Detect Modified Data from Unauthorized Access and Restore Facility on Server

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Abstract

Various e-commerce websites face issues regarding privacy of data because many users buy a product with lower price and there are chances that the data can be modified by attacker because of which it will result in the loss of the company as they are unaware of those changes. To overcome this drawback MD5 algorithm technique is introduced which is based on e commerce application. We have implemented both side security front end and back end using MD5 algorithm. Any changes done in server which is acting as mediator will affect both, front end as well as back end. Most of the users when visit the e-commerce website then price of product and the product itself attracts them the most. But there may be chances that the attacker can gain access to the database server and can change the price of the product or anything related to the website. For that purpose both side security system is used. The MD5 algorithm is used to detect & prevent data modification attacks and restore it with the original value .Duel security prevents attacks and prevents websites data from unauthorized updating by the attacker or third party.

Keywords: Duel security, MD algorithm, Intrusion detection, multi-tier web application, data leakage detection.

I. INTRODUCTION

Now day's database security is a major component of each and every organization. Database is used to store data in database but is not sufficient for any organization, since they have to deal with all issues related to database, from which,one of the main issue is database security. In this paper we have designed with the basic approach that determines whether data stored in database is tampered or not. Any business cannot afford the danger of an unauthorized user observing or changing the information in their databases. Web services are widely used in social networking by various peoples. Web services and applications have become popular and also their complexity has increased. Most of the tasks such as banking, social networking, and online shopping are done and are directly depend on web. As we are using web services which is present everywhere for personal as well as corporate data that are being attacked easily. Attacker attacks the back end server which provides the useful and valuable information thereby diverging front end attack. Data leakage is that the big issue for industries & different institutes. It is very hard for any supervisor to seek out out the information leaker among the system users. It creates a serious threat to organizations. It can destroy company’s brand and its reputation.

The **MD5** algorithm is a widely used algorithm for one way hashes that are used to verify without necessarily giving the original value. **MD5** Algorithm is used by UNIX systems to store the passwords of the user in a 128-bit encrypted format. **MD5** algorithms are widely used to check the integrity of the files.

MD5 message digest algorithm is the 5th version of the Message Digest Algorithm developed by Ron Rivest to produce 128 bit message digest. **MD5** is quite fast than other versions of message digest which takes the plain text of 512 bit blocks which is further divided into 16 blocks, each of 32 bit and produces the 128 bit message digest which is a set of four blocks, each of 32 bits. **MD5** produces the message digest through five steps i.e. padding, append length, divide input into 512 bit blocks, initialize chaining variables a process blocks and 4 rounds, uses different constant it in each iteration.

- Step 1- Padding means adding extra bits to the original message. So in MD5 original message is padded such that its length in bits is congruent to 448 modulo 512. Padding is done such that the total bits are 64 less being a multiple of 512 bits length. Padding is done even if the length of the original message is already congruent to 448 modulo 512. In padding bits, the only first bit is 1 and the rest of the bits are 0.
- Steps 2- After padding, 64 bits are inserted at the end which is used to record the length of the original input. Modulo 2^64. At this point, the resulting message has a length multiple of 512 bits.
- Step 3- A four-word buffer (A, B, C, and D) is used to compute the values for the message digest. Here A, B, C, and D are 32- bit registers and are initialized in the following way.

Word A	01	23	45	67
Word B	89	Ab	Cd	Ef
Word C	Fe	Dc	Ba	98
Word D	76	54	32	10

- Step 4 - Processing message in 16-word block

MD5 uses the auxiliary functions which take the input as three 32-bit number and produces a 32-bit output. These functions use logical operators like OR, XOR, NOR.

F(X, Y, Z)	XY v not (X)Z
G(X, Y, Z)	XZ v Y not (Z)
H(X, Y, Z)	X xor Y xor Z
I(X, Y, Z)	Y xor (X v not (Z))

The content of four buffers are mixed with the input using this auxiliary buffer and 16 rounds are performed using 16 basic operations.

