Efficient Cloud Storage for Multi User Pattern Using Machine Learning based Technique

T.Keerthana[*1], Dr.S.Jhansi Rani [#2], Associate Professor and S.S. Nandini [#3,] Research Scholar

Department of Computer Science and System Engineering, Andhra University College of Engineering, Vishakhapatnam, Andhra Pradesh.

*Abstract-*Nowadays almost all the organizations try to share their interest around cloud computing approaches for storing and accessing the files in remote servers rather than store and access from local machines. Apart from this, the data increase is gradually creating workload for the cloud service providers to meet the consumer needs. As there was lot of data increased in cloud server, single cloud service provider cannot able to give access for all the clients and hence there was several service providers came into real world for giving storage and access permissions. But the way to select the suitable service provider is still an impediment. This mainly motivated me to propose this article in which we try to launch a pattern based service negotiation technique for efficient data storage. Here this method will try to choose a plan according to the type of data which is allocated by the client and no extra burden should be incurred for the end users. This method has been implemented with an improved suggestion feature, which provides users with similar patterns recognized from their past entries to assist the users with their currents election. If this service is launched in current cloud servers, the cloud users can benefit from storing the data under the recommended storage area. This recommendation is purely avoiding excess storage problems for the end users while they want to store and access the information. In order to implement this concept we try to use the Machine Learning approach for performing the proposed application and we also use K-NN for finding the distance among suggested cloud services.

Index Terms:

Cloud Service Provider, K-Nearest Neighbor Algorithm, Data Consumer, Data Provider.

1. INTRODUCTION

In current days cloud computing is facing a lot of security challenges from different parts of the world due to increased data storage and API-driven automation. In the current days all the cloud servers are not providing complete privileges for the end users to choose the accurate plan for storing and accessing the information to and from the remote location. There are several measures which restrict the plan selection such as lack of knowledge for the end users, less optimization methods, low secure access and soon. Hence all the data consumers or providers fail to choose less cost for storing and accessing the file.
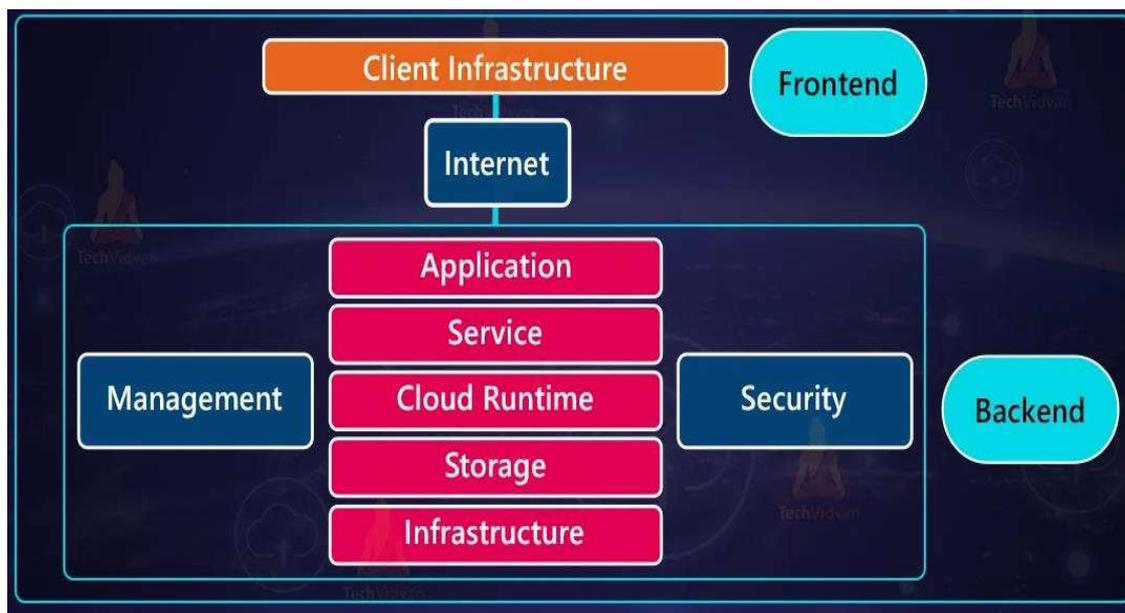
Figure.1 Represents the Cloud Computing Security (CCS) Architecture

