



# INTELLIGENT AND GENETIC ALGORITHM FOR EVALUATING THE PERFORMANCE OF LOAD BALANCER IN VIRTUALIZED CLOUD ENVIRONMENT

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**Abstract:** Cloud computing is a well-defined paradigm of computer offerings where information and assets are present collected from cloud-based cloud companies using well-designed internet primary services. Cloud Computing (CC) is just a combination of computer services and services and is offered to the public at an affordable price. Resource sharing may lead to problems with availability resources, which creates a stable environment. At CC, we have cloud service providers who work with large computer facilities fully defined in the application as they provide their services in a reliable mode. However; CC is him we are facing the problem of load balancing, which affects performance and weakens it when we load too much system. Improving an effective load balancing algorithm while using CC effectively of the ultimate goal of providers. Virtualization and scalability are some of the dynamics including upgrading VMs to CC. Data traffic and the provision of Web services are increasing day by day; so, load balancing is a major challenge in the CC sector and increases the value of the work re-editing. At this point in time, the emergence of CC requires a great deal of that infrastructure and resource development. The load balancing policy ensures the efficient use of an application for the provision of services to cloud registrars. Upload rating again prioritises subscribers through the appropriate system. As a contribution to research, this paper proposes a load balancing algorithm for CC. The proposed algorithm improves the performance of Cloud Computing applications.

Keywords: Cloud Computing, Virtualization, Load Balancing, Performance, Efficiency

## 1. Introduction

According to [1], due to the recent success of the internet in recent years, computer services are now available worldwide, which has led to the development of CC. For CC, the supplier needs to have infrastructure and service provider. In accordance with [2] [3], infrastructure providers are planning cloud platforms renting resources as needed for use. For infrastructure providers, service providers take over services to support end users. Big companies like Amazon, Google, and Microsoft are enticed by CC, as well are considered the largest companies in the IT world.

A CC is a facility where infrastructure, stadium, and software is provided based on client need. Strange Vision of CC In Visual Machines to provide resources such as much-needed services. Virtual efficient machine

transfers are made on the services of load balancing algorithms. The load balancing algorithm plays a significant role in deciding which VM will be assigned to the user on demand. There is also the possibility that there may be a number of applications at some point. [4] As a result, some of the applications are kept online, making it possible for you to transfer the request providers of additional services.

Therefore with the provision of a load balancing algorithm, users are able to decide to stay in line or get services from other providers [5]. Cloud computing is the distribution of various offerings and storage, servers, networks, software programs, ingenuity, and statistics, online to provide fast innovation, flexible resources, and economics of scale. Take a picture of a site that is open to everyone. A large number of customers can visit a site or online application at any time. The power of a web system to address these client needs without temporary delays becomes powerful. I might say cause system failure [6] [7]. The bad feeling is that the website is low or inaccessible and brings lost customers for a website owner all his work is based on his website. Balancing the load is important in this situation.

## 2. Related work

For CC, the main method used is the internet and the remote central server for applications and data managers. Additionally, in CC, users and organizations use applications without uploading personal files or accessing a computer as long as you have internet access. This procedure does not work because it involves processing, storage, bandwidth, and memory. A CC, by definition, is an example of a computer network in which a given system or a The program is performed on a connected server. In a typical client-server model, clients must contact the server at do any work. The difference in CC occurs as the computer process can apply to a large number of these connected computers using data virtualization [8] [9]

Virtualization is where several virtual servers are set up, is divided into a number of offline servers that run automatically, but are visible to users as one machine. Due to the changing nature of computer software, there is a need to develop an easy-to-use application on devices, which allows you to integrate resources, create demand on demand and update capabilities, and provide instant flexibility [10] [11]. This process is done using distributed computers that focus on the wide range of users that they can access distributes virtual hardware and online software infrastructure. This includes web software, network, web services, as well as distributed computer virtualization. The main ideas of CC are in the user's interest focus on distribution, compliance, and virtualization of computer programs.

Through virtualization, CC is capable of having a large customer base with countless virtual computer infrastructure [12]. Safety is paramount concern in the world of CC development. Visual material migration: Vision involves creating a machine as a file or file set. Uploaded load the computer can be slowed down by the active flow of the visible machine. The aim is to eliminate and reduce the burden on cloud computing where the load is distributed vigorously on the machine [13].

