



## Cloud Computing Service Ranking Approach Based on Multiple Attributes

Shubhangee B. Raipure<sup>1</sup> and R. N. Jugele<sup>2</sup>

Department of computer Science, Shivaji Science College, Nagpur.

shubhangee\_raipure@yahoo.com1

rn\_jugele@yahoo.com2

### ABSTRACT

Cloud computing is an emerging commercial infrastructure model that used to eliminate the need of maintaining expensive computing facilities by companies and institutes. Cloud computing is an Internet-based computing mode enables accessing information resources in users request time. There are different cloud Service providers present cloud services with different characteristics. On the other hand, determining the best cloud computing service for a cloud application is a serious problem for users. So ranking compares the different services offered by different providers based on quality of services used to select the most appropriate service. SMI based metrics are used to provide QOS and also Ranked Voting Method is used to rank the service providers in order to choose best service provider. In this paper, the existing approaches for ranking cloud computing services are analyzed based on multiple attributes like cost, performance etc.

**Keywords:** Cloud Computing, Cloud Service Provider, Quality of Service, Ranking, Service Measure Index.

### 1. INTRODUCTION:

Cloud Computing model provides services and delivers on demand resources (such as software, platform and infrastructure, in user's request time. Cloud services can be considered as the next utility required for human. In cloud environment every user has its own unique requirement. Thus, selecting the best service that fulfills user's application requirements is an important research challenge [1]. The quality of service (QoS) information is required in service comparison. This information can be measured by providers or a third party. Some attributes like response time, delay, usability, security, privacy and availability are defined for preparing quality of service information. The value of these attributes represents degree of quality of services [2].

The goal of ranking of services is helping users to evaluate and compare different services. So, users can select the most appropriate service that satisfies their requirement. Service ranking and selecting most appropriate service is performed by some approaches, such as three component architecture of Service Measurement Index (SMI) Cloud [5], service mapper, Service Ranking System (SRS), SLA Matching, CloudRank and Aggregation.

### 2. RANKING AND BACKGROUND :

#### 2.1 Ranking

Generally, ranking is sorting and assigning a degree to some choices. This concept is applied in some cases, such as ranking web services [3]. Therefore in cloud environment, maybe different level of quality of service received by different users but for same cloud service. So it is required that a ranking system receives user's requests with different requirement levels.

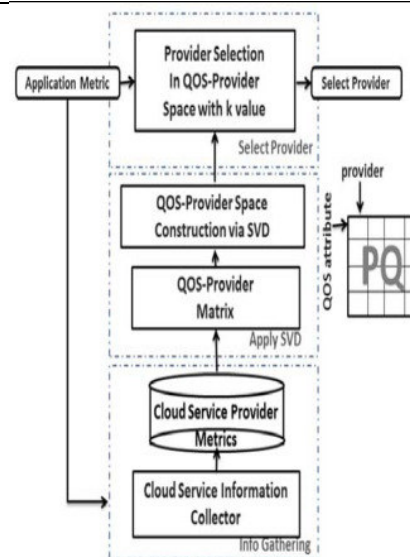


Fig 1: Cloud service mapper

Then, it finds some services which satisfy user requirements and ranks them for each user based on QOS. A framework is needed to perform these tasks. This framework should have the ability of receiving information from users and selecting the best service based on their requirements by service monitoring. Also, it is needed to consider following items for ranking of selected services [4].

- Which attributes should be selected for ranking?
- How the value of each attributes is determined?
- Which algorithm should be applied for ranking?
- How to get the received result? How to present them to the user?

- The answers of above questions are essential for ranking process. Different approaches may perform in the same way.

### 2.2 Service Monitoring

Monitoring is an action that observes the status of system and gathers and represents required information from different parts of system. Monitoring systems and services for collecting information could be performed in two different places.

- Service providers can perform monitoring for being aware of their service performance.
- A person or a system exist that is not a provider of the mentioned service, but perform monitoring just for getting information about servicing of that system.
- Monitoring approaches mostly uses from benchmark or other tools for gathers the information about quality of services.

### 2.3 Quality of Service

Quality of service represents functional attributes of the given service based on quantity or quality. It also represents the ability of a network or system for presenting better services[7]. Represented services in cloud computing environment have qualitative attributes such as accountability, agility, cost, performance, assurance, usability, security and privacy.

### 2.4 Qualitative Attributes In Service Comparison

Cloud Service Measurement Consortium (CSMIC) [6] has determined some attributes for measuring cloud computing services and adopted these attributes in the form of Service Measurement Index (SMI). These attributes are applied for comparing different cloud services and they are designed based on International Standard Organization (ISO). Generally, seven primary attributes exist for service comparison, each of which has series of sub attributes. These attributes are defined as follow [7].

