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Double Profit Maximization Scheme with Guaranteed Quality of Service in Heterogenous Cloud Environment

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ABSTRACT:

In this we deal about two things one is cloud computing and second is profit maximization. First thing what is cloud computing means it manages and stores the data which is done by virtualization. By using cloud computing we can have dynamic resource pools, virtualization and high availability. In this we have three things dynamic resource pools means its storage and virtualization means create virtual machine and high availability means if any drive breaks other drive will come on that place. First for profit maximization we should understand cloud renting cost, power consumption cost and also we need to calculate waiting time and service charge.

In this paper profit maximization we have two cloud environments one is homogenous cloud environment and second is heterogenous cloud environment they only consider homogenous cloud environment now, in this paper we propose heterogeneous cloud environment.

Keywords: ***Cloud Computing, Guaranteed Service Quality, Profit Maximization, Queuing Model, Service-Level Agreement, Waiting Time.***

INTRODUCTION

Cloud computing is rapidly turning into a successful and effective method for figuring assets. By brought together administration of assets and administrations, Cloud computing conveys facilitated administrations over the Internet. Cloud computing can give the most practical and vitality effective method for processing assets administration. Cloud computing transform's data innovation into common wares and utilities by utilizing the pay-per-use evaluating model. An administration supplier rents assets from the foundation sellers, constructs suitable multi server frameworks, and gives different administrations to clients. A buyer presents an administration solicitation to an administration supplier, gets the sought result from the administration supplier with certain administration level assention. At that point pays for the administration in view of the measure of the administration and the nature of the administration. An administration supplier can assemble distinctive multi server frameworks for various application areas, such that administration solicitations of various nature are sent to various multi server frameworks. Attributable to repetition of PC framework systems and capacity framework cloud may not be solid for information, the security score is concerned. In Cloud computing security is enormously enhanced due to a prevalent innovation security framework, which is currently effortlessly accessible and reasonable. Applications no more keep running on the desktop Personal Computer yet keep running in the cloud. This implies the PC does not require the preparing power or hard plate space as requested by customary desktop programming. Effective servers and so forth are no more required. The registering force of the cloud can be utilized to supplant or supplement inward figuring assets. Associations no more need to buy processing assets to handle the limit crests. Cloud computing is rapidly turning into a viable and productive method for figuring assets. By brought together administration of assets and administrations, Cloud computing conveys facilitated administrations over the Internet. Cloud computing can give the most financially savvy and vitality effective method for registering assets administration. Cloud computing transform's data innovation into conventional items and utilities by utilizing the pay-per-use estimating model. An administration supplier rents assets from the framework sellers, fabricates suitable multi server frameworks, and gives different administrations to clients. A purchaser presents an administration solicitation to an administration supplier, gets the coveted result from the administration supplier with certain administration level assention. At that point pays for the administration taking into account the measure of the administration and the nature of the administration. An administration supplier can assemble diverse multi server frameworks for various application spaces, such that administration solicitations of various nature are sent to various multi server frameworks. Inferable from excess of PC framework systems and capacity framework cloud may not be solid for information, the security score is concerned. In Cloud computing security is enormously enhanced in view of a prevalent innovation security framework, which is presently effectively accessible and moderate. Applications no more keep running on the desktop Personal Computer however keep running in the cloud. This implies the PC does not require the preparing power or hard circle space as requested by conventional desktop programming. Effective servers and so forth are no more required. The figuring force of the cloud can be utilized to supplant or supplement interior registering assets. Associations no more need to buy registering assets to handle the limit crests.

LITERATURE SURVEY:

Using clouds to host data query services has become an appealing solution for the advantages on scalability and cost-saving. However, some data might be sensitive that the data owner does not want to move to the cloud unless the data confidentiality and query privacy are guaranteed. In addition, a secured query service should still provide efficient query processing and significantly reduce the in-house work load for the purpose of cloud computing. Bearing these criteria in mind, The RASP data perturbation method to provide secure range query and kNN query services for protected data in the cloud. The RASP data perturbation method combines order preserving encryption, dimensionality expansion, random noise injection, and random projection, to provide strong resilience to attacks on the perturbed data and queries. It also preserves multidimensional ranges, which allows existing multidimensional indexing techniques to be applied in range query processing. The kNN-R algorithm is designed to work with the RASP range query algorithm to process the kNN queries.

