

Identification of Cloud Computing Service Quality Indicators with its Expected Involvement in Cloud Computing Services and its Performance Issues

Mr. Shripal Shah

Research scholar (Computer Science), RK University Rajkot
and Asst. Professor, SRK Institute Surat, Gujarat India
writetoshripal@yahoo.com

Dr. Sanjay Buch

Assistant Vice President (IT), Reliance Industries Limited,
Naroda, Ahmedabad, Gujarat India
sanjay.buch@gmail.com

Abstract:- Nowadays quality of cloud computing services, along with its proper service management, is one of the most important aspects of cloud computing model. Because of that, the cloud computing system can fulfill the need of users in a better way. To fulfill the need of cloud services quality, an evaluation series of quality standards are to be considered. Some of the most important standards have been considered while others are still under identification or under development.

Here a series of indicators is to be identified with an objective to guide the development of cloud service related products. Specification of high quality requirements and the evaluation of quality characteristics shall also be a part of this process.

Keywords- Cloud computing Services, Performance, Service quality, indicator

I. INTRODUCTION

The purpose of quality standard is to serve cloud product with a level of standards. Here need is to gather all the information related to service quality improvement based on the series of standards. This paper is meant to provide an introduction to the series of standards to understand consumer quality expectation and services provided by cloud service providers. It shall also include, need of information gathering from different organization / companies interested in improving their quality of the service^[1]

The series of standards can be identified as Service Quality Requirements and Evaluation (SQRE). Here the goal is to create a framework for the evaluation of cloud service quality. The evolution of several other standards is also very important. Following are some of specific key indicators related to performance and quality of federated cloud service. It provides various inputs which will be helpful to define quality model structure^[2,3] for outcome of service performance and quality evaluation of cloud computing service.

II. QUALITY MANAGEMENT FOR CLOUD SERVICES

Some attributes are required to define the standard that forms the division and define model with common parameters. Here terms and definitions can be referred further by all other standards from SQRE series. It consists of the following standards^[4,5].

- Service quality requirement and evaluation is helpful to provide structure model, terminology, guidelines, documents overview, intended users and associated parts of the series as well as reference models
- Planning and implementation management will provide requirements and guidance for a supporting function which is responsible for the management of service product requirements specification and evaluation^[6].

III. QUALITY MODEL FOR CLOUD SERVICES

The standards that form quality model are to be identified for quality standard models of cloud computing related service products, quality in use, and data. It shall involve following standards^[7].

- Software and service product quality model describes model which consist of characteristics and attributes for service quality.
- Data quality model helps to define a general data quality model for data retained in a structured format within a computer system. It focuses on the quality of the data as a part of system and defines a quality characteristic which is to be maintained for target data^[8].

IV. QUALITY MEASUREMENT FOR CLOUD SERVICES

The standards that forms quality measurement sub component shall include a service quality measurement reference model and practical guidance for their application. Presented measures apply to quality of service as shown below.

- Quality measurement model shows introductory explanation and a reference model that is common to quality measure elements, measures of service product quality and quality in use. It also provides guideline to the developers for selecting or developing, and applying measures^[9,10].
- Elements of quality measurement shall help to define a set of recommended base and derived measures, which are intended to be used during the whole service development life cycle. The document describes a set of measures that can be used as an input for the quality measurement of service in use.
- Service quality measurement describes a set of measures and provides guidance for measuring quality of service provided.

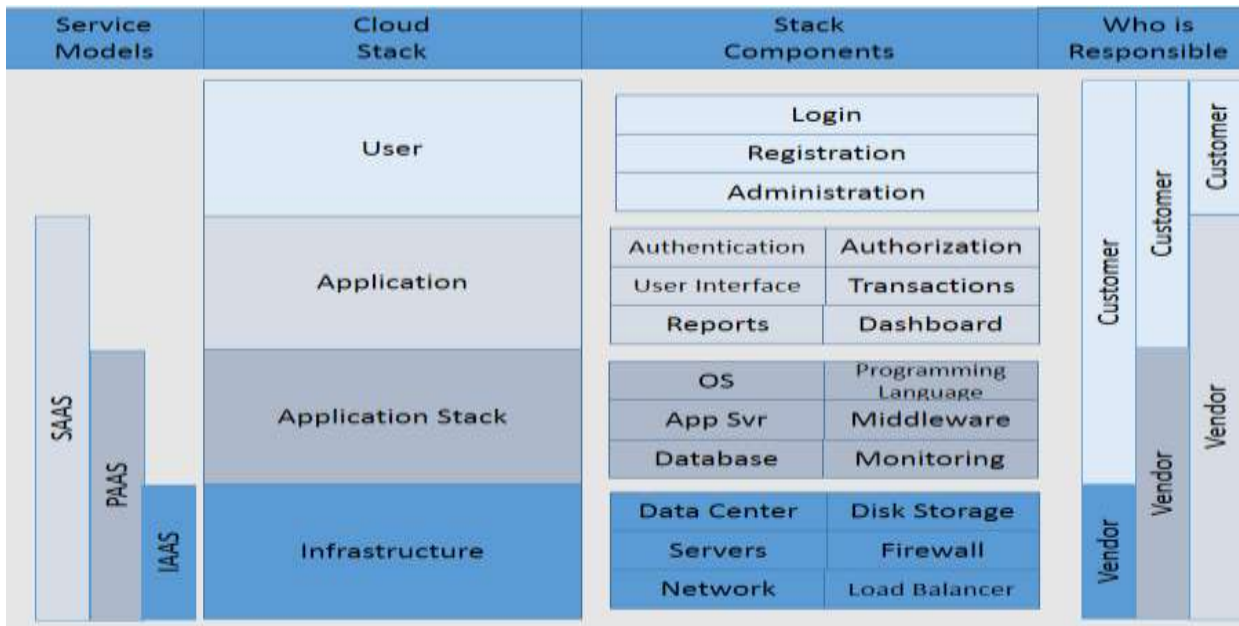


Figure 1. Involvement of different entities in cloud architecture

- Data quality measurement defines quality measures for quantitatively measuring quality of data in terms of standard characteristics list^[11].

