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Negative field length panics in DataRow.Decode #2507

✓ Closed

athuljayaram opened on Feb 19 · edited by athuljayaram

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Package: `github.com/jackc/pgproto3 v2.3.3`
File: `data_row.go:48-59`
Severity: 7.5 High
CWE: CWE-129 - Improper Validation of Array Index

Summary

`DataRow.Decode` panics with `slice bounds out of range` when a server sends a field length that is a negative int32 value (any uint32 in the range `0x80000000 - 0xFFFFFFFF`).

Root Cause

Line 48 reads the field length correctly as a signed int32:

```
go
msgSize := int(int32(binary.BigEndian.Uint32(src[rp:])))
```

The null sentinel check on the following line correctly handles -1. However, the subsequent bounds check at line 55:

```
if len(src[rp:]) < msgSize {
return &invalidMessageFormatErr{messageType: "DataRow"}
}
```

is vacuously false whenever msgSize is negative. In Go, len() always returns a non-negative integer, so len(...) < -13619152 can never be true. The guard is bypassed entirely, and execution reaches line 59:

```
dst.Values[i] = src[rp : rp+msgSize : rp+msgSize]
// panic: runtime error: slice bounds out of range [-13619152]
```

The process terminates unconditionally.

Impact

A malicious or compromised PostgreSQL server can crash any Go application using this library by sending a single crafted DataRow message. No special privilege is required — any server the client connects to can trigger this.

CVSS 3.1: AV:N/AC:L/PR:N/UI:N/S:U/C:N/I:N/A:H - 7.5 High

Fix


Add a msgSize < 0 guard between the null check and the bounds check:

```
if msgSize == -1 {
dst.Values[i] = nil
} else if msgSize < 0 || len(src[rp:]) < msgSize {
return &invalidMessageFormatErr{messageType: "DataRow"}
} else {
dst.Values[i] = src[rp : rp+msgSize : rp+msgSize]
rp += msgSize
}
```

Reference

<https://securityinfinity.com/research/memory-safety-vulnerabilities-in-go-postgresql-wire-protocol-parsers-pgproto3-pgx>



 **athuljayaram** changed the title ~~Negative field length panics in DataRow.Decode (slice bounds out of range)~~ Negative field length panics in DataRow.Decode on Feb 19



 **athuljayaram** mentioned this on Feb 19

🔗 [x/vulndb: potential Go vuln in github.com/jackc/pgproto3 golang/vulndb#4518](#)



jackc on Feb 20

Owner ⋮

The package you are referring, <https://github.com/jackc/pgproto3>, to reached end-of-life on July 1, 2025. The current version github.com/jackc/pgx/v5/pgproto3 is not vulnerable to this issue. See

[pgx/pgproto3/data_row.go](#)

Lines 48 to 59 in [0be0344](#)

```
48         // null
49         if valueLen == -1 {
50             dst.Values[i] = nil
51         } else {
52             if len(src[rp:]) < valueLen || valueLen < 0 {
53                 return &invalidMessageFormatErr{messageType: "DataRow"}
54             }
55
56             dst.Values[i] = src[rp : rp+valueLen : rp+valueLen]
57             rp += valueLen
58         }
59     }
```



athuljayaram on Feb 21 · edited by athuljayaram

Edits ▾ Author ⋮

Reported this issue only due to this

<https://github.com/jackc/pgproto3/blob/bc041643406d711f989a8f7ebe7b5a6fff2e29fe/README.md?plain=1#L7C49-L7C102>



jackc on Feb 21

Owner ⋮

Ah. Sorry. I can see now how that could be misleading. That was written 6 months before the EOL date. It was intended to be read as "only security updates will be accepted from now on up until the project is EOL".









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