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Encoding Query Based Lightweight Algorithm for Preventing SQL injection attack

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Abstract

SQL injection attacks are still common issue in web applications. Although different techniques have been proposed to prevent SQL injection attack, it has a high impact on web applications, especially associated with large and sensitive databases. In this attack, an attacker can inject malicious code into the data entry field of the input form and bypass authentication, access, then modification and deletion of data within the database. In this paper, a lightweight algorithm is introduced based on encoding of the query named (EQA) considering HTTP traffic parameters e.g. request and response time and message length. EQA hides the SQL relationship with the database, and prevents some common types of SQL injection (Tautology, Piggybacked and Comment). EQA is implemented and tested using MySQL and PHP environment and Wireshark platform. The results demonstrate that the proposal has a good performance in terms of security level, reducing HTTP request and response time and message length.

Keywords: SQL injection, Encoding Query, Vulnerabilities, Tautology, Piggybacked, Comment, HTTP traffic.

1. INTRODUCTION

Web application hacking is one of the most common attacks on both organizations and individuals [1]. The most common attack on websites is SQL injection attack (SQLIA) which remained the same for many years [2]. SQL injection and cross-site scripting attacks increased

by 38% in 2018 where the most popular WordPress hosts use SQL by default [3]. The Trust Wave reported in 2018 that the most common forms of web application attacks are those that exploit SQL injections where they constituted about 24% of the website attacks [4].