Web Application Security Threat - SQL injection

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Abstract

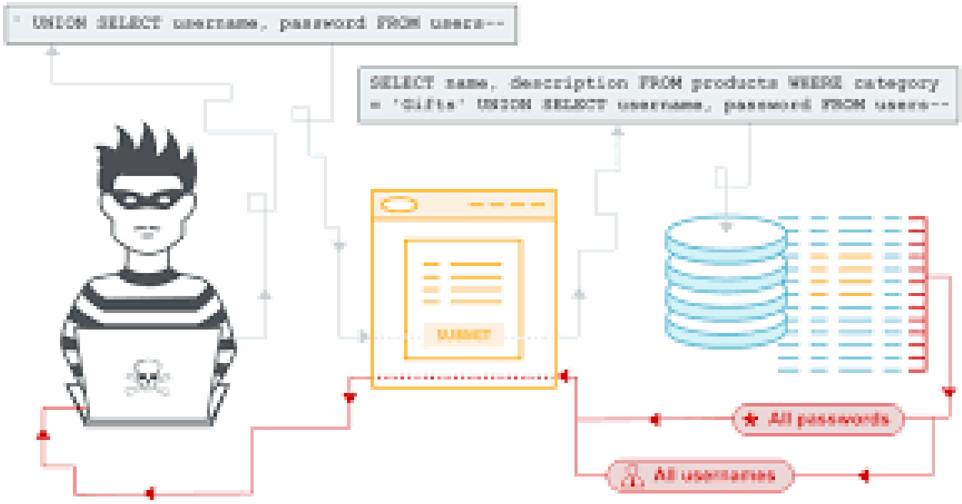
In this assignment paper we studied the concept of SQL injection which is a serious threat to Web Application Security. A brief research has been generated on it and it's preventive measures have been discussed and well versed for the readers.

1 Introduction

With the spread of the Internet and the WEB's rapid development, WEB applications not only improved the efficiency of work and enterprise strengthens the enterprise market competitiveness. Web platform have flexible, efficient, low cost and other information superiority has greatly improved the related department work efficiency, and promote the actual business thorough development, enhance the department and the outside world exchange, service and interaction. Our country's computer industry after more than ten years of development, the national industry production management system, are based on the Internet architecture, in the country's defense engineering, government office, financial systems, to network games, online banking, network transactions, is inseparable from the network. Today's Internet has become the indispensable part in life. How to effectively ensure network stability and safety operation is an important topic, also is the various network managers have a headache problem. Attack SQL injection is to use the insert harmful character attacktechnology. The attacker using programmers to user input data legitimacy detection notstrictly or not detection characteristics, deliberately in a different way from client submitspecial code to manipulate data, thus collection procedures and server information, obtainthe desired information.

2 Background

SQL Injection is an attack technique used to exploit applications that construct SQL statements from user-supplied input. When successful, the attacker is able to change the logic of SQL statements executed against the database.Due to the various Web server vulnerabilities and procedure of the rigor leads to a Web server script for attacks was increasing, its are mostly through the ASP or PHP scripting injection such as a major attack means, plus Web site rapid expansion of today, based on both the SQL injection also slowly become the mainstream way. Attack SQL injection is to use the insert harmful character attack technology. The attacker using programmers to user input data legitimacy detection not strictly or not detection characteristics, deliberately in a different way from client submit special code to manipulate data, thus collection procedures and server information, obtain the desired information.



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' UNION SELECT username, password FROM users--
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SELECT name, description FROM products WHERE category
= 'Gifts' UNION SELECT username, password FROM users--
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Figure 1: SQL Injection is an attack technique used to exploit applications that construct SQL statements from user-supplied input. When successful, the attacker is able to change the logicof SQL statements executed against the database.

3 Web Security Situation

With the deepening of the network applications, the Internet website quantity with amazing speed increase. Whether government departments, enterprises and various management agencies, through the website to establish various information platform for various business applications. Website is information release center, its database to store has a large amount of for users to share the important information and materials. Therefore, to ensure the normal operation of the web site, the security is website construction and operation process should be fully considered important issues. Although the Internet application scale developed rapidly, but the complexity of the network environment, and information system, variability of vulnerability, decide the existing computer system still does not have with own application development scale of corresponding security protection ability, a large number of online threats USES all sorts of hidden way constantly pounding network application platform. Network security problems are not reflected in the technical level of information counter, in actual social activities, threat generated more from the huge interest drive. Internet is an open, no control agency network, based on TCP/IP protocol Internet protocol families own open great place show various computer networking and interconnection and directly, and promoted the rapid development of Internet technology. But as in the early network protocol design neglect the safety, cause Internet in use and management of chaos, and gradually make the Internet itself of safety and security has been threatened. Hackers (Hacker) often get the chance to intrude into the computer on the network system, or stolen confidential data and theft privilege, or destroy the important data, or make the system function not fully exert until paralysis. Website unauthorized access to web security will be fatal, and its harm degree is the largest. System password simple and short, operating system of various vulnerabilities, various applications software defect, the default Shared folder, a large number of network application service of opening, safety level set too low for hackers illegal invasion will offer a convenient. With the expanding of network size, computer network virus to site the threat of a bigger role. Network virus spread on the Internet very fast, and its harm is enormous.

