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A Framework to Provide Assured QoS on Increasing of Profit using Cloud Computing

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ABSTRACT: Cloud computing is a popular way of providing resources and services to end user on demand. The profit is the important aspect with good Quality of Service from Customer Service Providers perspective. It is mainly analysed by the configuration of cloud service platform on the basis of market demand. Usually single long-term renting scheme is taking on by various CSPs, which cannot provide assured Quality of Service but bring on the issue of resource wastage. Most of the techniques in improving Cloud Profit are having some performance issue to acqiure accuracy. The Methodology proposes system implements double renting scheme exclusively long term and then short term. The combination of short and long term renting scheme leads to the maximized profit service quality of all requests, and also obtains more profit than the traditional way.

KEYWORDS: Cloud Service Providers (CSPs), Service Level Agreement (SLAs), Double Renting Scheme, Fuzzy Logic.

I. INTRODUCTION

NOW a day's cloud computing is the most popular way to provide the resources and services. Cloud computing is the efficient and operative way of management of the resource allocation and services. And it distributes hosted services over the internet. The hardware, software, information and all resources are focused and provided to end user on-demand. Usually, the pay-per-use pricing model is used by the cloud computing. Cloud computing uses three tiers, i.e., infrastructure providers, cloud service providers, customers (see fig.1).

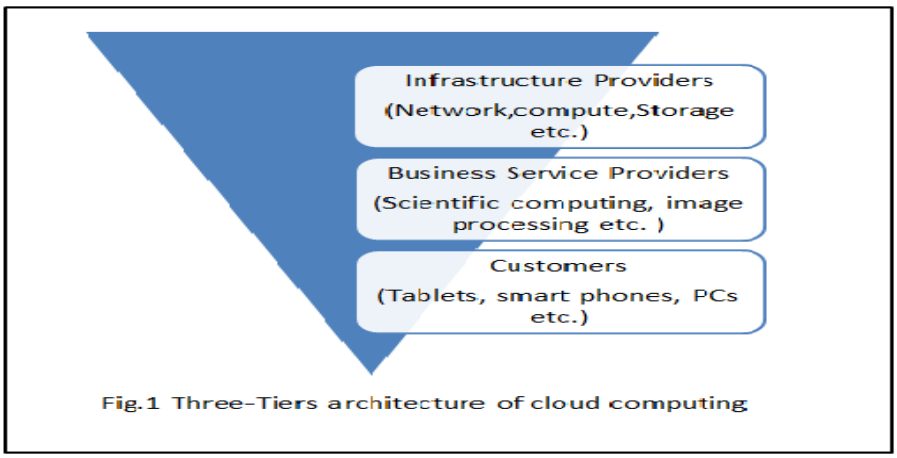

Fig.1 Three-Tiers architecture of cloud computing

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[1]Quality of Service plays a serious role in the effective reservations of the resources in the distributed system and widely used in the cloud computing and grid computing. [2] Usually infrastructure provider (Cloud owner) manages all the hardware and software facilities. A cloud service provider pays to infrastructure provider for resources and services and provides services to customers. Customers request for the services and pay for it based on the amount of data and the quality of the service. In many existing cloud system, they only consider the power consumption cost. As the important difference between existing models and ours, the resource rental cost is an important aspect as it affects the profit of the cloud service providers. Like all business, the profit of the service provider in associated with the two parts, i.e. cost and revenue. For CSPs, the cost is the renting cost paid to cloud owner plus electricity cost instigated by energy consumption. The cloud service provider rents a number of servers from cloud owner or infrastructure providers and creates various multiserver systems for various services domains. And each multiserver system is designed to serve particular service and application to the subscriber. [11] So the renting cost is proportional to the number of the multiserver systems . And electricity consumption of the multiserver systems depends on the number of servers, server utilization, and square of the speed 0of execution. The amount of service and quality of service are the factors which effect on the revenue. In the simple word, the profit of the cloud service provider is mainly determined by the configuration of its service platform. The traditional or existing models i.e. single resource renting scheme cannot assure the quality of all requests but wastes the huge amount of resources due to the workload of the system. So to resolve this weakness, the paper proposes the double renting scheme, which not only guarantees the QoS but also avoids the resource wastage. The double renting scheme is the combination of short-term renting scheme and long term renting pointing to the existing issues. The double renting scheme uses M/M/m+D queuing model and the performance indicators are analysed which effect on the double renting scheme. A fuzzy logic system is used; in general, a fuzzy logic is a reasoning structure that provides a means for converting linguistic strategies into control decisions. By using simple linguistic rules, it can attain a nonlinear mapping of an input space to an output space [9].
Basically, there are two types of pricing i.e. static and dynamic pricing. Static pricing simplest pricing which the fixes all price for whole time prospect. The cloud computing services are time dependent, so the time interval of the offered services is predetermined. This scheme provides pay-as-you-go. In pay as go scheme, the user pays for the query and has to pay only for how much resources are used. And in dynamic, there are two main criteria to decide the cost of the query. The first one is availability and the second is time horizon.

