New issue

ORDER BY SQL Injection Vulnerability in ShopSuite System #3

Closed

r3tree opened 2 weeks ago

Vulnerability Title: ORDER BY SQL Injection Vulnerability in ShopSuite System Product Item Listing

Vulnerability Type: SQL Injection (Order By Clause Injection)

Severity: High

Description: The ShopSuite system contains a SQL injection vulnerability in the `listItemKey` method of the `ProductItemDao` interface. Attackers can inject malicious SQL code through the `sidx` and `sort` parameters in ORDER BY clauses, allowing extraction of sensitive information from the database including product data, user information, system configuration, and potentially administrative credentials.

Vulnerability Location:

File: `src/main/resources/mapper/pt/ProductItemXml.xml` (line 72)
Method: `listItemKey`
Parameters: `params.sidx` and `params.sort` (direct string interpolation)
Complete URLs:

- `GET /front/pt/product/listItem` (unauthorized access)

Vulnerability Principle: When processing product item listing requests, the system directly interpolates user-controlled `sidx` and `sort` parameters into the SQL ORDER BY clause without any filtering, escaping, or whitelist validation. The vulnerability exists in the MyBatis XML mapper where `${params.sidx}` `${params.sort}` is directly concatenated into the SQL statement.

Code Analysis:

```
<!-- ProductItemXml.xml line 71-73 -->
<when test="(params.sidx != null and params.sort != null) and (params.sidx != '' and pa
```

```
    ORDER BY b.product_order ASC, i.${params.sidx} ${params.sort}, b.product_id DESC
</when>
```

Call Chain Analysis:

1. **Controller Layer** (User input entry):
   - `ProductController.listItem()` → `/front/pt/product/listItem`
2. **Service Layer**:
   - `ProductIndexServiceImpl.listItem()` (line 551) calls repository method
3. **Repository Layer**:
   - `ProductItemRepositoryImpl.listItemKey()` (line 85) calls DAO method
4. **DAO Layer**:
   - `ProductItemDao.listItemKey()` interface method
5. **SQL Layer**:
   - `ProductItemXml.xml` executes vulnerable SQL with `${params.sidx}` and `${params.sort}` interpolation

Impact Scope:

- Extraction of database product information (SKU, pricing, inventory)
- Extraction of user information and administrative accounts
- Extraction of database structure and configuration
- Potential extraction of sensitive business data and financial information
- Possible complete database compromise through UNION-based injection
- Database manipulation (INSERT/UPDATE/DELETE) in certain database configurations

Exploitation Conditions:

- No authentication required for frontend interfaces
- Authentication required for backend management interfaces
- Supports error-based, UNION-based, and time-based blind injection techniques
- MySQL database backend (based on SQL syntax)

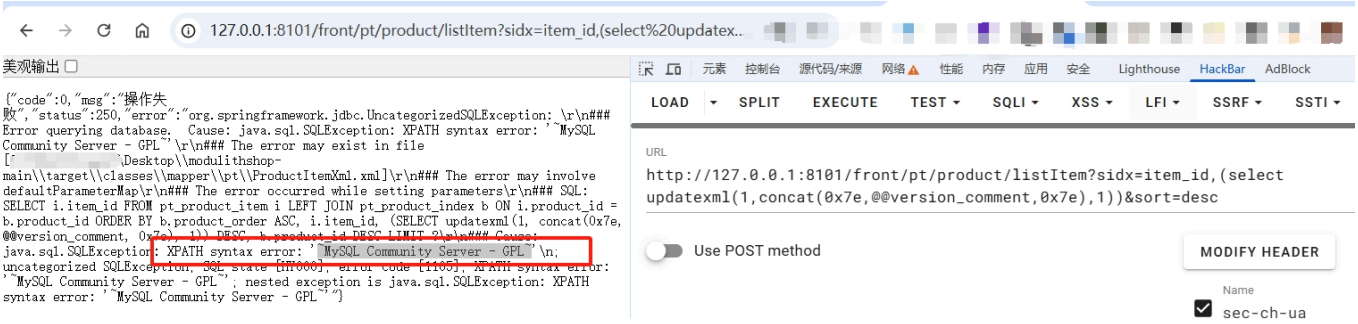
Payload Construction Format:

```
GET /front/pt/product/listItem?sidx=[SQL_INJECTION_PAYLOAD]&sort=[SORT_DIRECTION]
```

Attack Payload Examples:

Error-based SQL Injection:

```
GET /front/pt/product/listItem?sidx=item_id,(select
updatexml(1,concat(0x7e,@@version_comment,0x7e),1))&sort=desc
```



Fix Recommendations:

1. **Use Whitelist Validation**: Implement a whitelist of allowed column names for sorting
2. **Parameterized Queries**: Use MyBatis `#{}` parameter binding instead of `${}` string interpolation
3. **Input Validation**: Validate `sidx` against a predefined list of column names
4. **Sort Direction Validation**: Ensure `sort` parameter is only 'ASC' or 'DESC'
5. **SQL Filtering**: Implement a filter to remove SQL keywords from user input

Additional Security Measures:

1. Apply the same fix to all similar ORDER BY clauses in the codebase
2. Implement centralized input validation for all sorting parameters
3. Add security unit tests for SQL injection prevention
4. Consider implementing a database abstraction layer with built-in security controls
5. Conduct security code review for similar interpolation patterns in other XML mapper files

shsuishang 2 weeks ago Owner • • •

has fixed Commit `42bcb94`

shsuishang closed this as completed 2 weeks ago

Metadata

Assignees

No one assigned

Labels

No labels

Projects

No projects

Milestone

No milestone

Relationships

None yet

Development

Code with agent mode

No branches or pull requests

Participants