Introducing mCaptcha

No-nonsense, privacy-focused CAPTCHA system with seamless UX

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mcaptcha.org

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Overview

1) How does it work?
   1.1) Proof of work based rate limiting
   1.2) Variable difficulty Proof of work
   1.2) Performance and Protection Scope
2) Accessibility
3) Privacy
4) Reasons for not choosing mCaptcha

How does it work?

PoW based rate limiting

- Make the user do more work to send the request than the work the server needs to do to serve the request

  Generating proof[1]: `50,000 x hash()`
  Verifying proof: `1 x hash()`

- Fully transparant process:
  i. mCaptcha sends PoW[2] challenge to user
  ii. user generates PoW with challenge and sends PoW to mCaptcha
  iii. mCaptcha verifies proof; if valid: send access token else: deny access
  iv. Access token is send to client server(ex: codeberg.org)
  v. client server verifies authenticity of access token with mCaptcha

[1]: 50,000 hashes is an approximation, reality might be significantly higher.
[2]: Pow is short for Proof of Work

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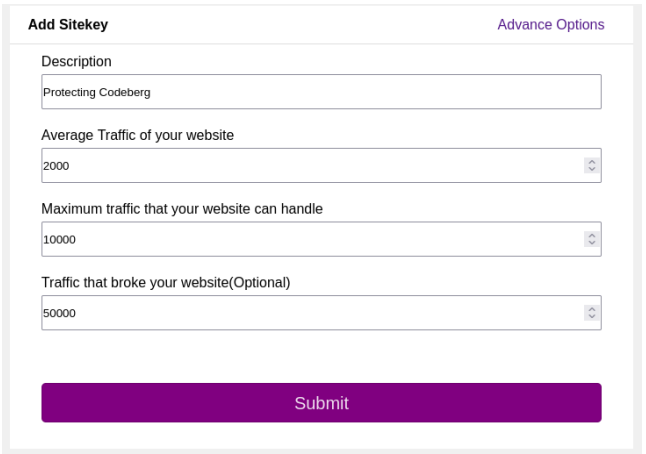
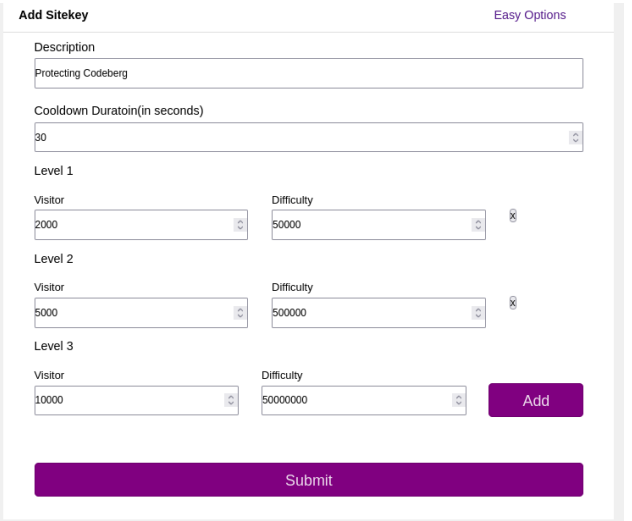
Variable difficulty Proof of work

(or how mCaptcha ups the ante when under attack)

- Difficulty factor increases when under attack, i.e, when number of requests increases in given time





Difficulty factor is configured based on a website statistics in easy and advance modes.

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Performance and Protection Scope

