IJCAT International Journal of Computing and Technology, Volume 1, Issue 2, March 2014
www.IJCAT.org
ISSN : 2348 - 6090

Private NUBE
(Private Cloud for Particular Organization)

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Abstract - Private Nube, is an expression used to describe a variety of different types of computing concepts that involve a large number of computers connected through a real-time communication network such as the Internet. The phrase is also more commonly used to refer to network-based services which appear to be provided by real server hardware. We describe the research undertaken in the six month, Private NUBE project, in which we built a demonstration cloud file storage service that allows users to login to it, by using their existing credentials from a configured trusted identity provider. Once authenticated, users are shown a set of accounts that they are the owners of, based on their identity attributes. Once users open one of their accounts, they can upload and download files to it. Not only that, but they can then grant access to their file resources to anyone else in the federated system, regardless of whether their chosen delegate has used the cloud service before or not.

Keywords **- Cloud_computing, SAAS, PAAS, IAAS, Cloud_hosting, Upload, Security.**

1. Introduction

Private Nube is cloud infrastructure operated solely for a single organization, whether managed internally or by a third-party and hosted internally or externally. Undertaking a private nube project requires a significant level and degree of engagement to virtualize the business environment, and requires the organization to revaluate decisions about existing resources. When done right, it can improve business, but every step in the project raises security issues that must be addressed to prevent serious vulnerabilities.

We are creating a private Nube(cloud) i.e. for a particular organization for various use. Private Nube is file storage system for file storage, file retrieve, file updating and deleting. Easily accessible data to our account from any device such as computer or a smartphone. Keeps your file synchronized on private storage so that you can easily use whenever you want by simply logging in your account.

The project provides Remote /Mobile access to you in file server. Share files with your co-worker or customers. You can use many applications for different purposes Private Nube provides a platform for a particular organization, where multiple clients can get connected and retrieve or upload the data as per there requirement. The Nube is divided into two main parts client side and server side. Client side is a user and server is admin to manage the Nube. The separate interface is provided for the client as well as server for uploading and downloading the data and applications. Administrator creates a user account for the client, through which client can store all the data on a cloud and can also be accessed from anywhere in an organization. This document is set in 10-point Times New Roman. If absolutely necessary, we suggest the use of condensed line spacing rather than smaller point sizes. Some technical formatting software print mathematical formulas in italic type, with subscripts and superscripts in a slightly smaller font size. This is acceptable.

2. Related Work

The main aim of the project is to store the data securely. To store data securely, it would deal to the terms like deletion or modification of data, the data can be deleted or modified accidently so to get rid of this disaster which could be caused by natural calamities or by any unfortunate activity we create the replica of the server which is just exactly same to the server which is acting towards the client. There are various techniques for backup and the technique used in this project is clustering.

2.1 Clustering

A cluster is two or more computers (called nodes or members) that work together to perform a task. There are four major types of clusters:

- Storage
- High availability
- Load balancing
- High performance

The redundancy of the server is must in the case of cloud computing because the organization is going to be dependent on the cloud they are going to use but spending the money on a backup is not worth of it. So to make the complete use of a server we have additionally add the load balancing service to the cluster so that it can balance the load of the traffic and the retrieval of data as well as uploading of data gets simple & fast.

2.2 Firewall

The firewalls secure the network from various attacks which comes from outside the network. There are various types of firewall which are used to secure the network the two basic type of firewalls are

1. Hardware based Firewall
2. Software based Firewall

We have used the software based firewall (comodo) for the private Nube the most probably used and a famous firewall is "Checkpoint" the blade software of checkpoint is one of the best software to implement it in a real world scenario.

The following use of Firewall

- The firewall prevents the network to get scanned. By preventing the scanning of a network we assure that any unauthorized user would not explore the vulnerability of a system.
- The server is placed in a specific zone which is known as DMZ i.e. Demilitarize zone. The advantage of keeping it in a DMZ is that it would not either be affected by the clients which are inside the network and hence security is enhanced by this feature.
- The each and every data which is going to be processed at the server end is first scanned by firewall and if malicious or affected by virus it would warn the user for it.

3. Methodology

3.1 Windows Server 2008R

Security enhancements include the addition of DNSSEC support for DNS Server Service. The DHCP server supports a large number of enhancements. DHCP Name protection for non-Windows machines to prevent name squatting, better performance through aggressive lease database caching, DHCP activity logging, auto-population of certain network interface fields, a wizard for split-scope configuration, DHCP Server role migration using WSMT, support for DHCPv6 Option 15 (User Class) and Option 32 (Information Refresh Time). The DHCP server runs in the context of the Network Service account which has fewer privileges to reduce potential damage if compromised.

