Efficient Scheme for Profit Maximization and QoS to Clients in Cloud

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ABSTRACT

As a successful and proficient approach to provide computing resources to clients on interest, cloud computing has turned out to be more prominent. In existing approach a single long term renting scheme is normally embraced to design a cloud stage. In this project, a double resource renting scheme is composed firstly in which provides short term leasing and long term leasing. It provides Quality of Service for all client requests as well as reduces the resource wastage. Another component named as M/M/m+D queuing model which calculates the average charge and ratio requests for clients. Finally optimization of cloud platform which minimizes the profit maximization problem. Eventually proposed scheme gives better quality service to clients and maximizes the profits for cloud resource providers.

Keywords:- Cloud Computing, Multiserver System, Profit Maximization, Service level Agreement, Payment Minimization.

I.INTRODUCTION

Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet). The name comes from the common use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation. Cloud computing consists of hardware and software resources made available on the Internet as managed third-party services. These services typically provide access to advanced software applications and high-end networks of server computers.[1]

Cloud computing turns IT into ordinary utilities by the pay-per-use price modelling. In cloud computing environment there are always three services namely infrastructure providers, service providers, and customers. In infrastructure providers deals with hardware and software facilities. A service provider provides resources from the infrastructure providers and provides customer services. A customer requests its request to a service provider and pays amount for the quality of the provided service. In this proposed work the Multiserver configuration of a service provider so that its profit is maximized.

The benefit of service provider in cloud computing is related to two tiers, which are cost and revenue. The cost is the payment to the infrastructure providers along with electricity bill caused by energy consumption, and the revenue is the service charge to the customer.[1]

A service provider generally takes a single ending scheme i.e, the servers in the service system are all long-term rented. There are limited number of servers, some of the incoming service requests cannot be processed immediately so there are inserted into a queue until it is handled by any server because the waiting time of the server cannot be too long because they has to satisfy quality of service requirements which is determined by a service-level agreement.

II .RELATED WORK

Service providers profit is related with many factors like cost, demand in market, configuration of system, satisfaction of customers. The pricing strategies are divided into two parts, static pricing and dynamic pricing. Static pricing relates to the price of server requests is fixed and it doesn't change with the conditions. In dynamic pricing a service provider delays the pricing after the customer demand is revealed.

A.Cloud System Model

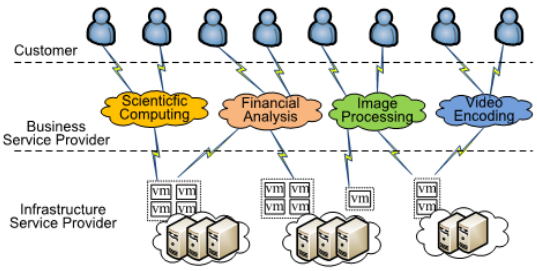

Fig 1: Three tier cloud structure

Cloud structure has three different parties, infrastructure providers, service providers and customers. Infrastructure providers provide two kinds of resource renting schemes, long term renting and short term renting.[fig1] Rental price of long-term renting is much cheaper than short term renting. Service provider provides Service level agreement, and pay for the service. The profit is calculated by the difference between cost and revenue.

B. Multi-server model

In three tier architecture system, a cloud service provider provides customers request to a service requests by using a multiserver system. In the multiserver system, first-come-first-served(FCFS) queuing model is used.

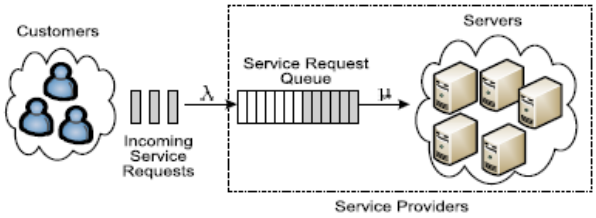

Fig 2: the multiserver system model,where service requests are first placed in a queue before they are processed by any servers.