Overview of the paper is summarized as follows:

- The study and implementation of the double renting scheme which combines long-term renting scheme with the short-term renting scheme.
- A multiserver system adoption and performance indicators analysis i.e. the average service charge and ratio of the requests that needs long term or short term servers.
- The optimal models or algorithms are configured to maximize the profit of the cloud service provider i.e. the actual and ideal solutions are obtained respectively.
- The series of comparisons are given to analyze the performance of proposed system and existing system which results that proposed system can achieve more profit than the traditional system.

II. RELATED WORK

In this Section we study on the recent work related to the profit of the Cloud Service provider in the cloud computing with respect to various factors such as Market demand, pricing index, system configuration and Quality of service for end-user or customers. Generally CSP increases the rate of the service to maximize profit but in this case customer will lose their interest in services due to high rates, this will lead to loss in profit of the CSPs, hence selecting reasonable pricing strategy is the most important aspect for the CSP. Pricing strategy is categorized in two categories firstly the static pricing strategy and secondly dynamic pricing strategy.
In static pricing strategy the price of the service request is fix and known in advance. And it does not change with conditions. On the contrary in dynamic pricing strategy a service provider delays the pricing decision until the customer demand is revealed so that CSPs can adjust prices accordingly. Due to this the flat pricing strategy is adopted. In which the all requests are treated under fixed price but predominant pricing encourages waste and incompatible with service

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differentiation. There is another type of static pricing strategy i.e. usage-based pricing strategy, in this the price of the service request is proportional to the service time and task execution requirement i.e. measured by the number of instructions to be executed. It reveals that one can use resources more efficiently.

Second factor affecting on profit of CSP is customer's satisfaction which is determined by QoS and charges. One can use the service level agreement (i.e. SLA) to improve the QoS. The SLA adopts the price compensation mechanism for the customer satisfaction so that more customers are attracted. There various SLAs are adopted by the CSPs, i.e. step wise charge function with two steps if a service request is handled before the deadline it is normally charged, but if service request is not handled in before its deadline. Then it is dropped and CSPs pays for it due to penalty. And charge is decreased continuously with the increasing waiting time until charge is free, in this strategy we use a two-step charge function where the service request served with high quality are normally charged, and otherwise are served for free.

The profit is the main issue form CSPs point of view so there are various technique are used to boost the profit. [16]Recently a large work is done to reduce the energy cost to increase profit of CSP i.e. Server turning off technique and dynamic CPU clock frequency scaling are adopted to reduce energy cost.

This paper considered the cloud system as an M/M/R/k queuing model where all services requested that exceed its maximum capacity are rejected, in this a function is designed to find the optimal combination of the server size (R) and the queue capacity (k) [3] this paper describes cloud service platform as an M/m/m model and the problem of the optimal multiserver configuration is formulated and solved. This work is closer to our work but it uses the singe renting scheme to configure a multiserver system, which is not used by varying market demands and it leads to low service quality and huge resource waste. To overcome this drawback another technique is used i.e. cloud federation, with the help of federation there is a mutual collaboration of the complementary resources' requirement of different CSPs over time to share their respective resource in concern to fulfil each demand of the customer. And CSPs have responsibility to take intelligent decisions about utilization of the federation depending on various conditions that might be faced, which is complicated problem. [2] It explains the resource management and performance of resources such as processors memory storage and network in cloud computing and it describes the cloud and the heritage of grids in cloud computing, history, current state of QoS, commercial cloud adopters, and open source and virtualization technology in QoS. And at last propose some open source question. Mainly uses the methods of grids computing and virtualization. So virtualization leads to many challenges in the field of cloud. To overcome those challenges paper addresses the issues of QoS in nascent paradigm. [5]The paper abbreviates Profit-driven service request scheduling based on dynamic reuse (PSRSDR) to achieve the optimal request scheduling. Also, presents the cloud service request model with service level agreement (i.e. SLA) constraints and revenue function of service provider. The SLA constraints on request processing time, cost which are directly associated with profit of CSPs and end-user. So time and cost is the main aspects, so user service request is formulated as,

