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OPTIMIZING OF RESOURCE ALLOCATION IN CLOUD COMPUTING WITH ADVANCED LOAD BALANCING ALGORITHM

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ABSTRACT: In this review article we have implemented research challenges in load balancing. and in this we targeted on pros and cons of cloud computing. In this study the essential part of load balancing algorithm come after the respective study of these past specified calculations in cloud computing with respect to to steadiness, utilization, inactive or dynamicity, asset agreeable or non-cooperativeness and prepare movement.

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

INTRODUCTION:

Cloud computing is an architecture which qualifies ubiquitous, appropriate, required network access to a shared pool of applications, networks, storage, services and servers. That can be fastly equipped and released with slightest management effort and interaction between service providers.

In year 1960 Joseph Carl Robnett Licklider work on ARPANET to associate individuals and data from anyplace at any time by the assistance of Cloud Computing, Cloud is utilized as a representation for the Web. In prior time cloud drawings are utilized to speak to communication systems and assist on it to supplant the web in computer organize graphs as in put of an reflection basic foundation it speaks to.

There are diverse sorts of Clouds they are open clouds, private clouds cross breed clouds and multi clouds. The clouds were effortlessly opposed by proprietorship and area but it is small bit complicated . Network computing, virtualization as well as web advances are the improvement of Cloud computing.

Cloud computing encompasses various architectural models, including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). These models provide different levels of abstraction and services to users. SaaS (Software as a Service) refers to cloud-based applications that are accessed over the internet. Users typically utilize these applications without the need for local installation or management. SaaS applications are provided by cloud service providers and are readily available for end-users to use. PaaS (Platform as a Service) is a cloud computing platform that offers developers a complete environment for developing, testing, and deploying web applications. It provides pre-configured infrastructure and tools, enabling developers to focus on application development rather than managing the underlying infrastructure.

LITERATURE REVIEW

Nandwal and Thakur [8,9] optimized resource allocation in cloud computing with a modified round robin algorithm approach and presented a modified round robin algorithm for resource allocation in cloud computing. The proposed algorithm takes into account workload characteristics, user priorities, and resource availability to dynamically allocate resources in a more efficient and effective manner. By considering these factors, the algorithm aims to achieve better load balancing, reduced response time, and improved resource utilization. Through experimental evaluations, the performance of the modified round robin algorithm is compared against traditional round robin approaches.

Richhariya et al. [10,11] proposed cross breed approach could be a combination of the need approach and Circular Robin calculation (RRA). Progressed Circular Robin calculation (RRA) is an approach comprising of two processors: a little processor where it is utilized to calculate the time cut for each handle and a fundamental processor where the forms are organized climbing based on their burst time which is taken as the need esteem. The approach aims to decrease the

Reaction Time however there's no execution testing to infer the comes about. The test comes about of examined writing that tended to the stack adjusting based on the Circular Robin calculation (RRA) approach. Jayaprakash et.al. [4] shown a systematic review of energy management strategies for resource allocation in the cloud. In the year 2013 Patel and Patel [6]Surveyed on resource allocation strategies in cloud computing. Pradhan et.al.[7] presented a Modified round robin algorithm for resource allocation in cloud computing . For its literature we have taken Wei [13], Sangwan et.al [12], Mansouri et.al. [5], Balharith & Alhaidari [2],Gao and Wu [3] and Ahmed et.al. [1]

PROPOSED WORK: This calculation makes a difference to expel the disadvantages of circular robin engineering in cloud computing by foundation of doling out non indistinguishable time cuts to person activities depends on its needs. Client remotely command the method concurring to their need. In this proposed designate whatever point a new prepare comes within the framework it is lined at a little processor. These little relegated processors is utilized to calculate the time required by each prepare and orchestrates these forms in climbing arrange by their burst time.

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=Max Burst Time+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.

IMPLEMENTATION:

4.1: Implementation Plan:

For implementation Net beans 7.3.1 environment using JDK8 in java language and dataset has been used.

Following steps have been performed for completion of work-

Implementation of front end-For designing of front end, as a programming language JAVA has been used with Netbeans7.3.1 IDE.

Results-Execution of each of algorithm is performed no. of times and results has been calculated by using different cloud load balancing algorithm on dataset. Graphs has been drawn using the various results as calculated.

