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A Multi-level Services for Scaling of applications in Cloud Services

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Abstract– Automatic scaling in cloud server provisioning resources has become an active area of research in the Cloud Computing paradigm. Cost of resources are different depending on configuration for using them. Hence efficient management resources are major interest to both Cloud Providers and Cloud Users. Here encapsulating some of the applications in virtual machines by using CCBP problem, analyzing server is like a bin and class is an whatever we using like applications.In this paper presents a multi-level Services mainly scaling of each of the applications by using cloud computing Services. Here we are using simulations through many applications for computing performance. Experimental results demonstrates that our system showing the satisfaction ratio,decision time and energy utilization that reduce the no of servers using when the load is low.

Key Words – Cloud computing, scaling,virual machine, cloud simulations.

1.INTRODUCTION

Now a day's Cloud computing is a new technology for resources providing which is in large data centers.cloud computing is a type of computing that depends on sharing computing resources rather than having local servers or present devices to handle applications.It is available as a service to the cloud providers and users.

Initially, it has to become for start business or by using the resources without any capital investment. Mainly cloud services are like as a pay per use model over the internet. They are some efficient services and products[2].For example,AmazonEC2,MicrosoftAzure,Google,IBM,Dell. This are use in cloud computing offering.

Here some of the cloud services,and service providers are to be chargeable and charging from the users according to what they are using in service policy method. Hence for this for maintain the perfect services and also service Providers have become to improve the Scalability factor and less energy consumption. Actually scaling of each applications is based on how to utilize the resources.

Scaling is the ability to increase or decrease the compute capacity of our applications by either changing the number of servers or changing the size of servers. Auto scaling is a web services that enables we to automatically Launch or Terminate Amazon web services based on user defined policies Services in the Cloud[4]. Most of the cloud computing Services are must be in pay as you go method.

Many web Applications can be usefull for the scaling of each applications within a Automatic Manner.Here Resources are utilized within increasing or decresing order by the cloud Service Provider. Then Scaling of Each Applications with respective by using the Multi level Services based on sequences.

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The rest of this paper is structured as follows. *Section 2* discusses related work which includes Scaling of Applications explanation. Ccbp for scaling of resources *Section 3* illustrates proposed work which is an major part. *Section 4* presents results obtained through simulating. Finally we conclude in *Section 5*.

2.RELATED WORK

The Class constrained bin packing problem had been extensively studied[5].Here we considers different constraints for this we first pack the class of items into particular no of bins here items is nothing about the applications to servers. Hence Here satisfying the memory usage and CPU Utilization based on service providers.

Mainly we consider CCBP problem,there is a limit for how many applications can run on particular servers. For this we use one efficient color set algorithm which is easy to recognize,how many applications can run simultaneously. Zhen Xiao[6] introduced a system that automatically scales the no of applications based on demand service policy.

2.1 Scaling of Applications:

Cloud computing, scaling[6] is the procedure for providing the services without lagging information if there is any increase or decrease on load while running applications. Here the System being able to adapt the user requests. Then we have to increase or decrease the resources. hence we maintains the cost and scalability factor should be balanced. In cloud computing mainly focuses on sharing data among a scalable network of nodes,across to the data centers and Web Services.

2.2 System Architecture:

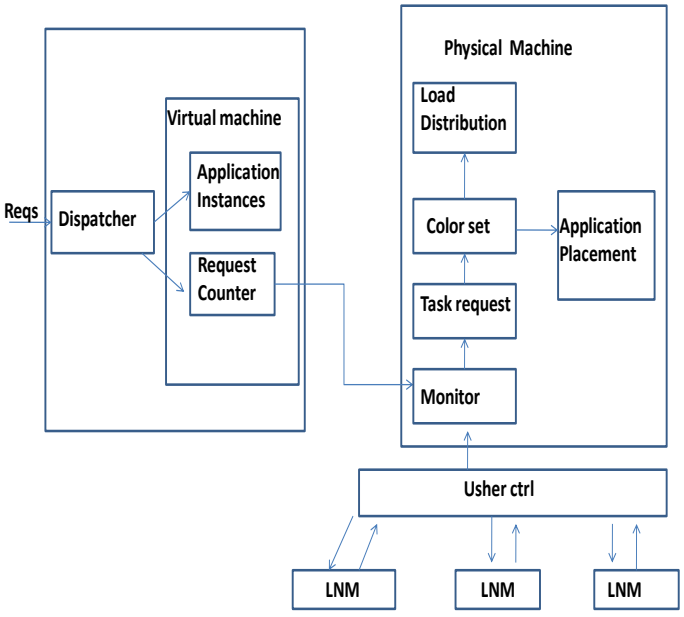


Fig1. System Implementation

The above fig shows that the encapsulating each application instances inside a virtual machine [VM]. Here virtual machine is an environment, actually a program or operating System which is not Physically exist but is created within environment. Virtual machines are necessary for providing Isolated among untrusted custumers or users. Here Amazon EC2 used this Virtual Machines in Cloud Computing. This are open source implementations.