- **Accountability:** if a system or a service does not have accountability, neither a person nor a company would use it. Also, they won't deploy their data on it. It is possible that the services cannot be accessed in need time, since they are not available.
- **Agility:** it is one of the most important advantages of cloud computing. With this attribute, organizations and people that are using cloud computing would become capable of changing or developing their service without paying any cost. In fact, services which have this attribute can add new abilities quickly.
- **Cost:** it is a choice which is asked in the beginning of cloud service selection and tries

to answer whether or not the service is cost efficient.

- **Performance:** there exist different providers that provide services with different performance levels. Organizations need to know how the performance of each service is.
- **Assurance:** this attribute represents probability of the cloud service performance based on the agreement between a user and a provider.
- **Security and Privacy:** it is the most important concept for each person or organization. It is about data maintenance and providing security and privacy for the user.
- **Usability:** this attribute is about quick adaptation of cloud services. If a cloud service has this attribute, its users can easily learn that service.

### 2.5 SERVICE MEASUREMENT INDEX :

Cloud Service Measurement Consortium (CSMIC) has determined some attributes for measuring cloud computing services and adopted these attributes in the form of Service Measurement Index (SMI). These attributes are applied for comparing different cloud services and they are designed based on International Standard Organization (ISO).

### 3. Research Methodology:

Besides cloud service providers, it face different problems of publishing services that expose resources, automatic service selection and easy use of services.

Cloud computing despite being in an early stage of adoption to replace in-house IT infrastructure due to its technological advantages such as elastic computing, cost benefits resulting from pay-as-you-go pricing and economy of scale. These factors have led to a rapid increase in the number of cloud vendors and services on offer. Given that cloud services could be characterized using multiple criteria (trust, cost, pricing policy, performance, reliability, scalability etc.) is important to have a methodology for selecting cloud services based on multiple criteria. Additionally, the end user requirements map to different criteria of the cloud services. This diversity in services and the number of available options have complicated the process of service selection and so there is a need for a comprehensive methodology for cloud service selection.

Currently, there is no framework that allow customers to evaluate Cloud offerings and rank them based on their ability to meet the user's Quality of Service (QoS) requirements. The propose framework and a mechanism that measure the quality and prioritize Cloud services

make a significant impact to satisfy their Service Level Agreement (SLA) and improve their QoS.

As the increasing numbers of various Cloud services are rapidly evolving and to select the best and optimal services is a great challenge. Cloud service selection framework in the Cloud helps a user to select the best services from different cloud providers that matches user requirements. The selection of a service based on the network, Quality of service and Virtual Machine (VM) platform factors of difference cloud providers.

#### 4. CONCLUSION:

Ranking of services as a framework evaluates different services and determines their priority. In cloud computing environment, there are different cloud providers which present services with different qualitative characteristics such as efficiency, cost etc. By increasing number of service providers, choosing the best cloud computing service for a specific application is a serious challenge for users.

Ranking prioritizes services for selecting the most appropriate service. We conclude that the standards of the ranking system should be considered at first for having an efficient ranking system. So, a system has ability to respond at any condition. Also, it is necessary to measure all of the qualitative values of selected services precisely. Considering an optimum algorithm for service ranking is necessary too.

#### REFERENCES :

- Leyli Mohammadkhanli, Arezoo Jahani," Ranking Approaches for Cloud Computing Services Based on Quality of Service: A Review "ARPN Journal of Systems and Software VOL. 4, NO. 2, March 2014
- S. Ding, S. Yang, Y. Zhang, C. Liang, C. Xia, "Combining QoS Prediction and Customer Satisfaction Estimation to Solve Cloud Service Trustworthiness Evaluation Problems," Knowledge-Based Systems, Vol. 56, pp. 216-225, 2014.
- R. Buyya, C. Vecchiola, S.T. Selvi, "Cloud Computing Architecture," chapter 4, pp. 111-140, 2013.
- A. Goscinski, M. Brock, "Toward Dynamic and Attribute Based Publication, Discovery and Selection for Cloud Computing," Future Generation Computer Systems, Vol.26, No. 7, pp. 947-970, 2010.
- Vidyashree C.N, Vidyashree , An Effective Approach To Find a Best Cloud Service Provider Using Ranked Voting Method,ISRASE vol 59, 2010
- "Cloud Service Measurement Index Consortium "(CSMIC),www.cloudcommons.com/service measurement index 2012.
- M.K. Saravanan, "an Enhanced QOS Architecture Based Framework for Ranking of Cloud Services," International Journal of Engineering Trends and Technology (IJETT), Vol. 4, No. 4, pp. 1022-1031, 2013.

