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REVIEW ARTICLE

A Review on Cloud Service Broker Policies

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Abstract— Resource sharing is the core rule governing the IT Industry. Cloud Computing is a paradigm for delivery of computing resources i.e. hardware and software over the internet. Cloud Computing enable individuals as well as business to use software and hardware as a service that are managed by third parties (Cloud vendors) at remote locations. This paper discussed the three cloud service broker policies for selecting the appropriate data centers in cloud environment.

Keywords— Cloud Computing, CloudAnalyst, Service Broker policy, Data Center selection, User Base

I. INTRODUCTION

Cloud computing is one of the leading computing field that has given the new visualization to the IT Industry. Cloud computing refers to hosted online services accessed via the internet, which can help in the faster deployment of user applications for less cost [1]. Cloud computing has opened an access as an innovative model for hosting and delivering services over the internet. Cloud computing provide users virtually boundless pay-per-use computing resources without the load of managing the underlying infrastructure. The core purpose of cloud computing is to provide the computing resources as a services to the consumer.

Clouds data centers are designed by architecting them as networks of virtual services so that users can access and deploy applications from anywhere in the world on demand at reasonable costs depending on their QoS (Quality of Service) requirements [1]. Since there are many Datacenters hosting the provided applications, the function of a service broker becomes very important in selecting the most suitable data center to serve the received request.

Cloud Analyst is a graphical cloud simulation tool that provides the necessary simulation environment for executing and analyzing various cloud scenarios. It also provides facilities to implement new policies and algorithms [9]. In the Cloud Analyst simulation tool, a Service Broker applies a service broker policy to select the target data center (DC) when a user creates a new request [6].

II. PROPOSED SYSTEM

The aim of proposed scheme is to compare the Cloud service broker policies: Closest datacenter, Optimal response time and Dynamically reconfigurable routing with load balancing considering various parameters and to find best cloud service broker policy on runtime virtual cloud environment achieving cost-effectiveness. It is assumed that out of three policies one will have less data centre processing time on runtime virtual cloud environment as compared to others using some parameters.

It has been concluded that there is always been the requirement to select appropriate datacenter so that further tasks for processing the request should be carried out with efficiency in least response time. So, the main issue related to service broker policy is to select the appropriate data center in a cost-effective manner. In order to balance the user requests of the resources it is essential to recognize cost effectiveness to achieve an overall improvement in system performance at a reasonable cost [1].

III. SERVICE BROKER POLICIES

A service broker decides which data center should provide the service to the requests coming from each user base and thus, service broker controls the traffic routing between User Bases and Data Centers [12]. Present version of CloudAnalyst implements three types of service brokers each implementing a different routing policy:

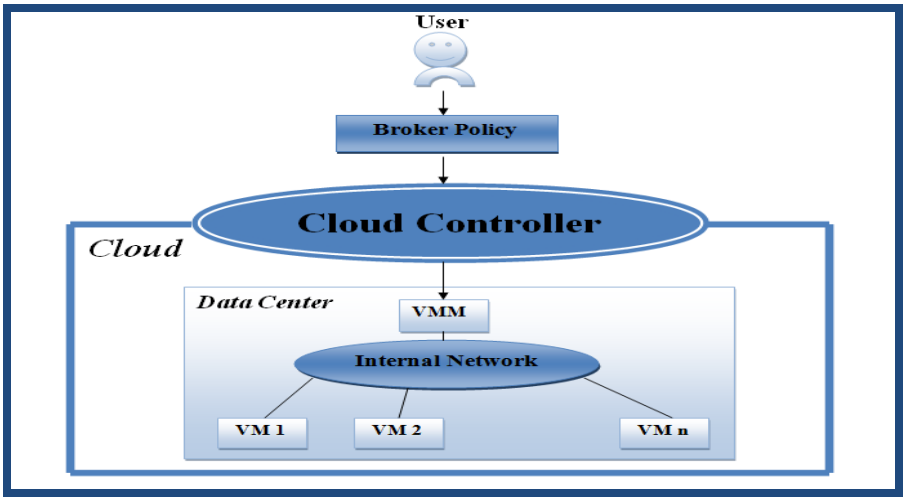

Fig 1: Cloud Service Broker

1. Proximity based routing policy/Closest Datacenter policy

In this case, the immediacy is the best path to the data center from user base supported network latency. The service broker can route user traffic to the closest data center in terms of transmission latency.