Here some of the functionalities are :

1.Virtual Machine
2. Primary Machne
3. Nodes

According to this virtual machines are having Application Instances, means the load information of each application instances . And Here Request Counter means the request no of each application instances through Switch.

The Physical machines are nothing about which includes the procedure for invoking periodically to make decisions. Load distribution indices for every application instances first we need to observe future resources , and then proceed to decide how to allocates their capacity or load over the group of running instances based on demand.

Then color set is nothing about the ccbp problem which includes how to allocate the resources among each application instances.And Task request ,it is the major part in this paper. Here there are some requests or tasks from the users which is discussed in later sections.

Hence the Application Placement is for deciding how many set of servers and its instances runs in periodically. Then it should be scales some of the multi level services among the set of applications based on service providers.

Based on this the physical machine schedules procedures of our system.

Finally the multiflexing of virtual machines and physical machines is managed by using the usher. Actually Usher is a virtual machine management system[7]. Here we use this for managing clusters through virtual machines. The main intension of our System is implementing some of set of plugins into Usher. Hence we use Local Node Manager because all the decisions which is in PM, are forwarded to the LNM for execution. Whether there is any waiting situations while running set of applications then it sends the information like stand by andwakeup instructions or application starts and stops instructions.

Here by observing some of the difficult applications can take more time to start and finish applications. so run each application inside virtual machines. Then HBFT which provides the sequence between the backup virtual machine and primary virtual machine at large frequency among 10's to 100's of milli sec's according to the major virtualization technology.

Actually,Here by using some Physical Machines or servers in the cloud.All the servers approximately having same capacity .Their are some requests or Tasks from the users.here first decide how to execute this tasks in all those servers. In previous they considers only applications are their and different classes are their. Now how to execute this tasks on to the servers,for this they proposed one color set algorithm is bin packing alg.

Intially they are some set of servers are their, first server don't have any color. Color means a Category of Applications, class Or all applications are related to data processing. So if a particular application comes,which is having a color value,first we find that any server having already running with that particular color,i.e suppose we use Red, Green,Blue. If we have to pack all the related R's items into one particular server all the related G's and B's are into one particular server,this is the concept of color bin packing algorithm.

Suppose S1,S2,S3 are 3 servers are available. S1 will be taken as Red color i.e one application says A1 app is R. alrdy servers are having CPU utilization and memory usage is their, here balance them if A1 app is put in server S1 which is in R, then some CPU utilization is grown up,Memory usage also grown up. Now some other A2 is coming which is of R color, Now if R is available so S1 in R,then put A2 app also in server S1. Then CPU& Memory utilization is still come down means availability of servers still down. If A3 app is come, here check whether any remaining is available,if not can't pack it in server ,then we have to find one more server. Now If G comes, G can't put in server S1,So we have to put this other server S2 and remaining process is same as above. And next we check with sever S3also which is in B.

Hence Based on server capacity we have to run all applications which is in simultaneous process. The CCBP problem[8] maintains for packing the items of a class in bins. Here intension is to minimize the application placement and energy consumption.

3. PROPOSED WORK

Initially some physical machines or servers in the cloud having same capacity only based on utilizing the resources. Now how to execute for differentiated Services,this is an extension part.so each applications are having different Priority,Multiple Services to their custumers or users. Some Cloud Service Providers give Mult level Services to their custumers, when resources are tight cloud service providers are gave to their premium custumers because they are having high demand satisfaction Ratio than other Custumers. i.e each app having priority. Here some are having High Priority,Some are having low Priority. In previous which is R,G,B they all are come and executed but here when R is more priority that paying more but G is in Low priority that paying Less,then we should be give priority to R Than G (R>G).