Carefullyanalyzetheattacksondataandqueriesunderapreciselydefinedthreatmodelandrealisticassumptions.Extensive experiments have been conducted to show the advantages of this approach on the balanceofperformance and security. Secure data intensive computing in the cloud is challenging, involving acomplicatedtradeoff among security, performance, extra costs, and cloud economics. Although fully homomorphic encryption is considered as the ultimate solution, it is still too expensive to be practical at the current stage.Incontrast,methodsthatpreservespecialtypesofdatautility,evenwithweakersecurity,mightbeacceptableinpractice. The recently proposed RASP perturbationmethod falls into this category. It can providepracticalsolution for specific problems such as secure range queries, statistical analysis, and machine learning. TheRASP perturbation embeds the multidimensional data into a secret higher dimensional space, enhanced with random noise add it ionto protect the confidentiality of data. It also providesaqueryperturbationmethodtotransformhalf-spacequeriestoaquadraticformand,meanwhile,preservingtheresultsofhalf-spacequeries.The utility preserving property and wide application domains are appealing.

However, since the security ofthismethodisnotthoroughlyanalyzed,theriskofusingthismethodisunknown.ThepurposeofthispaperistoinvestigatethesecurityoftheRASPperturbationmethodbasedonaspecificthreatmodel.Thethreatmodeldefines three levels of adversarialpower and the concerned attacks. Show that although the RASP perturbeddataand queries are secure on the lowest level of adversarial power, they do not satisfy the strongindistinguishability definition

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on higher levels of adversarial power. As noticed, theindistinguishabilitydefinitionmightnotbetoostrongto beusefulinthecontextofdataintensivecloudcomputation. Inaddition,the noise component in the perturbation renders it impossible to exactly recover the plain data; thus, allattacksare essentially estimation attacks. A weaker security definition based on information theoretic measures to describe the effectivenessofestimationattacks,andthenstudythesecurityunderthisweakerdefinition.Thissecurity analysis helps clearly identify the security weaknesses of the RASP perturbation and quantifytheexpected maintenance of confidentiality under different levels of adversarialpower.

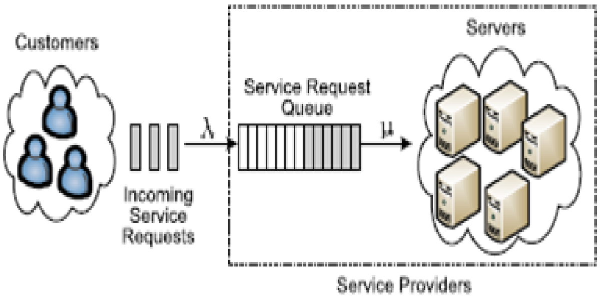
EXISTING SYSTEM:

In this existing system to configure a cloud service platform, a service provider usually adopts a single renting scheme. That's to say, the servers in the service system are all long-term rented. Because of the limited number of servers, some of the incoming service requests cannot be processed immediately. So they are first inserted into a queue until they can handle by any available server.

DISADVANTAGES OF EXISTING SYSTEM:

- The waiting time of the service requests is too long.
- Sharp increase of the renting cost or the electricity cost. Such increased cost may counterweight the gain from penalty reduction. In conclusion, the single renting scheme is not a good scheme for service providers.

SYSTEM ARCHITECTURE:



PROPOSED SYSTEM:

In this paper, we propose a novel renting scheme for service providers which not only can satisfy quality-of-service requirements, but also can obtain more profit. A novel double renting scheme is proposed for service providers and It combines long-term renting with short-term renting which can not only satisfy quality-of-service requirements under the varying system workload, but also reduce the resource waste greatly.

