IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

An Efficient Dynamic Load Balancing Algorithm for Virtual Machine in Cloud Computing

[1]Monesh Kumar, [2]Prof. Devendra Singh Rathore, [3]Prof. Mukesh Kumar

[1]M.Tech Student, [2]Asst. Prof. Computer Science Engg. Department, [3]HOD, Computer Science Engg. Department,

Rabindranath Tagore University, Bhopal, India

ABSTRACT- *In this paper software-defined network (SDN) approach used to provide a set of deliberate active allocators for virtual machines (VMs) in the cloud data center (DC). Each VM request has four parameters: CPU, RAM, disk, or memory. Virtual machine allocation is one of the challenges in cloud computing environments, especially for private cloud design. In this environment, each virtual machine is assigned to a physical host based on the resources available on the host. Specifically, in the case of different performance indicators and system requirements, quantifying the performance of scheduling and allocation strategies in the cloud infrastructure for different applications and service models is a very challenging and difficult solution.*

Key words – Cloud Computing, Network, Storage, VM, IT resources.

1. INTRODUCTION

In recent years, the idea of virtualization technology has become a more common phrase among IT professionals. Principal The concept behind this technology is to make Abstraction or separation between the application payload and the underlying distributed physics Host Resources (Buyyaa et al., 2009; Popek & Gothenburg (1974). It just means Physical resources can be represented as follows The logical or virtual resources depend on According to personal choice. Also, some The advantage of implementing virtualization technology is that it can help cloud resources Suppliers improve to reduce costs Machine utilization, reducing management Time and infrastructure costs. By introduction Appropriate management mechanism in addition to This virtualization function (as we have Recommendations made in this article), Can make logical resources dynamic Yes, logical resources can Increase or decrease according to the cloud User needs (the elasticity of the cloud). To Realize a true cloud computing system, every IT resource items must be capable of Dynamic deployment and management Real time based on dynamic concept It is suitable for resource allocation of cloud computing.Cloud computing has quickly become recognized as a general access device on the Internet. By deriving the standard definition, much attention has been paid to the concept

of cloud computing. Though, definition of cloud figuring is still contentious. But here we measured normal definition given by NIST. Cloud computing is a perfect for allowing suitable on-demand network charge to general configurable computing pools networks, servers, storage, applications, or services that can be used with minimal administrative work or the interaction of service providers to quickly configure and release Cloud computing is a new knowledge that has been used by more and more services in various countries (Ocano 2014). In today's world, knowledge has undergone revolutionary changes and has been used as a tool to store and secure data with its benefits and efficiencies, Masrom and Rahimli (2015). Both the public and private sectors have shown great interest in using cloud computing (Abolfazli et al., 2015). In addition, Arpithaor Kavitha (2014) believe that information technology has changed people's lives in a positive way and brought information gathering to a whole new level. Most departments have digitized or automated services through information technology. Cloud computing has made important contributions to healthcare integration, resource optimization and information sharing, thus promoting a new era of healthcare innovation. Sultan (2014) specified that cloud subtracting services provide organizations with opportunities to improve their operational efficiency in terms of providing high quality healthcare. Remote clinics in the Caprivi zone do not have access to cloud computing, or technology-based medical service solutions are very limited. This limitation has led people to use cloud computing to address the current tasks facing Caprivi Strip distant clinics Today the demand of Cloud computing is increased rapidly as it offer dynamic flexible scalable resource allocation. Cloud computing provide computing resources as a reliable services such as IaaS, PaaS and SaaS to users as pay as you go manner. In Cloud computing, each application runs on a virtual machine, where the resources be distributed virtually. The virtualization layer acts as an execution, hosting and management environment for application services. Therefore, the task scheduling problem in Cloud is two step problems. Thus, there is a requirement, when proposing an approach of solving one issue at one level; must also consider the other related issues either same level or another level i.e. some kind of integrated task scheduling approach need to be proposed.

2 -RELATED WORK

Nowadays, storage is most difficult issue for researchers in the cloud world. In field of IT field of information technology is a major technology. The use of these resources provides a variety of services through the Internet, and its accusations are based on use of cloud tools. It offers a wide range of production services, reliable and expensive. Therefore, as all organizations, governments and education departments move forward with the use of cloud services, the number of cloud computing users is increasing. So, when it comes to the demand of many users for cloud capitals, we can use load balancing technology for the needs of the users. The load balancing procedure can be used to correct load on the node (virtual machine) by dispensing load to the other node under load. The main purpose of balancing the load is to maintain the virtual balance, or virtual machine should not be under full or too tight load. In this article, we present a load balancing algorithm by relating two algorithms. For priority-based work we use a good honey heuristic algorithm; for non-compliant work we use an improved voting algorithm. The position of our investigation work is to recover the presentation of the system, the efficient use of resources and the deadline.

Rong Chen et al. (2019) The balanced distribution of Internet of Things (IoT) licenses can orally improve the use of IoT. Balancing and distributing resource loads must use high quality Internet virtualization to improve pheromone regeneration when the load is unbalanced, and complement the Internet work schedule. Traditional methods improve heurist information through online activities and the Internet of Things, but do not focus on improving pheromone innovation, which leads to unintended consequences needed. There is a program monitoring method for the Internet of things based on a moderate optimization algorithm. We looked at the cost and many features of an IoT virtual machine. Edit the position of the IoT virtual machine; calculates and adjusts the schedule of each resource, and provides the IoT schedule according to sources of historical data and current IoT data; you feel the modern programming of IoT resources; improves the imbalance of the IoT software. ; Use virtual body systems on the Internet to improve pheromone regeneration; finally feel the balance of the goods and the distribution of schedules on the Internet resources. The results of our experiments show that this method has a clear advantage in the execution time and can effectively preserve distribution of load balances on the IoT virtual machine.