Then Here Mainly we are doing when the task are comes based on priority, first map each task to one virtual machine and after that in each of this task having a Perticular Class,means some group of applications, or some are real time are their. Here we are proposing mainly we have to check Priority between all.

For doing this we use one particular tool i.e CloudSim.
CloudSim[9], is a toolkit for the designing and simulating of Cloud computing environments comes to the retrieval. It providing system and modelling of the Cloud computing components. In cloud environments simulations and applications are evaluating performances and they provide useful methods such as dynamic, distributed, and scalable environments.

The major advantages of simulation are:

- Ease to use and customization.
- Flexibility for defining configurations.
- **Cost benefits:** Here First creating, planning, testing, and then next repeatable same in any of application on the cloud may be expensive.so simulations are easy to rectify those problems.

3.1 An introduction to CloudSim :

CloudSim is a simulation tool that follows the cloud

developers to test the performance of their resources provisioned methods in a quotable and manageable Situation,[10].CloudSim is a library for using the simulation in to the clouds.It maintains some classes for specifyingdatacenters,Virtualmachines,applications,users,computational resources. By using this Components , easy to evaluate methods governed in clouds. Then it maintains scheduling algorithms, load balancing policies, etc. so here we used to assess the competence of methods from various specifications such as profit, application execution time, satisfy etc.

Hence there is an virtual machine placement algorithm[11] means how to place virtual machine in physical machines are nothng but servers, so we map each app into one VM.This VM is placed on PM so what VM is placed on to which PM, for this is Virtual Placement Algorithm.

3.2 CloudSim Implementation:

The CloudSim layer offering supports for simulation within cloud environment based on ,by adding utilized Resources, memory interfaces , storage, and Virtual Machines. It also provides hosts to VMs, application execution management.

Some of the components of Cloud Sim are as follows:

Hosts: It is like a physical resources for storage purpose.
Cloudlet: It indices the group of custumer requests. It was having the application ID, name of the custumer data, and also the capacity of the requesting execution contents.
Data centres: It specifies the infrastructure services providing by different cloud service providers.
Service broker: The service broker observes which data centre should be selects for providing the services based on the requests from the custumer base.
VMM allocation policy: It specifies providing policies based on how to allocate VMs to hosts.

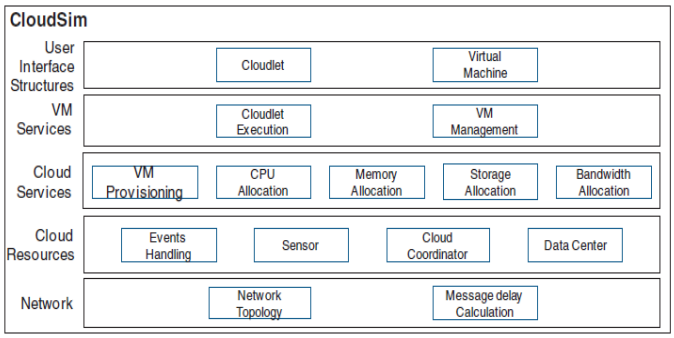


Fig 2 Cloud Sim Archietecture

CloudSim is a free and Open Source Software available at [12]. It is a code Library based on Java. This library we can directly used by integrating with the JDK to compile and execute the code. CloudSim is integrated with Java-based IDE (Integrated Devolopement Environment) which includes Net beans.

4.Simulation Results:

The main feature of Web applications is maintaining balance to the load on the servers efficienitly, for this we use to minimize the average response time and minimize Energy Consumption. According to this we use Multi Level Services for scaling of each applications by using some of the cloud service providers.

4.1 Simulation Scenario:

Here we proposed simulations through Cloud sim Platform. First we have set of items ,each item must be filled with minimum no of bins, Then we Consider how many servers are their,and what their cpu and memory usage. Next Task Request file, here also we some inputs like application id, CPU%, memory usage,Class, and priority.here Priority is major because we already said cloud service providers gives their services for mainly their premium custumers which are having high demand satisfaction ratio.

We maintains some task related files should be in easy to custumise the results. Then specify two modules like Single-Level Services, and Multi-Level Services.(like, No Priority, or only Priority).Here we proposed mainly Multi level services. And when simulations started then we can view the Results based on Performance..

According to simulations we got the Simulation time, energy consumption ,VM migrations[13] means it is used for managing many Applications and Resources within large scaled Virtualize data centers and Cloud Systems.And also we evaluated SLA violations.

