RESPONSIBILITY OF SLA MANAGER FOR VIOLATION INDICATION IN CLOUD

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*Abstract-***Cloud Computing is a collection of computer and server which is publically accessible via internet. The services available in the cloud are providing based on the Service Level Agreement (SLA).An SLA is a contract between an Cloud Service Provider (CSP) and the end user which stipulates and commits the CSP to a required level of service. An SLA should contain a specified level of service, support options, enforcement or penalty provisions for services not provided, a guaranteed level of system performance as relates to downtime or uptime, a specified level of customer support and what software or hardware will be provided and for what fee. In most scenarios the service providers try to deceive their users, because users don't have the awareness about the SLA. So Validating an SLA by user is always difficult. To overcome this problem we have proposed SLA manager who is responsible for validating the SLA in the user perspective. And also if violation occurs then the SLA manager sends the report to the concerned user.**

*Keywords-***SLA manager, Cloud Service Provider, Allocation**

I INTRODUCTION

Cloud computing builds on top of several other technologies, i.e. distributed computing, grid computing, utility computing and autonomic computing, and it can be envisaged as a natural step forward from the grid-utility model. In the heart of cloud computing infrastructure we find a group of reliable services delivered through powerful data computing centers that are based on modern virtualization technologies and related concepts such as component-based system engineering, orchestration of different services through workflows and service-oriented architectures (SOAs) . As consumers move towards adopting such a Service-Oriented Architecture, the quality and reliability of the services become important aspects. However the demands of the service consumers vary significantly. It is not possible to fulfill all consumer expectations from the service provider perspective and hence a balance needs to be made via a negotiation process. At the end of the negotiation process, provider and consumer commit to an agreement. In SOA terms, this agreement is referred to as a SLA. This SLA serves as the foundation for the expected level of service between the consumer and the provider. The QoS attributes that are generally part of an SLA (such as response time and throughput) however change constantly and to enforce the agreement, these parameters need to be closely monitored.

Service level agreements (SLAs) are agreements signed between a service provider and another party such as a service consumer, broker agent, or monitoring agent. Because cloud computing is a recent technology providing many services for critical business applications, reliable and flexible mechanisms to manage online contracts is very important. The purpose of using SLAs is to define a formal basis for performance and availability the provider guarantees to deliver. SLA contracts record the level of service, specified by several attributes such as availability, serviceability, performance, operation, billing or even penalties in the case of violation of the SLA. Also, a number of performance-related metrics are frequently used by Internet Service Providers (ISPs), such as service response time, data transfer rate, round-trip time, packet loss ratio and delay variance. Often, providers and customers negotiate utility-based SLAs that determine the cost and penalties based on the achieved performance level.

II RELATED WORK

One of the keys to SLA success is that appropriate people are chosen to oversee the creation and management of the agreement. Each party to the SLA needs an SLA Manager who works with the other party's SLA Manager to develop and manage the agreement. In some organizations, SLA responsibilities are only one component of the SLA Manager's job; in other organizations, particularly those with numerous SLAs, these responsibilities are a full-time job. [1]

The SLA Manager is the person in organization who is responsible for the ongoing management of the quality of services delivered into the client from another organization – whether from an outsource service provider, a shared service centre or even a global business services organization. [2] a method to represent relations between risks and services and between services and activities. This method improves forward and backward traceability. It helps to assess the

result of risk management by assessing the fulfillment of services [3]

There is a large body of work in the area of SLA provisioning and monitoring at infrastructure and platform layers, SLAs are usually assumed to be guaranteed at the application layer. However, application monitoring is a challenging task due to monitored metrics of the platform or infrastructure layer that cannot be easily mapped to the required metrics at the application layer. [4].

III PREFACE TO SLA:

a) *Service Level Agreement*

Service Level Agreement (SLA) is a term widely used in the telecommunication and networking area to specify Quality of Service (QoS) objectives It is now adopted in the field of computer science to serve the same purpose of specifying quality of service for Internet offered services. In Cloud computing, services and resources are provisioned through the Internet. Thus, SLA forms the basis for managing the business aspect of Cloud computing technology.

