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Secured Resource Sharing Platform for Collaborative Cloud Computing

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Abstract: **Advancements in cloud computing are leading to a promising future for collaborative cloud computing, where globally-scattered distributed cloud resources belonging to different organizations or individuals (i.e., entities) are collectively used in a cooperative manner to provide services. Due to the autonomous features of entities in CCC, Issues in resource sharing must be addressed. The server will share its resources with the other by maintaining the data, Main cloud acts a broker and it plays a vital role between users and different cloud resources, User data is processed by main cloud. The main objective is to identify the optimum cost and efficiency of the sharing cloud. A Round Robin technique is used to schedule the cloud server that is sharing cloud will have different Service like SAS Cloud, IAS cloud Based on the cloud server requested by the user, Broker will first find list of cloud server who can process the Service. Then cloud server is allotted based on the optimum cost and performance.**

Keywords: **CCC (Collaborative Cloud Computing), Secured Resource Sharing Platform.**

I. INTRODUCTION

The term cloud computing can be defined as "a system that is concerned with the integration, virtualization, standardization, and management of services and resources". Cloud computing envisions ubiquitous access to a shared pool of configurable resources such as compute, storage, network, and software. The benefits of cloud computing include minimized capital expenditure, utilization and efficiency improvement, high computing power, location and device independence and finally very high scalability.

As shown in Fig. 1 Collaborative Cloud Computing platform interconnects physical to cloud customers. When a cloud does not have sufficient resources demanded by its customers, it finds and uses the resources in other clouds. Cloud customers are charged by the actual usage of computing resources, storage, and bandwidth. The demand for scalable resources in some applications has been increasing very rapidly. For example, Dropbox currently has five million users, three times the number last year. A single cloud may not be able to provide sufficient resources for an application (especially during a peak time). Also, researchers may need to build a virtual lab environment connecting multiple clouds for petascale supercomputing capabilities or for fully utilizing idle resources. Indeed, most desktop systems are underutilized in most organizations; they are idle around 95 percent of the time. Thus, advancements in cloud computing are inevitably leading to a promising future for collaborative cloud computing (CCC), where globally- scattered distributed cloud resources belonging to different organizations or individuals collectively pooled and used in a cooperative manner to provide services.

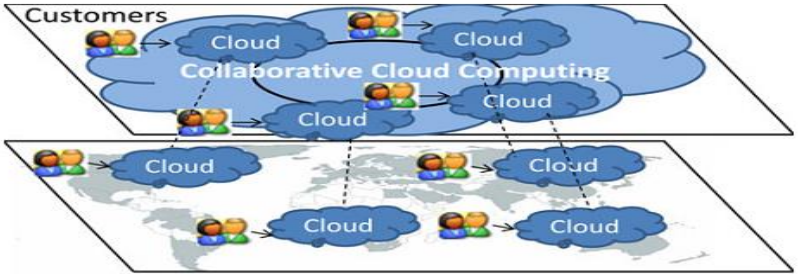

Fig 1: Collaborative Cloud Computing

II. RELATED WORK

In this paper [**1**] CTrust framework addressed for the security purpose by connecting various kinds of Virtualization Technology (VT) process in order to access resources like storage, network, and software. Secure Hypervisor framework (SecHYPE) makes the root trust for the cloud running application. Currently cloud computing techniques mostly used in e-commerce, online auctioning companies even though cloud computing connecting different types of system without regarding underlying architecture of computer system security issues is the major threat in the cloud computing. The National Institute of Standards and Technology (NIST) makes the research in the field of security as a primary concern on the cloud computing. Software abstraction has been used to create hardware and operating system coupling each other in order the cloud applications. This paper gives the detailed information about security analysis, system analysis, and cryptographic key management.

In this paper [2] makes the detail study about internet security problems, the major security problems are worms, spam and phishing attacks. In order to overcome the following problem they proposed Unified Threat Management (UTM) which is used to module and connects different types of networks. Intrusion Detection System (IDS) evolved quickly to the Distributed Denial of Service (DDoS) strings for identifying the signature steps to detected viruses. Collaborative Network Security Management System (CNSMS) creates the new integrated environment for developing Unified Threat Management (UTM). This paper mainly focuses on the security centre for the traffic data analysis and process to store large amount of data.

