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A Sophisticated Study of Round Robin and Equally Spread Current Execution Load in cloud computing

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Abstract: ***Cloud computing is an emerging technique that provides resources , storage and application to the user as per demand and user only required internet connection for accessing the application from everywhere at any time Cloud computing is based on the concepts of distributed computing, utility computing , virtualization and grid computing. The numbers of users accessing the cloud are rising day by day. cloud is based on data centres which are powerful to handle large number of users. It is a virtual pool of resources which are provided to users Internet. Load balancing in cloud computing will help clouds to increase their capacity , capability which results in powerful and reliability clouds. The reliability of clouds depends on the way it handle the loads, to overcome such problem clouds must be featured with the load balancing mechanism. This paper is a brief discussion on testing load balancing on proposed cloud model. The simulated results provided in this paper based on scheduling algorithm ESCE (Equally Spread Current Execution) load .ESCE Scheduling algorithms handle the random selection based load distributed problem round robin , we have proposed ESCE scheduling algorithm and compared it with the round robin scheduling to estimate processing time, response time which is having an impact on cost.***

Keywords— cloud computing, Round Robin, Equally Spread Current Execution Load, Load Balancing, cloud sim, cloud analyst.

I. INTRODUCTION

Cloud computing is the delivery of computing services over the Internet. Cloud computing is an emerging area within the field of information technology (IT). Cloud computing is a model for enabling , convenient, on-demand network to a shared pool of configurable computing resources (e.g., storage, applications, networks, services and servers) that can be rapidly provisioned and service provider interaction or released with minimal management effort. Cloud services allow individuals and businesses to use hardware and software that are managed by third parties at remote locations. Examples of cloud services include webmail, and online business applications, social networking sites, online file storage. Cloud computing provides a shared pool of resources, including networks, computer processing power, data storage space, user applications and specialized corporate. The cloud computing model allows access to information and computer resources from anywhere that a network connection is available.[1][2]

1.1 SERVICE MODELS

Saas (Software as a Service): Software application delivered through cloud computing technique. Builds software and end users to configure their needs. The customers (end-users)but not the flexibility to change or modify the software. It refers to a software that is deployed on a hosted service and is accessible via internet. There are several SaaS applications. Example of SAAS is Gmail where consumer can store, access the data and also no need to update Gmail software. Google gmail are popular examples that use the SaaS model of cloud computing.

IaaS (Infrastructure as a Service): Provides infrastructure on demand. CPU en storage delivered through cloud computing technique. In short we can say that with the advent of cloud computing, The infrastructure can be anything from storage to server applications on operating system. [2]The dynamic changes in the software industry is reported to like many software development companies to get this opportunity. cloud platforms provide a potential platform for developers to write applications and use.

PaaS (Platform as a Service): it provides a platform for users to perform various tasks. It offers the run time environment for applications. It also offers deployment tools and development required to develop applications. the Windows platform is the ability to build, [2][3]test developers and host applications and test developers that can be accessed by end users. PaaS has a feature of **point-and-click** tools that enables non-developers to create web applications. PaaS products are available with different development stacks. For example, .NET-based environment Microsoft Azure provides a, while Google App Engine offers a Java.

II. LOAD BALANCING

Load balancing is centralized or decentralized. The performances of computational system depend on several aspects, one of which is load balancing. Load balancing mechanism is totally dependent on the amount of work assigned to the system for a specific time period. The time where system has to work and manage according to the priority basics. There are several load balancing algorithms for the optimization and improvement of cloud performances. The interaction with factors and some load balancing algorithm which can be applicable for such factors are studied in the current paper. The nature of the algorithm can be static or dynamic, although some algorithms are simple but under some conditions they work more effectively. The only objective of the service provider is to provide maximum resources output and this can be achieved by implementing load balancing algorithm which helps in gaining this objective.

Cloud computing is a service oriented architecture. The only objective of the service provider is to provide maximum resources output and this can be achieved by implementing load balancing algorithm which helps in gaining this objective. The paper is a comparative study of such several algorithms.

Load Balancing algorithms are used for implementing. More load balancing algorithm are introduced like round robin algorithm a mining improvement in the performance. The effect of the algorithm depends on the architectural designs of the clouds [4]. The only differences with this algorithm are in their complicity. Today cloud computing is a set of several data centres which are sliced into virtual servers and located at different geographical location for providing services to the users. The paper includes the two fundamental algorithms for load balancing round robin, equally spread current. These algorithms are used for load balancing in cloud environment [5]. The existing system does have these polices of load balancing , but still the efficiency of these algorithms are studded and presented to find the best suited algorithm for load balancing of virtual servers. Load balancing helps in reducing the bandwidth usage which results in decreasing the cost of machine and maximizing the services offered by the service providers.[7] Load balancing works in the manner to decide which virtual machine is in steady state while which virtual machine will go on hold.

