International Research Journal of Education and Technology
Peer Reviewed Journal
ISSN 2581-7795

Energy-aware cloud workflow applications scheduling with geo-distributed data

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ABSTRACT

When a computation is requested by any system it is distributed to all the slaves existing in thatcloud in cloud computing. So the way in which the distribution is being done must get theresponse from all the slaves at the same time so that there should not be any waiting for anyparticular computing device to reply before further processing could happen. But in the realtime clouds heterogeneous computing devices exists and any process's execution time on theslaveisrequired to beestimated.The main feature in any load balancer is the asymmetric load distribution. A greater ratio ofworkload is to be given to those with higher computation capabilities. But sometimes onlyhigher computation power cannot help in deciding that how much share of the task can beassignedtothatsystem.Assignmentofpropertasktopropersysteminheterogeneouscomputinginfrastructure is donebyload balancer.

Load balancer is also responsible for 'Priority Activation' which means that when the number ofslavecomputingdevicesdropsbelowacertain pointthe load balancer awakesomeof theSleeping devices to maintain the computing performance.

Key Words: cloud, Recommendation System, NLP, cloud computing, Research Expertise, Expertise indices

INTRODUCTION

Cloud computing is made up by two terms first is cloud and second is computing. Cloud is thepool of different types of resources and computing is providing the resources to the end users inefficient manner. Cloud computing is a term which is generally used in case of Internet. Thewhole Internet can be viewed as a cloud. Capital and operational costs can be cut using cloudcomputing.TheFigure1.1showthecloudcomputingcomponentwhichareusedintheinternet.

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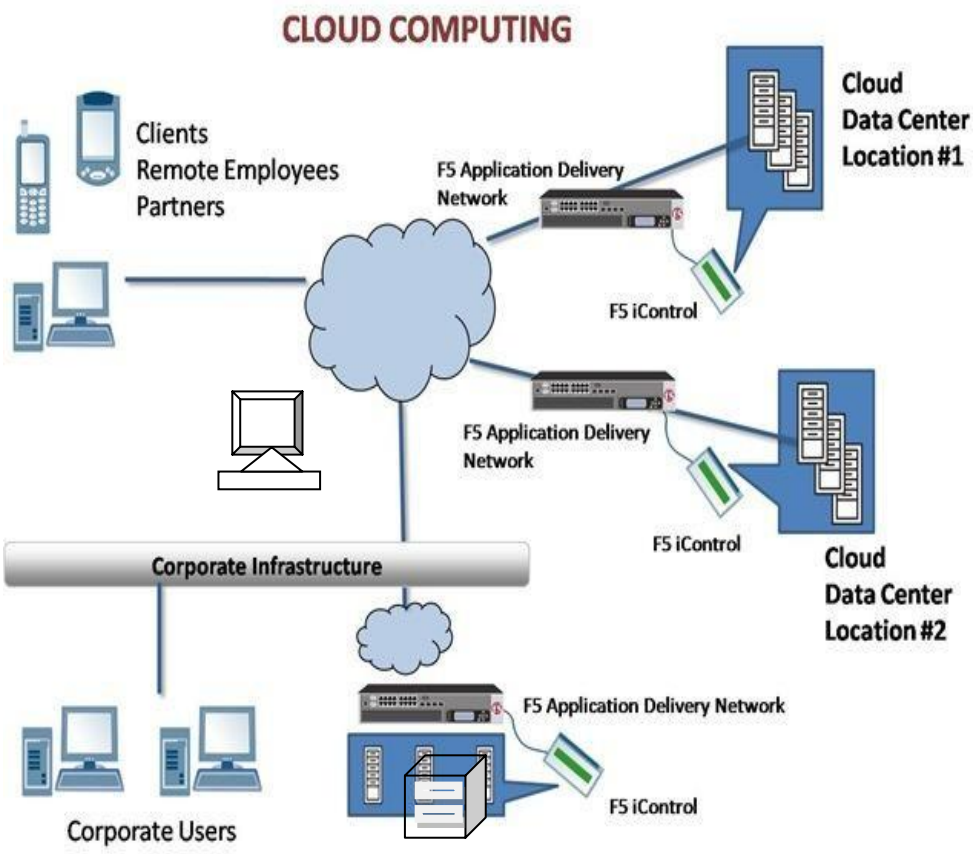

Figure1.1:AcloudisusedinnetworkdiagramstodepicttheInternet

Cloud computing is a vast concept. Cloud computing have several areas where there is a needofresearchloadbalancingisoneofthemainareas.Becauseitisnotalwayspractically

Feasible or cost efficient to maintain one or more idle services just as to fulfill the requireddemands.Jobscan'tbeassignedtoappropriateserversand clientsindividuallyforefficientloadbalancing as cloud is a very complex structure and components are present throughout a widespreadarea.Heresomeuncertaintyisattachedwhilejobsareassigned.