In this paper [3] Collaborative Cloud Computing is used to support very promising trends in cloud information extraction techniques. Retrieving of information from the different user is not that much possible and easy hence we could access data directly from the storage devices by using Neural Network (NN) based system. Artificial Neural Network (ANN) mechanism tends to activate the inputs function with the help of output values this technique used to get the information at the same time without any kind of additional efforts. This paper makes use of the learning system based on the Neural Network which reduces single point failure and removes all the problems lying in the cloud computing hence it gives out efficient and effective extraction of information for the collaborative cloud computing.

In this paper [4] Use of cloud computing with the collaboration of Multi cloud environment where cloud providers access software, platform, and infrastructure as the pay per use basis and gaining huge attention as per industrial expectations. The user used to gain the access to the cloud services but at the same time user gets vendor lock in therefore user as to access particular cloud service providers for low cost management to authentication to multi service providers. Security issues generated with the mash up centre should be around the service providers while implementing nodes on the cloud server. The main issues in the multi cloud environment performing task on the distributed service hence the collaboration framework for multi cloud system can be implemented. Different types of proxy techniques like proxy based framework, cloud hosted proxy, Peer to Peer proxy, and on – premise proxy are used for the security issues. This paper describes various research parameters on the multi cloud environment in order to provide low cost functionalities.

In this paper [5] cloud computing providers gives the bigger opportunity in order to deploy complex information technique as the infrastructure to the end user. Therefore cloud service needs very strong cloud control frame work which can orchestrate cloud resources like utilization, configuration, provisioning and decommissioning around physical resources. Infrastructure as a Service (IaaS) environmental model provides Virtual Machine (VM) as an operating system and hence make cloud server as the sophisticated combining virtual private cloud instance. This paper used to advocate a data centric approach for the cloud resource orchestration. Orchestration data format are structured and defined by using transactional semantics.

In this paper [6] cloud computing becomes very popular on the internet based paradigm hence cloud services provides users with IaaS (Infrastructure as a Service), Paas (Platform as a Service), SaaS (Software as a Service) but internet application might be still challenging for the cloud computing. While data centers is very much important to the internet services for providing Quality of Services (QoS). When the concurrency of Internet services burst beyond the data centre capacity, QoS cannot be ensured. This paper they focused on the internet based Virtual Computing Environment (iVCE) which is used to connect data centre and cloud computing resources. They designed and implemented the iVCE software model in order to provide economical cloud services.

In [7] the authors have proposed mercury designed for a scalable protocol to support multi attribute searches and explicit load balancing. Query conjunction ranges in more attributes which is not presented on the wild cards. They developed two important aspects for the query designing principles. First, Routing hub is created by multi attribute queries for the each

attribute, queries are passed to one hub which is corresponds to the attributes, and a new data has been sent to the entire hub in the associated format. Secondly, In order to support queries, mercury used to organize routing hub circular way for contiguously ring (i.e.) each attribute as a very high range of values for each node. A load balancing algorithm ensures load to be routed in the uniformly manner which is distributed across to different types of participating nodes. This paper help us to show how the mercury as been used to solve key problems for the distributed applications.

In [8] the authors have proposed Peer to Peer (P2P) reputation system which is used to perform trust able participation on the Peer data distribution which is used to feedback global reputation scores. Developing the decentralized server in the reputation method is very difficult because most of the Peer to Peer (P2P) application works on the unstructured internet platforms therefore it a huge challenge to perform unstructured reputation in the Peer to Peer (P2P) computing. In the traditional reputation system, when the peer used to complete transaction it makes the global reputation scores by computing local rates (i.e.) feedbacks hence reputation technique used to make decisions based on the trust. This paper they introduced new method called Gossip Trust which is used computes the reputation scores concurrently by all the nodes, result of the following experiments demonstrate overhead, storage, and scoring accuracy in the unstructured Peer to Peer (P2P).

