



Proposal: 2nd VerifyThis Long-term Challenge

presented at ETAPS 2023, Gidon Ernst (LMU Munich), Alexander Weigl (KIT)

- Website: <https://verifythis.github.io/>
Mailing List: <https://www.lists.kit.edu/sympa/info/verifythis-ltc>
Reference: <http://memcached.org/>

VerifyThis Long-Term Challenges

- complement short on-site competition events
- demonstrate practical potential of formal methods

Previously

- 1st Long-term Challenge: Hagrid keyserver (2020)
- Casino challenge: smart contract (2021)

2nd Challenge Wishlist (from discussions)

- collaborative: opportunities to share ideas & artifacts
 - “real-world”: can we produce working verified code?
 - easy start + technically deep follow-up
 - high-level view system’s view (protocols, ...)
 - low-level algorithms and data structures
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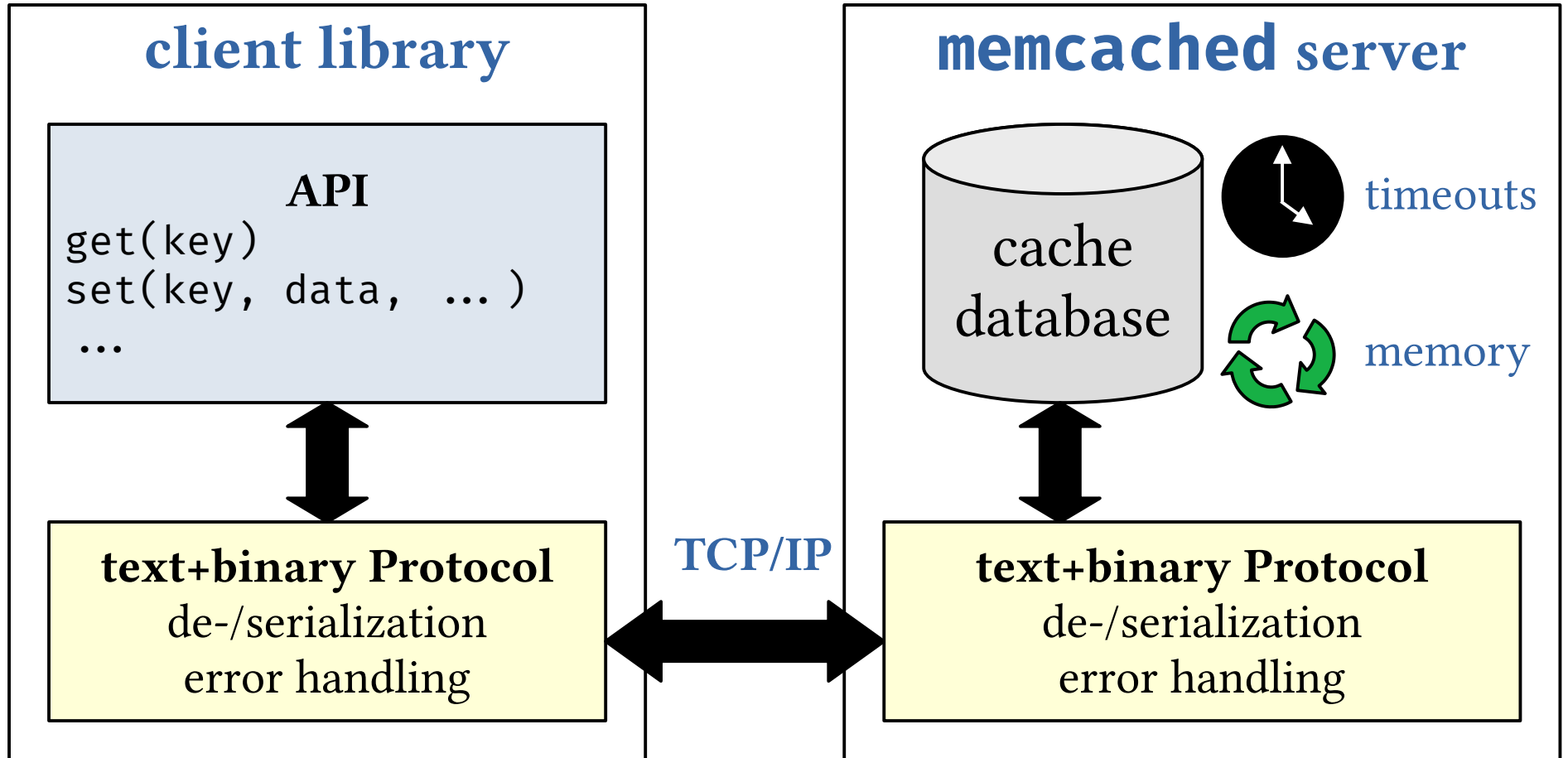
2nd Challenge

- ✓ collaborative
- ✓ “real-world”



- ✓ easy start + technically deep follow-up
- ✓ high-level view system's view (protocols, ...)
- ✓ low-level algorithms and data structures

Target: memcached



Memcached: Example Interaction

simple text-based connection

Command

```
$ telnet localhost 11211  
get foo
```

key

Response

```
VALUE foo 0 2  
hi  
END
```

data length

data

flags

memcached: Key-Value Cache

- few operations: get, set, replace, cas, ...
- interfaced via telnet or client APIs
- Map<Key, Entry> + glue code = drop-in replacement
<https://github.com/gernst/pycached>
<https://github.com/wadoon/bloatcache>
- lots of challenges: cache timeout + eviction, hash tables, parsing + serializing, OS integration, SLAB memory management, concurrency, load balancing proxy, API specifications, performance modeling

Participation, Timeline

Participate

- announce team + tools on mailing list
- actively reach out for collaboration

Planned Events

- informal meeting, e.g. at iFM Nov. 2023 and/or online
- workshop at ETAPS 2024
- ISoLA track 2024 + follow-up special issue (e.g. STTT CoCha)