Cloud computing is that user knowledge isn't hold on domestically however is hold on withintheknowledgecenterofnetincaseofcloud.Cloudsmanageandmaintaintheoperationofthoseknowledge centers. The users will access the hold on knowledge at any time by exploitationApplication Programming Interface (API) provided by cloud suppliers through any terminalinstrumentationconnectedtothenet.Cloudnotsolely providesstorageserviceshoweverhardware and code services are accessible to the overall public and business markets. Theservices provided by service suppliers will be everything, from the infrastructure, platform orcoderesources.

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OBJECTIVE OF THEWORK

As In complicated and enormous systems, there's an incredible need for load equalization. Forsimplifying load equalization globally (e.g. in a cloud), one issue which might be done is, usingtechniques would act at the parts of the clouds in such the simplest way that the load of theentirecloud is balanced.Thepurpose of loadbalancingcomprises:

- Getbetterperformanceconsiderably
- Encompassabackupsetupjustin casethesystem failsevenpartially
- Retainthesystemstability
- Haveroomforpotentialmodificationwithinthemethod

Thisvast need &scopeof load balancingmotivated us to workon the proposedalgorithm.

PROPOSED WORK

We have focused on an algorithm to schedule jobs and allocate servers in cloud systems in this proposed work. The algorithm is efficient as it provides optimal allocation. It maximizes the number of job requests that can be processed in unit time while conserving energy and keeping the costs low. The said optimal allocation is achieved by reducing the idle time of nodes of active servers and reducing the total number of servers used.

The recent/Round Robin algorithms are supposed that manages the load at the server by considering this standing of the all out there VMs for assignment the incoming requests intelligently. The VM-assign load balancer mainly focuses on the economical utilization of the resources/VMs. The formula distributes the load in such a fashion that below / over utilization (VMs) things will not arise. Compared to previous Active-VM load balance formula, the load wasn't properly distributed on the VMs. The recent algorithm is supposed that manages the load at the server by considering this standing of the all out there VMs for assignment the incoming requests intelligently. The VM-assign load balancer mainly focuses on the economical utilization of the resources/VMs. The formula distributes the load in such a fashion that below / over utilization (VMs) things will not arise. Compared to previous Active-VM load balance formula, the load wasn't properly distributed on the VMs.

We propose a new algorithm in which we will use three resources cup, memory and bandwidth in the algorithm to enhance the utilization of resources/VMs. The proposed approach will reduce the idle time of resources which will ultimately result in increased performance, better throughput & better resource utilization.

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RESULT: -

For the results we had implemented the proposed approach using Net Bean. Refer Figure 4.1 for result analysis. Here user fills all the PM and VM parameters Request to Cloud Server the main three parameters are: Memory and Bandwidth and CPU. After filling all the requirements users press on the buttons for result analysis.

