DEVELOPMENT AND RESEARCH OF A SOFTWARE COMPONENT FOR ASSESSING THE VULNERABILITY OF WEB APPLICATIONS TO SQL INJECTIONS

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SQL injection is a common web application security vulnerability where attackers deceive backend databases into executing unexpected commands by inserting malicious SQL code into user input [1]. This vulnerability may lead to serious consequences such as data leakage, data tampering, identity bypass, etc.

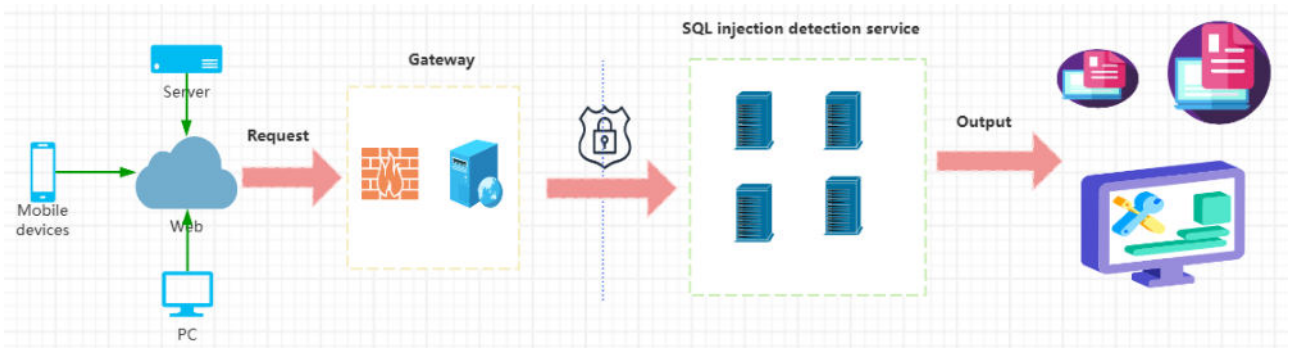

Fig. 1. – The Web applications to SQL injections architecture

This system is a software component used to evaluate SQL injection vulnerabilities in web applications. It combines static code analysis and dynamic penetration testing techniques, adopts a modular design, and supports automated scanning, risk assessment, and visual reporting [2].

This software component adopts a three-tier architecture design: data collection layer (static analysis, dynamic monitoring), analysis engine layer (rule-based detection, machine learning model detection), and visualization layer (generating interactive reports, displaying vulnerability distribution, risk level, and repair suggestions). Adopting key detection techniques: hybrid detection technology, adaptive rule engine, automated scanning, rule-based detection, machine learning model (LSTM – Long Short-Term Memory) to detect abnormal query patterns [3].

This component effectively enhances the detection capability of SQL injection vulnerabilities and the security of applications through intelligent analysis technology. In the future, support for more database types and detection of new injection attacks will be expanded, and integration with DevSecOps tools will be optimized.

References

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3. Zhang M. Web security detection technology based on machine learning // Information Security Research. – 2022.