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Cloud Computing: Hybrid Load Balancing Algorithm Proposal

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Abstract: In this paper we are giving an idea that focus on the response time with charges that are the vital issues in the todays time as we know these issues normally raise the outcome of load balancing by implementing for specific cloud platform.utilization of cloud computing technology that encourage a lot of issues, most of them associated with security, failure rate and mainly related to the vital issue load balancing. This research papers focuses on numerous of load balancing algorithms and provide a hybrid algorithm to overcome the load balancing problem. This approach provide a proposal by the exercise of mixed attributes of two main load balancing algorithms to overcome the over or extra load on a specific nodes by extra load transfer or extra load move on other desire nodes according to the possibility or condition. It also satisfies the requirements of customers that can make a trust between the system and the end user entire the world.

Keywords: *Cloud Computing, Load balancing, static algorithm, Dynamic algorithm, Cloud analyst*

1 Introduction

Now days as we know Cloud technology are popular technology that is accepatable globally with the help of the internet. This technology provides a lot of way to do the variety of work efficiently and effectively for the customer on the bases of rent that decide as per use this technology, services, type of cloud, and infrastructure. At the present virtualization concept make easy to use by the number of virtual servers as of an exacting physical server. This server will be available to every one client to meet their requirements that based on the resources. The cloud computing technology provided a facility of different forms of services like private, public, hybrid, and community. Every work is done in accordance with Platform as a Service (PaaS) which is specific for plateforms, Information as a Service (IaaS) which is specific for information, and Software as a Service (SaaS) which is specific for software. [1]. diverse models perform differently, such as private services of Clouds, which include limited base with administration therefore well secured as of outsiders. While the public Cloud is quite secure. Hybrid cloud may be combination any two cloud attributes like here we are include the joint efforst of the private and public clouds that make services for both public and private clouds. A number of several offered by cloud service to companies that are, IBM, Amazon, Google, and others Cloud. [1][2]. the concept behind cloud technology is to share the resources with customers according pay-per-use basis by the help of internet, which decreases startup and ongoing costs. [3]. Because the usage of cloud technology is becoming more accepted and rapidly expanding, a slew of difficulties develop from time to time, some of which are critical and must be addressed as thoroughly as possible in terms of security and load balancing. So distribute the job load among the right nodes to avoid load problems since no one node is overloaded, idle, or underloaded. A good and efficient load balancing concept that will undoubtedly make certain that every node in the balanced completes the work load while necessary [4][5][6]. Here a number of algorithms with a diversity of answers; therefore we combined two algorithm aspects to build a decent method for load balancing. Two algorithms were fused in this idea. That are Equal Spread (ESCE) and Priority methods.[5][7]. In this learning, presented efforts operate on the problem of overload, through the purpose of moving the burden from overloaded to underloaded or ideal VMs and making them additional resourceful and fit according to needs.

The goal of this article to create a well-organized combined algorithm that works on loaded virtual machines plus enhance the response time and cost while using fewer resources. The Joint load balancing technique (JLB) is introduced here, which is a mix of two load balancing algoriths that are Equally Spread Current Execution (ESCE) and a double priority algorithm[8][9]. Cloud technology is a critical platform for resource allocation and service delivery. Here the response time of ESCE and double investigated. In this study, used mixture of Equally Spread Current Execution (ESCE) load balancing techniques with a double priority. For the outcomes simulations, we utilised for simulation tools that is Cloud Analyst. [9][10]. Load balancing is a method of allocating the load to every available node in a distributed system in order to perform more speedily as well as effectively.

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Load balancing is a similar system strategy utilizes to achieve ideal organization situation via distributing workloads equitably across several processors. [11]. It does load balancing prior to programme execution. Load balancing is a method where every node in a system is assigned an equal amount of work in a cloud environment. [12]. the importance of cloud load balancing is assigning the load to all nodes through resource practice. Load balancing techniques will guarantee that all loads are distributed evenly to every node and that no node is over whelmed. The goal of load balancing is to achieve the most excellent potential resource practice, throughput, prevent overload, plus response time. A static load balancing methods is having a common issue ift once the development is recognised, then final host variety for work allocation is full and not to be modified throughout development finishing. [13].So The Equally Spread Current Execution Algorithm (ESCE) and the Priority Algorithm were integrated in this study. Thus approach, present an algorithms that operate on the problem of load, with the goal of moving the burden as of overloaded toward underloaded or else ideal virtual machines, making them extra well-organized.

