Profit Maximization in Cloud Computing for Customer-Satisfaction-Aware Optimal Multiserver Configuration

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Abstract— Along with the event of cloud computing, associate increasing range of enterprises begin to adopt cloud service, which promotes the emergence of the many cloud service suppliers. For cloud service suppliers, a way to put together their cloud service platforms to obtain the utmost profit becomes progressively the main focus that they concentrate to. During this paper, we tend to take client satisfaction into consideration to deal with this downside. client satisfaction affects the profit of cloud service suppliers in 2 ways in which. On one hand, the cloud configuration affects the standard of service that is a very important issue poignant client satisfaction. On the opposite hand, the customer satisfaction affects the request arrival rate of a cloud service supplier. However, few existing works take client satisfaction into thought in determination profit maximization downside, or the present works considering client satisfaction don't provides a correct formalized definition for it. Hence, we tend to first of all check with the definition of client satisfaction in political economy and develop a formula for measuring client satisfaction in cloud computing. And then, associate analysis is given intimately on however the client satisfaction affects the profit. Lastly, taking into thought client satisfaction, service-level agreement, transaction worth, energy consumption then forth, a profit maximization downside is developed and solved to induce the optimum configuration such the profit is maximized.

Key words: Profit Maximization in Cloud Computing, Cloud Computing

I. INTRODUCTION

Cloud computing is that the delivery of resources and computing as a service instead of a product over the web, specified accesses to shared hardware, software, databases, data, and every one resources area unit provided to shoppers on-demand. Customers use and pay money for services on-demand while not considering the direct infrastructure prices and therefore the consequent maintenance price. Thanks to such benefits, cloud computing is changing into a lot of and a lot of in style and has received respectable attention recently. Nowadays, there are several cloud service suppliers, like Amazon EC2, Microsoft Azure, Saleforce.com, and then forth. As a form of recent IT industrial model, profit is a crucial concern of cloud service suppliers. The cloud service suppliers rent resources from infrastructure suppliers to set up the service platforms and supply paid services to customers to create profits .For cloud service providers, how to configure their cloud service platforms to obtain the maximal profit becomes increasingly the focus that they pay attention to. The optimal configuration problem with profit maximization of cloud service providers has been researched in our previous researches which assumed that the cloud service demand is known in advance and not affected by external factors. However, the request arrival rate of a service provider is affected by many factors in actual, and customer satisfaction is the most important factor. For example, customers could submit their tasks to a cloud computing platform or execute them on their local computing platforms. The customer behaviour depends on if the cloud service is attractive enough to them. To configure a cloud service platform properly, the cloud service provider should know how customer satisfaction affects the service demands. Hence, considering customer satisfaction in profit optimization problem is necessary. However, few existing works take customer satisfaction into consideration in solving profit maximization problem, or the existing works considering customer satisfaction do not give a proper formalized definition for it. To address the problem, this paper adopts the thought in Business Administration, and firstly defines the customer satisfaction level of cloud computing. Based on the definition of customer satisfaction, we build a profit maximization model in which the effect of customer satisfaction on quality of service (QoS) and price of service (PoS) is considered. From an economic standpoint, two factors affecting customer satisfaction are QoS and PoS. The PoS is determined by cloud service providers. The QoS is determined by the service capacity of a cloud service provider which largely depends on its platform configuration. Under the given pricing strategy, the only way to improve the customer satisfaction level is to promote the QoS, which can be achieved by configuring cloud platform with higher service capability. Doing therefore will have an effect on a cloud service supplier from 2 asides. On one hand, the upper client satisfaction level ends up in the next market share, therefore the cloud service supplier will gain additional revenues. On the opposite hand, additional resources area unit rented to boost the service capability that ends up in the rise of prices. Hence, the last word answer of up profit is to search out AN best cloud platform configuration theme. During this paper, we tend to build a client satisfaction aware profit optimisation model and propose a distinct hill rising algorithmic program to search out the numeric best cloud configuration for cloud service suppliers.

II. EXISTING SYSTEM

Along with the event of cloud computing, associate increasing range of enterprises begin to adopt cloud service that promotes the emergence of the many cloud service suppliers. For cloud service suppliers, a way to put together their cloud service platforms to get the most profit becomes progressively the main target that they concentrate to. The optimum configuration drawback with profit maximization of cloud service suppliers has been researched in previous

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search. Few existing works take client satisfaction into thought in determination profit maximization drawback, or the present works considering client satisfaction don't provides a correct formalized definition for it. existing formulas measure client satisfaction of cloud computing cannot Along with the event of cloud computing, associate increasing range of enterprises begin to adopt cloud service, that promotes the emergence of the many cloud service suppliers. For cloud service suppliers, a way to put together their cloud service platforms to get the most profit becomes progressively the main target that they concentrate to. The optimum configuration drawback with profit maximization of cloud service suppliers has been researched in previous search. Few existing works take client satisfaction into thought in determination profit maximization drawback, or the present works considering client satisfaction don't provides a correct formalized definition for it. Existing formulas measure client satisfaction of cloud computing cannot properly replicate the definition of client satisfaction, and that they failed to take under consideration user's psychological variations.

