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DESIGN AND IMPLEMENTATION OF CLOUD BROKER CLOUD BURSTING

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ABSTRACT

Cloud bursting is the process of integrating public cloud resources along with internal IT infrastructure. Hybrid cloud bursting can be a cost-effective way to deal with the increasing complexity of big data analytics, especially for iterative applications. Unfortunately, there is no comprehensive approach for treating the problems of cloud bursting. Most researchers try to tackle one of the aspects of cloud bursting process by suggesting frameworks or through reusing certain techniques to enhance the throughput. The emergence of cloud computing, industry is moving its applications and products into cloud as cloud environments are characterized by several features. It also offers a variety of services for various business ventures to improve their business offerings and to increase their revenue. With independent cloud service providers (CSPs) existing at present, it is challenging for users to choose an appropriate CSP. This, coupled with other challenges such as security, reliability, and user lock in, has given rise to the need for a cloud broker that can act as an intermediary between cloud customers and CSPs to connect them and to help them in making their business-critical decisions.

KEYWORDS: Cloud Computing, Bursting, Broker, Encryption

I. INTRODUCTION

Cloud computing has various deployment models such as public clouds, private clouds, community clouds, and hybrid clouds. It is classified depending on whom owns, manages and has the rights to use the resources and services of the cloud. Hybrid cloud is defined as a cloud infrastructure composed of two or more cloud infrastructures (private, public, or community clouds) that remain unique entities, but are bound together via technologies and approaches for the purposes of application, data portability, resource sharing, and service sharing application, data portability, resource sharing, and service sharing.

1.1 Cloud Bursting:

Cloud bursting is one of the cloud computing techniques that adopts hybrid cloud model. Cloud bursting still has issues that hinder it from being adopted widely as a solution for any business problems. One of these issues is the delay time consumed in moving the applications and its data to the public cloud when a sudden peak load arises in the private cloud.

1.2 Cloud brokers:

Cloud brokers play an intermediary role, to help customers locate the best and the most cost-effective CSP for their needs. A cloud broker is by far the best solution for multiple cloud orchestration (including aggregating, integrating, customizing, and governing cloud services) for SMEs and large enterprises. Major advantages are cost savings, information availability, and market adaptation.

1.3 Service Broker:

The Service Broker is a middleware, enables disparate system integration at run time. The Service Broker Compound pattern is comprised of Data Model Transformation, Data Format Transformation and protocol Bridging Patterns integrated together

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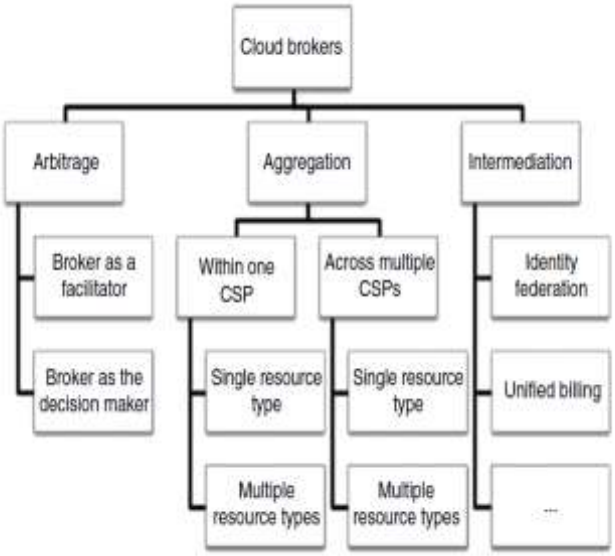

Figure 1: Classification of cloud brokers

II. MATERIALS AND METHODS

Abhijeet G Purohit et al [2] described load balancing in a public cloud by partitioning the cloud into several sub-clouds. This division of public cloud into several sub-clouds is done based on the geographical location. For that approach they use a central controlling system that monitors all the sub clouds. And also they have described a framework which can accommodate multiple suitable scheduling algorithms based on the status of the balancer system and the workload.

They also Comparison between some algorithms they are Token Routing, Round Robin, Randomized, Central Queuing, Least Connection.

Ms.Shilpa and D.Moreet [3] introduces a better load balance model for public cloud based on the cloud partitioning concept with a switch mechanism to choose different strategies for different situations. The algorithm applies the game theory for load balancing strategy to improve the efficiency in the public cloud environment.

