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Personality and Value aware Scheduling of User Requests in a Cloud for Profit Maximization

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ABSTRACT

The main objective of a cloud provider is to make benefits by offering types of services to clients. Existing benefit improvement systems utilize homogeneous client models in which client character is overlooked, bringing about less benefits and especially prominently lower client fulfilment that thusly, prompts less clients and decreased benefits. In this paper, we propose proficient character mindful solicitation planning plans to expand the benefit of the cloud supplier under the limitation of client satisfaction. In particular, we first model the assistance demands at the granularity of individual character and propose a customized client fulfilment forecast model dependent on polls. Along these lines, we plan a personality-guided whole integer linear programming (ILP)- based request scheduling algorithm to expand the benefit under the requirement of client fulfilment, which is trailed by a surmised yet lightweight value assessment and cross entropy (VACE)-based benefit improvement conspire. The VACE-based plan is particularly custom-made for applications with high booking goal. Broad re-enactment results show that our customer satisfaction prediction model can accomplish the precision of up to 83%, and our benefit streamlining plans can improve the benefit by in any event 3.96% when contrasted with the benchmarking strategies while as yet getting a speedup of at any rate 1.68x

Keywords- Cloud computing, profit maximization, user request scheduling, user personality, multi-server system, customer satisfaction.

1. INTRODUCTION

Cloud computing has become a very popular IT plan of action that conveys different hardware and software resources to the cloud clients on request in a pay-per-use manner over the internet. Cloud computing has worked with the improvement of cloud suppliers across the world and has made an assortment of computation models for unavoidable and pervasive applications. With regards to cloud computing, the cloud supplier targets at maximizing its benefit while clients request an excellent of cloud services. As increasingly more cloud suppliers are accessible to cloud clients, maximize benefit while fulfilling heterogeneous clients in a competitive cloud market has become a gigantic test for cloud providers.

Profit improvement can be accomplished by either expanding income or reducing the cost for a low price. Effective pricing mechanisms are utilized to expand income, while different cloud asset the executives plans are utilized to lessen costs. Concerning valuing, different models have been proposed to all the more likely adjust to changing cloud providers revenue which acquires extraordinary advantages to the increment cloud suppliers' incomes. In any case, existing pricing mechanisms are client autonomous, hence neglect to join client attributes or character. Client character in brain research is utilized to portray the individual contrasts in the example of thinking, emotion, and behavior.

In the cloud service market, different users have a different requirement for a service price and quality of service (QoS). Service price and QoS are two key issues that users are most concerned about this. Accordingly, an existing pricing strategy that ignore user personality could result in tainted QoS for users and reduced revenue for cloud providers.

The main contributions of this paper are listed as follows.

1.1 Scope

- We propose a personalized service request model to internment users' modifications in terms of service execution requirements, service price, response time, and so on. We also develop a user satisfaction model to the predict user satisfaction further down different service price and QoS levels.
- We present an integer linear programming (ILP) based task of scheduling scheme to optimizing the cloud provider's income. Later the ILP-based algorithm is so inefficient, a lightweight value assessment and cross

entropy (VACE) based scheduling scheme is more proposed to gain a near-optimal solution for profit maximization.

Extensive wide simulation experiments have been showed into validate the efficiency of the proposed an algorithm. Outcomes show that our proposed schemes are greater to the benchmarking schemes in terms of revenues by at least 3.96% while accomplishing at least 1.68 intervals of speedup.

2. METHODOLOGIES

2.1 Cloud Computing Platform and Models

In this study, we study a three-tire cloud computing architecture that contains users, a cloud provider, and a infrastructure provider. As shown in Figure 1, heterogeneous users submit their service requests to the cloud provider, receive the looked-for results from the cloud provider, and pay per use for the service based on service quantity and service quality. The cloud provider handles users' service requests by leasing resources like servers from the infrastructure provider. These heterogeneous servers are modelled as a multi-server system, in which each server is considered by a given supply voltage-frequency duo pair. A service request queue with immeasurable capacity is sustained by the multi-server system for to come requests when all the servers are demanding. Request scheduling Received requests Service request queue Users Servers Cloud Provider.

2.1.1 Cloud User Model

Users with dissimilar personalities have different predilections for service price and QoS, and the preferences further have an impact on user satisfaction with respect to the services. Therefore, in this section, we model users from perspective of a service request model and user satisfaction model, in turn

2.1.2 User service request model

We undertake the arrival of service requests at the multi-server system surveys a streaming procedure. When the users submit a request to the cloud provider, these requests are the major placed in the request queue before they can be stimulated by any servers.

2.1.3 User satisfaction model

Explosive growth of cloud providers, providing a good service experience to users with different personalities makes the cloud providers more competitive in the cloud market. For users, service price and QoS are two important factors that affect their experience. Users certainly expectation to get the best QoS at a low price.

2.1.4 Cloud Provider Model

The cloud provider provides services to users and charge them for the close of the service requests. Since users have different personalities and the attributes of a service requests are different, it is usual to charge users at the granularity of a service request. We define the cloud provider's revenues the sum of charges of all service requests

2.1.5 User Personality-Guided Satisfaction Prediction

In this module, we first discover with the impact of a user's personality on his or her satisfaction with reverence to the service. Successively, we develop a personality-guided user satisfaction prediction model to achieve prediction of user satisfaction under dissimilar service price and QoS levels.

