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Efficient Quality scheme for Heterogeneous environment in Cloud Computing

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ABSTRACT

Cloud computing is a rapidly evolving service for potential clients who wish to outsource their data storage or subscribe to cloud services. There are laws that might prevent the firm from using certain cloud service provider (CSP). When using a cloud service, there is a need for ongoing agreements between cloud service users (CSUs) and (CSPs). Currently, this comes in the form of written agreements known as cloud service agreements (CSAs). CSAs contain information on the quality of service (QoS) that the CSP is promising to deliver to the CSU. In this paper, a model is proposed a novel three-step scheme to maintain the QoS in the cloud computing heterogeneous environment. Auditing body (e.g. cloud carriers, cloud brokers, cloud auditors) which is part of CSP, can assist a CSU in ensuring that they are receiving the promised services from their chosen CSP. To support this model, propose a three-step approach for customers to evaluate the service-level agreement (SLA) of their CSAs.

Keywords— ***cloud computing; security evaluation; cloud service providers; cloud service agreement; quality of service; service level agreement***

I) INTRODUCTION

Cloud service agreements (CSAs) are primarily written formal documents or agreements that contain the relationship between the cloud customer (buyer) and the cloud service provider (seller), as well as other entities, such as cloud carriers, cloud brokers, and the cloud auditors. CSAs are essentially a "terms of service" agreement that everyone agrees to when signing up for certain services (e.g., iTunes). Any of these written service agreements are legally binding agreements for both the service users and service providers. A typical CSA is made up of three major sections: Customer Agreement (CA), Acceptable Use Policy (AUP), and Service Level Agreement (SLA) 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 [1]. SoS to provide a clear and concise view of QoS events within cloud computing environments that proactively informs enterprise operators of the state of the enterprise and, thereby, enables timely operator response to QoS problems The architectural

frameworks considered in these excellent surveys are one dimensional and principally deal with the infrastructure, platform, and software as service layers of cloud computing [2]. With a quality model, cloud consumer scan confirm whether services are provided with the expected quality, and can eliminate potential misrepresentation. So, a quality model is able to protect cloud consumers' interests [3]. Cloud data integrity and availability and enforce the quality of cloud storage service, efficient methods that enable on-demand data correctness verification on behalf of cloud users have to be designed [4]. The composability of multi-organizational business processes/workflows with respect to the context-driven and time dependent access control policies of service providers. These workflows are assumed to be executed on a recurrent basis and require long term collaboration among the organizational domains providing underlying services [5].

This paper, discusses five different Quality schemes such as double quality renting scheme, system of systems with quality of service scheme, CLOUDQUAL scheme, flexible distributed storage integrity auditing scheme and GTRBAC policy scheme These Quality schemes provide the better quality of the cloud computing. But these scheme also have some problem so to overcome such problems improve version of quality scheme is proposed here that is "**A novel three-step scheme to maintain the QoS in the cloud computing heterogeneous environment".**

II) BACKGROUND

Many studies on quality models have been done to develop the quality scheme in recent past years. Such schemes are double quality renting scheme is designed firstly in which short-term renting and long-term renting are combined aiming at the existing issues. This double renting scheme can effectively guarantee the quality of service of all requests and reduce the resource waste greatly [1]. System of Systems (SoS) approach to enable Quality of Service monitoring, management, and response for enterprise systems that deliver computing as a service through a cloud computing environment. QoS is discussed in but is limited in application to the task of virtual machine provisioning in data centers rather than to end-user satisfiability [2]. CLODQUAL can be used to represent, measure, and compare the quality of the providers, such that mutual understanding can be established among cloud stakeholders. A quality model for cloud services, called CLOUDQUAL, which specifies six quality dimensions and five quality metrics: It is a model with quality dimensions and metrics that targets general cloud services [3]. Flexible distributed storage integrity auditing scheme, utilizing the homomorphic token and distributed erasure-coded data. The proposed design allows users to audit the cloud storage with very lightweight communication and computation cost [4]. Generalized Temporal Role Based Access Control (GTRBAC) model to specify the time, quality dependent access control policy of a domain. A non-reentrant system does not allow simultaneous, interleaved, or nested invocations and only one instance of such system exists at any time [5].