3- PROPOSED APPROACH

The objective of IT Resource Allocator (ITRA) is to receive as many VM requests as probable while reducing network power ingesting. Each VM request has four parameters that represent maximum usage of CPU, RAM, disk, or bandwidth. When a new request appears, ITRA connects the lowest cost network path to each obtainable server and discards the server with insufficient or insufficient resources. At least one trail is available. Trail costs are calculated as the amount of electricity that the new network power consumes. More clearly, ITRA allocates network paths to minimize the increase in power consumption for network equipment. The proposed system is introduced to conquer all the shortcomings of the existing system. The system we propose plans the entire task within a specific time limit while improving system performance the purpose of VM placement is to evenly distribute dynamic workloads to all hosts in the cloud to improve resource operation and execution time. It distributes the incoming tasks to all available VMs. To achieve balance and avoid overload, the proposed algorithm allocates tasks to the least loaded VM and prevents the allocation of tasks to a VM when the variation of this VM processing time from average processing time of all VMs becomes more than or equal to a threshold value. This leads to a reduction of overall response time and the processing time of hosts.

Data centre: It is set of swarms or servers which provide substructure service. Data center formation can be heterogeneous or homogeneous incomes.

Hosts: It is the physical entity that is resource to tasks.

Job: Job is the task

Service Broker: It determines which VM will provide the requested service.

VM allocation: These policies in Cloud Sim can assign a revenue allocation model to tasks. Load balancing between the virtual machine is done by Cloud Simulator have to analyze which virtual machine has highest space for resource.

For achieving load balancing we assign job to virtual machines. Then initialize all ram size broker id, job id and host id for the particular virtual machine. Finally we have to analyse the work load of the jobs which is in the job. We also analyse the following in Bar chart.

•Work Load

•Flow

•Cost

TASK SCHEDULING ALGORITHM: Many parallel submissions contain multiple IT equipment. Although the performance of these or some of the devices in the job depends on the completion of other tasks, other tasks can be performed at the same time, thus increasing the parallelism of the problem. The preparation of tasks is difficult to transfer tasks in the system. This method can improve the overall performance of the application while ensuring that the results are correct. The task scheduling problem can be modeled as a weighted directed acyclic graph .The peak represents the task or its weight represents the size of the inventory calculation. The arc represents the communication between two tasks and its weight represents the cost of the communication. The straightened edges show the dependence between the two tasks. The main goal of task scheduling is to schedule tasks on the processor and minimize the completion time for scheduling, i.e. the completion time of the last task is in relation to the start time of first task. The output from the problem is to assign tasks to processors. Greed is an algorithmic paradigm that gradually builds solutions and always chooses the next solution that provides the most obvious and direct benefits. Greedy algorithm is used for optimization problems. If the problem has the following characteristics, you can use Greedy to solve the optimization problem: at each step we can make the best choice that seems to be the best at the moment and we can get best resolution to complete difficult. If the greedy algorithm can solve the problem, it will typically be best way to solve the problem because avaricious algorithm is usually more efficient than other techniques, such as dynamic programming. But the greedy algorithm cannot always be used. For example, you can use greedy algorithm to solve small backpack problem A data flow diagram (DFD) is a method of representative data flow of a procedure or schema (usually an information schema). The DFD also provides information about results or inputs of each thing or procedure itself. The data flow diagram has no regulator flow, no decision rules, no loops. Flowcharts can describe precise data-based operations.

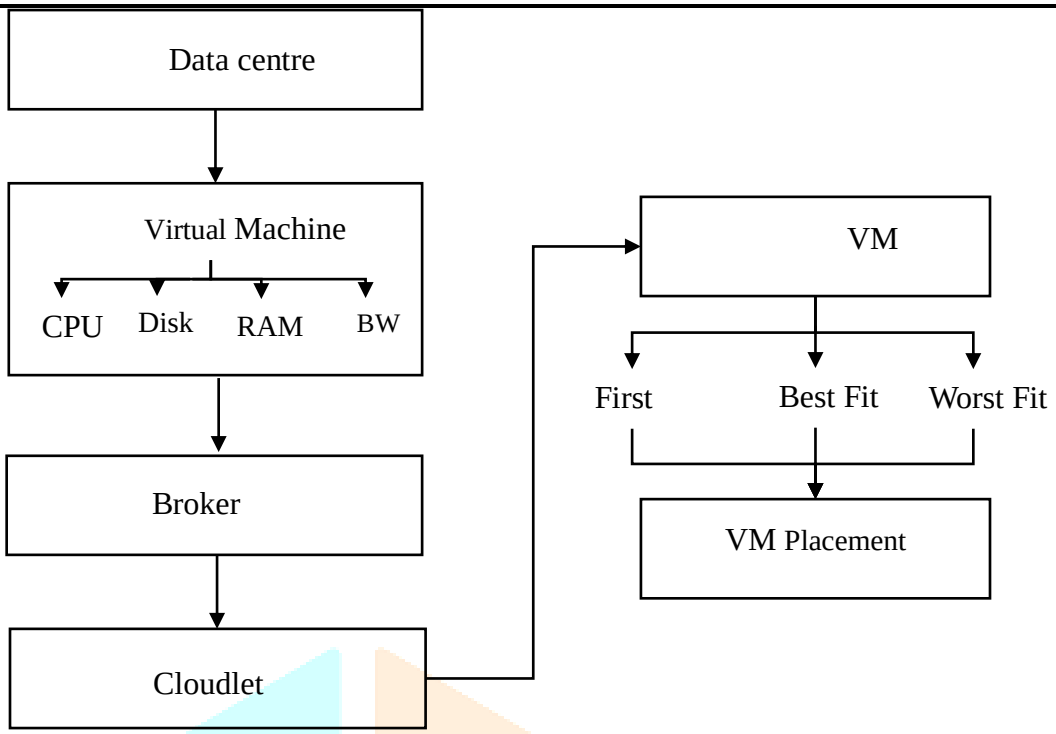

Fig 1 Flow Diagram

4- RESULT DISCUSSION

VM Creation: In computing, a virtual machine (VM) is an imitation of a computer scheme. The virtual machine is founded on the computer architecture or provides the features of a physical computer. Their implementation may involve particular hardware, software or a combination. World Cup placement is a key issue in the integration of virtual resources. The virtual process machine is designed to execute computer programs in a platform-dependent environment.