The overall goal of this project is to balance the load on clouds. Balancing load on the cloud will improve the performance of cloud services substantially. It will prevent overloading of servers, which would otherwise degrade the performance. The response time will also improve. This software maybe used for efficient data storage on clouds and load balancing. This software will help dynamically allocate jobs (data) to the least loaded server. Thus overall performance of cloud services will not be affected. It aims at having a backup plan in case the system fails even partially. Also work is done to maintain the system stability. There are provisions to accommodate future modifications in the system.

Pooja and Mishra [4] studies on various policies in relation to the algorithms developed are analyzed using an analysis tool, namely, cloud analyst. Comparison is also made for variants of Round Robin (RR) algorithms.

The load distribution problem on various nodes of a distributed system is solved in the present work to improve both resource utilization and job response time by analyzing the variants of RR algorithm. The overloading and under loading situations are avoided. Thus, load balancing ensures that all the processor in the system or every node in the network does approximately the equal amount of work at any instant of time. The proposed algorithm shows better response time as compared to the other algorithms.

K. Mahurkar et. al. [5] presented, different approach to gain the solution of the OCRP algorithm is measured including deterministic corresponding formulation, sample-average estimate, and Benders decomposition. Numerical studies are at length achieved in which the results clearly show that with the OCRP algorithm.

In this paper they proposed the OCRP algorithm which is used to obtain optimal solution. OCRP algorithm uses Bender decomposition, Stochastic programming model, sample average approximation and deterministic equivalent formulation .OCRP result in reduction of the cost for resource provisioning. SAA method overcomes the provisioning problem with large set of scenario which is impossible to solve by deterministic equivalent formulation directly.

B. Wickremansinghe et. al. [6] presented payment intensive cost constraint cloud run flow scheduling algorithm. Algorithm considers execution cost in addition to execution time frame just as ones two press button

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considerations. Ones algorithm minimizes your current cost under certain consumer designated deadlines. The proposed methodology is actually mainly based on computational capability associated with Virtual Machines.

J. Kaur [7] introduced a brand new VM fill up Balancing Algorithm is actually Weighted Active Monitoring populate Balancing Algorithm applying CloudSim tools, due to the Datacenter to help efficiently load balance requests between ones exhibited virtual devices assigning the weight, in order to achieve far better performance parameters. Here VMs associated with different processing powers along with the tasks/requests usually are designated or perhaps issued on the all-powerful VM and then on the lowest so on.

III. RESULTS AND DISCUSSION

Load balancing schemes relying on whether the approach dynamics are main will also be both static and dynamic. Static schemes don't use the method information and are less elaborate whilst dynamic schemes will carry extra expenditures for the process however can change because the method repute alterations. A dynamic scheme is used right here for its flexibility.

- Round Robin Load Balancer
- Throttled Load Balancer (TLB)
- Active Monitoring Load Balancer (AMLB)

IV. PROPOSED WORK

If cloud partition is idle, many computing belongings can be decided and reasonably few jobs usually are arriving. In this dilemma, this cloud partition has the capability to method jobs as swiftly as you potentially can so an easy load balancing method will also be employed.

Algorithm Description: The Cloud Partitioning algorithm contains n cloudlets and loc points for each job.
In algorithm for loop is used and the value of i is initialized from (1….n)**loc[i]**

Algorithm 1: Best Cloud Partition Bases of Geographic Location and Load Status Evaluation finds the location of cloudlets. There are partition of number of resources and number of cloudlets. The loc[i] compares the number of resources cloudlets from partition1, partition2, and partition3 if the condition is less than the other partition it assigns the value of loc[i] to partition1 or partition2 or partiotion3.

```
Cloud partition algorithm (cloudlets[n])
{
//cloudlets is array of jobs
//loc point location of each job;
// n is number of cloudlets
fori=1 to n
 {
        loc[i]=find_location(cloudlets[i]);
        if(loc[i]=loc_of_partition1 and no_of_resources_cloudlet[i]< partition1_resources)
        {
                Assign cloudlet[i] to partition1;
        }
        if(loc[i]=loc_of_partition2 and no_of_resources_cloudlet[i] < partition2_resources)
        {
                Assign cloudlet[i] to partition2;
        }
        if(loc[i]=loc_of_partition3 and no_of_resources_cloudlet[i] < partition3_resources)
        {
                Assign cloudlet[i] to partition3;
        }
 }
}
```