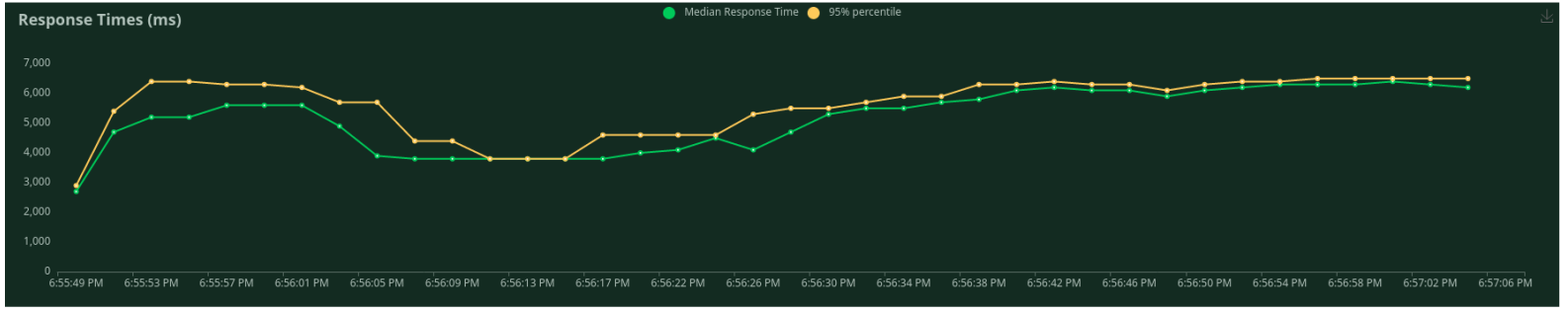
- Effective against DDoS attacks
- Doesn’t detect spam

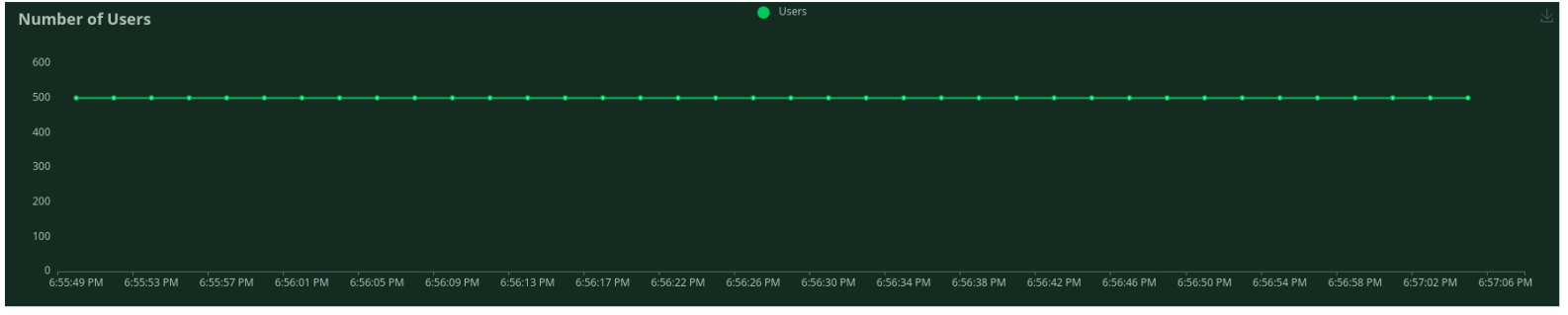
Performance and Protection Scope: Benchmark

- demo-server is a demo implementation with two endpoints that do the exact same thing: process and register a user but differ in the fact the one of them(/protected) is protected by mCaptcha.

