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Database Intrusion Detection and Protection System Using Log Mining and Forensic Analysis

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Abstract- Most PCs confirm client ID and secret word before clients can login there frameworks. By imparting login examples to collies or making examples open makes PC framework security week. On the off chance that there is a legitimate client of a framework who assault the framework inside is difficult to recognize. Since interruption recognition frameworks and firewalls recognize and disengage malevolent practices dispatched from the outside universe of the framework just. By examining framework calls produced by summons can distinguish these charges, with which to precisely recognize assaults, and assault examples are the components of an assault. Consequently, the security framework, named the Internal Intrusion Detection and Protection System, is proposed to recognize insider assaults at framework call level by utilizing log mining and criminological procedures investigation. Interruption recognition depends on mining database follows put away in log documents. Another system for recognizing noxious database exchanges consequence of the mining procedure is utilized to frame client profiles that can display ordinary conduct and distinguish gatecrashers. The zone of PC legal sciences loans itself vigorously to the reaction of a criminal infringement that has as of now happened on a framework. This framework will see the measurable application inside of the structure of Intrusion Detection and points of interest work fulfilled on a model inconsistency Intrusion Detection framework.

Keywords: Database Security, Data Mining, Identifying Users, Intrusion Detection, Real-time System.

INTRODUCTION

Data mining (the analysis step of the "Knowledge Discovery in Databases" process) is a field at the intersection of computer science and statistics, is the process that attempts to discover patterns in large data sets. It utilizes methods at the intersection of artificial intelligence, machine learning, statistics, and database systems. The overall goal of the data mining process is to extract information from a data set and transform it into an understandable structure for further use. Aside from the raw analysis step, it involves database and data management aspects, data pre-processing, model and inference considerations, interestingness metrics, complexity considerations, post processing of discovered structures, visualization, and online updating.

The Internal Intrusion Detection and Protection System creates users personal profiles to keep track of users usage habits as their forensic features and determines whether a valid login user is the account holder or not by comparing his/her current computer usage behaviours with the patterns collected in the account holder's personal profile.

Text mining, sometimes alternately referred to as text data mining, roughly equivalent to text analytics, refers to the process of deriving high-quality information from text. High-quality information is typically derived through the devising of patterns and trends through means such as statistical pattern learning. Text mining usually involves the process of structuring the input text (usually parsing, along with the addition of some derived linguistic features and the removal of others, and subsequent insertion into a database), deriving patterns within the structured data, and finally evaluation and interpretation of the output.

Log files are generated by system processes to record activities for subsequent analysis. They can be useful tools for troubleshooting system problems and also to check for inappropriate activity. The UNIX releases are preconfigured to record certain information in log files, but configuration settings are available to increase the amount of information recorded. A server log is a log file (or several files) automatically created and maintained by a server of activity performed by it. Log files can be very useful resources for security incident investigations.

The need for secure data storage has become a necessity of our time. Medical records, financial records, and legal information are all in need of secure storage. In the era of globalization and dynamic world economies, data outsourcing is inevitable. Security is major concern in data outsourcing environment, since data is under the custody of third party service provider. In present systems, third party can access and view data even though they are not authorized to do so or even when the data is outsourced to the auditors or allow the employee of the organization to do the updating in the database. This may lead to the serious data theft, data tampering and even data leakages causing severe business impact to data owner.

LITERATURE SURVEY

A. Database Intrusion Detection using Weighted Sequence Mining, JOURNAL OF COMPUTERS**:** Data mining is widely used to identify interesting, potentially useful and understandable patterns from a large data epository. With many organizations focusing on web based on-line transactions; the threat of security violations has also increased. Since database stores valuable information of an application, its security has started getting attention. An intrusion detection system (IDS) is used to detect potential violations in database security. In every database, some of the attributes are considered more sensitive to malicious modifications compared to others. We propose an algorithm for finding dependencies among important data items in a relational database management system. Any transaction that does not follow these dependency rules are identified as malicious.

