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Optimized Resource Utilization in Cloud Computing

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ABSTRACT

Cloud Computing is one of the best and popular technology in the recent years, which enables the advanced technology in IT industry. It has become a strong topic for both start up or small scale industry that use the resources based on pay as you use. There is an enormous development in Cloud Computing and heavy demand for various services from different customers. The cloud service provider helps in modelling management and allocation of various resources of cloud based on the customers demand. Existing algorithms help in balancing the load across various servers of the cloud and help in optimizing the resource utilization in terms of processing, response time and cost. These algorithms lack servers' capacity check prior customer request assignment. The limitation of these algorithms is overcome by developing new Throttled VM load balancing algorithm. This algorithm helps in minimizing processing and response time.

Keywords :- Cloud Computing, Simulation, Cloud Analyst, DataCenter, Load Balancing policy.

I. INTRODUCTION

Cloud computing has its signature in every field. The main definition of cloud computing is to save, maintain and access the data from the internet but not on a personal computers. It also enabling computing resources users based on demands. Computer resources are storage, applications, services and network server. Cloud computing bill is depending upon the usage you will pay only what you used. Enabling the resources through cloud is similar to electricity from power station. Cloud computing has many problems some of them are reduce response, data transfer time and minimum data transfer cost.

A. Architecture of Cloud Computing

Architecture of cloud computing contains 4 layers they are Application, Hardware, Infrastructure and Platform layer.

Application Layer: It includes application and web services and it is visible to end users of cloud. Services given by this layer is used by the user through web requestor, it is payable sometime.

Platforms Layer: It includes software frame work storage. In this layer developer develop the application and deploying them on cloud, these applications are developed using some programming languages such as java or python.

Infrastructure Layer: It includes virtual machine. This layer provides resources to other higher level layer.

Hardware Layer: It includes CPU, memory, disk, bandwidth; this is bottom layer of cloud computing architecture. The users of these layers are big enterprises.

II. LITERATURE SURVEY

In this research, they have used the greedy method algorithm to overcome the problem of resource utilization in cloud. Privately owned cloud in cloud computing will allocate the services to large number of users. For available resources there are many requests gather at same time and that resources are used by users via internet. The purpose of this article is to identify best utilization scheduling algorithm for resources in the form of profit, minimizing response and processing time etc. The proposed algorithm is based on 0/1 knapsack problem, the algorithm is build on java language.

modified active monitoring algorithm for optimized resource utilization in cloud computing. The load balancing becomes an very popular in cloud computing environment and cloud computing is growing very rapidly. The user from any world request for services of cloud computing. In this paper they used modified active monitoring algorithm which assigns the client request to virtual machine in optimized manner. This algorithm is built on cloud analyst using java programming language the result of this is compared with existing algorithm.

A. Objectives Of This Paper

- Exploring and understanding various resource management techniques in cloud computing and their drawbacks.
- Coming up with the enhanced technique to overcome the drawbacks in existing techniques.
- Comparing the results of new algorithm with existing algorithm based on Cloudsim. The parameters are Response, Throughput and Turn around time.

III. PROPOSED SYSTEM

The proposed system helps to reduce the overall response, processing time and data transfer cost. User Request for resources in DataCenter and data centre checks for availability of virtual machine. This can be facilitated by Threshold algorithm which uses hash table.

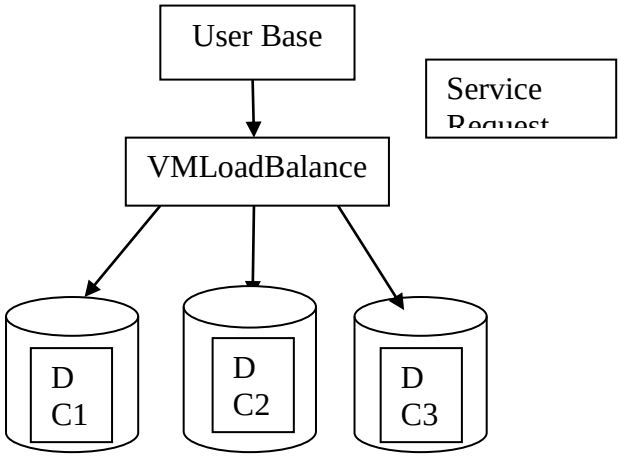

Fig 1 Data Flow Diagram

UserBases: This component represents a set of users and generates traffic representing the users.

VMLoadBalancer: This component models the load balancing policy that is used by data center for providing the service to requests. This is used VMLoadBalancerController to identify the VM assigned to next cloudlet.

DataCenter: This component is most popular entity in cloud analyst. A single datacenter is assigned to a single cloudsim.

A. Threshold Algorithm

Threshold algorithm is best in terms of performance and response time when compared to existing algorithm they are round robin and Active Monitoring. It assigns the all new request in efficient manner to VM.

Step 1: ThresholdVmLoadbalancer maintains a hash table for virtual machines and state of VM's (BUSY/AVAILABLE), at the starting all VM's are assigned to "0".

Step 2: New request is received by DataCenter controller.

Step 3: The ThresholdVmLoadbalancer is queried by DataCenter controller for next allocation.

Step 4: ThresholdVmLoadbalancer checks hash table from the beginning unless first VM is found available, 1.

DataCenter Controller receives the VM's id by the ThresholdVmLoadbalancer [2].

The ThresholdVmLoadbalancer sends the request to VM identified by that id[2].

ThresholdVmLoadbalancer updates the hash table. If not Found,

-1 is returned by the ThresholdVmLoadbalancer.

Step 5: When VM completes its request processing, the Datacenter controller response cloulets.

Step 6: Checks for any waiting request in queue by DataCenter controller, if any continue from step 3.

Step 7: Continue from step 2.

B. Results

Algorithms	Number Of Data Centers	Number Of User Bases	Over all Response Tine(ms)	DataCenter Processing Time(ms)
Round Robin	5	25	76.77	2.96
Active Monitoring	5	25	75.97	2.17
Threshold	5	25	74.70	0.90
Round Robin	5	50	50.19	0.56
Active Monitoring	5	50	50.16	0.53
Threshold	5	50	50.13	0.50

IV. CONCLUSION

Load balancing is required to distribute the workload evenly across all nodes to achieve high performance with minimum overheads. With proper load balancing waiting time can be kept to a minimum which will further maximize the response time. Comparison of different load balancing algorithms is carried out on the basis of certain parameters. The comparison shows that static load balancing algorithms are more stable. Analysis of the performance of three VM load balancing algorithms along with two service broker policy has been done for large scale application considering peak hours and workloads. Simulation showed that proposed strategy works better as response time along with DC processing time got reduced considerably. This analysis helps further in designing new load balancing algorithms.

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[4] Harsha MB, Dr. SarojaDevi, P.G Scholar, Dept. of Computer Science and Engineering, NMAMIT, Udupi, Karnataka, India1 Professor and Head, Dept. of Computer Science and Engineering, NMAMIT, Udupi, Karnataka, India2, Previous Allocation Based Active Monitoring Algorithm for Load Balancing in Cloud Computing, International Journal of Innovative Research in Science,Engineering and Technology