Energy management: The benefits of using the cloud include scale economics. Energy conservation is an important issue in the global economy. As shrink suppliers support a wide range of global assets, each has its own property. How can a data center component be used while maintaining its validity?

Data storage and management: Information storage is another important requirement. So how can the data be distributed with the most efficient storage and faster access to the cloud system?

Distribution of cloud node location: Alternatives are provided only for proximity and small nodes communication delay. However, designing an effective load balancing method can be defined successfully locally dispersed nodes remains a challenge.

LB Scalability: The most accessible and sought-after cloud services allow visitors to access scaling resources quickly at any time. The solid load balancer should take into account the rapidly changing needs of computer systems, memory, device architecture, and so on.

### 3. Classification and Load Balancing

Clouds are highly divided into three forms based on the different services offered by them. These are the three ways of cloud resources include; IaaS which includes hardware-related services through the use of CC principles. Provides virtual machine, virtual storage, file or object storage, virtual infrastructure, IP addresses, disk image library, green block storage, virtual reality networks loading scale, firewalls, and software. Supplier goods they found them when they wanted large tanks placed in a data center.

PaaS models include a cloud-based provider computer platform, which includes website, web server, operating system, and programming language murder in space. Application developers use their software solutions in the cloud space outside the need for software absorption and hardware layers or the cost of purchasing and managing it. SaaS- integration provides all software in the cloud. Leading users of each application are given access to the software system, hosted by cloud providers. Load balancing is a technology for distributing loads to other resources in a given system.

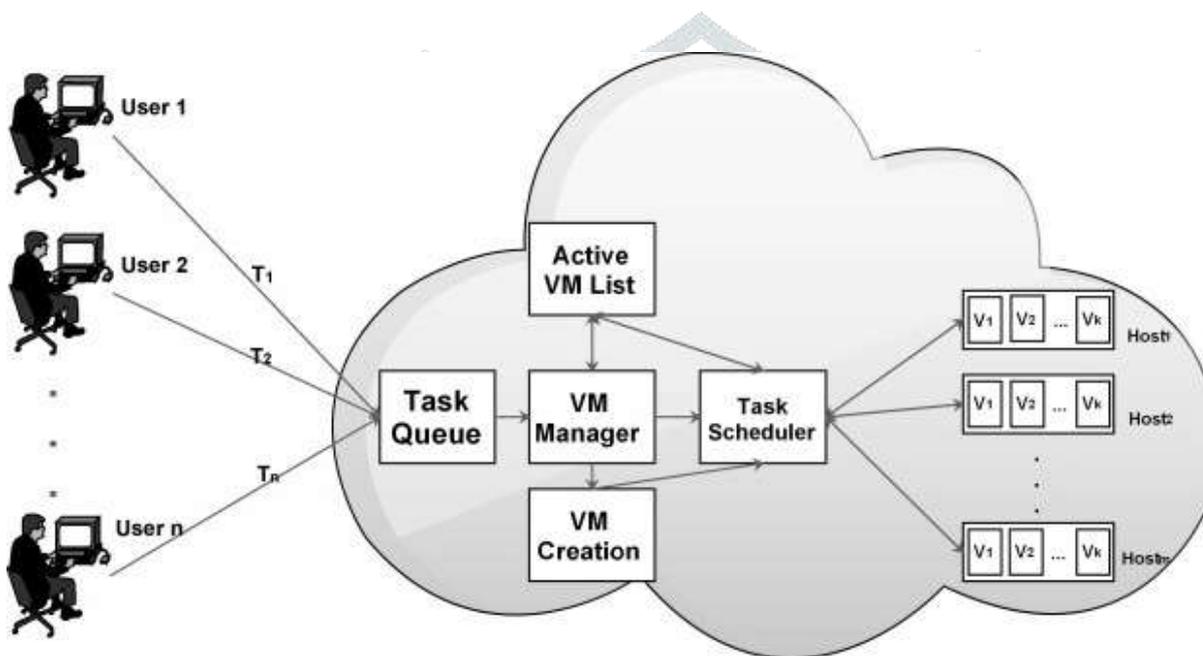


Figure 1: Task Queue and VM Operation in Load Balancing Mode

Thus, upload-spread to cloud-based structures are very important because all resources need to perform the same amount of work at any given time. The most important process is to provide specific solutions for the balance between applications and solutions of any application provided. Online traffic on cloud load balances is automatically maintained by loading loads between multiple servers and resources.

