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Implementation of a More Secure Public Cloud Service

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ABSTRACT: This paper is regarding implementation of a public cloud, which contains some additional features when an analogy is made to traditional public cloud services, characteristics and features. Cloud is the new upcoming technology which has its ever increasing growth. Cloud is used to gain ubiquitous access, so the files are available to every computer. The only desideratum is that in order to access such files virtually, is internet. . These files can be accessed virtually via internet. Different types of clouds are Private, Public, Community and Hybrid. Public cloud's services can be used by anyone to gain ubiquitous access. In addition to providing services to everyone, public cloud must also maintain security and authentication. Thus, this paper provides details about this cloud's services and its implementation.

KEYWORDS: Public Cloud, View, Add, Manage

I. INTRODUCTION

Cloud is basically providing various computing services for shared pool of resources such as storage, database, networking, software and more, over the internet [1]. Cloud can be considered as an internet. As stated above, there are different types of clouds [2]:

- Private Cloud
- Public Cloud
- Community Cloud
- Hybrid Cloud

Private cloud is used by an organization for using different services only limited within the use of organization. Cloud may be created by some third party vendor. Here, the security is very high as compared to public cloud. Public cloud is used to provide services for shared resources to everyone. Community cloud is used by organisations having similar strategies and outcomes. It may be created by some third party vendor. Hybrid cloud is a combination of two or more clouds, thus providing features and characteristics of multiple clouds [2].

Different types of services provided by cloud are [3]:

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Infrastructure as a Service (IaaS)

In SaaS, provider installs, maintains and manages the software. The consumer can only access the application. It cannot change, access or maintain the platform. In PaaS, the consumer can access the application and platform. Here, the consumer cannot control the operating system and hardware infrastructure on which they are running. In IaaS, the consumer can access application and platform just as in PaaS. In addition to this, IaaS can also access the operating systems and hardware infrastructure, which is not possible in PaaS [3]. These services can be demonstrated by these diagrams [4]:

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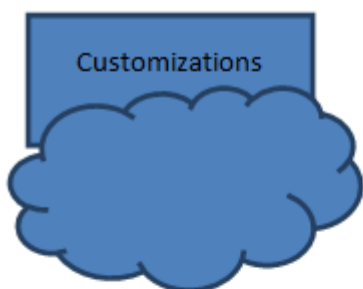


Fig 1.1 Software as a Service (SaaS)

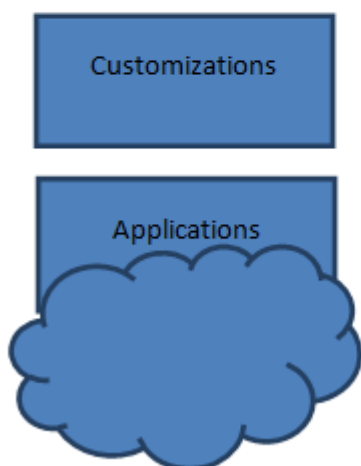


Fig 1.2 Platform as a Service (PaaS)

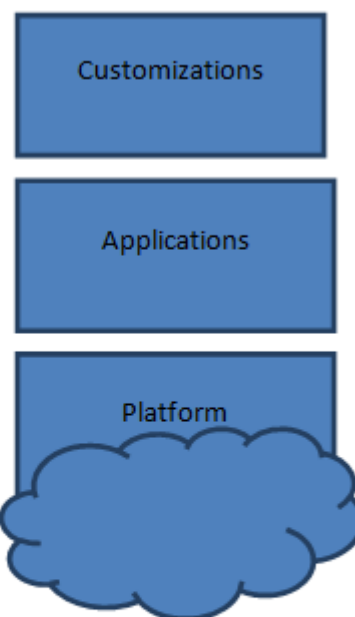


Fig 1.3 Infrastructure as a Service (IaaS):

The services represented by rectangle are accessible to consumer. The cloud structure is used to represent services that not accessible to the consumer and are directly provided by the service provider. An example of users of SaaS, PaaS, IaaS are Business end-user, Developer and I.T Professional respectively [4].

Characteristics of cloud are [7]:

- On Demand Self Service: A user can provision computing capabilities such as network storage and server time without human interaction.
- Broad Network Access: The cloud can be accessed by using any platforms (mobile phone, pc or tablet).
- Resource pooling: The resources have to pooled to serve multiple consumers providing multi-tenancy.
- Rapid Elasticity: Capabilities can be elastically provisioned and released. It must appear to consumer, at any point of time, to be available.
- Measured Service: Cloud optimizes and controls resources by a metering capability at some level of abstraction to the type of services. It can be storage, database, etc.

II. LITERATURE SURVEY

According to [3], public cloud contains compute, database and storage services. Storage services are used to provide storage space to make access to everyone. Database services are used to provide database. The entire database is not shown to the public, but a part of it is shown.

