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Load Evaluation on Cloud with Hybrid Technique 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 an easy scheduler. One of the reasons 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 there are priorities.*

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

1. INTRODUCTION

Job Scheduling is a process of allocating jobs onto available resources in time. It is also defined as the process of finding an efficient mapping of tasks to the suitable resources so that the execution can be completed with the satisfaction of some objective functions. The objective functions could be such as minimization of execution time as specified by customers and maximization of resource utilization as specified by service providers. Efficiency of scheduling algorithm directly affects the performance of the system with respect to delivered Quality of Service. In short, more efficient is the scheduling algorithm, better is the Quality of Service delivered. Every Scheduling problem has three important elements. They are:

Machine Configuration: A single machine with a single or multiple processors or a cluster of machines with a single or multiple processors in each machine etc.

Optimization Criterion: It defines the objective(s) of the scheduling algorithm e.g. reducing make span, minimizing response time, minimizing resource cost etc.

Set of constraints and characteristics: The scheduling of tasks may be dependent on some other tasks or independent of each other, thus defining a certain execution order and thus a certain set of constraints.

The various objectives of optimization criteria can be:

- CPU Utilization
- Throughput
- Response Time
- Waiting Time
- Turnaround Time
- Fairness
- Resource Cost

A typical Cloud modeled applying CloudSim involves after four entities Datacenters, Hosts, Virtual Machine in addition application form along with system Software.

1. Datacenter: Datacenter is set of hosts. This can be responsible regarding managing virtual models (VMs) (e.g., VM provisioning). It behaves similar to an IaaS provider from finding requests with regard to VMs via brokers.

2. Datacenter Broker: This class represents the broker acting on behalf of a user. It modifies a couple of mechanisms: ones mechanism for submitting VM provisioning requests to be able to data centers and mechanism with regard to submitting tasks to VMs.

3. Host: Host executes actionsregarding management of VMs (e.g., creation along with destruction) and update task processing to be able to VMs. a good host possesses the defined policy to provisioning memory, processing elements, and also bandwidth to virtual machines. A good host is associatedfor you to the data center. The idea can host virtual machines.

4. VM: This represents the software implementation of a machine that executes applications called virtual machine (VM), which functions to be a physical machine. Each virtual machine divides your own resources received by the host among tasks working from it.

5. Cloudlet: The cloudlet class can be also known as being a task. CloudSim represents complexity of the application in relation to their computational requirements. the class is managed through the scheduling policy that will be implemented inside Datacenter Broker Class.

2. LITERATURE REVIEW:

Pooja Samal et al (2013) [4] load distribution problem on various nodes of a distribution system is solved. The work has been improved both resource utilization and job response time by analyzing the various of Round Robin algorithm.

Kunal Mahurkar et al (2013) [7] presents OCRP (Optimal cloud resource provisioning) algorithm to solve the over provisioning and under provisioning problems in existing cloud mechanism. In the given solution they focused on optimal decisions in demand uncertainty and price uncertainty.

RajKumar somani et al (2014) [2]proposed the hybrid method for VM level load balancing.

- Round Robin Algorithm
- Throttled Algorithm

It is also been implemented for IaaS framework in simulated cloud computing environment and the result obtained were analyzed. These two algorithms has been proposed for virtual machine level load balancing that do not consider the current load state of VM while allocating some new job to it.

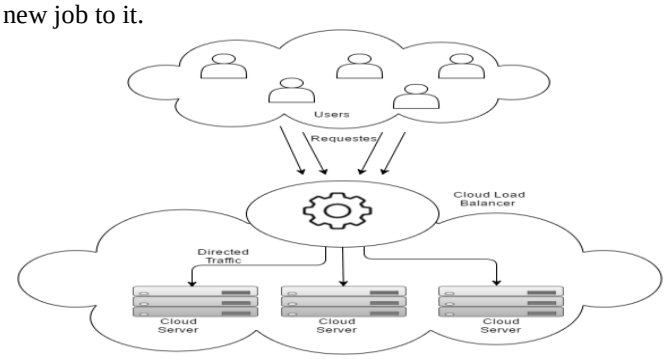

Figure 1: Cloud Load Balancer

The concept of circular way to allocate VMs has been taken from Round Robin algorithm and inspiration of checking availability on each step has been taken from throttled algorithm.

Ritu Kapur (2015) [3] presents a new Cost Effective Resource Scheduling algorithm,which when compared with the algorithm in outperforms it. The Simulations demonstrated prove the above fact. The CERS algorithm considers load balancing as an important Quality of Service parameter performs a check for its necessity and if required does the load balancing and optimizes the performance as well as the overall resource cost.

3. PROBLEM IDENTIFICATION

In Current Scenario, with an environment of mobile cloud the task is divided and disseminated into same size of small jobs i.e. Cloudlets. These Cloudlets as well as Virtual Machines are scheduled according to the various scheduling policy for e.g. FCFS, Round Robin etc. Generally in Cloud Computing scenario user submit the task to be performed / executed. Cloud Coordinator (CC) divides the task into equal sized cloudlets and passes it to Datacenter (DC). Normally it takes a lot of time because the cloudlets are processed one at a time in FCFS manner as and when they reach to VM[8]. VM executes the cloudlets present in the queue as they reach the VM's. Basically this default job scheduled policy is extremely Time- Consuming, Cost insensitive and inefficient [9].In Figure 1 show that cloud load balancer working.

The scheduling of tasks in cloud means choose the best suitable resource available for execution of tasks or to allocate computer machines to tasks in such a manner that the

completion time is minimized as possible. In scheduling algorithms list of tasks is created by giving priority to each and every tasks where setting of priority to different tasks can be based on various parameters. Tasks are then chooses according to their priorities and assigned to available processors and computer machines which satisfy a predefined objective function[10].

A. Scheduling Types

1) Static scheduling schedule tasks in known environment i.e. it already has the information about complete structure of tasks and mapping of resources before execution, estimates of task execution/running time[].
2) Dynamic scheduling must depend on not only the submitted tasks to cloud environment but also the current states of system and computer machines to make scheduling decision[12].

Performance Evolution
Proposed System performs the following steps:

1. Calculate the cost of each task
2. Sort the task according the following parameters
    a. CPU
    b. RAM
    c. Bandwidth
    d. Storage
3. Also arrange the VM according the following parameters
    a. CPU
    b. RAM
    c. Bandwidth
    d. Storage
4. Check the status of Each VM.
5. Schedule the sorted VMs on the basis of sorted task
6. Calculate throughput, response time of each task

4. CONCLUSION

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.

In future we will implement cloud load balancing algorithms. Compare existing algorithm with hybrid algorithm on the basis of computation time, memory and throughput.

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