

Cloud Computing and Data Masking Techniques

Umang jain, Tarun Kumar, Ajeet Kumar

Student MCA (LE), CCSIT, TMU, Moradabad-244001

Student MCA (LE), CCSIT, TMU, Moradabad-244001

Student MCA (LE), CCSIT, TMU, Moradabad-244001

Assistant Professor, CCSIT, TMU, Moradabad-244001

umangjain.jain12@gmail.com

tarunchauhan81212@gmail.co

ajayc.computer@tmu.ac.in

Abstract- Cloud computing is a technology, which provides low cost, scalable computation capacity and services to enterprises on demand for expansion. Although, cloud computing is facilitating the Information technology industry, the research and development in this ring is yet to be satisfactory. Cloud computing resources offered service on an as-needed basis, and delivered by IP-based connectivity, providing highly scalable, reliable on-demand services with agile management capabilities. There are a lot of development in the cloud computing, security of the data in the cloud has become the one of main aspects in the cloud computing. Cloud computing is nothing but the distribution of the resources in an open environment which leads to the security problems

Keywords: - Cloud Computing, Deployment Models, Service Models, Data Masking Techniques.

I. Introduction

Cloud Computing is a technology which use the internet and dominant remote servers to maintain data and applications. It is a cluster of computers and servers connected together over the internet. It refers to designing, manipulating and accessing the applications online. It allows clients and businesses to use applications without installation and access their personal file from any computer with the support of internet. It also deals online data storage, infrastructure and application. It is architecture for providing computing services via internet on demand and pay per use admission to a pool of shared assets for the network storage, applications and services. It is fully an internet based technology in which consumer data is stored and maintained in data center of cloud provider like Google, Amazon, and Salesforce.com etc. The resources in cloud system are translucent for the application and the client do not know the place of resource. The client can

access your application from anyplace. The amount of resources provided in the cloud system for the cloud system for the client is increased when their requirements are high and decreases when their requirements are less. The cloud computing can be seen as the main change of information industry and will make more effect on the development of information technology for the society.

NOTE: - The Research paper is divide into a section are given below.

Section 1 gives an overview about Cloud Computing Service Models. Section II explains about the detailed System Architecture. Section III explains about Different types of Masking. In Section IV Data Masking Techniques. In last V section conclusion the paper

II. CLOUD COMPUTING SERVICE MODELS

There are 3 types of cloud computing services models.

A. Software as a Service

It is the upper layer supplier in which customer with set to use applications running on the infrastructure provider. Software as a service can be explained as a process by which Application Service Provider provide distinct software application ended the internet. Software as a Service applications are pattern for end users, deliver above the internet. It allows the purchaser to reduce of installing and operating the application on his

own computer and also get rid of the immense load of software maintenance.

Benefits of Software as a Service

- It helps to managed software from a central location.
- The consumer can sign up and quickly start using creative business apps.
- Software carried in a 'one to many' model.
- There is no setup costs, as these are available with other applications

B. Platform as a Service

It is a inner layer which offer platform oriented service. In this client has responsibility for application deployment and to provide securing access to the application itself. It is especially beneficial for situation where various developers working on a development project. Here the consumer does not control the essential cloud infrastructure including network, servers, operating systems, or storage, but it control over the deployed applications and possibly configuration settings for the application-hosting environment

Benefits of Platform as a Service

- Develop application and get to market faster.
- Integration with web services and databases via common standards
- Reduce difficulty with middleware as a service.
- Crews in various locations can work together

C. Infrastructure as a Service

It can be utilized by enterprise customers to create cost effective and easily scalable IT solutions where the difficulties and expenses of managing the underlying hardware are

farm out to the cloud provider. The user can buy the infrastructure according to the requirements instead of buying the infrastructure that might not be used for months. It operates on a —Pay as you go model .For a startup business; one of the most difficult things to do is keep resources expenditures under control.

Benefits of Infrastructure as a Service

- Infrastructure scales on demand to support dynamic workloads.
- Generally include multiple users on a single piece of hardware.
- Flexible and advanced services are available on request.
- No need to capitalize in your own hardware

III. Deployment Models

Deployment models define the type of accesses to the cloud i.e. how the cloud is located? Cloud can have any 4 type of access: Public, private, Hybrid and community.

Public cloud: Public cloud which is created on standard cloud computing, services may be free or offered on a pay-per-use model. The public cloud allows system and services to be easily accessible to general public. Public cloud may be less safe because it is open to everyone. Public clouds offers service, usually over an internet connection. A public cloud is lying on the internet and designed to be used by any consumer with an internet connection to provide a similar range of capabilities and services. Organizations should require that any selected public cloud computing solution should be configured, deployed, and managed to meet their security and other requirements.

