
A Strategy for Cloud Computing based on Vital Machine Processing Power

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ABSTRACT

Cloud computing is the process of using the internet to gain access to third-party storage, databases, and memory. Virtualization is used by service providers to deliver these services to end users. In cloud computing, load balancing is the most critical component. The primary goal of a service provider is to deliver services that maximize end-user satisfaction while minimizing resource use. Load balancing is the term for this procedure. The load balancing algorithm is used by the service provider for this purpose. In this paper, an improved method for load balancing in cloud computing is proposed. Where the request will be allocated is determined by the length of the requested job and the virtual machine's processing power. The long-running job will be assigned to the virtual machine with the most processing power, based on the processor number. All virtual machines will receive an equal amount of requests, but the length of each operation will vary. As a result, the load in each virtual machine will be as similar as possible. It's a good load balancing algorithm for cloud computing.

Keywords: *Cloud Computing, Load Balancing, Weight, Processing Power.*

INTRODUCTION

The most widely used technology is cloud computing. Nowadays, everyone uses cloud computing services, whether directly or indirectly. In terms of virtualization, it is the method by which a third-party service provider distributes storage, application services, and databases to the general public. This can be accessed via the internet [1]. The most critical aspect of this procedure is load balancing. In cloud computing, load balancing is the process of providing maximum satisfaction to end users, greater performance in terms of response time and data processing time, and proper resource use. The service provider keeps this up by employing various load balancing algorithms. The load is balanced by a load balancer, which determines all virtual machine information. That the present load on a virtual machine, the desired job, and which virtual machine is capable of taking the load are all combined in such a way that no virtual machine is overloaded or idle. There are a variety of load balancing algorithms available for this.

ALGORITHM ANALYSIS

Active Monitoring Load Balancing

In active monitoring load balancing an information table is maintained which contains the information about virtual machine, virtual machine ID, number of requested allocated to it [5]. When a new request come than it parse the table to find the least loaded VM .The load balancer returns the VM id to the data center than data center allocate the request to the VM .It notifies the load balancer about the allocation .The load balancer update the VM information table .similarly when the job is completed the cloudlet notifies the data center

.than the load balancer again update its information table by de allocating the VM .Than the VM is free to take any new work . It is an effective load balancing algorithm for balancing load in cloud computing.

Weighted Active Monitoring Load Balancing

The ‘Weighted Active Monitoring Load Algorithm’ is implemented; modifying the Active Monitoring Load Balancer by assigning a weight to each VM of cloud computing in order to achieve better response time and processing time .each VM is assigned a processing power that is the number of processor . Here weight means processing power of virtual machine that is depend on the processor of the virtual machine [5].

Round Robin Algorithm (RR)

It is a static load balancing algorithm, which does not consider the previous load state of a node at the time of assigning jobs [3]. It is uses the concept of time quantum or slices. Here the time is divided into multiple slices and each node is given a particular time quantum and in this quantum the node will perform its operations [4]. The resources of the service provider are provided to the client on the basis of this time quantum .If time quantum is very large then Round Robin Scheduling Algorithm is same as the FCFS Scheduling.

PROPOSED METHOD

Here a load balancing method is proposed as titled “A policy for cloud computing load balancing based on virtual machine processing power”. It is a new method for load balancing in cloud computing .It is new technique modified based on weighted active monitoring load balancing algorithm which could be more efficient in terms of load balancing.

This algorithm basically depends on the virtual machine processing power (number of processor) and cloud let length. In weighted active monitoring load balancing algorithm the virtual machine are assigned different processing power based on the number of processor. The new requests are allocated to the VM based on the processing power. If a VM has one processor, there basically one request will be allocated and if a VM has three processor than three request will be allocated.

Keeping in mind the processor power, in new method cloud let will be allocate depending on the cloudlet length .The long length cloud let will be allocate to the VM that has maximum number of processor .And the shortest length of cloud let will be allocate to the VM that has minimum number of processor. By this all VM will get the equal number of request but with different length based on their processing power. By this method load will be balanced more efficiently. No extra pressure on a particular VM.As request will be allocated to VM based on the length of cloud let and also the processing power so load will be distributed equally and limited resource will be utilized properly.

