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RESEARCH ARTICLE

IMPROVED LOAD BALANCING MODEL BASED ON PARTITIONING IN CLOUD COMPUTING

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Abstract: Load balancing plays a vital role in improving performance of cloud servers. Implementing better load balancing schemes improves performance of cloud servers there by more number of users can be satisfied. As number of cloud users increasing day by day load on cloud servers need to be maintained. In this article load balancing schemes are analyzed and a better load balancing scheme is identified in dynamic environment.

Introduction:

Cloud computing is large group of remote servers interconnected together that provide a facility of sharing. The cloud computing is high utility technology in world and having the ability to change IT software industry. Due to its simple architecture most of companies are adapting cloud computing. The numbers of cloud service providers are increasing day by day as the number of cloud users are increasing in day to day life. The increase of web traffic and load make load balancing as a big research topic.

The term load balancing refers to distribution of larger processing load to smaller processing nodes for improving overall performance of system. An ideal load balancing algorithm should avoid overloading on a certain node in a partitioned cloud. Security, reliability response time throughput are some factors while choosing a good load balancing algorithm. The main aim of good load balancing algorithm is to improve throughput and reduce response time of the system.

In this article both static and dynamic schemes are discussed and analyzed there by a good load balancing strategy is selected. When the User submits the job the job arrive at the main controller the main controller allocates the jobs to the node.

Load balancing schemes:

To distribute load of multiple networks to achieve maximum throughput minimize the response time and to avoid the overloading at a certain node we implement some algorithms.

Round Robin algorithm:

Round robin implements an equal priority to all jobs mechanism. Based on time slice each and every process is allotted with a certain time in a round robin manner. It is very simple to implement.

Equally spread current execution:

ESCG work based on job priorities. It distributes the load randomly by checking the load and then shifts the load to virtual machine which is lightly loaded so that to maximize throughput. It uses spread spectrum technique in which load is spread over virtual machines.

Throttled load balancing algorithm:

In throttled algorithm job manager maintains list of virtual machines and jobs assigned to them. Throttled algorithm finds appropriate virtual machine for assigning a particular job. If all virtual machines are in a heavy state it maintains jobs in job queue till virtual machine is free to process a job.

Related Work:

Load balancing can be implemented in both static and dynamic schemes.

Cloud analyst is a tool provided by cloud bus organization to analyze the performance of the cloud. In cloud analyst there are certain terminologies as follows.

User base: The user base represents the single user but here user base represents a group of users.

Data center: Datacenter manages the data management activities virtual machines creation destruction and other routing schemes.

Figure 1: cloud analyst tool

Proposed Work:

By using the cloud analyst tool both static and dynamic schemes are analyzed and there by a better load balancing model and scheme is determined

Static schemes:

The static scheme does not analyze the systems state. It implements a single scenario for every situation. It is simple to implement. For example if static system uses round robin algorithm, for idle normal and busy states the system uses the same algorithm. It does not provide better results.

The analysis performed on static load balancing schemes round robin, equally spread current execution, throttled individually and the Overall response time, data center processing time, total revenue in dollars are listed in the following analysis.

If we observe the above analysis although better algorithms are used there is no change in response time of the three algorithms. Not only the response time but also the other factors are remained unchanged. so the use of static algorithms are not preferable.

	Round Robin	ESCG	Throttled
Overall response time	300.12	300.12	300.12
Data center processing time(m.sec)	0.35	0.35	0.35
VM cost($)	0.50	0.50	0.50
Total cost	16	16	16

Table: analysis of static load

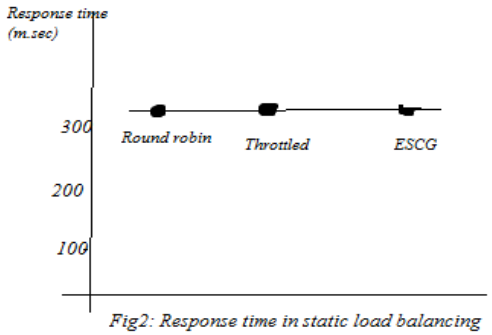

Fig2: Response time in static load balancing

Implementing dynamic schemes:

Dynamic schemes analyze the systems current status. Although dynamic schemes are difficult to implement, dynamic schemes identifies the current position of the server whether it is in idle represented with certain thresholdor it is in normal or else it is in overloaded state.