4 SQL injection

Due to the various Web server vulnerabilities and procedure of the rigor leads to a Web server script for attacks was increasing, its are mostly through the ASP or PHP scripting injection such as a major attack means, plus Web site rapid expansion of today, based on both the SQL injection also slowly become the mainstream way. Attack SQL injection is to use the insert harmful character attack technology. The attacker using programmers to user input data legitimacy detection not strictly or not detection characteristics, deliberately in a different way from client submit special code to manipulate data, thus collection procedures and server information, obtain the desired information. This paper briefly introduces the concept of SOL injection attack and principle, and the realization process of SQL injection attack, and on this basis describes how to detect SQL injection attack, summarizes the general SQL injection attack prevention methods. And the ASP website platform system injection attack prevention technology examples are analyzed, make prevent SQL injection technology in the practical application of web security system plays a better, more effectively resist hackers and other malicious damage.

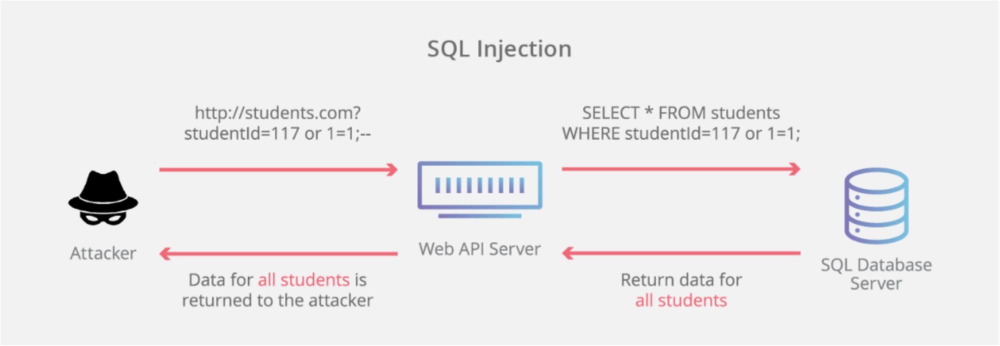

Figure 2: The attacker using programmers to userinput data legitimacy detection not strictly or not detection characteristics, deliberately in adifferent way from client submit special code to manipulate data, thus collection proceduresand server information, obtain the desired information.

5 Preventive Measures

The use of parameterized lactobacillus colonisation statement To defense SQL injection, user input is absolutely cannot directly to be embedded SQL statements. On the contrary, the user input must be filtered, or use of parameterized statement. Parametric statements and not use parameters user input into the statement. In most cases, the SQL statement was fixed. Then, the user input will be limited to a parameter. To avoid using explain program, because that's what hackers to perform an illegal means of command. Prevent SQL injection, and avoid some detailed error messages, because the hackers can use the information. To use a standard input mechanism to verify all confirmed the input data of length, type, a statement, enterprise rules, etc. Using professional vulnerability scanning tools.

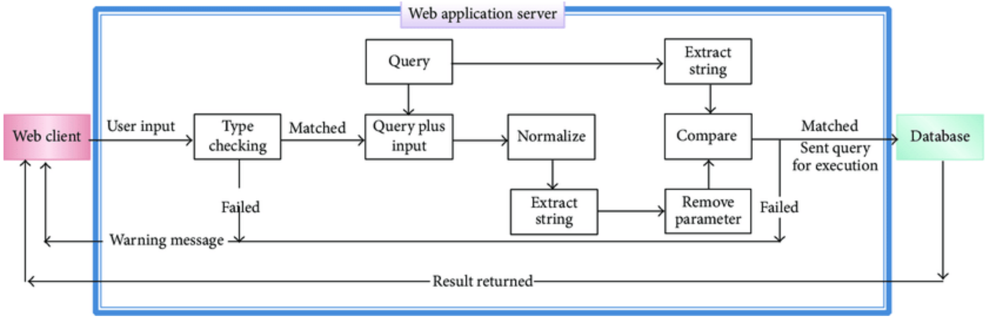

Figure 3: The use of parameterized lactobacillus colonisation statement To defense SQL injection, userinput is absolutely cannot directly to be embedded SQL statements.

6 Conclusions

In this paper the SOL injection attack method, principle and attack implementation process is discussed and summarized in this paper, due to a SQL injection attack is for application development process of the programming loophole, so for the vast majority of firewall speaking, this kind of attack can be bypassed. Although the database server version has been updated, various scripting language itself fewer vulnerabilities, but as SOL injection technology unceasing enhancement, as long as the Web application system or source still existed in such loophole, will lurk this concern, especially when SOL injection attack with some other attack tool with, the server and system are huge threat. Therefore, the study SQL injection attack prevention methods, pay attention to the safety of SOL Server configuration, strengthening the code to user input information filtering check to develop safe Web applications has important significance. With the development of network security technology, also need to SQL injection attack technology to do further research, due to the SQL injection technique quite flexible, in injection time will come across many unexpected situation. Therefore in setting up Web server to overall consideration host and the security of the system, set up the server and the database security options, completes the code's safety inspection work, so that we can do to prevent this, the greatest degree realizes network security.

Table 1: Research Papers used extensively as base paper.

Paper	*Publisher*
Review of SQL Injection : Problems and Prevention	Researchgate
Detection and Prevention of SQL Injection Attack: A Survey	IJCSMC
SQL injection attack and guard technical research	ScienceDirect
Research of SQL injection attack and prevention technology	IEEE

7 Future Enhancements

There is scope for further improvement in the WAPS-CIVS prevention system. The SQL injection preventer of WAPS-CIVS does not address injection through the stored procedure. The Stored procedure is a common method to operate the database at the database server. The WAPSCIVS considers the SQL statement crafted at the application / business logic of the web application. The XPath injection is similar to SQL injection, and nowadays, it has become popular where XML data is used as a data store for the web application. The WAPS-CIVS addressed only the tautology based XPath injection in a web application. It does not address the insert XQuery and union XQuery. The XPath injection preventer can be further improved by addressing issues other than tautology based injections.

References

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