A Factor based Load Balancing in Cloud

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Abstract- **—Cloud computing is an area that is rapidly gaining popularity in both academia and industry. There are different resources in cloud like Virtual Machine ,CPU resource, server located in different datacenter. The server machines are consuming energy to provide services to users in cloud computing. For analyzing the resource allocation in cloud computing which is scalable to n servers then we will require Cloud simulation and modeling tool which will take create the cloud as per requirement. we have analyzed simulation of cloud on CloudSim and Cloud report for better analysis of cloud..Load balancing helps to achieve a high user satisfaction and resource utilization ratio by ensuring an efficient and fair allocation of every computing resource. load balancing aids in minimizing resource consumption, implementing fail-over, enabling scalability, avoiding bottlenecks and over- provisioning etc. In this paper a load balancing algorithm to balance the load among virtual machines in cloud data center.**

Keywords— Load balancing Cloud Data Center, Virtualization, CloudAnalyst, cloudsim, cloud Reports

I INTRODUCTION

The cloud means the applications and services that are offered from data center to all over the world. These applications and services are offered over the internet. To meet cloud computing requirements, CloudSim was developed for modeling and simulation of extensible Clouds [3]. For analyzing performance of cloud environment in various ways , actual deployment of cloud is costly and difficult task, therefore not preferable. For this reason various simulation tools are used to model and analyze cloud computing environment and applications, graphically analyze the results before the actual deployment of clouds. The services provide by cloud computing are infrastructure as a service (IaaS), platform as a service (PaaS) and software as a service (SaaS) that are made available as pay-as-you-go model to clients, Cloud computing is based on the concept of virtualization. Virtualization is a method for creating what are called virtual servers that run on a cluster of a number of real servers. Virtualization allows for a smaller number of high- powered servers to create a larger number of less-powered servers while reducing the overall cost in space, power, and other infrastructure.

Load balancing is one of these problems, it plays a very important role in the realization of Cloud Computing. Load balancing means the ability to distribute the load over a number of separate systems therefore the overall performance of processing the incoming requests increased. There are four major resources processor (CPU), memory (RAM), network and storage (Disk). In traditional computing environments, researchers [16, 17, and 18] have proposed various static, dynamic and mixed load balancing policies. In the cloud computing environment, load balancing is required to achieve short response time and high system throughput. For cloud environment various load balancing approaches have been proposed such as Honeybee-based load balancing technique [3], Active Clustering [3], Random sampling [3], Active Monitoring Load Balancer [4], Throttled Load Balancer [4], WCAP [6], JIQ [7], CLBVM [13] etc.

II RELATED WORK

In cloud environment, load balancing is a method that circulates the dynamic nearby workload similarly across entire available nodes. Load balancing is used for achieving resource utilization ration and service provisioning, therefore enhancing the entire system performance. In load balancing, incoming tasks are coming from the different location are received by the load balancer and then tasks are circulated to the data farm for the appropriate load distribution. A perfect load balancing algorithm ought to evade under loading or overloading particular node. important goal of a load balancing in an environment of cloud computing remains to growth the reply time of job with the aid of job by the whole load of procedure. Load balancers can operate in dual exclusive approaches: one is the cooperative and other is Non- cooperative. In non-cooperative mode, the duties run independently as a way to enhance the reply time of nearby tasks. In cooperative, the nodes work even as to be able to acquire the common purpose of optimizing the overall response time [4], [5] and [8]. Selecting the appropriate data center: For Selecting the appropriate data center we have load balancing policies which affect the performance to a great extent. As it is first step towards providing better cloud performance. Therefore, properly selecting a data center by using appropriate load balancing algorithm is work of research.

Selecting appropriate VM: After selecting appropriate data center the Load balancing is the most important aspect in any data center. Load can be balanced only if proper VM allocation is done for a particular user request. Various Load balancing techniques are present

and proposed to enhance the cloud performance.
The Situation may arise that all the requests may go to only one data center. As a result of that only one data center is highly loaded and others are not. Other situation may arise that there is a need of migrating VM or allocating new VM for a user request. There is a lot of research work going on for providing Service Broker policies and Load balancing algorithms which would increase/enhance Cloud Environment performance.

