, such as the requirement of a check, the workload of an application environment, the configuration (m and s) of a multi server system, the service stage agreement c, the satisfaction (r and0) of a consumer, the quality (W and T) of a service, the price of a low-quality service, the cost and m of renting, the cost (P and P) of energy utilization, and a service provider's margin and profit. The cloud caching service can maximize its profit using an optimal pricing scheme. Optimal pricing necessitate an appropriately simplified price-demand model that incorporates the correlations of structures in the cache services. Provides a multi-cloud service for an e-search application that achieves optimal pricing for the products available in different cloud services (like Amazon, Azure, eBay, etc)in a clustered environment. This work propose a novel pricing scheme designed for a cloud cluster that offers inter-querying services and aims at the maximization of the cloud profit. An appropriate price demand and formulate the optimal pricing problem.

### *B. Power Consumption Model*

The power consumption of a server has been modeled into two different ways: offline and online. In the first case, Simple Power, Watt Software Mambo estimates the energy consumption of an entire server. However these models use analytical methods based on low-level information such as the number of CPU cycles used. The main advantage is that they provide high accuracy. The disconnected nature of such models requires extensive simulation, resulting in a significant amount of time to estimate power consumption. Therefore, these models are not feasible to predict the energy consumption of highly dynamic environments such as cloud computing data centers. To overcome this problem, a line is proposed (runtime) methodology. These models are based on information monitored through performance counters. These counters monitor the activities performed by applications such as the number of accesses (to Caches) and switching activities within the processors.

- ***Server Configuration***

*Plan Reservation*- In reservation plan, the cloud uses reserve the cloud in advance for their requirements.

***a. Space Utilization*** -The space timing calculates by the reference of cloud usage. That is, the cost also calculates based on cloud space utilization and cloud usage.

***b. Analysis of Performance*** -We analyze and compare the performance offered by different configurations of the computing collect, focused in the execution of loosely coupled applications. In particular, we have chosen nine different cluster configurations with different number of worker nodes from the three clouds**.** Providers and different number of Jobs (depending on the cluster size), as shown in the definition of the different cluster configurations, we use the following acronyms infrastructure; Amazon EC2 Europe cloud AmazonEC2 US cloud and flexible Hosts cloud. The number preceding the site acronym represents the number of worker nodes. For example, is a cluster with four worker nodes deployed in the local infrastructure; and is an eight-node cluster, four deploy in the local infrastructure and four in Amazon. To represent the execution profile of loosely coupled applications, the will use the Embarrassingly Distributed benchmark from the Numerical Aero dynamic Simulation Benchmarks.

***c. Analyzing the Priority*** The want to enable the use of large-scale distributed systems for task-parallel applications, which are linked into useful workflows through the looser task coupling model of passing data via files between dependent tasks .This potentially larger class of task-parallel quality Extraction. The need to expand the computational resources in a massive surveillance network is clear but traditional means of purchasing new equipment for short-term tasks every year is inefficient. In this work I will provide evidence in support of utilizing a cloud computing infrastructure to perform computationally intensive feature extraction tasks on data streams. Competent off-loading of computational tasks to cloud resources will involve a minimization of the Time needed to expand the cloud resources, an professional model of communication and a study of the interaction between the in-network computational resources and remote resources in the cloud.

- ***Task Scheduling***

Each and every user assigns the task to cloud, so that task will assign to the cloud in priority scheduling basis or if anyone cloud is free mean, user job assign to that cloud

## VI. Conclusion

The combination of short-term renting with long-term renting forms Double-Quality-Guaranteed (DQG) renting scheme, which can reduce the resource waste eventually and adapt to the dynamical demand of computing capacity.The profit maximization problem is formulated in a homogeneous cloud environment, because the analysis of a heterogeneous environment is much more complicated than that of a homogenous environment.

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