Performance Analysis of service Broker Policies in Cloud Environment using Cloud Analyst Tool

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Abstract:- **Many of the new technologies are present in cloud computing for Internet application developers, where shared recourses, data and information are provided to computers and other devices on demand. Previously the deployment and hosting of the application is problem for the developers but now it is easy and cheap to solve this problem in cloud computing. Several cloud providers are available, which are providing selected data centre location at different prize. To overcome this problem a new application was proposed cloud Analyst for cloud environment. It was develop to replicate the large scale cloud application with the purpose of studying the performance of such applications under a variety of consumption configuration. Cloud Analyst tool helps the developers to understand how to distribute the application among the cloud network and services by doing the study of application performance and the incoming from the provider with the use of service brokers.**

Keywords— **Cloud computing, Simulation, Modelling, Service broker.**

I. Introduction

Cloud computing is a very popular technology in IT sector. Cloud computing has a distributed architecture which has centralized server to provide resources and services desired by the user. With the help of cloud computing user can access the data and application from all over the world present on Internet [1]. Cloud computing allows the user to access the data and services remotely from the other node [2]. Cloud computing can be classified in various types: Public Cloud, the computing infrastructure is hosted by the cloud vendor only the customer has no visibility and control over the cloud infrastructure. Private Cloud, the cloud infrastructure available only for a particular organization. Hybrid Cloud, the combination of public and private cloud computing. Community cloud, the cloud infrastructure available only for any particular community. On the basis of service provider clouds are Iaas (Infrastructure as a Service), PaaS (Platform as a Service), and SaaS (Software as a Service). Cloud computing is a distributed system so it distribute its load to other resources and servers for improving the performance of server and quick response to the cloud user's request. It distributes the server's workload to other servers and resources in a balance manner to balance the traffic on network and avoid overload.

In cloud computing the load balancing aspect is divided into two types i.e. Data App Service Broker and Data Center Controller [3]. Data App Service Broker also called Data Center Selection. As it named Data Selection Policy so it decides with data center is suitable to respond to the request comes from the user [4].

II. Related Work

In 2012, it is conclude that proposed service broker policy works efficiently with respect to the cost for the data center selection. Two algorithms are proposed and also be concluded that the processing time in the proposed algorithm (1) is higher than the closest data center algorithm but in the proposed algorithm (2), the processing time is improved [4].

In 2014, Considering the unique features of long-connectivity applications, an algorithm is proposed which improves the performance of existing service proximity service broker algorithm. Proposed algorithm optimizes the number of connections and reduces average

DC request service timing. Finally, experiments show that proposed algorithm improves the performance of existing SPSB algorithm. The future work may include design and development of

effective service broker algorithm for multimedia and live streaming web applications [5].

III. Service Broker Policy

Service Broker Policy is used to divided the whole world's data into various data center and decides which data center has to respond to the request comes from the user [4].
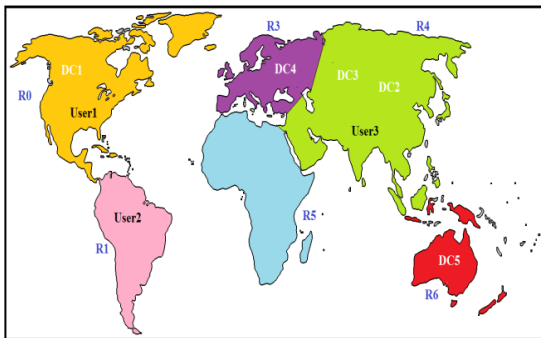

Geographically distributed datacenters

From the above fig we can easily understood about the policy. It describes that which data center replies to which user request.
There are three Service Broker Policies already existing in Cloud Analyst as follows:

IV. Closest Data Center Policy

This policy is based on the concept of region proximity which is made by the use of lowest network latency first criteria to describe the order of the data center in the list. In this policy the request of user is fulfilled by the closest data center, if more than one data center occurs near then the choice will be made randomly.
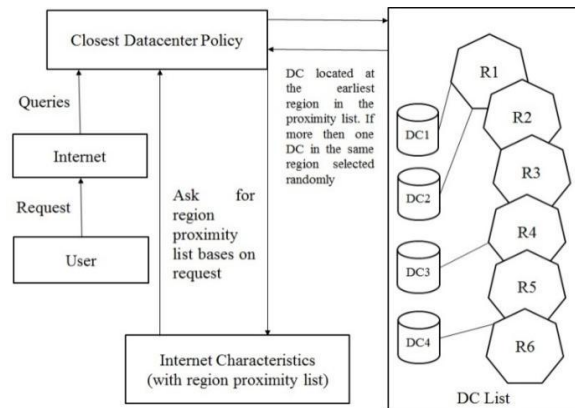
Closest Datacenter Policy

V. Optimize Response Time Policy

First it estimate the closest data center by using the closest data center policy but when it starts degrading the performance then it estimate the least response time for the user request. There may be 50:50 chance of occurrence of closest and least response time data center then again the choice will be made randomly.