In this paper [9] they described a detailed study about how cloud computing can be used to deployed to perform by orchestration in an very high complex set of sub system operations like storage, allocation of the resources to the network. In order to process the following process they introduced technique called Cloud Orchestration Policy Engine (COPE) in a distributed platform for the automated resource orchestration. COPE gives cloud server a detailed description about objectives and customer requirements in a policy specification methodology. This paper they have given new technique that how they integrate current result with the cloud orchestration environment of COPE (Cloud Orchestration Policy Engine).

In this paper [10] Peer to Peer (P2P) online networking is the most efficient platform at the same time very much security threat is generated hence trust worthiness should be maintained around the cloud server environment this paper gives elaborate study and present detail of reputation based Peer Trust mechanism for comparing and quantifying data based on the feedback engines and implementation of such model over structure Peer to Peer (P2P) network. Authors have introduced three types of trust parameters like feedback in terms of amount of satisfaction, number of transaction, and credibility of feedback and they described two types of adaptive factors like transaction context factor, and community context factor hence these two techniques trust parameters and adaptive factors used to compute peers trustworthiness. Trustworthiness is based on following fact received peer from other peers and total number of transferred peers. Secondly they defined combination trust metric with the following terminology.

III. ISSUES IN CURRENT ENVIRONMENT

The three tasks must be executed in a distributed manner since centralized methods are not suitable for large-scale CCC. However, though many distributed resMgt and repMgt systems for grids have been proposed previously, and cloud resource orchestration (i.e., resource provision, configuration, utilization and decommission across a distributed set of physical resources in clouds) has been studied in recent years, these two issues have typically been addressed separately. Simply building and combining individual resMgt and repMgt systems in CCC will generate doubled, prohibitively high overhead. Moreover, most previous resMgt and repMgt approaches are not sufficiently efficient or effective in the large-scale and dynamic environment of CCC. In the social networking sites provides only the digitalized friendship and cloud computing is only a emerging process and managing resources and Pricing them is a challenging Task. There is no win - win situation between resource providers and Users. In the existing system there is no proper management of resources and there is no priority for sharing the services.

IV. PROPOSED METHOD

Social Networking of Process is combined with the Cloud Computing Process to Form New Component Called as “Social Cloud Computing”. Using this Process the Resources can be shared among the Social Cloud Servers Which Would Provide Effective and Uninterrupted Support for the Users. Resource sharing can be Volunteer, Reputation, Posted Price or even Auction Based Activity.

Main Cloud act as Broker and it plays a vital role between users and Different Cloud Resource Providers. User will the Data and then Processed by the Broker. Sharing Cloud service will specify their Cost & Efficiency to Perform the Job.

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The main Objective is to identify the Optimum Cost and efficiency of the Sharing Cloud. A Round Robin technique is used to schedule the Cloud Server that is Sharing Cloud will have different Service like SAS Cloud, IAS Cloud so we have multiple Cloud Server with Multiple Service .Based on the Cloud Server requested by the User Broker will first find list of Cloud Server who can process the Service. Then Cloud server is allotted based on the Optimum Cost and Performance .Round Robin base Sharing allotment is assigned to the different Cloud Server

V. COLLABORATIVE CLOUD COMPUTING (CCC)

Cloud computing can be used to deployed and perform various orchestration in an very high complex set, therefore sub system operations like storage, allocation of the resources to the network has been order in order to process the following process they introduced new technique called Cloud Orchestration Policy Engine (COPE) in a distributed format, hence the automated resource for orchestration COPE has been given to the cloud server for a detailed description of objectives and customer requirements in a policy specification methodology. They have integrated the current results with the cloud orchestration environment of COPE (Cloud Orchestration Policy Engine). Peer to Peer (P2P) online networking tool is the most efficient platform and also much security threat has been generated hence trust worthiness should be maintained around the cloud server. Reputation based Peer Trust mechanism used for comparing and quantifying data in the feedback engines and implementation of such model over structure Peer to Peer (P2P) network has been carried out. Two types of adaptive factors like transaction context factor, and community context factor has been evolved hence these two techniques trust parameters and adaptive factors for the compute peers trustworthiness. Trustworthiness is based on following fact received peer from other peers and total number of transferred peers. Secondly they defined combination trust metric with the following terminology based.

