

Exposing Issues and Challenges in Performance of Cloud Computing Services.

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Abstract: In current era of high performance computing, cloud computing is considered as new paradigm of ubiquitous computing. Peoples are changing their views and accordingly demand of consumer services for real world applications is getting diversified. Most of all global IT leader companies have started to consume cloud services in one or another way by putting their demands. The cloud is rapidly maturing towards its goal to satisfy federated need of consumer's need for real-world applications. It is tried to reflect survey of current research related to open issues associated with clouds service performance with consideration of maintenance of performance and quality management and also simulates service level agreement based testing on the large scale commercial testing environment. One of the key aspect of the existing approach is it cloud environment need to achieve more flexibility to satisfy diversified users need and providers service delivery model. A collaborative system shall apply the concept of the cloud service performance testing to reduce the mitigations in cloud data and loss of the service availability and data integrity aspects.

Keywords: Cloud service, Performance, quality measurement, federated services

I. Introduction:

The term "cloud computing" is not a very old concept. Here different kind of services plays important key role to fulfill consumers need. Nowadays, cloud is one of the best solutions for people who are looking for rapid implementation methods. Cloud computing services are working on the concept of pay as you go. Different kind of services can be hired from cloud service providers to avoid high capital investments and aggressive pricing. Cloud providers even test unconventional and predatory pricing strategies. Retaining the customer base is goal for cloud computing providers.

In area of IaaS, PaaS and SaaS application software and real world applications, everything is provided in terms of services and at the same time quality of the software is always expected by all kind of users. Management of software is being implemented to consider common issues such as lack of compatibility between service provided and service expected. Sometimes issues of service portability or required flexibility may come into the picture. For different kind of service consumption a service level agreement plays key role. Some other associated aspects like area of network where the service is planned to be consumed, traffic on internet, provision of internet service, internet bandwidth are also involved in such issue. In cloud computing services few service measurement software are providing performance measurement & monitoring results but it is applicable to certain areas only and there is no automated quality evaluation system designed for cloud computing services. Moreover security issue is also one of major challenge which requires more attention.

The Structure of other parts of this paper is organized in different sections as shown below: In starting section introductory part is covered which shows related work of this area including simulation, evaluation methods and tool. In next section issues of cloud computing services are introduced briefly and then the main purpose of this paper is

provided. Here in this section, factors and criteria that is used in simulation are explained. Finally in last, the performance of cloud in different scenarios will be evaluated. At the end, a conclusion is given along with various references.

II. Cloud Computing Service Performance Measurement:

As per literature survey it has been identified that there are many tools and proposed frameworks are available for quality evaluation. Few of them are operated but it can be used for a specific task as per its design and focused area of performance evaluation. For measurement of cloud service quality management there are some common issues like lack of compatibility between service provided by service provider and service expected by cloud service consumers. Consideration of various network topology and internet connections used by cloud service consumers also affects performance. Here main communication channel between cloud service consumer and cloud service provider is through internet connection only. Quality of internet depends upon internet speed, internet phone, path tracking and web surfing connection as well as firewall, proxy or any other cache devices.

Popular tools and internationally accepted tools for performance measurement of cloud service are CloudHamony and CloudSleuth. These tools provide facility of performance measurement & monitoring its results. But it can work for a specific area like automation in virtualization layer. It is the most unique characteristic of cloud computing system. Now here it is to be noted that there are so many sub components which are also partially associated with performance issues of cloud services. Such sub performance indicators associated with quality and performance also requires proper attention which is missing at most of the time. Moreover there is no typical benchmarking system developed for such issues. Due to these areas also shows

compose of cloud system. It will allow measurement of service quality along with monitoring system and quality requirements. Here performance issues are correlated with system, network, virtualization, communication channel, security techniques, services implementation and SLA compliance of cloud service infrastructure used.

III. Cloud Service Performance measurement issues

As per details analyzed in previous section, main five performance key indicators can be defined as following five indicators. These performance indicators are highly associated with parameters such as performance of system, performance of security technique used, performance of cloud service itself, performance of network, internet as well communication channel and finally compliance of service level agreement. System performance is cumulative performance of its sub parameters. It can be defined as evaluating performance of the processing unit, capacity of computation / repetition speed, provision of direct memory access along with disk I/O, availability and capacity of cache memory and Memory I/O of the processing unit.

It is also to be verified that out of total available resources how much resources like memory, storage disk and processing power is allocated for creating and maintenance for virtual resource of VM. Selection of security algorithm or technique also affects performance of security and examination of vulnerabilities such as encryption of virtual server and latest security pack application. Aspect of service performance measurement covers evaluation of the application's performance which runs in a virtual server, and throughput time, response time and processing volume of data for each service application should be measured separately.

While focusing on performance of network components, volume of processing data, network bandwidth and communication protocol used, packet rate, error rate and delay time in network of service provider can be measured. Finally compliance of service level agreement in terms of percentage shows fulfillment of client's need and after all it shows satisfaction clients need. Here main measurement parameter requires attention is downtime of such services. If there is some fault during execution of such service, then fault tolerance system and backup compliance rate should also be evaluated.

Here past experience of cloud service consumer plays a vital role. By providing full support in all respect and maintaining uptime of such services may help to the cloud service provider to change its impression in such issues. Paying complete attention to the main and sub key performance indicators is highly important. Management and maintenance of such parameter takes the cloud service provider to the higher level of performance. Accordingly its associated quality value can also become better than the past. Here maintenance of response time and throughput time is very important and challenging.

It is not like that if such services are not measured, monitored and managed then cloud related issues cannot be addressed properly. But it simply protects from complete failures and disasters that can occur at any point of time. Here variation in performance of cloud service directly

affects its quality. However, cloud computing failures and disasters in past also includes popular and reputed organizations namely Google, Amazon, Microsoft and Skype.

These cloud service performance issues can be considered with help of following examples.

1. Disaster of Amazon EC2 and Microsoft cloud

In past a large amount of downtime occur due to cloud disaster with Amazon Elastic Cloud Computing. Many SMEs became standstill due to the downtime shown by EC2. Many IT organizations became idle and had reported a large amount loss in their organization due to non function of cloud services. Moreover there had been case with Amazon and Microsoft due to bad weather struck and finally reached to cloud failures. Both the servers were collapsed due to thunder lighting strike. Finally it was resulted a huge loss to leading big and small organizations. At that time the servers were remained non-functional and didn't give access for consecutive two days.

Outcome of above examples says that many events like up gradation in software or firmware, power failure and unpredictable heavy load on server may cause failure of such cloud services. Recovery in such cases depends upon total number of servers down in data center. After recovery also it should be ensured that all the cloud services are working properly. Under such scenario service level agreement also plays important role. Due to nonfunctional cloud services loss is to be settled as per the condition mentioned in SLA at later stage.

IV. Conclusion:

Basic intention of this paper is to expose various performance related issue of Cloud computing service. Such issues should be considered for measurement and monitoring of cloud service performance in main basic services like IaaS, PaaS, SaaS or related diversified services. Monitoring of quality level with is required parameters in specific areas such as performance of communication channel, server system performance, security algorithm performance and core service performance. Summing up of all these performance parameters shall allow us to get details of SLA compliance in cloud service infrastructure system. Moreover, quality due to performance variation the degradation in quality can also be identified and finally it allows the end user to visualize the quality and performance complete cloud service infrastructure system.

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