From the above figure 1[8], we can clearly identify that CCS has several components and allthecomponentsaremainlyconnectedthroughtheinternet.Herewehavetwomaincategories: One is Client Infrastructure and other one is back end management. Initially the client infrastructures developed by the cloud service providers and for that front end we try to connect the back end with the help of the internet. In the back end we can see some components such as: application, service, cloud runtime, storage and infrastructure. For all the components we can see a common security component which is going to provide security for each and every individual component which is present in the CCS.

In general we concentrate on back end management for providing security of cloud data storage because all the data which is uploaded into the cloud server will come under backend management. In general for storing any information we need back end support so that storage of dataispossibleunderbackend.Incurrentmulticloudenvironmentlotofuserstrytoconnectfrom several locations for storing and accessing the file in heterogeneous manner(I.e. No two cloud consumerscanguaranteesametypeofdatawithsameparametersarestoredandtheyaccesssame type of storage space).Hence this is main motivation for developing cloud based technique for storing and access the information.

2. LITERATURESURVEY

In this section we will mainly discuss about the background work that is carried out in order to prove the performance of our proposed Method. Literature survey is the most important step in software development process. For any software or application development, this step plays a very crucial role by determining the several factors like time, money, effort, lines of code and company strength. Once all these several factors are satisfied, then we need to determine which operating system and language used for developing the application. Once the programmers start building the application, they will first observe what are the pre-defined inventions that are done on same concept and then they will try to design the task in some innovated manner.

MOTIVATION

Two well known authors, P. Mell and T. Grance ,et.al, proposed a paper and described cloud computing as a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models[1].

Hoang T.Dinhetal., [2] have explained that there is a growth of the mobile applications and growing of cloud computing concept, mobile cloud computing(MCC)has been introduced for mobile services. In this paper, they explained that about the definition, architecture and applications.JonathanChaseetal.,[3]have discussed about the network applications in cloud computing. They propose an approach that integrates virtual machine and network bandwidth provisioning.

Two well known authors, H. Li, and W. Sun ,et.al, proposed a paper and described cloud computing [4] has been gradually considered the most significant turning point in the development of information technology during past few years. People reap the benefits from cloud, such as ubiquitous and flexible access, considerable capital expenditure savings, pay-as-you-go computing resources configuration, etc. Many companies, organizations, and individual users have adopted the public cloud storage service to facilitate their business operations, research, or every day needs. However, in the outsourcing cloud computing model, users' physical control of the underlying infrastructure including the system hardware and lower levels of softwarestack,is shifted to third-party public cloud service providers, such as Drop box, Google Drive, Microsoft Skydive and so on. In addition, the sensitive data of users are also out sourced to ands to red in the cloud, e.g., they may upload emails, photos, financial reports, and health records to the cloud[7] .Thus, the potential private information leakage and integrity of the outsourced data is one of the primary concerns for the cloud users. This paper focuses on the enabling and critical cloud computing security protection techniques and surveys on the recent researches in these areas. In addition, we further point out some unsolved but important challenging issues and hopefully provides insight in to their possible solutions.

Dr.P. Chitti Babu et al.,[5] have discussed about the fog computing as it is application of cloud computing . Cloud computing is an application based software infrastructure that stores data on remote servers, which can be accessed over the Internet. They are mainly explained about the security issues while storing of large amount of data.

Chittumothu Srividhya etal.,[6] propose a three-layer storage framework based on fog computing. In this framework they are using bucket concept based algorithms and secure the data information and then it can show the security and efficiency in their scheme.