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Flowchart of Proposed work: The flowchart describes that, firstly we initialize the value by 1 then check the number of location number if it false then the procedure will directly stops but if it is true then it checks three conditions for the location number:

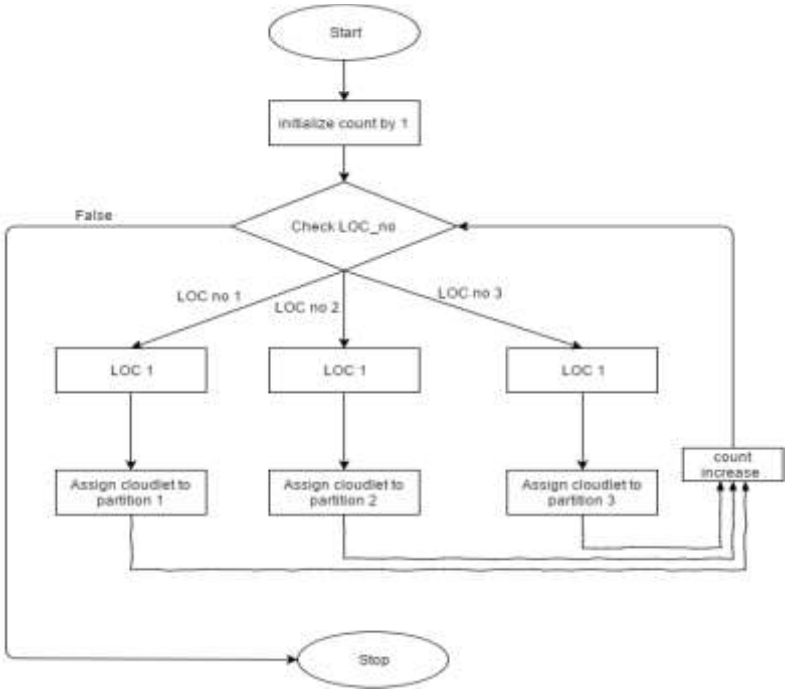

Figure 2 Flow Chart of Proposed System

- If location number is 1 then it assigns the cloudlets to partition1 and increases the count.
- If location number is 2 then it assigns the cloudlets to partition2 and increases the count.
- If location number is 3 then it assigns the cloudlets to partition3 and increases the count.
-

V. RESULT ANALYSIS

Existing system and proposed system implement on java using Eclipse (Kepler). Fist cloud user login on cloud then send resources request to the serve.

Cloud user and cloud server both can view resources request. Cloud server view resources request of all the uses. We compared parameters between existing and proposed system are following:

- Available memory
- Used memory
- Available RAM
- Used RAM
- Available VMs
- Used VMs

Resources details of each user for existing and proposed work are shown in below tables

Table 1: Used and Resources Details of Each User on Existing System

User Name	Availability Memory	Used Memory	Available RAM	Used RAM	Available VMs	Used VMs
test@gmail.com	55347376	600000	12000	4000	4	2
user@gmail.com	52605712	1400000	11700	4300	2	4
Test1@gmail.com	45085872	1410000	11300	4700	0	6

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Table 2: Used and Resources Details of Each User on Proposed System

User Name	Availability Memory	Used Memory	Available RAM	Used RAM	Available VMs	Used VMs
test@gmail.com	60344344	400000	15000	5200	6	2
user@gmail.com	56050660	150000	14700	5400	3	4
Test1@gmail.com	48085072	1210000	13000	3400	1	6