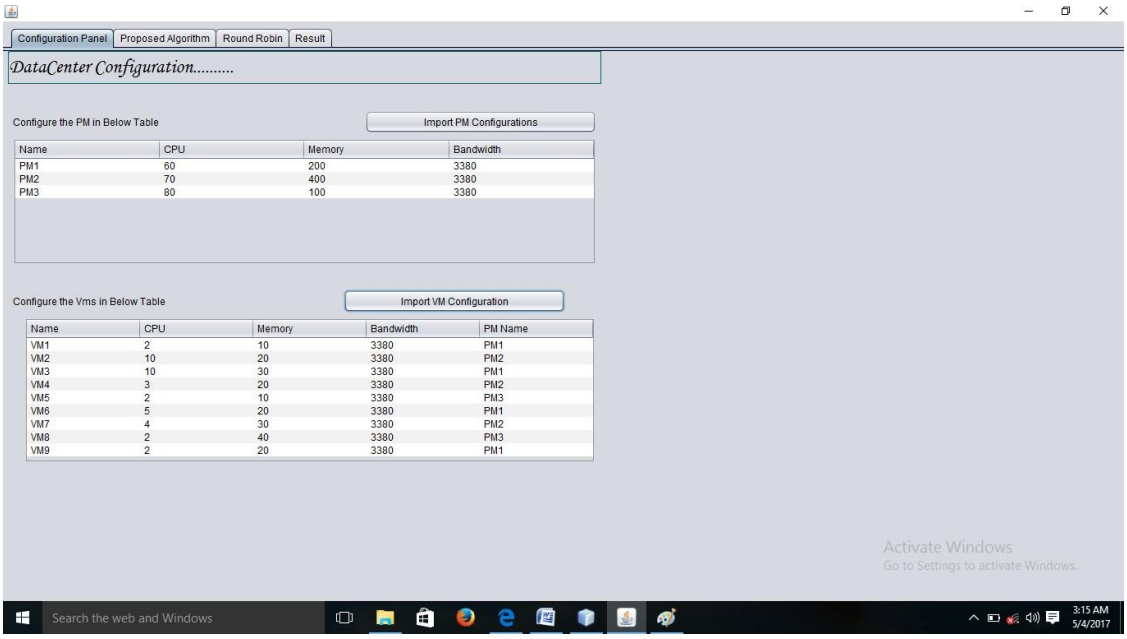

Figure 4.1: Imported PM and VM Figure

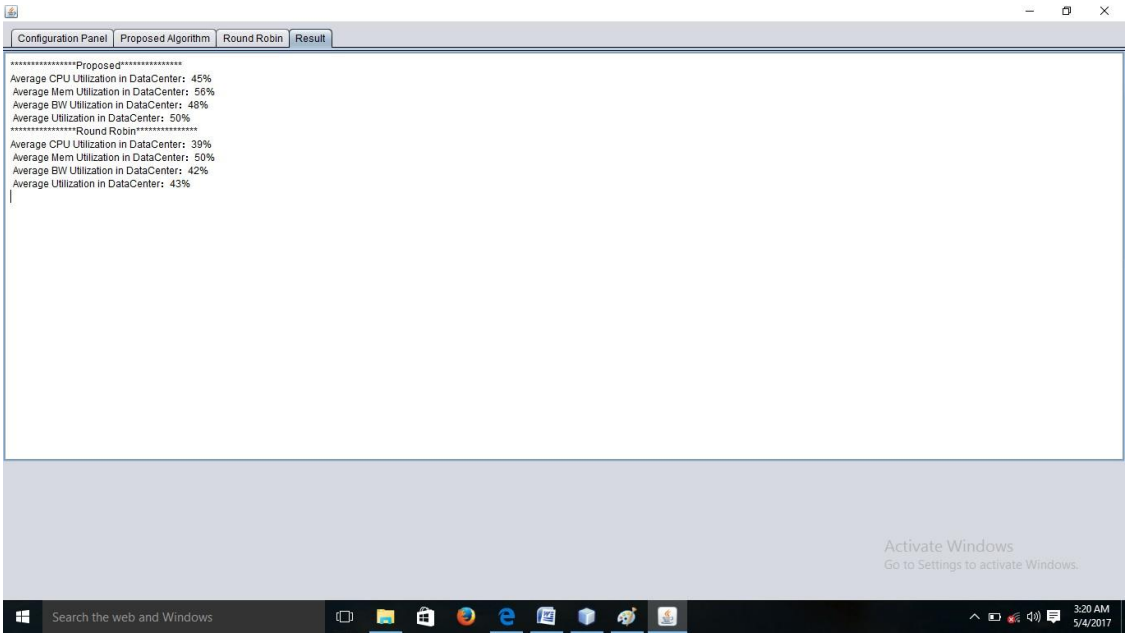

Figure 4.2: Result Analysis of PM and VM

Table 4.1 shows a comparison between Existing and Proposed Algorithm based on Utilization of resources.