VI. ARCHITECTURAL DIAGRAM

The sharing of resources over collaborative cloud computing consists of different module in order for efficient transfer of data. Fig 2 depicts the overall architecture of the proposed system.

Fig 2: Architectural Diagram

A. Network construction: First the user has to construct the network and establish a connection between each node. The user must give the total number of nodes as input and also the name for each node must be given. After giving the name or IP address of each node the user must make a one-way communication or two way communications between each node. Thus network construction should be made.

B. Cloud Server: The Server Module, it is the controller module for control the total network. Also the cloud servers will respond to the queries that are sent by the clients in the network. These serves only maintains the all details such as peer name, IP Address, and Port Number for all the peers in the network. Resource Allocation is also done the cloud servers. The Resource Allocation by the following four methods as Explained below.

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1. Resource Allocation using Reputation Method: In this method the resource is allocated using by Reputation method. If the Requested cloud server doesn't have the enough cloud space to finish the job means, the Cloud server will request the cloud server which has previously got the response from the Cloud server (Cloud server which now requesting the resource).

***2. Resource Allocation using Fixed Price Method*:** Here if the requested cloud server doesn't have the enough cloud space to finish the job means, the cloud server which has the enough space will provide the space for fixed price. For example, if the resource of 10 GB is requested to the Cloud server which has 6GB. In this case the cloud server will get the additional space from another cloud server for some fixed price.

***3. Resource Allocation using Volunteer Method:* Here** if the requested cloud server doesn't have the enough cloud space to finish the job means, the cloud server which has the enough space will provide the space voluntarily. So the job will be finished easily.

***4. Resource Allocation using Auction Method*:** Here if the requested cloud server doesn't have the enough cloud space to finish the job means, the cloud server will send the request to all Cloud servers, so the each server will provide the cloud space for the some cost. In this case the Cloud the server can obtain the Cloud space at low cost.

***C. File upload / download*: Any** node can search for any particular file and it can download the particular file if that file is available in some other nodes. Likewise a user can upload any file to specified location.

VII. ALGORITHMS USED

Round-Robin Scheduling Algorithm - It is one of the oldest, simplest, fairest and most widely used Scheduling algorithms, designed especially for Resource sharing Systems. Round-robin (RR) is algorithms employed by process and network schedulers in computing. As the term is generally used, time slices are assigned to each process in equal portions and in circular order, handling all processes without priority (also known as cyclic executive). Round-robin scheduling is simple, easy to implement, and starvation-free. Round-robin scheduling can also be applied to other scheduling problems, such as data packet scheduling in computer networks. It is an Operating System concept. The name of the algorithm comes from the round-robin principle known from other fields. In order to schedule processes fairly, a round-robin scheduler generally employs time-sharing, giving each job a time slot or quantum (its allowance of CPU time), and interrupting the job if it is not completed by then.