This paper introduces five quality scheme ie double resource renting scheme, system of systems with quality of service scheme, CLOUDQUAL scheme, flexible distributed storage integrity auditing scheme and GTRBAC policy scheme these are organizes as follows. **Section I** Introduction. **Section II** discusses Background. **Section**

III discusses previous work. **Section IV** discusses existing methodologies. **Section V** discusses attributes and parameters and how these are affected on quality models. **Section VI** proposed method and outcome result possible. Finally **section VII** Conclude this review paper.

III) PREVIOUS WORK DONE

Jing Mei et al (2015) [1] have proposed a double quality renting scheme is designed firstly in which short-term renting and long-term renting are combined aiming at the existing issues. M/M/m+D queuing model and the performance indicators that affect the profit of our double renting scheme are analyzed. the double-quality guaranteed resource renting scheme which combines long term renting with short-term renting. The main computing capacity is provided by the long-term rented servers due to their low price.

Paul C. Hershey (2015) [2] proposed system of systems scheme has a structure that comprises interdependent systems that integrate to form a higher order system. This hierarchy can include monitoring and response at the highest-level system down to the smallest sub-component system.

Xianrong Zheng et al (2014) [3] have proposed CLOUDQUAL quality model for cloud services which specifies six quality dimensions and five quality metrics. CLOUDQUAL can evaluate their quality, which demonstrates its effectiveness.

Cong Wang et al (2012) [4] has proposed the flexible distributed storage integrity auditing mechanism, utilizing the homomorphic token and distributed erasure-coded data. The proposed design allows users to audit the cloud storage with very lightweight communication and computation cost. The auditing result not only ensures strong cloud storage correctness guarantee, but also simultaneously achieves fast data error localization, i.e., the identification of misbehaving server. Considering the cloud data are dynamic in nature, the proposed design further supports secure and efficient dynamic operations on outsourced data, including block modification, deletion, and append.

Basit Shafiq et al (2017) [5] has proposed Generalized Temporal Role Based Access Control (GTRBAC) GTRBAC policy instance has a finite number of authorization states. Therefore, according to the above criterion a domain is a non-reentrant system.

IV) EXISTING METHODOLOGIES

Many quality schemes have been implemented over the last several decades. There are different methodologies that are implemented for different quality models ie double quality renting scheme, system of systems with

quality of service scheme, CLOUDQUAL scheme, flexible distributed storage integrity auditing scheme and GTRBAC policy scheme

A Double Quality Guaranteed Scheme

Double Quality Guaranteed Scheme adopts the traditional FCFS queuing discipline. For each service request entering the system, the system records its waiting time. The requests are assigned and executed on the long-term rented servers in the order of arrival times. Once the waiting time of a request reaches D, a temporary server is rented from infrastructure providers to process the request. Consider the novel service model as an M/M/m+D queuing model The M/M/m+D model is a special M/M/m queuing.

1: A multiserver system with m servers is running and waiting for the events as follows
2: A queue Q is initialized as empty
3: **Event** – A service request arrives
4: Search if any server is available
5: **if true then**
6: Assign the service request to one available server
7: **else**
8: Put it at the end of queue Q and record its waiting time
9: **end if**
10: **End Event**
11: **Event**—A server becomes idle
12: Search if the queue Q is empty
13: **if true then**
14: Wait for a new service request
15: **else**
16: Take the first service request from queue Q and assign it to the idle server
17: **end if**
18: **End Event**
19: **Event** – The deadline of a request is achieved
20: Rent a temporary server to execute the request and release the temporary server when the request is completed
21: **End Event**

Fig.1. Double Quality Guaranteed Scheme

B SoS approach

SoS approach to enable QoS monitoring, management, and response for enterprise systems that deliver computing as a service through a cloud computing environment. A concrete example is provided for application of new SoS approach to a real-world scenario (viz., distributed denial of service). Simulated results confirm the efficacy of the Approach The systems that comprise a SoS include coupling with respect to such areas as data, information, functions, state, and algorithm. A loss of any portion of the SoS will degrade the overall performance or capabilities of the higher order system therefore, the systems are interdependent.