Table 4.1: Comparing result of Algorithm

RESOURCES NAME	**PROPOSED ALGORITHM**	**EXISTING ALGORITHM**
Avg. CPU Utilization in Datacenter	41%	39%
Avg. MEM Utilization in Datacenter	51%	50%
Avg. BW Utilization in Datacenter	44%	42%
Avg. Utilization in Datacenter	45%	43%

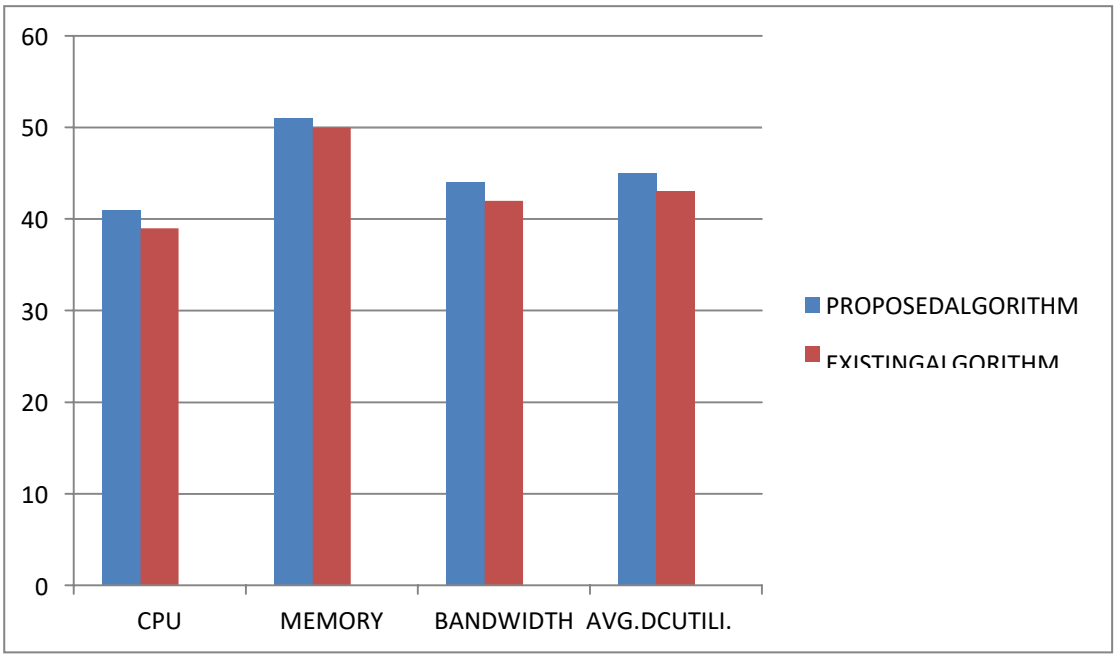

Figure 4.3: Graph to show Avg. Utilization of Resources

Graph 4.1 shows the average utilization of CPU, MEMORY, BANDWIDTH and Avg. Utilization in Datacenter of Proposed and Existing Algorithm.