Location of virtual machine: In this module, select the following strategies: In terms of the use of system resources, it incorporates the best multi-resource adjustment and selects the server with the lowest resource availability; selects the best server multi-resource fit with the highest resource availability to balance the load between all available servers

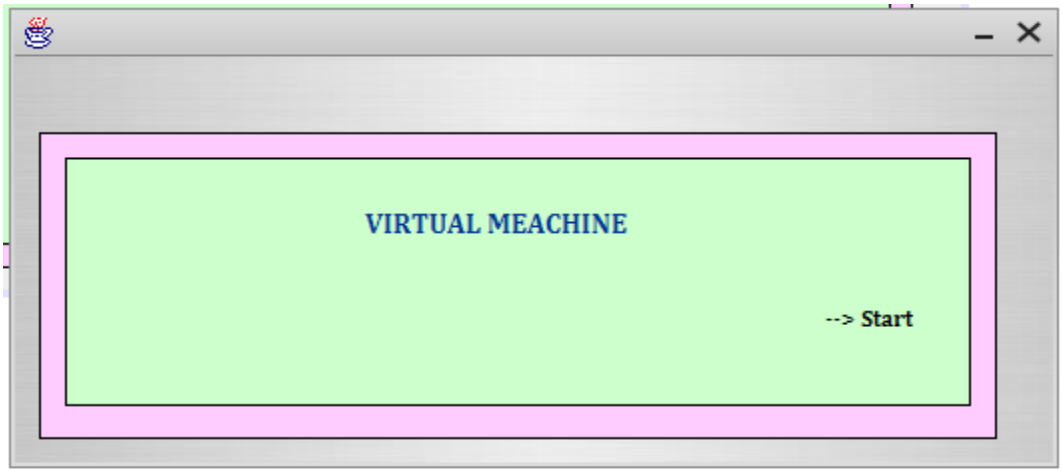

Fig 2 Starting Window

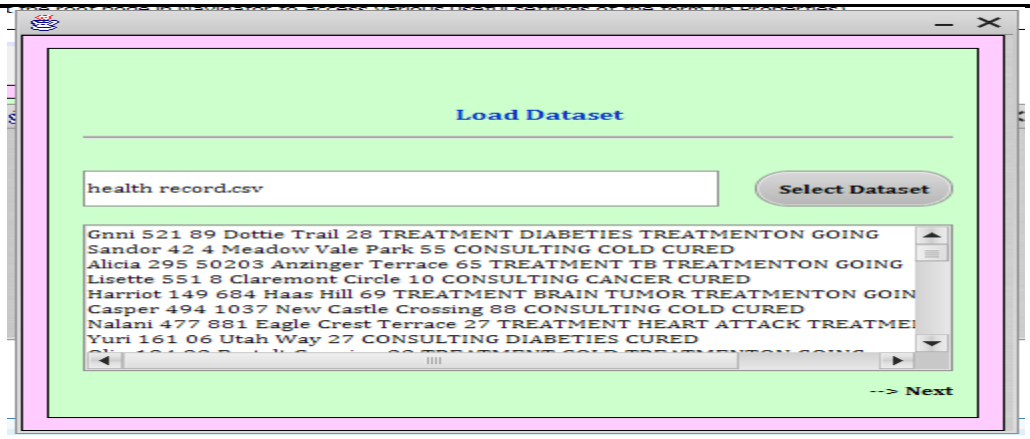

Fig 3 Load Dataset

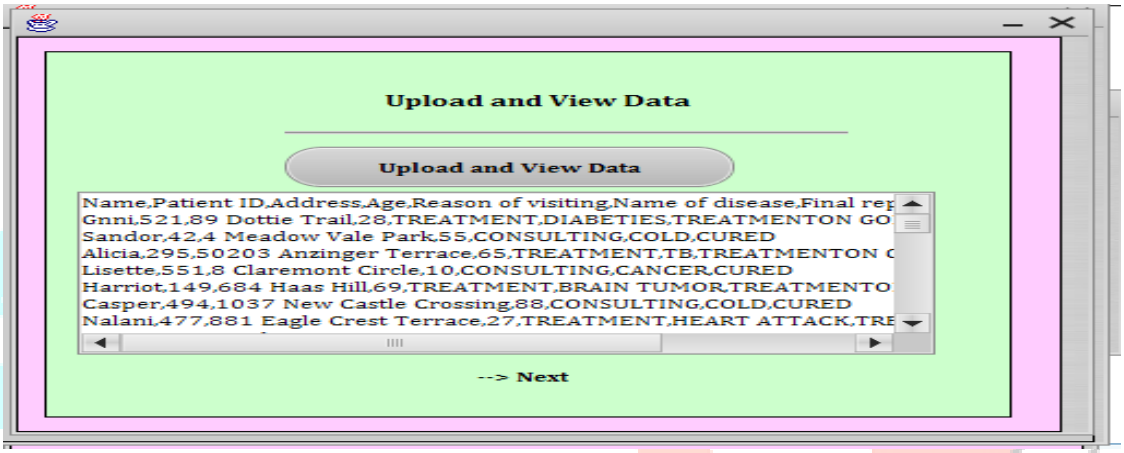

Fig 4 Upload Dataset