Cloud computing is one of the fastest implementing technology in the decade. Many companies are trying to introduce clouds and implement, due to its flexible and simple architecture.This result in the increasing number of users reaching cloud. Although clouds are divide in private ,public and hybrid models but still problem of reliability may arise in these clouds [2],[3]. Some clouds are also designed for online software testing. Cloud computing has been adopted by organization which includes, online application design by Google app managers, social networking websites and by Google doc which are some of the important implementation and a step ahead in cloud computing. This suggests that cloud computing will change the way we interact with the resources through Internet. Cloud computing models used virtualization technology; this technology helps in slicing a single data centre or high power server to act as multiple machines. To implement virtualization additional software is also need. This software is the system software on an operating system, can be from windows for example open source environment like Linux Load balancing is the pre requirements for increasing the cloud performance and for completely utilizing the resources. It depends on the hardware configuration of the data centre or server in how may virtual machine they can be divided.

2.1 LOAD BALANCING ALGORITHMS

The paper describes about two load balancing algorithms which are Round robin algorithm, equally spread current execution load. The allocation of the VMs the load balancing algorithms plays an important role. As when the request arrives at the data center, and decide VM is to be allocated it will be decided with the help of the load balancing algorithms. Thus different load balancing algorithms for the cloud computing are discussed here.

- **Round Robin**: Round robin use the time slicing mechanism. The time is divided and interval is allotted to each node. The name of the algorithm suggests that it works in the round manner where each node is allotted with a time slice and has to wait for their turn. Each node is allotted with a time slice in which they have to perform their task. This algorithm is the default algorithm used in the simulation. An open source simulation performed the algorithm software know as cloud analyst It allocates each process or task with a time slot and after the time slot the job gets change and next jobs comes into execution. This algorithm simply allots the job in round robin fashion which doesn't consider the load on different machines.

- **Equally spread current execution load**: This algorithm requires a load balancer which monitors the jobs which are asked for execution. The balancer looks over the queue frequently for new jobs and then allots them to the list of free virtual server. The task of load balancer is to queue up the jobs and hand over them to different virtual machines. The balance also maintains the list of task allotted to virtual servers, it helps them to identify that virtual machines are need to be allotted with new jobs and free.[12] The name suggests about this algorithm that it work on equally spreading the execution load on different virtual machine. The experimental work for this algorithm is performed using the cloud analyst simulation.

III. EXPERIMENTAL WORK

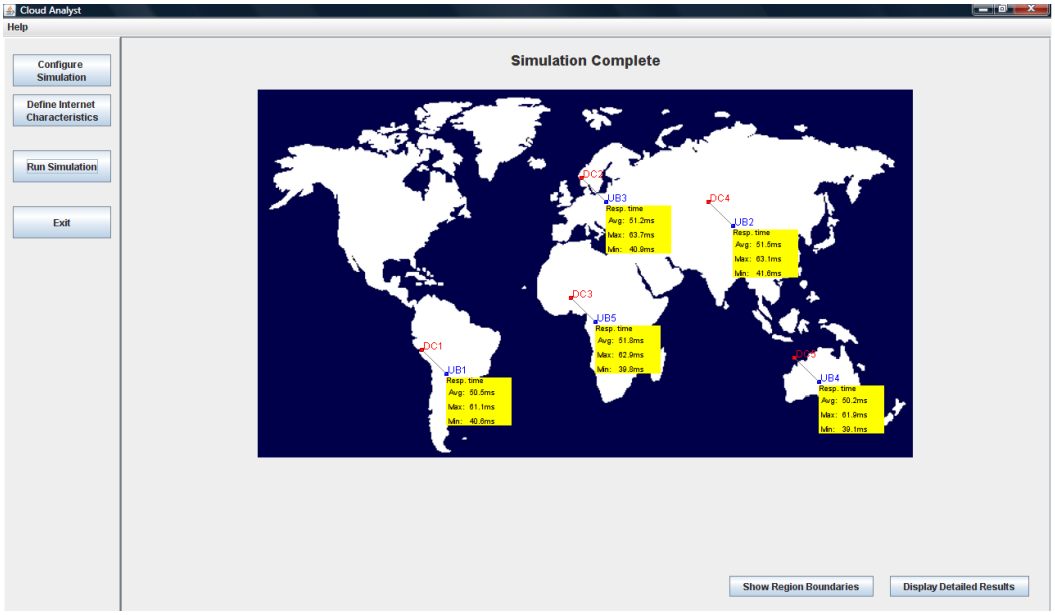
The experimental work is performed using simulation software named as cloud analyst. The cloudsim allow studying various constraints by changing the parameters. The simulation is based on the cloudsim simulator; cloudsim is based on java and consist of a GUI interface which helps in easy configuration of attributes required for experiment. The different algorithms used for load balancing. This figure shows the environment for cloud analyst simulation tool. The simulation comes with three important menus, run simulation, configure simulation and define Internet characteristics [8], [9].This