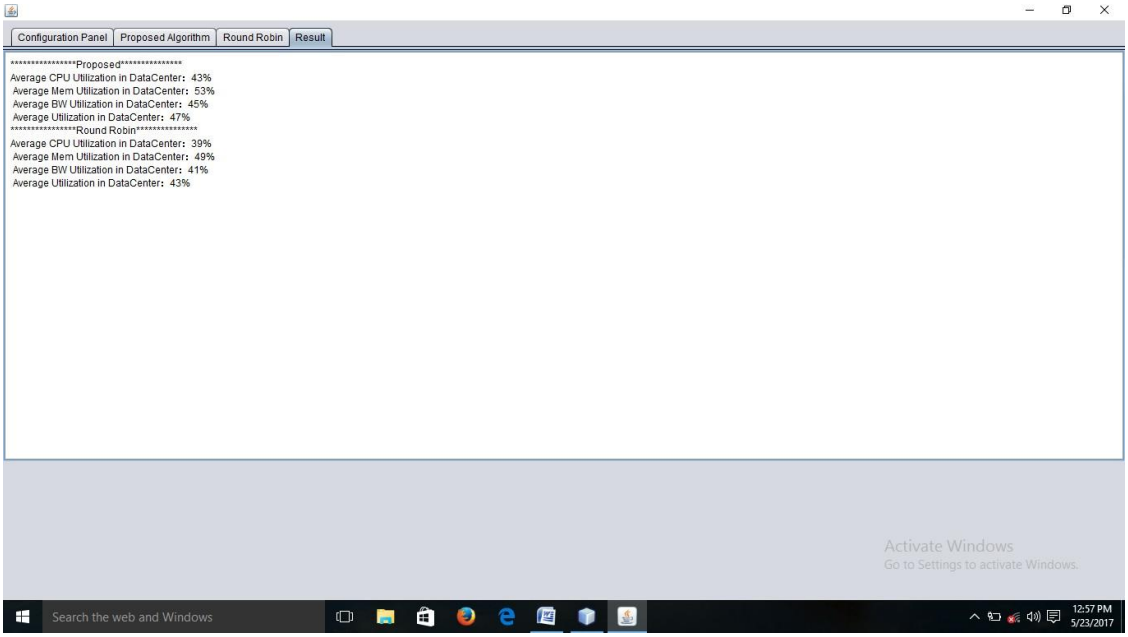

Table 4.2 shows a comparison between Existing and Proposed Algorithm based on Utilization of resources.

Table 4.2: Comparing result of Algorithm

RESOURCES NAME	**PROPOSED ALGORITHM**	**EXISTING ALGORITHM**
Avg. CPU Utilization in Datacenter	43%	39%
Avg. MEM Utilization in Datacenter	53%	49%
Avg. BW Utilization in Datacenter	45%	41%
Avg. Utilization in Datacenter	47%	43%

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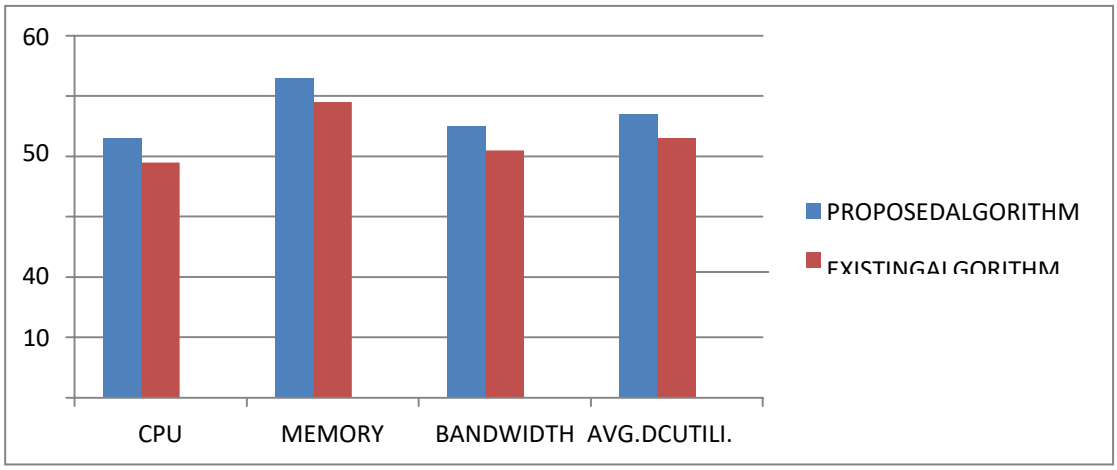

Figure 4.5: Graph to show Avg. Utilization of Resources

Graph 4.2 shows the average utilization of CPU, MEMORY, BANDWIDTH and Avg. Utilization in Datacenter of Proposed and Existing Algorithm.