This has been beneficial because it increases the output while avoiding overflow like and a decrease in response time. In paper, the algorithm for measuring the load of good performance of a CC application states discussed, and a summary of the information provided. Different algorithms are designed for different purposes e.g. some algorithms are intended to achieve maximum effect; some aim to have less time to respond, while others aims to have the highest utilization of resources while others aim to have transactions across all system scales. It shows the context in which some of the loads balancing algorithms are working in the CC environment.

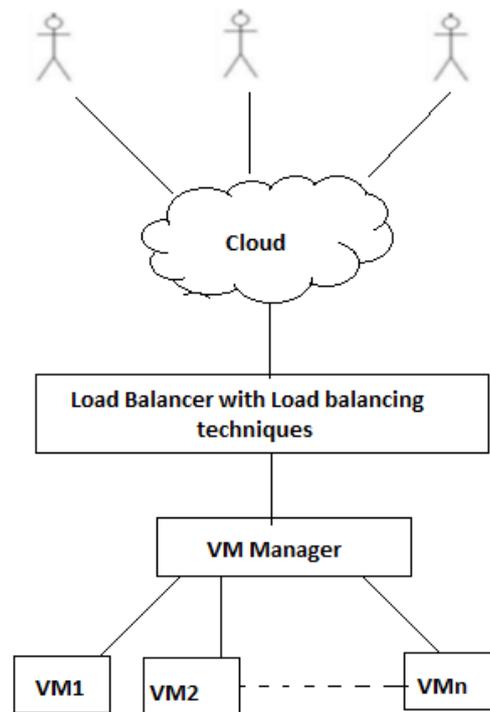


Figure 2: VM Operations and Load Balancing in Cloud

## 5. Load Balancer - Process and Algorithm

Round Robin (RR) divides time into a few pieces and each is given a certain amount of time in which it performs jobs. The DCC in this algorithm assigns applications around a list of VMs. Random VM is preferred the group also assigned the first application by the DCC, which later distributed the other applications in a circular manner.

Weighted Round Robin Allocation is the best RRLB that gives weight to all available VMs so if VM can carry twice as much load as other VMs, weighs 2, and will be allocated two applications powerful VM. The RRA is very simple, however, takes a moderate wait time, and has a high content change, high switching time, and low performance.

