

# Reversible Watermarking Technique For Relational Database In Cloud Computing Environment

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*Abstract: In past few year, Cloud computing has become an important technology in terms of computing in the field of internet computing. A large amount of data gets process in cloud environment, but still not a secure way to store data. When it comes to claiming the ownership of certain data, digital watermarking plays an important role. Digital watermarking is the copyright protection technology concern with ownership rights and data tampering. It embeds multimedia data as well as relational data. While the main concern with watermarking is that there is a huge risk of loss of data quality. Reversible watermarking not just provides ownership rights but also maintains data quality. In this paper, we while study reversible watermarking of relational database cloud environment.*

*Keywords: Reversible Watermarking, Relational Database, Cloud Computing, Genetic Algorithm.*

## I. INTRODUCTION

In the increasing usage of internet and cloud computing data is generated at a large scale [1]. Cloud computing is the next stage in evolution of the internet. The cloud computing provides the means through which everything from computing power to computing infrastructure, applications, business processes to personal collaboration can be delivered as a service wherever and whenever needed. Cloud computing takes the technology, services and applications that are similar to those on the internet and turns them into a self-service utility. Cloud makes reference to the two essential concept abstraction and virtualization. Cloud Computing provides the capability to use the storage resources as well as computing resources on usage basic and reduce the investment and expenditures in organizations computing environment [4]. For example SQL Azure is Microsoft's cloud database service. Based on SQL Server database technology and built on Microsoft's Windows Azure cloud computing platform, SQL Azure enables organizations to store relational data in the cloud and quickly scale the size of their databases up or down as business needs change. Data is hosted, managed and provisioned in Microsoft data centers. Cloud environment is a massive technology which provides an efficient database

storage and database access. Similarly relational database are stored in cloud for database access. This data can be insecure as it can be accessed easily. Database watermarking can be used to enforce ownership rights of relational data; however a major drawback of these techniques is that they modify the data to a very large extent which often results in the loss of data quality [1]. Reversible watermarking plays an important role in preventing such kind of data quality loss. Reversible Watermarking has found a huge surge of experimentation in its domain in past decade as the need of recovering original work image after extracting the watermark arises in various application. Data quality can be defined as appropriate information for the use of application or user. Reversible watermarking has following phases: a) Data preprocessing phase b) Watermark encoding phase c) Watermark decoding phase and d) Data recovery. To perform this operation Generic Algorithm an optimized algorithm is considered in reversible watermarking

The reminder of this paper is organized as follows. Section 2 brief overview on literature survey. In section 3 Proposed System is defined. Section 4 gives basic idea on reversible watermarking. In section 5 system architecture is defined. Finally this paper is concluded with future scope in section 6.

## II. LITERATURE SURVEY

In paper [1], Saman Iftikhar, Kamran and Zahid Anwar suggest a robust reversible watermarking which retrieves the data even after malicious attacks.

In paper [3] Zhiwei Yua , Clark Thomborsonb , Chaokun Wangc, Jianmin Wangc, and Rui Lic proposed cloud computing environment for watermarking which makes more efficient data available at cluod environment.

In paper [5] authors introduced robustless watermarking of relational database with the help of circular histogram modulation.

## III. PROPOSED SYSTEM

Security of increasing amount of database stored in cloud environment is of most concern in today's world, especially when the data is copyright with an ownership. The process of embedding a copyright on database can lead to loss of data quality. Hence reversible watermarking is introduced to prevent data quality loss and provide recovery of original data. Reversible watermarking will be implemented on such relational database which is present in Cloud. Thus user can sustain the ownership of the data as well as avoid any kind of data loss over a massive platform.

## IV. REVERSIBLE WATERMARKING

This is the best and main feature of reversible watermarking to extract the original data as it is without any distortion. Reversible Watermarking is evolved which assures the data quality along with data recovery. Reversible and Robust watermarking technique for the relational database is proposed for better results. Reversible watermarking has to satisfy the following characteristics:

- ✓ **ROBUSTNESS:** The watermarked image should not be destructed from the standard image processing and malicious attacks. For example before transmitting, image can be compressed or rotated. Robustness of the watermark data means that the watermark data should not be destroyed if someone performs the some operations on data. It may be malicious attacks or non-malicious operations for example rotation, scaling. There may be some intentional or non- intentional attacks that tries to remove the embedded watermark. It is the important requirement of the watermarking
- ✓ **IMPERCEPTIBILITY:** A watermark that is embedded into the image may be visible or non-visible. The visible watermark is perceptible. To decrease the risk of cracking, most of the watermarks are invisible. At the same time the quality of watermarked image is also important. If the watermark embedding process affects the quality of the watermarked image, then it will lose its value.
- ✓ **EMBEDDING AND EXTRACTING:** The watermark embedding process must be easy. Similarly, it must be secure to embed and retrieve the watermark by the owner.

With the above requirements reversible watermarking has to satisfy the following two characteristics:

- **BLIND:** To retrieve the embedded watermark, it requires the original image in some conventional watermarking schemes. In reversible watermarking, it is not necessary to have the original image. It can directly extract the embedded watermark. Such a technique is known as blind watermarking that means it does not require the original image to extract the watermark.
- **HIGHER EMBEDDING CAPACITY:** Capacity property of digital watermarks refers to amount of information that can be embedded within the media. The embedding capacity of the reversible watermarking is much more than the conventional watermarking scheme. The embedding capacity should not be low as it affects the accuracy of extracted watermark and the recovered image.