A service level agreement can be defined as a contract signed between a Cloud provider and a customer describing functional and non-functional characteristics of a service including QoS requirements, penalties in case of violations, and a set of metrics, which are used to measure the provisioning of the requirements [53, 111, 144]. The goal of an SLA parameter is described as its objective popularly known as Service Level Objective.

b) *SLA Framework for Message Indication*

SLA Framework is made up of two core aspects. The first part comprises the monitoring aspect and its objective is to provide monitored information to the second part that comprises the knowledge management aspect, which analyzes the monitored information and provide reactive actions to manage the Cloud environment.
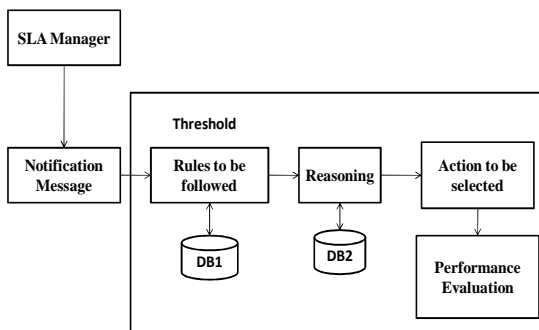

Figure 1: SLA Framework

The knowledge management receives the monitored

information in the analysis phase and analyzes it to determine the preventive action to be taken.

c) *Components of an SLA:*

An SLA can comprise a few short pages up to a few hundred pages. The basic components are a statement of the parties intent, an outline of the responsibilities of each party (including acceptable performance parameters with applicable metrics), a statement on the expected duration of the agreement, a description of the applications and services covered by the agreement, procedures for monitoring the service levels, a schedule for remediation of outages and associated penalties, and problem-resolution procedures.

IV LIMITATIONS IN THE EXISTING SYSTEM

Although, there is a large body of work considering development of flexible and self-manageable Cloud computing infrastructures, there is still a lack of adequate monitoring infrastructures capable of predicting possible SLA violations[7][8][9]. With the ever growing interest in Cloud computing from both, industry and academia, and the rapid growth of Cloud computational infrastructure resources, the management of the infrastructures to efficiently provision resources and services to customers is now a challenging task Cloud management systems consist of components such as, monitoring techniques, scheduling and deployment mechanism, and resource allocation and de-allocation strategies [10].

The Cloud provider should provide services based on the SLA which is signed by their user. Sometimes the provider is not following the SLA. For example the SLA contains the network bandwidth as 1 mbps. But in the peak hours the bandwidth may be vary. For the loss of bandwidth the provider should give credit to the user. And also sometime users violate the SLA. For that user should be fined or penalty should be paid by the provider. But in real time the issue is not taken into consideration. Because the users are not aware of the SLA and also there is no such analyzing tools for SLA violation and monitoring. Further, in real time the providers not accepting their mistakes. They try to blame the users for their mistakes.

V PROPOSED AGENDA

To overcome above problem, we have introduced a SLA manager for analyzing SLA violations of the Cloud. If the violation occurs then they send report to customer or provider. For to achieve this it is necessary to create a SLA based on Storage, Server, Network, Data operations, Security and Other Software Components.

The sequences of steps that are involved to perform the proposed framework are,

    a) Creating a good SLA.
    b) Introducing an Analyzer/ manager for analyzing and monitoring a SLA.
    c) Alert by sending report to the Provider for user SLA violations and the User for provider SLA violations.

a) SLA Definition:

An SLA is a working process to define and balance business requirements with available service resources.Further a contract agreement is inbetween user and service providers. Based on this SLA is created for Cloud based parameters such as Server, Storage, Data center operations, Security and some other software components

b) SLA Monitoring:

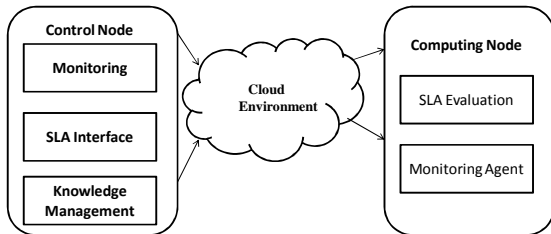SLA Monitriong is to collect the data from cloud and stored in the Database.