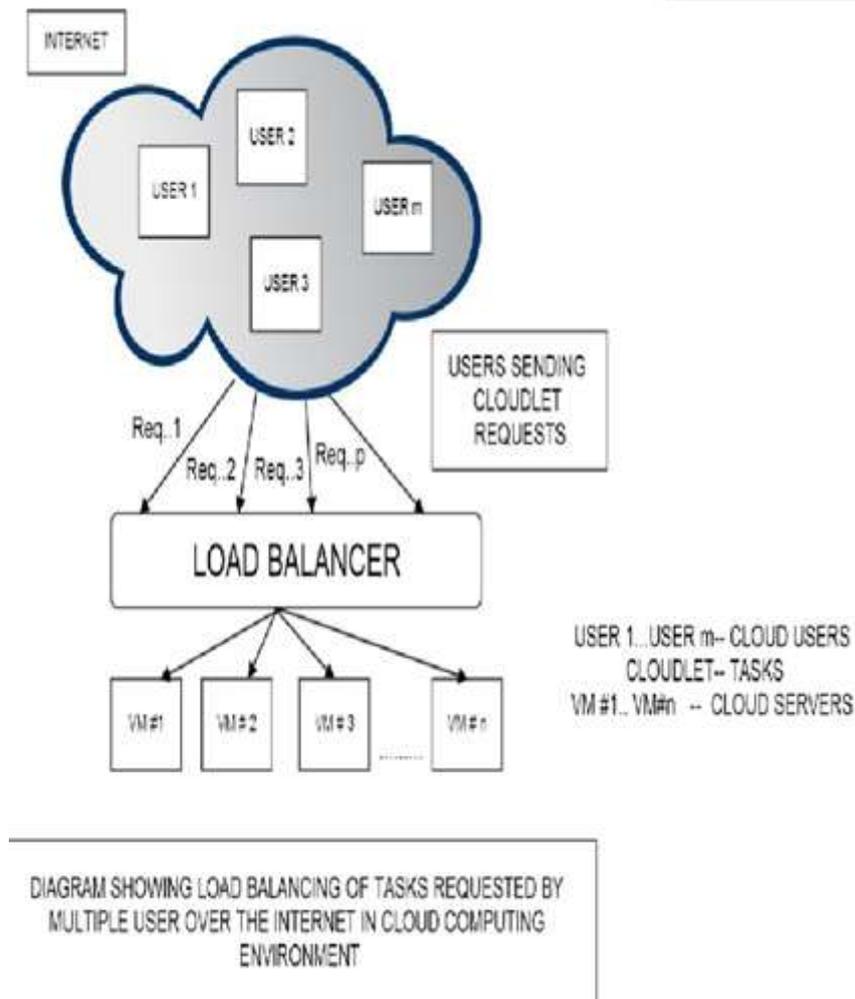


Figure 3: Load Balancer in System Level Cloudlet Applications

It shows the performance of the RR balancer algorithm. ESCE maintains a database of virtual machines and the number of applications currently assigned to Virtual equipment. In the first stage, all visible machines have 0 divisions. As the application reaches the DCC for allocation on a new virtual machine, it is indexed and identified by a lightly loaded virtual machine. If more than that one virtual machine, one to be identified first to clear the load.

ESCE returns the virtual machine ID DCC where the virtual machine identified by that ID is requested, and the LB is notified immediately allocation, which also updates the allocation table leading to an increase in the share value of that virtual machine. Upon completion of the request process, the DCC receives a response cloud and notifies it LB of virtual machine output resulting in a decrease in the number of virtual machine distributions. It illustrates the ESCE. Controls the number of applications provided for all VM and related information.

On arrival of a new application, determines the minimum VM volume and provides that application. The first fixed VM is selected when available at least uploaded. The active VM id is restored to the database manager, and the database administrator assigns application using that ID. It describes in detail the effective monitoring load.

*To improve the performance of cloud computing applications we have developed an algorithm for managing load balancing in CC. The artificial code algorithm used to edit tasks on a virtual machine contains the following information:*

1. Sort jobs based on incremental deadline
  - Tasks if they have the same deadline, then Select a task in the pre-arrival time
  - Other
  - Priority Support (deadline) With each virtual machine
2. Use of statistics
3. Sort visible equipment according to its use
  - Repeat

When a virtual machine is found and the task is assigned to a heavy virtual machine.  
 then  
 Move work to a less used machine  
 Other  
 Start editing  
 Until all tasks assigned to the virtual machine  
 Finish

## 6. Proposed Algorithm and Evaluation

Our proposed algorithm helps maintain load balancing using key, The time of arrival work, means that the work is ready and in line, which can be measured in milliseconds. The type of work can be determined by the length of the work and further can be distinguished by difficulty, intermediate, and light. Work deadline time is also measured in milliseconds and represents the maximum result time of function.