3. EXISTING SYSTEM AND ITS LIMITATIONS

In the existing cloud servers, there was no concept like recommendation of storage services by the service providers. All the primitive cloud servers try to create some pre-defined plans for the data users who want to register and store their sensitive information into the cloud server. The data users need to choose one plan prior to the data storage in order to get one account. The cloud users don't have prior knowledge about the several cloud service providers and how they are differed one with other for storing and accessing the files.

Limitations of the Existing System:

1) All the existing schemes are limited to the static allocation of storage space.

2) All the current cloud servers have no recommendation of services facility.

3) The current cloud servers have no security to choose different plans according to their

   type of data which they are willing to store.

4) The current cloud servers are creating lot of wastage of space and creating complexity in terms of storage cost for the end users.

5) The current clouds are not efficient in providing dynamic cloud storage service based on user type of data.

4. PROPOSEDWORK AND ITS ADVANTAGES

The proposed cloud environment is aimed at protecting users cost and time while storing data in a CSP. To solve the increasing server negotiation challenges, a pattern-based service negotiation method has been utilized in this research work. This method has been implemented with an improved suggestion feature, which provides users with similar patterns recognized for their past entries to assist the users with their current selection. By launching this type of service, the cloud users can get benefited in storing the data under recommended storage area. These recommendations will avoid excess cost for storing and also provide reliability for the end users to store and access the data. In order to implement this concept we try to use Machine Learning approach for performing the proposed application and we also use K-NN for finding the distance among suggested cloud services.

Advantages of the proposed system:

1. The proposed schemes are allocating space dynamically for the end users.

2. The Proposed system has recommendation of services facility.

3. The proposed cloud servers have security to choose different plans according to their type of data which they are willing to store.

4. The proposed system reduced a lot of time and cost complexity while storing and accessing the data.

5. These recommendations will avoid excess cost for storing and also provide reliability for the end users to store and access the data.

5. THE PROPOSED ARCHITECTURE
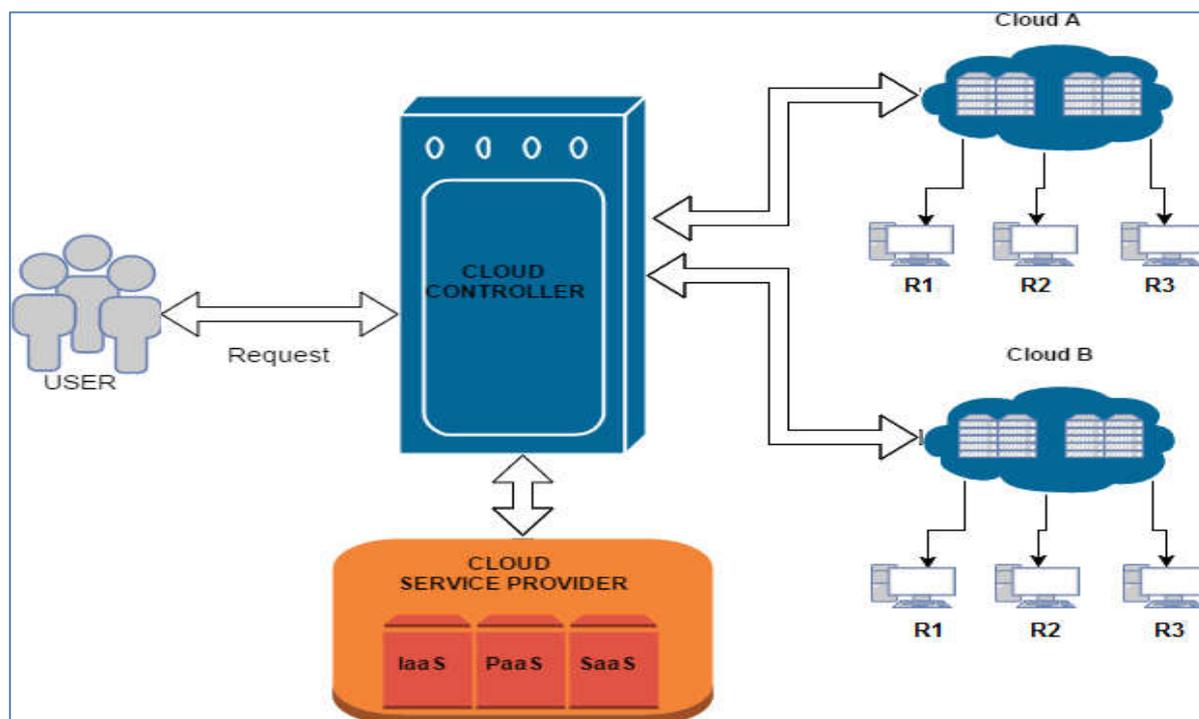
Figure.2 Represents the Proposed Architecture Diagram