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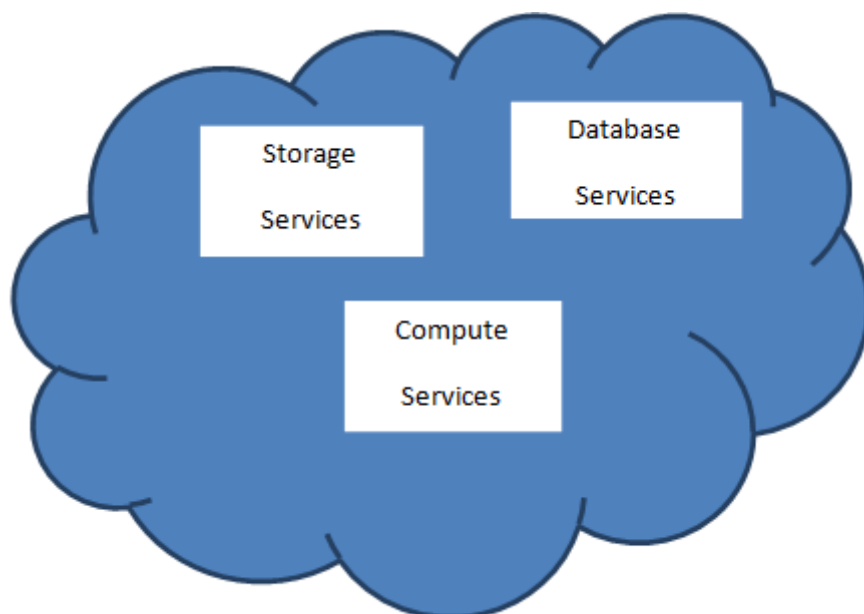


Fig 2.1 Public Cloud

According to [5], public cloud provides many services in the virtualized environment, constructed using shared pool of physical resources, which can be conspicuously accessed only using the internet. It provides services to multiple clients using the same shared infrastructure. Some examples includes public cloud providing different services like cloud storage services, online software applications, cloud hosting including web hosting and cloud based development environments.

According to a survey conducted by [6] for enterprise workloads in cloud

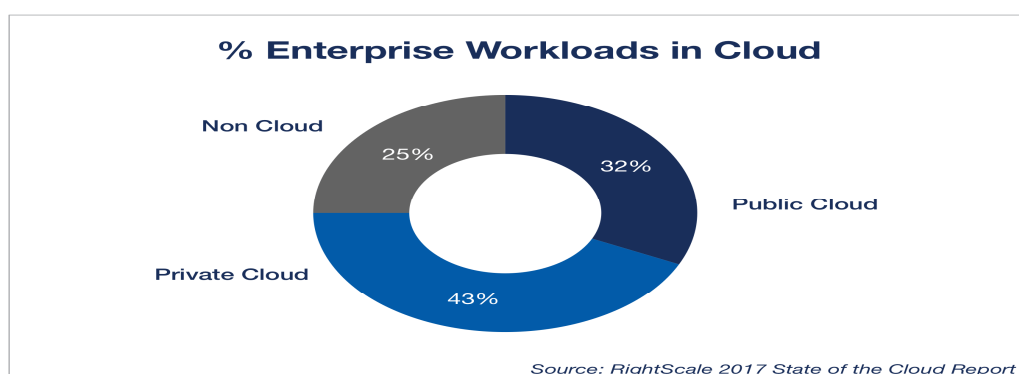


Fig 2.2

Thus, the use of public cloud is limited in enterprise as evident from the data provided above. The cardinal reason is because of lack of security. Of all the cloud types mentioned above, public cloud is least secure. One of the reasons is because it is accessible to everyone, which is a characteristic feature of public cloud. On the other hand, private cloud's use is limited for common people because it is expensive as compared to private cloud.



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III. PROPOSED SYSTEM

Thus, public cloud has to be made more secured. Proper records of users have to be stored in the database. Thus, authentication of the users also has to be maintained. This is done by taking user's name, phone-no, email-id, password, etc. The account is only created when the email-id is validated. This does not allow user to create multiple accounts with same email. The email will itself be the login-id. This public cloud will provide three functionalities:

- VIEW
- ADD
- REMOVE

The first functionality is VIEW the shared pool of resources. It will only display the resources or files shared to all the users. The second functionality is ADD. It is used to add a particular file to shared pool of files. It can be used by any of the users, and the content will be displayed to each and every user. The third functionality will be available to only those users who have used the second functionality. In this third functionality, the user can REMOVE only those files which were added by them by using the second functionality. The database will not be provided to the users. If it is provided, then it result in SQL injection or some similar type of attack related to database.

