A Novel approach for Load Balancing distribution and storage by using Cloud Computing

Anjali Sharma[1*] and *K.K.* Sharma[2]

[1]School of Computer Science and Applications, IIMT University, Meerut, India
[2]School of Computer Science and Applications, IIMT University, Meerut, India

Abstract. Today's Cloud computing is the popular technology to complete the work in an efficient way, this provides an important platform to storing data in terms of pay as per use and accessible for everyone by the help of the internet. As we know the use of this technology invites many issues, some are security, failure rate and most critical load balancing. These research papers focus on load balancing and also provide an algorithm to overcome this issue. This paper proposed an idea to minimize the extra burden on the nodes through load shift or load transfer according to the availability or requirement while nodes are overloaded. Here we are discussing many algorithms and their features and find out the proposed joint algorithm which works accordingly as demanded and also offer an idea to overcome the problem of over burdens on nodes by load balancing.

1 Introduction

Today's Cloud Computing is grooming technology that uses the internet for its implementation. This technology provides everything to customers on rent as pay per use like hardware, software, the platform. Here virtualization concept is used which produces the number of virtual servers from a particular physical server. These physical servers will be public to all customers to complete their needs according to their resources. Cloud based on models classified into private, public, hybrid and also community. All are works according to Platform as a Service (PaaS), information as a Service (IaaS), Software as a Service (SaaS) [1]. Different models behave differently like private Clouds have restricted basis and management so they are much protected from others. Whereas public Clouds are extremely disposed to security. Hybrid cloud is a grouping of private as well as public cloud so behaved versatility on behalf of public Cloud and private Cloud. There are many cloud service providers which offer Cloud services like Amazon, Google and so on [1][2] Cloud. The idea of this computing is shared resources to users by using internet on the based on pay per-use, which will reduces the starting and operating cost [3].Now a day's use of cloud computing is very popular and enhancing speedily day by day so numbers of issues arise time to time some are very important which need to solve as much as possible related to security and balancing the load. So share the workload to the appropriate nodes that may overcome the problem related to load because no one node is overloaded or idle of under loaded. A successful and well-organized load balancing algorithm will ensure that all nodes in frame completes the same work load as needed [4][5][6].we are having numerous algorithms that have a variety of solutions then get the combination of two algorithm features to produce a good algorithm for load balancing. This paper combined two algorithms Equally Spread Current Execution Algorithm (ESCE) and Priority Algorithm.[5][7]. In this paper, proposed algorithms works on the load, with the purpose of this load will be move on over loaded to under loaded or no loaded virtual machines and make more efficient and well organized.

The purpose of this research paper is to design an efficient joint algorithm that can work on the load on virtual machines and improve the response time with less resource consumption. Here introduce the Joint approach which applied for load balancing using Equally Spread Current Execution (ESCE) algorithms and double priority load balancing algorithm.[8][9].

Cloud computing is one of the most important platforms for resource allocation and their service. Here ESCE load balancing algorithms and double priority load balancing algorithms are analyzed for the response time. In this research paper, taking advantage of both Equally Spread Current Execution (ESCE) load balancing

* Corresponding author: anjali.shail@gmail.com

algorithms and double priority load balancing algorithms in hybrid mode we have used and simulated *the results by Cloud Analyst[9][10*]. Load balancing is the way to allot the load to each and every node in a distributed system in terms to work quickly and efficiently. Load balancing is a parallel system method which is used to accomplish the optimal system state, by these workloads are extended uniformly into various comp*uters [11*]. It implements the load balancing before execution of the programs. In a cloud atmosphere, load balancing is a way in which all nodes in the network are given *an equivalent amount of work [12*]. The significance of the load balancing in the cloud is allocating the load to every node with resource consumption. Load balancing algorithms will ensure that all loads equally distribute to all nodes efficiently and no one node will be overloaded. The objective of load balancing is first best possible resource consumption, greatest throughput, avoiding overload and highest response time. There is a universal problem with static load balancing algorithms is that when the process is recognized, the last selection of a host for job allotment is complete then cannot be customi*zed during process execution [13*].So This paper combined two algorithms Equally Spread Current Execution Algorithm (ESCE) and Priority Algorithm. In this paper, proposed algorithms work on the load, with the purpose of this load being moved from loaded to under load or no loaded virtual machines and made more efficient and well organized.

1.1 Available Load Balancing Algorithms

To divide the workload to all available VM's efficiently and effectively that is mainly based on their throughput and its latency, at this point we will exercise one is Equally Spread Current Execution Algorithm (ESCE) and second is Priority Algorithm.

1.1.1 Equally Spread Current Execution Algorithm (ESCE)

In this approach load balancer makes a safeguard which shares the load to everyone VMs which are associated with data centers. It uses heap to VMs through scrutiny at present time, the heap deal is that the VM is not as much stacked and its output is in terms of fewer time taken with more throughput. All records maintained in a table which holds by load balancer and also solicitations number is starting at circulated respective VM [14].while everyone VMs stacked then demand make as of DC to allocate novel VM, then if it is verified from that table used for smallest amount stacked VM. Data center offers demand to VM perceived correctly, when VM completes the task, load balancer educates the data center.