The optimal configuration problem of service providers for profit maximization is formulated and two kinds of optimal solutions, i.e., the ideal solutions and the actual solutions, are obtained respectively.

ADVANTAGES OF PROPOSED SYSTEM:

- Increase in the quality of service requests and maximize the profit of 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.

Algorithm 1 Double-Quality-Guaranteed (DQG) Scheme

```
A multiserver system with m servers is running and waiting for the events as follows
A queue Q is initialized as empty
Event – A service request arrives
Search if any server is available
if true then
    Assign the service request to one available server
else
    Put it at the end of queue Q and record its waiting time
end if
End Event
Event – A server becomes idle
Search if the queue Q is empty
if true then
    Wait for a new service request
else
    Take the first service request from queue Q and assign it
    to the idle server
end if
End Event
Event – The deadline of a request is achieved
Rent a temporary server to execute the request and release
the temporary server when the request is completed
End Event
```

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Algorithm 2 Finding the optimal size

Input: s, λ, $\overline{r}$, a, P^*, α, β, γ, δ, ξ, and D
Output: the optimal number *Opt_size* of fixed servers

$Profit\_max \leftarrow 0$
find the server size m using the analytical method in Section 5.1.1
$m_l^* \leftarrow \lfloor m \rfloor$, $m_u^* \leftarrow \lceil m \rceil$
$Profit_l \leftarrow Profit(m_l^*, s)$, $Profit_u \leftarrow Profit(m_u^*, s)$
if $Profit_l > Profit_u$ **then**
  $Profit\_max \leftarrow Profit_l$
  $Opt\_size \leftarrow m_l^*$
else
  $Profit\_max \leftarrow Profit_u$
  $Opt\_size \leftarrow m_u^*$
end if

Algorithm 3 Finding the optimal speed

Input: m, λ, $\overline{r}$, a, P^*, α, β, γ, δ, ξ, and D
Output: the optimal server speed *Opt_speed*

$Profit\_max \leftarrow 0$
find the server speed s using the analytical method in Section 5.1.2
$s_l^* \leftarrow s_i$, $s_u^* \leftarrow s_{i+1}$ if $s_i < s \leq s_{i+1}$
$Profit_l \leftarrow Profit(m, s_l^*)$, $Profit_u \leftarrow Profit(m, s_u^*)$
if $Profit_l > Profit_u$ **then**
  $Profit\_max \leftarrow Profit_l$
  $Opt\_speed \leftarrow s_l^*$
else
  $Profit\_max \leftarrow Profit_u$
  $Opt\_speed \leftarrow s_u^*$
end if

Algorithm 4 Finding the optimal size and speed

Input: λ, $\overline{r}$, a, P^*, α, β, γ, δ, ξ, and D
Output: the optimal number *Opt_size* of fixed servers and the optimal execution speed *Opt_speed* of servers

$Profit\_max \leftarrow 0$
find the server size m and speed s using the analytical method in Section 5.1.3
$m_l^* \leftarrow \lfloor m \rfloor$, $m_u^* \leftarrow \lceil m \rceil$
find the optimal speed s_l^* and s_u^* using Algorithm 3 with server size m_l^* and m_u^*, respectively
$Profit_l \leftarrow Profit(m_l^*, s_l^*)$, $Profit_u \leftarrow Profit(m_u^*, s_u^*)$
if $Profit_l \leq Profit_u$ **then**
  $Profit\_max \leftarrow Profit_u$
  $Opt\_size \leftarrow m_u^*$, $Opt\_speed \leftarrow s_u^*$
else
  $Profit\_max \leftarrow Profit_l$
  $Opt\_size \leftarrow m_l^*$, $Opt\_speed \leftarrow s_l^*$
end if

CONCULSION:

This paper has proposed a novel double quality guaranteed 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 queuing 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 , 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 renting scheme.

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