Resource Allocation and Data Provisioning for Data Centers in Cloud

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Abstract— The storage server based companies are getting increased like GO DADDY, BIG ROCK, NET4, SPEEDHOST and etc. Each server need to maintain their own storage server, it may leads to server overload. Due to this problem here we are introducing an intelligent scheme for dynamic resource allocation. The resource which is provided by infrastructure as a service (IaaS). The reason for using Infrastructure as a service is, this layer deals all types of storage and storage limitations which can be internally programmed. This method will be working under data provisioning methods. Each and every cloud servers will be internally connected under the security rules. The main advantage is, in case a sever space getting increased or got full means, the hand shaking method will automatically allot space in the next allocated server. A log file will be maintained for this resource allocation. In case of the current server will be getting some free space means, the allocated data will be transfers to the original source server. This process will not take much time duration; it will be done in a nano second. For this process the current server will be pay for another server. This process will be executed till last storage will be getting allocated. Here the policies are not over rules like stealing of data and security issues. This is because during the time of data re-allocation all the data and details will be encrypted dual times. During the time of retrieval the data will be again decrypted. This method was done using Quantum Cryptography. Without violating the policies this resource allocation can be done perfectly.

Key words: Cloud computing, secure data storage and transfer, IaaS (Infrastructure as a Service), Quantum cryptography

I. INTRODUCTION

Cloud computing is a general term that involves for anything in delivering hosted services over the Internet.

Many definitions have been presented for cloud computing [1, 2, 3]. From the three services Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS), (Iaas) type of service had been selected in the proposed system. The goal cloud computing is to apply traditional supercomputing, or high-performance computing power, normally used by military and research facilities, to perform tens of trillions of computations per second, in consumer-oriented applications such as financial portfolios, to deliver personalized information, to provide data storage or to power large, immersive computer games

The primary objective is to develop client server architecture between various data centers using data provisioning methods. Without increase in the storage space all data and request can be accessed. This lead to companies can invest less on their storage server. When even the native server's space got free, the current data will be transferred into the native storage without any conditions. It is done under priority storage method. Security policies will not be violated. Every rule comes under security policies. Infrastructure as a server has been implemented here which has more flexibility in storage servers. Data will be encrypted dual time, before and after reaching the native storage server. Quantum Cryptography is used for dual time encryption. The transfer data log can be maintained for monitoring the data transactions.

II. LITERATURE SURVEY

Nejad, M.M..et al [4] proposed a mechanism in which the users pass the request bundles for which the user do not have incentives. He performed extensive experiments with real workload traces to find the investigate and the proposed mechanisms achieve promising and appropriate results were extracted.

Quantum cryptography[10] relies on two important elements, they are -the Heisenberg Uncertainty principle and the principle of photon polarization. The author summarizes the current state of quantum cryptography with the real–world application implementation.

M. Elboukhari et al [11] introduced a scheme for integrating Quantum Cryptography in this protocol for authentication and data encryption.

S.no	Title	Author	Advantages	Disadvantages
1	Truthful greedy mechanisms for dynamic virtual machine provisioning and allocation in clouds[5]	Mahyar Movahed Nejad, 2015	Virtual machine temporary data provisioning involves new features and increased stability	Magnified physical features
2	A combinatorial auction-based dynamic vm provisioning and allocation in clouds[6]	Zaman, S., Grosu, D.	Overload avoidance, server improvements	Complex root cause analysis
3	Resource allocation challenges in virtual machine based IT environments[7]	Cherkasova et al (2007)	virtual machine sprawl	problem of allocating resources to the hypervisor
4	Efficient resource management for cloud computing environments[8]	Andrew J. Younge et al (2010)	Resource managing are efficient and usage of power, minimal performance overhead	High operating cost

5	Guest-aware priority based virtual machine scheduling for highly consolidated server[9]	Dongsung Kim et al (2008)	Minimal virtual machine design	Low response time

Table 1: Comparison of existing papers

III. PROBLEM DEFINITION

A. Magnified Physical Failures

Ten important servers running on one physical host and its RAID controller run amok, wiping out all of your hard disks. Already had two or three incidents from malfunctioning RAID controllers from well-known brands

B. Degraded Performance

There is no doubt that virtualization requires extra hardware resources. The problem is that it is almost impossible to estimate in advance how many extra resources will be needed, that there are capacity planning guides and tools but from my experience every piece of software behaves differently in a virtualized environment. We have applications that are quite modest as long as they run on a physical server, but when they were virtualized their resource requirement multiplied

C. Complex Root Cause Analysis

Virtualized a server certainly implies big changes to the whole system. A new layer of complexity is added and can cause new problems. However, the main difficulty is that if something doesn't work as it is supposed to, it can require considerable extra efforts to find the cause of the problem

D. Virtual Machine Sprawl

Even though virtual server management can get quite complex, installing a new virtual machine is a piece of cake. Just clone your master image to a new VM and you are done within a few seconds. The problem is that the number of servers might grow faster than the number of admins who are supposed to manage them. It is good that even virtual

IV. PROPOSED SYSTEM

Proposed system is to overcome the problems of the existing system and it comfortable for user satisfaction. The main objective of this project is to develop client server based architecture for resource allocation in a cloud data centre. Here the application used for this project will be providing web space for customers for their web hosting purpose. Each and every website should contain own web space for data storage purpose.

