Efficient Resource Allocation in Cloud Computing

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ABSTRACT

Now a days, cloud computing is an emergent technology. Cloud computing has reduced the workload on the IT sector in term of investment, energy, resource sharing etc. But still cloud computing is in strive phase. Resource sharing, Task scheduling, SLA are the issues to affect on the performance of cloud. Here, we focused on the Google cluster data for the task and by using the proposed system we efficiently allocate the resources to the respective cluster. The proposed system also gives the better option to allocate resources for such Google cluster data.

Keyword: - *Round Robin, SJF,Resource Allocation, K-Means, Clustering, Optimization, Google cluster.*

1. INTRODUCTION

In cloud computing different resources are provided to the users with the help of dynamic resource allocation. Resource allocation is an integral part of Infrastructure-as-a-Service model. Resource allocation is one of the major issues in cloud computing. The aim of system is to allocate the available resources to needed cloud user through Internet. Resource allocation is the process of allocating the resources to the clients according to their need. There are various algorithms which are being used for resource allocation in cloud computing. These algorithms help in scheduling virtual machines on the server at various data centres. Some of these algorithms are ACO (Ant Colony Optimization Algorithm), Bee's Algorithm, Bin Packing Algorithm, Non-preemptive and Preemptive Scheduling Algorithm, Priority algorithm and Choco Based (CB) algorithm. These algorithms are used for efficient resource allocation in cloud computing.

2. LITERATURE SURVEY

Google-cluster traces: format + schema.

In this document describes the semantics, data format, and schema of usage traces of a Google compute cell. This document describes version 2.1 of the trace format, and should be read in conjunction with the detailed information provided with a trace. They mentioning different task events like timestamp, missing info., job ID, task-index- within the job, machine ID, event type, user name, scheduling class, priority, resource request for CPU cores, resource request for RAM, resource request for local disk space, different- machine constraint.

A network-aware virtual machine placement and migration approach in cloud computing.

Cloud computing represents a major step up in computing whereby shared computation resources are provided on demand. In such a scenario, applications and data thereof can be hosted by various networked virtual machines (VMs). As applications, especially data-intensive applications, often need to communicate with data frequently, the network I/O performance would affect the overall application performance significantly. Therefore, placement of virtual machines which host an application and migration of these virtual machines while the unexpected network latency or congestion occurs is critical to achieve and maintain the application performance. To address these issues, this paper proposes a virtual machine placement and migration approach to minimizing the data transfer time consumption.

Dynamic Load Balancing and Efficient Load Estimators for Asynchronous Iterative Algorithms.

In this paper they shown the very high power of synchronism for parallel iterative algorithms in a global context of grid computing. In this article, They study the interest of coupling load balancing with asynchronies in such algorithms. After proposing a non-centralized version of dynamic load balancing which is best suited to asynchronies, they verify its efficiency by some experiments on a general Partial Differential Equation (PDE) problem. Finally, they give some general conditions for the use of load balancing to obtain good results with this kind of algorithms and discuss the choice of the residual as an efficient load estimator

2.1 .Proposed System

The cloud computing is the need of today's IT world. The Cloud computing has reduced the investment capital by virtualization of the resources. There is no need to purchase separate resource to each customer with this strength. The cloud computing has face the problem of how to manage existing resources with incoming users request. This long lasting challenge motivate to work in this area.

3. SYSTEM ARCHITECTURE

In System Architecture firstly collecting Google data-set. On that Google data-set applying the clustering Algorithm to forming the cluster of task. This cluster is given to the System for applying the different optimization algorithm on that cluster task. And finally finding which optimization algorithm is giving better throughput.

