Profit Optimization for Cloud Service Provider through Service Mechanism

Dr.P.Chitti Babu[1], V.Vinod Kumar[2], C.Siva Krishnaiah[3]

[1]*Professor & Principal, APGCCS, Rajampet,*

[2] *Student, MCA Department , APGCCS, Rajampet,*

[3]*Assistant Professor, MCA Department ,APGCCS, Rajampet*

[1]drpcbit@gmail.com

[2]vinodkumarvv432@gmail.com

[3]sivacmca@gmail.com

***Abstract*— A layout of service mechanism for income optimizations of both a cloud company and its more than one customers. I recollect the hassle from a recreation theoretic angle and signify the connection among the cloud issuer and its a couple of customers as a Stackelberg sport, wherein the techniques of all users are concern to that of the cloud provider. The cloud company tries to pick and provide suitable servers and configure a proper request allocation method to lessen power cost even as pleasant its cloud users on the same time. The design of its Servers choice space by way of including a controlling parameter and configure an most beneficial request allocation method. For each user, I design a software feature which combines the internet earnings with time efficiency and try and maximize its value beneath the method of the cloud provider. I formulate the competitions among all customers as a Generalized Nash Equilibrium Problem (GNEP). I solve the problem via using Variational Inequality (VI) idea and prove that there exists a generalized Nash equilibrium answer IIservice mechanism. I conduct a few numerical calculations to verify the theoretical analyses. The experimental results display that the IA set of rules can advantage each of a cloud company and its a couple of clients by using configuring right strategies.**

***Keywords*— GNEP, IA, VI, DVFS, QoS, VM, IBE**

I. INTRODUCTION

Cloud computing is an an increasing number of popular paradigm of supplying subscription-oriented services to organizations and clients. Usually, the provided offerings seek advice from Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS), which can be all made to be had to most of the people in a pay-as-you-pass manner. To support numerous services, an increasing number of cloud centres are equipped with lots of computing nodes, which results in wonderful energy fee. It is mentioned that approximately 50% management price range of Amazon′s records middle is used for powering and Colling the physical servers. There are also researchers who've studied the fee of records centres and concluded that around 40% of the amortized price of a records centre falls into power associated categories. Hence, it's far important to reduce strength cost for enhancing the profit of a cloud issuer.

II. RELATED WORK

Hardly ever any preceding works inspect more than one customers′ earnings optimizations, not to mention optimizing the income of a cloud issuer and its customers at the equal time. The authors attempt to reduce electricity intake with the aid of the use of Dynamic Voltage Frequency Scaling (DVFS) approach. In existing machine, primarily based on DVFS approach and the concept of slack sharing amongst processors, the authors also proposed two novel electricity-conscious scheduling algorithms.

III. PROPOSED WORK

The work design a new carrier mechanism for income optimizations of each a cloud provider and its more than one users. A game theoretic angle and characterize the connection between the cloud issuer and its users as a Stackelberg game, wherein the techniques of all customers are challenge to that of the cloud provider. A mechanism, the cloud issuer tries to choose appropriate servers and configure a right request allocation method to reduce energy price while pleasurable its customers on the same time.

To our expertise, hardly ever any previous works inspect more than one customers′ profit optimizations, not to mention optimizing the profits of a cloud provider and its users on the identical time. In this paintings, we first attempt to optimize a couple of users′ profits. Since multiple cloud customers compete for the use of the assets of a cloud company, and the software of each person is affected by the decisions (provider request strategies) of different users, it's far natural to analyse the behaviours of such systems as strategic games.

In Algorithm 1, we note that the for loop (Steps 3-5) requires Θ(L(ε)) to complete as well as the other for loop (Steps 7-11). In step 6, it takes at most Θ(L(ε) log L(ε))to sort the elements insetQ(ε) L .Therefore, the outer for loop (Steps 2-12) takes time Θ(m(2L(ε) +L(ε) logL(ε))) = Θ(mL(ε) logL(ε)). Thus, the time complexity of Algorithm 1 is Θ(m + mL(ε) logL(ε)) = Θ(mL(ε) logL(ε)). This completes the proof and the result follows.