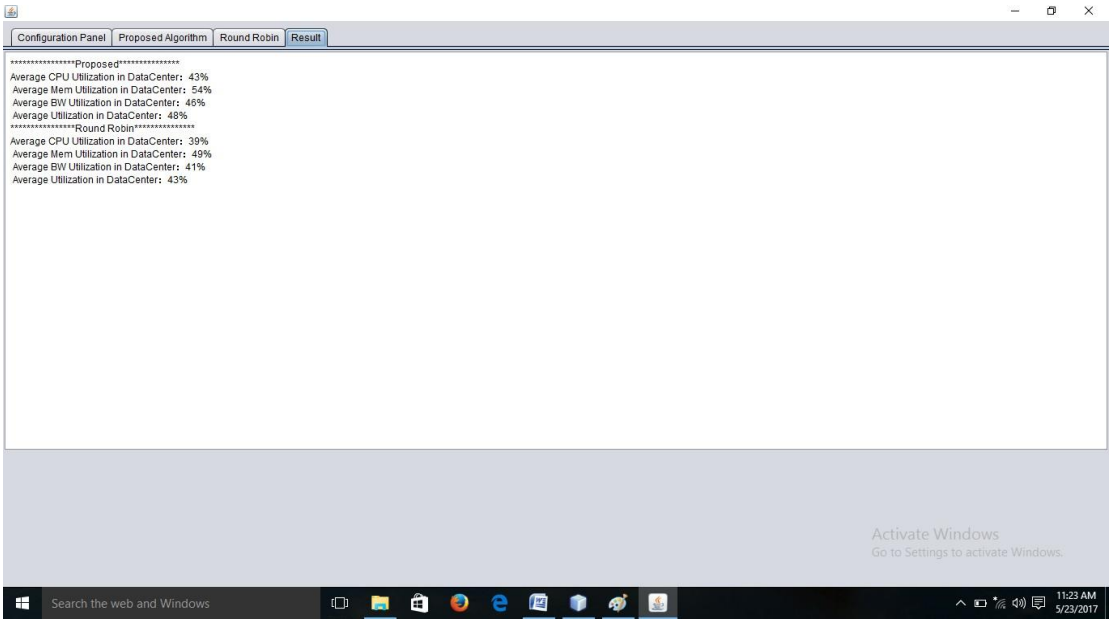

Figure 4.6: Result Analysis of PM2 and VM2

Table 4.3 shows a comparison between Existing and Proposed Algorithm based on Utilization of resources.

Table 4.3: Comparing result of Algorithm

RESOURCES NAME	PROPOSED ALGORITHM	EXISTING ALGORITHM
Avg. CPU Utilization in Datacenter	43%	39%
Avg. MEM Utilization in Datacenter	54%	49%
Avg. BW Utilization in Datacenter	46%	41%
Avg. Utilization in Datacenter	49%	43%

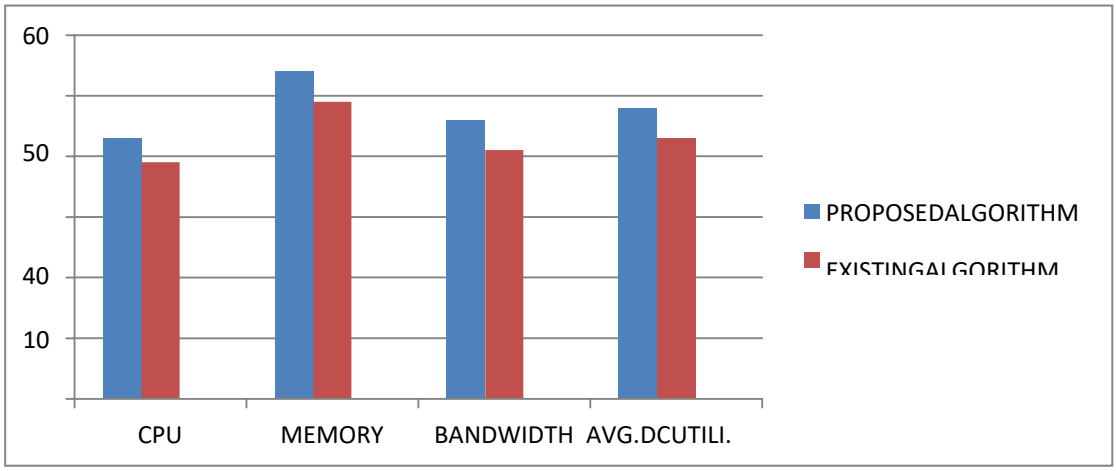

Figure 4.7: Graph to show Avg. Utilization of Resources

Graph 4.3 shows the average utilization of CPU, MEMORY, BANDWIDTH and Avg. Utilization in Datacenter of Proposed and Existing Algorithm.

