

An Efficient Resource Provisioned Technique in Cloud Computing Environment.

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Abstract: *Different ICT-empowered service providers additionally have either embraced distributed computing or began moving administrations to cloud framework. Be that as it may, the expanding interest for cloud based foundation has come about into extreme issue of managing the resources and adjusting of load for cloud specialist providers and customers. Specialists have recommended various resource provisioning techniques for effective resource usage. An epic burden adjusting procedure addressing the movement of the outstanding task at hand from over-stacked VM to gently stacked VM in distributed computing conditions is presented in this paper. An undertaking is made to help the cloud accomplices to beat the imbalanced asset utilization issue is shown in this paper.*

Keywords : *Cloud computing, Load balancing , task scheduling, task migration.*

I. INTRODUCTION

Now a days in the field of programming Engineering and data Technology cloud processing demonstrates to be a main and generally utilized innovation. cloud figuring is there to hand over the administrations to the customers at whatever point they need in a very intentional way [1]. cloud figuring causes you in a numerous manner like the customer can get to information through various devices, for model, workstation, individual work area, tablets, telephone. As the main edge of data innovation, it drives a few clouds suppliers towards moving on it with huge element, for example, versatility, versatility and adaptability. Likewise, unique features, for instance, 24*7 openness from wherever, pay per use show, and opportunity from the capital utilization prompts upsurge in the allotment of the disseminated registering. alongside highlight it additionally has numerous difficulties like burden adjusting, planning, security, server farm vitality utilization, administration accessibility, and execution checking [3]. From this, all difficulties one of the difficulties noted for the cloud registering is load adjusting point of burden adjusting is a procedure of appointing the heap between assets to complete the base use time, greatest throughput, and to improve the exhibition. Albeit various research has been directed on load adjusting and task planning of the cloud registering, our overview features the essential job of the heap

adjusting and beneficiary of the heap adjusting in cloud registering [1][4]. Basically, we will introduce a segment of the progressing papers that assess the heap adjusting calculations. Deliberate survey of various sorts of burden adjusting calculations and employment relocation strategies gave by Inderveer et.al (2015) [2] [13] [6]. Examination of the predefined load adjusting calculations which comprise of the properties of Algorithm, parameters, favorable circumstances, and disservices by the creators. They additionally give consideration of the difficulties of calculations. Regardless, there work needs exchange related to cloud registering as they prevalently complement on Grid processing. Calculations like Artificial Bee settlement enhancement, Particle swarm advancement, Ant province streamlining, Genetic calculation surveyed by Mahmoud, horbaty ,Farrag et.al(2015) for adjusting the heap in cloud computing. A tale calculation called as Ant Lion Optimizer (ALO) which award better outcome in the purpose of nature of administration and reaction time also contrasted with the customary ones which likewise proposed by the creator.

An investigation of various calculations, for example, the Throttled calculation, a min-min calculation which use to adjust the heap in cloud registering carried out by chen, wang et.al.(2014). In light of the client needs another calculation has prescribed by the creator which comprises of the all-inclusive sort of the min-min calculation. this works for the static condition however. To encourage the endeavor of the cutting-edge scientists in the heap adjusting calculation field. we have considered the current burden adjusting calculation challenges, focal points, injuries and the open issues related to the heap adjusting. The reason for this paper is

- To study the different load balancing algorithms.
- To talk about the upsides and downsides of the resource provisioning.
- To design a new resource provisioning technique

The rest of the paper is sorted out as pursues. In next section, learn about different existing cloud load balancing strategies is portrayed. A one of a kind load balancing component is introduced in section 3. Exploratory outcomes are talked about in section 4. Concluding comments are depicted in section 5.

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II. RELATED WORK

The distributed computing condition contains widened segments and accomplices, for example, organizing, capacity segments, data centers, process center points, administration providers, administration purchasers, and Service Level Agreements. In writing study diverse asset tasks and burden adjusting strategies are accessible. Figure 1 portrays the situation about how burden adjusting functions in cloud conditions. Exactly when customer sends a solicitation to the Cloud Controller, solicitation will be sent to the heap balancer for executing load adjusting figurings. The heap balancer will pick which virtual machine will manage the particular solicitation subject to the availability of the virtual machines. Cloud controller handles the task the leading group of the solicitation send by the customer [5]. Endeavors are submitted to the heap balancer where burden adjusting strategy comes to play for assignment of sensible virtual machine for executing the tasks. VM administrator will manage all of the commitments of the virtual machine. Virtualization is overseeing advancement in the distributed computing. The target of virtualization is to share the assets, for instance, sharing the gear, memory among the virtual machines. As Virtual machine will be used to manage the customer's solicitation, treatment of solicitation is a one of the testing issues in the distributed computing. If a bit of the virtual machines are over-used and a bit of the virtual machines are under stacked which will result into the decrease in the execution and moreover decay the nature of administration [8]. A hypervisor or VMM will be used to manage the virtual machines. A hypervisor will pick which virtual machine will manage the particular solicitation reliant on trouble calculation of the virtual machines and will satisfy the customer's solicitation.