SQL injection may be a code injection technique, wont to attack data-driven applications, during which nefarious SQL statements area units are inserted into associate degree entry field for execution (e.g. to dump the information contents to the attacker). SQL injection should exploit a security vulnerability in associate application's code, as an example, once user input is either incorrectly filtered for string literal escape characters embedded in SQL statements or user input is not strongly typewritten and unexpectedly dead. SQL injection is generally referred as associate degree attack vector for websites.
SQL Injection poses a heavy security issue over the net or over web application. In SQL injection attacks, hackers will cash in of poorly coded net application code to introduce malicious code into the organization's systems and network. The vulnerability exists if the internet application is not properly filter or validate the entered information by a user on an internet page. Giant net applications have many places wherever users will input file, which might give a SQL injection chance. Aggressor will steal confidential information of the organization with these attacks ensuing loss of market price of the organization. This paper presents an efficient survey of SQL Injection attack, detection and bar techniques.
SQL Injection Attacks area unit only methodology for stealing the information from back end, by the assistance of those attacks hacker will get access to the information and steal sensitive data. Usually these attacks area unit generated from net input thus these area unit referred to as input validation attacks. Currently now a days most net applications area unit being hacked are victimization SQL Injection attacks methodology. It comes below high 10 security threat in net applications [14]. With the assistance of those attack, aggressor will get table name, information schema, and additionally aggressor will use DML statements from the equipped input from net application to the information server ensuing a corrupt information. This paper presents completely different form of SQL injection attacks and their bar techniques.

There are four main classes of SQL Injection attacks against databases.

SQL Manipulation: It's the method of modifying the SQL statements by exploitation numerous operations like UNION. Another way of implementing SQL Injection exploitation SQL Manipulation technique is by dynamical the wherever clause of the SQL statement to urge totally different results.

Code Injection: Code injection is that the method of inserting new SQL statement. In every code injection attacks it appends a SQL Server EXECUTE command to the vulnerable SQL statement. This sort of attack is barely attainable once multiple SQL statements per info request area unit supported.

Function Call Injection: It's the method of inserting numerous info perform calls into a vulnerable SQL statement. These perform decisions that will create AN OS call or manipulate information within the info.

Buffer Overflow: Buffer overflow is caused by exploitation call injection. For many of the business and open supply databases, patches area units are offered. This sort of attack is feasible once the server is UN-patched.

This paper presents a good survey of the SQL Injection attacks and additionally describes attacks area unit enforced on the info exploitation SQL queries. The attacks are categorized. Finally a comparative analysis of various varieties of detection and hindrance techniques of SQL Injection attacks is conferred.

II. LITERATURE SURVEY

[1] X. Chen, J. Li, X. Huang, J. Ma, and W. Lou," New in public Verifiable Databases with economical Updates", 2015, during this paper author has developed a model that notion of verifiable information (VDB) permits a resource-constrained consumer to firmly source a really massive information to AN untrusted server so it might later retrieve a information record and update it by assignment a brand new price. Also, any try by the server to tamper with the info are detected by the consumer. Author proposes a brand new VDB framework from vector commitment supported the concept of commitment binding. the development isn't solely public verifiable however conjointly secure below the FAU attack. moreover, he proves that our construction are able to do the required security properties.

[2] Anmin Fu, Shui Yu, Yuqing Zhang, Huaqun Wang, Changing Huang, "NPP: a brand new Privacy-Aware Public Auditing theme for Cloud information Sharing with cluster Users", 2016, this paper author style a brand new privacy-aware public auditing mechanism for shared cloud information by constructing a homomorphic verifiable cluster signature. in contrast to the prevailing solutions, our theme needs a minimum of cluster managers to recover a trace key hand in glove, that eliminates the abuse of single-authority power and provides non-frame ability. Moreover, our theme ensures that cluster users will trace information changes through selected binary tree; and may recover the most recent correct information block once the present information block is broken. additionally, the formal security analysis and experimental results indicate that our theme is demonstrably secure and economical.

[3] Ekta Naik, Ramesh Kagalkar, "Detecting and Preventing Intrusions In Multi-tier net Applications", 2014, during this paper, author proposes enforced double guard exploitation net info and repair manager moreover, it quantify the constraints of any multitier IDS in terms of coaching sessions and practicality coverage. I'm implementing the bar techniques for attacks. i'm conjointly finding information processing Address of persona non grata. A network Intrusion Detection System are often classified into 2 types: anomaly detection and misuse detection. Anomaly detection 1st needs the IDS to outline and characterized the proper and acceptable static kind and dynamic behaviour of the system, which may then be accustomed sight abnormal changes or abnormal behaviour.