Cloud computing platform such as Amazon EC2, IBM blue cloud, private clouds, there are lot of nodes managed by the cloud managers like Calyptus,OpenNebula, Nimbus. The cloud provides virtual machines for job resources. The user may submit their jobs in cloud in queuing system such as SGE, PBS or Condor. [fig2]

III. QUALITY GAURENTEED SCHEME

First use a renting scheme named as the Double Quality Guaranteed renting scheme which provides both short term leasing and long term leasing. The DQG scheme follows the general FCFS queuing scheme.A M/M/m+D queuing model is used for calculating waiting time between the requests.

C. Proposed Scheme

In this section, a Payment Minimization Error-Tolerant Algorithm is proposed to minimize the payment to clients in terms of minimal rent by reducing the wastage of resources. Payment minimization Error tolerant algorithm mainly focuses on customer perspective. A novel resource allocation algorithm for cloud system that supports VM-multiplexing technology, aiming to minimize user's payment on his task and also endeavour to guarantee its execution deadline. When the resources provisioned are relatively sufficient, we can guarantee task's execution time always within its deadline even under the wrong prediction about task's workload characteristic.

A. ALGORITHM

Payment minimization Error-tolerant Algorithm

R=Execution Dimension,
Bk=Price Vector,
Rk=Resource Vector,
Lk=Workload Vector,
D=Deadline,
Ak=Available Vector

Input: D(ti);
Output: execution node ps , r*(ti)

- Γ =Π, C=D (ti), r*=ϕ (empty set);
- Repeat
- rΓ* (ti , ps) = CO-STEP (Γ,c);
- on Γ*
- Ω = dk/ dk Є Γ & $r\ k(*)$ (ti , ps) > ak(ps)};
- Γ =Γ\ Ω/*Γ take away Ω* /
- C= C –θ $l\ k\ a\ k\ d\ k\ \epsilon\Omega$ /* Update C* /
- r* (ti , ps) = r* (ti , ps) U ($r\ k(*)$ = ak(ps)|dk Є Ω& ak(ps)
- is dk _s upper bound};
- until (Ω =ϕ);
- `r* (ti , ps) = r* (ti , ps) U rΓ* (ti , ps)
- end for
- Select the smallest p(ti) by traversing the candidate solution set;
- Output the selected node ps and resource allocation r*(ti,ps);

B.RESULTS

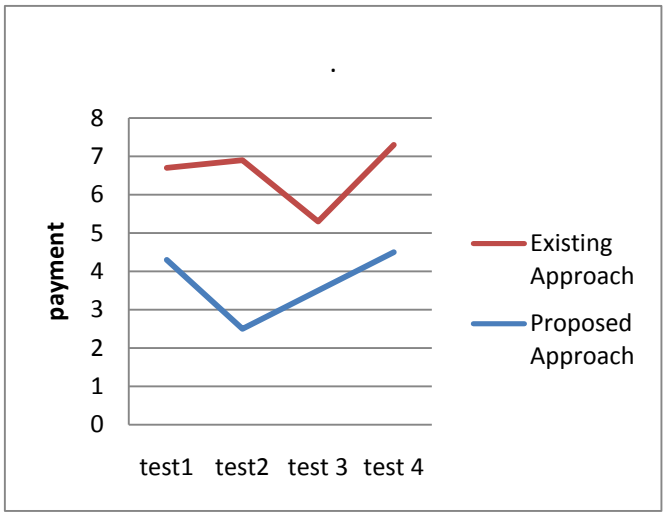

Fig 3: Resultant graph

This resulted graph indicates the performance of proposed approach which minimizes the payment for client services compared to existing approach.

IV. CONCLUSION

In order to guarantee the quality of service requests and 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 queueing 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. In this paper, we only consider the profit maximization problem in a homogeneous cloud environment, because the analysis of a heterogeneous environment is much more complicated than that of a homogenous environment. However, we will extend our study to a heterogeneous environment in the future.

FUTURE WORK

In this project, we just consider the benefit augmentation issue in a homogeneous cloud environment, in light of the fact that the investigation of a heterogeneous domain is a great deal more confounded than that of a homogenous domain. Notwithstanding, we will extend our study to a heterogeneous domain.

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