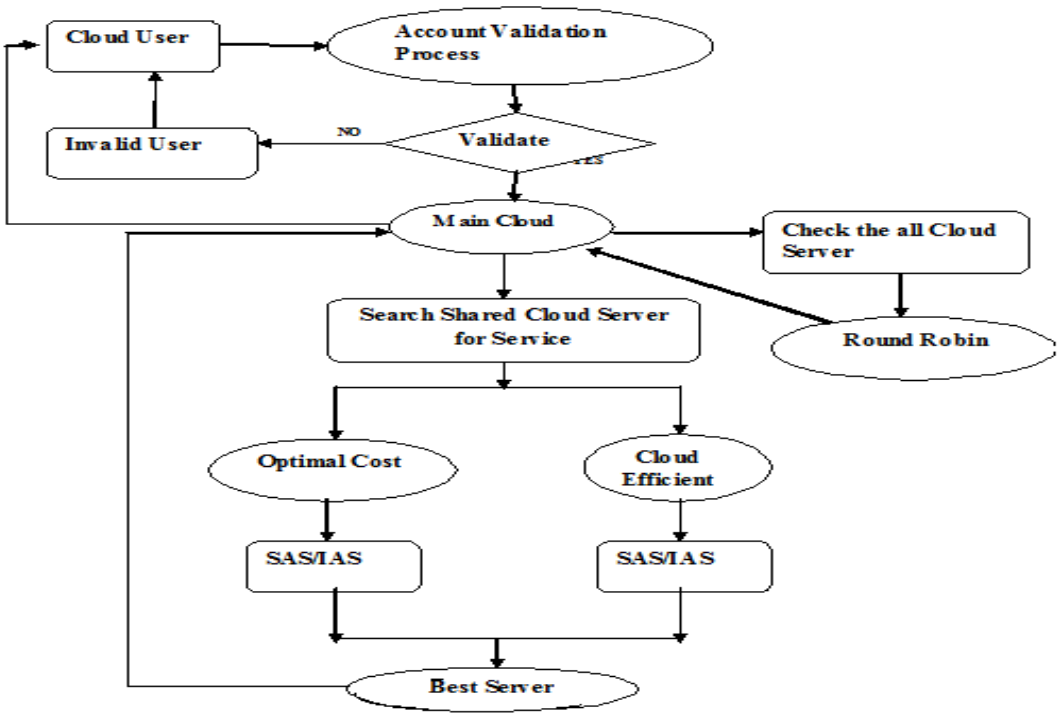

Fig 3: Flowchart Diagram

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Algorithm

ROUND_ROBIN_RESOURCE_SHARING ()

