



TigerBeetle

1000X WORLD TOUR

13 CITIES | 6 DAYS

Why is TigerBeetle



Videos

Sl

tigerbeetle so bad

tigerbeetle so slow

tigerbeetle so expensive

tigerbeetle so good

tigerbeetle so bad reddit

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tle
erbeetle.com

e - 1000x

actions (OLTP ...



CAPTAIN: TAKE OFF EVERY 'ZIG'././



We are so lucky to get a lectures on trade offs from a database company who's product only stores integers

7:56 AM · Nov 22, 2025

Bank Account	
Debit	Credit
1000	

Transfer:
debit_account_id: 1
credit_account_id: 2
amount: 1000

Income	
Debit	Credit
	1000

```

____.-----'-----:-----'.____
(      |      :      |      )
 \    ,;,, ,    :    \    /
  | \%%%%%\_-----:-----/~~~~~/|
 /  , \%%%%%\    |      / @*@ / , \
/_ /  ^^^^ ^^^^   |      ~~~~~~ \ _\
(@1)              |              (@1)
||-----|-----||
||-----|-----||
/_|-----|-----|_ \

```

```
$ tigerbeetle benchmark
12212 batches in 220.09 s
transfer batch size = 8189 txs
transfer batch delay = 0 us
load accepted = 454365 tx/s
batch latency p1    = 6 ms
batch latency p50   = 15 ms
batch latency p99   = 87 ms
batch latency p100  = 94 ms
```

```
$ zig/zig build vopr -Drelease -Dvopr-state-machine=testing -- 5787638273934613219  
SEED=5787638273934613219
```

```
replicas=3  
standbys=3  
clients=13  
request_probability=67/100  
idle_on_probability=17/100  
idle_off_probability=12/100  
one_way_delay_mean=40.584ms ticks  
one_way_delay_min=18.342ms ticks  
packet_loss_probability=16/100  
path_maximum_capacity=3 messages  
path_clog_duration_mean=1.407s ticks  
path_clog_probability=2/100  
packet_replay_probability=5/100  
partition_mode=uniform_size  
partition_symmetry=symmetric  
partition_probability=1/100  
unpartition_probability=7/100  
partition_stability=200 ticks  
unpartition_stability=3 ticks  
read_latency_min=26.973ms
```

```
$ cat src/vopr.zig
```

```
...
    const storage_fault_atlas: Cluster.StorageFaultAtlas.Options = .{
        .faulty_superblock = true,
        .faulty_wal_headers = replica_count > 1,
        .faulty_wal_prepares = replica_count > 1,
        .faulty_client_replies = replica_count > 1,
        // >2 instead of >1 because in R=2, a lagging replica may sync to the leading replica,
        // but then the leading replica may have the only copy of a block in the cluster.
        .faulty_grid = replica_count > 2,
    };
...
```

```
$ cat src/vsr/replica.zig
```

```
...
```

```
    // Disable all dynamic allocation from this point onwards.  
    self.static_allocator.transition_from_init_to_static();
```

```
...
```

Replica 0

Replica 2

Replica 4

Replica 1

Replica 3

Replica 5

Events:

create_account id=1

create_account id=2

create_transfer
debit_account_id=1
credit_account_id=2
amount=100

create_transfer
debit_account_id=1
credit_account_id=2
amount=150

create_transfer
debit_account_id=1
credit_account_id=2
amount=30

----- State Machine ----->

State:

account id=1
debit_amount=280
credit_amount=0

account id=2
debit_amount=0
credit_amount=280

```
class Account {
  debit_balance: number
  credit_balance: number
}

class Transfer {
  debit_account_id: number
  credit_account_id: number
  amount: number
}

class State {
  accounts: Map<number, Account>
  transfers: Array<Transfer>
}

// Mutates State in-place :)
function create_transfer(state: State, transfer: Transfer): State {
  state.transfers.append(transfer);
  state.accounts.get(transfer.debit_account_id).debit_balance += transfer.amount
  state.accounts.get(transfer.credit_account_id).credit_balance += transfer.amount
}
```

```
class Account {
  debit_balance: number
  credit_balance: number
}

class Transfer {
  debit_account_id: number
  credit_account_id: number
  amount: number
}

class State {
  accounts: Map<number, Account>
  transfers: Array<Transfer>
}

// Mutates State in-place :)
function create_transfer(state: State, transfer: Transfer): State {
  state.transfers.append(transfer);
  state.accounts.get(transfer.debit_account_id).debit_balance += transfer.amount
  state.accounts.get(transfer.credit_account_id).credit_balance += transfer.amount
}
```