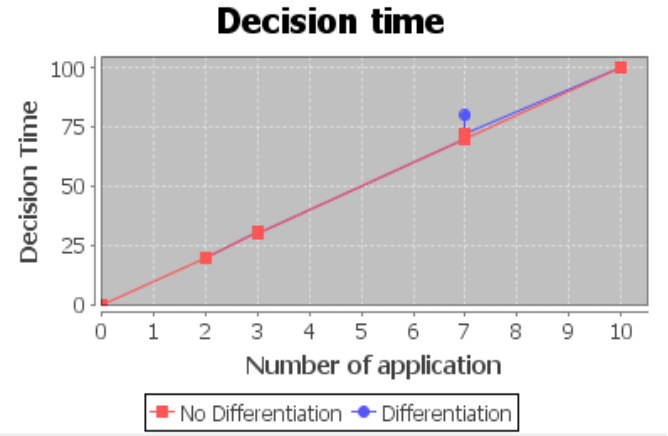


Fig 3 Decision time based on applications

Here the decision time shows that which is in multi level services providing cloud providers to the cloud consumers,based on priority ,and with out using priority. Based on this it shows No differentiation is like a single level, and differentiation is like a multi level services. Hence when no of applications increases then decision time also increases,and if no of applications decreases then decision time decreases.

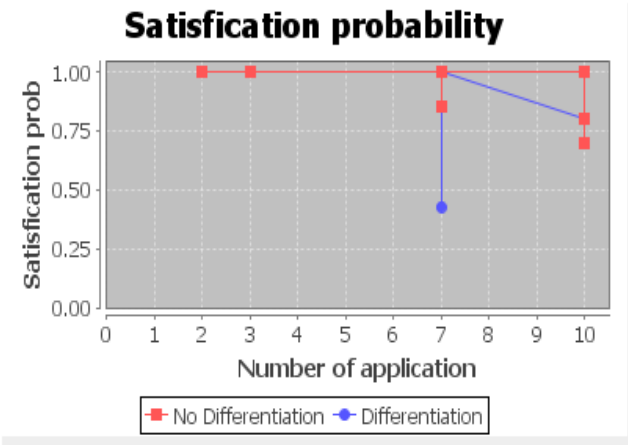
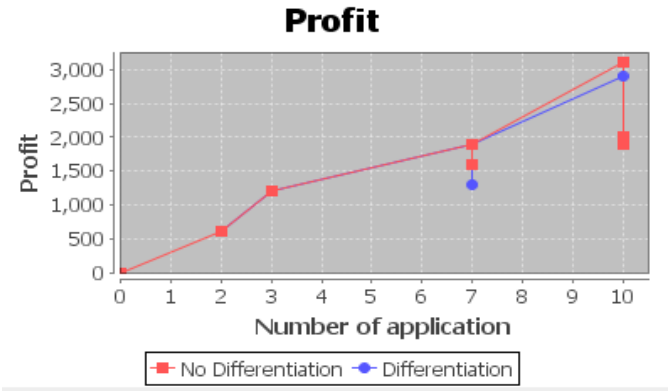


Fig4.Satisfaction probability about cloud consumers

Here the Satisfaction Probability means while cloud providers, main purpose is to satisfy the cloud consumers for giving their Services through Cloud computing. Then Cloud Consumers used the services, has what they are use that only they pay.So as Satisfaction Ratio should perform Efficiently.



Here it shows that based on the no of applications and its energy consumption ,we estimated the profit for single Level and Multi Level services (No Differtiation and Differtiation). Hence Profit becomes some times more and some times less based on resources utilization.

5.CONCLUSION

We presented the implementation of a system that Can scales each Application instances based on demand service policy.So here we using color bin packing problem and its extension is We have Evaluated our System by using CloudSim platform for varied number of tasks and measuring the Satisfaction Probability and profit on cloud. So In this System we developed an Efficient Multi-Level Service to distributes incoming user requests within the set of Equivalence classes.

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Kasapogu Swetha received B.Tech degree in Computer Science & Engineering from Kottam college of Engineering Chinna Tekur, Kurnool, affiliated to JNTUA College of Engineering, Anantapuramu, A.P, India, during 2008 to 2012. Currently pursuing M.Tech in Computer Science from JNTUA College of Engineering, Anantapuramu, A.P, India, during 2013 to 2015 batch. Her Area of interests include cloud computing, Network Security,Data mining.

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