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Framework for Dynamic Resource Allocation and Scheduling for Cloud

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Abstract - Studies of Cloud Computing have mainly addressed the implementation of private cloud and study of how the facilities can be implemented. The study of cloud includes the implementation of various security algorithms and also to include the study of various internet message transfer protocols (This system uses STMP protocol). The existing cloud services available in market are way costly and they cannot be implemented on small scale. These technologies are developed by big organizations like Google, Microsoft, and Yahoo etc. And these are cannot be used on small systems. The system designed, implemented and described in this report can be used on small scale.

This report describes the development and implementation of framework for dynamic resource allocation for cloud computing based on local open cloud, IAAS services, STMP, HTTP protocols, various encryption algorithms, message transfer protocols. This system is used for storing file in encrypted format on local cloud also the system is able to send request to access other user's file. Also the admin panel is there so that admin can observe all activities of other user's and also admin is able to block, delete or deactivate the user in other words he can change accessibility of other users. When number of nodes tries to access the traditional system then eventually the system gets crashed because the load on the cloud is not equally distributed. Also the data which is stored on the cloud for every user should be moved to another directory if the more space is gets occupied. The implemented cloud system consists of following major areas:

a) User Registration / Add user.

b) Upload file.

c) Encryption of uploaded file.

d) Accessing and request for specific file.

e) Message transfer and private key transfer.

f) Load balancing.

g) DNS pointing.

The implemented system will generate the report based on the number of user registered on the system, the space occupied by them, how the data is stored, and how the load is getting distributed on the cloud system. The system will be fully flexible by allowing quick modifications to represent various studies such as increase in number of users, increase in data storage. Admin is able to observe all the activities by the user. DNS pointing is can be used to locate and describe which server is online and working (active state) with its associated name. The system is real-time load balancing system. Thus, the system will be great help to use on the small scale systems or other small projects where there is no need of buying heavy server services instead this complete system can be used for the local service.

Keywords: Load Balancing, Cloud, AES Etc.

1. INTRODUCTION

Framework for dynamic resource allocation for cloud is a system used for effective scheduling of load on the cloud systems and also with enhanced security measures. The system is based on following factors IAAS (Infrastructure as a service) for cloud services, STMP (Simple mail transfer protocol) is used to notify the user about file access request and also to send the private key of one user (owner of the file) to another user who is requester of file, AES (Advances encryption standards) is used in order to protect the data/files which are uploaded on the cloud by users. This uploaded data will be encrypted by AES algorithm so that the uploaded data cannot be viewed by any other user.

The main purpose of the system is to distribute all the load on the cloud efficiently so that the cloud services can run more efficiently and effectively also the security to cloud should be increased by using encryption algorithm such as AES. The complete Cloud System consist of following major areas they are: Admin panel to control all other accounts, creating a user (i.e. User registration), uploading a file to the Cloud, Encryption and storage of the file on the cloud, load balancing, DNS pointing. The features included in the system are user login is provided, file storage is provided, secure data storage provided, Asymmetric key cryptography features for secure storage provided, load balancing provided, Ability of user to accept or reject the request for file access provided, With asymmetric key generation the facility to notify user about request to access file and to send the private key to specific user is provided (used 1B21mmcoe@gmail.com as a dummy email which will notify user and send's the private key). These all features will be great help to create efficient system that can run on even small platforms, use better encryption support also can take corrective actions to balance the load.

1.1 MATHMATICAL MODEL

Let S be the system

S = {I, O, F, sc, fc}

I= {set of inputs}

O= {set of outputs}

F= {distribute the data and keeps replica of each data}

I1= {data} O1= {load is balanced}

sc= {success case} ={load is balanced}

1.2 NEED OF THE PROJECT/ MOTIVATION

Framework for dynamic resource allocation for cloud system is process of executing the system on server/cloud with the intent of minimize the load on the cloud system also to enhance the security. The increase in data on the cloud services had made the manual load balancing of cloud admin intensive and expensive and cost of managing the cloud servers grows drastically. The current available system like Google cloud, Yahoo, Microsoft are used by large organizations and these systems are feasible for small systems. They are designed for the large systems. If we develop a local system there is need of small system that can handle the load also which supports good security achievements. Automation in the system as well as developing the system on uniform platform that is Java, Html, Jsp, Bootstrap language will increase in performance can have better optimality, better security and can reduce the time required to balance load on server. Automation would invariably reduce the redundancy, manual efforts required to balance load on server, maximizing repeatability and also will increase the accuracy of the system. The user will come to know about his status of used data storage. The one of the advantages of the system are the system is able to store the user files in encrypted format also when the other user want to access that file then the owner of the user will be informed via E-mail.