menu is for configuring the experiment and setting up the load balancing algorithms. The performances of these algorithms are showed in the experimental work. Simulation tool is having options to switch algorithm according to the requirement.

3.1 Description

Simulation setup and Performance analysis using the cloud analyst tool to evaluate the proposed algorithm carried out for a period of one hour the number of users, data centres. Step how can find your result value and compare it.

1. Setup the all data value than save it.
2. Then load configure, load configuration result window will be appear on screen.
3. Then explore the result.
4. Save result on PDF, then save all result value.
5. Compare all data value using chart.
6. Finally your result is show.



3.2 User Base

Figure 1.define the user base to represent the single user, but user base should be used to represent a multi numbers of users for efficiency of simulation.

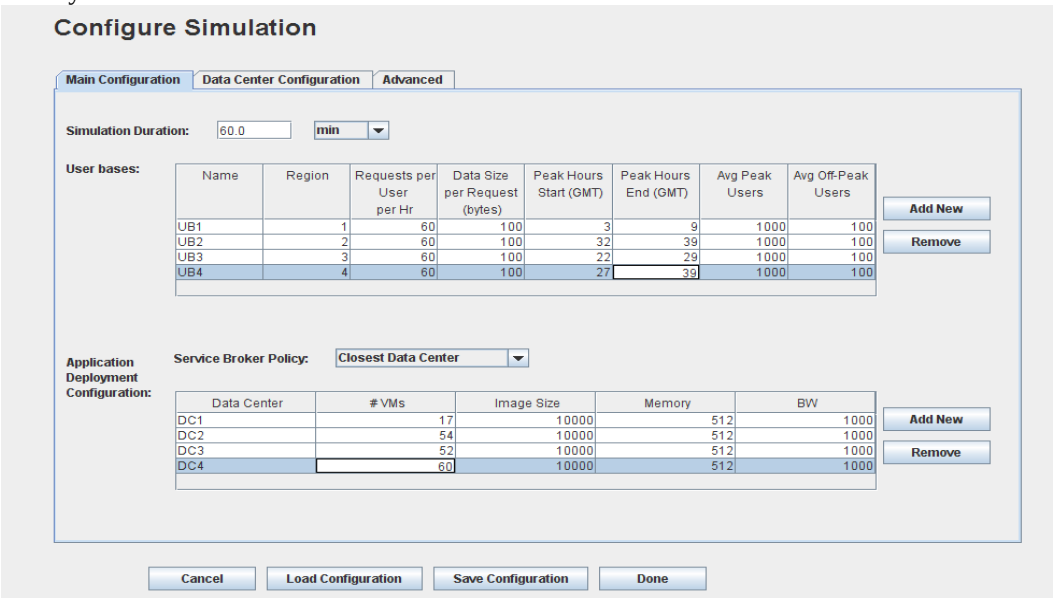


Figure 1.simulation configuration

3.3 Datacenter

Datacenter manages the data management activities virtual machines creation and destruction and does the routing of user requests received from user base through the internet to virtual machines. After performing the simulation the result computed by cloud analyst is shown in following below figures 2. We have used the above defined configuration for each load balancing policy one by one and depending on it.