V. PERFORMANCE EFFICIENCY OF CLOUD SERVICES

This characteristic represents the performance relative to the amount of resources used under stated conditions. This characteristic is composed of the following attributes.

- Time to time behavioral functionality can be consider to evaluate the response, processing times and throughput rates of a service during execution of its functions to meet the requirements.
- Resource utilization shall be used to consider the amounts and types of resources used by a service during execution of its functions to satisfy the requirements^[12].
- Performance capability also associates degree to which the maximum limits of a service parameter can be work without disturbing capabilities.

VI. COMPATIBILITY OF CLOUD SERVICES

It is also associated with a checkpoint mark to which a services or a component of a service can exchange information with other component, or a sub components, and perform its required service related functions, while sharing the same hardware or service environment. This characteristic is composed of the following attributes^[13].

- Shared resource utilization associates with a service which can perform its required functions efficiently while sharing a common resource in specific environment and resources with other services, without affecting other services.
- Inter service communication shall be considered when two or more services would like to exchange information and use exchanged information^[14].

VII. USABILITY OF CLOUD SERVICES

Here the federated services can be used by variety of users to achieve diversified goals with effective, efficient and satisfactory manner in a specified context of use. This characteristic is composed of the following attributes^[15].

- Recognizing appropriate service is a point to which users can check whether a service is appropriate for their needs or not.
- Always goal of service is pre defined and the capability of service is to be verified by self assessment.
- Operational capability of services involves some parameters of a service that make it easy to operate and control the cloud services.
- Protecting service in some situation of error is also an important aspect to be considered to maintain robustness.
- Interface should be aesthetics to confirm which a user interface makes satisfactory interaction possible for satisfying interaction for the user^[16].
- Service selection and wide acceptance can be considered by people with the widest range of characteristics and capabilities of use.

VIII. RELIABLE CLOUD COMPUTING SERVICES

Reliable service involves selected functions of services under specified condition for a specified period of time. This characteristic is composed of the following attributes.

- Consistent service checks that a service meets needs for reliability under normal operation mode^[17].
- List of available services works for verification to check service or component of a service is operational and accessible when required for use.



Figure 2. Cloud computing service quality parameters

- Fault tolerance capable service operates as intended despite the presence of hardware or software related service faults^[18].

IX. SECURITY ASPECTS OF CLOUD SERVICES

It means a service should also support to protect information and data. It means that the cloud services have the right of data access in a proper way according to their types and permission levels of agreement. Following attributes shows the characteristic of the service.

- Confidential service confirms that data access shall be done by only privileged users only other people can't access the data through the service.
- Integrity of services ensures that any kind of unauthorized access, or change in service structure of data.
- Non-repudiation in services ensures which actions or events can be proven to have taken place, so that the events or actions should be repudiated now.
- Accountable or using meter of service involves the actions of an entity can be traced unique to the entity.

- Proving authentic identity of a subject or resource can be proved to be the one claimed^[19].

X. PORTABLE CLOUD SERVICES

Portable service word conveys a message that the cloud service can be transferred from its original location to some new location for the operational or usage of environment. This characteristic is composed of the following attributes.

- Taking cloud service shall be more efficient and can be able to adopt other service or other usage in environments.
- Installation part of service shall include that the install and uninstall process of a service can be completed in a specified environment without any problem. Moreover removal of service should not affect any other functional capacity of the cloud service product^[20].

XI. CLOUD SERVICE EVALUATION AS ADHOC PRODUCT

Every day, more and more organizations become interested in assuring and controlling the quality of their service products, and although each organization has characteristics

that differentiate them from the rest, they can generally be classified into one of the following categories^[21,22]:

- Outsource of such service development for different Government agencies are getting increase. Such contracts are being given to some external companies or service development units. Because of this, Government need to have quality control measures for verification of the service that they receive. Here service should meet the minimum quality requirements, and also allow the people to manage the service level agreements^[23].
- Such service companies outsource either by near shoring or by off shoring, a part of their service development processes. Because of that, such parties have to monitor and control the quality of the service supplied to them^[24].
- Developers are interested to have a mechanism that allows them to assure the quality of the service they develop^[25].
- Service developers are interested to assure their clients for the quality of the service that they would like to provide to them by means of independent verification and validation it very important factor^[26].

XII. CONCLUSION

To summarize the cloud computing service evaluation, it is required to highlight the benefits that service. Here quality evaluation provides to two kinds of organizations; companies that develop service and organizations that acquire service.

Proof of assessment done by an third part or an agency should be independent and accredited to carry out audits. It is an area that has not been contemplated by the series of standards until now. Nevertheless, service product certification is of great interest to developers or purchasers of service products, since it allows for identifying the quality of a service product in a quick and standardized way. Thus, these indicators related to quality and performance can be used in service quality or service testing laboratory related agency. It can also be helpful to evaluate cloud service, maintain capacity and certify the level of quality for cloud computing service in conformity with its related standards.

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