[4] V. Vu, S. Setty, A.J. Blumberg, and M. Walfish, "A hybrid architecture for interactive verifiable computation", 2013, this work is promising however suffers from one in every of 2 problems: either it depends on big-ticket cryptography, instead it applies to a restricted category of computations. Worse, it's not forever clear that protocol can perform higher for a given drawback. He describe a system that (a) extends optimized refinements of the non cryptographic protocols to a far broader category of computations, (b) uses static analysis to fail over to the cryptologic ones once the non cryptographic ones would be dearer, and (c) incorporates this core into a designed system that has a compiler for a problem-oriented language, a distributed server, and GPU acceleration. Experimental results indicate

that our system performs higher and applies additional wide than the most effective within the literature.

[5] S. Pearson and A. Benameur, “Privacy, security, and trust problems arising from cloud computing”, 2010, Cloud computing is AN rising paradigm for giant scale infrastructures. it's the advantage of reducing price by sharing computing and storage resources, combined with AN on-demand provisioning mechanism looking forward to a pay-per-use business model. These new options have an on the spot impact on the budgeting of IT budgeting however conjointly have an effect on ancient security, trust and privacy mechanisms. several of those mechanisms aren't any longer adequate, however got to be rethought to suit this new paradigm. during this paper he assess however security, trust and privacy problems occur within the context of cloud computing and discuss ways in which during which they will be self-addressed.

III. EXISTING SYSTEM

In Existing System we often face the problems with the privacy of the network system and private data. There are some security issues like, data modification can be done by attackers by unauthorized access. It will be the loss of the business person itself because restore facility for modified data is not available.

IV. PROPOSED SYSTEM

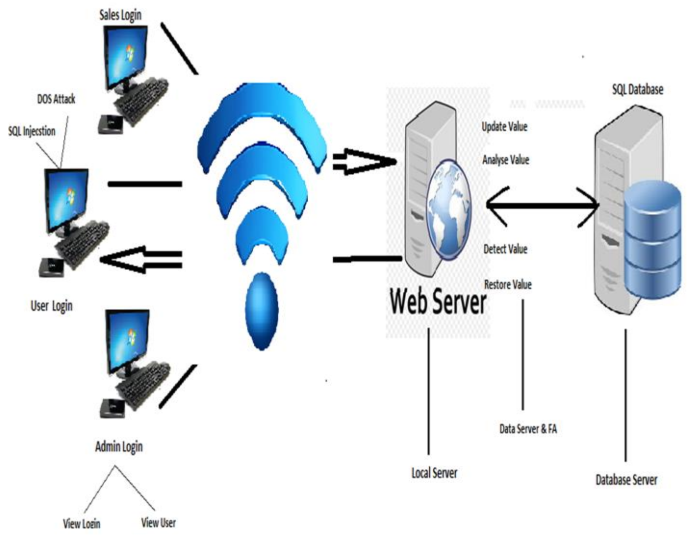

Fig 1. System architecture

A. System Overview:

Here are 5 modules. They are user module, admin module, sales department module, server module which is running continuously and database module where we can fire all queries. So in user module user can view product, buy product, update profile etc. Admin login is able to view all login of users and the number of users. In sales department the actual updation of price and product is being done and in middle there is secure server which handles all the changes in front end as well as back end (database). That is when the attacker modifies the data this secure server will detect it and prevent it.

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B. Module Explanation:

User Module:

User has authorize login access. User can update all personal information. User can also give authority to generated secure encryption process.

Sales Department:

Sales department work as a hacker. Here hacker changes the database value of any product without authentication.

Admin Module:

Admin is the authorized person, he checks all the user activity records as well as profile. Admin can also watch the tempering on changing the values from database.

C. Flow of System:

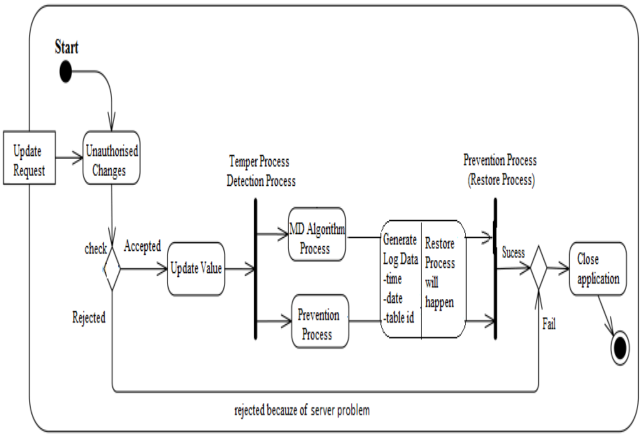

Start
Update Request
Unauthorised Changes
check
Accepted
Rejected
Update Value
Temper Process Detection Process
MD Algorithm Process
Prevention Process
Generate Log Data -time -date -table id
Restore Process will happen
Prevention Process (Restore Process)
Sucess
Fail
Close application
rejected becauze of server problem

Fig 2. Flow of system

V. Result

The MD5 Algorithm recommended that the tamper detection complete only for the tiles but in our approach we perform the tamper detection on live data. In our approach This Algorithm gives a systematic path to the employee and auditor for the secure communication with the system. By using this algorithm we stop the database disturbance form insider’s and the outsider’s. Because of the audit log it is capably auditing the central database.