$$User\_Req = (User\_\ budget, Ts, Max\_time, deadline, ptrsp)$$

Where,

User_budget – The maximum amount of currency that user is willing to pay for the request i.e. the revenue of the CSPs for processing request of user.

Ts – It is maximum time required to complete the request by a standard VM instance.

Max_time – it's a maximum processing delay without paying any penalty acquired by CSPs for more profit the CSPs are try to finish in this deadline.

Deadline – it's a upper limit of the processing request if the user request achieves this limit then SLA violation event occurs and the service provider will compensate the user for failure.

Ptrsp – it is the relation or ratio between processing time revenue of CSPs.

The **revenue function** for the CSPs is,

$$Revenue = \begin{cases} User\_budget & , Ta \le Max\_time \\ User\_budget - delay * ptrsp & , Max\_time \le Ta \le deadline \\ -delay * ptrsp & , Ta > deadline \end{cases}$$

Where,

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Revenue - The total profit or revenue of the CSPs by finishing user service request.
Ta – Actual execution time of user request.
delay – It is the actual delay to calculate penalty of CSP. This is,

$$delay = \begin{cases} Ta\text{-}Max\_time & , if\ Max\_time < Ta \leq deadline \\ Ta - deadline & , if\ Ta > deadline \end{cases}$$

III. PROPOSED ALGORITHM

In Traditional single resource renting scheme we cannot guarantee qualitative response to all requests but it waste some amount of resources due to system overhead.to overcome this issue, we propose a double renting scheme which not only focus on quality but also reduce resources wastage.

The proposed methodology of system can be explained through following models:-

Module-A **Server Availability**
- Input: Sender data file.
- Process: Space Inspection.
- Output: Allocating server decision.

Module-B **Data management**
- Input: Allocating server decision.
- Process: Data placement by socket programming.
- Output: Data allocation.

Module-C **QOS handling**
- Input: User data.
- Process: Space management.
- Output: QOS managed.

Module-D **Intimation**
- Input: User data.
- Process: Space run out situation awareness by Fuzzy logic.
- Output: Intimation to CSP.

In this section we combine long-term renting with short-term renting and named it as double-quality-guaranteed resource renting scheme. Due to their low price the main computing will be handled by the long-term server and the short term rented server provide the extra capacity in peak period

Module A - **Server availability**
In this module we are initializing our system by checking whether the server is available for response the request.

Module B - **Data management**
In this module we are allocating data for client requests.it check to CSP for data allocation.

Module C - **QoS handling**
In this model it similarly allocates space in dynamic allocation basis without failure. As double renting scheme is ensured QoS, by handling space management in runtime.

Module D – **Intimation**
In this model we are trying to focus on client alert notification. As client get dynamic space without knowing behind process on runtime. We will give client alert by using fuzzy logic.

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This logic will divide the space into 5 parameters and make client alert accordingly usage of data.

IV. PSEUDO CODE

I. Here in the proposed system initially cloud service provider (CSP) seeks the data space allocation from the cloud owner for the business purpose. Then CSP will allocate both regular and threshold data space. Threshold data space is the space which will be active once the regular space will be filled. Once this is done many of the end users (subscribers) are register with the CSP to store their data in the assigned space.

II. As the subscriber uploads the data into the cloud then the space availability will be checked in the regular data space server for proper storage. If there is no enough space then the system is going to use the threshold space server. This is process can be depicted in the below algorithm A.

A. SERVER AVAILABILITY

Input: Subscriber data **D**
Output: Server Availability

Step 1. Start
Step 2. Upload the Data **D**
Step 3. Data Size $\mathbf{D_S}$
Step 4. Get the storage space in cloud WRT to CSP as $\mathbf{S_p}$
Step 5. **IF** $\mathbf{S_p > D_S}$
Step 6. Allocate CSP regular server for data storage
Step 7. **ELSE**
Step 8. Allocate CSP threshold server for data storage
Step 9. **END**

III. Here in this step intimation to the CSP is done based on the availability of the storage space at the servers for the uploaded data from the subscribers.