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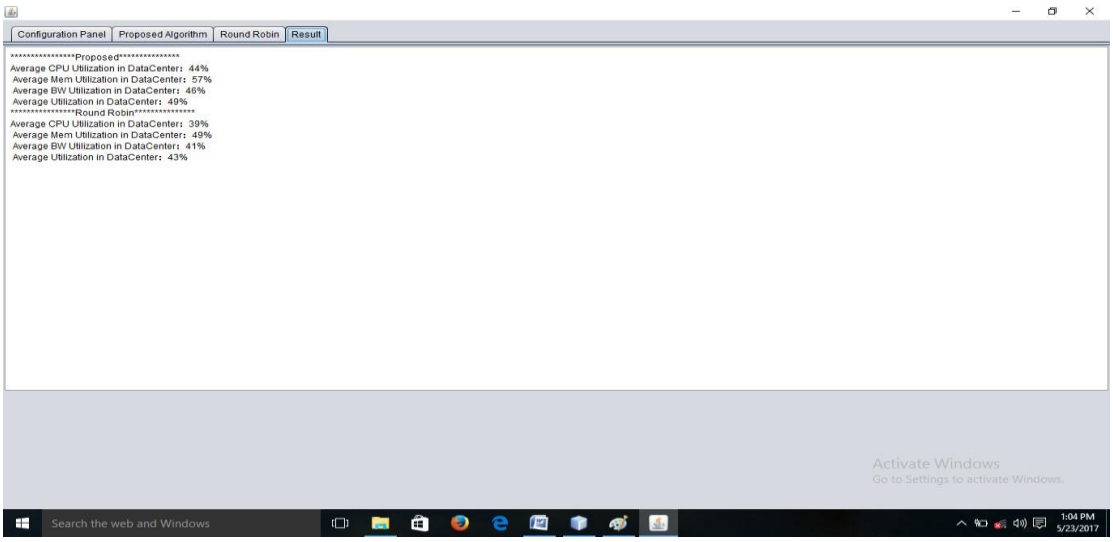

Figure 4.8: Result Analysis of PM3 and VM3

Table 4.4 shows a comparison between Existing and Proposed Algorithm based on Utilization of resources.

Table 4.4: Comparing result of Algorithm

RESOURCES NAME	**PROPOSED ALGORITHM**	**EXISTING ALGORITHM**
Avg. CPU Utilization in Datacenter	44%	39%
Avg. MEM Utilization in Datacenter	57%	49%
Avg. BW Utilization in Datacenter	46%	41%
Avg. Utilization in Datacenter	49%	43%

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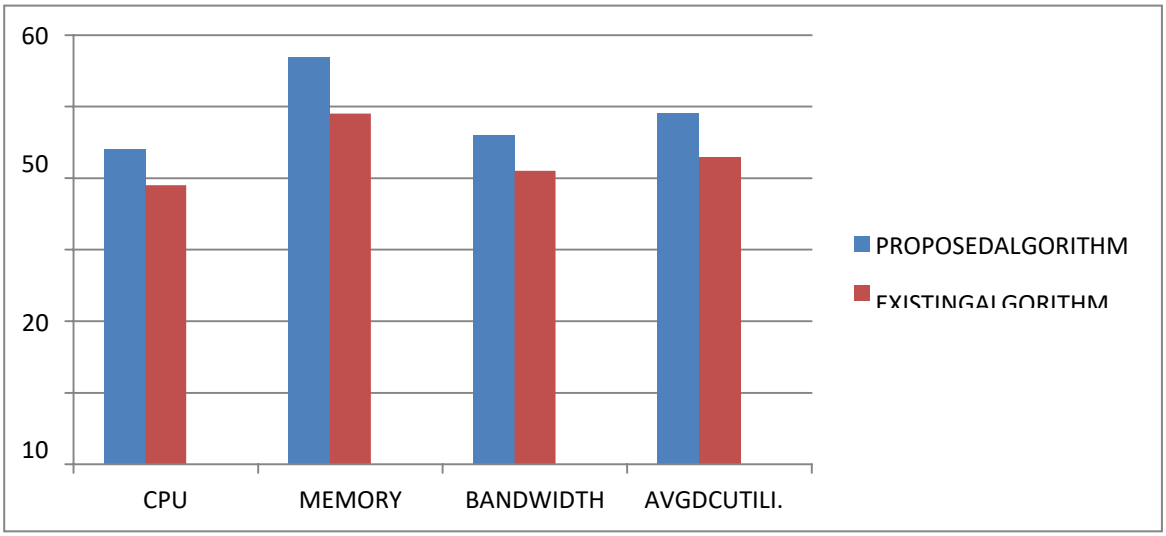

Graph 4.4 shows the average utilization of CPU, MEMORY, BANDWIDTH and Avg. Utilization in Datacenter of Proposed and Existing Algorithm.

Conclusion-

The recent algorithms is designed which helps in managing the load at the server side (Cloud) taking into consideration the present status of the all presented VMs for conveying the incoming requests cleverly. The VM-assign load balancer primarily focuses on the resourceful utilization of the resources/VMs. The algorithm distributes the load in such a manner that under/ over exploitation (VMs) situations will not take place. On Comparing with the previous Active-VM load balance algorithm, the load was not correctly distributed on the VMs in previous algorithm.In this Dissertation we have implement a new algorithm in which we have use three resources in the recent algorithm to enhance the utilization of resources/VMs. This approach reduces the idle time of resources which will ultimately result in increased performance, better throughput & better utilization of resources.