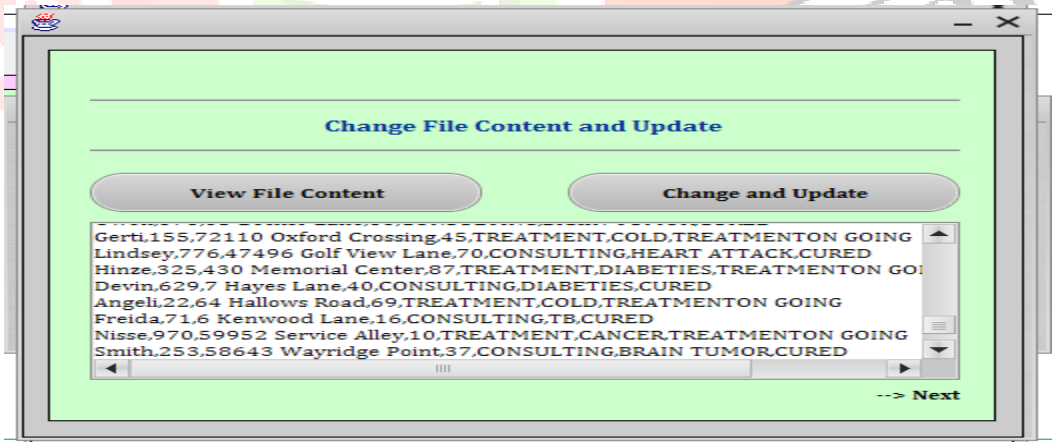

Fig 5 Choose File

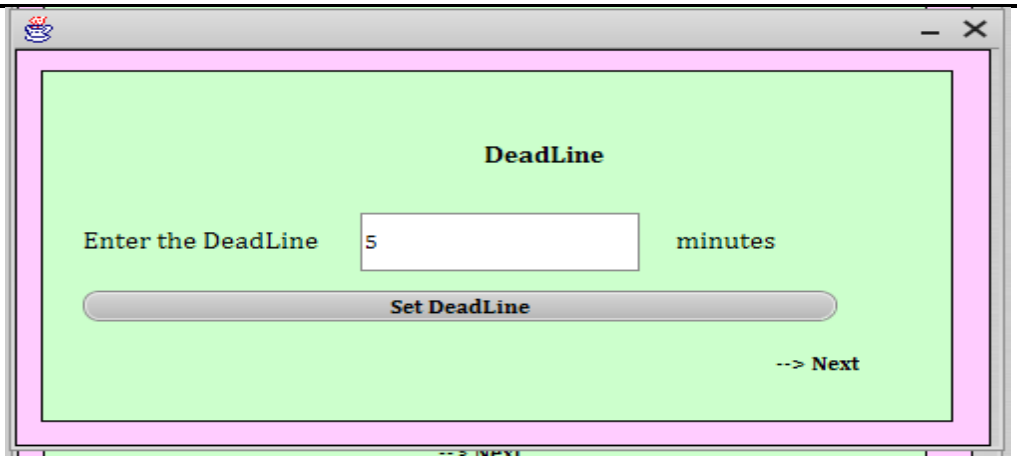

Fig 6 Load Line

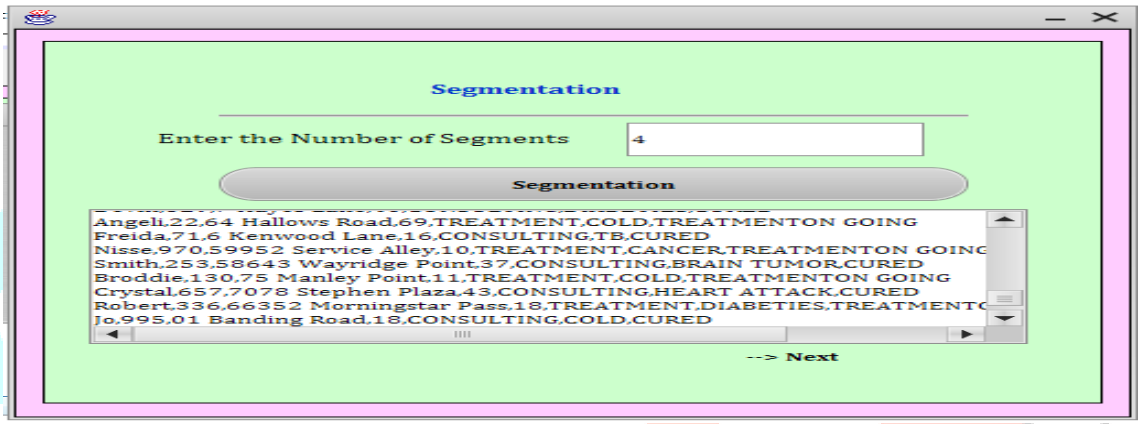

Fig 7 Segmentation

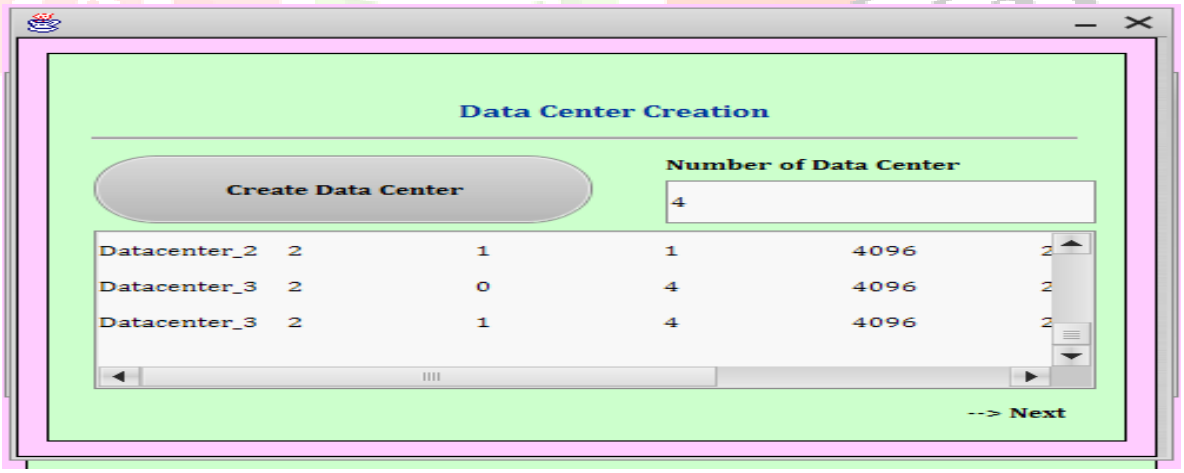

Fig 8 Data Centre Creation

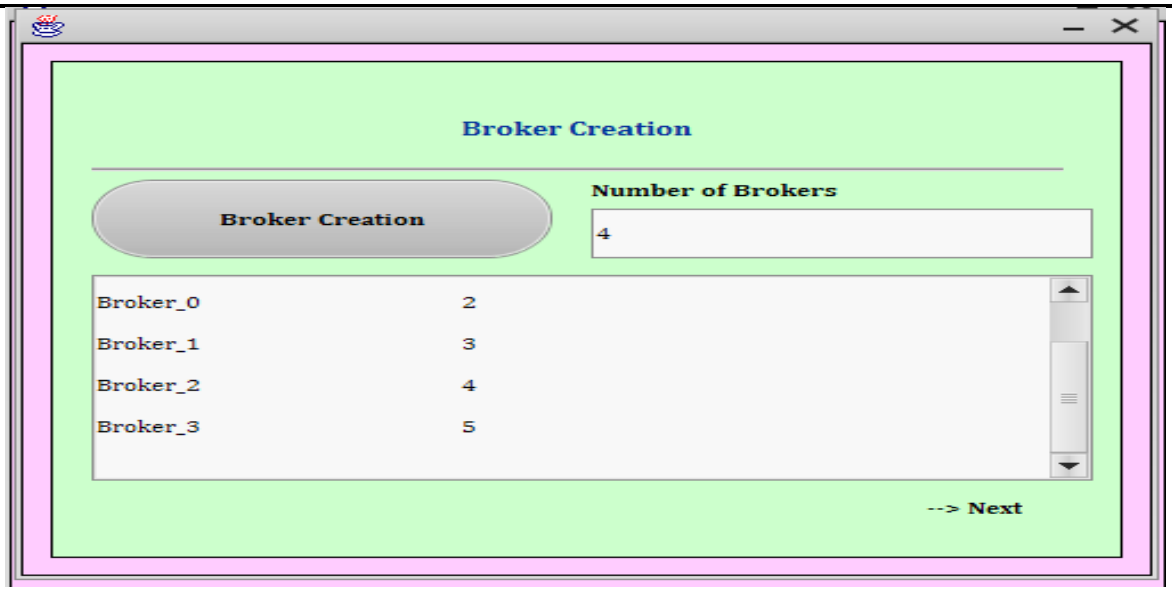

Fig 9 Broker Creation

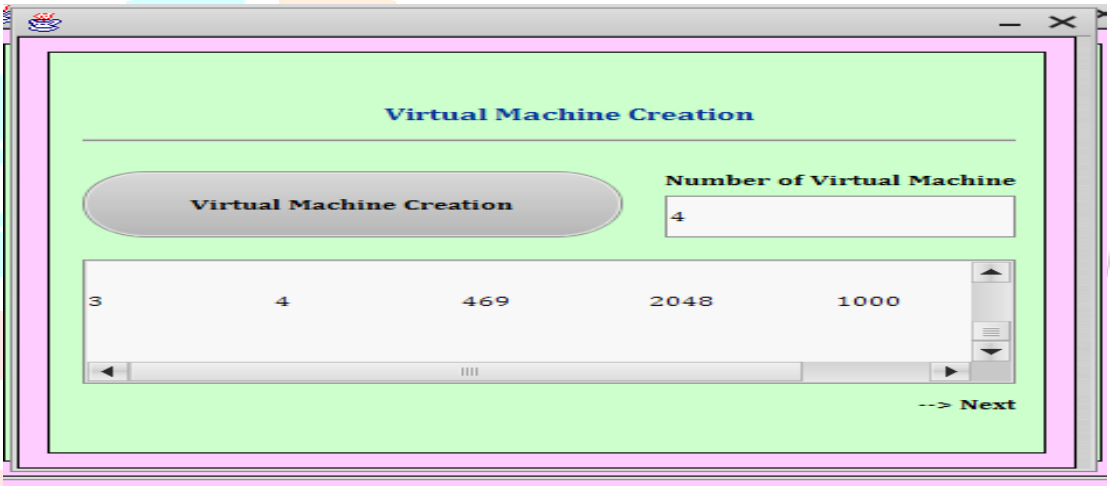

Fig 10 Virtual Machine Creation

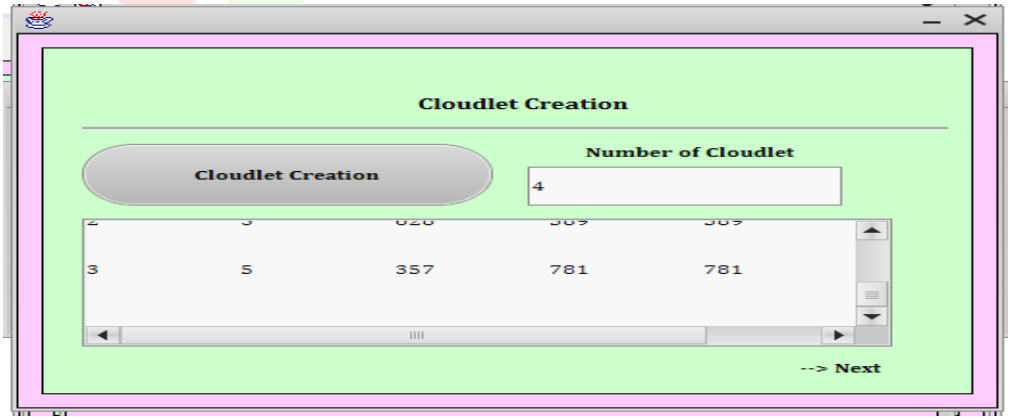

Fig 11 Cloudlet Creation

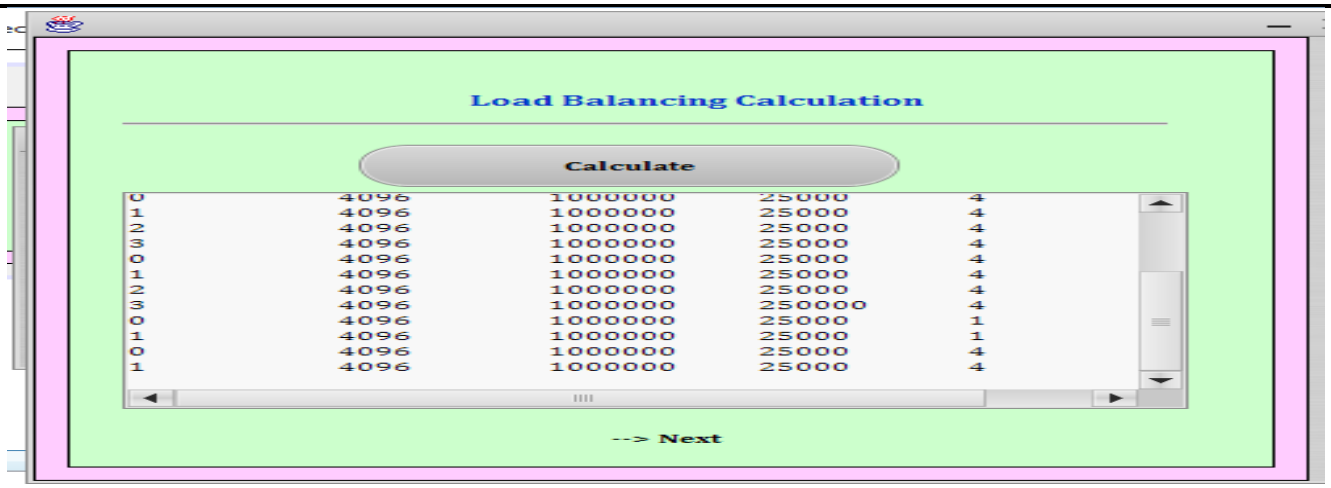

Fig 12 Load Balancing Creation

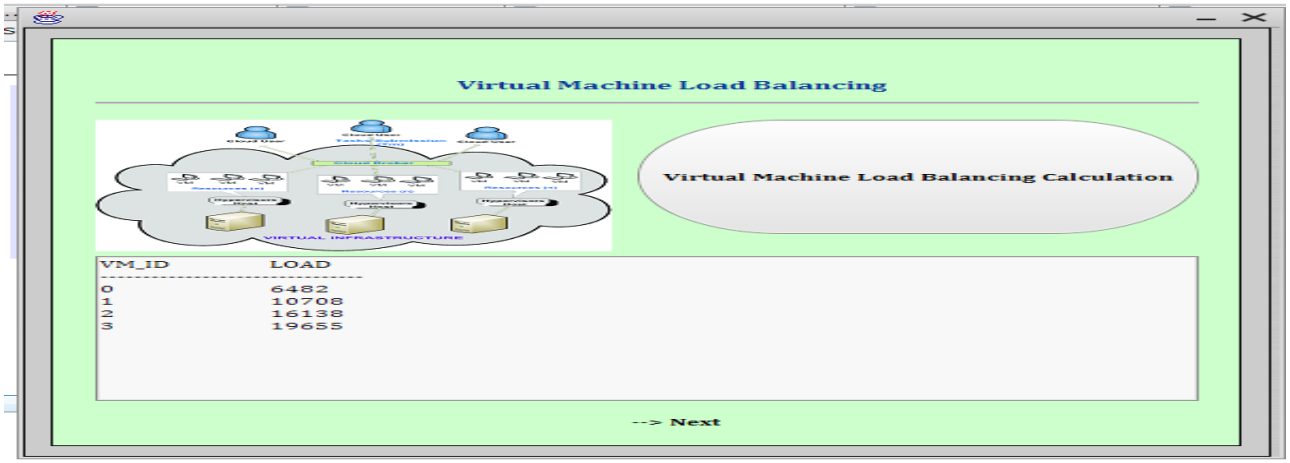