Algorithm 1 Calculate Q(ε) L (ε,r,μ,E,M)
Input: ε,r,μ,E,M.
Output: Q(ε) L .
1: Initialization: For each server j (j ∈M), calculate Pj1. Set Q(ε) L = {∅}.
2: for (each server j ∈M) do
3: for (each element S ∈Q(ε) L) do
4: Merge server j into set S, i.e., set S ←S∪{j}.
5: end for
6: Sort the elements in Q(ε) L such that PT(S(1))≤P T(S(2))≤ ... ≤ PT(S(|Q(ε) L |)).
7: for (i from 1 to Q(ε) L−1) do
8: if (PT(S(i+1))≤ (1 + ε)PT(S(i))) then
9: Remove S(i+1) from Q(ε) L , i.e., set Q(ε) L ← Q(ε) L −{S(i+1)}.
10: end if
11: end for
12: end for
13: return Q(ε) L .

Algorithm 2 Calculate ph S(ϵ,μ,λh Σ,S)
Input: ϵ,μ,λh Σ,S
Output: ph S .
1: Initialization: Let inc be a relative small positive constant. Set ph S ← 0, and ϕ ← 0.
2: while (∑ j∈S ph j < 1) do
3: Set mid1 ← ϕ + inc, and ϕ ← mid1.
4: for (each server j ∈S) do
5: ph j ← Calculate ph j (ϵ,μj,λh Σ,ϕ).
6: end for
7: Set inc ← 2×inc.
8: end while
9: Set lb ← 0 and ub ← ϕ.
10: while (ub−lb > ϵ) do
11: Set mid1 ← (ub + lb)/2, and ϕ ← mid1.
12: for (each server j ∈S) do
13: ph j ← Calculate ph j (ϵ,μj,λh Σ,ϕ).
14: if (∑ j∈S ph j < 1) then
15: Set lb ← mid1.
16: else
17: Set ub ← mid1.
18: end if
19: end for
20: end while
21: Set ϕ ← (ub + lb)/2.
22: for (each server j ∈S) do
23: ph j ← Calculate ph j (ϵ,μj,λh Σ,ϕ).
24: end for
25: return ph S .

In algorithm implementation we calculate the net profit at most in each time slot for the Cloud Provider. Therefore, we characterize the server during our approximation process. In this algorithm the value we assumed as to be greater than zero. The algorithm calculates and finds an approximated solution space by selecting some server subset representatives and removing similar ones. At the beginning we set an empty subset then for a server we merge it into each of the subsets according to their largest possible gained profits.

IV. COMPARITIVE RESULTS

In Fig 1: The details about the users who are successfully registered in Cloud Management those user's details are listed in this Figure.

In Fig 2: This figure shows the user purchased products with their type of service.

In Fig 3: This Figure shows the details of purchase or buy product. In this we can select the type of service and validity of service.

In Fig 4: This Figure shows the details of services with their details and product details along with price.

Fig 1:User Information

Fig 2: Purchased Products

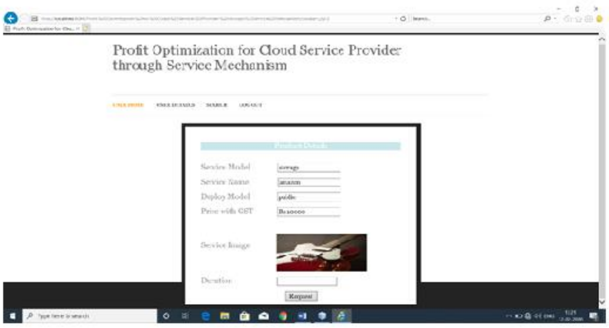

Fig 3: Buy Product

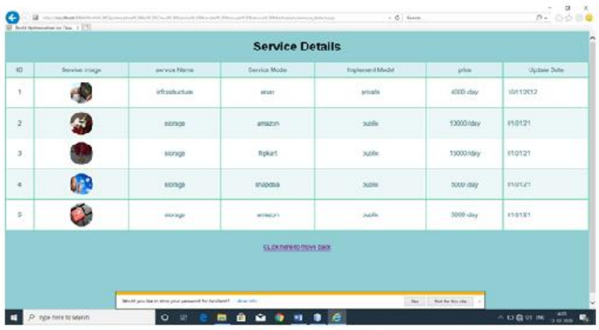

Fig 4: Service Details

V. CONCLUSION

With the popularization of cloud computing and its many advantages such as cost-effectiveness, elasticity, and scalability, more and more applications are moved from local computing environment to cloud centre. In this work, we try to design a new service mechanism for profit optimizations of both a cloud provider and its multiple users.

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