B. Signature-based Multi-Layer Distributed Intrusion Detection System: The Internet and computer networks are exposed to an increasing number of security threats. With new types of attacks appearing 10 continually, developing flexible and adaptive security oriented approaches is a severe challenge. Intrusions detection systems (IDSs) are systems that try to detect attacks as they occur or after the attacks took place. IDSs collect network traffic information from some point on the network or computer system and then use this information to secure the network. In this context, signature-based network intrusion detection techniques are a valuable technology to protect target systems and networks against malicious activities.

C. Mining Association Rules between Sets of Items in Large Databases: We are given a large database of customer transactions. Each transaction consists of items purchased by a customer in a visit. We present an efficient algorithm that generates all significant association rules between items in the database. The algorithm in-corporates buffer management and novel estimation and pruning techniques. We also present results of applying this algorithm to sales data obtained from a large retailing company, which shows the effectiveness of the algorithm

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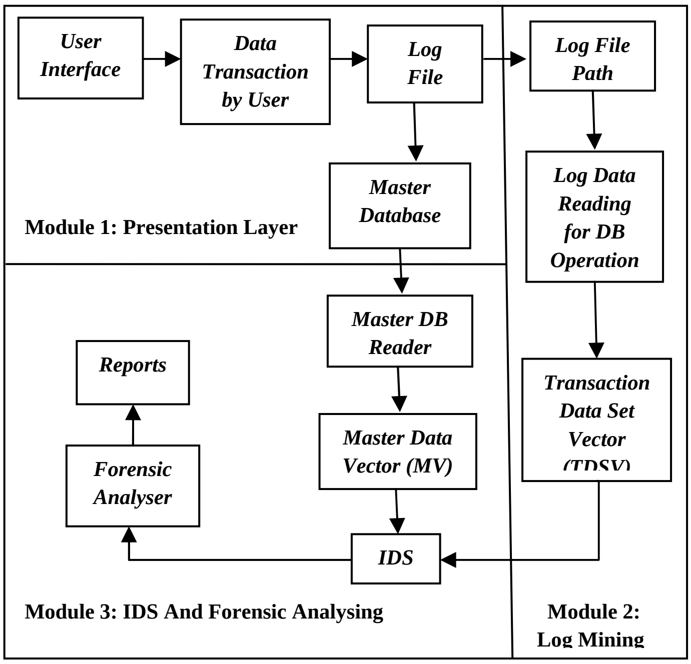
PROPOSED SYSTEM

System Architecture:



The proposed database intrusion detection system consists of log mining mechanism and an intrusion detection mechanism. In this we are using vector concept for detection of intrusion. Vector is array list with extended properties which follows dynamic and automatic addition of data at run time. So it reduces the computations. In this we are mining log file for comparison purpose to detect intrusion. Initially, system copies the contents from log file into temporary file as no one can perform operations on log file directly. Then with original database the comparison is carried out. And intrusion is detected if any and report is generated which gives field where the intrusion is occurred and also gives date and time.

So the system follows:
1. To allow Users to perform transactions.
2. Provides the facility to read log file and collect all transaction data.
3. Provides a facility to collect all infected data from Master DB.
4. Provides a facility to detect tamper detection.
5. Provides a facility to perform forensic analysis on tampered data.
As a result our system works faster with better performance.

Our Proposed system consists of three modules:-

1. Presentation Layer: - This module is for the most part identified with User Interface (UI). In this client cooperate with framework through JSP pages. So in this client gives the info to the framework and this information go through the log document and put away into the expert database.
2. Log Mining: - This module is identified with log document filtering. In this as of now created log record is perused by the framework. So by checking the substance for each database exchange, it makes the exchange information set vector (TDSV) for each exchange.
3. IDS and Forensic Analysis: - In this module, the framework will identify the interruption if happened and will create the report for interruption. In this, framework will produce the expert information set vector (MV) for every exchange in the expert database. Utilizing MV and TDSV it will recognize the interruption happened in the expert database and will produce the report where the really the interruption happened, when and by whom**.**

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