A COMPARATIVE STUDY OF DIFFERENT CLOUD SERVERS ON THE BASIS JOB SCHEDULING APPROACH

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***Abstract*: Cloud computing is the technology in which sharing of resources or communication takes place over the internet through clouds. Cloud computing allows to communicate between clients and providers without the need of installation. It has been found that today large number of companies is adopting the cloud technology to gain the profit in less cost. But sometimes due to high usage of systems problem of load balancing occurs. Load balancing is what it means balancing the work between all the systems, in which some systems has less work, so that throughput can be enhanced. In the proposed work, we will achieve good load balancing via use of FCFS and Priority algorithm. The whole simulation has been taken place in .NET environment. Also in the end it will be evaluated which one performs better in load balancing.**

Keywords*:* Load Balancing, FCFS, Priority Algorithm, Cloud, .net

I. INTRODUCTION

Division of the work among various servers, drives as well as other resources is called load balancing. Mainly problem of load balancing occurs at data centers because they handle the large quantity of load balancing. Load balancing in clouds is different from normal load balancing architecture. Load balancing makes it sure that each node in the system has equal work distribution; No node has to sit idle.

So to balance work between nodes, transfer of work takes place from high work load nodes to low work nodes. There are two ways of applying load among nodes:

1) In the iterative methods, the final destination node is determined through several iteration steps.
2) In the direct methods, the final destination node is selected in one step.

Load balancing is done to enhance the throughput, response time, executing time, waiting condition .The important things that have to take care while developing load balancing algorithms are estimation of load, division among nodes, nature of work transferred.

This load considered can be in terms of CPU load, amount of memory used, delay or Network load.

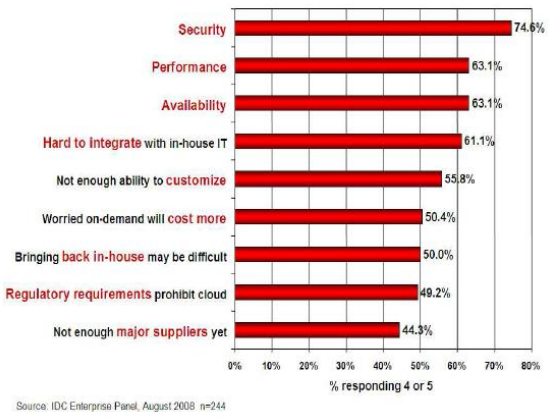
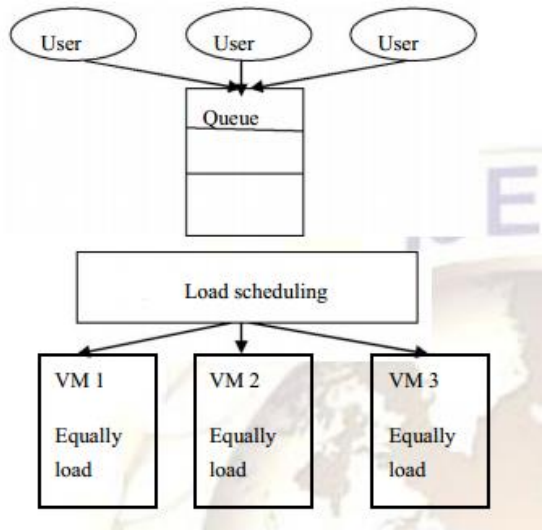


Figure.1 Load Balancing Performance during 2011 year

II. USAGE OF LOAD BALANCING

1) *Limiting your points of failure*: If we found that load has been distributed evenly, but some nodes failure occurs then work can be divided among active nodes without taking the site down.
2) *Load Distribution*: A single server does not distribute the work evenly so there is need of dual servers. The next step is to combine the power of multiple servers with Load Balancing.



Figire.2 Load balancing among machines

3) *Goals of load balancing***:** The goals of load balancing are
   a) To get better the performance significantly
   b) To have a endorsement arrangement in case the arrangement be unsuccessful even partially
   c) To preserve the system firmness
   d) To contain future modification in the system
   e) To improve the response time
   f) To reduce the waiting condition in the queue.