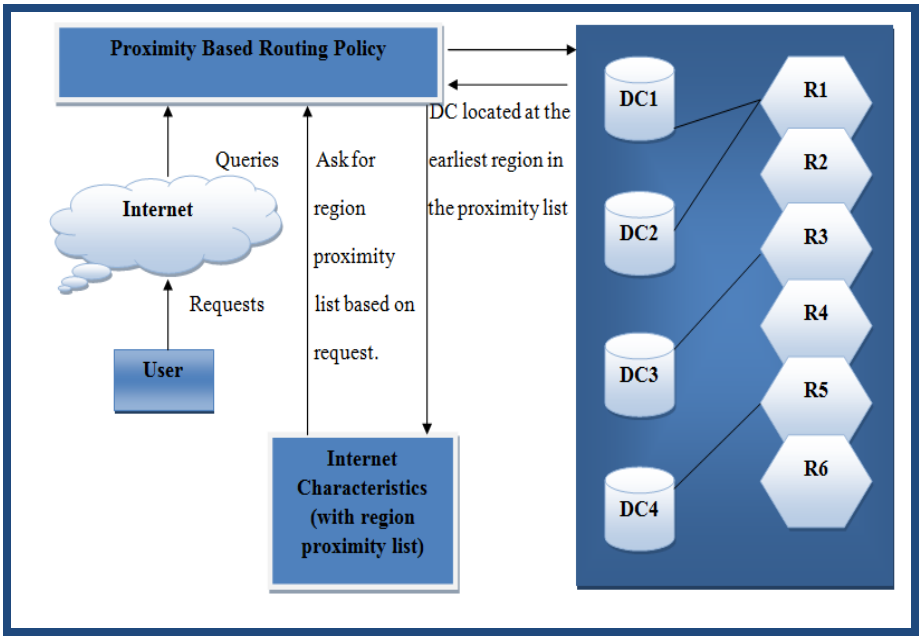

Fig 2: Service Proximity based routing in CloudAnalyst

A region proximity list is maintained by making use of the "lowest network latency first" criteria to set the order of occurrence of data centers in the list. The data centre that occurs first in the list, i.e., the closest data centre is selected to fulfill the request using this policy. In case more than one data centers with the same latency are available, a random selection of the data centers is made. This policy is therefore beneficial in case the request can be satisfied by a data center that is quite close or within the same region [9].

2. Performance Optimized routing policy

In this case, the Service Broker monitors the performance of all data centers and routes traffic to the data center with the the best estimated response time to the end user at the time it is queried. If the estimated response time is the one for the closest data centre, then the closest data centre is selected. Otherwise, the closest data centre or the data centre with the least response time is selected with a 50:50 chance of occurrence [7].

3. Dynamically reconfiguring router policy

This policy makes use of basic concept of proximity based routing but there exists an extra responsibility of scaling the application operation based on the load it faces. This is done by increasing or decreasing the number of VMs allocated in the data center, according to the current processing times as compared against best processing time ever achieved [7].

IV. CLOUDANALYST

CloudAnalyst is a GUI based simulation tool, developed on the top of the CloudSim.

Fig 3: Cloud Analyst GUI [*15*]

It gives the simulation results in terms of chart and table that includes cost, response time, datacenter processing time, and load over datacenter, etc [2]. By using Cloud Analyst, application developers are able to determine the best plan for allocation of resources among available data centres, strategy for selecting data centres to serve user requests, and costs related to applications [1].

The main features of CloudAnalyst are as follows:

1. Graphical output in terms of charts and tables.
2. GUI based tool.
3. Deploys different service brokering policies depending on the requirements.
4. Repeatability of experiments**.**
5. Ease of extension.

