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Online Energy Efficient Resource Allocation in Cloud Computing Using GAA Algorithm

Priyadarshini D[1], Sowmya S[2], Balaji A S[3], Maheswari M[4], Dr. Roselin Mary S[5]

Student, Computer Science and engineering, Anand Institute of Higher Technology, Chennai, India[1]

Student, Computer Science and Engineering, Anand Institute of Higher Technology, Chennai, India[2]

Assistant Professor, Computer Science and Engineering, Anand Institute of Higher Technology, Chennai, India[3]

Assistant Professor, Computer Science and Engineering, Anand Institute of Higher Technology, Chennai, India[4]

Head of Department, Computer Science and Engineering, Anand Institute of Higher Technology, Chennai, India[5]

Abstract: Cloud computing is the on-demand delivery of computer system resources primarily data storage and processing power without direct, active user oversight. The Cloud is a collection of diverse materials. Cloud computing's handling of storage has made load balancing possible. The practice of efficiently distributing the load among the servers such that no server is overcrowded or under loaded is known as load balancing. This is accomplished by effectively and successfully splitting the task using the Enhanced Weighted Round Robin. This project's main goal is to reduce response time while enhancing performance by USING GAA algorithm. Using Genetic algorithm for providing expected service result to the user as well as using Any Colony algorithm for efficient resource managing that helps to reduce the response time. Mainly resource allocation are theoritically provides best result but in practical user suffers with bad experience. For that using Analytical algorithm, it helps to analyze the data from the user request and make a decision to process the data in the analytical mode. Finally, efficient resource allocation in data center can be calculated and analyzed by using the combining algorithm of Genetic, Ant Colony and Analytical.

Keywords : Service And Vm Scheduling , Analysis , Static load Balancing , Optimal Static Load Balancing Algorithms , Quality of Services, Genetic Algorithm , Ant Colony Optimization , Analytical Algorithm.

I. INTRODUCTION

Cloud Computing is developing as a auspicious paradigm for providing computing resources like networks, servers, storage, applications as a service over the internet.. Cloud Computing provides everything as a service (XaaS) like Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS).In SaaS , applications are provided to user through client devices like web browser and user need not to manage anything like storage, server, network, operating system etc. eg: Google apps .In PaaS , the platform at which software can be developed and deployed eg: Google App Engine. There are mainly two type of task scheduling in cloud computing: static scheduling and dynamic scheduling.

The main Purpose is to schedule tasks to the Virtual Machines in accordance with adaptable time, which involves finding out a proper sequence in which tasks can be executed under transaction logic constraints. The job scheduling of cloud computing is a challenge. To take up this challenge we review the number of efficiently job scheduling algorithms.

II. RELATED WORKS

Quick allocation and release of resources is possible with minimal management effort. Being an delivery of computers as a service as opposed to a product. In IaaS, users are given access to computing resources such servers, processing power, storage, and networking on a subscription basis [1]. Scheduling defines which task should be completed on which machine in order to allocate tasks to the proper machines to accomplish certain goals. Resources in the cloud are scheduled at two levels, namely the physical level and the virtual machine level, as opposed to traditional scheduling, where tasks are directly mapped to resources at one level (Fig 1). The task's scheduling information is known for static tasks. Whereas in dynamic task scheduling, information of the task is not known prior to execution [2], before execution such as execution time. In a cloud environment, a user requests a computational resource, which the cloud provider allots after determining the right resource. Among them as depicted in figure 1. There may be a variety of requirements for tasks that users submit for execution, including execution time, memory space, cost, data traffic, response time, etc. Also, the resources used in cloud computing may be varied and spread geographically. Single cloud environments and multi-

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cloud environments are two different types of cloud environments. Virtual machines (VMs) are scheduled in single-cloud systems where an infrastructure provider may have numerous physically dispersed data centers. Resource characteristics like dynamicity, cost, and others are typically the main optimization criteria in single-cloud scenarios. Whereas in multi-cloud scenarios, a cloud infrastructure transfers some of its workload to another infrastructure, and a cloud user creates and operates virtual machines (VMs) across various cloud infrastructures to increase service availability, fault tolerance, etc. These traits make creating task scheduling in the cloud more difficult. By taking into account one of these criteria while ignoring the others, many academics have developed various algorithms.