III. PROPOSED METHODS OF LOAD BALANCING

1) *FCFS***:** First-come, first-served (FCFS) – sometimes first- in, first-served and first-come, first choice is a service policy whereby the requests of customers or clients are attended to in the order that they arrived, without other biases or preferences. It is also called FIFO. Mainly it is used in batch systems. Its performance metric is average waiting time.

Problems with FCFS:

a) Non- preemptive
b) Cannot optimize resources in parallel.

2) *Priority based:* In Priority Scheduling, each process is given a priority, and higher priority process executes first in comparison to low priority process.

Priorities can be defined as following:

a) Internally defined priorities use quantities to measure priority like time limits, memory requirements, the number of open files, and the ratio of average I/O burst to average CPU burst have been used in computing priorities.

b) External priorities use priorities on the basis of importance of the process, the type and amount of funds being paid for computer use, the department sponsoring the work, and other, often political, factors.

Priority scheduling can be either pre-emptive or no preemptive.

a) A pre-emptive priority scheduling algorithm will preempt the CPU if the priority of the newly arrived process is higher than the priority of the currently running process.
b) A no preemptive priority scheduling algorithm will simply put the new process at the head of the ready queue.

IV. METHODOLOGY

1) On the basis of FCFS

for each task t in the ordered list
if task is first task in the queue then
Find minimum execution time
Else
if task k on the same processor p_j
comm_time = 0
Else
comm._time=communication time between two nodes
end if
for each processor *pi*
Task_execution_time = excution_time + comm_time + predecessor_excution time
end

2) *On the basis of Priority*

for each task in list
if task is first task in the queue then
Execute task to processor pi with high priority
Else
if task k on the same processor p_j
Prority=0
Else
Priority=1
end if
for each processor
Task_execution_priority = high then low
end for
Execute task to processor with high priority

V. RESULTS AND DISCUSSIONS

The results simulation has been taken place in the .net environment along with azure windows. The various parameters used are performance, jobs executed, energy consumption, system crash.

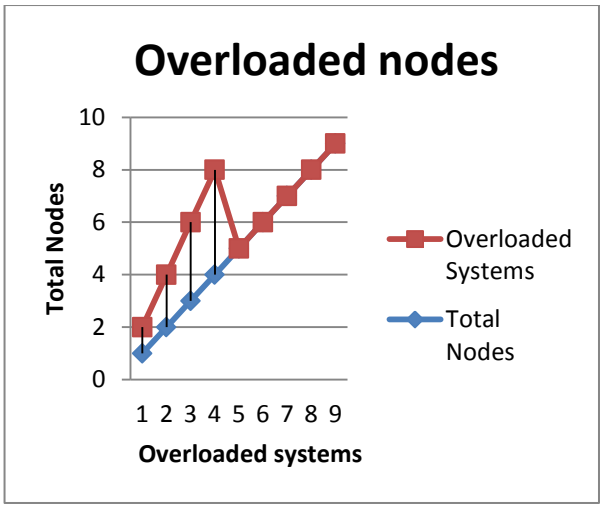


Figure.3 Overloaded systems versus total nodes

The above figure shows that, if Total no. of systems is 10 then out of which 5 are found to be overloaded.

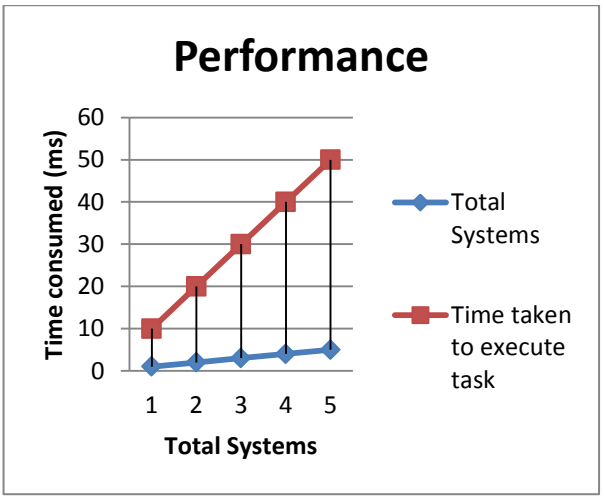


Figure.4 Performance

The above figure shows that how much time is taken by each system to execute.

