

A Virtual Machine Scheduling Algorithm Based on the Gravitational Effect for Green Cloud Computing

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ABSTRACT: The cloud is the architecture in which virtual machines, data centers, hosts and brokers are involved in the communication. The broker search most reliable virtual machine for the cloudlet execution. In the network uncertainty may happen due to which system get overloaded. In this research, work technique is proposed to increase fault tolerance of the system. The proposed improvement is based on the ACO algorithm which can select the best virtual machine on which cloudlet will be migrated. The performance of the proposed algorithm is testing on cloudsims in terms of execution time, energy consumption. The simulation results demonstrated that execution time and energy consumption of ACO is least as compared to TESA Algorithm. The proposed algorithm can be used for the load balancing in cloud computing

KEYWORDS: Cloudlet, ACO, Migration, virtual machine

I. INTRODUCTION

Cloud computing is a computing paradigm [1]. In this the systems are large in numbers that are connected in public and private networks. The reason behind using cloud computing is to provide an infrastructure for applications that should be dynamically scalable that has been used for storing data and files. The invention of cloud computing has reduced the cost too much extent along with it reduces the time required for application hosting, content storage and delivery

The fig.1.1 shown below is the diagram of Cloud Computing. It shows that the Cloud computing is get use in number of devices such as PC, Television, Phone, codes, App server and database. The services are offer by both CSPs and ISPs (Internet Service Providers).

In general three types of services are offer by cloud providers i.e. Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). The organization has to pay the cloud provider on the basis of usage of resources on computation basis all these reasons force a organization to attract towards cloud computing. In order to make ensure that organization will always be available to customers when required can be meet using the services of cloud computing [2].

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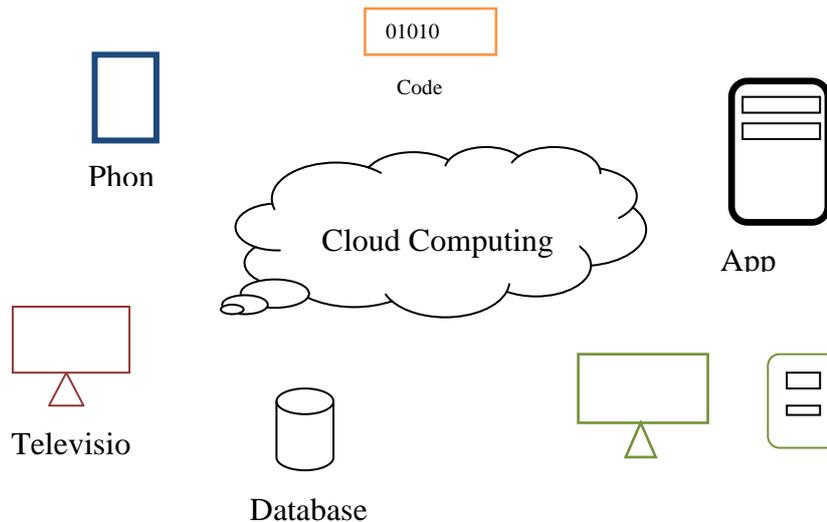


Fig.1: Cloud Computing

II. LITERATURE REVIEW

Meysam Masoudi, et.al, (2017), have investigated [21] the problem of power minimization for the user terminals by application offloading in multi-cell multi-user OFDMA mobile cloud computing networks where some practical constraints such as backhaul capacity limitation, interference level on each channel and maximum tolerable delay as user's quality of service is taken into account. By the use of D.C.

Jagadeeswara Rao, et.al, (2017), have recommended that Cloud computing is a great platform using which corporate world is totally looking to reduce their expenditure on resources like software, platform tools and infrastructure. Cloud computing gives a cost effective infrastructure with high scalability and performance

Mr. Nitin S. More, et.al, (2017), have recommended dealing with studying various techniques, models, and algorithms, for efficient green cloud computing by using virtualization techniques. There are numerous techniques which are related to power saving which can also help in enhancing the efficiency of the systems on the basis of sever and network involved. All such strategies are to be studied here in order to present a study on the existing methods .

Ehsan Arianyan, (2016), has proposed a consolidation as a novel technique for energy saving in Cloud data centers. One of the major drawbacks of current studies on consolidation solution is that they focus only on one criterion and ignore other ones. Based on modified analytic hierarchy process (AHP) technique this study proposed a novel multi objective consolidation solution.

Federico Larumbe, et.al, (2016), have presented [25] in this paper that the response time of the systems is less for the users that are near to the VMs. This results in enhancing the QoS for the users due to distribution of VMs near to those users. The impact of maximization of energy consumption of cloud is very negative.