The public cloud offers following benefits:

1. Public cloud provides ultimate scalability.

2. Cloud services like Infrastructure as a Service, Platform as a Service, Software as a Service follow the public cloud, so it is more flexible.

Private cloud: A private cloud offers more security than public clouds. It is set up within an group's internal enterprise data centre. The scalable resources and virtual applications provided by the cloud vendor are merging together which are available for cloud users to share and use. The use of private cloud can be much additional secure than that of the public cloud because of its specified center exposure. The organization can access to run on a specific Private cloud. Corporations are critical that the private cloud proves less risky. The ability of Private cloud is to virtualize services maximizes hardware usage, ultimately reducing costs and complexity. Most important assets of any organization are its resources and its data. The major drawback of private cloud is costly

Private cloud offers following benefits:

- 1) Flexibility and scale which meet client burdens.
- 2) Resource sharing among a huge number of customers

Hybrid Cloud: A Hybrid Cloud is an combined cloud services which use both private and public cloud to perform different functions within the same organization. It can also be defined as multiple cloud systems that are connected in a way which allows programs and data to be moved easily from one system to another . It is a configuration of at minimum one private cloud and at minimum one public cloud. This computing model combines the security benefits of a private cloud as well as public cloud. Hybrid Cloud provides more safe control of the data and applications which allows various parties to access information over the Internet

Hybrid Cloud offers following benefits:

1. It provides security as the private cloud element of the hybrid cloud model provides the security where it is needed for sensitive operations and also fulfil customer requirements for data handling and data storage where it is appropriate.
2. Supplies support for cloud-bursting.

Need of Data Masking:

1. Leverage off-shore development/consultant
2. Moving the test data to cloud.
3. Sending data to vendors.
4. When copy sensitive data outside of production environment.

IV. Different types of Masking

- A. Static data masking: Static data masking is used by most institute when they create testing and in fact is the only thinkable masking method when using outsourced developers in a separate location or a distinct company. In these cases it is necessary to identical the database. When doing so, it is dangerous to use a static data masking tools. These tools make sure that all complex data is masked before sending it out of the union. Static data masking offers a basic level of data shield by creating an offline or testing database using a standard ETL procedure. [7]The static data base can be updated constantly, for example on a daily or weekly basis.
- B. Dynamic data masking: Dynamic Data Masking is a strategy for controlling or limiting illegal access to data, where data streams from a database environment are transformed as they are requested. DDM provides result for the cases where individuals are working close to the production environment, but should not have access to the original data. . For example, workers and staffers may be trying to update a production database. It is important that they do not have access to sensitive data such as individual credit card numbers, health data, etc. — with Dynamic data masking, the information is altered, so that these technicians are working with harmless data as they manipulate a database.

V. Data Masking Techniques

- A. Substitution: Substitution technique is the most operational method of applying data masking and able to preserve the authentic

look of the data records. This method consists of randomly replacing the contents of a column of data with information that looks similar but is completely unrelated to the real details. For example, the surnames in a customer database could be sanitized by replacing the real last names with surnames drawn from a largish random list. Substitution data can sometimes be very hard to find in large length - however any data masking software should contain datasets of commonly required items. For example, to sanitize surnames by substitution, a list of random last names must be available. Then to sanitize telephone one numbers, a list of phone numbers must be available. The substitution method need to be applied for many of the fields in database structure such as telephone numbers, zip codes, credit card numbers and other card type numbers like Social Security numbers .

- B. **Shuffling:** Shuffling is like to substitution except that the substitution data is derived from the column itself. In elementary terms the data is randomly shuffled with the column. Shuffling is effective for small amounts of data. Another consideration is the algorithm used to shuffle the data. If the shuffling method can be determined, then the data can be easily —unshuffled. For example, if the shuffle algorithm simply ran down the table exchange the column data in between every group of two rows it would not take much work from an interested party to revert things to their unshuffled state. Shuffling is rarely powerful when used on small amounts of data. For example, if there are only 5 rows in a table it possibly will not be too difficult to figure out which of the shuffled data really belongs to which row.
- C. **Encryption:** Encryption is one of the most compound methods to solve the data

masking problem. The Encryption technique algorithmically tangle the data. This usually does not leave the data looking accurate and can sometimes make the data larger. Encryption also destroys the formatting and look and feel of the data. Encrypted data rarely looks significant; in fact, it usually looks like binary data. This sometimes leads to character set issues when manipulating encrypted varchar fields.

VI. Conclusion

Generally most organization needs grouping of dynamic and static database masking. In this paper we discussed about the cloud services models, deployment models and security in cloud by using data masking techniques. Storage of data on the cloud refines the way we manage the storage of data and access the data from the cloud. This paper also explores the need of data masking in present information. Data masking will enable us to accomplish the following: (a) Increase protection against data theft. (b) Enforces 'need to access'. (c) Provides realistic data for testing, development and data sharing.

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