Figure 2: SLA Monitoring

c) SLA Management and Control:

Collect the SLAs of particular user from databases and it is stored on the SLA manager Database. If any change occurs in the SLAs, the changes are update frequently. This is then compared with the SLA and Monitored data.

d) SLA Reporting:

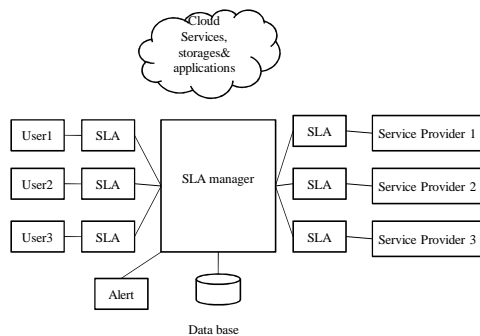If mismatch occurs then send the report to the corresponding users.

Figure 3: SLA Mismatch

VI SLA ENFORCEMENT AND MANAGEMENT

The management and enforcement of Service Level Agreement (SLA) in Clouds is not a trivial task. SLAs have become the basis for service provisioning in Cloud markets and therefore, an inevitable aspect of Cloud computing. In this section, we present existing concepts for the management of SLAs.

In their approach, they propose two possible policy enforcement strategies for handling SLA violation:

i) Prevention before violation

ii)Reaction after violation.

The prevention strategy is based on prediction of possible future violations, which can be obtained by monitoring predefined prevention thresholds. The reaction strategy is only acceptable if the violation does not result in complete service failure. The service provider allows the violation of an SLA in order to enforce others. In such cases, it specifies priority for different SLAs based on business impact.

VII EXPERIMENTAL RESULTS

The Parameters that are considered for business requirements are availability and utilization time. In availability it specifies the process usage time and in case of utilization it considers the CPU usage time and process of resident time.

Table 1: Allocated Resource for the user based on SLA

User ID	CPU	RAM	Memory
1	3	1	3
2	3	1	2
3	2	2	3

Figure 4: Parameters chosen

Further it chooses the query to run so that time and amount of CPU usage can be obtained

Table 2: Availability table based on data available from cloud monitoring

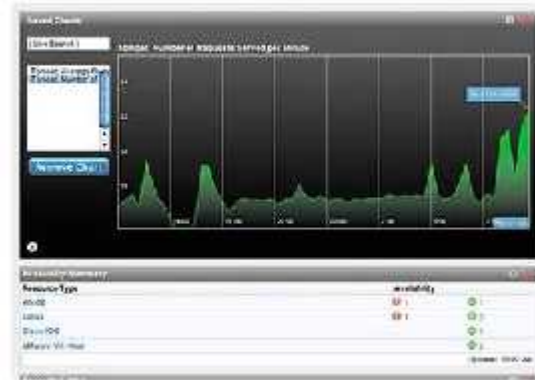| User ID	CPU	RAM	Memory
1	4	2	4
2	3	1	2
3	3	2	3

Figure 6: Availability Summary

The entire number of request served by SLA manager are obtained in the availability summary

VIII CONCLUSION

From the proposed work SLA manager chooses initially the parameters needed for SLA violation and thus verify the duration of the CPU utilization. Futher monitors the SLA violation and intimate it to the user. So that the user can demand from the CSP for SLA violation. Thus the user needs can be satisfied.

Figure 5: Selecting the Query

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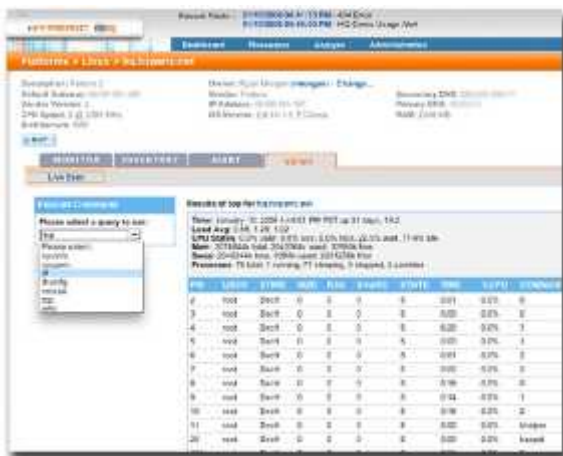
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