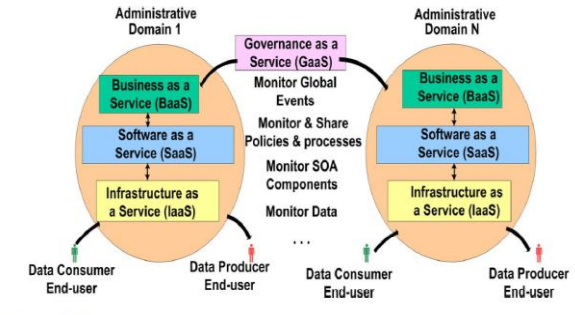

Fig.2. Net-centric SOA-based SoS.

C CLOUDQUAL

CLOUDQUAL for cloud services use. It is a scheme with quality dimensions and metrics that targets general cloud services. CLOUDQUAL contains six quality dimensions, i.e., usability, availability, reliability, responsiveness, security, and elasticity, of which usability is subjective, whereas the others are objective. To demonstrate the effectiveness of CLOUDQUAL, Conduct empirical case studies on three storage clouds. Results show that CLOUDQUAL can evaluate their quality. To demonstrate its soundness, Validate CLOUDQUAL with standard criteria and show that it can differentiate service quality.

D Flexible distributed storage integrity auditing mechanism

Flexible distributed storage integrity auditing mechanism, utilizing the homomorphic token and distributed erasure-coded data. The proposed design allows users to audit the cloud storage with very lightweight communication and computation cost. in the distributed case when such inconsistencies are successfully detected, to find which server the data error lies in is also of great significance, since it can always be the first step to fast recover the storage errors and/or identifying potential threats of external attacks.

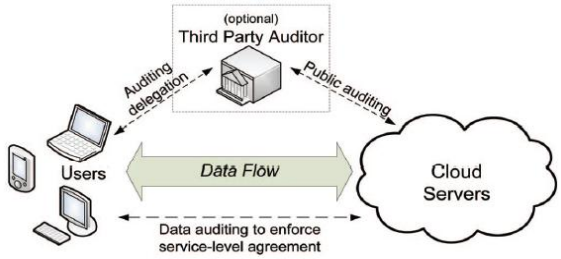

Fig.3.Flexible distributed storage integrity auditing mechanism

E GTRBAC policy

A domain's GTRBAC policy specifies the authorizations for its component services. service is essentially an encapsulation of one or more tasks with certain temporal and ordering
constraints. At the interaction modelling level, a task is viewed as an operation on a resource by an authorized subject without considering who is authorized to access the resource and how such operation can be executed. In the GTRBAC model, a task can be represented as an activation of a particular role by an authorized user, where the role is a collection of permissions required to perform the requested operation on the underlying resource object (s) and the user corresponds to the subject executing the task.

V) ANALYSIS AND DISCUSSION

Double quality renting scheme adopts the traditional FCFS queuing discipline. For each service request entering the system records its waiting time. The requests are assigned and executed on the long-term rented servers in the order of arrival times. Profit maximization problem it support only homogeneous cloud environment [1]. System of Systems Scheme extends traditional monitoring, management, and response for IaaS and SaaS to a

complete SOA stack that includes business logic. The architectural model used a service oriented architectural is multidimensional extending to layers of business and governance as services [2]. CLOUDQUAL can evalute their quality, which demonstrates its effectiveness. Methods validate a quality model using standard criteria, namely, correlation, consistency, and discriminative power. It is unable to offer objective quality measurements [3]. Flexible distributed storage integrity auditing scheme utilizing the homomorphic token and distributed erasure coded data. Propose an effective and flexible distributed scheme with explicit dynamic data support, including block update, delete, and append [4]. GTRBAC Policy approach is unique and does not compromise the autonomy and privacy of collaborating domains [5].