{

Initialize the MySpace, Volunteer Space, and ReputationSpace

If space is available in CLOUD SERVER in MySpace

File is uploaded in MySpace

Else if space is available in CLOUD SERVER in Volunteer Space

File is uploaded in VoulnteerSpace

Else if space is available in CLOUD SERVER in ReputationSpace

File is uploaded in ReputationSpace

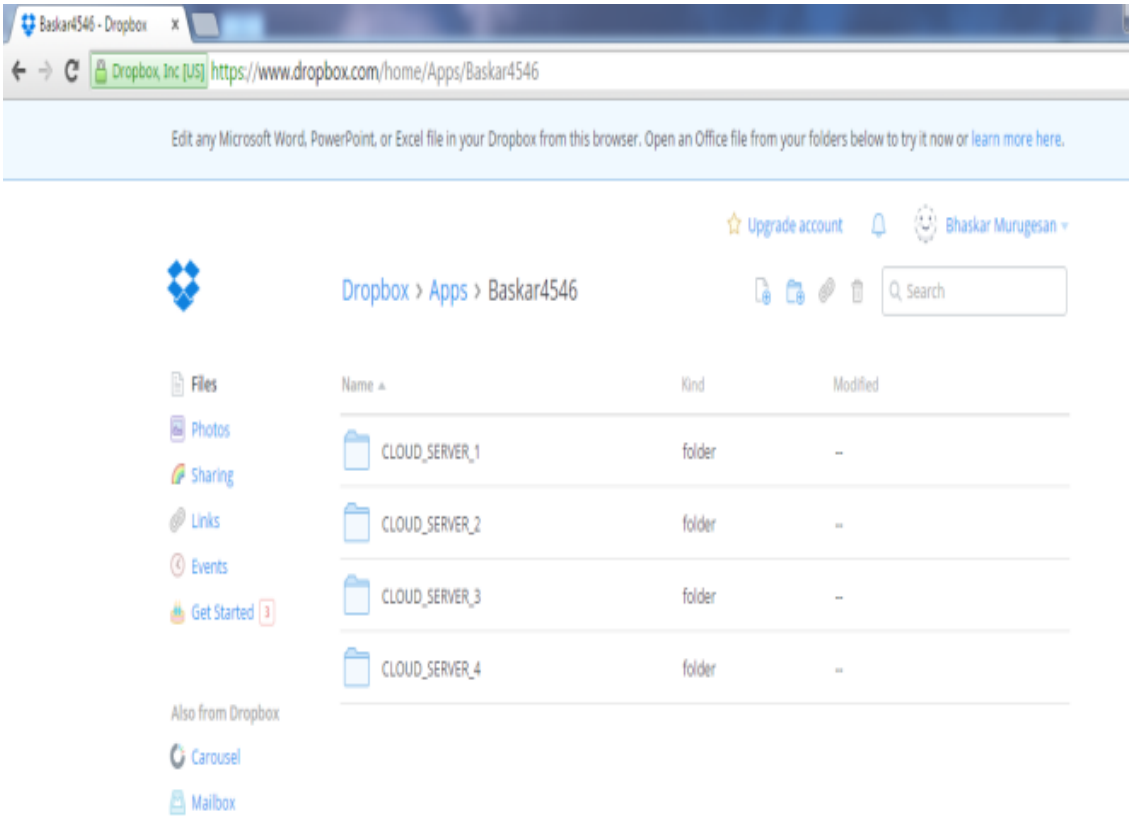
Else

File is uploaded in CLOUD SERVER based on cost

}

The main advantage of this algorithm is that it utilizes all the resources in a balanced order. An equal number of VMs are allocated to all the nodes which ensure fairness. However, the major drawback of using this algorithm is that the power consumption will be high as many nodes will be kept turned-on for a long time. If three resources can be run on a single node, all the three nodes will be turned on when Round Robin is used which will consume a significant amount of power.

VIII. RESULT



The above diagram depicts the account created in Dropbox and segregation of Clouds in the Dropbox cloud service provider. Data files uploaded are stored in the above mentioned clouds.

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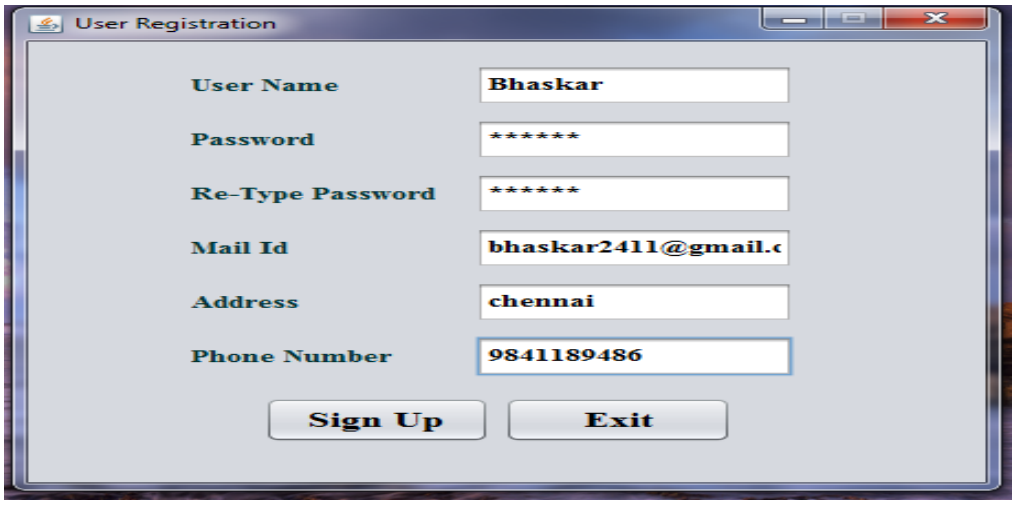
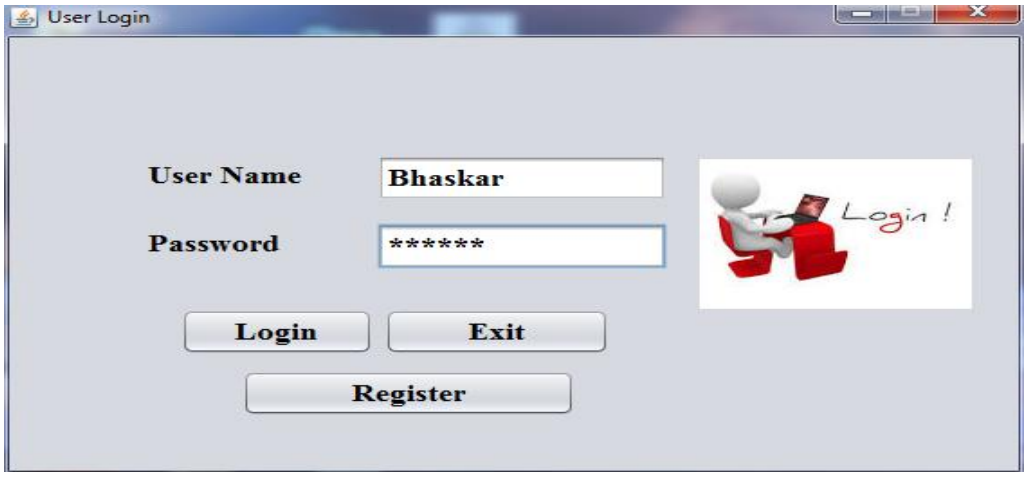
User Registration