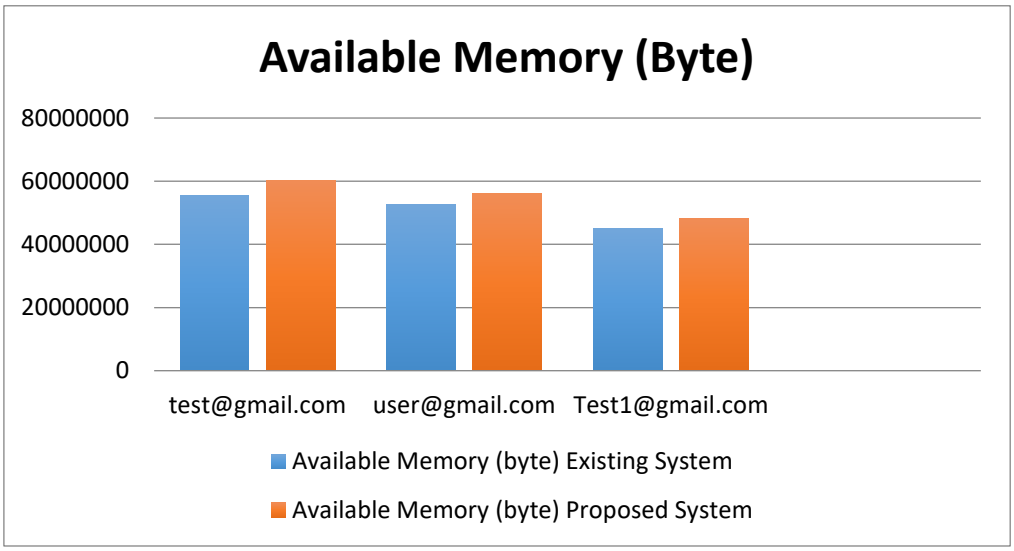

Figure 3 Available Memory comparison

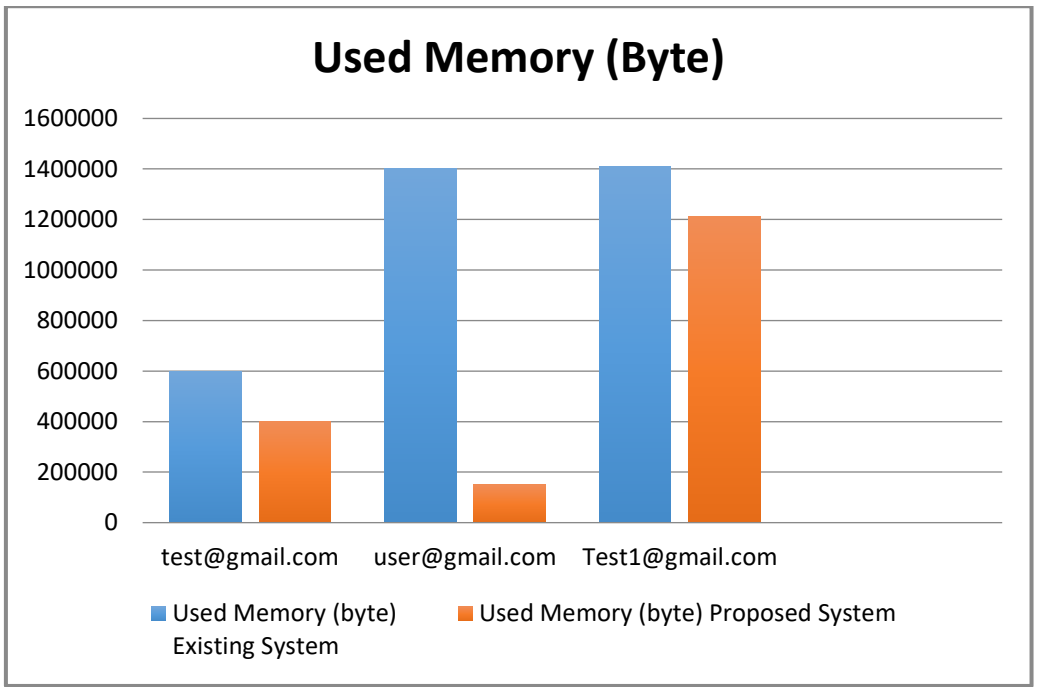

Figure 4 Used Memory comparison

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VI. CONCLUSION

Load balancing within the cloud-computing surroundings comes with an important outcomes on the efficiency. Just right load balancing makes cloud computing extra powerful and improves person pleasure. In working with many of our customers, we have found that application-tier cloud bursting uses a high level of technical style and correspondingly higher costs. Based on your needs, there may be alternate approaches to achieve essentially the same advantages. At the same time, public cloud providers are addressing some of the communication challenges with various types of direct connect offerings. For anyone who is contemplating using multiple clouds simultaneously, we can help you minimize complexity and avoid headaches. These approaches should reduce the barriers between clouds.

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