



# **Profit Maximization Mechanism with Guaranteed Quality of Service in Cloud Computing**

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**ABSTRACT:** A successful and effective approach to give registering assets and administrations to clients on interest, distributed computing has turned out to be increasingly famous. From cloud administration suppliers' point of view, benefit is a standout amongst the most critical contemplations, and it is for the most part controlled by the design of a cloud administration stage under given business sector request. Be that as it may, a solitary long haul leasing plan is normally received to arrange a cloud stage, which can't promise the administration quality yet prompts genuine asset waste. In this paper, a twofold asset leasing plan is outlined firstly in which transient leasing and long haul leasing are joined going for the current issues. This twofold leasing plan can adequately ensure the nature of administration of all solicitations and decrease the asset squander incredibly. Besides, an administration framework is considered as a M/M/m+D lining model and the execution markers that influence the benefit of our twofold leasing plan are examined, e.g., the normal charge, the proportion of solicitations that need interim servers, et cetera. Thirdly, a benefit augmentation issue is defined for the twofold leasing plan and the upgraded design of a cloud stage is gotten by tackling the benefit amplification issue. At long last, a progression of computations is directed to look at the benefit of our proposed plan with that of the single leasing plan. The outcomes demonstrate that our plan cannot just ensure the administration nature of all solicitations, additionally get more benefit than the last mentioned.

**KEYWORDS:** Cloud computing, multi-server system, pricing model, profit, queuing model, server configuration service charge, service-level agreement, waiting time.

## **I. INTRODUCTION**

Distributed computing is rapidly turning into a viable and productive method for figuring assets. By incorporated administration of assets and administrations, distributed computing conveys facilitated administrations over the Internet. Distributed computing can give the most financially savvy and vitality effective method for figuring assets administration.[6] Distributed computing transform's data innovation into conventional products and utilities by utilizing the pay-per-use evaluating model. An administration supplier rents assets from the base merchants, manufactures suitable multi server frameworks, and gives different administrations to clients. A shopper presents an administration solicitation to an administration supplier, the fancied result from the administration supplier with certain administration level understands.[1] At that point pays for the administration in light of the measure of the administration and the nature of the administration. An administration supplier can manufacture diverse multi server frameworks for various application spaces, such that administration solicitations of various natures are sent to various multi server frameworks. Attributable to repetition of PC framework systems and capacity framework cloud may not be dependable for information, the security score is concerned. In distributed computing security is massively enhanced as a result of a predominant innovation security framework, which is currently effectively accessible and moderate. Applications no more keep running on the desktop Personal Computer however keep running in the cloud. This implies the PC does not require the handling power or hard circle space as requested by customary desktop programming.



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Effective servers and so forth are no more required. The processing force of the cloud can be utilized to supplant or supplement inner figuring assets. Associations no more need to buy registering assets to handle the limit tops. [5] Distributed computing is rapidly turning into a compelling and productive method for registering assets. By brought together administration of assets and administrations, distributed computing conveys facilitated administrations over the Internet. Distributed computing can give the most financially savvy and vitality productive method for figuring assets administration. Distributed computing transform's data innovation into normal things and utilities by utilizing the pay-per-use estimating model. An administration supplier rents assets from the foundation sellers, fabricates suitable multi server frameworks, and gives different administrations to clients.[6] A customer presents an administration solicitation to an administration supplier, gets the wanted result from the administration supplier with certain administration level assertion. At that point pays for the administration taking into account the measure of the administration and the nature of the administration. An administration supplier can fabricate diverse multi server frameworks for various application areas, such that administration solicitations of various natures are sent to various multi server frameworks. Inferable from repetition of PC framework systems and capacity framework cloud may not be solid for information, the security score is concerned.[2] In distributed computing security is massively enhanced on account of a predominant innovation security framework, which is currently effortlessly accessible and reasonable. Applications no more keep running on the desktop Personal Computer yet keep running in the cloud. This implies the PC does not require the preparing power or hard circle space as requested by customary desktop programming. Effective servers and so forth are no more required. The registering force of the cloud can be utilized to supplant or supplement inner figuring assets. Associations no more need to buy registering assets to handle the limit crests.[9]

## 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. RELATED WORK

### 1. PROFIT MAXIMIZATION IN CLOUD COMPUTING

#### From this Paper We Referred-

We 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  $M/M/1$  queuing model, we formulated and solved the problem of optimal multi-server 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.