Fig 4.13 Virtual Machine Load Balancing

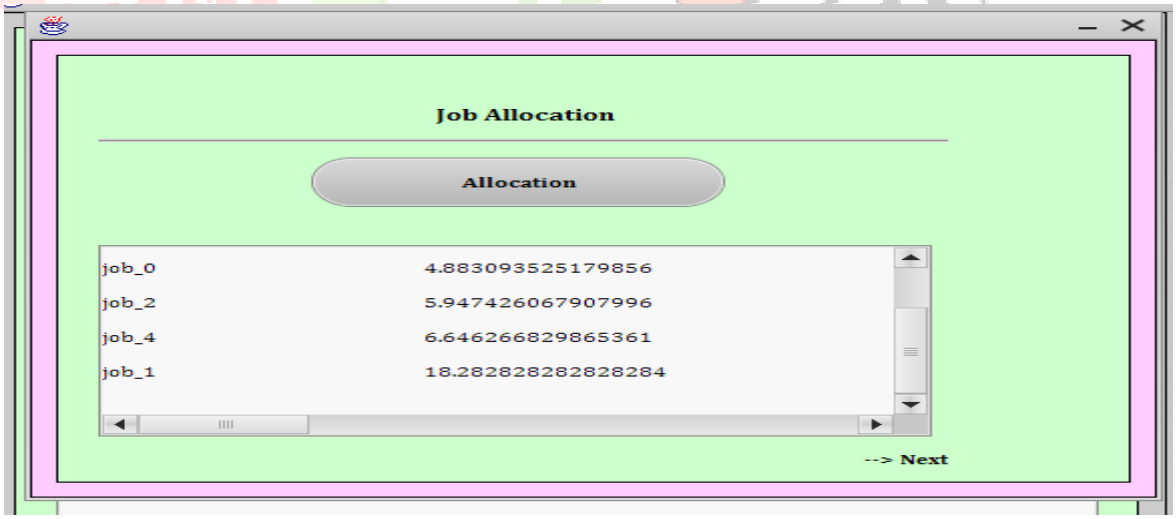

Fig 4.14 Job Creation

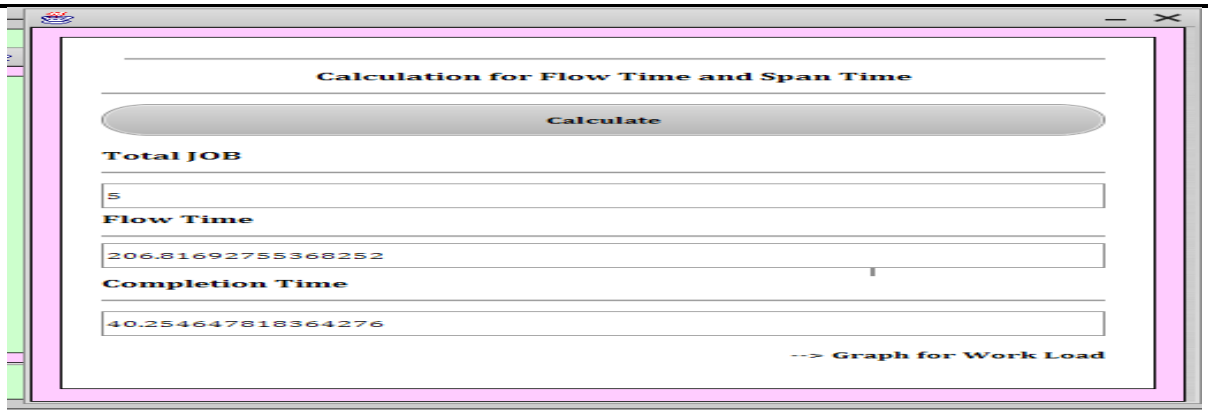

Fig 4.15 Calculation Flow Time and Span Time

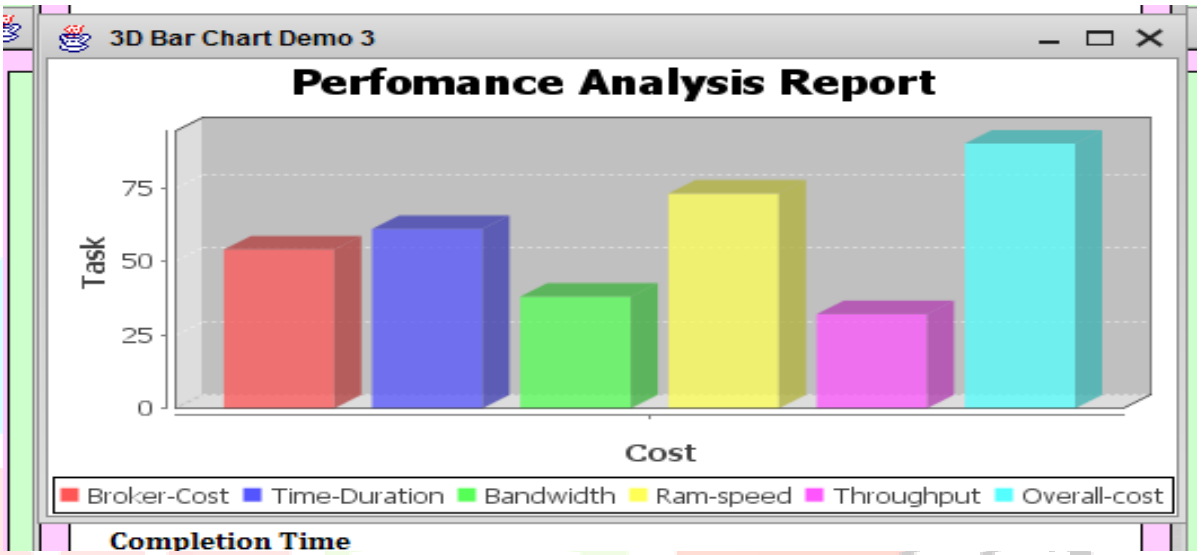

Fig 16 performance analysis report

5. CONCLUSION

In this work, a dynamic allocation focused on power consumption was proposed for virtual machines, which took into account CPU, RAM, disk and bandwidth. We have implemented two strategies (namely BF and WF) and allocation strategies, and evaluated performance-based universal distributors and non-universal distributors. The number of accepted requests. The replication results show that, compared to the classic equivalent allocation, our work can be extended in the following directions: Trigger-based VM migration technology can be extended to include additional runtime to take support the management team in the actual VM migration. In commercial applications, reliable energy and resource planning virtual machines can be integrated with secure cloud systems. Time-limited transfer accounts can be used to design and test the schedule of computer systems lighting equipment. Energy optimization algorithms can be applied to mobile cloud computing to generate data in heterogeneous environments. In this article, we provide a power-conscious dynamic allocator for virtual machines that takes into account CPU, RAM, disk, and bandwidth. We use a modified version of Dijkstra's algorithm to distribute all network streams on the most energy efficient path. We implemented two strategies (namely BF and WF) and 10 allocation strategies, and assessed the performance of joint