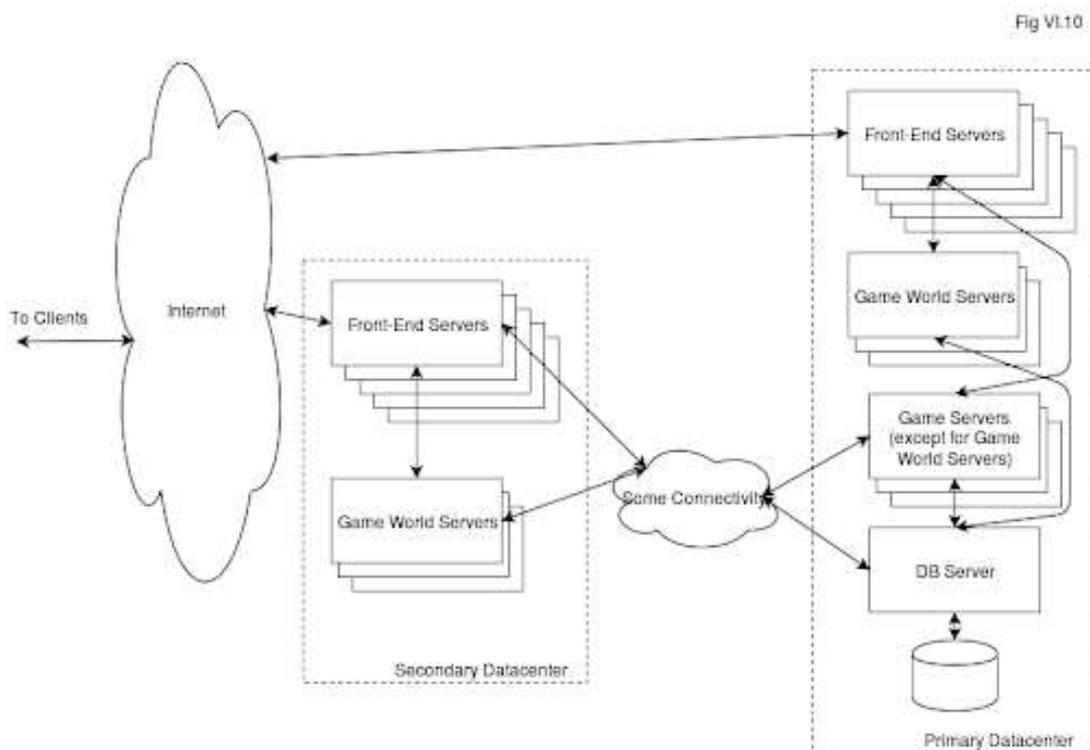
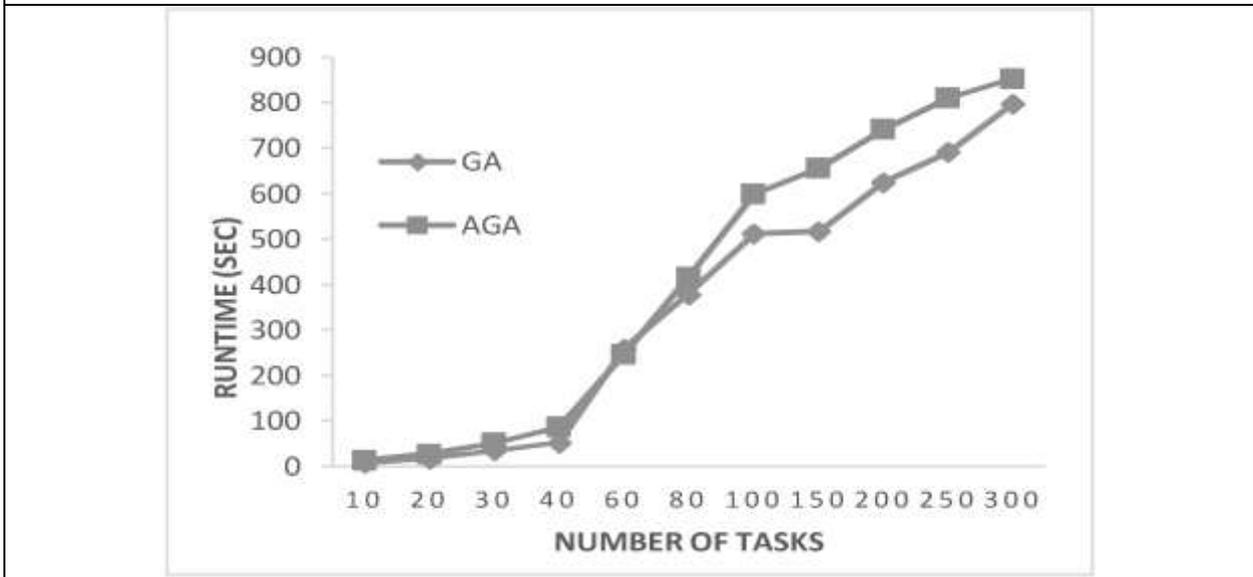