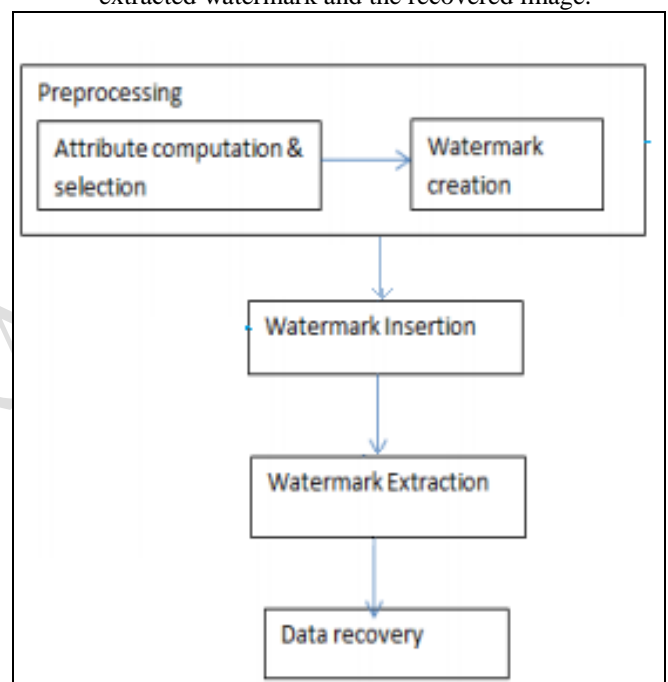


Figure 1: Reversible Watermarking

In the preprocessing phase, two important jobs are performed: (1) selection of a suitable function for watermarking; (2) with the use of optimization technique i.e. genetic algorithm calculation of an optimal watermark. This parameter is further used for the watermark insertion and watermark extraction phase. After the preprocessing in watermark insertion information embedded in such way that data quality will not degrade. In the watermark extraction the watermark information is decoded without distortion. The data recovery phase is responsible for the error correction as well as recovery of information.

## V. ARCHITECTURE OF REVERSIBLE WATERMARKING IN CLOUD ENVIRONMENT

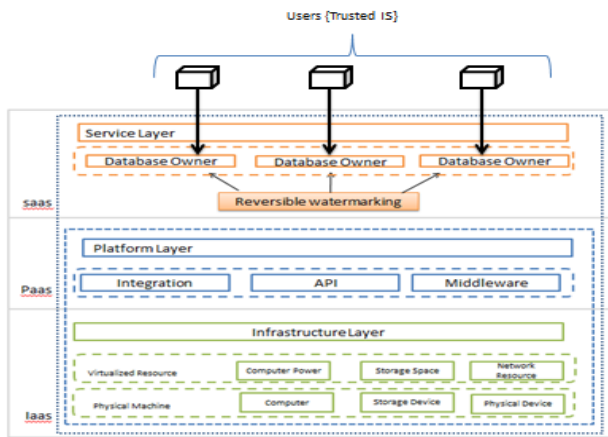


Figure 2: Reversible Watermarking in cloud environment

Reversible watermarking architecture is shown in Figure 2. We insert a reversible watermarking process in Service Layer of a cloud [2]. This layer provides “software as a service” (SaaS) to end-users. We do not modify the lower layers of “platform as a service” (PaaS) and “infrastructure as a service” (IaaS). In (SaaS) database owner maintain relational database, these data can be accessed by trusted end user. These user access the requested data for application use.

## VI. CONCLUSION

The reversible watermarking in cloud computing environment for relational database is proposed in this paper. Cloud computing is a massive platform for data storage but security questions are yet to be solved Digital watermarking is the method of embedding data into digital multimedia content as well as relational database which can lead to data quality loss. Reversible watermarking in cloud prevents from data

quality loss as well as keeps the data secure in cloud environment.

## REFERENCES

- [1] Saman Iftikhar, Kamran And Zahid Anwar “RRW – A Robust And Reversible Watermarking Technique For Relational Data.” IEEE Transactions On Knowledge And Data Engineering Vol X, No: XX, 2015.
- [2] Yu-Chao Liu, Y “A Method For Trust Management In Cloud Computing: Data Coloring By Cloud Watermarking.” 1476-8186 1751-8520, Institute Of Automation, Chinese Academy Of Sciences, 2011.
- [3] Zhiwei Yua, Clark Thomborsonb, Chaokun Wangc, Jianmin Wangc, And Rui Lic “A Cloud Based Watermarking Method For Health Data Security.” High Performance Computing And Simulation (HPCS), 2012 International Conference.
- [4] Navneet Singh, Prof. Shailendra Singh “The Amalgamation Of Digital Watermarking And Cloud Watermarking For Security Enhancement In Cloud Computing.” International Journal Of Computer Science & Mobile Computing, 2013.
- [5] Javier Franco-Contreras, Gouenou Coatrieux, Frédéric Cuppens, Nora Cuppens-Boulahia, And Christian Roux, “Robust Lossless Watermarking Of Relational Database On Circular Histogram Modulation.” IEEE Transactions On Information Forensics And Security, Vol. 9, No. 3, March 2014.
- [6] Shi-Jinn Horng And Mahmoud E. Farfoura- “A Novel Blind Reversible Method For Watermarking Relational Databases”, International Symposium
- [7] On Parallel And Distributed Processing With Applications, 2010
- [8] “Walmart To Start Sharing Its Sales Data,” [Http://www.Nypost.Com/P/News/Business/Walmart-Opensup](http://www.Nypost.Com/P/News/Business/Walmart-Opensup), Last Updated: 09:55 AM On February 4, 2012, Last Accessed: July, 20 2