If the system status is in idle or normal main controller [2] will allocate job to virtual machine to process job or if it is busy it will wait till virtual machine is idle. Dynamic load balancing model may implements more than on load balancing schemes.

As shown in figure below the load balancing is implemented with more than on scheme, it implemented round robin throttled equally spread current execution. By implementing more than one algorithm the load on server gets reduced there by a great user satisfaction achieved.

Algorithm

Start

User submit a job to main controller

Identify the status of partition.

If state=idle!!normal

Processjob

Else

Search for another partition.

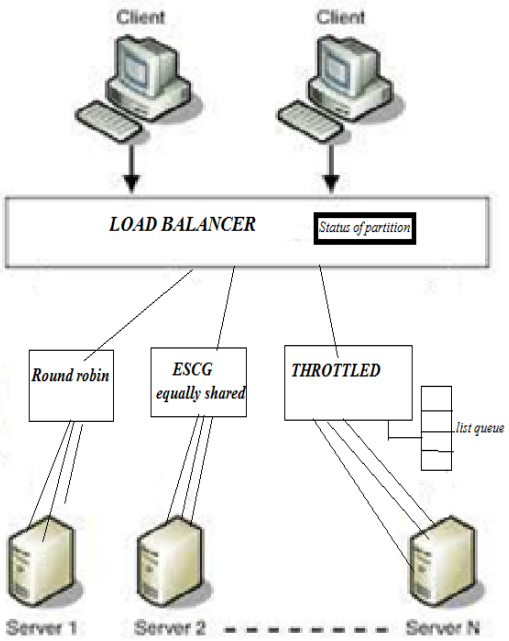

Fig2: model with Dynamic schemes

The analysis of load balancing model in dynamic environment using RR, ESCG, and Throttled are as shown in below tables.

	Round Robin	ESCG	Throttled
Overall response time	223.34	209.75	209.74
Data center processing time (m.sec)	13.84	10.11	10.10
VM cost($)	5.3	4.45	4.03
Total	18.3	18.3	18.3

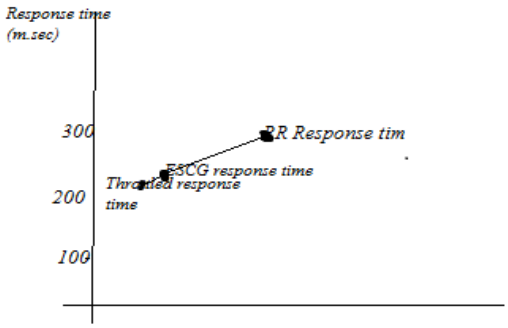

Fig 3: Response time graph

Although it costs equal and high when compared to static algorithms there is a great variation in terms of response time the response time is very less in dynamic schemes.

Regarding the dynamic schemes if we observe the cost and response time, there is a similar cost in all the three algorithms but there is a variation in terms of response time.

Based on the response time the throttle and the equally spread current execution are best algorithms in dynamic load balancing environments.

Conclusion:

Finally dynamic schemes are effective in balancing load when compared to static schemes. In dynamic schemes throttled and equally spread current execution are better to balance the load based on dynamic load environments.

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References:

1. Gaochao XU Jungie pang: "Load balancing model based on partitioning public cloud".

2. Dr.Hemanth s mahalle : "Load balancing on cloud centers".

3. Bhathiya: "Cloud analyst cloud sim based visual modeler for analyzing cloud computing environments and applications"

4. Ramprasad pandey, P.Gotham Prasad rao: "Load balancing in cloud computing system".

5. WWW.cloudbus.org/cloudsim

