
AN EFFECTIVE TECHNIQUE FOR PERFORMING LOAD BALANCING IN CLOUD

COMPUTING ENVIRONMENT

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Abstract:

Cloud computing is an interesting era of research, where motivation is to find out the best outcome and productive data security and sharing approach. Load balancing in public impair by way of division of cloud just right geographical position. Load balancing is frequently a strategy of controlling the visitors in a cloud atmosphere. Cloud requests hunt for assets for performance. The resources are quite often storage, processing, bandwidth, and many others. Allocation these belongings efficaciously to the entire competing jobs are named as load balancing. This paper will provide a comprehensive survey of cloud load balancing techniques. This paper also proposes an updated load balancing technique. This proposed technique uses the concept of hash map for effective allocation of virtual machines to user requests.

1. Introduction:

Cloud computing [1] [2] is a recent technological development in the computing field in which mainly focused on designing of services which can be provided to the users in same way as the basic utilities like food, water, gas, electricity and telephony. In this technology services are developed and hosted on the cloud (a network designed for storing data called datacenter) and then these services are offered to users always whenever they want to use. The

cloud hosted services are delivered to users in pay-per-use, multi-tenancy, scalability, self-operability, on-demand and cost effective manner. Cloud computing is become popular because of above mention services offered to users. All the services offered by servers to users are provided by cloud service provider (CSP) which is working same as the ISP (Internet service provider) in the internet computing.

Cloud Computing still under inside their development stage and also has quite a few issue in addition to challenges out of a several questions in cloud scheduling plays very important role inside determining your current effective execution. Scheduling refers for the set connected with policies to be able to control your order involving function for you to possibly be performed by a computer system. There have been different people associated with scheduling algorithm existing throughout distributed computing system along with job scheduling will be single of them. The main advantage involving job scheduling algorithm will be in order to achieve a good high performance computing and also the simplest process throughput. Scheduling manages availability involving CPU memory and good scheduling policy gives maximum utilization of resource.

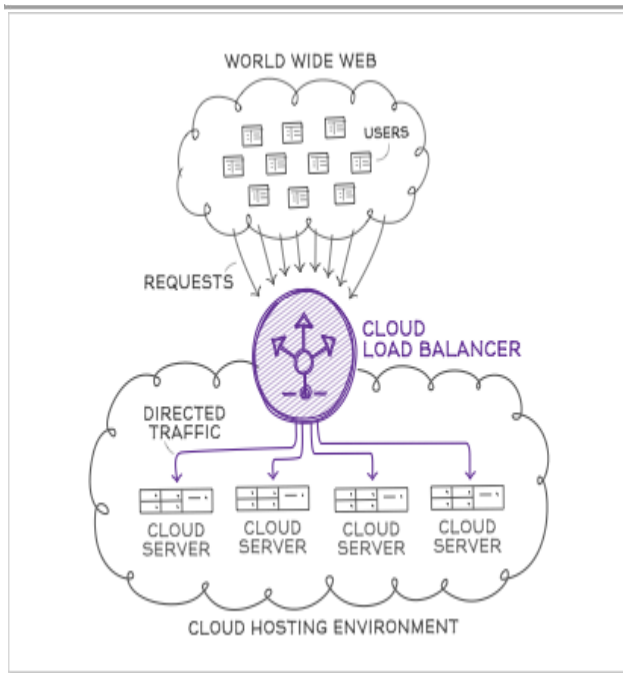


Figure 1: Cloud Load Balancing [4]

Load balancing in cloud computing systems is really a challenge now. Always a distributed solution is required because it is not always practically feasible or cost efficient to maintain one or more idle services just as to fulfill the required demands. Jobs can't be assigned to appropriate servers and clients individually for efficient load balancing as cloud is a very complex structure and components are present throughout a wide spread area. Here some uncertainty is attached while jobs are assigned.

To improve the performance in different types of cloud a number of Load balancing techniques are used. These Load balancing techniques are selected as per the load received. Depending on the load and the distance from the user, applications are directed to the data center to optimize the performance.

2. Literature Review:

Throttled load balancing technique ensures that only a per-defined number of internet cloudlets are allocated to a single VM at any point of time. If more groups are presents in the data center than the number of available VM than some of the requests have to be queued until the next VM is available.

[1] In this paper, Load balancing from the cloud-computing environment has an important impact on the performance. Good load balancing makes cloud computing more cost-effective and improves user satisfaction. This article introduces a far better load balance model for the public cloud good cloud-partitioning concept with a switch mechanism to pick different strategies for different conditions.