2. Proposed Algorithm

In this paper, we suggest combining the attributes of double priority and ESCE methods. In this way, load balancing algorithm improvements will be introduced. The decision table indicates the VM status that maintains the sequence of priority algorithms while a sequence of client requests demands the demands are then separated based on the length of the cloudlets, and then the cloudlets are sorted and computed based on their length. According to MIPS, VMs were sorted again; using FCFS to assign the cloudlet, with the shortest length cloudlet receiving the highest priority, and the next is based on VMs that were ranked based on their MIPS. The smallest cloudlet length allowed for fewer MIPS VMs, reducing starving issues and shortening cloudlet performance time. Following that, Equally Spread Current Execution Algorithms (ESCE) work by allocating load equitably to each current server, ensuring that no server is idle, underloaded, or overloaded.

Here this will work on two stages like figure 1.

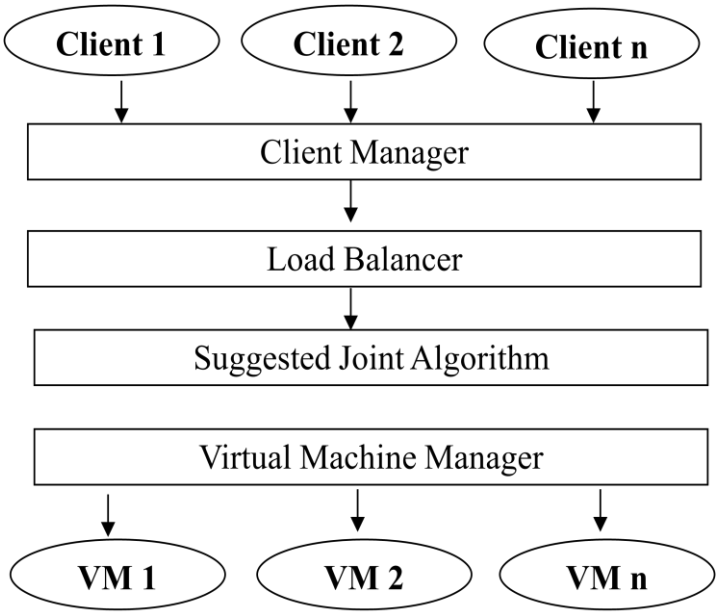


Fig 1. Suggested Algorithm

Stage 1: belong to (ESCE) method, here load balancer creates a safe way to distributes the over load among all VMs linked related data centres. Now it uses heap to examine VMs; after that the VM is not as stacked, and the outcome of less time consumed plus higher throughput. Compelete records are kept in an assign table that must be maintained by the load balancer, with solicitations numbers begin at the spreading corresponding VM. [14]. When all VMs are stacked, the request is made by DC to create a new VM, and checks from that table, the least quantity of stacked VM is utilized. The data centre provides demand to VMs that are deemed to be right; while VM ends the job, then data centre informed by the help of load balancer .

Stage 2: (Priority algorithm) It is treated as a priority on based its request. In this research, here two priorities focused[15,16,17], one is cloudlet shortest length, which would be given the highest priority,

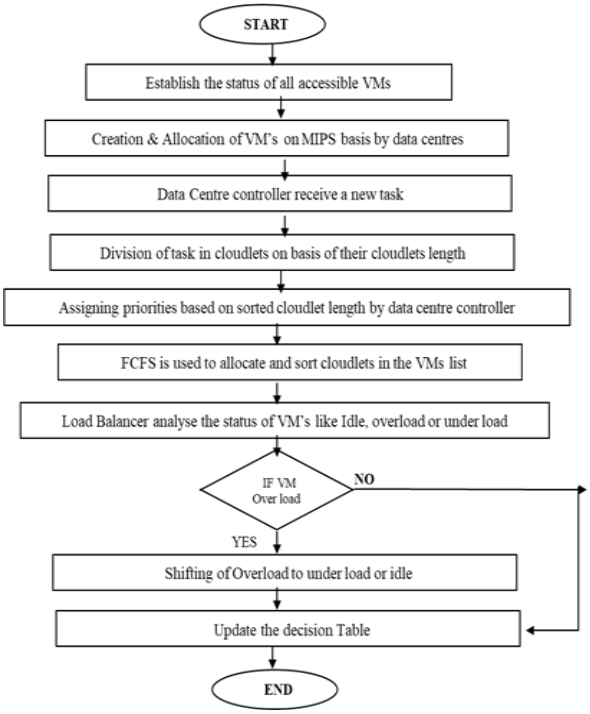
according the VMs ranked by MIPS. The shortest cloudlet length will be permitted for the lowest MIPS VMs. This notion may help to minimise hunger and shorten reaction times.. This estimate provide a decent effort to the completion by providing resources to ask for, that may be a higher task execution number and a lower job submitted number. For these tests, a load balancer is used. In this work, a novel load balancing method with reduced reaction time and cost is suggested, as shown in Table 1.