Events:

create_account_v0.1 id=1

create_account_v0.1 id=2

create_transfer_v0.2
debit_account_id=1
credit_account_id=2
amount=100

create_transfer_v0.2
debit_account_id=1
credit_account_id=2
amount=150

create_transfer_v0.2
debit_account_id=1
credit_account_id=2
amount=30

----- State Machine v0.1 ----->

----- State Machine v0.2 ----->

->

State:

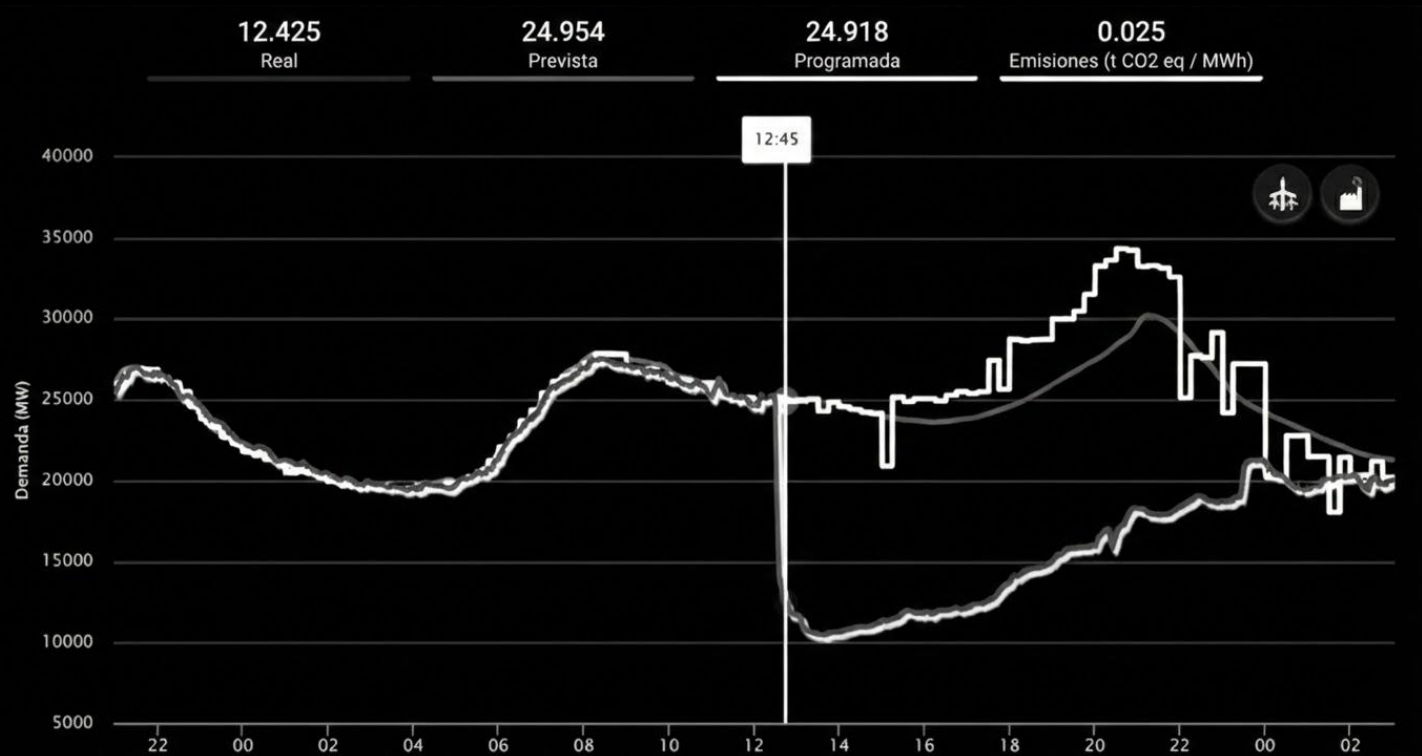
account id=1
debit_amount=280
credit_amount=0

account id=2
debit_amount=0
credit_amount=280

```
$ ssh root@machine-0  
machine-0$ systemctl stop tigerbeetle
```