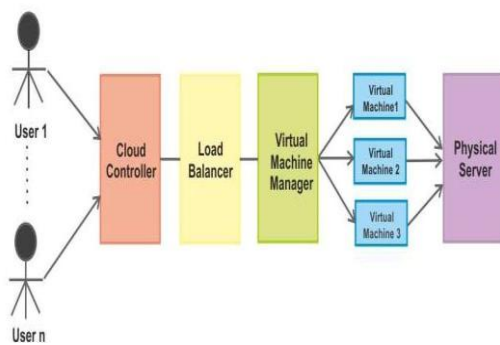


Fig 1 Load Balancing Scenario

III. PROPOSED MECHANISM

From the writing survey, restricted work has been practiced for load balancing in cloud computing condition and those present frameworks do have requirements that ought to be tended to. Thusly there is a need for another procedure that can offer the most extraordinary asset use, greatest throughput, less reaction time, dynamic asset booking with adaptability. This work proposes an efficient Resource Provisioning method for Load Balancing in cloud computing conditions to address the above issues. At whatever point a VM gets overloaded, the specialist co-op requirements to

scatter the asset in such a manner, that the accessible assets will be utilized in a fitting manner and load at all the virtual machines will stay adjusted. The proposed resource provisioning technique for load balancing is as follows.

Step1: Initialize n Virtual Machines based on the configuration such as CPU,RAM,Hard disk

$$VM_n = VM_1 + VM_2 + VM_3 + VM_4 + \dots + VM_n$$

Step 2: Request handler will handle n request from the clients such that

$$R_n = R_1 + R_2 + R_3 + R_4 + \dots + R_n$$

Step 3: Request Handler will check whether the request is valid or not and if the request is valid it will be forwarded to Load Balancer.

Step 4: Load Balancer consist of VM_Maintainance Table which maintain the all records of VM in VM's table which consist of information such as memory utilization ratio, cpu utilization, fitness value and load status.

Step 5: Calculate Memory Utilization Ratio based on the memory usage

$$\lambda_{available_memory} = \lambda_{total_memory} - \lambda_{used_memory} \quad (1)$$

$$\gamma = (\lambda_{available_memory}) / (\lambda_{total_memory}) * 100 \quad (2)$$

Step 6: Every VM will maintain a Request queue to handle the incoming request from the users

ρ = current queue size of VM's.

Q_L Threshold = Threshold limit of request queue.

$\delta\rho$ = service request queue size

Calculating the service request size

$$\delta\rho = \rho / \delta t$$

If ($\delta\rho > Q_L$ Threshold)

No new request can be handled by server.

Step 7: Set the threshold value of VM's to indicate whether the VM is critical or not..

If ($\zeta > 25 \ \&\& \ \zeta < 75$)

```
{
    Allocation_status = normal
    Update load_table of VMs
}
```

```
Else
{
    Allocation_status = critical
    Call VM_Load_Balancer()
}
```

Step 8: VM_Load_Balancer()

```
{
    For client's request
    Create analysis table based on response time which
    consist of Migration_id,
    Destination_id,
```



Memory_Utilization_Ratio and response time.

Mapping of analysis_table and VM_maintenance_table to find out the suitable VM.

}

Step 9: Based on response time of different VM , forward the request to suitable VM.

Step 10: Once VM will be migrated, Check Resource utilization of VM.

IV. IMPLEMENTATION AND RESULTS

Implementation of the proposed algorithm of Resource provisioning algorithm has been implemented on open source platform of OpenStack cloud in Redhat Linux. Hardware specifications where we have use 12 GB of RAM and have used 1 TB of storage where as we have use Cent OS as an operating System and open stack as a Cloud computing platform which consist an iso file of Fedora Linux.