From the above fig 2, we can clearly identify the proposed cloud server is having some components such as:

1) Cloud Users

2) Cloud Service Provider

3) Cloud Controller

4) Cloud Servers

In general for primitive clouds, there is no concept such as cloud controller which will be very helpful in our current application. The cloud controller will initially receive the request from the client and then verify the complete request. Based on the type of request appropriate storage facility will be given by the cloud controller for storing and accessing the information under secure manner. The proposed schemes are allocating space dynamically for the end users. The Proposed system has recommendation of services facility and it has the facility to choose different plans according to their type of data which they are willing to store. The proposed system reduced a lot of time and cost complexity while storing and accessing the data. These recommendations will avoid excess cost for storing and also provide reliability for the end users to store and access the data.

6. PROPOSED K-NEAREST NEIGHBORS ALGORITHM INMACHINE LEARNING

In this section we try to represent the proposed efficient data storage and retrieval of multi level cloud using ML based presaging technique. The proposed system contains cloud controller which will try to recommend set of plans for the cloud users to choose for account creation. The cloud controller internally uses this KNN algorithm as best classification algorithm to classify the best plans among several and efficiently recommend for the end users.

ALGORITHM

The following is the procedure for recommendation of best plans based on KNN.

The k-nearest neighbor algorithm stores all the available data and classifies a new data point based on the similarity measure (e.g., distance functions). Here the data is nothing but several available plans which are categorized based on cost and size. If there is any new plan launched with some new changes, this will also enter into the list using the well suited category by using K- NN algorithm.

Suppose there are two classes, i.e., **Class A** and **Class B**, and we have a new unknown data point "**?**",so this data point will lie in which of these classes. To solve this problem, we need a K-NN algorithm.

By using the K-NN, we can easily identify the class of a particular dataset. The data point is classified by a majority vote of its neighbors, with the data point being assigned to the class most common amongst its K nearest neighbors measured by a distance function. Here the most number of data users are choosing one plan appropriately for storing and accessing the information, and then such plan is treated as best plan and it will be recommended for the next upcoming users.
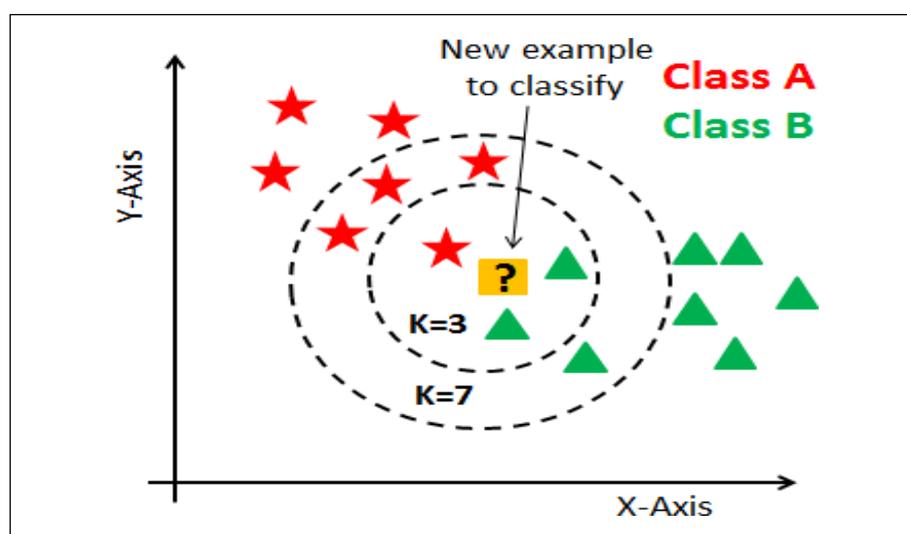