### 2. SURVEY PAPER FOR MAXIMIZATION OF PROFIT IN CLOUD COMPUTING

#### From this Paper We Referred-



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A 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 ( $r$  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. And this will schedule the job according to optimization of speed and size of the input hereby maximizing the profit.

### 3. A REVIEW OF SAAS PROFIT MAXIMIZATION IN CLOUD COMPUTING

#### From this Paper We Referred-

Cloud computing is the technology of the next generation which unifies everything into one. It is an on demand service because it offers dynamic flexible resource allocation for reliable and guaranteed services in pay use manner to users. The review shows that SaaS is very important layer in cloud computing because all the allocation of resources to the application is done by SaaS providers. This paper focused on the review of customer requests for SaaS providers with the explicit aim of cost minimization or to increase the profit with dynamic demands handling. An effective strategy is required for achieving user satisfaction and maximizing the profit for cloud service providers. This paper discusses just about the review of SaaS layer in cloud computing based on the QoS parameter and SLA.

### 4. INTEGRATION OF MULTISERVER FOR PROFIT EFFICIENCY IN CLOUD COMPUTING

#### From this Paper We Referred-

They have proposed a pricing model for cloud computing which takes many factors into consideration, such as the requirement  $r$  of a check, the workload of an application Environment, the configuration ( $m$  and  $s$ ) of a multi-server system, the service level concurrence  $c$ , the satisfaction ( $r$  and  $s$ ) of a consumer, the quality ( $W$  and  $T$ ) of a service, the price  $d$  of a low-quality service, the cost of renting, the cost of energy consumption, and a cloud service provider's margin and earnings  $a$ . By using an  $M/M/m$  queuing model, the formulated and solved the problem of optimal multi server configuration for profit maximization in a cloud computing environment. The discussion can be easily extended to other service charge functions.

### V. COMPARISON OF EXISTING AND PROPOSED

EXISTING SYSTEM	METHODS	ADVANTAGES	DISADVANTAGES
Scheduling Parallel Application on Utility Grids: Time and Cost Trade-off.	simplest Deadline Scheduler Operates two modes a)Capped b)NonCapped	Resource allocation in cloud environment can be performed automatically and dynamically Cost stays under the budget. The model can be trained on one system and then applied on different system effectively	Problem with dynamic approach is high runtime overhead. Only on-demand pricing model is user Consumers only get profit.
Scheduling Workflows with Budget Constrains	Meta scheduling Min-Min cost time tradeoff Max-max cost time tradeoff	Minimize the cost Tradeoff factor indicating level of cost for users	User get benefit not for service provider. power consumption is not considered Based only on pay on demand pricing model. Other pricing model is not considered
Resource provisioning with Budget Constrains for Adaptive Application in Cloud Computing	Loss and Gain Approach	Budget constraints are satisfied. Simple to execute Better makespan is build	Only considering the time and cost OS and other parameters are not considering. Loss approach takes more time.
Prediction of Job Resource Requirements for Deadline Schedulers to Manage High-level SLAs on Cloud	a)Self adjusting predictor b)Analytical predictor	It contains two predictors. if SAP is not trained, Analytical predictor schedules. It will be executed before the deadline. Predict the CPU for jobs	Cost is not considering. Considering only the execution time. Other parameters are not considering.
BAG- of -Tasks Scheduling under Budget Constraints.	Budget constrained scheduler	does not exceed the budget user can determine the budget	Quality of service is not considered. user only get benefit.

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## VI. PROPOSED MECHANISM

In this section, we first propose the Double-Quality- Guaranteed (DQG) resource renting scheme which combines long-term renting with short-term renting. The 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-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.

