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Task-7

1.Blind SQL Injection

Blind SQL Injection is a sophisticated attack vector where attackers inject malicious SQL queries into vulnerable web applications, aiming to retrieve sensitive information from the backend database indirectly. Unlike traditional SQL injection attacks, blind SQL injection doesn't yield immediate feedback to the attacker. Instead, attackers rely on subtle clues or timing differences in the application's responses to infer data. Techniques such as boolean-based and time-based queries are commonly employed to extract information without directly viewing the database output. This type of attack is particularly challenging to detect and mitigate because it doesn't typically leave visible traces in the application's behavior. Blind SQL injection attacks can be devastating, allowing attackers to steal confidential data, escalate privileges, or execute unauthorized commands within the database. Preventative measures against blind SQL injection include thorough input validation, parameterized queries, and implementing least privilege access controls to limit potential damage. Organizations must prioritize robust security practices and regularly conduct security assessments to identify and address vulnerabilities before they can be exploited by malicious actors.

2.Time Delay SQL Injection

Time Delay SQL Injection is a variant of SQL injection where attackers inject malicious SQL queries into vulnerable web applications with the intention of causing delays in the database's response. Unlike traditional SQL injection attacks that aim for immediate data extraction, time delay injections are stealthier, as they don't provide direct feedback to the attacker. Attackers utilize functions like `SLEEP()` or `WAITFOR DELAY` in their injected queries to introduce delays in the application's response. By analysing the time it takes for the application to respond to these injected queries, attackers can infer information about the database schema, data, or underlying infrastructure. Time Delay SQL Injection attacks are often used when other injection techniques are mitigated by security measures such as input validation or parameterized queries. Mitigating time delay SQL injection involves implementing strict input validation,

using parameterized queries, and regularly updating and patching web application frameworks and libraries to prevent exploitation of known vulnerabilities. Organizations must also monitor application performance for anomalies that could indicate potential attacks.

3.Boolean-based SQL Injection

Boolean-based SQL Injection is a sophisticated attack technique employed by hackers to manipulate the logic of a vulnerable web application's SQL queries. In this type of attack, malicious SQL code is injected into input fields with the aim of altering the application's behavior based on the truth or falsity of certain conditions. Attackers exploit the application's response, which varies depending on whether the injected condition is true or false. By carefully crafting SQL queries with conditional statements, such as `AND`, `OR`, or `NOT`, attackers can extract sensitive information from the database, bypass authentication mechanisms, or even execute unauthorized actions. Since boolean-based SQL injection attacks don't rely on error messages or visible anomalies, they can be particularly challenging to detect and mitigate. Prevention methods include input validation, using parameterized queries, employing least privilege principles, and regularly auditing and patching web applications for security vulnerabilities. Additionally, security teams should implement comprehensive monitoring and logging systems to detect and respond to suspicious activity indicative of SQL injection attacks.

4.Heavy Query SQL Injection

Heavy Query SQL Injection is a malicious technique where attackers inject complex and resource-intensive SQL queries into vulnerable web applications. Unlike traditional SQL injection attacks aimed at extracting data or compromising security, heavy query injections are focused on causing significant strain on the database server. Attackers craft queries that consume excessive CPU, memory, or disk resources, potentially leading to denial of service (DoS) or severe performance degradation. These resource-intensive queries may involve operations like cartesian joins, nested subqueries, or sorting large datasets

5. In-band SQL Injection

In-band SQL Injection, also known as classic SQL injection, is the most common and straightforward type of SQL injection attack. In this attack, attackers inject malicious SQL code directly into vulnerable input fields of a web application, such as login forms or search boxes. The injected SQL commands are executed by the application's database server, allowing attackers to manipulate the database and potentially access or modify sensitive information. In-band SQL injection attacks pose a significant threat to web applications, as they can lead to data breaches, unauthorized access, and system compromise. To mitigate the risk of in-band SQL injection, developers should implement secure coding practices, such as input validation, parameterized queries, and least privilege principles. Regular security assessments and code

reviews are also essential to identify and remediate vulnerabilities before they can be exploited by attackers.

6.Error-based SQL Injection

Error-based SQL Injection is a type of in-band SQL injection attack where attackers inject malicious SQL code into vulnerable input fields of a web application. The injected SQL code is designed to trigger errors in the application's database server, revealing valuable information that attackers can exploit.In this attack, attackers intentionally manipulate the SQL syntax to cause the application to generate error messages containing sensitive data from the database. These error messages may include details about the database schema, table names, column names, or even portions of the query results. By carefully analyzing these error messages, attackers can gather insights into the database structure and contents, facilitating further exploitation.