- DDoS Benchmarks source code is available at: https://github.com/mCaptcha/dos

Benchmark: unprotected endpoint stats





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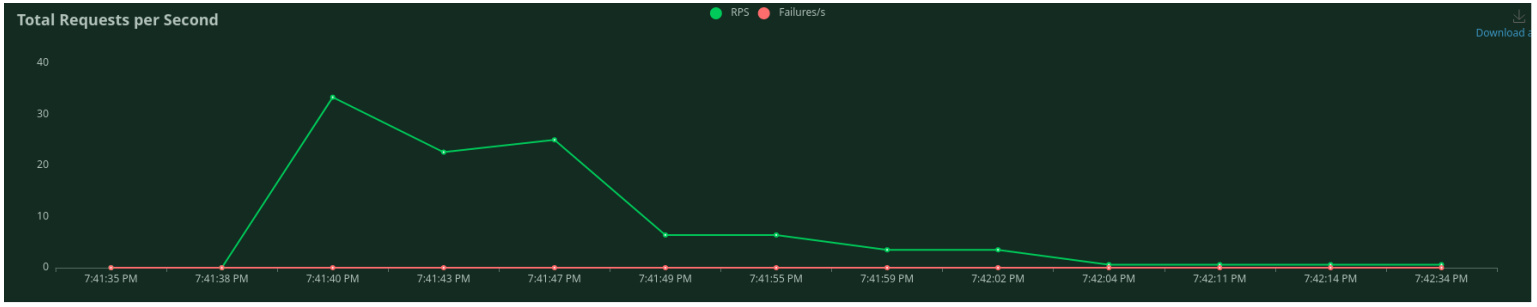
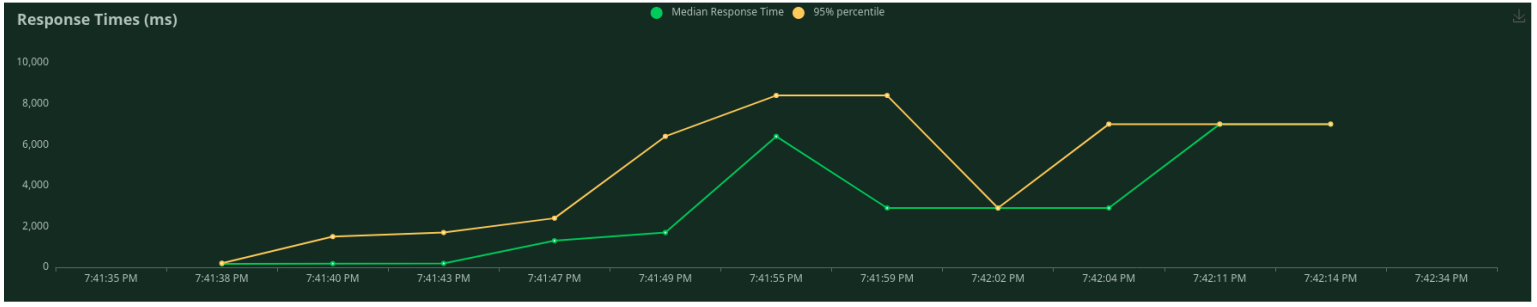
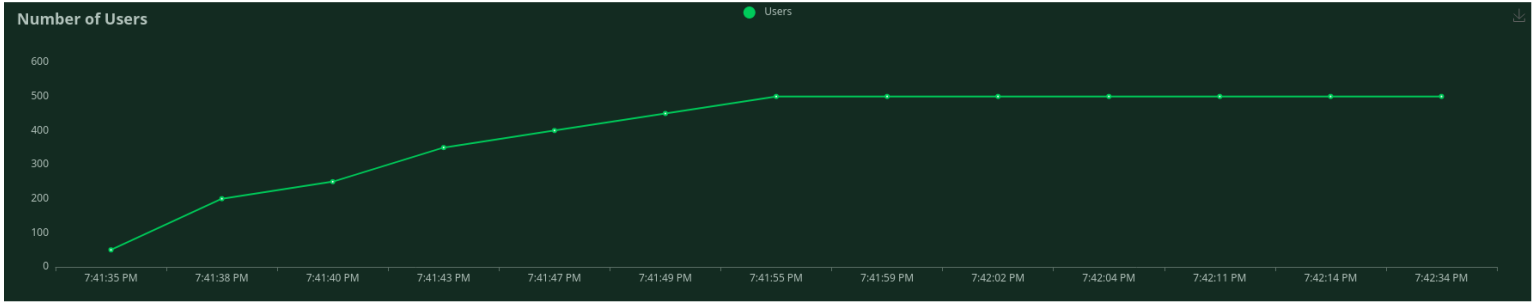
Benchmark: protected endpoint stats







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Accessibility

PROS

- All validation happens at the a click of a button. No images, no text and no audio.

CONS

- Hasn’t been audited for accessibility
- Older, slow devices may fail validation. Can be mitigated by expert configuration but might still happen. survey.mcaptcha.org is WIP, should help admins when data is available.

Privacy

- No cookies
- IP is not logged; IP rate-limiting
- Works in Tor
- All JavaScript executed(and full project) is Free Software

Reasons for not choosing mCaptcha

- Single-person project
- Hasn’t been audited
- Doesn’t protect against spam

Resources

- Homepage: https://mcaptcha.org
- Source code: https://github.com/mCaptcha
- Matrix space: https://matrix.to/#/#mcaptcha:matrix.batsense.net
- Fediverse: @mCaptcha@batsense.net