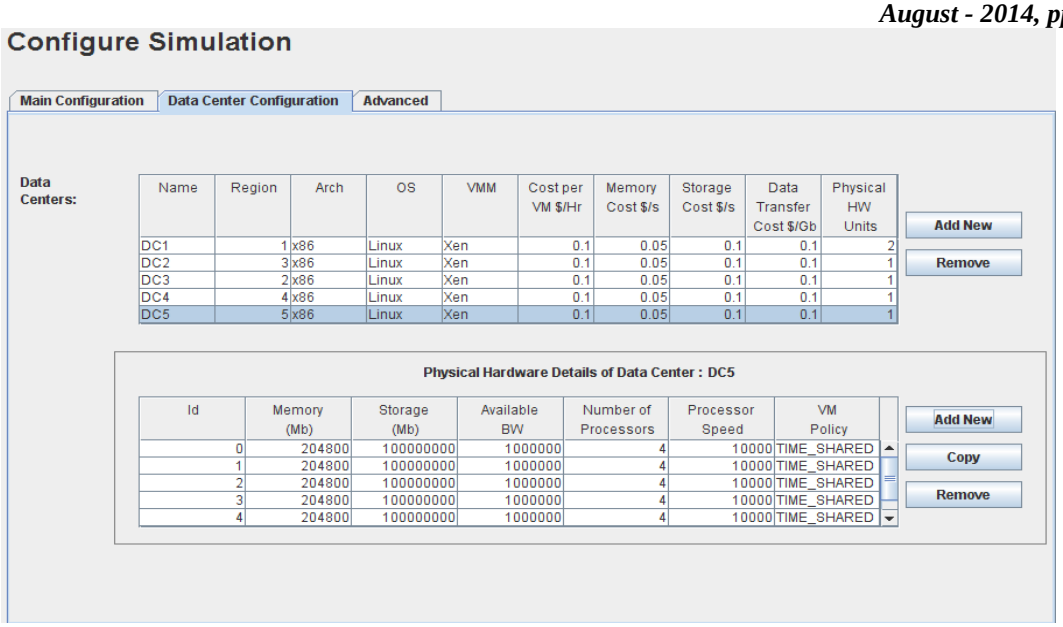


Figure 2.simulation configuration

3.4 Result

3.4.1 Response Time and Processing Cost Using Round Robin

Overall Response Time Summary

	Avg (ms)	Min (ms)	Max (ms)
Overall response time:	51.04	39.13	63.13
Data Center processing time:	1.40	0.02	2.65

Response Time by Region

Userbase	Avg (ms)	Min (ms)	Max (ms)
UB1	50.52	41.57	62.85
UB2	51.50	41.38	63.13
UB3	51.18	40.93	62.91
UB4	50.15	39.13	61.88
UB5	51.83	39.79	62.92

Figure3. Response time values

Cost

Total Virtual Machine Cost ($):	14.15
Total Data Transfer Cost ($):	0.25
Grand Total: ($)	14.41

Data Center	VM Cost $	Data Transfer Cost $	Total $
DC4	5.02	0.00	5.02
DC3	0.50	0.19	0.69
DC2	5.12	0.00	5.12
DC1	3.51	0.06	3.58

Figure 4 cost values Round Robin

3.4.2 Response Time and Processing Cost Using Equally Spread Current Execution Load

Overall Response Time Summary

	Avg (ms)	Min (ms)	Max (ms)
Overall response time:	50.78	38.96	63.80
Data Center processing time:	1.10	0.03	2.11

Response Time by Region

Userbase	Avg (ms)	Min (ms)	Max (ms)
UB1	50.25	38.96	60.24
UB2	51.42	40.06	63.80
UB3	51.36	40.86	61.36
UB4	50.07	40.39	59.40

Figure 5. Response time values of Equally Spread Current Execution Load

Cost

Total Virtual Machine Cost ($):	12.85
Total Data Transfer Cost ($):	0.25
Grand Total: ($)	13.10

Data Center	VM Cost $	Data Transfer Cost $	Total $
DC4	0.50	0.06	0.57
DC3	5.22	0.07	5.28
DC2	5.42	0.06	5.48
DC1	1.71	0.06	1.77

Figure 6 cost of equally Spread Current Execution Load

IV. CONCLUSION

Time and Cost are the key challenge for every IT engineer to develop products that can enhance the performance in the cloud based IT sectors. Current approaches lack efficient scheduling and resource allocation techniques leading to increased operational cost and time. This paper aims towards the development of enhanced approaches through improved job scheduling and Load balancing techniques for overcoming the above-stated issues. Here, Equally Spread Current Execution Load algorithm dynamically allocates the resources to the job in queue leading to reduced cost in data transfer and virtual machine formation. The simulation results show overall time and cost results and comparison of load balancing algorithm

V. FUTURE SCOPE

There is a need of a load balancing policy which will be beneficial to service provider to reduce the cost and time while allocating the resources to the different virtual machines. Thus saving the resources which can be utilized. The algorithms are round robin, Equally spread current execution load active monitoring load balancer. Equally spread current execution load algorithm in Virtual Machine environment of cloud computing in order to achieve better processing time and cost, response time.

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