A New Static Load Balancing Algorithm in Cloud Computing

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ABSTRACT
This paper proposes an algorithm that we named as a New Static load balancing algorithm in cloud computing. The proposed algorithm is using the concept of both Active Monitoring Load Balancing Algorithm and Throttled Load Balancing Algorithm. The detailed design, pseudo code and implementation of algorithm are also presented in this paper. The results (Overall Response Time and Datacenter Processing Time) obtained are compared with the results of Throttled Load Balancing Algorithm. This comparison is done after implementing and analysing each of the existing algorithms discussed in this paper, and found that Throttled Load Balancing Algorithm is best among all the existing. The other sections in the paper are introduction, related works, conclusion etc.

General Terms
Cloud Computing, Load Balancing.

Keywords
datacenter, static load balancing, algorithm.

1. INTRODUCTION
The cloud computing is one of the hot topic now-a- days. Lots of research is going on in this field. There are many issues in the area which are being discussed currently. One such issue is of load balancing in cloud computing. Load Balancing is used for minimizing the total waiting time of the user. In cloud computing load balancing are used for balancing the load on virtual machine and cloud resources. When request generated by users are received by cloud hosting environment, the load balancer (load balancing algorithm) distribute the load over various cloud server so that all server should be utilized efficiently (no server is under loaded or over loaded).

The paper proposes a New Static Load Balancing Algorithm in cloud computing. The idea of proposed algorithm has been taken from two algorithms i.e. Throttled Load Balancing Algorithm and Active Monitoring Load Balancing Algorithm. Proposed algorithm removes the drawback of both. The algorithm is implemented in CloudSim simulator using java. The result obtained shows the proposed algorithm reduces the Overall Response Time and Datacenter Processing Time.

The rest of the paper is organized as follows: related work is presented in section 2. Section 3 presents the comparison of various existing static load balancing algorithm. Section 4 presents the proposed algorithm that includes flowchart and pseudo-code. Experimental setup has been given in section 5 of the paper. Section 6 gives results its comparison and analysis and section 7 concludes the paper.

2. RELATED WORK
This section presents the related works to the load balancing algorithms in clouds. The load balancing in cloud computing is obtained in two ways: Dynamic Load Balancing Algorithm and Static Load Balancing Algorithm. The Dynamic load balancing algorithm does not require prior knowledge of system resources, so that the decision of shifting of the load depends on the current state of system on the other hand the static load balancing algorithm requires prior knowledge of system resources, so that the decision of shifting of the load does not depend on the current state of system. Static algorithm performs better if prior knowledge of server is mentioned. Further from figure 1 we can see classification of both types of algorithms.
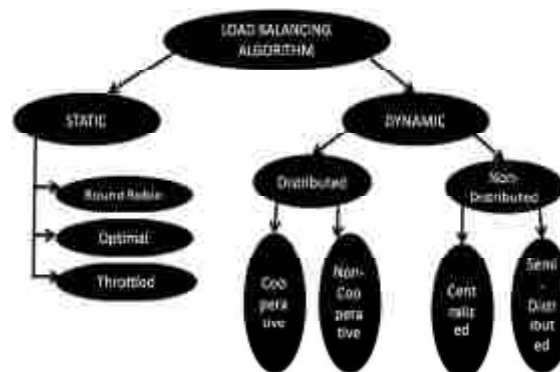

Figure 1: Classification of load balancing algorithms in cloud.

As this paper proposes a new Static load balancing algorithm so we discusses each types of static load balancing algorithms in detail which are:

2.1 Round Robin Scheduling Algorithm
One of the simplest load balancing techniques is Round Robin, in which all processes are divided amid all available processors [2]. The allocation order of processes is maintained locally which is independent of the allocation from the remote processor. In this technique, the request is sent to the node having least number of connections, and because of this at some point of time, some node may be heavily loaded and other remain idle.

Drawback of Round Robin Load Balancing Algorithm

It simply works on time slicing. It allocates the load on various nodes on basis of time without considering the need of resource.

2.2 Active Monitoring Load Balancing (Optimal) Algorithm
In equally spread current execution the random arrival of load in a cloud environment can cause of some the server to be heavily loaded while other server is idle or only lightly loaded. Equally load distributing improves performance by transferring load from heavily loaded server to lightly loaded