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REVIEW: DYNAMIC LOAD BALANCING TECHNIQUES FOR HETEROGENEOUS CLOUD COMPUTING

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Abstract — Cloud computing provides dynamic resource service on the internet. Important challenge in cloud computing is, to improve resources Utilization. To recognize this goal, several load balancing techniques are available and have been proposed. But, most of them considers the homogeneous working environment that does not consider resource specific demand. In practice, when the cloud scales up and connects with other clouds, on the back end side loads to the virtual machines varies accordingly. Here, we want to minimize maximum end to end delay plus, average end to end delay. This will result to the better performance of cloud computing in modern trends. The turnaround time is combination of waiting time and completion time of task. To reduce maximum turnaround time we must consider dynamic algorithm .In this paper we have described new techniques of load balancing that deal with heterogeneity and above specific problems.

Keywords- cloud computing, heterogeneous networks, load balancing, resource specific demand

I. INTRODUCTION

Cloud computing is the distribution of computing as a service rather than a product. There are mainly three types of cloud as public, private and hybrid Cloud. Cloud computing provides different services as software as a service (SAAS), Infrastructure as a service (IAAS) and Platform as a service (PAAS). It also provides shared resources, software, and information is provided to computers and other devices as a utility over a network. User can access the services anywhere easily without whole product. The services provide slow services due to traffic switch over. So, it crate problem of slow response time and performance. To solve this problem virtualization provides better flexibility. Virtualization reduces initial investment and maintenance cost, especially for the requirements of hardware, software and professional skills. Cloud platform provides fast service to the delivery to its clients and thus should be reliable in computing resources [1].

Load balancing is a technique that use of resource with equal load between servers that provides maximum throughput with minimum response time. We can balance the load by transfer the load to less utilized node. Basically, two types of algorithms for load balancing algorithm are used such as Static Load Balancing Algorithm and Dynamic Load Balancing Algorithm. Static load balancing algorithm does not consider the static load of node. It executes the request without considering load states of node. Static algorithms are mostly suitable for homogeneous and stable environments and can produce very good results in these environments. So, there are creating problem of single point of failure, storage and replicas of data. Dynamic load balancing algorithm considers the current load states of node. It includes mainly two processes: monitoring the states of server and assigning request to the server. It is used in the situation where different load for each node is required. Dynamic algorithms are more flexible and take into consideration different types of attributes in the system both prior to and during run-time [1]

II. CHALLENGES

The dynamic sharing of load needs dynamic resource allocation and hence produces number of the following challenge and issues, which are summarized as follow.

2.1 Optimal Load Balancing of VM

Load balancer is distributes the incoming request to all the virtual machines (VM). There is need of schedule the user requests in an efficient way such that provides minimum response time. There is also need improvement by taking more dynamic situations of the user requests.

2.2 Load imbalance problem

After allocation of user requests to the virtual machine, load imbalance of the node issues may occur. Some nodes have more load of the request and some have less load of request. So, we require load balancing algorithm which distributing the load in efficient way.

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2.3 Resource specific demand

There is different type of request from user so the cloud computing requires classification the quest and assign the tasks to the same type of hosts. Note that a task is basic unit of request.

2.4 Dynamic

The cloud servers must be dynamically configured to satisfy the assignment because the cloud service is requested by distinct users with various types of tasks at different time.

2.5 Maximum end to end delay

This factor defines maximum turnaround time of tasks. The turnaround time is calculated based on the waiting time and completion time of request. So good algorithm must reduce maximum end to end delay of set of tasks.

III. LITERATURE REVIEW

Surbhi kapoor and Dr. chetna Dabas [2] proposed algorithm which satisfice both heterogeneous environments and resources specific demand of tasks. The algorithm work with cluster the virtual machine and then find appropriate virtual machine for the request then particular vm list of the cluster is search for finding the suitable virtual machine. Snajay k. dharandher [3] proposed algorithm which based on the VMs into cluster and perform the master slave configuration so the first it distributes load among the master and the among the master to slaves. Yean – Fu and Chih –Lung chang [4] proposed algorithm that use FCSS, mini –mini and Max –Min with dynamic clustering to improve the performance of cloud computing. It considers the type between tasks and CSs should be match to improve the system performance. It classifies similar types CSs in to cluster. In cloud computing especially for the various types requirements so this work adopts the dynamic cluster method and then execute the load balancing mechanism to reduce the round trip and processing the. Upasana lakhani, niharika singh, ajay jangta [5] proposed In this paper centralized load balancing algorithm has been proposed that dynamically balance the load and ensure overall performance of the system This concept focus on achieving high resource utilization reduce job rejection and improve computation capabilities and fault tolerance. Gamal F Elhady and Medhat A. Tawfeek [6] Proposed that is based on swarm intelligence, minimize the makespan that is finishing time of last job. The results of the experiments are presented and the strengths of each algorithm are investigated

IV. DISCUSSION

The table 4.1 describe algorithm parameter table which contains comparison of algorithm with different parameters and second tale 4.2 describe advantages and disadvantages of algorithm

Paper	Response time	Execution time	Turnaround time	Throughput	Max end to end delay	Average end to end delay	Fault tolerance	makespan
[2]	Yes	Yes	Yes	Yes	No	No	No	No
[3]	Yes	Yes	Yes	No	No	No	No	No
[4]	Yes	No	No	No	Yes	Yes	No	No
[5]	Yes	Yes	No	No	No	No	Yes	No
[6]	Yes	Yes	Yes	No	No	No	Yes	Yes

Table 2.1: Parameter Used In Load Balancing Algorithm

Paper	Advantages	Disadvantages
[2]	heterogeneity, scalability, resource specific demand	not fault tolerance provided
[3]	improve response time and throughput	takes more times due to flooding

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[4]	gives max performance with clustering and min max	static algorithm can be replace bay dynamic
[5]	optimum resource utilizations, fault tolerance, improve computational capacity	lower performance
[6]	The Best case scenario is that the under loaded node is found at beginning of the search. Decentralized, no single point of failure.	Nodes status change after ants visit to them is not taken into account. Network overhead due to the large number of ans. Start Points of initiation of ants and numbers of ants are not clear

TABLE 4.2: Advantages Disadvantages of Load Balancing

V. CONCLUSION

In this paper, we surveyed multiple algorithms of load balancing for Cloud Computing. We discussed the challenges that must be addressed to provide the most suitable and efficient load balancing algorithms. We also discussed the advantages and disadvantages of these algorithms. We can improve existing clustering algorithm by different clustering technique and different service distribution technique like K median with ant colony algorithm

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