1.1.2 Priority Algorithm

Priority algorithm is based on priority on behalf of demand. in this paper we focused on double priority [15,16,17], which based on smallest length cloudlet and it will be provided with maximum priority and other is based on VMs which sorted on their MIPS,smallest length cloudlet will be allow to lowest MIPS VMs, through this concept starvation issue can be stay away, and response time can be reduced [18-23]. This estimation will be a good attempt to bear the completing via gives the resources to ask for, which may be to get an enhanced task executions number plus decrease employment submitted number, load balancer is selected these evaluations like fig 1.

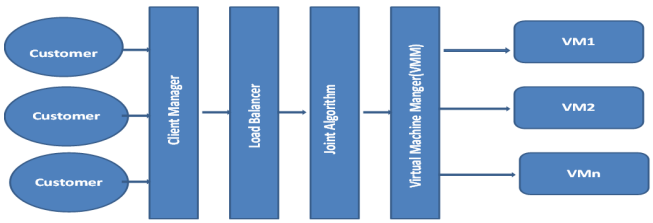

Fig.1. Load balancer with algorithms.

1.2 Novel Approach Joint Algorithm

Here proposed joint features of double priority and ESCE algorithms which will introduce the both algorithm benefits. One VM status indicated by the decision tree then maintains the priority algorithm when a sequence of customer requests is received. Then requests are divided into Cloudlets and Cloudlets lengths and then cloudlet sorted according to their length and calculated. On based on MIPS once more VMs again sorted and

used FCFS way to allocated the cloudlet as the smallest length cloudlet will be provided maximum priority and next is based on VMs, so sorted on their MIPS smallest length cloudlet will be allow to lowest MIPS VMs, through this concept starvation issue will be reduce, and performance time of cloudlet will be minimized. After that Equally Spread Current Execution algorithms (ESCE) works on allocated load uniformly to every present server, through this ECSE algorithm concept no server is idle or under loaded and over loaded like as Fig. 2.

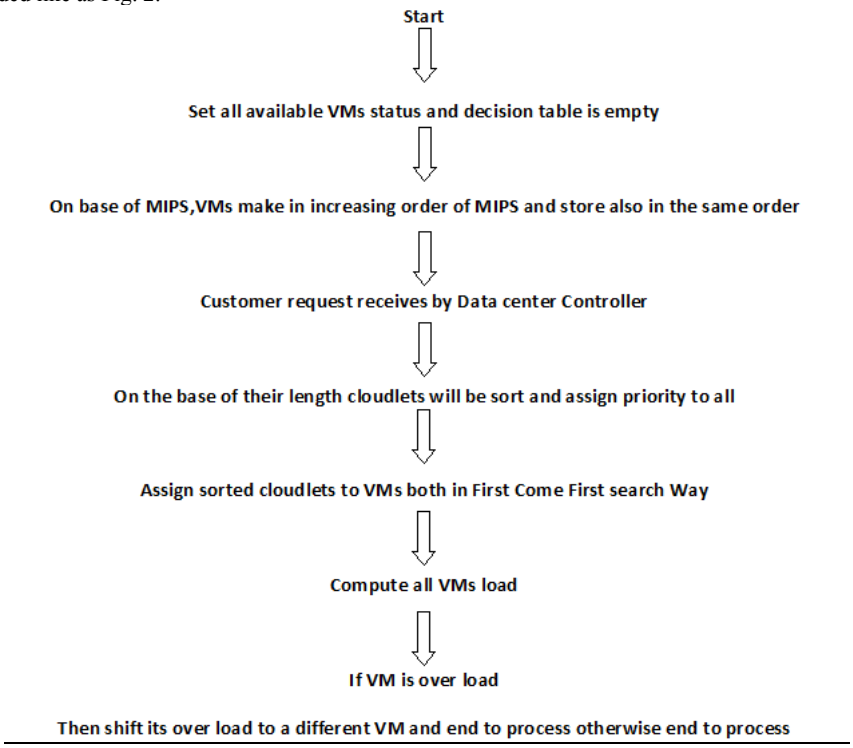

Fig.2. Flowchart for proposed Joint Algorithm.

This paper combined two algorithms Equally Spread Current Execution Algorithm (ESCE) and Priority Algorithm for joint proposed algorithm this algorithm works on the load, with the purpose of this load will be move on over loaded to under load or no loaded virtual machines and make more efficient and well organized. This algorithm will be planning some steps like

Step-1: firstly, set all available VM's status and there is no entry in the decision tree.
Step-2: create VMs on base of their MIPS by data center controller and will store them in the similar mode.
Step-3: new job will be received by the data center controller.
Step-4: then the job will be divided by it into cloudlets then calculated according to its length base.
Step-5: After that, sort Cloudlets based on their length by data center controller and assign the priority.
Step-6: now FCFS is used for both allocate and the sorted cloudlets to the VMs list.
Step-7: now check the status of VMs, is idle or under loaded or over loaded by load balancer
Step-8: condition if yes, at that time over load will be shifted to under or idle load.
Step-9: After that, I need to revise the decision table.
Step-10: End the Process.