Result Analysis-For result analysis no of execution is performed and chart of analysis is created for comparison.

4.2: Tools:

To ensure effective implementation and accurate evaluation of the existing approaches, it is necessary to introduce certain tools that facilitate development and validate the results. These tools fall into two main categories: implementation supporting tools and evaluation tools.

- JDK 1.7
- MYSQL 5.0
- Net Beans 7.3.1
- JFree Chart Library

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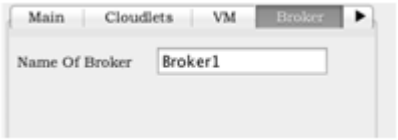
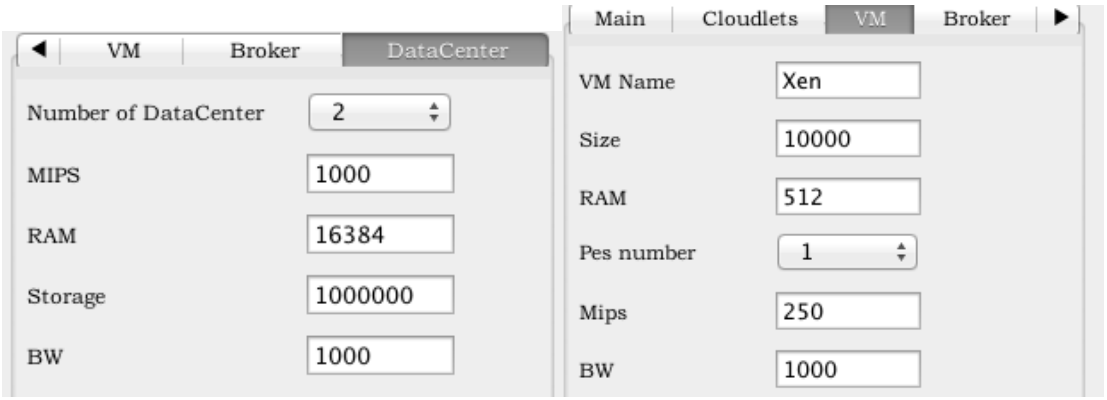
RESULT:

5.1 Result Analysis:

The proposed system is an implementation in NetBeans using advanced Java. It involves a cloud simulator that allows simulation with various configurations. Before running the simulation, users can configure several parameters, including the number of data centers, cloudlets, VM specifications, bandwidth, and MIPS.

The system focuses on two scheduling algorithms: Round Robin and Modified Round Robin. These algorithms are responsible for workload distribution and resource allocation within the simulation. By comparing their performance, users can determine the most suitable algorithm for their specific requirements.





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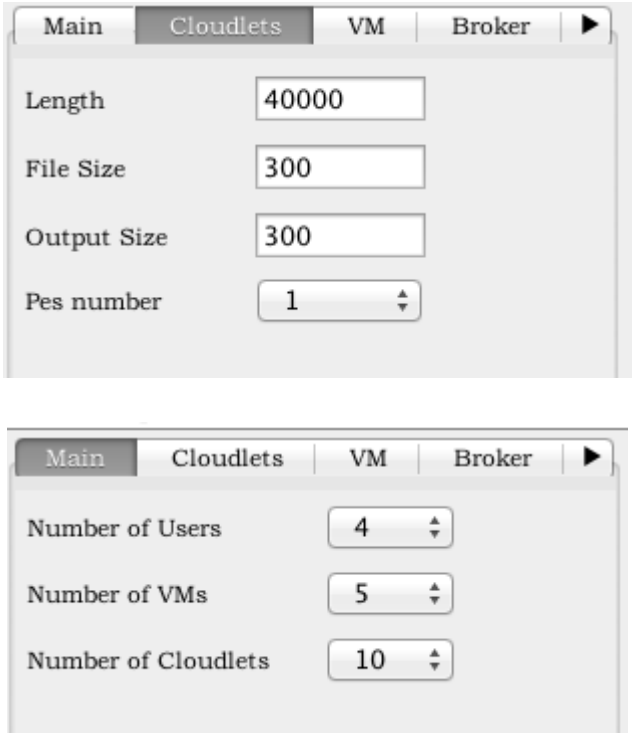