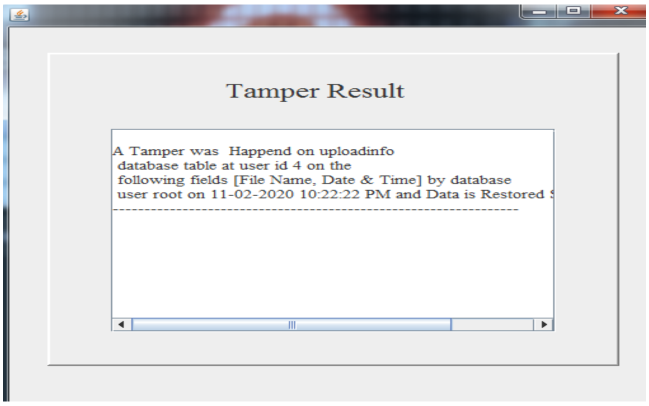
Table 1 Result

Sr no	Table Name	Product Id	Data & Time
1	Product Details	ID 1	15/01/2020,01:23 PM
2	Product Details	ID 2	16/01/2020,03:45 PM
3	User Details	User Name	17/01/2020,04:00 PM

In this paper we have identified the threats of SQL injection and DOS attack using Intrusion Detection System. Additional security measures can be provided using stored procedures. This approach applies mapping model to detect SQL injection and DOS attacks. Also we have identified the tempering attack on database using MD5 Algorithm.

We have achieved this by isolating the flow of information from each web server session with a virtualization technique. Also, we quantified the detection accuracy of our approach when we attempted to model static and dynamic web requests with the back-end file system and database queries.

In below show the final expected result of our proposed system.



```
A Tamper was  Happend on uploadinfo
 database table at user id 4 on the
 following fields [File Name, Date & Time] by database
 user root on 11-02-2020 10:22:22 PM and Data is Restored
--------------------------------------------------------------
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Fig 3. Forensic analysis result of data based attack

VI.CONCLUSION AND FUTURE SCOPE

Conclusion:

We are going to propose the Application of Modified data detection system through unauthorized access. By using MD5 algorithm we are restoring modified data in front end web (HTTP) requests and back end DB (SQL) queries. We are going to append the input data and generate hash value and these hash values are compared, that is the original one and the modified one. After appending padding will be done that will detect that the value has been changed and restore the original hash value within fraction of seconds.

Future Scope:

In future we can analyze phishing attack and cross site scripting attack that can be installed on wide range of machines having different operating systems and platforms. In future we can work on global server to do analysis on the temper server.

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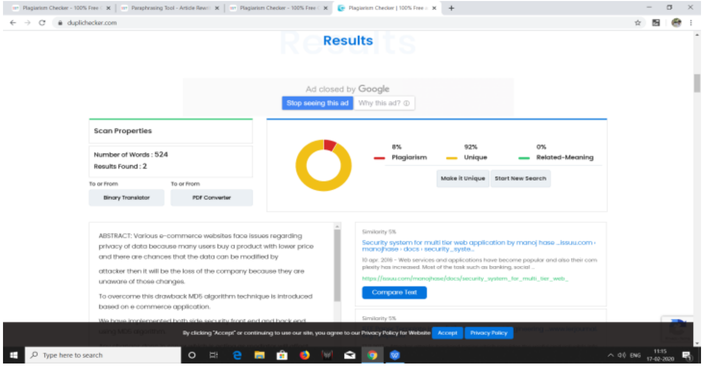
Plagiarism:



Number of Words : 524
Results Found : 2

ABSTRACT: Various e-commerce websites face issues regarding privacy of data because many users buy a product with lower price and there are chances that the data can be modified by

attacker then it will be the loss of the company because they are unaware of those changes.

To overcome this drawback MD5 algorithm technique is introduced based on e commerce application.

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