The three stages of the cloud scheduling process are as follows: a. Resource discovering and filtering - The cloud user submits a resource request to the service provider, who then looks for and locates the appropriate resources. b. Resource selection - Resources are chosen based on the specifications for the task and resource selection. d. Submission of the Task is sent to the resource of choice. Modern computer systems must have cloud computing as a component. In the previous few decades, computing concepts, technologies, and architectures have advanced and consolidated. Technology is always changing and evolving in many areas. A computing technology that is quickly establishing itself as the next phase in the creation and implementation of more and more distributed applications is cloud computing. Developers must create procedures that optimize the use of architectural and deployment paradigms in order to reap the full benefits of cloud computing. Because virtualization technology enables cloud computing infrastructures to be scalable, the role of virtual machines has become a crucial concern. Hence, figuring out how to schedule virtual machines most effectively is crucial. Three layers make up the cloud computing architecture for software that needs internet-based on-demand services. The major objective is to assign work to the virtual machines according to flexible time, which entails determining the right order in which tasks can be carried out while being constrained by transaction logic. In order to meet this problem, we examine the several effective task scheduling strategies. It aims to do a good job.

III. EXISTING SYSTEM

Previously, the existing systems have worked on making complete utilization of resources and improving the response time of the job, looking into the load balancing process that holds the condition where some of the nodes involved are overloaded while others are not.

Therefore, efficient load balanced cloud environment with suitable algorithms that support the features of delay-optimal scheduling of VMs as a decision-making process by using a feasible VM configuration to present the physical resource requirements.

IV. PROPOSED SYSTEM

By distributing our survey, we hope to determine which service provider provides network access, security, application software, and data storage are provided by a data center that is implemented as a type of server farm with the necessary infrastructure and is situated online.

The Enhanced Weighted Round Robin algorithm operates in such a way that it distributes the task with the longest execution time to the server with the most weight, in addition to taking the servers' specifications into account. This guarantees that the load is divided equally among the servers, reducing response time.

V. IMPLEMENTATION

With each key actor in the IT provisioning group offering its own opinion of what the subject matter should contain, cloud software services have grown into a sizable study topic. The above materials are an attempt at finding a middle ground and providing a basis for further research.

Two very important topics have either not been covered or require considerably more attention and cloud databases. Both are significant for exchanging data between applications through the cloud. Another important topic in the deployment of cloud computing and software-as-a-service is "cloud computing privacy."

5.1 Work Flow : In the science cloud computing environment, software services are the integration of software and hardware. So, the scheduling and allocation of software service must consider the following aspect: the software licenses, the hardware computing ability, the SLA between the user and the system management, the load balance of the system, the utilization of the hardware and software resource. To design the optimization scheduling algorithm and strategy, the information model of application software service system is given first.

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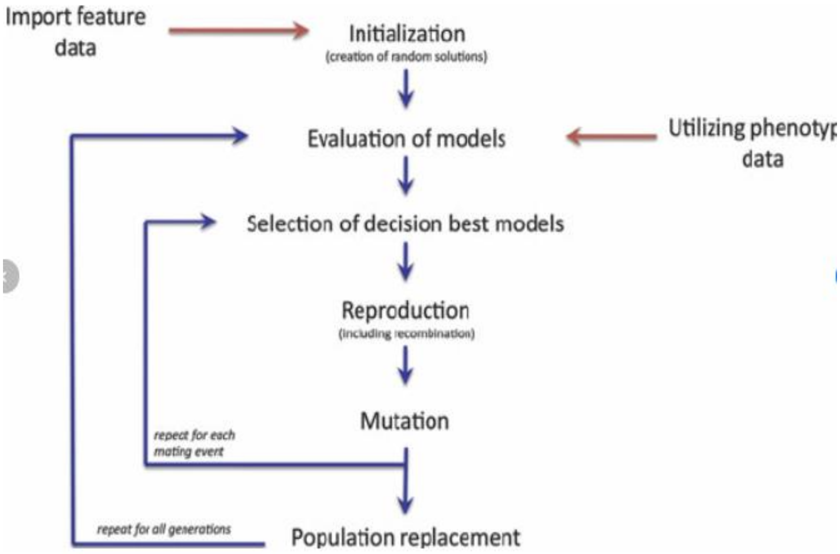
5.2 Genetic Algorithm