Quality scheme	Advantages	Disadvantages
Double quality renting scheme,	Improve Security using a novel Double-Quality-Guaranteed renting scheme for service provider	It support only homogeneous cloud environment.
System of systems with quality of service scheme, scheme	1. Provide a great flexibility for the system to set different access policies. 2. Highly confidential	Lack of efficiency.
CLOUDQUAL	Improved six quality dimensions using CLOUDQUAL	It is unable to offer objective quality measurements
flexible distributed storage integrity	Propose an effective and flexible distributed	Capabilities of handling dynamic data remains unclear,

auditing	scheme with explicit dynamic data support, including block update, delete, and append.	which inevitably limits their full applicability in cloud storage scenarios
GTRBAC policy scheme	The proposed approach is unique and does not compromise the autonomy and privacy of collaborating domains.	According to the above explanation a domain is a non reentrant system.

TABLE 1: Comparisons between different quality Schemes.

PROPOSED METHODOLOGY

With the continual growth of cloud computing, there needs to be a way to better establish and maintain trust between the CSP and the CSU. One way to do that is through the enforcement of CSAs with the help of a cloud auditor. Our proposed solution involves three simple steps to establish trust, and maintain that trust by ensuring that CSPs are providing the promised services. The first step is an initial review of the CSA offered by the CSU's desired cloud service. After the initial review, if the CSU should choose to continue with said cloud service, there will be constant monitoring of various cloud metrics. Finally, after monitoring the services, every quarter there will be a re-evaluation of the CSA to make sure it is up-to date for the services being provided. A novel three-step scheme provides various quality metrics are as shown below.

Agility: The agility metric is used to measure the ability of the cloud service to scale with the increased or decreased workload.

Response time: This is our second basic cloud metric that needs to be constantly monitored. Response time, in this sense, is the same as any other response time in a client-server relationship.

Throughput: This brings us to our third basic cloud metric throughput which is arguably the most important metric in cloud computing.

Durability: is another metric applicable in cloud services. Durability is the probability of data loss.

Power: Power is defined as the total watt usage by the cloud system.

Security: Cloud computing security can be described as the set of control-based technologies and policies devised to adhere to regulatory compliance rules and protect data applications, vital information, and infrastructure associated with cloud computing use. Novel three-step Scheme to maintain the QoS in the cloud computing environment.

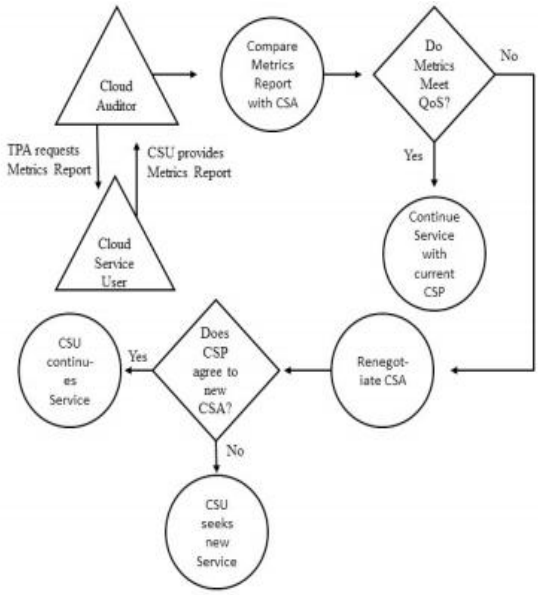

Fig.4.-Architecture for services for different stakeholders in cloud environment

OUTCOME POSSIBLE RESULT

The proposed method "a novel three-step scheme to maintain the QoS in the cloud computing environment." will be successfully improves the heterogeneous environment.

VII) CONCLUSION

In this paper, propose a novel three-step scheme to maintain the QoS in the cloud computing environment. Our approach includes an evaluation of ten metrics that are important factors when it comes to choosing the correct CSP for a CSU. Each of the metrics involved are considered the most important aspects a CSU should consider when they are in the market for a CSP. It support only heterogeneous cloud environment.

FUTURE SCOPE:

In future work assign different tools discussed such as Intel's Benchmark Install and Test Tool or IBM's Cloud Bench to evaluate the ten metrics of a specified CSP that is in current use of a CSU. It would be ideal to test our

approach with different types of CSUs, such as an individual user for personal use, a small-scale business or organization, and a nationally scaled business.

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