Figure : Configuration Details of Cloud-Sim Simulator

Output & Graphs:

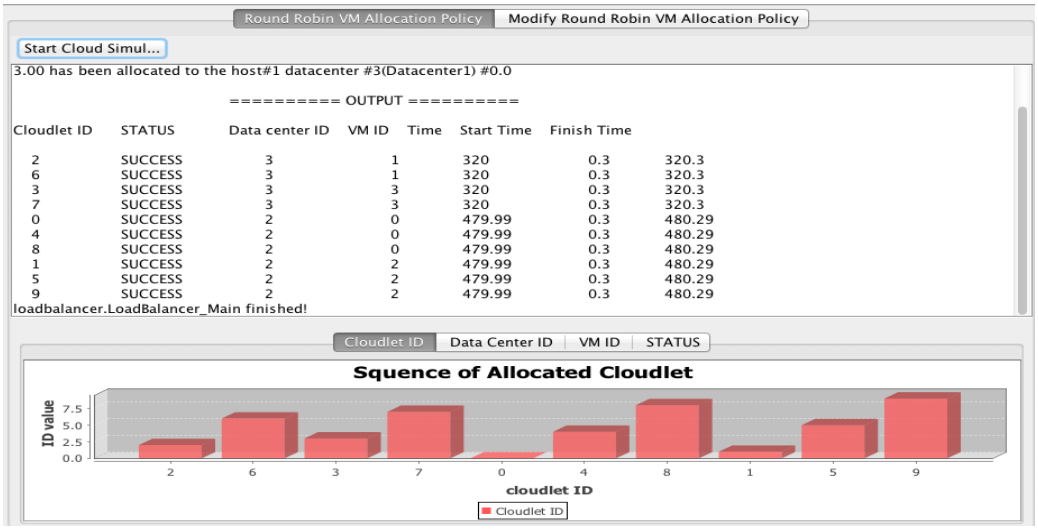

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Figure 5.2: Response Time of cloudlets using Round Robin Load Balancing Algorithm

