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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 presented in section 4. Concluding comments are depicted in section 5.
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 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.

III. PROPOSED MECHANISM

I 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.

Step 1: Initialize n Virtual Machines based on the configuration such as CPU,RAM,Hard disk

\[ VMn = VM1 + VM2 + VM3 + VM4 + \ldots \ldots + VMn \]

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

\[ Rn = R1 + R2 + R3 + R4 + \ldots \ldots + Rn \]

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

\[ \lambda_{available\_memory} = \lambda_{total\_memory} - \lambda_{used\_memory} \]  
\[ \gamma = \left( \frac{\lambda_{available\_memory}}{\lambda_{total\_memory}} \right) \times 100 \]  

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

\[ \rho = current\_queue\_size\_of\_VM's. \]  
\[ Q_L\_Threshold = Threshold\_limit\_of\_request\_queue. \]  
\[ \delta \rho = service\_request\_queue\_size \]  
Calculating the service request size

\[ \delta \rho = \frac{\rho}{\delta t} \]  

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.

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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


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.