ALGORITHM

- **STEPS 1-** Create VM’s of different Datacenter according to computing power on terms of its processor, speed, memory and storage.
- **STEP 2** - maintain information of each cloudlet (cloud let length, cloud let ID)
- **STEP 3** - Set each VM different processing power.
- **STEP 4** - use selection sort algorithm to arrange the cloudlet from large to small based on length.

- **STEP 5-** when requests to allocate, datacenter parse the VM table to allocate it to the appropriate VM based on the length and datacenter processing power.
- **STEP 6-** After Identifying the VM's it allocate requests to the appropriate VM according to the length.
- **STEP 7-** VM Load Balancer returns the VM id to the Data Center Controller.
- **STEP 8-** The Data Center Controller sends the request to the VM identified by that id.
- **STEP 9-** Data Center Controller notifies the VM Load Balancer of the new allocation.
- **STEP 10-** When the VM finishes processing the request, and the Data Center Controller Receives the response cloudlet, it notifies the VM Load Balancer of the VM de-allocation.
- **STEP 11-** Continue from step 5.

RESULT ANALYSIS

Cloud let with different length are allocating to different virtual machine depending on the processing power of virtual machine.

```

Initialising...
2000000
5

1500000
2

600000
4

500000
3

500000
1

400000
0
    
```

Result (a) 1- sorting the cloud let by selection sort algorithm.

===== OUTPUT =====

Cloudlet ID	STATUS	Data center ID	VM ID	Time	Start Time	Finish Time
3	SUCCESS	2	2	12.5	0.1	12.6
1	SUCCESS	2	1	25	0.1	25.1
5	SUCCESS	2	2	50	0.1	50.1
2	SUCCESS	2	1	75	0.1	75.1
0	SUCCESS	2	0	80	0.1	80.1
4	SUCCESS	2	0	100	0.1	100.1

Enhanced method finished!

Result (a) 2 – Allocating the cloud let to the virtual machine based on the cloudlet length and processing power of virtual machine.

```

Initialising...
3500000
1
1000000
3
700000
5
500000
2
350000
0
100000
4

```

Result (b) 1-sorting the cloud let based on length

```

===== OUTPUT =====

```

Cloudlet ID	STATUS	Data center ID	VM ID	Time	Start Time	Finish Time
4	SUCCESS	2	0	9.9	0.1	10
2	SUCCESS	2	2	12.5	0.1	12.6
0	SUCCESS	2	1	17.5	0.1	17.6
3	SUCCESS	2	1	50	0.1	50.1
5	SUCCESS	2	0	74.95	0.1	75.05
1	SUCCESS	2	2	87.5	0.1	87.6

Enhanced method finished!

Result b (2)-Allocating the cloud let to virtual machine based on the processing power.

As we can see at first the cloud let are sorted from large to small based on their length by the sorting algorithm .As we have three virtual machine, the cloud let with largest length are assigned to the virtual machine which have most processing power based on the number of processor .Than the next largest lengths cloud let is assign to the virtual machine that have processing power less than most powerful virtual machine. And so on.

When all virtual machine are assigned by a single cloud let but we have more cloud let than they will be also assigned to the same virtual machine repeatedly. This is done by a loop .When one circle is completed if there are more cloud let than loop will be continued until all the cloud let are assigned .By this all the virtual machine get equal number of cloud let as possible but the length of the cloud let are not same in the VM. Where the processing power of virtual machine is large there the cloud let length is also large and the cloud let length is small in the virtual machine with less processing power. So, no virtual machine will not seat as idle and all the resource will be used perfectly. This load balancing method will give better performance than other.

FUTURE WORK

The load balancer allocates the cloud let based on the cloud let length and processing power of virtual machine .In future we will try to improve this method. We will take more information about the cloud let and will maintain virtual machine table .there will be a scale of length of cloud let .if the length of cloud let is large than the scale than the work will be done with respect to a time quantum .

CONCLUSION

An enhanced algorithm for load balancing in cloud computing is proposed and implemented in cloud computing environment using cloud sim toolkit ,in java language . The virtual machines are assigned different processing power based on different number of processor .Than the cloud lets with different length are allocated based on their length and the processing power of virtual machine. The cloud let with largest length are assigned on the virtual machine which have most powerful processor .And the less lengths of cloud let are assigned on less powerful virtual machine .By this load can be balanced in cloud computing .

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