3. LITERATURE REVIEW

A Genetic Model for Pricing in Cloud Computing Markets.[13], Cloud Computing markets ascend as an efficient way to allocate resources for the execution of tasks and services within a set of geologically isolated providers from dissimilar organizations. Client applications and service providers happen in a market and negotiate for the sales of services by incomes of the signature of a Service Level Agreement. Depending on the status of the demand, the provider is able to a offer higher or lower prices for maximizing of its profit. It is difficult to establish a profitable pricing function in competitive markets, because there are several features that can influence in the prices. This paper deals with the problem of offering modest prices in the negotiation [13] of services in Cloud Computing marketplaces. A Genetic Algorithms is an approach is proposed, in which a naive pricing function grows to a pricing function that offers suitable prices in function of the system status. Its results are associated with additional pricing strategies, demonstrating its validity. [13]

Energy and Performance Management of Green Data Centers: A Profit Maximization Approach [11],In this study While a large body of work has recently focused on decreasing data center's energy expenses, there exists no prior work on examining the trade-off between minimizing data center's energy expenses and a maximizing their revenue for many Internet and cloud computing services that they may offer. In this paper, we pursue to tackle this shortcoming by offering a systematic approach to a maximize green data center's profit, that is revenue minus cost. In this regard, we explicitly take into account practical service-level agreements (SLAs)

that currently exist between data centers and their clients. Our model also contains various other factors such as accessibility of local renewable power generation at data centers and the stochastic nature of data centers' workload. Additionally, we propose a original optimization-based profit maximization strategy for data centers for two a altered cases, without and with behind-the meter renewable generators. We demonstration that the formulated optimization complications in both cases are convex programs; therefore, they are tractable and appropriate for applied implementation. Using various experimental data and via computer simulations, we assess the performance of the proposed optimization-based profit maximization strategy and show that it significantly outdoes two comparable energy and performance management algorithms that are recently planned in the literature.[11]

Optimal service pricing for a cloud cache [5], We study the cloud provider, such as Amazon, provides computing capacity in the procedure of virtual instances and charges customers a time-varying price for the period they use the instances [5]. The cloud provider's problem is then to discover an optimal pricing policy, in face of stochastic demand arrivals and departures, so that the average expected revenue is maximized in the extended run. We assume a revenue management framework to tackle the problem. Optimality conditions and structural results are obtained for our stochastic preparation, which income insights on the optimal pricing strategy [5]. Mathematical results confirm our analysis and reveal additional properties of optimal pricing policies for the infinite horizon case. [5]

Optimal Multiserver Configuration for Profit Maximization in Cloud Computing [7], As cloud computing develops more and more standard, understanding the economics of cloud computing becomes a critically important. To maximize the income, a service provider should understand a both equally service charges and business costs, and how they are determined by the features of the applications and the configuration of a multiserver system. The problem of optimal multiserver configuration for profit maximization in a cloud computing environment is considered. Our pricing model incomes such factors into considerations as the amount of a service, the workload of an application environment, the configuration [7] of a multiserver system, the service level agreement, the satisfaction of a consumer [7], the quality of a service, the fine of a low quality service, the cost of renting, the cost of energy consumption, and a service provider's margin and profit. Our approach is to treat a multiserver system as an M/M/m a queuing model, such that our optimization problem can be expressed and solved analytically. Two server speed and power consumption models are measured, namely, the idle-speed model and the constant speed model7]. The planned or probability of density function of the waiting time of a anew arrived service request is derived. The expected service charge to a service request is designed. The predictable net business gain in one unit of time is obtained. Numerical calculations of the optimal server size and the optimal server speed are demonstrated [7].

A Manifesto for Future Generation Cloud Computing: Research Directions for the Next Decade [2], The Cloud computing paradigm has transformed the computer science horizon during the past decade and has allowed the appearance of computing as the fifth utility [3]. It has captured significant attention of academia, businesses and government bodies. Now, it has arisen as the backbone of modern economy by offering subscription-based services in anytime, anywhere subsequent a pay-as-you-go model. This has instigated

- A Smaller establishment times for start-ups,
- A Creation of scalable global enterprise applications,
- Better cost-to-value associativity for scientific and high-performance computing applications
- Different invocation/execution models for pervasive and universal applications. [2]

The new technological developments and paradigms such as server less computing, software-defined networking, Internet of Things(IoT), and a processing at network edge are creating novel chances for Cloud computing. Though, they are also posing several new challenges and creating the need for new methods and research approaches, as well as the re-evaluation of the models that were developed to address issues such as scalability, elasticity, reliability, security, sustainability, and application models.[2]

4.CONCLUSION

In this paper, we propose efficient personality-guided user request scheduling schemes for cloud profit maximization. More precisely, we first create a personalized user model and cloud provider model, based on which a profit optimization problem is framed. At that time, we propose a user personality-guided satisfaction prediction technique recognized on surveys.

In the upcoming, first, we will study the user satisfaction prediction model in depth by captivating the more issues into account, and improve the accuracy of prediction outcomes by adopting neural network techniques to train the user satisfaction model. Second, we will study a more flexible multi-server system model that lets long standing and short-term resource leasing mechanisms for additional improving user satisfaction. Finally, based on these models, we plan to resolve the profit maximization problem by a significant the optimal request scheduling as well as the optimal multi-server configuration. Additionally, our goal to design a personality-guided CRM system and a profit-aware DRM system for real cloud service providers

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