Chonglin Gu, et.al (2015), have recommended that for research utilization, virtual machine consolidation is the best solution found. Once the power consumption for each VM is known, more power can be saved here. There are numerous modeling methods proposed here in order to calculate the power consumption as it is not easily calculated in direct manner.

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Ke HAN, et.al, (2015), has study on the cooperative behavior of multiple cloud servers and present the hierarchical cooperative game model for improve energy efficiency in Green Clouds. An evolutionary mechanism is proposed in this paper, which provides a change in the multiplexed methods that are needed for initial optimal solutions for various users. This results in reducing the loss of efficiency in these systems. Both optimization and fairness have been taken into account by this algorithm.

III. EXISTING ALGORITHMS FOR CLOUD SECURITY

In the basepaper, meta-heuristic algorithm is applied on the broker for the selection of most capable virtual machine for cloudlet execution. The meta-heuristic algorithms are probability driven algorithms which leads to fault occurrence in the network. In this research work, technique of virtual machine migration will be proposed which reduce chances of fault occurrence and also reduce resource consumption in the network.

IV. PROPOSED SYSTEM

The green cloud computing is the energy efficient approach of cloud computing to store and process data from clouds. The fault occurrence is major issue of the green cloud computing which reduce its efficiency. In the base paper, meta-heuristic approach is used for the cloud assignment and execution. In this research, ACO algorithm will be applied for the task execution and task assignment. ACO algorithm is been implemented which migrate the task from one virtual machine to other in case of machine overloading.

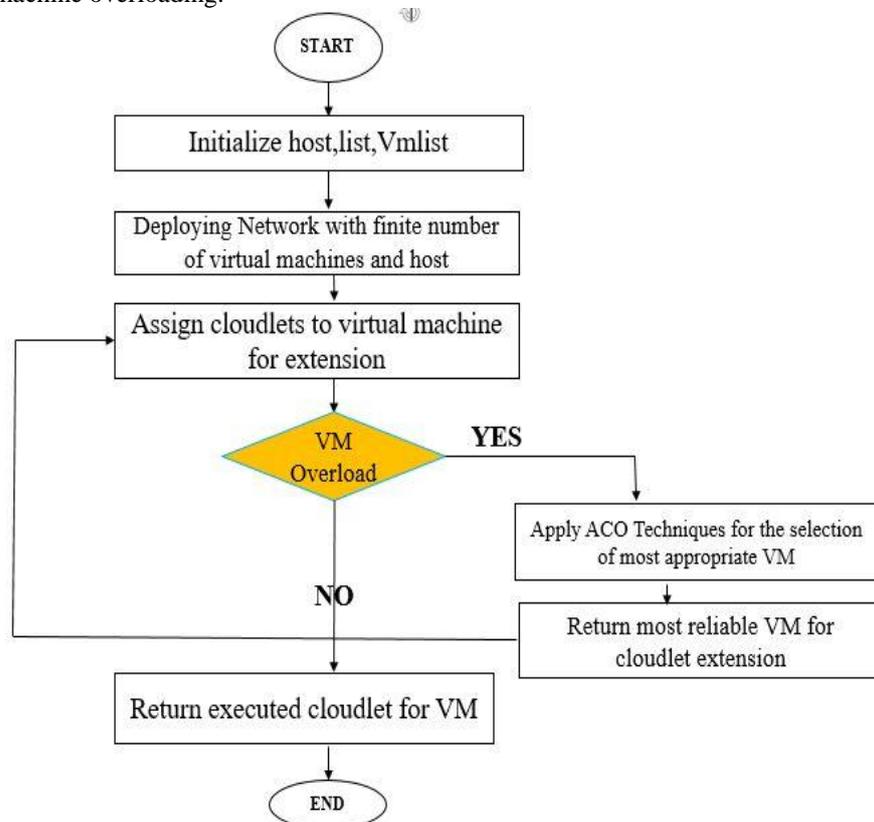


Fig. 2 Proposed Flowchart

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V. RESULT AND DISCURSION

The ACO is the algorithm which is applied for the task migration in cloud computing. The ACO works in the three phases for the selection of optimal machine to perform task migration. Proposed algorithm is tested in cloudsim that provide its performance described in table.