III. LOAD BALANCING

load balancing algorithm "Central Load Balancer" will balance the load among virtual machines having different hardware configurations and will distribute the load based on hardware configuration and states of virtual machines in data center. This technique will be able to perform quick and reliable load balancing in cloud computing environment through utilization of all virtual machines according to their computing capacities.

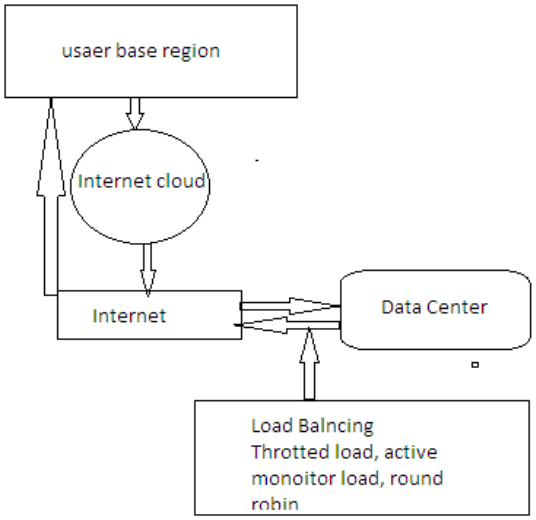


Figure 3.1. Working of Load Balancer

1. When the request arrives, the closest region is selected depending upon the proximity list .

2. Regional list (DcList) of datacenters is loaded from regional Data center Index map with corresponding closest region.

3. Pointer and load Counter values are loaded for corresponding closest region.

Select the data center in circular fashion keeping into consideration the proportion loads. For example if entry for number of virtual machines for DC1, DC2 and DC3 is 50, 30 and 10 respectively. So the corresponding proportion loads are in the ratio 3,5,15. Thus DC1 is assigned to process the first 3 cloudlets, DC2 is assigned to process the next 5 cloudlets and DC3 is assigned to process the next 15 cloudlets, out of first 23 cloudlets and the whole selection process is done in a repeated manner to process the entire set of workloads.

IV. EXPERIMENTAL SETUP

The algorithm is implemented and integrated in CloudAnalyst tool [4].The CloudAnalyst is a CloudSim-based tool for modelling and analysis of large cloud computing enviroment.

Table 4.1 7 user bases representing the 7 region

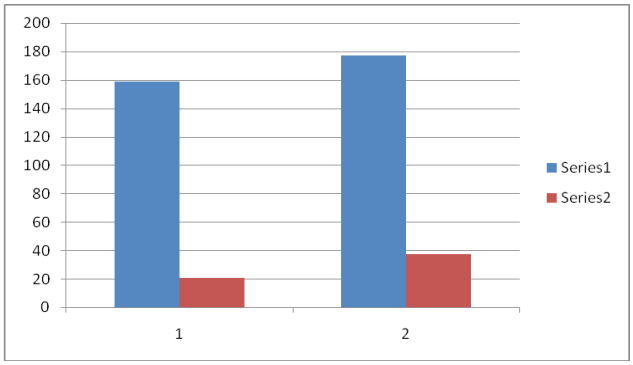
Data Center	Avg (ms)	Min (ms)	Max (ms)
DC1	8.25	0.17	42.83
DC2	35.04	0.58	63.50
DC3	55.33	0.86	100.98
DC4	57.05	0.88	100.99
DC5	8.00	0.37	13.36
DC6	38.44	2.57	63.35
DC7	60.97	4.05	100.86

TABLE 4.2. OVERALL RESPONSE TIME

After applying factor based allocation

	Avg (ms)	Min (ms)	Max(ms)
Overall response time:	156.58	42.55	665.09
Data Center processing time:	20.43	0.17	100.99

predominant task among the various defined approach based activity. It's requisite to allocate the dynamic local workload equally through the entire nodes to acquire an excessive user gratification and resource utilization ratio by making definite that every computing resource is distributed effectually and justly. In this paper, we have done the survey on the various and numerous load balancing algorithms within the cloud environment which are already proposed by various researchers and authors.



VI. CONCLUSION

In this paper, we have studied load balancing algorithms under cloud environment. In cloud computing, load balancing is a We have observed that the response time of our proposed algorithm " Load Balancer" is less as ompared to other three load balancing policies

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