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COMPARISONS BETWEEN CLOUD LOAD BALANCING ALGORITHMS USING CLOUDSIM SIMULATOR

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Abstract:

Load balancing in the cloud-computing environment has an important impact on the performance. Good load balancing makes cloud computing more efficient and improves user satisfaction. Load balancing with cloud computing provides a good efficient strategy to several inquiries residing inside cloud computing environment set. complete balancing must acquire straight into accounts two tasks, one will be the resource provisioning as well as resource allocation along with will be task scheduling throughout distributed System. Round robin algorithm can be via far the Easiest algorithm shown to help distribute populate among nodes. . Because of this reason it is frequently the first preference when implementing a easy scheduler. One of the reason for it being so simple is that the only information required is a list of nodes. The proposed algorithm eliminates the drawbacks of implementing a simple round robin architecture in cloud computing by introducing a concept of assigning different time slices to individual processes depending on their are priorities.

Keywords: **Cloud computing, load balancing, Task Scheduling, Round Robin**

1. INTRODUCTION:

Cloud computing comes throughout focus development of grid computing, virtualization as well as web technologies. Cloud computing is usually the world wide web based computing That presents infrastructure as service (IaaS), platform as service (PaaS), software as Service (SaaS). Throughout SaaS, software application form is usually created shown through the cloud provider. PaaS a good application development platform for the developer to Create a internet based application. Within IaaS computing infrastructure can be sent to be a help towards the requester. In your current application form associated with Virtual Machine (VM)[1].These model usually are developed viewable from a good subscription basis utilizing cost Equally you-use model to be able to customers, regardless regarding their location. Cloud Computing still under inside their development stage and also has quite a few issue in addition to challenges out of a several questions in cloud scheduling plays very important role inside determining your current effective execution. Scheduling[12] refers for the set connected with policies to be able to control your order involving function for you to possibly be performed by an computer system. There has been different people associated with scheduling algorithm existing throughout distributed computing system, along with job scheduling will be single of them. the main advantage involving job scheduling algorithm [2][5]will be in order to achieve a good high performance computing and also the Simplest process throughput. Scheduling manages availability involving CPU memory[3] and good scheduling policy gives maximum utilization of resource.

2. LITERATURE REVIEW

In paper [2] author proposed a great approach for work scheduling algorithm In line with populate balancing inside cloud computing. the particular paper pointed out 2 level work scheduling based towards complete balancing. such career scheduling can\'t sole meet user's requirement but in addition supply the high resource utilization. this paper presented the implementation of a efficient Qualityof ASSISTANCE (QoS) based Meta-Scheduler AS WELL AS Backfill strategy based light The strain Virtual Machine Scheduler pertaining to dispatching jobs

The authors regarding paper [6] presented the optimized algorithm regarding career scheduling Based on genetic simulated annealing algorithm. the particular considers your current QoS Requirements similar to completion time, bandwidth, cost, distance, reliability involving various other type tasks. Here annealing can be implemented after the selection, crossover AS WELL AS mutation, to help improve local search ability connected with genetic algorithm.

In the particular paper [8] hierarchical scheduling is presented that helps in achieving ASSIST Level Agreement with uncomplicated solution through the ASSISTANCE provider. within THE proposed approach Quality of HELP metric similar to reply day is actually attained coming from executing your own high priority jobs (deadline based jobs) first via estimatingjob completion time frame and also the priority jobs tend to be spawned because of the remaining employment through the help connected with task Scheduler.

The paper [13] presented payment intensive cost constraint cloud run flow scheduling algorithm.

3. COMPONENTS OF CLOUD SYSTEM:

A typical Cloud modeled applying CloudSim involves after four entities Datacenters[10], Hosts, Virtual m/c in addition application form along with system Software which are shown in figure1.

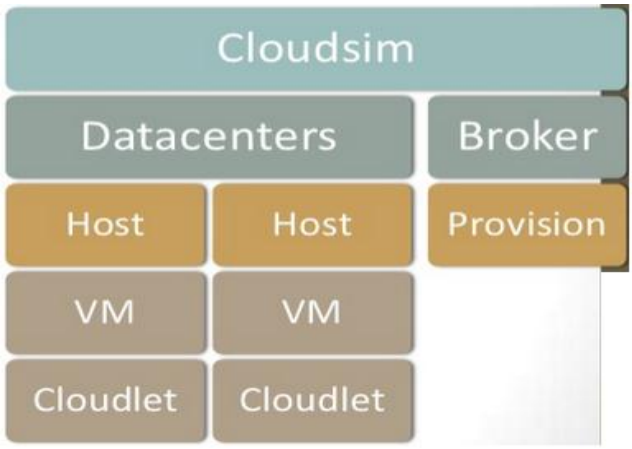

Fig1. Block diagram of Components of Cloud System

4. LOAD BALANCING ALGORITHMS:

Since the job arrival pattern is not predictable and the capacities of each node in the cloud differ, for load balancing problem[6], workload control is crucial to improve system performance and maintain stability. Load balancing schemes depending on whether the system dynamics are important can be either static or dynamic. Static schemes do not use the system information and are less complex while dynamic schemes will bring additional costs for the system but can change as the system status changes. A dynamic scheme is used here for its flexibility.