## VII. ARCHITECTURE

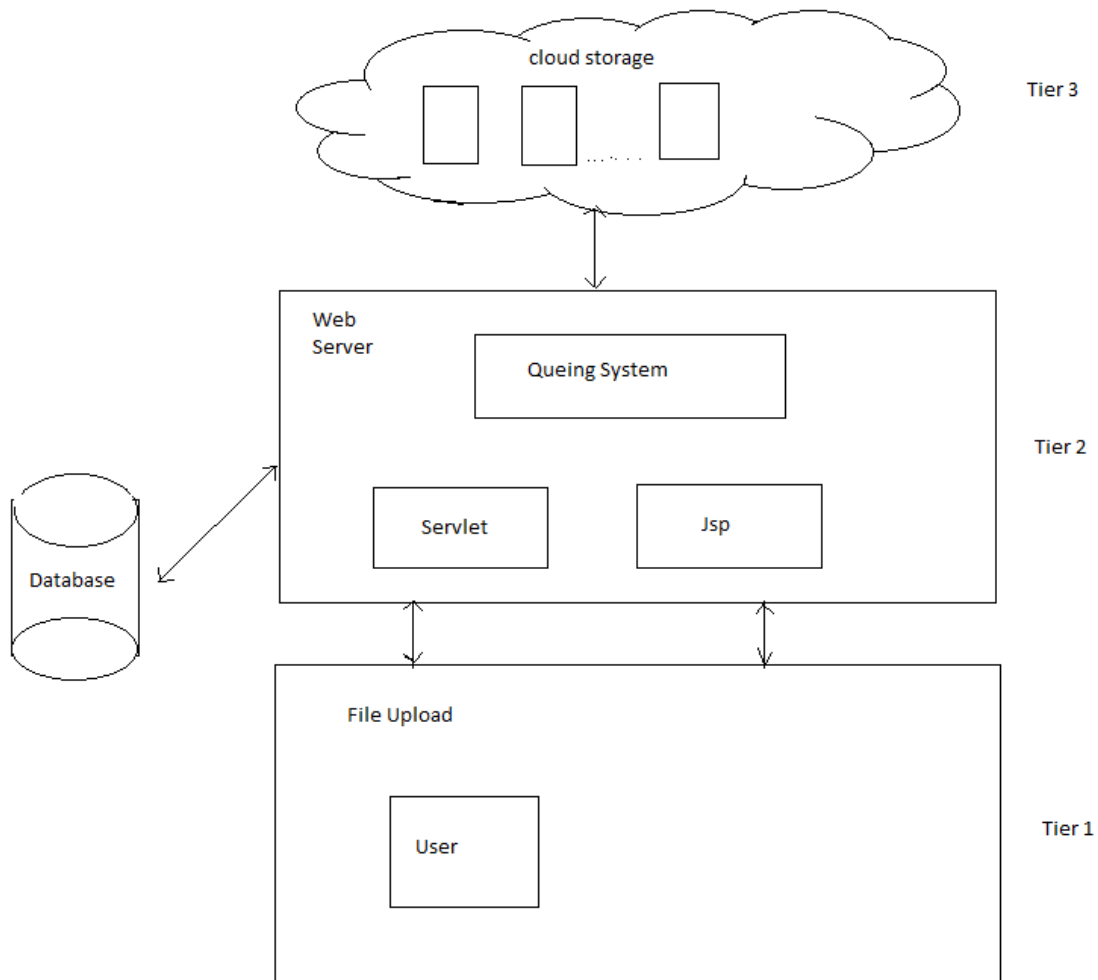


Fig No. 01 System Architecture



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## VIII. IMPLEMENTATION OF MODULES

### 1. 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.

### 2. 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 built 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.

### 3. 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 are 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.

### 4. Infrastructure Service Provider Module:

In the three-tier structure, an infrastructure provider provides 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.



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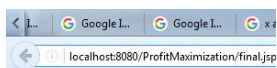
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## IX. COMPARISION AND GRAPGHS

Cost (GB) Vs VM in Cloud

Round Robin for VM Workload-6.9GB



NO	COST IN GB	DAY
1	2.5	VM2
2	3.5	VM1
3	7	VM3

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## X. 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+Dqueuing 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. 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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