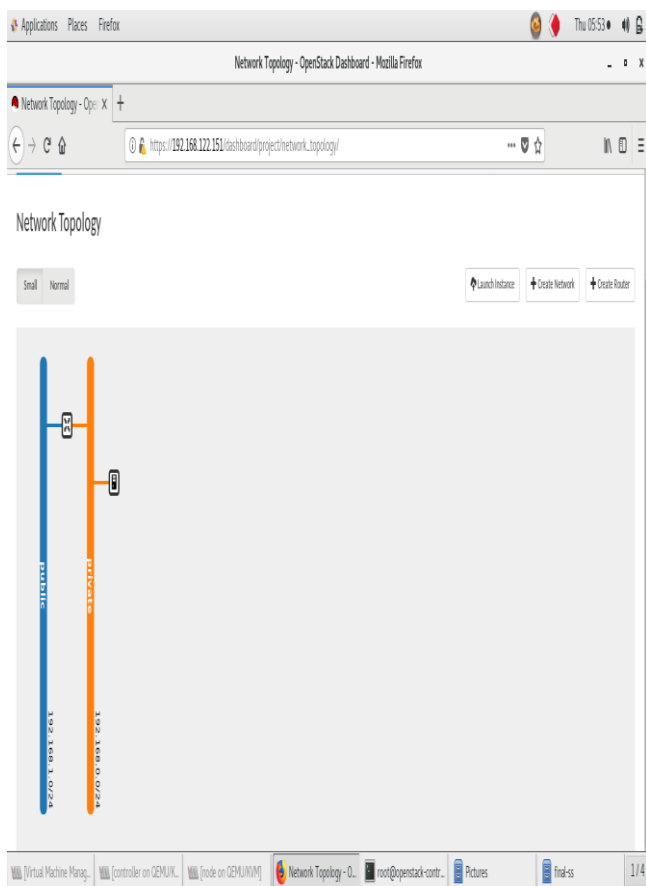


Fig 2 Creating Network Architecture in OpenStack Cloud

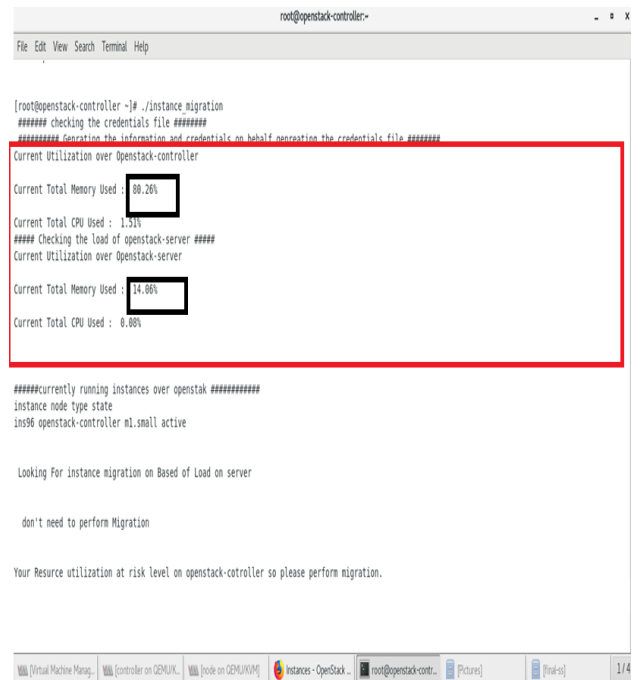


Fig 3 Load of Instances before applying Load Balancing Algorithm.