Now a day's storage server based companies are getting increased like GO DADDY, BIG ROCK, NET4, SPEEDHOST and etc. Each server need to maintain their own storage server, their cloud storage will be last up to 100 to 200 TB in minimum. For example Facebook needs minimum of 50 TB per month. Most of the companies will not take much interest in buying or increasing new cloud spaces, it's quite expensive also. Some companies may need maximum number of storage at a same time. Due to this problem here we are introducing an intelligent scheme for resource allocation.

These resources are provided as three different types of services: infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS). IaaS provides CPUs, storage, networks and other low level resources, PaaS provides programming interfaces, and SaaS provides already created applications. Here in our project we are dealing with storage resource allocation, which comes under the category of Infrastructure as a service (IaaS). The reason for using Infrastructure as a service is, this layer deals all types of storage and storage limitations which can be internally programmed. This feature is not available in other layers. Cloud providers form a large pool of abstracted, virtualized, and dynamically scalable resources allocated to users based on a pay-as-you-go model. This method will be working under data provisioning methods. Each and every cloud servers will be internally connected under the security rules. The main advantage is, in case a sever space getting increased or got full means, the hand shaking method will automatically allot space in the next allocated server. A log file will be maintained for this resource allocation. In case of the current server will be getting some free space means, the allocated data will be transfers to the original source server. This process will not take much time duration; it will be done in a nano second. For this process the current server will be pay for another server. This process will be executed till last storage will be getting allocated. Hand shaking with more servers will leads to increase in storage without buying new servers or increasing in cloud storage space.

So finally increase in server storage may leads to more expensive as per IaaS - Infrastructure as a service. Still this method is not implemented in any company due their company policies. But here the policies are not over rules like stealing of data and security issues. This is because during the time of data re-allocation all the data and details will be encrypted dual times. During the time of retrieval the data will be again decrypted. This method was done using Quantum Cryptography. Without violating the policies this resource allocation can be done perfectly.
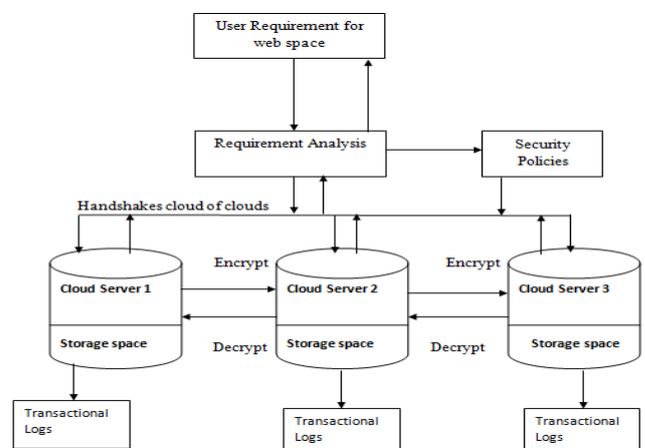
A. Architecture diagram

Fig. 1: Architecture Diagram of resource allocation

B. Advantages of Proposed System

1) Overload Avoidance

The capacity of a PM (Primary Machine) must satisfy the resource needs from all hand shaking server on it. Or else, the PM is overloaded and leads to provide less performance of its VMs

2) Green Computing

The number of PMs used should be optimized as long as they could satisfy the needs of all VMs. And Idle PMs can be turned off to save energy

3) Sever Improvements

The proposed system consists of number of servers, predictor, hotspot and cold spot solvers and migration list. Set of servers used for running different applications. Predictor is used to execute periodically to evaluate the resource allocation status based on the predicted future demands of virtual machines

V. RESULT ANALYSIS

The cloud admin is log in and connected to the particular company server to provide accessing of cloud storage; here the application used for this will be providing web space for customers for their web hosting purpose. Cloud and server are connected to provide Web domain purpose (WWW) World Wide Web for clients. Figure 2 shows the cloud of clouds admin.
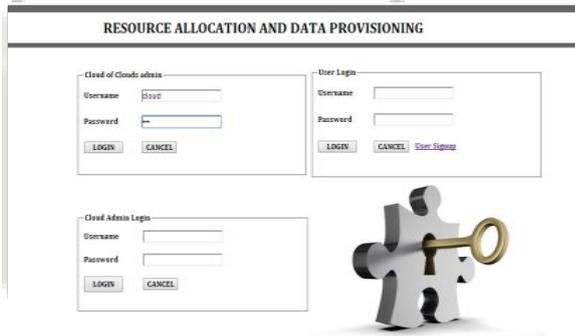