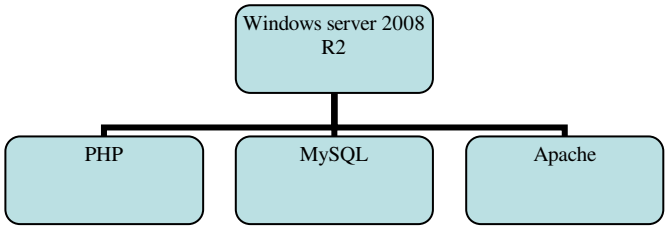

Fig. 1 Components used for configuration.

3.2 PHP

PHP is a general-purpose scripting language that is especially suited to server-side web development where PHP generally runs on a web server. Any PHP code in a requested file is executed by the PHP runtime, usually to create dynamic web page content or dynamic images used on websites or elsewhere. About 30% of all vulnerabilities listed on the National Vulnerability Database are linked to PHP.

3.3 MySQL

MySQL is the most popular Open Source Relational SQL database management system. MySQL is one of the best RDBMS being used for developing web-based software applications. MySQL is a popular choice of database for use in web applications, and is a central component of the widely used LAMP (Linux, Apache, MySQL, PHP) open source web application software stack.

3.4 Apache

Apache supports a variety of features, many implemented as compiled modules which extend the core functionality. These can range from server-side programming language support to authentication schemes. Apache features configurable error messages, DBMS-based authentication databases, and content negotiation. It is also supported by several graphical user interfaces (GUIs).

4. Basic Model

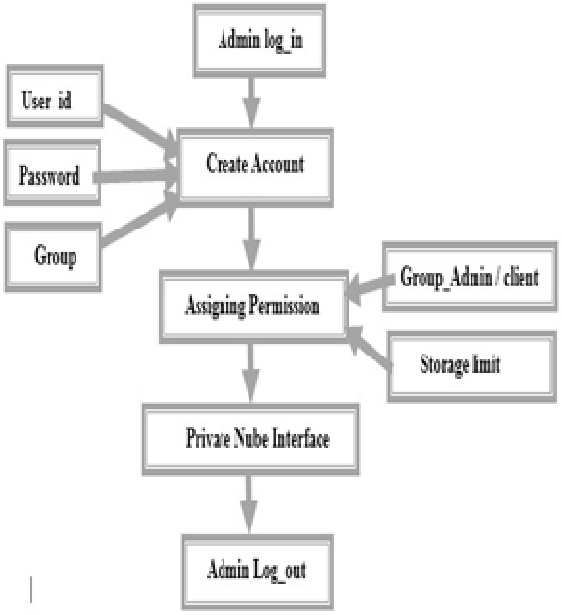

Fig. 2 Flow of Admin Account

The figure described the flow of the activity of a particular administrator who manages all the accounts and provides varied storage space as per the requirements of the user. The tasks which are going to be performed by the administrator is as follows

- The admin log in with an secured key (MD5 hash used)
- The clients request the admin for their account and a specific user name and password is allocated to the user
- The admin defines the group for all the users and every group may or may not have a separate administrator
- While assigning the permission to the user the administrator decides how much the storage space would get allocated, else the default space allocated to an user is 2 GB
- The administrator can install and delete the applications which provides simplicity for the users to get there task done efficiently.
- The private Nube interface is shown in the Snapshots

The Client side has almost the same interface as admin has the only difference is that the user cannot modify or delete others account as well as he cannot make any changes which may be an embarrassment to other users. The figure describes the flow of data in the client side

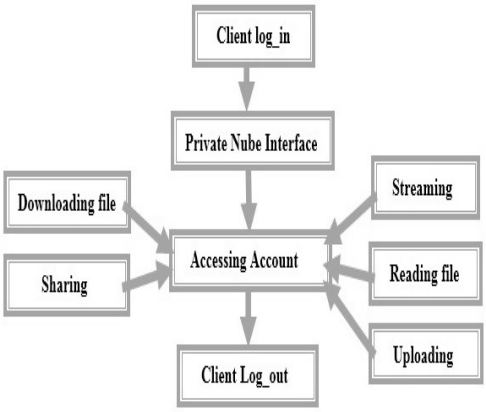

Fig. 3 Flow of Client Account

The client can access the data as described

- The client is provided with a specific username and password by the administrator
- The Nube interface comes up after logging in the account and the interface contains most of the features which will provide user the comfort for processing the data
- As per the above figure the client can stream a particular music file (.mp3, .mp4, etc.)
- The videos are also streamed and can also be downloaded (.mp4, .wmv, .vlc, etc.)
- The images (.jpeg, .png etc) can be shared and an application is embedded which can make a slide show of all the images
- The documents file such as docx, pdf, ppt files can be easily uploaded/downloaded & can be read