III. PROPOSE SYSTEM

In this paper, we have a tendency to tend to require consumer satisfaction into thought to influence this consumer satisfaction affects the profit of cloud service suppliers in two ways that during which. On one hand, the cloud configuration affects the quality of service that's an important issue touching consumer satisfaction. On the alternative hand, the client satisfaction affects the request arrival rate of a cloud service provider. However, few existing works take consumer satisfaction into thought in resolution profit maximization disadvantage, or this works considering consumer satisfaction do not provides an accurate formalized definition for it. Hence, we have a tendency to tend to 1st raise the definition of consumer satisfaction in political economy and develop a formula for measure consumer satisfaction in cloud computing. And then, Associate in nursing analysis is given intimately on but the consumer satisfaction affects the profit. Lastly, taking into thought consumer satisfaction, service-level agreement, dealing value, energy consumption therefore forth, a profit maximization disadvantage is developed and resolved to urge the most effective configuration we have a tendency to use the definition of client satisfaction leveraged from economic science and develop a formula to live client satisfaction in cloud. And then, however cloud configuration affects client satisfaction and the way client satisfaction affects the profit of cloud service suppliers area unit analyzed. Supported these works, a profit maximization drawback considering client satisfaction is developed and solved specified the best configuration. client satisfaction is a crucial issue that ought to be thought of during a service market, i.e., cloud computing, that may be a live off however merchandise and services equipped by an organization meet or surpass client expectation [9, 10], and it directly affects the quantity of consumers of an organization, and therefore the profit consequently. In general, the client satisfaction level of an organization is associate degree accumulation of the satisfaction values of all customers. Within the following, we have a tendency to 1st offer the satisfaction formula of every client, then the client satisfaction of an organization. We have a tendency to study associate degree best configuration disadvantage of profit maximization. The most effective solutions are solved by a separate hill rising algorithmic program. Lastly, a series of calculations are conducted to research the dynamic trend of profit. Moreover, a gaggle of calculations area unit conducted to match the profit and best configuration of two things with and whereas not considering the feeling of consumer satisfaction on consumer demand. The results show that after considering consumer satisfaction, our model performs higher in overall is obtained. Such the profit is maximized.

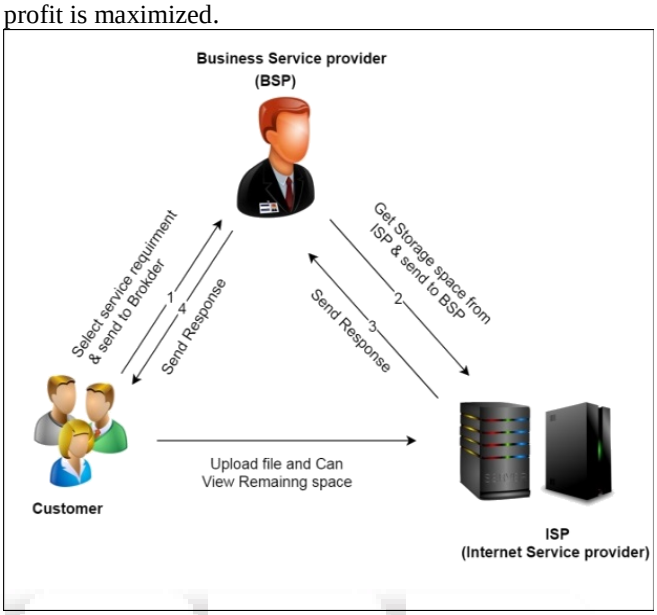

Fig. 1: System Architecture

A. *Advantages*

1) Performance is high.
2) Customer satisfaction in solving optimal configuration problem with profit maximization.
3) Improve the service quality of cloud service provider.

B. *Disadvantages*

1) In existing system, customer satisfaction did not give a proper formalized.
2) Optimal configuration problem with profit maximization in cloud service.

C. *Mathematical Model*

1) Let S be a system. S={I,O,P,F,s,Ic}
2) Identify set of input as I
– Let I = {select cloud services and send to business service provider}
3) Identify set of output as O
– Let O={Customer satisfaction in solving optimal configuration problem with profit maximization }
4) Identify the set of processes P

$$P = \{S_{QoS}, S_{PoS}, S, M_s, Mopt, PROopt\}$$

– QoS -quality of serviceand
– PoS- price of service
– S=Service provider.
– Ms=Market share.
– Mopt- Optimal server.
– Proopt- optimal profit.
5) Identify failure cases as F

F = {Customer is not satisfied with Service provider and Business service provider}.

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6) Identify success as s.
s = {Improved the service quality of cloud service provider with customer satisfaction.}
7) Identify the initial condition as Ic
Ic = { select cloud service provider as per requirement).

D. Hill Climbing Algorithm

Hill Climbing is a technique to solve certain optimization problems. In this technique, we start with a sub-optimal solution and the solution is improved repeatedly until some condition is maximized. The idea of starting with a sub-optimal solution is compared to starting from the base of the hill, improving the solution is compared to walking up the hill, and finally maximizing some condition is compared to reaching the top of the hill.

1) Algorithm: Hill Climbing

- Evaluate the initial state.
- Loop until a solution is found or there are no new operators left to be applied:
  - Select and apply a new operator
  - Evaluate the new state:
- goal -⟶ quit
- better than current state -⟶ new current state

IV. CONCLUSION AND FUTURE SCOPE

We propose a client satisfaction in resolution optimal configuration drawback with profit maximization. Because the present works don't provides a correct definition and calculation formula for client satisfaction, hence, we initial provides a definition of client satisfaction leveraged from social science and develop a formula for activity client satisfaction in cloud. Supported the love of client satisfaction on employment, we tend to analyze the interaction between the market demand and also the client satisfaction, and give the calculation of the particular task arrival rate below different configurations. Additionally, we tend to study associate optimum configuration drawback of profit maximization.

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