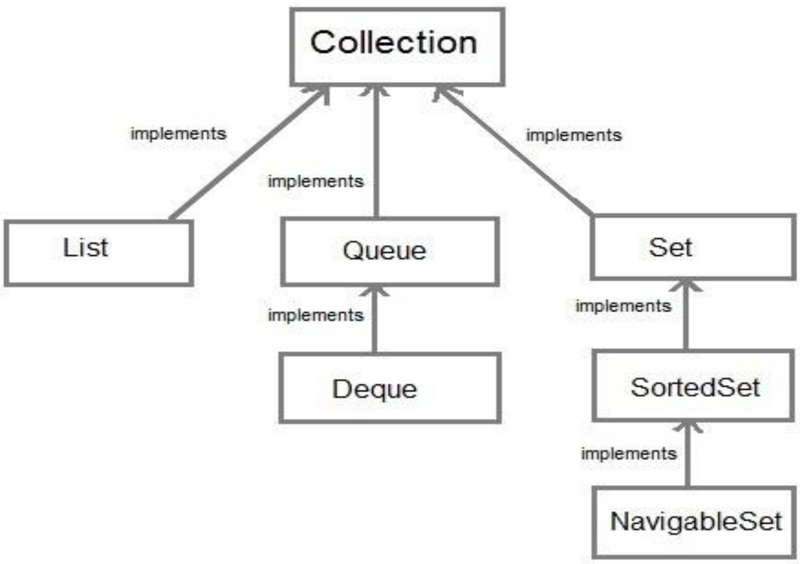
5.3 ANT Colony Optimization : Ant Colony Optimization (ACO) algorithms – extend traditional construction heuristics with an ability to exploit experience gathered during the optimization process. **s p = s p ⊗ e**

5.4 Analytical Algorithm : Analyse the problem. Develop a high-level algorithm. Refine the algorithm by adding more detail. Review the algorithm.

5.5 Application Of Java : Java is widely used in every corner of world and of human life. Java is not only used in software but is also widely used in designing hardware controlling software components.

1. Web Applications like Linkedin.com, Snapdeal.com etc
2. Mobile Operating System like Android
3. Embedded Systems

5.5 Collection Framework



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5.5.1 MYSQL : MySQL, officially called "My Sequel" is the world's most widely used open-source relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases, though SQLite probably has more total embedded deployments. LAMP is "Linux, Apache, MySQL, Perl/PHP/Python."Freesoftware-open source projects that require a full-featured database management system often use MySQL. For commercial use, several paid editions are available, and offer additional functionality. Applications which use MySQL databases include: TYPO3, MODx, Joomla, WordPress, phpBB, MyBB, Drupal and other software. MySQL is also used in many high-profile, large-scale websites, including Wikipedia, Google (though not for searches), Facebook, Twitter, Flicker and YouTube.

5.5.2 Cloudset Creation : During the simulation time, when new VMs and/or Cloudlets are created and submitted to an existing broker, this broker have to ensure that the cloudlets are executed until the end of the simulation. Even creating and submitting the VMs and cloudlets, the existing broker just ignore them and only the cloudlets created before the simulation start are run.