Few exiting load-balancing algorithms are as follows[2][5]:

1. Token Routing
2. Round Robin
3. Randomized
4. Central Queue

5.ROUND ROBIN ALGORITHM:

It is a static fill up balancing algorithm, that does not take the previous fill up state of an node for the day involving assigning jobs. This makes USE of your round robin scheduling algorithm regarding allocating jobs. The item selects your very first node arbitrarily and then, allocates jobs for you to just about all additional nodes in an round robin manner [15]. the actual algorithm is effective from random menus of the virtual machines. the datacenter controller allocates your requests for you to a record of VMs with a good rotating basis. your current primary obtain can be assigned to an VM selected randomly by the group subsequently ones details Center controller assigns your requests in the circular order. soon after your own VM is actually allotted your request, your own VM is usually shifted towards end of a record [1][3][5].

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The round robin algorithm is as follows:

Step1.
set all the VM allocation is zero and record of each VM index by Round Robin load balancer.
Step2.
a. user request/task/cloudlet receives by data center receivers.

b. On the base of priority allocated virtual machine
c. Basis of priority load balancer allocate the time quantum to user request
Step 3.
After the complete of task(cloudlets),VM are allocated to other user request.
Step4.
Checks new /pending/waiting requests in queue by data center controller.
Step5.
Go to step 2.

6.PROPOSED ALGORITHM:

The proposed algorithm eliminates the drawbacks of implementing a simple round robin architecture in cloud computing by introducing a concept of assigning different time slices to individual processes depending on their are priorities. The priority of a process is assigned by user externally. In the proposed architecture when a new process arrives in the system it is queued at a small processor. This small dedicated processor is used to calculate the time slices of each process, arranges the processes in ascending order of their burst times and then creates the ready queue for the main processor. This small dedicated processor is used to reduce the burden of the main processor. The processes then execute in the main processor according to round robin scheduling algorithm with their individual time slices. Whenever a new process arrives in the system ready queue, its time slice is calculated and enquired to the main processor's ready queue.

Whenever a process completes its execution it is removed from both the system ready queue and the main processor ready queue. The process continues until the main processor ready queue becomes empty. I am assuming that lesser number implies higher priority

The Proposed round robin algorithm is as follows:

Step1.
set all the VM allocation is zero and record of each VM index by Round Robin load balancer.
Step2.
a. user request/task/cloudlet receives by data center receivers..
b. On the base of priority allocated virtual machine and calculate range (R)

$$R = \text{Max Burst Time} + \text{Min Burst Time}$$

c. Basis of range and priority, load balancer allocate the time quantum to user request

Step 3.
After the complete of task(cloudlets),VM are allocated to other user request..

Step4.
Checks new /pending/waiting requests in queue by data center controller.

Step5. Go to step 2.

7. Implementation and Result:

Proposed system implemented in NetBeans using advanced JAVA. Cloud simulator is simulated for simulation with different configuration. Before simulation we configure many parameters like number of datacenters, number of cloudlets, VM configuration, bandwidth and MIPS.Round Robin and Modified Round Robin evolution with following configuration which show in below.

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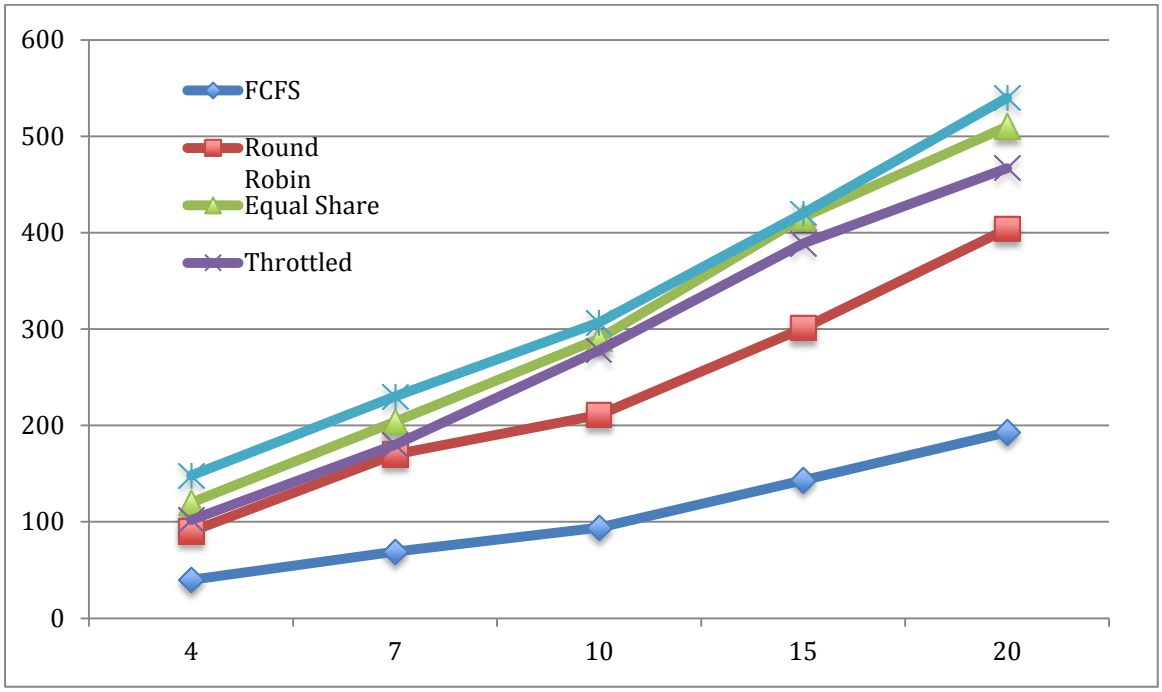