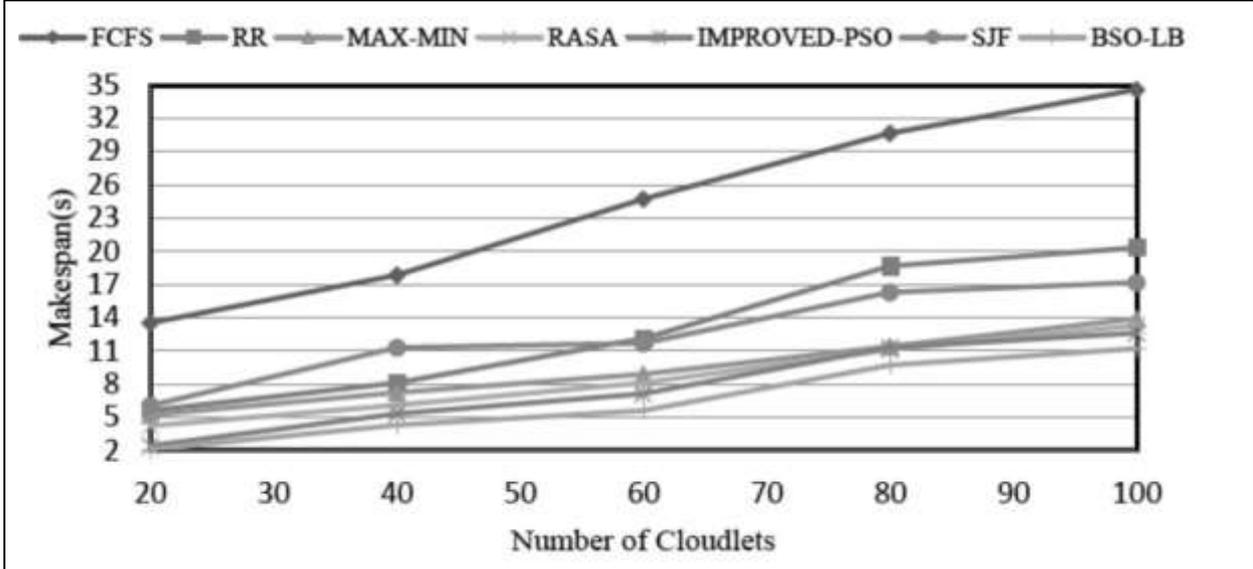
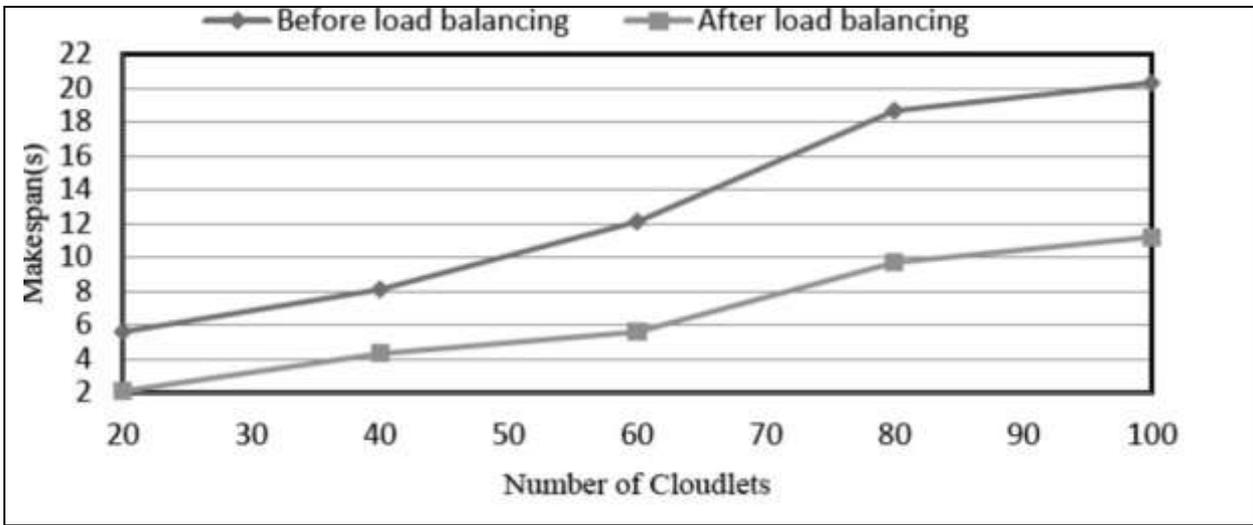