Table1. Suuuggested algorithm: Joint Load Balancing

Input: tasks

Output: overcome the load problem

Demostration way: flow Chart



3. Method

Cloud computing technology plays a vital role in term to give the user trusts and their services. In the COVID era no one can ignore this technology either they are doing work from home or facing the diseases, that time everyone know the importance of cloud and their utility as we all completely dependent directly or indirectly on that so for load safety that proposal will play a role model. As a result, many of us are confronted with and combating the sickness, while others remain at home, contributing nothing in the creation of new skills and social contact. This might have a negative impact on the customer's real and internal health.

Stage 1: Incoming jobs →Allot to accesible server→assign load of customer -→Excellent completion.

Stage 2: Incoming Jobs→Assigned server is not vacant or over load →wait until the threshold time→server is now available or under load→assemble the current demand of client→ Excellent completion.

The suggested document work makes it response time less with cost and also gives the customer satisfaction. Cloud analyst toolkit work on incoming requests and gives the output, the Cloud analyst is also detained as benefit for joint algorithm and provides desired results. Literature survey is shown in Table 2.

Table 2. Results of a literature review

Algorithm	Results	Limitations	Tool used
ESCE	Mainly evaluate the response time and cost	tual machine has less no of allocation with less load	Cloud Analyst
Priority	Mainly evaluate the response time and cost	work on priority allest length cloudlet	Cloud Analyst

4. Results And Discussion

Three algorithms have been tried for the purpose of simulation through cloud analyst tool; these two algorithms provide an attribute for relative constraints. Figure 3 is showing the disparities in response time and cost to analyse and run the aforementioned algorithms; in this case, Cloud Analyst tools are used [20]. Truly, as we know cloud analyst is an addition of simulator of cloudsim that aids modeller in conditions as of execution by simulating alterations within parameters regularly and easily. Cloud analysts employ three main types simulation with cloud analyst setup simulation, establish internet characteristics, and execute simulation. [21][22]

Total cost = less cost as compared to ECSE and priority algorithms (1)

Response time= effective and efficient jobs executed within the specified load (2)

Less response time + Less Cost = specified execution for server and customer satisfaction (3)

Server status = { **under load/ideal** **If demand load available then node get load otherwise**

Over load/busy **Search for appropriate server**

For Cloud analyst environment need to implement java program code with ellipse and math jar files and all saved on a specified drive of the system and run the bat file of cloud analyst by set the user base and data center and the execution screens are shown as outputs [23][24][25]. Table 3 is indicating the improved response time in terms to average (ms). With priority and ESCE algorithms have given more response time as compared to newly added joint algorithm.

Table 3. Performance Assessment

Factors	overall response time		
Load balancing algorithms	Priority	ESCE	Joint
Improvement in average response time(ms)	174.65 (average)	174.60 (average)	173.94 (average)

5. Conclusion

By The use of two main algorithms like (ESSC) Equally Spread Current Execution algorithms and (DP) Double Priority are being combined to create a joint algorithm. This algorithm took use of (ESSC) Equally Spread Current Execution methods as well as (DP) Double Priority and focused on total response time and cost with customer satisfaction through certain parameters.. After evaluation result are indicated less response time and cost by joint efforts as compared (ESCE) Equally Spread Current Execution algorithms and (DP) Double Priority. For future work, we may also include VMs and their MIPS as an important aspect, since a variety of characteristics, such as bandwidth, memory, and many others, can be utilised for evaluation and prioritisation.

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