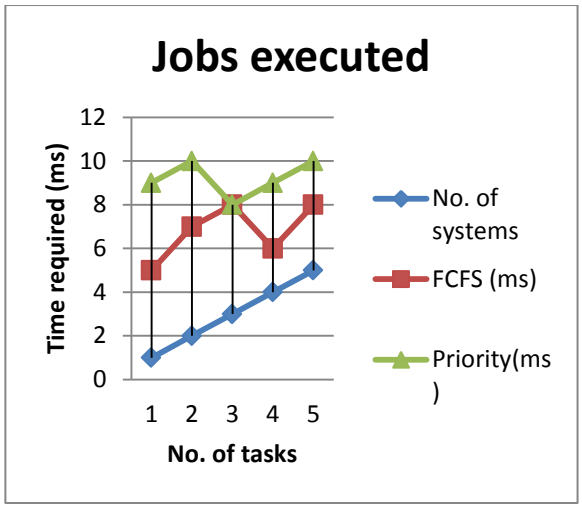


Figure.5 Performance of executing task by Priority and FCFS

The above figure shows that FCFS takes less time to execute tasks and Priority takes much time in comparison to FCFS.

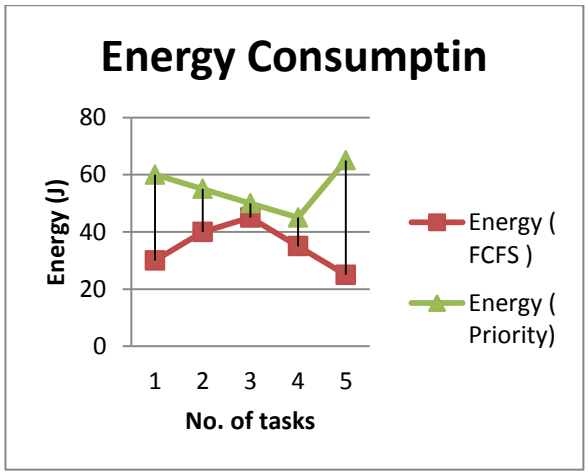


Figure.6 Energy Consumption

The above graph shows that FCFS takes less energy to execute tasks and Priority takes much energy in comparison to FCFS.

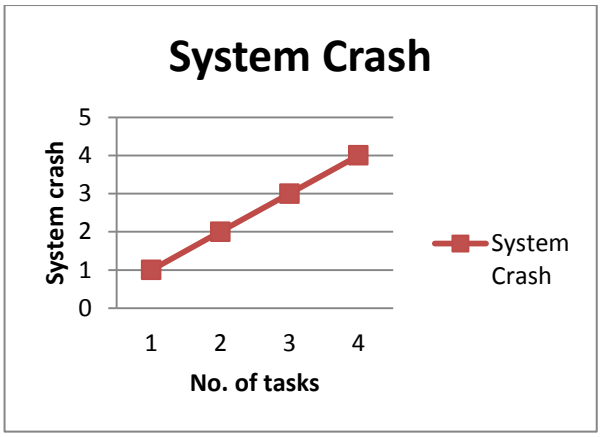


Figure.6 System crash

The above graph shows that systems crashes takes place only 4 times when tasks are executed at normal pace.

VI. CONCLUSION

Till now we have discussed on basic concepts of Cloud Computing and Load balancing and studied proposed load balancing algorithms, which has been applied to clouds e.g. FCFS and Priority based algorithm.. In the end we have concluded that the time consumption, load balance of FCFS is minimum from the other scheduling algorithm like Priority based.

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