...

```
$ ssh root@machine-5  
machine-5$ systemctl stop tigerbeetle
```

dmesg

```
kernel: amdgpu 0000:06:00.0: [drm] *ERROR* dc_dmub_srv_log_diagnostic_data: DMCUB error
kernel: amdgpu 0000:06:00.0: [drm] *ERROR* dc_dmub_srv_log_diagnostic_data: DMCUB error
kernel: amdgpu 0000:06:00.0: [drm] *ERROR* dc_dmub_srv_log_diagnostic_data: DMCUB error
kernel: amdgpu 0000:06:00.0: [drm] *ERROR* dc_dmub_srv_log_diagnostic_data: DMCUB error
kernel: amdgpu 0000:06:00.0: [drm] *ERROR* dc_dmub_srv_log_diagnostic_data: DMCUB error
kernel: amdgpu 0000:06:00.0: [drm] *ERROR* dc_dmub_srv_log_diagnostic_data: DMCUB error
kernel: amdgpu 0000:06:00.0: [drm] *ERROR* dc_dmub_srv_log_diagnostic_data: DMCUB error
kernel: amdgpu 0000:06:00.0: [drm] *ERROR* dc_dmub_srv_log_diagnostic_data: DMCUB error
kernel: amdgpu 0000:06:00.0: [drm] *ERROR* [CRTC:79:crtc-0] flip_done timed out
kernel: [drm:amdgpu_dm_atomic_check [amdgpu]] *ERROR* [CRTC:79:crtc-0] hw_done or flip_done timed out
kernel: amdgpu 0000:06:00.0: [drm] *ERROR* flip_done timed out
kernel: amdgpu 0000:06:00.0: [drm] *ERROR* [CRTC:79:crtc-0] commit wait timed out
```



Events:

create_account_v0.1 id=1

create_account_v0.1 id=2

upgrade from=v0.1 to=v0.2

create_transfer_v0.2
debit_account_id=1
credit_account_id=2
amount=100

create_transfer_v0.2
debit_account_id=1
credit_account_id=2
amount=150

create_transfer_v0.2
debit_account_id=1
credit_account_id=2
amount=30

----- State Machine v0.1 ----->

----- State Machine v0.2 ----->

->

State:

account id=1
debit_amount=280
credit_amount=0

account id=2
debit_amount=0
credit_amount=280

```
$ curl -Lo tigerbeetle.zip https://linux.tigerbeetle.com && unzip tigerbeetle.zip
Archive:  tigerbeetle.zip
  inflating: tigerbeetle
```

```
$ curl -Lo tigerbeetle.zip https://mac.tigerbeetle.com && unzip tigerbeetle.zip
Archive:  tigerbeetle.zip
  inflating: tigerbeetle
```

```
> curl.exe -Lo tigerbeetle.zip https://windows.tigerbeetle.com; Expand-Archive tigerbeetle.zip .
Archive:  tigerbeetle.zip
  inflating: tigerbeetle.exe
```

```
$ binwalk tigerbeetle
```

```
/home/user/tigerbeetle
```

DECIMAL	HEXADECIMAL	DESCRIPTION
0	0x0	ELF binary, 64-bit executable
4092789	0x3E7375	ELF binary, 64-bit executable
8161925	0x7C8A85	ELF binary, 64-bit executable
12265853	0xBB297D	ELF binary, 64-bit executable
16367621	0xF9C005	ELF binary, 64-bit executable

```
Analyzed 1 file for 85 file signatures (187 magic patterns) in 126.0 milliseconds
```

```
# uname -a
```

```
Linux laptop 6.16.9-arch1-1 #1 SMP PREEMPT_DYNAMIC Thu, 25 Sep 2025 17:17:24 +0000 x86_64 GNU/Linux
```

```
# uname -a
```

```
Darwin MacBook-Pro 23.5.0 Darwin Kernel Version 23.5.0:
```

```
Fri Mar 15 00:23:12 PST 2024; root:xnu-10002.121.3~2/RELEASE_ARM64_T6000 arm64
```

```
# ver
```

```
Microsoft Windows [Version 10.0.22631.3593]
```

```
$ clamscan -r /home/user/downloads/
```

```
/home/user/downloads/tigerbeetle.exe: Win.Trojan.Generic-1234567 FOUND
```

```
----- SCAN SUMMARY -----
```

```
Known viruses: 8723641
```

```
Engine version: 1.2.1
```

```
Scanned directories: 12
```

```
Scanned files: 57
```

```
Infected files: 2
```

```
Data scanned: 22.11 MB
```

```
Data read: 23.80 MB (ratio 0.93:1)
```

```
Time: 9.337 sec (0 m 9 s)
```

```
$ ldd tigerbeetle-launcher
    linux-vdso.so.1 (0x0000740410e2f000)
    tigerbeetle.so.40 => /usr/lib/tigerbeetle.so.40 (0x0000740410dbb000)
    tigerbeetle.so.39 => /usr/lib/tigerbeetle.so.39 (0x0000740410dbb000)
```

```
const tigerbeetle_40_binary = @embedFile("tigerbeetle-40");
```

```
...
```

```
try shell.cwd.writeFile({  
  .sub_path = "/tmp/tigerbeetle_40",  
  .data = tigerbeetle_40_binary,  
});
```

```
// Use objcopy to add in our new body, as well as its header - even though the
// header is still zero!
```

```
try shell.exec(
    \\{llvm_objcopy} --enable-deterministic-archives --keep-undefined
    \\
    \\    --add-section .tb_mvb={body}
    \\    --set-section-flags .tb_mvb=contents,noload,readonly
    \\
    \\    --add-section .tb_mvh={header_zero}
    \\    --set-section-flags .tb_mvh=contents,noload,readonly
    \\
    \\    {working}
, .{
    .llvm_objcopy = options.llvm_objcopy,
    .body = sections.body,
    .header_zero = sections.header_zero,
    .working = tigerbeetle_working,
});
```



```
$ xxd any-modern.exe
```

```
00000000: 4d5a 7800 0100 0000 0400 0000 0000 0000 0000 0000 MZx.....
00000014: 0000 0000 4000 0000 0000 0000 0000 0000 0000 0000 ....@.....
00000028: 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 .....
0000003c: 7800 0000 0e1f ba0e 00b4 09cd 21b8 014c cd21 5468 x.....!..L.!Th
00000050: 6973 2070 726f 6772 616d 2063 616e 6e6f 7420 6265 is program cannot be
00000064: 2072 756e 2069 6e20 444f 5320 6d6f 6465 2e24 0000 run in DOS mode.$..
00000078: 5045 0000 6486 0800 04ad b4c6 0000 0000 0000 0000 PE..d.....
```