Figure 3- KNN classification

From the above figure, we can clearly identify that X &Y-axis are mapped with some set of symbols which are nothing but data items. Here the data item is nothing but the set ofplanswhicharecreatedbythecloudserviceprovidersforstoringandaccessingthe information in a secure manner. Here, we can see that if **k = 3**, then based on the distance function used, the nearest three neighbors of the data point is found and based on the majority votes of its neighbors, the data point is classified into a class. In the case of **k=3,**for the above diagram, it's **Class B.** Similarly, when **k = 7,** for the above diagram, based on the majority votes of its neighbors, the data point is classified to **Class A**. Now once the data points are categorized, based on the user test information one can able to identify the best plan recommended based on size of the data. This recommendation is efficient done with the help of K-NN algorithm.

7. IMPLEMENTATION MODULES

Implementation is a stage where theoretical design is converted into programmatically manner. Here we will try to divide the application into number of modules and then try to do coding for those modules. The application is mainly divided into three modules. They are as follows:

1) Customer Module

2) Cloud Service Provider Module

3) Cloud Admin Module

1) CUSTOMERMODULE
First of all, the Cloud Customer can register. While registering he required a valid user email and mobile number for further communications. Once the customer registration is completed then admin can activate the customer. Once admin activated the customer then customer can login into our system. After login he can upload the data by selecting the cloud services. The customer history or log based suggestion he may see in his screen. To view suggestions we used KNN algorithm. In the suggestion we can see the distance also. The top k value maintained by programmatically.

2) CLOUD SERVICE PROVIDER MODULE

The Cloud Service Provider can login based on Admin created information. Here we took some sample service which is not really existed. To check the performance only we took the services name like Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform etc… for each service once CSP will be available. He can check the customer sends data to CSP, and KNN recommended suggestion also he can see. The suggestions will be available for CSP on which time the customer done the process.

3) CLOUD ADMIN MODULE
Cloud admin will monitor the system, he can activate the registered customers. The cloud admin will create the Cloud Service Provider based on minimum information. When creating CSP's he can assign the cloud services to the users. Cloud also can view the customer uploaded data based on services names.

8. EXPERIMENTAL REPORTS

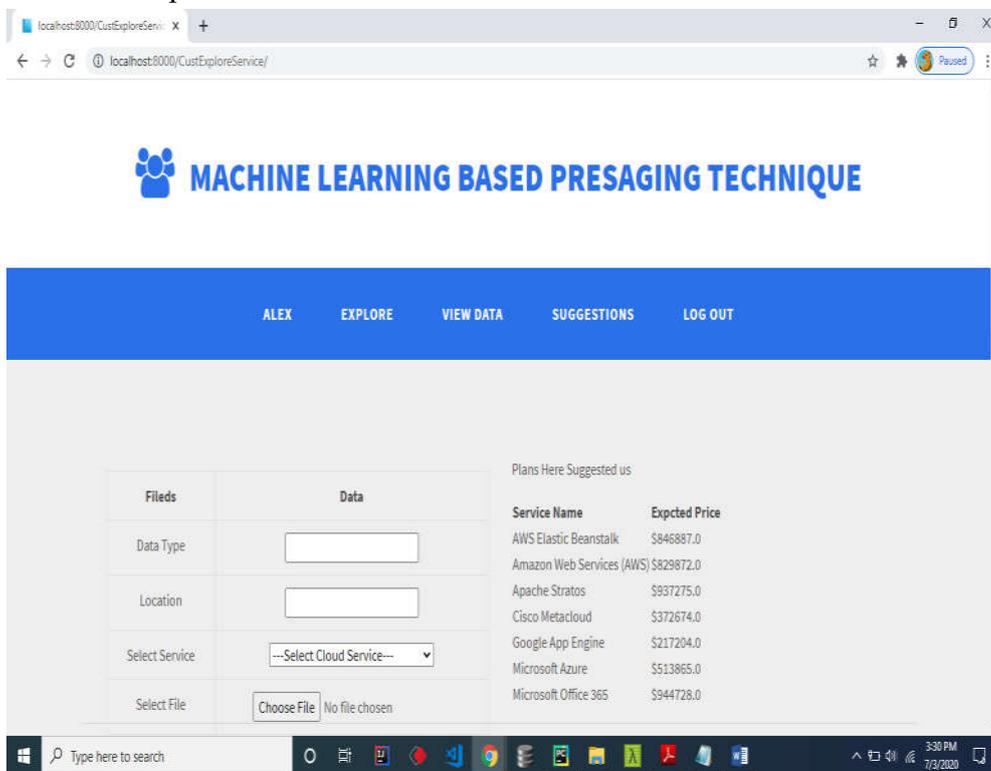Here we designed the application in python programming and the following are the some of the sample screens.