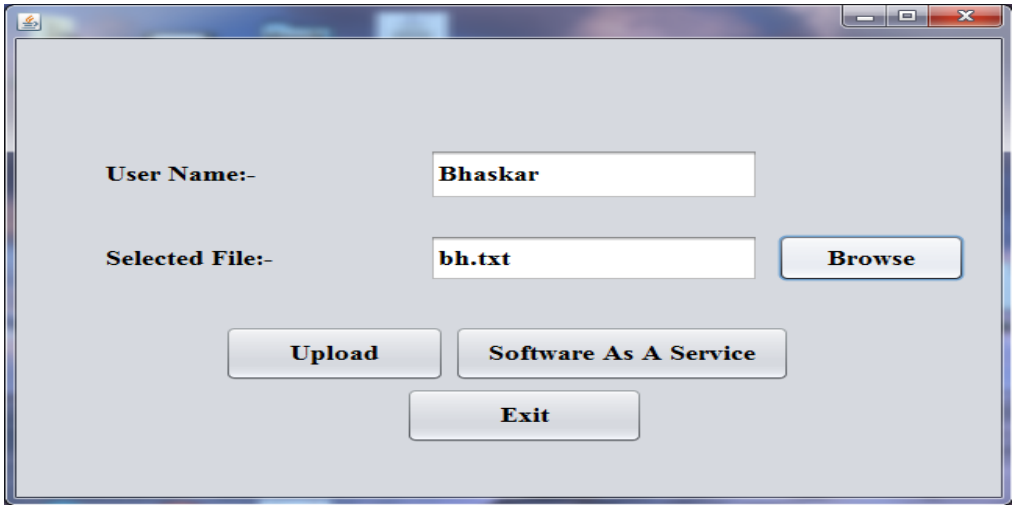


In the User registration Page we are creating user with the required information in order to upload the files. Once user registered their details they can login any time to upload the information in the cloud service provider.