and non-joint allocators based on the number of accepted applications. The simulation results show that, compared to the classic equivalent path allocation, the modified version of Dijkstra distributes the network traffic, thus reducing the power consumption by 1 kW (about 3.3% of the consumption of previous total energy). When it comes to performance experiences, the performance of the common distributor is better than that of the disjoint distributor, achieving higher average acceptance rate and lower standard deviation. The results also show that the behavior between BF and WF distributors is also different, especially when we use disjoint distributors: disjoint BF distributors achieve a higher standard deviation value, as the two-step distribution process can be due to a lack of The network refuses the VM to request resources in the second step. Regarding the allocation strategy, the joint version of BF MODA allocates more VMs equally, while the standard deviation of the joint implementation of WF F-ITRA is the lowest. Finally, when a strategy with less CPU usage is required, A-ITRA is the best choice.The management system offered by a dedicated management system can help cloud customers identify reliable service providers based on their value proposition. By incorporating the mechanics based on mobile logic technology to identify and overcome the various interventions within the system, the application of the presentation system can be enhanced. Using mobile operators to gather information about bad competitors will reduce network traffic, which is mainly due to the exchange of information between different companies. In addition, it reduces the likelihood of candidates forgetting through information exchanged on the network. The recent restoration of technological proposals on technology suggests that there are many aspects to consider in the cost of data centers, virtual machine migration, energy consumption and contracting. The level of service. In a cloud environment, the power consumption of the data center is very high; efficient energy algorithms must be developed. By adopting the genetic method to place the initial VM, an attempt was made to reduce the computational and communication costs of the data center in the proposed work. The proposed work can be extended to implement dynamic placement of virtual machines in order to reduce data center costs.

REFERENCES

1. R. Jain and S. Paul, “Network virtualization and software defined networking for cloud computing: a survey,” IEEE Communications Magazine, vol. 51, no. 11, pp. 24–31, 2013.
2. M. Gharbaoui, B. Martini, D. Adami, G. Antichi, S. Giordano, and P. Castoldi, “On virtualization-aware traffic engineering in OpenFlow Data Centers networks,” in Network Operations and Management Symposium (NOMS), 2014 IEEE. IEEE, 2014, pp. 1–8.
3. A. Lara, A. Kolasani, and B. Ramamurthy, “Network Innovation using OpenFlow: A Survey,” IEEE Communications Surveys & Tutorials, vol. 16, no. 1, pp. 493–512, 2014.
4. G. Portaluri, D. Adami, A. Gabbrielli, S. Giordano, and M. Pagano, “Power consumption-aware virtual machine allocation in cloud data center,” in 2016 IEEE Globecom Workshops (GC Wkshps), Dec 2016, pp. 1–6.
5. J. D´ıaz, J. Entrialgo, M. Garc´ıa, J. Garc´ıa, and D. Garc´ıa, “Optimal allocation of virtual machines in multi-cloud environments with reserved and on-demand pricing,”Future Generation Computer Systems, vol. 71, pp. 129–144, 2017.

6. T. Gu´erout, Y. Gaoua, C. Artigues, G. Da Costa, P. Lopez, and T. Monteil, "Mixed integer linear programming for quality of service optimization in clouds,"Future Generation Computer Systems, vol. 71, pp. 1–17, 2017.
7. M. Alicherry and T. V. Lakshman, "Network aware resource allocation in distributed clouds," in INFOCOM, 2012 Proceedings IEEE, March 2012, pp. 963–971.
8. A. Vichare, Z. P. Gomes, N. Fernandes, and F. Cardoza, "Cloud computing using OCRP and virtual machines for dynamic allocation of resources," in Technologies for sustainable development (ICTSD), 2015 International Conference on. IEEE, 2015, pp. 1–5. [Online].
9. .Karan D. Patel Tosal M. Bhalodia An Efficient Dynamic Load Balancing Algorithm for Virtual Machine in Cloud Computing 2019 International Conference on Intelligent Computing and Control Systems (ICCS) Year: 2019 ISBN: 978-1-5386-8113-8 DOI: 10.1109/IEEE Madurai, India, India
10. Bishwabara Panda Suresh Chandra MoharanaHimansu Das Manoj Kumar Mishra Energy Aware Virtual Machine Consolidation for Load Balancing in Virtualized Environment 2019 International Conference on Communication and Electronics Systems (ICCES) Year: 2019 ISBN: 978-1-7281-1261-9 DOI: 10.1109/IEEE Coimbatore, India, India
11. M. Kanthimathi D. Vijayakumar An Enhanced Approach of Genetic and Ant colony based Load Balancing in Cloud Environment 2018 International Conference on Soft-computing and Network Security (ICSNS) Year: 2018 ISBN: 978-1-5386-4552-9 DOI: 10.1109/ IEEE Coimbatore, India
12. S. WilsonPrakash P. Deepalakshmi Artificial Neural Network Based Load Balancing On Software Defined Networking 2019 IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing (INCOS) Year: 2019
13. Vishalika Deepti Malhotra LD_ASG: Load Balancing Algorithm in Cloud Computing 2018 Fifth International Conference on Parallel, Distributed and Grid Computing (PDGC) Year: 2018 ISBN: 978-1-7281-0646-5 DOI: 10.1109/ IEEE Solan Himachal Pradesh, India, India
14. Sreelakshmi S. Sindhu Multi-Objective PSO Based Task Scheduling - A Load Balancing Approach in Cloud 2019 1st International Conference on Innovations in Information and Communication Technology (ICIICT) Year: 2019 ISBN: 978-1-7281-1604-4 DOI: 10.1109/IEEE CHENNAI, India, India
15. Rong Chen Effective Scheduling Simulation of Internet of Things Load Balanced Sharing of Resources 2019 IEEE 5th International Conference on Computer and Communications (ICCC) Year: 2019 ISBN: 978-1-7281-4743-7 DOI: 10.1109/ IEEE Chengdu, China, China
16. . K Bhargavi B. SathishBabu Load Balancing Scheme for the Public Cloud using Reinforcement Learning with Raven Roosting Optimization Policy (RROP) 2019 4th International Conference on Computational Systems and Information Technology for Sustainable Solution (CSITSS) Year: 2019 ISBN: 978-1-7281-2619-7 DOI: 10.1109/IEEE Bengaluru, India, India