> Load commands

>> Segment load command

>>> Segment number and section numbers

>> Link libraries

>>> Link library ordinal numbers

>> __LINKEDIT symbol table

>>> Symbol table organization

>> __LINKEDIT Symbol table information

>>> Indirect table

>> __LINKEDIT Compressed table

>>> Binding information

>> Application main entry point

>> Application UUID number

>> Minimum OS version



Mach-O Universal Header

Offset	Bytes	Description
0	4	Magic Number
4	4	Number of binaries

Mach-O Universal File Entries

Offset	Bytes	Description
0	4	CPU Type
4	4	CPU Subtype
8	4	File Offset
12	4	Size
16	4	Alignment



```
$ file tigerbeetle
```

```
tigerbeetle: Mach-O universal binary with 6 architectures:
```

```
    [arm64:\012- Mach-O 64-bit arm64 executable,
```

```
flags:<NOUNDEFS|DYLDLINK|TWOLEVEL|NO_REEXPORTED_DYLIBS|PIE|HAS_TLV_DESCRIPTOR  
S>]
```

```
    [\012- x86_64:\012- Mach-O 64-bit x86_64 executable,
```

```
flags:<NOUNDEFS|DYLDLINK|TWOLEVEL|WEAK_DEFINES|BINDS_TO_WEAK|NO_REEXPORTED_DY  
LIBS|PIE|HAS_TLV_DESCRIPTOR>]
```

```
    [\012- vax]
```

```
    [\012- romp]
```

```
    [\012- ns32032]
```

```
    [\012- ns32332]
```



```
$ man proxytunnel
```

```
...
```

BUGS

This software is bug-free, at least we'd like to think so. If you do not agree with us, please provide the proof with your friendly report at <https://github.com/proxytunnel/proxytunnel/issues> :)

```
...
```

```
$ man 3 read
```

SYNOPSIS

```
ssize_t read(int fildes, void *buf, size_t nbyte);
```

The value returned may be less than nbyte if the number of bytes left in the file is less than nbyte, if the read() request was interrupted by a signal, or if the file is a pipe or FIFO or special file and has fewer than nbyte bytes immediately available for reading.

```
$ cat main.zig
pub fn main() !void {
    _ = multiply(128, 2);
}

pub fn multiply(a: u8, b: u8) u8 {
    return a * b;
}

$ zig run main.zig
thread 464530 panic: integer overflow
/tmp/main.zig:6:14: 0x113e8b4 in multiply (main.zig)
    return a * b;
           ^
/tmp/main.zig:2:16: 0x113d370 in main (main.zig)
    _ = multiply(128, 2);
           ^
```

```
$ cat ~/lessons
```

- * drop down a level of abstraction
- * use existing guarantees
- * problems lie at the edges, always
- * simplicity for the user