7. Union-based SQL Injection

Union-based SQL Injection is a type of in-band SQL injection attack where attackers inject malicious SQL code into vulnerable input fields of a web application. The injected SQL code typically includes a UNION operator, allowing attackers to combine the results of their injected query with the original query executed by the application.In a Union-based SQL Injection attack, attackers craft SQL queries that manipulate the database to return additional information not originally intended by the application. By leveraging the UNION operator, attackers can append their own SELECT statement to the original query, thereby extracting data from other tables or system files.

8. End-of-line" command SQL injection

End-of-line" command SQL injection, also known as newline injection or line break injection, is a type of injection attack where an attacker exploits the absence of proper input validation to inject additional SQL commands into a query by inserting newline characters (\n) or other control characters. In this type of attack, the attacker injects newline characters or other special characters into input fields of a vulnerable web application. These characters are interpreted by the application as the end of a SQL statement, allowing the attacker to append additional SQL commands to the original query. To prevent end-of-line command SQL injection attacks, developers should implement proper input validation and sanitization techniques to ensure that user input is properly escaped before being used in SQL queries.

9.Piggy bank query" SQL injection

Piggy bank query" SQL injection refers to a specific type of SQL injection attack where an attacker manipulates a database query used in a piggy bank application. In a piggy bank application, users typically have accounts where they can deposit and withdraw money, and the application stores this information in a database. In a piggy bank query SQL injection attack, an attacker exploits vulnerabilities in the application's input validation mechanisms to inject malicious SQL code into the database query responsible for managing user account balances. By injecting SQL commands such as UNION, INSERT, UPDATE, or DELETE into the query, the attacker can manipulate the account balances, potentially stealing funds from other users or modifying their own account balance.

10. "System stored SQL injections"

System stored SQL injections as a term doesn't directly exist within the context of SQL injection attacks. However, it's possible that you might be referring to attacks involving exploiting stored procedures or functions within a database system. Stored procedures and functions are precompiled SQL code stored within the database itself. They are designed to provide reusability and better performance by executing a set of SQL statements when invoked. However, if these stored procedures are not properly secured or if they execute dynamic SQL statements constructed from user input without proper validation, they can become vulnerable to SQL injection attacks. System stored SQL injections" could refer to a scenario where attackers exploit vulnerabilities within the stored procedures, functions, or system views provided by the database management system (DBMS) itself. In some cases, database systems provide default stored procedures, functions, or system views for administrative tasks or system monitoring. These built-in components are part of the database system and are often used by developers to perform common database operations.

11. illegal query SQL injection

illegal query SQL injection refers to a scenario where an attacker injects malicious SQL code into a vulnerable web application with the intention of executing queries that are unauthorized or prohibited by the application's security policies. The term "illegal query SQL injection" could imply injecting SQL commands that violate the application's intended functionality, business rules, or security policies. For example, an attacker might attempt to inject SQL code to bypass authentication mechanisms, escalate privileges, or access data that they are not authorized to view. To prevent illegal query SQL injection attacks, it's crucial to implement robust input validation and sanitization techniques, such as parameterized queries and input validation, to ensure that user input is properly validated and sanitized before being used in SQL queries. Additionally, enforcing strict access controls, least privilege principles, and regularly updating and patching the application's security mechanisms can help mitigate the risk of SQL injection attacks and maintain the integrity and security of the system.

12.Out-of-band SQL injection

Out-of-band SQL injection" refers to a type of SQL injection attack where the attacker does not directly receive the results of the injected query within the application's response. Instead, the attacker retrieves data through a separate channel, such as an out-of-band network connection, which is not part of the application's response. In a typical SQL injection attack, the attacker injects malicious SQL code into vulnerable input fields of a web application. The injected SQL code is executed by the application's database server, and the results are included in the application's response, allowing the attacker to extract sensitive information. However, in out-of-band SQL injection attacks, the attacker may inject SQL commands that trigger actions within the database server that result in data being sent to the attacker through a different channel, such as email, DNS requests, or HTTP requests to an external server controlled by the attacker. This allows the attacker to bypass certain security controls that may prevent direct data extraction from the application's response.