REFERENCES

[1]KaursandSupriyaKinger2,“AnalysisofLoadBalancingTechniquesinCloudComputing”, International Journal of Computers & Technology, volume 4, No. 2, March- April2013, pg737-741.

[2].BhatiyaWickremansinghe1,RodrigoN.Calheiros2andDr.RajkumarBuyya3,"CloudAnalyst:ACloudSim-basedVisulModellerforAnalysingCloudComputingEnvironmentsand Applications",IEEEComputerSociety, 2015, pp.446-452.

[3].Dr.RajkumarBuyya,"CloudSim:atoolkitformodellingandsimulationofcloudcomputing environments and evaluation of resource provisioning algorithm", published online24 august in WileyOnlineLibrary2010, pp. 23-50

[4].PoojaandMishra2,"AnalysisofVariantsinRoundRobinAlgorithmsforLoadBalancing in Cloud Computing", (IJCSIT) International Journals of Computer Science andInformationTechnologies, Volume4 (3), 2013, pg. no. 416-419.

[5]. Sonika Matele1, Dr, K James2 and Navneet Singh3, "A Study of Load Balancing IssueAmongMultifariousIssuesofCloudComputingEnvironment",InternationalJournalsofEmerging Technolog Computational and Applied Science (IJETCAS), volume 13- 142, 2013,pg.236-241.

[6] Abhijeet G Purohit et. "Load balancing in public cloud by division of cloud based on thegeographicallocation"[InternationalJournalofResearchinEngineeringandTechnology] Volume:03/2014

[7].Ms.ShilpaD.Moreet."ReviewsofLoadBalancingBasedonPartitioninginCloudComputing" [International Journal of Computer Science and Information Technologies, Vol. 5(3), 2014].

[8]. Dr. Rakesh Rathi, Vaishali Sharma and Sumit Kumar Bole, "Round Robin Data CenterSelectioninSingleRegionforServiceProximityServiceBrokerinCloudAnalyst",International Journal of Computer & Technology, Volume 4 no. 2, March- April 2013, pg. no.254-260.

[9] Amandeep Kaur sidhu and Supriya Kinger2, "Analysis of Load Balancing Techniques inCloudComputing",InternationalJournalofComputers&Technology,volume4,No.2,March - April 2013, pg737-741.

[10]. Pooja Samal and Pranati Mishra, "Analysis of Variants in Round Robin Algorithms forLoad Balancing in Cloud Computing", (IJCSIT) International Journals of Computer ScienceandInformation Technologies, Volume4(3),2013, pg. no. 416-419.

[11]. Syed TauhidZuheri1, Tamanna Shamrin2 and Rusia Tanbin3, Firoj Mahmud4,

"AnEfficient Load Balancing Approach in Cloud Environment by using Round Robin Algorithm",InternationalJournal of Artificial and Mechatronics,volume 1,issue5, 2013,pp 96-99.

[12]. Kunal Mahurkar, Shraddha Katore and Suraj Bhaisade3, Pratikawale4, "Reducing Cost ofProvisioning in Cloud Computing", International Journal of Advance in Computer Science andCloudComputing, Volume-1,Issue-2, nov.-2013, pg. 6-8.

[13]. B. SantoshKumarand Dr.LathaParthiban2, "AnImplementationofLoadBalancingPolicyforVirtualMachinesAssociatedwitha DataCentre",InternationalJournalofComputerScience & Engineering Technology (IJCSET), volume 5 no. 03, March 2014, pp. 253- 261.

.[14].SubasishMohapatra1,Subhadarshini2andK.SmrutiRekha3,"AnalysisofDifferentVarientsinRoundRobinAlgorithmsforLoadBalancinginCloudComputing",InternationalJournal of ComputerApplication, Volume 69-no. 22, may2013, pp.17-21.

[15]. Randles1, M Lamb2 and Taleb Bendiab3, "A Comparative Study into Distributed LoadBalancingAlgorithmforCloudComputing",AdvancedInformationNetworkingandApplicationWorkshop (WAINA) 2010.