5.5.3 Scheduling : A scheduling framework can be implemented by using different parameters.

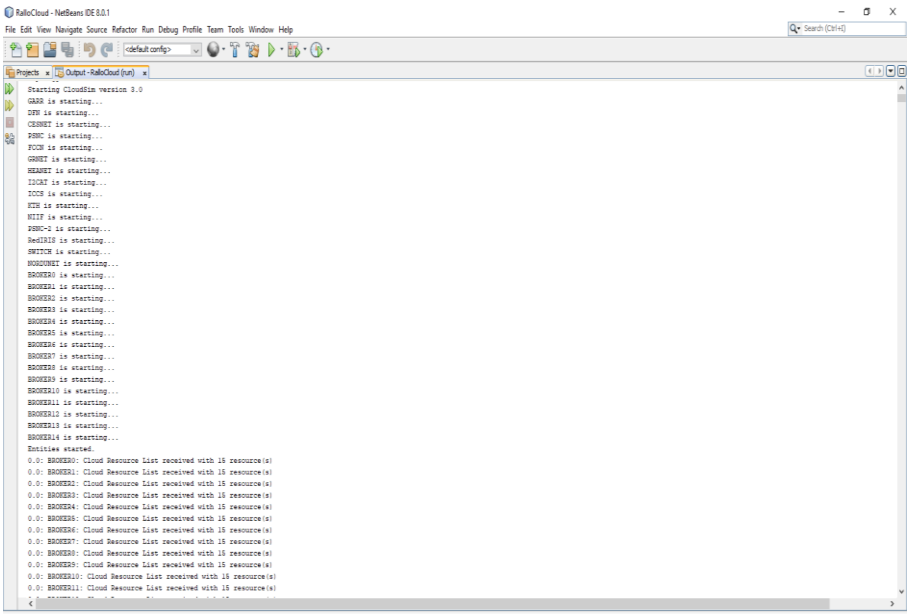
- Load balancing and energy efficiency of the data centers and virtual machines.
- Quality of service parameters calculated by the user which contain execution time, cost and so on.
- It should satisfy the security features.
- Fairness resource allocation places a vital role in scheduling.

5.5.4 Analysis : In this module, we mainly discuss Min-max and Min-well algorithm we developed a new generalized priority based algorithm with limited task, future we will take more task and try to reduce the execution time as presented and we develop this algorithm to grid environment and will observe the difference of time in cloud an grid.

5.6 Result Generation : The experimental results indicated that proposed model decrease waiting time at global scheduler in cloud architecture. Proposed model will use cloud computing algorithms based on SJF algorithms to decrease the time of routing end users requests. We propose a Shortest Job First resource allocation approach, called multi-resource allocation to allocate resource according to diversified requirements on different types of resources. Our solution includes a VM allocation algorithm to ensure Min-max and Min-one are allocated appropriately to avoid skewed resource utilization.

