



A Comparative Performance Evaluation of Distributed Load Balancing Algorithms in Cloud Computing

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Abstract— Cloud computing offers internet based paradigm which enables the providing and managing of the resources and services. It differs from traditional computing methods in various ways. All the data and resources are moved to cloud servers where services are provided by the cloud owner on the pay-per-use basis. In this pretext, there is a need to discuss innovative techniques to assess the process of reassigning the total load of the individual systems of the whole of the collection. This paper includes the performance evaluation of distributed load balancing algorithms on the basis of execution time.

Keywords— Cloud Computing, CloudSim, Distributed, Load Balancing, Virtual Machine.

I. INTRODUCTION

Cloud computing is latest development of computing models after Distributed Computing, Parallel Processing and Grid Computing which is spreading rapidly in every field. It provides endless services. It provides the ease of managing the infrastructure and decreasing the maintenance cost [6]. Cloud computing refers to internet based development and utilization of computer technology, and hence cloud computing can be said as a model of Internet- based computing. Various issues are there in cloud computing like security issues, data backup, load balancing and multiplatform support. As we are discussing about the cloud computing applications, we must ensure that our cloud is balancing the load which is given to it effectively. Load balancing is a new technique that facilitates networks and resources by providing a maximum throughput with minimum response time. Dividing the traffic between servers, data can be sent and received without major delay.

II. DISTRIBUTED LOAD BALANCING ALGORITHMS

In this section, a discussion regarding the comparison of analysed Distributed load balancing Algorithms viz. Round Robin Load balancer, Honeybee Foraging Load Balancer and average Weighted Active Monitoring Load Balancer. The performance analysis on the basis of execution time has been given.

1. Round Robin Algorithm

It is based upon the concept of random sampling. It involves the load selection from a collective system where some nodes are heavily loaded while others are not [9].

2. Honeybee Foraging Algorithms

In the operation of load balancing, each server takes a certain bee role with different probabilities p_x or p_r . These values are used to role play the honeybee colony where some bees are foragers which explore (p_x); others are harvesters which exploit existing sources. In nutshell, a server which successfully satisfies a request will post on the advert board with probability p_r . Any server which does not reads the advert board reverts back to the foraging behaviour in order to service a random virtual server's queue request [10].

3. Average Weighted Active Monitoring Algorithm

It uses the concept of weights in active monitoring, varying amount of available processing power of server assigned to virtual machines. Out of all, application services are allotted to the most strong VM and then to the lowest and so on the basis of availability and weight [4].

III. PERFORMANCE ANALYSIS

This section includes the details of implementation of above mentioned algorithms. CloudSim simulator and Java environment has been used for the implementation.

Table 1: Execution Time Taken by three implemented algorithms.

Number of Simulations	Execution Time in seconds(Round Robin Algorithm)	Execution Time in seconds(Honeybee Foraging Algorithm)	Execution Time in seconds(Average Weighted Active Monitoring Algorithm)
1	8	14	1
2	9	23	5
3	11	27	13

4	12	28	13
5	14	35	14
6	17	39	19
7	20	44	43
8	20	46	47
9	30	54	48
10	54	55	58

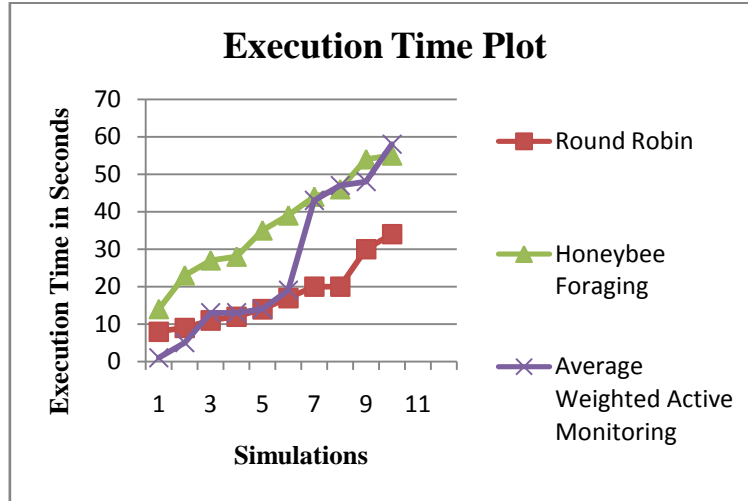


Fig 1: Execution Time taken by three implemented algorithms

IV. CONCLUSION AND FUTURE WORK

Cloud Computing is internet based computing in which resources are provided to users on demand. Time reduction is one of the very important concern to build up a cloud system. In this dissertation Distributed Load Balancing Algorithms of cloud computing are analyzed. From the analysis and comparison, it is concluded that Round Robin algorithm takes lesser time for Execution than Honeybee Foraging and Average Weighted Active Monitoring Algorithm. Among the Honeybee Foraging and Average Weighted Active Monitoring Algorithm, Average Weighted Active Monitoring takes lesser time for execution. Thus, Round Robin Algorithm is more efficient than Honeybee foraging and Average Weighted Active Monitoring Algorithm. In the future, performance of compared algorithms can be evaluated on the basis of other parameters. More number of scenarios can be added in the existing research work.

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