Fig. 2: cloud of clouds admin

Then Server details are updated and saved which contains the details like server name, server location, server ID, server space management; number of users, allocated bandwidth, data excess notification, security policies and etc. in this figure storage space provided by the company is 100mb for web hosting space to clients. Figure 3 shows the server creation and get notified.
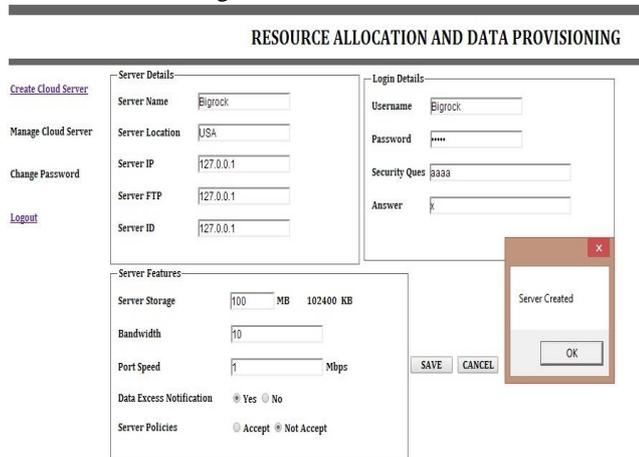

Fig. 3: Server is created and get notified

In this we create cloud server. When the server details and server features are updated then the server admin logged in to create server and get connected with the cloud. The server of Bigrock cloud admin enters the username and password to view the server details as well as total space, available space and number of users currently using their server space. The bigrock server admin checks the server details of available space details. Currently there is no users get allocated so the total and available space of 100mb is still available in server.

Manage users: It is used to view the details of client. This is used to store id information. In this all the server transactions will be monitored and stored as log file.
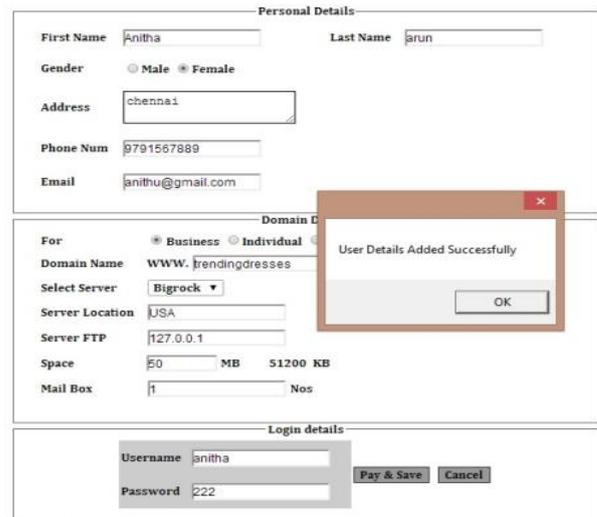

Fig. 4: users gets allocated

The no of users' signup with the required personal details gets allocated in the bigrock server which is selected in select server option and available domain is entered, here the user uses 10mb from the 100mb space provided by the server and this user is added in their server. Figure 4 shows the user allocation.
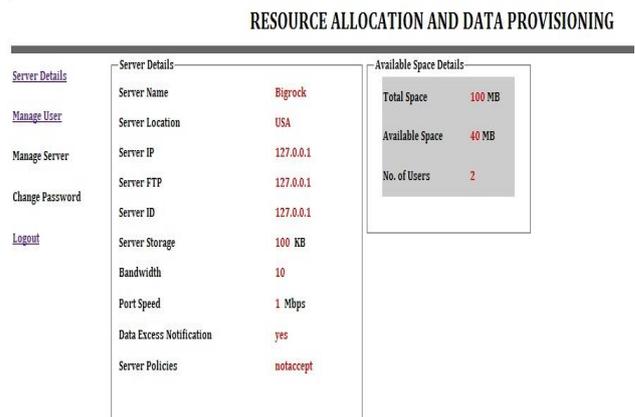

Fig. 5: Server details

Figure 5: shows the server details. The bigrock admin checks for the available space .The available space details are shown with the total space of 100mb in which available space is 40mb and number of users using the storage space is two of 60mb.

Transactional log: Transaction log is maintained to view the user personal details and how much they using in server storage space and what domain they are using it.

Fig. 6: notification of space exceeded

Figure 6: shows the notification of space exceeded. The storage space gets exceeded when third user wants 45 mb space. Then the user may select another server in select server option. The server admin get notified when the space is exceeded of 100mb.

The existing system compresses the data and allocates data in server so there may be chance of missing the data but in this paper the client data cannot be missed and highly security policies are implemented.

VI. CONCLUSION

In this paper, we propose an effective resource allocation and data provisioning for data centers in cloud of clouds. This construction drastically reduces the communication and storage overhead. These systems will works on single server model in an efficient manner. It is concluded that the application works well and satisfy the commitment. This is simultaneously accessed from more than one system. Further enhancements can be made to the application, so that the web site functions very attractive and useful manner than the present one. The speed of the transactions become more enough now.

VII. FUTURE ENHANCEMENT

The future enhancement works on the advanced file system distribution Each and every cloud server will be internally connected under the security rules. Security rules have been created according the www (World Wide Web) authority and Stack and Queue methods has been implemented for efficient data revocation

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