2. PROBLEM DEFINATION

Framework for dynamic resource allocation for cloud is system that based on cloud services, various internet protocols, encryption algorithm for automation and load balancing.

2.4 LITERATURE SURVEY

In traditional approach people often try to use big services provided by Amazon, Google to connect with their system even if the system is much smaller and it doesn't actually need that type of big services. Also the system is unable to work if your basic (main) machine is not available. These various services are provided by different tech. companies are expensive and they are not always that secure. For example the Google drive's data can be easily retrieved if the owner gives permission to 1 file in his storage not all files but if one time the one user asks permission for the data and one time access is given to that user not more.

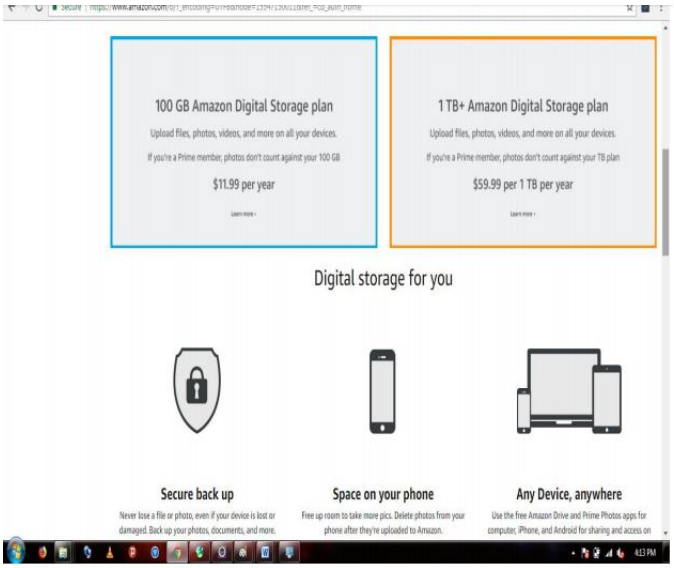

Fig. Amazon cloud and its pricing

When a user is using a small system and does not need this large amount of data storage but he can use his own storage as a cloud and other users also can use this storage as a cloud service. Our system is beneficial for such systems where there is no need of large systems and small storage is sufficient for the user. Our system is also capable of balancing the load i.e. data uploaded on the cloud. The framework designed allows the system to concentrate on minimizing the load on the cloud by moving the unused data into other storage hence the other storage is used as resource and the data which is unused will be moved to that folder. This method will decrease the load on the server and will free some space so that user can do his work daily basis. This includes description of the interfaces required to integrate the modules in later stages. The flow goes in following manner. First the new user needs to give all the required personal credentials by filling up the "user registration" form. At this stage user needs to provide their mail id and password during registration that will be useful for login at every time. The user can then login with the registered mail id and password on the page. After the successful login, now user is navigated to a page wherein they are able to view options namely "upload files", "request files", "files details". The user can send request for the files made available by other users. On sending the request, the file owner will receive a notification mail along with a key. The file owner now needs to login on the web page where they could either accept or reject the request made by users. The file is being transmitted in encrypted mode in order to ensure data security for that requested file. The user is able to view the file details. The user can even upload the files present in their system and made those files available for other users. The administrator is the one who is responsible for handling the load on the system. Once the administrator encounters that the file has

not been used by the user within a particular time period that file will be transmitted to a temporary folder. This transmission of unused files to a temporary folder makes it possible for the user to download the other required files in their respective user folder, thus creating an additional space for useful files only and balancing the overload over the user system. In case if the unused files are not being transmitted the users file folder might get filled up beyond the allocated space assigned to them and user will not be able to download additional files required. Such situation will ultimately lead to user's system failure.

2.5 METHODOLOGIES OF PROBLEM SOLVING AND EFFICIENCY ISSUES

The proposed system resides between cloud server and database.

• The number of users connected, active users, amount of storage used, number of files uploaded can be seen through admin panel.

• The selected data by the user is categorized into three sections Education, Hospitality, Business which is selected by user.