IV. IMPLEMENTATION

The registration and login pages are created using basic HTML, JavaScript and CSS. These registration details are saved in the database and are checked during login by using PHP. The page which contains three functionalities mentioned above are VIEW, ADD and REMOVE is created using bootstrap.

ionalities.html

Secure Public Cloud

Welcome Yash

VIEW

ADD

MANAGE

Fig 4.1 Functionalities of the Cloud

Here, a user named Yash has logged in. He will see this page directly after login. After clicking the view button, all files present in public cloud which that user wants others to see, will be seen.



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Cloud Contents

Welcome Yash



Fig 4.2 View Functionality of the cloud

After clicking ADD button, an option is given to browse the file. After selecting the file, we add it to the database.

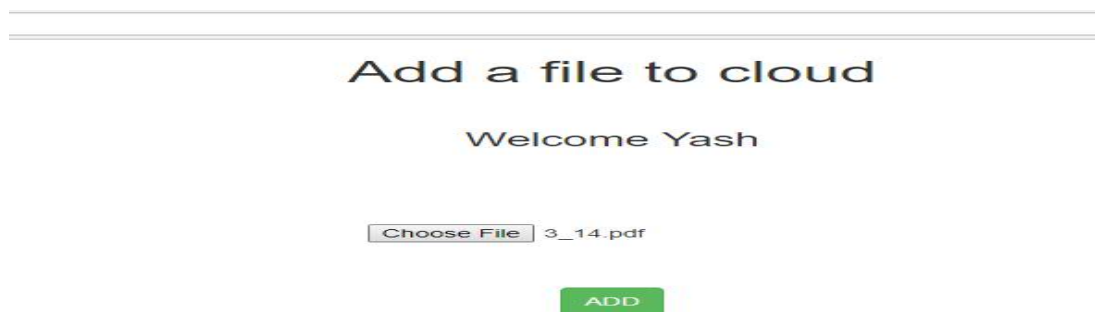


Fig 4.3 Add file functionality of the cloud

When we click on MANAGE button, it shows the user logged in and the files uploaded and manage the file i.e reveal or hide the file.

MANAGE the Cloud

Welcome Yash

Filename	Status	Change Status
3_14.pdf	SEEN	HIDE
69.pdf	HIDDEN	REVEAL
example1.jpg	SEEN	HIDE
hr.pdf	SEEN	HIDE
wt.pdf	HIDDEN	REVEAL

Fig 4.4 Manage functionality of the cloud

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The actual database is shown below

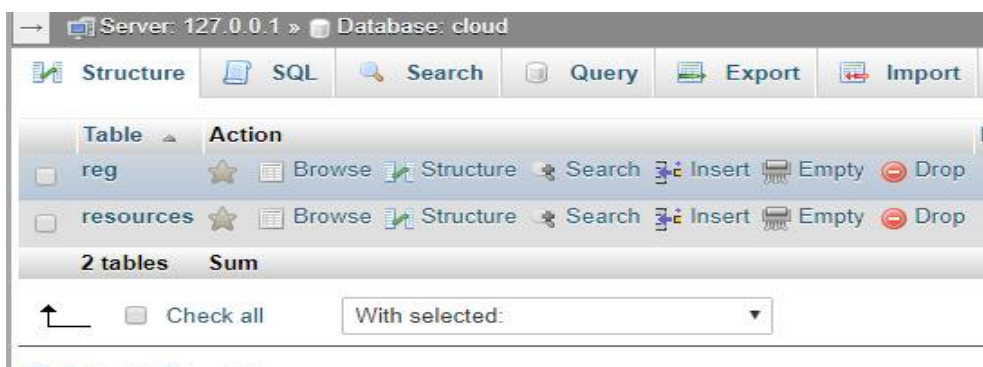


Fig 4.5 Tables used to manage functionalities and security of the cloud

It contains a database named cloud. Cloud contains two tables, which are reg and resources.



Fig 4.6 Reg table contains 2 rows which are 2 users having username and password



Fig 4.6 Entries present in reg table

Fig 4.7 Entries present in resources table



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Here, the table resources contain 4 attributes filename, owner, password and status. Status indicates whether that file will be displayed or not. Here, example1.jpg will be displayed and example2.png will not be displayed and so on.

V. CONCLUSION

Thus, we have implemented the more secure public cloud. It can be accessed any time, but only authenticated users can have authentication. The framework is prepared using bootstrap. Thus, it has inbuilt feature of working properly in different platforms. Thus, it also supports broad network access. Multiple users can also use the file at same time, providing multi-tenancy. It is easy to scale users and resources, thus rapid elasticity is also possible. This cloud provides storage as a service to its users. This cloud can be accessed by anyone, just they have to make authenticate themselves to minimize their apocryphal behaviour. Thus, it is a public cloud. It is more secure because it only allows those people to hide and reveal resources, if that user has added it. Thus, anyone else cannot modify or delete resources uploaded by others. Thus, it is more secure and reduces apocryphal behaviour taking place in this public cloud.

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