2 Simulation Step

To analyze and execute the mentioned algorithms we are using Cloud Analyst tools [18]. Actually cloud analyst is an extension of cloudsim, it facilitates the modeler in terms of execution as simulation repeatedly

with the variations within parameters rapidly and simply forms. Like fig 3 cloud analyst tool interface with GUI. Cloud analysts work with mainly three main styles like configure simulation, define internet characteristics and run simulation [19,20].which is very useful for simulation in the cloud analyst tool.

Fig.3. GUI Interface of Cloud Analyst.

This tool offers a variety of features for switching algorithms according to demand. Simulation setup and analysis of outputs are done for a period of 60 minutes through taking a variety of users, and their data centers like DC1, DC2, and so on which have the numbers of VMs correspondingly. In cloud analyst tools some parameters are fixed like VM-image size, VM-image size, VM-memory, VM-Bandwidth, Data center architecture and many more.

3 Data Input for Simulation

By the help of simulation the proposed algorithm can be examined in a better way and can see the effectiveness of the suggested algorithm and find the profitability for customers in terms of decreasing price as changes. Here we used cloudsim and eclipse.Cloudsim is a simulator to check the real existence of concepts and also used Eclipse principles with java, it is (IDE).
Here CloudSim and Eclipse will be used for simulation. Input data for simulation is exposed like the pattern of the VM and Cloudlet size. Here we will obtain a huge number of Cloudlets that will be different in sizes. After the implementation of algorithms steps, we can add the joint algorithm in cloud analyst for simulation.

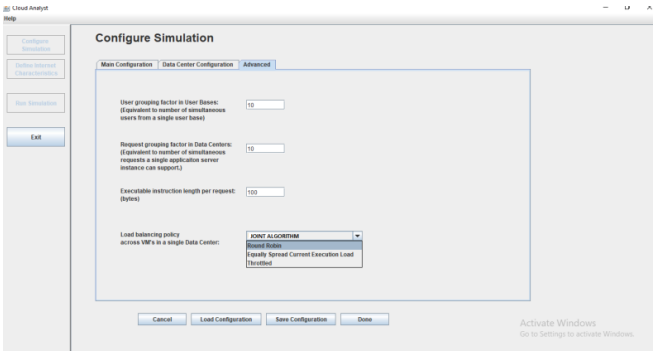

Fig.4. Joint Algorithm working in Cloud Analyst.

4 Results and Discussion

Complete analysis will be implemented with the help of cloud analyst, and will get results of proposed joint algorithm.MIPS of every VMs will be produced at random base except VM 0 which has least MIPS whereas final VM will have the highest MIPS.Through this way the starvation problem can be stay away from that. Now we can present that no VM is idle or under loaded or overloaded. Every one VM's will uniformly operate roughly 70%. So our proposed joint algorithm will handle the load balancing problem more as response time less in comparison of ESCE and priority algorithms like fig. 5.

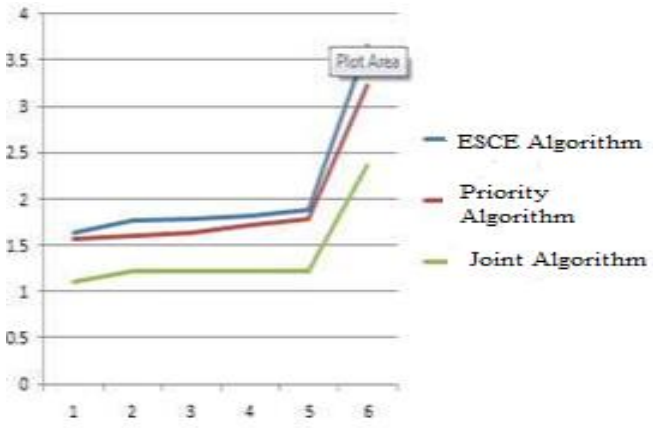

Fig.5. Results analysis by line graph.

In Fig 5 can see the output of the proposed joint algorithm demonstrated like total time is to be taken for the large amount will be reduced to complete the job. Joint algorithms will conclude that an overall response time will be enhanced around the 40 percent rather than ESCE and priority algorithms.

5 Conclusion

A joint approach is planned by using joint efforts of two algorithms one is (ESSC) Equally Spread Current Execution algorithms and another is (DP) Double Priority, it is implemented in the environment of the Cloud analyst. This algorithm recommended reward (ESSC) Equally Spread Current Execution algorithms and another is (DP) Double Priority. In this way we focused on the overall response time with finish time like estimate constraints. After evaluation we can see the result of less time with respect to the overall response time and the processing time by the joint efforts as compared two algorithms one is (ESCE) Equally Spread Current Execution algorithms and another is (DP) Double Priority. According our idea, here as measured VM's MIPS as a significant feature can see its prospect like a number of parameters can be used for assessment and priority like bandwidth, memory and many more.

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