[2] In this Paper, Load balancing in public impair by division of cloud good geographical location. Load balancing can be a method of controlling the traffic in a cloud environment. Cloud applications hunt for resources for execution. The resources are usually storage, processing, bandwidth, etc. allocation these resources efficiently to all the competing jobs are named as load balancing.

[3] Load Balancing Model Depending on Cloud Partitioning for the Public Cloud environment comes with an important impact on the effectiveness of network load. A cloud computing system, which isn't going to use load balancing, has many drawbacks. Now days the use of Internet and related resources has increased widely. Due to this there exists tremendous increase in workload. So there exists uneven distribution of this workload, which results in server overloading and may cause accident. In such systems the resources are not optimally used.

[4] Author Proposed, describe related operate ok job scheduling in cloud computing environment. Author connected with paper [1] presented a great brief description involving CloudSim toolkit and his Functionality.

[5] Author proposed a great approach for work scheduling algorithm in line with populate balancing inside cloud computing. The particular paper pointed out 2 level work scheduling based towards complete balancing. Such career scheduling can't sole meet user's requirement but in addition supply the high resource utilization.

[6] In paper presented payment intensive cost constraint cloud run flow scheduling algorithm. Algorithm considers execution cost in addition to execution time frame just as ones two press button considerations.

[7] In paper a brand new VM fill up Balancing algorithm is actually weighted active monitoring populate balancing algorithm applying CloudSim tools, due to the Datacenter to help efficiently load balance requests between ones exhibited virtual devices assigning the weight, in order to achieve far better performance parameters.

[8] Author proposed a good algorithm can be ant colony optimization that random optimization search approach is usually obtained pertaining to allocating your current incoming jobs on the virtual products your algorithm uses a great positive feedback mechanism as well as imitates ones behaviour of true ant colonies throughout nature find meal as well as to affiliate to help each other via pheromone laid from paths travelled.

3. Proposed Methodology:

Input:

- Data centre requests r_1, r_2, \dots, r_n
- Available virtual machines vm_1, vm_2, \dots, vm_n

Output:

- Data centre requests r_1, r_2, \dots, r_n are allocated available virtual machines vm_1, vm_2, \dots, vm_n

Process:

1. The algorithm maintains a hash map table of all the available virtual machines which their current state and the expected response time. The algorithm calculates the throughput of all virtual machines & stores it in hash map table. This state may be available or busy. At the beginning, all the virtual machines are available.
2. When data centre controller receives a request then it forwards that request to the advanced throttled load balancer. The advanced throttled algorithm sorts the list of all the available virtual machines in the descending order of their throughput. The update throttled load balancer is responsible for the virtual machine allocation. So that the job can be accomplished.
3. The algorithm scans the hash map table. It checks the status of the available virtual machine.
 - 4.1 If hash map table size < VM state list size, Then Allocate the VM. Else wait for the VM to get free.
 - Then the algorithm sends the VM id of that machine to the data centre controller
 - Data centre controller sends a request to that virtual machine
 - Data centre controller sends a notification of this new allocation to the updated throttled
 - The algorithm updates the hash map index accordingly
 - 5.1 If a virtual machine with least load and the minimum response time is not found.
 - If the priority of the new request is greater than the priority of the executing request,

then the executing request is switched by the new request and placed in Queue

- o If not found it queue the request

- 6 When the virtual machine finishes the request.
 - The data centre controller sends a notification to advanced throttled that the vm id has finished the request.
 - advanced throttled modifies the hash map table accordingly
- 7 If there are more requests then the data centre controller repeats step 3 for other virtual machines until the size of the hash map table is reached. Also of the size of hash map table is reached then the parsing starts with the first hash map index.

4. Result Analysis:

The proposed algorithm is implemented on Cloud Analyst. It is java based implementation tool. We have considered 2 Data Center (DC) with 20 VMs. Simulation was repeated for Round Robin, Throttled and proposed Modified Throttled algorithm respectively. With the proposed algorithm response time for request has been improved compared to other two algorithms. The following table 1 gives the information about average response time of all three algorithms.

Algorithm	Response Time (ms)
Throttled Existing	379.76
Throttled Proposed	379.64

Table 1: Result Comparison

5. Conclusion:

In this sort of paper, we describe load balancing in a public cloud by way of partitioning this cloud into a few sub-clouds. This division of public impair right into a quantity of sub-clouds is finished excellent geographical vicinity. This paper elaborated the notion of cloud load balancing in lucrative manner. It also provided a detailed study of existing and most popular techniques of cloud load balancing. It also provided an updated technique for load balancing of incoming user requests in a cloud environment. The results have shown that the proposed technique is effective. The authors of this paper hope that this research work will be fruitful for future researchers.

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