• When data is stored on cloud it gets encrypted into AES format so no one will able to read the file. • Every user has specific space allotted to him this can be viewed through the file details.

• When one user wants to access the file of other user then he will request to that user for file other user will get notification about it. When file owner accepts the request then the private key will be sent to requesting user. Only after using this (private) key requesting user can download the file.

• System uses Mysql database to store the login information and Navicat tool is used as connector between the main cloud module and Mysql database.

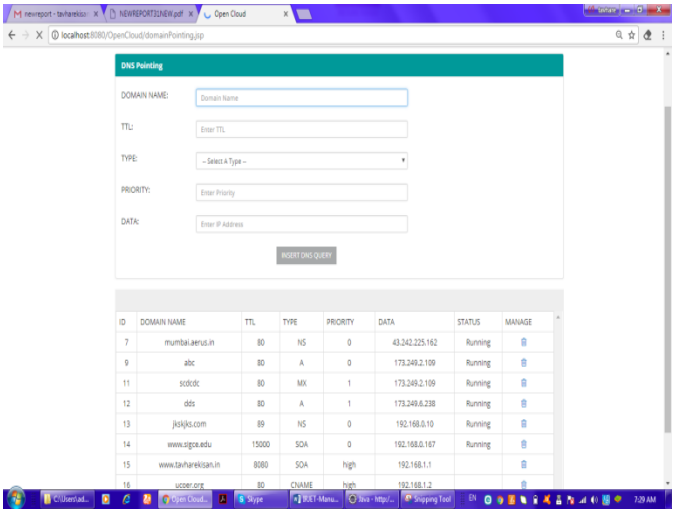

Fig -1: DNS Pointing

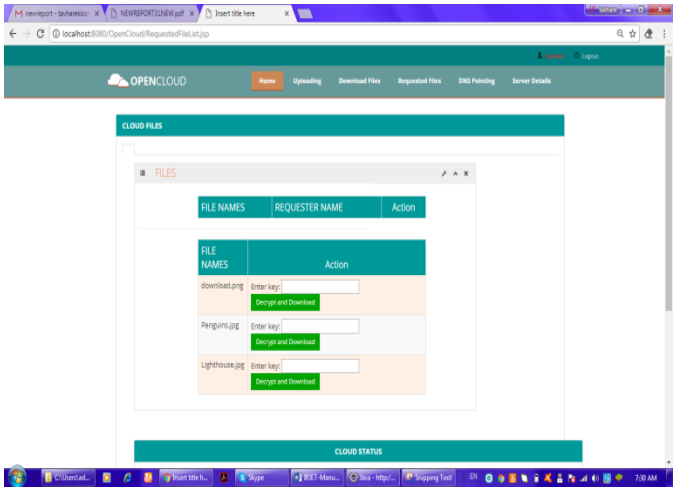

Fig-2:AES Encryption.

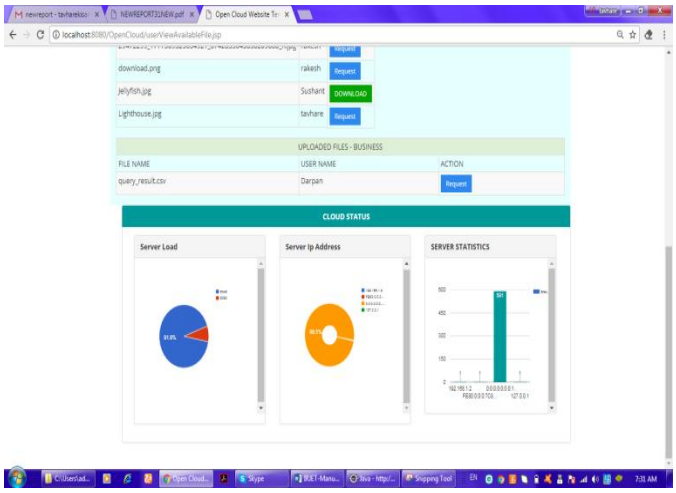

Fig-3: Cloud Status

3. CONCLUSION

Load will be evenly distributed. Hence, there is less chance of system failure.

4. APPLICATIONS

Useful in industrial sector where there is a need for large amount of data to be generated and its exchange over the network which further requires management of computing resources.

- Useful for enterprises with small scale applications.
- The system can be used in school, college
- Useful in small private organizations.
- It can be used when there is no need for buying expensive and large services of big companies like Google, Amazon.

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