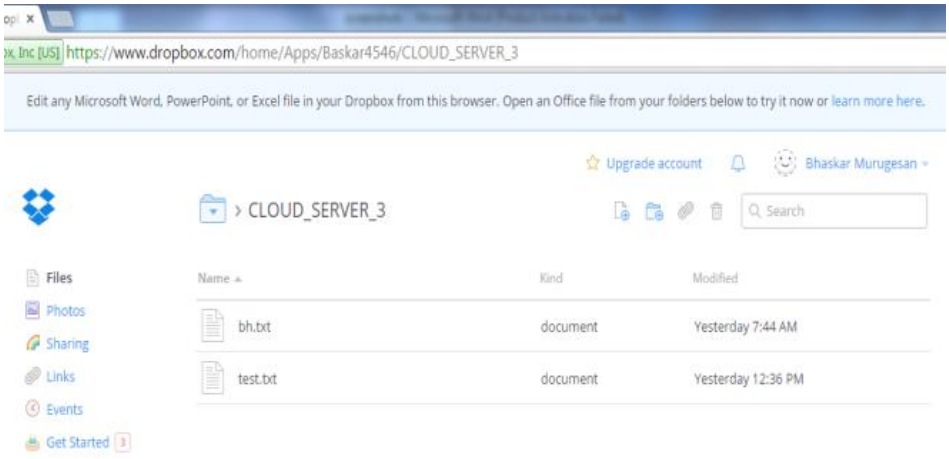


The above mentioned diagram displays the user log in screen. Once registered users can login with the assigned user name and password in order for them to upload the files in the cloud.

File Upload screen



Files can be uploaded from the specified path. The screen shot above shows the files being uploaded.



The above mentioned diagram displays the files that are uploaded by the user in one of the clouds which is created in the Dropbox cloud server provider

IX. CONCLUSION

Information exchange in cloud computing has become essential. The fundamental idea of the approach is to implement a mediator server which acts as a broker. Broker plays a vital role between users and resource providers. User will request the data and then processed by the broker. Service providers will specify their cost & efficiency to perform the job. The main objective is to identify the optimum cost and efficiency of the grid resource providers.

For security of data the encryption is proposed which ensures safety for the data owners. Service providers are deployed with multiple jobs. Based on the job requested by the user, Broker will first find list of resource providers who can process the work. Then work is split and allotted based on the optimum cost and the performance. Round robin based work allotment is assigned to the different grid servers.

REFERENCES

[1] CTrust: A Framework for Secure and Trustworthy Application Execution in Cloud Computing. (Satyajeet Nimgaonka, Srujan Kotikela and Mahadevan Gomathisankaran) ISBN 978 – 1 – 62561 – 001 - 0.

[2] Cloud Computing – based Forensic Analysis for Collaborative Network Security Management System. (Zhen Chen, Fuye Han, Junwei cao, Xin Jiang, and Shuo Chen) TSINGHUA SCIENCE and TECHNOLOGY ISSN 1007 - 0214 05/12 pp 40-50 Volume -18, no -1, Feb 2013.

[3] An Efficient Information Retrieval Approach for Collaborative Cloud Computing. (B.Hema Mrs.R.Hemalatha) ICMACE-14.

[4] A Review of Collaboration of Multi-Cloud- An Effective Use of Cloud Computing. (Swaraj P.Thakre, and Prof R.Chopde) IJAIEM Volume 2, Issue 3, Mar 13.

[5] Cloud Resource Orchestration: A Data Centric Approach. (Chanbin Liu, Yun Mao, Jacobus E. Vander Merwe, and Mary F.Fernandez) CIDR 11 Jan 9-12, 2011.

[6] Internet – based Virtual Computing Environment Beyond the Data Centre as Computer. (Xicheng Lu, Huaimin Wang, Jiwang, Jie xu, and DongSheng Li) Doi:10:1016/j Future 2011.08.005.

[7] Mercury: Supporting Scalable Multi Attribute Range Queries. (Ashwin R. Bharambe, Mukesh Agrawal, and Srinivasan Seshan) SIGCOMM.'04, Aug30 – Sep3, 2004 Portland Oregon USA. ACM 1 – 58113 – 862 - 8/04/0008.

[8] Gossip – based Reputation Aggregation for Unstructured Peer to Peer Networks. (Runfang Zhou, and Kai Hwang) IPDPS 2007Long Beach CA. March 27-29, 2007.

[9] Declarative Automated Cloud Resource Orchestration. (Changbin Liu, Boon Thau Loo, and Yun Mao) ACM 978 – 1 – 4503 – 0976 - 9/11/10.

[10] PeerTrust: Supporting Reputation based Trust for Peer to Peer Electronic Communities. (Li Xiong, and Ling Liu) IEEE conference on E – commerce (CEC'03).