IV. Here timely intimation is done based on the fuzzy logic which is performed by receiving the inverse space levels of the data storage server and threshold server .The values of the space levels are divided into 5 ranges for the simplicity using fuzzy logic between the ranges 0 to 1. And they are known as fuzzy crisp values as shown below.

VERY LOW	0 TO 0.2
LOW	0.21 TO 0.4
MEDIUM	0.41 TO 0.6
HIGH	0.61 TO 0.8
VERY HIGH	0.81 TO 1.0

Any regular server space which is about to fill-up is assigned fuzzy value as VERY LOW, whereas any threshold server pace which is about finish is assigning a value as VERY HIGH. Based on these facts of fuzzy crisp values ῑ timely intimation to the CSP is done through the mailing system.

The whole process cab be shown in the below algorithm.

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B. IMPROVED PROFIT MAXIMIZATION SCHEME

Step 1. A multiserver system with *m* servers is running and waiting for the events
Step 2. An Event queue *Q* is initialized as empty
Step 3. **Event** – A service request arrives
Step 4. Record Arrival time of the event and start count down for waiting time
Step 5. Search for server Availability
Step 6. **if** true **then**
Step 7. Assign the service request to one available server
Step 8. **else**
Step 9. Put it at the end of queue *Q* and record its waiting time
Step 10. **end if**
Step 11. **End Event**
Step 12. **Check for the Event space**
Step 13. **if** true **then**
Step 14. Perform event
Step 15. **else**
Step 16. Check for the event priority
Step 17. Allocate temporary space based on Fuzzy Logic
Step 18. Perform event
Step 19. Update space
Step 20. **End Event**

V. RESULTS

To measure the performance of the system we set the bench mark on different number of users in the web application in cloud for data storage service system. we allow the number of users to seek the service of the CSP for availability of the storage space on uploading the storage data to the cloud environment. To evaluate the performance of the system WAPT 8.0 web load testing tool is used. And then experiment is plotted in the plot.

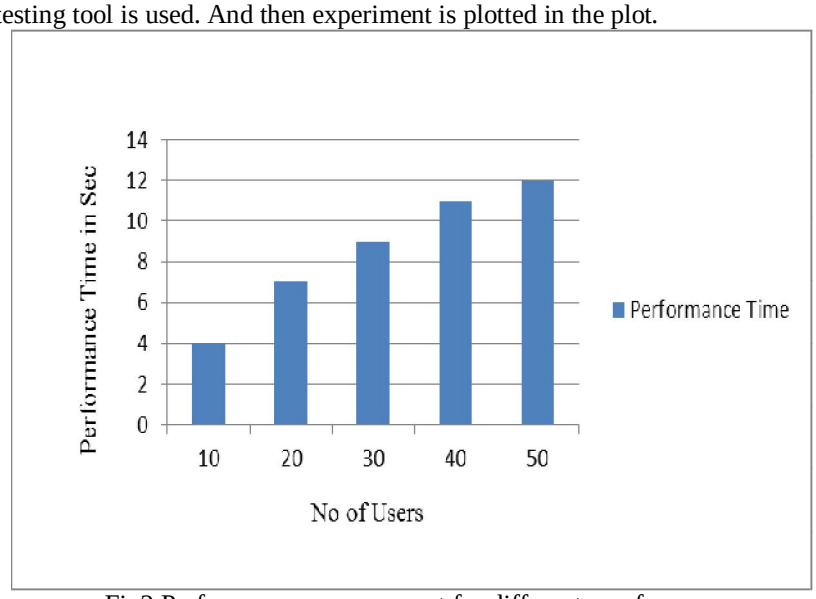

Fig2.Performance measurement for different no of users.

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The above plot expresses result of data storage service of CSP at cloud end with the measuring parameter as time which is not directly proportional to number of users. So this indicates that the system over performs the optimization of storage facility at cloud in matter of time.