5. Snapshots

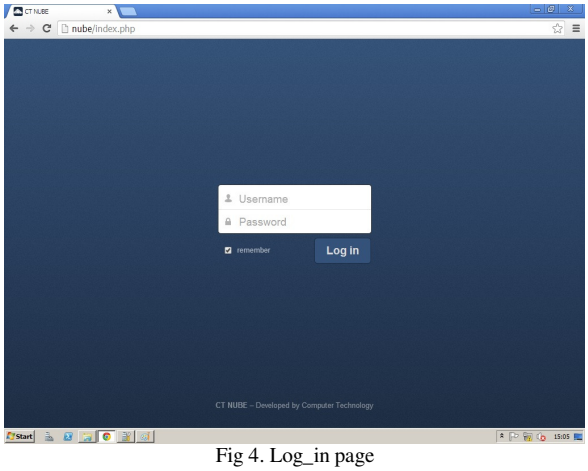

Fig 4. Log_in page

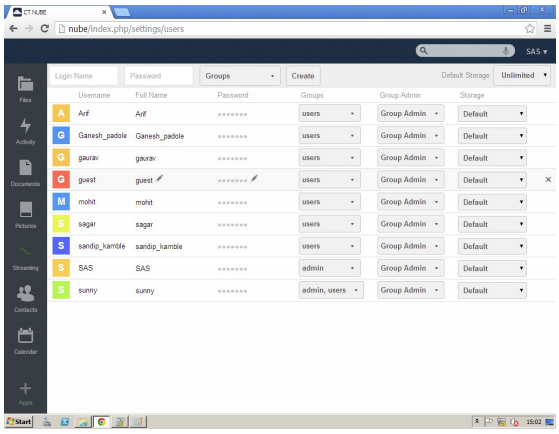

Fig.5 Interface of Admin

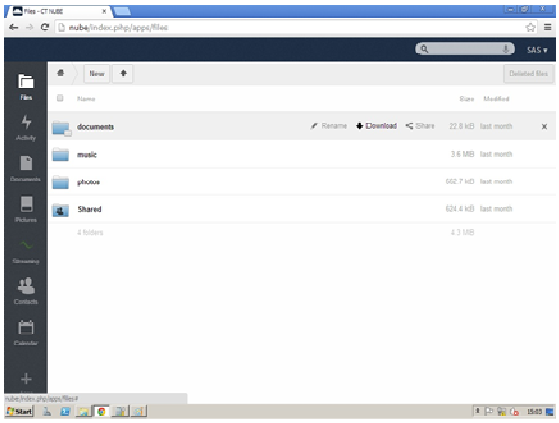

Fig. 6 Admin Main Page

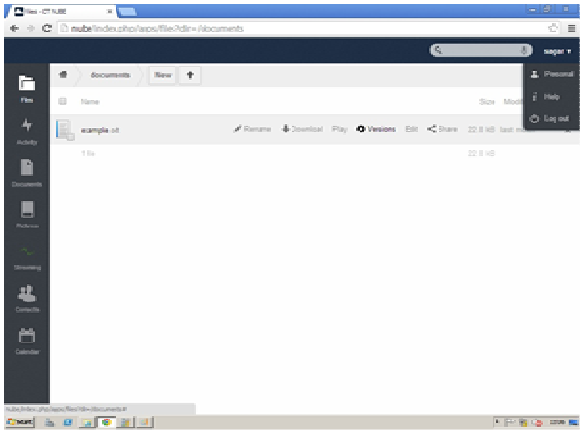

Fig.7 Sharing Interface

6. System Design

The Private Nube is derived from a free and open-source web application for data synchronization, file sharing, and cloud storage. It employs SabreDAV, an open-source WebDAV server. Private Nube is written in PHP & JavaScript scripting language It is designed to work with several database management system which includes SQLite, MariaDB, MySQL, Oracle Database, and PostgreSQL

The services provided by private Nube is

- File storage in conventional directory structures or via WebDAV.
- Synchronization of clients.
- Calendar (also as CalDAV).
- Task scheduler.
- Address book (also as CardDAV).
- Music streaming (through Ampache).
- User and group administration (via OpenID or LDAP).
- Sharing of content across groups or public URLsOnline text editor with syntax highlighting and code folding
- URL shortening Suite.
- Photo gallery.
- PDF viewer (using pdf.js).
- Viewer for ODF Files (.odt, .odp, .ods).
- Logging Module: supports extensive logging of file-related actions, logs, who accessed what, when and from where.

7. Conclusion

Private Nube addresses many of these challenges. With cloud technology, Organizations can achieve greater degrees of automation, scalability, and availability while reducing the management burden on their own staff. For certain applications and business scenarios, enterprises can also shift costs from large capital outlays every six months or so to regular monthly fees. However, private Nube introduces new concerns over security and data sovereignty in public cloud deployments

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