Fig 2 Response Time Comparisons between algorithms

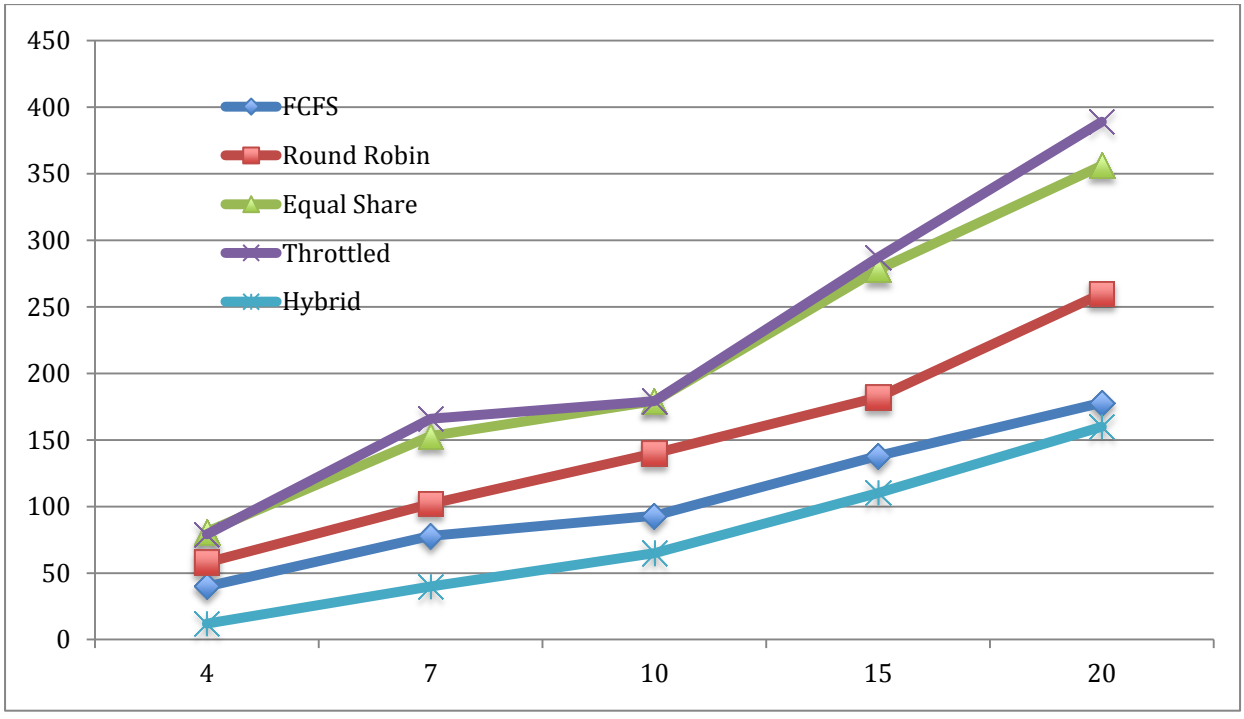

Fig 3 Waiting Time Comparisons between algorithms

8. CONCLUSION

This paper presents a concept of Cloud Computing along with research challenges in load balancing. It also focus on merits and demerits of the cloud computing. Major thrust is given on the study of load balancing algorithm, followed by a comparative survey of these abovementioned algorithms in cloud computing with respect to stability, resource utilization, static or dynamicity, cooperative or non-cooperativeness and process migration. This paper aims towards the establishment of performance qualitative analysis on existing VM load balancing algorithm and then implemented in CloudSim and java language.

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