VI. CONCLUSION AND FUTURE WORK

In order to achieve the quality of service requests and maximize the profit of service providers, this paper has proposed double-renting-schemes (DRG) for providers. This scheme combines short-term renting along with long term renting which can reduce wastage of resource greatly and using dynamic space allocation at runtime. While maximizing the profit we had taken many factors in considerations, such as market demand, workload of requests, and the server level agreement. . In addition, a series of calculations are performed to compare the profit obtained by the DRS with the Single-Renting-Schemes (SQR). The results show that our scheme outperforms the SQR scheme in terms of both Quality of service and profit.We only consider the profit maximization problem in terms of a homogeneous cloud platform, because the analysis of a heterogeneous environment is much more complicated than that of a homogenous environment. We have to analysis the architecture in 360 degree way However; we will extend our study to a heterogeneous environment in the future.

REFERENCES

[1] Jing Mei, Kenli Li, Member, IEEE, Aijia Ouyang and Keqin Li, Fellow, IEEE "A Profit Maximization Scheme with Guaranteed Quality of Service in Cloud Computing." IEEE TRANSACTIONS ON COMPUTERS VOL: PP NO: 99 YEAR 2015.
[2] Django Armstrong, Karim Djemame"Towards Quality of Service in the Cloud"
[3] Junwei Cao, Senior Member, IEEE Kai Hwang, Fellow, IEEE Keqin Li, Senior Member, IEEE Albert Y. Zomaya, Fellow, IEEE "Optimal Multiserver Configuration for Profit Maximization in Cloud Computing" IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS.
[4] Harry Katzan, Jr., Savannah State University, USA "On An Ontological View Of Cloud Computing" Journal of Service Science – 2010 Volume 3, Number 1
[5] Zhipiao Liu Qibo Sun, Shangguang Wang, Hua Zou, Fangchun Yang "Profit-driven Cloud Service Request Scheduling Under SLA Constraints" Journal of Information & Computational Science 9: 14 (2012) 4065–4073
[6] Pepijn de Langen and Ben Juurlink "Leakage-Aware Multiprocessor Scheduling for Low Power" CONFERENCE PAPER · MAY 2006 DOI: 10.1109/IPDPS.2006.1639317.
[7] Gérard P. Cachon _ Pnina Feldman "Dynamic versus Static Pricing in the Presence of Strategic Consumers"
[8] Chi-Kin Chau, Qian Wang, Qian Wang "On the Viability of Paris Metro Pricing for Communication and Service Networks" IEEE INFOCOM 2010.
[9] Adel Nadjaran Toosi and Rajkumar Buyya "A Fuzzy Logic-based Controller for Cost and Energy Efficient Load Balancing in Geo-Distributed Data Centres"
[10] Varun Kamra, Kapil Sonawane, Pankaja Alappanavar"cloud computing and its pricing schemes" Varun Kamra et al. / International Journal on Computer Science and Engineering (IJCSE).
[11] Shajulin Benedict, Rejitha R.S. and V.Vasudevan,"Threshold Accepting Scheduling algorithm for scientific workflows in Wireless Grids",Fourth International Conference on Networked Computing and Advanced Information Management.
[12] Yi-Ju Chiang , Yen-Chieh Ouyang1*,Ching-Hsien Hsu2 "An Optimal Cost-Efficient Resource Provisioning for Multi-Servers Cloud Computing" 2013 International Conference on Cloud Computing and Big Data.
[13] Kartheek Kanagala,K.Chandra Sekaran,"An Approach for Dynamic Scaling of Resources in Enterprise Cloud" 2013 IEEE International Conference on Cloud Computing Technology and Science.
[14] Ritu , Sushma Jain "A Trust Model in Cloud Computing Based on Fuzzy Logic" IEEE International Conference On Recent Trends In Electronics Information Communication Technology, May 20-21, 2016, India
[15] Zhigang Zhou, Hongli Zhang, Xiangzhan Yu, and Junwu Guo ,"Continuous Resource Allocation in Cloud Computing", IEEE ICC 2015 SAC - Data Storage and Cloud Computing.
[16] Shahaji Nalawade, Vikas Ghadage, Sagar Aher, Sambhaji Palve "A Heuristic Framework for Increasing Profit at Cloud Paradigm" International Journal of Emerging Research in Management &Technology ISSN: 2278-9359 (Volume-5, Issue-5) May2016.
[17] Yi-Ju Chiang and Yen-Chieh Ouyang, "Profit Optimization in SLA-Aware Cloud Services with a Finite Capacity Queuing Model", Hindawi Publishing Corporation Mathematical Problems in Engineering Volume 2014, Article ID 534510.

BIOGRAPHY

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