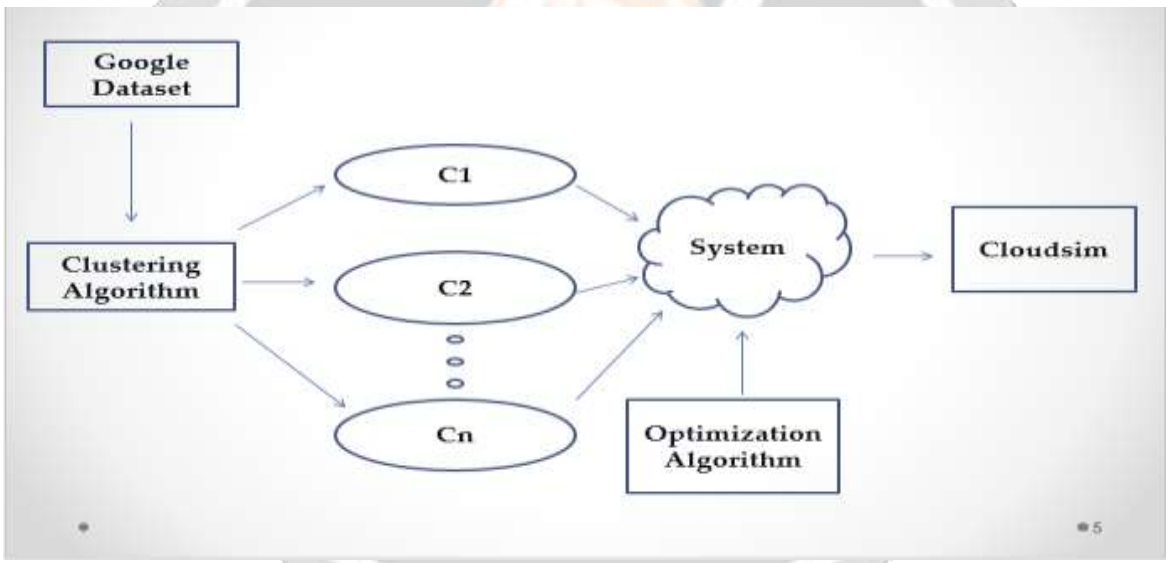


Fig 1: System Architecture

4. WORKING

In this system the concept is to allocate the resource in cloud computing. To complete this work first we need the google dataset which is of size 32 GB. In data set there are overall 13 parameters and we going to consider only 5 of the main parameters which are

1. Priority,
2. Resource request for CPU cores,
3. Resource request for RAM,
4. Resource request for local disk space,
5. Different machine constraint.

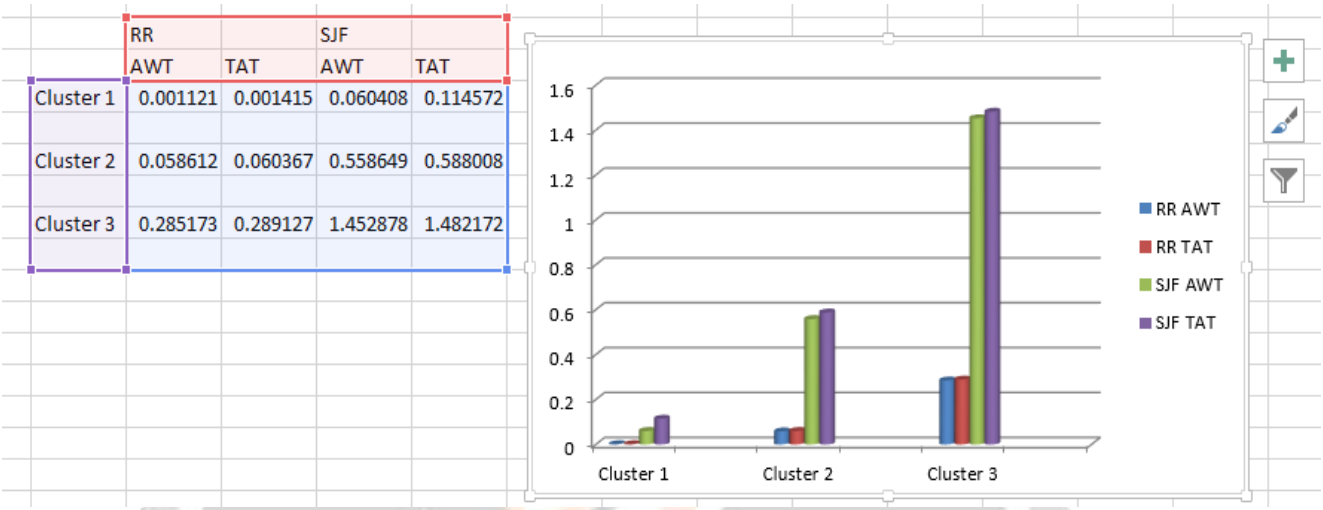
After selecting the parameters we are going to apply the clustering algorithm on that dataset. The clustering algorithm used is K-means. The K-means is dynamic in nature in forming the cluster and it is distance based clustering algorithm. When the cluster are created they will be given to the system which will be applying the optimization algorithm. The optimization algorithm used are 1) Round-Robin (RR), 2) Shortest Job First (SJF). The aim is to find out that which algorithm gives the less average waiting time and turnaround time.

This both of the optimization algorithm will be applied on all of cluster created. The output of both

algorithm will be compared and the algorithm with better output will be selected. The applied algorithm will be used to increase the throughput.

5. RESULTS

The below figure shows the graph and the table which have the result of both the technique i.e. RR and SJF. As the cluster are formed the optimization technique is applied for calculating the average waiting time and turnaround time. The X-axis have the cluster and Y-axis shows the time. From below table we get that the Round-Robin is the better algorithm for resource allocation (RA) and it requires less average waiting time. It increases the throughput of system.



	RR		SJF	
	AWT	TAT	AWT	TAT
Cluster 1	0.001121	0.001415	0.060408	0.114572
Cluster 2	0.058612	0.060367	0.558649	0.588008
Cluster 3	0.285173	0.289127	1.452878	1.482172

Fig 2:Result

6. CONCLUSION

The real motivation to move towards cloud computing is to save cost. There are various issues which stop the cloud from to make best. out of various issues our work has specially focused on better resource allocation for cloud computing. Resource allocation is one of the key issue of cloud and it also matters into the revenue of cloud computing. Cloud computing focus on efficient resource utilization. Resource utilization depends on effective resource allocation. Resource optimization deals with performance and cost associated with cloud and increases the throughput.

7. REFERENCES

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