VI. RESULTS AND DISCUSSION

CLOUDSIM ANALYSIS



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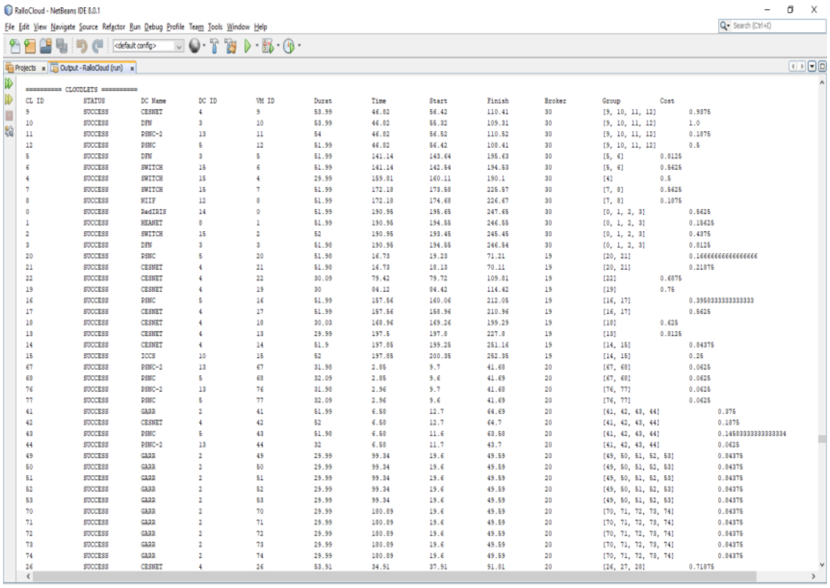
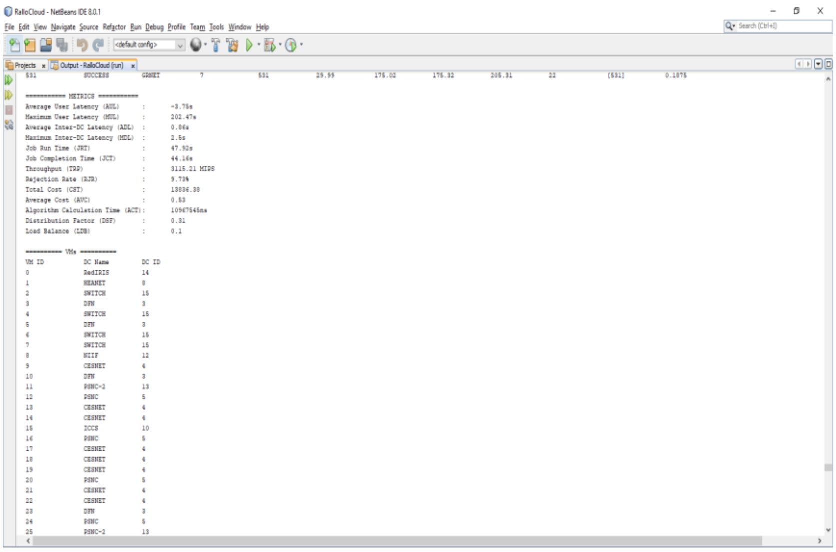
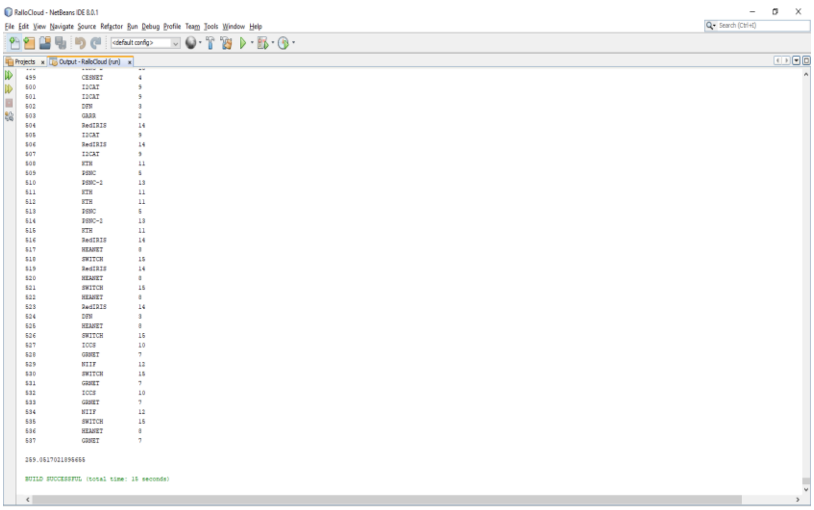
6.1 Results:







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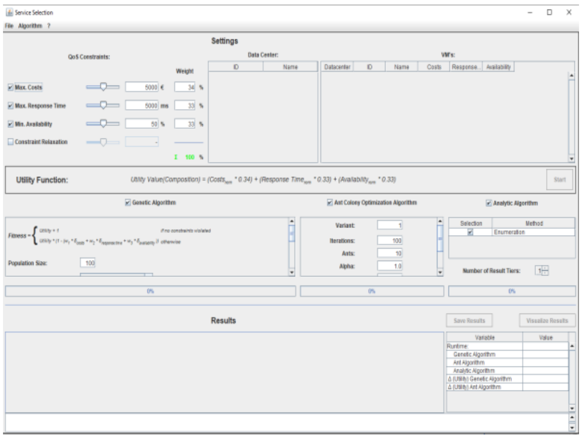
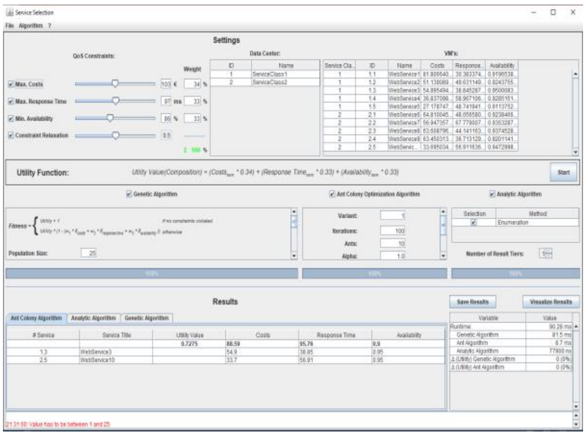
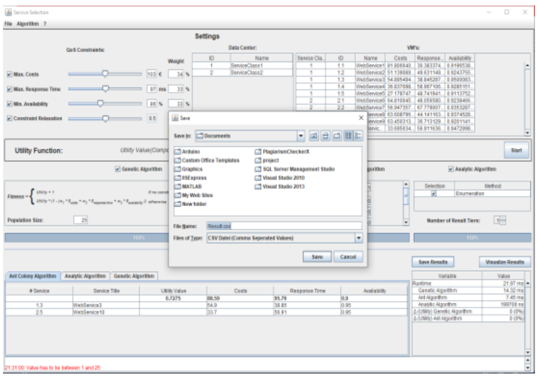
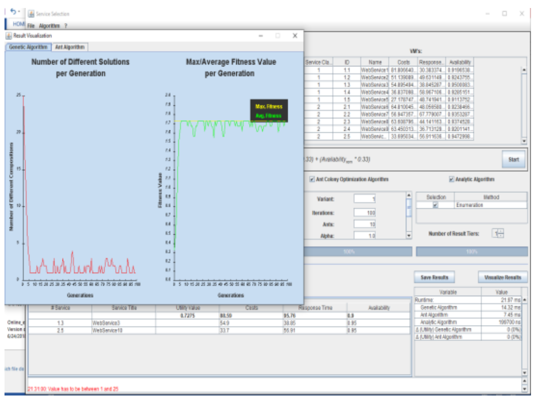
SERVICE SELECTION





FIND QUALITY OF SERVICES





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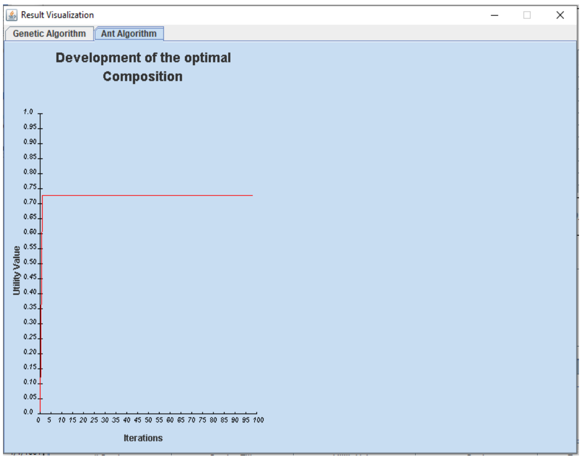

VII. CONCLUSION

In this paper, contains a survey of the design, implementation, and evaluation of a resource management system for cloud computing services. A system of virtual us is based on the altering demands of adaptively multiplexing physical resources. This is utilizing a skewness metric that combines the VM resources and other features as necessary before the server's capacity is fully utilized. The approach successfully avoided overload and enabled green computing for a system with many resource constraints.

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