VI. Dynamically reconfigurable routing with load

This is an extension to Closest Datacenter Policy where the routing logic is similar. But it has one more responsibility of scaling the application deployment based on the load it is facing. It also increases or decreases the no. of VMs accordingly. This will be done taking under consideration the current processing times and best processing time ever achieved.

VII. Cloud Analyst Tool

Even cloud make distribution of applications easy to the user, but developers faces many problems in fulfilling the user request because of the geographical distribution of areas. Internet is used all around the world so user can be so far from the data center so it create problem in performance of network. Cloud Analyst Tool was developed at Melbourne whose aim is to support the

evaluation of social network tools according to geographical distribution of users and data centers [6].

Practical comparison of these policies using Cloud Analyst:

Now in the below table the configuration is given which is used to take the simulation results for practical comparison of three service broker policy[6].

Configuration Table

| Parameter	Value Used
UB Name	UB1
Region	2
Request Per User Per Hour	60
Data Size Per Request	100
Peak hour start(GMT)	3
Peak hour end (GMT)	9
Avg Peak Users	40000
Avg Off Peak Users	4000
DC 1 – No Of VM	75
DC 2 – No Of VM	50
DC 3 – No Of VM	25
VM Image Size	10000MB
VM Memory	512MB
VM Bandwidth	1000bps
DC 1 – No Of Physical Machine	2
DC 2– No Of Physical Machine	2
DC 1 – No Of Physical Machine	2
DC – Memory Per Machine	204800Mb
DC – Storage Per Machine	100000000 Mb
DC –Available BW Per Machine	1000000
DC – No Of s Processors Per Machine	4
DC – Processor Speed	10000MIPS
DC – VM Policy	Time Shared
User Grouping Factor	1000
Request Grouping Factor	100
Executable Instruction Length	500
Load Balancing Policy	Throttled

In CloudAnalyst, user base configuration and VM memory, image size, bandwidth should be define under Main Configuration tab. Datacenter configuration which consists no. of hosts, processor speed, memory, storage, bandwidth, VM policy should be define under Datacenter configuration tab. User grouping factor, request grouping factor, instruction length, load balancing policy should be

define under Advanced tab. Third policy gives useless results. So the comparison is done only between first two policies. The
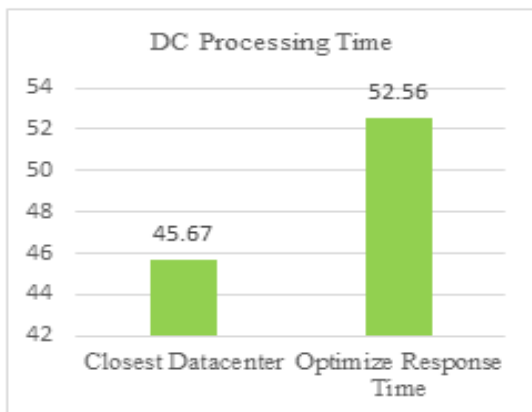
comparison is given below in terms of graphs for cost, response time and datacenter processing time[6].

Graph of Cost
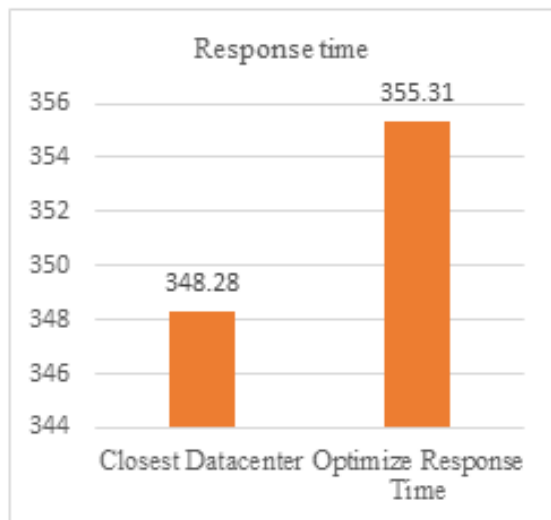
Graph of Response time

Graph of DC Processing Time

From above graphs we can say that closest datacenter gives the best results in terms of cost and response time compare to another two policies.

VIII.   Conclusion

From above discussion, we can conclude that Cloud Sim is limited to VM Management because in Cloud Sim brokerage policy is combinely given with VM Management which can't be easily modified. In Cloud Analyst these two facilities are separately given and it also provide geographically distributed cloud

environment. So if we want to work particularly on service broker or load balancing then Cloud Analyst is best option. In both simulator there is no specific SLA parameter. But Cloud Sim is in developing mode and they are trying to include SLA parameter so in future it can be there in Cloud Sim. From the survey of service broker policy we can conclude that we have to take care of two parameter cost and performance. Till now, whichever new service broker policy is proposed that improves either cost or performance. So when we try to propose new service broker policy we have to take care that both parameters can be improved [6].

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