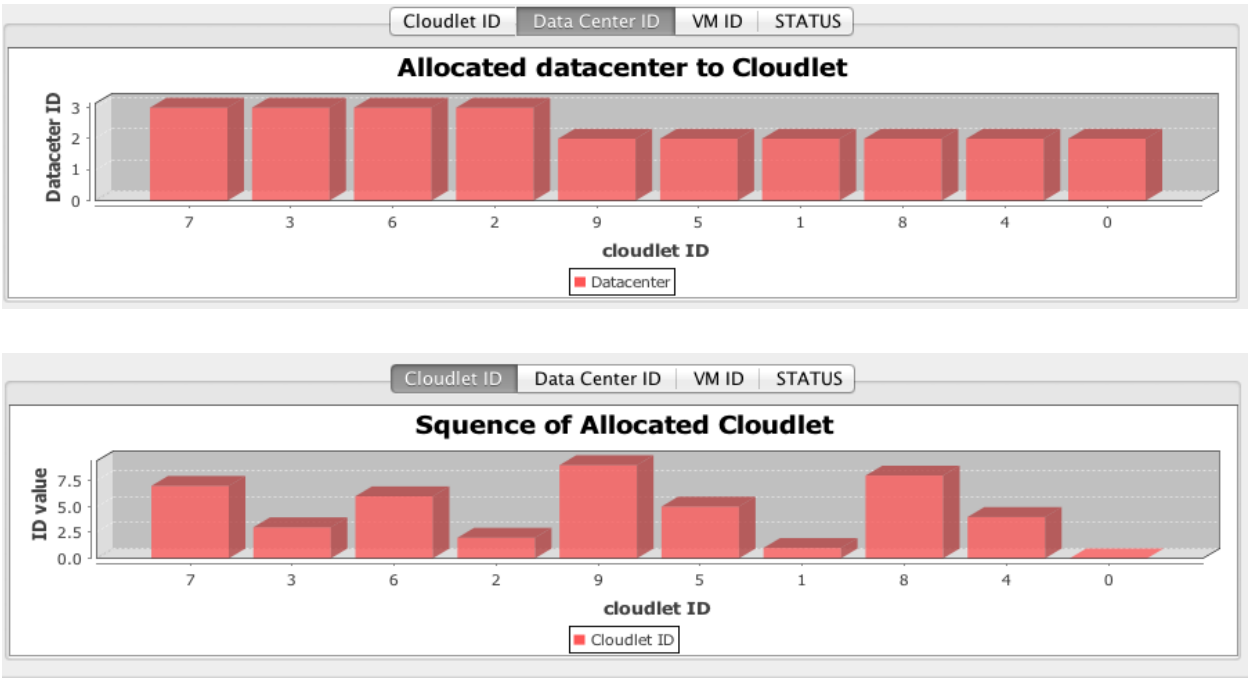
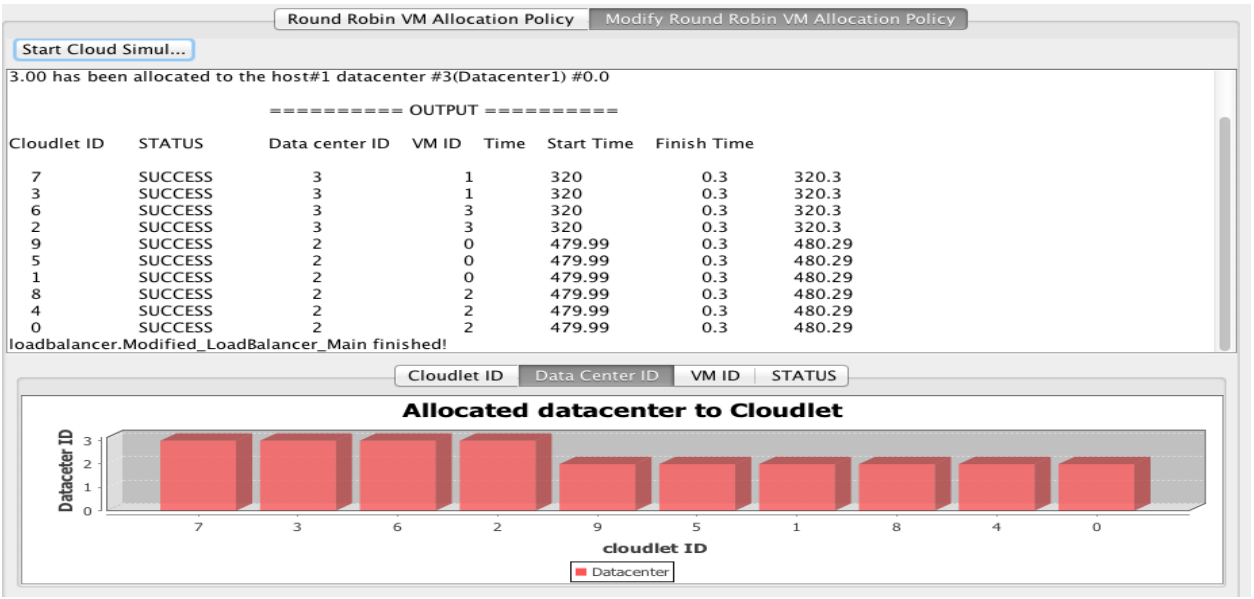


Figure 5.3: Data Centers and VM Allocation using Round Robin Load Balancing Algorithm



CONCLUSION:

Key advantage of agile-based resource allocation is its ability to handle unpredictable or bursty workloads effectively. By employing techniques such as auto-scaling and load balancing, cloud providers can automatically scale up or down resources in response to sudden spikes or drops in workload. This elasticity ensures that applications can seamlessly handle varying levels of demand without compromising performance or incurring unnecessary costs. Agile resource allocation also allows for rapid reconfiguration and reallocation of resources, enabling cloud providers to adapt to changing business requirements and market conditions swiftly.

Agile-based resource allocation and optimization strategies have transformed the landscape of cloud computing. This approach enables cloud providers to allocate resources dynamically, optimize their utilization, and handle unpredictable workloads efficiently. By embracing agile resource allocation, cloud providers can deliver higher performance, scalability, and cost-efficiency to their customers while fostering stronger collaboration and customer satisfaction. As cloud computing continues to evolve, agile-based resource allocation strategies will remain a critical component in driving the success of cloud-based services.

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