Figure 4: Data Centre Application – Generated from Google DeepLearn Tool

The key calculator and distribution for each application based on the threshold value, as well as the distribution of the service in the required applications. Below we provide a step-by-step guide to the implementation of the proposed algorithm.

Stage 1: Reading user request data such as value, time, location, price, and the requested server name done while adding all values to the linked list.  
 Stage 2: Provide PV (significant value) for all user application list activity.  
 Stage 3: Based on the pre-defined conditions for each application and the task to be performed, locate the PV node (important value).  
 Stage 4: For each user input data, check whether it is within the limit value or not  
 Stage 5: User request ready to execute.



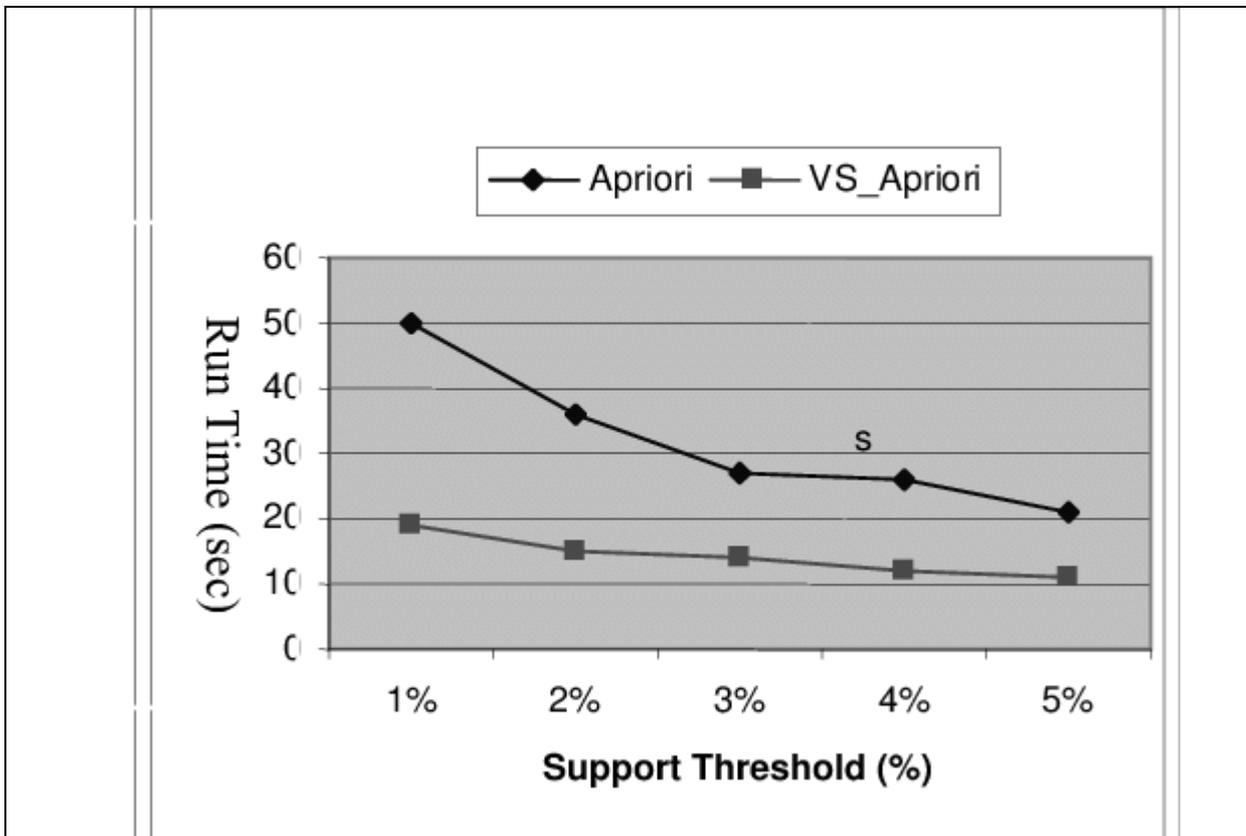


Figure 5: Result from Google DeepLearn – Load Balancer Levels

Due to the rapid and significant advances in cloud computing, there is an urgent need efficient and high performance that meets the renewable needs of users. One of the most touching things the function of a CC is a load measurement. This paper worked to find a solution to increase the efficiency of the active load process. To do this, we have developed a pre-based algorithm. This algorithm learns each other's tasks and deadlines work and rearrange them based on the deadline.

If there are two tasks with the same deadline, it will prioritize the task that has the first time to arrive. This algorithm effectively helps to hire jobs easily and quickly, thus improving overall load balancing performance. Different cloud-based applications have a direct impact on load balancing. Upload rating helps the performance of a different app with advanced apps.

## 7. Conclusion

Cloud computing is very important in technology and business, as it gives users everything like this services include applications, forums, and infrastructure, all as services. So in the ongoing development too growth to meet the current needs of users. However, the increase in services provided has led to many challenges CC and one of these challenges is load balancing. Therefore, this paper proposed an algorithm based on the aim is to improve performance and balance the load by studying the value of each task and arranging it based on it deadline for improving and improving response time. The proposed algorithm is well suited for expansion Cloud Computing performance and resource utilization.

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