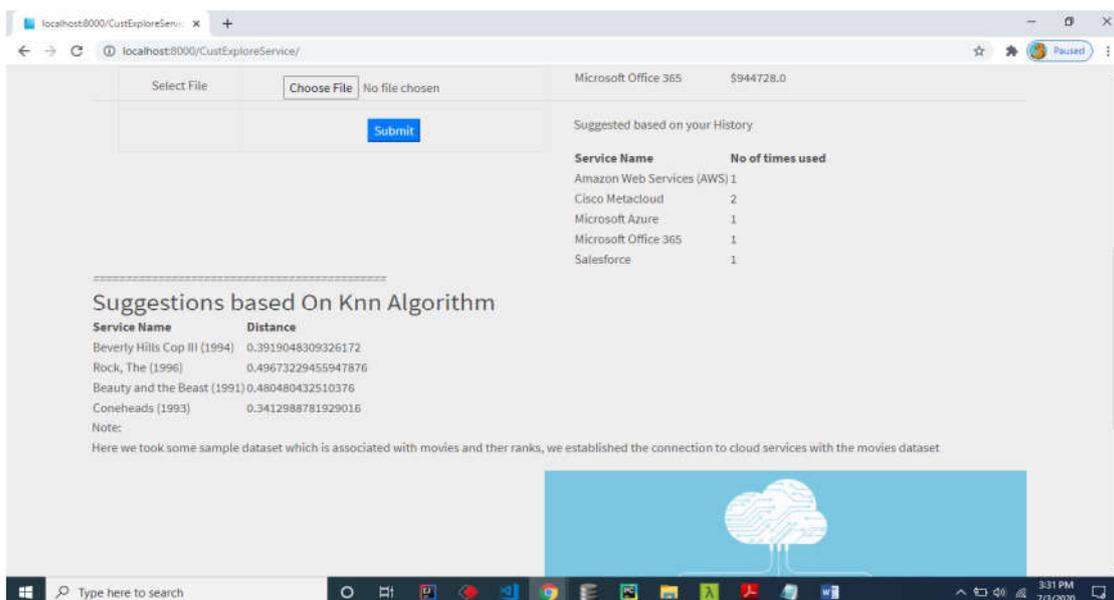**Figure-4 Customer Selecting Cloud Service**

Figure-5 Customer Suggestions

Figure 6- KNN- Suggestions

9. CONCLUSION

In this proposed article we have integrated ML Based Presaging technique for efficient data storage and accessing and this feature greatly optimize the storage cost for the customers who wish to store and access the information from remote servers. In this application we used K-NN as classification algorithm so that recommendation of best plans for the customers is automatically classified by using K-NN algorithm. By conducting various experiments on our proposed protocol, our comparison results clearly tell that our proposed approach is best in providing efficient data storage in cloud server and optimize the storage cost for the cloud customers.

10. REFERENCES

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