No of Cloudlets	Execution Time		Energy Consumption	
	TESA	Proposed	TESA	Proposed
10	20	12	0.8	0.2
20	65	50	0.85	0.22
30	90	60	0.91	0.21
40	120	95	0.7	0.3
50	110	100	0.78	0.28
60	150	120	0.9	0.5
70	180	100	0.84	0.45
80	150	100	0.89	0.49

Table 1: Comparison table

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VI. CONCLUSION

The virtual machine migration is the technique which is applied to migrate the cloudlets of one virtual machine to another. In this work, it is been concluded that due to virtual machine overloading execution time and space utilization is increased at steady rate. The ACO algorithm is applied in this work, which will migrate the task of the virtual machine which get overloaded to another virtual machine for the efficient execution. The performance of proposed algorithm is tested in CloudSim and it is been analyzed that execution time and space utilization is reduced after virtual machine migration.

Future Work

Following are the various future prospective of this research work :-

1. The proposed algorithm can be further improved to increase the reliability of the algorithm in terms of resource consumption
2. The proposed algorithm can be further compared with other algorithms of virtual machine migration

REFERENCES

- [1] Jagadeeswara Rao. G, G. Stalin Babu, "Energy Analysis of Task Scheduling Algorithms in Green Cloud", IEEE International Conference on Innovative Mechanisms for Industry Applications (ICIMIA 2017), vol. 45, 302-305, 2017.
- [2] Rubyga. G, Dr. Ponsy R.K Sathia Bhama, "A Survey Of Computing Strategies For Green Cloud", IEEE Second International Conference on Science Technology Engineering and Management (ICONSTEM), vol. 27, 141-145, 2016.
- [3] Abdallah Ali Z. A. IBRAHIM, Dzmityr KLIASOVICH, Ariel OLEKSIK, "Virtual Desktop Infrastructures: architecture, survey and green aspects proof of concept", IEEE, vol. 35, 130-138, 2016.
- [4] S. Agarwal, R. Biswas, and A. Nath, " Virtual Desktop Infrastructure in Higher Education Institution Energy Efficiency as an application of Green Computing", IEEE Fourth International Conference on Communication Systems and Network Technologies, vol. 27, 110-121, 2014.
- [5] A. Kochut, "Power and Performance Modeling of Virtualized Desktop Systems", IEEE International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems, vol.30, pp.354-362, 2009.
- [6] Gaganjot Kaur, Sugandhi Midha, "A preemptive priority based job scheduling algorithm in green cloud computing", IEEE, vol. 27, pp. 152- 156, 2016.
- [7] Shreenath Acharya, Demian Antony D'Mello, "A taxonomy of Live Virtual Machine (VM) Migration mechanisms in cloud computing environment", IEEE Conference publication, vol. 37, 809-815, 2013.
- [8] Pushpendra Kumar Yadav, Dr.N.L.Prajapati, "An Overview of Genetic Algorithm and Modeling", IEEE International Journal of Scientific and Research Publications, vol. 2, pp. 1-4, 2014.
- [9] J. Gubbi, R. Buyya, S. Marusic, M. Palaniswami, "Internet of things (IoT): A vision, architectural elements, and future directions," Elsevier Future Generation Computer System, Vol. 29, pp. 1645-1660, 2013.
- [10] A. Sgora and D. D. Vergados, "Handoff prioritization and decision schemes in wireless cellular networks: a survey," IEEE Communications Surveys Tutorials, Vol. 11, No. 4, pp. 57-77, April 2009.
- [11] I. Mashal, O. Alsaryrah, T.-Y. Chung, C.-Z. Yang, W.-H. Kuo, and D. P. Agrawal, "Choices for interaction with things on Internet and underlying issues," Ad Hoc Networks, vol. 28, pp. 68-90, 2015.
- [12] O. Said and M. Masud, "Towards internet of things: survey and future vision," International Journal of Computer Networks, vol. 5, no. 1, pp. 1-17, 2013.
- [13] M. Wu, T.-J. Lu, F.-Y. Ling, J. Sun, and H.-Y. Du, "Research on the architecture of internet of thing", 3rd International Conference on Advanced Computer Theory and Engineering (ICACTE '10), vol. 5, pp. V5-484-V5-487, 2010.
- [14] R. Khan, S. U. Khan, R. Zaheer, and S. Khan, "Future internet: the internet of things architecture, possible applications and key challenges," in Proceedings of the 10th International Conference on Frontiers of Information Technology (FIT '12), vol. 34, pp. 257-260, 2012
- [15] S. Tekinay and B. Jabbari, "Handover and channel assignment in mobile cellular networks," IEEE Communication Magazine, Vol. 29, No. 11, pp. 42-46, 1991.