The main components of CloudAnalyst are as follows:

- **GUI Package**: It handles the GUI and acts as the front end controller for the application.
- **Region**: There are six different regions corresponding to six different continents.
- **User Base**: A User Base models a group of users that is considered as a single unit in the simulation and its main responsibility is to generate traffic for the simulation [7].
- **Data Center (DC)**: In cloud environment, Data centers work as central repository for storage, management and propogation of user requests.
- **DC Controller**: This component controls various DC activities.
- **Internet**: This component models the Internet and implements the traffic routing behaviour [1].
- **Internet Characteristics**: This component models a group of user requests as a single unit in the simulation process and also maintains the characteristics of the internet during the simulation.
- **VM Load Balancer**: This component models the load balance policy used by data centres when serving allocation requests [6].
- **Service Broker**: A Service Broker act as inter-mediator between User Base and Data Centers and selects appropriate data centers for execution of user requests from the user base.

V. ROUTING OF USER REQUESTS IN CLOUDANALYST

In Cloud-Analyst, how the routing of user request takes place is shown in the figure below including the use of service broker policy and the virtual machine load balancer [3].

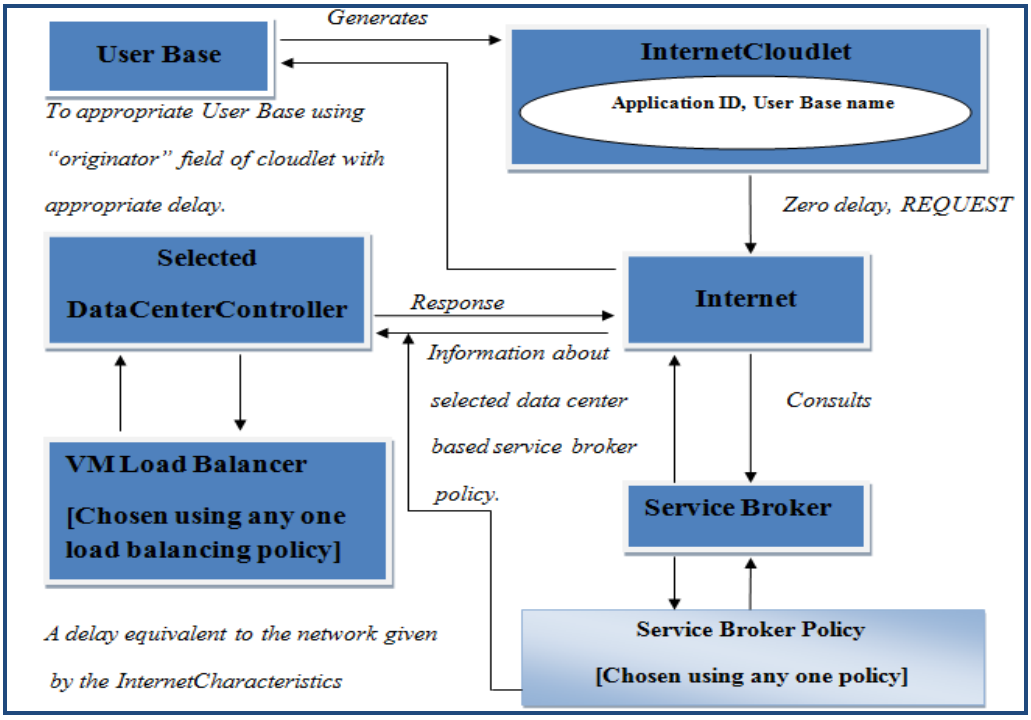

Fig 4: Routing of Users request in CloudAnalyst

User Base generates an Internet Cloudlet, with the application id for the application it is intended and also includes the name of the User Base itself as the originator for routing back the responses [4]. REQUEST is sent to the internet, with Zero delay. On receiving the REQUEST, Internet asks the Service Broker to select the appropriate data center for execution of user request. The Service Broker selects a datacenter using any service broker policy and sends the information about selected data center controller to the Internet. Using this information from the Service Broker, Internet now sends the REQUEST to the Data Center Controller. Now the selected Data Center Controller uses VM load balancer using any load balancing policy and sends the RESPONSE to the Internet. Now Internet will use the "originator" field of the cloudlet information it received earlier and will add appropriate network delay with RESPONSE and sends to the User Base [4].

VI. CONCLUSION

The paper concentrates on three Cloud Service Broker policies: Closest Datacenter policy**,** Performance Optimized routing policy and Dynamically reconfigure router policy and it has been concluded that the main issue related to service broker policy is to select the appropriate data center in a cost-effective manner. For assigning the requests to the data center, the algorithm uses different parameters like closest path, performance and location of the resource etc.

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