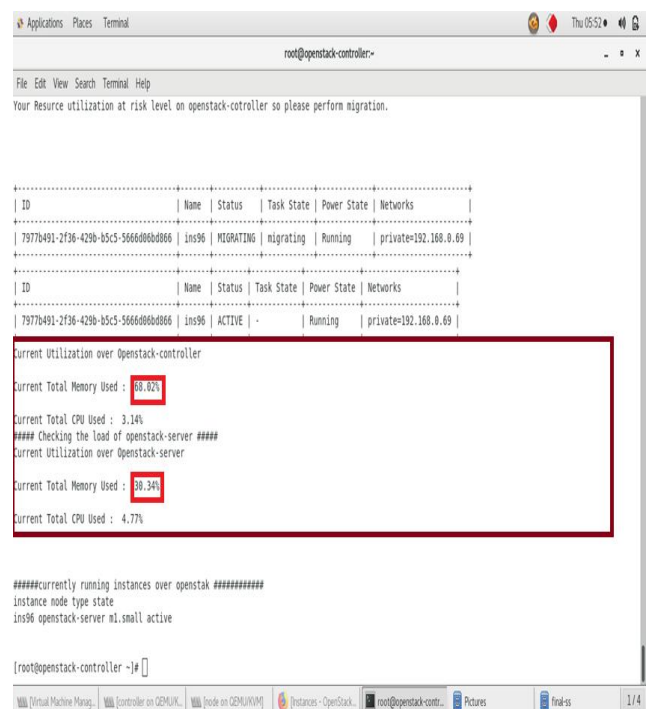


Fig 4 Load of Instances after applying Load Balancing Algorithm

The prescribed load balancing calculation has been researched the cloud foundation which is doled out in the past segment. The workload circumstance before load balancing has showed up in Fig. 2. Before load balancing, the virtual machine having an IP address [192.168.0.69] is overloaded, however the virtual machine having an IP address [192.168.0.70] is underloaded.

The load balancer decides to change load among overloaded VM [192.168.0.69] and underloaded VM [192.168.0.70]. Workload balancing after load balancing shows up in Fig. 3. Afterload balancing, directly the virtual machine having IP address [192.168.0.69] is working regularly, which was earlier strongly loaded before load balancing happened.

V. CONCLUSION

In this exploration paper, a novel load balancing method in cloud computing has been proposed and the recommended technique is useful for the productive asset usage of the VM's and improve the exhibition of the Virtual Machines. The system actualized in open stack cloud computing condition builds up a unique asset mapping calculation for cloud computing conditions where reasonable VM should find dependent on the migration_id where CPU usage of assets increment over the limit esteem. Future work will be centered around executing proposed work to improve the result by including the parameters, for example, versatility and adaptation to internal failure.

REFERENCES

1. Mesbahi, M. and Rahmani, AM. (2016). Load Balancing in Cloud Computing: A State of the Art Survey”, International Journal of Modern Education and Computer Science. 8(3), 64.
2. Milani, AS. And Navimipour, NJ. (2016). Load balancing mechanisms and techniques in the cloud environments: Systematic literature review and future trends. Journal of Network and Computer Applications, 71, 86–98.
3. Farrag, AAS. and Mahmoud, SA. (2015). Intelligent Cloud Algorithms for Load Balancing problems: A Survey. IEEE Seventh International Conference on Intelligent Computing and Information Systems (ICICIS '15), 210-216.
4. Kanakala, VRT. and Reddy, VK. (2015). Performance Analysis of Load Balancing Techniques in Cloud Computing Environment. TELKOMNIKA Indonesian Journal of Electrical Engineering, 13(3), 568-573.
5. Ivanisenko, IN. and Radivilova, TA. (2015). Survey of Major Load-balancing algorithms in Distributed System. Information Technologies in Innovation Business Conference (ITIB).
6. Gutierrez-Garcia, JO. and Ramirez-Nafarrate, A. (2015). Agent-based load balancing in Cloud data centers. Cluster Computing, 18(3):1041–1062.
7. Mishra, NK. and Misha, N. (2015). Load Balancing Techniques: Need, Objectives and Major challenges in Cloud Computing: A Systematic Review. International Journal of Computer, 131(18).
8. Dasgupta, K. and Mandalb, B., Duttac, P., Mondald, JK., and Dame, S. (2013). A Genetic Algorithm(GA) based Load-balancing strategy for Cloud Computing”, International Conference on Computational Intelligence: Modeling Techniques and Applications (CIMTA), 10, 340-347.
9. Singha, A. and Juneja, D., and Malhotra, M. (2015). Autonomous Agent Based Load-balancing algorithm in Cloud Computing. International Conference on Advanced Computing Technologies and Applications (ICACTA), 45, 832–841
10. Gautam, JV., Prajapati, HB., Dabhi, VK., and Chaudhary, S. (2015). A Survey on Job Scheduling Algorithms in Big Data Processing. IEEE International Conference on Electrical, Computer and Communication Technologies (ICECCT' 15)
11. Ghafari, S.M., et al. Bee-MMT (2013) A load balancing method for power consumption management in cloud computing. in Contemporary Computing (IC3), Sixth International Conference, IEEE.. O. Young, “Synthetic structure of industrial plastics (Book style with paper title and editor),” in *Plastics*, 2nd ed. vol. 3, J. Peters, Ed. New York: McGraw-Hill, 1964, pp. 15–64.

AUTHORS PROFILE



Jaimeel Shah is a research scholar and PhD pursuing in field of computer engineering and is currently working on different issues on cloud computing.



Dr Chirag Patel has completed his PhD from the Nirma University. His performance in the field of research is enormous and providing guidance to many PhD as well as PG scholars.